

PROJECT APPLESEED

BECOMING RIFLEMEN

A Do-It-Yourself Manual

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*In 1843, 91-year-old Capt. Levi Preston was asked by a young historian why he had fought on **April 19th, 1775***

"Was it the Stamp Act, the Tea Act, perhaps the treatises of John Locke?, " asked the historian.

"No, sirree," the captain countered. He had not seen any stamps, sipped any tea, or read anything other than the Bible, the catechism, and Watts's Psalms.

*The old man's mind drifted generations into the past, where he relived his memory of **April 19th, 1775**. Captain Preston sees his neighbors, his family, his town in arms. Everything they love, put in risk of failure. Muster alarms and church bells resonating in warning. Smells of smoke in the morning mist. Once again, he felt his heart of fire travel down to warm his cold gut.*

He lingered there for a long moment, considered carefully; and then replied with steadfast simplicity and precision.

*"What we meant in going for those Redcoats was this: we always had been free, and we meant to be **always free**. They didn't mean we should."*

Part I

THE RIFLEMAN

The Rifleman is a person capable of hitting 20 inch targets from 500 meters with standard, rack grade equipment and ammunition. The Rifleman does not rely on special equipment for excellent marksmanship, but on true skill and knowledge. Riflemen can hit any target they see.

Being able to hit multiple targets in rapid fire at 500m is skill unique to the Rifleman. Being able to hit at 500m maximizes one's effectiveness while minimizing one's risk. Most adversaries can only consistently hit targets at 300m and closer. By being beyond 300m, the Rifleman is a little safer yet very effective.

The intention of this pamphlet is to offer the information to equip average individuals with the fundamental skills and knowledge to become expert Riflemen.

Choosing a Rifle

For our purposes, caliber and rate of fire are the elements which need most consideration when choosing a rifle. Modern military-type rifles are preferred as they are often plentiful, cheap, auto loading (semi-automatic) and proven. Since we plan on being competent with targets at 500 meters, we need a caliber consistently capable of hitting these targets.

For this reason, the 7.62x51 nato (.308 winchester), 30.06 springfield or 7.62x54r are preferred over smaller or more unstable calibers. The other common calibers are 5.56 nato (.223 winchester) or the 7.62x39. These are inferior because they are not *as* effective at longer ranges. Of course, it can be done. Use what you have.

The 7.62x51 caliber is a nato standardized round for current state armies. Surplus ammunition is generally available if searched for. There are several options for rifles in this caliber.

The best option is the M1A. The M1A is the semi-automatic version of the U.S. Military's short lived M14. The M1A offers supreme accuracy, excellent sights, and a 20 round magazine.

Another option is a FN/FAL type battle rifle. These are excellent rifles and are standard issue for many armies. These are quite a bit cheaper in price than the M1A, making it more accessible. The sighting system, however, is not quite as simple or perfected as the M1A.

The AR-10 is another option, though often pricey as it has not been a military standard issue rifle. It is essentially an AR15 (more about below) chambered in 7.62x51.

The 30.06 Springfield caliber is also ideal for the Rifleman, commonly known for its use in the M1 Garand. The M1 Garand is the predecessor to the M14/M1A. They are virtually the same except for specific caliber and bullet capacity. The M1 Garand is more widely available than the M1A and can be cheaper. WWII surplus rifles are being sold through the Civilian Marksmanship Program (for U.S. Citizens) for as low as \$495, though be careful to buy a good one.

All of the above rifles are excellent choices for the Rifleman.

The 7.62x54R (7.62 Russian) can be used primarily in the Mosin Nagant rifle. This magazine fed bolt action rifle is excellent for accuracy and is quite inexpensive (Can be found for around \$80). This rifle is an excellent choice for the Rifleman on a budget.

Also check out the British Enfield and the German Mauser as inexpensive and accurate bolt action rifles.

Other calibers: 5.56 nato (.223 winchester) and 7.62x39

Known as "the black rifle" the AR15 is the civilian semiautomatic version of the U.S. military's current issue M16/M4. The AR15 is extremely versatile and common, manufactured by many companies and individuals. Generally, two sizes are available for consideration: 16 inch barrel and a 20 inch barrel. The 16 inch barrel is designed for heavier, more expensive ammunition and close quarter fighting. The 20 inch barrel is generally better for longer range targets and standard ammunition. The 16 inch barreled AR15 is a carbine. The 20 inch barreled AR15 is a *rifle*.

Surplus ammunition is generally found in two bullet weights: 55 grains and 62 grains. A 20" barrel with a 1:9 twist is a "one size fits all" option. For the Rifleman, choose a 20" barrel with a 1:9 twist and find military 62 grain bullets. If you have a different configuration, that's okay. Use it.

While this rifle is common and culturally popular, it is not *ideal* for Rifleman-type shooting. Despite its light caliber, it can however be very effective. It is still a very good option.

The 7.62x39 caliber is mainly used in an AK47 or SKS. The infamous AK47 is popular, plentiful, and full of cultural associations. Ammunition is plentiful and cheap. While mechanistically reliable, it is not reliable to hit targets beyond 300 meters. Avoid if possible, buy if necessary.

Cousin to the AK47 is the SKS. Designed by the Soviets for closer engagements than the 7.62 Russian caliber, the SKS is also effective to around 300 meters, though can be stretched further. Avoid if possible, buy if necessary.

In the end, equipment is subordinate to knowledge and skill. A Rifleman can take up any rifle and be accurate. It is preferred that a Rifleman has one rifle. This ensures that they will know their rifle most intimately and will not have a “collector” mentality. To the Rifleman, shooting is a necessary skill; Riflemanship not sport or commodity. It is not done for competition nor can it be bought or sold.

Part II

TECHNIQUE

Technique is a combination of knowledge of concepts and physical skill.

The Rifleman fires from three main field positions: prone, sitting and standing. Each position has its practical applications based on distance of target, terrain, and time for preparation. Each position is designed to minimize the use of muscles. Muscles become tired and thus unstable. Therefore the use of muscle is contrary to achieving steady aim.

These positions are built with bone as the main support mechanism. In addition to "bone to bone" support, proper sling use is essential to the Rifleman. The sling is much more than a carrying tool. The sling is primarily to be used as a shooting tool. When in proper use the sling will steady the rifle and greatly improve accuracy. Ideally, the Rifleman will obtain a U.S.G.I Web Sling.

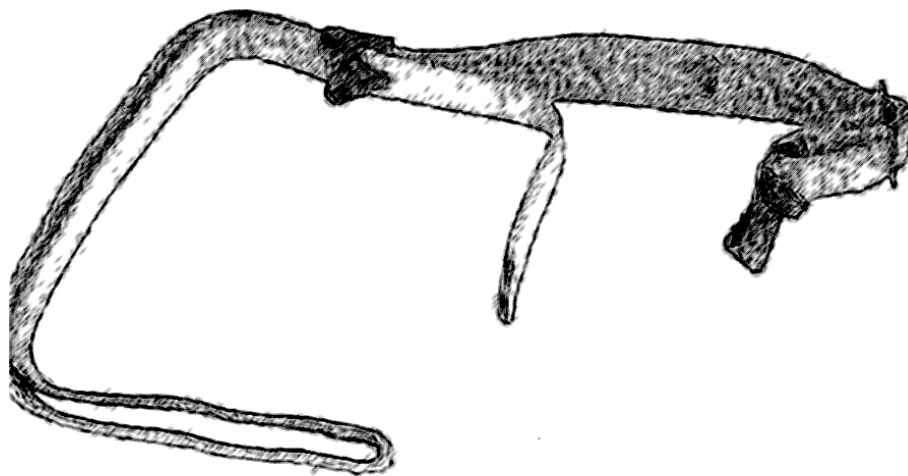


Figure 1. U.S.G.I. Web Sling

Above is a U.S.G.I. Web Sling. The left side of the above pictured sling connects through the uppersling swivel of the rifle. The right side of the above pictured sling connects via hook to the bottom sling swivel. If you need to attach sling swivels to your rifle, make sure you use 1.25" swivels.

In a pinch, create a sling out of a piece of rope, belt, or whatever. If you do not have sling swivels, fashion something out of zip ties, duct tape and wire. There is no excuse for not using a sling. The "loop sling" configuration may be difficult to do without a proper G.I. web sling. Look ahead and use the "hasty sling" for the positions. The serious shooter will find a way to either obtain a U.S.G.I. Web Sling or they will make one.

The U.S.G.I. Web Sling is useful in two main configurations: Hasty Sling and Loop Sling. The Loop Sling configuration connects the rifle to the Rifleman, solidifying them into a single unit. The sling remains connected to the forward swivel and is attached to the shooter's support arm.

The following diagrams show a right handed shooter. Left-handed shooters will do the opposite. For a Right-handed shooter, the "support side" is the left side of their body. The "Trigger Side" is the right side of their body. Left-handed shooters are the opposite.



Figure 2. Detach U.S.G.I Web Sling from Lower Sling Swivel.

To get "slung up" a Rifleman will detach the sling from the lower swivel (the swivel on the butt stock).

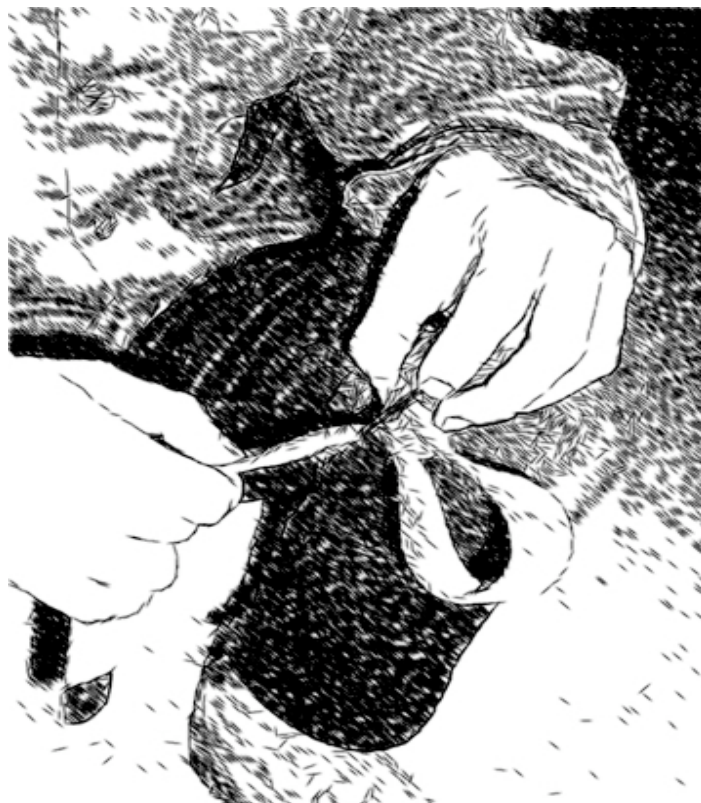


Figure 3. Creating The Loop

Grabbing the main line of the sling, push back into the lower buckle. There is only one way to do this correctly. Make sure the loop that is created is formed with the same length of sling that makes up the main line. The main line of the sling is the section that stretches above the lower buckle to the upper buckle.



Figure 4. Putting the loop on the support arm.

The loop is created by feeding the main line into the buckle. Insert your support hand down through the loop. Work the loop up onto your shoulder. The loop should be as high up on the shoulder as possible, above the bicep. The hardware of the lower swivel clip should be on the outside of your arm. At this point, there are two possible ways the sling has been put on. Only one way is correct.



Figure 5. If the hardware is between the mainline and the arm, the sling is on incorrectly.

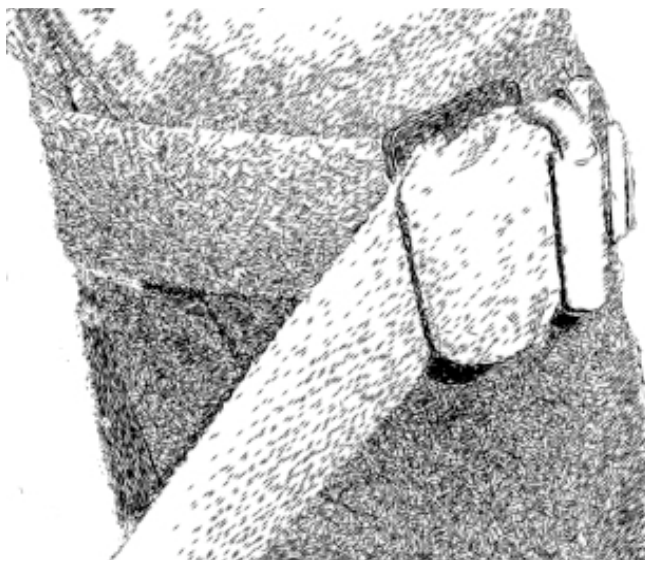


Figure 6. If the loop tightens when the main line is pulled and the hardware is on the outside of the arm, the sling is on correctly.

Thick clothing, or a U.S. Marine Corps shooting jacket will help keep the loop from slipping down your arm. The loop sling is the preferred configuration for the Rifleman. It should be used in the prone and sitting position.

The Prone Position

The prone position is the most stable position. It is the most stable position as it allows the most contact with the ground and involves no muscle for support.



Figure 7. Trigger Side



Figure 8. Support Side

The prone position is made stable by its **Steady Hold Factors**. These are individual elements that construct a stable position.

Steady Hold Factors are as follows:

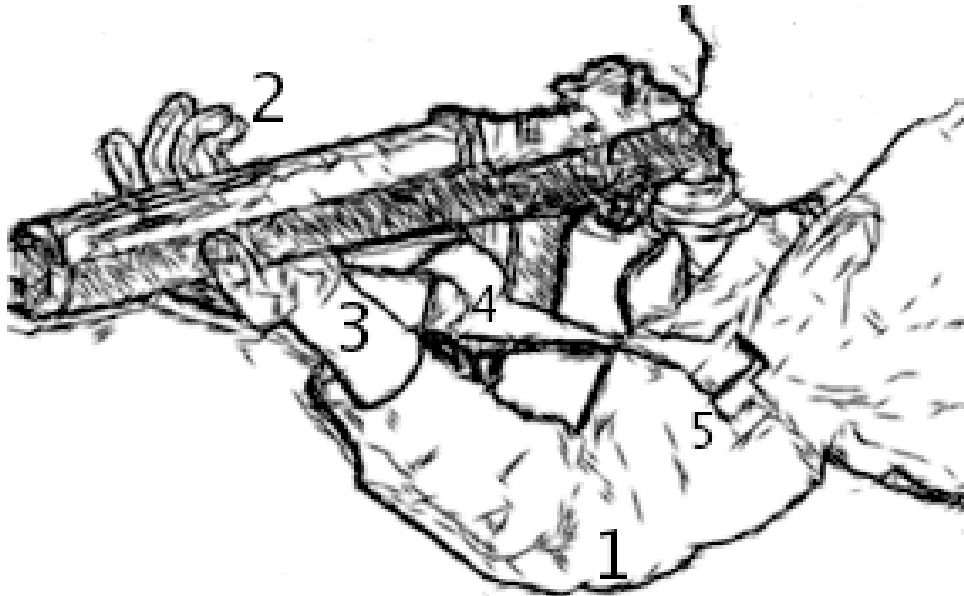


Figure 9. Steady Hold Factors 1-5.

1. Support Elbow Under the Rifle
2. Support Hand Relaxed
3. Sling Behind Support Wrist
4. Sling is Snug
5. Sling Well Up on Support Arm

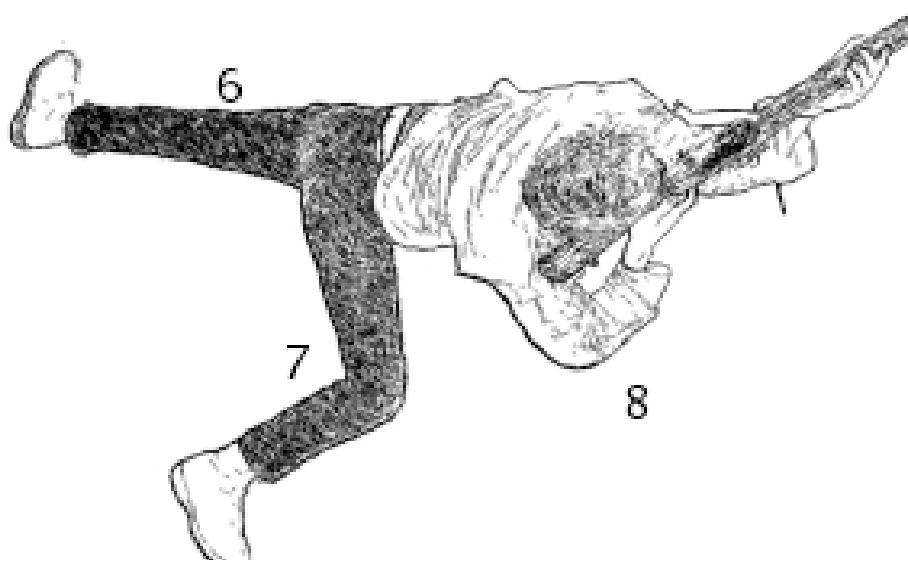


Figure 10. Steady Hold Factors 6-8.

6. Support Side Leg in Line With Spine
7. Trigger Side Leg Bent at Knee
8. Trigger Side Elbow Planted Firmly

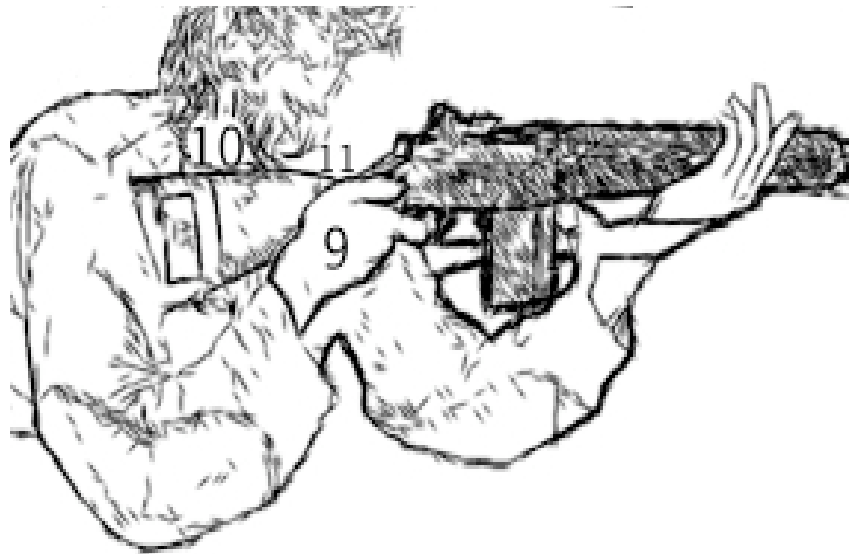


Figure 11. Steady Hold Factors 9-11.

- 9. Trigger Hand Firm "Handshake"
- 10. Neck Extended (Turkey Neck)
- 11. Cheek Planted on Stock (Cheek Weld)

Steady Hold Factors for Prone – Explained

Each steady hold factor serves a specific purpose towards building a successful prone position. The reasons are:

1. Support Elbow Under the Rifle

The support elbow should be directly under the rifle. This is for at least two reasons. First, when the elbow is under the rifle muscles are not being used. If the elbow is to the side of the rifle, muscles are being used to hold the rifle up. When the elbow is under, the rifle rests on the bone of the hand and is supported by the forearm bone which is in contact with the ground at the elbow. No muscles are needed.

You will be able to tell if your elbow is not under the rifle when: Your sights move diagonally or horizontally when you breathe in and out. Your sights should move vertically when you breathe. This is accomplished by making sure the elbow is under the rifle.

Some may claim it is not possible due to a magazine being in the way. Experiment with how your rifle rests on your hand by moving the rifle over onto your fingers or onto the pads opposite your knuckles. Angling your body at a 30 degree angle to the right of the target will help to position your elbow underneath the rifle.

2. Support Hand Relaxed

The support hand should be relaxed. It should not grip the rifle. Remember, the point is to be relaxed to remove muscle from the position. Gripping introduces muscle. Keep your hand relaxed.

If possible, slide your support hand up the stock and against the sling swivel. This gives you a consistent place to put your hand and is less likely to be knocked around by recoil. If you cannot reach your sling swivel while keeping your forearm at a 60° angle to the ground, create a stop with duct tape and empty shell casings.

3. Sling Behind Support Wrist

The sling should pass behind the support hand. This increases support and stability by connecting the body with the ground (through the elbow) to the rifle.

4. Sling is Snug

The sling should be snug and not tight. If it is loose it is not doing anything. The point of the sling is to create a bridge truss, keeping your support arm in a stable and consistent position. When one "relaxes into the sling," one is releasing muscle tension and allowing the sling to hold the rifle up. The sling holds the support forearm at 60° or greater angle from the ground.

5. Sling Well Up on Support Arm

The loop of your sling should be well up on your support arm. This is above your bicep. If it is high on the arm, it should not be over muscle. This will decrease the effect your heart rate will have on your position. Thick clothing or a U.S. Marine Corps shooting jacket will help keep your sling high on your arm. Do not let the sling cut off circulation to your arm. T-shirts or loose fitting clothing do not work well for keeping the loop in position.

The sling should stay roughly parallel to the ground. It will leave the loop on your arm pass behind the wrist and connect to the sling swivel all while being parallel to the ground. The hard ware of the sling should be on the outside of your arm. The sling should tighten when the main line is pulled.

6. Support Side Leg in Line With Spine

Your support leg should be straight in line with your spine. Your support foot should be as flat as possible. Your toe should not dig into the ground. Point your toe in or out, but do not dig in. Dug in, your foot will move, affecting your sights.

7. Trigger Side Leg Bent at Knee

Your trigger side leg should be bent at the knee in a roughly 90 degree angle. The higher you can stretch your leg, the better. Some flexible people can meet their trigger knee with their trigger elbow. This is an extreme, but it demonstrates the point. This helps to absorb recoil and lift your diaphragm off the ground to keep breathing from affecting your sights.

8. Trigger Side Elbow Planted Firmly

Your trigger elbow should not be relied upon to hold you up. It simply is rested on the ground to allow your trigger finger to function without strain. However, it should be planted firmly in order to not be knocked out of position by recoil.

9. Trigger Hand Firm "Handshake"

The trigger hand should not grip the rifle like a garden tool. A light, yet firm handshake grip is sufficient. The trigger hand should pull the rifle into the pocket of the shoulder. Contact with the stock should be minimal, yet solid. Move the thumb to the trigger side of the stock. It does not need to wrap around the back. Middle, ring and pinky fingers come into contact with the pistol grip only at the fingertip. This leaves a space between the palm and the pistol grip.

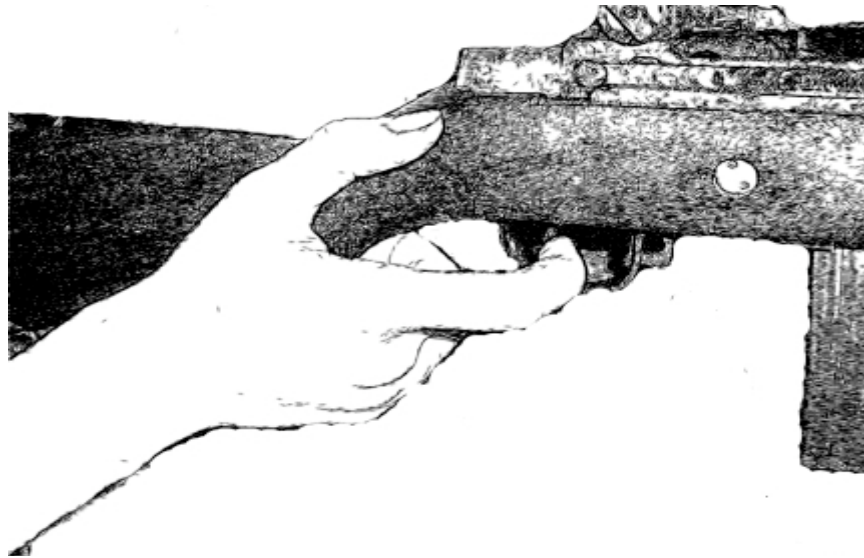


Figure 12. The Trigger Hand

The trigger finger should not touch the stock. Instead, it should be bent in a "C" shape, leaving an air gap between the finger and the stock. When the trigger finger touches the stock, shots tend to drag in a sideways direction. This is called "dragging wood." Contact with the trigger should be with the tip of the trigger finger, or the middle of the first pad of the finger. The trigger should be squeezed straight back. Nothing in your position should move while taking the shot except for the tip of your finger.

10. Neck Extended (Turkey Neck)

The neck should extend as far as possible. This develops a consistent sight picture. Consistency in form is key if one is to be consistently accurate. If the neck is extended to different lengths, a consistent sight picture is impossible. However, if it is extended as far as it will go, it will always be consistent. This is called a "turkey neck." If done correctly, recoil will not hurt your face. This is because your neck is fully extended, recoil will push back your shoulder and your extended neck will follow, moving with the rifle.

AR15 shooters will want to put their nose on the charging handle. Don't worry, it won't hurt you as you will move with the recoil.

11. Cheek Planted on Stock (Cheek Weld)

When the neck is extended fully, plant your cheek on the stock. This solidifies the cheek weld. Your eyes should be level with the sights. If not, one might need to build up the stock with materials. Long limbed shooters will need to build up their stocks to produce a good cheek weld. Cloth and duct tape work well. If eyes are still not in line with the sights, adjust your position so the angle of your body is more or less extreme to the target.

Other Points on the Prone Position

The shooter lies at a 30 degree angle to the target. The support leg and spine are not parallel with the rifle barrel. The 30 degree angle helps one get their elbow under the rifle, absorb recoil and altogether build a stable position.

A common error of new shooters in the prone position is improper use of the sling. While it may be worn correctly, it must be *used*. This means your weight must be supported by the sling. Also, the rifle must be held up by the sling/forearm system. Commonly, shooters lie too flat for the sling to be effective. Scrunch your body to be slightly shorter, decreasing the distance between your support elbow and your hips. This will increase the angle of your forearm to the ground. Remember, it should be at a 60 degree angle to the ground. An upside down equilateral triangle should form; The sling forms the top, parallel to the ground. The forearm and your lower arm form the other two sides.

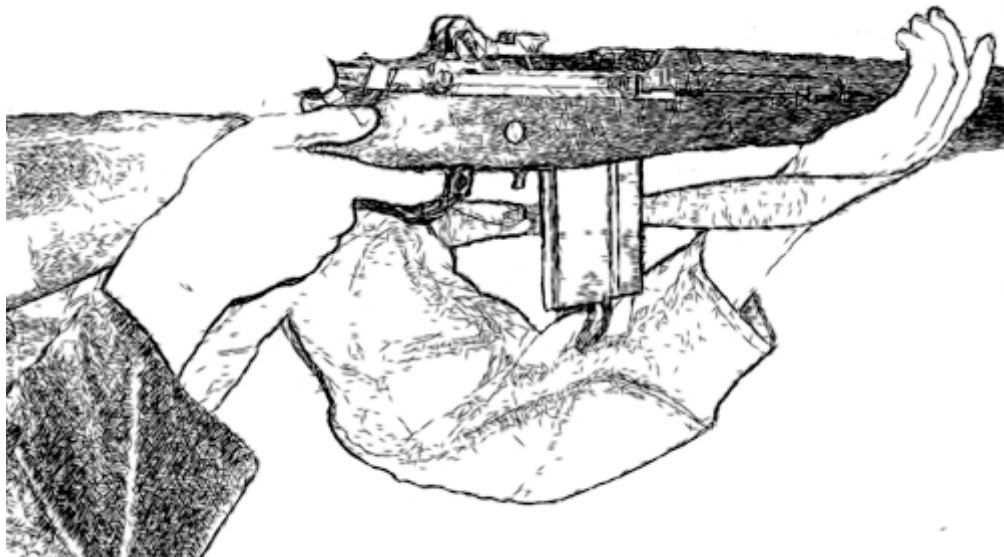


Figure 13. The Support Arm Triangle

Important: *Once in position, never move your support elbow! You'll find out why later.*

Natural Point of Aim (NPOA)

Once a proper position is built, the shooter has the foundation for good shooting. However, the concept of Natural Point of Aim must be understood to make full use of a proper position.

Natural Point of Aim (NPOA) is a concept that must be understood if one intends to master Rifleman-type shooting. First, a semi-fictional story to relate the known to the unknown.

Early cannons were simple contraptions. Imagine a barrel lain across a rope. The heavy cannon barrel would sag down and settle in the middle of the rope. It would rest there naturally. Time came for some target shooting. The cannoneers approached the cannon, deciding they needed to aim a little bit to the right in order to hit the target. The solutions seemed simple. One cannoneer went around front and pushed the barrel of the cannon over to the right until it was pointed in the correct direction, on target.

Once pointed in the right direction, the cannoneer in the rear lit the cannon. BOOM! The cannon leaped out of aim. It moved back to the middle of the rope. It moved to where it wanted to naturally lie. It moved back to its natural point of aim. Of course, the cannon missed its target. The cannoneers have learned the importance of natural point of aim.

The cannoneers got smart. They rebuilt the cannon carriage. Instead of a rope, they fixed the barrel to a solid wooden foundation. When aiming, they moved the entire cannon carriage. Now every time they fired, the cannon would hit its mark as it was always in its natural point of aim.

NPOA is the place where you and your rifle point naturally. Naturally means without muscle and a relaxed body. The cannon resting at the bottom of the rope is in natural point of aim. However, natural point of aim is not always on target. Therefore, a cannon carriage was invented to shift the barrel/carriage contraption as one.

As a Rifleman, one must become a cannon carriage. This is the purpose of the prone position. The prone position is essentially the cannon carriage, and the rifle: the cannon.

Finding Natural Point of Aim

To find your NPOA, sling up, get into position and follow these steps:

1. Close your eyes
2. Relax your muscles
3. Breathe in, Breathe out
4. Open your eyes
5. Shift if necessary

If you are completely relaxed, this will be your natural point of aim. Ninety-nine percent of the time you will not be on target. This is fine. What did the cannoneers do to get back on target? They moved the cannon carriage. Your body, (the cannon carriage) must move in order to bring your sights on target. Do not use your arm muscles to move the sights onto the target. This is equivalent to the cannoneers pushing the cannon across the rope. Move the carriage!

How does one move the carriage?

Your support elbow stays planted. It does not move. Your support elbow is your pivot point. Do not move your elbow!

Instead, shift your hips. A slight shift in the hips is enough to change your natural point of aim. If you need to move your sights to the right, shift your hips left. This angles your body (cannon carriage) in point of aim that is closer to your target. A shift requires you to lift your hips off the ground and place them somewhere else. Typically a shift will only be a few inches. After you shift, remember to relax again.

Aim from the hip.

Narrative of Finding Natural Point of Aim

You lie down and get into the prone position. You lay down in the general direction of the target with your body angled approximately 30 degrees towards the trigger side of the target. However, you are not (at this point) concerned with exactly where the target resides.

You are in position. Now, RELAX! This means consciously think of your body parts. You relax your support hand, your support arm, bicep, shoulder, back, neck, trigger hand, *everything*. Then, you close your eyes. While they are closed, breathe in and breathe out. Open your eyes. Now, where is your front sight? Remember, 99% of the time it will not be on target. This is *okay*. If you are relaxed and in a stable position, your sights are pointing in their Natural Point of Aim. Good Job.

Actually, this time, your sights are below the target and to the right. No problem. You keep your support elbow planted as a pivot point and you shift your hips. This time, you shift your hips slightly to the *right*. This brings your NPOA somewhere back left toward the target. Then, you shift your hips *back* a little. This will raise your NPOA. Now, go through the NPOA test steps again.

1. Close your eyes
2. Relax your muscles
3. Breathe in, Breathe out
4. Open your eyes
5. Shift if necessary

This time, my front sight is still below and too far left. I must not have shifted for enough elevation and too much windage. So, I shift my hips back a tiny bit to raise my front sight. I shift my hips left a little bit to bring my front sight back to the right. I go through the NPOA test steps again, and finally, I am on my target. My target sits just on top of my front sight since I am using the Six O' Clock hold. I breathe in and watch my front sight dip below the target. I breathe out and watch my sight raise right back to my Six O' Clock hold.

At first you will need to shift many times before your natural point of aim is on target. This is okay. Over time and with practice you will not need to shift as many times as you develop the skill. For now, be patient and **do not cut corners**. You will only be cheating yourself.

Be the cannon carriage and Aim from the hip.

Why NPOA?

Natural Point of Aim in partnership with a good field position allows the shooter to deliver rapid, well aimed fire. A shooter in a good position and in true natural point of aim can empty their magazine quickly and accurately at a rate of 20 rounds per minute.

The Sitting Position

The sitting position is the second most stable position. It is useful for shooting over something like snow, grass or vegetation. The fundamental Steady Hold Factors still hold true for the sitting position. For this position, use the loop sling configuration.

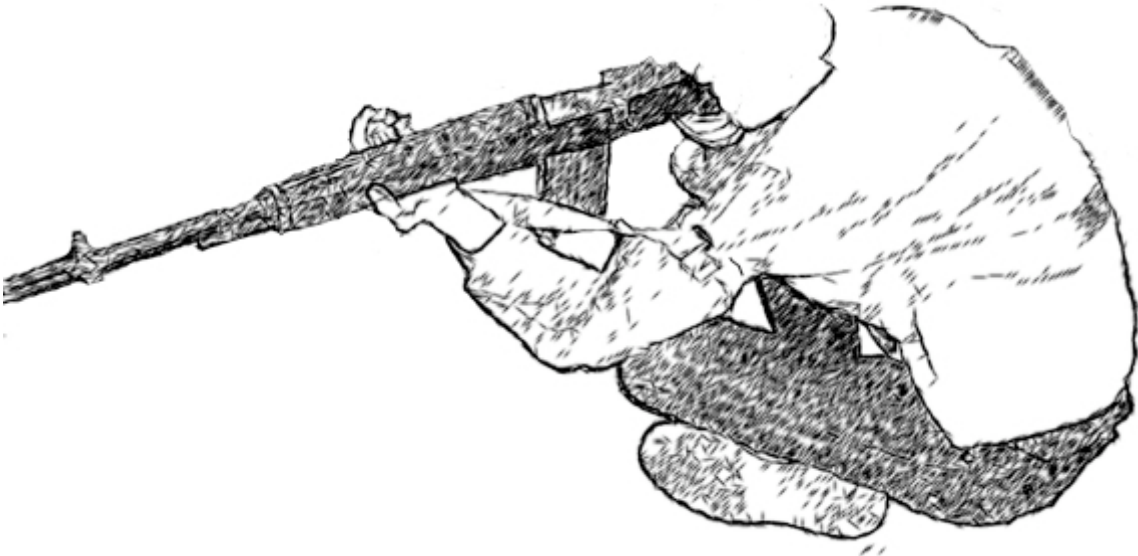


Figure 14. Sitting Position, Support Side

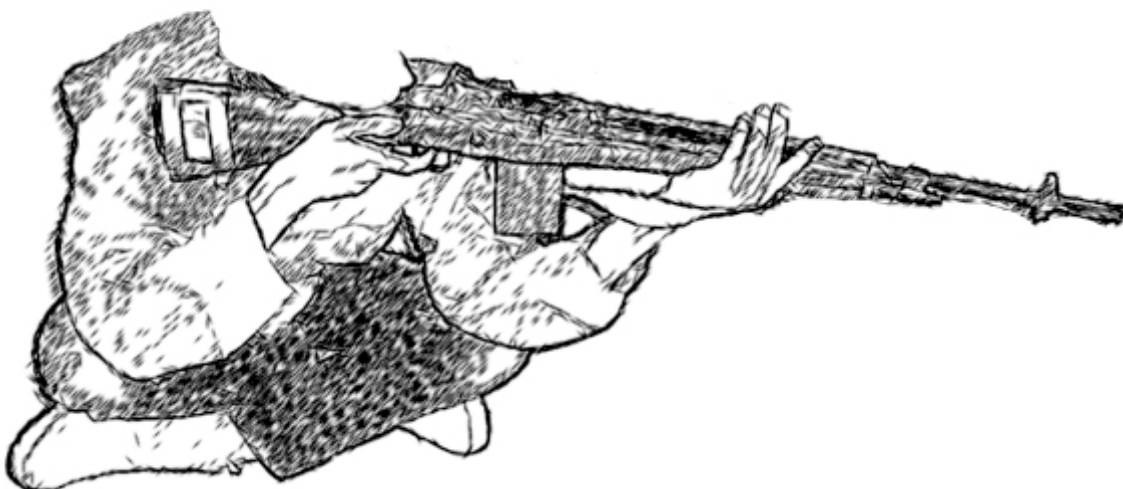


Figure 15. Sitting Position, Trigger Side

The sitting position is a modification of prone position. The basic Steady Hold Factors are the same. This means:

1. Elbow is Under the Rifle
2. Support Hand is Relaxed
3. Sling Behind Support Wrist
4. Sling is Snug
5. Sling Well Up on Support Arm
6. Neck Extended (Turkey Neck)
7. Cheek Planted on Stock (Cheek Weld)
8. Firm Handshake Grip
9. Trigger Finger Air-Gap (Not Dragging Wood)

These elements stay the same in all positions.

A few things distinguish the sitting position.

The shooter is angled approximately 30 degrees to the trigger side of the target. Legs are crossed. **Elbows sit *in front of* and in firm contact with the knees.** Legs are crossed. It does not matter which leg goes over the other. Try both. You are looking for stability. A determining factor about which leg is on top is elevation. A lot of people have trouble getting this position to support a NPOA that is high enough to be on target. Try switching your legs. Or, try tightening your legs so your feet hold your thighs up. Some people almost sit on their feet. Others are more spread out.

Your elbows are in front of your knees. This is to absorb recoil. If your elbows are on top of your knees, each shot will knock your elbows off forcing you to reacquire Natural Point of Aim. If your position is built correctly, you can find Natural Point of Aim on target. When NPOA is truly on target and your position correctly built, each shot's recoil will rock the shooter back. Due to good position the shooter will recover from the recoil and the sights will settle back into NPOA, on target.

Natural Point of Aim still counts in the sitting position. It can be as exact as the prone position. You find NPOA the same way, following the same steps.

1. Close your eyes
2. Relax your muscles
3. Breathe in, Breathe out
4. Open your eyes
5. Shift if necessary

Shifting is a little different in the sitting position as opposed to prone. There is still a pivot point. It is essentially the bottom ankle of your crossed legs. Shift around this point. To gain elevation, bring your butt closer to your ankles or bring your knees closer. To lose elevation, loosen up. Windage (left and right) adjustments are made by scooting your butt left or right. Everything else in your position stays put and stable. Aim by scooting.

This position is difficult at first. Stick with it, stretch your body, and practice to get it right. It will eventually work.

The Six Steps to Firing the Shot

There are Six Steps to Firing the Shot. While learning, one should go through each step consciously until it becomes natural. Perhaps when you are learning, write these down on the trigger side arm of shooting jacket so you can see these while in position and putting them into action. Each shot should be fired with all of the six steps performed correctly.

Six Steps to Firing the Shot:

1. Sight Alignment
2. Sight Picture
3. Respiratory Pause
4. Focus
 - a. Focus Your Eye on the Front Sight
 - b. Focus Your Mind on Keeping the Front Sight on Target
5. Trigger Squeeze
6. Follow Through
 - a. Call the Shot
 - b. Trigger Reset

1. Sight Alignment

The first step to firing a shot is known as sight alignment. This is where one simply lines up the rear and front sights in the correct way. For peep sights, one must make sure the front sight post is in the center of the rear aperture. There should be the same amount of space on either side (left or right) of the front sight post while being visually within the rear aperture. Also, the top of the front sight post should be vertically in the middle of the rear aperture.

The peep sight has two components: The rear sight and the front sight.

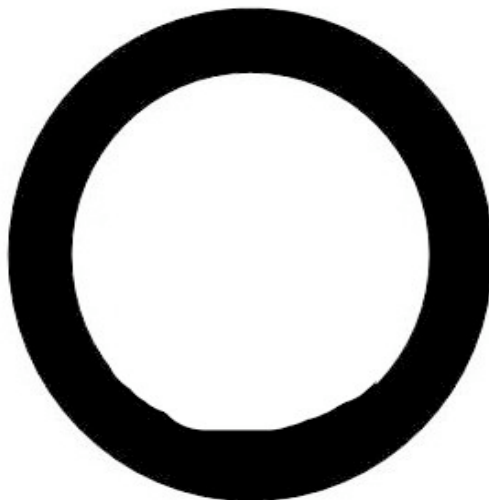


Figure 16. Rear Sight



Figure 17. Front Sight

Your rifle will only be accurate if aligned in proper and consistent sight picture.



Figure 18. Correct Sight Alignment

The front sight post is in the middle of the circle. The front sight "wings" help one to gauge the lateral center of the circle. A common mistake is to only focus on lateral sight alignment. One must make sure to develop a consistent vertical sight alignment as well. Proper Cheek Weld and Turkey Neck help with consistent vertical sight alignment by solidifying your face in a constant position. Make sure the front sight post is in the same position in relationship to your rear sight aperture. If not, you will not be consistently accurate.

While the peep sight is the most common sight for the Rifleman, other sight options exist. The scope is a common sight for the rifle. Proper sight alignment is accomplished when the entire circle of the glass is bright and visible. If there are dark regions around the cross hairs, this is improper sight alignment. Move your face.

One may have to modify their rifle to acquire proper sight alignment. One may need to build up their stock, raising their cheek weld, to raise their eyes to their sights. Do not be afraid of duct tape and random materials. A raised stock can be made with rags and duct tape.

2. Sight Picture

Sight Picture is the accomplished by bringing the proper Sight Alignment on target. There are two main sight pictures.

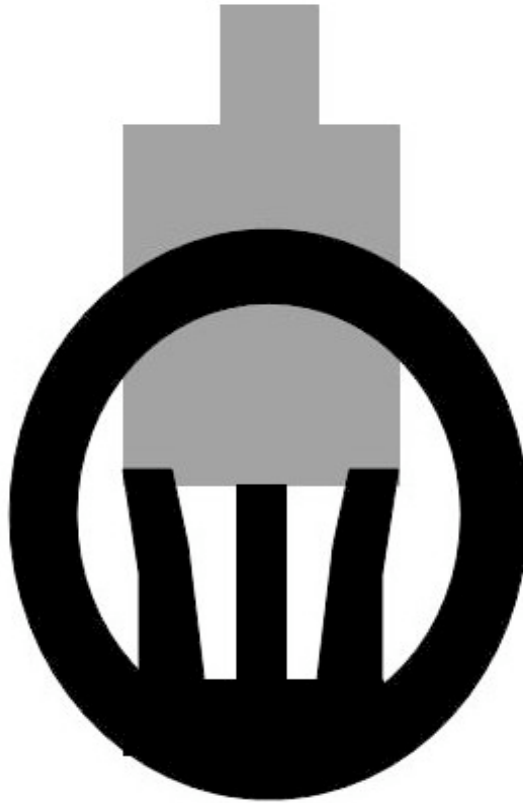


Figure 19. Six O' Clock Hold



Figure 20. Center of Mass Hold

Each sight picture has practical uses. The center of mass hold is generally used for closer distances (up to 200 yards). This is because the target is big enough to not be obscured by the front sight. Also, this has a lot to do with trajectory (the bullet's flight path), which will be covered later. Scopes will always use the center of mass hold since the cross hairs mark exactly where the bullet will go.

The Six O' Clock sight picture puts the target on top of the front sight post. For this reason, it is often known as "pumpkin on the post." The main advantage of the Six O' Clock hold is visibility of targets at far distances. When a target appears small, it is best to use a Six O' Clock hold so that the target is not covered up by the front sight post.

For most Rifleman-type situations, the Six O' Clock/pumpkin on the post sight picture is preferable. Consistency is key to accuracy. Once a rifle is zeroed (sighted in) for a certain sight picture, one must always use it for distances equal to or further than their zeroing distance.

3. Respiratory Pause

In proper position, you will notice that breathing affects your sights. With each breath, your sights will move vertically. When you inhale, your diaphragm pushes off the ground, raising your shoulder and lowering your front sight. When you exhale, the diaphragm empties and your front sight raises to where it rests naturally.

You want to fire the shot when you have exhaled. This is for several reasons. First, it is a consistent place as once you have exhaled, there is no more air to raise or lower the front sight. Also, holding an inhaled breath requires muscle. Since the use of muscle is contrary to firing a good shot, the exhaled state of breath is preferred.

At this point, the shooter will acquire Natural Point of Aim, using the technique that was discussed earlier.

4. Focus

4a. Focus Your Eye on the Front Sight

When aiming, there are three things your eye can potentially focus on.

1. The target
2. The front sight
3. The rear sight

Your eye can only focus on one thing. It should focus on the front sight. The front sight should appear crisp and clear while the target is blurry, and the rear sight hardly noticed. By now you do not need to see the target. You should have found your NPOA on target during step three.

One must focus their eye on the front sight as this is what determines where the bullet will actually end up. The shooter is aiming the rifle, not the target. Therefore, focus your eye on the front sight.

4b. Focus Your Mind on Keeping the Front Sight on Target

Firing a rifle requires the attention of your whole being. Like your body, your mind has a specific job. This step requires that the shooter focus their mind on keeping the front sight on target. This means that the shooter should think only about keeping the front sight on target.

While the front sight is visually focused upon, the mind should repeat over and over "front sight on target, front sight on target, front sight on target." While one is saying this to themselves, they should. . .

5. Trigger Squeeze

. . . Squeeze the trigger. This does not mean yank, jerk or even pull. Firm steady pressure should be applied to the trigger. It should be squeezed steadily and straight back. Once the shot is fired, hold the trigger back for a second or two. A yank, jerk, pull, or flicking your finger off the trigger once it has been squeezed will throw your shots off.

6. Follow Through

After the shot breaks, the shooter must hold the trigger back for a moment. This allows the bullet to leave the barrel before any extra movement affects the shot. Also, Follow Through requires you to "ride the recoil." The positions taught in this book are built so when a shot goes off, one's body position will absorb recoil yet stay solid. If your position is built correctly and you are truly firing with your natural point of aim on target, recoil will settle your sights back on target.

6a. Call the Shot

Feedback is important to the Rifleman. One should take a "mental snapshot" of where your front sight was when the shot was fired. This allows you to know instantly whether or not your shot was a hit. If your front sight was on target when the shot went off, then you can call the shot "good." If the front sight was not on target when the shot went off, then you can call the shot "a miss." However, if you called it "a miss," then it is not a wasted shot. Also, watch for downrange feedback, such as a splash in the dirt. Use this information to correct your next shot.

6b. Trigger Reset

Once the shot went off, your finger should have held the trigger back. This allows time for the bullet to leave your barrel without disturbance. After completing steps 7 and 8, slowly guide your trigger forward again until you feel a "click." This click is your sear resetting. Keep your finger on the trigger, maintaining slight pressure. Do not remove your finger from the trigger while your sights are on target.

Narrative of Firing a Shot

I sling up. I get into prone position. I chamber a round and remove my safety. I *relax*. I intentionally think to myself, "relax my forearm, my hands, my shoulders, *my* back, my diaphragm." When I am relaxed, I go through the Six Steps to Firing the Shot.

Sight Alignment I make sure my front sight is in the correct place relative to my rear sight. I am conscious of my turkey neck and cheek weld, making sure they are in my consistent spot. I again relax.

Sight Picture. I bring my sights onto my target. I do this by moving my hips (swivel the cannon carriage). This is a general direction move, we will fine tune later. I now place the tip of my trigger finger on the trigger. **Respiratory Pause.** Here I become conscious of my breathing.

I breathe in and watch my sights dip below the target. I breathe out and watch my sights rise back underneath my target (since I am using a 6 o'clock hold).

During Respiratory Pause, I check my Natural Point of Aim. I close my eyes. I relax my muscles. I breathe in, breathe out. I open my eyes. I ask myself, "Where is my front sight?" 99% of the time it is not on target. This time it is high and to the left. My support elbow is planted. It will not move during my shifting. I shift my hips a tiny bit left. This brings my front sight a little to the right towards the target. I shift my hips a little forward. This brings my front sight down a little, more towards the target.

I close my eyes. I relax my muscles. I breathe in, I breathe out. I open my eyes. I ask myself, "where is my front target?" This time I am "on" horizontally. However, my front sight is covering the target. I am aiming too high. I shift my hips a bit forward. I repeat the process.

Close my eyes, Relax my muscles, Breathe In, Breathe Out, Open My Eyes. I am right on target with my proper sight picture.

At this point, I **Focus my Eye on the Front Sight**. Since my Natural Point of Aim is on target, all I have to do is remain in position and relaxed and I will remain on target. There is no more need to focus on the target. I focus my eye on the front sight, making the target blurry and the front sight black and crisp.

Once my eye is focused on the front sight, I **Focus my Mind on Keeping the Front Sight on Target**. This is where mind controls matter. If you *will* a good shot, it will come. I say to myself, while keeping my front sight visually in focus, "front sight on target, front sight on target, front sight on target." Over and over again. I am clearing my mind and focusing it on the task.

While I am repeating, "front sight on target" to myself, I **Squeeze the Trigger**. Once my mind has decided to squeeze the trigger, it should not continue to think about the act of squeezing. While I am squeezing I continue to say, "front sight on target, front sight on target, front sight on. . ."

BANG! I have just fired the shot. It surprised me. Good. I want to be surprised by the shot. If I am surprised it is because my mind is focused on keeping the front sight on target. My mind will not have mental space to consider recoil, therefore making me buck or flinch in anticipation of recoil.

Follow Through. After the shot is fired, *I hold the trigger back*. Recoil moves my barrel around. Since I have a well built position and my sling is snug and in use, my sights settle back on target. My body settles back into its Natural Point of Aim.

During this time, I **Call the Shot**. This means I keep my eyes open during the shot, taking a mental snapshot of where my front sight was when the shot went off. My front sight was on target at the time of the bang so I will call the shot "good." If, say, I took a mental snapshot of the front sight off target when the shot went off, I would call it "bad." If I called the shot but it did not hit the target, it is still a good shot. I would use the miss as a learning opportunity to make the next shot successful. No shot should be wasted.

Finally, it is time for **Trigger Reset**. After the shot went "BANG," I held the trigger back. Since it went bang I rode the recoil (follow through) and called the shot. Now I slowly guide the trigger forward until I feel it click. This click is the sear resetting. Do not remove your finger from the trigger at all while you are firing shots. This is what makes good trigger control which makes good accuracy.

The Standing Position



Figure 21. Standing Position, Trigger Side

The standing position is the least stable position. However, there are techniques to make it considerably stable. Again, universal Steady Hold Factors hold true.

- 1. Elbow is Under the Rifle**
- 2. Support Hand is Relaxed**
- 3. Sling Behind Support Wrist**
- 4. Sling is Snug**
- 5. Sling Well Up on Support Arm**
- 6. Neck Extended (Turkey Neck)**
- 7. Cheek Planted on Stock (Cheek Weld)**
- 8. Firm Handshake Grip**
- 9. Trigger Finger Air-Gap (Not Dragging Wood)**

The shooter will face towards the trigger side of the target at 90 degrees. Their feet will be spaced shoulderwidth apart. This position calls for a different sling configuration. It is called the Hasty Sling. The hasty sling is a configuration where both ends of the sling are connected to the rifle's sling swivels; One swivel on the butt stock, one up on the hand guard of the rifle.

Getting Into the Hasty Sling

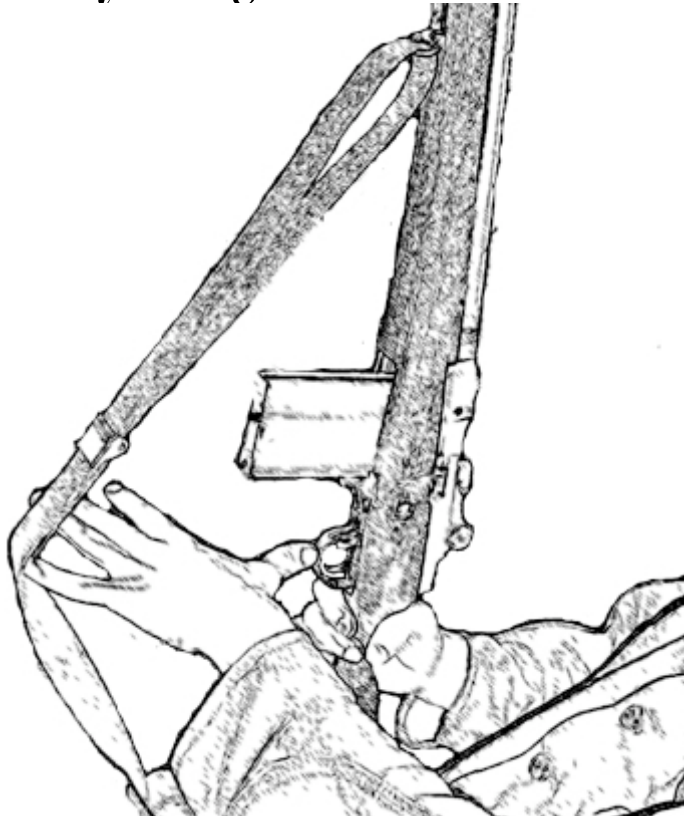


Figure 22. Adjusting Sling Tension

Adjust the sling so your hands spread thumb-tip to pinky-tip will fit between the sling and the trigger guard.

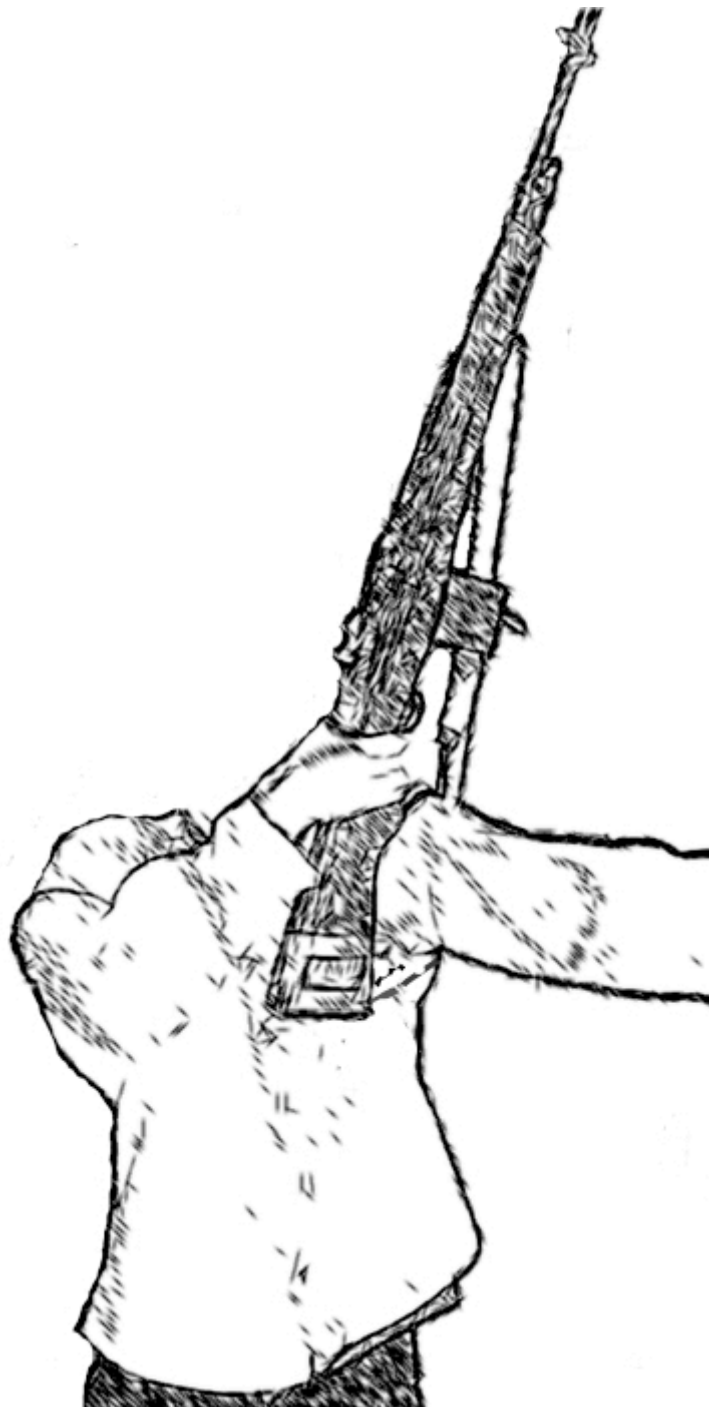


Figure 23. Pull Sling into Armpit

Hold your rifle with your trigger hand. Extend your support arm out at a 90 degree angle from your body. Put your support arm through the sling and work it into your armpit.



Figure 24. Grasp Rifle and Pull it Down across Torso

With your trigger hand gripping the rifle, push up. This will bring the bottom sling swivel into your armpit. Without moving the rifle, bring your support hand up and wrap it behind the sling (like in prone position). The sling will pass behind the support wrist.

Keep both of your hands gripping the rifle. Now pull the rifle down, bringing the stock of the rifle in front of your torso. This will tighten up the sling.



Figure 25. Raise Rifle Butt Plate into Should Pocket

When the rifle is pulled down and tight across your torso, bring the butt into your shoulder. With your trigger palm, grab the butt of the rifle and bring it into your shoulder pocket. It can be high in your pocket.

The sights should be level with your eye. Do not bring your face down to your rifle, bring your rifle up to your face (while keeping it in your pocket). Now, reach around with your trigger hand and grab the pistol grip. Your trigger elbow will stick out in a "chicken wing." This opens up the pocket of your shoulder.

Natural Point of Aim still applies in the standing position. To find, get slung up and into position. Close your eyes and wiggle your rifle around. Let it naturally settle. Open your eyes and observe where you need to move. Your front foot is your pivot point. Do not move your front foot. Use the back foot to pivot around your front foot. To gain elevation, move your back foot back. To lose elevation, move your back foot forward. To adjust windage, move your back foot left or right.

When shooting a long string of shots, make sure to take a break. Your rifle is inevitably being supported by some arm muscles in the standing position. Muscles get tired, so give them a break. Every 3-4 shots, lower your rifle muzzle to rest your arms. Also, when you are firing, do not fuss the shot. Taking it sooner rather than later is best as your muscles will not be as tired.

Your front sight will wobble over the target since this position is not as stable. Learn to embrace the wobble by keeping constant pressure on the trigger and squeezing off final bit when your sight passes over the target.

Rifleman's Cadence

The Rifleman is capable of delivering rapid, well aimed fire. This is accomplished through good position, natural point of aim, the Six Steps to Firing the Shot, and *cadence*. Cadence is the Rifleman's rhythm, delivering a well aimed shot approximately every three seconds. Once in position and when NPOA is on target, the Rifleman will ride the recoil and use cadence to place all their shots in the same place.

To fire in cadence, a Rifleman gets into a solid position. The Rifleman cycles through the Six Steps to Firing the Shot, taking time at step three to find their Natural Point of Aim. Cadence is the time it takes for a Rifleman to go through all the 6 steps to firing the shot.

It seems like a lot, but if in NPOA, many of the steps do not need attention when firing a string of shots. For example, the shooter is in NPOA, the shooter is focusing their eye, their mind, squeezing and BANG! The shooter breathes in, breathes out, BANG!, breathes in, breathes out, BANG! Those shots were fired in cadence. When firing in cadence, be aware that bodies sometimes tense up after shots, especially the support hand. This will throw off your NPOA and affect your sight picture. Stay relaxed between shots.

The point of cadence is to force the shooter to trust their Natural Point of Aim, allowing their position to resettle the sights after each shot on target. All the shooter has to do then is breathe and squeeze (the trigger). Also, cadence will help the shooter to not fuss the shot. A shooter fusses the shot when they take too long to fire the shot because they do not have NPOA and are using muscles to aim.

Part III

CONCEPTS

Minute of Angle

Before you can zero your rifle, you must know a unit of measurement by which to adjust your sights. Typically, Americans measure distances in inches and yards. Your rifle's standard unit of measurement is known as a Minute of Angle (MOA).

A bit of geometry.

A circle is divided into 360 degrees. A Minute of Angle is 1/60th of a degree. Imagine an angle leaving your rifle's barrel extending towards infinity. The angle originates from the muzzle of your rifle and extends downrange, widening at a constant rate. The reason Riflemen use Minutes of Angle is because a minute of angle is a standard rate of deviation, giving the Rifleman a language that communicates distances relevant to the target. If you don't understand yet, you will.

For now, let's say this imaginary angle stemming from your rifle is 1 Minute of Angle. The question is, how big will this Minute of Angle be at certain distances from your rifle?

The standard is:

1 Minute of Angle is equal to 1 inch per 100 yards. (1 MOA = 1" per 100 yds)

At 100 yards, the 1 MOA cone will be 1 inch wide. At two hundred yards, the 1 MOA cone will be 2 inches wide. At 500 yards, the 1 MOA cone will be 5 inches wide.

For now, yards and meters will be used interchangeably for ease of explanation. More precise language is not needed for Rifleman work, yet. A distance in meters is about 10% further than the same number in yards. 100 meters equals 110 yards.

1 Minute of Angle

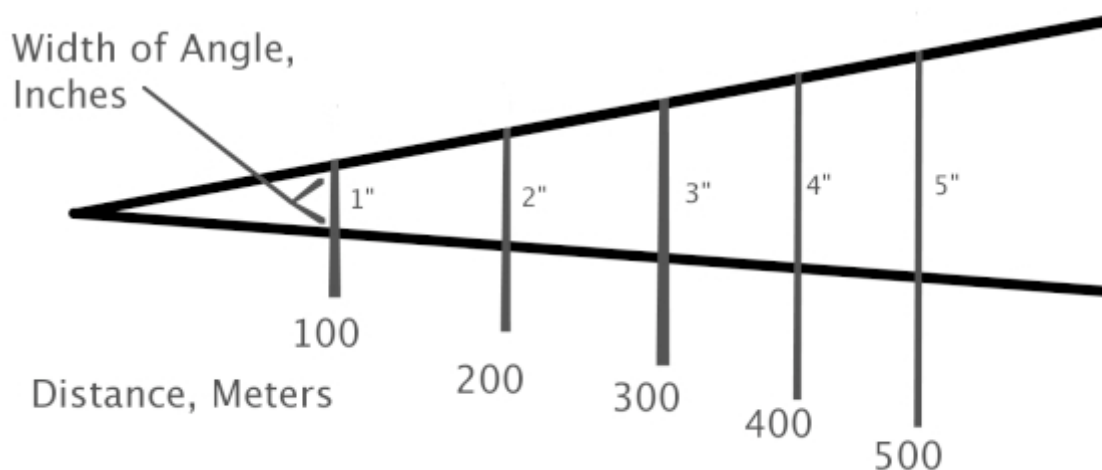


Figure 26. One Minute of Angle

As mentioned earlier, the Rifleman's standard is 4 MOA. The Rifleman is capable of shooting 4 MOA groups or better.

How large is 4 MOA at 100 yards?

Answer: 4 inches.

How big is 4 MOA at 300 yards?

Answer: 12 inches.

This is because we know that $1 \text{ MOA} = 1'' \text{ per } 100 \text{ yds}$. Therefore, at 300 yards 1 MOA will equal 3 inches. Since 4 MOA is four 1 MOAs, it will be four times as large. Therefore, 4 MOA at 300 yards equals 12 inches.

A Rifleman is accurate out to (at least) 500 yards. Why is this? 1 MOA at 500 yards is 5 inches. 4 MOA at 500 yards is $(4 \times 5) 20''$. The Rifleman can hit 20 inch targets at 500 yards.

With this knowledge of Minute of Angle we can begin to zero your rifle.

Zeroing Your Rifle

Zeroing is the process by which you match your rifle's line of sight with trajectory.

Line of sight is the imaginary line that extends from your eye, through your sights, and into infinity. Trajectory is the path the bullet takes when fired from your rifle. The line of sight is straight, while your bullet's path is curved. Your barrel is slightly pointed upwards (the below diagram exaggerates this). The bullet leaves your barrel traveling upwards until it is overcome by gravity and begins to travel downwards.

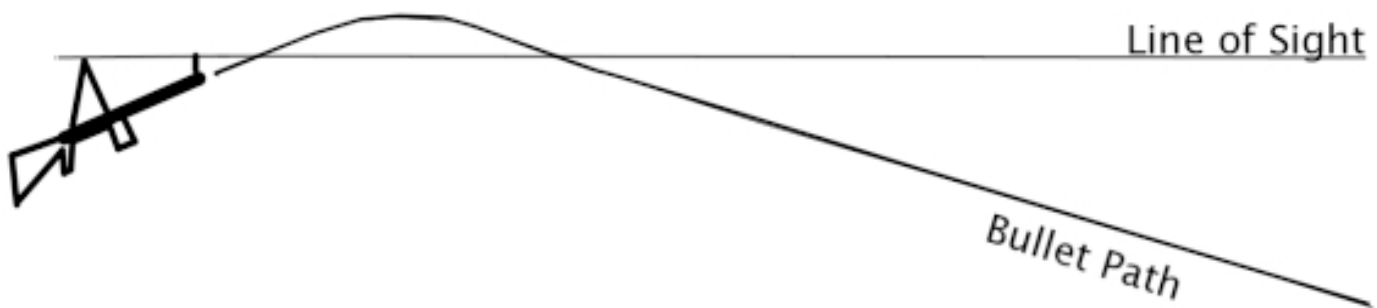


Figure 27. Line of Sight and Bullet Path

The point of zeroing is to match your line of sight with your bullet's trajectory. Notice in the above diagram how the line of sight and the trajectory meet at two points. A .30 caliber (.308/7.62x51, 7.62x39, 7.62x51r, 30.06) bullet's trajectory will cross the line of sight at 25 and 200 Meters. Therefore, one will zero at 25m. Once one is zeroed at 25m, you will "be on" at 200m.

An AR15 is a little different since it uses a different cartridge (5.56 nato/.223 winchester) and its sights being higher off the barrel. Its trajectory causes the bullet to cross the line of sight

at 33m and 300m. Therefore, if one is zeroed at 33m, one will "be on" at 300 meters. However, a Rifleman using an AR15 should still zero at 25m. More on the AR15 later.

Most modern centerfire rifle bullet paths cross the line of sight at 25m and 200m. "Sight-in-handle" type rifles (AR15) will zero at 300m. Scoped rifles generally zero at 300m.

Zeroing Procedure

Place a 1" square at 25m. Get into proper prone position. Acquire NPOA. Follow the 6 steps to firing a shot and fire a 3-5 round group into the square using the 6-o-clock hold. Do not zero your rifle off a bench, sandbags, or bipod. Zero your rifle in the prone position, it is after all, the position of which you should be proficient. You are only as good as your performance in the field.

If your group is 4 MOA or smaller you are ready to adjust your sights. If not, do not worry about being zeroed. Work on the fundamentals until you have a small, tight group somewhere on the paper. If your group is 4 MOA or under and you have called your shots "good," then you are ready to adjust your sights.

Earlier we learned that $1 \text{ MOA} = 1" \text{ per } 100 \text{ yards}$. We are shooting at 25 meters. This is $\frac{1}{4}$ the distance of 100 meters. Therefore, 1 MOA at 25 meters equals $\frac{1}{4}$ inch. We are shooting at a 1" (4 MOA at 25m) square because it is the Rifleman's standard. (Remember, 4MOA at 500m = 20")

Say you have a group low and to the right. Now follow the procedure known as. . .

Inches, Minutes, Clicks

Inches, Minutes, Clicks is a three step zeroing procedure. The first step, **Inches**, requires one to measure the distance you want to move a group in inches. The second step, **Minutes**, requires one to convert the measurement of inches into Minutes of Angle. The third step, **Clicks**, requires one to adjust the sights of the rifle by knowing how many Minutes of Angle each "Click" (an increment of movement on the sight) will move the sight.

Inches

Measure the distance of the center of your group to the center of the square. Measure in inches. For this example, we are 2 inches right and 1.25 inch down.

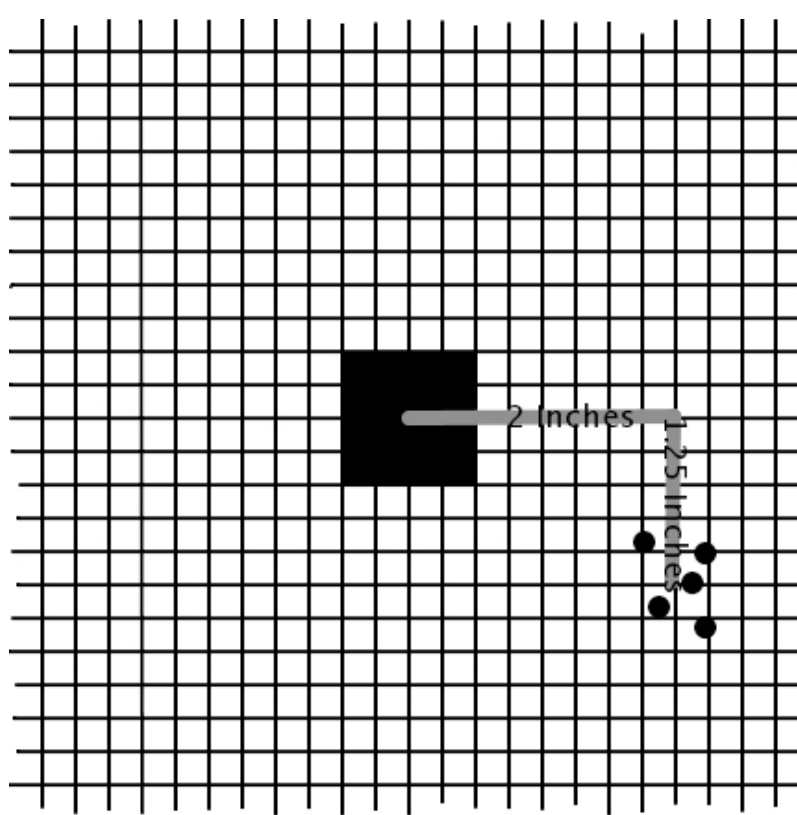


Figure 28. 1 MOA Grid at 25 Meters (Not Drawn to Scale)

The above group is:

2" Right

1.25" Down

Minutes

Convert this measurement to Minute of Angle.

Remember, we are at 25m, so 1 Minute of Angle at 25 meters is 1/4 inch.

2" = 8 MOA at 25m

1.25" = 5 MOA at 25m

We know we need to move your sights 8 Minute of Angle up and 5 Minute of Angle left. Write this down! You will forget.

Clicks

Return to your rifle. Your sights adjust in "clicks". The best rifle for understanding this procedure is the M1 Garand or M1A. This is because on these rifles, each "click" equals one Minute of Angle.

If we were to adjust this group, we would simply "click" the sights 8 Minute of Angle up and 5 Minute of Angle left. We would then be zeroed.

Note: When adjusting sights, rear sights should be moved the direction you want your group to move. Front sights adjustments will move groups opposite. For example, if I want to move my group left with my rear sight, I should move my rear sight left. However, If I want to move my group down with my front sight, I will move my front sight up.

If you are using a rifle other than an M1/M1A, you need to know how many MOA one "click" equals on your sights. Sometimes it is written down, on your sights, but most times it is not. One way of discovering this is to put a piece of paper down range at 25m. Fire a five shot group, move your sights 10 "clicks" to the right. Fire another 5 shot group. Move your sights 10 "clicks" up. Fire a five shot group. Move your sights 10 "clicks" left. Fire a five shot group. Move your sights 10 "clicks" down. You should be back where you started. Go down range and measure the distance between the center of each group. For example, your bottom left group is 5" left of your bottom right group. Around the square, each group is 5 inches from the previously fired group.

To find how many MOA each "click" moves your sights, divide inches by "clicks". In this case,

$5" / 10 \text{ "clicks"} = 1/2 \text{ MOA}$. So, your sights "click" in 1/2 Minute of Angle. One click will be a half of a minute of angle.

Back to the original example. If you need to move your sights 8 Minutes of Angle left, then you would have to "click" 16 times since each "click" is 1/2 MOA. Likewise, you would have to "click" your elevation 10 "clicks" to bring your group up 5 MOA.

Scopes are often adjusted in finer measurements. Sometimes written on a scope, it will say something like "1 click equals 1/4 inch at 100 yards."

Interpret this. We know 1 MOA at 100 yards equals 1 inch. If 1 click equals 1/4 inch at 100 yards, then each click must be 1/4 MOA. This is because 1/4 of 1 MOA at 100 yards equals 1/4 inch.

Follow the **Inches, Minutes, Clicks** procedure when you zero and you will save time and ammo as each adjustment will be intentional and measured. A Rifleman should be able to zero with one "called good" shot.

The 4 Minute of Angle Standard

The Rifleman is capable of a 4 MOA standard. The accuracy accomplished at 25m will translate to Rifleman quality hits out at further distances. If one can keep all their shots in 1" at 25m, then one can keep all their shots in 20" at 500m. This is due to the cone of fire.

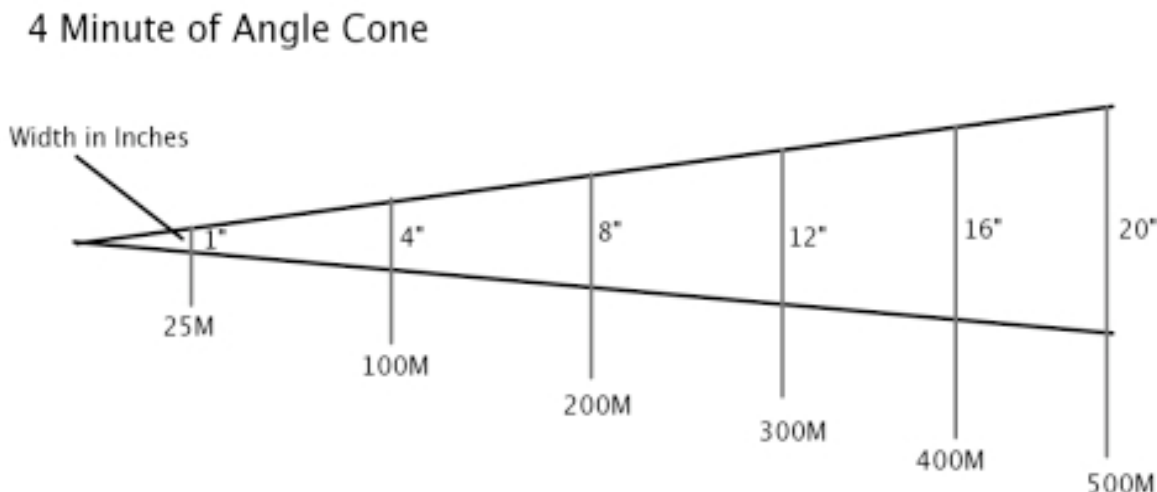


Figure 29. 4 Minute of Angle Cone of Fire

A Rifleman's accuracy is a combination of two things: equipment and skill. Most standard military rifles with standard ball ammunition are capable of 2 MOA when devoid of human error. This means that the Rifleman is "allowed" 2 MOA of mistake in order to accomplish a 4 MOA standard.

Understanding the cone of fire is useful for translating issues of accuracy, distance, wind, ect. The cone of fire is the concept that connects accuracy with distance. If you can put all your shots into a 1" square at 25m then with a little more knowledge about "come ups" and trajectory, you will put all your shots into a 20" target at 500m.

Keep the same sight picture as at 25 yards. Group sizes will remain the same (in MOA) as when shooting at 25 yards ("What you do at 25m, is what you'll do at 400m, or 500m"). When sights are adjusted a "cone of fire" is being moved, not individual shots, and the center of that cone should fall in the center of the target, just as with the 4 MOA squares.

Zeroing the AR15

The AR15 comes in many varieties. There are two standard barrel lengths: 20" and 16". The rear sight is built into the carry handle. Attached carry handles (A2) click in 1 MOA. Detachable carry handles (A3) sights click in 1/2 MOA. The elevation drum is marked differently between 20" attached carry handles and 16" detached carry handles. The 20" barreled attached carry handle elevation drum is marked 8/3. Detached carry handle elevation drums are marked 6/3. The detached carry handle with elevation drums marked 6/3 can be used on both 20" and 16" barreled rifles.

Because of different barrel lengths, the bullet path will be slightly different.

The difference in barrel length does this:

A 16" AR15's bullet path will cross the line of sight in 2 places: 25M and 300M.

A 20" AR15's bullet path will cross the line of sight in 2 places: 31M and 300M.

To zero a 16" for 300M, simply zero at 25m on the 6/3 setting.

To zero a 20" for 300M with a detachable carry handle (A3) sights, zero at $6/3 + 2$

To zero a 20" for 300M with an attached carry handle (A2) sights, zero at $8/3 + 1$

To zero a 16" barreled rifle with a detachable carry handle marked 6/3, rotate your elevation drum to the 6/3 mark. Fire a 3-5 round group at a 1" square at 25m. Adjust windage with your rear sights. Adjust elevation with your *front* sight post. The front sight adjusts for elevation by screwing it further into or out of the sight base. To raise bullet impact, move your front sight in the direction marked "UP." Make adjustments until your group is on target following the Inches, Minutes, Clicks procedure. Once on target, do not alter your front sight.

To zero a 20" barreled AR15 with a detachable carry handle marked 6/3, rotate your elevation drum to the 6/3 mark *plus 2 clicks*. It should select the marking "Z" which stands for "zero". This makes up for the difference in bullet path as described above. Follow the same zeroing procedure (IMC), adjusting elevation with the front sight until on target.

To zero a 20" barreled rifle with an attached carry handle marked 8/3, rotate your elevation drum to the 8/3 mark *plus 1 click*. Follow the same zeroing procedure, adjusting elevation with the front sight until on target.

Once zeroed, the 6/3 setting or the 8/3 setting will have the rifle be zeroed for 300M. For targets beyond 300M, rotate the elevation drum to indexed numbers. 4=400M, 5=500M, ect. A full rotation of a "6/3" knob up will again select "6/3" and is the 600M zero. A full rotation of an "8/3" knob up will again select "8/3" and is the 800M zero. Return your knob to the 300m setting. For targets closer than 300, switch to the aperture marked "0-2". This will change your zero to 200m. The large aperture (marked "0-2") is intended for close targets and low light situations. When zeroing for 300m, use the small (unmarked) aperture.

Come Ups

A "come up" is the term to describe sight adjustments to compensate for bullet drop. As seen in fig. 27, your bullet's path does not match your line of sight. The bullet travels above and below the line of sight. A sight adjustment must be made if one is to connect the line of sight with the bullet path, thus being sighted in for that distance. A .30 caliber rifle sighted in at 25 meters will "be on" at 200M. Typically, the path of a 7.62x51 150 grain Nato round has this standardized path:

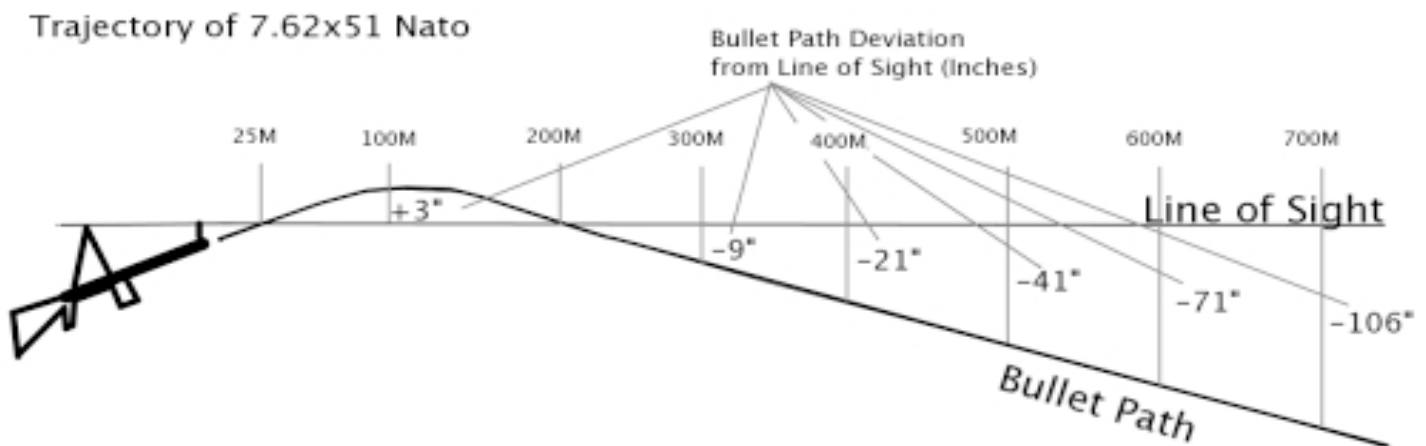


Figure 30. 7.62x51 Ball Trajectory

The above inch values show the bullet path's deviance from the line of sight at certain distances. Essentially, the bullet path will always remain the same. By adjusting one's sights, one can match the line of sight with the bullet path. The above drop values are valid when the rifle is zeroed for 200m. So, when zeroed at 200m, the bullet will be 41" below the line of sight at 500M.

A come up is used to change the line of sight to compensate for bullet drop. Say the rifle is zeroed at 200m but your target is at 500m. If you do not adjust your sights and fired at the 500m target, you will be 41" below the target. You must adjust your sights.

Your rifle is zeroed to hit at 200m. However, you are looking at a 300m target. The above chart shows that with a 7.62x51 Nato trajectory, your bullet will be 9" below the 300m target. Remember, we do not adjust our sights in inches. We adjust them in Minutes of Angle. At 300 meters, how many MOA are in 9 inches? 3 MOA. Click your sights up 3 MOA.

Now you want to shoot at a target at 400m. The chart above shows the bullet will be 21" below the line of sight if zeroed at 200m. How many MOA should you click your sights up?

From your 200M setting, you click your sights up 3 MOA to be at your 300M zero. This compensates for the 9" of drop between 200m and 300m. However, if you fired at your 400m target with your 300m zero, you would still be 12 inches below the target. How many MOA are in 12 inches at 400m? 3 MOA. Click your sights up another 3 MOA.

For most M1A rifles, the come up chart is follows.

100 -> 200 = 3 MOA
 200 -> 300 = 3 MOA
 300 -> 400 = 3 MOA
 400 -> 500 = 4 MOA
 500 -> 600 = 5 MOA
 600 -> 700 = 5 MOA
 700 -> 800 = 6 MOA
 800 -> 900 = 8 MOA
 900 -> 1000 = 8 MOA

Verbally, the chart is read as: To adjust my zero from 100 to 200, click up 3 MOA. To adjust my sights from 200 to 300, click up 3 MOA. It can work in reverse. Say one is zeroed at 500 and wants to engage a target at 200. Click down 4 MOA to get the 400 zero. Click down another 3 MOA to get the 300 zero. Click down another 3 MOA to get the 200 zero. This is a chart showing drop in MOA and inches for a 7.62x51 Ball bullet

Meters / Yards	MOA	Drop (Inches)	Total Drop	
100 -> 200	3	+ 3"		
200 -> 300	3	-9"	-9"	
300 -> 400	3	-12"	-21"	
400 -> 500	4	-20"	-41"	
500 -> 600	5	-30"	-71"	
600 -> 700	5	-35"	-106"	
700 -> 800	6	-48"	-154"	
800 -> 900	8	-72"	-226"	
900 -> 1000	8	-80"	-306"	

Figure 31. 7.62x51 Ball Trajectory Values

The above are common values for Military Surplus Ball 7.62x51 ammunition fired from an M1A. Actual values may vary. You should go out into the field and test your come ups to be sure you will be able to hit at longer distances. When you get the chance, go out to a long distance range and fire at each distance. Make sure you know how *your* ammunition fires from *your* rifle and where it will be at whatever distance. Though nato attempts to standardize ammunition, some may fire differently. For example, Portuguese surplus may zero 2 MOA lower than German. These are things you should test and memorize. Write this information down and tape it to the stock of your rifle. It is a good idea to write your come ups down and tape it to the side of your rifle, so it is always with you.

Battle Sight Zero

A Battle Sight Zero is designed to give as close to a "one size fits all" zero for most "battle" situations. Essentially it is used to engage targets between 0-300 meters with one sight setting. The M1A Battle Sight Zero is 250m. This is zero where the bullet path deviates from the line of sight not very much, allowing hits at distances 0-300m. Distances beyond 300m require sight adjustment.

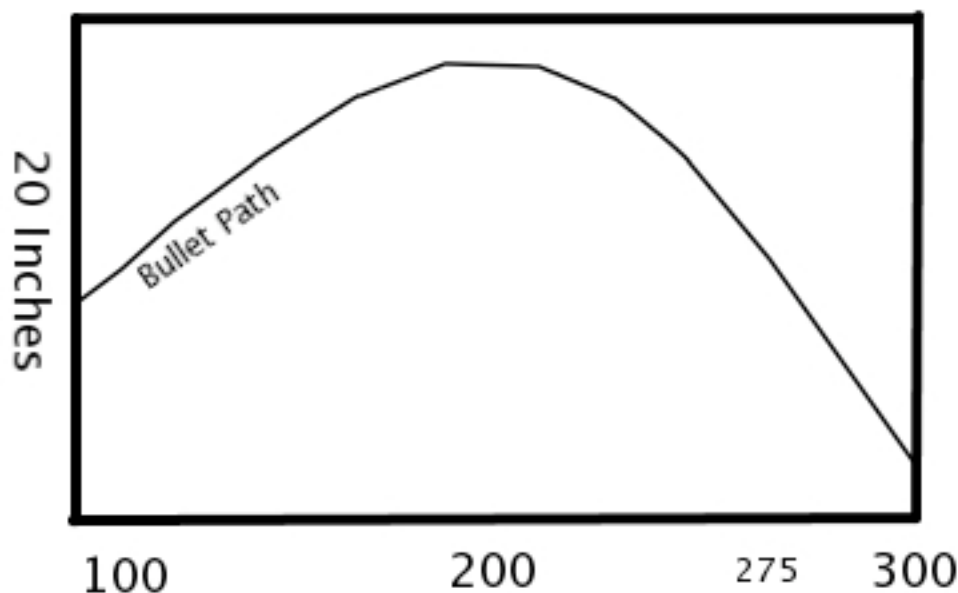


Figure 32. Battle Sight Zero, .30 cal. In Yards.

The above diagram shows the bullet path of a .30 cal round zeroed at 275 yards/250m. No matter where the 20" target is, it will be hit somewhere. Sometimes high, sometimes low, but *on*. Simply aim at the center of your 20" target and fire. This is why the standard M1A front sight appears to be the same width as a 20" target at 250m. It helps with range finding. More about that later.

Some rear sights are indexed. This means they may have little numbers on the elevation knob indicating distance in hundreds of yards or meters. When you zero, make sure to "index

your sights." This means make sure that your 200 meter index number actually corresponds to your 200 meter zero. This can be done by loosening a screw to change the knob without moving the sights. Or, on AK47 and AR15 type rifles, one can move the front sight while the rear sight stays put on the desired indexed number for the initial zeroing procedure.

AR15 Battle Sight Zeros are a little different. When the elevation knob is at "6/3" or "8/3," the small (unmarked) aperture is for targets at distances 300 and beyond. For closer targets, one must "hold under" (which means aim a bit low) or switch to the 0-2 aperture which automatically changes your zero to 200.

Part IV

Full Distance Rifleman Knowledge

The intention of this manual is to provide the knowledge to make Riflemen. Riflemen are capable of hitting 20 inch targets at 500 meters with standard equipment. Riflemen are not snipers. Snipers take one shot at one target. Riflemen deliver well-aimed rapid fire on several targets at 500m. They do not need to know exact formulas to deal with highly specialized situations. A four Minute of Angle standard does not require absolute precision. However, it will benefit the Rifleman to know a couple simple rules and concepts to help adapt to most situations.

Full Distance Practicing

One must gather information about their rifle's trajectory. To do this, zero your rifle at 25m using the above procedure. Once your zero is found at 25m, take note of where this setting is. Count how many clicks this setting is from "the bottom" of your sights. Do this for each type of ammunition. For example, my Portuguese 7.62 zeros 11 clicks from the bottom, while my German zeros 14 clicks from the bottom. You must write this down! There is space at the back of this manual for notes. You must maintain a shooting notebook to record what you learn about your rifle at the range.

Once your rifle is zeroed at 25m move to full distance. Keep your sights zeroed at 25m. Set up 4 MOA targets at distances of 100, 200, 300, 400, 500 (and more if desired). Fire 5 round groups at each distance with your 25m zero. Keep the 6 o'clock hold. Downrange at each target, record the following information:

Is the group 4MOA or less? If not, refire your group at that distance. If yes, count how many MOA the center of the group is high or low from the center of the target. Record this information. You should know where your rifle will group at each distance with your 25m zero. Do this for each rifle/ammunition combination you own. Write this information down.

With this information, you can determine how many clicks are required to adjust for bullet drop at each distance. For example,

*While shooting my M1A at 400 yards with my 25/200m zero, the center of my 400 yard group was 24" below the center of my target. This is about 6 MOA low. To hit the target, I now **know** that I must click up 6 MOA to adjust my 25/200m zero to hit at 400m.*

The Rifleman should form and fill out a come-up chart, similar to figure 31 above. There is space for this in the back of this pamphlet.

Simple Wind

Another reason for preferring the .30 caliber rifle over smaller caliber is wind. The .30 caliber round is much less affected by wind at longer distances than, say, the 5.56. Volumes could be written about exact calculation of wind and its relationship to the bullet in flight. However, only a few ground rules need be laid to get a good idea about how to deal with wind. On top of this knowledge, one should practice in all conditions to truly understand the effects of wind.

While there are difficult calculations for predicting wind effects on a bullet path, the common person does not have time to learn all these and make them second nature. Instead, a simplified version should be memorized, called the "Simplified Wind Rule."

"If you believe that wind will significantly affect the shot, favor the upwind side of the target at 300 and half-off at 500 yards."

Half-off means half a target off. Watch for downrange feedback -call the shot- and compensate for any follow-up shots. Verify at a range in varying conditions.

Range Estimation

In full distance shooting, firing the shot is the easiest step. Target detection and range estimation are most difficult. For range estimation, use your rifle's built in range finder: the front sight. In general, a rifle's front sight will be the width of a 20 inch target at some distance. Usually this distance is the Battle Sight Zero. If the target appears the same width or wider than the front sight, simply take the shot.

A Rifleman should know the distance at which their front sight equals a 20 inch target. Using this knowledge, a Rifleman should be able to use their front sight as a range finder. For example, a standard M1A sight is usually 7 MOA wide. This is the same width of a 20 inch target at 250m.

$$\begin{aligned} 1\text{moa} @ 250\text{m} &= 2.5 \text{ inches} \\ 2.5 \text{ inches} \times 7 \text{ MOA} &\sim 20 \text{ inches} \end{aligned}$$

Therefore, the front sight appears to equal a 20" target at 250m

Other ranges can be estimated using the same logic. Say the target appears to be half of your front sight. How large does that man-sized target (20") appear in MOA? 3.5 moa since it is half your front sight.

$$\begin{aligned} 7 \text{ MOA} / 2 &= 3.5 \text{ MOA} \quad (\text{half the 7 MOA front sight}) \\ 1 \text{ MOA} @ 500\text{m} &= 5 \text{ inches} \\ 3.5 \text{ MOA} \times 5 \text{ inches} (1\text{moa}@500) &= 17.5 \text{ " (close enough to 20" at 500 yards)} \end{aligned}$$

Therefore, half the front sight appears to equal a 20" target at 500m

Other methods of range finding exist. Some memorize how objects appear at various distances. This is sometimes reliable. Others use a range finder. However, a Rifleman will always have their rifle. Go into the field and get to know the relationship between your front sight and a 20 inch target at various distances beyond 300m. Only practice will make you comfortable and proficient in range finding.

Slope

In general, a Rifleman will not need to compensate for slope. However, in extreme cases it may be necessary. As a general rule:

“Unless the target is 300 yards or more away, AND the slope is 45 degrees or STEEPER, you simply take the shot with a normal sight picture.”

If the target is beyond 300 and at a 45 degree angle, aim a little low on the target. This simplified formula works for uphill slopes and downhill slopes. As always, try it and confirm it for *your* rifle in the field.

Weather/Atmospheric Effects

Weather will have an effect on your bullet path. General rules are as follows:

Temperature- For every 20 degrees Fahrenheit (.6 degrees Celsius), point of impact will shift 1 MOA. As temperature increases, adjust your sights down. As temperature decreases, adjust your sights up.

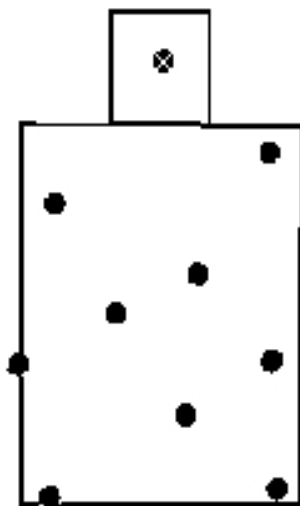
Humidity- For every 20% change in humidity, point of impact will shift 1 MOA. As humidity increases, adjust your sights up. As humidity decreases, adjust your sights down.

Elevation- For every 5,000 feet (1,500m) of elevation change, point of impact will shift 1 MOA. As elevation increases, adjust your sights down. As elevation decreases, adjust your sights up.

Essentially, as the air thins (lower humidity, higher elevation, higher temperature) there will be less drag on the bullet so it will fly flatter. However, do not rely on these figures. Simply confirm your zero in all weather and write it down so you know how to adjust.

Shot Group Analysis

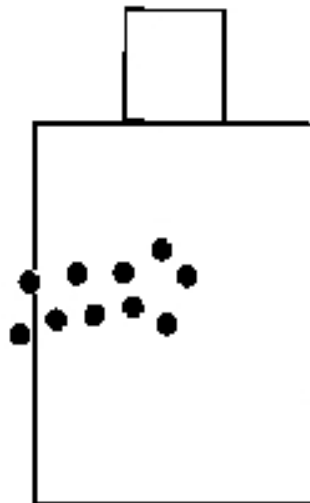
The most common shooting errors are caused by shooter failure to fire each shot 'by the numbers'. Below are common shot groups and their probable causes. The aiming point on each target is 'center of mass'. Shooter error is the focus, so weather effects are not considered. Likewise, rifle and ammo are assumed to be accurate, and rifle zeroed. Where a right handed shooter is assumed, left-handed shooters will experience the reverse effect.



Probable Causes:

1. No definite group: focusing aiming eye on target, instead of front sight.
2. Loose position.
3. Flinching, bucking, and jerking [Improper trigger control] every shot.
4. Failure to keep eyes open when rifle fires.
5. Slight alignment/spot weld not consistent.

Cure: Focus "front sight", not target. Review/practice position fundamentals; fire each shot by the numbers. *Ball & dummy" drill is essential for detecting & curing causes #3 and #4.



Probable Causes:

1. Finger placed too far into trigger guard. When rifle fires, the finger moves back rapidly and drags against the right side of the stock, causing the rifle, and front sight, to move to the left.
2. Squeezing trigger on an angle, not straight back.

Solution: Place finger on trigger so that daylight shows between finger and stock - usually, the first pad of the trigger finger will do it.

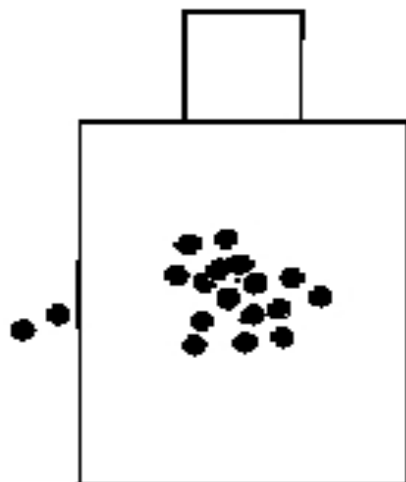


Probable Causes:

1. Canting the rifle.
2. Front sight not in correct alignment with rear, but is displaced horizontally from shot to shot.
3. Loose front sight
4. Muscling rifle [incorrect NPOA]; loose position.

Solution: Keep sights and rifle vertical for each shot; always align sights correctly. Check/tighten front sight. Check NPOA.

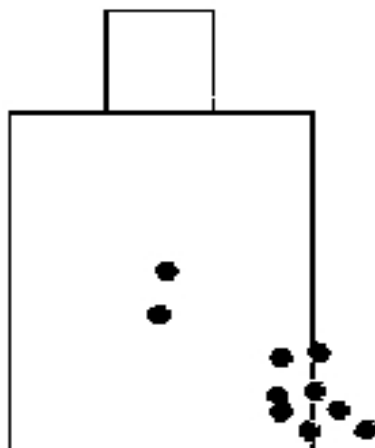
Target Analysis



Probable Causes:

1. The two shots out of the group are caused by firing the first shot out of each rapid-fire mag at a slow-fire cadence.

Solution: Fire ALL shots, including the *first* shot from each magazine, at the same rapid cadence

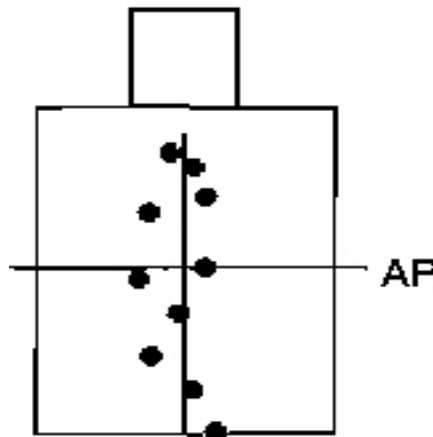


Probable Causes:

1. During the rapid-fire stages of the AQT, losing NPOA during mag change. The shots from the 2nd mag may be in any direction off the center.
2. Firing first shot of each mag (assuming a mag change) at slow fire cadence, and balance at rapid cadence - eight rds will be at your rapid fire zero, and two rounds at your slow-fire zero.

Solution: Never move the elbow under the rifle while changing mags. Once you get that NPOA, KEEP it!

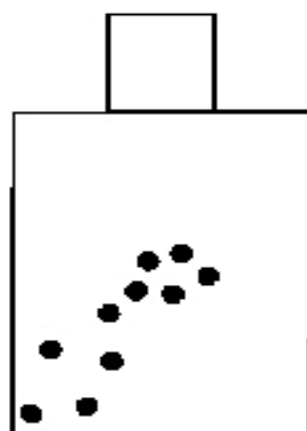
Fire each shot - and every shot - at your rapid fire cadence.



Probable Causes:

1. Failure to hold breath or erratic breathing while squeezing the trigger - ie, filling lungs to capacity for one shot but breathing out or exhaling for next shot
2. Eye relief (spot weld) not held constant.
3. Improper vertical alignment of sights.

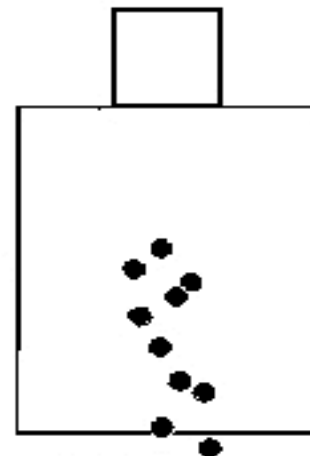
Solution: Place cheek on same spot on stock for each shot, be consistent in holding breath, and keep your sights aligned.



Probable Causes:

1. "Bucking" - a slight push with the right shoulder on the butt in anticipation of recoil will move the sights, and the shot, in the 7-8:30 area. Effect is opposite for left-handed shooter.

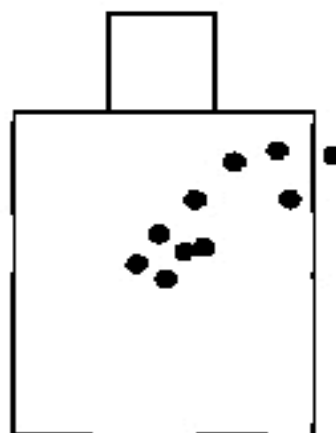
Solution: "Ball and Dummy" drill to detect and correct. Feed the shooter dummy rounds or empty rifle until he quits flinching, bucking, and jerking the trigger - all revealed by muzzle motion when the hammer falls on a dummy or empty chamber. Once he settles down, feed him a couple live rounds and then some more empties as a double-check.



Probable Cause:

1. Sling becoming looser with each shot. The sling keeper is slipping, or the arm loop is otherwise loose, allowing the sling to slip down on the arm.
2. Loose rear sight.
3. Too low a position.
4. Change in position of rifle in shoulder after reload.

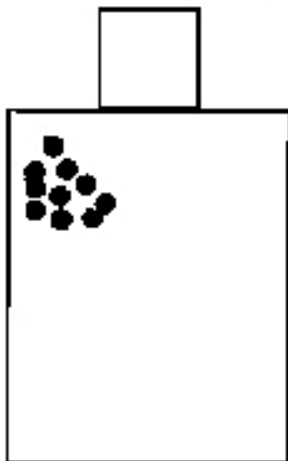
Solution: Make sure keeper and loop is tight, sling is same place on arm, and sling tension is uniform from shot to shot. Check rear sight elevation tension and retighten. Check fundamentals of position. Do "2-round" drill - load mag with one round, get in position, fire, change mags, and fire one round. Both rounds should be in same group.



Probable Causes:

1. "Heeling" or "helping" the rifle in anticipation of the discharge. As the sear releases at the end of the squeeze, the palm or heel of the right hand is pushed forward slightly, causing the sights to go up and right. Effect is opposite for left-handed shooter. [especially M16/M14E2 pistol-grip stocks]

Solution: "Ball & Dummy" until shooter is cured.



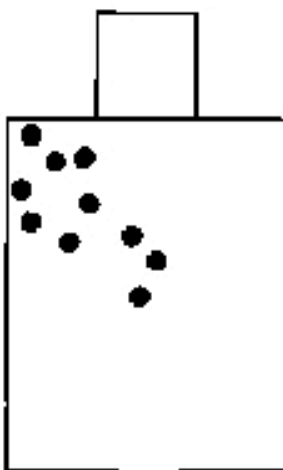
Probable Causes:

Compact group, out of AP.

1. Same error each time, in this case a left-handed shooter 'heeling' each shot.

2. Natural Point of Aim (NPOA) not obtained, forcing the shooter to 'muscle' the sights onto the target.

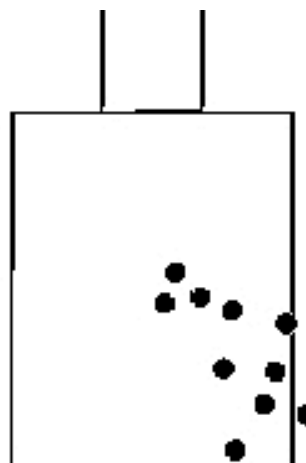
Solution: Check NPOA: line sights up on the target, close your eyes, relax your body, deep breathe in, let it out, and open your eyes. If the sights are now off the target, shift your weight slightly around the elbow under the forearm [prone] to bring the sights back on the target. Repeat the process until you open your eyes and the sights are on the target. Then anchor elbow.



Probable Causes:

1. Failure to 'followthrough'; shooter failed to hold trigger back an instant after the shot and started to relax too soon. Releasing the trigger too soon allows the hand to move, which moves the sights.

Solution: Think the word "followthrough" as you hold the trigger back an instant after the rifle discharges, and you will solve the problem.



Probable Causes:

1. "Jerking" the trigger, not squeezing it, causing the front sight to dip to the right

2. "Flinching"; shooter pulls right shoulder to rear in anticipation of shot.

3. Left elbow not being under the rifle, right elbow slipping, loose sling [prone], or the left elbow slipping down the leg, right elbow slipping [sitting].

4. Binding of forearm with left hand.

Solution: On 1) and 2) above, "ball and dummy" training.

Seldom does a shot group show only one error. Remember to eliminate from consideration any 'called' shots - you already know about them! Never forget; 'bucking' shots are usually 7 to 10 o'clock, 'flinching' and 'jerking' shots tend to 1 to 5 o'clock, but may be anywhere on the target. Remember you have a zero for each position, and a zero for varying cadences, which you establish via actual practice.

Part VI

How to Practice

Becoming a Rifleman requires dedicated practice. It is not enough to simply read this manual and keep the rifle put away for the rainy day. You must somehow extract knowledge from these words and integrate them into your body, making these concepts and techniques second nature. You will need to practice a lot. After many hours of practice and perhaps hundreds of rounds, you will have the "ah ha!" moment. At this moment, everything will feel right. You will go down range and all your bullet holes will be stacked up inside each other.

Practicing At The Range

Practice until you can put 10 rounds into a 1" square at 25m in 30 seconds. Then, practice until you can put 20 rounds into two 1 inch squares. 10 into each of square at 25m in 70 seconds. Keep adding difficulty. Be creative and think of how to mimic potential situations.

Do not only fire at one target. Make several targets. Practice shifting between them. You must reacquire NPOA for each target. Practice making your shifts second nature. Also, do not only fire from one position. Time yourself. Start standing, drop into prone position or sitting position. This creates a course of fire that requires you to quickly acquire your Natural Point of Aim. Make sure to have several targets, practicing your NPOA shifts.

Practice with friends. Create timed drills and assign each a target. Practice working together as a team to hit each target. Do not neglect practicing at full distance. You must *know* how your rifle performs at each distance, in every type of weather, with different ammunition. Also, know how your sights work at in the dark. Write down information you learn at the range about your trajectory for each type of ammunition or weather conditions. This kind of information is invaluable and cannot be compiled by anyone but you.

Learn from your mistakes. Read your groups. They hold valuable information that can be interpreted to help identify your mistakes. Typically, vertical stringing of shots means you are failing to have a consistent respiratory pause. Or, your sight picture is inconsistent. No distinguishable group likely means the shooter is failing to focus on the front sight, failing to call the shot (closing their eyes after each shot), has a loose position, has an inconsistent sight picture, may have no true NPOA, or is flinching, bucking or jerking. A group stringing left of the target might indicate the shooter is improperly squeezing the trigger, dragging a finger on the stock or squeezing at an angle. Effects will be opposite for left-handed shooters. If the shot groups string horizontally on both sides of the target, one may be canting the rifle, have an inconsistent sight picture, a loose front sight, may not have true NPOA, or most commonly, the shooter's elbow is not underneath the rifle.

A group trailing diagonally low and to the left of the target means a shooter is bucking, or pushing against the butt of the rifle in anticipation of recoil. A group trailing above and to the left, the shooter may be heeling, or moving unnaturally to help the recoil. A group trailing up and to the left of the target means a shooter is not following through, meaning the shooter did not hold back the trigger or is releasing the trigger too soon. A group stringing low and to the right indicates the shooter is either jerking the trigger (not squeezing), flinching (pulling the rifle into the right shoulder in anticipation of the shot), or the elbow is not under the rifle.

Make every course of fire purposeful by focusing on at least one element of this manual. The Rifleman is prudent and focused. Some find it useful to train with a .22 caliber rifle. Ammunition is cheap and readily available, allowing the practicing Rifleman to fire 1000s of rounds cheaply. Modifications can be made to .22 rifles to convert their sights to Peep sights. It may seem like overkill to have two rifles, but practice is invaluable, and you will need to train other people somehow.

Practicing At Home

It is possible that the most valuable practice you can do can be done without firing a shot. Dry firing is a very effective way to practice, and the best part is: It's Free. Get into each position. Without ammunition (have a friend verify your rifle is empty), go through the Six Steps to Firing the Shot. Acquire your natural point of aim, and take practice "dry" shots at a dot on a wall. Work on all the above mentioned stuff. The only difference between dry firing and actually shooting is dealing with recoil and learning the physics of trajectory. There are stories of people dry firing every day and with little to no experience, going to the range and accomplishing that Rifleman standard of 4 MOA.

Also, read all you can about your rifle and ammunition. Study further the concepts of trajectory, minute of angle and advanced information. Make sure you know how to clean your rifle well. Make sure you have spare parts ready and with you in the field if something breaks.

Above all, once you have mastered the Rifleman's standard,
TEACH OTHERS WHAT YOU KNOW.

Range Data Notes:

In memory of the Revolutionary War Veterans of April 19, 1775

