

MCRP 3-1A

Rifle Marksmanship



U.S. Marine Corps

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FOREWORD

1. PURPOSE

Marine Corps Reference Publication (MCRP) 3-01A, *Rifle Marksmanship*, provides the doctrine, techniques, and procedures for Marine Corps rifle marksmanship.

2. SCOPE

Every Marine is first and foremost, a rifleman. MCRP 3-01A reflects this ethos and the Marine Corps warfighting philosophy. This publication discusses the individual skills required for effective rifle marksmanship, and standardizes the techniques and procedures throughout the Marine Corps. It constitutes the doctrinal basis for all entry level and sustainment level rifle marksmanship training.

3. SUPERSESSION

MCRP 3-01A supersedes the discussion of rifle marksmanship in Fleet Marine Force Manual (FMFM) 0-8, *Basic Marksmanship* and FMFM 0-9, *Field Firing for the M16A2 Rifle*. (The discussion of pistol marksmanship in FMFM 0-8 remains in effect until superseded by MCRP 3-01B, *Pistol Marksmanship*, which is currently under development.)

4. CHANGES

Recommendations for improving this manual are invited from commands as well as directly from individuals. Forward suggestions using the User Suggestion Form format to:

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5. CERTIFICATION

Reviewed and approved this date.

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Rifle Marksmanship

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Chapter 1

Introduction to Rifle Marksmanship

1001. Role of the Marine Rifleman

All Marines share a common warfighting belief. The essence of this belief is captured by a simple yet powerful credo: “Every Marine a rifleman.” In other words, every Marine, regardless of specialty, has a fundamental purpose. All Marines are forged from a common experience, share a common set of values, and are trained as members of an expeditionary force in readiness. There are no “rear area” Marines. The range, mobility, and lethality of modern weapons ensure that no one is too far from potentially life threatening situations when Marines respond to a crisis. The Marine rifleman of the next conflict will be, as in the past, among the first to confront the enemy and last to hang his weapon on the rack after hostilities cease.

To be successful, Marine Corps forces must control the battlespace. In most cases, this involves control of the ground. This cannot be done without the rifleman who seizes terrain from the enemy by fire and maneuver during offensive operations. In defensive operations, the rifleman’s ability to occupy and control terrain is also very dependent upon his skill in delivering accurate fires that repel enemy assaults. Therefore, marksmanship proficiency is an essential key to military effectiveness in ground combat operations. Armed conflicts will continue to be fought in various parts of the world, from urban to jungle to desert environments. It can be assumed that the Marine Corps will be involved in these conflicts whenever national interests are threatened. The role of the Marine rifleman is to assist his unit in accomplishing its mission. The rifle is the primary means by which Marines do this.

The range of military operations stretches from war to military operations other than war. Conflict within the range of military operations can take a wide range of forms reflecting the degree of violence involved. At one end is war. War is characterized by large-scale, sustained combat consisting of engagements, battles, and campaigns among organized groups. At the other end of the scale are those actions referred to as military operations other than war. Military operations other than war focus on deterring aggression, resolving conflict, promoting peace, and supporting civil authorities. Use of military forces in peacetime helps keep the day-to-day tensions of competing groups below the threshold of armed conflict. However, whenever the situation warrants the application of deadly force, the Marine rifleman must be able to deliver well aimed shots to eliminate the threat. Sometimes the need for a well aimed shot may even be heightened by the presence of noncombatants in close proximity to the target. The proficient rifleman handles this challenge without escalating the level of violence or causing collateral damage unnecessarily. The Marine rifleman must have the versatility, flexibility, and skills to deal with a situation at any level of intensity across the entire range of military operations.

To be combat ready, the Marine must be skilled in the techniques and procedures of rifle marksmanship. Although equipped with the best rifle in the world, a unit with poorly trained riflemen cannot be depended upon to accomplish its mission. A poorly trained rifleman can lack

1 confidence or may even possess false confidence. Usually, the poorly trained rifleman either fails
2 to fire his weapon or fires ineffectively the general direction of the enemy. To send Marines into
3 harm's way, without thorough training in the use of their individual weapons carries undue risks
4 for every Marine in that unit. On the other hand, a well trained rifleman has confidence and can
5 usually deliver accurate fire under the most adverse battle conditions. It is the latter who can best
6 contribute to mission accomplishment.

7 **1002. Conditions Affecting Marksmanship in Combat**

8 There are many factors that affect the application of marksmanship in combat. The more common
9 of these are:

10 a. Most targets are linear in nature and will consist of a number of men or objects irregularly
11 spaced along covered or concealed areas.

12 b. Most targets can be detected by smoke, flash, dust, noise, or movement, but will only be
13 visible for a brief moment before taking cover.

14 c. The nature of the target, irregularities of terrain and vegetation will generally require a rifleman
15 to use a position other than prone in order to fire effectively on the target.

16 d. The time in which a target can be engaged is often fleeting.

17 **1003. Combat Mindset**

18 In a combat environment, the Marine must be constantly prepared to engage targets. When a
19 target presents itself, there may be little time to take action. The target must be engaged quickly
20 and accurately. Combat presents a unique set of demands on a Marine. Common experiences
21 include: violence, danger, fear, stress, uncertainty, pain, rapidly changing situations, and death.
22 Marines must be both physically and mentally prepared to face these horrors. It will not be
23 enough to simply know marksmanship techniques. The Marine must have the ability to eliminate
24 their own hesitancy, fear, or uncertainty of action and focus on the actions required to fire
25 well-aimed shots. The combat mindset requires both physical and mental preparation.

26 **a. Physical Preparation.** In combat, targets can present themselves without warning.
27 Therefore, it is essential for the Marine to maintain proper balance and control of his weapon at
28 all times so he can quickly assume a firing position, present the weapon, and accurately engage
29 the target. However, speed alone does not equate to effective target engagement. The Marine
30 should fire only as fast as he can fire accurately, never exceeding his physical capabilities to
31 assume a good firing position and to apply the fundamentals of marksmanship. To be effective in
32 combat, the Marine must train to perfect the physical skills of shooting so they become second
33 nature. The more physical skills that can be performed automatically, the more concentration that
34 can be given to the mental side of target engagement.

- 1 **b. Mental Preparation.** While combat is unpredictable and constantly changing, the Marine can
2 prepare himself mentally for the contingencies of battle so he can act readily when confronted
3 with a target. The stress of battle, coupled with the often limited time available to engage targets,
4 requires concentration on the mental aspects of target engagement, e.g., scanning for targets,
5 detection of targets, and the selection and use of cover.
- 6 **(1) Knowledge of the Combat Environment.** Be constantly aware of the surroundings to
7 include the terrain, available cover, possible areas of enemy contact, backdrop of the target
8 etc. This awareness will enable the Marine to select and assume a firing position and to
9 quickly and accurately engage targets.
- 10 **(2) Plan of Action.** In combat, the situation will dictate the action to be taken. The Marine
11 must identify and evaluate possible courses of action and develop a plan for target
12 engagement that will be appropriate to the requirements of the situation when it presents
13 itself.
- 14 **(3) Confidence.** A Marine's level of confidence is rooted in the belief that future challenges
15 will be overcome-- particularly the challenge of firing well aimed shots in a combat
16 environment where the enemy may be returning fire. A key factor in a Marine's level of
17 confidence is the degree to which he has mastered the tactics, techniques, and procedures of
18 rifle marksmanship. Mastery of rifle marksmanship can only be obtained by classroom
19 instruction and the application of the marksmanship fundamentals during range firing, field
20 firing, or while using marksmanship training devices.

1
2

Chapter 2

Introduction to the M16A2 Service Rifle

3 2001. Characteristics/Capabilities

- 4 • The M16A2 rifle is a lightweight, 5.56mm, magazine-fed, gas-operated, air-cooled,
5 shoulder-fired rifle.
- 6 • The rifle fires in either semiautomatic (single shot) mode or a three-round burst through
7 the use of a selector lever.
- 8 • The M16A2 rifle has a maximum effective range of 550 meters for individual or point
9 targets.
- 10 • The bore and chamber are chrome-plated to reduce wear and fouling.
- 11 • The handguards are aluminum-lined and are vented to permit air to circulate around the
12 barrel for cooling purposes and to protect the gas tube.
- 13 • An aluminum receiver helps reduce the overall weight of the rifle.
- 14 • The trigger guard is equipped with a spring-loaded retaining pin that, when depressed,
15 allows the trigger guard to be rotated out of the way for access to the trigger while
16 wearing heavy gloves.
- 17 • An ejection port cover prevents dirt and sand from getting into the rifle through the
18 ejection port. This ejection port cover should be closed when the rifle is not being fired.
19 It is automatically opened by the action of the bolt carrier.
- 20 • The muzzle compensator serves as a flash suppressor and assists in reducing muzzle jump.

21 2002. Nomenclature

22 **Figure 2-1. M16A2 Service Rifle - Right Side View.**

23 **Figure 2-2. M16A2 Service Rifle - Left Side View.**

1 2003. Operational Controls

2 a. Selector Lever

3 The selector lever has three settings which may be selected depending on the firing situation. See
4 figure 2-3.

- 5 • **Safe.** The selector lever in the safe position prevents the rifle from firing.
- 6 • **Semi.** The selector lever in the semi position allows one shot to be fired with each pull of
7 the trigger.
- 8 • **Burst.** The selector lever in the burst position allows the rifle to continue its cycle of
9 operation until interrupted by the burst cam. With each pull of the trigger, the burst cam
10 limits the maximum number of rounds fired to three. The burst cam is not "self-indexing."
11 If burst is selected, the burst cam does not automatically reset to the first shot position of
12 the 3-round burst. One, two, or three shots may be fired on the first pull of the trigger.
13 Each subsequent pull of the trigger results in a complete 3-round burst unless the trigger is
14 released before the cycle is complete. If the trigger is released during the burst and the
15 3-round cycle is interrupted, the next pull of the trigger fires the rounds remaining in the
16 interrupted 3-round cycle.

17 **Figure 2-3. Selector Lever.**

18 **b. Magazine Release Button.** The magazine release button releases the magazine from the
19 magazine well. See figure 2-4.

20 **Figure 2-4. Magazine Release Button.**

21 **c. Charging Handle.** When the charging handle is pulled to the rear, the bolt unlocks from the
22 barrel extension locking lugs and the bolt carrier group moves to the rear of the receiver. See
23 figure 2-5.

24 **Figure 2-5. Charging Handle.**

25 **d. Bolt Catch.** If the charging handle is pulled to the rear when the lower portion of the bolt
26 catch is depressed, the bolt carrier group will lock to the rear. When the bolt carrier group is
27 locked to the rear and the upper portion of the bolt catch is depressed, the bolt carrier group will
28 slide forward into the firing position. See figure 2-6.

29 **Figure 2-6. Bolt Catch.**

1 2004. Cycle of Operation

2 **a. Feeding.** Once rearward motion causes the bolt carrier group to clear the top of the
3 magazine, the expansion of the magazine spring forces a round into the path of the bolt. After the
4 action spring overcomes and absorbs the rearward motion of the bolt carrier group, it expands
5 and sends the buffer assembly and bolt carrier group forward with enough force to strip a round
6 from the magazine. See figure 2-7.

7 **Figure 2-7. Feeding.**

8 **b. Chambering.** As the bolt carrier group continues to move forward, pushing a fresh round in
9 front of it, the face of the bolt thrusts the new round into the chamber. The extractor claw grips
10 the rim of the cartridge case. The ejector is forced into its hole, compressing the ejector spring.
11 See figure 2-8.

12 **Figure 2-8. Chambering.**

13 **c. Locking.** As the bolt carrier group continues to move forward, the bolt locking lugs are
14 forced against the barrel extension and the bolt cam pin is forced along the cam track. The bolt
15 rotates and aligns the bolt locking lugs behind the barrel extension locking lugs. The weapon is
16 ready to fire. See figure 2-9.

17 **Figure 2-9. Locking.**

18 **d. Firing.** The hammer releases and strikes the head of the firing pin, driving the firing pin into
19 the round's primer. The primer ignites the powder in the cartridge. Gas generated by the rapid
20 burning of powder propels the projectile through the barrel. After the projectile passes the gas
21 port, a portion of the expanding gas enters the gas port and gas tube. The gas tube directs the gas
22 rearward into the bolt carrier key and causes the bolt carrier to move rearward. See figure 2-10.

23 **Figure 2-10. Firing.**

24 **e. Unlocking.** As the bolt carrier moves to the rear, the bolt cam pin follows the path of the cam
25 track located in the bolt carrier. This causes the bolt assembly to rotate until the bolt locking lugs
26 are no longer aligned behind the barrel extension locking lugs. See figure 2-11.

27 **Figure 2-11. Unlocking.**

28 **f. Extracting.** As the bolt carrier group continues to move to the rear, the extractor claw
29 withdraws the cartridge case from the chamber. See figure 2-12.

30 **Figure 2-12. Extracting.**

31 **g. Ejecting.** The ejector, located in the bolt face, is compressed into the bolt body by the base of
32 the cartridge case. The rearward movement of the bolt carrier group allows the nose of the

1 cartridge case to clear the front of the ejection port. The cartridge case is thrown out by the
2 action of the ejector and spring. See figure 2-13.

3 **Figure 2-13. Ejecting.**

4 **h. Cocking.** Continuing its rearward travel, the bolt carrier overrides the hammer, forces it
5 down into the receiver, compresses the hammer spring, and causes the disconnecter to engage the
6 lower hammer hook. See figure 2-14.

7 **Figure 2-14. Cocking.**

8 **2005. Ammunition**

9 Four types of ammunition are authorized for use with the M16A2 service rifle (see figure 2-15):

10 **Figure 2-15. Authorized Ammunition.**

11 **a. Ball**

12 **(1) M193.** This ammunition is a 5.56mm centerfire cartridge with a 55-grain gilded-metal
13 jacket, lead alloy core bullet. The primer and case are waterproofed. The M193 ball
14 ammunition has no identifying marks.

15 **(2) M855.** This ammunition is the primary ammunition for the M16A2 service rifle. It is
16 identified by a green tip. Its 5.56mm centerfire cartridge has better penetration than the
17 M193. It has a 62-grain gilded-metal jacket bullet. The rear two-thirds of the core of the
18 projectile is lead alloy and the front one-third is the penetrating material. The primer and case
19 are waterproofed.

20 **b. Tracer.** This ammunition has the same basic characteristics as ball ammunition. It is
21 identified by a bright red tip. Its primary uses include observation firing, incendiary effect, and
22 signaling. Tracer ammunition should be intermixed with ball ammunition in a ratio no greater
23 than one-to-one. The preferred ratio is four ball to one tracer to prevent metal fouling in the bore.

24 **c. Dummy.** This ammunition has six grooves along the side of the case. It contains no
25 propellants or primer. The primer well is open to prevent damage to the firing pin. The dummy
26 cartridge is used during dry fire and for other training purposes.

27 **d. Blank.** This ammunition has the case mouth closed with a seven-petal rosette crimp. It
28 contains no projectile. Blank ammunition is identified by its violet tip and is used for training
29 purposes.

1 2006. Preventive Maintenance

2 Normal care and cleaning will result in proper functioning of all parts of the rifle. Use only
3 issue-type cleaning materials. Improper maintenance can cause stoppages, reducing combat
4 readiness and effectiveness.

5 a. Disassembly

6 (1) Disassembly of the M16A2 Service Rifle into Three Main Groups

7

8 • Ensure the rifle is in Condition 4 (see paragraph 3002).

9 • Remove the sling.

10 • Move the take down pin from left to right as far as it will go to allow the lower
11 receiver to pivot down from the upper receiver.

12 • Move the receiver pivot pin from left to right as far as it will go and separate the upper
13 and lower receivers.

14 • Pull back the charging handle and bolt carrier about three inches and remove the bolt
15 carrier group.

16 • Remove the charging handle by sliding it back and down, out of the upper receiver.

17 See figure 2-16.

18

Figure 2-16. Three Main Groups.

19 (2) Disassembling the Upper Receiver

20 • Remove the handguards using the “buddy system.” Place the rifle on the buttstock
21 and press down on the slip ring with both hands. Have your buddy pull the
22 handguards free. See figure 2-17.

23

Figure 2-17. Removing the Handguards.

24

CAUTION

25

Use caution when the handguards are off the rifle.

26

They provide protection for the gas tube.

27

Damage to the gas tube will affect the functioning of the rifle.

28

• No further disassembly is conducted on the upper receiver group.

29

(3) Disassembling the Bolt Carrier. To disassemble the bolt carrier:

- 1 • Remove the firing pin retaining pin.
- 2 • Push the bolt back into the bolt carrier to the locked position.
- 3 • Tap the base of the bolt carrier against the palm of your hand so the firing pin will
- 4 drop out.
- 5 • Rotate the bolt cam pin 1/4 turn and lift it out.
- 6
- 7 • Withdraw the bolt assembly from the carrier.
- 8 • Press on the rear of the extractor and use the firing pin to push out the extractor
- 9 retaining pin. Remove the extractor and spring. The spring should be permanently
- 10 attached to the extractor. See figure 2-18.

CAUTION

Be careful not to damage the tip of the firing pin
while pushing out the extractor retaining pin.

Figure 2-18. Bolt Carrier Disassembled.

(4) Disassembling the Lower Receiver. To disassemble the lower receiver:

- 16 • Press in the buffer and depress the buffer retainer (it may be necessary to use the
- 17 edge of the charging handle to do this).
- 18 • Press the hammer downward and ease the buffer and action spring forward and out
- 19 of the receiver.
- 20 • Separate the parts. See figure 2-19.

Figure 2-19. Lower Receiver Disassembled.

- 22 • No further disassembly of the lower receiver is performed.

Note

In combat situations, the rifle may be partially disassembled
in any sequence. However, this is the exception rather than the rule.
Under normal circumstances, disassemble your rifle in the sequence
just performed. Any further disassembly of the rifle is to be
performed by a qualified armorer.

(5) Magazine Disassembly. The magazine should be disassembled regularly for cleaning to avoid the possibility of malfunction or stoppage of the rifle caused by dirty or damaged magazines. To disassemble the magazine:

- 1 • Pry up and push the base plate out from the magazine.
- 2 • Jiggle the spring and follower to remove. Do not remove the follower from the
- 3 spring. See figure 2-20.

4 **Figure 2-20. Magazine Disassembled.**

5 **b. Cleaning**

6 **(1) Cleaning Materials.** The following cleaning materials are used in preventive
7 maintenance (see figure 2-21):

- 8 • Brushes: bore, chamber, and general purpose.
- 9 • Rod in three sections and a handle assembly.
- 10 • Patch holder section, swabs, patches, pipe cleaners, and rags.
- 11 • CLP (Cleaner, Lubricant, and Preservative). CLP does three things. It contains
12 solvents to dissolve firing residue and carbon, it lays down a layer of Teflon as it dries
13 to provide lubrication, and it prevents rust from forming. To use CLP:
 - 14 • Always shake the bottle well before use.
 - 15 • Place a few drops of CLP on a patch or rag.
 - 16 • Clean your rifle with these patches and rags until they come out clean.
 - 17 • Take a clean patch or rag and apply a fresh, light coat of CLP.

18 **Figure 2-21. Cleaning Materials.**

19 **(2) Cleaning the Upper Receiver.** Basic cleaning of the upper receiver group should
20 include the following:

- 21 • Attach the three rod sections together but leave each one about two turns short of
22 being tight.
- 23 • Attach the patch holder onto the rod.
- 24 • Point the muzzle down and insert the non-patch end of the rod into the chamber.
25 Attach the handle to the cleaning rod section and pull a CLP-moistened 5.56mm patch
26 through the bore.

- 1 • Attach the bore brush to the rod but leave it two turns short of being tight. Put a few
2 drops of CLP on the bore brush. Insert the rod into the barrel from the chamber end,
3 attach the handle, and pull the brush through the bore.
- 4 • Inspect the bore for cleanliness by holding the muzzle to your eye and looking into the
5 bore.
- 6 • Repeat the above steps until the patches come out of the bore clean.
- 7 • Attach the chamber brush and one section of the cleaning rod to the handle. Moisten
8 it well with CLP and insert it into the chamber.
- 9 • Scrub the chamber and bolt lugs using a combination of a plunging and clockwise
10 rotating action.

11 **Note**

12 Do not reverse direction of the brush
13 while it is in the chamber.

- 14 • Clean the interior portion of the upper receiver with the general purpose brush and
15 CLP.
- 16 • Dry the bore, chamber, and the interior of the receiver with rifle patches until they
17 come out clean.
- 18 • Wipe the barrel, gas tube, and handguards clean with a rag.

19 **(3) Cleaning the Bolt Carrier Group**

- 20 • Clean the outer and inner surfaces of the bolt carrier with a general purpose brush.
- 21 • Clean the bolt carrier key with a pipe cleaner.
- 22 • Clean the locking lugs, gas rings, and exterior of the bolt with the general purpose
23 brush.
- 24 • Insert a swab into the rear of the bolt and swab out the firing pin recess and gas ports.
- 25 • Clean the extractor with the general purpose brush, ensuring all the carbon is removed
26 from underneath the extractor lip.
- 27 • Clean the firing pin, firing pin retaining pin, and extractor pin using the general
28 purpose brush and CLP.
- 29 • Clean the charging handle assembly with the general purpose brush and patches.

1 **(4) Cleaning the Lower Receiver**

- 2 • Wipe dirt from the firing mechanism with a clean patch and general purpose brush/pipe
3 cleaners.
- 4
- 5 • Clean the outside of the receiver with the general purpose brush and CLP. Clean the
6 buttplate and rear sling swivel, ensuring the drain hole is clear of dirt.
- 7
- 8 • Wipe the inside of the buffer tube, buffer, and action spring.
- 9
- 8 • Wipe the inside of the magazine well with a rag.
- 9 • Wipe out the inside of the pistol grip, ensuring it is clean.

10 **(5) Cleaning the Magazine.** Clean the inside of the magazine with the general purpose
11 brush and CLP. Wipe dry. Keep the spring lightly oiled.

12 **c. Inspection.** While cleaning the rifle, and during each succeeding step in the preventive
13 maintenance process, inspect each part for cracks and chips and to ensure parts are not bent or
14 badly worn. Report any damaged part to the armorer. Inspection is a critical step to ensure the
15 combat readiness of your rifle. It is performed normally during rifle cleaning (prior to
16 lubrication), however, it can be performed throughout the preventive maintenance process.

17 **d. Lubrication.** Lubrication is performed as part of the detailed procedure for preventive
18 maintenance. Lubrication procedures are also performed in preparation for firing.

19 **(1) Lubricant.** In all but the coldest arctic conditions, CLP is the lubricant for the rifle.
20 Remember to remove excess CLP from the bore and chamber before firing.

- 21 • Lightly lube means that a film of CLP barely visible to the eye should be applied.
- 22 • Generously lube means that the CLP should be applied heavily enough that it can be
23 spread with the finger.

24 **(2) Upper Receiver**

- 25 • Lightly lube the inside of the upper receiver, bore, chamber, outer surfaces of the
26 barrel, and surfaces under the handguard.
- 27 • Depress the front sight detent and apply two or three drops of CLP to the front sight
28 detent. Depress several times to work lubrication into the spring.
- 29 • Lubricate the moving parts and elevation screw shaft of the rear sight.

1 **(3) Bolt Carrier Group**

- 2 • Generously lube the outside of the cam pin area, the bolt rings, and outside the bolt
3 body.
- 4 • Lightly lube the charging handle and the inner and outer surfaces of the bolt carrier.

5 **(4) Lower Receiver**

- 6 • Lightly lube the inside of the lower receiver extension.
- 7 • Generously lube the moving parts inside the lower receiver and their pins.

8 **e. Reassembly**9 **(1) Reassembling the Rifle**

- 10 • Return all cleaning gear into the buttstock of the rifle and close the buttplate.
- 11 • Connect the buffer and action spring and insert them into the buffer tube/stock.
- 12 • Place the extractor and spring back on the bolt. Depress the extractor to align the
13 holes and reinsert the extractor pin.

14 **Note**

15 The extractor assembly has a rubber insert within
16 the spring. Do not attempt to remove it.

17 If the spring comes loose, put the large end of
18 the spring in the extractor and seat it. Push in the extractor pin.

- 19 • Stagger the gas rings on the bolt to stop gas loss; then insert the bolt into the carrier.
20 Do not switch bolts between rifles.
- 21 • Hold the bolt carrier with the bolt carrier key at 12 o'clock. Insert the bolt into the
22 bolt carrier with the extractor at 12 o'clock.
- 23 • Rotate the bolt counterclockwise until the cam pin hole aligns to the cam pin slot in
24 the bolt carrier.

25 **WARNING**

26 Ensure the cam pin is installed in the bolt
27 group or the rifle may explode while firing.

- 28 • Insert the bolt cam pin through the bolt carrier and into the bolt. Rotate the cam pin
29 1/4 turn right or left. Pull the bolt forward until it stops.

- 1 • Drop in the firing pin from the rear of the bolt carrier and seat it.
- 2 • Replace the firing pin retaining pin. Ensure the head of the firing pin retaining pin is
3 recessed inside the bolt carrier. The firing pin should not fall out when the bolt carrier
4 group is turned upside down.
- 5 • Place the charging handle in the upper receiver by lining it up with the grooves in the
6 receiver. Push the charging handle partially in.
- 7 • With the bolt in the unlocked position, place the bolt carrier key into the groove of the
8 charging handle.
- 9 • Push the charging handle and bolt carrier group into the upper receiver until the
10 charging handle locks.
- 11 • Join the upper and lower receivers and engage the receiver pivot pin.
- 12 • Ensure the selector lever is on safe before closing the upper receiver. Close the upper
13 and lower receiver groups. Push in the takedown pin.
- 14 • Install the handguards using the “buddy system.”
- 15 • Replace the sling.
- 16 **(2) Reassembling the Magazine.** To reassemble the magazine:
 - 17 • Insert the follower and jiggle the spring to install.
 - 18 • Slide the base under all four tabs until the base catches. Make sure the printing is on
19 the outside.

20 **2007. Function Check**

21 A function check is performed to ensure the rifle operates properly. To perform a function check:

- 22 • Place the weapon in Condition 4 (see paragraph 3002).
- 23 • Pull the charging handle to the rear and release. Ensure the selector lever is on safe and
24 pull the trigger. The hammer should not fall.
- 25 • Place the selector lever on semi. Pull the trigger and hold it to the rear. The hammer
26 should fall. Pull the charging handle to the rear and release. Release the trigger and pull
27 again. The hammer should fall.
- 28

- 1 • Pull the charging handle to the rear and release. Place the selector lever on burst. Pull the
2 trigger and hold it to the rear. The hammer should fall. Pull the charging handle to the
3 rear three times and release. Release the trigger and pull again. The hammer should fall.
- 4 • Pull the charging handle to the rear and release. Place the selector lever on safe.

5 **2008. User Serviceability Inspection**

6 Individual Marines must perform user serviceability inspections on their weapons before firing
7 them. This inspection ensures the weapon is in an acceptable operating condition.

- 8 • Conduct a function check.
- 9 • Check the rifle to ensure the following:
 - 10 • Compensator is tight.
 - 11 • Barrel is tight.
 - 12 • Front sight post is straight.
 - 13 • Front sight post is adjustable.
 - 14 • Handguards are serviceable.
 - 15 • Rear sight elevation and windage knobs are adjustable and have distinct clicks.
 - 16 • Stock is tight on the lower receiver.
 - 17 • Weapon is properly lubricated for operational conditions.
 - 18 • Barrel is clear of obstructions.

19 **2009. Field Maintenance**

20 Preventive maintenance in the field is performed when detailed disassembly and cleaning is not
21 practical due to operational tempo or the level of threat. To perform limited field preventive
22 maintenance:

- 23 • Place the rifle in Condition 4 (see paragraph 3002).

- 1 • Break the rifle down by removing the rear take down pin and rotating the upper receiver
2 and barrel forward.
- 3 • Remove the bolt carrier group.
4
- 5 • Do not disassemble the bolt carrier group further.
- 6 • Clean the bolt carrier group.
- 7 • Clean the upper and lower receiver groups (without further disassembly).
- 8 • Clean the bore and chamber.
- 9 • Lubricate the rifle.
- 10 • Reassemble the rifle and perform a user serviceability inspection.

11 **2010. Cleaning the Rifle in Abnormal Conditions**

12 The climatic conditions in various locations require special knowledge about cleaning and
13 maintaining the rifle. The conditions that will affect the rifle the most are: hot, wet tropical; hot,
14 dry desert; arctic or low temperature; and heavy rain and fording.

15 **a. Hot, Wet Tropical**

- 16 • Perform normal maintenance.
- 17 • Clean and lubricate your rifle more often. Inspect hidden surfaces for corrosion. Pay
18 particular attention to spring-loaded detents.
- 19 • Use lubricant more liberally.
- 20 • Unload and check the inside of the magazine more frequently. Wipe dry and check for
21 corrosion.
- 22 • When practical, keep the rifle covered.

23 **b. Hot, Dry Desert.** Hot dry climates are usually areas that contain blowing sand and fine dust.
24 Dust and sand will get into the rifle and magazines, causing stoppages. It is imperative to pay
25 particular attention to the cleaning and lubrication of the rifle in this type of climate.

- 26 • Corrosion is less likely to form in these environments, and lubrication will attract more
27 dirt. For this reason, use lubrication more sparingly.

- 1 • Whenever practical, keep the rifle covered.
- 2 **c. Arctic or Low Temperature.** Clean and lubricate the rifle in a warm room, with the rifle at
3 room temperature, if possible. Lubricating Oil, Arctic Weapons (LAW) can be used below a
4 temperature of zero degrees Fahrenheit and must be used below -35 degrees Fahrenheit.
- 5 • Keep the rifle covered when moving from a warm to a cold environment to allow gradual
6 cooling of the rifle. This prevents the condensation of moisture and freezing.
- 7 • Condensation will form on the rifle when it is moved from outdoors to indoors. If
8 possible, leave the rifle in a protected but cold area outdoors. When bringing the rifle
9 inside to a warm place, it should be disassembled and wiped down several times as it
10 warms.
- 11 • Always try to keep the rifle dry.
- 12 • Unload and hand function the rifle every 30 minutes, if possible, to help prevent freezing
13 of functional parts.
- 14 • Do not lay a warm rifle in snow or ice.
- 15 • Keep the inside of the magazine and ammunition wiped dry. Moisture will freeze and
16 cause stoppages.
- 17 **d. Heavy Rain and Fording**
- 18 • When practical, keep the rifle dry and covered.
- 19 • Always try to keep water out of the barrel. If water does get in, drain and (if possible) dry
20 with a patch. If water is in the barrel, point the muzzle down and break the seal by pulling
21 back slightly on the charging handle so the water will drain. If water is in the stock of the
22 weapon, ensure the drain hole in the stock is clear so the water can run out.
- 23 • Perform normal maintenance.

Chapter 3

Weapons Handling

Weapons handling procedures are a consistent and standardized way for a Marine to handle, operate, and employ the rifle safely and effectively. Proper weapons handling procedures ensure the safety of Marines by reducing negligent discharges and reinforcing positive identification of targets before engagement. Weapons handling procedures apply at all levels of training and during combat operations.

3001. Safety Rules

Safe handling of the rifle is critical. If weapons handling procedures are not used, a Marine risks his safety and the safety of his fellow Marines. During combat, a Marine must react quickly, safely, and be mentally prepared to engage targets. To ensure that only the intended target is engaged, a Marine must apply the following safety rules at all times:

a. Rule 1—Treat every weapon as if it were loaded. When a Marine takes charge of an unattended or attended rifle in any situation, he must treat the weapon as if it were loaded, determine its condition (see paragraph 3003), and continue applying the other safety rules.

b. Rule 2—Never point a weapon at anything you do not intend to shoot. Maintain muzzle awareness at all times.

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

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

3002. Weapons Conditions

A weapon's readiness is described by one of four conditions. The steps in the loading and unloading process take the rifle through four specific conditions of readiness for live fire.

a. Condition 1. Magazine inserted, round in chamber, bolt forward, safety on, ejection port cover closed.

b. Condition 2. Not applicable to the M16A2 rifle.

1 **c. Condition 3.** Magazine inserted, chamber empty, bolt forward, safety on, ejection port cover
2 closed.

3 **d. Condition 4.** Magazine removed, chamber empty, bolt forward, safety on, ejection port cover
4 closed.

5 **3003. Determining a Weapon's Condition (Chamber Check)**

6 When a Marine takes charge of a weapon in any situation, he must determine its condition.
7 Situations include coming across an unmanned rifle in combat, taking charge of your own weapon
8 after it has been unattended (e.g., out of a rifle rack, left in a vehicle), or taking charge of another
9 Marine's weapon that is attended or unattended. To determine the condition of the weapon in
10 any of these situations, the Marine should:

- 11 • Ensure the rifle is on safe.
- 12 • Conduct a chamber check to determine the condition of the weapon:

13 **Note**

14 A chamber check may be conducted at any time.

- 15 • Bring your left hand back against the magazine well.
- 16 • Extend the fingers of your left hand and cover the ejection port (see figure 3-1).

17 **Figure 3-1. Position of Hand.**

- 18 • Grab the charging handle with the index and middle fingers of your right hand.
- 19 • Pull the charging handle slightly to the rear and visually inspect the chamber (see
20 figure 3-2).

21 **Figure 3-2. Chamber Check.**

22 **CAUTION**

23 Pulling the charging handle too far to the rear
24 while inspecting the chamber may cause
25 a double feed or ejection of one round of ammunition.

26 **Note**

27 When performing a chamber check at night or during low visibility,
28 rather than visually inspecting the chamber, insert one finger of your left hand
29 into the ejection port and feel whether a round is present or not. See figure 3-3.

1 **Figure 3-3. Chamber Check at Night.**

2 • Remove the magazine and observe if ammunition is present. If time permits, count the
3 rounds.

4 • Insert the magazine into the magazine well.

5 **3004. Weapons Commands**

6 Weapons commands dictate the specific steps required to load and unload the rifle. Six
7 commands are used in weapons handling:

8 **a. Load.** This command is used to take the weapon from Condition 4 to Condition 3.

9 **b. Make Ready.** This command is used to take the weapon from Condition 3 to Condition 1.

10 **c. Fire.** This command is used to specify when a Marine may engage targets.

11 **d. Cease Fire.** This command is used to specify when a Marine must stop target engagement.

12 **e. Unload.** This command is used to take the weapon from any condition to Condition 4.

13 **f. Unload, Show Clear.** This command is used when a second individual must check the
14 weapon to verify that no ammunition is present before the rifle is placed in Condition 4.

15 **3005. Loading the Rifle.** Perform the following steps to load the rifle (take the rifle to
16 Condition 3):

17 • Ensure the weapon is in Condition 4.

18 • Withdraw the magazine from the magazine pouch.

19 • Ensure the magazine is filled.

20 • Fully insert the magazine in the magazine well.

21 • Without releasing the magazine, tug downward on the magazine to ensure it is seated.

22 • Fasten the magazine pouch.

23 • Close the ejection port cover.

1 **3006. Making the Rifle Ready.** Perform the following steps to make the rifle ready for firing
2 (take the rifle to Condition 1):

- 3 • Pull the charging handle to the rear and release. There are two methods of doing this:
- 4 • Grip the pistol grip firmly with the right hand and pull the charging handle with the left
5 hand to its rearmost position and release (see figure 3-4).

6 **Figure 3-4. Pulling the Charging Handle with the Left Hand.**

- 7 • Or grip the handguards firmly with the left hand and pull the charging handle with the
8 right hand to its rearmost position and release (see figure 3-5).

9 **Figure 3-5. Pulling the Charging Handle with the Right Hand.**

- 10 • To ensure ammunition has been chambered, conduct a chamber check if the tactical
11 situation permits (see paragraph 3003).
- 12 • Check the sights (to ensure proper BZO setting, correct rear sight aperture, etc.).
- 13 • Close the ejection port cover (if time and situation permit).

14 **3007. Fire.** On the command "Fire," aim the rifle, take the rifle off safe, and pull the trigger.

15 **3008. Cease Fire.** On the command "Cease Fire," perform the following steps:

- 16 • Place your trigger finger straight along the receiver.
- 17 • Place the weapon on safe.

18 **3009. Unloading the Rifle.** Perform the following steps to unload the rifle (take the rifle to
19 Condition 4):

- 20 • Attempt to place the weapon on safe.
- 21 • Remove the magazine from the rifle and retain it on your person.
- 22 • While cupping the left hand under the ejection port, rotate the weapon until the ejection
23 port is facing down.
- 24 • Pull the charging handle to the rear and catch the round in the left hand (see figure 3-6).

1 **Figure 3-6. Catching the Round.**

- 2 • Lock the bolt to the rear.
- 3 • Put the weapon on safe, if it would not move to safe earlier.
- 4 • Ensure the chamber is empty and no ammunition is present.
- 5 • Release the charging handle and observe the bolt moving forward on an empty chamber
- 6 (see figure 3-7).

7 **Figure 3-7. Observing the Chamber.**

- 8 • Close the ejection port cover.
- 9 • Check the sights (for proper BZO setting, correct rear sight aperture, etc.).
- 10 • Place any ejected round into the magazine and return the magazine to the magazine pouch
- 11 and close the magazine pouch.

12 **3010. Unloading and Showing the Rifle Clear.** Perform the following steps to unload the rifle

13 and show it clear (take the rifle to Condition 4):

- 14 • Attempt to place the weapon on safe.
- 15 • Remove the magazine from the rifle and retain it on your person.
- 16 • While cupping the left hand under the ejection port, rotate the weapon until the ejection
- 17 port is facing down.
- 18 • Pull the charging handle to the rear and catch the round in the left hand.
- 19 • Lock the bolt to the rear.
- 20 • Ensure the chamber is empty and no ammunition is present.
- 21 • Have a second party inspect the weapon to ensure no ammunition is present (see figure
- 22 3-8). The second party:
- 23 • Visually inspects the chamber to ensure it is empty, no ammunition is present, and
- 24 the magazine is removed.
- 25 • Ensures the weapon is on safe.

- 1 • Acknowledges the rifle is clear.

2 **Figure 3-8. Second Party Inspection.**

- 3 • After receiving acknowledgment that the rifle is clear, release the bolt catch and observe
4 the bolt moving forward on an empty chamber.
- 5 • Close the ejection port cover.
- 6 • Check the sights (for proper BZO setting, correct rear sight aperture, etc.).
- 7 • Place any ejected round into the magazine and return the magazine to the magazine pouch
8 and close the magazine pouch.

9 **3011. Filling and Storing Magazines**

10 **a. Filling the Magazine with Loose Rounds.** Perform the following steps to fill the magazine:

- 11 • Remove a magazine from the magazine pouch.
- 12 • Place the bottom of the magazine on a solid foundation.
- 13 • Place a round on top of the follower.
- 14 • Press down until the round is held between the follower and feed lips of the magazine (see
15 figure 3-9).
- 16 • Repeat until the desired number of rounds is inserted. The recommended number of
17 rounds per magazine is 28 or 29. Thirty rounds in the magazine may prohibit the
18 magazine from seating properly on a closed bolt.
- 19 • Tap the back of the magazine to ensure the rounds are seated against the back of the
20 magazine.

21 **Figure 3-9. Filling the Magazine.**

22

23 **b. Filling the Magazine Using a 10-round Stripper Clip and Magazine Filler.** The magazine
24 can also be filled quickly using a 10-round stripper clip and the magazine filler (see figure 3-10).

25 **Figure 3-10. Magazine Filler and 10-round Stripper Clip.**

26 Perform the following steps to fill the magazine with the 10-round stripper clip (see figure 3-11):

- 27 • Remove a magazine from the magazine pouch.

- 1 • Slide the magazine filler into place.
- 2 • Place a 10-round stripper clip into the narrow portion of the magazine filler.
- 3 • Place the bottom of the magazine on a solid foundation.
- 4 • Using thumb pressure on the rear of the top cartridge, press down firmly until all ten
5 rounds are below the feed lips of the magazine.
- 6 • Remove the empty stripper clip while holding the magazine filler in place.
- 7 • Repeat until the desired number of rounds is inserted. The recommended number of
8 rounds per magazine is 28 or 29. Thirty rounds in the magazine may prohibit the
9 magazine from seating properly on a closed bolt.
- 10 • Remove the magazine filler and retain it for future use.
- 11 • Tap the back of the magazine to ensure the rounds are seated against the back of the
12 magazine.

13 **Figure 3-11. Filling the Magazine with a Stripper Clip and Magazine Filler.**

14 **c. Storing Magazines**

- 15 **(1) Magazine Pouch.** In a magazine pouch, filled magazines are stored with rounds down
16 and projectiles pointing away from the body.
- 17 **(2) Load-Bearing Vest.** In a load-bearing vest, filled magazines are stored with rounds
18 down and projectiles pointing inboard.
- 19 **(3) Empty or Partially Filled Magazines.** Empty or partially filled magazines are stored
20 with the follower up to allow the selection of filled magazines by touch (i.e., at night).

21 **3012. Reloading the Rifle**

- 22 **a. Principles of Reloading.** The first priority when performing a reload is to get the rifle
23 reloaded and back into action. The second priority when performing a reload is to retain the
24 magazine so when you move, the magazine moves with you. When time permits, retain
25 magazines securely on your person (e.g., in magazine pouch, flak jacket, cargo pocket). The
26 combat situation may dictate dropping the magazine to the deck when performing a reload. This
27 is acceptable as long as it is picked up before moving to another location.

- 1 • Take cover before reloading. Always reload before leaving cover to take advantage of the
2 protection provided by cover.
- 3 • Every effort should be made not to reload on the move. When moving, your focus should
4 be on moving.
- 5 • When reloading, your focus should be on reloading only. Do not focus on the enemy;
6 focus instead on the magazine change.
- 7 • When reloading, draw the weapon in close to your body so you can see what you are
8 doing and retain positive control of the magazine.
- 9 • When the new magazine is inserted, tug on it to ensure it is seated. Do not slam the
10 magazine into the weapon hard enough to cause a round to partially pop out of the
11 magazine. This action will cause a double feed and require remedial action.
12
- 13 • Retain your empty magazines. When there is a lull in the action, refill those magazines so
14 they will be available for future use.
- 15 • During a lull in the action, replace your magazine when you know you are low on
16 ammunition. This ensures a full magazine of ammunition in the rifle should action resume.
17 Do not wait until the magazine is completely empty to replace it.
- 18 • If a reload in any position other than prone is required, use a magazine from the left
19 magazine pouch. This leaves filled magazines on the right for reloading in the prone
20 position.

21 **b. Condition 1 Reload.** A Condition 1 reload is performed when the weapon is in Condition 1
22 by replacing the magazine before it runs out of ammunition. To perform a Condition 1 reload,
23 perform the following steps:

- 24 • Remove the partially filled magazine and retain it on your person, if time permits.
- 25 • Withdraw a filled magazine from the magazine pouch.
- 26 • Fully insert the filled magazine into the magazine well and tug downward on the magazine
27 to ensure it is properly seated.
- 28 • Fasten the magazine pouch.

29 **c. Dry Reload.** A dry reload is required when the magazine in the weapon has been emptied and
30 the bolt has locked to the rear. To perform a dry reload:

- 31 • Press the magazine release button.

- 1 • Remove the empty magazine and retain it on your person if time permits.
- 2 • Fully insert a filled magazine into the magazine well and tug downward on the magazine to
3 ensure it is properly seated. Because the bolt is locked to the rear, the Marine must be
4 careful not to jam the magazine into the weapon so hard as to cause a round to protrude
5 from the magazine. This can cause a double feed and require remedial action.
- 6 • Release or press the bolt catch to allow the bolt carrier to move forward, and observe the
7 round being chambered. This places the rifle in Condition 1.

8 **3013. Remedial Action**

9 If the rifle fails to fire, a Marine performs remedial action. Remedial action is investigating the
10 cause of the stoppage, clearing the stoppage, and returning the weapon to operation.

11 **a. Observe for Indicators.** Once the rifle ceases firing, the Marine must visually or physically
12 observe the weapon to identify the problem before he can clear it. The steps taken to clear the
13 weapon are based on the following three indicators:

14 **(1) Indicator - The bolt is forward or the ejection port cover is closed.** See figure 3-12.
15 To clear the weapon:

16 **Figure 3-12. and Figure 3-12a. Bolt Forward or Ejection Port Cover Closed.**

- 17 • Seek cover if the tactical situation permits.
- 18 • Tap - Tap the bottom of the magazine.
- 19 • Rack - Pull the charging handle to the rear and release it.
- 20 • Bang - Sight in and attempt to fire.

21 **(2) Indicator - The bolt is locked to the rear.** See figure 3-13. To clear the weapon:

22 **Figure 3-13. Bolt Locked to the Rear.**

- 23 • Seek cover if the tactical situation permits.
- 24 • Conduct a reload.
- 25 • Sight in and attempt to fire.

26 **(3) Indicator - Brass is obstructing the chamber area (usually indicating a double feed**
27 **or failure to eject).** See figure 3-14. To clear the weapon:

1 **Figure 3-14. Brass Obstructing the Chamber.**

- 2 • Seek cover if the tactical situation permits.
- 3 • Attempt to remove the magazine.
- 4 • Attempt to lock the bolt to the rear.
- 5 • If the bolt will not lock to the rear, rotate the rifle so the ejection port is facing down;
- 6 hold the charging handle to the rear as far as it will go and shake the rifle to free the
- 7 round(s). If the rounds do not shake free, hold the charging handle to the rear and
- 8 strike the butt of the rifle on the ground or manually clear the round.
- 9 • Conduct a reload.
- 10 • Sight in and attempt to fire.

11 **b. Audible Pop or Reduced Recoil.** An audible pop occurs when only a portion of the

12 propellant is ignited. It is normally identifiable by reduced recoil and a lower report. This is

13 sometimes accompanied by excessive smoke escaping from the chamber area. To clear the rifle in

14 a combat environment:

- 15 • Place the rifle in Condition 4.
- 16 • Remove the bolt carrier group.
- 17 • Inspect the bore for an obstruction from the chamber end.
- 18 • Insert a cleaning rod into the bore from the muzzle end and clear the obstruction.
- 19 • Conduct a reload.
- 20 • Sight in and attempt to fire.

21 **3014. Weapon Carries**

22 Weapons carries provide an effective way to handle the rifle while remaining alert to enemy

23 engagement. Weapons carries are tied to threat conditions and are assumed in response to a

24 specific threat situation. The weapons carry assumed prepares the Marine, both mentally and

25 physically, for target engagement. The sling provides additional support for the weapon when

26 firing; therefore, the hasty sling should be used in conjunction with the carries.

1 **a. Tactical Carry.** A Marine carries the rifle at the Tactical Carry if no immediate threat is
2 present. The Tactical Carry permits control of the rifle while a Marine is moving, yet it still
3 allows quick engagement of the enemy. A Marine performs the following steps to assume the
4 Tactical Carry:

- 5 • Place the left hand on the handguards, the right hand around the pistol grip, the trigger
6 finger straight along the receiver (see figure 3-15), and the right thumb on top of the
7 selector lever (see figure 3-16).

8 **Figure 3-15. Straight Trigger Finger.**

9 **Figure 3-16. Thumb on Selector Lever.**

- 10 • Place the buttstock along the side of the body at approximately hip level.
- 11 • Angle the muzzle upward about 45 degrees in a safe direction.
- 12 • Position the muzzle in front of the eyes, slightly below eye level (see figure 3-17).
- 13 • Move the head and the eyes with the muzzle as it moves.

14 **Figure 3-17. Tactical Carry.**

15 **b. Alert.** A Marine carries the rifle at the Alert if enemy contact is likely. The Alert is also used
16 for moving in urban or other restrictive terrain where targets may appear at close quarters. A
17 Marine can engage the enemy faster from the Alert than from the Tactical Carry. However, the
18 Alert is more tiring than the Tactical Carry and its use can be physically demanding. A Marine
19 performs the following steps to assume the Alert:

- 20 • Place the left hand on the handguards, the right hand around the pistol grip, the trigger
21 finger straight along the receiver (see figure 3-18), and the right thumb on top of the
22 selector lever (see figure 3-19).

23 **Figure 3-18. Straight Trigger Finger.**

24 **Figure 3-19. Thumb on Selector Lever.**

- 25 • Place the buttstock in the shoulder.
- 26 • Angle the muzzle downward about 45 degrees and point it in a safe direction or the
27 general direction of likely enemy contact (see figure 3-20).

28 **Figure 3-20. Alert.**

1 **c. Ready.** A Marine carries the rifle at the Ready if contact with the enemy is imminent. The
2 Ready allows immediate target engagement, but it is very tiring to maintain over a long period of
3 time. A Marine performs the following steps to assume the Ready:

- 4 • Place the left hand on the handguards, the right hand around the pistol grip, the trigger
5 finger straight along the receiver (see figure 3-21), and the right thumb on top of the
6 selector lever (see figure 3-22).

7 **Figure 3-21. Straight Trigger Finger.**

8 **Figure 3-22. Thumb on Selector Lever.**

- 9 • Place the buttstock in the shoulder.
10 • Point the muzzle in the direction of the enemy.
11 • Lower the sights to just below eye level so that a clear field of view is maintained so that a
12 target may be identified (see figure 3-23).

13 **Figure 3-23. Ready.**

14 **3015. Weapons Transports**

15 Weapons transports are used to carry the rifle over the back or shoulders when moving for long
16 periods; they provide a more relaxed position for walking. Weapons transports are used if no
17 immediate threat is present. They are also used whenever one or both hands are needed for other
18 work.

19 **a. Strong Side Sling Arms (Muzzle Up) Transport.** To assume the strong side sling arms
20 (muzzle up) transport from the Tactical Carry, a Marine performs the following steps (see figure
21 3-24):

- 22 • Release the hold on the pistol grip.
23 • Lower the buttstock and bring the rifle to a vertical position.
24 • With the right hand, grasp the sling above the left forearm.
25 • With the left hand, guide the rifle around the right shoulder.
26 • With the right hand, apply downward pressure on the sling. This stabilizes the rifle on the
27 shoulder.

28 **Figure 3-24. Strong Side Sling Arms (Muzzle Up) Transport.**

1 **b. Weak Side Sling Arms (Muzzle Down) Transport.** The weak side sling arms (muzzle
2 down) transport can be used in inclement weather to keep moisture out of the rifle's bore. To
3 assume this transport from the Tactical Carry, a Marine performs the following steps (see figure
4 3-25):

- 5 • Release the hold on the pistol grip.
- 6 • With the left hand, rotate the muzzle down and bring the rifle to a vertical position on the
7 left side of the body. The pistol grip is pointed outboard.
- 8 • With the right hand, place the sling on the left shoulder.

9 **Figure 3-25. Weak Side Sling Arms (Muzzle Down) Transport.**

10 **c. Cross Body Sling Arms Transport.** A Marine uses the cross body sling arms transport if he
11 requires both hands for work. The rifle is slung across the back with the muzzle up or down.
12 Normally, the rifle is carried with the muzzle down to prevent pointing the muzzle in an unsafe
13 direction. See figure 3-26.

14 **Figure 13-26. Cross Body Sling Arms Transport.**

15 **Note**

16 Ensure the muzzle of the rifle is maintained in a
17 safe direction when assuming this transport.

18 **3016. Transferring the Rifle**

19 Proper weapons handling is required every time a Marine passes a weapon to another Marine or
20 receives a weapon from another Marine. It is the responsibility of the Marine receiving or taking
21 charge of a weapon to determine its condition. Depending on the situation, there are two
22 procedures that can be used to transfer a rifle from one Marine to another: Show Clear Transfer
23 and Condition Unknown Transfer.

24 **a. Show Clear Transfer.** To properly pass a rifle between Marines, perform the following
25 procedures:

26 The Marine handing off the rifle must:

- 27 • Ensure the rifle is on safe.
- 28 • Remove the magazine if it is present.
- 29 • Lock the bolt to the rear.

- 1 • Visually inspect the chamber to ensure there is no ammunition present.
- 2 • Leave the bolt locked to the rear and hand the weapon to the other Marine.
- 3 The Marine receiving the weapon must:
- 4 • Ensure the rifle is on safe.
- 5 • Visually inspect the chamber to ensure there is no ammunition present.
- 6 • Release the bolt catch and observe the bolt going forward on an empty chamber.
- 7 • Close the ejection port cover.

8 **Figure 3-27. Show Clear Transfer.**

9 **b. Condition Unknown Transfer.** The procedures for the Condition Unknown Transfer are
10 conducted by a Marine when he takes charge of an unmanned rifle in any situation. To properly
11 pass a rifle between Marines when its condition is unknown, the Marine receiving the weapon
12 must perform the following procedures:

- 13 • Ensure the rifle is on safe.
- 14 • Conduct a chamber check to determine the condition of the weapon (see paragraph 3003).
- 15 • Remove the magazine and observe if ammunition is present in the magazine. If time
16 permits, count the rounds.
- 17 • Insert the magazine into the magazine well.

18 **3017. Clearing Barrel Procedures**

19 **a. Purpose of a Clearing Barrel.** The sole purpose of a clearing barrel is to provide a safe
20 direction in which to aim a weapon when loading; unloading; and unloading, showing clear. See
21 figure 3-27. Clearing barrel procedures are identical to the weapons handling procedures for the
22 rifle for loading; unloading; and unloading, showing clear.

23 **Figure 3-28. Clearing Barrel.**

24 **b. Procedures for "Load."** On the command "Load," the Marine will perform the following
25 steps to take the rifle from Condition 4 to Condition 3:

- 26 • With a straight trigger finger, point the rifle in the clearing barrel.
- 27 • Ensure the rifle is in Condition 4.

- 1 • Withdraw a magazine from the magazine pouch.
- 2 • Ensure the magazine is filled.
- 3 • Fully insert the magazine into the magazine well.
- 4 • Without releasing the magazine, tug downward on the magazine to ensure it is seated.
- 5 • Fasten the magazine pouch.
- 6 • Close the ejection port cover.

7 **c. Procedures for "Make Ready."** If standard operating procedures or rules of engagement
8 require the rifle to be carried in Condition 1, the Marine will "Make Ready" at the clearing barrel.
9 On the command "Make Ready," the Marine will perform the following steps to take the rifle
10 from Condition 3 to Condition 1:

- 11 • Pull the charging handle to the rear and release. There are two methods of doing this:
 - 12 • Grip the pistol grip firmly with the right hand and pull the charging handle with the left
13 hand to its rearmost position and release.
 - 14 • Or grip the handguards firmly with the left hand and pull the charging handle with the
15 right hand to its rearmost position and release.
- 16 • To ensure ammunition has been chambered, conduct a chamber check.
- 17 • Check the sights (to ensure proper BZO setting, correct rear sight aperture, etc.).
- 18 • Close the ejection port cover.

19 **d. Procedures for "Unload."** On the supervisor's command "Unload," the Marine will perform
20 the following steps to take the rifle from any condition to Condition 4:

- 21 • With a straight trigger finger, point the rifle in the clearing barrel.
- 22 • Attempt to place the weapon on safe.
- 23 • Remove the magazine from the rifle and retain it on your person.
- 24 • While cupping the left hand under the ejection port, rotate the weapon until the ejection
25 port is facing down.
26
- 27 • Pull the charging handle to the rear and catch the round in the left hand (see figure 3-20).

- 1 • Lock the bolt to the rear.
 - 2 • Put the weapon on safe, if it would not move to safe earlier.
 - 3 • Ensure the chamber is empty and no ammunition is present.
 - 4 • Release the charging handle and observe the bolt moving forward on an empty chamber.
 - 5 • Close the ejection port cover.
 - 6 • Check the sights (for proper BZO setting, correct rear sight aperture, etc.).
 - 7 • Place any ejected round into the magazine and return the magazine to the magazine pouch
 - 8 and close the magazine pouch.
- 9 **d. Procedures for "Unload, Show Clear."** On the supervisor's command "Unload, Show
- 10 Clear," the Marine will perform the following steps to take the rifle from any condition to
- 11 Condition 4:
- 12 • With a straight trigger finger, point the rifle in the clearing barrel.
 - 13 • Attempt to place the weapon on safe.
 - 14 • Remove the magazine from the rifle and retain it on your person.
 - 15 • While cupping the left hand under the ejection port, rotate the weapon until the ejection
 - 16 port is facing down.
 - 17 • Pull the charging handle to the rear and catch the round in the left hand.
 - 18 • Lock the bolt to the rear.
 - 19 • Ensure the chamber is empty and no ammunition is present.
 - 20 • Have a second party inspect the weapon to ensure no ammunition is present. The second
 - 21 party:
 - 22 • Visually inspects the chamber to ensure it is empty, no ammunition is present, and
 - 23 the magazine is removed.
 - 24 • Ensures the weapon is on safe.
 - 25 • Acknowledges the rifle is clear.

- 1 • After receiving acknowledgment that the rifle is clear, release the bolt catch and observe
2 the bolt moving forward on an empty chamber.
- 3 • Close the ejection port cover.
- 4 • Check the sights (for proper BZO setting, correct rear sight aperture, etc.).
- 5 • Place any ejected round into the magazine and return the magazine to the magazine pouch
6 and close the magazine pouch.

Chapter 4

Fundamentals of Marksmanship

The fundamentals of marksmanship are aiming, breath control, and trigger control. These fundamentals provide the foundation for all marksmanship principles and skills. For rifle fire to be effective, it must be accurate. A rifleman who merely sprays shots in the vicinity of the enemy produces little effect. The fundamentals of marksmanship, when applied correctly, form the basis for delivering accurate fire on enemy targets. These skills must be developed so that they are applied instinctively. During combat, the fundamentals of marksmanship must be applied in a limited time frame which corresponds to the size and the distance of the target. At longer ranges, the target is smaller and a more precise shot is required to accurately engage the target. The fundamentals are more critical to accurate engagement as the range to the target increases. To be accurate at longer ranges, the Marine must take the time to slow down and accurately apply the fundamentals. At shorter ranges, the enemy must be engaged quickly before it engages the Marine. As the size of the target increases, and the distance to the target decreases, the fundamentals, while still necessary, become less critical to accuracy. In combat a Marine must apply proper aiming, breathing, and trigger control techniques without hesitation.

4001. Aiming

a. Sight Alignment. Sight alignment is the relationship between the front sight post and rear sight aperture and the aiming eye. This relationship is the most critical to aiming and must remain consistent from shot to shot. To achieve correct sight alignment (see figure 4-1):

- Center the tip of the front sight post vertically and horizontally in the rear sight aperture.
- Imagine a horizontal line drawn through the center of the rear sight aperture. The top of the front sight post will appear to touch this line. Imagine a vertical line drawn through the center of the rear sight aperture. The line will appear to bisect the front sight post.

Figure 4-1. Correct Sight Alignment.

b. Sight Picture. Sight picture is the placement of the tip of the front sight post in relation to the target while maintaining sight alignment. Correct sight alignment but improper sight placement on the target will cause the bullet to impact the target incorrectly.

- To achieve correct sight picture, place the tip of the front sight post at the center of the target while maintaining sight alignment (see figure 4-2). Center mass is the correct aiming point so that point of aim/point of impact is achieved.

Figure 4-2. Correct Sight Picture.

- 1 • The sighting system for the M16A2 rifle is designed to work using a center mass sight
2 picture.
- 3 • In combat, targets are often indistinct and oddly shaped. The center mass hold is the most
4 sensible to use because it provides a consistent aiming point (see figure 4-3).

5 **Figure 4-3. Examples of Correct Sight Picture.**

6 **c. Importance of Correct Sight Alignment.** A sight alignment error results in a misplaced shot.
7 The error grows proportionately greater as the distance to the target increases. An error in sight
8 picture, however, remains constant regardless of the distance to the target. See figure 4-4.

9 **Figure 4-4. Importance of Correct Sight Alignment.**

10 **d. Factors Affecting Sight Alignment and Sight Picture**

11 **(1) Stock Weld.** Stock weld is the point of firm contact between the cheek and the stock of
12 the rifle (see figure 4-5). The head should be as erect as possible to enable the aiming eye to
13 look straight through the rear sight aperture. If the position of the Marine's head causes him
14 to look across the bridge of his nose or out from under his eyebrow, the eye will be strained.
15 The eye functions best in its natural forward position. Changing the placement of the cheek up
16 or down on the stock from shot to shot may affect the zero on the rifle due to the perception
17 of the rear sight aperture. A consistent and proper stock weld is critical to the aiming process
18 because it provides consistency in eye relief which affects the ability to align the sights.

19 **Figure 4-5. Stock Weld.**

20 **(2) Eye Relief.** Eye relief is the distance between the rear sight aperture and the aiming eye
21 (see figure 4-6). Normal eye relief is two to six inches from the rear sight aperture, depending
22 on the firing position. Every Marine is different. The distance between the aiming eye and the
23 rear sight aperture depends on the size of the Marine and the firing position. While eye relief
24 varies from one position to another, it is important to have the same eye relief for all shots
25 fired from a particular position.

26 **Figure 4-6. Eye Relief.**

- 27 • If the eye is too close to the rear sight aperture, it will be difficult to line up the front
28 sight post in the rear sight aperture (see figure 4-7). Moving the eye back from the
29 rear sight aperture will make the aperture appear smaller and allow the tip of the front
30 sight post to be easily lined up inside the rear sight aperture.

31 **Figure 4-7. Shortened Eye Relief.**

- 32 • If the eye is too far from the rear sight aperture, it will be difficult to acquire the target
33 and to maintain a precise aiming point (see figure 4-8).

Figure 4-8. Extended Eye Relief.

(3) **Wearing of Glasses.** Wearing glasses can alter the perception of sight alignment and sight picture. If wearing glasses, it is critical to look through the optic center of the lens.

d. Acquiring and Maintaining Sight Alignment and Sight Picture

(1) The human eye can focus clearly on only one object at a time. For accurate shooting, it is important to focus on the tip of the front sight post the second the shot is fired. When the shot is fired, focus must be on the tip of the front sight post; secondary focus will include the rear sight and the target. The rear sight and the target will appear blurry. To stare or fix the vision on the front sight post for longer than a few seconds can distort the image, making it difficult to detect minute errors in sight alignment.

(2) Proper stock weld and placement of the butt of the rifle in the shoulder aids in establishing sight alignment quickly. The rifle butt's placement in the shoulder serves as the pivot point for presenting the rifle upward to a fixed point on the cheek (stock weld). During combat, a Marine will look at the target as the rifle is presented. As the rifle sights become level with the aiming eye, a Marine visually locates the target through the rear sight aperture. As the rifle settles, a Marine's focus shifts back to the front sight post to place the tip of the post on the target and obtain sight alignment and sight picture. To maintain sight alignment and sight picture, the Marine's focus should shift repeatedly from the front sight post to the target until correct sight alignment and sight picture are obtained. This enables the detection of minute errors in sight alignment and sight picture.

e. Size and Distance to the Target. During combat, the fundamentals of marksmanship must be applied in a time frame consistent with the size and the distance of the target.

(1) Long-range Engagements

(a) At longer ranges, the target is smaller and a more precise shot is required to accurately engage the target. Sight alignment and sight picture are more critical to accurate engagement as the range to the target increases. To be accurate at longer ranges, the Marine must take the time to slow down and accurately apply the fundamentals.

(b) As the distance to the target increases, the front sight post covers more of the target, making it difficult to establish a center of mass hold (see figure 4-9). There is a tendency to look at the target by lowering the tip of the front sight post. This causes shots to impact low or miss the target completely. A Marine must consciously aim at the center of mass and attempt to maintain a center mass sight picture.

Figure 4-9. Sight Picture at Long-range Engagements.

1 **(2) Short-range Engagements.** At shorter ranges, the enemy must be engaged quickly
2 before it engages the Marine. As the size of the target increases, and the distance to the target
3 decreases, sight alignment becomes less critical to accuracy. At very short ranges, a deviation
4 in sight alignment can still produce accurate results as long as the tip of the front sight post is
5 in the rear sight aperture and on the target (see figure 4-10). The time required to engage a
6 target is unique to each individual. Although a Marine must engage the target rapidly, some
7 semblance of sight alignment is still required to be accurate.

8 **Figure 4-10. Sight Picture at Short-range Engagements.**

9 **4002. Breath Control**

10 Proper breath control is critical to the aiming process. Breathing causes the body to move. This
11 movement transfers to the rifle making it impossible to maintain proper sight picture. Breath
12 control allows the Marine to fire the rifle at the moment of least movement.

13 **a. Breath Control During Long-range or Precision Fire (Slow Fire).** It is critical that
14 Marines interrupt their breathing at a point of natural respiratory pause before firing a long-range
15 shot or a precision shot from any distance. A respiratory cycle lasts 4 to 5 seconds. Inhaling and
16 exhaling require about 2 seconds each. Between each respiratory cycle there is a natural pause of
17 2 to 3 seconds. The pause can be extended up to 10 seconds. During the pause, breathing
18 muscles are relaxed and the sights settle at their natural point of aim. To minimize movement,
19 Marines must fire the shot during the natural respiratory pause. The basic technique is as follows:

- 20 • Breathe naturally until the sight picture begins to settle.
- 21 • Take a slightly deeper breath.
- 22 • Exhale and stop breathing at the natural respiratory pause.
- 23 • Fire the shot during the natural respiratory pause.

24 **Note**
25 If the sight picture does not sufficiently settle
26 to allow the shot to be fired, resume normal
27 breathing and repeat the process.

28 **b. Breath Control During All Other Combat Situations.** A Marine in a combat environment
29 may not have the time to fire a shot during the natural respiratory pause. His breathing and heart
30 rate increase due to physical exertion or the stress of battle. Therefore, he must interrupt his
31 breathing cycle to create a pause that is long enough to fire a shot. However, a Marine should not
32 make a conscious effort to perform breath control. The basic technique is as follows:

- 33 • Take a deep breath filling the lungs with oxygen.

- 1 • Hold the breath and apply pressure to the trigger.
- 2 • Fire the shot.

3 **Note**

4 It may be necessary to take several deep breaths
5 quickly before holding the breath.

6 **4003. Trigger Control**

7 Trigger control is the skillful manipulation of the trigger that causes the rifle to fire without
8 disturbing sight alignment or sight picture. Controlling the trigger is a mental process, while
9 pulling the trigger is a mechanical process.

10 **a. Grip.** A firm grip is essential for effective trigger control. The grip is established before
11 starting the application of trigger control and it is maintained through the duration of the shot. To
12 establish a firm grip on the rifle, position the “V” formed between the thumb and index finger on
13 the pistol grip behind the trigger. The fingers and the thumb are placed around the pistol grip in a
14 location that allows the trigger finger to be placed naturally on the trigger and the thumb in a
15 position to operate the safety. Once established, the grip should be firm enough to allow
16 manipulation of the trigger straight to the rear without disturbing the sights. See figure 4-11.

17 **Figure 4-11. Grip.**

18 **b. Trigger Finger Placement.** Correct trigger finger placement allows the trigger to be pulled
19 straight to the rear without disturbing sight alignment. The trigger finger should contact the
20 trigger naturally. The trigger finger should not contact the rifle receiver or trigger guard.

21 **c. Types of Trigger Control.** There are two techniques of trigger control: uninterrupted and
22 interrupted.

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

26 **(2) Interrupted Trigger Control.** Interrupted trigger control is used in extremely windy
27 conditions when the weapon will not settle, forcing the Marine to pause until the sights return
28 to his aiming point. To perform interrupted trigger control:

- 29 • Move the trigger to the rear until an error is detected in the aiming process.
- 30 • When this occurs, stop the rearward motion on the trigger but maintain the pressure on
31 the trigger until sight picture is achieved.

- 1 • When the sight picture settles, continue the rearward motion on the trigger until the shot is
2 fired.

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

7 **4004. Follow-Through/Recovery**

8 **a. Follow-Through.** Follow-through is the continued application of the fundamentals until the
9 round has exited the barrel. In combat, follow-through is important to avoid altering the impact
10 of the round by keeping the rifle as still as possible until the round exits the barrel.

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

1
2

Chapter 5

Rifle Firing Positions

3 In a combat environment, a Marine must be prepared to engage the enemy under any
4 circumstance. There are four basic firing positions: prone, sitting, kneeling, and standing. These
5 positions provide a stable foundation for effective shooting. A stable firing position allows a
6 Marine to hold the rifle steady and to control the trigger while keeping the sights aligned. During
7 training, a Marine learns positions in a step-by-step process, guided by a series of precise
8 movements until the Marine assumes a correct position. The purpose of this is to ensure that the
9 Marine correctly applies all of the factors that assist him in holding the rifle steady. The Marine
10 will gradually become accustomed to the feel of the positions through practice and eventually will
11 be able to know instinctively whether his position is correct. In combat, it may not be possible to
12 assume a textbook firing position due to terrain, available cover, engagement time, dispersion of
13 targets, and other limiting factors. Modifications to the basic positions may have to be made to
14 adjust to the combat environment. The Marine must strive to assume a position that offers
15 stability for firing, maximum cover and concealment from the enemy, and maximum observation
16 of the target.

17 **5001. Selecting a Firing Position.** The selection of a firing position (prone, sitting, kneeling,
18 standing) is based on terrain, available cover, dispersion of targets, and other limiting factors. A
19 Marine must select a position that offers stability, mobility, and observation.

20 **a. Stability.** A firing position must provide a stable platform for accurate and consistent
21 shooting. If the position is solid, the rifle sights should recover after recoil to the same position
22 on the target. This allows for rapid reengagement of the enemy. The prone position provides the
23 most stability for firing, while the standing position provides the least stability.

24 **b. Mobility.** A firing position must provide a Marine with the mobility required to move to new
25 cover or to another area. The standing position permits maximum mobility. It allows the most
26 lateral movement for engagement of widely dispersed targets. The prone position allows the least
27 mobility and allows limited lateral movement.

28 **c. Observation of the Enemy.** A firing position must limit a Marine's exposure to the enemy,
29 yet allow observation of the enemy. Manmade structures and terrain features (e.g., vegetation,
30 earth contours) often dictate the shooting position. The standing position normally provides the
31 best field of view, but it usually allows the most exposure to the enemy. The prone position
32 normally allows the least exposure, but it usually provides a limited field of view.

33 **5002. Types and Uses of the Rifle Web Sling**

34 **a. Purpose.** The rifle sling, when adjusted properly, provides maximum stability for the weapon
35 and helps reduce the effects of the rifle's recoil. Once a sling adjustment is found that provides

1 maximum control of the weapon, the same sling adjustment should be maintained. Varying the
2 sling tension extensively will affect the strike of the bullet, which will make maintaining a
3 battlesight zero (BZO) difficult. Using the same sling adjustment will ensure the accuracy of
4 rounds on target.

5 **b. Types of Slings.** There are two basic types of rifle sling adjustments: the hasty sling and loop
6 sling.

7 **5003. Hasty Sling**

8 **a. Application.** The hasty sling is used in all firing positions. The hasty sling is advantageous in
9 combat because it can be acquired quickly and it provides added stability to the rifle.

10 (1) The hasty sling can be easily assumed and acquired quickly.

11 (2) The same sling setting can be used for all firing positions.

12 (3) If properly adjusted, the hasty sling supports the weight of the weapon and provides
13 maximum stability for the rifle and reduces the effects of the rifle's recoil.

14 (4) When using the hasty sling, controlled muscle tension is applied to offer resistance against
15 the sling. Resistance against the hasty sling controls the point at which the rifle sights will
16 settle.

17 **b. Donning the Hasty Sling.** To form the hasty sling, a Marine performs the following steps:

18 • Hold the rifle vertical with the barrel pointing upward.

19 • Unhook the J-hook from the lower sling swivel.

20 • Loosen the sling keeper.

21 • Adjust the sling until the J-hook hangs below the butt of the rifle. (The distance will
22 vary based on the individual Marine, but the J-hook will usually hang approximately 3
23 - 10 inches below the butt.) See figure 5-1.

24 **Figure 5-1. J-Hook Location.**

25 • Turn the sling a half turn outboard (this will allow the sling to lay flat against the back
26 of the hand and arm).

27 • Attach the J-hook to the lower sling swivel so the open end of the J-hook faces
28 outboard, away from the rifle. See figure 5-2.

29 **Figure 5-2. J-Hook Turned Outboard.**

- 1 • While holding the rifle with the right hand, place the left arm through the sling near the
2 lower sling swivel. The arm makes contact on the sling just below the triceps, above
3 the elbow.
- 4 • Slide the arm up through the sling below the half twist. The sling lies flat on the back
5 of the arm.
- 6 • With the left hand, grasp the handguard so the sling lies flat against the back of the
7 hand or wrist. See figure 5-3.

8 **Figure 5-3. Back of Hand/Wrist Against the Sling.**

- 9 • Place the left hand under the rifle so the handguard rests in the “V” formed by the
10 thumb and forefinger.
- 11 • Move the left hand as required to level the rifle with the line of sight. Hand placement
12 is correct approximately midway back on the handguard.
- 13 • Placement of the forward hand controls the tension on the sling between the wrist and
14 the upper sling swivel (see figure 5-4). This hand placement, with a straight locked
15 wrist, will cause the sling to pull straight under the handguards and serves to stabilize
16 the muzzle of the rifle.
- 17 • Move the feed end of the sling in or out of the sling keeper to adjust the hasty sling. It
18 is important for the hasty sling to be adjusted so it supports the rifle.

19 **Figure 5-4 and 5-4a. Position of Forward Hand.**

- 20
- 21 • Sling tension is further adjusted by moving the elbow outboard or by squaring the
22 body more toward the target. See figure 5-5. (This enables one sling setting to fit all
23 positions.)

24 **Figure 5-5. Position of Left Elbow.**

- 25 • Locate the sling keeper near the feed end of the sling and secure.

26 **c. Seven Factors Common to All Shooting Positions as they Apply with the Hasty Sling.**

27 There are seven factors common to all shooting positions (see Figure 5-6). In a hasty sling
28 configuration, the sling is attached to the upper and lower sling swivels of the rifle. When the left
29 arm is placed in the hasty sling, tension created by the sling travels from side to side. The tension
30 created by the sling affects how the position is established. There are fundamental differences
31 between the application of the seven factors when using the hasty sling. The most marked of
32 these is placement of the left hand and the left elbow.

33 **Figure 5-6. Seven Factors with the Hasty Sling.**

1 **(1) Left Hand.** The placement of the forward hand affects placement of the left elbow, eye
2 relief, stock weld, and sling tension.

3 **(a)** To maximize the support provided by the hasty sling, the forward hand, wrist, and
4 forearm should be straight with the wrist locked in place; the hand is rotated up so the rifle
5 rests in the "V" formed by the thumb and index finger; the fingers will not normally curl
6 around the handguards. Instead, they will pinch the handguard slightly to keep the hand
7 from slipping on the handguard during recoil.

8 **(b)** Forward hand placement must be adjusted to stabilize the front sight of the rifle. The
9 rifle can be stabilized using the hasty sling in two ways:

- 10 • The tension on the sling created by the hasty sling causes the center of balance to
11 change on the rifle. With the hasty sling donned, the sling pulls down on the sling
12 swivel disrupting the center of balance and causing the muzzle to drop. When the
13 Marine is using a hasty sling, the forward hand must be extended on the
14 handguards to center the balance of the rifle and counteract the downward tension
15 at the muzzle. See figure 5-7.

16 **Figure 5-7. Position of Left Hand.**

- 17 • When the forward hand's wrist is straight and locked, it creates resistance on the
18 sling close to the muzzle. This resistance allows the muzzle to be stabilized. In
19 contrast, when the rifle rests across the palm of the hand, the only resistance
20 created is where the sling meets the triceps. Since the resistance is further from
21 the muzzle of the rifle, it makes stabilizing the rifle more difficult.

22 **(c)** Because the forward hand is extended on the handguards, the left elbow and triceps
23 will not be inverted against the rib cage; the left elbow will be pushed outboard against the
24 tension of the sling. Muscular tension applied outboard against the sling will serve to
25 stabilize the rifle sights. The position of the left elbow will cause the shooter's body
26 position to be more squared to the target. See figure 5-8.

27 **Figure 5-8. Position of Left Elbow.**

28 **(2) Rifle Butt in the Pocket of the Shoulder.** Place the rifle butt firmly into the pocket
29 formed in the right shoulder. This provides resistance to recoil, helps steady the rifle, and
30 prevents the rifle butt from slipping in the shoulder during firing. Consistent placement of the
31 rifle butt in the shoulder pocket is essential to maintaining a BZO and firing tight shot groups.

32 **(a)** With the hasty sling donned, the placement of the buttstock in the shoulder will be
33 lower than when not using a sling, affecting the Marine's eye relief. However, the butt
34 should be placed high in the shoulder to achieve a proper stock weld. Placing the weapon
35 high in the shoulder allows the Marine to bring the stock up to his head, rather than lower

1 his head to the stock which can degrade acquisition of sight alignment and sight picture.
2 See figure 5-9.

3
4 **Figure 5-9. Buttstock in the Shoulder.**

5 **(b)** If the Marine is using the hasty sling properly to support his position, the Marine will
6 be more squared to the target; the rifle will not be angled across the chest.

7 **(3) Grip of the Right Hand.** Grasp the pistol grip with the right hand and place the
8 forefinger on the trigger, with the thumb and remaining fingers wrapped around the pistol grip
9 (see figure 5-10). Firm rearward pressure should be exerted to help keep the rifle butt firmly
10 in the shoulder, reducing the effects of recoil. The trigger finger should be placed naturally on
11 the trigger and care should be taken to ensure that the trigger finger can move independently
12 without dragging on the side of the receiver. Proper placement of the right hand on the pistol
13 grip allows the trigger to be moved straight to the rear without disturbing sight alignment.

14 **Figure 5-10. Grip of the Right Hand.**

15 **(4) Right Elbow.** The right elbow should be positioned naturally to provide balance to the
16 position and create a pocket in the shoulder for the rifle butt. If the elbow is correctly
17 positioned, it helps to form the pocket in the right shoulder where the rifle butt rests. The
18 exact placement of the elbow varies with each shooting position but should remain consistent
19 from shot to shot, ensuring the resistance to recoil remains constant. See figure 5-11.

20 **Figure 5-11. Right Elbow.**

21 **(5) Stock Weld.** The placement of the shooter's cheek against the stock should remain firm
22 and consistent from shot to shot. Consistency of stock weld is achieved through proper
23 placement of the rifle butt in the pocket of the shoulder. A firm contact between the cheek
24 and the stock enables the head and rifle to recoil as a single unit. Stock weld provides quick
25 recovery between rapid fire shots, keeps the aiming eye centered in the rear sight aperture,
26 and prevents the head from bouncing off the stock during recoil. The head should remain
27 erect to allow the aiming eye to look straight through the rear sight aperture. See figure 5-12.

28 **Figure 5-12. Stock Weld.**

29 **(6) Breathing.** Breathing causes movement of the chest and a corresponding movement in
30 the rifle and its sights. To minimize this movement and the effect it has on aim, learn to
31 control breathing and extend the natural respiratory pause for a few seconds during the final
32 aiming and firing process. Do not extend the natural respiratory pause for an uncomfortable
33 period. This can cause blurry vision and will decrease the ability to deliver well-aimed shots.

34 **(7) Muscular Tension.** With the hasty sling donned, the Marine must apply an amount of
35 controlled muscular tension in the left arm to keep the sling taut and stabilize the weapon.
36 The muscular tension is applied outward against the sling rather than in an effort to hold the

1 rifle up. However, muscular tension should not be excessive to cause the Marine to shake,
2 tremble, or fatigue.

3 **5004. Loop Sling**

4 **a. Application.** The loop sling provides the greatest amount of stability during firing. This
5 stability allows the Marine to perfect marksmanship fundamentals. A loop sling takes longer to
6 don or remove than a hasty sling. Therefore, it has limited combat application; it is best used
7 where stability of hold is needed for a precision or long-range shot. The loop sling is used in the
8 prone, sitting, and kneeling positions. It provides maximum stability in all the supported firing
9 positions.

10 **b. Donning the Loop Sling.** To form the loop sling:

- 11 • Place the rifle butt on the right hip and cradle the rifle in the right arm.
- 12 • Disconnect the J-hook from the lower sling swivel.
- 13 • With the M-buckle near the hook, feed the sling through the top of the M-buckle to form
14 a loop large enough to slip over the arm. See figure 5-13.

15 **Figure 5-13. Forming a Loop.**

- 16 • Give the loop a half turn outboard and insert the left arm through the loop, positioning the
17 loop above the biceps. The loop is high on the left arm above the biceps muscle in such a
18 position that it does not transmit pulse beat to the rifle.
- 19 • Position the M-buckle on the outside of the left arm. See figure 5-14.

20 **Figure 5-14. Position of M-buckle.**

- 21 • Tighten the loop on the left arm, ensuring the M-buckle moves toward the center of the
22 arm as the loop tightens. The sling must pull from the center of the arm to be properly
23 positioned. In this way, as tension is applied to the sling in the firing position, the loop
24 will tighten.
- 25 • To adjust the sling for the proper length, loosen the sling keeper and pull up or down
26 (toward or away) from the loop. This adjustment varies with every individual and every
27 firing position:
 - 28 • The loop should not be tightened excessively on the arm. If blood flow is restricted,
29 excessive pulse beat is transmitted through the rifle sling to the rifle and causes a
30 noticeable, rhythmic movement of the rifle sights. When this occurs, a stable hold at
31 the desired aiming point is impossible to achieve.

- 1 • Tension on the rifle sling is correct when it causes the rifle butt to be forced rearward
2 into the pocket of the shoulder. This serves to keep the buttplate in the shoulder
3 pocket during recoil. To increase the amount of tension on the rifle sling, the sling
4 must be shortened. To lessen the tension, the rifle sling must be lengthened.
- 5 • Move the sling keeper toward the left arm and secure it. The sling keeper should be
6 positioned near the feed end of the sling.
- 7 • Place the left hand over the sling from the left side and under the rifle. The rifle handguard
8 should rest in the "V" formed between the thumb and forefinger.
- 9 • Move the left hand as required to achieve desired sight picture. Adjust the length of the
10 sling for proper sling tension and support. See figure 5-15.

11 **Figure 5-15. Loop Sling Donned.**

12 **c. Three Elements of a Good Shooting Position as they Apply with the Loop Sling.** There
13 are three elements of a good shooting position that apply when using a loop sling:

14 **(1) Bone Support.** The body's skeletal structure provides a stable foundation to support the
15 rifle's weight. A weak shooting position will not withstand the repeated recoil of a rifle when
16 firing at the sustained rate or buffeting from wind. To attain a correct shooting position, the
17 bones of the body must support as much of the rifle's weight as possible. Proper use of the
18 sling provides additional support.

19 **(a)** The weight of the weapon should be supported by bone rather than muscle because
20 muscles fatigue whereas bones do not.

21 **(b)** Establish a strong foundation for the rifle by utilizing bone support. This will enable
22 the Marine to relax as much as possible while minimizing the movement of the weapon
23 due to muscle tension.

24 **(2) Muscular Relaxation.** Once bone support is achieved, muscles are relaxed. Muscular
25 relaxation helps to hold the rifle steady and increase the accuracy of your aim. Muscular
26 relaxation also permits the use of maximum bone support to create a minimum arc of
27 movement and consistency in resistance to recoil. There is no way to achieve muscular
28 relaxation without bone support. During the shooting process, the muscles of the body must
29 be relaxed as much as possible. Muscles that are tense will cause excessive movement of the
30 rifle, disturbing the aim. When proper bone support and muscular relaxation are achieved, the
31 rifle will settle onto your aiming point, making it possible to apply trigger control and deliver a
32 well-aimed shot.

33 **(3) Natural Point of Aim.** The point at which the rifle sights settle when bone support and
34 muscular relaxation are achieved is called the natural point of aim.

1 (a) Since the rifle becomes an extension of the body, it may be necessary to adjust the
2 position of the body until the rifle sights settle naturally on the desired aiming point on the
3 target.

4 (b) When in a shooting position with proper sight alignment, the position of the tip of the
5 front sight post will indicate the natural point of aim. When completely relaxed, the tip of
6 the front sight post should rest on the desired aiming point.

7 (c) One method of checking for natural point of aim is to aim in on your target, close
8 your eyes, take a couple of breaths, and relax as much as possible. When you open your
9 eyes, the tip of the front sight post should be positioned on the desired aiming point while
10 maintaining sight alignment.

11 (d) For each shooting position, specific adjustments will cause your rifle sights to settle
12 center mass, achieving a natural point of aim.

- 13 • In all positions, natural point of aim can be adjusted by:
 - 14 • Varying the placement of the left hand in relation to the handguards.
 - 15 • Moving the left hand forward on the handguards lowers the muzzle of the
16 weapon, causing the sights to settle lower on the target.
 - 17 • Moving the left hand back on the handguards raises the muzzle of the
18 weapon, causing the sights to settle higher on the target.
 - 19 • Varying the placement of the stock in the shoulder.
 - 20 • Moving the stock higher in the shoulder lowers the muzzle of the weapon,
21 causing the sights to settle lower on the target.
 - 22 • Moving the stock lower in the shoulder raises the muzzle of the weapon,
23 causing the sights to settle higher on the target.
 - 24 • Natural point of aim can be adjusted right or left by adjusting body alignment
25 in relation to the target.
26
27
 - 28 • In the prone position, if the natural point of aim is above or below the desired
29 aiming point, move your body slightly forward or back using your left elbow as a
30 pivot and by digging your toes in.
 - 31 • Pushing your body forward causes the sights to settle lower on the target.
 - 32 • Pulling your body backward causes the sights to settle higher on the target.

- 1 • In the kneeling and sitting positions, natural point of aim can be adjusted by
2 varying the placement of the left elbow on the knee.
- 3 • Moving the left elbow forward on the knee lowers the muzzle of the weapon,
4 causing the sights to settle lower on the target.
- 5 • Moving the left hand back on the knee raises the muzzle of the weapon,
6 causing the sights to settle higher on the target.

7 **d. Seven Factors Common to All Shooting Positions as they Apply with the Loop Sling.**

8 The following seven factors must be incorporated into all firing positions with the loop sling (see
9 figure 5-16):

10 **Figure 5-16. Seven Factors with the Loop Sling.**

11 **(1) Left Hand.** In all positions established with the loop sling, it is desirable that the
12 handguard of the rifle rest in the "V" formed by the thumb and index finger of the left hand.
13 The left wrist is straight with the rifle resting across the heel of the hand. The left elbow
14 should be positioned directly under the weapon to create bone support and a consistent
15 resistance to recoil. The fingers can curl against the handguard, but should apply only the
16 minimum amount of pressure to prevent the hand from slipping on the handguard. Move the
17 left hand rearward or forward on the handguards to adjust for elevation (moving the hand
18 rearward elevates the muzzle). See figure 5-17.

19 **Figure 5-17. Position of Left Hand.**

20 **(2) Rifle Butt in the Pocket of the Shoulder.** Place the rifle butt firmly into the pocket
21 formed in the right shoulder. This reduces the effect of recoil, helps steady the rifle, and
22 prevents the rifle butt from slipping in the shoulder during firing. Consistent placement of the
23 rifle butt in the shoulder pocket is essential to firing tight shot groups and maintaining a **true**
24 **zero**. See figure 5-18.

25 **Figure 5-18. Rifle Butt in the Shoulder.**

26 **(3) Grip of the Right Hand.** Grasp the pistol grip with the right hand and place the
27 forefinger on the trigger, with the thumb and remaining fingers wrapped around the pistol
28 grip. Firm rearward pressure should be exerted to help keep the rifle butt firmly in the
29 shoulder, reducing the effects of recoil. The trigger finger should be placed naturally on the
30 trigger and care should be taken to ensure that the trigger finger can move independently
31 without dragging on the side of the receiver. Proper placement of the right hand on the pistol
32 grip allows the trigger to be moved straight to the rear without disturbing sight alignment.
33 See figure 5-19.

34 **Figure 5-19. Grip of the Right Hand.**

1 (4) **Right Elbow.** The right elbow should be positioned naturally to provide balance to the
2 position and create a pocket in the shoulder for the rifle butt. If the elbow is correctly
3 positioned, it helps to form the pocket in the right shoulder where the rifle butt rests. The
4 exact placement of the elbow varies with each shooting position but should remain consistent
5 from shot to shot, ensuring the resistance to recoil remains constant. See figure 5-20.

6 **Figure 5-20. Right Elbow.**

7 (5) **Stock Weld.** The placement of the shooter's cheek against the stock should remain firm
8 and consistent from shot to shot. Consistency of stock weld is achieved through proper
9 placement of the rifle butt in the pocket of the shoulder. A firm contact between the cheek
10 and the stock enables the head and rifle to recoil as a single unit. This provides quick
11 recovery between rapid fire shots, keeps the aiming eye centered in the rear sight aperture,
12 and prevents the head from bouncing off the stock during recoil. See figure 5-21.

13 **Figure 5-21. Stock Weld.**

14 (6) **Breathing.** Breathing causes movement of the chest and a corresponding movement in
15 the rifle and its sights. To minimize this movement and the effect it has on your aim, learn to
16 control your breathing and extend your natural respiratory pause for a few seconds during the
17 final aiming and firing process. Do not extend your natural respiratory pause for an
18 uncomfortable period. This can cause blurry vision and will decrease your ability to deliver
19 well-aimed shots.

20 (7) **Relaxation.** Relaxation prevents undue muscle strain and reduces excessive movement.
21 If proper relaxation is achieved, natural point of aim and sight alignment can be maintained.

22 **5005. Prone Position**

23 **a. Application.** The prone position provides a very steady foundation for shooting, is easy to
24 assume, and presents a low profile for maximum concealment. However, the prone position is the
25 least mobile of the shooting positions and may restrict a Marine's field of view for observation. In
26 this position, the weight is evenly distributed on the elbows, providing maximum support and
27 good stability for the rifle.

28 **b. Assuming the Prone Position.** The position can be assumed by either moving forward or
29 dropping backward into position, depending on the combat situation. For example, it may be
30 necessary to drop backward into position to avoid crowding cover, or to avoid covering
31 uncleared terrain.

32 (1) **Moving Forward into Position.** To move forward into the prone position, the Marine
33 performs the following steps:

- 1 • Stand erect, face the target, and spread your feet a comfortable distance.
- 2
- 3 • Place your left hand on the handguard, your right hand on the pistol grip.
- 4 • Lower yourself into position by dropping to both knees (see figure 5-22).

5 **Figure 5-22. Dropping to Both Knees.**

- 6 • Then shift your weight forward to lower your upper body to the ground using your
- 7 right hand to break the forward motion. See figure 5-23.

8 **Figure 5-23. Moving Forward Into Position.**

9 **(2) Dropping Back into Position.** To drop back into the prone position, the Marine
10 performs the following steps:

- 11 • Place your left hand on the handguard, your right hand on the pistol grip.
- 12 • Squat to the ground and break the fall with either hand (see figure 5-24).

13 **Figure 5-24. Breaking the Fall.**

- 14 • Kick both legs straight to the rear (see figure 5-25).

15 **Figure 5-25. Kicking Back Into Position.**

16 **c. Straight Leg Position with the Hasty Sling.** Apply the seven factors to this position
17 (paragraph 5003c). To assume the straight leg prone position with the hasty sling, either move
18 forward or drop back into position (see figure 5-26):

19 **Figure 5-26. Straight Leg Prone Position with Hasty Sling.**

- 20 • Once on the ground, extend your left elbow in front of you. Stretch your legs out behind
21 you. Spread your feet a comfortable distance apart with your toes pointing outboard and
22 the inner portion of your feet in contact with the ground.
- 23 • As much of your body mass should be aligned directly behind the rifle as possible.
- 24 • If body alignment is correct, the weapon's recoil is absorbed by the whole body and
25 not just the shoulder.
- 26 • Lower your right elbow to the ground so your shoulders are level.

- 1 • Grasp the pistol grip with your right hand and pull back to place the rifle butt in your right
2 shoulder pocket. Apply rearward pressure with your right hand to hold the rifle butt in
3 your shoulder.
- 4 • Lower your head and place your cheek firmly against the stock to allow the aiming eye to
5 look through the rear sight aperture.
- 6 • Adjust the position of your left elbow to adjust sling tension (moving the elbow out
7 tightens the sling).
- 8 • At the same time, move your left hand to a location under the handguard which allows the
9 sling to support the weapon. To adjust for elevation:
 - 10 • Move the left hand rearward or forward on the handguards (moving the hand
11 rearward elevates the muzzle).
 - 12 • Open or close the “V” of the left hand for small adjustments (closing the “V”
13 elevates the muzzle).
- 14 To adjust for a cant in the rifle, rotate the handguard left or right in the “V” formed by the
15 thumb and forefinger.

16 **d. Straight Leg Position with the Loop Sling.** Apply the three elements and seven factors to
17 this position (paragraph 5004c and d). To assume the straight leg prone position with the loop
18 sling, either move forward or drop back into position (see figure 5-27):

19 **Figure 5-27. Straight Leg Prone Position with Loop Sling.**

- 20 • Once on the ground, roll your body to the left side as you extend and invert your left
21 elbow on the ground. Stretch your legs out behind you. Spread your feet a comfortable
22 distance apart with your toes pointing outboard and the inner portion of your feet in
23 contact with the ground.
- 24 • As much of your body mass should be aligned directly behind the rifle as possible.
- 25 • If body alignment is correct, the weapon's recoil is absorbed by the whole body and
26 not just the shoulder.
- 27 • Grasp the rifle butt with your right hand and place the rifle butt into your right shoulder
28 pocket.
- 29 • Rotate your body to the right while your elbow is lowered to the ground so your
30 shoulders are level and your right hand pulls and holds the rifle in your shoulder.

- 1 • Lower your head and place your cheek firmly against the stock to allow the aiming eye to
2 look through the rear sight aperture.
- 3 • Move your left hand to a location under the handguard which provides maximum bone
4 support and stability for the weapon. This may require that you remove the rifle from
5 your shoulder to reposition your left hand. To adjust for elevation:
 - 6 • Move the left hand rearward or forward on the handguards (moving the hand
7 rearward elevates the muzzle).
 - 8 • Open or close the “V” of the left hand for small adjustments (closing the “V”
9 elevates the muzzle).
- 10 **e. Cocked Leg Position with the Hasty Sling.** Apply the seven factors to this position
11 (paragraph 5003c). To assume the cocked leg prone position with the hasty sling, either move
12 forward or drop back into position (see figure 5-28):

13 **Figure 5-28. Cocked Leg Prone Position with Hasty Sling.**

- 14 • Once on the ground, roll your body to the left side and extend your left elbow on the
15 ground. Your left leg is stretched out behind you, almost in a straight line. This allows
16 the mass of the body to be placed behind the rifle to aid in absorbing recoil.
- 17 • Turn the toe of your left foot inboard so the outside of your left leg and foot are in contact
18 with the ground. Bend your right leg and draw it up toward your body to a comfortable
19 position. Turn your right leg and foot outboard so the inside of your right boot is in
20 contact with the ground. Cocking the leg will raise the diaphragm, making breathing
21 easier.
- 22 • Grasp the pistol grip with your right hand and pull back to place the rifle butt in your right
23 shoulder pocket. Apply rearward pressure with your right hand to hold the rifle butt in
24 your shoulder.
- 25 • Roll your body to the right while lowering your right elbow to the ground. The right
26 shoulder is higher than the left shoulder in the cocked leg position.
- 27 • Lower your head and place your cheek firmly against the stock to allow the aiming eye to
28 look through the rear sight aperture.
- 29 • Adjust the position of your left elbow to adjust sling tension (moving the elbow out
30 tightens the sling).
- 31 • At the same time, move your left hand to a location under the handguard which allows the
32 sling to support the weapon and the front sight to be centered in the rear sight aperture.
33 To adjust for elevation:

- 1 • Move the left hand rearward or forward on the handguards (moving the hand
2 rearward elevates the muzzle).
- 3 • Open or close the “V” of the left hand for small adjustments (closing the “V”
4 elevates the muzzle).
- 5 To adjust for a cant in the rifle, rotate the handguard left or right in the “V” formed by
6 the thumb and forefinger.

7 **f. Cocked Leg Position with the Loop Sling.** Apply the three elements and seven factors to
8 this position (paragraph 5004c and d). To assume the cocked leg prone position with the loop
9 sling, either move forward or drop back into position (see figure 5-29):

10 **Figure 5-29. Cocked Leg Prone Position with Loop Sling.**

- 11 • Once on the ground, roll your body to the left side and extend and invert your left elbow
12 on the ground. Your left leg is stretched out behind you, almost in a straight line. This
13 allows the mass of the body to be placed behind the rifle to aid in absorbing recoil.
- 14 • Turn the toe of your left foot inboard so the outside of your left leg and foot are in contact
15 with the ground. Then bend your right leg and draw it up toward your body to a
16 comfortable position. Turn your right leg and foot outboard so the inside of your right
17 boot is in contact with the ground. Cocking the leg will raise the diaphragm, making
18 breathing easier.
- 19 • Grasp the rifle butt with your right hand and place the rifle butt into your right shoulder
20 pocket.
- 21 • Roll your body to the right while lowering your right elbow to the ground. The right
22 shoulder is higher than the left shoulder in the cocked leg position.
- 23 • Lower your head and place your cheek firmly against the stock to allow the aiming eye to
24 look through the rear sight aperture.
- 25 • Move your left hand to a location under the handguard which provides maximum bone
26 support and stability for the weapon and allows the front sight post to be centered in the
27 rear sight aperture. To adjust for elevation:
- 28 • Move the left hand rearward or forward on the handguards (moving the hand
29 rearward elevates the muzzle).
- 30 • Open or close the “V” of the left hand for small adjustments (closing the “V”
31 elevates the muzzle).

1 **5006. Kneeling Position**

2 **a. Description.** The kneeling position is quick to assume and easy to maneuver from. It is
3 usually assumed after initial engagement has been made from a standing position. It can easily be
4 adapted to available cover. A tripod is formed by the left foot, right foot, and right knee when the
5 Marine assumes the position. This gives the Marine a stable foundation for shooting. The
6 kneeling position also presents a higher profile to facilitate a better field of view as compared to
7 the prone and sitting positions.

8 **b. Assuming the Kneeling Position.** The kneeling position can be assumed by either moving
9 forward or dropping back into position, depending on the combat situation. For example, it may
10 be necessary to drop back into position to avoid crowding cover, or to avoid covering uncleared
11 terrain.

12 **(1) Moving Forward into Position.** To move forward into the kneeling position, the
13 Marine steps forward toward the target with his left foot and assumes the kneeling position.

14 **(2) Dropping Back into Position.** To drop back into the kneeling position, the Marine
15 leaves his left foot in place and steps backward with his right foot and assumes the kneeling
16 position.

17 **c. High Kneeling Position with the Hasty Sling.** Apply the seven factors to this position
18 (paragraph 5003c). To assume the high kneeling position with the hasty sling, either move
19 forward or drop back into position (see figure 5-30):

20 **Figure 5-30. High Kneeling Position with Hasty Sling.**

- 21 • Square your body to the target.
- 22 • Place your left hand under the handguard.
- 23 • Kneel down on your right knee.
- 24 • Keep your right ankle straight, with the toe of your boot in contact with the ground and
25 curled under by the weight of your body.
- 26 • Place the right portion of your buttocks on or over your right heel; contact with the heel
27 provides more stability to the position. However, the use of cover may not allow the
28 buttocks to make contact with the heel.
- 29 • Place your left foot forward to a point that allows your shin to be vertically straight. Your
30 left foot should be flat on the ground.

- 1 • Place the flat part of your upper left arm, just above the elbow, against the inside of your
2 left knee so it is in firm contact.
- 3 • Lean slightly forward to decrease recovery time during recoil.
- 4 • Grasp the pistol grip with your right hand and pull back to place the rifle butt in your right
5 shoulder pocket. Apply rearward pressure with your right hand to hold the rifle butt in
6 your shoulder.
- 7 • Bend your right elbow to provide the least muscular tension possible and lower it to a
8 natural position.
- 9 • Lower your head and place your cheek firmly against the stock to allow the aiming eye to
10 look through the rear sight aperture.
- 11 • Adjust your position to adjust sling tension. Widening your stance or moving your left
12 elbow out tightens the sling.
- 13 • At the same time, move your left hand to a location under the handguard which allows the
14 sling to support the weapon and the front sight to be centered in the rear sight aperture.
15 To adjust for elevation:
 - 16 • Move the left hand rearward or forward on the handguards (moving the hand
17 rearward elevates the muzzle).
 - 18 • Open or close the “V” of the left hand for small adjustments (closing the “V”
19 elevates the muzzle).
- 20 To adjust for a cant in the rifle, rotate the handguard left or right in the “V” formed by the
21 thumb and forefinger.

22 **d. High Kneeling Position with the Loop Sling.** Apply the three elements and seven factors to
23 this position (paragraph 5004c and d). To assume the high kneeling position with the loop sling,
24 either move forward or drop back into position (see figure 5-31):

25 **Figure 5-31. High Kneeling Position with Loop Sling.**

- 26 • Position your body at a 45-degree angle to the target.
- 27 • Place your left hand under the handguard.
- 28 • Kneel down on your right knee so your right lower leg is approximately parallel to the
29 target.

- 1 • Keep your right ankle straight, with the toe of your boot in contact with the ground and
2 curled under by the weight of your body.
- 3 • Place the right portion of your buttocks on or over your right heel; contact with the heel
4 provides more stability to the position.
- 5 • Place your left foot forward to a point that allows your shin to be vertically straight. Your
6 left foot should be flat on the ground since it will be supporting the majority of your
7 weight.
- 8 • Place the flat part of your upper left arm, just above the elbow, on your left knee so it is in
9 firm contact with the flat surface formed on top of your bent knee. The point of your left
10 elbow will extend just slightly past the left knee.
- 11 • Lean slightly forward into the sling for support.
- 12 • Grasp the rifle butt with your right hand and place the rifle butt into your right shoulder
13 pocket.
- 14 • Bend your right elbow to provide the least muscular tension possible and lower it to a
15 natural position.
- 16 • Lower your head and place your cheek firmly against the stock to allow the aiming eye to
17 look through the rear sight aperture.
- 18 • Move your left hand to a location under the handguard which provides maximum bone
19 support and stability for the weapon and allows the front sight post to be centered in the
20 rear sight aperture. To adjust for elevation:
 - 21 • Move the left hand rearward or forward on the handguards (moving the hand
22 rearward elevates the muzzle).
 - 23 • Open or close the “V” of the left hand for small adjustments (closing the “V”
24 elevates the muzzle).
- 25 **e. Medium Kneeling Position.** This is also referred to as the bootlace kneeling position.
26 Assume the medium kneeling position in the same way as the high kneeling position with the
27 exception of the right foot. The right ankle is straight and the foot is stretched out with the
28 bootlaces in contact with the ground. The buttocks are in contact with the heel of the right foot.
29 See figure 5-32.

30 **Figure 5-32. Medium Kneeling Position.**

- 31 **f. Low Kneeling Position.** The low kneeling position is most commonly used when firing from
32 a forward slope. Assume the low kneeling position in the same way as the high kneeling position

1 with the exception of the placement of the right foot. Turn the right ankle so the outside of the
2 foot is in contact with the ground and the buttocks are in contact with the inside of the foot. See
3 figure 5-33.

4 **Figure 5-33. Low Kneeling Position.**

5 **5007. Sitting Position.** There are three variations of the sitting position: crossed ankle, crossed
6 leg, and open leg. Experiment with all the variations and select that position which provides the
7 most stability for firing.

8 **a. Description.** The sitting position provides an extremely stable base. However, it provides
9 limited lateral movement and it is not easy to maneuver from. It has several variations that can be
10 adapted to the individual Marine. The sitting position provides greater elevation than the prone
11 position while still having a fairly low profile.

12 **b. Crossed Ankle Sitting Position with the Hasty Sling.** The crossed ankle sitting position is
13 an extremely stable shooting position. This position places most of the body's weight behind the
14 weapon and aids in quick shot recovery. Apply the seven factors to this position (paragraph
15 5003c). To assume the crossed ankle sitting position with the hasty sling (see figure 5-34):

16

17

Figure 5-34. Crossed Ankle Sitting Position with Hasty Sling.

- 18 • Square your body to the target.
- 19 • Place your left hand under the handguard.
- 20 • Bend at the knees and break your fall with your right hand.
- 21 • Push backward with your feet to extend your legs and place your buttocks on the ground.
- 22 • Cross your left ankle over your right ankle.
- 23 • Bend forward at the waist and place your left elbow on your left leg below the knee.
- 24 • Grasp the pistol grip with your right hand and pull back to place the rifle butt in your right
25 shoulder pocket. Apply rearward pressure with your right hand to hold the rifle butt in
26 your shoulder.
- 27 • Lower your right elbow to the inside of your right knee.
- 28 • Lower your head and place your cheek firmly against the stock to allow the aiming eye to
29 look through the rear sight aperture.

- 1 • Adjust your position to adjust sling tension. Widening your stance and moving your left
2 elbow out tighten the sling.
- 3 • At the same time, move your left hand to a location under the handguard which allows the
4 sling to support the weapon and the front sight to be centered in the rear sight aperture.
5 To adjust for elevation:
- 6 • Move the left hand rearward or forward on the handguards (moving the hand
7 rearward elevates the muzzle).
- 8 • Open or close the “V” of the left hand for small adjustments (closing the “V”
9 elevates the muzzle).
- 10 To adjust for a cant in the rifle, rotate the handguard left or right in the “V” formed by the
11 thumb and forefinger.

12 **c. Crossed Ankle Sitting Position with the Loop Sling.** Apply the three elements and seven
13 factors to this position (paragraph 5004c and d). To assume the crossed ankle sitting position
14 with the loop sling (see figure 5-35):

15 **Figure 5-35. Crossed Ankle Sitting Position with Loop Sling.**

- 16 • Position your body at approximately a 30-degree angle to the target.
- 17 • Place your left hand under the handguard.
- 18 • Bend at the knees and break your fall with your right hand.
- 19 • Push backward with your feet to extend your legs and place your buttocks on the ground.
- 20 • Cross your left ankle over your right ankle.
- 21 • Bend forward at the waist and place your left elbow on your left leg below the knee.
- 22 • Grasp the rifle butt with your right hand and place the rifle butt into your right shoulder
23 pocket.
- 24 • Lower your right elbow to the inside of your right knee.
- 25 • Lower your head and place your cheek firmly against the stock to allow the aiming eye to
26 look through the rear sight aperture.
- 27 • Move your left hand to a location under the handguard which provides maximum bone
28 support and stability of the weapon and allows the front sight post to be centered in the
29 rear sight aperture. To adjust for elevation:

- 1 • Move the left hand rearward or forward on the handguards (moving the hand
2 rearward elevates the muzzle).
- 3 • Open or close the “V” of the left hand for small adjustments (closing the “V”
4 elevates the muzzle).

5 **d. Crossed Leg Sitting Position with the Hasty Sling.** The crossed leg sitting position
6 provides a medium base of support and places some of the body's weight behind the weapon for
7 quick recovery after each shot. Apply the seven factors to this position (paragraph 5003c). To
8 assume the crossed leg sitting position with the hasty sling (see figure 5-36):
9

10 **Figure 5-36. Crossed Leg Sitting Position with Hasty Sling.**

- 11 • Square your body to the target.
- 12 • Place your left hand under the handguard.
- 13 • Cross your left leg over your right leg.
- 14 • Bend at the knees while breaking your fall with your right hand.
- 15 • Place your buttocks on the ground as close to your crossed legs as you comfortably can.
- 16 • Bend forward at the waist while placing your left elbow on your left leg into the bend of
17 the knee.
- 18 • Grasp the pistol grip with your right hand and pull back to place the rifle butt in your right
19 shoulder pocket. Apply rearward pressure with your right hand to hold the rifle butt in
20 your shoulder.
- 21 • Lower your right elbow to the inside of your right knee.
- 22 • Lower your head and place your cheek firmly against the stock to allow the aiming eye to
23 look through the rear sight aperture.
- 24 • Adjust your position to adjust sling tension. Widening your stance or moving your left
25 elbow out tightens the sling.
- 26 • At the same time, move your left hand to a location under the handguard which allows the
27 sling to support the weapon and the front sight to be centered in the rear sight aperture.
28 To adjust for elevation:
 - 29 • Move the left hand rearward or forward on the handguards (moving the hand
30 rearward elevates the muzzle).

- 1 • Open or close the “V” of the left hand for small adjustments (closing the “V”
2 elevates the muzzle).

3 To adjust for a cant in the rifle, rotate the handguard left or right in the “V” formed by the
4 thumb and forefinger.

5 **e. Crossed Leg Sitting Position with the Loop Sling.** Apply the three elements and seven
6 factors to this position (paragraph 5004c and d). To assume the crossed leg sitting position with
7 the loop sling (see figure 5-37):

8 **Figure 5-37. Crossed Leg Sitting Position with Loop Sling.**

- 9
- 10 • Position your body at a 45- to 60-degree angle to the target.
- 11 • Place your left hand under the handguard.
- 12 • Cross your left leg over your right leg.
- 13 • Bend at the knees while breaking your fall with your right hand.
- 14 • Place your buttocks on the ground as close to your crossed legs as you comfortably can.
- 15 • Bend forward at the waist while placing your left elbow on your left leg into the bend of
16 the knee.
- 17 • Grasp the rifle butt with your right hand and place the rifle butt into your right shoulder
18 pocket.
- 19 • Lower your right elbow to the inside of your right knee.
- 20 • Lower your head and place your cheek firmly against the stock to allow the aiming eye to
21 look through the rear sight aperture.
- 22 • Move your left hand to a location under the handguard which provides maximum bone
23 support and stability of the weapon and allows the front sight post to be centered in the
24 rear sight aperture. To adjust for elevation:
- 25 • Move the left hand rearward or forward on the handguards (moving the hand
26 rearward elevates the muzzle).
- 27 • Open or close the “V” of the left hand for small adjustments (closing the “V”
28 elevates the muzzle).

1 **f. Open Leg Sitting Position with the Hasty Sling.** The open leg sitting position provides a
2 medium base of support and is most commonly used when firing from a forward slope. Apply the
3 seven factors to this position (paragraph 5003c). To assume the open leg sitting position with the
4 hasty sling (see figure 5-38):

5 **Figure 5-38. Open Leg Sitting Position with Hasty Sling.**

- 6 • Square your body to the target.
- 7 • Place your feet approximately shoulder width apart.
- 8 • Place your left hand under the handguard.
- 9 • Bend at the knees while breaking your fall with your right hand.
- 10 • Push backward with your feet to extend your legs and place your buttocks on the ground.
- 11 • Place your left elbow on the inside of your left knee.
- 12 • Grasp the pistol grip with your right hand and pull back to place the rifle butt in your right
13 shoulder pocket. Apply rearward pressure with your right hand to hold the rifle butt in
14 your shoulder.
- 15 • Lower your right elbow to the inside of your right knee.
- 16 • Lower your head and place your cheek firmly against the stock to allow the aiming eye to
17 look through the rear sight aperture.
- 18 • At the same time, move your left hand to a location under the handguard which allows the
19 sling to support the weapon and the front sight to be centered in the rear sight aperture.
20 To adjust for elevation:
 - 21 • Move the left hand rearward or forward on the handguards (moving the hand
22 rearward elevates the muzzle).
 - 23 • Open or close the “V” of the left hand for small adjustments (closing the “V”
24 elevates the muzzle).
- 25 To adjust for a cant in the rifle, rotate the handguard left or right in the “V” formed by the
26 thumb and forefinger.

27 **g. Open Leg Sitting Position with the Loop Sling.** Apply the three elements and seven factors
28 to this position (paragraph 5004c and d). To assume the open leg sitting position with the loop
29 sling (see figure 5-39):

30

Figure 5-39. Open Leg Sitting Position with Loop Sling.

- 1
- 2 • Position your body at approximately a 30-degree angle to the target.
- 3 • Place your feet approximately shoulder width apart.
- 4 • Place your left hand under the handguard.
- 5 • Bend at the knees while breaking your fall with your right hand.
- 6 • Push backward with your feet to extend your legs and place your buttocks on the ground.
- 7 • Place your left elbow on the inside of your left knee.
- 8 • Grasp the rifle butt with your right hand and place the rifle butt into your right shoulder
- 9 pocket.
- 10 • Lower your right elbow to the inside of your right knee.
- 11 • Lower your head and place your cheek firmly against the stock to allow the aiming eye to
- 12 look through the rear sight aperture.
- 13 • Move your left hand to a location under the handguard which provides maximum bone
- 14 support and stability of the weapon. Slight muscle tension of the legs may be required to
- 15 support the rifle. To adjust for elevation:
 - 16 • Move the left hand rearward or forward on the handguards (moving the hand
 - 17 rearward elevates the muzzle).
 - 18 • Open or close the “V” of the left hand for small adjustments (closing the “V”
 - 19 elevates the muzzle).

20 5008. Standing Position

21 **a. Description.** The standing position is the quickest position to assume and the easiest to
22 maneuver from. It allows greater mobility than other positions. The standing position is often
23 used for immediate combat engagement. The standing position is supported by the shooter's legs
24 and feet and provides a small area of contact with the ground. In addition, the body's center of
25 gravity is high above the ground. Therefore, maintaining balance is critical in this position.

26 **b. Standing Position with the Hasty Sling.** Apply the seven factors to this position (paragraph
27 5003c). To assume the standing position with the hasty sling (see figure 5-40):

28 Figure 5-40. Standing Position with Hasty Sling.

- 1 • Square your body to the target.
- 2 • Spread your feet apart to a comfortable distance with the left foot slightly in front of the
3 right foot. This distance may be wider than shoulder width.
- 4 • Distribute your weight evenly over both feet and hips. Your legs should be slightly bent
5 for balance. Balance will shift forward slightly to decrease recovery time and increase the
6 stability of the hold.
- 7 • Place your left hand under the handguard.
- 8 • Grasp the pistol grip with your right hand and pull back to place the rifle butt in your right
9 shoulder pocket. Apply rearward pressure with your right hand to hold the rifle butt in
10 your shoulder.
- 11 • Hold your right elbow in a natural position.
- 12 • Bring the rifle sights up to eye level instead of lowering your head to the sights and place
13 your cheek firmly against the stock. Ensure your head is erect so the aiming eye can look
14 through the rear sight aperture.
- 15 • Move your left hand to a location under the handguard which allows the sling to support
16 the weapon and the front sight to be centered in the rear sight aperture. To adjust for
17 elevation:
 - 18 • Move the left hand rearward or forward on the handguards (moving the hand
19 rearward elevates the muzzle).
 - 20 • Open or close the “V” of the left hand for small adjustments (closing the “V”
21 elevates the muzzle).
- 22 To adjust for a cant in the rifle, rotate the handguard left or right in the “V” formed by the
23 thumb and forefinger.
- 24 • Adjust your position to adjust sling tension. Moving your left elbow out tightens the
25 sling.

Chapter 6

Use of Cover and Concealment

6001. Cover and Concealment

In a combat environment, a Marine must be prepared to fire from any type of cover or concealment. Cover is anything that protects a Marine from enemy fire. Cover may be an existing hole, a hastily dug shelter, or a well-prepared fighting position with overhead protection. Concealment is anything that hides a Marine from enemy view, but it may not afford protection. Concealment can be obtained from buildings, trees, crops, and skillful use of ground contours. A Marine can use any object or terrain feature that protects him from enemy fire, hides him from enemy view, allows him to observe the enemy, and provides support for a firing position.

a. Types of Cover

(1) Frontal Cover. A firing position should have frontal cover that provides protection from small arms fire and indirect fire fragments. Ideally, frontal cover should be thick enough to stop small arms fire, high enough to provide protection from enemy fire, and wide enough to provide cover when firing to the left or right edge of a sector of fire.

(2) Ideal Cover. The ideal cover provides:

- Overhead, flank, and rear protection from direct and indirect fire.
- Free use of personal weapons.
- Concealment from enemy observation.
- A concealed route in and out.
- An unobstructed view of a wide and deep area of fire.

b. Common Cover Materials. Any material that protects a Marine from small arms fire can be used for cover. Some common materials include sandbags, trees, logs, and cinder blocks. Table 6-1 presents some common materials and their minimum thickness required for protection from small arms fire.

Material	Minimum Thickness (in inches)
Concrete	7
Broken stone (rubble)	20

Dry sand	24
Wet sand	35
Logs (oak)	40
Earth (packed)	48

Table 6-1. Minimum Thickness for Protection Against Small Arms.

(1) Sandbags. Cover can be improved and positions can be fortified by filling sandbags with dirt/sand and placing them around the position. Sandbags should be tightly packed because bullets can easily penetrate moist or loosely packed sandbags. Overlapping sandbags increase protection and decrease the bullet's ability to penetrate the sandbag. A minimum thickness of three sandbags is required to stop small arms fire.

(2) Trees/Logs. Wood is a relatively dense material and offers good cover and protection. Bullets have a tendency to fragment when they penetrate wood. Live trees have a greater resistance to bullet penetration than dead trees. Wood that has been treated with creosote, such as telephone poles and railroad ties, offers better protection from projectiles than untreated wood, but it still does not ensure positive protection from small arms fire.

(3) Cinder Blocks. Cinder blocks are not impenetrable cover. Although they are made of a dense material, the composition of a cinder block is so brittle that a bullet can shatter the block upon impact. This can cause injury to a Marine by secondary fragmentation.

c. Firing From Specific Types of Cover. Effective cover allows a Marine to engage enemy targets while protecting himself from enemy fire. Several types of cover provide support, protection, and concealment and do not interfere with target engagement. A Marine must adapt firing positions to the type of cover available.

(1) Fighting Hole. A Marine should use fighting holes if available. See figure 6-1. After a Marine enters the fighting hole, he adds or removes dirt, sandbags, or other supports to fit his height. To assume a firing position, a Marine performs the following steps:

- Place the right foot to the rear as a brace.
- Lean forward until the chest is against the forward wall of the fighting hole.
- Extend the left arm and elbow over the forward side of the fighting hole so the left forearm rests against the back of the parapet.
- Place the rifle butt into the pocket of the right shoulder and grasp the pistol grip with the right hand.
- Place the right elbow on solid support using the elbow rest of the fighting hole or sandbags placed around the fighting hole.

1 **Figure 6-1. Fighting Hole Position.**

2 (2) **Rooftop.** If possible, a Marine's entire body should be positioned behind the apex of the
3 rooftop, using the apex to support the rifle. See figure 6-2. If the body cannot be positioned
4 behind the apex, place the left arm over the apex of the roof to hold the weight of the body.
5 Only expose as little of the head and shoulders as possible. See figure 6-3.

6
7 **Figure 6-2. Rooftop Position Supported by the Apex.**

8 **Figure 6-3. Rooftop Position Behind the Apex.**

9 (3) **Window.** The Marine can establish a supported or unsupported position from a window.
10 (a) **Unsupported.** A Marine can establish an unsupported position back from the
11 opening of the window so that the muzzle does not protrude and interior shadows provide
12 concealment so as not to provide a silhouette to the enemy. See figure 6-4.

13 **Figure 6-4. Unsupported Window Position.**

14 (b) **Supported.** When additional stability is needed, a Marine can establish a supported
15 position by placing the rifle handguards or his forearm in the "V" formed by the side and
16 bottom of the window sill. See figure 6-5.

17 **Figure 6-5 and 6-5a. Supported Window Position.**

18 (4) **Vehicle.** In many combat situations, particularly in urban environments, a vehicle may be
19 the best form of cover.

20 (a) When using a vehicle for cover, the engine block provides the most protection from
21 small arms fire. The Marine should establish a position behind the front wheel so the
22 engine block is between him and the target (see figure 6-6). From this position, the
23 Marine may fire over, under, or around the vehicle. This is a particularly effective position
24 for larger vehicles that are high off the ground.

25 **Figure 6-6and 6-6a. Using the Front of a Vehicle for Cover.**

26 (b) The Marine can establish additional support for the rifle by positioning himself behind
27 the door jamb (frame of door) and placing the rifle against the "V" formed by the open
28 door and door frame (see figure 6-7). From this position, the Marine may fire over the
29 hood of the vehicle while using the engine block for protection. However, this position
30 limits lateral mobility and it is more difficult to maneuver from.

31 **Figure 6-7 and 6-7a. Establishing a Supported Position in a Vehicle.**

1 (c) At the back of the vehicle, the only cover is provided by the axle and the wheel. If the
2 Marine must shoot from the back of the vehicle, he must position himself directly behind
3 the wheel as much as possible (see figure 6-8).

4 **Figure 6-8. Using the Back of a Vehicle for Cover.**

5 **6002. Supported Firing Positions.** Supports are foundations for positions; positions are
6 foundations for the rifle. To maximize the support the position provides, the firing position
7 should be adjusted to fit or conform to the shape of the cover. Elements of a sound firing
8 position, such as balance and stability, must be incorporated and adjusted to fit the situation and
9 type of cover. A supported firing position should minimize exposure to the enemy, maximize the
10 stability of the rifle and protection from enemy fire, and provide observation of the enemy. A
11 Marine can use any available support (e.g., logs, rocks, sandbags, or walls) to stabilize his firing
12 position. The surrounding combat environment dictates the type of support and position used.

13 **a. Firing Position Considerations When Using Cover and Concealment.** Regardless of the
14 combat environment (e.g., urban, desert, jungle), the uses are the same for different types of cover
15 of like height and width. For example, cover is used to support the weapon and position in the
16 same manner behind a tree or a telephone pole; behind a berm, or a wall, or a vehicle; or behind a
17 log or a curb; etc.

18 **(1) Adjusting the Shooting Position.** The proper use of cover provides protection from
19 enemy fire. Cover and concealment should provide additional support for the position. The
20 type of cover can dictate which firing position (e.g., standing, kneeling, sitting, prone) will be
21 the most effective. For example, a Marine's height in relation to the height of the cover aids in
22 the selection of a firing position.

23 **(a)** The firing position selected should be adjusted to fit the type of cover to:

- 24 • Provide stability. The position should be adjusted to cover to stabilize the rifle
25 sights and allow the management of recoil to recover on target.
- 26 • Permit mobility. The position should be adjusted to cover to permit lateral
27 engagement of dispersed targets and movement to other cover.
- 28 • Allow observation of the area/enemy while minimizing exposure to the enemy.

29 **(b)** The firing position is adjusted to fit the type of cover by adjusting the seven factors
30 (i.e., left hand, pocket of shoulder, right elbow, stock weld, grip of right hand) to support
31 the rifle or the position.

32 **(2) Keeping the Entire Body Behind Cover.** A Marine should minimize exposure of any
33 part of his body to fire. Be especially aware of the head, right elbow, knees, or any other
34 body part that may extend beyond the cover.

1 **(3) Firing From the Right or Left Side of Cover.**

2 **(a)** To minimize exposure and maximize the cover's protection, a right-handed Marine
3 should fire from the right side of cover and a left-handed Marine should fire from the left
4 side, if possible (see figure 6-9).

5 **Figure 6-9. Firing from the Right Side of Cover.**

6 **(b)** If, however, a right-handed Marine must fire from the left side of cover, he fires
7 right-handed but adjusts his position behind cover and uses the rollout technique (see
8 paragraph 6003b) to engage the target. See figure 6-10.

9 **Figure 6-10. Firing from the Right Side of Cover.**

10 **(4) Firing Over the Top of Cover.** Firing over the top of cover provides a wider field of
11 view and lateral movement. When firing over the top of cover, the position may be supported
12 and stabilized by resting the handguard or the left forearm on the cover (see figure 6-11). The
13 Marine should keep as low a profile as possible; the rifle should be as close to the top of cover
14 as possible.

15 **Figure 6-11. Firing Over the Top of Cover.**

16 **(5) Maintaining Muzzle Awareness.** When firing over the top of cover, a Marine must
17 remain aware of the location of his muzzle and remember that the sights are higher than the
18 barrel. Therefore, a Marine must maintain a position that ensures the muzzle is high enough
19 to clear the cover (e.g., window sill, top of wall) as he obtains sight alignment/sight picture on
20 the target (see figure 6-12).

21 **Figure 6-12. Clearing Cover with the Muzzle.**

22 **(6) Clearing the Ejection Port.** Ensure the cover does not obstruct the ejection port. If the
23 ejection port is blocked, the obstruction can interfere with the ejection of the spent cartridge
24 case and cause a stoppage.

25 **(7) Resting the Magazine.** The bottom, front, or side of the rifle magazine can rest on or
26 against support to provide additional stability (see figures 6-13, 6-14, and 6-15). However,
27 the back of the magazine should not be pulled back against support because it can cause a
28 stoppage by not allowing a round to feed from the magazine.

29 **Figure 6-13. Bottom of Magazine on Support.**

30 **Figure 6-14. Front of Magazine on Support.**

31 **Figure 6-15. Side of Magazine on Support.**

1 **b. Seven Factors.** The seven factors are applied when firing from cover, however, some may
2 have to be modified slightly to accommodate the artificial support provided the rifle and position.

3 **(1) The Left Hand.** The support should be used to help stabilize both the firing position and
4 the rifle to enable the Marine to maintain sight alignment and sight picture.

- 5 • The forearm or hand can contact the support to stabilize the weapon. Rest the
6 forearm or the meaty portion of the bottom of the left hand on the support and rest the
7 rifle in the “V” formed by the thumb and forefinger of the left hand (see figure 6-16).

8 **Figure 6-16. Forearm Resting on Cover.**

- 9 • The rifle’s handguards may rest on the support, but the barrel may not (see figure
10 6-17). Placement of the left hand on the handguard may have to be adjusted forward
11 or back to accommodate the cover and the additional support provided by the rifle
12 resting on the cover.

13 **Figure 6-17. Handguards Resting on Cover.**

- 14 • If the handguards are resting on the cover, the left hand can pull down on the
15 handguards to further stabilize the weapon.

16 **(2) Rifle in the Pocket of the Shoulder.** Regardless of the combat situation or the height of
17 the cover, the butt of the rifle must remain in the pocket of the shoulder to manage the effects
18 of recoil, stabilize the rifle, and maintain the rifle’s battlesight zero (see figure 6-18). The
19 firing position must be adjusted behind cover to enable the rifle to be placed in the shoulder.

20 **Figure 6-18. Rifle in Pocket of Shoulder from Behind Cover.**

21 **(3) Stock Weld.** Regardless of the cover, the firing position must be adjusted to allow stock
22 weld to be achieved (see figure 6-19). Proper stock weld provides quick recovery between
23 shots and keeps the aiming eye centered in the rear sight aperture.

24 **Figure 6-19. Stock Weld from Behind Cover.**

25 **(4) Right Elbow.** The right elbow can be placed on or against support to stabilize the
26 weapon and the position (see figure 6-20). Ensure the elbow is not extended beyond cover to
27 telegraph the position to the enemy.

28 **Figure 6-20. Right Elbow Resting on Cover.**

29 **(5) Grip of the Right Hand.** If the rifle handguards, the forward hand, or the forearm rest
30 on cover for support, the grip of the right hand should pull back and down on the pistol grip
31 to further stabilize the weapon in the shoulder and on the support.

32 **(6) Breathing.** Breathing does not change when firing from a supported position.

1 **(7) Muscular Tension.** To create balance and support for the position, the Marine may shift
2 his body weight into or against support (see figure 6-21). This enables the Marine to use
3 cover to support his body weight, reducing the need for muscular tension.

4 **Figure 6-21. Shifting Body Weight Into Cover.**

5 **b. Types of Supported Positions**

6 **(1) Supported Prone.** If possible, a Marine should use the supported prone position
7 when firing from behind cover. It is the steadiest position and provides the lowest
8 silhouette. This position provides maximum protection from enemy fire.

9
10 **(a)** Support the position by placing the handguards, the forearm, or the magazine
11 on or against support (see figure 6-22).

12 **Figure 6-22. Supported Prone.**

13 **(b)** The prone position can be assumed behind a tree, a wall, a log, or almost any
14 type of cover. It is flexible and allows shooting from all sides and from cover of
15 varying sizes.

16 **(c)** The body must be adjusted to conform to the cover. For example, if the cover
17 is narrow, keep the legs together. The body should be in line with the rifle and
18 directly behind the rifle (see figure 6-23). This presents a smaller target to the
19 enemy and provides more body mass to absorb recoil.

20 **Figure 6-23 and 6-23a. Supported Prone Behind Narrow Cover.**

21 **(2) Supported Kneeling.** When the prone position cannot be used because of the height
22 of the support, the supported kneeling position may be appropriate. The kneeling position
23 provides additional mobility over the prone position.

24 **(a)** The kneeling position allows shooting from all sides and from cover of varying
25 sizes. This position may be altered to maximize the use of cover or support by
26 assuming a variation of the kneeling position (high, medium, or low).

27 **(b)** In the kneeling position, the Marine must not telegraph his position behind the
28 cover with his knee. When shooting around the sides of cover, the Marine should
29 strive to keep his right knee in line with his left foot so as not to telegraph the
30 knee. See figure 6-24.

31 **Figure 6-24. Supported Kneeling.**

32 **(c)** Support the position by placing the handguards, the forearm, or the magazine
33 on or against support. In addition, the position (e.g., a knee, the side of the body)
34 may rest against support (see figure 6-25).

1 **Figure 6-25. Supported Kneeling with Body Against Support.**

2 (d) If the rifle is resting on support, the Marine may not need to stabilize the
3 weapon by placing his left elbow on his knee (see figure 6-26).

4 **Figure 6-26. Supported Kneeling with Rifle Resting on Support.**

5 **(3) Supported Sitting.** A supported sitting position may be used to fire over the top of
6 cover when mobility is not as critical. A sitting position can be comfortably assumed for a
7 longer period of time than a kneeling position and it can conform to higher cover when a
8 prone position cannot be used.

9 (a) Support the position by placing the handguards, the forearm, or the magazine on or
10 against support (see figure 6-27).

11 **Figure 6-27. Supported Sitting.**

12 (b) If the rifle is resting on support, the Marine may not need to stabilize the weapon by
13 placing his left or right elbows on his legs (see figure 6-28).

14 **Figure 6-28. Supported Sitting with Rifle on Support.**

15 **(4) Supported Standing.** The supported standing position provides greater mobility
16 than the other positions and usually provides greater observation of the enemy. The
17 supported standing position is effectively used behind high cover (e.g., window, over a
18 wall) or narrow cover (e.g., tree, telephone pole).

19 (a) To assume the supported standing position, the Marine leans his body forward
20 or against support to stabilize the weapon and the position.

21 (b) Support the position by placing the handguards, the forearm, or the magazine
22 on or against support. In addition, the position (e.g., the side of the body) may
23 rest against support (see figure 6-29).

24 **Figure 6-29. Supported Standing.**

25 **6003. Searching for Targets and Engaging Them From Behind Cover**

26 To locate targets when behind cover or to ensure the area is clear before moving, the Marine must
27 expose as little of himself as possible to the enemy. Additionally, the Marine must be ready to fire
28 if a target is located. There are two techniques that can be used to locate and engage targets from
29 behind cover: the pie and rollout techniques. These techniques minimize the Marine's exposure
30 to enemy fire while placing the Marine in a position to engage targets or to move to another
31 location if necessary. These techniques are also used to enter a building or structure. Both

1 techniques are used in the kneeling and standing positions. To be accurate in engaging targets
2 using either technique, the seven factors must be applied, i.e., the grip of the right hand must pull
3 the weapon into the shoulder, the butt of the rifle must be firmly placed in the shoulder, stock
4 weld must be established to allow the aiming eye to look through the rear sight.

5 **a. Pie Technique.** To perform the pie technique:

- 6 • Staying behind cover, move back and away from the leading edge of the cover. The
7 surroundings and situation will dictate the distance you should move back and away from
8 the cover. Generally, the further back the Marine is from cover, the greater his area of
9 observation; staying too close to cover decreases the area of observation (see figure 6-30).
10 However, if the Marine is too far back from cover, he can come off the leading edge of
11 cover and it is difficult to know how much of his body is being exposed to the enemy.

12 **Figure 6-30. Area of Observation Using the Pie Technique.**

- 13 • Assume a firing position and lower the rifle sights enough to have a clear field of view,
14 orienting the muzzle on the leading edge of the cover. (In a building, the baseboards serve
15 as a reference point for the muzzle of the rifle when searching for targets.)
- 16 • Taking small side steps, slowly move out from behind the cover, covering the field of view
17 with the aiming eye and muzzle of the weapon. Wherever the eyes move, the muzzle
18 should move (eyes, muzzle, target). The muzzle should remain on the leading edge of
19 cover, serving as a pivot point when moving out. See figure 6-31.

20 **Figure 6-31. Pie Technique.**

- 21 • Continue taking small side steps and moving out from cover until a target is identified or
22 the area is found to be clear.
- 23 • When a target is identified, sweep the safety, place the finger on the trigger, and engage
24 the target.

25 **b. Rollout Technique.** To perform the rollout technique:

- 26 • Staying behind cover, move back and position the body so it is in line with the leading
27 edge of the cover, ensuring that no part of the body extends beyond the cover.
28
- 29 • Assume a firing position and come to the Ready, ensuring the muzzle is just behind the
30 cover.
- 31 • Canting the head and weapon slightly, roll the upper body out to the side just enough to
32 have a clear field of view and allow the muzzle to clear the cover. Keeping the feet in
33 place, push up on the ball of one foot to facilitate rolling out. See figure 6-32.

1 **Figure 6-32. Rollout Technique.**

- 2 • Continue rolling out from cover until a target is identified or the area is found to be clear.
- 3 • When a target is identified, sweep the safety, place the finger on the trigger, and
4 engage the target.
- 5 • If a target is identified before moving out from cover, the rifle should be taken off safe
6 before moving out using the rollout technique.

7 **c. Combining the Pie and Rollout Techniques.** In some situations, it may be necessary to
8 utilize both the pie and rollout technique in order to search an entire area for targets (e.g., corner
9 of a building, a doorway). Changing from one technique to another may permit the Marine to
10 minimize his exposure to the enemy and reduce the time that he is exposed to enemy fire.

11 **6004. Moving Out From Behind Cover.** A Marine must be constantly aware of his
12 surroundings and available cover should a threat appear. He should avoid obvious danger areas
13 and move quickly through danger areas that cannot be avoided.

- 14 • When moving from cover to cover, the Marine should select the next cover location and plan
15 his route before moving from his present position. This is done by quickly looking from
16 behind cover to ensure the area is clear, ensuring the head and eyes are exposed for as short a
17 time as possible.
- 18 • If necessary, the Marine should conduct a Condition 1 reload before moving from cover.
- 19 • Once the Marine is committed to moving, all focus should be on moving until cover is
20 reassumed.

Chapter 7

Rifle Presentation

7001. Presentation of the Rifle

In a combat environment, targets may present themselves with little or no warning. To maintain an advantage, the Marine carries his weapon in a position appropriate to the threat level that permits the rifle to be easily carried but also presented as quickly as possible. A carry is also established based on the situation such as moving in a close quarter environment, moving over or under objects, etc.

a. Presenting the Rifle From the Tactical Carry. At the Tactical Carry, no immediate threat is present. This carry permits the rifle to be easily carried for long periods of time, but it does not permit the quickest presentation to a target. If the situation changes and a target presents itself, a Marine performs the following steps to present the rifle from the Tactical Carry once a target appears:

- Extend the rifle toward the target keeping the muzzle slightly up so the buttstock clears all personal equipment. Continue to look at the target.
- At the same time, place the rifle in Condition 1. There are two methods of placing 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 (see figure 7-1).

Figure 7-1. Pulling Charging Handle with Left Hand.

- Grip the handguards firmly with the left hand. Pull the charging handle with the right hand to its rearmost position and release (see figure 7-2).

Figure 7-2. Pulling Charging Handle with Right Hand.

- As the rifle is being presented, take the rifle off safe and place the trigger finger on the trigger (see figure 7-3).

Figure 7-3, 7-3a, and 7-3b . Sweeping the Safety.

- Level the rifle while pulling it firmly into the pocket of the shoulder to obtain proper stock weld. Do not move the head down to meet the stock of the rifle.

Note

If the rifle is in the shoulder properly, the aiming eye will be able to look through the rear sight as soon as the stock makes contact with the cheek.

- As the sights become level with the aiming eye, visually locate the target through the rear sight aperture. As the rifle sights settle, shift the focus back to the front sight post to obtain sight alignment, and place the tip of the post center mass on the target to obtain sight picture.

b. Presenting the Rifle From the Alert. At the Alert, enemy contact is likely. The Alert is also used for moving in urban or other restrictive terrain where targets present themselves in close quarters. To present the rifle from the Alert, a Marine performs the following steps once a target appears:

- While looking at the target, bring the muzzle up by raising the left hand, allowing the rifle butt to pivot in the shoulder. At the same time, pull the rifle firmly into the pocket of the shoulder.
- As the rifle is being presented, take the rifle off safe and place the trigger finger on the trigger (see figure 7-4).

Figure 7-4, 7-4a, and 7-4b. Sweeping the Safety.

- As the stock makes contact with the cheek, level the rifle to obtain proper stock weld. Do not move the head down to meet the stock of the rifle.

Note

If the rifle is in the shoulder properly, the aiming eye will be able to look through the rear sight as soon as the stock makes contact with the cheek.

- As the sights become level with the aiming eye, visually locate the target through the rear sight aperture. As the rifle sights settle, shift the focus back to the front sight post to obtain sight alignment, and place the tip of the post center mass on the target to obtain sight picture.

c. Presenting the Rifle From the Ready. At the Ready, enemy contact is imminent. To present the rifle from the Ready, a Marine performs the following steps once a target appears:

- While looking at the target, bring the muzzle up by raising the left hand, allowing the rifle butt to pivot in the shoulder. At the same time, pull the rifle firmly into the pocket of the shoulder.

- 1 • As the rifle is being presented, take the rifle off safe and place the trigger finger on the
2 trigger (see figure 7-5).

3 **Figure 7-5, 7-5a, 7-5b. Sweeping the Safety.**

- 4 • As the stock makes contact with the cheek, level the rifle to obtain proper stock weld. Do
5 not move the head down to meet the stock of the rifle.

6 **Note**

7 If the rifle is in the shoulder properly, the aiming eye will
8 be able to look through the rear sight as soon as
9 the stock makes contact with the cheek.

- 10 • As the sights become level with the aiming eye, visually locate the target through the rear
11 sight aperture. As the rifle sights settle, shift the focus back to the front sight post to
12 obtain sight alignment, and place the tip of the post center mass on the target to obtain
13 sight picture.

14 **d. Presenting the Rifle From the Strong Side Sling Arms Transport.** To present the rifle
15 from Strong Side Sling Arms, a Marine performs the following steps once a target appears:

- 16 • While looking at the target, lean forward slightly to facilitate removal of the rifle from the
17 shoulder.
- 18 • Reach under the right arm with the left hand between the sling and the body and grasp the
19 handguards (see figure 7-6). At the same time, pull down on the sling and raise the right
20 elbow out and parallel to the deck.

21 **Figure 7-6. Grasping the Handguards.**

- 22 • Roll the right shoulder forward and release the sling from the right hand once the
23 handguards have cleared the elbow. At the same time, pull the rifle forward off the
24 shoulder with the left hand.

- 25 • Continue pulling the rifle forward with the left hand while rotating the rifle parallel to the
26 deck; when the right arm is free of the sling and the rifle clears all personal gear, grasp the
27 charging handle with the right hand (see figure 7-7) and pull it to its rearmost position and
28 release.

29 **Figure 7-7. Clearing Gear and Grasping the Charging Handle.**

- 30 • Establish a firing grip with the right hand while keeping the trigger finger straight along
31 the receiver.
- 32 • Take the rifle off safe and place the trigger finger on the trigger (see figure 7-8).

1 **Figure 7-8, 7-8a, and 7-8b. Sweeping the Safety.**

- 2 • Level the rifle while pulling it firmly into the pocket of the shoulder to obtain proper stock
3 weld. Do not move the head down to meet the stock of the rifle.

4

5 **Note**

6 If the rifle is in the shoulder properly, the aiming eye will
7 be able to look through the rear sight as soon as
8 the stock makes contact with the cheek.

- 9 • As the sights become level with the aiming eye, visually locate the target through the rear
10 sight aperture. As the rifle sights settle, shift the focus back to the front sight post to
11 obtain sight alignment, and place the tip of the post center mass on the target to obtain
12 sight picture.

13 **e. Presenting the Rifle From the Weak Side Sling Arms Transport.** The hasty sling should
14 be maintained while presenting the rifle from this transport. To present the rifle from Weak Side
15 Sling Arms, a Marine performs the following steps once a target appears:

- 16 • While looking at the target, lean forward slightly to facilitate removal of the rifle from the
17 shoulder.
- 18 • Grasp the sling with the right hand to prevent the rifle from falling off the shoulder.
- 19 • Grasp the handguards with the left hand (the index finger points toward the muzzle). See
20 figure 7-9.

21 **Figure 7-9. Grasping the Handguards.**

- 22 • Rotate the rifle counterclockwise (until the magazine rests on the left forearm) while
23 extending the muzzle toward the target.
- 24 • Continue extending the rifle toward the target to ensure the rifle clears all personal gear.
- 25 • Grasp the charging handle with the right hand and pull it to its rearmost position and
26 release (see figure 7-10).

27 **Figure 7-10. Clearing Gear and Grasping the Charging Handle.**

- 28 • Establish a firing grip with the right hand while keeping the trigger finger straight along
29 the receiver.
- 30 • Take the rifle off safe and place the trigger finger on the trigger (see figure 7-11).

31 **Figure 7-11, 7-11a, and 7-11b. Sweeping the Safety.**

- 1 • Level the rifle while pulling it firmly into the pocket of the shoulder to obtain proper stock
2 weld. Do not move the head down to meet the stock of the rifle.

3 **Note**

4 If the rifle is in the shoulder properly, the aiming eye will
5 be able to look through the rear sight as soon as
6 the stock makes contact with the cheek.

- 7 • As the sights become level with the aiming eye, visually locate the target through the rear
8 sight aperture. As the rifle sights settle, shift the focus back to the front sight post to
9 obtain sight alignment, and place the tip of the post center mass on the target to obtain
10 sight picture.

11 **7002. Search and Assess**

12 After a Marine engages a target, he must immediately search the area and assess the results of his
13 engagement. Searching and assessing enables the Marine to avoid tunnel vision that can restrict
14 the focus so that an indication of other targets is overlooked.

15 **a. Purpose.** The Marine searches the area for additional targets or for cover. The Marine
16 assesses the situation to determine if he needs to re-engage a target, engage a new target, take
17 cover, assume a more stable position, cease engagement, etc.

18 **b. Technique.** The Marine moves only as fast as he is capable of delivering well-aimed shots on
19 target. The speed of engagement should not exceed physical abilities. To search and assess, a
20 Marine performs the following steps:

- 21 • Lower the rifle to look over the sights.
22
23 • Place the trigger finger straight along the receiver.

24 **Figure 7-12. Straight Trigger Finger.**

- 25 • Search the area and assess the situation/threat by moving the head, eyes, and rifle left and
26 right to cover the immediate area. The muzzle moves with the head and eyes in one fluid
27 motion while searching. Keep both eyes open to increase the field of view.
28 • Once a Marine determines the area is clear of enemy threat, he places the rifle on safe.

29 **c. Searching and Assessing to a Higher Profile.** Depending on the tactical situation, the
30 Marine may choose to increase his area of observation by searching and assessing to a higher
31 profile position.

1 **(1) Prone to Kneeling.** After searching and assessing at the prone position, move to a
2 kneeling position by performing the following steps:

- 3 • While maintaining control of the pistol grip, lower the rifle butt out of the shoulder.
- 4 • Drop the left hand to the deck and, bringing it back, push up off the deck to both knees
5 (see figure 7-13).

6 **Figure 7-13 and 7-13a. Pushing Up Off the Deck to Both Knees.**

- 7 • Grasp the handguard with the left hand and place the rifle butt in the pocket of the
8 shoulder.
- 9 • Assume a kneeling position and search and assess (see figure 7-14).

10 **Figure 7-14. Kneeling Search and Assess.**

11 **(2) Sitting to Kneeling.** After searching and assessing at the sitting position, move to a
12 kneeling position by performing the following steps:

- 13 • Maintain control of the rifle with the rifle butt in the pocket of the shoulder.
- 14 • Uncross the legs to an open leg position.
- 15 • Tuck the right foot underneath the left thigh, as close to the buttocks as possible (see
16 figure 7-15).

17 **Figure 7-15. Tucking the Right Foot.**

- 18 • Lean forward and to the right and roll on to the right knee to a kneeling position and
19 search and assess (see figure 7-16).

20 **Note**

21 It may be necessary to release the rifle with the right hand and push
22 off the deck with the right hand to assist in rolling up to a kneeling position.

23 **Figure 7-16. Rolling Up to a Kneeling Position.**

24 **(3) Kneeling to Standing.** After searching and assessing at the kneeling position, maintain
25 control of the rifle with the rifle butt in the pocket of the shoulder, and stand while continuing
26 to search and assess.

Chapter 8

Effects of Weather

Wind, temperature, and precipitation can affect the trajectory of the bullet. In addition, all weather conditions have a physical and psychological effect on Marines. Marines must use techniques to offset the effects of wind, light, temperature, and precipitation (snow, sleet, rain). Through proper training, Marines can develop the confidence required to reduce the physical and psychological effects of weather so that they may offset the effects of weather during combat situations.

8001. Physical Effects of Wind on the Bullet

a. Physical Effects. The weather condition that presents the greatest problem to shooting is the wind. Wind affects a bullet's trajectory. The effect of wind on the bullet as it travels down range is referred to as deflection. The wind deflects the bullet laterally in its flight to the target (see figure 8-1).

Figure 8-1. Deflection of a Bullet.

The bullet's exposure time to the wind determines the amount the bullet is deflected from its original trajectory. Deflection increases as the distance to the target increases. There are three factors that affect the amount of deflection of the bullet: velocity of the wind, range to the target, and velocity of the bullet.

- The greater the velocity of the wind, the more the bullet will be deflected.
- As the distance to the target increases, the speed of the bullet slows allowing the wind to have a greater effect on shot placement.
- A bullet with a high muzzle velocity will not be affected by the wind as much as a bullet with a low muzzle velocity.

b. Determining Windage Adjustments to Offset the Effects of Wind. The velocity and direction of the wind in relationship to the bullet must be determined to offset the wind's effects. If Marines can classify wind values and determine velocity within 5 mph, they can effectively engage targets in windy conditions.

(1) Wind Direction. Determine wind direction by observing the direction vegetation is moving, by feeling the wind blow against the body, or by observing the direction of a flag (in training).

1 **(4) Windage Adjustments.** After identifying wind direction, wind classification, and wind
2 velocity, determine the windage adjustments needed to enable the bullet to strike the target.
3 Determine windage adjustments in the following ways:

4 **(a) Observation Method.** Use the windage chart provided in figure 8-4. Match the
5 wind velocity, wind direction, and range to the target to the information in the chart to
6 determine the correct number of clicks to apply to the windage knob.

7 **Figure 8-4. Windage Click Chart for the Observation Method.**

8 **(b) Windage and Elevation Rules.** Apply the windage and elevation rules to the
9 known strike of the round. Moving the front sight post, elevation knob, or windage knob
10 one graduation or notch is referred to as moving one “click” on the sight. The windage
11 and elevation rules define how far the strike of the round will move on the target for each
12 click of front and rear sight elevation or rear sight windage for each 100 yards of range to
13 the target.

14 • **Front Sight Elevation Rule.** One click of front sight elevation adjustment will
15 move the strike of the round on the target approximately 1 ¼ inches for every 100
16 yards of range to the target.

17
18 • **Rear Sight Elevation Rule.** One click of rear sight elevation adjustment will
19 move the strike of the round on the target approximately 1 inch for every 100
20 yards of range to the target.

21 • **Windage Rule.** One click of windage adjustment will move the strike of the
22 round on the target approximately 1/2 inch for every 100 yards of range to the
23 target.

24 **(c) Flag Method.** Use the windage chart provided in figure 8-5. Match the wind
25 velocity, wind direction, and range to the target to the information in the chart to
26 determine the correct number of clicks to apply to the windage knob.

27 **Figure 8-5. Windage Click Chart for the Flag Method.**

28 Once the number of windage clicks is determined, turn the windage knob causing the rear
29 sight aperture to move into the direction of the wind. (See chapter 9.)

30 **8002. Physical Effects of Temperature and Precipitation on the Bullet and the Rifle**

31 **a. Temperature**

32 **(1)** Extreme changes in temperature cause fluctuation in the rifle’s chamber pressure. This
33 fluctuation is caused by changes in the propellant’s temperature. In cold weather, as rifle

1 chamber pressure decreases, the bullet exits the muzzle at a lower velocity, and the bullet
2 impacts the target below the point of aim. In extreme heat, the rifle's chamber pressure
3 increases causing the bullet to exit the muzzle at a higher velocity and impact the target above
4 the point of aim. Hot air is less dense than cool air and provides less resistance to the bullet;
5 this allows the bullet to travel faster and experience less deflection from the wind. Cold air is
6 dense and provides the bullet with more resistance; this causes the bullet to travel slower and
7 experience greater deflection from the wind. Once the rifle is zeroed, a change in temperature
8 of 20 degrees or more can cause the bullet to strike above or below the point of aim.
9 Therefore, if the temperature changes 20 degrees or more, a Marine should rezero the rifle.

10 (2) If the rifle is exposed to below freezing temperatures, it should not be brought
11 immediately into a warm location. Condensation may form on and in the rifle, and it may
12 freeze if re-exposed to the cold. Ice that forms inside the rifle may cause it to malfunction.
13 Ice can form on the rear sight aperture due to condensation, making it impossible to acquire
14 sight alignment.

15 **b. Precipitation.** Freezing rain and other types of precipitation may make the rifle difficult to
16 handle, foul the rifle and cause stoppages, or build up in the barrel or compensator and cause
17 erratic shots. The bullet veers off its trajectory if it strikes water droplets on its way out the
18 barrel. Care should be taken to keep the barrel and muzzle free of water. If the rifle has been
19 submerged, ensure the bore is drained before firing. To drain the bore, pull the charging handle
20 slightly to the rear and hold for a few seconds while the muzzle points down. Once the barrel has
21 been drained, turn the rifle muzzle up to allow the water to drain out of the stock.

22 **8003. Physical and Psychological Effects of Weather on Marines**

23 **a. Wind.** Marines can shoot effectively in windy conditions if they apply a few basic techniques
24 and develop the proper mental attitude. The Marine can combat the wind in a number of ways:

25 (1) Make subtle changes to the basic shooting positions, such as increasing muscular tension,
26 to reduce movement of the rifle.

27 (2) Seek support to stabilize the rifle.

28 (3) Hold the shot and apply the fundamentals during a lull in the wind.

29 (4) Fire one well-aimed shot rather than two.

30 **b. Temperature**

31 (1) **Extreme Heat.** In extreme heat, a Marine may experience rapid fatigue. Heat can cause
32 muscle cramps, heat exhaustion, heat stroke, blurred vision, and reduced concentration levels
33 that result in inaccurate shooting. Increased fluid intake and good physical condition can
34 offset the effects of extreme heat. Sweat running into the eyes can cause irritation and make it

1 difficult to see the sights. Extreme heat also can create ground mirages that cause a target to
2 appear indistinct and to drift from side to side. Heat waves or mirages may also distort the
3 target shape or the appearance of the front sight post. A mirage created by the heat of the
4 barrel reduces a Marine's ability to see the sight clearly. To overcome the effects of heat and
5 accurately engage a target, a Marine should maintain a center of mass hold.

6 **(2) Extreme Cold.** Extreme cold may affect a Marine's ability to concentrate. If a Marine's
7 hands are numb, he will have difficulty holding a frigid rifle and executing effective trigger
8 control. To protect the hands in a cold environment, a Marine should wear arctic mittens or
9 gloves. To operate the rifle while wearing arctic mittens or gloves, a Marine depresses the
10 trigger guard plunger to open the trigger guard. This allows easier access to the trigger. See
11 figure 8-6. The hasty sling can assist in holding the hand in place on the hand guards so the
12 hand does not slip while wearing mittens.

13 **Figure 8-6. Open Trigger Guard.**

14 **c. Precipitation.** Precipitation (rain, snow, hail, sleet) can affect target engagement, a Marine's
15 comfort level, and a Marine's ability to concentrate. The amount and type of precipitation may
16 obscure or completely hide the target and it may reduce a Marine's ability to establish an accurate
17 sight picture. Precipitation collecting on the rear sight aperture can make it difficult to establish
18 sight alignment and sight picture. Protect the sights as much as possible during periods of
19 precipitation. It is easy to lose concentration when wet and uncomfortable. Proper dress reduces
20 the effects of precipitation on the Marine.

21 **d. Light.** Light conditions can change the appearance of a target. Light affects each Marine
22 differently. Light can affect range estimation, visual acuity, or the placement of the tip of the
23 front sight on the target. By maintaining a center of mass hold, the effects of light can be
24 reduced.

25 **(1) Bright Light.** Bright light conditions exist under a clear blue sky with no fog or haze
26 present to filter the sunlight. Bright light can make a target appear smaller and farther away.
27 As a result, it is easy to overestimate range. Loss of visual acuity can cause surroundings to
28 bleed into the actual target making it seem indistinct. Maintaining a center of mass hold,
29 regardless of how indistinct the target appears, ensures the best chances for an effective shot.

30 **(2) Overcast.** An overcast condition exists when a solid layer of clouds obstructs the sun.
31 The amount of available light changes as the overcast thickens. Overcast conditions can
32 make a target appear larger and closer. As a result, it is easy to underestimate range. During
33 a light overcast, the target appears very distinct and the rifle sights appear very distinct,
34 making it easy to establish sight alignment. As the overcast thickens, it becomes difficult to
35 identify the target from the surroundings.

36 **(3) Haze.** Hazy conditions exist when fog, dust, humidity, or smoke are present. Hazy
37 conditions can make a target appear indistinct making it difficult to establish sight picture.

Chapter 9

Zeroing

1
2

3 To be combat effective, it is essential for the Marine to know how to zero his rifle. Zeroing is
4 adjusting the sights on the weapon to cause the shots to impact where the Marine aims. This
5 must be done while compensating for the effects of weather and the range to the target. It is
6 critical that Marines can zero their rifles and make the sight adjustments required to engage
7 targets accurately.

8 **9001. Elements of Zeroing**

9 There are five basic elements involved in zeroing a rifle: line of sight, point of aim, centerline of
10 the bore, trajectory, and range. See figure 9-1.

11 **Figure 9-1. Elements of Zeroing.**

12 **a. Line of Sight.** The line of sight is a straight line which begins at the center of the eye,
13 proceeds through the center of the rear sight aperture, and passes across the tip of the front sight
14 post to an aiming point on a target.

15 **b. Aiming Point.** The aiming point is the precise point where the tip of the front sight post is
16 placed in relationship to the target.

17 **c. Centerline of the Bore.** Centerline of the bore is an imaginary straight line beginning at the
18 chamber end of the barrel, proceeding out of the muzzle, and continuing indefinitely.

19 **d. Trajectory.** In flight, a bullet does not follow a straight line but travels in a curve or arc
20 which is called trajectory. Trajectory is the path a bullet travels to the target. As the bullet exits
21 the muzzle it travels on an upward path, intersecting the line of sight (because the sights are above
22 the muzzle). As the bullet travels farther, it begins to drop and intersects the line of sight again.

23 **e. Range.** Range is the known distance from the rifle to the target.

24 **9002. Battlesight Zero (BZO)**

25 BZO is the elevation and windage settings required to engage point targets from 0-300
26 yards/meters under ideal weather conditions (i.e., no wind). This means that the rifle sight are
27 adjusted so the bullet's trajectory and the line of sight intersect at a range of 300 yards/meters.
28 When zeroing in windy conditions, the adjustments for windage to offset the effects of wind must
29 be removed to establish a BZO.

1 9003. M16A2 Sighting System

2 The sighting system of the M16A2 service rifle consists of a front sight post and two rear sight
3 apertures.

4 **a. Front Sight.** The front sight post is used to adjust for elevation. The front sight consists of a
5 square, rotating sight post with a four-position, spring-loaded detent (see figure 9-2). To adjust
6 for elevation, use a pointed instrument (or the tip of a cartridge) to depress the detent and rotate
7 the front sight post (see figure 9-3).

8 • To raise the strike of the bullet, rotate the post clockwise (in the direction of the arrow
9 marked UP) or to the right.

10 • To lower the strike of the bullet, rotate the post counterclockwise (in the opposite
11 direction of the arrow) or to the left.

12 **Figure 9-2. Front Sight.**

13 **Figure 9-3. Front Sight Adjustment.**

14 **b. Rear Sight.** The rear sight consists of two sight apertures, a windage knob, and an elevation
15 knob. See figure 9-5. The large aperture marked 0-2 is used for target engagement during
16 limited visibility, when a greater field of view is desired, or for engagements of targets closer than
17 200 yards. The unmarked aperture (small aperture) is used for zeroing and normal firing
18 situations.

19 **Figure 9-4. Rear Sight.**

20 **(1) Elevation Knob.** The rear sight elevation knob is used to adjust the sight for a specific
21 range to the target. The elevation knob is indexed as shown in figure 9-5. Each number on
22 the knob represents a distance from the target in 100-meter increments. To adjust for range
23 to the target, rotate the elevation knob so the desired setting is aligned with the index on the
24 left side of the receiver.

25 **Figure 9-5. Elevation Knob.**

26 **(a)** If the elevation knob is turned so the number 8/3 aligns with the elevation index line,
27 the 3 indicates 300 yards/meters (see figure 9-6)

28 **Figure 9-6. Rear Sight Elevation Knob Set for 300 Meters.**

29 **(b)** When the rear sight elevation knob is set on 8/3 for 800 yards/meters, there will be a
30 considerable gap (1/4 inch) between the rear sight housing and the upper receiver (see
31 figure 9-7).

Figure 9-7. Rear Sight Elevation Knob Set for 800 Meters.

(c) A hasty sight setting is the setting placed on the rear sight elevation knob to engage targets beyond 300 yards/meters. Hasty sight settings for ranges of 400 to 800 yards/meters are applied by rotating the rear sight elevation knob to the number that corresponds with the engagement distance of the enemy. Aligning the number 4, 5, 6, or 7 with the elevation index line places the elevation BZO for 400, 500, 600, or 700 yards/meters, respectively. If a clockwise rotation is continued, the number 8/3 appears for the second time on the elevation index line and indicates an 800 yard/meter elevation BZO.

(2) **Windage Knob.** The windage knob is used to adjust the strike of the round right or left. The windage knob is marked with an arrow that shows the direction the strike of the round is being moved. See figure 9-8.

Figure 9-8. Windage Knob.

- To move the strike of the round to the right, rotate the windage knob clockwise (in the direction of the arrow marked R).
- To move the strike of the round to the left, rotate the windage knob counterclockwise.

9004. Windage and Elevation Rules

Moving the front sight post, elevation knob, or windage knob one graduation or notch is referred to as moving one “click” on the sight. The windage and elevation rules define how far the strike of the round will move on the target for each click of front and rear sight elevation or rear sight windage for each 100 yards of range to the target.

a. Front Sight Elevation Rule. One click of front sight elevation adjustment will move the strike of the round on the target approximately 1 ¼ inches for every 100 yards of range to the target.

b. Rear Sight Elevation Rule. One click of rear sight elevation adjustment will move the strike of the round on the target approximately 1 inch for every 100 yards of range to the target.

c. Windage Rule. One click of windage adjustment will move the strike of the round on the target approximately 1/2 inch for every 100 yards of range to the target.

9005. Initial Sight Settings

1 Initial sight settings are those settings that serve as the starting point for initial zeroing from which
2 all sight adjustments are made. If the Marine already has a BZO established on his rifle, he may
3 begin the zeroing process by using the previously established BZO sight settings. To set the
4 sights to initial sight settings:

5 **a. Front Sight Post.** To set the front sight post to initial sight setting, depress the front sight
6 detent and rotate the front sight post until the base of the front sight post is flush with the front
7 sight housing.

8 **b. Rear Sight Elevation Knob.** To set the elevation knob at the initial sight setting, perform the
9 following:

- 10 • Rotate the rear sight elevation knob counterclockwise until the moveable rear sight
11 housing is bottomed out on the upper receiver. See figure 9-9.

12 **Figure 9-9. Bottoming Out Elevation Knob.**

13 **Note**

14 Once bottomed out, the rear sight elevation knob should be three
15 clicks counterclockwise from 8/3. If the sight fails to move three
16 clicks counterclockwise from 8/3, it must be
17 adjusted by a qualified armorer.

- 18 • Rotate the rear sight elevation knob clockwise until the number 8/3 aligns with the
19 index mark located on the left side of the upper receiver. See figure 9-10.

20 **Figure 9-10. Elevation Knob Set at 8/3.**

21 **c. Windage Knob.** To set the windage knob to initial sight setting, rotate the windage knob
22 until the index line located on the top of the large rear sight aperture aligns with the centerline on
23 the windage index scale located on the moveable base of the rear sight assembly. See figure 9-11.

24 **Figure 9-11. Aligning Index Line.**

25 **9006. Zeroing Process**

26 During the zeroing process, all elevation adjustments are made on the front sight post. Once a
27 BZO is established, the front sight post should never be moved, except when rezeroing the rifle.
28 (The rear sight elevation knob is used for dialing in the range to the target.) Zeroing is conducted
29 at a range of 300 yards/meters. To prepare a rifle for zeroing, the rifle sights must be adjusted to
30 the initial sight settings as outlined in paragraph 9005. Perform the following steps to zero the
31 rifle:

- 32 • Fire a 3-shot group at the sustained rate of fire (12 to 15 rounds per minute).

- 1 • Triangulate the shot group to find the center. See figure 9-12.

2 **Figure 9-12. Triangulating Shot Group.**

- 3 • Determine the vertical distance in inches from the center of the shot group to the center of
4 the target. See figure 9-13.

5 **Figure 9-13. Determining Vertical Distance.**

- 6 • Make elevation adjustments on the front sight post to move the center of the shot group
7 to the center of the target.

- 8 • Determine the lateral distance from the center of the shot group to the center of the target.
9 See figure 9-14.

10 **Figure 9-14. Determining Lateral Distance.**

- 11 • Make lateral adjustments on the windage knob to move the center of the shot group to the
12 center of the target.

- 13 • Repeat the preceding steps until the shot group is centered.

- 14 • Fire a 4-round shot group to confirm the sight setting.

- 15 • Once the sight setting is confirmed, determine the value and direction of the wind and
16 remove the number of clicks added to the windage knob (if necessary) to compensate for
17 current wind conditions. This becomes the BZO setting for the rifle.

18 **9007. Field Expedient Battlesight Zeroing**

19 BZO is the elevation and windage setting established at 300 yards that enables a Marine to engage
20 point targets from 0-300 yards under ideal weather conditions. If a 300-yard range is not
21 available, a field expedient BZO can be established at a reduced range of 36 yards. When a rifle is
22 zeroed for 300 yards, the bullet crosses the line of sight twice. It first crosses the line of sight on
23 its upward path of trajectory at 36 yards, and again farther down range at 300 yards (see figure
24 9-15). Therefore a rifle's BZO may be established at a distance of 36 yards and the same BZO
25 will be effective at 300 yards. If a BZO at 300 meters is desirable, the distance to zero the rifle
26 for a field expedient BZO is 30 meters.

27 **Figure 9-15. Bullet Crossing the Line of Sight Twice.**

28 To establish a field expedient BZO at 36 yards or 30 meters when a 300-yard/meter range is not
29 available, a Marine performs the same steps as the zeroing process outlined in paragraph 9006.

1 However, since wind does not affect the round at 36 yards/30 meters, windage is not removed
2 from the windage knob after confirming the BZO. To be accurate, the target must be placed
3 exactly 36 yards (or 30 meters) from the muzzle of the rifle.

4 **9008. Factors Causing a BZO to be Reconfirmed**

5 Marines are responsible for maintaining a BZO on their rifles at all times. Many factors influence
6 the BZO of a rifle. If operating in a combat environment, Marines should confirm their BZO as
7 often as possible. Atmospheric conditions, humidity, and temperature can cause BZOs to change
8 on a daily basis. To confirm a BZO, a Marine may begin the zeroing process by using the
9 previously established BZO sight settings rather than placing the sights at initial sight setting. The
10 following factors cause a BZO to be reconfirmed.

11 **a. Maintenance.** It is possible for the BZO to change if ordnance personnel perform
12 maintenance on a rifle. If maintenance was performed, it is critical that the rifle be rezeroed as
13 soon as possible.

14 **b. Temperature.** An extreme change in temperature (i.e., 20 degrees or more) will cause the
15 elevation BZO to change. Changes in temperature cause chamber pressure to increase when hot
16 and decrease when cold. This causes shots to impact the target high in hot temperatures and low
17 in cold temperatures.

18 **c. Climate.** Changing climates (i.e., moving from a dry climate to a tropical climate) can mean
19 changes in air density, moisture content, temperature, or barometric pressure. Any of these
20 elements can affect the rifle's BZO.

21 **d. Ammunition.** Inconsistencies in the production of ammunition lots can change a rifle's BZO.

22 **e. Ground Elevation.** Drastic changes in ground elevation can create changes in air density,
23 moisture content, temperature, or barometric pressure. Any of these elements can affect the
24 rifle's BZO.

25 **f. Uniform.** If Marines zero their rifle in the utility uniform and fire in full battle gear their BZO
26 will change. The wearing of full battle gear changes eye relief, placement of the rifle in the
27 shoulder pocket, and the way the rifle is supported on the handguard. Marines must establish
28 their BZOs while wearing the uniform and equipment they will be wearing while engaging targets.

29 **9009. Factors Affecting the Accuracy of a BZO**

30 Anything the Marine changes from shot to shot affects the accuracy of his BZO. The following
31 factors, when applied inconsistently, diminish the accuracy of a BZO:

- 1 • Any of the seven factors (forward hand, grip, right elbow, stock weld, rifle butt in the pocket
- 2 of the shoulder, relaxation, breathing).
- 3 • Sling tension.
- 4 • Trigger control.
- 5 • Sight picture.

6

Chapter 10

Engagement Techniques

1
2
3 A Marine must maintain the ability to react instinctively in a combat environment—day or night.
4 He must possess a combat mindset that eliminates any hesitation, fear, or uncertainty of action,
5 allows him to engage the enemy rapidly, and allows him to focus on the actions required to fire
6 well-aimed shots. A Marine must remember that speed alone does not equate to effective target
7 engagement. He should fire only as fast as he can fire accurately. He should never exceed his
8 physical capability to engage a target effectively. To be effective in combat, a Marine must train
9 to perfect the physical skills of target engagement (such as presenting the weapon and assuming a
10 shooting position) until they become instinctive. In addition, a Marine must employ effective
11 engagement techniques that enable the acquisition and engagement of a variety of targets in
12 diverse combat conditions.

13 **10001. Target Detection**

14 To be proficient, a Marine rifleman must be able to detect targets, determine the range to targets,
15 and accurately engage the targets. There are many variables affecting a Marine's ability to detect
16 and determine the range to combat targets. An enemy rarely fails to use some type of cover or
17 concealment when he is in the vicinity of Marine units. Enemy targets on the battlefield may be
18 single or multiple, stationary or moving, or completely hidden from view. Success in locating an
19 enemy target will depend upon the observer's position, his skill in searching an area, and his
20 ability to recognize target indicators.

21 **a. Target Indicators.** Most combat targets are detected at close range by smoke, flash, dust,
22 noise, or movement, and are usually seen only momentarily. Target indicators are anything that
23 reveal an individual's position to the enemy. These indicators are grouped into three general
24 areas; movement, sound, and improper camouflage.

25

26 **(1) Movement.** The human eye is attracted to movement, especially sudden movement. The
27 Marine need not be looking directly at an object to notice movement. The degree of difficulty
28 in locating moving targets depends primarily on the speed of movement. A slowly moving
29 target will be harder to detect than one with quick jerky movements.

30 **(2) Sound.** Sound can also be used to detect an enemy position. Sound may be made by
31 movement, rattling equipment, or talking. Sound provides only a general location of the
32 enemy, making it difficult to pinpoint a target by sound alone. However, sound can alert the
33 Marine to the presence of a target and increase his probability of locating it through other
34 indicators.

35 **(3) Improper Camouflage.** There are three indicators caused by improper camouflage:
36 shine, outline, and contrast with the background. Most targets on the battlefield are detected

1 due to improper camouflage. However, many times an observation post or enemy firing
2 position will blend almost perfectly with the natural background. Only through extremely
3 careful, detailed searching will these positions be revealed.
4

5 **(a) Shine.** Shine is created from reflective objects such as metal or glass. It may also
6 come from pools of water and even the natural oils from the skin. Shine acts as a beacon
7 to the target's position.

8 **(b) Outline.** Most enemy soldiers will camouflage themselves, their equipment, and their
9 positions. The outline of objects such as the body, head and shoulders, weapons, and web
10 gear are recognizable even from a distance. The human eye will often pick up a
11 recognizable shape and concentrate on it even if the object cannot be identified right away.
12 The reliability of this indicator depends upon visibility and the experience of the observer.

13 **(c) Contrast With the Background.** Indicators in this category include objects that
14 stand out against (contrast with) a background because of differences in color, surface,
15 and shape. For instance, a target wearing a dark uniform would be clearly visible in an
16 area of snow or sand. Geometric shapes, such as helmets or rifle barrels, can be easy to
17 detect in a wooded area. Fresh soil around a fighting hole contrasts with the otherwise
18 unbroken ground surface. While observing an area, take note of anything that looks out
19 of place or unusual and study it in more detail. This will greatly increase your chances of
20 spotting a hidden enemy.

21 **b. Identifying Target Location**

22 **(1) Observation Position**

23 **(a)** A good position is one that offers maximum visibility of the area while affording cover
24 and concealment. The optimal observation position should allow the Marine to scan all
25 the areas of observation and offer enough concealment to prevent his position from being
26 detected.

27 **(b)** The Marine should avoid positions that are obvious or stand out, such as a lone tree
28 in a field or a pile of rocks on a hill. These positions may be ideal points for easy
29 observation, but they will also make it easier for the enemy to locate the Marine.

30 **(2) Methods for Searching an Area.** In searching an area, the Marine will be looking for
31 target indicators. There are two techniques for searching an area: the hasty search and the
32 detailed search.

33 **(a) Hasty Search.** When a Marine moves into a new area, he must quickly check for
34 enemy activity which may pose an immediate danger. This search is known as the hasty
35 search and should take about 30 seconds.

- 1 • Quickly glance at various points throughout the area rather than sweeping the eyes
2 across the terrain in one continuous movement. Search the area nearest you first
3 since it poses the greatest potential for danger.

- 4 • This method of search is effective because it takes advantage of peripheral vision.
5 Peripheral vision enables you to detect any movement in a wide area around the
6 object being observed. For this technique to be effective, the eyes must be focused
7 briefly on specific points (i.e., areas that may provide cover or concealment for the
8 enemy).

9 **(b) Detailed Search.** A detailed search is a systematic examination of a specific target
10 indicator or of the entire observation area.

- 11 • A detailed search should be conducted immediately on target indicators located
12 during the hasty search. The detailed search should be made from top to bottom
13 or side to side, observing the entire object in exact detail. If multiple indicators
14 were observed during the hasty search, the detailed search should begin with the
15 indicator that appears to pose the greatest threat.

- 16 • After a thorough search of target indicators, or if no indicators were located
17 during the hasty search, a detailed search should be made of the entire observation
18 area. The 50-meter overlapping strip method of search is used.

- 19 • Normally, the area nearest the observer offers the greatest potential danger and
20 should be searched first. Begin the search at one flank, systematically
21 searching the terrain at the front in 180 degree arcs, searching everything in
22 exacting detail, 50 meters in depth. See figure 10-1.

- 23 • After reaching the opposite flank, systematically cover the area between 40 and
24 90 meters from your position. The second search of the terrain includes about
25 10 meters of the area examined during the first search. This technique ensures
26 complete coverage of the area.

- 27 • Continue the overlapping strip search method for as far as you can see.

- 28 •

- 29 •

30 **Figure 10-1. Searching the Terrain in Overlapping Strips.**

1 **c. Maintaining Observation**
2

3 **(1) Method.** The combat situation will dictate the method of maintaining observation of an
4 area. Generally, the method will include a combination of hasty and detailed searches.

5 **(2) Sequence of Observation.** Observation is often conducted by a two-man team. One
6 team member should constantly observe the entire area using the hasty search technique and
7 the other team member should conduct a detailed overlapping strip search. If you are
8 observing as an individual, devise a plan to ensure that the area of observation is completely
9 covered. When entering a new area, immediately conduct a hasty search. Since a hasty
10 search may fail to detect some indicators, periodically conduct a detailed search of the area.
11 A detailed search should also be conducted any time your attention has been diverted from the
12 search area.

13 **d. Remembering Target Location.** Most targets are seen only briefly and most areas contain
14 multiple targets. Once you have located a target indicator, you will need to remember its location
15 to engage it successfully. To help remember the location of a target, select a known feature and
16 use it as a reference point to determine the distance and general direction to the target.

17 **e. Preparing a Range Card.** When the pace of battle slows or you move into a defensive
18 posture, an observation log or range card can be maintained to record the location of targets,
19 terrain features, etc. This information can be recorded on a sheet of paper or a locally produced
20 form. Recording information is helpful if you will observe from the same position over a period
21 of time or if the area has numerous terrain features or multiple target locations. A range card is a
22 rough sketch of an observer's area of responsibility. It depicts the range and direction from the
23 observer's position to easily recognizable objects, terrain features, avenues of approach, and
24 possible enemy positions (see figure 10-2). When a potential threat appears, its range can be
25 quickly determined by its relative position to the reference points on the range card. To prepare a
26 range card, the Marine estimates ranges to various dominant terrain features, buildings, and other
27 reference points in his sector and plots them on the range card in their proper places. The Marine
28 draws avenues of approach and dead space, as appropriate. Drawings are made as if the Marine
29 is looking straight down over his observation area. The Marine then draws a line from his
30 position to each object or feature on the card and records the range to each object.

31 **Figure 10-2. Range Card.**

32 **10002. Range Estimation**

33 To engage targets at unknown distances, a Marine must determine the distance from his location
34 to a known point. This is known as range estimation. The ability to determine range is a skill
35 that must be developed if a Marine is to successfully engage targets at unknown distances.
36 Precise range estimation enhances accuracy, enhances the chance of survival, and determines if a

1 target can be effectively engaged using the rifle's existing BZO or if a new sight setting or point of
2 aim is required.

3 a. Range Estimation Methods

4 **(1) Unit of Measure Method.** To use this method, a Marine visualizes a distance of 100
5 yards/meters on the ground, and then estimates how many of these units will fit between him
6 and the target. This determines the total distance to the target. See figure 10-3. The greatest
7 limitation of this method is that its accuracy is related to the amount of visible terrain. For
8 example, if a target appears at a range of 500 yards/meters or more and only a portion of the
9 ground between a Marine and the target can be seen, it becomes difficult to use the unit of
10 measure method to estimate range accurately. A Marine must practice this method frequently
11 to be proficient. Whenever possible, a Marine should select an object, estimate the range, and
12 then verify the actual range by either pacing or using another accurate measurement.

13 **Figure 10-3. Unit of Measure Method.**

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

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

22

23 • If the target is less than the width of the front sight post, the target is in excess of 300
24 yards/meters. Therefore, the rifle's BZO cannot be used effectively.

25

26 • If the target is wider than the front sight post, the target is less than 300 yards/meters
27 and can be engaged point of aim/point of impact using the rifle's BZO.

28

29 See figure 10-4.

30 **Figure 10-4. Front Sight Post Method.**

31 **(3) Visible Detail Method.** The amount of detail seen at various ranges can provide a
32 Marine with an estimate of the target's distance. To use this method, a Marine must be
33 familiar with the size and various details of personnel and equipment at known distances.
34 Visibility limits (such as weather, smoke, or darkness) the effectiveness of this method. A
35 Marine should observe a man while he is standing, kneeling, and in the prone position at
36 known ranges of 100 to 500 yards/meters. He should note the man's size, characteristics/size
37 of his uniform and equipment, and any other pertinent details. The Marine then uses this as a
38 guide to determine range over an unknown distance. A Marine also should study the

1 appearance of other familiar objects such as rifles and vehicles. To use this method, a Marine
2 applies the following general guidelines:

- 3 • At 100 yards/meters, the target can be clearly observed in detail and facial features can
4 be distinguished
- 5
- 6 • At 200 yards/meters, the target can be clearly observed. There is a loss of facial detail.
7 The color of the skin and equipment are still identifiable.
- 8
- 9 • At 300 yards/meters, the target has a clear body outline, face color usually remains
10 accurate, but remaining details are blurred.
- 11
- 12 • At 400 yards/meters, the body outline is clear but remaining detail is blurred.
- 13
- 14 • At 500 yards/meters, the body shape begins to taper at the ends. The head becomes
15 indistinct from the shoulders.
- 16
- 17 • At 600 yards/meters, the body is wedge-shaped with no head.

18 **(4) Bracketing Method.** This method of range estimation estimates the shortest possible
19 distance and the greatest possible distance to the target. For example, a Marine estimates that
20 a target may be as close as 300 yards/meters but it could be as far away as 500 yards/meters.
21 The estimated distances are averaged to determine the estimated range to the target. For
22 example, the average of 300 yards/meters and 500 yards/meters is 400 yards/meters.

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

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

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

36 **(1) Nature of the Target**

- 37 • An object with a regular outline such as a steel helmet, rifle, or vehicle on a clear day
38 will appear to be closer than one with an irregular outline such as a camouflaged

1 object.

2

3 • A target that contrasts with its background will appear to be closer than one that
4 blends in with its background.

5

6 • A partially exposed object will appear to be farther away than it is.

7

8 • A target will appear to be farther away if the target is smaller than the objects
9 surrounding it.

10 (2) Nature of Terrain

11 • Upward sloping terrain gives the illusion of shorter distance.

12

13 • Downward sloping terrain gives the illusion of greater distance.

14

15 • Terrain with dead space makes the target appear to be closer.

16

17 • Smooth terrain such as sand, water, or snow gives the illusion of greater distance.

18 (3) Light Conditions

19 • The more clearly a target can be seen, the closer it appears to be.

20

21 • A target in full sunlight appears to be closer than one observed at dawn or dusk.

22

23 • Smoke, fog, rain, or anything else that obscures vision will give the illusion of greater
24 distance.

25

26 • The position of the sun affects estimation by the eye. If the sun is behind the viewer, it
27 lights the target better so the target appears closer. If the sun is directly beyond the
28 target, the glare makes the target appear farther away.

29 10003. Offset Aiming

30 The conditions of rifle fire in combat may not permit mechanical adjustments of the sights. To
31 engage a target during combat, a Marine may be required to aim his rifle at a point on the target
32 other than center mass. This is known as offset aiming. Offset aiming is used to compensate for
33 the distance and size of the target, wind, and speed and angle of a moving target. There are two
34 primary techniques for offset aiming: point of aim technique and known strike of the round.

35 **a. Point of Aim Technique.** The point of aim technique is the shifting of the point of aim (sight
36 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 figure 10-5).

Figure 10-5. Points of Aim for Elevation.

(1) Elevation. Predetermined points of aim sector the target horizontally. The tip of the front sight post held at shoulder level is considered one point of aim; the tip of the front sight post held at the top of the target's head is considered two points of aim. These points of aim are used to compensate for the elevation required to engage a target beyond the BZO capability of the rifle or to engage a small target inside the BZO of the weapon.

(a) Beyond the BZO. To use the point of aim technique to engage a target beyond the BZO of the rifle, 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.

(b) Inside the BZO. If the rifle is properly zeroed for 300 yards/meters, the trajectory (path of the bullet) will rise approximately 4 1/2 inches above the line of sight at a distance of approximately 175 yards/meters. At other distances, the strike of the bullet will be less than 4 1/2 inches above the point of aim. Only at 36 yards/30 meters and 300 yards/meters does the point of impact coincide with the point of aim. If only a portion of the target is visible (e.g., the head of an enemy soldier), the trajectory of the bullet may have to be taken into consideration when firing at a distance other than 300 yards/meters.

If a Marine does not consider trajectory, he may shoot over the top of the target if the target is small and at a distance other than 300 yards/meters. See figure 10-6.

Figure 10-6. Trajectory and Point of Aim/Point of Impact.

(2) Windage. Predetermined points of aim sector the target vertically (see figure 10-7). The tip of the front sight post centered on the leading edge of the target is considered one point of aim; the trailing edge of the front sight post held on the leading edge of the target is considered two points of aim. The same units of measure are applied off the target for holds of additional points of aim. These points of aim are used to compensate for wind affecting the strike of the round and when there is no time to adjust the rifle's sights, or when a lead is required to engage a moving target (points of aim for moving targets are discussed in paragraph 10007b3). Figure 10-8 provides points of aim for full value winds.

Figure 10-7. Points of Aim for Windage.

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

Figure 10-8. Points of Aim for Full Value Winds.

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. 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.

9 **10004. Techniques of Fire**

10 The size and distance to the target should dictate the technique of fire.

11 **a. Two-Shot Technique.** In combat, an effective technique for eliminating a threat is to rapidly
12 fire more than one shot on the target. Two shots fired in rapid succession will increase the trauma
13 (i.e., shock, blood loss) on the target, increasing the Marine's chances of quickly eliminating the
14 threat. Firing two shots enables the Marine to break out of the tunnel vision often associated with
15 firing in combat and then assess the situation to determine follow-on action. To execute the
16 two-shot technique, the Marine acquires sight picture for each shot fired (each pull of the trigger).

17 **b. Single Shot Technique.** If the target is at a long range or it is small (i.e., partially exposed), it
18 can best be engaged with a single, precision shot. Stability of hold and sight alignment are more
19 critical to accurate engagement of long-range or small targets. To engage a target with the single
20 shot technique, the Marine must slow down the application of the fundamentals and place one
21 well-aimed shot on target.

22 **c. Sustained Rate of Fire.** An effective method for delivering suppressive fire is to fire at the
23 sustained rate of 12 to 15 rounds per minute. Management of recoil is critical to bring the sights
24 back on target after shot is fired.

25 **d. Three-Round Burst Technique.** When set on burst, the design of the rifle permits three
26 shots to be fired from a single trigger pull. The rounds fire as fast as the weapon will function and
27 cause the muzzle to climb during recoil. The ability to manage recoil is extremely important when
28 firing the rifle on burst. To achieve the desired effect (i.e., 3 rounds on target), the Marine must
29 control the jump angle of the weapon to maintain the sights on target. At short ranges (i.e., 25
30 meters or less), firing on three-round burst can be an effective technique to place rounds on a
31 man-sized target quickly to increase trauma on the target. To execute the three-round burst
32 technique, the Marine places the selector lever on burst, aims center mass, and acquires sight
33 picture once for the single trigger pull.

1 **10005. Engaging Immediate Threat Targets**

2 Immediate threat target engagement is characterized by short-range engagement (i.e., less than 50
3 meters) with little or no warning which requires an immediate response to engage an enemy. This
4 type of engagement is likely in an urban, jungle, or close quarters environment. If this type of
5 engagement is likely, the large rear sight aperture (0-2) should be placed up to provide a wider
6 field of view and detection of targets. Marksmanship skills include quick presentation and
7 compression of the fundamentals (i.e., quick acquisition of sight picture, uninterrupted trigger
8 control). At close ranges, perfect sight alignment is not as critical to accuracy on target.
9 However, the front sight post must be in the rear sight aperture; proper sight alignment is always
10 the goal.

11 **10006. Engaging Multiple Targets**

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

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

22 **a. Prioritizing Targets.** The combat situation will usually dictate the order of multiple target
23 engagement. Target priority is based on factors such as proximity, threat, and opportunity, and
24 no two situations will be the same. The principal method is to determine the level of threat for
25 each target so all may be engaged in succession from the most threatening to the least threatening.
26 The target that poses the greatest threat (e.g., closest, greatest firepower) should be engaged first.
27 Prioritizing targets is an ongoing process. Changes in threat level, proximity, or the target itself
28 may cause a Marine to revise his priorities. Therefore, a Marine must remain alert to changes in a
29 target's threat level and proximity and other target opportunities as the battle progresses.

30 **b. Technique of Engagement.** To engage multiple targets, the Marine performs the following
31 steps:

32 (1) Engage the first target with two rounds.

33 (2) The recoil of the rifle can be used to direct the recovery of the weapon on to the next
34 target. As the weapon is coming down in its recovery, the Marine physically brings the sights

1 onto the desired target. Pressure is maintained on the trigger throughout recovery and trigger
2 control is applied at a rate consistent with the Marine's ability to establish sight picture on the
3 desired target.

4 **(3)** When possible, such as when all targets are of equal threat, the Marine should engage
5 targets in a direction that maximizes support and control of the weapon.

6 **(4)** The preceding steps are repeated until all targets are engaged.

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

13 **(1) Prone.** The prone position limits left and right lateral movement and is, therefore, not
14 recommended for engaging short-range targets. This adjustment occurs because the elbows
15 are firmly placed on the ground and they restrict upper body movement.

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

20 **(3) Kneeling.** The kneeling position provides a wider, lateral range of motion since only one
21 elbow is used for support. A Marine moves from one target to another by rotating at the
22 waist to move the forward arm in the direction of the target, either right or left.

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

28 **10007. Engaging Moving Targets**

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

32 **a. Types of Moving Targets.** There are two types of moving targets: moving targets and stop
33 and go targets. Moving targets move in a consistent manner and remain in a Marine's field of
34 vision. A walking or running man is an example of a moving target. A stop and go target appears

1 and disappears during its movement. A stop and go target will present itself for only a short time
2 before it reestablishes cover. An enemy moving from cover to cover is an example of a stop and
3 go target. This target is most vulnerable to fire at the beginning and end of its movement to new
4 cover because the target must gain momentum to exit its existing cover and then slow to avoid
5 overrunning the new cover position.

6 **b. Leads.** When a shot is fired at a moving target, the target continues to move during the time
7 the bullet is in flight. Therefore, a Marine must aim in front of the target, otherwise, the shot will
8 fall behind the target. This is called taking a lead. Lead is the distance in advance of the target
9 that the rifle sights are placed to accurately engage the target when it is moving.

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

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

16
17 **(b) Speed.** If a man is running, a greater lead is required because the man will move a
18 greater distance while the bullet is in flight.

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

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

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

25 **(b) Half Lead.** The target is moving obliquely across a Marine's line of sight (at a
26 45-degree angle). One arm and over half the back or chest are visible. This target
27 requires half of a full lead because it will move half as far as a target moving directly
28 across a Marine's line of sight during the flight of the bullet.

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

33 **(3) Point of Aim Technique.** See paragraph 10003a for a detailed discussion on the point
34 of aim technique. The following guidelines apply if a Marine uses the point of aim technique
35 to establish a lead for a moving target at various ranges and speeds (see figure 10-9). These

1 guidelines do not consider wind or other effects of weather. Body width in these examples is
2 considered to be 12 inches (side view of the target).

3 **Figure 10-9. Points of Aim for Windage.**

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

- 6 • At a range of 200 yards/meters or less, no lead is required.
7
8 • At a range of 300 yards/meters, hold one point of aim in the direction the target is
9 moving.

10 **(b)** For a fast walking target (approximately 4 mph) moving directly across the line of
11 sight (full lead):

- 12 • At a range of 200 yards/meters or less, hold one point of aim in the direction the
13 target is moving.
14
15 • At a range of 300 yards/meters, hold two points of aim in the direction the target is
16 moving.

17 **(c)** For a target running (approximately 6 mph) directly across the line of sight (full lead):

- 18 • At a range of 100 yards/meters or less, hold one point of aim in the direction the
19 target is moving.
20
21 • At a range of 200 yards/meters, hold two points of aim in the direction the target is
22 moving.
23

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

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

28 **(1) The Tracking Method.** The tracking method is used for a target that is moving at a
29 steady pace over a well determined route. If a Marine uses the tracking method, he tracks the
30 target with the rifle's front sight post while maintaining sight alignment and a point of aim on
31 or ahead of (leading) the target until the shot is fired. When establishing a lead on a moving
32 target, the rifle sights will not be centered on the target and instead will be held on a lead in
33 front of the target. See figure 10-10. To execute the tracking method, a Marine performs the
34 following steps:

- 35 • Present the rifle to the target.

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

12 **Figure 10-10. Tracking Method.**

13 **(2) The Ambush Method.** The ambush method is used when it is difficult to track the target
14 with the rifle, as in the prone or sitting position. The lead required to effectively engage the
15 target determines the engagement point. With the sights settled, the target moves into the
16 predetermined engagement point and creates the desired sight picture. See figure 10-11. The
17 trigger is pulled simultaneously with the establishment of sight picture. To execute the
18 ambush method, a Marine performs the following steps:

- 19 • Select an aiming point ahead of the target.
 - 20
 - 21 • Obtain sight alignment on the aiming point.
 - 22
 - 23 • Hold sight alignment until the target moves into vision and the desired sight picture is
24 established.
 - 25
 - 26 • Engage the target once sight picture is acquired.
 - 27
 - 28 • Follow-through so the rifle sights are not disturbed as the bullet exits the muzzle.
- 29 A variation of the ambush method can be used when engaging a stop and go target. A
30 Marine should look for a pattern of exposure; e.g., every 15 seconds. Once a pattern is
31 determined, a Marine establishes a lead by aiming at a point in front of the area in which
32 the target is expected to appear, then he fires the shot at the moment the target appears.

33 **Figure 10-11. Ambush Method.**

1 **d. Marksmanship Fundamentals.** Engaging moving targets requires concentration and
2 adherence to the fundamentals of marksmanship. The following modifications to the
3 fundamentals of marksmanship are critical to the engagement of moving targets.

4 **(1) Sight Picture.** Typically, sight picture is the target's center of mass. If a Marine engages
5 a moving target, he bases his sight picture on the target's range, speed, and angle of
6 movement, i.e., sight alignment may be established on a point of aim in front of the target.

7 **(2) Trigger Control.** As with any target engagement, trigger control is critical to the
8 execution of shots that do not disturb sight alignment or sight picture. A Marine can apply
9 pressure on the trigger prior to establishing sight picture, but there should be no rearward
10 movement of the trigger until sight picture is established. Interrupted trigger control is not
11 recommended because the lead will be lost or have to be adjusted to reassume proper sight
12 picture. When using the tracking method, continue tracking as trigger control is applied to
13 ensure the shot does not impact behind the moving target.
14

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

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

24 **10008. Engaging Targets at Unknown Distances**

25 **a. Hasty Sight Setting.** While a BZO is considered true for 300 yards/meters, a Marine must be
26 capable of engaging targets beyond this distance *or to compensate for wind*. The rifle's sighting
27 system allows sight settings for distances out to 800 yards/meters in 100-yard/meter increments.
28 If a Marine must establish a BZO for extended ranges, it is referred to a hasty sight setting. To
29 achieve a hasty sight setting, a Marine dials the appropriate range numeral on the rear sight
30 elevation knob that corresponds to the range to the target. For example, if the rear sight elevation
31 knob is set at 8/3 and a target appears at 500 yards/meters, rotate the knob to the 5 setting (see
32 figure 10-12).

33 **Figure 10-12. Hasty Sight Setting.**

34 **b. Point of Aim Technique.** If the distance to the target is beyond the BZO capability of the
35 rifle and time does not permit adjustment of the sights, a Marine can use offset aiming techniques
36 to apply a point of aim for elevation to engage the target. See paragraph 10003a.

1 10009. Engaging Targets During Low Light and Darkness

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

8 **a. Night Vision.** A Marine can improve his ability to see during periods of darkness or low light
9 by obtaining and maintaining night vision. Since adapting to night vision is a slow and gradual
10 process, steps should be taken to protect night vision once it is obtained.

11 **(1) Obtaining Night Vision.** There are two methods used to obtain night vision. The first
12 method is to remain in an area of darkness for about 30 minutes. This area can be indoors or
13 outdoors. The major disadvantage of this approach is that an individual is not able to perform
14 any tasks while acquiring night vision in total darkness. The second method is to remain in a
15 darkened area under low intensity red light (similar to the light used in a photographer's
16 darkroom) for about 20 minutes, followed by about 10 minutes in darkness without the red
17 light. This method produces almost complete night vision adaptation while permitting the
18 performance of some tasks during the adjustment period.

19 **(2) Maintaining Night Vision.** Because the eyes take a long time to adjust to darkness, it is
20 important to protect night vision once it is acquired. To maintain night vision:

- 21 • Avoid looking at any bright light. Bright light will reactivate the cones in the eye and
22 deactivate the rods, eliminating night vision and requiring readaptation.
- 23 • Shield the eyes from parachute flares, spotlights, or headlights.
- 24 • When using a flashlight to read a map or other material:
 - 25 • Put one hand over the glass to limit the area illuminated and the intensity of the light.
26 Keeping one eye shut will reduce the amount of night vision lost.
 - 27 • Cover the light with a red filter to help reduce the loss of night vision.
 - 28 • Minimize the time spent using a flashlight.

29 **(3) Factors Affecting Night Vision.** Some physical factors may affect your night vision and
30 reduce your ability to see as clearly as possible in low light or darkness. These factors
31 include:

- 32 • Fatigue.

- 1 • Lack of oxygen.
- 2 • Long exposure to sunlight.
- 3 • Heavy smoking.
- 4 • Drugs.
- 5 • Headaches.
- 6 • Illness.
- 7 • Consumption of alcohol within the past 48 hours.
- 8 • Improper diet.

9 **b. Searching Methods.** Once night vision has been acquired, the Marine can located targets.
10 Some daylight observation techniques (e.g., searching for target indicators) also apply during
11 periods of darkness or low light.

12

13 **(1) Off-center Vision.** Off-center vision is the technique of keeping the attention focused on
14 an object without looking directly at it (see figure 10-13). To search for targets using
15 off-center vision, never look directly at the object you are observing. You will see the object
16 much better by using off-center vision. Look slightly to the left, right, above, or below the
17 object. Experiment and practice to find the best off-center angle for you. For most people, it
18 is about 6 to 10 degrees away from the object, or about a fist's width at arm's length.

19

Note

20 Staring at a stationary object in the dark may make it appear to be moving. This occurs because
21 the eye has nothing on which to reference the exact position of the object. This illusion can be
22 prevented by visually aligning the object against something else, such as a finger at arm's length.

23

Figure 10-13. Off-center Vision.

24 **(2) Scanning/Figure Eight Scan.** Scanning is the use of off-center vision to observe an area
25 or object and involves moving the eyes in a series of separate movements across the objective
26 area.

- 27 • A common method is to move the eyes in a figure eight pattern (see figure 10-14). The
28 eyes are moved in short, abrupt, irregular movements over and around the area. Once a
29 target indicator has been detected, your focus should be concentrated in that area, but not
30 directly at it. Pause a few seconds at each point of observation since the eyes cannot
31 focus on a still object while in motion. You must rest your eyes frequently when scanning
32 since the rods that produce night vision fatigue quickly, generally in about 4-10 seconds.

- 1 • While you are observing, there may be periodic blackouts of night vision due to simple
2 fatigue. This is normal and is not a cause for alarm. Night vision will quickly return
3 after the eyes are moved and blinked a few times.
- 4 • It is more effective to scan from a prone position or a position closer to the ground
5 than the object being observed. This will create a silhouetted view of the object.
- 6 • When scanning an area, look and listen for the same target indicators as in daylight:
7 movement, sound, and improper camouflage.
- 8 • Objects in bright moonlight/ starlight cast shadows just as in sunlight.
- 9 • Sound always seems to be louder at night than during daylight.

10 **Figure 10-14. Figure Eight Scan.**

11 **c. Types of Illumination.** There are two types of illumination that assist engagement during low
12 light or darkness: ambient light and artificial illumination. Both ambient light and artificial
13 illumination can affect target perception (distance and size) and night vision capabilities.

14 **(1) Ambient light** is the light produced by natural means (i.e., the sun, moon, and stars).
15 Considerable variations occur in ambient light due to the time of day, time of year, weather
16 conditions, terrain, and vegetation.

17 **(2) Artificial illumination** is the light produced by a process other than natural means. There
18 are two types of artificial illumination used in combat: air and ground. Artificial light can be
19 used to illuminate an area for target detection or to illuminate a specific target to pinpoint its
20 position.

21 **d. Effects of Illumination.** In some combat situations, ambient light and artificial illumination
22 may assist a Marine in locating targets. However, this light can affect perception of the target and
23 disrupt night vision. The introduction of artificial light requires the eyes to make a sudden, drastic
24 adjustment to the amount of light received. This can cause a temporary blinding because night
25 vision was abruptly interrupted. Ambient light also can cause a blinding effect; e.g., a Marine may
26 experience temporary blindness or reduced night vision if a bright moon suddenly appears from
27 behind the clouds.

28 **(1) Light behind a Marine or light between the Marine and a target** illuminates the front of the
29 target and makes it appear closer than it is.

30 **(2) Light beyond the target** displays the target in silhouette and makes it appear farther away
31 than it is. If the target is silhouetted, it is easier to see and easier to engage.

1 **(3)** Air illumination devices are in constant motion as they descend to the ground. This
2 movement creates changing shadows on any illuminated target, causing a stationary target to
3 appear as if it is moving.

4 **10010. Engaging Targets While Wearing the Field Protective Mask**

5 While engaging targets in a combat environment, a Marine is under considerable stress caused by
6 fear, fatigue, and the noise of battle. His stress is further aggravated by the fear and uncertainty
7 associated with a nuclear, biological, and chemical (NBC) threat. However, a Marine must be
8 able to operate under any battlefield condition, including an NBC environment. If a Marine wears
9 the field protective mask, its bulk and reduced visibility can affect his firing position which in turn
10 affects the rifle's zero and his ability to engage the target. A Marine must make adjustments to
11 his firing position and the application of marksmanship fundamentals to counter the additional
12 gear worn in an NBC environment. Therefore, a Marine should practice wearing his field
13 protective mask when he is not in a combat environment. This allows him to overcome any
14 restrictions caused by the mask, develop confidence in his ability to execute well-aimed shots
15 while wearing the mask, and develop a plan of action. This plan should address how the rifle is
16 presented to the target, how long the mask is worn, and the likelihood of enemy contact. If a
17 Marine expects to wear the mask for an extended period and enemy contact is likely, he should
18 consider adjusting the rifle sights so that his first rounds are on target.

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

21 **(1) Aiming.** Wearing the field protective mask affects the aiming process and the ability to
22 locate targets. The bulk of the mask may require an adjustment to stock weld, eye relief, head
23 position, and placement of the buttstock in the shoulder.

24 **(2) Breath Control.** Wearing the field protective mask affects breath control because
25 breathing may be harder. Temporary fogging of the lens also may be experienced. If fogging
26 occurs, a Marine should take a deep breath and fire while holding a full breath of air (inhaling
27 clears the fog).

28 **b. Firing Position.** A good firing position provides balance, control, and stability during firing.
29 The field protective mask's added bulk and other restrictions may require a Marine to make
30 changes to his firing position. The adjustments are unique to each Marine and based on his body
31 size and shape and his ability to adapt to the mask. Adjustments should be minor. However, all
32 firing positions will be affected in the following areas:

33 **(1) Stock Weld.** Changing the placement of the cheek on the stock may affect the rifle's
34 zero. Therefore, if an NBC attack is possible, a Marine should obtain a zero for the rifle in
35 full MOPP gear. Stock weld will not be as comfortable or feel as solid as it does without the
36 field protective mask. The loss of sensitivity between the cheek and the stock, due to the
37 mask, may cause the cheek to be pressed too firmly against the stock. Pressing the cheek too

1 firmly against the stock can cause the seal of the field protective mask to break. If this occurs,
2 quickly clear the mask and resume a firing position. If the lens of the field protective mask
3 fogs up while in a firing position, this indicates that the mask's seal has been broken. Clear the
4 mask and resume the firing position.

5 **(2) Eye Relief.** The added bulk of the field protective mask may increase eye relief because
6 the head is farther back along the stock. If the eye is too far from the rear sight aperture it
7 may be difficult to acquire the target and to maintain a precise aiming point; if the eye is too
8 close, the rear sight can hit the mask, possibly breaking a lens or its seal.

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

13 **(4) Placement of the Buttstock in the Shoulder.** Placement of the buttstock in the shoulder
14 pocket may have to be altered due to the mask's added bulk. If the rifle is canted, a Marine
15 may place the buttstock of the rifle just outside of the pocket to achieve sight alignment.
16 Holding the rifle straight is the preferred method of obtaining sight alignment. However, if
17 sight alignment cannot be achieved in this position, a Marine may alter the hold of the rifle to
18 bring the aiming eye in line with the sights. Canting the rifle drastically affects the rifle's zero.
19 A Marine should cant the rifle only as much as is needed to obtain a good stock weld and
20 proper sight alignment. If the rifle is canted, the point of impact may not coincide with the
21 point of aim. For example, when wearing the mask, a right-handed Marine's point of impact is
22 usually high and to the left of center mass (for a left-handed Marine, high and to the right of
23 center mass). Therefore a Marine has to offset aim an equal and opposite distance low and to
24 the right. See paragraph 10003a for a discussion on offset aiming and the known strike of the
25 round technique.

Appendix A

Glossary

A

aiming point. The aiming point is the precise point where the tip of the front sight post is placed in relationship to the target.

alibi. Any condition caused by the weapon, ammunition, or range operation that causes the shooter not to have an equal opportunity to complete a string of fire as all other shooters on the range.

B

battlesight zero (BZO). The elevation and windage settings required to engage point targets from 0-300 yards/meters under ideal weather conditions (i.e., no wind).

bone support. The body's skeletal structure supporting the rifle's weight.

breath control. Procedure used to fire the rifle at the moment of least movement in the body and the rifle.

burst. With the rifle's selector lever in the burst position, the rifle will fire a maximum of three rounds each time the trigger is pulled.

C

canting. An angular deviation of the weapon to the left or right from a vertical position during firing.

center of mass. A point that is horizontally and vertically centered on the target.

center of mass hold. The placement of the tip of the front sight on the target center of mass prior to the shot breaking.

centerline of the bore. An imaginary straight line beginning at the chamber end of the barrel and proceeding out of the muzzle.

chamber check. Procedure used to determine a weapon's condition.

D

double feed. The attempted simultaneous feeding of multiple rounds from the magazine.

dry fire. Aiming, cocking, and squeezing the trigger of an unloaded rifle in order to practice firing.

detailed search. Method for conducting a systematic search of an area for specific target indicators.

E

eye relief. The distance between the rear sight aperture and the aiming eye.

F

function check. Procedure used to ensure the rifle operates properly.

flag method. Procedure used to determine wind velocity and direction on a Known Distance (KD) range.

field expedient battlesight zeroing. Process used to zero the rifle at 36 yards when a 300-yard range is not available.

G

gas operated. A self-loading firearm that utilizes the expanding force of the propellant's powder gases to extract a fired cartridge case and insert a fresh cartridge while cocking the gun and making it ready to fire.

H

hasty search. Method for quickly searching an area for enemy activity.

hasty sight setting. An adjustment in sight settings from the BZO to compensate for range or wind.

I

immediate threat target. A target that presents itself at a range anywhere from 0 to 50 yards that requires an immediate engagement to reduce the threat.

initial sight setting. Sight setting placed on a rifle that serves as the starting point from which all sight adjustments are made for the initial zeroing process.

L

limited technical inspection. An inspection performed by an armorer on a weapon to determine its operational status; deals with safety and function, not accuracy. Also called LTI.

line of sight. An imaginary line extending from the shooter's eye through the rifle's sights and onto an aiming point on a target.

load. Procedure used to take a weapon from Condition 4 to Condition 3.

M

magazine fed. A mechanical, automatic means of supplying a firearm with ammunition to be chambered.

make ready. Procedure used to take a weapon from Condition 3 to Condition 1.

muscular relaxation. The state of tension required to properly control the rifle. The shooter's muscles are in a relaxed state of control - tightened but not tensed.

N

natural point of aim. The location at which the rifle's sights settle if bone support and muscular relaxation are achieved.

O

observation method. Procedure used to determine wind velocity and direction in a tactical situation.

R

range. 1. A place where shooting is practiced. 2. The distance traveled by a projectile to a specified target.

range card. A rough sketch of an observer's area of responsibility depicting the range and direction to recognizable objects, terrain features, avenues of approach, and possible enemy positions.

S

semiautomatic. 1. Partially automatic. 2. Ejection of the used shell and chambering of the succeeding round of ammunition after the trigger is pulled. With the rifle's selector lever on semiautomatic, the rifle will fire one round each time the trigger is pulled.

shooter error. Any action generated by the shooter that causes the weapon to fail to fire.

sight alignment. The placement of the tip of the front sight post in the center of the rear sight aperture.

sight picture. The placement of the tip of the front sight post in the center of the target while maintaining sight alignment.

stock weld. The firm, consistent contact of the cheek with the weapon's buttstock.

stoppage. Any condition that causes the rifle to fail to fire.

T

target indicators. Anything that reveals an individual's position to the enemy.

trajectory. The path of a projectile through the air and to a target.

triangulation process. Process used to determine the vertical and horizontal sight adjustments that must be made to center a shot group.

trigger control. The skillful manipulation of the trigger that causes the rifle to fire without disturbing sight alignment or sight picture.

U

unload. Procedure used to take a weapon from any condition to Condition 4.

unload, show clear. Procedure used to take a weapon from any condition to Condition 4 while requiring a second individual to check the weapon to verify that no ammunition is present.

user serviceability inspection. Procedure used to ensure a weapon is in an acceptable operating condition.

W

weapons carry. Procedure used to effectively handle the rifle while remaining alert to enemy engagement.

weapons condition. Describes a weapon's readiness for live fire.

weapons transport. Procedure used to carry the rifle for long periods of time and when one or both hands are needed for other work.

windage and elevation rules. Rules that define how far the strike of the round will move on the target for each click of front and rear sight elevation or rear sight windage for each 100 yards of range to the target.

Z

zeroing. The process used to adjust the rifle sights to cause shots to impact where the Marine aims.

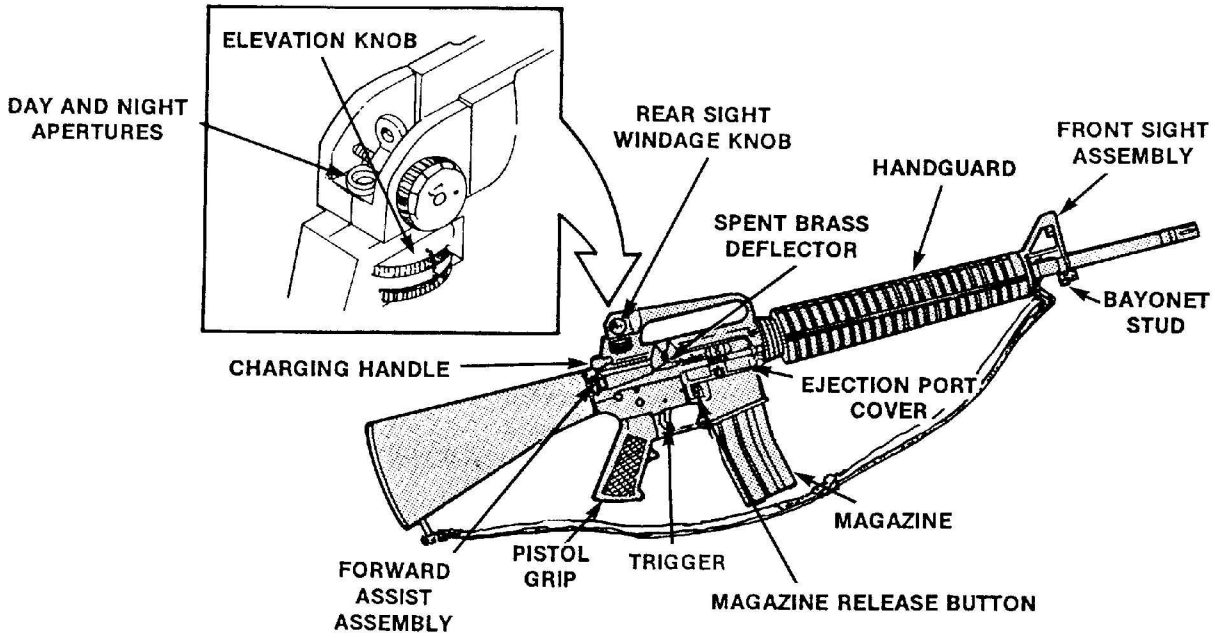


Fig 2-1

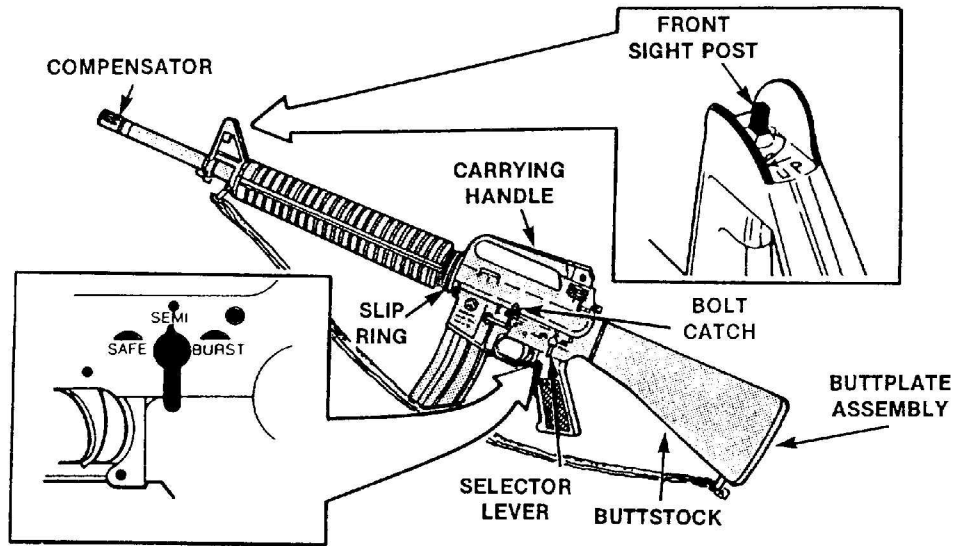


Fig 2-2

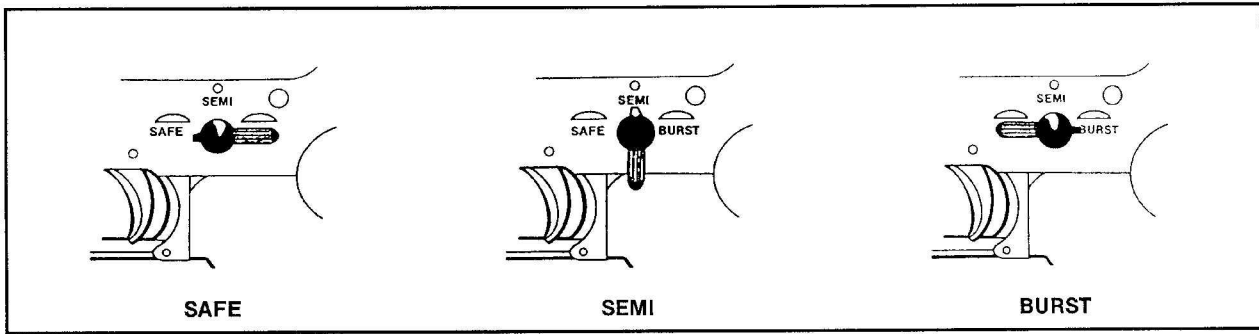
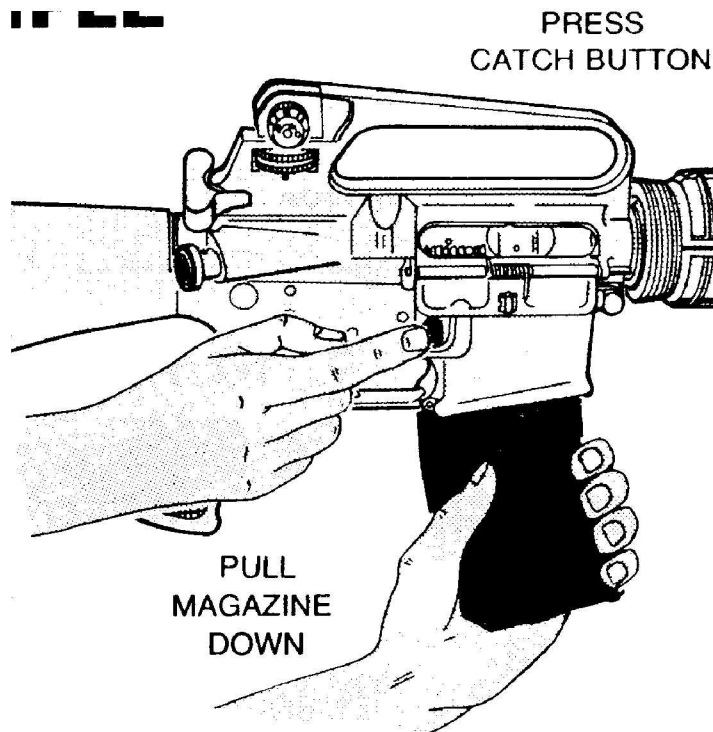


Figure 3-2. Selected Positions.

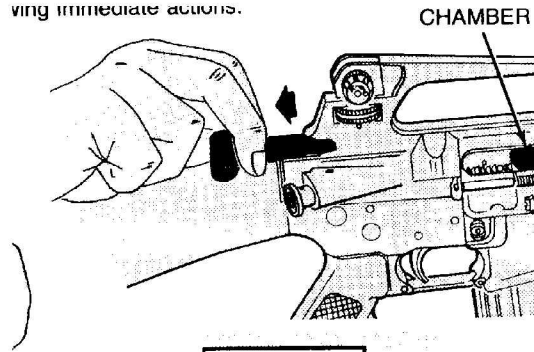
Fig 2-3



2 Remove magazine.

Fig. 2-4

ving immediate actions.



WARNING

Do not load with a hot chamber.

- 2 PULL charging handle all the way back. OBSERVE ejection of case or cartridge. Check chamber for obstruction.

Fig. 2-5

- 3 To lock bolt open, pull charging handle rearward. Press bottom of bolt catch and allow bolt to move forward until it engages bolt catch. Return charging handle to forward. If you haven't before, place selector lever on SAFE.
- 4 Check receiver and chamber to ensure these areas contain no ammo.
- 5 With selector lever pointing toward SAFE, allow bolt to go forward by pressing upper portion of bolt catch.

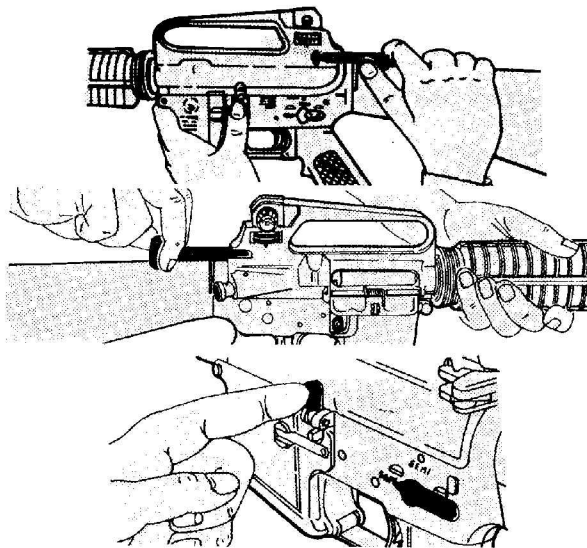


Fig. 2-6

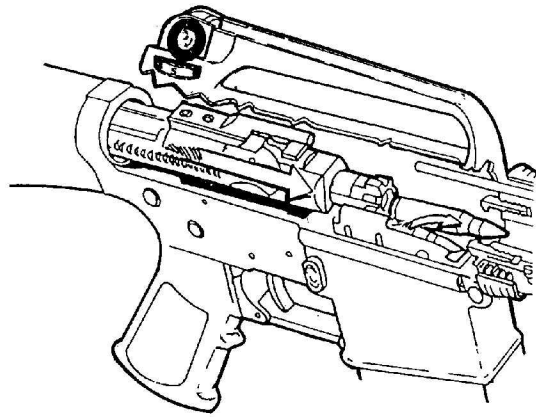


Figure 3-3. Feeding.

Fig. 2-7

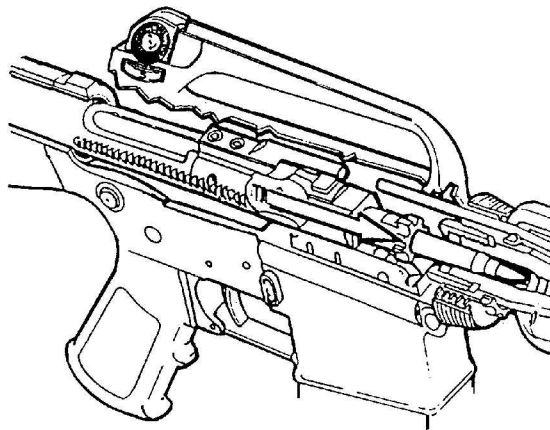


Figure 3-4. Chambering.

Fig. 2-8

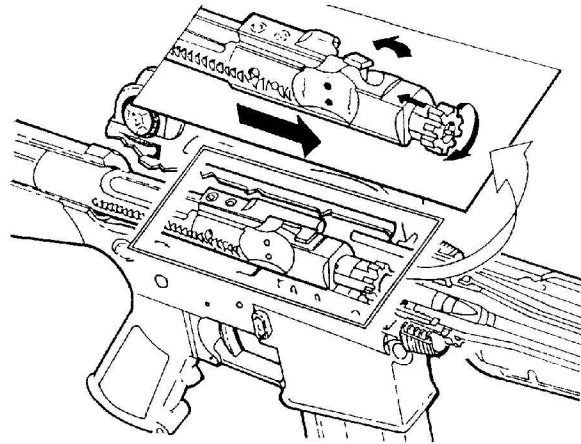


Figure 3-5. Locking.

Fig. 2-9

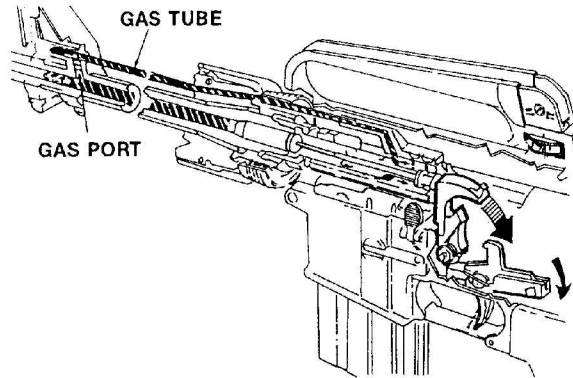


Figure 3-6. Firing.

Fig. 2-10

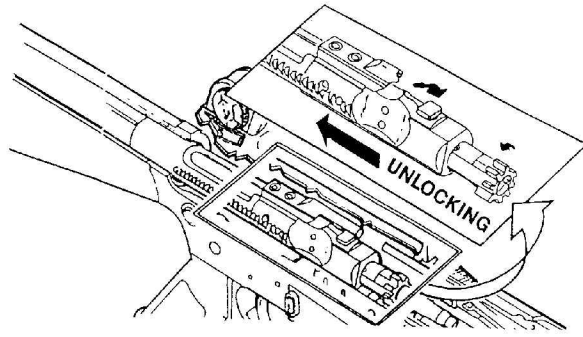


Figure 3-7. Unlocking.

Fig. 2-11

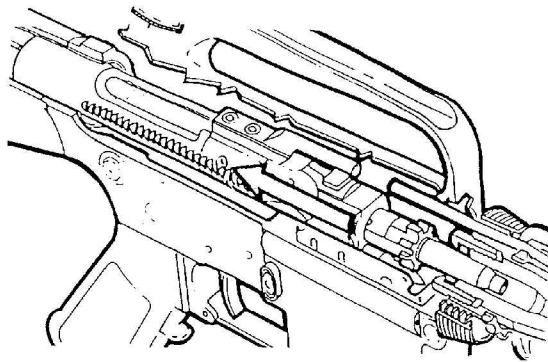


Figure 3-8. Extracting.

Fig. 2-12

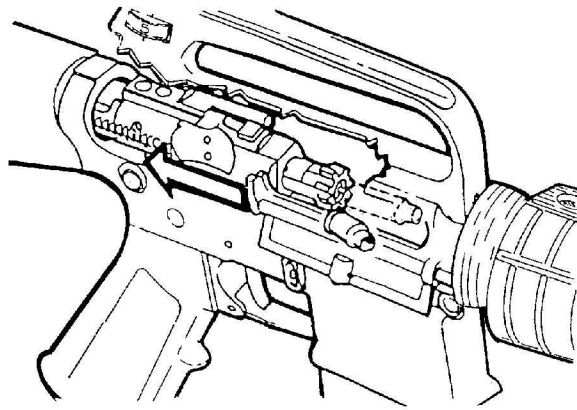


Figure 3-9. Ejecting.

Fig. 2-13

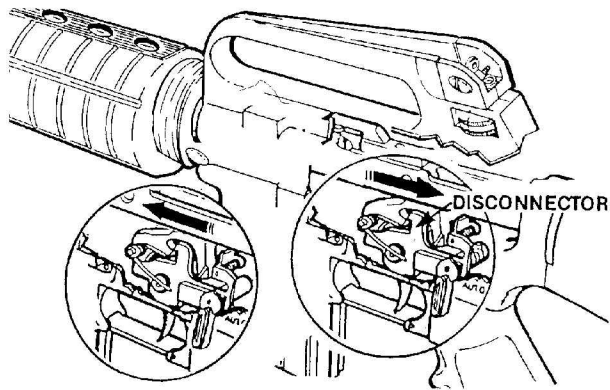


Figure 3-10. Cocking.

Fig. 2-14

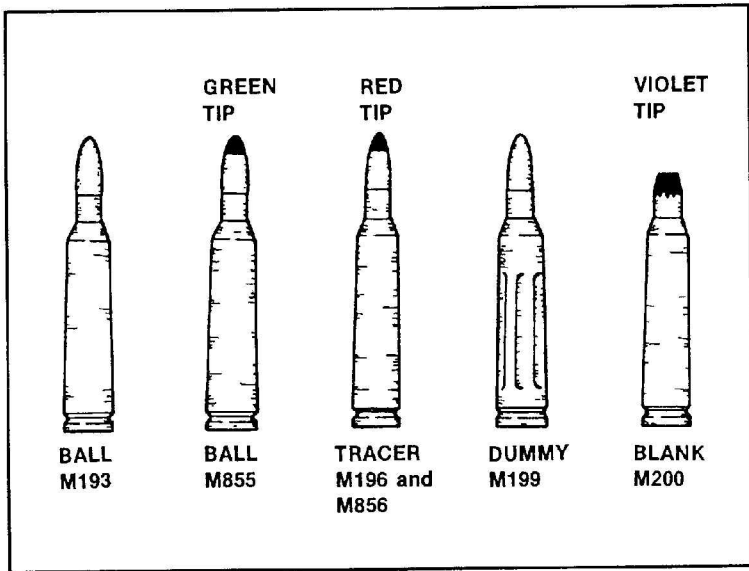


Fig. 2-15

(reverse blank) A-1



Fig. 2-16

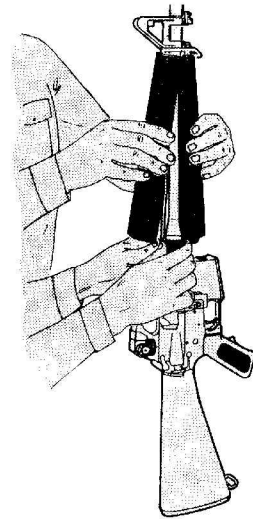


Fig 2-17



Fig. 2-18



Fig. 2-19



Fig. 2-20



Fig. 2-21



Fig. 3-1



Fig. 3-2



Fig. 3-3



Fig. 3-4



Fig. 3-5

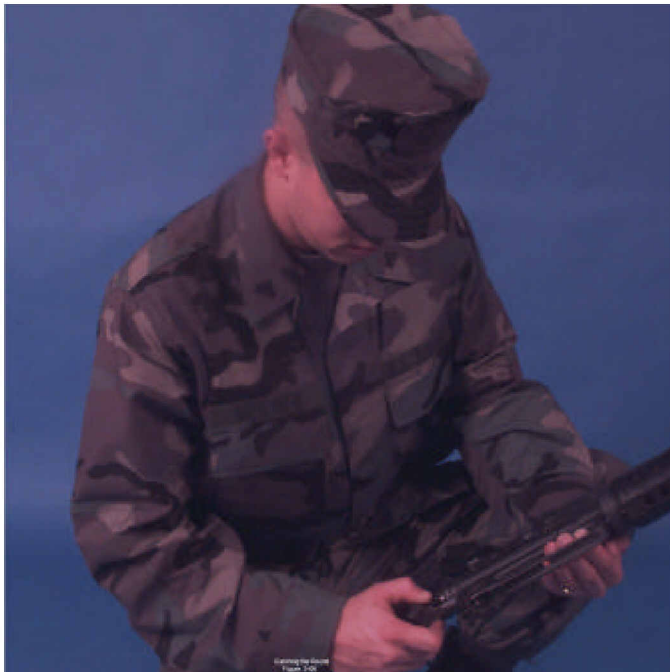


Fig. 3-6



Fig. 3-7



Fig. 3-8



Fig 3-9

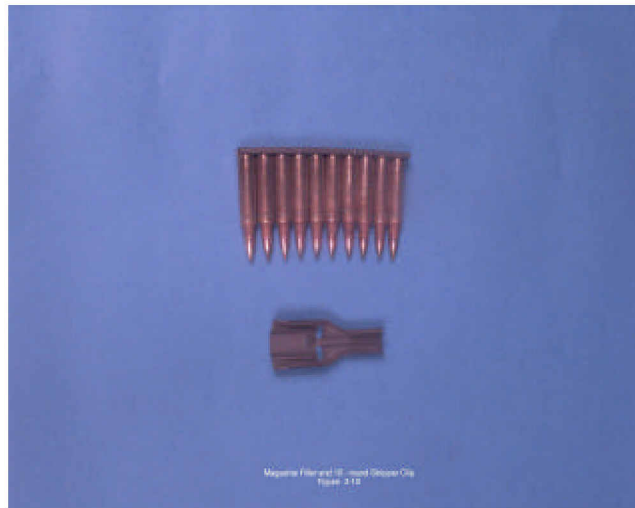


Fig. 3-10

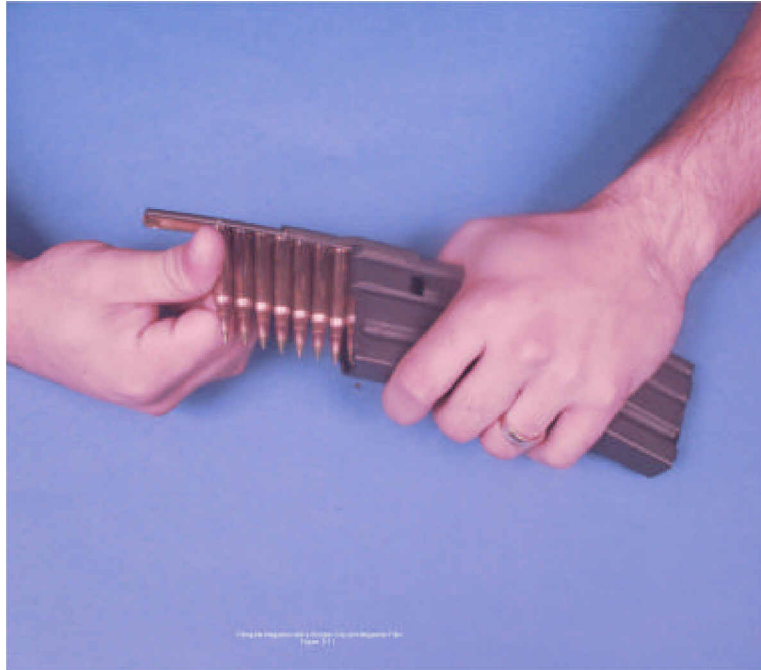


Fig. 3-11



Fig. 3-12



Fig. 3-12a



Fig. 3-13



Fig. 3-14



Fig. 3-15, 3-18, 3-21



Fig. 3-16, 3-19, 3-22



Fig. 3-17



Fig. 3-20



Fig. 3-23



Fig. 3-24



Fig. 3-25



Fig. 3-26



Fig. 3-26a



Fig. 3-27



Fig. 3-28



Fig. 4-5



Fig. 4-6f (far)

CORRECT SIGHT ALIGNMENT

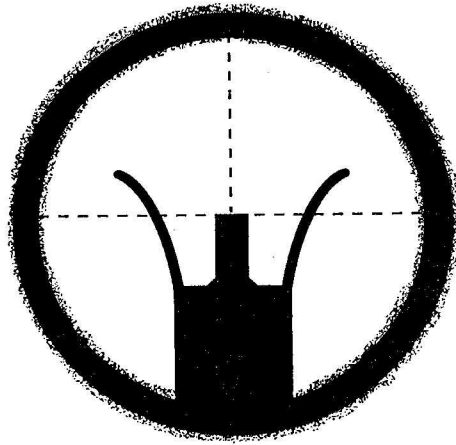


Figure 4-1

Fig. 4-1

CORRECT SIGHT PICTURE

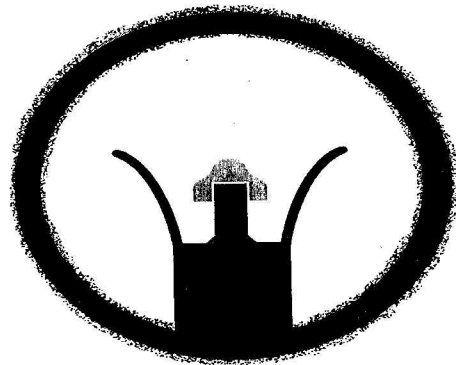


Fig 4-2

Fig. 4-2

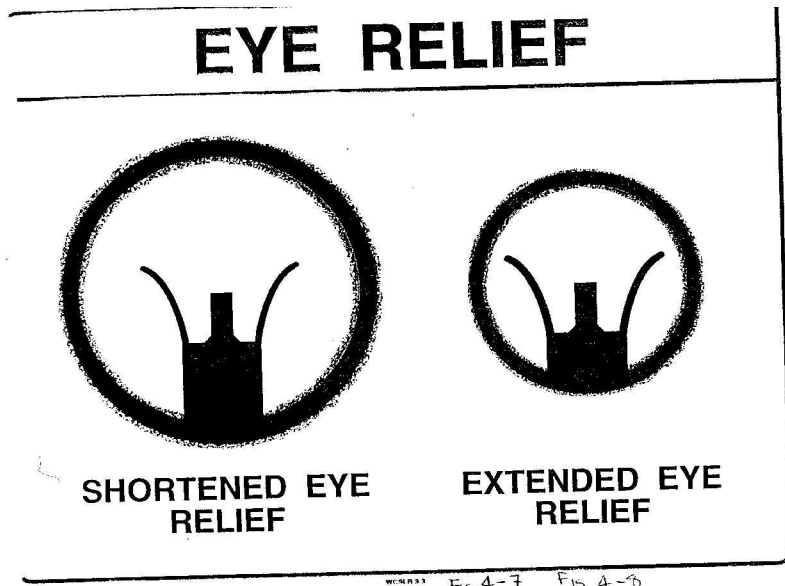


Fig. 4-7 and Fig. 4-8



Fig. 4-6c (close)



Fig. 4-6p (perfect)



Fig. 4-11



Fig 5-1



Fig. 5-2



Fig. 5-3



Fig. 5-4



Fig. 5-4a



Fig. 5-5



Fig. 5-6



Figure 5-7



Fig. 5-8



Fig. 5-9



Fig. 5-10



Fig. 5-11



Fig. 5-12



Fig. 5-13



Fig. 5-14



Fig. 5-15



Fig. 5-16



Fig. 5-17



Fig. 5-18



Fig. 5-19



Fig. 5-20



Fig. 5-21



Fig. 5-22



Fig 5-23



Fig. 5-24



Fig. 5-25



Fig. 5-26



Fig. 5-27

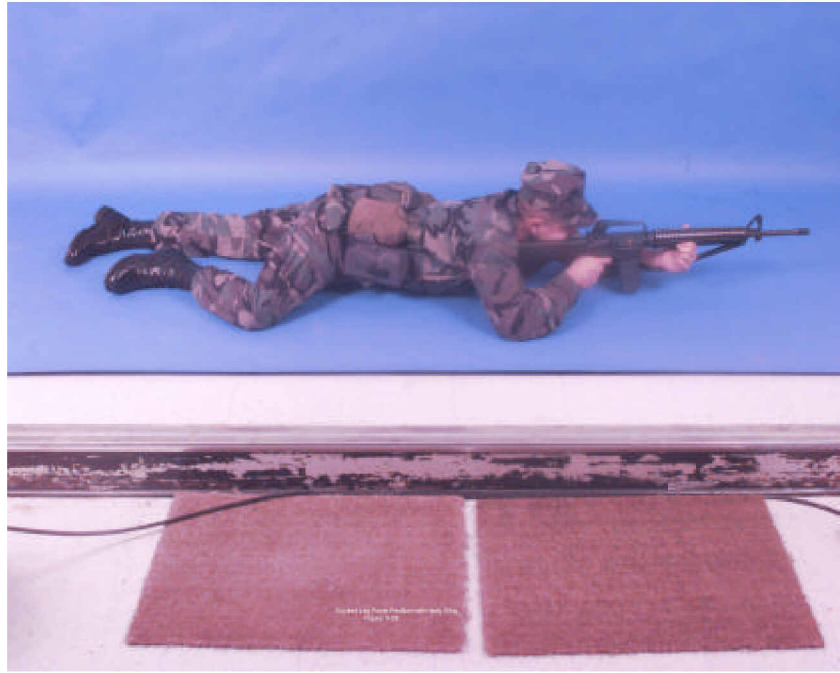


Fig. 5-28



Fig. 5-29



Fig. 5-30



Fig. 5-31



Fig. 5-32



Fig. 5-33



Fig. 5-34



Fig. 5-35



Fig. 5-36



Fig. 5-37



Fig 5-38



Fig. 5-39



Fig. 5-40



Fig. 6-1



Fig. 6-2



Fig. 6-3



Fig. 6-4



Fig. 6-5



Fig. 6-5a



Fig. 6-6



Fig 6-6a



Fig. 6-7



Fig. 6-7a



Fig. 6-8



Fig. 6-9



Fig. 6-10



Fig. 6-11



Fig. 6-12



Fig. 6-13



Fig. 6-14



Fig. 6-15



Fig. 6-16



Fig. 6-17



Fig. 6-21



Fig. 6-22



Fig. 6-23



Fig. 6-23a



Fig. 6-24



Fig. 6-25



Fig. 6-26



Fig. 6-27



Fig. 6-28



Fig. 6-29



Fig. 7-1



Fig. 7-2



Fig. 7-3



Fig. 7-3a



Fig. 7-3b



Fig. 7-4



Fig. 7-4a



Fig. 7-4b



Fig. 7-5



Fig. 7-5a



Fig. 7-5b



Fig. 7-6



Fig. 7-7



Fig. 7-8



Fig. 7-8a



Fig. 7-8b



Fig. 7-9



Fig. 7-10



Fig. 7-11



Fig. 7-11A



Fig. 7-11b



Fig. 7-12



Fig. 7-13



Fig. 7-13a



Fig. 7-14

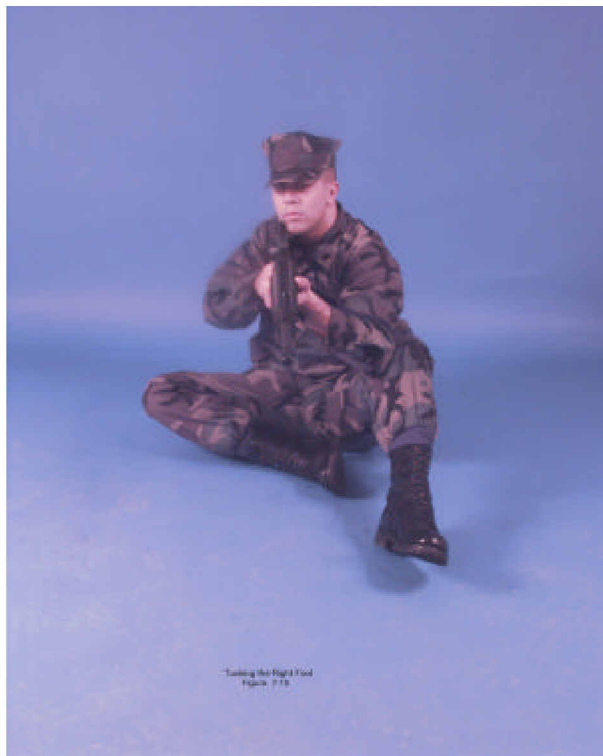


Fig. 7-15



Fig. 7-16

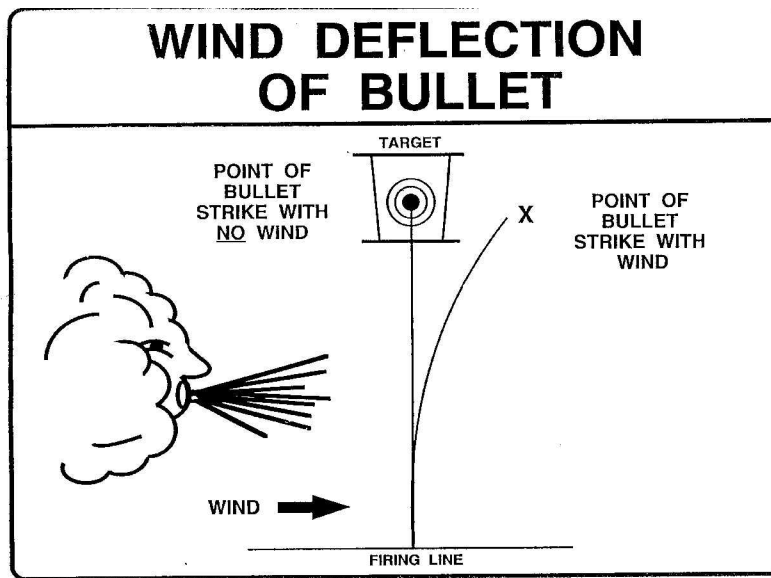


Figure 8-1

Fig. 8-1

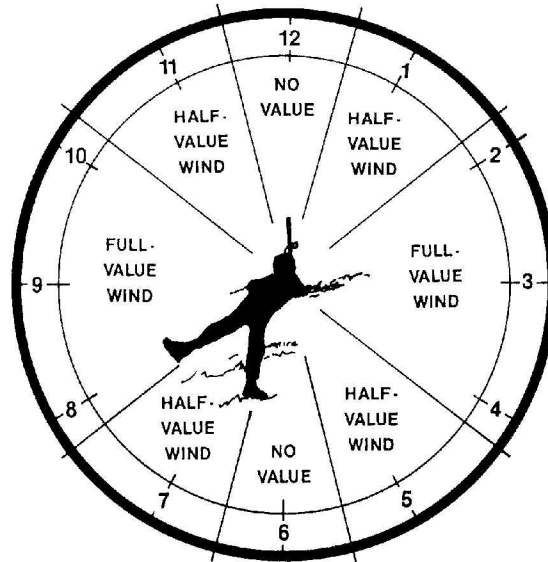


Figure 6-1. Clock System.

Fig. 8-2

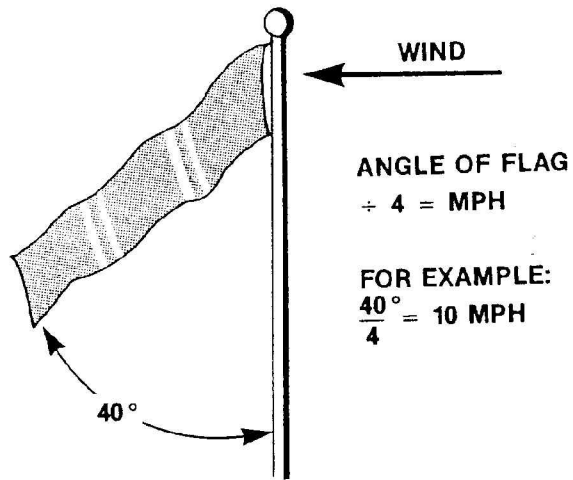


Figure 6-3. Flag Method.

Fig. 8-3




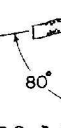

RANGE FLAG ANGLES	 20°		 40°		 60°		 80°		 90°+	
	5 MPH		10 MPH		15 MPH		20 MPH		25 MPH	
RANGE YARDS	WIND VALUE		WIND VALUE		WIND VALUE		WIND VALUE		WIND VALUE	
	F U L L	$\frac{1}{2}$	F U L L	$\frac{1}{2}$	F U L L	$\frac{1}{2}$	F U L L	$\frac{1}{2}$	F U L L	$\frac{1}{2}$
200	2	1	3	1	5	2	6	3	8	4
300	3	1	6	3	10	5	13	6	16	8
400	4	2	9	4	13	6	18	9	22	11
500	6	3	12	6	18	9	24	12	30	15
600	8	4	15	7	23	11	31	16	39	20
700	10	5	20	10	30	15	39	20	49	24
800	12	6	25	12	37	18	50	25	62	31

Figure 6-4. Windage Click Chart.

Fig. 8-5



Fig. 8-6

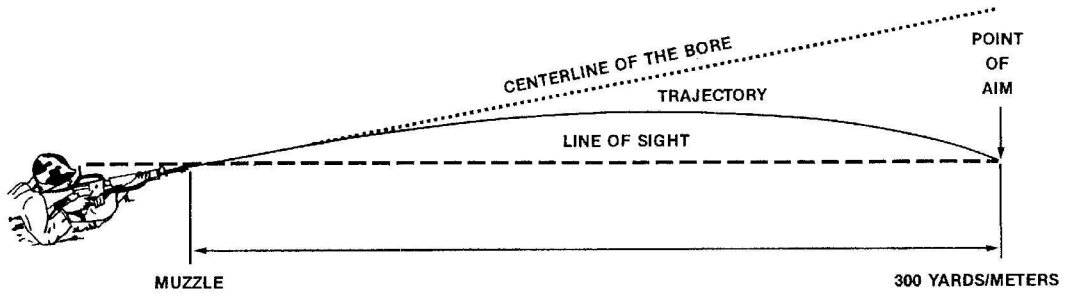


Figure 7-1. Elements of Zeroing.

7-1

Fig. 9-1

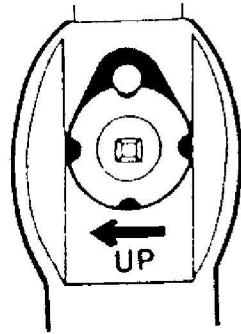


Figure 7-3. Front Sight.

Fig. 9-2

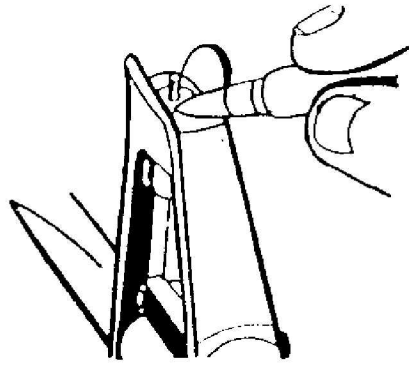


Figure 7-4. Front Sight Adjustment.

Fig. 9-3

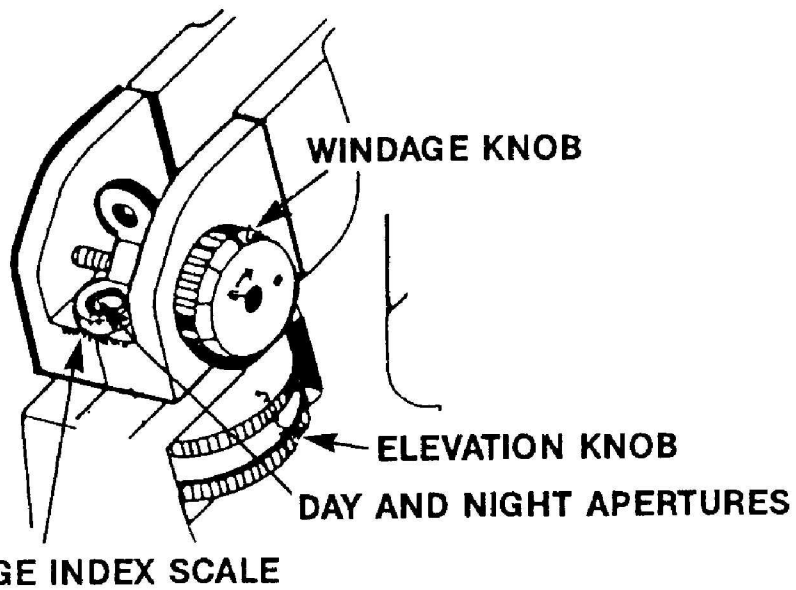


Figure 7-6. Rear Sight.

Fig. 9-4

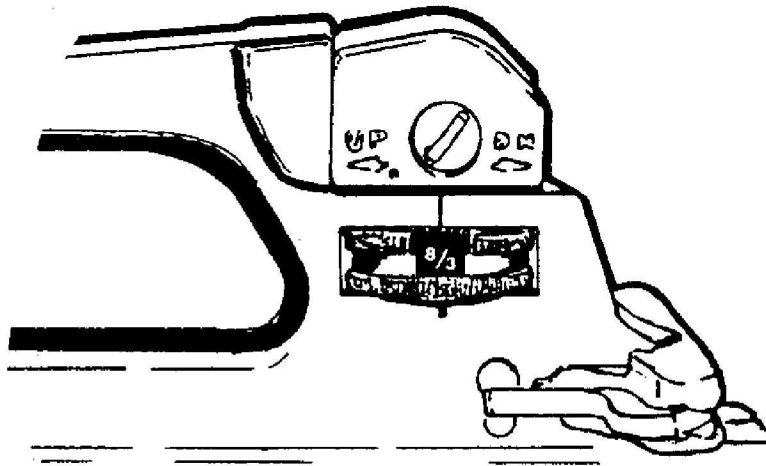


Figure 7-9. Elevation Knob Set at 8/3.

Fig. 9-5



Fig. 9-6



Fig. 9-7

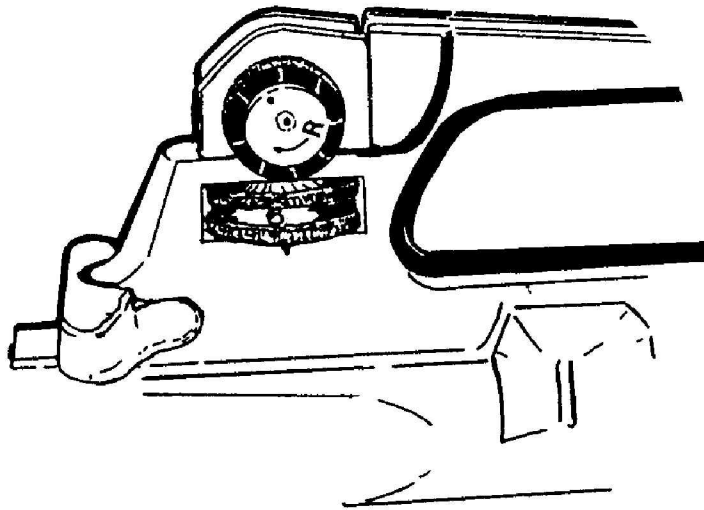


Figure 7-10. Windage Knob.

Fig. 9-8



Fig. 9-9

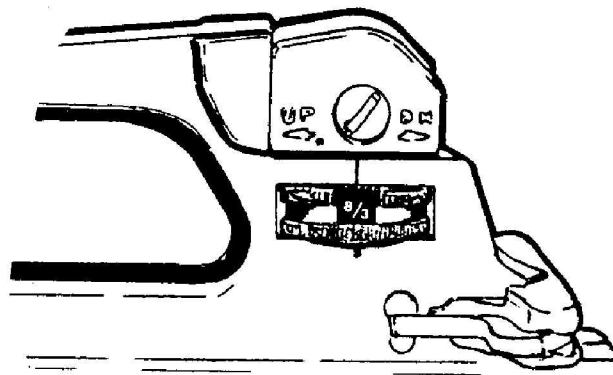


Figure 7-9. Elevation Knob Set at 8/3.

Fig. 9-10

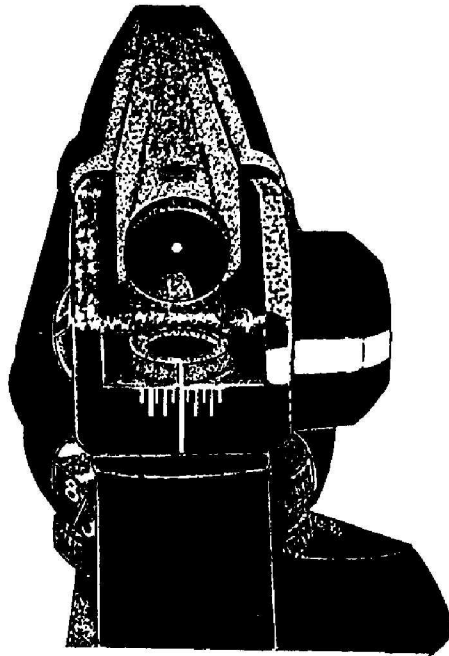


Figure 7-12. Marking Windage Knob.

Fig. 9-11

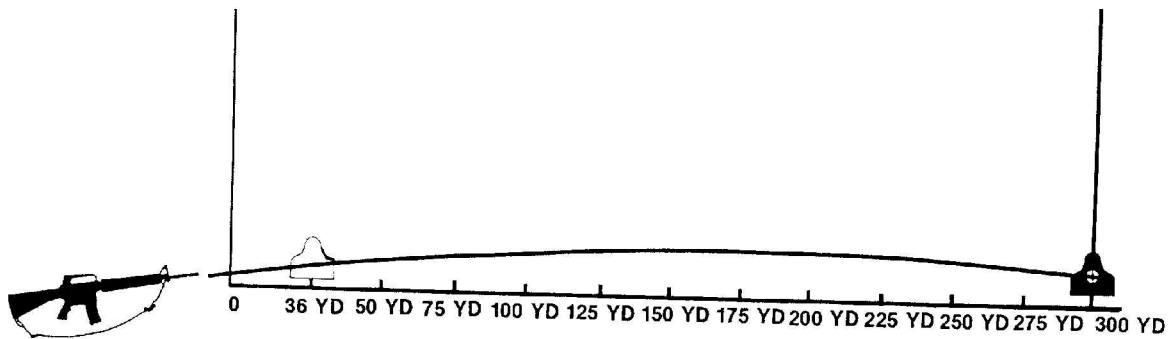


Figure 7-2. 300-Yard Zero.

Fig. 9-15