

# Chapter 11

## Engagement Techniques

A Marine must maintain the ability to react instinctively in a combat environment—day or night. He must possess a combat mindset that eliminates any hesitation, fear, or uncertainty of action, allows him to engage the enemy rapidly, and allows him to focus on the actions required to fire well-aimed shots. This becomes critical during low-light conditions or periods of darkness because a Marine's field of vision is reduced and every noise, movement, and muzzle blast is intensified.

A Marine must remember that speed alone does not equate to effective target engagement. He should fire only as fast as he can fire accurately. He should never exceed his physical capability to engage a target effectively. To be effective in combat, a Marine must train to perfect the physical skills of target engagement (such as presenting the weapon and assuming a shooting position) until they become instinctive.

### 11001. Search and Assessment

After a Marine engages a target, he must immediately search and assess the area for any additional threats. To search and assess, a Marine performs the following steps:

- Lower the rifle to look over the sights.
- Place the trigger finger straight along the receiver.
- Search the area and assess the situation/threat by moving the head, eyes, and rifle left and right (approximately 10 degrees from center).

#### Note

The muzzle moves with the head and eyes in one fluid motion while searching. Keep both eyes open to increase the field of view.

Once a Marine determines that the area is clear of enemy threat, he may place the rifle on *SAFE*.

### 11002. Engaging Targets During Limited Exposure Time

In a combat environment, targets may present themselves with little or no warning. This reduces a Marine's reaction time and the ability to engage targets effectively. To maintain an advantage, a Marine should practice weapons presentation techniques until they become instinctive. How a Marine carries or transports the rifle, partially determines the weapons presentation technique used. Continued practice of various presentation techniques from each weapon carry/transport helps a Marine to refine his skill, shorten his reaction time, and engage targets effectively in a combat environment.

a. **Presenting the Rifle From the Tactical Carry.** To present the rifle from the tactical carry, a Marine performs the following steps once a target appears:

- Extend the rifle toward the target keeping the muzzle slightly up so the buttstock clears all personal equipment.
- Place the rifle in **condition 1**.

To place the rifle in **condition 1** if it is in **condition 3**—

- Grip the pistol grip firmly with the right hand.
- Pull the charging handle with the left hand to its rearmost position and release just prior to taking the rifle off *SAFE*.

An alternative method is to—

- Grip the handguards firmly with the left hand.
- Pull the charging handle with the right hand to its rearmost position and release.

- Level the rifle and pull it firmly into the pocket of the shoulder to obtain proper stock weld once the buttstock clears all personal equipment.
- Hold the head as erect as possible. This allows the aiming eye to see directly through the sights. Do not move the head down to meet the stock of the rifle. Changing the placement of the head from the normal stock weld position may affect the zero.
- Take the rifle off *SAFE*.
- Place the trigger finger on the trigger.
- Align the sights to center mass on the target.
- Engage the target.
- Search and assess the situation/threat (see para. 11001).

**b. Presenting the Rifle From the Alert Carry.** To present the rifle from the alert carry, a Marine performs the following steps once a target appears:

- Bring the rifle up to eye level and obtain proper stock weld.
- Hold the head as erect as possible. This allows the aiming eye to see directly through the sights.

- Take the rifle off *SAFE*.
- Place the trigger finger on the trigger.
- Align the sights to center mass on the target.
- Engage the target.
- Search and assess the situation/threat (see para. 11001).

**c. Presenting the Rifle From the Ready Carry.** To present the rifle from the ready carry, a Marine performs the following steps once a target appears:

- Bring the rifle up to eye level and obtain proper stock weld.
- Hold the head as erect as possible. This allows the aiming eye to see directly through the sights.
- Take the rifle off *SAFE*.
- Place the trigger finger on the trigger.
- Align the sights to center mass on the target.
- Engage the target.
- Search and assess the situation/threat (see para. 11001).

**d. Presenting the Rifle From the Strong Side Sling Arms Transport (Strong Hand Technique).** To present the rifle from the strong side sling arms transport using the strong hand technique, a Marine performs the following steps once a target appears:

- Take one step back with the right foot and lean forward slightly. This facilitates removal of the rifle from the shoulder.
- Reach under the right arm with the left hand between the sling and the body and grasp the handguards. At the same time, pull down on the sling and raise the right elbow out and parallel to the deck.

- Roll the right shoulder forward and release the sling from the right hand once the handguards have cleared the elbow. At the same time, pull the rifle forward off the shoulder with the left hand.
- Continue pulling the rifle forward with the left hand while rotating the rifle parallel to the deck until the right arm is free of the sling and the rifle clears all personal gear.
- Grasp the charging handle with the right hand and pull it to its rearmost position and release.
- Establish a firing grip with the right hand while keeping the trigger finger straight along the receiver.
- Level the rifle and pull it into the shoulder and obtain proper stock weld.
- Hold the head as erect as possible. This allows the aiming eye to see directly through the sights.
- Take the rifle off *SAFE*.
- Place the trigger finger on the trigger and align the sights to center mass on the target.
- Engage the target.
- Search and assess the situation/threat (see para. 11001).

e. **Presenting the Rifle From the Strong Side Sling Arms Transport (Weak Hand Technique).** The presentation of the rifle from strong side sling arms transport (weak hand technique) is the same as the strong hand technique explained in subparagraph 11002d with the following variation:

- Establish a firing grip with the right hand once the rifle is parallel to the deck and the right arm is free of the sling.
- Keep the trigger finger straight along the receiver.

- Grasp the charging handle with the left hand, continue the forward movement of the rifle to ensure it clears all personal gear, pull the charging handle to its rearmost position and release.

- Regrasp the handguards with the left hand.

f. **Presenting the Rifle From the Weak Side Sling Arms Transport (Strong Hand Technique).** To present the rifle from weak side sling arms (strong hand technique), a Marine performs the following steps once a target appears:

- Take one step back with the right foot and lean forward slightly. This facilitates removing the rifle from the shoulder.
- Grasp the sling with the right hand to prevent the rifle from falling off the shoulder.
- Grasp the handguards with the left hand (the index finger points toward the muzzle).
- Rotate the rifle counterclockwise (until the magazine rests on the left forearm) while extending the muzzle toward the target.
- Continue extending the rifle toward the target to ensure the rifle clears all personal gear.
- Grasp the charging handle with the right hand and pull it to its rearmost position and release.
- Establish a firing grip with the right hand while keeping the trigger finger straight along the receiver.
- Pull the rifle into the pocket of the shoulder and obtain proper stock weld.
- Hold the head as erect as possible. This allows the aiming eye to see directly through the sights.
- Take the rifle off *SAFE*.

- Place the trigger finger on the trigger and align the sights to center mass on the target.
- Engage the target.
- Search and assess the situation/threat (see para. 11001).

**g. Presenting the Rifle From the Weak Side Sling Arms Transport (Weak Hand Technique).** The presentation of the rifle from the weak side sling arms transport (weak hand technique) is the same as the strong hand technique discussed in para 11002f with the following variations:

- Establish a firing grip with the right hand.
- Keep the trigger finger straight along the receiver.
- Continue to extend the rifle toward the target to ensure that the buttstock of the rifle clears all personal gear.
- Grasp the charging handle with the left hand and as the rifle is extended, pull the charging handle to its rearmost position and release.

### 11003. Engaging Targets During Low Light and Darkness

Combat targets are frequently engaged during periods of darkness or under low-light conditions. Basic marksmanship fundamentals do not change for targets engaged under these conditions. However, the principles of night vision must be applied and target detection is applied differently. During periods of darkness or low light, a Marine's vision is extremely limited. A Marine must learn the techniques of night observation in order to detect potential targets, and he must develop skills that allow him to engage targets under these conditions.

There are two types of illumination that assist engagement during low light or darkness: ambient light and artificial illumination. Both ambient light and artificial illumination can affect target perception (distance and size) and night vision capabilities. Ambient light is the light produced by natural means (i.e., the sun, moon, and stars).

Considerable variations occur in ambient light due to the time of day, time of year, weather conditions, terrain, and vegetation. Artificial illumination is the light produced by a process other than natural means. Artificial light can be used to illuminate an area for target detection or to illuminate a specific target to pinpoint its position. There are two types of artificial illumination used in combat: air and ground.

The introduction of artificial light requires the eyes to make a sudden, drastic adjustment to the amount of light received. This can cause a temporary blinding because night vision was abruptly interrupted. Ambient light also can cause a blinding effect; e.g., a Marine may experience temporary blindness or reduced night vision if a bright moon suddenly appears from behind the clouds. Light behind or between a Marine and the target illuminates the front of the target and makes it appear closer than it is. Light beyond the target displays the target in silhouette and makes it appear farther away than it is. If the target is silhouetted, it is easier to see and easier to engage. If air illumination devices are used, they are in constant motion as they descend to the ground. This movement creates changing shadows on any illuminated target, causing a stationary target to appear as if it is moving.

In some combat situations, ambient light and artificial illumination may assist a Marine in locating targets. However, this light can affect perception of the target and disrupt night vision. Knowing the effects of illumination are critical to accurate target engagement during low-light conditions or during periods of darkness. A Marine's ability to engage the target should not diminish due to changes in light conditions.

### 11004. Engaging Targets While Wearing the Field Protective Mask

While engaging targets in a combat environment, a Marine is under considerable stress caused by fear, fatigue, and the noise of battle. His stress is further aggravated by the fear and uncertainty associated with a nuclear, biological, and chemical (NBC) threat. However, a Marine must be able to operate under any battlefield condition, including an NBC environment.

To overcome these anxieties, a Marine can wear mission-oriented protective posture (MOPP) gear, especially the field protective mask. If a Marine wears the field protective mask, its bulk and reduced visibility can affect his firing position and ability to engage the target and the rifle's zero. A Marine must make adjustments to his firing position and the application of marksmanship fundamentals to counter the additional gear worn in an NBC environment. Therefore, a Marine should practice wearing his field protective mask when he is not in a combat environment. This allows him to overcome any restrictions caused by the mask, develop confidence in his ability to execute well-aimed shots while wearing the mask, and develop a plan of action. This plan should address how the rifle is presented to the target, how long the mask is worn, and the likelihood of enemy contact. If a Marine expects to wear the mask for an extended period and enemy contact is likely, he should consider adjusting the rifle sights so that his first rounds are on target.

**a. Marksmanship Fundamentals.** Wearing the field protective mask requires a Marine to make modifications to his aiming and breath control techniques.

(1) **Aiming.** Wearing the field protective mask affects the aiming process and the ability to locate targets. The need to adjust stock weld, eye relief, head position, placement of the buttstock, or hold on the rifle can affect sight alignment. Glasses should be removed when donning the field protective mask. If glasses are worn with the field protective mask, the mask may not seal. If a Marine wears glasses, he is issued a set of optical inserts for the mask. He should install the inserts in the mask prior to assuming the firing position.

(2) **Breath Control.** Wearing the field protective mask may affect breath control, but training can teach a Marine to overcome this impairment. With the mask on, a Marine will hear his own breathing. He should not let this distract him from breath control or the application of any of the other fundamentals of marksmanship. Temporary fogging of the lens also may be experienced. If fogging occurs, a Marine should take a deep breath and fire while holding a full breath of air (inhaling clears the fog).

**b. Field Firing Position.** A good firing position provides balance, control, and stability during firing. The field

protective mask's added bulk and other restrictions may require a Marine to make changes to his field firing position. The adjustments are unique to each Marine and based on his body size and shape and his ability to adapt to the mask. Adjustments should be minor. However, all firing positions will be affected in the following areas:

(1) **Stock Weld.** Changing the placement of the cheek on the stock may affect the zero. Therefore, if an NBC attack is possible, a Marine should obtain a zero for the rifle in full MOPP gear.

Stock weld will not be as comfortable or feel as solid as it does without the field protective mask. The loss of sensitivity between the cheek and the stock, due to the mask, may cause the cheek to be pressed too firmly against the stock. Pressing the cheek too firmly against the stock can cause the seal of the field protective mask to break. If this occurs, quickly clear the mask and resume a firing position. If the lens of the field protective mask fogs up while in a firing position, this indicates that the mask's seal has been broken. Clear the mask and resume the firing position.

(2) **Eye Relief.** Eye relief is the distance between the rear sight aperture and the aiming eye. The added bulk of the field protective mask may increase eye relief because the head is farther back along the stock. If the eye is too far from the rear sight aperture it may be difficult to acquire the target and to maintain a precise aiming point.

(3) **Head Position.** The mask's shape and bulk can make sight alignment difficult to achieve. The restrictive vision caused by the mask may force a Marine to roll or tilt his head over the stock to achieve sight alignment. The Marine should keep his head as erect as possible while maintaining sight alignment.

(4) **Placement of the Buttstock in the Shoulder.** Placement of the buttstock in the shoulder pocket may have to be altered due to the mask's added bulk. If the rifle is canted, a Marine can place the buttstock of the rifle outside of the pocket to achieve sight alignment.

(5) **Canting the Rifle.** Holding the rifle straight is the preferred method of obtaining sight alignment. However, if sight alignment cannot be achieved in this

position, a Marine may alter the hold of the rifle to bring the aiming eye in line with the sights. This is usually done by canting the rifle inboard approximately 45 degrees. Canting the rifle drastically affects the rifle's zero. A Marine should cant the rifle only as much as is needed to obtain a good stock weld and proper sight alignment. If the rifle is canted, a slightly different grip on the handguard may be required.

**c. Offset Aiming.** In battle, a Marine may not have time to adjust his rifle sights to compensate for the differences in aim caused by wearing the field protective mask. A Marine may have to cant his rifle to establish sight picture. If the rifle is canted, the point of impact may not coincide with the point of aim. For example, when wearing the mask, a right-handed Marine's point of impact is usually high and to the left of center mass (for a left-handed Marine, high and to the right of center mass). Therefore a Marine has to offset aim an equal and opposite distance low and to the right. See paragraph 11008 for a discussion on offset aiming.

## 11005. Engaging Multiple Targets

When engaging multiple targets, the fundamentals of marksmanship still apply, but a Marine must prioritize targets and carefully plan his engagements to ensure successful target engagement. Mental preparedness and the ability to make split-second decisions are the key to successful engagement of multiple targets. The proper mindset allows a Marine to react instinctively and to control the pace of the battle rather than just reacting to the threat.

After the first target is engaged, a Marine must immediately engage the next target and continue to engage targets until they are eliminated. While engaging multiple targets, a Marine must be aware of his surroundings and not focus on just one target. He must rapidly prioritize the targets, establish an engagement sequence, and engage the targets. A Marine also must maintain constant awareness and continuously search the terrain for additional targets.

**a. Prioritizing Targets.** The target that poses the greatest threat should be engaged first. Prioritizing targets is an ongoing process. The combat situation usually dictates the order of target engagement. A target's priority is based on proximity, threat, and opportunity. Changes in threat

level, proximity, or the target itself may cause a Marine to revise his priorities. Therefore, a Marine must remain alert to changes in a target's threat level and proximity and other target opportunities as the battle progresses.

**b. Field Firing Position.** The selection and effective use of a field firing position is critical to the successful engagement of multiple targets. A Marine should make a quick observation of the terrain and select a firing position that provides good cover and concealment, as well as the flexibility to engage multiple targets. If enemy targets are widely dispersed, the selected position must provide the Marine with flexibility of movement. The more restrictive the firing position, the longer it will take a Marine to eliminate multiple targets.

**(1) Prone.** Engaging short-range targets from the prone position requires a major adjustment to the basic position with each shot fired. This adjustment occurs because the elbows are firmly placed on the ground and they restrict upper body movement. The prone position restricts and lengthens the recovery time of the rifle sights onto subsequent targets.

**(2) Sitting.** Like the prone position, the sitting position allows limited lateral movement. This makes engagement of widely-dispersed multiple targets difficult. To ease engagement, the forward arm can be moved by pivoting on the elbow, but this movement disturbs the stability of the position.

**(3) Kneeling.** The kneeling position provides a wider, lateral range of motion since only one elbow is used for support. A Marine moves from one target to another by moving the forward arm and the forward leg in the direction of the target.

**(4) Standing.** The standing position allows maximum lateral movement. Multiple targets are engaged by rotating the upper body to a position where the sights can be aligned on the desired target. If severe or radical adjustments are required to engage widely dispersed targets, a Marine moves his feet to establish a new position rather than give up maximum stability of the rifle. This avoids poorly placed shots that can result from an unstable position.

c. **Marksmanship Fundamentals.** The application of the fundamentals of marksmanship are applied under a slightly different technique. Once the first target is engaged, the techniques required to engage additional targets are as follows:

(1) **Follow-through.** The Marine is committed to follow-on shots and can use the rifle's recoil to direct the recovery of the rifle onto the next target. As the rifle is coming down in its recovery, a Marine physically moves the sights to the next target.

(2) **Trigger Control.** Pressure is maintained on the trigger throughout recovery and is applied at a rate consistent with the Marine's ability to establish sight picture on the desired target.

(3) **Sight Picture.** A Marine should not hesitate between the time sight picture is established and the time the shot breaks.

(4) **Bone Support.** If possible, a Marine selects a field firing position and engages targets in a way that maximizes bone support and control of the rifle. To maximize bone support, a right-handed Marine engages targets right to left and a left-handed Marine engages targets left to right. This allows a Marine to engage targets while moving the rifle into the support and keeps the forward elbow under the rifle for maximum bone support.

## 11006. Engaging Moving Targets

In combat, it is unlikely that a target will remain stationary. The enemy will move quickly from cover to cover, exposing himself for the shortest possible time. Therefore, a Marine must quickly engage a moving target before it disappears.

There are two types of moving targets: moving targets and stop and go targets. Moving targets move in a consistent manner and remain in a Marine's field of vision. A walking or running man is an example of a moving target. A stop and go target appears and disappears during its movement. A stop and go target will present itself for only a short time before it reestablishes cover. An enemy moving from cover to cover is an example of a stop and go

target. This target is most vulnerable to fire at the beginning and end of its movement to new cover because the target must gain momentum to exit its existing cover and then slow to avoid overrunning the new cover position.

a. **Marksmanship Fundamentals.** Engaging moving targets requires concentration and adherence to the fundamentals of marksmanship. With practice, a Marine can engage a moving target with the same speed and accuracy used to engage a stationary target. The skill required to engage moving targets is a perishable skill, therefore it must be practiced frequently. The following modifications to the fundamentals of marksmanship are critical to the engagement of moving targets.

(1) **Sight Picture.** Typically, sight picture is the target's center of mass. If a Marine engages a moving target, he bases his sight picture on the target's range, speed, and angle of movement.

(2) **Trigger Control.** As with any target engagement, trigger control is critical to the execution of shots that do not disturb sight alignment or sight picture. A Marine can apply pressure on the trigger prior to establishing sight picture, but there should be no rearward movement of the trigger until sight picture is established. Interrupted trigger control is not recommended because the lead will be lost or have to be adjusted to reassume proper sight picture. If a Marine is using the tracking method, he tends to stop tracking as trigger control is applied. This causes the shot to impact behind the moving target.

(3) **Follow-through.** If a Marine uses the tracking method to engage moving targets, he continues to track the target during follow-through so the desired lead is maintained as the bullet exits the muzzle. Continuous tracking also enables a second shot to be fired on target if necessary.

(4) **Stable Position.** To engage moving targets using the tracking method, the rifle must be moved smoothly and steadily as the target moves. A stable position steadies the rifle sights while tracking. Additional rearward pressure may be applied to the pistol grip to help steady the rifle during tracking and trigger control. The elbows may be moved from the support so the target can be tracked smoothly.

b. **Engagement Methods.** Moving targets are the most difficult targets to engage. However, they can be engaged successfully by using the tracking or the ambush method.

(1) **The Tracking Method.** The tracking method is used for a target that is moving at a steady pace over a well determined route. If a Marine uses the tracking method, he follows the target with the front sight post while maintaining sight alignment and a point of aim on or ahead of (leading) the target until the shot is fired. If a Marine establishes a lead on a moving target engagement, his sights will not be centered on the target. See figure 11-1. To execute the tracking method, a Marine performs the following steps:

- Present the rifle to the target.
- Swing the muzzle of the rifle through the target (from the rear of the target to the front) to the desired lead (point of aim). The point of aim may be on the target or some point in front of the target depending upon the target's range, speed, and angle of movement.
- Track and maintain focus on the front sight post while acquiring the desired sight picture. It may be necessary to shift the focus between the front sight post and the target while acquiring sight picture, but the focus must be on the tip of the front sight post when the shot is fired.
- Engage the target once sight picture is acquired while maintaining the proper lead.
- Follow-through so the lead is maintained as the bullet exits the muzzle.
- Continue to track in case a second shot needs to be fired on the target.

### Figure 11-1. Tracking Method.

(2) **The Ambush Method.** The ambush method is used when it is difficult to track the target with the rifle, as in the prone or sitting position. The lead required to effectively engage the target determines the engagement point. With the sights settled, the target moves into the predetermined engagement point and creates the desired sight picture. See figure 11-2. The trigger is pulled simultaneously with the establishment of sight picture. To execute the ambush method, a Marine performs the following steps:

- Select an aiming point ahead of the target.
- Obtain sight alignment on the aiming point.
- Hold sight alignment until the target moves into vision and the desired sight picture is established.
- Engage the target once sight picture is acquired.
- Follow-through so the rifle sights are not disturbed as the bullet exits the muzzle.

A variation of the ambush method can be used when engaging a stop and go target. A Marine should look for a pattern of exposure; e.g., every 15 seconds. Once a pattern is determined, a Marine establishes a lead by aiming at a point in front of the area in which the target is expected to appear, then he fires the shot at the moment the target appears.

### Figure 11-2. Ambush Method.

c. **Leads.** When a shot is fired at a moving target, the target continues to move during the time the bullet is in flight. Therefore, a Marine must aim in front of the target, otherwise, the shot will fall behind the target. This is called taking a lead. Lead is the distance in advance of the target that the rifle sights are placed to accurately engage the target when it is moving. Determining the amount of lead required to engage a moving target must be as precise as possible if a Marine is to achieve success. To provide a greater field of view for engaging moving targets at close range, a Marine may use the 0-2 aperture (see fig. 11-3).

(1) **Amount of Lead Required.** Factors that affect the amount of lead are the target's range, speed, and angle of movement.

(a) **Range.** Lead is determined by the rifle's distance to the target. When a shot is fired at a moving target, the target continues to move during the time the bullet is in flight. This time of flight could allow a target to move out of the bullet's path if the round was fired directly at the target. Time of flight increases as range to the target increases.

(b) **Speed.** If a man is running, a greater lead is required because the man will move a greater distance while the bullet is in flight.

### Figure 11-3. 0-2 Aperture.

(c) **Angle of Movement.** The angle of movement across the line of sight relative to the flight of the bullet determines the type (amount) of lead.

(2) **Types of Leads.** There are three types of leads.

(a) **Full Lead.** The target is moving straight across a Marine's line of sight with only one arm and half the body visible. This target requires a full lead because it will move the greatest distance across a Marine's line of sight during the flight of the bullet.

(b) **Half Lead.** The target is moving obliquely across a Marine's line of sight (at a 45 degree angle). One arm and over half the back or chest are visible. This target requires half of a full lead because it will move half as far as a target moving directly across a Marine's line of sight during the flight of the bullet.

(c) **No Lead.** The target is moving directly toward or away from a Marine and presents a full view of both arms and the entire back or chest. No lead is required. A Marine engages this target as if it was a stationary target because it is not moving across his line of sight.

(3) **Point of Aim Technique.** See paragraph 11008a for a detailed discussion on point of aim technique. The following guidelines apply if a Marine uses the

point of aim technique to establish a lead for a moving target at various ranges and speeds. These guidelines do not consider wind or other effects of weather. Body width in these examples is considered to be 12 inches (side view of the target).

For a slow walking target (approximately 2-2.5 mph) moving directly across the line of sight (full lead)—

- At a range of 200 yards/meters or less, no lead is required.
- At a range of 300 yards/meters, hold two points of aim in the direction the target is moving.

For a fast walking target (approximately 4 mph) moving directly across the line of sight (full lead)—

- At a range of 200 yards/meters or less, hold one point of aim in the direction the target is moving.
- At a range of 300 yards/meters, hold four points of aim in the direction the target is moving.

For a target running (approximately 6 mph) directly across the line of sight (full lead) —

- At a range of 100 yards/meters or less, hold one point of aim in the direction the target is moving.
- At a range of 200 yards/meters, hold four points of aim in the direction the target is moving.

For a target moving at a 45 degree angle (an oblique target) across the line of sight, the lead is one half that required for a target moving directly across the line of sight.

## 11007. Engaging Targets at Unknown Distances

To engage targets at unknown distances, a Marine must determine the distance from his location to a known point. This is known as range estimation. The ability to determine range is a skill that must be developed if a Marine is to engage targets at unknown distances successfully. Precise range estimation enhances accuracy, enhances the chance of survival, and determines if a target can be effectively engaged using the rifle's existing BZO or if a new sight setting is required.

### a. Range Estimation Methods

(1) **Unit of Measure Method.** To use this method, a Marine visualizes a distance of 100 yards/meters on the ground, then he estimates how many of these units will fit between him and the target. This determines the total distance to the target.

The greatest limitation of this method is that its accuracy is related to the amount of visible terrain. For example, if a target appears at a range of 500 yards/meters or more and only a portion of the ground between a Marine and the target can be seen, it becomes difficult to use the unit of measure method to estimate range accurately.

A Marine must practice this method frequently to be proficient. Whenever possible, a Marine should select an object, estimate the range, and then verify the actual range by either pacing or using another accurate measurement.

(2) **Appearance Method.** To use this method, a Marine must be familiar with the size and various details of personnel and equipment at known distances. Visibility limits (such as weather, smoke, or darkness) the effectiveness of this method.

**(3) Front Sight Post Method.** The area of the target covered by the front sight post can be used to estimate range to a target. A Marine notes the appearance of the front sight post on a known-distance target. A Marine then uses this as a guide to determine range over an unknown distance. Because the apparent size of the target changes as the distance to the target changes, the amount of the target covered by the front sight post varies based on the range. In addition, a Marine's eye relief and perception of the front sight post affect the amount of the target that is visible. To use this method, a Marine must apply the following guidelines:

The front sight post covers the width of a man's chest or body at approximately 300 yards/meters.

- If the target is less than the width of the front sight post, the target is in excess of 300 yards/meters. Therefore, the BZO cannot be used effectively.
- If the target is wider than the front sight post, the target is less than 300 yards/meters and can be engaged point of aim/point of impact using the BZO.

See figure 11-4.

**(4) Visible Detail Method.** The amount of detail seen at various ranges can provide a Marine with an estimate of the target's distance. A Marine should observe a man while he is standing, kneeling, and in the prone position at known ranges of 100 to 500 yards/meters. He should note the man's size,

characteristics/size of his uniform and equipment, and any other pertinent details. The Marine then uses this as a guide to determine range over an unknown distance. A Marine also should study the appearance of other familiar objects such as rifles and vehicles. To use this method, a Marine applies the following general guidelines:

- At 100 yards/meters, the target can be clearly observed in detail and facial features can be distinguished
- At 200 yards/meters, the target can be clearly observed. There is a loss of facial detail. The color of the skin and equipment are still identifiable.
- At 300 yards/meters, the target has a clear body outline, face color usually remains accurate, but remaining details are blurred.
- At 400 yards/meters, the body outline is clear but remaining detail is blurred.
- At 500 yards/meters, the body shape begins to taper at the ends. The head becomes indistinct from the shoulders.
- At 600 yards/meters, the body is wedge-shaped with no head.

**(5) Bracketing Method.** This method of range estimation estimates the shortest possible distance and the

Figure 11-4. Front Sight Post Method.

greatest possible distance to the target. For example, a Marine estimates that a target may be as close as 300 yards/meters but it could be as far away as 500 yards/meters. The estimated distances are averaged to determine the estimated range to the target. For example, the average of 300 yards/meters and 500 yards/meters is 400 yards/meters.

**(6) Halving Method.** This method of range estimation judges ranges out to 800 yards/meters. To use this method, a Marine estimates the distance halfway between him and the target, then doubles that distance to get the total distance to the target. A Marine must take care when judging the distance to the halfway point, any error made in judging the halfway distance is doubled when estimating the total distance.

**(7) Combination Method.** The methods previously discussed require optimal conditions with regard to the target, terrain, and visibility in order to obtain an accurate range estimation. A Marine should estimate the range using two of the methods discussed above and then compare the estimates, or two Marines can compare their estimates. The average of the two estimates should be close to the actual range to the target.

**b. Factors Affecting Range Estimation.** There are specific factors that will affect the accuracy of estimation. A Marine must be aware of these factors and attempt to compensate for their effects.

#### Nature of the Target

- An object with a regular outline such as a steel helmet, rifle, or vehicle on a clear day will appear to be closer than one with an irregular outline such as a camouflaged object.
- A target that contrasts with its background will appear to be closer than one that blends in with its background.
- A partially exposed object will appear to be farther away than it is.
- A target will appear to be farther away if the target is smaller than the objects surrounding it.

#### Nature of Terrain

- Upward sloping terrain gives the illusion of shorter distance.
- Downward sloping terrain gives the illusion of greater distance.
- Terrain with dead space makes the target appear to be closer.
- Smooth terrain such as sand, water, or snow gives the illusion of greater distance.

#### Light Conditions

- The more clearly a target can be seen, the closer it appears to be.
- A target in full sunlight appears to be closer than one observed at dawn or dusk.
- Smoke, fog, rain, or anything else that obscures vision will give the illusion of greater distance.
- The position of the sun affects estimation by the eye. If the sun is behind the viewer, it lights the target better so the target appears closer. If the sun is directly beyond the target, the glare makes the target appear farther away.

**c. Hasty Sight Setting.** While a BZO is considered to be a true zero for 300 yards/meters, a Marine must be capable of engaging targets beyond this distance. The rifle's sighting system allows sight settings for distances out to 800 yards/meters in 100-yard/meter increments. If a Marine must establish a BZO for extended ranges, it is referred to a hasty sight setting. To achieve a hasty sight setting, a Marine dials the appropriate range numeral on the rear sight elevation knob that corresponds to the range to the target. For example, if the rear sight elevation knob is set at 8/3 and a target appears at 500 yards/meters, rotate the knob to the 5 setting (see fig. 11-5).

**d. Point of Aim Technique.** If the distance to the target is beyond the BZO capability of the rifle and time does not permit adjustment of the sights, a Marine can use offset

aiming techniques to engage the enemy. See paragraph 11008a.

## 11008. Offset Aiming

To engage a target during combat, a Marine may be required to aim his rifle at a point on the target other than center mass. This is known as offset aiming. Offset aiming is used to compensate for weather, distance and size of the target, and speed and angle of a moving target. There are three techniques for offset aiming: point of aim technique, known strike of the round, and miss drills.

a. **Point of Aim Technique.** The point of aim technique is the shifting of the sight picture to a predetermined location on or off the target to compensate for a known condition (i.e., wind, distance, movement). Each predetermined location is known as a point of aim (see fig. 11-6). The point of aim technique is used when wind affects the strike of the round and there is not time to adjust the rifle's sights, when the distance to the target is beyond the BZO capability of the rifle, or when a lead is required to engage a moving target. To use the point of aim technique to engage a target at an unknown distance, a Marine must apply the following guidelines:

- When range to the target is estimated to be beyond 300 yards/meters out to 400 meters, hold one point of aim.

- When the range to the target is estimated to be beyond 400 yards/meters out to 500 meters, hold two points of aim.

(1) **Wind.** If wind affects the strike of the round and there is no time to adjust the rifle's sights, a Marine can use the point of aim technique to compensate for the wind's effects. Table 11-1 provides points of aim for full value winds. Also see figure 11-6.

————— **Note** —————

A hold of more than four points of aim may be difficult to acquire and maintain because the front sight housing can mask the target.

(2) **Distance.** If a target appears beyond the BZO capability of the rifle and time does not permit sight adjustment, a Marine uses predetermined points of aim to compensate for changes in elevation. See figure 11-6.

(3) **Moving Targets.** To engage a moving target effectively, a Marine must understand points of aim and leads. The predetermined points of aim are used to establish a lead on a moving target. See figure 11-7.

————— **Note** —————

A hold of more than four points of aim may be difficult to acquire and maintain because the front sight housing can mask the target.

Figure 11-5. Hasty Sight Setting.

Figure 11-6. Points of Aim.

Table 11-1. Windage Points of Aim.

Wind	Distance	Points of Aim
Light (0-5 mph)	0-300 yards/meters	0
Medium/Strong (6-25 mph)	0-200 yards/meters	1
Medium (6-15 mph)	200-300 yards/meters	2
Strong (16-25 mph)	200-300 yards/meters	4

**b. Known Strike of the Round.** This offset aiming technique shifts the point of aim (sight picture) to compensate for rounds that strike off target center. The known strike of the round method is used if the strike of the round is known. It is useful when firing with the field protective mask donned. To engage a target using this method, a Marine aims an equal distance from center mass opposite the known strike of the round. For example, if the round strikes high and left, a Marine aims an equal and opposite distance low and right.

**c. Miss Drills.** This offset aiming technique shifts the point of aim (sight picture) to compensate for rounds that strike off target center. Miss drills are used if there is no indication that the round impacted the target. To perform a miss drill, a Marine fires at the base of the target, observes the impact of the round, and adjusts the aiming

point on the target. Due to terrain, foliage, concentration on maintaining sight alignment, and other variables, it is often difficult to observe the bullet's impact. If a Marine cannot observe the bullet's impact, he should shoot a string of fire toward the target's center mass until he hits the target or observes the round strike the target. The miss drill is the least preferred offset aiming technique.

**Figure 11-7. Moving Target Points of Aim.**