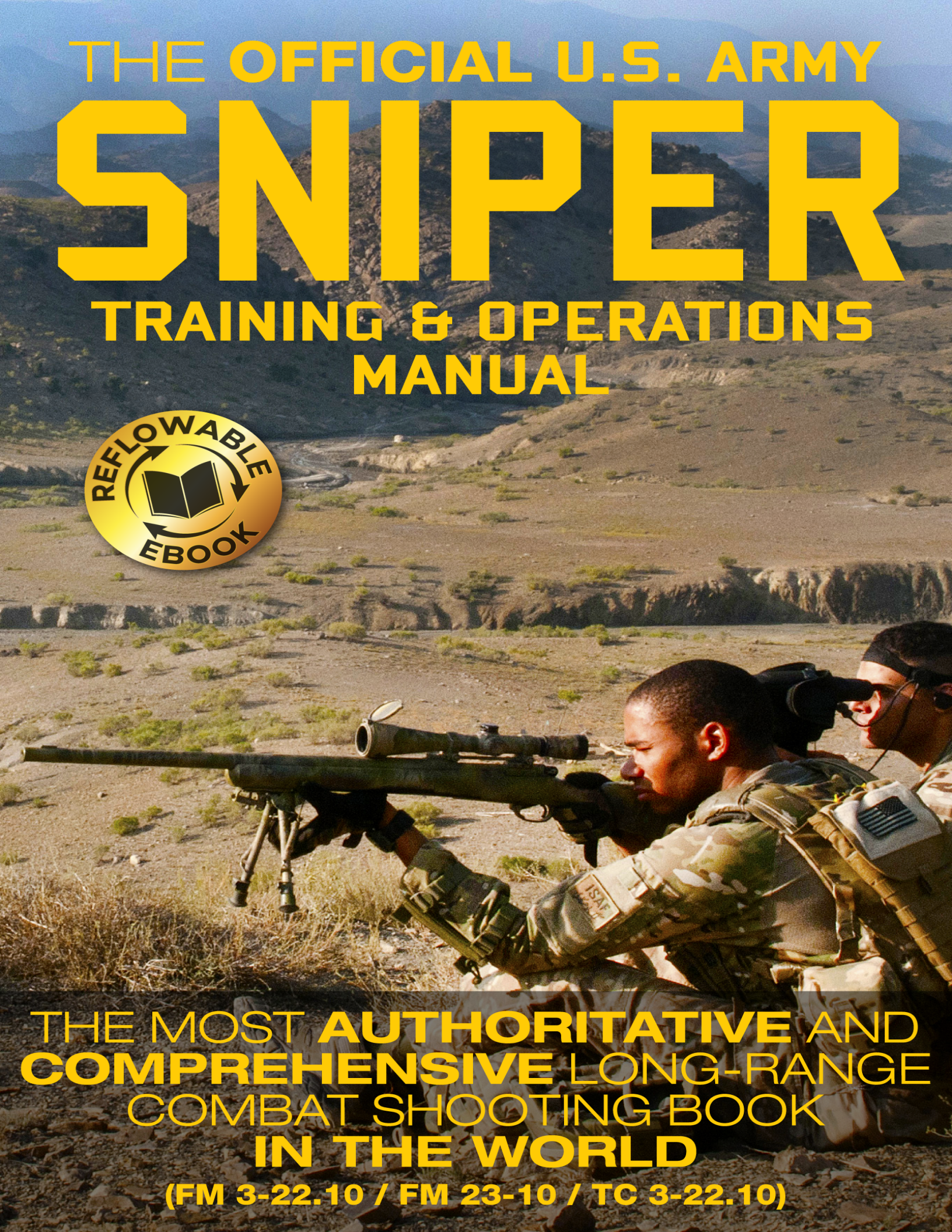
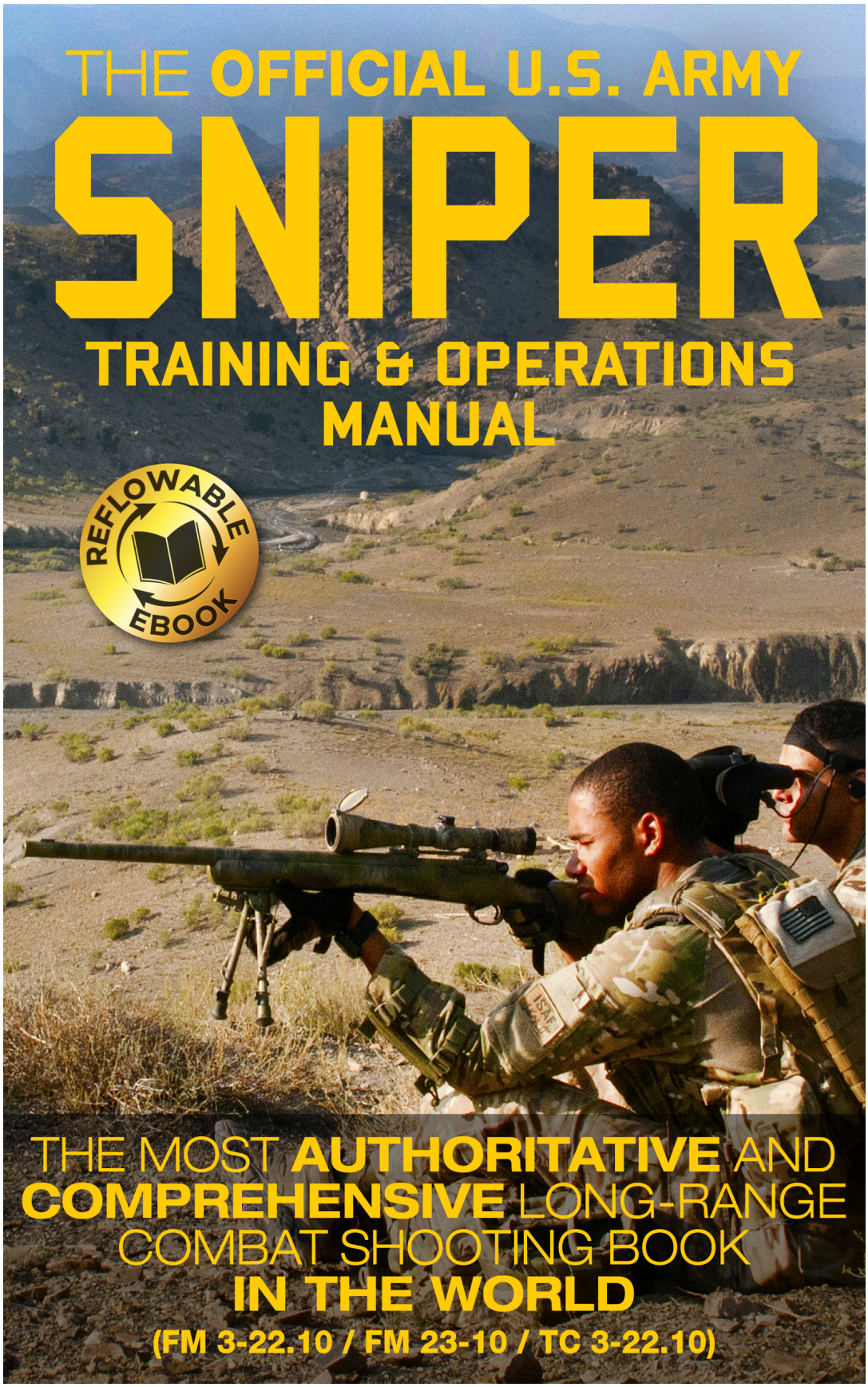
THE OFFICIAL U.S. ARMY SNIPER TRAINING & OPERATIONS MANUAL



THE MOST **AUTHORITATIVE** AND **COMPREHENSIVE** LONG-RANGE COMBAT SHOOTING BOOK **IN THE WORLD**

(FM 3-22.10 / FM 23-10 / TC 3-22.10)


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The Official US Army Sniper Training and Operations Manual

The Most Authoritative & Comprehensive Long-Range Combat Shooting Book in the World (FM 3-22.10 / FM 23-10 / TC 3-22.10)

US Army, Rick Carlile

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Ebook Introduction

Since 1987, the US Army Sniper School at Fort Benning, Georgia, has trained Active Duty, Reserves, and National Guard soldiers to become long-range marksmen par excellence, capable of eliminating high-value targets, gathering intelligence, and protecting their comrades with a mixture of stealth, patience, situational awareness, cunning, and mastery of the long-range rifle.

This book contains the distilled wisdom of the Sniper School's instructors and expert marksmen, giving you over 450 pages of unique insight into the long-range combat shooter's art.

This ebook is presented as an alternate format for accessing the publication. It has been modified to meet the requirements of the ebook format, but is as far as possible unabridged. For the first time, this publication is available to you as a reflowable ebook. Unlike awkward fixed-layout ebooks, a reflowable book adapts to your reading device and your settings. You are in control of how it displays.

Because of the very large quantity of information contained within this ebook, it is beneficial that the reader becomes familiar with the structure of the contents:

— Generally, each section of the ebook consists of a heading, followed by one or more paragraphs. Each such paragraph has an identifier that consists of two numbers separated by a dash. The first number refers to the chapter number, and the second number refers to the paragraph's position in the chapter. For example, paragraph "8-5" is the fifth paragraph in chapter eight. This enables you to easily cross-reference the paragraph in the ebook with its counterpart in the print or audiobook edition, and is also useful for referencing information in a group training environment.

— Each figure in this publication also has an identifier, which consists of two numbers separated by a dash, and whose format is similar to the

paragraph numbering format. For example, "Figure 8-12" is the twelfth figure in chapter eight.

Chapter 1: Introduction

The sniper has special abilities, training, and equipment. His mission is to deliver discriminatory, highly accurate rifle fire against enemy targets which cannot be engaged successfully by the rifleman because of range, size, location, visibility, or fleeting nature. Sniping requires the perfection of basic infantry skills.

MISSION

1-1. In combat, the primary mission of a sniper is to support combat operations by delivering precise long-range fire on selected targets. This creates a marked effect on enemy troops; it creates casualties, slows movement, instills fear and influences their decisions and actions, lowers morale, and adds confusion to their operations. The secondary mission of the sniper is to collect and report battlefield information.

1-2. A well-trained sniper, combined with the inherent accuracy of his rifle and ammunition, is a versatile supporting arm available to an infantry commander. A sniper enhances a unit's firepower and augments the varied means for destruction and harassment of the enemy. Whether a sniper is organic or attached, he provides that unit with supporting fire. The sniper's role is unique in that it is the sole means by which a unit can engage point targets at distances beyond the effective range of M16- and M4-series weapons. This role becomes more significant when the target is entrenched or positioned among civilians, or during riot control missions; the fires of automatic weapons in such operations can result in the wounding or killing of noncombatants.

1-3. Snipers are employed in all levels of conflict. This includes conventional offensive and defensive combat in which precision fire is delivered at long ranges.

HISTORY

“Nothing chills the blood of a Soldier on the battlefield more than the crack of a rifle shot and the cry of “SNIPER!” A skilled sniper can stop even the largest units in their tracks with a few well-aimed shots that take out key personnel such as scouts or officers, seriously damaging the enemy’s moral.”

- Michael E. Haskew, The Sniper at War: From the American

Revolutionary War to the Present Day

“Certainly there is no hunting like the hunting of an armed man, and those who have hunted armed men long enough and liked it never care for anything else thereafter.”

- Ernest Hemingway, "On the Blue Water," Esquire, April 1936

1-4. From Leonardo Da Vinci to the present, the long-range marksman has had a marked effect on the direction, drive, and scope of battle. By his discriminatory nature, he has felled the command structure of his enemies, rendered their equipment useless, and driven fear into the hearts of their men. The sniper is one of the most effective weapons on the field of battle. He is frugal and precise.

1-5. The term "sniper" originally had nothing to do with the current use of the word; "sniper" described an 18th century English gamesman who was able to successfully hunt the small, fast, and agile snipe (a European gamebird, similar to the woodcock). Snipers were skilled trackers and marksmen, much like modern day snipers. The term "sniper" first entered military use in 1773, when Soldiers began "sniping," or putting their hats on sticks for the enemy to shoot at.

1-6. World War I introduced the world to a new type of combat, trench warfare. The trench sniper moved about the battlefield alone, searched for targets of value, used his scope to observe enemy positions, and recorded his observations in a special notebook. This was the birth of the modern sniper.

PERSONNEL SELECTION CRITERIA

1-7. Commander involvement in personnel selection is critical. The high standards of training and the independent nature of the sniper's mission require the commander to screen sniper candidates carefully, looking for evidence of potential aptitude as a sniper. The commander should consider the following factors prior to selecting and recommending a Soldier for attendance to the US Army Sniper School (USASS).

QUALIFICATIONS

1-8. A Soldier needs high motivation and the ability to learn various skills if he is to withstand the rigorous training program and the increased personal risk and rigors of the job. He also needs an excellent personal record. A sniper candidate must meet criteria in the areas of marksmanship, physical condition, vision, psychological profile (mental and emotional balance), intelligence, and fieldcraft.

Marksmanship

1-9. The chain of command must ensure that sniper candidates meet expert annual marksmanship qualification standards. As an expert, he must also show a basic understanding of marksmanship fundamentals.

Physical Condition

1-10. The sniper is often employed in extended operations with little sleep, food, or water. This requires outstanding physical condition. Good health means good reflexes, muscular control, and stamina. Also, the self-confidence and control that Soldiers gain from athletics, especially from team sports, prove definite assets to a sniper candidate.

1-11. No sniper should be a habitual smoker or user of smokeless tobacco. Smoke or an unsuppressed smoker's cough can reveal the sniper's position. Also, the efficiency of a Soldier who has quit using tobacco only for the mission is impaired by involuntary nervousness and irritation.

Vision

1-12. Excellent vision (e.g., vision correctable to 20/20 or better) is the sniper's main tool. A Soldier who wears glasses could become a liability as the glasses may be lost or damaged. Color blindness is also an additional liability, since it prevents the sniper from detecting camouflaged targets.

Psychological Profile

1-13. A psychological examination can help reveal whether a candidate has the right psychological qualities to be a sniper:

- Will he pull the trigger at the right time and place?
- Is he reliable?
- Has he shown initiative, loyalty, discipline, and emotional stability?

1-14. The sniper must be able to eliminate targets calmly and deliberately, even if they pose no immediate threat to him. Killing in self-defense or in the defense of others is much easier than doing so without apparent provocation. The sniper must be able to do his job without anxiety and remorse. Those whose motivation toward sniper training rests mainly in the desire for prestige may lack the rationality that the job requires.

Intelligence

1-15. A sniper must either possess a working knowledge or be able to learn the following:

- Ballistics.
- Ammunition types and capabilities.
- Adjustment of optical devices.
- Radio operation and procedures.
- Observation and adjustment of mortar and artillery fire.
- Land navigation.

- Military intelligence collection and reports.
- Identification of threat uniforms and equipment.

Fieldcraft

1-16. The sniper must know the field and feel comfortable spending long periods there. An extensive background in the outdoors and a vast knowledge of natural outdoor occurrences will help aid him in the timely and efficient execution of many of his tasks.

US ARMY SNIPER SCHOOL PREREQUISITES

1-17. The commander must ensure that the candidate—

- Is male.
- Is at least a private first class.
- Is Active duty, Army National Guard, or Army Reserve.
- Has a good performance record.
- Has a minimum GT score of 110, nonwaiverable.
- Earned at least 70 points on each event during the Army Physical Fitness Test.
- Has no history of alcohol or drug abuse.
- Has no record of disciplinary action.
- Has volunteered for sniper school.
- Has vision correctable to at least 20/20 and passes red/green color vision test.
- Is an expert marksman with the M16-/M4-series weapon.

- Meets a minimum retainability of one year upon graduation date.
- Meets the height and weight standards in accordance with AR 600-9.
- Is in career management field 11-series, 18-series, or 19D.

CAPABILITIES OF A UNITED STATES ARMY SNIPER SCHOOL GRADUATE

1-18. Upon graduation from the USASS, the sniper will return to the unit highly skilled in fieldcraft and marksmanship and capable of—

- Providing precision fires on selected targets from concealed positions from 100 to 800 meters.
- Engaging moving targets from 100 to 600 meters during daylight hours.
- Engaging moving targets from 100 to 400 meters during hours of limited visibility.
- Engaging targets with the long-range sniper rifle (LRSR) from 100 to 2000 meters.
- Accurately reporting battlefield information in sketch, sniper log, range card, or digital formats.
- Conducting tactical movement while under direct observation in woodland and urban environments.
- Detecting targets and recalling pertinent target characteristics.
- Performing all tasks in this manual.

TRAINING

1-19. The sniper's training is extensive and covers many subjects. The two main goals are to increase his value as a force multiplier and to ensure his

survival on the battlefield. To achieve these goals, the sniper must practice until he masters his art. To ensure maximum effectiveness with minimum risk, the sniper's skills must include both long-range rifle marksmanship and fieldcraft. To allow the sniper team to focus for maximum results in the time available, sniper training is unique from other unit training.

EMPLOYMENT

1-20. The sniper team is employed in all types of tactical operations, including conventional offensive and defensive combat operations, combat patrols, ambushes, countersniper operations, civil support operations, observation duties, urban operations, and retrograde operations in which snipers are part of stay-behind forces or forces left in contact.

NOTE: See Chapter 7 for detailed sniper employment considerations.

WEAPON SYSTEMS

1-21. All sniper weapon systems can deliver long-range, precision fire at their maximum effective ranges. There are three primary sniper weapons:

- M110 Semiautomatic Sniper System (SASS).
- M24 Sniper Weapon System (SWS).
- M107 long-range sniper rifle (LRSR).

NOTE: Chapter 2 addresses the M110 SASS and the M107 LRSR. The M24 SWS is being replaced by the M110 SASS. For more information about the M24 SWS, see Appendix D.

M110 SEMIAUTOMATIC SNIPER SYSTEM

1-22. The M110 SASS is a semiautomatic, direct gas-operated, air-cooled, magazine-fed, precision 7.62- mm direct line of sight weapon system equipped with the MIL-STD-1913 rail system.

1-23. The M110 SASS enables trained snipers to—

- Engage and destroy enemy personnel at long and short ranges.
- Consistently hit personnel-size targets at ranges of 800 meters or further, dependent on the sniper's abilities (e.g., shooter-dependent).
- Capitalize on shooting and maintenance proficiency on M16-type rifles.
- Attach and detach other sighting systems and accessories with approved mounting systems without loss of combat zero.

M24 SNIPER WEAPON SYSTEM

1-24. The M24 SWS is a 7.62-mm, bolt-action, six-round repeating rifle. The system consists of the rifle, day optic sight (DOS), iron sight, bipod, deployment kit, cleaning kit, soft rifle carrying case, optic case, system case, and operator's manual. With the M24 SWS, a sniper can destroy sensitive equipment and can cause personnel casualties out to 800 meters.

M107 LONG-RANGE SNIPER RIFLE

1-25. The M107 LRSR is a man-portable, direct line of sight weapon system capable of providing precision fire at a distance of up to 1,800 meters. The M107 LRSR has a bipod, muzzle brake, carrying handle, telescope (DOS), sling, and six 10-round removable magazines. These all fit into the M107's fitted carrying case, along with cleaning equipment and scope adjustment tools. The M107 LRSR has a 4.5 x 14 variable power scope and integral backup iron sights (BUIS).

ORGANIZATION

1-26. The organization and employment of snipers is a process that is continually evolving and is dictated by the current modified table of organization and equipment (MTOE), unit commander, threat, and area of

operations. Sniper sections are assigned to particular types of units, each of which has a sniper employment officer (SEO).

UNITS WITH SNIPERS

1-27. Table 1-1 depicts the units with snipers and the number of authorized positions.

Table 1-1. Units with snipers.

BRIGADE COMBAT TEAMS	AUTHORIZED POSITIONS
Infantry Brigade Combat Team (Light) (IBCT)	Air Assault Battalion = 10 B4 Airborne Battalion = 10 B4 Reconnaissance, surveillance, and target acquisition (RSTA) = 7 B4 Total of 27 B4 coded slots
Heavy Brigade Combat Team (Mechanized) (HBCT)	Total of 20 B4 coded slots Modified table of organization and equipment (MTOE) has no B4 slots in RSTA
Stryker Brigade Combat Team (SBCT)	Consists of 51 B4 coded slots 30 with the maneuver battalions 2 per company, total of 18

	48 actual positions and 3 staff
NOTE: B4 indicates the additional skill identifier (ASI) for sniper-qualified.	

SNIPER SECTION

1-28. This modular element consists of a section leader and two or three sniper teams, each with two or three men. For some missions, the sniper team is assigned a separate security force.

NOTE: Whether the teams consist of two or three Soldiers, all members should be highly trained in the use of all team equipment.

1-29. Sniper operations are characterized by the actions of individual sniper teams. However, destroying an important target or several high-priority targets might require multiple teams.

Traditional Two-Man Sniper Team

1-30. Having two snipers on a team provides for mutual protection and relief. When working in two-man teams, one sniper serves as the sniper and the team leader, while the other sniper serves as the observer.

Three-Man (Heavy) Sniper Team

1-31. Three-man teams are considered heavy teams. When working in three-man teams, the first sniper serves as the sniper and the team leader, the second sniper serves as the observer, and the third provides area security.

Four-Man Sniper Team

1-32. In a four-man sniper team, it is recommended that each team member be sniper-qualified (ASI-B4). At a minimum, two members of the team

must be sniper-qualified. Table 1-2 depicts the team members' roles and weapons.

Table 1-2. Four-man sniper team duties and weapons.

DUTY POSITION	ALTERNATE DUTY POSITION	WEAPONS
Shooter	Observer	M110 SASS, M24 SWS, M14/M21, M4, M9
Observer	Shooter	M110 SASS, M24 SWS, M14/M21, M4, M9
Security	Breachman	M4/M203, M9, Shotgun
Security	Radio-telephone operator	M4, M249 squad automatic weapon (SAW), M9

DUTIES AND RESPONSIBILITIES

1-33. Each member of the sniper section has specific responsibilities. Only through repeated practice can the section begin to function properly.

SNIPER EMPLOYMENT OFFICER

1-34. The SEO is responsible for advising the unit commander on the employment and control of snipers. The acronym KACTIS-D will assist the SEO in the execution of his duties and responsibilities of the sniper section:

- **K** - Knowledge of sniper capabilities. The SEO understands the capabilities and limitations of his teams, to include movement and

camouflage techniques, observation techniques, hide site operations, and marksmanship.

- **A** - Advise the supported unit commander. The SEO advises the supported unit commander, S-3, and S2 on how to best employ the unit's sniper team. The SEO ensures the commander realizes his snipers are his eyes, ears, and trigger finger on the battlefield.

- **C** - Coordinate all aspects of the sniper mission. Coordination begins at the mission-planning phase, and is a continual process. The SEO coordinates the assignment of sniper teams to missions to support units or as an integrated part of a sniper mission. To prevent fratricide and possible compromise of position and mission, the SEO coordinates terrain and sectors of operation with units in the area of operation (AO).

- **T** - Training should be realistic, varied, challenging, and mission-oriented. Every skill required of a sniper is perishable and requires continual practice. The SEO ensures that his teams are allocated the proper time and resources needed to maintain their effectiveness.

- **I** - Issue combat orders to the teams. The SEO issues the order either formally or informally to the sniper section/team leader using an operation order (OPORD) or fragmentary order (FRAGO).

- **S** - Supervise planning, preparation, and rehearsals. The SEO should provide supervision for the planning of the mission, the preparation of the mission, and mission rehearsals. A good brief-back indicates the sniper team's readiness for the mission.

- **D** - Debrief all members of the team upon completion of the mission. The SEO should conduct detailed debriefings after completion of the mission. The sniper team(s) will bring all pertinent information (e.g., their data books, sniper logs, field sketches, range cards, and digital photos) to the debriefing.

SECTION LEADER

1-35. The section leader is the subject matter expert on all sniper-related issues, including training, equipment, weapons, and employment. The sniper section leader advises the SEO on all training and employment issues, and may act as the SEO if needed.

TEAM LEADER

1-36. The sniper team leader is responsible for the training, employment, and conduct of his team. The sniper team leader executes the orders of the SEO and section leader and is responsible for accomplishing the mission.

SHOOTER (SNIPER)

1-37. The shooter—

- Provides precision long-range fire on key targets and selected targets of opportunity.
- Properly performs all phases of the integrated act of firing.
- Provides an accurate mil reading of the target.
- Accurately applies corrections provided by the observer.

OBSERVER (SPOTTER)

1-38. The observer—

- Properly identifies targets.
- Accurately calculates range to the targets based upon the mil reading provided by the shooter.
- Constantly monitors any environmental or situational changes and provides the shooter with accurate corrections.
- Observes spots the impact of the round and provides immediate corrections for subsequent engagements.

ARMS ROOM CONCEPT

1-39. Sniper teams should be able to use any available weapon from the unit's arms room, as needed. This flexibility of choice is referred to as the arms room concept. The addition of newer weapons, such as the M110 SASS, will allow the sniper team to better match their weapons to the mission.

CAPABILITIES AND LIMITATIONS

1-40. Snipers enable the commander to disrupt, destroy, or otherwise reduce the effectiveness of the enemy. The commander can use the sniper team in various missions, to include conventional attack, defense, delay, economy-of-force, or even stability and support.

CAPABILITIES

1-41. Snipers have specialized capabilities, including—

- Surprise.
- Information gathering.
- Precise fire control.

Surprise

1-42. Snipers' stalking techniques, camouflage, and concealed firing positions make them nearly undetectable to the enemy until the sniper fires.

Information Gathering

1-43. Snipers' observational and navigational skills and specialized equipment help them see the terrain in great detail and observe changes. They can provide the commander details about the terrain, obstacles, likely avenues of approach, or other pertinent information.

Precise Fire Control

1-44. Snipers' techniques of range estimation allow the accurate and efficient control of indirect fire and prove to be an asset in the quest of achieving a first-round fire for effect.

LIMITATIONS

1-45. Leaders should consider the following limitations when employing snipers:

- Mobility.
- Command and control.
- Prolonged independent employment.
- Continuous employment.
- Sustainment.

Mobility

1-46. Although a sniper team inserts by almost any method and over great distances, its mobility after insertion is limited. Sniper teams rely on stealth, not speed, to secure their movement. Lack of integral transport can strand them. Commanders must plan how to retrieve and redeploy the sniper team.

Command and Control

1-47. The organic sniper team is a new concept. Commanders must learn the best missions for their sniper teams and assign them accordingly.

Prolonged Independent Employment

1-48. Snipers can only support themselves for a short period; resupply operations can compromise their location, mission, and safety.

Continuous Employment

1-49. Commanders and their staffs should understand that continuous employment reduces the sniper's effectiveness greatly, so they should plan accordingly. For example, the commander might deploy all sniper teams at once, leaving none available; or he can deploy fewer sniper teams at a time, leaving the other teams rested and ready for the next mission.

Sustainment

1-50. Sniping skills perish quickly; therefore, sniper teams must sustain and sharpen those skills regularly. To deny the importance and need to sustain sniper training deprives the commander of a valuable asset.

POSITIONS

1-51. Snipers normally operate from static positions. They try to position themselves where they can receive local protection from friendly elements.

NOTE: Chapter 3 describes the selection, construction, occupation, and types of sniper positions.

MISSION PREPARATION

1-52. During mission preparation, sniper teams use planning factors to estimate the amount of time, coordination, and effort that must be expended to support the impending mission. Arms, ammunition, and equipment are dependent on mission, enemy, terrain and weather, troops and support available, time available, civil considerations (METT-TC).

NOTE: Chapter 6 describes the steps and phases for preparing for sniper missions.

GENERIC SNIPER TASKS

1-53. Many sniper tasks are common to all operations. Unit SEOs develop these tasks and add others based on the commander’s intent and on operational requirements. These tasks include—

- Target enemy command posts and key enemy leaders.
- Target enemy crew-served weapons and crews.
- Cover defilades.
- Cover engineer and pioneer parties.
- Cover demolition guards and supply columns.
- Perform countersniper operations.
- Protect flanks.
- Dominate key terrain.
- Deploy as part of cutoff forces.
- Deploy forward to cover counterattack routes.
- Deploy as part of a forward operating base (FOB) or as a separate FOB.
- Select targets to engage just before an attack.
- Cover obstacles while friendly forces cross them.
- Observe and control indirect fire onto enemy positions.
- Place accurate fire into bunkers.
- Ambush or harass a withdrawing enemy.
- Provide covering fire for observation posts (OPs) and firing positions.
- Overwatches the movement to and assault of the objectives.
- Disable or destroy key enemy equipment and material.

LAW OF LAND WARFARE AND RULES OF ENGAGEMENT

1-54. The rules of engagement (ROE) direct how a commander may use force to achieve military objectives. The ROE impose political, practical, and legal limitations upon commanders and Soldiers. Before each mission, a sniper should be given the ROE specific to his mission. The principles basic to all ROE include—

- The law of land warfare.
- Basic human rights.
- Soldiers' and units' absolute and inherent right to defend themselves.
- Soldiers' and units' obligations to respond with minimum force needed.

1-55. In situations that the mission's ROE fail to address, the sniper might have to fall back on the Law of Land Warfare (FM 27-10) to help him decide when to use deadly force.

PRINCIPLES GOVERNING USE OF DEADLY FORCE

1-56. The use of deadly force is governed by four principles:

(1) Military necessity.

(2) Distinction.

(3) Avoidance of unnecessary suffering.

(4) Rule of proportionality.

Military Necessity

1-57. The principle of military necessity dictates that the sniper may use force allowed by international law that is necessary to secure the prompt

submission of the enemy. The only other requirement is that destroying the target must offer a direct and concrete military advantage:

Distinction

1-58. The principle of distinction states that the sniper should never target noncombatant civilians and civilian objects. Because a sniper can deliver discriminatory direct fire, a sniper who kills a noncombatant civilian is considered to have committed a war crime.

People

1-59. The following people are protected under the law of land warfare:

- Unarmed civilians.
- Wounded or sick combatants who are out of combat.
- Medical personnel, even if armed, unless protecting patients.
- Chaplains.
- Personnel attempting to surrender.
- Noncombatant parachutist.
- Soldiers under a flag(s) of truce.

1-60. However, they lose their protected status when they start, join, or continue a fight.

Places and Things

1-61. Protected places and things include—

- Undefended buildings or those with nonmilitary uses.
- Places of worship.

- Medical treatment sites.
- Historic and cultural sites.
- Places marked with protective symbols, such as a red crescent.
- Cultural objects.
- Medical supplies.
- Ambulances.

1-62. However, they lose this protected status the moment they are used for military purposes.

Avoidance of Unnecessary Suffering

1-63. This principle prohibits the sniper from using force designed to inflict suffering, injury, or destruction beyond what is necessary to accomplish legitimate military purposes. For example, a sniper may not alter US weapons and ammunition to enhance suffering.

Rule of Proportionality

1-64. This principle prohibits the sniper from causing any suffering, injury, or destruction to noncombatants or civilian objects which would be excessive in relation to the concrete and direct military advantage anticipated.

Chapter 2: Equipment

This chapter describes the equipment available for the sniper team to perform its mission effectively. Team members carry only what they need to accomplish the mission. Above all else, they need durable, accurate weapons that allow them to deliver long-range, precision fire. Table 2-1 compares the three sniper weapons. The sniper team also carries communications, optics, and other equipment as needed.

NOTE: This chapter addresses the M110 SASS and the M107 LRSR. The M24 SWS is being replaced by the M110 SASS. For more information about the M24 SWS, see Appendix D.

Table 2-1. Sniper weapons.

WEAPON	TYPE	DESCRIPTION	OPTICS
M110	Semiautomatic Sniper System (SASS)	Semiautomatic 7.62-mm, magazine- fed weapon equipped with MIL-STD-1913 rail adapter system	Leupold 3.5 x 10 power day optic sight (DOS) Backup iron sight (BUIS) AN/PVS-26
M24	Sniper Weapon System (SWS)	Durable 7.62-mm bolt-action, six-shot weapon	AN/PVS-10 integrated daysight and nightsight M3A telescope--daysight

			Iron sights
M107	Long-range sniper rifle (LRSR)	.50-caliber, semiautomatic, air-cooled, short-recoil, box-magazine-fed weapon	MK 4 - 4.5 to 14x variable scope Iron sights AN/PAS-13C thermal weapon sight (TWS)

SECTION I. PRIMARY WEAPONS

Based upon current operational considerations, the US Army has deemed necessary the development and implementation of a semiautomatic sniper system. The resulting products are addressed in this section.

M110 SEMIAUTOMATIC SNIPER SYSTEM

2-1. The M110 SASS (Figures 2-1 to 2-4) is a semiautomatic, direct gas-operated, air-cooled, magazine- fed, precision 7.62-mm direct line of sight weapon system equipped with the MIL-STD-1913 rail system.

2-2. The M110 SASS enables trained snipers to—

- Engage and destroy enemy personnel at long and short ranges.

- Consistently hit personnel-size targets at ranges of 800 meters or further, dependent on the sniper's abilities (e.g., shooter-dependent).

- Capitalize on shooting and maintenance proficiency on M16-type rifles.

- Attach and detach other sighting systems and accessories with approved mounting systems without loss of combat zero.

2-3. The M110 SASS's design capitalizes on prior shooting and maintenance skills of individuals trained and proficient with M16- and M4-type weapons, but provides a more robust and precision arm. The rifle's free-floating barrel system is one of the key contributors to its accuracy. This simple design does not require application of glass bedding compound or barrel replacement by trained and equipped armorers. Further, the weapon's primary ammunition, the 7.62-mm x 51-mm NATO caliber 175-grain M118LR ammunition, provides very accurate firing capability at extended ranges (600 to 1,000 meters).

2-4. The M110 SASS has—

- An adjustable buttstock with assembled length variations. The operator may set the buttstock to any length between 40.5 and 42.0 inches without using tools.

- An ambidextrous safety selector lever and bolt release.

- A bolt carrier and bolt assembly similar to that of M16- and M4-series weapons. The bolt has inner and outer gas rings, and the firing pin retaining pin is a captured pin.

2-5. This weapon is issued with—

- A deployment kit that allows operator-level maintenance and repair.
- Two sight systems: the DOS and the BUIS.
- The MIL-STD-1913 rail adapter system, which allows for various optics to be attached based upon mission requirements.
- 10- and 20-round magazines.
- The 3.5 x 10 variable power precision rifle scope. This scope retains its zero throughout all power settings. The variable power scope has an illuminated tactical milling reticle (TMR).
- An integrated, acoustic flash and blast suppressor serial-number-matched to the weapon.

2-6. A complete kit of accessories can be provided for sustained deployment in remote areas. A variety of capabilities may be obtained by combining basic issue and ancillary items, which can be tailored for a variety of tactical applications ranging from countersniper actions to the most severe operational environments. Optional accessories for the rifle include—

- An adjustable sling.
- Operator cleaning and maintenance kit.
- Drag bag.
- Scope covers.
- Scope lens covers and/or night scopes.
- Scope/crown cover.
- Universal night sight (UNS).
- Illuminating laser.

2-7. Table 2-2 depicts the technical specifications for M110 SASS. Figures 2-1 through 2-4 show the M110 SASS components and accessories.

Table 2-2. Technical specifications for M110 Semiautomatic Sniper System.

AMMUNITION	7.62-mm x 51-mm M118 special ball/long-range (SB/LR)
	M852 Match
BARREL RIFLING AND TWIST	20-inch barrel (not including flash suppressor) with five grooves, right-hand twist with 1 turn in 11 inches
MUZZLE VELOCITY	SB: 2,600 feet per second (fps)
	LR: 2750 fps
MAXIMUM EFFECTIVE RANGE	800 meters or further, dependent on the sniper's abilities (e.g., shooter-dependent)
OVERALL LENGTH (BUTT TO MUZZLE)	Without suppressor buttstock collapsed: 42.0 inches
	Without suppressor and buttstock collapsed: 46.5 inches
	With suppressor and buttstock extended: 48.25 inches
SUPPRESSOR LENGTH	14.25 inches
MAGAZINE CAPACITY	10- and 20-round magazines

RIFLE WEIGHTS UNLOADED	Without sights, adapters, or mounts: 10.81 pounds
	With front and rear iron sights, and bipod adapter: 11.06 pounds
	With BUIS, bipod adapter, and Leupold 3.5 x 10 SASS scope: 12.82 pounds

COMPLETE	With Leupold 3.5 x 10 DOS, and Bipod Adapter with Leveling Mechanism Type-S Bipod	
	Weight	13.7 pounds
	7.62-mm Quick-Detach (QD) Sound Suppressor	
	Weight	1.96 pounds
	Length	46.5 inches
	20-Round Magazine of M118 LR Ammunition	
	Weight (unloaded)	.46 pounds
	Weight (loaded)	1.62 pounds
	Leveling Mechanism Type-S Bipod	
	Weight	.87 pounds
	Bipod Adapter	
	Weight	.12 pounds
	Leupold 3.5 x 10 Illuminated Reticle DOS With .5 Minute of Angle (MOA) Elevation Clicks and 30-mm Mount	
	Weight	1.76 pounds

DOS MAGNIFICATION	Variable power 3.5 x 10 power with M2-type (double revolution) ballistic cam (with .5 MOA elevation and windage adjustment clicks)	
RIFLE DEPLOYMENT (HARD) SYSTEM CASE, LENGTH	Dimensions	51 inches long x 17 inches wide x 12 inches deep
	Weight	78 pounds loaded with drag bag



Figure 2-1. M110 Semiautomatic Sniper System.



Figure 2-2. M110 Semiautomatic Sniper System components.



Figure 2-3. M110 Semiautomatic Sniper System accessory items.

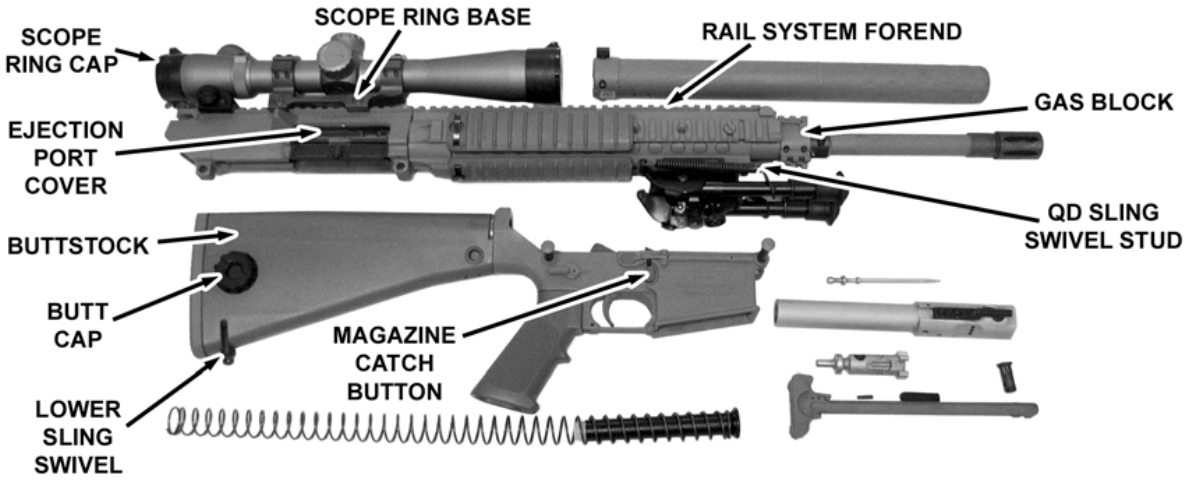


Figure 2-4. M110 Semiautomatic Sniper System disassembled in major groups.

OPERATION AND CHARACTERISTICS

2-8. To effectively operate the M110 SASS, the sniper must understand its components and how they work, and be able to maintain and repair them.

WARNING

Before beginning an inspection or performing any maintenance procedures, ensure the rifle is clear. Never place live ammunition near administrative, cleaning, or maintenance areas. Never leave rifle or ammunition unattended.

Service Upon Receipt

2-9. Upon receiving the weapon—

(1) Check system case for signs of damage.

(2) Conduct safety check and inspect the equipment for damage that may have occurred during shipment.

(3) Inspect contents of the system case against the shipping documents and/or the rifle system parts list. Not all applicable accessories may have been shipped with your rifle. Check with your supervisor to verify that the contents of your shipment are correct and complete.

(4) Clear and field strip the rifle to ensure that there are no missing parts. (5) Clean the rifle. When finished, inspect the bore for obstructions.

NOTE: See Appendix G for more information about cleaning the rifle.

DANGER

Do not leave cleaning patches in the bore. Cleaning patches left in the bore may cause explosion upon firing the weapon.

(6) Perform safety and functional checks.

(7) If the DOS is not attached to the rifle, attach it and check eye relief with your stock weld. Remount the scope, or adjust the scope's position between the scope mounting rings if necessary.

(8) Check for eyepiece focus. With the M110 SASS buttstock, eye relief may also be changed by adjusting the buttstock length.

(9) Move to a suitable firing range, and check zero of the rifle and scope combination. Adjust the sling to fit your requirements, and test fire all magazines included with the rifle. Manually unload unfired rounds carefully, taking care to avoid damaging the magazine feed lips.

NOTE: Magazines are best tested loaded with 18 rounds; you need not fire more than 5 rounds of the 18 for an adequate magazine test. Although the magazine will function loaded with 20 rounds, loading under a closed bolt is more reliable with only 18 rounds loaded due to the extra energy you need to apply to overcome the fully compressed magazine spring. Fire 9 rounds when testing a 10-round magazine.

2-10. The rifle and magazines are ready for service.

Safety Selector Lever (Safety)

2-11. The M110 SASS has an ambidextrous safety selector lever (Figure 2-5) located on the both sides of the lower receiver. The lever has two positions: SAFE and FIRE.

WARNING

The rifle may fire any time the safety selector lever is in the FIRE position and the trigger is pulled. When you are not actually firing your rifle, always rotate the safety selector lever to the SAFE position.

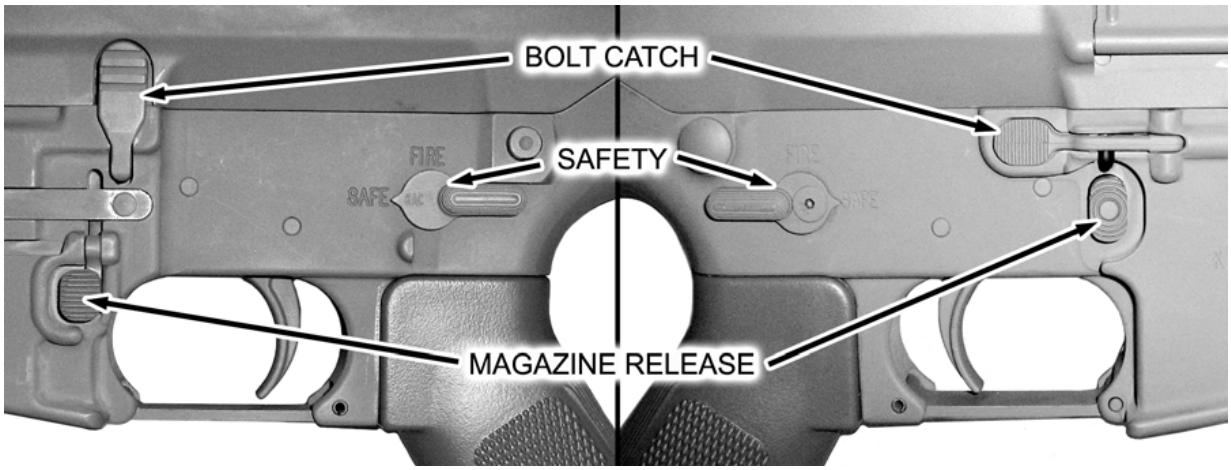


Figure 2-5. Ambidextrous safety selector lever, magazine release, and bolt catch.

SAFE Position

NOTE: The safety selector lever may be rotated to the SAFE position any time the bolt is held fully to the rear or when the bolt is forward and the hammer is cocked.

2-12. Keep the safety selector lever in the SAFE position while handling, loading, or unloading the rifle. When the safety selector lever is rotated to the SAFE position, the rifle hammer is fully cocked, but the firing sear is blocked from movement. When the safety selector lever is properly engaged and serviceable, it provides protection from accidental discharge under normal usage.

2-13. To rotate the safety selector lever to the SAFE position, pull the charging handle fully to the rear (while looking through the ejection port to ensure that the chamber is clear).

FIRE Position

2-14. When you are ready to fire, confirm your target, rotate the safety selector lever to the FIRE position, and squeeze the trigger.

Charging Handle

2-15. The charging handle is located at the rear of the upper receiver and is the primary means of cocking the bolt and loading or unloading the chamber. It has a spring-loaded catch, which retains it in its forward position during firing.

2-16. To operate the charging handle, depress the catch, while pulling the charging handle to the rear. When the bolt is fully to the rear, the handle will come to a stop.

NOTE: The ejection port cover snaps open as the bolt passes. This allows you to inspect the chamber and lock the bolt to the rear (with the bolt catch) if desired.

Rates of Fire

CAUTION

In training and peacetime, the rifle should never be fired with unnecessary rapidity or past the point where the barrel/sound suppressor is too hot to be held comfortably in a bare hand. Although the mechanism is capable of a high and rapid rate of fire, abuse of this capability will lead to premature barrel wear, loss of match grade accuracy, and premature suppressor failure.

2-17. The maximum sustained rate of fire for maximum barrel life is shown in Table 2-3.

NOTE: The maximum sustained rate of fire is not a recommended rate of fire. In combat, snipers may be required to exceed the maximum sustained rate of fire to accomplish the mission. In training, snipers should rarely—if ever—approach the maximum sustained rate of fire.

2-18. Barrel life is expected to exceed the M24 SWS's (5,000 rounds) when a realistic sniper weapon firing schedule is followed. The life expectancy will decrease when barrel is overheated. After 100 rounds, the sniper should allow the rifle to fully cool before continuing to fire.

2-19. The sniper should also maintain the weapon and clean the bore properly, using approved gun cleaning chemical products to remove copper fouling after firing 500 rounds. The sniper should also clean the bore every 100 rounds to increase barrel life and provide the best accuracy with subsequent shot groups. The round count will be cut in half when suppressed.

Table 2-3. Maximum sustained firing rate: 4-minute firing cycle.

20-ROUND CYCLE	ROUNDS/ MINUTE	ROUNDS/ MINUTE	ROUNDS/ MINUTE	ROUNDS/ MINUTE	TOTAL ROUNDS FIRED	CUMULATIVE TIME IN MINUTES

1	5	5	5	5	20	4
2-minute cooling cycle with the bolt open						
2	5	5	5	5	40	10
2-minute cooling cycle with the bolt open						
3	5	5	5	5	60	16
2-minute cooling cycle with the bolt open						
4	5	5	5	5	80	22
2-minute cooling cycle with the bolt open						
5	5	5	5	5	100	28
Stop firing. After firing 100 rounds in 28 minutes, allow the barrel to cool. Clean and completely remove copper from the bore.						

Clearing Procedures

2-20. To clear the rifle—

(1) Point rifle in safe direction and rotate safety selector lever to the SAFE position.

WARNING

If you are unable to move the safety selector lever to the SAFE position, perform the following steps with extreme care.

(2) Remove the magazine by depressing the magazine catch button and pulling the magazine down.

(3) Pull the charging handle fully to the rear (while looking through the ejection port to ensure that the chamber is clear).

(4) Lock the bolt open by pulling charging handle rearward, and pressing and holding the bottom of the bolt catch. Allow the bolt to move forward until it engages the bolt catch. Return the charging handle forward. If you have not already done so, place the weapon on SAFE.

(5) Visually inspect the receiver and the chamber areas for ammunition.

(6) With the safety selector lever pointing to SAFE, allow the bolt to move fully forward by pressing the upper portion of the bolt catch. The bolt should spring forward. Close the ejection port cover.

SAFETY/TRIGGER FUNCTIONAL CHECK

WARNING

Always clear the rifle before checking function of the safety selector lever and the trigger.

Checking SAFE Position

2-21. To verify that the safety selector lever SAFE position is functional—

(1) Remove the magazine.

(2) Pull the charging handle fully to the rear, and lock the bolt to the rear.

(3) Return the charging handle to its forward position.

(4) Visually check the receiver and the chamber area for ammunition or foreign objects.

(5) Release the bolt catch, and allow the bolt to lock into the chamber.

(6) Rotate the safety selector lever to the SAFE position.

(7) Squeeze the trigger fully to the rear.

NOTE: You should not hear anything, as the hammer should not fall.

(8) Release the trigger.

Checking FIRE Position and Disconnector

2-22. To verify that the safety selector lever FIRE position and disconnector are functional—

(1) Rotate the safety selector lever to the FIRE position.

(2) Squeeze the trigger fully to the rear.

NOTE: You should hear hammer fall forward with a distinct click.

(3) Continue holding the trigger fully to the rear.

(4) While holding the trigger to the rear, pull the charging handle rearward.

(5) Ride the charging handle forward slowly.

NOTE: You should hear nothing, as the hammer should be held to the rear by the disconnector.

(6) Slowly release the trigger.

NOTE: You should hear a light click as the hammer is released from the disconnector and engages the sear.

(7) Squeeze the trigger fully to the rear.

NOTE: You should hear the hammer fall forward with a distinct click.

(8) Close the ejection port cover.

PRE-FIRE CHECKS

2-23. Before each firing sequence, the sniper must check—

- The appearance and completeness of all parts.
- The bolt to ensure that it locks, unlocks, and moves smoothly.
- The safety selector lever to ensure it can be smoothly (but not too easily) rotated from SAFE to FIRE.
- The trigger to ensure that, when the safety selector lever is in the SAFE position, the trigger will not pull and the weapon will not fire. Also, ensure that when the safety selector lever is in the FIRE position, the trigger pull is smooth and crisp.
- The scope mounting ring nuts for proper torque (65 inch/pounds).

- The stock for any cracks, splits, or contact with the barrel.

- The rail system. Ensure that it is tightly mounted and that there are no obstructions between the rings and the rails.

- The scope for obstructions such as dirt, dust, moisture, or loose or damaged lenses.

BARREL BREAK-IN

2-24. The M110 SASS comes from the manufacturer ready to shoot; however, it is recommended that the weapon be broken in to enhance its life and accuracy.

NOTE: Should you need to immediately employ or use the weapon you may disregard the break in procedure; however, the weapon's life may suffer depending on how it is used.

2-25. To break in the weapon—

(1) Clear the weapon.

(2) Remove the bolt carrier group.

(3) Insert the bore guide.

(4) Dry patch the barrel to remove any obstacles.

(5) Remove the bore guide.

(6) Reinsert the bolt carrier group.

(7) Load and fire one round.

(8) Clean the weapon.

NOTE: See Appendix G for more information about cleaning the weapon.

(9) Repeat firing 1 round and cleaning until you have fired 10 rounds.

(10) Load and fire 3 rounds.

(11) Clean the weapon.

NOTE: See Appendix G for more information about cleaning the weapon.

(12) Repeat firing 3 rounds and cleaning until you have fired 30 rounds (10 iterations total) for a total of 40 rounds being fired through the rifle.

(13) Load and fire 5 rounds.

(14) Clean the weapon.

NOTE: See Appendix G for more information about cleaning the weapon.

(15) Repeat firing 5 rounds and cleaning until you have fired 50 rounds (10 iterations total) for a total of 90 rounds being fired through the rifle.

(16) Load and fire 10 rounds.

(17) Clean the weapon.

(18) This should be 100 rounds total fired through the rifle. The barrel break-in is now complete.

LOADING

2-26. To load the weapon—

(1) Point rifle in a safe direction, and lock the bolt to the rear with bolt catch.

(2) Place safety selector lever in the SAFE position, and visually check the chamber and the receiver.

(3) Insert a loaded magazine into the magazine well until the magazine catch engages and retains the magazine.

(4) Slap the bottom of magazine with the palm of your hand to be sure that the magazine is locked into the magazine well.

(5) Push on the upper portion of the bolt catch to release the bolt. The bolt will spring forward and load the first round into the chamber.

WARNING

The rifle is now loaded. Keep it pointed in a safe direction. If you rotate the safety selector lever to the FIRE position, the rifle will fire when you pull the trigger.

UNLOADING

2-27. To unload the weapon—

(1) Point the rifle in a safe direction.

(2) Rotate the safety selector lever to the SAFE position if possible.

NOTE: If the hammer is not cocked, the safety selector lever cannot be rotated to SAFE.

(3) Remove the magazine by depressing the magazine catch button while pulling the magazine from the magazine well.

(4) Pull the charging handle rearward, and lock the bolt to the rear by pressing on the bottom portion of the bolt catch.

(5) If not done so already, move the safety selector lever to the SAFE position.

(6) Inspect the chamber and the inside of the receiver for cartridges or brass. Remove rounds or other debris.

(7) Release the charging handle, let the bolt move forward, and close the dust cover.

QUICK-DETACH SOUND SUPPRESSOR

2-28. The M110 SASS's quick-detach (QD) sound suppressor significantly decreases the sound level, muzzle flash, and recoil of the weapon on which it is installed. It weighs approximately 1 1/2 pounds, is constructed of stainless steel, and is coated with a green moly resin. Technical specifications for the QD sound suppressor are shown in Table 2-4.

2-29. The QD sound suppressor interfaces with the two vertical slots cut at the three and nine o'clock positions on the sides of the gas block/front sight base. The alignment pin on the underside of the gas block at the six o'clock position prevents improper installation of the suppressor.

CAUTION

Never subject the QD sound suppressor to more than 20 rounds of sustained fire (five rounds per minute for four minutes). If this limit is reached, allow the unit to cool to ambient temperature before resuming fire. To precisely

maintain the point of impact, the suppressor should be allowed to cool to ambient temperature every 10 rounds.

A noticeable increase in sound indicates that the QD sound suppressor needs maintenance. If ignored, this reduces the effectiveness of the QD sound suppressor.

Table 2-4. Quick-detach sound suppressor technical specifications.

LENGTH	14.125 inches
DIAMETER	1 3/8 inches
WEIGHT	1.96 pounds
CONSTRUCTION	Stainless steel
TYPE	Baffle
SOUND SUPPRESSION	30-decibel drop (average and ammunition dependent)

CAUTION

The QD sound suppressor is not designed to be used wet. Under no circumstances should it be filled with grease, oil, or any other lubricant before use. The use of a lubricant could alter the path of the projectile and/or foul the gas system and moving parts of the rifle.

Installation

2-30. To install the QD sound suppressor—

(1) Confirm the rifle is unloaded and on SAFE.

(2) Remove the magazine.

(3) Pull the bolt carrier assembly to the rear and visually inspect the chamber and receiver.

(4) Close the bolt carrier assembly, confirm that the selector is set to SAFE, and close the dust cover.

(5) With muzzle pointed away from you, raise the locking latch on the QD sound suppressor and slide the suppressor over the barrel (Figure 2-6).

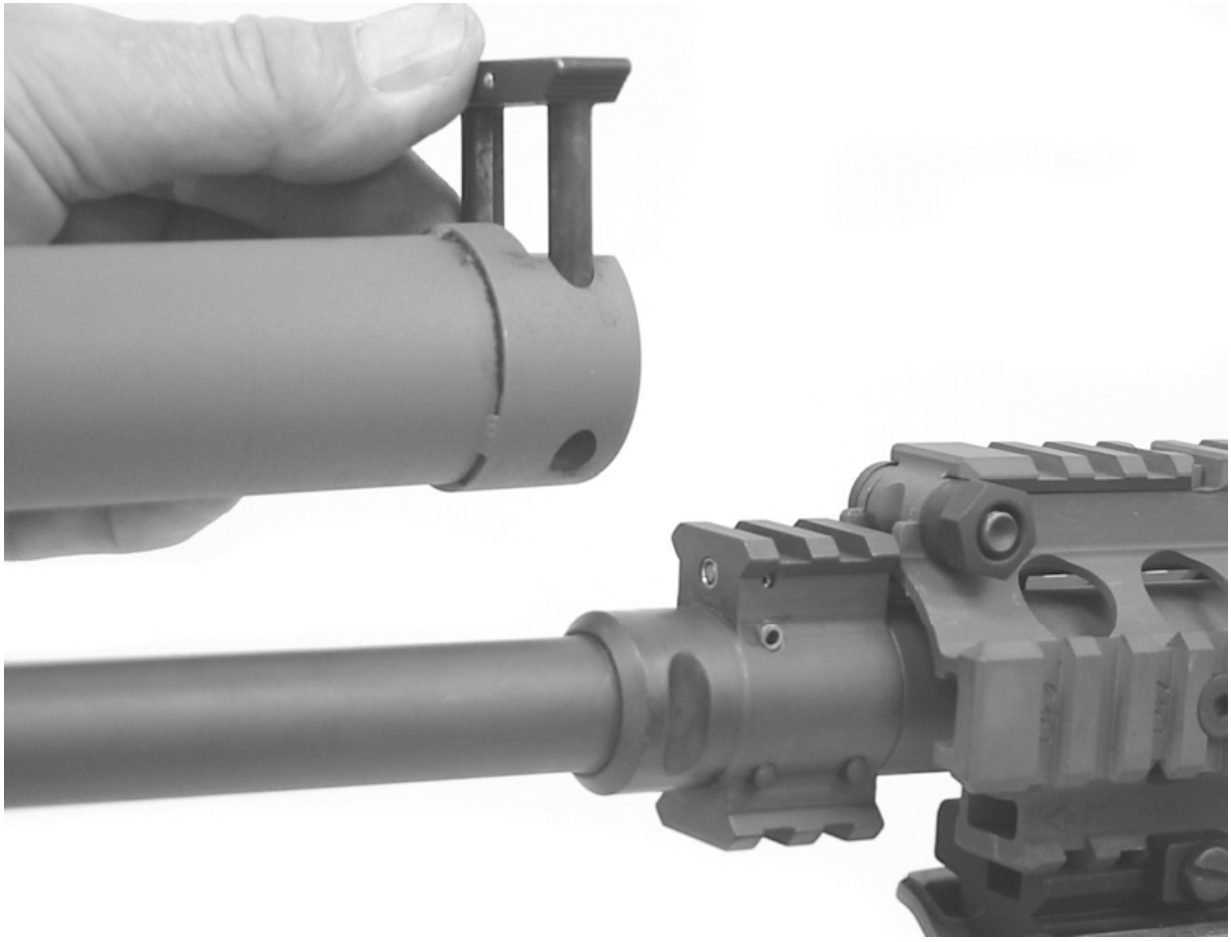


Figure 2-6. Raise the locking latch.

(6) Rotate the QD sound suppressor counterclockwise until it engages the alignment pin in the barrel (Figure 2-7).

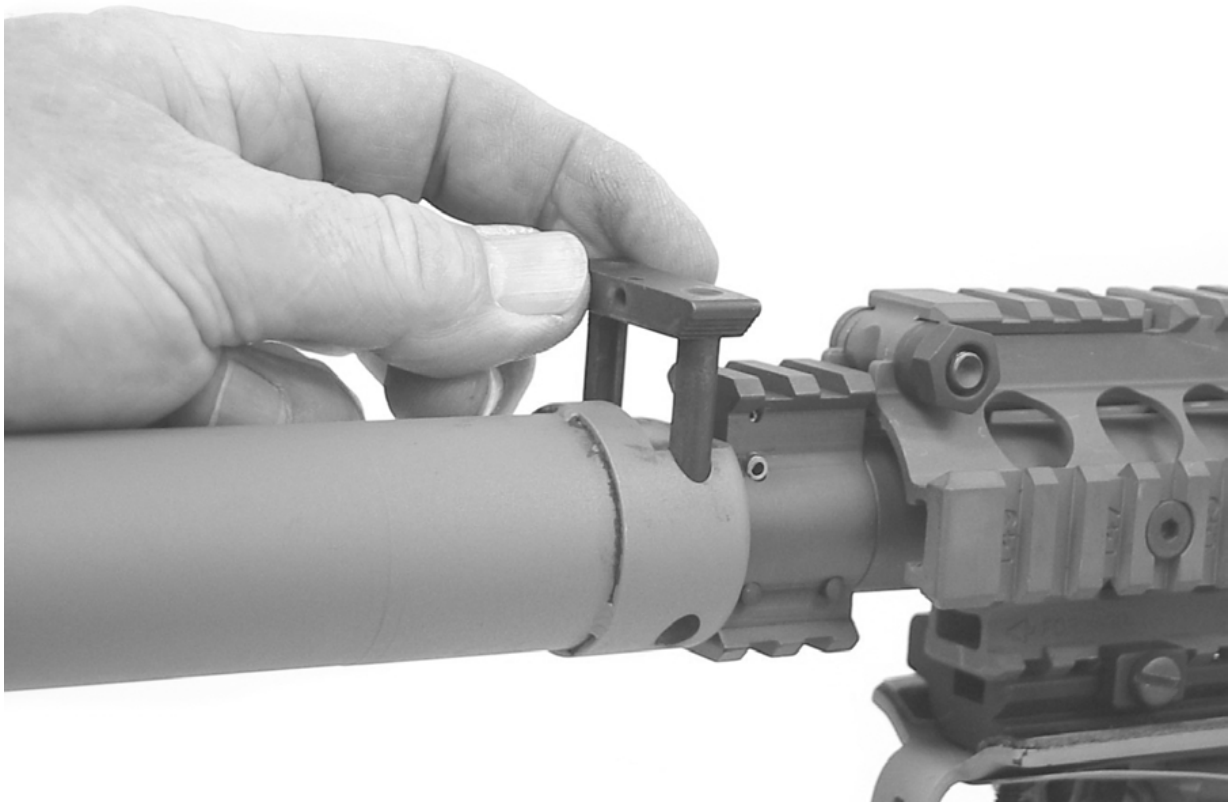


Figure 2-7. Quick-detach sound suppressor in position on the barrel.

(7) While holding the QD sound suppressor firmly to the rear and against the alignment pin in the barrel, lower the locking latch on the QD sound suppressor until flush with the top of the suppressor (Figure 2-8).



Figure 2-8. Quick-detach sound suppressor locked and latched, fully engaged.

Removal

WARNING

After use, the QD sound suppressor will be extremely hot. Protect your hands with leather or heat-resistant gloves when removing hot QD sound

suppressors.

2-31. To remove the QD sound suppressor—

(1) Confirm that the rifle is unloaded and on SAFE. Point the muzzle away from yourself.

(2) To remove the suppressor while hot, use a bayonet or other available tool to raise the locking latch.

(3) Rotate the suppressor clockwise, and slide the suppressor straight off the barrel.

BACKUP IRON SIGHT

2-32. The M110 SASS's BUIS consists of folding rear and front iron sights. The rear iron sight is a match- grade peep aperture. The front iron sight is an integral, self-locking, folding sight at the front of the fore- end's top rail. These sights are integrated for use when the DOS is removed.

2-33. When attached and not in use, the BUIS does not interfere with the mounting or employment of the rifle's primary optics. This sight allows for rapid attachment and detachment with a common flat blade screwdriver or a coin.

NOTES:

1. The DOS must be removed before use.

2. The BUIS needs to be mounted and zeroed prior to mounting optics if the probability of use is an operational consideration.

3. The BUIS retains zero if removed and reattached.

Adjustments

2-34. The folding rear and front iron sights enable the sniper to make adjustments for windage and elevation.

Windage

2-35. Windage adjustments are made with the rear iron sight windage knob. Windage adjustments are in 1/2 minute of angle (MOA) clicks (1/8 inch at 25 meters and 1/2 inch at 100 meters).

Elevation

2-36. Elevation adjustments are made to the front sightpost during zeroing; subsequent major range adjustments are applied to the rear iron sight elevation adjustment drum. The rear iron sight's elevation drum is marked from 200 to 600 meters in 100-meter increments. Intermediate 1/2 MOA adjustments allow for a total of 30 MOA adjustments; allowing for precise intermediate range settings being dialed on the sight (1/4 turn equals 1.5 inches at 100 meters per click).

NOTE: The front sightpost is adjustable for zero elevation without tools.

Installation

2-37. To install the rear iron sight—

(1) Loosen the retention screw of the BUIS four to five turns (it is not necessary to remove it), and lift the sight away from receiver rail or mounting surface.

NOTE: The rear iron sight's retention screw normally lies in the third rearward slot on the receiver rail.

(2) With the scope removed and mounting rails clean, mount the BUIS by engaging the right side of rail with right-side claws of the bases.

(3) Rotate the rear iron sight base down against receiver rail.

(4) Hold the assembly in place with your thumb.

(5) Tighten the retention screws against their clamps firmly.

CAUTION

Do not overtighten the retention screws with tools.

2-38. To install the front iron sight—

(1) Depress the lock from the left side.

(2) Raise the front iron sight.

(3) The lock should reset to remain its up or down position.

Removal

2-39. To remove the BUIS, perform the installation procedures in reverse, using a screwdriver as necessary.

NOTE: A coin that fits either screw slot may be used if a screwdriver is not available.

25-Meter Zero

2-40. To zero the BUIS—

(1) Install the front and rear sights as described in the installation procedures.

(2) Adjust the front sightpost by rotating the elevation knob clockwise or counterclockwise.

(3) Align the “Z” mark on the left side of the rear iron sight.

(4) Align the windage index line with the windage zero line on the base of the iron sight.

(5) Confirm the zero at 200 meters. Fire a three-round shot group at a 200-meter target, and fine tune elevation adjustments with the front sightpost.

NOTES:

1. 1/4 turn of the front sightpost moves the strike of the round 3/8 inches at 25 meters.

2. 1 click of windage moves the strike of the round 1/8 inch at 25 meters.

3.5-10X VARIABLE-POWER DAY OPTIC SIGHT

NOTE: Different scopes may be used on this rifle. Always refer to specific instructions when available.

2-41. The DOS (Figure 2-9) is a 3.5-10x variable precision rifle scope that retains its zero throughout all power settings. The scope has an illuminated, improved TMR powered by an Army common/standard battery DL1/3N (NSN: 6135-01-398-5922). The DOS uses a one-piece scope mount that allows the operator to detach and re-attach the scope to the rifle without loss of zero. The scope mount interface is compatible with the MIL-STD-1913 rail adapter.



Figure 2-9. 3.5-10x variable-power day optic sight.

Mounting

2-42. Before mounting the DOS—

(1) Lubricate the threads of each mounting nut with one drop of oil.

(2) Rotate the mounting nuts to evenly distribute the lubricant.

(3) Wipe away any excess oil.

(4) Leave the nuts fully loosened (turned counterclockwise 2 or 3 turns on their shafts until the bases are seated on the receiver rail).

(5) Inspect each mounting ring nut and mount claw for burrs and debris. Remove any debris from the surfaces.

(6) Inspect the receiver dovetail for burrs and debris.

NOTE: See the armorer to remove burrs with a fine stone, if necessary.

2-43. When the DOS is attached without using the T-handle torque wrench and re-zeroing of the system cannot be accomplished through live firing, snipers should use the following steps. To mount the DOS and scope rings to the upper receiver dovetail—

(1) Hold the rifle horizontally, with the ejection port facing up.

(2) Hook the fixed claws of the sight mounts under the right side of the receiver dovetail.

(3) Screw the scope ring bolt shafts down into the selected dovetail slots.

(4) Continue holding the optic against the receiver dovetail during the following steps.

NOTE: There are several pairs of mounting slots to accommodate eye relief and scope ring location. Once you select a pair, they should be reused to retain zero if the sight is removed and reattached.

(5) Slide the rear mount claw under and against the receiver dovetail.

(6) Finger-tighten the mounting ring nut.

(7) Slide the front claw under/against the dovetail, and finger-tighten the mounting nut.

2-44. If the above conditions are not true, snipers should use T-handle torque wrench as described in the following steps. To mount the DOS and scope rings to the upper receiver dovetail—

(1) Use the 1/2-inch combination wrench (or plastic T-wrench from cleaning kit) to tighten the rear mounting ring nut 1/4 turn.

(2) Use the 1/2-inch combination wrench to tighten the front mounting ring nut 1/4 turn.

(3) With the T-handle torque wrench preset to 65 inch/pounds, tighten the rear mounting ring nut until the torque wrench clicks.

(4) With the T- handle torque wrench pre-set to 65 inch/pounds, tighten the front mounting ring nut until the torque wrench clicks.

(5) After the initial ten rounds have been fired, check the tightness of the mounting ring nuts, and tighten if necessary.

CAUTION

Do not over tighten the mounting ring nuts.

(6) Tighten the scope ring cap screws to 15 to 20 inch/pounds. Ensure that the gaps on either side of the ring are the same. The crosshair must be plumb when the scope is mounted in the rings and on the rifle. If not, adding elevation clicks at long ranges will cause unwanted windage shifts, and may cause you to miss your target.

Removing

2-45. To remove the DOS and scope rings from the upper receiver dovetail—

(1) Use the 1/2-inch combination wrench to loosen the front and rear mounting ring nuts, while holding the optic firmly against the receiver dovetail.

CAUTION

Never use torque wrench to loosen the front and rear mounting ring nuts.

(2) Holding the left side of the rifle downward, rotate the scope away from the nuts to disengage it from the receiver dovetail. The nuts may rotate completely off their shafts.

Changing the Battery

2-46. To change the battery—

(1) Grasp the side striations of the knob firmly.

(2) Rotate just the cover edge counterclockwise.

(3) Remove the old battery, and replace it with a new one with the positive side up.

Adjusting

2-47. The DOS elevation and windage adjustments are 1/2 MOA and provide for visible and tactile setting adjustment indications.

NOTE: The scope has a separate target focus/parallax adjustment knob located next to the elevation and windage adjustment knobs.

2-48. The elevation knob is an operator-removable and -adjustable bullet drop compensator (BDC, Figure 2-10) ballistically matched to the M118 LR ammunition and marked in hundred-meter increments from 100 to 1000 meters. The elevation dial is graduated in 1/2 MOA clicks (i.e., 2 clicks at 300 meters equals 3 inches). Intermittent clicks (provided for a total of more than 50 MOA) enable the sniper to apply recorded ballistic data to the firing of other ammunition, as well as fine-tune individual M118 LR data.

NOTE: To attain the 1/2 MOA range adjustment clicks and have the BDC to a range of 1,000 meters, the sniper must rotate the BDC knob nearly one and one-half turns to range from the 100-meter starting point, to the 1,000-meter marking. Subsequently, the 800-, 900-, and 1,000- meter range markings appear above the row markings for 100 to 700 meters. The 900-meter mark shares the same apparent position as the 400-meter mark. However, these marks are actually 30 MOA apart.

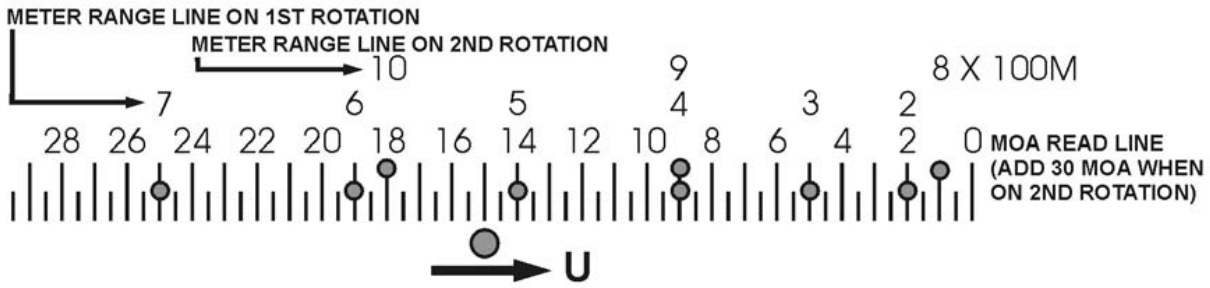


Figure 2-10. Bullet drop compensator.

Focusing

2-49. With proper focus, both the reticle and the target will have maximum sharpness.

NOTE: To properly focus the reticle and scope, you should have an area where you can observe a target at about 300 meters. Focus the scope yourself; all human eyes see things differently.

Eyepiece/Reticle

2-50. Eyepiece focusing is performed after mounting the DOS and supporting the rifle in a steady rest.

NOTE: When unscrewing the eyepiece, make sure it is not completely rotated off the scope body. If the eyepiece is already too far back, rotate the lock ring and eyepiece forward until focused. The M110 SASS has a diopter focus ring and no lock ring.

2-51. To focus the eyepiece—

(1) Rotate the scope's variable power ring to its highest magnification and the target/parallax focusing knob to its infinity setting.

(2) Unscrew the eyepiece one turn counterclockwise to back it away from its lock ring. Make sure the lock ring is free by turning a 1/4 turn.

(3) Point the rifle at a clear area of the sky, and turn the eyepiece while observing the sharpness of the reticle.

(4) Turn the eyepiece several rotations so as to move it at least 1/8 of an inch. It will take this much movement to change reticle sharpness.

NOTE: The M110 SASS's diopter adjustment ring is marked for your reference and requires little rotation to bring the reticle into sharp focus.

(5) Once at the best focus point, turn the eyepiece back and forth through the focus point until the reticle is at its maximum sharpness.

(6) Look away from the scope, and let your eyes focus on a distant object. Then, quickly look into the scope at the reticle. It should appear clear and sharp.

(7) Repeat Steps 3 through 6 until focus is set for your eyes.

2-52. The reticle's ON/OFF and brightness control knob are marked with indicators for OFF and the numbers 1 through 11. The brightest setting, 11, is the first detent counterclockwise from OFF. The dimmest setting, 1, is only visible with night vision goggles (NVG) or similar equipment.

CAUTION

When turning the knob counterclockwise to decrease reticle intensity, grasp it by its sides and not the top serrated edge of the knob because you may inadvertently loosen the battery compartment cover as you turn it. It is a good habit to always turn the knob clockwise so as not to loosen the battery cover.

Target/Parallax

2-53. The DOS has a target focus/parallax adjustment knob on the left side of the scope.

2-54. To focus the target/parallax—

(1) Focus the reticle as described in the reticle focus procedures.

(2) Observe the markings on the dial. The larger dots are settings for closer ranges; the infinity mark is for the most distant targets. Note the dial stops at either the minimum or maximum setting.

(3) Steady the rifle, and observe a small target at from 100 to 300 meters through the scope.

(4) Move your head slightly from left to right and note if the target appears to move away from the center of the crosshairs.

NOTE: If target appears to move, parallax is present and you need to adjust the knob.

(5) Rotate the target focus/parallax knob slightly in each direction, and observe the apparent target movement by moving your head.

(6) Find the best knob position for both the elimination of parallax and target focus.

(7) When shooting at closer or more distant targets, the dial may require a minor readjustment.

Zeroing

2-55. Once the reticle and scope are properly focused and parallax minimized, zero with the rifle's correct ammunition or the ammunition you will use during the mission using one of three methods:

- 300-meter zeroing method.
- 50-meter zeroing method.
- 25-meter zeroing method.

NOTE: The elevation knobs can be replaced and are calibrated to the trajectories and standard velocities (and barrel lengths) of specific rounds at sea level. The knob marked 7.62 is for M118LR ammunition used in combat by snipers. The elevation zero and adjustment knob is on top of the scope. The windage zero and adjustment dial is located to the right side of the scope.

100-Meter Zero

2-56. To perform 100-meter zero—

NOTE: Use a large target to capture all rounds fired.

(1) Set the elevation dial to 100 meters (0 mark on the range scale) and windage dial to zero (0). If a measurable wind is blowing, make appropriate adjustments to the windage dial.

(2) Fire a 3-shot group at 100 meters.

(3) Unload the rifle, and move downrange to spot the 3-round shot group.

NOTES:

1. Take the rifle with you, and keep your ammunition covered so the sun does not heat it up and change its ballistics.

2. On a known distance (KD) range, there is no need to move downrange.

(4) Calculate the clicks necessary to move the shot group (point of impact) to the point of aim. The following click adjustments apply:

• Elevation Dial: 1/2 MOA per click. At 100 meters, one click equals 1/2 inch. At 200 meters, one click equals 1 inch. At 300 meters, one click equals 1 1/2 inches.

• Windage Dial: 1/2 MOA per click. At 100 meters, one click equals 1/2 inch. At 200 meters, one click equals 1 inch. At 300 meters, one click equals 1 1/2 inches.

NOTE: If your shot group does not appear on target, apply 25-meter zeroing procedures.

(5) Ignoring the other markings on the dials for the moment, rotate the dials the estimated number of clicks to move the point of impact to the point of aim.

(6) Refire a 3-round shot group from 100 meters. Repeat Steps 2 through 5 until the point of impact is the same as the point of aim.

(7) Carefully loosen the three small set screws located around the edges of the elevation and windage knobs with a 1/16-inch hex head wrench.

(8) Gently rotate (slip scales) the elevation knob until the 0 on the upper scale lines up with the scope's 0 reference mark.

NOTE: The small set screws need only be loosened 1 or 2 turns to allow dials to rotate freely without actually changing internal zero adjustments.

(9) Retighten the small setscrews. Use the short end of the hex head wrench as a handle when tightening, and use the long end as a handle to loosen small setscrews.

CAUTION

Do not over tighten the small set screws on the windage and elevation dials. This will strip the threads and cause the windage and elevation dials to become inoperable.

(10) Set the BDC to 3, and fire a 3-round shot group at a 300-meter target to confirm zero of the weapon system.

50-Meter Alternate Zero

2-57. The 50-meter method is the closest range that focal adjustments can be made on sniper optics accurately allowing both the reticle and target to be viewed with clarity and focus. Provided the reticle and scope are properly focused and parallax is minimized, the reticle pattern and target should both appear with equal clarity when

viewed at this range. Unless an optic possesses an extended focus range, clarity will not be achieved at lesser ranges. To perform 50-meter alternate zero—

(1) Adjust the focus knob to the 50-meter target.

(2) With the elevation set at 300 meters (3), fire a 3-shot group.

(3) Unload the rifle and move to the target.

NOTE: The point of impact for the 3-shot group should be approximately 1/4 inch above the point of aim.

(4) Make appropriate elevation and windage click adjustments as follows:

- Elevation: At 50 meters, one click equals 1/4 inch.

- Windage: At 50 meters, one click equals 1/4 inch.

(5) Fire a 3-round shot group at a 300-meter target to confirm zero of the weapon system.

NOTE: Once the rifle has been zeroed using an alternate method, all other range markings should be considered approximate. If a specific range is required for tactical success, confirm zero at actual mission range, if known ahead of time.

25-Meter Alternate Zero

2-58. The 25-meter method establishes only a rough zero; snipers should never rely on it for tactical applications. The sniper should always confirm zero at longer ranges; 300 meters is recommended. To perform 25-meter alternate zero—

(1) Adjust focus knob to the 25-meter target.

NOTES:

1. The target need not be in perfect focus for the 25-meter procedure.

2. Placing a black paper disk with a small aperture hole in the center over the objective lens may bring the 25-meter target into better focus.

(2) With elevation set at 300 meters (3), fire a 3-shot group.

(3) Unload the rifle, and move to the target.

NOTE: The point of impact for the 3-shot group should be approximately 1/2 inch above the point of aim.

(4) Make appropriate elevation and windage click adjustments as follows:

- Elevation: At 25 meters, one click equals 1/8 inch.
- Windage: At 25 meters, one click equals 1/8 inch.

(5) Repeat Steps 1 through 4 until the point of impact is approximately 1/2 inch above point of aim.

(6) Fire a 3-round shot group at a 300-meter target to confirm zero of the weapon system.

NOTE: Once the rifle has been zeroed using an alternate method, all other range markings should be considered approximate. If a specific range is required for tactical success, confirm zero at actual mission range, if known ahead of time.

(7) Perform 100-meter zeroing procedure to establish true zero.

Tactical Milling Reticle

2-59. The TMR is a modified duplex crosshair with thick outer sections that become thin as they approach the center and cross (Figure 2-11). A special feature of this reticle is the series of small hash marks equally spaced on the thin crosshair sections. These hash marks indicate 1-mil and 1/2-mil increments for a finely graduated total measurement of 10 mils. The fine lines provide for more accurate range estimation.

2-60. Using the hash marks and stadia lines at 10x magnification and the height or width of a known object, it is possible to determine range to that object (Figure 2-12 and Table 2-5). For example, a human target looks 6 feet (1.83 meters) tall, and at 500 meters, are 3.65 or 3.6 mils high. Given a good estimate of the object's size, the sniper can accurately determine target range using this technique.

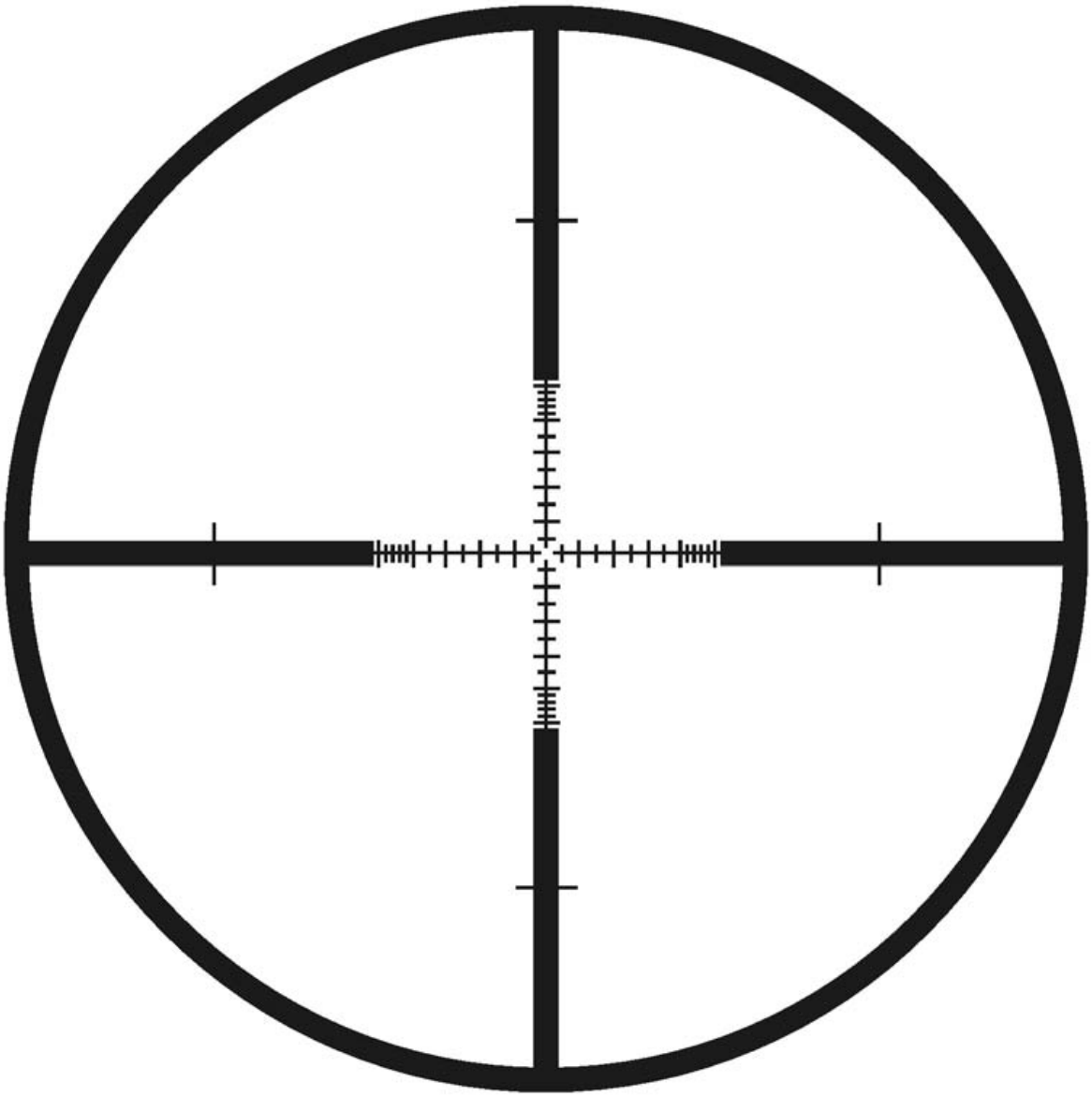


Figure 2-11. Tactical milling reticle hash marks and stadia lines.

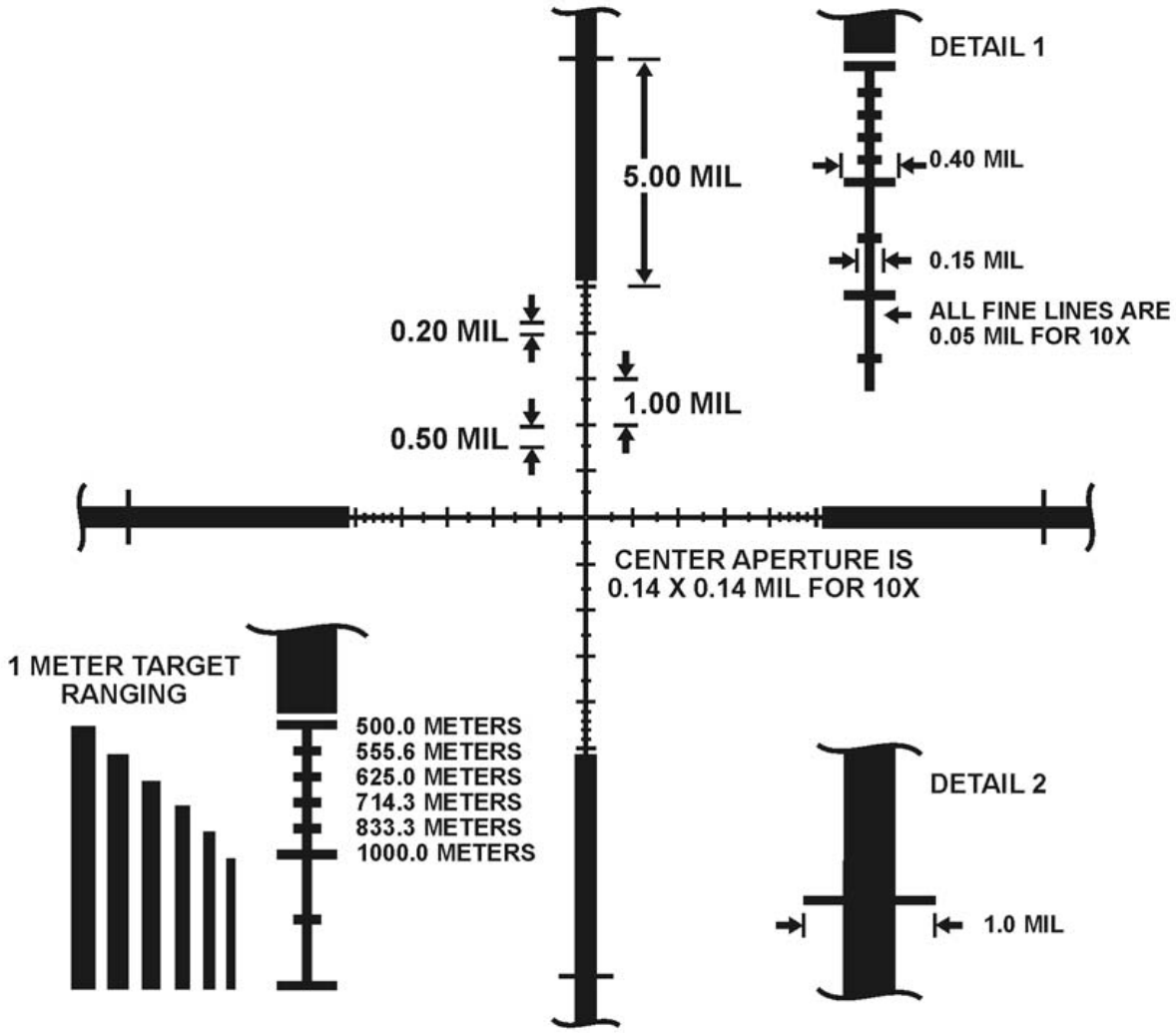


Figure 2-12. Tactical milling reticle breakdown.

Table 2-5. Tactical milling reticle conversion chart.

UNIT OF MEASURE	CONVERSION (1 mil equals x)
Yards	1 yard (about 36 inches) at 1,000 yards
	1/2 yard (about 18 inches) at 500 yards
	1/4 yard (about 9 inches) at 250 yards

Meters	1 meter (about 39.37 inches) at 1,000 meters
	1/2 meter (about 20 inches) at 500 meters
	1/4 meter (about 10 inches) at 250 meters
To convert yards into meters: yards x .9144 = meters To convert meters into yards: meters ÷ .9144 = yards	
NOTE: 1,000 meters is nearly 1,094 yards. If your scope's elevation knob is in meters and you wish to use yards, one or two clicks down from the meter range setting may be correct for your yardage range estimates, especially at 300 yards or more.	

AN/PVS-26 UNIVERSAL NIGHT SIGHT

2-61. The AN/PVS-26 UNS (Figures 2-13 and 2-14) is a high-performance, long-range, low-profile, uni- power device which allows night operation of any weapon system equipped with a MIL-STD-1913 rail adapter. It is primarily used on weapons with the DOS as their primary sighting system.

2-62. The AN/PVS-26 UNS can be mounted forward of the DOS without adverse effect on the weapon's point of aim or point of impact. The AN/PVS-26 UNS does not require zeroing when being installed in front of a DOS; however, to ensure optimal picture quality, the DOS (if equipped with a parallax or focus adjustment knob) should be adjusted to near-infinity parallax-free. This allows the DOS to be focused clearly on the back of the image intensifier tube. The focus on the AN/PVS-26 UNS can then be used to adjust the focus of the sight picture.

2-63. The components of the AN/PVS-26 are shown in Table 2-6.

NOTE: Although the AN/PVS-26 is equipped with an auto-gated tube and can function in high light situations, it is recommended that the gain be turned to the minimum possible setting to optimize the contrast and sharpness of the image.

CAUTION

Using the AN/PVS-26 under high light conditions can damage the image intensifier assembly.

Table 2-6. AN/PVS-26 universal night sight components.

SYSTEM RESOLUTION	4.8 lp/mm minimum using 100-percent contrast United States Air Force Resolution Chart	
FOCUS RANGE	15 meters to infinity adjustment range	
MAGNIFICATION	1x	
IMAGE INTENSIFIER	Gen 3 OMNI6 gated image intensifier	
CONTROLS	ON/OFF/Gain in a single knob, focus ring	
OBJECTIVE LENS	120-mm telephoto	
EXIT PUPIL	Collimated	
BORESIGHT	Deviation	Less than .5 MOA
	Repeatability	Less than .5 MOA
	Factory Boresight	To within 1 MOA of alignment to the DOS point of impact
	Retention	Maintained within .5 MOA over a 300-round firing schedule
ENVIRONMENTAL	MIL-STD-810-E used as guideline, temperature ranges, saltwater	

RESISTANCE, IMMERSION	To 3 feet saltwater pressure	
FINISH	Matte black, corrosion and saltwater resistant	
DIMENSIONS	Width	3.1 inches
	Length	9.5 inches
	Weight (with batteries)	3 pounds, 3 ounces
MOUNTING OPTIONS	Any MIL-STD-1913 rail with adequate room and clearance forward of the DOS	
POWER	2 AA batteries	
OBJECTIVE FOCUS CONTINUITY	Continually adjustable from approximately 15 meters to infinity via the manual adjustment control	
DISPLAY BRIGHTNESS	Variable display brightness which allows viewing from 105 lux (bright sunshine) to 10-4 lux (total darkness) without inhibiting user's dark-adapted vision	

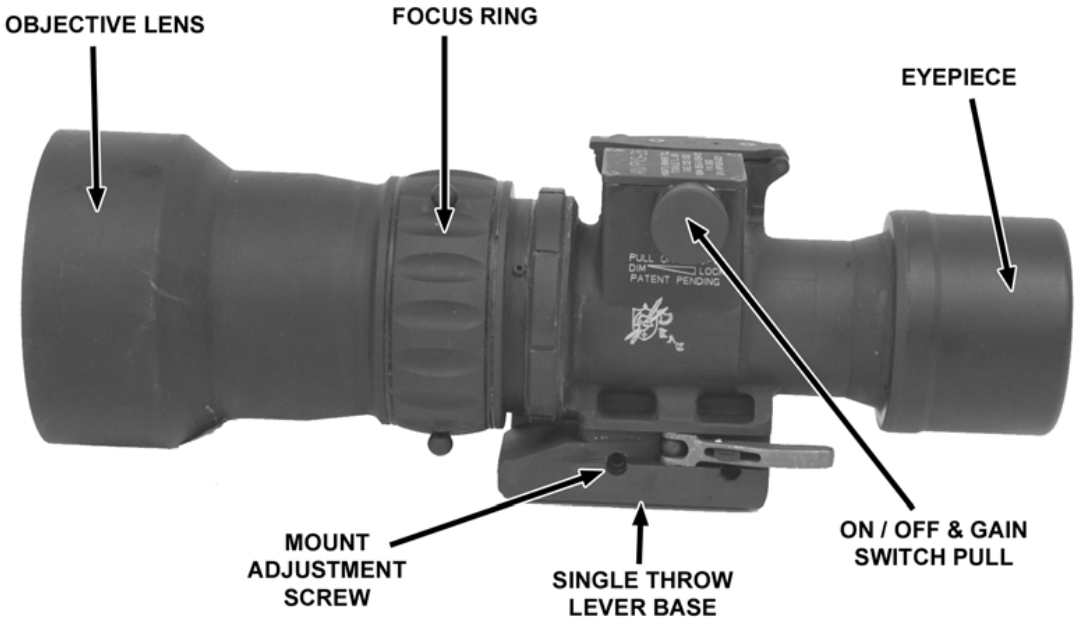


Figure 2-13. AN/PVS-26 universal night sight (left side).

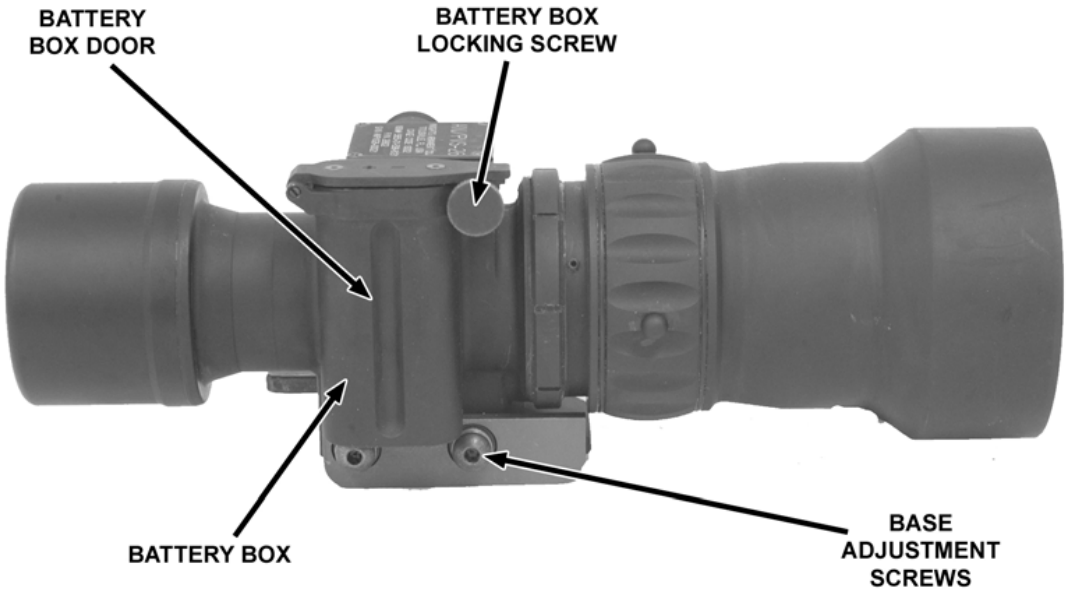


Figure 2-14. AN/PVS-26 universal night sight (right side).

Mounting

2-64. To mount the AN/PVS-26 UNS—

(1) Loosen the locking screws located under the single throw locking lever using a 3/32 hex key wrench.

(2) Loosen the base adjustment screws approximately 1 complete turn counterclockwise using a 1/8 hex key wrench.

(3) Place the AN/PVS-26 UNS on the rail adapter so that it sets properly in the mounting lugs.

(4) Ensure that proper sight alignment occurs.

(5) Mount the sight as close as possible to the DOS, ensuring that they do not touch.

(6) Close the single throw lever until it locks into place.

(7) Place the shroud (letter-side up) underneath the spacing between the DOS and the night sight.

Wrap the side without the hook and pile tape first, and then wrap the other side for a snug fit.

NOTE: Refer to the TM for additional questions.

Adjusting

2-65. To adjust the AN/PVS-26 UNS for the best viewing conditions, the sniper can adjust—

- Gain settings.
- Tube brightness.
- Focus.

Gain Settings

2-66. To adjust the gain settings on the AN/PVS-26 UNS—

(1) Pull out the ON/OFF and Gain switch.

(2) Rotate it clockwise to turn on and adjust gain settings from high to low.

(3) Turn counterclockwise to lock the switch into the OFF position.

Tube Brightness

2-67. To adjust the tube brightness on the AN/PVS-26 UNS—

NOTE: The tube brightness will be HIGH at turn-on.

(1) Turn the switch clockwise to make it dimmer.

(2) Adjust the brightness for the best contrast and resolution for existing conditions.

Focus

2-68. To adjust the focus on the AN/PVS-26 UNS, use the focus ring to make focal adjustments to the sight.

AN/PVS-22 UNIVERSAL NIGHT SIGHT

2-69. The AN/PVS-22 UNS (Figure 2-15) is a high-resolution, clip-on night vision weapon sight that mounts on any MIL-STD-1913 rail adapter forward of an existing scope, adding night vision capabilities to daytime target acquisition platforms. The UNS utilizes a full MIL-SPEC Gen 3 (autogated pinnacle) image intensifier tube and a fast f/1.15 catadioptric lens for a brighter and sharper image in starlight. The unit is installed, operated, and removed without tools and without affecting boresight. The unit can be mounted on a spotting scope for long-range reconnaissance, hand-held as a night observation device (NOD), or used in other night-time operations requiring night vision capabilities. Table 2-7 outlines the AN/PVS-22 UNS specifications.

Table 2-7. AN/PVS-22 universal night sight specifications.

BORESIGHT CHARACTERISTICS	Accuracy	Factory Aligned to 1/2 MOA or Better
	Retention	Permanent to w/in 1 MOA or Better
	Adjustments	None
	Repeatability	Within 1/2 MOA

PERFORMANCE	Resolution (Minimum)	3.2
	Resolution (Typical)	3.5
FACIAL IDENTIFICATION RANGES	Starlight, Low Contrast	75 meters
	Starlight, Optimum Contrast	110 meters
	¼ Moonlight, Low Contrast	110 meters
	¼ Moonlight, Optimum Contrast	135 meters
MAN DETECTION RANGES	Starlight, Low Contrast	740 meters
	Starlight, Optimum Contrast	1050 meters
	¼ Moonlight, Low Contrast	1060 meters
	¼ Moonlight, Optimum Contrast	1340 meters

OPTICAL CHARACTERISTICS	Objective Lens Focal Length	68 millimeters
	Objective Lens f/Number	f/1.15
	Output Optic Exit Pupil Diameter	40 millimeters

CHARACTERISTICS	Controls	ON/OFF/Gain, Focus
	Batteries	2 AA
	Interface (to MIL-STD-1913)	Single Locking Lever
	Operating Temperature	-30 degrees to +60 degrees C
	Submersion	66 feet for 2 hours
	Length	7.1 inches
	Max Height Above Rail	2.95 inches
	Weight (without batteries)	32 ounces
	Magnification	Unity
	Optimum DOS Magnification	1x - 12x
	Field of View	13 degrees
	Focus Range	10 meters to infinity
	Image Intensifier Gain	1,000 - 75,000



Figure 2-15. AN/PVS-22 universal night sight.

M107 LONG-RANGE SNIPER RIFLE

2-70. The M107 LRSR (Figure 2-16) is a man-portable, direct line of sight weapon system capable of providing precision fire at a distance of up to 1,800 meters. The M107 LRSR has a bipod, muzzle brake, carrying handle, telescope (DOS), sling, and six 10-round removable magazines. These all fit into the M107's fitted carrying case, along with cleaning equipment and scope adjustment tools. The M107 LRSR has a 4.5 x 14 variable power scope and integral BUIS. Table 2-8 lists technical data for the M107 LRSR.

NOTE: Appendix G discusses how to inspect and lubricate the M107 LRSR and how to perform preventive maintenance checks and services (PMCS). For detailed information, see TM 9-1005-239-10.



Figure 2-16. M107 long-range sniper rifle.

WARNING

Never fire saboted light armor penetrator (SLAP) or saboted light armor penetrator tracer (SLAP-T) ammunition through the M107 LRSR. Forcing it to chamber and fire may cause serious injury to personnel and damage to the rifle.

Ammunition that predates 1965 should not be fired through this weapon.

Table 2-8. Technical specifications for the M107 long-range sniper rifle.

GENERAL	
Weight of gun and scope	28.5 pounds (12.9 kilograms), unloaded
Overall length assembled	57 inches (88.9 centimeters)
Length in take-down mode	38 inches (86.4 centimeters)
Barrel length	29 inches (73.7 centimeters)
Magazine capacity	10 rounds

Stock	Integral to the lower receiver	
Safety selector	Manual thumb lever	
Magazine weight	Ten rounds	4.1 pounds
	Eight rounds	3.6 pounds
FIRING CHARACTERISTICS WITH STANDARD 660-GRAIN BULLET		
Muzzle velocity	About 2,800 FPS (853 meters per second)	
Maximum range	About 7,450 yards (6,800 meters)	
Maximum effective range	2,000 yards (1,830 meters)	
SIGHT		
Type	4.5 to 14x variable-power scope	
Reticle lens elevation	1 click equals 1/4 MOA at 100 meters	
Fine tuning of windage and elevation	1 click equals 1/4 MOA at 100 meters	
Eye relief	3 to 6 inches	
COMPATIBLE CALIBER .50 AMMUNITION		
MK 211 Mod 0 armor-piercing incendiary (API) M33 ball	M8 armor-piercing (AP)	

M17 tracer M1022 ball	M20 armor-piercing incendiary, tracer (API-T) M1A1 blank

OPERATION AND CHARACTERISTICS

2-71. To effectively operate the M107 LRSR, the sniper must understand its components and how they work, and be able to maintain and repair them.

WARNING

Before beginning an inspection or performing any maintenance procedures, ensure the rifle is clear. Never place live ammunition near administrative, cleaning, or maintenance areas. Never leave rifle or ammunition unattended.

Service Upon Receipt

2-72. The M107 LRSR, scope, and six magazines are issued in a fitted carrying case. Each weapon also has a case of maintenance and deployment accessories. The unit must inspect everything for completeness and proper functioning. As he removes them from the case, the sniper assembles, checks the functioning of, and inventories the rifle and its equipment.

Assembly

DANGER

Ensure that the weapon is unloaded and on safe before field stripping and assembling the M107 LRSR.

2-73. Perform the following steps to assemble the rifle:

(1) Remove the lower receiver from the carrying case, and extend the bipod legs. Place the lower receiver on a flat surface.

(2) Remove the rear and midlock pins from the lower receiver.

(3) Remove the upper receiver from the case.

(4) Fully extend the barrel.

(5) Grasp the barrel key, not the spring. Using your thumb and index fingers, pull the key into place on the key slot.

(6) Position the upper receiver, rear end up and muzzle down, over the lower receiver. Engage the front hook of the upper receiver into the bar on the lower receiver.

(7) Grasp the charging handle, and pull back on the buffer spring (which is under tension) until the bolt clears the barrel.

(8) Lower and close the upper receiver onto the lower receiver, and ride the charging handle forward.

(9) Insert the rear and midlock pins.

(10) Place the safety selector on SAFE.

Function Check

2-74. The function check ensures that the M107 LRSR is properly assembled. To perform a function check—

(1) Pull the bolt to the rear, and ride the charging handle forward.

(2) Place the weapon on SAFE.

(3) Pull the trigger. The firing pin should not move. The weapon should make no sound.

(4) Place the weapon on FIRE.

(5) Place the safety selector on FIRE.

(6) Pull the trigger. The firing pin should move, and you should hear a soft click.

Inventory

2-75. Inventory the rest of the equipment in the carrying and accessory cases against the packing lists or TM 9-1005-239-10.

CYCLES OF OPERATION

2-76. The M107 LRSR has eight steps in its cycle of operation:

- Feeding.

- Chambering.
- Locking.
- Firing.
- Unlocking.
- Cocking.
- Extracting.
- Ejecting.

NOTE: More than one step can occur at the same time. See TM 9-1005-239-10 for information about each step in the cycle of operation.

LOADING

2-77. The sniper loads a magazine, inserts the magazine into the rifle, and chambers a round as follows.

Loading Magazine

CAUTION

The magazine spring presses up on the rounds in the magazine, which forces the top bullet against the bottom of the bolt. When the magazine is completely full, this pressure can make locking in a magazine difficult, and increases the chance of a jam.

2-78. To load a magazine—

(1) Center a cartridge between the feed lips in the magazine.

(2) Press back and down on the cartridge until it snaps under the lips.

(3) Repeat Steps 1 and 2 until the magazine is full.

NOTE: Although the magazine technically holds ten rounds, never load more than nine.

(4) Tap the back of the magazine on your hand to seat the cartridges to the rear.

(5) Ensure that the magazine does not interfere with the nose of the projectiles.

Inserting Magazine

CAUTION

Before inserting a magazine, ensure that the safety selector is in the SAFE position and that the chamber is clear of obstructions.

2-79. To insert a magazine (Figure 2-17)—

(1) Dry cycle the weapon a few times by grasping the charging handle and working the bolt back and forth all the way several times. If the upper or lower receiver was damaged in shipping, the bolt carrier will stick.

(2) Insert the magazine into the magazine well. Tilt the magazine so that the bullets point upward.

(3) Hook the front of the magazine on the hinge in the front of the magazine well.

(4) Rotate the rear of the magazine upward until you hear it click into the rear magazine catch.

NOTE: Ensure that the magazine hook is in the correct place. Tug on the magazine to ensure that the magazine is seated properly.



Figure 2-17. Proper placement of the magazine.

Chambering Cartridge

CAUTION

Before chambering a cartridge, ensure that the safety selector is in the SAFE position and that the chamber is clear of obstructions. Ensure that the muzzle is pointed in a safe direction downrange.

2-80. To chamber a cartridge—

(1) Move the charging handle all the way to the rear.

(2) Release the charging handle to chamber the first round from the magazine.

WARNING

Never try to force a cartridge into the chamber.

If the bolt fails to close fully, clear any obstructions until you can chamber a round successfully without forcing it.

(3) Tap the charging handle to ensure that the bolt is fully forward.

(4) Move the safety selector to the FIRE position.

UNLOADING

WARNING

The bolt does not automatically remain to the rear when the rifle or magazine is empty. Always physically check the chamber to ensure that the rifle is empty. Move the safety selector to the SAFE position before performing unloading procedures.

2-81. To unload the weapon—

(1) Press the magazine catch forward, toward the magazine.

(2) Remove the magazine.

(3) Pull the charging handle to the rear.

(4) Observe the chamber to ensure that no rounds are remaining.

2-82. After unloading the rifle—

(1) Hold the charging handle to the rear.

(2) Look into the chamber to ensure that the breech and chamber are free of any rounds or obstructions.

AUTHORIZED CARTRIDGES

2-83. Table 2-9 shows the only ammunition authorized for use in the M107 LRSR.

Table 2-9. Authorized cartridges.

NOMENCLATURE	TYPE	MARKINGS ON TIP

MK211 Mod 0	High-explosive (HE), armor-piercing incendiary (API)	Green tip and gray
M33	Ball	None
M17	Tracer	Maroon or brown
M8	Armor-piercing incendiary (API)	Gray
M20	Armor-piercing incendiary, tracer (API-T)	Red tip and gray
M1A1	Blank	N/A

Care, Handling, and Preservation

WARNING

NEVER FIRE corroded or dented cartridges, cartridges with loose bullets, or any other defective rounds detected by visual inspection as this may cause damage to the weapon or injury to personnel.

2-84. Snipers should use the following guidelines to properly care for, handle, and preserve ammunition:

- Check ammunition and magazines frequently for corrosion. Wipe off light corrosion with a dry cloth. Do not lubricate the ammunition.

- Only open ammunition containers when you are about to use the ammunition. Opening it too soon can allow it to corrode, especially in damp climates.

- Protect ammunition from mud, dirt, and water. If the ammunition gets wet or dirty, wipe it off before use.

- Never expose ammunition to the direct rays of the sun. If the powder is hot, excessive pressure could develop when you fire.

• Never allow oil or grease to get onto your ammunition. Both attract dust and other abrasives that, when you fire the ammunition, will damage the operating parts of the weapon. Oiled cartridges also produce excessive chamber pressure.

VARIABLE POWER SCOPE

2-85. This 4.5 x 14 power scope is a commercial product purchased for use with the M107 LRSR. The variable power scope mounts on the top rail of the LRSR. Once mounted, it should remain there, even during routine maintenance.

NOTE: TM 9-1005-239-10 discusses the M107 LRSR and the variable scope.

Components

2-86. The scope has seven main components (Figure 2-18):

• Objective lens.

• Elevation adjustment turret. • Windage adjustment turret. • Power selector ring.

• Eyepiece lock ring.

• Parallax adjustment turret.

• Eyepiece lens.

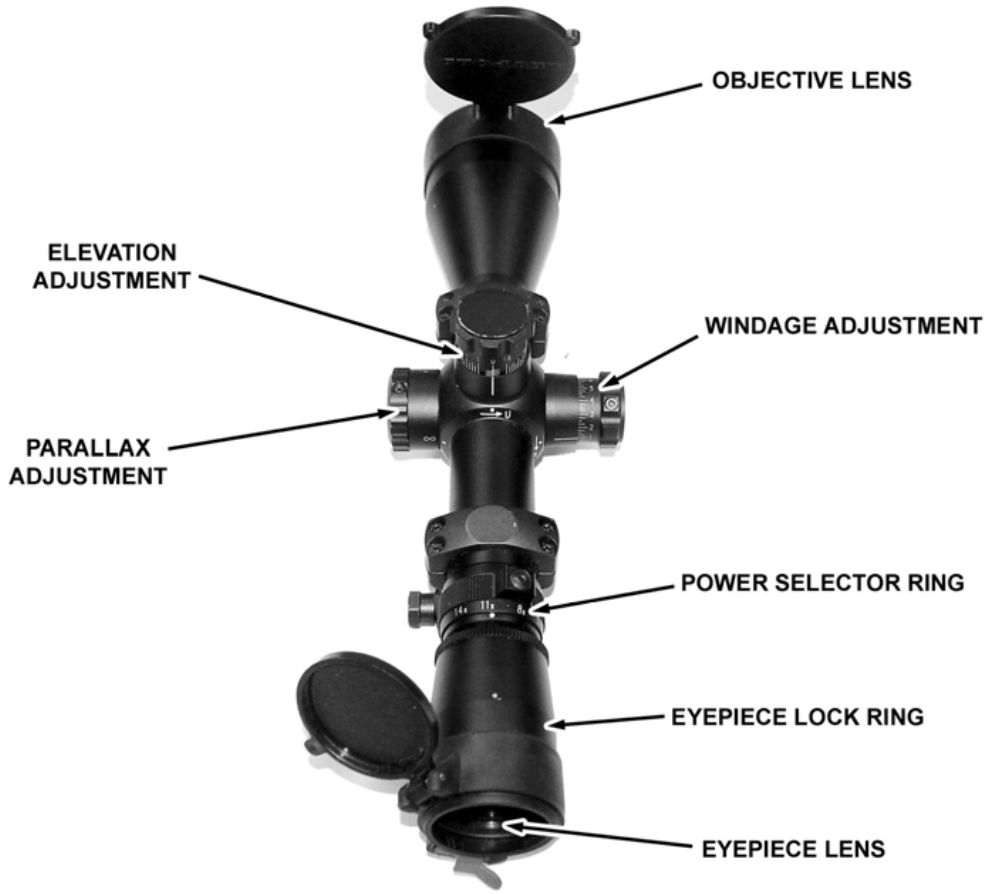


Figure 2-18. Components of the variable scope.

Windage and Elevation Turrets

2-87. Each click of the windage and elevation turrets (Figure 2-19) represents 1/4 MOA, so four clicks equal 1 MOA.

- The initial setting for windage is 52 MOA which, multiplied times 4, equals 208 clicks. Turn the windage turret clockwise until it bottoms out, and then turn it counterclockwise 208 clicks.

- The initial setting for elevation is 34 MOA which, multiplied times 4, equals 136 clicks. Turn the elevation turret clockwise until it bottoms out, and then turn it counterclockwise 136 clicks.

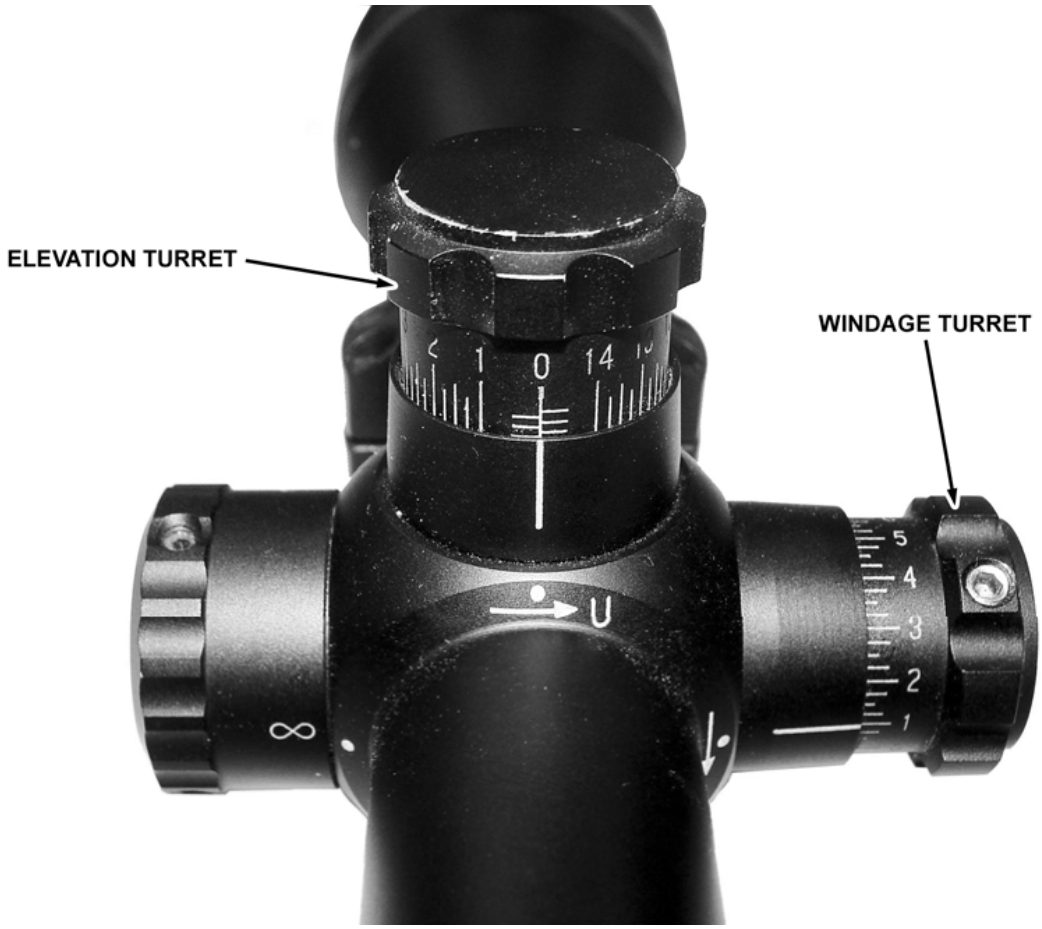


Figure 2-19. Windage and elevation turrets on the variable scope.

Reticle

2-88. The reticle (Figure 2-20) has one vertical and one horizontal line, each of which is thick toward the outer edge of the reticle and thinner toward the center. Each also has four mil dots on each side of center. When the sniper knows the size of the target, he can use the reticle to estimate range. Table 2-10 shows some of the dimensions of the reticle that can be used for range estimation.

NOTE: One mil equals 3.438 MOA.

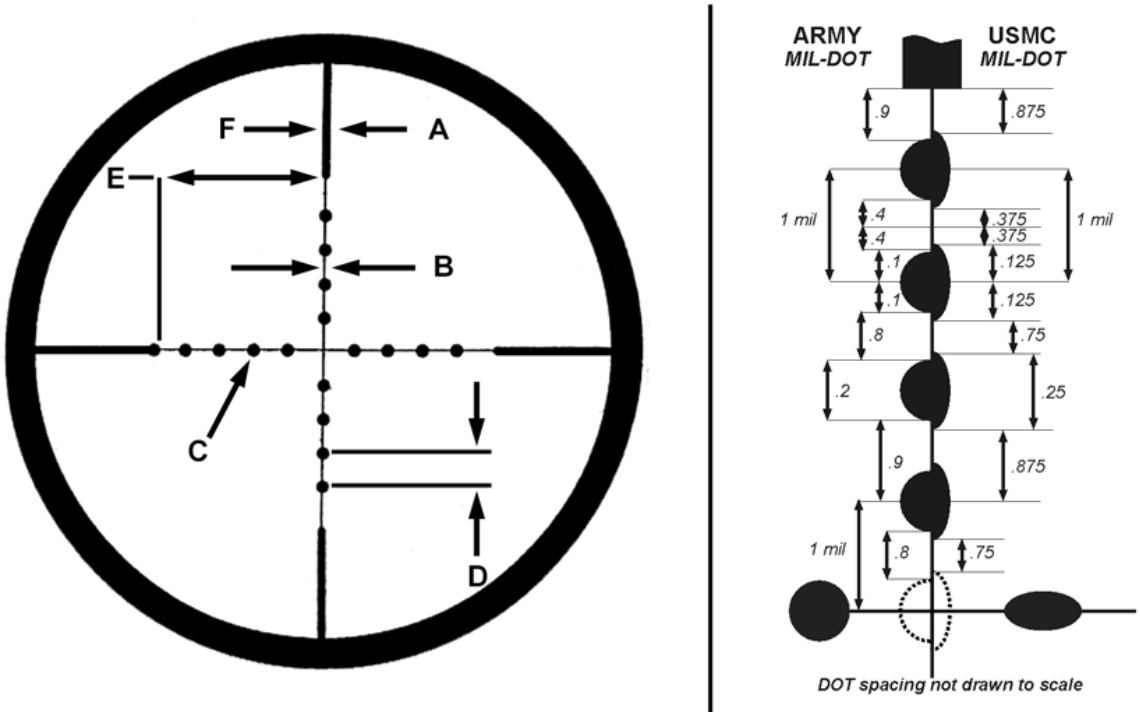


Figure 2-20. Reticle of the variable scope.

Table 2-10. Dimensions of reticle components, variable scope.

DIMENSION	DESCRIPTION	MOA	MILS
A to F	Width of the thick portion of the vertical and horizontal lines	1.0	0.3
B	Width of the thin portion of the vertical and horizontal lines	0.1	0.03
C	Width of a mil dot	0.7	0.2
D	Length between two mil dots, center to center	3.5	1
E	Length of the thin portion of the vertical and horizontal lines	35.0	10

Mounting

2-89. The variable power scope is mounted by the manufacturer with the rear ring mount on slot 4 of the rail adapter, torqued to 65 inch/pounds. To mount the variable power scope—

NOTE: Always allows 3 to 6 inches of eye relief when in the prone position.

(1) Ensure that the scope is mounted on slot 4 of the rail adapter, torqued to 65 inch/pounds.

NOTE: For any weapon with a full-length Picatinny rail, mount the scope on slot 6.

WARNING

Shooting uphill or with the scope mounted too far to the rear can cause the eyepiece to injure your brow.

(2) To remove the ring mount from the rail adapter, use a 1/2-inch wrench and turn counterclockwise.

(3) Tighten the ring mount nuts to 65 inch/pounds using the T-handled torque wrench.

(4) Mount the scope with the rear ring mount on slot 4 of the rail.

(5) Hold the rifle in your normal firing position. Set the scope to the highest possible magnification.

(6) Slowly move the scope forward or backward on the rail adapter until you achieve a full field of view.

(7) Position your scope for rough eye relief.

(8) To achieve optimal eye relief, loosen the optic rings and slide the telescope tube forward or backward.

(9) Without disturbing the eye relief, rotate the scope until the elevation adjustment dial is on top of the scope.

(10) From a firing position, check to be sure that the vertical hair of the reticle aligns with the vertical axis of the firearm.

NOTE: Misalignment can reduce long-range accuracy.

(11) When you are satisfied with the vertical alignment, tighten the ring screws evenly and securely. This keeps the scope from twisting. Start in one corner, move to the opposite corner, and then tighten the screws above and below. Continue until all screws are tight.

Known Distance Zeroing

2-90. The sniper zeroes the scope on a KD range using the zero target (NSN 6920-00-900-8205).

2-91. To perform a KD zero—

(1) Assume a prone supported firing position at 100 meters.

(2) Fire three rounds at the center of the target, keeping the same aiming point each time. Triangulate the three-round shot group.

(3) Adjust the windage and elevation, as needed.

(4) Continue firing three-round shot groups and adjusting the windage and elevation until the shot group is at the target's center of mass.

NOTE: At 100 meters, one MOA equals about 1 inch.

(5) Loosen the screws on the elevation and windage dials.

(6) Turn the elevation turret to index line 1. Tighten the screws.

(7) Turn the windage turret until the 0 on the turret aligns with the index line. Tighten the screws.

(8) Confirm the zero by setting the elevation turret to 500 meters. Fire a three-round shot group at a 500-meter target.

2-92. Table 2-11 shows the estimated number of clicks needed to adjust for various ranges.

Table 2-11. Estimated clicks required to adjust the variable scope for various ranges.

RANGE (METERS)	CLICKS (ELEVATION)	MOA
100 (Zero)	136 *	34.0

200	26	6.50
300	7	1.75
400	7	1.75
500	8	1.50
600	9	2.25
700	12	3.00
800	16	4.00
900	18	4.50
1,000	24	6.00
* Number of clicks from the bottom. All other numbers represent the number of clicks to move from the previous range setting.		

Reticle Focus

2-93. To focus the reticle—

(1) Point the scope at an object silhouetted against a light-colored background. With your established eye relief, the reticle should appear sharp and crisp. If not, use the eyepiece to adjust your focus.

(2) Turn the eyepiece until the reticle looks fuzzy, and then turn the eyepiece until the reticle looks clear and sharp.

(3) When you are satisfied with the image, turn the lock ring so that it rests firmly against the eyepiece.

Parallax

2-94. Parallax is the apparent movement of the target relative to the reticle. It occurs when the sniper moves his eye away from the center of the eyepiece.

NOTE: The parallax adjustment turret is unnumbered. Focus the reticle before turning the parallax adjustment turret.

2-95. To adjust the scope for parallax—

(1) Look through the scope, concentrating on the center aiming point of the reticle.

(2) Move your head slightly up and down.

(3) The aiming point should remain in exactly the same position against the target. If it moves, adjust the focus until the aiming point stabilizes.

Field Zero

2-96. To perform a field zero—

(1) Set the scope to the highest power, and acquire the target. (2) Determine the range to the target.

(3) Fire one round.

(4) Adjust as needed to move the center of the point of aim.

(5) Use the center of the bullet strike as a reference point to make final adjustments to windage and elevation.

(6) Fire a second round using the same point of aim.

(7) Confirm that the strike of the bullet is the same as the point of aim. If not, continue adjusting until you achieve a zero.

Adjustment of Dials

2-97. The sniper can reposition any dial on the scope, whether it has a numbered dial or an indicator, so that the marked zero of the dial aligns with the position indicator.

NOTE: The sniper need not readjust the scope once he has zeroed. This way, he will know the original zero in case he has to adjust it in the field.

2-98. To reposition the dials—

(1) Remove the turret caps.

(2) For both the elevation and windage, loosen the set screws that surround the top of the knob until the cylinder turns freely.

(3) Loosen the hex screws to align the 0 on the cylinder and with the 0 on the cap.

(4) Turn the power selector ring in front of the eyepiece assembly to align your desired magnification with the gold dot on the body of your scope.

Iron Sights

2-99. The sniper flips up the integral iron sights (Figure 2-21) when needed. The rear iron sight is marked from 100 to 1,500 meters. To zero the iron sights—



Figure 2-21. Iron sights.

(1) Assume a prone supported firing position 100 meters from the zero target (NSN 6920-00-900-8205).

(2) Align the index line with the 100-meter range line on the scale.

(3) Align the windage index line with the windage zero index line on the base of the iron sight.

(4) Align the rear peep sight with the front sightpost to get the proper sight picture.

(5) Fire a three-round shot group at the zero target's center of mass, keeping the same aimpoint with each shot.

(6) Note the strike of the rounds, and adjust the windage and elevation accordingly.

(7) Continue firing three-round shot groups.

(8) Adjust the windage and elevation until a group hits the target's center of mass.

NOTE: One click moves the strike of the round just over 1 1/2 inches up or down (elevation) or 3/4-inch left or right (windage) at 100 meters.

(9) Once the shot group hits the target's center of mass, loosen the screw on the elevation scale.

(10) Slide the scale until the 100-meter line aligns with the 1 on the peep sight.

(11) Tighten the screw.

(12) Confirm the zero by setting the elevation scale to the 500-meter line and firing a 3-round shot group at a 500-meter target.

DEPLOYMENT KIT

2-100. The deployment kit is made up of five separate kits.

NOTE: See Appendix G for a description of kit components.

SECTION II. OTHER EQUIPMENT

The sniper uses other equipment to reduce the chance of detection.

PRIMARY WEAPONS FOR OTHER SNIPER TEAM MEMBERS

2-101. The sniper's M110 SASS or M107 LRSR lacks the firepower to allow him to break contact. However, the other team member(s) have weapons that allow them to do so. Table 2-12 provides more information about these weapons.

NOTE: Refer to the field manuals (FMs) for each device for detailed characteristics and operating procedures.

Table 2-12. Primary weapons for other sniper team members.

DEVICE	DESCRIPTION	FIELD MANUAL
M16-Series Rifle	The leader-observer usually carries an M16A2 rifle or an M4 carbine with an M203 grenade launcher. The M16A2's rapid fire and the destructive firepower of the grenade launcher give the team the capability to break contact.	FMs 3-22.9 and 3-22.31
M4 Carbine with M203 Grenade Launcher		
M249 Squad Automatic Weapon (SAW)	On a heavy (three-Soldier) sniper team, the security member can carry the gas-operated, air-cooled, belt- or magazine-fed M249 SAW in the automatic rifle role.	FM 3-22.68

	This weapon fires from an open bolt and can fire heavy suppressive fire up to 850 rounds a minute. The Soldier can fire it from the shoulder, hip, underarm, or bipod. Belted ammunition feeds from a 100-round assault magazine or a 200-round ammunition box. In an emergency, the M249 SAW can use 20- or 30-round M16/M4 weapon magazines, but this increases the chance of stoppages.	

IMAGE-INTENSIFICATION AND INFRARED DEVICES

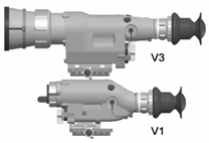
2-102. The sniper team uses various optical devices to help them conduct continuous operations during the hours of limited visibility. Table 2-13 outlines the image-intensification and infrared devices used.

NOTE: Refer to the technical manuals (TMs) for each device for detailed characteristics and operating procedures.

Image-intensification and infrared devices.

DEVICE	DESCRIPTION	TECHNICAL MANUAL
AN/PVS-14 Monocular Night Vision Device (NVD) 	The AN/PVS-14 is a lightweight, battery-operated, monocular NVD. It can be handheld or helmet-mounted for visual observation or weapon-mounted on the M16/M4 Picatinny rail and the M24 SWS with the monolock rail. It provides effective observation ability during night combat operations. Due to this being a passive device, it is undetectable by visual or electronic means.	TM 11-5855-306-10

AN/PVS-17 Monocular NVD 	The AN/PVS-17 is a lightweight, compact, and high performance system. It weighs less than two pounds and is submersible to 20 meters (66 feet). Mounting on the extended carbine rail has been optimized to allow other systems, such as a laser aimer/illuminator, to be used in conjunction with the sight. It has a standby mode that can be activated by a push button located on the top of the unit. Its red light-emitting diode (LED) dot projected reticle has five brightness levels controlled by a selection knob. The AN/PVS-17 has a 4.5x 108mm version that is being offered to extend engagement range beyond 600 meters.	N/A
AN/PAS-13B Heavy Thermal Weapon Sight (HTWS) 	The AN/PAS-13B HTWS is a second generation forward- looking infrared radar (FLIR) that can be used to see in total darkness, in adverse weather conditions, and through battlefield smoke and dust. Its user can differentiate between friendly and enemy vehicles by easily identifying cold spot recognition markers. Trace can also be spotted with this system. The AN/PAS-13B HTWS provides interchangeable telescopes for quick adaptation to any mission and has video output. It is electronically programmable, requires no visible light to operate, and will not shut down when hit by direct light. The AN/PAS-13B HTWS can be installed on the M2, M4, M16, M19, M24 SWS, and M107 LRSR, but is light enough to be handheld- operated.	TM 11-5855-312-10

AN/PAS-13C TWS 	The AN/PAS-13C (V1, V3) TWS is an infrared (IR) imaging sensor used for target acquisition under conditions of low visibility. IR light is received through the telescope, detected by an IR sensor, converted to digital data, processed, and displayed for the user.	TM 11-5855-316-10
AN/PVS-7 NVG 	These goggles have better resolution and viewing abilities than AN/PVS-5 NVG. They also mount on the head for hands-free use, if desired.	TM 11-5855-262-10-1
AN/PAQ-4C Infrared Aiming Light 	The AN/PAQ-4C provides a rapid, accurate aimpoint for personnel engaged in night operations. The AN/PAQ-4C does this by projecting a highly collimated laser beam invisible to the eye, but readily seen with NVG. Once boresighted to a weapon, the operator simply puts the laser beam on the target and fires. The AN/PAQ-4C has a range of 1,000 meters.	TM 11-5855-301-12&P
AN/PEQ-2A Target Pointer, Illuminator, Aiming Light 	The AN/PEQ-2A is a laser that emits a pinpoint beam of infrared light for precise aiming. It has a separate infrared illumination beam with adjustable focus to illuminate shadowed areas. The snipers use it with NVDs, handheld as an illuminator-pointer, or mounted with the included brackets and accessory mounts. The snipers can use the AN/PEQ-2A to accurately direct	TM 11-5855-308-12&P

	fire, as well as to illuminate and designate areas and targets.	

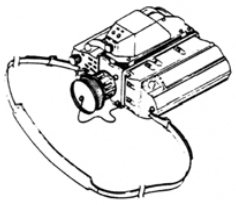
RANGEFINDERS

2-103. The mil-relation formula is a viable means of range estimation; however, in light of technological advances, laser rangefinders (Table 2-14) provide a more accurate and rapid means of estimating range to targets.

Table 2-14. Rangefinders.

DEVICE	DESCRIPTION	TECHNICAL MANUAL
Mark VII Handheld Eyesafe Laser Rangefinder 	The Mark VII handheld eyesafe laser rangefinder combines a Class I eyesafe laser rangefinder, a digital magnetic compass, switchable day or night vision channels, and an RS-232 digital interface into a compact, lightweight handheld device ideally suited for artillery forward observers, forward air controllers, and long-range reconnaissance patrols. When connected to a suitable global positioning system (GPS) and ruggedized handheld computer, precise target location information can be transmitted digitally.	N/A
Viper 	A multipurpose, day and night capable target acquisition sight and fire control unit, the Viper is designed for light infantry weapons and rocket launchers. The Viper attaches to the weapon over a standard Picatinny rail. This device	N/A

	integrates an x1 optical (red dot) sight with a data and symbols overlay, a laser rangefinder, a tilt and roll sensor, and a powerful processor. The Viper facilitates accurate aiming and firing of direct or indirect fire through the use of accurate range measuring and processing of aimpoint ballistic compensation.	
AN/PSQ-23 Illuminator, Integrated, Small Arms (STORM) 	The STORM is a compact micro-laser rangefinder with integral multifunction lasers. It contains a laser rangefinder, digital magnetic compass, visible aiming laser, infrared aiming laser, adjustable infrared illuminator, and a tactical engagement simulation system laser (multiple integrated laser engagement system [MILES]). All lasers [with the exception of the illumination laser] can be aligned to the bore of the individual weapon using a single set of azimuth and elevation adjusters.	TM 9-5855-1913-13&P
Vector 21 	Vector 21 serves as four instruments in one: its binoculars provide superb optics in a robust, watertight, rubber- armored casing; its digital compass displays the magnetic azimuth or grid azimuth in degrees, gon, or mils; its laser rangefinder measures 5 meters to over 10 kilometers, depending on the visibility and nature of the target; and its inclinometer displays vertical angles between -45 and +45 degrees. As its name implies, the Vector measures the polar vector from the sniper's position to the target.	N/A

AN/PVS-6 Mini Eyesafe Laser Infrared Observation Set (MELIOS) 	The MELIOS AN/PVS-6 is a lightweight range estimator. Snipers can use it handheld or mounted on a tripod. In its eyepiece, it displays accurate ranges from 50 to 9,995 meters, in 5-meter increments. Snipers can also mount it with and boresight it to the AN/TAS-6 long-range NVD.	TM 11-5860-202-10

OBSERVATION DEVICES

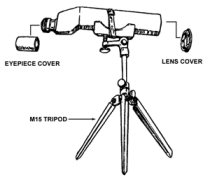
2-104. The team carries observation devices on every mission. The observer uses the chosen devices to determine wind speed and direction, read the mirage, and observe the bullet trace and impact. The sniper uses this information to quickly and accurately adjust for wind conditions. Two types of observation devices are used: telescopes and binoculars.

TELESCOPES

2-105. Telescopes are used for high-magnification, which permits long-range target observation and detection. The observer easily distinguishes camouflaged targets and those in deep shadows, which he would miss with shorter-range sighting devices. Table 2-15 outlines the types of telescopes that Army snipers use.

Table 2-15. Telescopes.

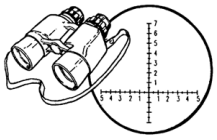
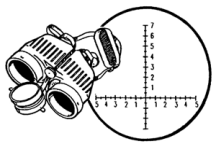
DEVICE	DESCRIPTION	TECHNICAL MANUAL

M144 Telescope 	This 15 x 45 power telescope is lightweight, but rugged. It is 16 inches long and weighs 6 3/4 pounds. The M144 has a detachable laser filter unit (LFU), a tripod, an antireflective device, and a carrying case.	N/A
M49 Telescope 	The M49 is a 20-power prismatic telescope. The M49 telescope has a removable eyepiece, objective lens covers, an M15 tripod with canvas carrier, and a hard case carrier for the scope itself.	TM 9-1556
GR12 Spotting Scope 	The GR12 is a 12x40 spotting scope with a 60-mm objective lens. It uses a fluoride-based glass objective for low dispersion of light and clearer, sharper color and contrast. The GR12 has a compact folding tripod, soft ballistic case, and carrying strap.	N/A

BINOCULARS

2-106. Because of their wider field of view, binoculars are better for hasty scans and large-area observation than the sniper scope or the observation telescope. Table 2-16 outlines the types of binoculars that Army snipers use.

Table 2-16. Binoculars.

DEVICE	DESCRIPTION
M19 Binoculars 	These 7-power binoculars, with their 50-mm objective lens, are the preferred optical instrument for hasty scans. They have an interpupillary scale on the hinge. One side of the binoculars has a laminated reticle pattern with a vertical and horizontal mil scale, graduated in 10-mil increments. The sniper can use these binoculars— To call for and adjust indirect fires. To observe target areas. To observe enemy movement and positions. To identify aircraft. To improve low-light viewing. To estimate and determine range.
M22 Binoculars 	These binoculars have the same features as the M19 binoculars, plus fold-down eyepiece cups for people who wear glasses--the eyepiece cups reduce the distance between the eyes and the eyepieces. The M22 binoculars also have protective covers for the objective and eyepiece lenses and laser-protection filters on the inside of the objective lenses. Direct sunlight can reflect off these lenses. The reticle pattern differs from that of the M19 binoculars.
M24 Binoculars	The M24 binocular is a lightweight, compact instrument intended for use in general field observation. The lens covers provide protection for the binocular. The binocular is equipped with a neck strap for easy portability. These binoculars are equipped with pop-down eye-cups for use by

	personnel who wear eyeglasses to shorten the distance between eyes and eyepiece.

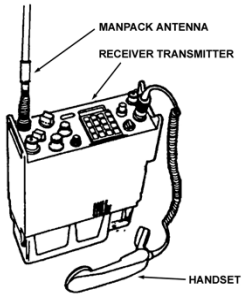
COMMUNICATION EQUIPMENT

2-107. The sniper team must have a man-portable radio that gives the team secure communications with the units involved in their mission. Table 2-17 outlines the communication equipment used by Army snipers.

NOTE: Refer to the technical manuals (TMs) for each radio system for detailed characteristics and operating procedures.

Table 2-17. Communication devices.

DEVICE	DESCRIPTION	TECHNICAL MANUAL
Single-Channel Ground-to-Earth Radio System (SINCGARS) RT-1523E 	The SINCGARS RT-1523E advanced system improvement program (ASIP) radio is the primary combat net radio for the Army, designated primarily for voice command and control for Infantry, armor, and artillery units. This single-channel ground and airborne radio system combines features of its predecessors with enhancements to reduce its weight and size and to optimize its performance in the tactical internet. SINCGARS can be used at short or long ranges for voice or digital communications. It can be used for single-channel operation or in a jam-resistant, frequency-hopping mode.	TM 11-5820-890-10-6

AN/PRC-119 Radio 	The sniper team carries this VHF/FM radio for secure communications with the other units on the same mission. This radio is designed for simple, quick operation. It has a 16-element keypad for push-button tuning. It can be used at short and long ranges for voice, frequency shift keying (FSK), or digital data communications. It can also be used for single-channel operation or in a jam-resistant, frequency-hopping mode that can be changed as needed.	TM 11-5820-890-10-1
AN/PRC-148 Radio 	The AN/PRC-148 is a rugged, lightweight, multiband handheld radio weighing less than two pounds. It operates in the 30-512 MHz frequency range and provides inter/intra team communications ground-to- ground, ground-to-air, and over satellite. The Joint Tactical Radio System enhanced multiband inter-/intra- team radio (JEM) configuration, which is an evolution of the battle-proven multiband inter-/intra-team radio, affords improved security, is capable of hosting future waveforms, and offers access to higher data throughput and networking capabilities.	N/A
AN/PRC-152 Radio	The AN/PRC-152 is a single-channel, multiband handheld radio providing the multi-mission capabilities needed by snipers. It is able to store multiple fill files, extending the time between	N/A

	reconfigurations. The handheld optionally includes an embedded GPS receiver to display local position and to provide automatic position reporting for situational awareness.	

OTHER TYPES OF EQUIPMENT

2-108. Every sniper should be equipped with the items outlined in Table 2-18, at a minimum.

Table 2-18. Other types of equipment.

DEVICE	DESCRIPTION
Sidearm	Each member of the team should have a sidearm such as an M9 or a .45-caliber handgun. This protects them from nearby threats while on the ground moving or while in a sniper position.
Compass	Each member of the sniper team must have a lensatic compass for land navigation.
Maps	The team must have military maps of the AO.
Calculator	The team uses a dual-powered (solar-powered with battery backup) pocket calculator with lighted display to compute

	distances with the mil-relation formula. The team should only use the lighted display under cover.
Rucksack	Ghillie suit
	Two-quart canteen
	Entrenching tool
	First-aid kit
	Pruning shears
	Sewing kit with needles and nylon thread
	Spare netting and garnish
	Rations
	Personal items, as needed
Metal measuring tape	The team carries a standard 10- to 25-foot metal carpenter's tape to measure items in the operational area. They record their findings in the sniper data book. NOTE: Chapter 4 discusses range estimation.

Chapter 3: Field Techniques

How well the sniper accomplishes his mission, and whether he avoids injury or death, depends largely on how well he knows, understands, and applies field techniques while he moves, hides, observes, and detects targets. This chapter discusses field techniques, including camouflage, movement, positions, observation, target detection and selection, range estimation, and records.

SECTION I. CAMOUFLAGE

Skillful camouflage techniques can determine not only the success of a mission, but also whether the sniper team lives or dies. The sniper must conceal himself, his equipment, and his position from enemy observation. To remain undetected, snipers must constantly use the available terrain, vegetation, and shadows to their advantage.

NOTE: See FM 20-3 for more information about camouflage.

TARGET INDICATORS

3-1. Target indicators are anything a Soldier does or fails to do that could result in detection. This aspect also applies to enemy soldiers; the sniper team can also use target indicators to detect the enemy. Target indicators include—

- Sound.
- Movement.
- Improper camouflage.
- Disturbance of wildlife.
- Odors.

SOUND

3-2. Although certain sounds of movement might be dismissed as natural, other sounds, such as the rattling of equipment and talking, are distinctly unnatural. Lack of visibility (i.e., darkness) heightens other senses, increasing the chances of detection.

MOVEMENT

3-3. The human eye is attracted to movement, and it detects quick or jerky movements more readily than slow, deliberate movements. Although movement is more easily detected in daylight, the eye will be similarly attracted at night.

IMPROPER CAMOUFLAGE

3-4. Reflections (shiny facial planes or inanimate surfaces), outlines, and shapes that contrast with their backgrounds draw certain attention to a position.

DISTURBANCE OF WILDLIFE

3-5. The sudden flight of birds, the abrupt cessation of animal sounds, or the fearful reaction of animals to unknown stimuli draws attention to an area.

ODORS

3-6. The smell of cooking food, smoke, soap, lotions, and insect repellents indicate human presence.

BASIC CAMOUFLAGE METHODS

3-7. The members of the sniper team use three basic methods of camouflage:

- Hiding.
- Blending.
- Deceiving.

HIDING

3-8. Team members conceal their bodies behind objects or thick vegetation.

BLENDING

3-9. Team members match their personal camouflage to the surrounding area well enough to avoid visual detection.

DECEIVING

3-10. The team deceives the enemy into drawing false conclusions about their location.

TYPES OF CAMOUFLAGE

3-11. The team can use two types of camouflage: natural and artificial.

NATURAL

3-12. Team members add local vegetation and other materials to their appearance to alter their outline and appearance.

NOTE: Always gather natural vegetation from the area where you are going as opposed to where you have been. Be aware of sudden vegetation changes.

ARTIFICIAL

3-13. Team members use materials or substances produced for the purpose of concealing with color or coverage, such as camouflage sticks, face paints, nets, or veils with which members can cover all exposed skin.

3-14. When using camouflage sticks or face paints, they lighten the shadowed parts of their faces and darken the shiny parts. They can use four techniques of applying camouflage (Table 3-1):

- Stripes.
- Blotches.

- Combination.
- Digital.

Table 3-1. Techniques of applying camouflage and their best use.

TECHNIQUE	BEST USE
Stripes	Heavily wooded areas with little leafy vegetation
Blotches	Areas with lots of leafy vegetation
Combination	Movement through changing terrain; all-purpose
Digital	Night and in urban or mountainous environments; depends heavily on color selection

FIELD-EXPEDIENT CAMOUFLAGE

3-15. The sniper team might have to use field-expedient camouflage, if they lack other means. In place of camouflage sticks or face paint, they could use charcoal, walnut stain, mud, or anything else that will hide the color of their skin. They should avoid using oil or grease due to the strong odor and shine. They should always use natural vegetation, which they can attach to the body using boot bands or rubber bands or by cutting holes in the uniform.

EQUIPMENT

3-16. The sniper team also camouflages their equipment, ensuring that the camouflage allows for unhindered operation.

RIFLES

3-17. All sniper and team weapons should be camouflaged to break up their outlines. The M110 SASS or the M24 SWS can be carried in a drag bag (Figure 3-1), which is a rifle case made of canvas. Like the ghillie suit, this bag can be covered with jute, which provides a base to apply natural vegetation.



Figure 3-1. Drag bag.

OPTICS

3-18. The team must camouflage their optics to avoid silhouetting them and to prevent light from reflecting off the lenses. They can cover lenses with field-expedient methods (i.e., mesh-type webbing or a "bird's nest" [rolled up grass placed into the lens]) or commercial products (i.e., the antireflection dioptic system, which is a honeycomb filter that screws onto the lens).

PACK

3-19. The team must also camouflage their pack. Whether they are traveling with a lightweight day pack, or an extended mission pack, it should be covered similarly to a drag bag to avoid detection. Netting and jute can be applied directly to the pack.

VEGETATION AND TERRAIN

3-20. The sniper team alters their camouflage to blend in with changes in vegetation and terrain in different geographic areas.

SNOW-COVERED AREAS

3-21. In snowy areas, blending colors works better than using texture. In areas with heavy snow or in wooded areas with trees covered with snow, the team should wear full white camouflage suits. In areas with snow on the ground but not on the trees, they should wear white trousers with green and brown tops.

DESERT

3-22. In sandy desert with little vegetation, the team should use blends of tan and brown. To remain unnoticed, they must make full use of available terrain and vegetation.

JUNGLE

3-23. In jungle areas, the team must use textured camouflage, contrasting colors, and natural vegetation.

URBAN AREAS

3-24. In urban areas, the sniper team's camouflage should consist of blended colors. Shades of gray in geometric shapes usually work best. Textured camouflage matters less in urban areas.

GHILLIE SUIT

3-25. The ghillie suit is a camouflage uniform that is covered with irregular patterns of jute/garnish, attached by netting (Figure 3-2). A ghillie suit does not make the sniper invisible to enemy observation; it only serves as a base in the total camouflage process.

DANGER

Ghillie suits will catch on fire. Keep them (and you, when you are wearing one) away from open flames. Avoid smoking near a ghillie suit or when wearing one.



Figure 3-2. Ghillie suit.

CONSTRUCTION

3-26. To construct a ghillie suit—

(1) Begin with a battle dress uniform (BDU), desert combat uniform (DCU), or Army combat uniform (ACU).

(2) Remove the pockets, and place them on the sleeves, shoulders, or sides of the shirt.

(3) Cover the front with canvas or some type of heavy, reinforced cloth.

(4) Cover heavy-wear areas, such as knees and elbows, with two layers of canvas.

NOTE: Canvas can be stitched with nylon twine or glued with rubberized cement.

(5) Reinforce the seam of the crotch with heavy nylon thread.

(6) Place the jute/garnish so that it covers the sniper's shoulders and reaches down just above his elbows (on the sleeves).

(7) Apply the jute/garnish to the back of the suit so that it covers the sniper's sides when in the prone position.

(8) Cover a bush hat with garnish so that it breaks up the outline of the sniper's neck, but allows the sniper to see and move.

(9) Make a veil from a net or piece of cloth covered with garnish or netting so that it covers the weapon and sniper's head when in a firing position.

NOTE: The veil can be sewn into the ghillie suit or carried separately.

(10) Add natural vegetation to help the sniper blend with his surroundings.

GHILLIE SUIT ACCESSORY KIT

3-27. Table 3-2 lists items included in the ghillie suit accessory kit (GSAK).

Table 3-2. Ghillie suit accessory kit (NSN 8415-01-394-7698).

Universal Netting, 46" x 60" (Desert Sand)	Dye Pack, 3 oz. (3 ea.) (Dark Green)

500 Denier Cordura, 60" x 60" (Olive Drab Green)	Dye Pack, 3 oz. (1 ea.) (Dark Brown)
500 Denier Cordura, 60" x 72" (Coyote)	Eagle Non-Elastic "Webbing" Suspenders (1) Green
Long Gun Concealment (1000 Denier Cordura), 6' (Desert Sand)	Ghillie Suit Netting, Brown (5' x 9')
1" Field Expedite SR Clips, 20 pieces. (Coyote Tan)	Drawstring Compression Sack 12" x 28", (Black)
1" Nylon Tubular Webbing, 20' (Desert Sand)	Seam Grip, 8 oz. tube (2 ea. per GSAK)
1" Velcro (Hook/Loop), 6' (Coyote Tan)	Grey/Tan Reversible Parka, Regular Length
2" Velcro (Hook/Loop), 3' (Coyote Tan)	Grey/Tan Reversible Trousers, Regular Length
8" Zip Ties, 200 pieces (Black)	Grey/Tan Reversible Pack Cover
550 Cord, gutted, 100' (Tan)	6 Rolls Modacrylic Material, 1 1/2" wide - 30 yds. Long, (Desert Sand)
New, Stronger Stainless Steel Needles, (1 Set)	2 Rolls Modacrylic Material, 1 1/2" wide - 30 yds. Long, (Green)

Thread T-138 Nylon, 1 lb. (Brown & Green)	2 Rolls Modacrylic Material, 1 1/2" wide - 30 yds. Long, (Brown)

COVER AND CONCEALMENT

3-28. Understanding and applying the principles of cover and concealment protects the sniper from enemy observation.

COVER

3-29. Cover is protection from the fire of enemy weapons. Natural (i.e., ravines, hollows, and reverse slopes) and artificial cover (i.e., fighting positions, trenches, and walls) protect the sniper from flat trajectory fires and partly protect them from high-angle fires and the effects of nuclear explosions.

3-30. Snipers must always seek and use all the cover that the terrain provides. Even the smallest depression or fold in the ground might provide some cover when the sniper needs it most. Properly used, a 6-inch depression can provide enough cover to save a sniper under fire. Snipers can also use the most difficult terrain available, because enemy patrols are less likely to move through these areas.

3-31. By combining proper cover and movement techniques, the sniper can protect himself from enemy fire. For protection while moving, the sniper uses routes that put cover between himself and the enemy.

CONCEALMENT

3-32. Concealment is protection from enemy observation. The sniper can use natural (i.e., bushes, grass, and shadows) or artificial concealment (i.e., materials such as burlap and camouflage nets). Snipers must consider the effects of seasonal changes on the materials used for natural and artificial concealment.

3-33. The principles of concealment include—

• Avoid unnecessary movement.

• Use all available concealment.

• Stay low to observe.

• Avoid shiny reflections.

• Avoid skylines.

• Alter familiar outlines.

• Observe noise and light discipline.

Avoid Unnecessary Movement

3-34. The team must remain as still as possible to maintain their concealment. Any movement, especially against a stationary background, can attract attention. When the team moves to a new position, they do so carefully and only inches at a time, always scanning ahead to ensure they are moving toward their next position. They move by a planned and concealed route, preferably during limited visibility.

Use All Available Concealment

3-35. Available concealment includes—

• Background.

• Shadows.

Background

3-36. Snipers must blend in with their background to prevent detection. The trees, bushes, grass, earth, and man-made structures that form the background vary in color and appearance. The team must choose natural or

man-made materials to alter their appearance, enabling them to avoid detection.

Shadows

3-37. In the open, the sniper team stands out clearly, but in the shadows, they are difficult to see. Shadows exist under most conditions, day and night.

Stay Low to Observe

3-38. A low silhouette makes it difficult for the enemy to see a sniper team; therefore, they observe from the lowest position terrain and vegetation allow.

Avoid Reflections

3-39. Reflections off shiny surfaces instantly attract attention and are visible from great distances. Snipers should use optics carefully in bright sunshine and always be aware that reflections can give him away.

NOTE: Watch faces, compasses, identification tags, and belt buckles should be covered or subdued if possible.

Avoid Skylines

3-40. The clear silhouette of a figure on the skyline is a good target. It is visible from great distances, even at night, because a dark outline stands out against the lighter night sky.

Alter Familiar Outlines

3-41. Military equipment and the human body are familiar outlines. The sniper team must disguise their shapes using ghillie suits or outer smocks covered with irregular patterns of garnish.

Observe Noise Discipline

3-42. The sniper team must keep quiet. Enemy patrols or OPs can easily distinguish equipment and human noises, such as clanking gear or talking. Before a mission, the team must silence their gear so that it makes no sound during movement. During the mission, they operate in silence.

3-43. The sniper team must avoid using any light if at all possible. If the team must use light, they use only a red light under a cover.

NOTE: The team should never use a white light.

SECTION II. MOVEMENT

A sniper team's mission and method of employment differ in many ways from those of the infantry squad. One of the most noticeable differences is in the movement techniques the sniper team uses. Because their movement must not be detected or even suspected by the enemy, the sniper team must master individual movement techniques.

MOVEMENT RULES

3-44. When moving, the sniper team must always—

- Assume the area is under enemy observation.
- Go slowly, measuring progress in inches and feet.
- Avoid rubbing against trees, bushes, and tall grasses, as this would cause overhead movement.
- Plan every movement and move in segments of the route at a time.
- Stop, look, and listen often.
- Move during disturbances such as gunfire, explosions, aircraft noise, wind, or anything that will distract the enemy's attention or conceal the team's movement.
- Understand the disturbance left by movement through an area.

INDIVIDUAL MOVEMENT TECHNIQUES

3-45. The individual movement techniques used by the sniper team are designed to allow undetected movement. These techniques include—

- Low crawl.

- Medium crawl.
- High crawl.
- Hand-and-knees crawl.
- Walk.

LOW CRAWL

3-46. The team should use this movement technique when—

- Concealment is extremely limited.
- The enemy is close.
- They occupy a firing position.

3-47. To perform a low crawl (Figure 3-3)—

NOTE: Darken any exposed skin on your hands before using this method.

(1) Lay on the ground, with your head down, legs together, and hands flat on the ground.

(2) Push with your toes and pull with your fingers to move.

(3) Hold your weapon by its sling if you are not using a drag bag.



Figure 3-3. Sniper low crawl.

MEDIUM CRAWL

3-48. The medium crawl resembles the infantry low crawl. The team uses this movement technique when concealment is limited, but they need to move faster than the sniper low crawl allows.

3-49. To perform a medium crawl (Figure 3-4)—

NOTE: Darken any exposed skin on your hands before using this method.

(1) Lay on the ground, with your head down, legs spread, and hands flat on the ground.

(2) Push with your legs and pull with your arms to move.

(3) Hold your weapon by its sling if you are not using a drag bag.



Figure 3-4. Medium crawl.

HIGH CRAWL

3-50. The high crawl resembles the infantry high crawl. The team uses this movement technique when—

- Concealment is limited.

- Concealment is high enough to allow sniper to raise his body off the ground.

3-51. To perform a high crawl (Figure 3-5)—

(1) Lay on the ground, with your head down.

(2) Raise your body slightly by supporting your body with your elbows and knees.

(3) Move on your elbows and knees.

(4) Cradle your weapon in your arms if you are not using a drag bag.

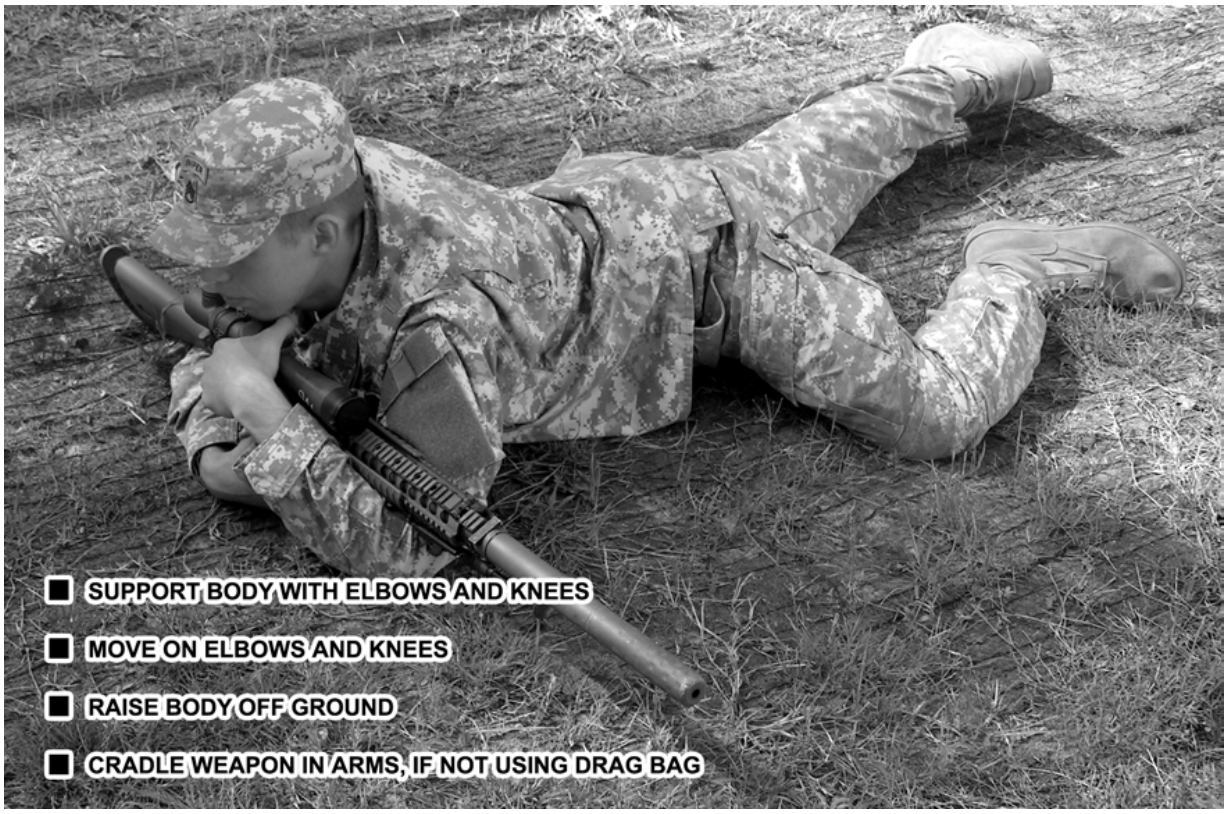


Figure 3-5. High crawl.

HAND-AND-KNEES CRAWL

3-52. The team uses the hand-and-knees crawl when—

- Some concealment is available.
- They need to move faster than the sniper medium crawl allows.

3-53. To perform a hands-and-knees crawl (Figure 3-6)—

(1) Lay on the ground.

(2) Raise your body by supporting your body with your knees and hand, and raise your head.

(3) Move on your knees and hand.

(4) Cradle your weapon in the arm not supporting your body, with your scope in your armpit.

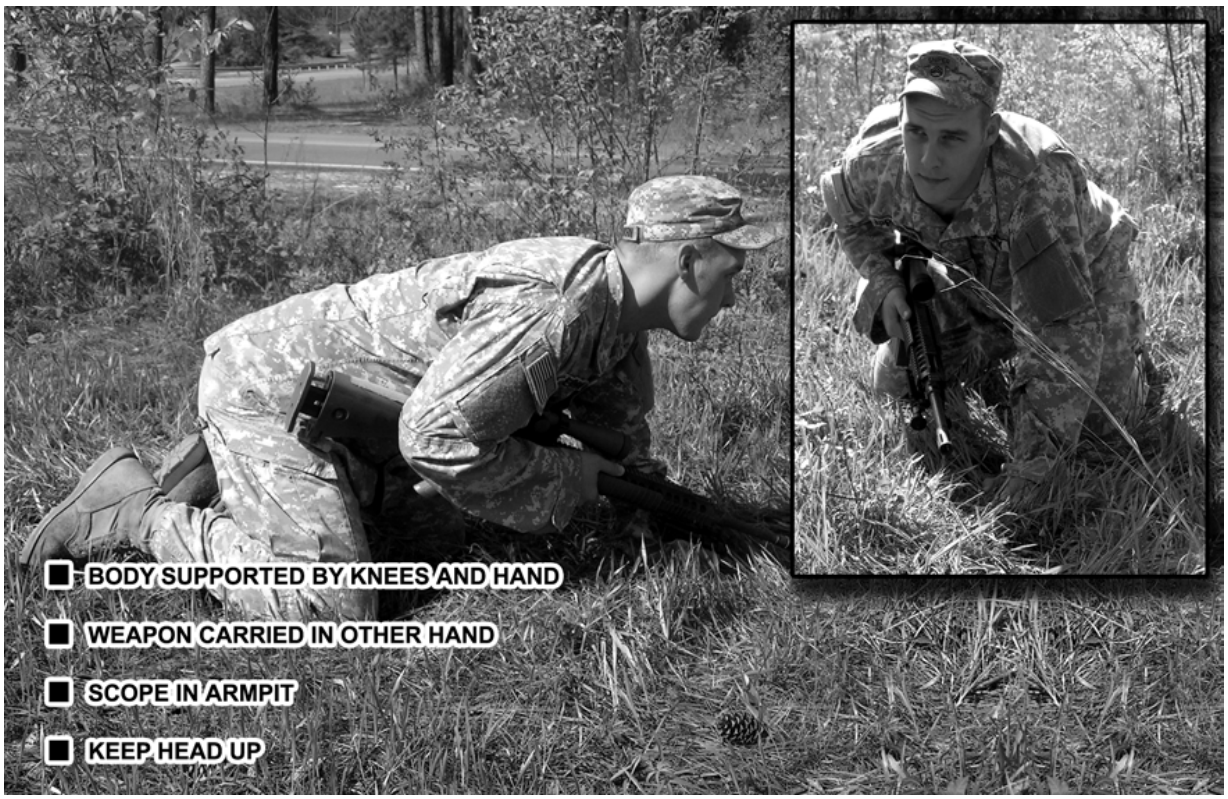


Figure 3-6. Hand-and-knees crawl.

WALK

3-54. The team walks when—

- Concealment is good.
- They need to move fast.
- The enemy is not likely to be close by.

3-55. To walk (Figure 3-7)—

(1) Crouch, with your body bent forward, knees bent, and head up.

(2) Align your weapon with your body, with the muzzle pointed down.

(3) Move by walking as normal.

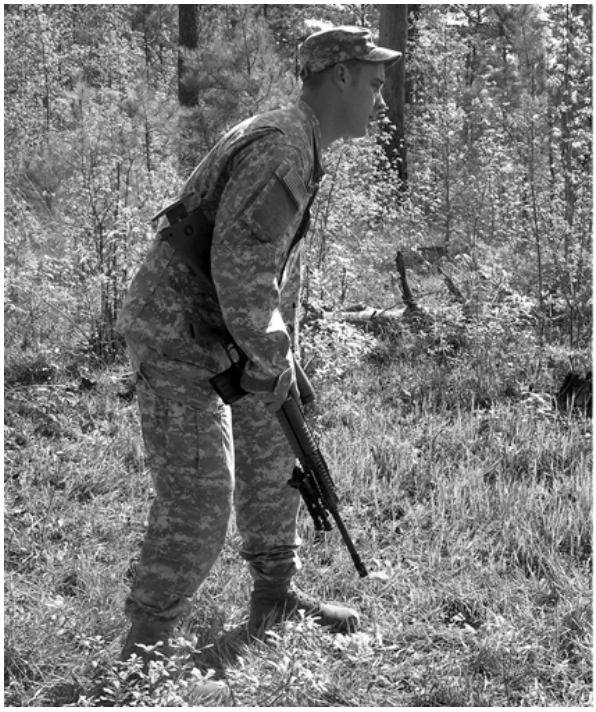


Figure 3-7. Walking.

TEAM MOVEMENT TECHNIQUES

3-56. Due to their lack of personnel and firepower, the sniper team must avoid detection by the enemy. It must also avoid fighting the enemy in sustained engagements.

MOVEMENT WITH SECURITY ELEMENT

3-57. The team can reach its AO faster and more safely when traveling with a security element than they could alone. The security element serves as a reaction force should the team be detected. When the sniper team is attached to a security element—

- The sniper team leader is in charge of the team while it is attached to the element.

- The sniper team always appears as an integral part of the element.

- The sniper team wears the same uniform as the element members.

- The sniper team maintains proper intervals and positions in all formations.

- Sniper team members should stay close to each other in formation and not on opposite sides of a wedge formation.

- The sniper weapon system is carried in line and close to the body or in a bag, hiding its outline and barrel length.

- All equipment unique to a sniper team (i.e., optics and ghillie suits) is concealed from view.

3-58. Depending on the type of mission, the sniper team could be attached to a security element of team to platoon size.

DETACHMENT FROM SECURITY ELEMENT

3-59. Once in the AO, the sniper team separates from the security element and operates alone. At the separation point, the security team can provide cover for the sniper team's operation. Two examples of separation follow.

Example 1

3-60. The security element provides security while the team prepares for the operation. When this occurs—

(1) The sniper team dons the ghillie suits and camouflages itself and its equipment.

(2) The sniper team ensures all equipment is secure and caches any nonessential equipment.

(3) Once the team is prepared, it assumes a concealed position, and the security element departs the area.

(4) Once the security element has departed, the team waits in position long enough to ensure neither itself nor the security element has been compromised. Then, the team moves to its tentative position.

Example 2

3-61. The security element conducts a short security halt at the separation point. When this occurs—

(1) The sniper team halts and ensures that they have good available concealment and that each person knows the others' locations.

(2) The security element proceeds, leaving the sniper team in place.

(3) The sniper team remains in position until the security element clears the area. Then, the team organizes itself as required by the mission and moves on to its tentative position.

NOTE: This type of separation works well in urban operations.

ROUTE SELECTION

3-62. When selecting routes, the sniper team must remember its strengths and weaknesses. The following guidelines should be used when selecting a route:

- Avoid known enemy positions and obstacles.
- Seek terrain that offers the best cover and concealment.
- Take advantage of difficult terrain (i.e., swamps, dense woods).
- Avoid trails, roads, and footpaths.
- Use caution when moving through urban or populated areas.
- Avoid areas of heavy enemy activity.

NAVIGATION

3-63. To aid the sniper team in navigation, they should—

- Memorize their route by studying maps, aerial photos, or sketches.

- Note distinctive features (i.e., hills, streams, and roads) and their locations relative to the route.

- Plan alternate routes.

- Plan how to circumvent obstacles.

- Use terrain countdown. The team should memorize terrain features along the route from the start point to the objective, and then count them as they pass to ensure they stay on the route.

ORIENTATION

3-64. The sniper team maintains orientation at all times. As it moves, it observes the terrain carefully and mentally checks off the distinctive features noted in the planning and study of the route. Many aids are available to ensure orientation:

- The locations and directions of flow of principal streams.

- Hills, valleys, roads, and other peculiar terrain features.

- Railroad tracks, power lines, and other man-made objects.

MOVEMENT FORMATION

3-65. The size of the sniper team and their limited firepower restrict them to one type of formation. When moving as a member of a two-man traditional sniper team—

- The team leader designates the movement techniques and routes used.

- The observer is the point man; the sniper follows.

- They maintain an interval of no more than 20 meters and keep visual contact with each other, even when lying on the ground.

- The observer maintains security to the front, from 9 o'clock to 3 o'clock. The sniper maintains security to the rear, from 3 o'clock to 9 o'clock (overlapping).

- The sniper reacts to the observer's actions.

- The team leader designates rally points.

IMMEDIATE ACTION DRILLS

3-66. A sniper team must never become decisively engaged with the enemy. They must rehearse immediate action drills until they react automatically and immediately to unexpected contact. Standing operating procedures (SOPs) should be established and rehearsed so that the team can react to different situations. These situations can include—

- Visual contact.

- Ambush.

- Indirect fire.

- Air attack.

Visual Contact

3-67. If the sniper team sees the enemy and the enemy fails to see the team, then the sniper team freezes. If they have time, they assume the best covered and concealed position and stay there until the enemy passes. If the enemy is entrenched, the sniper team must use an alternate route to their position.

NOTE: The team will not initiate contact.

Ambush

3-68. In an ambush, the sniper team's objective is to break contact immediately. For example—

(1) The observer delivers rapid fire.

(2) The sniper throws smoke grenades between the observer and the enemy.

(3) The sniper delivers well-aimed shots at the most threatening targets until the smoke covers the area.

(4) The observer throws fragmentation grenades and withdraws toward the sniper, ensuring that he does not mask the sniper's fire.

(5) The team moves to a location where the enemy cannot observe or place direct fire on it.

NOTE: If the team must remain in contact, the sniper calls for indirect fires or a security element. If team members get separated, they should return to the last designated en route rally point.

Indirect Fire

3-69. When reacting to indirect fires, the team must move out of the area as quickly as possible, which can result in the team's exact location and direction being pinpointed. Therefore, the team must not only react to indirect fire, but must also take actions to conceal their movement. For example—

(1) The team leader moves the team out of the impact area using the quickest route, giving the team the direction and distance to move (clock method).

(2) Team members immediately move out in the direction and go the distance he tells them.

(3) Once out of the impact area, the team leader moves the team farther away along the most direct concealed route and continues the mission using

an alternate route.

NOTE: If team members get separated, they should return to the last designated en route rally point.

Air Attack

3-70. When facing an air attack—

(1) Team members assume the best available covered and concealed positions.

(2) Between passes of the aircraft, team members move to positions with better cover and concealment.

NOTE: The team does not engage the aircraft.

(3) Team members remain in positions until attacking aircraft depart.

NOTE: If team members get separated, they should return to the last designated en route rally point.

SECTION III. POSITIONS

The sniper team selects a position based on the commander's intent. Position selection is characterized by the selection of three types of positions:

- Objective rally point (ORP).
- Tentative final firing position (TFFP).
- Hide.

Further, the sniper team determines four categories of positions:

- Primary.
- Alternate.
- Contingency.
- Emergency.

After the sniper team selects the location, they determine how they will move into the area to locate and occupy it.

SELECTION

3-71. Upon receiving a mission, the sniper team locates the target area, and then determines the best location for a TFFP. They use topographic maps, aerial photographs, pre-mission visual reconnaissance, and information from units in the area. The sniper team ensures that the position balances—

- Maximum fields of fire and observation of the target area.
- Concealment from enemy observation.
- Covered routes to and from the position.

- Location at least 400- to 700-meters from the target area.

- A natural or man-made obstacle between the position and the target area.

SITE LOCATION

3-72. The sniper team must use imagination and ingenuity in choosing a good location for the position. The location must allow the team to be effective, but must also appear to the enemy to be the least likely location for a team position, such as—

- The undersides of logs in a deadfall area.

- Tunnels bored from one side of a knoll to the other.

- Swamps.

- Deep shadows.

- Areas inside rubble piles.

3-73. A sniper team must remember that a position that seems ideally located may have the same appeal to the enemy. Therefore, the team avoids choosing locations at, on, or near—

- A point or crest of prominent terrain features.

- Isolated objects.

- Bends or ends of roads, trails, or streams.

- Populated areas.

CONSIDERATIONS

3-74. Whether a sniper team remains in position for a few minutes or a few days, the basic considerations for locating the position are the same:

- Location.
- Time.
- Personnel and equipment.

Location

3-75. When selecting a location, consider—

- Type of terrain and soil.
- Enemy location and capabilities.

Type of Terrain and Soil

3-76. Digging and boring tunnels can be tough, whether in hard soil or in fine, loose sand. The team adapts any gullies, holes, or hollow tree stumps that they can find.

Enemy Location and Capabilities

3-77. Enemy patrols in the area may be close enough to the position to hear any noises that the team might make during construction. The team also considers the enemy's night vision and detection capabilities.

Time

3-78. When selecting a position, time considerations include—

- Length of occupation.
- Construction time.

Length of Occupation

3-79. If the sniper team's mission requires it to remain in one position for a long time, the team builds a more livable position. This allows the team to operate more effectively for a longer time.

Construction Time

3-80. During mission planning, the sniper team must consider how long construction will take.

Personnel and Equipment

3-81. When selecting a position, personnel and equipment considerations include—

- Personnel needed for construction.
- Equipment needed for construction.

Personnel Needed for Construction

3-82. If needed, the team coordinates for more construction personnel or for a construction security element.

Equipment Needed for Construction

3-83. The team plans for the use of any extra equipment needed for construction (e.g., bow saws, picks, axes).

OCCUPATION

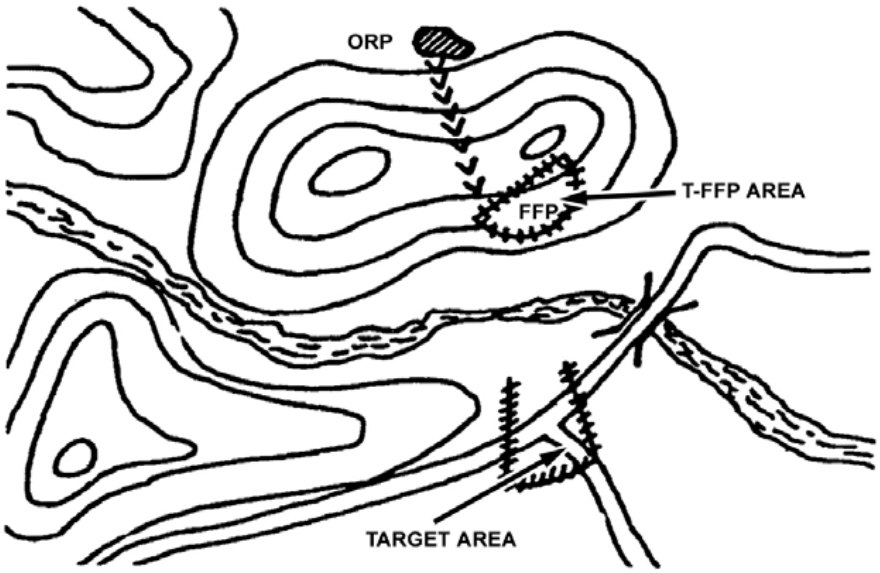
3-84. During the mission-planning phase, the sniper also selects an ORP. From the ORP, the sniper team reconnoiters the tentative position to determine the exact location of its final position. The ORP should provide cover and concealment from enemy fire and observation, and offer good routes into and out of the selected area. From the ORP, the team moves forward to view the tentative position area (Figure 3-8). While reconnoitering or moving to the position, the team—

- Moves slowly and deliberately in the low crawl.
- Avoids unnecessary movement of trees, bushes, and grass.
- Avoids making noise of any kind.

- Stays in the shadows, if any.
- Stops, looks, and listens every few feet.

3-85. When the sniper team arrives at the firing position, they—

- Conduct a detailed search of the target area.
- Start constructing the firing position.
- Organize equipment for easy access.



CONSTRUCTION

Figure 3-8. Tentative position areas.

3-86. A sniper mission always requires the team to occupy some type of position. These positions can range from a hasty position, which a team may use for a few hours, to a more permanent position, which the team might use for a few days.

NOTE: The team should always plan to build their position during limited visibility.

TYPES

3-87. The team can use hasty positions, expedient positions, or belly or semipermanent hide positions.

Hasty Position

3-88. The team uses a hasty position when they are in a position for a short time, when they cannot construct a position due to the location of the enemy, or when they must assume a position on the fly.

Advantages

3-89. This type of position—

- Requires no construction. The team uses whatever is available for cover and concealment.

- Can be occupied in a short time. As soon as they find a suitable position, the team need only prepare loopholes by moving small amounts of vegetation or by simply backing a few feet away from existing vegetation to conceal muzzle blast.

Disadvantages

3-90. This type of position—

- Affords no freedom of movement. Any careless movement could compromise the team.

- Restricts observation of large areas. This type of position is normally used to observe a specific target area (intersection, passage, or crossing).

- Offers no protection from direct or indirect fires.

- Relies heavily on personal camouflage. The team's only protection against detection is personal camouflage and the ability to use the available terrain.

Timelines

3-91. This type of position does not require construction. The team should remain in this type of position only for up to 12 hours.

Expedient Position

3-92. When a sniper team must stay in position longer, they should construct an expedient position (Figure 3-9). This position keeps the sniper's silhouette as low as possible, but still allows him to fire and observe effectively.



Figure 3-9. Expedient position.

Advantages

3-93. This type of position—

- Requires little construction. This type of position is constructed by digging a hole in the ground just large enough for the team and its equipment. Soil dug from the position can be placed in sandbags and used for building firing platforms.

- Conceals most of the body and equipment. Only optics, rifles, and the heads of the sniper team are visible above ground level.

- Provides some protection from direct fires due to its lower silhouette.

Disadvantages

3-94. This position—

- Affords more freedom of movement than the hasty position, but movement is still restricted.

Team members must keep themselves below ground level and raise and lower their heads slowly.

- Affords little protection from indirect fires. This position offers no protection from fragmentation and falling debris.

- Exposes the head, weapons, and optics. The team must rely heavily on the camouflage of these exposed areas.

Timelines

3-95. This time required for construction varies from 1 to 3 hours, depending on the situation. The team should remain in this type of position from 6 to 12 hours.

Belly Hide Position

3-96. This type of position (Figure 3-10) is much like the expedient position. However, the team can dig out a belly-hide position beneath a tree, rock, tracked vehicle, rubble pile, or any other available object that offers overhead protection, freedom of movement, and a concealed entrance and exit.

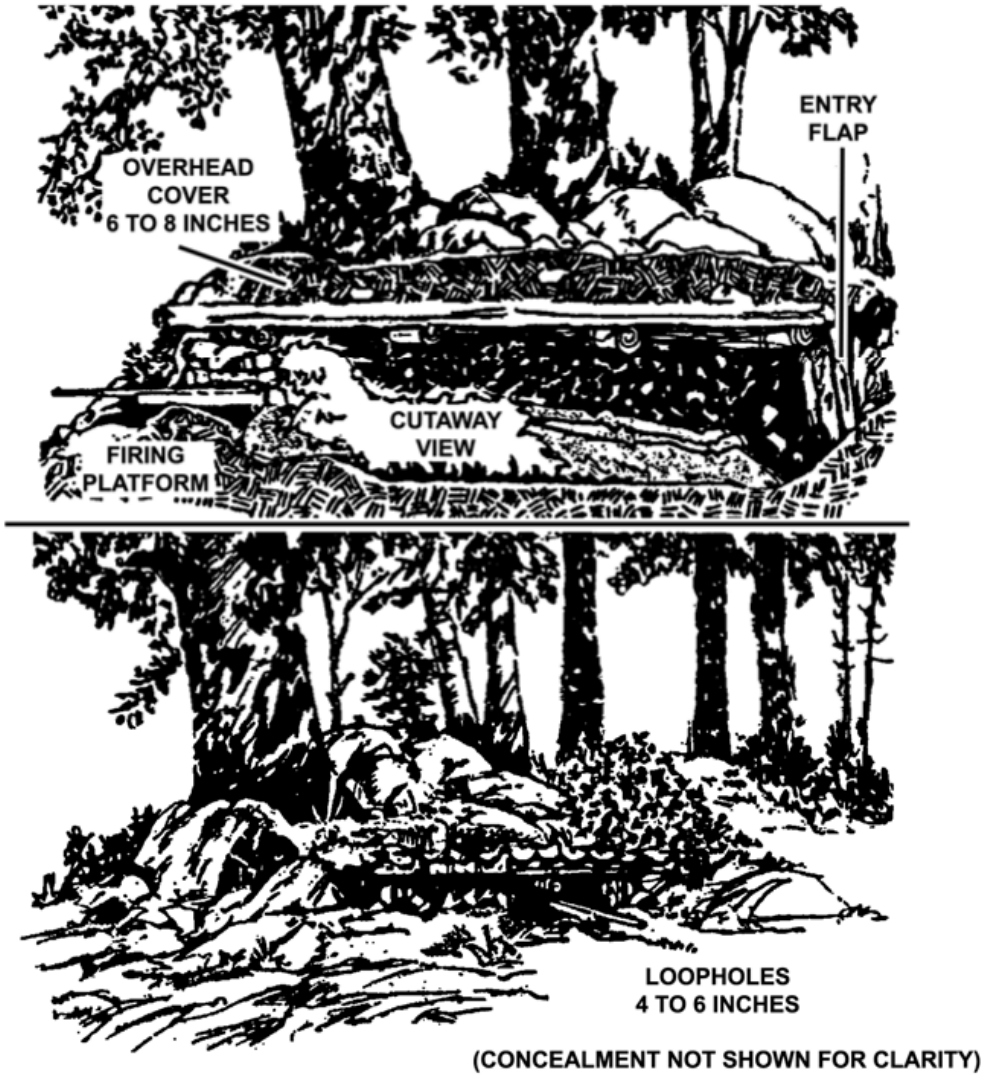


Figure 3-10. Belly hide position.

Advantages

3-97. This type of position—

- Has overhead cover, which protects the team from the effects of indirect fires.

- Enables the team to move freely in the darkened area inside the position.

NOTE: Cover the entrance or exit door to prevent silhouetting.

- Enables the team to store all equipment except the rifle barrels, which must remain in a hide position. If team can build a large enough position, they might also keep rifle barrels inside.

Disadvantages

3-98. This type of position—

- Takes longer to build than an expedient position.
- Uses more materials and tools such as saws, axes, and waterproofing.
- Limits the sniper's body positions.

Timelines

3-99. This time required for construction varies from 4 to 6 hours. The team should remain in this type of position from 12 to 48 hours.

Semipermanent Hide Position

3-100. The semipermanent hide position (Figure 3-11) is used mostly in defensive situations. Like the belly hide position, it takes more people and time to construct than other types of positions. It can be constructed by tunneling through a knoll or under natural objects already in place. Unlike the belly hide position, it is designed to allow sniper teams to remain in place for extended periods or to be relieved in place by other sniper teams.



Figure 3-11. Semipermanent hide position.

Advantages

3-101. This type of position—

- Offers the most freedom of movement within the position. Team members can sit, stand, lie down, and move back and forth freely.

- Has overhead cover, which protects the team from the effects of indirect fires.

- Offers complete concealment. Only the loopholes are detectable.

- Lets both sniper and observer see the target area at the same time.

- Is easy to maintain for extended periods.

- Lets the team operate effectively for a longer period of time than other types of positions.

Disadvantages

3-102. Compared to other types of positions, a semipermanent hide position —

- Takes more people, time, and tools to build. For this reason, it must be constructed well away from the enemy, at night, and finished before dawn.

- Increases risk of detection. Using a position for several days or having teams relieve each other in a position always increases the risk of detection.

Timelines

3-103. This time required for construction varies from 4 to 6 hours, with four people working. The team should remain in this type of position for 48 or more hours (if the team is relieved by other teams).

ELEMENTS

3-104. Hide position should incorporate the following elements—

- Pit.

- Exterior construction.

- Overhead cover.

- Entrance.

- Loopholes.

- Camouflage.

- Approaches.

Pit

3-105. Construction of the hide position starts with the pit, since it protects the sniper team. The snipers remove all excavated dirt by placing it in sandbags, taking it away on a tarp, or removing it by some other means.

Then, they hide the dirt in a plowed field, under a log, or in another location.

Exterior Construction

3-106. Belly and semipermanent hide positions can be constructed of stone, brick, wood, or turf. Regardless of material, the team does their best to bulletproof the front of the hide position. The team can use the following techniques:

• Pack protective jackets around the loophole areas.

• Emplace an angled armor plate with a loophole cut into it behind the hide loophole.

• Sandbag the loopholes from the inside.

Overhead Cover

3-107. The team builds the roof on top of logs. To keep dust out of the position, they place a tarp, layers of empty sandbags, or canvas over the logs. They follow this with a layer of dirt, a layer of gravel, another layer of dirt, then camouflage. They should try to countersink the roof to make it hard for the enemy to see.

Entrance

3-108. To prevent detection, the sniper team constructs an entrance door sturdy enough to bear a man's weight.

Loopholes

3-109. Constructing loopholes (Figure 3-12) takes care and practice to ensure that they allow adequate fields of fire. Each loophole measures 10 to 14 inches in diameter inside, tapering to 4 to 8 inches in diameter outside. Overhead clearance must allow the sniper to sight on the target area with his scope. To camouflage loopholes, the team uses foliage or other materials that blend with or are natural to the surroundings.

NOTE: To cover a large area, a position may have more than two sets of loopholes. The entrance/exit must be covered to prevent light from entering and highlighting the loopholes. Also, the team should cover the loopholes when they are not using them.

Camouflage

3-110. The ground surrounding the hide must appear unaltered; camouflage must blend with the surroundings.

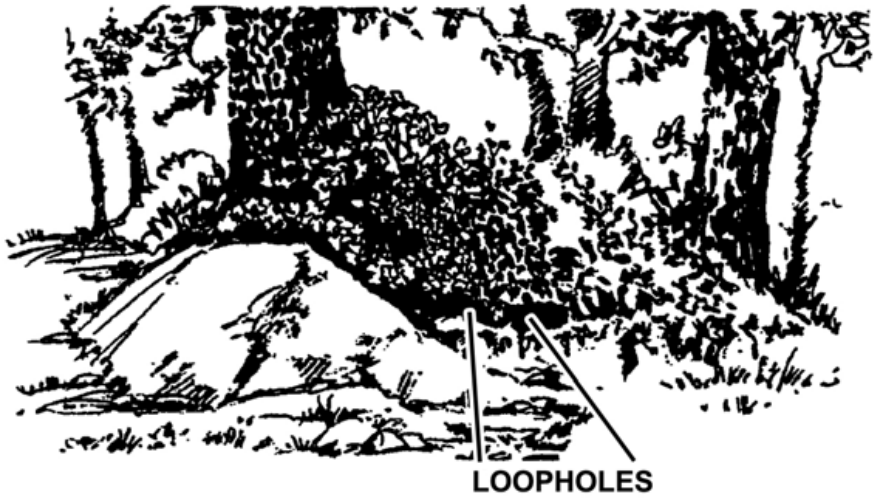


Figure 3-12. Loopholes.

Approaches

3-111. Because construction time would have been wasted if the enemy saw the team entering the hide, the team must conceal their approaches to it. They should try to enter the hide in the dark, move as little as possible, and adhere to trail discipline. In built-up areas, they need a secure and quiet approach. To avoid drawing attention to the mission, they must plan movement carefully.

ROUTINE

3-112. Although the construction of positions may differ, the routines while in position are the same:

- When rotating observation duties, the sniper weapon should remain in place on the firing platform, and the optics should be handed from one team member to the other.

- The sniper data book, observation logs, range cards, and the radio should be placed between the team members so that both have easy access to them.

- The team members should establish a system of observing, eating, resting, and making latrine calls.

SECTION IV. OBSERVATION

The sniper team's success depends upon its powers of observation. The purpose of observation is to gather facts and provide information for a specific intent. The sniper team performs the secondary mission of collecting and reporting battlefield intelligence to enable the commander to act rather than react.

TYPES OF VISUAL SEARCHES

3-113. While observing a target area, the sniper team alternately conducts two types of visual searches: hasty and detailed.

HASTY SEARCH

3-114. A hasty search is the first phase of observing a target area. The observer conducts a hasty search immediately after the team occupies the firing position. A hasty search consists of quick glances with binoculars at specific points, terrain features, or other areas that could conceal the enemy. The observer views the closest area first, since it poses the most immediate threat. Then, he searches farther out until he has searched the entire target area. When he sees or suspects a target, he uses an observation telescope to view the area in detail.

NOTE: The telescope's narrow field of view increases search time, and its strong magnification causes eye fatigue sooner than if using the wider field of view, but weaker magnification binoculars.

DETAILED SEARCH

3-115. After completing a hasty search, the observer conducts a detailed search (Figure 3-13). This is a more thorough search of the target area. It consists of 180-degree arcs or sweeps, 50 meters in depth, with each sweep overlapping the previous one by at least 10 meters. This ensures that the

observer sees the whole area. Just as with the hasty search, the observer starts by searching the area nearest the sniper team's position.

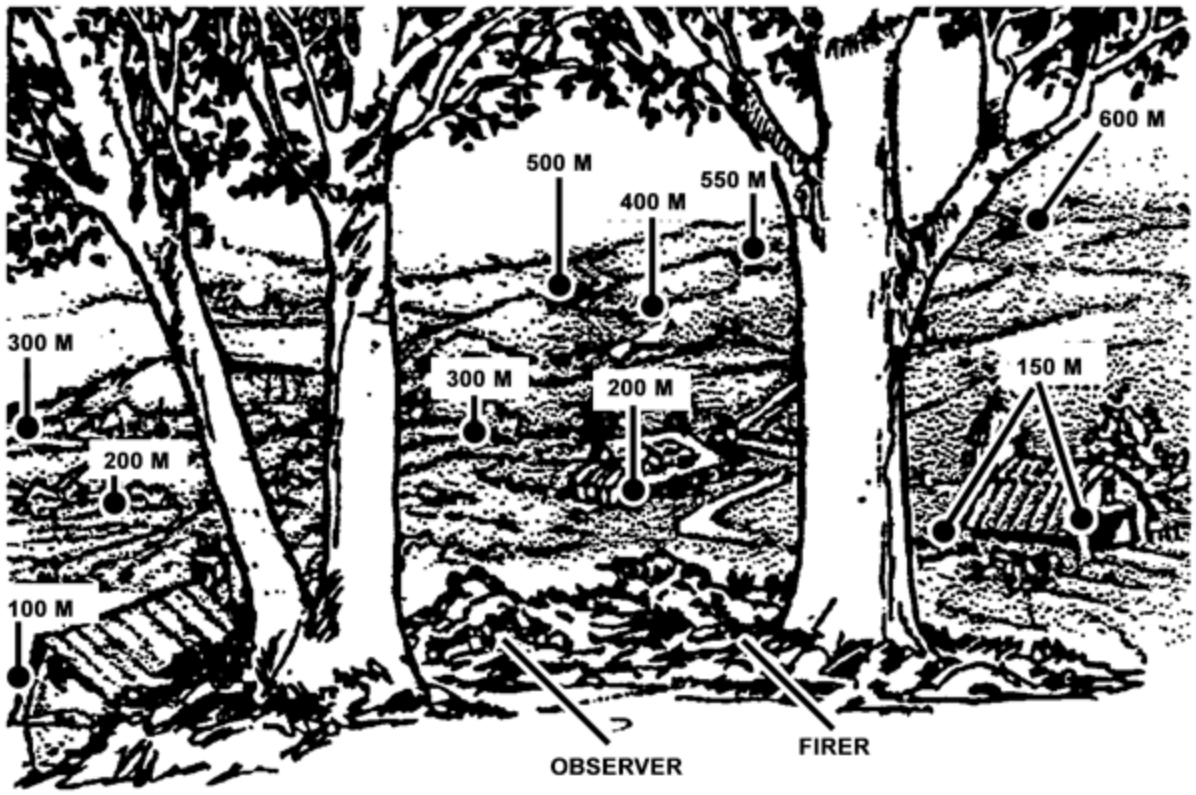


Figure 3-13. Detailed search.

SEARCH CYCLE

3-116. The team repeats the hasty-detailed search cycle three or four times. This helps them get used to the area. With each pass, they see things that they missed before. While the observer initially searches the area, the sniper records prominent features, reference points, and distances on a range card. After the first cycle of searches (one hasty followed by one detailed search) is finished, the observer views the area using a combination of hasty and detailed search techniques. After that, the team members alternate the observation task about every 30 minutes.

ELEMENTS OF OBSERVATION

3-117. The four elements of observation include—

- Remaining aware.
- Understanding.
- Recording.
- Responding.

REMAINING AWARE

3-118. Awareness means consciously tuning into a specific fact. A sniper team must stay aware of their surroundings, taking nothing for granted. They must also consider other elements that can influence and distort their awareness:

- An object's size and shape can be misinterpreted if viewed incompletely or inaccurately.
- Distractions degrade the quality of observations.
- Active participation or degree of interest can diminish toward the event.
- Physical abilities (the five senses) have limitations.
- Environmental changes affect accuracy.
- Imagination can exaggerate or distort observations.

UNDERSTANDING

3-119. Understanding comes from education, training, practice, and experience. It enhances the sniper team's knowledge about what they should observe, broadens its ability to view and consider all aspects, and aids in its evaluation of information.

RECORDING

3-120. Recording is the ability to save and recall what was observed. Usually, the sniper team has mechanical aids (i.e., writing utensils, sniper data book, sketch kits, tape recorders, and cameras) to support the recording of events. However, the best tool for recording observations is memory. The ability to record, retain, and recall depends on the team's mental capacity, alertness, and ability to recognize what they need to record the most. Other factors that affect recording include—

- The amount of training and practice in observation.
- Skill gained through experience.
- Similarity of previous incidents.
- Time interval between observing and recording.
- The ability to understand or convey messages through verbal or other means.

RESPONDING

3-121. Response is the sniper team's action toward information. It may be as simple as recording events in a sniper data book, making a communications call, or firing a well-aimed shot.

NOTE: Chapter 9 discusses the keep in memory (KIM) exercise.

TWILIGHT TECHNIQUES

3-122. Because twilight induces a false sense of security, both sides are prone to carelessness and are more likely to cause a target indicator. With this in mind, the sniper team must take additional precautions. For example, they should note the locations of OPs for night reference.

NOTE: The M3A and the TMR telescope reticle are still visible up to 30 minutes after end evening nautical twilight (EENT) and before begin morning nautical twilight (BMNT).

NIGHT TECHNIQUES

3-123. Without night vision devices (NVDs), the sniper team must depend upon eyesight. Regardless of night brightness, the human eye functions with less precision at night than during the day. For maximum effectiveness, the team must apply the following principles of night vision:

- Night adaptation.
- Off-center vision.
- Factors affecting night vision.

NIGHT ADAPTATION

3-124. Before departing on a mission, the sniper team should wear sunglasses or red-lenses goggles in lighted areas. After departure, they should halt for 30 minutes to listen and to adapt to the darkness.

OFF-CENTER VISION

3-125. In dim light, an object under direct focus blurs, appears to change, and sometimes fades out entirely. However, when the eyes are focused at different points, about 5 to 10 degrees away from an object, peripheral vision provides a sharper view.

FACTORS AFFECTING NIGHT VISION

3-126. The sniper team controls the following night vision factors:

- Having too little Vitamin A in the system impairs night vision. However, taking large dosages of Vitamin A all at once will not improve night vision (and can be toxic); this must be accomplished gradually.

- Colds, fatigue, narcotics, headaches, tobacco usage, and alcohol reduce night vision.

- Exposure to bright light degrades night vision and requires a re-adaptation to darkness.

ILLUMINATION AIDS

3-127. The sniper team may use artificial illumination to observe and fire. Examples include—

- Artillery illumination fire.

- Campfires.

- Lighted buildings.

ARTILLERY ILLUMINATION FIRE

3-128. Artillery and mortar fire can illuminate the target area. If available, mortar illumination cartridges using infrared can be used in conjunction with NVDs. However, great care must be taken to avoid alerting the enemy.

CAMPFIRES

3-129. Enemy soldiers might be illuminated by fires from battlefield damage or, if poorly disciplined, use campfires. The sniper can use this opportune illumination to engage the enemy.

LIGHTED BUILDINGS

3-130. The sniper can eliminate occupants of lighted buildings or nearby personnel revealed by the light source.

SECTION V. TARGET DETECTION AND SELECTION

To determine targets, the sniper team records the types and locations of potential targets in the area. The team must select key targets that will cause the greatest harm to the enemy in a given situation. The team must also consider if indirect fire would work better on some targets, based on their sizes or locations.

TARGET INDEX

3-131. To index targets and reduce engagement time, the sniper team refers to the completed DA Form 7637-R (Sniper's Range Card). The observer locates a prominent terrain feature near the target and provides this and other useful information to the sniper to help him find the target. Information that the team members share varies with the situation. Depending on the condition of the battlefield and the number of possible targets, the observer might sound like a forward observer (FO) giving a call for fire to a fire direction center (FDC).

PURPOSE

3-132. The sniper team indexes targets for the following reasons:

- The team can occupy the final firing position (FFP) before an attack. While there, they locate, index, and record target locations, and then decide on the priority of the targets.

- Indiscriminate firing might alert closer, more valuable enemy targets.

- Engagement of a distant target might disclose the FFP to a nearby enemy.

- Sighting of several targets at the same time requires a system for remembering all the locations.

CONSIDERATIONS

3-133. When indexing targets, the sniper team considers—

- Exposure times.
- Number of targets.
- Spacing or distance between targets.
- Evaluation of aiming points.

Exposure Times

3-134. Moving targets might only be exposed for a short time. The sniper team should note where each target disappears before the engagement. This allows the team to fire at several targets in rapid succession.

Number of Targets

3-135. If several targets appear and disappear at the same time, the sniper team will have a hard time determining each target's point of disappearance. Therefore, sniper teams must concentrate on the most important targets.

Spacing or Distance Between Targets

3-136. The greater the distance between targets, the more difficult it is to see their movement. In such cases, the team should locate and engage the nearest targets.

Evaluation of Aiming Points

3-137. Targets that disappear behind good aiming points are easily recorded and remembered; targets with poor aiming points are easily lost. Assuming that two such targets are of equal value and danger, the team should engage the one with the most dangerous aiming point first.

LOCATION OF HIDDEN FIRES

3-138. To locate hidden fires, the team uses the crack-thump method. When using this method, the team listens for the crack of the round and the thump of the weapon being fired to obtain the distance to and location of the firer.

Distance to Firer

3-139. The time difference between the crack and the thump can be converted into an approximate range. A one-second lapse between the two is about 550 meters with most calibers.

Location of Firer

3-140. By observing in the direction of the thump and near the predetermined range, the sniper team has a good chance of seeing the enemy's muzzle flash or blast from subsequent shots.

Limitations

3-141. The crack-thump method has the following limitations:

- Isolating the crack and thump is difficult when many shots are fired.

- Mountainous areas, tall buildings, and other high, restrictive terrain can cause echoes, which render this method ineffective.

TARGET SELECTION

3-142. Target selection may be forced upon the sniper team. For example, the team might lose a rapidly moving target before they can positively identify it. Further, any enemy that threatens the position of the sniper team is a high-value target.

3-143. When selecting key targets, the team must consider the following factors:

- Threat to sniper team.

- Probability of first-round hit.

• Certainty of target's identity.

• Target's effect on enemy.

• Enemy reaction to sniper fire.

• Effect on overall mission.

THREAT TO SNIPER TEAM

3-144. The sniper team must consider the relative danger that the target presents. This can be an immediate threat, such as an enemy element approaching the team's position, or a future threat, such as enemy snipers or dog tracking teams.

PROBABILITY OF FIRST-ROUND HIT

3-145. The sniper team must determine the chances of hitting the target with the first shot by considering—

• Distance to the target.

• Wind direction and velocity.

• Visibility of the target area.

• Amount of the target that is exposed.

• Time the target is exposed.

• Speed and direction of target movement.

CERTAINTY OF TARGET'S IDENTITY

3-146. The sniper team must be reasonably certain that the target it is considering is the key target. The team must be familiar with the target’s identity. This includes uniform markings and special equipment. For example, since officers are normally higher priority targets than

noncommissioned officers (NCOs), knowing rank insignias will help the sniper properly identify the key target.

TARGET'S EFFECT ON ENEMY

3-147. The sniper team must consider what the loss of a particular target will do to the enemy's fighting ability. The team must choose the target whose loss will be the most detrimental to the enemy's ability to fight.

ENEMY REACTION TO SNIPER FIRE

3-148. The sniper team must consider what the enemy will do once the shot has been fired. They must be prepared to receive immediate indirect suppressive fire, and for enemy sweeps of the area.

EFFECT ON OVERALL MISSION

3-149. The sniper team must consider how the engagement will affect the overall mission. The mission might be to gather intelligence for a certain period of time. Firing not only alerts the enemy to a team's presence, but might also stop the mission if it forces the team to move from its position.

KEY TARGETS

3-150. Key targets include key personnel and weapon systems and equipment.

PERSONNEL TARGETS

3-151. Key personnel targets identify themselves by their actions or mannerisms, positions within formations, rank or insignia, or worn or carried equipment. Key personnel targets include—

- Snipers.
- Dog tracking teams.

- Scouts.
- Officers.
- Noncommissioned officers.
- Vehicle commanders and drivers.
- Communication personnel.
- Weapon crews.

Snipers

3-152. Snipers are the number one target of any sniper team. An enemy sniper threatens friendly forces and is the natural enemy of the sniper. The fleeting nature of a sniper is reason enough to engage him because he might never be seen again.

Dog Tracking Teams

3-153. Dog tracking teams greatly threaten sniper and other special teams working in the area. It is hard to fool a trained dog. When engaging a dog tracking team, the sniper should engage the dog's handler first; this confuses the dog, and other team members may be unable to control it.

Scouts

3-154. Scouts are keen observers, provide valuable information about friendly units, and have the ability to control indirect fires, making them dangerous on the battlefield.

Officers

3-155. In some forces, losing key officers causes major disruption and impairs coordination for hours.

Noncommissioned Officers

3-156. Losing NCOs disrupts operations and reduces the morale of lower ranking personnel.

Vehicle Commanders and Drivers

3-157. Many vehicles are useless without a commander or driver. Shooting the driver could cause the vehicle to crash, injuring or killing others on board.

Communication Personnel

3-158. In some forces, only highly trained personnel know how to operate the various types of radios. Eliminating these soldiers can seriously damage the enemy's communications.

Weapon Crews

3-159. Eliminating weapon crews reduces the amount of fire on friendly troops.

WEAPON SYSTEMS AND EQUIPMENT TARGETS

3-160. Key targets can also include weapon systems and equipment. Key weapon systems and equipment targets include—

- Weapon systems.
- Optics on vehicles.
- Communication and radar equipment.

Weapon Systems

3-161. Many high-technology weapons, especially computer-guided systems, can be rendered useless by one well-placed round in the guidance controller.

Optics on Vehicles

3-162. Inside closed vehicles, personnel can only see outside by looking through optics. The sniper can blind a vehicle by damaging these systems.

Communication and Radar Equipment

3-163. The right shot in the right place can ruin a tactically valuable radar or communication system. Also, only highly trained personnel can repair these systems in place. Eliminating these personnel might impair the enemy's ability to perform field repair.

SECTION VI. RANGE ESTIMATION

A sniper team must accurately determine distance, properly adjust elevation on the sniper weapon system, and prepare topographical sketches or range cards. Thus, the team must know various range estimation techniques.

FACTORS

3-164. Three factors affect range estimation (Table 3-3):

- Nature of target.
- Nature of terrain.
- Light conditions.

Table 3-3. Factors that affect range estimation and effects.

FACTORS	EFFECTS
Nature of the Target	
Outline	An object of regular outline, such as a house, appears closer than one of irregular outline, such as a clump of trees.
Contrast	A target that contrasts with its background appears to be closer than it actually is.
Exposure	A partly exposed target appears more distant than it actually is.

Nature of Terrain	
Contoured Terrain	Looking across contoured terrain makes a target seem farther.
Smooth Terrain	Looking across smooth terrain, such as sand, water, or snow, makes a distant target seem nearer.
Downhill	Looking downhill at a target makes it seem farther.
Uphill	Looking uphill at a target makes it seem nearer.
Light Conditions	
Sun Behind Observer	A front-lit target seems nearer.
Sun Behind Target	A back-lit target seems farther away.

METHODS

3-165. Sniper teams use seven methods to estimate range to the target:

- Paper strip method.
- 100-meter unit of measure method.
- Appearance of object method.

- Bracketing method.
- Range card method.
- Mil-relation formula.
- Combination method.

PAPER STRIP METHOD

3-166. The paper strip method (Figure 3-14) is useful when determining longer distances (1,000 meters or greater). To perform this method—

(1) Place the edge of a strip of paper on the map, and ensure it is long enough to reach between the two points.

(2) Pencil a tick mark on the paper at the team's position and another at the distant location.

(3) Place the paper on the map's bar scale, located at the bottom center of the map. Align the left tick mark with the 0 on the scale.

(4) Read to the right to the second mark, and note the corresponding distance represented between the two marks.

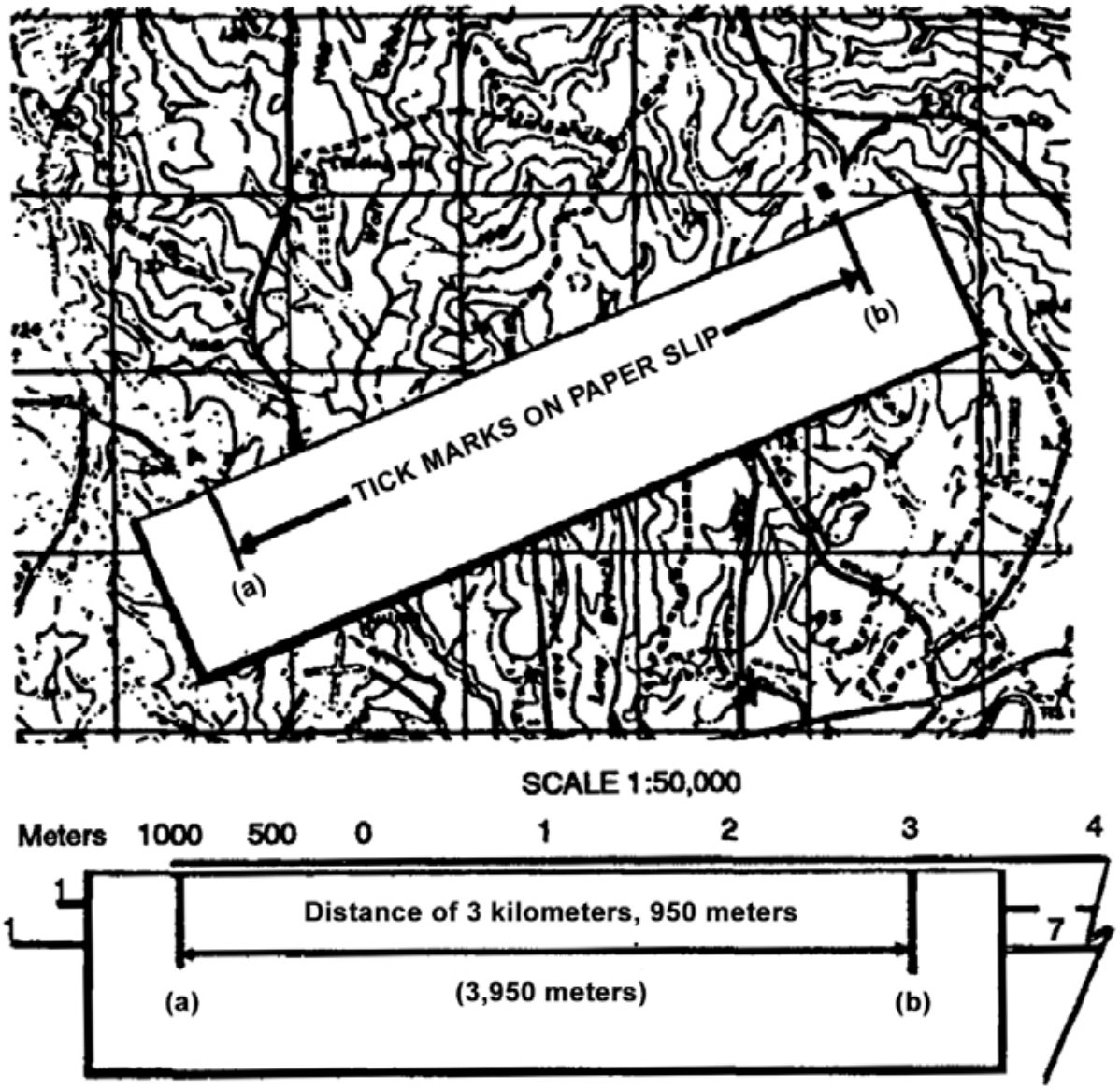


Figure 3-14. Paper strip method.

100-METER UNIT OF MEASURE METHOD

3-167. To use this method (Figure 3-15)—

(1) Visualize a distance of 100 meters on the ground.

(2) For ranges up to 500 meters, determine the number of 100-meter increments between the two objects you wish to measure.

(3) Beyond 500 meters, select a point halfway to the object, and determine the number of 100-meter increments to the halfway point. Double this number to estimate the range to the object.

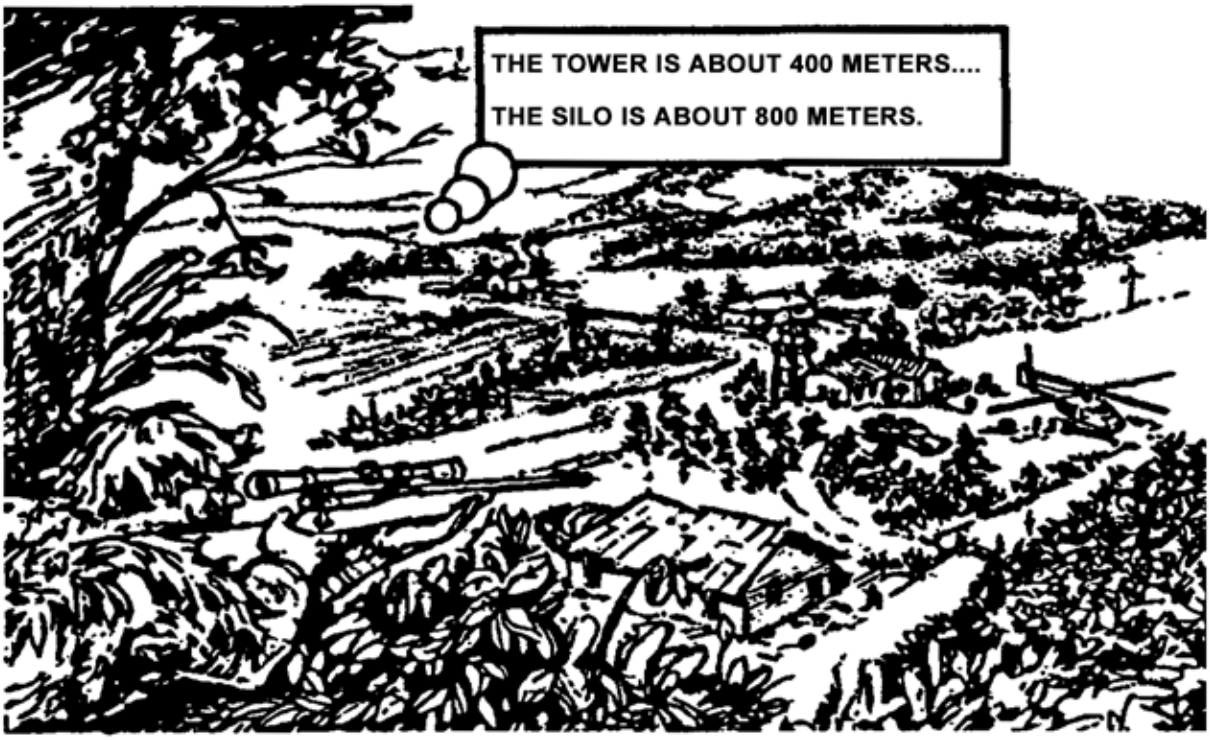


Figure 3-15. 100-meter unit of measure method.

APPEARANCE OF OBJECT METHOD

3-168. This method enables the sniper to determine range using the size and other details about an object. To use this method, the sniper team must know the details that characterize objects at various ranges. Table

3-4 shows what is visible on the human body at specific ranges.

Table 3-4. Range estimation based on appearance of object.

RANGE (in meters)	WHAT YOU CAN SEE

200	Clear in all detail such as equipment, skin color
300	Clear body outline, face color good, remaining detail blurred
400	Body outline clear, other details blurred
500	Body tapered, head indistinct from body
600	Body a wedge shape, with no head apparent
700	Solid wedge shape (body outline)

BRACKETING METHOD

3-169. Using this method, the sniper team assumes that the target is between X and Y meters away. Averaging these values gives an estimate of the distance to the target.

RANGE CARD METHOD

3-170. The sniper team can use a range card to quickly determine ranges throughout the target area. Once they see a target, the team determines where it is located on the card, and then they read the range to the target.

MIL-RELATION FORMULA

3-171. This is the preferred method of range estimation. This method uses a mil-scale reticle located in the sniper's binoculars and DOS. There are two ways to manipulate the mil-relation formula. In the first, the sniper

calculates the distance to the target. In the second, he calculates the target size. Figures 3-16 to 3-19 depicts the various reticles snipers and observers use.

3-172. The use of the TMR during range estimation will facilitate rapid mil reading of targets with definitive solutions. The TMR is broken down using stadia lines to further aid in use during the range estimation process.

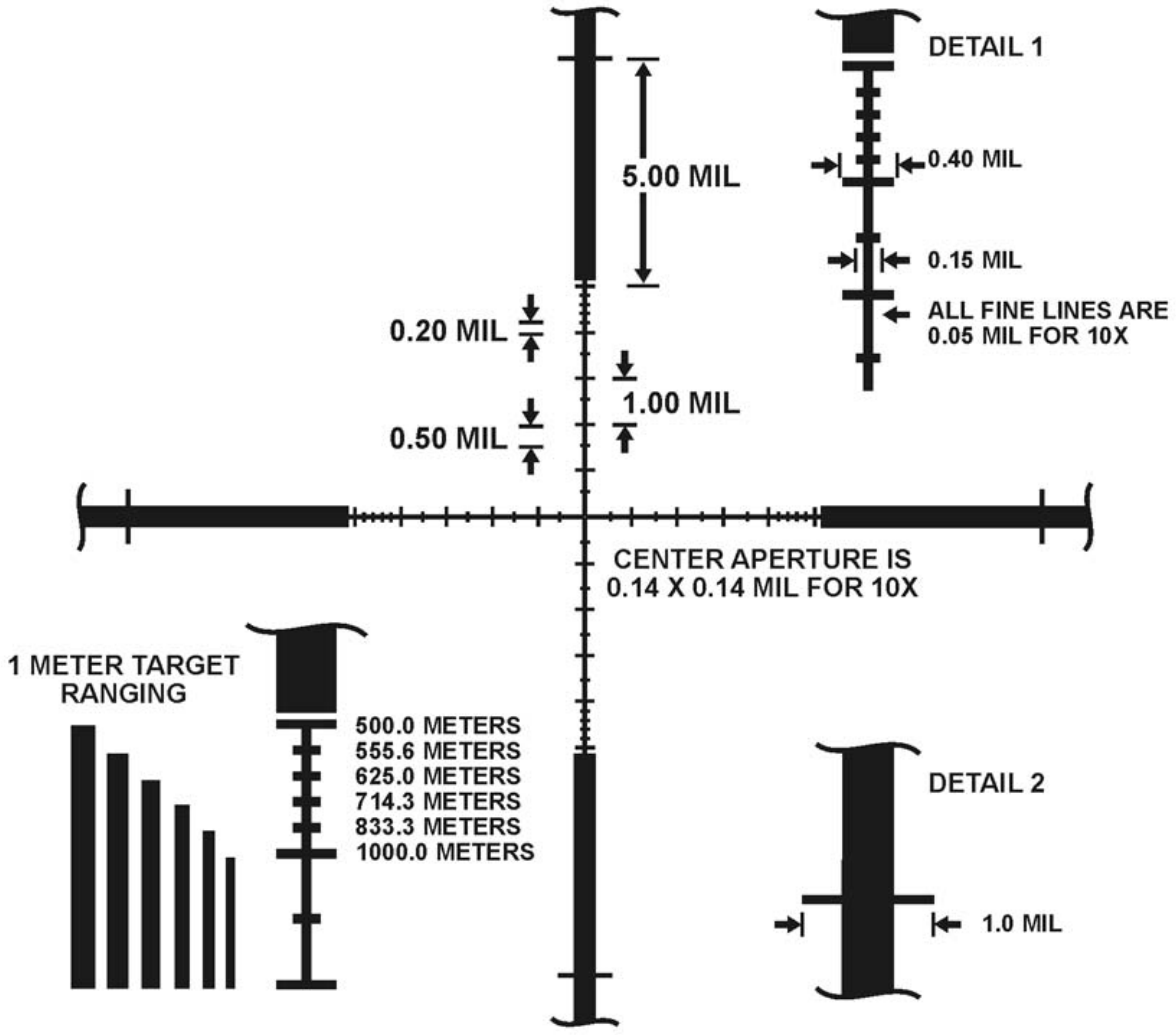


Figure 3-16. Tactical milling reticle breakdown.

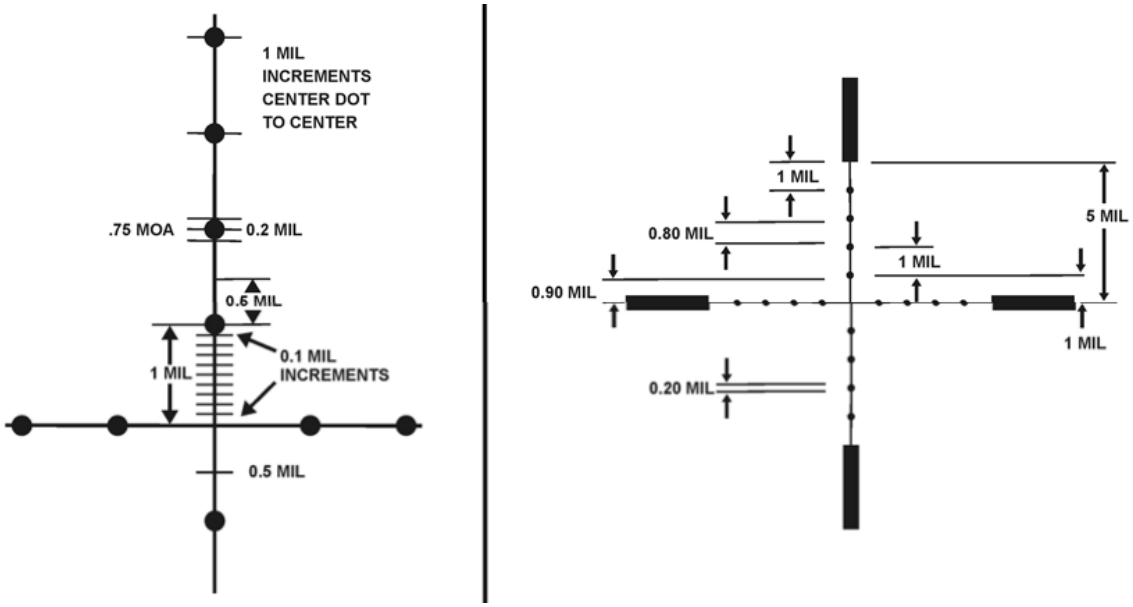


Figure 3-17. M3A, Mark IV, AN/PVS-10, AN/PAS-13B(V)3, and M151 spotting scope reticle breakdown.

3-173. Figure 3-18 depicts an Hours H25 mil reticle pattern breakdown. This reticle pattern is broken down in a manner which allows for rapid re-engagement of targets moving or stationary without applying any corrections using holdoff techniques based upon the strike of the round, as well as allowing for quick range estimation due to the stadia line pattern.

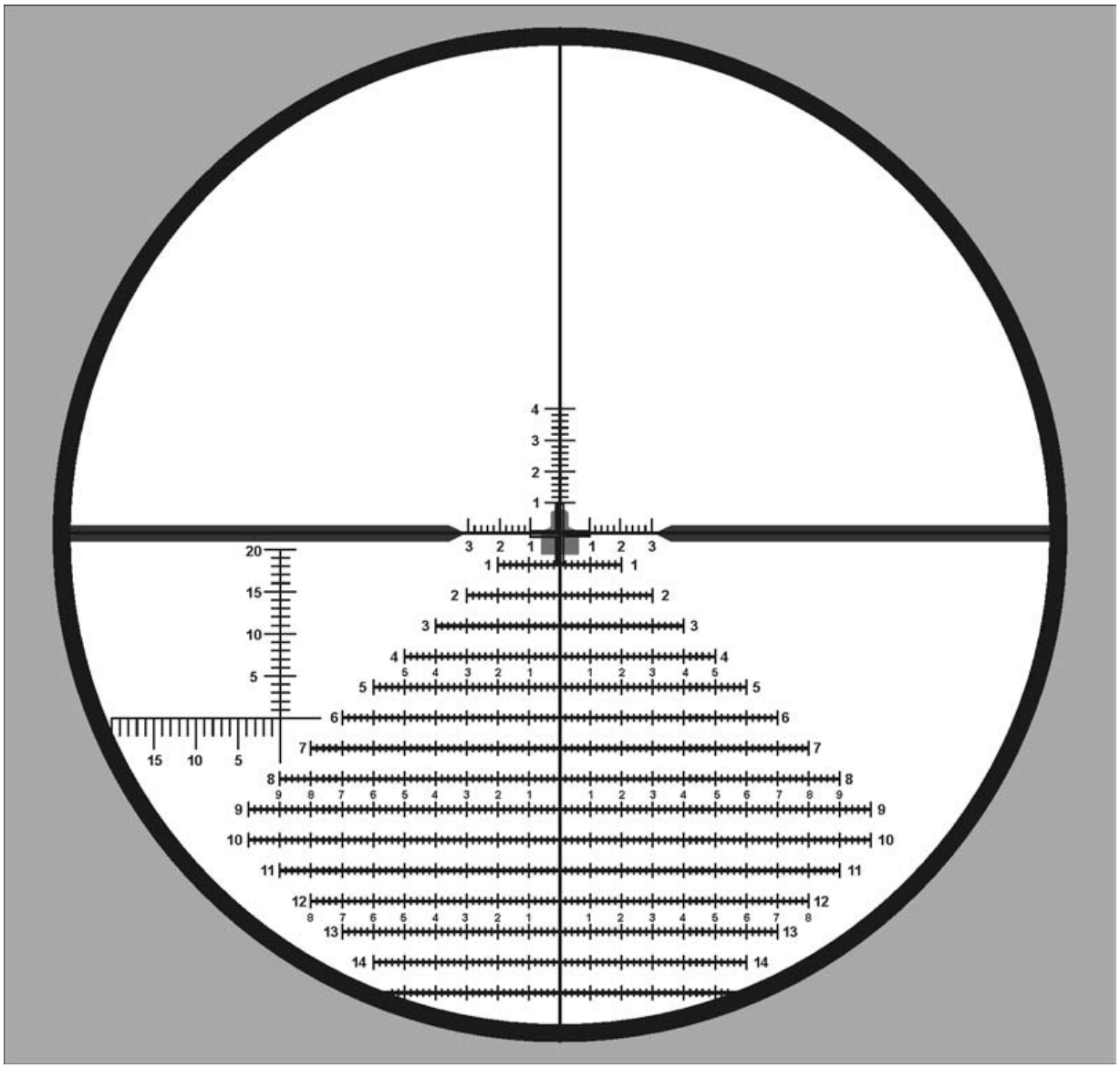


Figure 3-18. Hours H25 mil reticle pattern breakdown.

3-174. Figure 3-19 depicts a United States Marine Corps standard mil dot reticle pattern breakdown. This unique mil dot pattern requires greater understanding of the dimensions of the mil dots and distances separating them.

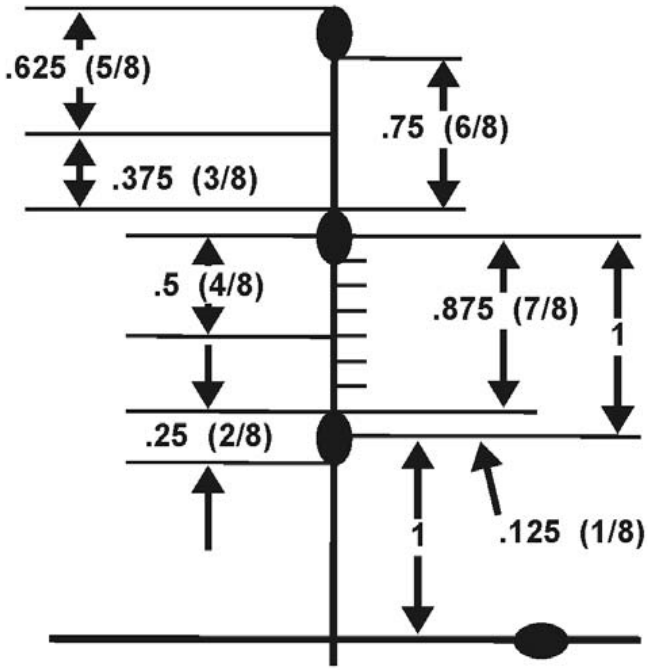


Figure 3-19. United States Marine Corps standard mil dot reticle pattern breakdown.

Estimating Target Range in Meters

3-175. To use this method—

(1) Note the target's size in inches or meters.

(2) Using the mil scale reticle, estimate the target's height.

NOTE: At 1,000 meters, a 1-mil equals 1 meter.

(3) Divide the estimated height of the target in meters by the size of the target in mils.

NOTE: To convert inches to meters, multiply the number of inches by .0254.

(4) Multiply by 1,000 to get the range in meters.

$$\frac{\text{estimated height in meters}}{\text{size of target in mils}} \times 1{,}000 = \text{estimated range in meters}$$

NOTE: If you must estimate the range to a target partially hidden by glare, foliage, obstacle, or position, measure the size of the portion of the target for which you need the height.

Estimating Target Height or Width in Inches

3-176. To estimate the target height in inches—

(1) Multiply 25.4 (the inches-to-meters conversion factor of 0.0254 x 1000) by the target size in inches. This will give you the constant.

NOTE: Constants can be determined and annotated in advance.

$$25.4 \times \text{target height in inches} = \text{constant}$$

(2) Measure the target using the mil dots in the M3A scope, or the hash marks on the TMR. (3) Divide the constant by the mil reading to get the range.

$$\frac{\text{constant}}{\text{mil reading}} = \text{range}$$

BACKWARD MANIPULATION METHOD

3-177. Familiarity with the mil relation formula is a must. Snipers need to be able to manipulate the formula backward as well. To perform the backward manipulation method, divide the range to the target by 25.4 and multiply by .8 to receive your answer.

Example

You have a target that you know is 825 meters from your location with a mil reading of .8 what is the size of the target/area? Divide the range to the target by 25.4 and multiply by .8, the answer is 26 inches.

COMBINATION METHOD

3-178. In a combat environment, perfect conditions rarely exist, reducing the effectiveness of a given method. For example, areas with a lot of dead space limit the accuracy of the 100-meter method. Poor visibility limits the use of the appearance-of-object method. However, an experienced sniper team should be able to combine methods to estimate range fairly accurately.

LASER RANGEFINDER

3-179. A laser rangefinder gives the accurate range to any target; therefore, when a sniper team has one, they should use it. When aiming the laser at a specific target, the sniper should support as he would his weapon to ensure accuracy. If the target is too small for the laser to pick it up, aiming at a larger object near the target, such as a building, vehicle, tree, or terrain feature, will suffice. The sniper team should keep a sniper data book, complete with the following measurements:

- Vehicles, including—

  Height of road wheels.

  Length of (tank) main gun tubes.

  Dimensions of weapon systems.

- Average height of human targets in the AO.

- Urban environment, including—

  Average size of doorways.

  Average size of windows.

  Average width of streets and lanes.

NOTE: In the United States, the average width of a paved road is 10 feet.

Height of soda machines.

3-180. As the sniper team develops a sniper data book, they convert all measurements into constants and compute them with different mil readings. Table 3-5 shows some examples, and the team can incorporate them into their sniper data book.

Table 3-5. Range estimation table.

6-FOOT TALL PERSON			5-FOOT 6-INCH TALL PERSON		
Height (in mils)	Standing	Sitting/Kneeling	Height (in mils)	Standing	Sitting/Kneeling
1.0	2,000	1,000	1.0	1,800	900
1.5	1,333	666	1.5	1,200	600
2.0	1,000	500	2.0	900	450
2.5	800	400	2.5	750	375
3.0	666	333	3.0	600	300
3.5	571	286	3.5	514	257
4.0	500	250	4.0	450	225
4.5	444	222	4.5	400	200

5.0	400	200	5.0	360	180
5.5	364	182	5.5	327	164
6.0	333	167	6.0	300	150
6.5	308	154	6.5	277	139
7.0	286	143	7.0	257	129
NOTE: Table is in yards (to convert to meters multiply by .9144)					

SECTION VII. RECORDS

Because the sniper team's secondary mission is collecting and reporting information, they must know how to accurately relay what they observe. They record their observations in the sniper data book, which contains a range card, military sketch forms, and an observation log.

RANGE CARD

3-181. Although the team can record target area information on any available paper, ideally, they use DA Form 7637-R (Figure 3-20).

NOTE: A blank copy of DA Form 7637-R is provided at the end of this publication for local reproduction.

3-182. DA Form 7637-R shows the target area from above, with annotated distances to various locations. Range rings printed on the form give the sniper team a quick range reference and a means to record target locations. The team can draw dashed lines to indicate sectors of fire. This allows them to refer to target locations relative to the sectors, such as "the intersection in Sector A." The team also draws their own positions and distances to prominent objects and terrain features. They determine the maximum range for the range card, so they can add indirect-fire targets to it. On DA Form 7637-R, the team should record—

- Method of obtaining range.
- Left and right limits of engageable area.
- Major terrain features, roads, and structures.
- Range, elevation, and windage settings needed at various distances.
- Distances throughout the area.
- Temperature and wind.

- Target reference points (TRPs) (azimuth, distance, and description).

NOTE: Keep DA Form 7637-R updated by replacing entries for temperature, wind direction, and wind velocity with new entries, should any change.

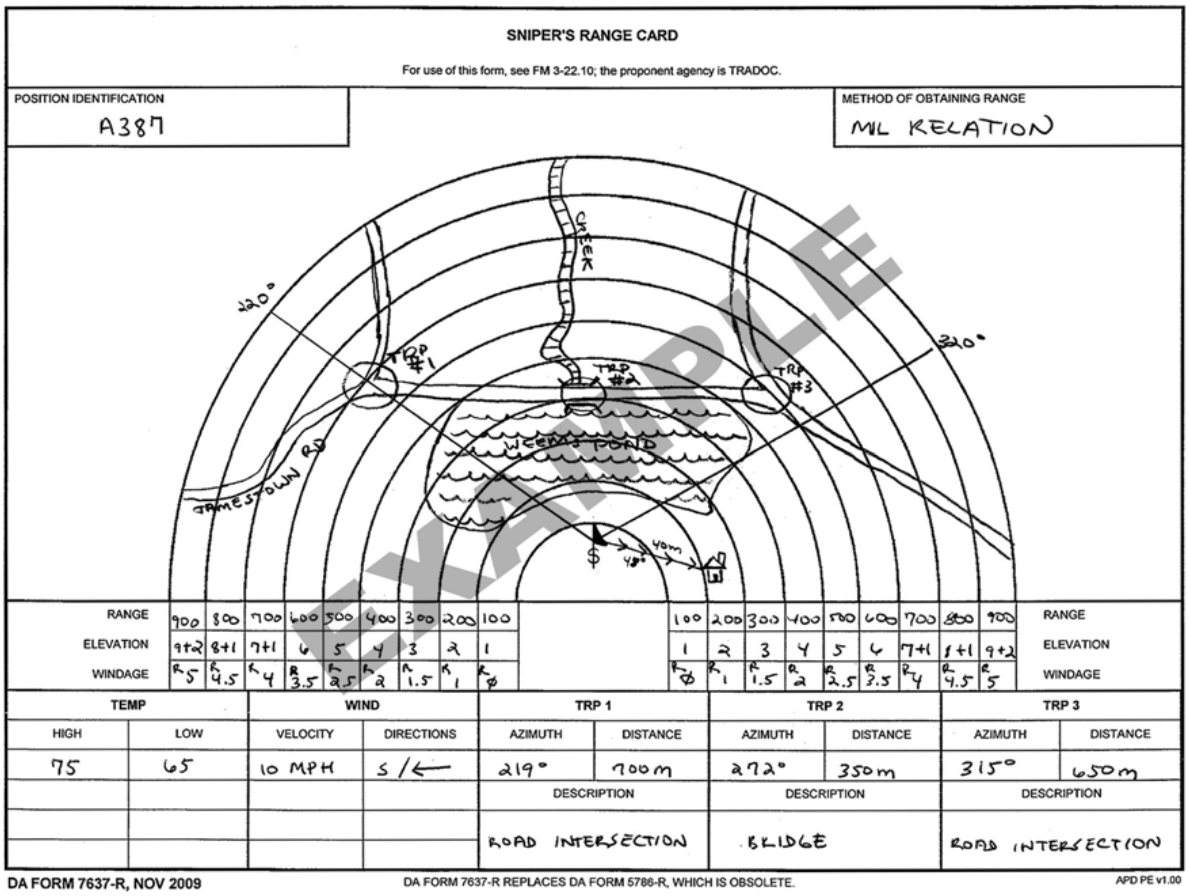


Figure 3-20. Example of completed DA Form 7637-R (Sniper's Range Card).

MILITARY SKETCH

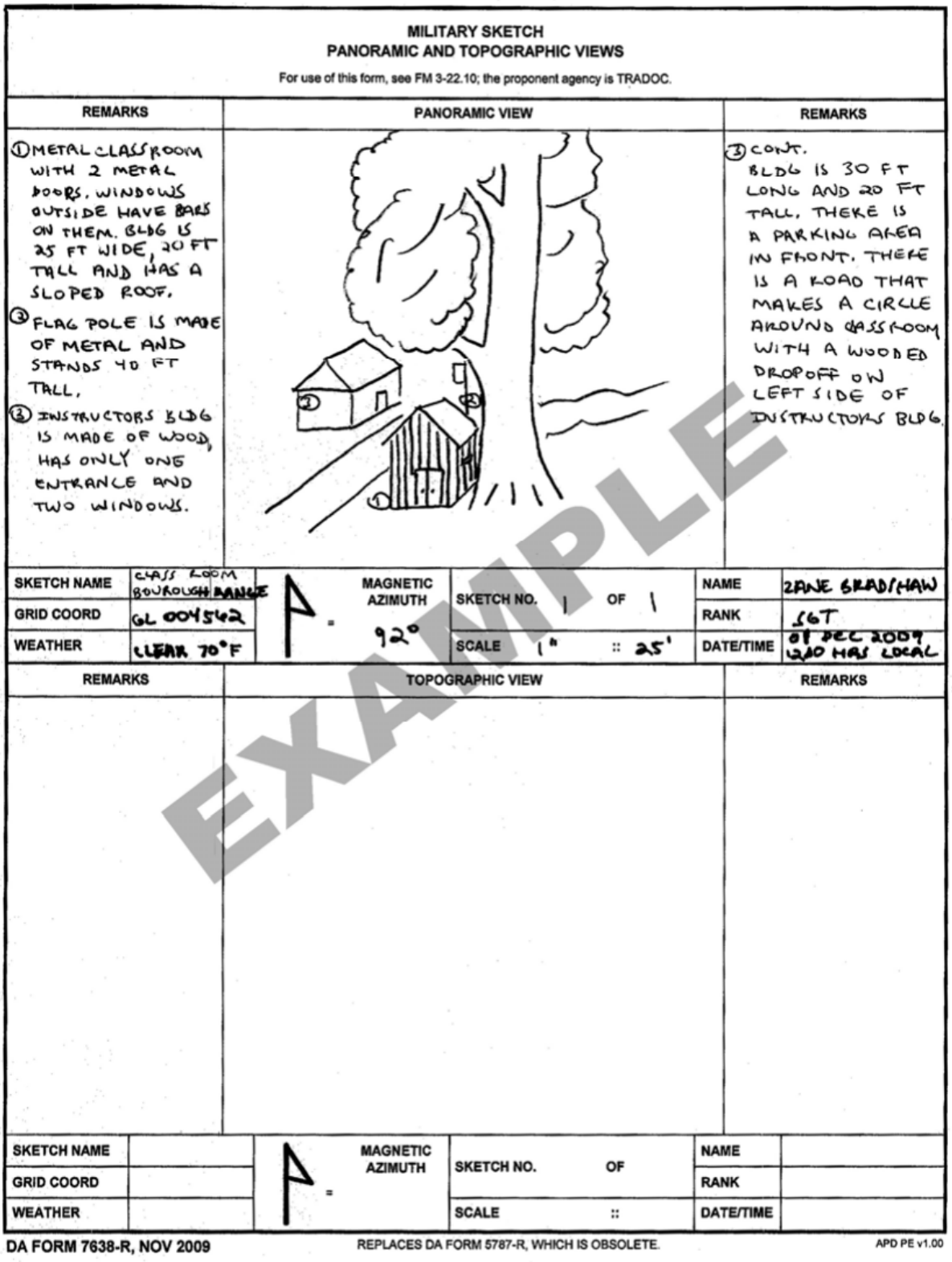
3-183. The sniper records supplemental information about a general area, its terrain features, and its man-made structures on DA Form 7638-R (Military Sketch—Panoramic and Topographic Views, shown in Figures 3-21 and 3-22). Military sketches give intelligence sections a detailed, on-the-ground view of an area or object. These sketches let the viewer see the area from a different perspective, include objects missing from existing maps, allow for

examination of areas shown in too little detail on existing maps, and but also provide detail such as types of fences and number of telephone wires. FM 3-25.26 describes two types of military sketches: road area and field.

NOTE: A blank copy of DA Form 7638-R is provided at the end of this publication for local reproduction.

PANORAMIC SKETCH

3-184. A panoramic sketch (Figure 3-21) shows a scaled area or object from the sniper team's perspective. It also shows details about a specific area or a man-made structure.



MILITARY SKETCH
PANORAMIC AND TOPOGRAPHIC VIEWS

For use of this form, see FM 3-22.10; the proponent agency is TRADOC.

REMARKS	PANORAMIC VIEW	REMARKS
① METAL CLASSROOM WITH 2 METAL DOORS, WINDOWS OUTSIDE HAVE BARS ON THEM. BLDG IS 25 FT WIDE, 20 FT TALL AND HAS A SLOPED ROOF. ③ FLAG POLE IS MADE OF METAL AND STANDS 40 FT TALL. ② INSTRUCTORS BLDG IS MADE OF WOOD, HAS ONLY ONE ENTRANCE AND TWO WINDOWS.		③ CONT. BLDG IS 30 FT LONG AND 20 FT TALL, THERE IS A PARKING AREA IN FRONT. THERE IS A ROAD THAT MAKES A CIRCLE AROUND CLASSROOM WITH A WOODED DROPOFF ON LEFT SIDE OF INSTRUCTORS BLDG.

SKETCH NAME	CLASS ROOM BOURLOUGH RANGE	MAGNETIC AZIMUTH = 92°	SKETCH NO. 1 OF 1	NAME	ZANE BRADSHAW
GRID COORD	GL 004562			RANK	SGT
WEATHER	CLEAR 70°F		SCALE 1" :: 25'	DATE/TIME	01 DEC 2009 1240 HRS LOCAL

REMARKS	TOPOGRAPHIC VIEW	REMARKS

SKETCH NAME		MAGNETIC AZIMUTH =	SKETCH NO. OF	NAME	
GRID COORD				RANK	
WEATHER			SCALE ::	DATE/TIME	

DA FORM 7638-R, NOV 2009 — REPLACES DA FORM 5787-R, WHICH IS OBSOLETE. — APD PE v1.00

EXAMPLE

Figure 3-21. Example of completed DA Form 7638-R (Military Sketch —Panoramic and Topographic Views) for panoramic sketch.

Contents

3-185. Snipers should use the keyword TVST to remember what details need to be included on the panoramic sketch:

- Terrain. What is it like (roads, creeks, hills, flat, type and composition of soil)? Is it capable of supporting vehicle movement or is it restricted to foot movement?

- Vegetation. What is there (height, location of trees, grass, farmland, etc.)?

- Structures. What types (buildings, size, type, doors, windows, elevated, used for, condition, etc.)?

- Tactical Importance. What can this be used for (friendly or enemy)?

3-186. Panoramic sketches also include—

- Remarks sections (two).

- Sketch name.

- Grid coordinates of sniper team's position.

- Weather.

- Magnetic azimuth through the center of sketch.

- Sketch number and scale of sketch or photo number.

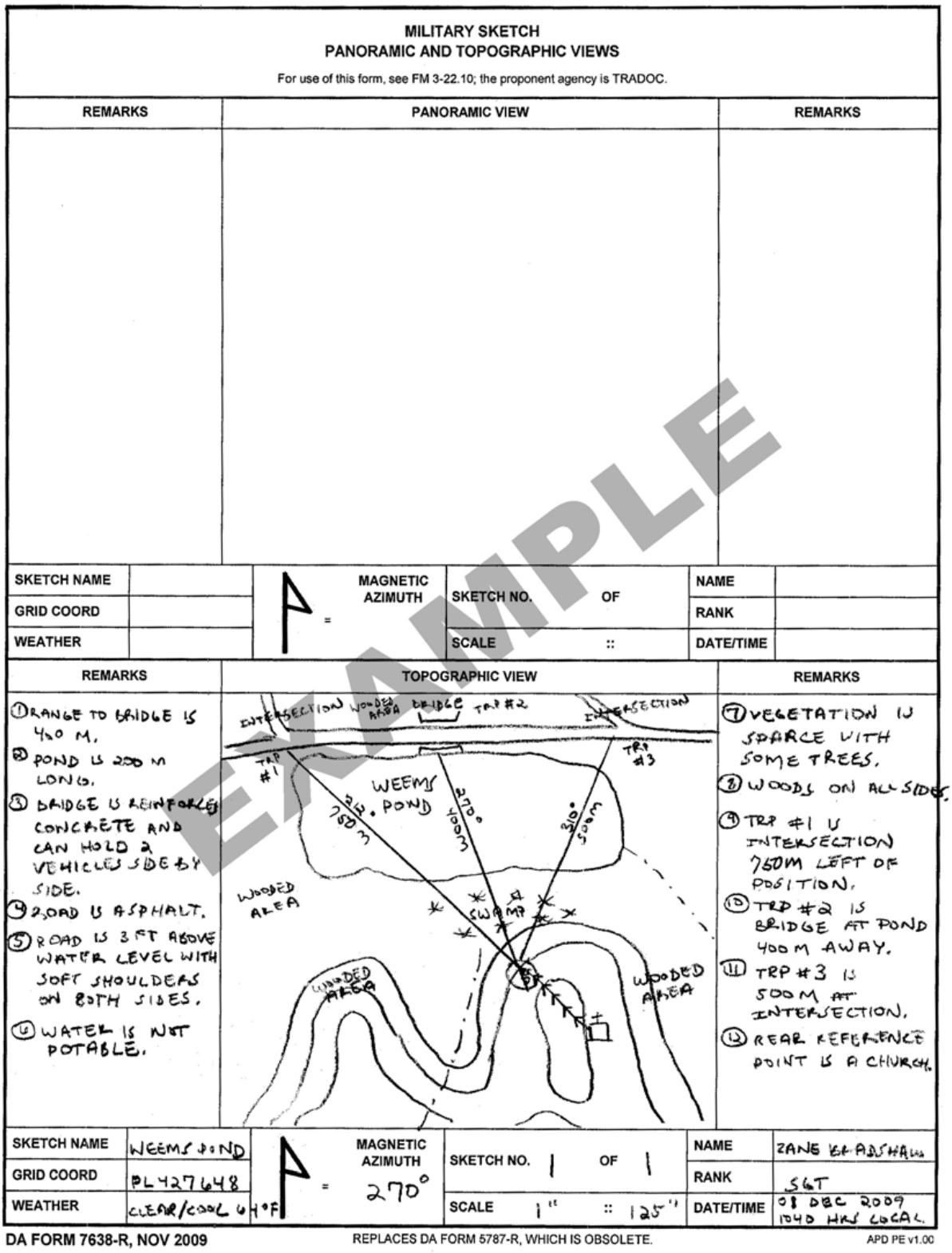
- Sector area (width and depth).

- Date and time.

- Name and rank of originator.

TOPOGRAPHIC SKETCH

3-187. A topographic sketch (Figure 3-22) shows scaled topography (i.e., terrain features, including elevation, and terrain types, such as forests and swamps). On a topographic sketch, the sniper team can describe large areas such as road systems, streams, and rivers, and natural and man-made obstacles. They can also show accurate distances and azimuths between major features. The team can also use topographic sketches as overlays on range cards.



MILITARY SKETCH
PANORAMIC AND TOPOGRAPHIC VIEWS

For use of this form, see FM 3-22.10; the proponent agency is TRADOC.

REMARKS	PANORAMIC VIEW	REMARKS

SKETCH NAME		MAGNETIC AZIMUTH	SKETCH NO. OF	NAME	
GRID COORD		=		RANK	
WEATHER			SCALE ::	DATE/TIME	

REMARKS	TOPOGRAPHIC VIEW	REMARKS
(1) RANGE TO BRIDGE IS 400 M. (2) POND IS 200 M LONG. (3) BRIDGE IS REINFORCED CONCRETE AND CAN HOLD 2 VEHICLES SIDE BY SIDE. (4) ROAD IS ASPHALT. (5) ROAD IS 3 FT ABOVE WATER LEVEL WITH SOFT SHOULDERS ON BOTH SIDES. (6) WATER IS NOT POTABLE.		(7) VEGETATION IS SPARCE WITH SOME TREES. (8) WOODS ON ALL SIDES. (9) TRP #1 IS INTERSECTION 760M LEFT OF POSITION. (10) TRP #2 IS BRIDGE AT POND 400 M AWAY. (11) TRP #3 IS 500 M AT INTERSECTION. (12) REAR REFERENCE POINT IS A CHURCH.

SKETCH NAME	WEEMS POND	MAGNETIC AZIMUTH	SKETCH NO. 1 OF 1	NAME	ZANE ~~EA~~ ABSHAIR
GRID COORD	PL427648	= 270°		RANK	SGT
WEATHER	CLEAR/COOL 64°F		SCALE 1" :: 125'	DATE/TIME	08 DEC 2009 1040 HRS LOCAL

EXAMPLE

Figure 3-22. Example of completed DA Form 7638-R (Military Sketch —Panoramic and Topographic Views) for topographic sketch.

Contents

3-188. A topographic sketch includes—

- Sketch name, number, and scale.
- Date and time.
- Grid coordinates of the sniper team's position.
- Remarks.
- Weather.
- Magnetic azimuth.

DRAWING PROCEDURES

3-189. As with all drawings, artistic skill is an asset, but with practice, anyone can draw satisfactory sketches.

- Work from the whole to the part. First, determine the boundaries of the sketch. Then, sketch the larger objects, such as hills, mountains, or outlines of large buildings. After drawing the large objects in the sketch, add the details.

- Use common shapes to show common objects. Instead of sketching each individual tree, hedgerow, or wood line, use common shapes. Concentrate on fine details only if they are tactically important.

PERSPECTIVE

3-190. When a sniper is drawing a sketch, he must have a basic understanding of the rules of perspective if he is to achieve a realistic effect. In drawing, perspective is an approximate representation on a flat surface (i.e., paper), of an image as it is perceived by the eye. All perspective drawings assume a viewer is a certain distance away from the drawing. Objects are scaled relative to that viewer.

Elements

3-191. There are three main elements present in each form of perspective:

- Vanishing point.
- Convergence lines.
- Horizon line.

Horizon Line

3-192. As its name suggests, this line describes the horizon, which is always considered to be at eye level. For instance, an object sited above the horizon line is above the viewer's eye level and will therefore show its underside.

Convergence Lines

3-193. All parallel lines in a scene will always appear to converge to a single point (the vanishing points). There is one exception to this rule: lines viewed parallel or perpendicular to the viewer will not converge. In one- and two-point perspective, you can also consider all vertical lines as non-converging lines.

Vanishing Points

3-194. Sited on the horizon line, these are the points where all convergence lines meet. Although always on the horizon, their position on the horizon depends on the viewer's angle to the viewed object.

3-195. Use the following guidelines to determine the appropriate placement of the vanishing point (Figure 3-23):

- Draw a horizon line and mark a vanishing point in the middle of it.
- Parallel lines on the ground that are horizontal (perpendicular to the observer's line of sight) vanish at a point on the horizon.

• Parallel lines on the ground that slope downward away from the observer vanish at a point below the horizon.

• Parallel lines on the ground that slope upward, away from the observer vanish at a point above the horizon.

• Parallel lines that recede to the right vanish on the right, and those that recede to the left vanish on the left.

3-196. Any number of vanishing points is possible in a drawing, one for each set of parallel lines that are at an angle relative to the plane of the drawing.

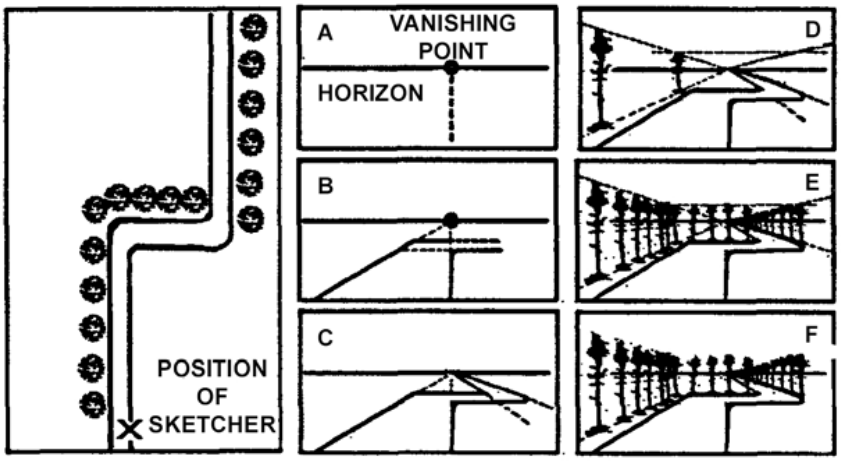


Figure 3-23. Use of vanishing points from a one-point perspective.

Forms of Perspective

3-197. There are four basic forms of perspective:

• Zero-point.

• One-point.

• Two-point.

• Three-point.

NOTE: One-point, two-point, and three-point perspective are dependent on the structure of the scene being viewed.

Zero-Point Perspective

3-198. Vanishing points exist only when parallel lines are present in the scene; a non-linear scene, therefore, would not have any vanishing points. A perspective without vanishing points, or zero-point perspective (Figure 3-24), occurs when the viewer is observing a natural scene (e.g., a mountain range), which frequently does not contain parallel lines. A perspective without vanishing points can still create a sense of depth through appropriate scale (e.g., when drawing a mountain range, more distant mountains have smaller scale features).

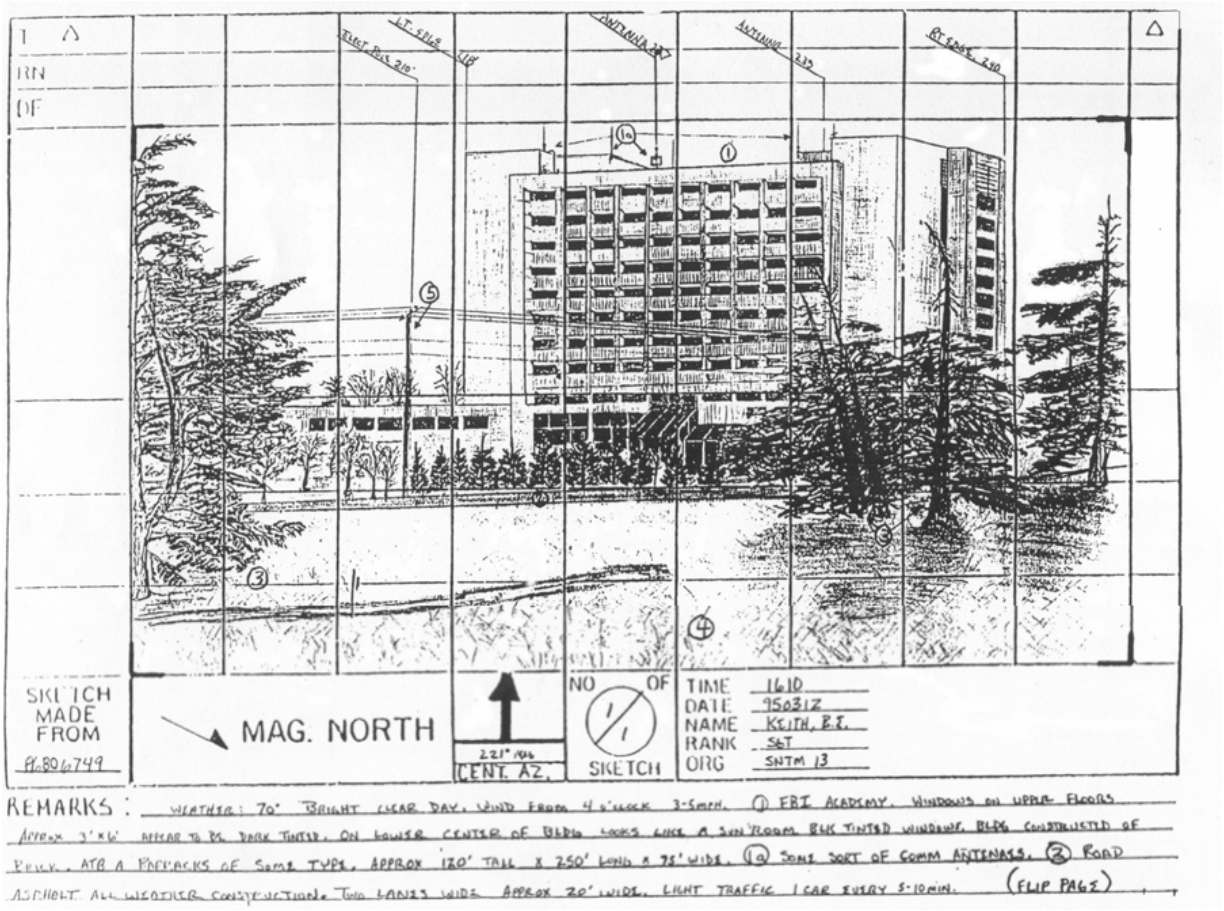


Figure 3-24. Zero-point perspective.

One-Point Perspective

3-199. The one-point perspective (Figure 3-25) is typically used for roads, railroad tracks, or buildings viewed so that the front is directly facing the viewer. Any objects that are made up of lines either directly parallel or perpendicular to the viewer's line of sight (e.g., railroad slats) can be represented with one-point perspective.

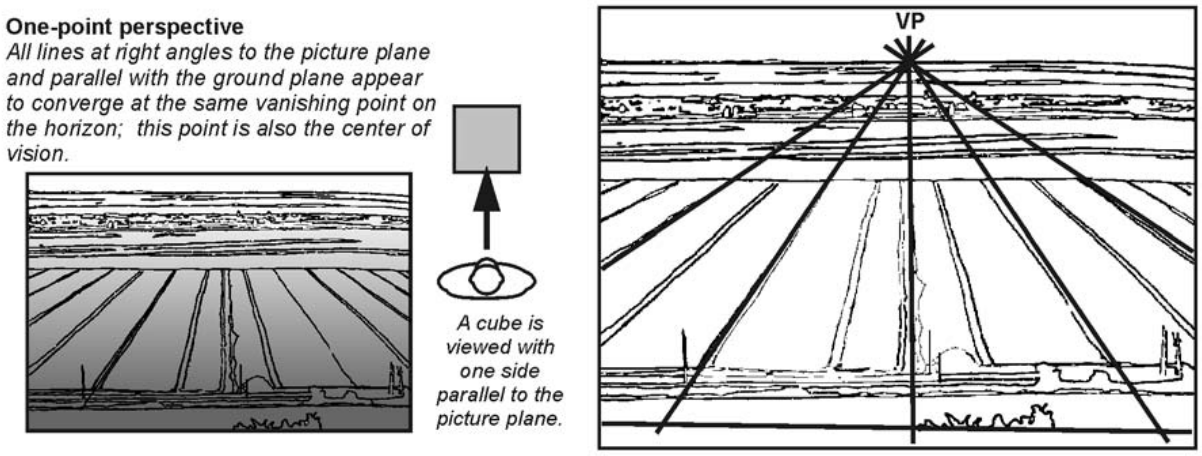


Figure 3-25. One-point perspective.

Two-Point Perspective

3-200. Two-point perspective (Figure 3-26) can be used to draw the same objects as one-point perspective, rotated (i.e., looking at the corner of a house or looking at two forked roads shrink into the distance). One point represents one set of parallel lines; the other point represents the other. Looking at a house from the corner, one wall would recede toward one vanishing point, the other wall would recede toward the opposite vanishing point.

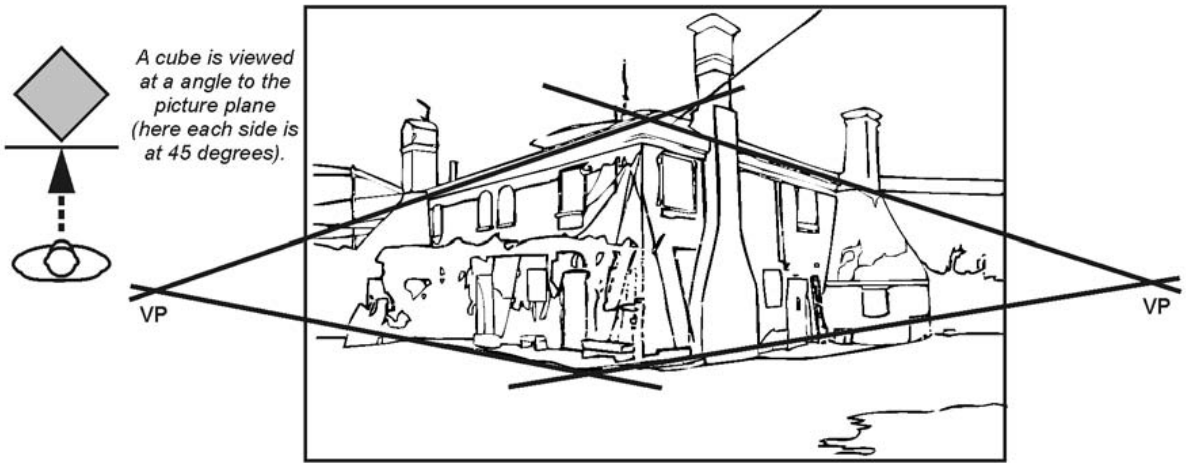


Figure 3-26. Two-point perspective.

Three-Point Perspective

3-201. The three-point perspective is usually used for buildings seen from above or below. In addition to the two vanishing points for each wall, there is now one below the ground to depict how those walls recede into the ground. Looking up at a tall building is another common example of the third vanishing point. This time, the third vanishing point is high in space (Figure 3-27).

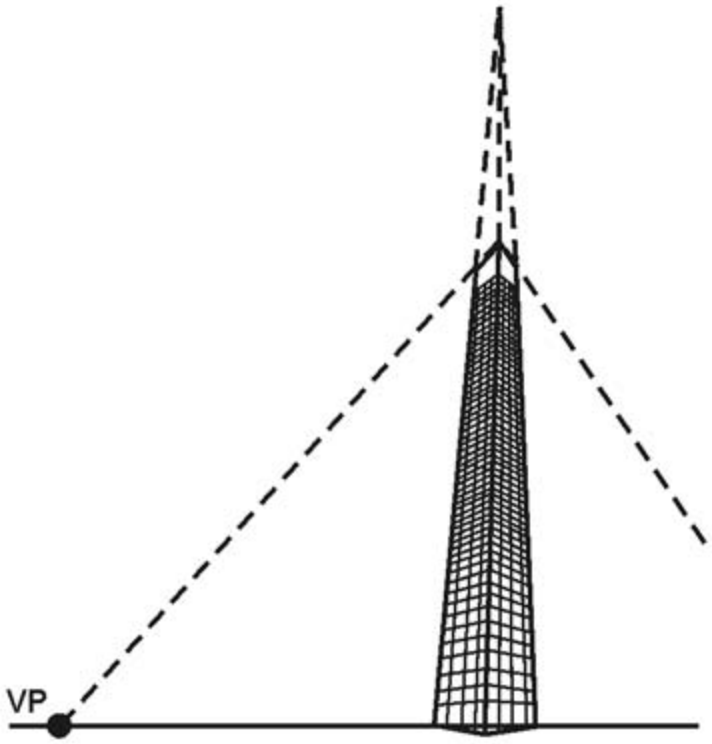


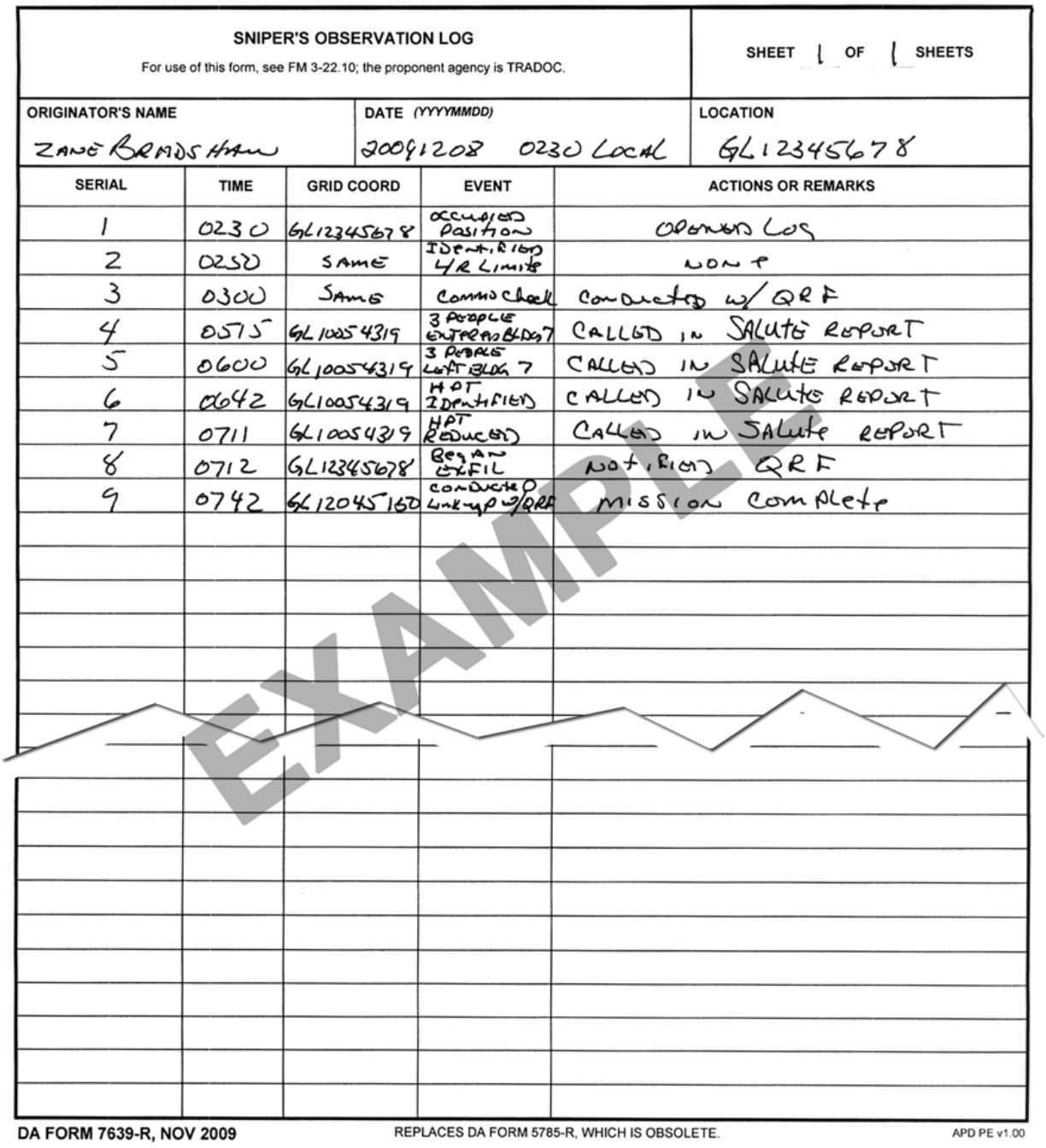
Figure 3-27. Three-point perspective.

SNIPER LOG BOOK

3-202. The sniper log book is a written, chronological record of all activities and events that take place in a sniper team's area. It is used with military sketches and range cards; this combination not only gives commanders and intelligence personnel information about the appearance of the area and activity within it.

3-203. The sniper team records the information on DA Form 7639-R (Sniper's Observation Log, shown in Figure 3-28).

NOTE: A blank copy of DA Form 7639-R is provided at the end of this publication for local reproduction.



SNIPER'S OBSERVATION LOG

For use of this form, see FM 3-22.10; the proponent agency is TRADOC.

SHEET 1 OF 1 SHEETS

ORIGINATOR'S NAME	DATE (YYYYMMDD)	LOCATION
ZANE BRADSHAW	20091208 0230 LOCAL	GL12345678

SERIAL	TIME	GRID COORD	EVENT	ACTIONS OR REMARKS
1	0230	GL12345678	OCCUPIED POSITION	OPENED LOG
2	0250	SAME	IDENTIFIED R/R LIMITS	NONE
3	0300	SAME	COMM CHECK	CONDUCTED W/ QRF
4	0515	GL10054319	3 PEOPLE ENTERED BLDG 7	CALLED IN SALUTE REPORT
5	0600	GL10054319	3 PEOPLE LEFT BLDG 7	CALLED IN SALUTE REPORT
6	0642	GL10054319	HPT IDENTIFIED	CALLED IN SALUTE REPORT
7	0711	GL10054319	HPT REDUCED	CALLED IN SALUTE REPORT
8	0712	GL12345678	BEGAN EXFIL	NOTIFIED QRF
9	0742	GL12045160	CONDUCTED LINK-UP W/QRF	MISSION COMPLETE

EXAMPLE

DA FORM 7639-R, NOV 2009 REPLACES DA FORM 5785-R, WHICH IS OBSOLETE. APD PE v1.00

Figure 3-28. Example DA Form 7639-R (Sniper's Observation Log).

Chapter 4: Marksmanship

Sniper marksmanship focuses on the techniques needed to make the sniper team proficient in marksmanship fundamentals and advanced marksmanship skills. This allows them to engage targets successfully at extended ranges. These skills include determining the effects of weather conditions on ballistics, holding off for elevation and windage, engaging moving targets, using and adjusting scopes, and zeroing.

SECTION I. FUNDAMENTALS

The sniper team must receive thorough training in the four fundamentals of marksmanship. These include steady position, aiming, breath control, and trigger control. These fundamentals develop fixed and correct firing habits for instinctive application. Because these skills are highly perishable, snipers must constantly reinforce them.

STEADY POSITION

4-1. A good firing position (Figure 4-1) lets the sniper relax and concentrate. Three elements of a steady position are bone support, muscular relaxation, and a natural point of aim.



Figure 4-1. Firing position.

BONE SUPPORT

4-2. This is the foundation of the firing position; your bones provide steady support for your weapon.

MUSCLE RELAXATION

4-3. Aside from tension in the trigger finger and firing hand, any use of the muscles moves the crosshairs. When using bone support, you can relax your muscles, which reduces movement due to tension or trembling.

NATURAL POINT OF AIM

4-4. The point at which the rifle naturally rests relative to the aiming point is called the natural point of aim. Since the sniper's rifle becomes an extension of his body, he must adjust the position of his body until his rifle points naturally at the selected aiming point on the target.

4-5. Once in position and aiming at the selected aiming point on the target, check for natural point of aim:

(1) Close your eyes.

(2) Take a couple of breaths, and relax as much as possible.

(3) When you open your eyes, the crosshairs should be on the same aiming point.

4-6. Once the sniper finds his natural point of aim, he should maintain his position relative to the target, periodically check his natural point of aim, and readjust as needed. To change the elevation of the natural point of aim —

(1) Leave your elbows in place.

(2) Slide your body forward or rearward. This lowers or raises the muzzle of your weapon, respectively.

M24 Sniper Weapon System Bolt Operation

4-7. For the sniper to maintain his natural point of aim after he fires the weapon, he must ensure that he operates the bolt properly. Manipulating the bolt slowly decreases movement during reloading. The sniper should practice reloading while in the prone position, without removing the butt of the weapon from his firing shoulder. The two ways to do this are—

- Slow bolt manipulation.
- Cant and drop.

ELEMENTS OF A MODIFIED STEADY POSITION

4-8. On the battlefield, the sniper must assume a steady firing position and make maximum use of cover and concealment. Depending on the terrain, vegetation, and tactical situation, the sniper can modify the basic positions. When assuming any firing position—

- Use any support available.
- Avoid touching the support with the barrel of the weapon; this interferes with barrel harmonics and reduces accuracy.
- Use a cushion between the weapon and support to keep the weapon from slipping.
- Use the prone supported position whenever possible.

4-9. The elements of a modified steady position (Table 4-1) include—

- Nonfiring hand.
- Firing hand.
- Butt of stock.
- Elbows.
- Stock weld.

Table 4-1. Elements of a modified steady position.

ELEMENT	WEAPON SYSTEM	PROCEDURE
Nonfiring hand	M110 SASS/ M24 SWS	Use the nonfiring hand to support the butt of the weapon, use one of the following methods: Place your hand next to your chest, and rest the tip of the butt on that hand. To raise the weapon's butt, ball up your hand into a fist; to lower it, loosen your hand. Hold a sand sock in your nonfiring hand, and place the weapon's butt on the sock. To raise the butt of the weapon, squeeze the sock to make it taller. To lower the butt, loosen your grip on the sock.
	M107 LRSR	Place your nonfiring hand on the monopod.

Firing hand	M110 SASS	Grasp the pistol grip, and pull slightly to the rear to keep the butt of the weapon firmly in the pocket of your shoulder.
	M24 SWS	Grip the small of the stock. Using your middle and ring fingers, pull slightly rearward to keep the butt of the weapon firmly in the pocket of your shoulder. Place your thumb over the top of the small of the stock or alongside the safety. Place your index finger on the trigger, but make sure that your finger does not touch the stock. This keeps your trigger pull from disturbing the lay of the rifle.
	M107 LRSR	Grasp the pistol grip, and pull slightly to the rear to keep the butt of the weapon firmly in the pocket of your shoulder.
Butt of stock	All	Place the butt of the stock firmly in the pocket of your shoulder. You can insert a pad on your ghillie suit where the butt of the weapon makes contact with the suit. This reduces the effects of your pulse and breathing, which can affect weapon accuracy.
Elbows	All	Find a comfortable position that gives you the best support. To lower your body, push your elbows out as far as you can.
Stock Weld	All	Place your cheek in the same place on the stock every time. A change in stock weld affects sight alignment and accuracy. Mark the spot on the

		stock with a piece of moleskin or some other material.

FIRING POSITIONS

4-10. On the battlefield, the sniper must assume the steadiest possible covered and concealed position. The sniper must apply the fundamentals of relaxation and maximum support for his rifle. He should adjust the position to best fit his own body structure.

Characteristics

4-11. Good firing positions share certain characteristics:

- Support.
- Observation.
- Protection.
- Concealment.
- Depth.

Support

4-12. The position must provide adequate support for the sniper to maintain his aim throughout the firing sequence.

NOTE: To ensure proper weapon support, the sniper can use either natural or prepared rifle rests. Using a rest keeps the sniper from transferring muscular tension to the rifle.

Observation

4-13. The firing position must provide a clear view of the target. The sniper must be able to observe, identify, prioritize, and engage targets in his target

area.

Protection

4-14. When choosing the firing position, the sniper should consider the consequences of enemy detection. The position must protect him from small arms fire and allow for concealed withdrawal under fire.

Concealment

4-15. The sniper should choose a position that enables maximum application of fieldcraft skills during the firing sequence.

Depth

4-16. Vegetation between the sniper's position and the enemy creates the appearance of depth. This helps conceal the sniper and can even offer some cover. The sniper should use the amount, type, and placement of vegetation that gives him the greatest appearance of depth without interfering with his sight picture or the flight of the round.

Types

4-17. There are four types of firing positions:

- Prone.
- Kneeling supported.
- Standing.
- Sling-supported.

Prone Position

4-18. The prone position has four variations:

• Supported.

• Unsupported.

• Hawkins.

• Side.

Prone Supported Position

4-19. The prone supported position is the steadiest position (Figure 4-2). The sniper should use it whenever he can.

4-20. To assume the prone supported position—

(1) Lie down, and place the weapon on a support such as a buttpack, rucksack, or bipod.

(2) Ensure that you can still point the weapon at the target.

(3) Keeping your position as low as possible, align your body with your weapon as much as you can, not at an angle to it. This presents less of a target to the enemy.

NOTE: Absorb the recoil by positioning your body mass directly behind the rifle and forming a straight line on your firing side (with the rifle, your shoulder, your hip, and your foot). If feasible, use sand bags to help absorb the muzzle blast.

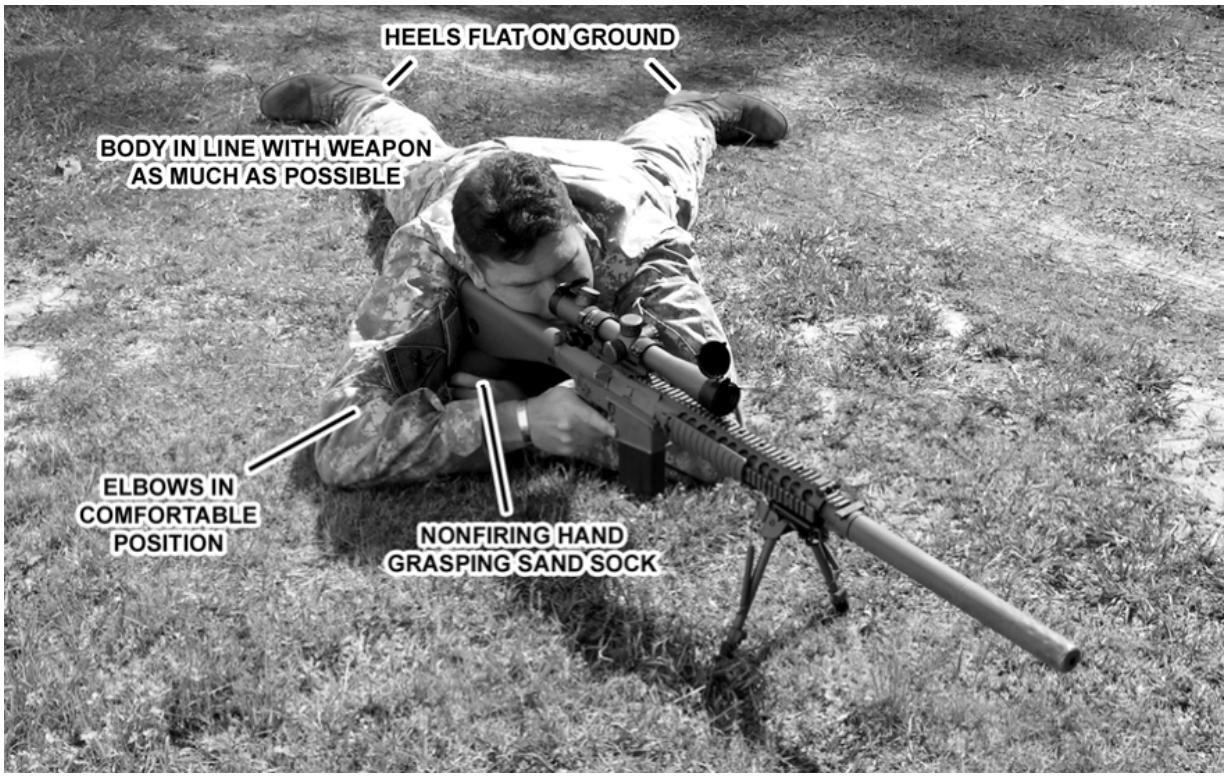


Figure 4-2. Prone supported position.

Prone Unsupported Position

4-21. The prone unsupported position (Figure 4-3) also provides a stable firing platform.

4-22. To assume the prone unsupported position—

(1) Place the rifle butt in the pocket of your firing shoulder.

(2) Grasp the small of the stock (M24 SWS), or pistol grip (M107 LRSR and M110 SASS) with your firing hand.

(3) Lower your firing elbow to the ground.

(4) Rest the rifle in the "V" formed by the thumb and fingers of your nonfiring hand.

NOTE: For greater support, move the elbow of your nonfiring hand in line with the weapon.

(5) Adjust the position of your firing elbow until your shoulders are about level.

(6) Pull back firmly on the rifle with both hands.

(7) Get a stock weld and relax, keeping your heels close to the ground.



Figure 4-3. Prone unsupported position.

Hawkins Position (M24 Sniper Weapon System only)

4-23. The Hawkins position (Figure 4-4) is a variation of the prone unsupported position. It is stable and its low profile aids in concealment. The sniper should use this position when firing from a low bank or a depression in the ground, over a roof, or similar situations. This position is unsuitable for level ground, because the sniper cannot raise the muzzle high enough to aim at the target.

4-24. To assume the Hawkins position— (1) Assume a prone position.

(2) Grasp the upper sling swivel and sling with your nonfiring hand, forming a fist to support the front of the weapon.

(3) Lock your nonfiring arm straight so that it will absorb the weapon's recoil.

(4) Rest the butt of the weapon on the ground and under your firing shoulder.

(5) Adjust the elevation by tightening or relaxing the fist of your nonfiring hand. For more elevation, place a support under your nonfiring fist.



Figure 4-4. Hawkins position.

Side Prone Position (M24 Sniper Weapon System only)

4-25. The side prone position (Figure 4-5) can be used in an urban environment when the sniper cannot adjust a loophole or when he is firing from under a vehicle. This is a difficult position to use and requires constant practice.

4-26. To assume a side prone position—

(1) Assume a prone position.

(2) Keeping a low profile, turn your rifle 90 degrees to the left, and then load from the top.

NOTE: Remember that with the weapon canted 90 degrees, you will use the elevation knob to adjust for windage and the windage knob to adjust for

elevation.

(3) Use a sand sock to support the stock.

(4) Adjust the elevation of the weapon by tightening and loosening the fist of your nonfiring hand.

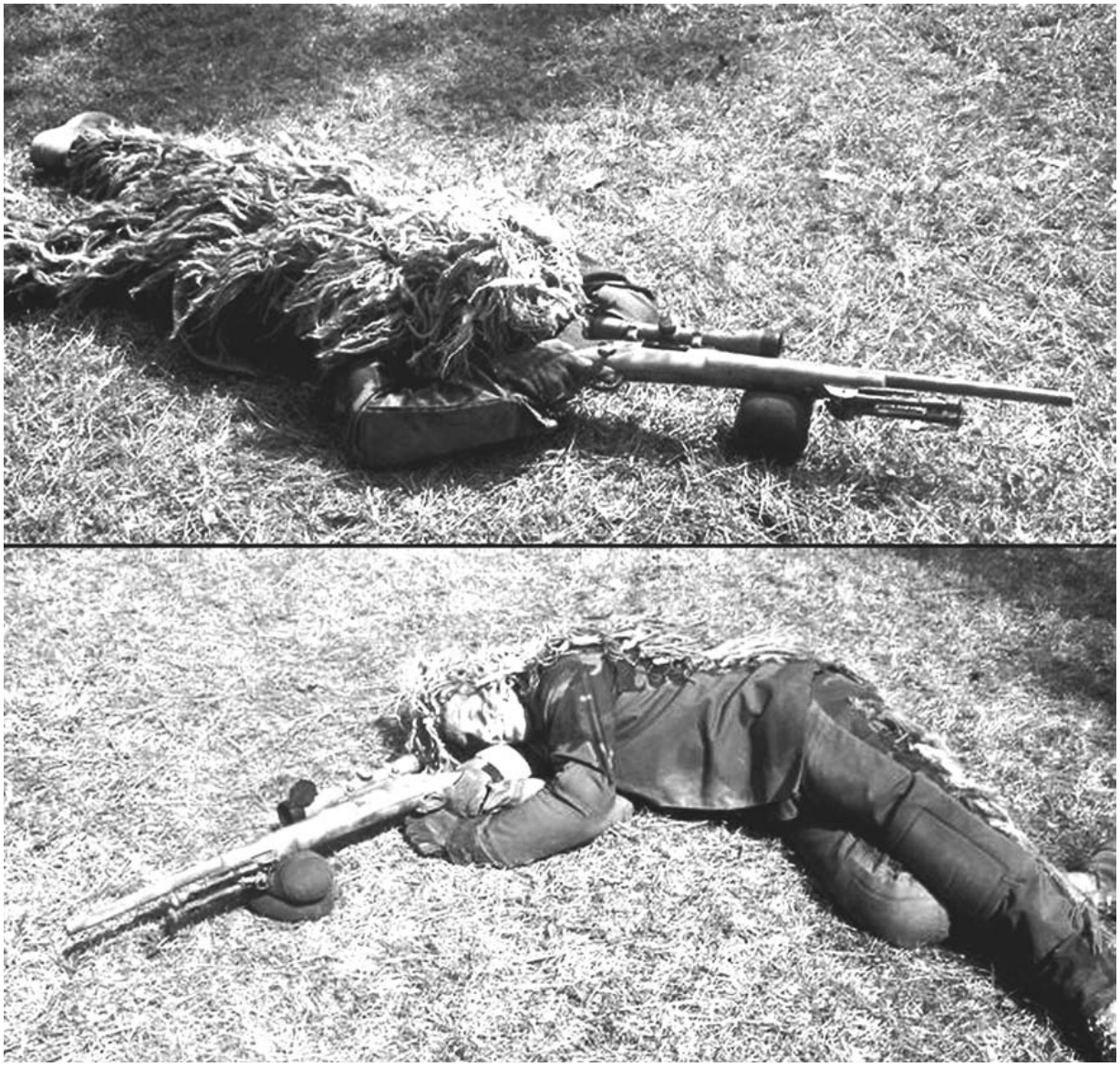


Figure 4-5. Side prone position.

Kneeling Supported Position

4-27. To assume the kneeling supported position—

(1) Use a tree or some other immovable object for support, cover, or concealment. Gain support by contact with the calf and knee of the leading leg, the upper forearm, or the shoulder. You may also rest the rifle on the hand lightly against the support.

NOTE: Ensure the barrel does not touch the support.

(2) Face 45 degrees to the right of the direction of the target.

(3) Kneel down, and place the right knee on the ground, keeping the left leg as vertical as possible.

(4) Sit back on the right heel. Place it directly under the spinal column.

(5) Grasp the small of the stock with the firing hand, and cradle the fore-end of the weapon in a crook formed with the left arm.

(6) Place the butt of the weapon in the pocket of the shoulder, and place the meaty underside of the left elbow on top of the left knee.

(7) Reach under the weapon with the left hand, lightly grasp the firing arm.

(8) Relax forward and into the support, using the left shoulder as a contact point.

Standing Position

4-28. While the standing position provides the least stability, it can be assumed quickly while moving and is a good position for target area observation. Support for any portion of the body or weapon improves stability. There are two types of standing positions, depending on the type of support available:

- Standing supported position with—

  Horizontal support.

  Vertical support.

- Standing unsupported position, off-hand.

Standing Supported Position, Horizontal Support

4-29. The standing supported position with horizontal support (Figure 4-6) is the most unsteady supported position; the sniper should use it only as a last resort. This position involves the use of some form of horizontal support, such as a wall or ledge.

4-30. To assume the standing supported position with horizontal support—

(1) Locate a solid object for support.

NOTE: Avoid branches, which sway in a breeze.

(2) Form a "V" with the thumb and forefinger of your nonfiring hand.

(3) Place your nonfiring hand against the support with the fore-end of the weapon resting in the "V" of your hand. This steadies the weapon and allows quick recovery from recoil.

(4) Rest the weapon on a soft surface. Resting the weapon on a hard surface could cause the weapon to slide.

(5) Place the butt of the weapon in the pocket of your shoulder.

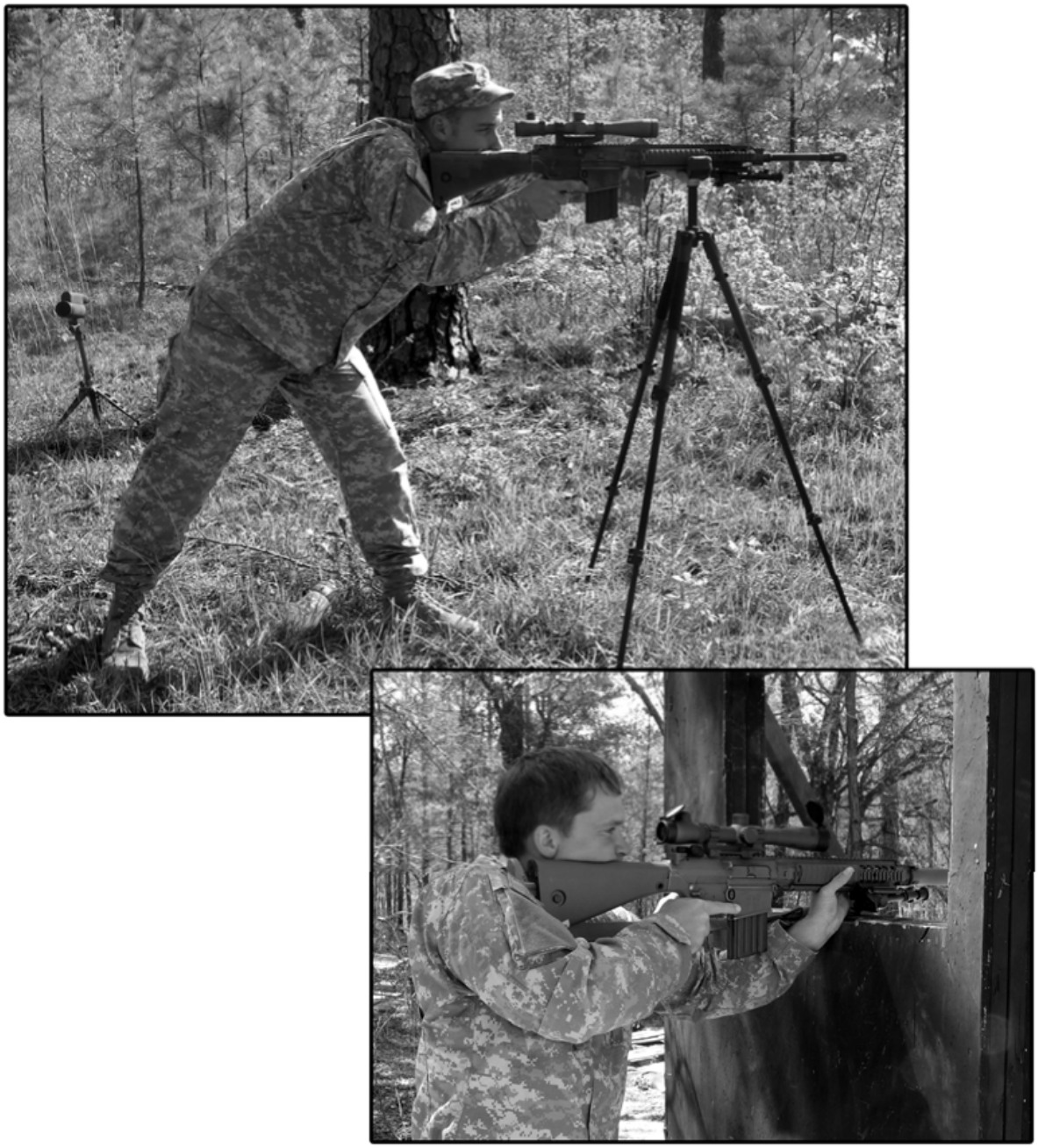


Figure 4-6. Standing supported position, horizontal support.

Standing Supported Position, Vertical Support

4-31. The standing supported position with vertical support (Figure 4-7) involves the use of some form of vertical support, such as a tree, telephone pole, corner of building, or vehicle.

4-32. To assume the standing supported position with vertical support—

(1) Locate stable support.

(2) Face the target, and then turn 45 degrees to the right of the target.

(3) Place the palm of your nonfiring hand at arm's length against the support.

(4) Lock your left arm straight, let your left leg buckle, and place your body weight against the nonfiring hand. Keep your trailing leg straight.

(5) Place the fore-end of the weapon in the "V" formed by extending the thumb of your nonfiring hand.

(6) Exert more pressure to the rear with your firing hand.



Figure 4-7. Standing supported position, vertical support.

Standing Unsupported Position, Off-Hand

4-33. The standing unsupported position, off-hand (Figure 4-8), is the worst position because it is the least stable and most exposed.

(1) Face perpendicular to the target, in the direction of your firing hand.

(2) Keep your firing elbow parallel with the ground.

(3) Push your nonfiring hip forward and support your nonfiring elbow with your ribcage, hip, or equipment.

(4) Move your entire body to align sights with target.



Figure 4-8. Standing unsupported position, off-hand.

Sling-Supported Position

4-34. There are 2 variations of the sling-supported position:

- Sling-supported prone.
- Sling-supported sitting.

Sling-Supported Prone Position

4-35. To assume the sling-supported prone position—

(1) Face the target squarely, with the sling attached to the biceps of your nonfiring arm.

(2) Lie down facing the target, with your legs straight to the rear.

(3) Extend your nonfiring elbow so it is in line with you and the target, and is directly under the weapon.

(4) With your firing hand, push forward on the butt of the stock, and fit the stock into the pocket of your shoulder.

(5) Place the firing-side elbow down wherever it feels natural, and grasp the pistol grip of the stock

(M110 SASS) or the small of the stock (M24 SWS), pulling it firmly into the shoulder.

(6) Rest your cheek naturally on the stock, where you can see through the sights and acquire the target.

(7) Draw your firing-side knee up to a comfortable position so as to take the weight off of the diaphragm.

(8) Obtain a natural point of aim.

(9) Center the target in the reticle by leaving the elbows in place and shifting the waist left or right to traverse and forward or backward to adjust

the elevation.

Sling-Supported Sitting Position

4-36. To assume the sling-supported sitting position—

(1) Face the body 30 degrees away from the target in the direction of the firing hand.

(2) Sit down and cross your ankles (with the nonfiring-side ankle across the firing-side ankle).

(3) Properly adjust your sling for the sitting position.

(4) Place the palm of your firing hand on the butt of the stock, and push the stock into your shoulder while allowing the weapon to rest on your nonfiring hand.

(5) Grasp the pistol grip of the stock (M110 SASS) or the small of the stock (M24 SWS) with your firing hand, and pull the stock firmly into your firing shoulder.

(6) Rest your elbows inside your knees, and lean forward.

NOTE: Do not permit direct contact between the points of your elbows and the points of your knees, but allow the bones, not the muscles, to support the weapon.

(7) Hold the stock high enough in your shoulder to require only a slight tilt of the head to acquire the sights. Do not cant the weapon.

(8) Raise and lower the muzzle by moving the nonfiring hand forward and backward on the forestock (the farther back, the better), watching the rise and fall of the weapon during breathing and holding your breath at the point during exhalation where your breath stops naturally for a moment.

FIELD-EXPEDIENT WEAPON SUPPORTS

4-37. In the field, the sniper will seldom have the luxury of a sandbag for support, so he will have to use his common sense and imagination. Field-expedient weapon supports include—

- Sand sock.
- Rucksack and buttpack.
- Sandbag.
- Bipod.
- Tripod.
- Forked stake.

4-38. Practice choosing, preparing, and using the following field-expedient supports often.

Sand Sock

4-39. When in the prone supported position, the sniper should place a sand sock (Figure 4-9) under the rear sling swivel to increase stability and reduce body contact with the weapon. He can also use the sand sock as padding between the weapon and a rigid support.

NOTE: If the sniper has an M107 LRSR, he should use the monopod to adjust for elevation.



Figure 4-9. Sand sock.

4-40. Despite the name, a sand sock is constructed using a real sock, but not real sand. The sniper should purchase a commercial sand sock or construct one. To construct a sand sock—

(1) Nearly fill a standard issue olive drab wool sock with a non-biodegradable stuffing material (e.g., sand, rice, craft beads, or polypropylene beads).

(2) Knot the filled sock.

Rucksack and Buttpack

4-41. If the terrain offers no support, the sniper should use his rucksack or buttpack (Figure 4-10). To stabilize the pack and conform it to the shape of the weapon, he might have to adjust the positions of any hard objects inside of the pack. The sniper can also build a rest at the bottom of the rucksack frame.

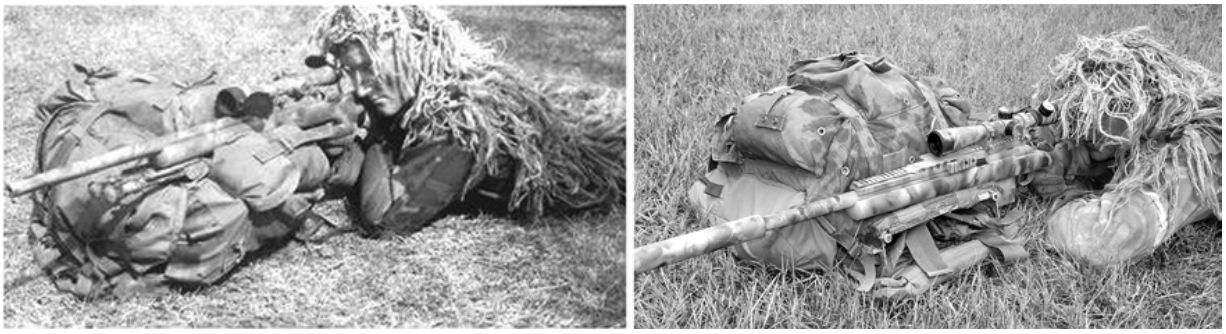


Figure 4-10. Rucksack.

Sandbag

4-42. For support, the sniper can fill an empty sandbag (Figure 4-11).



Figure 4-11. Sandbag.

Tripod

4-43. To build a field-expedient tripod (Figure 4-12)—

(1) Join three 12-inch long sticks (one thicker than the others).

(2) Wrap 550 or similar cord at the center point.

(3) Tie the sticks together, leaving enough slack to fold the legs out into a triangular base.

(4) Place the fore-end of the weapon between the three uprights.

Bipod

4-44. To build a field-expedient bipod (Figure 4-12)—

(1) Join two 12-inch sticks that are thick enough to support the weight of the weapon.

(2) Wrap 550 or similar cord at the center point.

(3) Tie the sticks together, leaving enough slack to fold the legs out like scissors.

(4) Place the weapon between the two uprights.

Forked Stake

4-45. Delivery of long-range precision fire will be nearly impossible when using this support. Because a forked stake is less stable than other field-expedients, snipers should use it as a last resort.

4-46. To use a forked stake (Figure 4-12)—

(1) Drive a forked stake into the ground.

NOTE: Unless you can drive the forked stake into the ground, you must use the nonfiring hand to hold the stake in the upright position.

(2) Place the weapon between the forks of the stake.

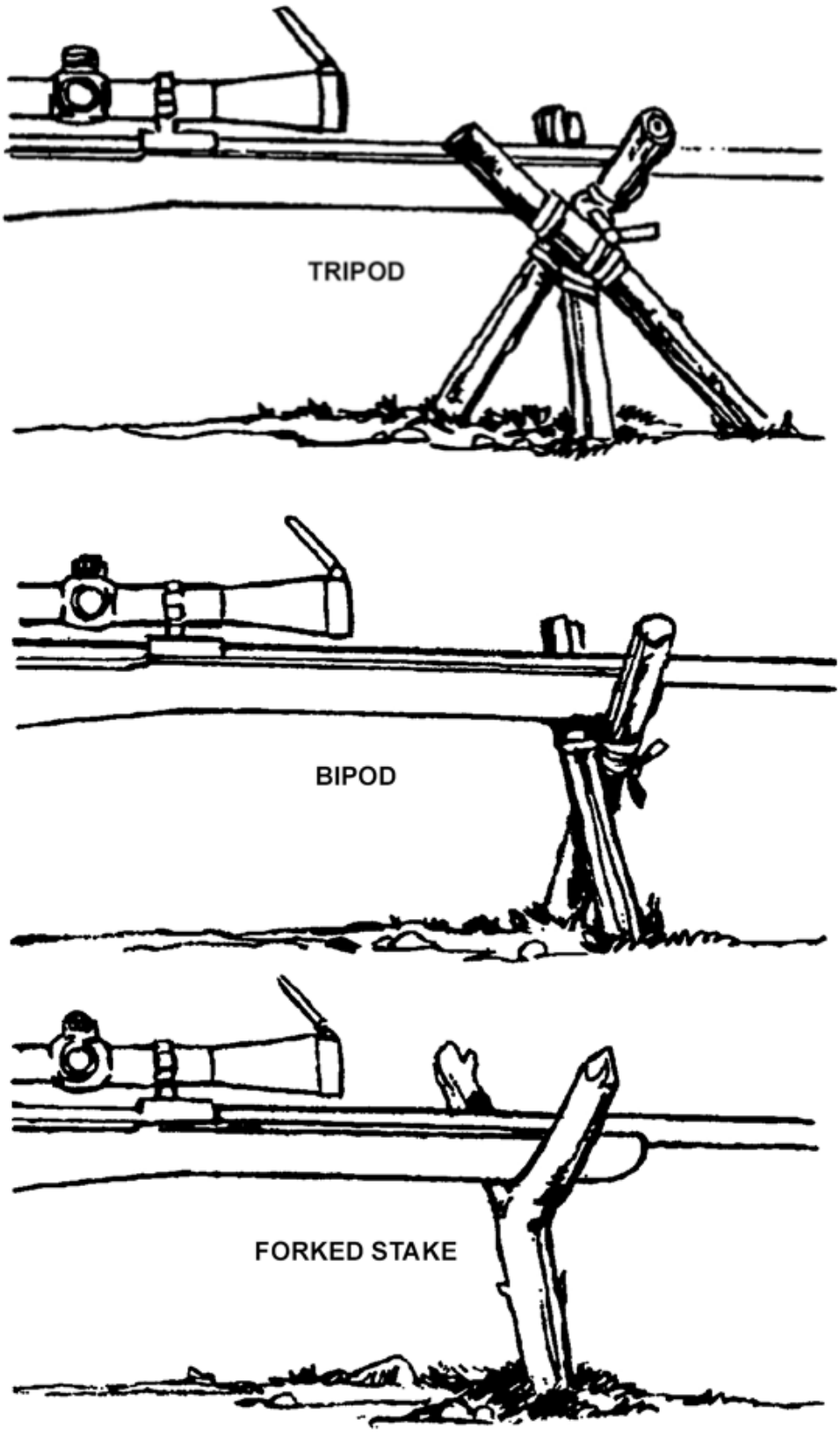

TRIPOD
BIPOD
FORKED STAKE

Figure 4-12. Field-expedient tripod, bipod, and forked stake.

SNIPER AND OBSERVER POSITIONING

4-47. The sniper should find a place on the ground where he can build a steady, comfortable position with the best possible cover and concealment and view of the target area. Once the sniper is set up, the observer positions himself out of the sniper's field of view, on his firing side (Figure 4-13). The closer the observer gets his spotting telescope to the sniper's line of bore, the easier for him to follow the trace of the bullet and to observe the point of impact. Overall, the observer's best position is at 4 to 5 o'clock (7 to 8 o'clock with left-handed snipers) from the firing shoulder and near (but not touching) the sniper.

WARNING

When the sniper is firing the M107 LRSR, the observer should set up several feet behind the sniper and observe over the sniper's head. This keeps him out of the way of the oblique (45 degree) backblast of the M107 LRSR.



Figure 4-13. Sniper team positioning.

NOTE: See paragraphs 4-185 and 4-186 for more information about trace.

4-48. If a sniper with an M110 SASS or M24 SWS lacks weapon support in his position, he can use the observer's body instead. However, the sniper must then try to compensate for the body movement of two people rather than just his own.

4-49. The sniper should practice and prepare to use an observer supported position. A variety of positions can be used; however, the two most stable are—

- Prone.
- Sitting.

Prone

4-50. To assume the prone position (Figure 4-14)—

(1) The observer lies at a 45- to 75-degree angle to the target and observes the area through his spotting telescope.

(2) The sniper assumes a prone supported position, using the back of the observer's thighs for support.

NOTE: Due to the offset angle, the observer may only see the bullet impact.



Figure 4-14. Prone observer supported position.

Sitting

4-51. If vegetation prevents the sniper from assuming a prone position (Figure 4-15)—

(1) The observer faces the target area and assumes a cross-legged sitting position. He places his elbows on his knees to stabilize his position and uses binoculars or a spotting scope with a tripod.

(2) The sniper sets up behind the observer in an open-legged, cross-legged, or kneeling position, depending on the target's elevation.

(3) The sniper places the fore-end of the weapon across the observer's left shoulder, stabilizing the weapon with the forefinger of his nonfiring hand.

4-52. When using this position, the sniper's effective engagement of targets at extended ranges is difficult and used only as a last resort. When practicing this position, the sniper and observer must enter respiratory pause together to eliminate movement from breathing.

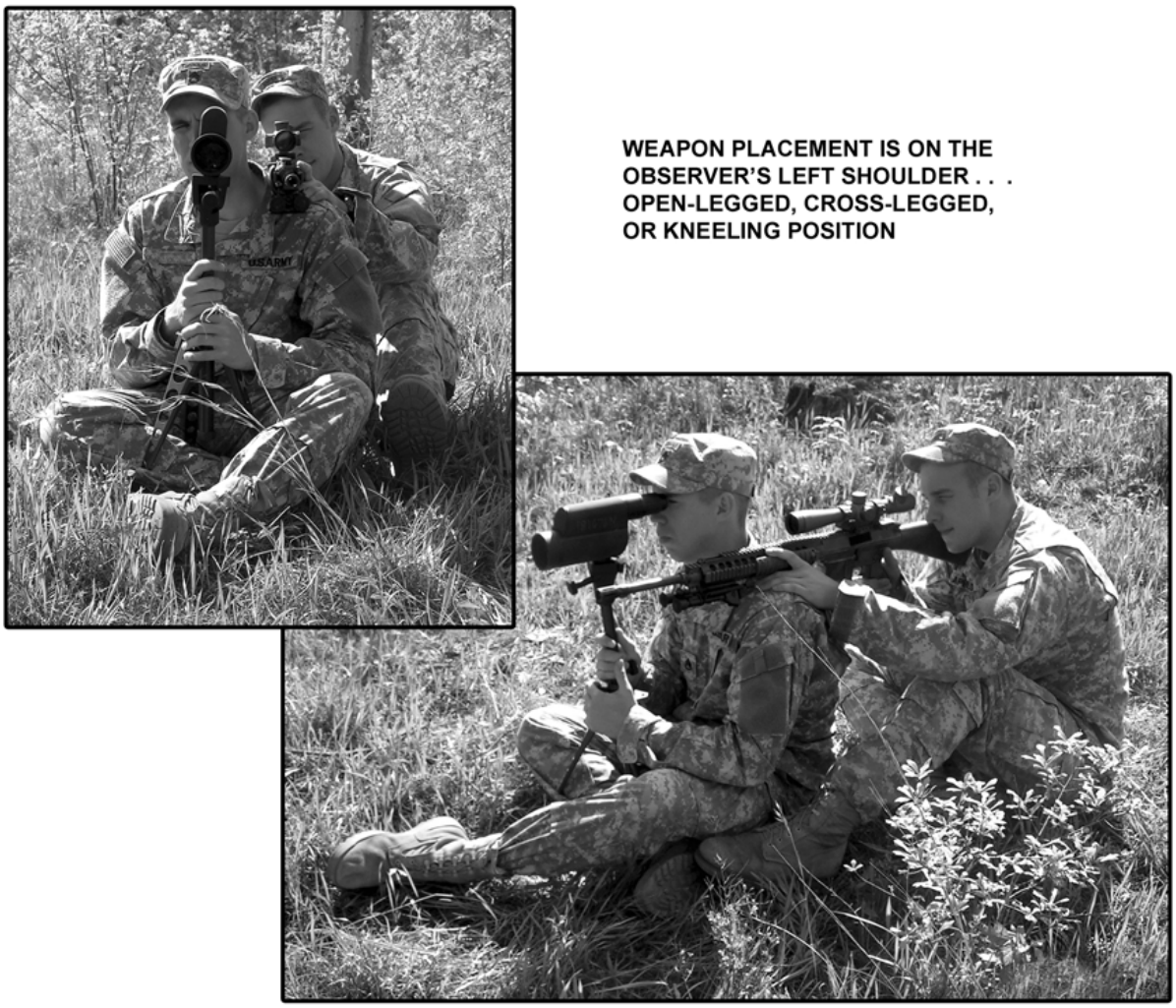


Figure 4-15. Sitting position.

AIMING

4-53. The sniper starts the aiming process by aligning the rifle with the target when assuming a firing position. He should point the rifle naturally at

the desired point of aim. By adjusting the weapon and body as a single unit, rechecking, and readjusting as needed, the sniper achieves a true natural point of aim. Once the position is established, the sniper then aims the weapon at the exact point on the target. Aiming involves determination of dominant eye, fitting the rifle to the firer, eye relief, sight alignment, and sight picture.

DOMINANT EYE

4-54. This exercise assists the sniper in determining which eye he should use when engaging targets. The sniper's dominant eye should be identified early in training to prevent unnecessary problems, such as a blurred sight picture or the inability to acquire a tight shot group. To perform dominant eye training—

(1) Extend one arm to the front, and point your index finger skyward to select an aiming point.

(2) With both eyes open, align the index finger with the aiming point.

(3) Close one eye at a time while looking at the aiming point. One eye will make the finger appear to move off the aiming point; the other eye will stay on the aiming point. The dominant eye is the eye that does not move the finger from the aiming point.

4-55. Some individuals may have difficulty aiming because of interference from their dominant eye, if this is not the eye used in the aiming process. This may require the sniper to fire from the other side of the weapon (right-handed firer will fire left-handed).

FIT OF RIFLE TO INDIVIDUAL FIRER

4-56. There are several adjustments that must be made both to the rifle itself and to the associated equipment to achieve a natural firing position. The sniper must experiment to find the adjustments that work best for him.

NOTE: Before checking for proper fit, the sniper must don the ghillie suit jacket he will use in operations or one that will allow for the same results.

Stock Weld

4-57. To aid in adjusting eye relief, the sniper might have to mark the stock where his cheek touches it. This is the stock weld. While in the prone position, he pads the stock to raise or lower his cheek to the correct position. Then, he uses tape to secure the padding to the stock.

Adjustment of Pull Length

4-58. Length of pull is the distance between the butt and the trigger. The sniper must determine the proper length of pull in all firing positions. Table 4-2 outlines the sniper weapons and their associated stock adjustments.

Table 4-2. Weapons and stock adjustments.

WEAPON	STOCK ADJUSTMENT
M110 SASS	Up to 1 1/2 inches
M24 SWS	1 to 5 inches
M107 LRSR	N/A

Tactical Intervention Specialist Cuff Sling (M110 Semiautomatic Sniper System)

4-59. The tactical intervention specialist (TIS) cuff sling may be used to maximize support in all firing positions. The TIS cuff sling has hook and pile tape and clip buckles to enable the sniper to rapidly attach the sling to the weapon and remove it.

Sling (M24 Sniper Weapon System)

4-60. The sniper adjusts the sling so that it provides maximum support in all firing positions. He marks the sling for each position.

Bipod

4-61. Depending on the sniper's build, he might have to extend the bipod legs for greater comfort.

Monopod (M107 Long-Range Sniper Rifle)

4-62. The monopod is used the same way as the sand sock. To raise the butt of the weapon, the sniper rotates the monopod counterclockwise; to lower the butt of the weapon, he rotates the monopod clockwise.

EYE RELIEF

4-63. Eye relief is the distance from the sniper's firing eye to the rear sight or the rear of the scope tube. Eye relief will vary from firing position to firing position and from sniper to sniper, according to the sniper's neck length, his angle of head approach to the stock, the depth of his shoulder pocket, and his firing position.

4-64. To achieve proper eye relief, the sniper must keep his head as upright as possible, with his firing eye located directly behind the rear portion of the sighting system. This head placement allows the muscles surrounding his eye to relax. The best aid to consistent eye relief is maintaining the same stock weld from shot to shot.

CAUTION

Incorrect head placement causes the sniper to look out of the top or corner of his eye, resulting in muscular strain. Such strain leads to blurred vision and eye strain. The sniper can also avoid eye strain by not staring through the telescopic or iron sights for extended periods.

4-65. When using iron sights, the sniper ensures the distance remains consistent from shot to shot to preclude changing what he views through the rear sight. Eye relief distance (Figure 4-16) is more rigidly controlled with telescopic sights than with iron sights. The sniper must take care to prevent eye injury caused by the scope tube striking his brow during recoil.



Figure 4-16. Eye relief.

SIGHT ALIGNMENT

4-66. When sight alignment and picture are perfect and all else is done correctly, the shot will hit center of mass on the target.

Telescopic Sights

4-67. With telescopic sights, sight alignment is the relationship between the crosshairs (reticle) and a full field of view as seen by the sniper. To achieve proper sight alignment with telescopic sights—

(1) Place your head so that a full field of view fills the tube, with no dark shadows or crescents to cause inaccurate shots.

(2) Center the reticle in a full field of view, ensuring the vertical crosshair is straight up and down so the rifle is not canted.

NOTE: The center is easiest for the sniper's eye to locate and allows for consistent reticle placement.

Iron Sights

4-68. With iron sights, sight alignment is the relationship between the front and rear sights as seen by the sniper. To achieve proper sight alignment with iron sights, center the top edge of the front sight blade horizontally and vertically within the rear aperture.

NOTE: The center of aperture is easiest for the eye to locate and allows the sniper to be consistent in blade location.

Errors

4-69. When an error in sight alignment occurs (Figure 4-17), the bullet displaces in the direction of the error. Such an error creates an angular displacement between the line of sight and the line of bore. This displacement increases as range increases; the amount of bullet displacement depends on the size of alignment error. Close targets show little or no visible error. Distant targets can show great displacement or can be missed altogether due to severe sight misalignment.

4-70. A sniper can vary his head position and eye relief from shot to shot, causing sight alignment errors. An inexperienced sniper is prone to this kind of error, since he is unsure of what correctly aligned sights look like.

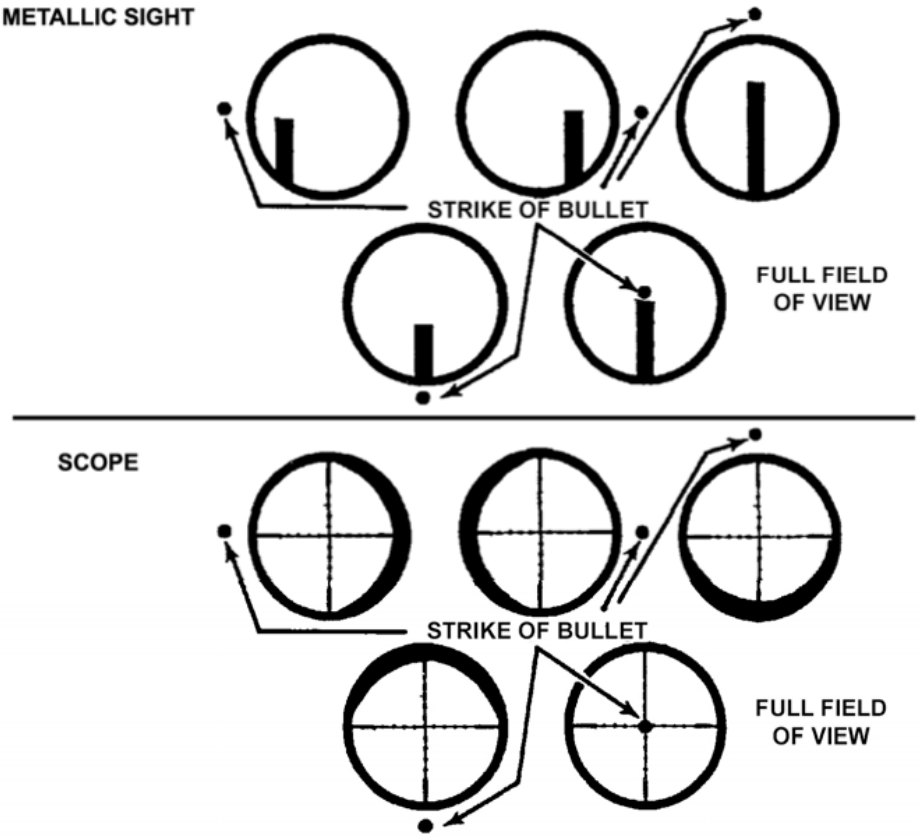


Figure 4-17. Sight alignment and sight alignment error.

SIGHT PICTURE

4-71. If the sniper aims at what he wants to shoot, he will hit it; likewise, if he fails to aim at the desired aiming point, he will miss it.

Telescopic Sights

4-72. With telescopic sights, the sight picture is the relationship between the reticle and full field of view and the target as seen by the sniper. To achieve proper sight picture with telescopic sights—

(1) Center the reticle in a full field of view.

(2) Place the reticle in the center of the largest visible mass of the target.

NOTE: The center of mass of the target is easiest for the sniper to locate, and it surrounds the intended point of impact with a maximum amount of target area.

Iron Sights

4-73. With iron sights, the sight picture is the relationship between the rear aperture, the front sight blade, and the target as seen by the sniper. To achieve proper sight picture with iron sights—

(1) Center the top edge of the blade in the rear aperture.

(2) Place the top edge of the blade in the center of the largest visible mass of the target.

NOTE: If the target presents his torso, disregard his head and aim at the center of the torso.

Errors

4-74. An error in sight picture is an error in the placement of the aiming point (Figure 4-18). Because no displacement exists as range increases, close and far targets are hit or missed depending on where the front sight or the reticle is when the rifle fires. All snipers face this kind of error every time they shoot. This is because, regardless of firing position stability, the weapon will always be moving (wobble area). The sniper must adjust his firing position so that his wobble area is as small as possible and centered on the target. With proper adjustments, the sniper should be able to fire the shot while the front sight blade or reticle is at, or very near, the desired aiming point.

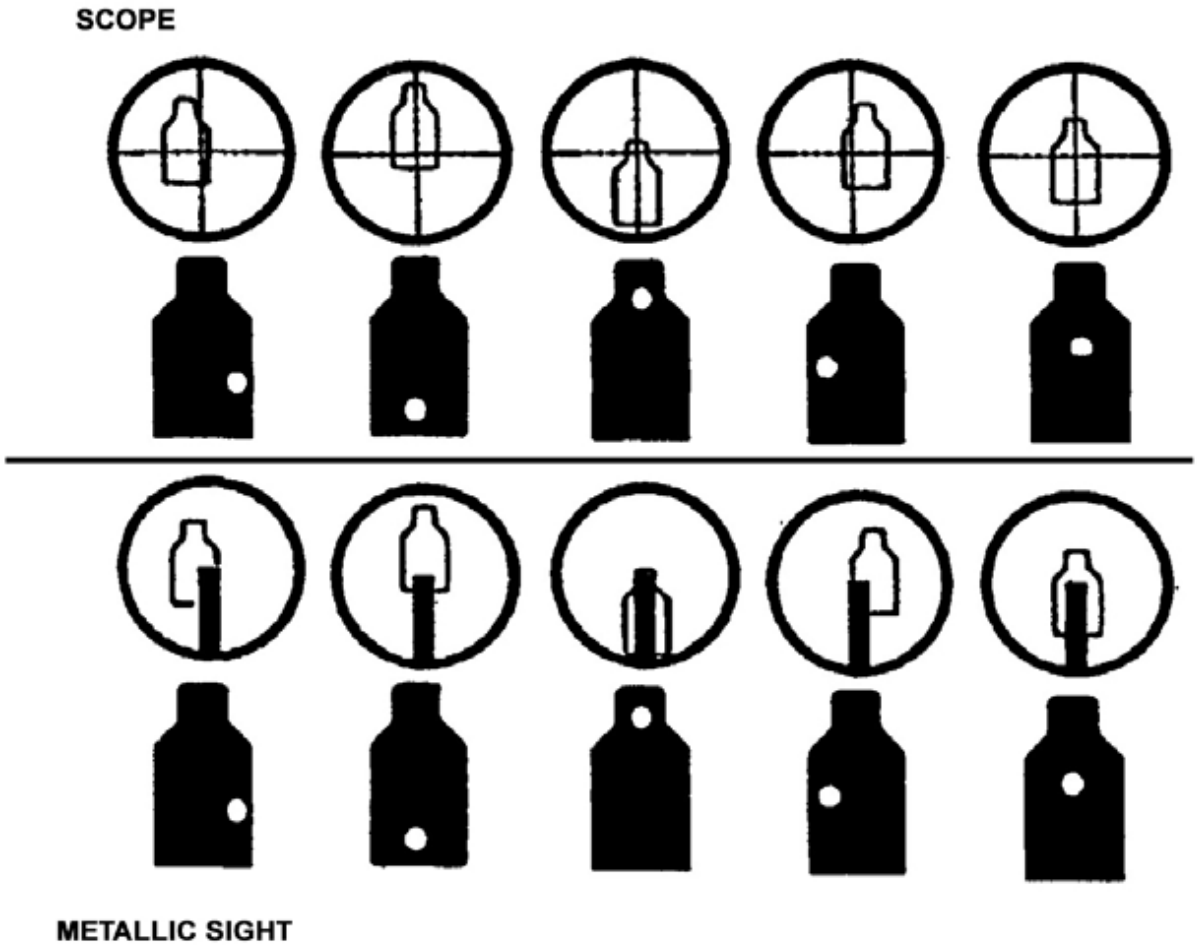


Figure 4-18. Sight picture and sight picture error.

ERRORS IN AIMING PROCESS

4-75. Everyone makes occasional errors in aiming. Some common causes for aiming errors include—

- Shadow effects.
- Cant.
- Parallax.

Shadow Effects

4-76. During aiming, the sniper must ensure that the telescope's field of view is clear and shadow-free. Incorrect eye relief creates a circular shadow that reduces the size of the field, hindering observation. Crescent-shaped shadows cause the bullets to strike on the side opposite from the shadow (Figure 4-19).

4-77. If the sniper notices a shadow on the edges of the field of view (FOV), then he must find a head position where he can clearly see the entire FOV.

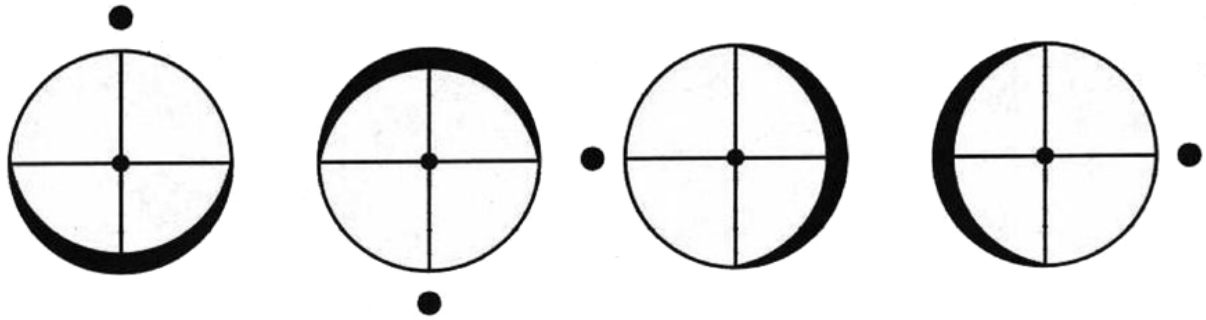


Figure 4-19. Effects of scope shadow on the fall of the shot.

Cant

4-78. Canting is the act of tipping the rifle to either side of the vertical. If the horizontal crosshair cants, the strike of the bullet hits low and in the direction of the cant. The more the cant or greater the range, the farther off the target the strike will be.

Parallax

4-79. While focusing on the target, the sniper moves his head slightly from side to side. The reticle might seem to move across the target face, even though the rifle and scope are motionless. This movement is called parallax. Parallax occurs when the target image is focused incorrectly on the reticle's focal plane, causing the target image and the reticle to seem to be in two separate places within the scope. This makes the reticle seem to move across the target.

NOTE: See Chapter 2 for weapon-specific parallax adjustments.

BREATH CONTROL

4-80. Breath control is important to accurate aim. The rise and fall of the chest during a breath will move the rifle. Therefore, the sniper must align his sight between breaths. To do this—

(1) Assume your firing position, and breathe naturally until your hold starts to settle.

(2) Inhale, taking a deep breath.

(3) Exhale normally.

(4) Stop at the moment of natural respiratory pause, and plan to fire the shot during the pause.

NOTES:

1. If your hold settles too little to allow you to fire, resume normal breathing, and repeat the process.

2. When you have many fast engagements, force your breathing through a rapid, shallow cycle between shots, instead of trying to hold your breath or breathing. Fire during the forced respiratory pauses.

3. A respiratory pause should feel natural. If it lasts beyond 8 or 10 seconds, the body runs out of oxygen and sends out signals to resume breathing. These signals cause involuntary movements in the diaphragm, which interfere with the sniper's ability to concentrate.

TRIGGER CONTROL

4-81. Controlling the trigger means causing the rifle to fire when the sight picture is at its best, without causing the rifle to move. A proper trigger squeeze uniformly increases pressure straight to the rear until the rifle fires.

Best Sight Picture + Least Movement = Trigger Control

NOTE: Trigger control is more difficult with the M107 LRSR due to its 7- to 9-pound trigger pull. The sniper should place his firing finger as low on the trigger as he can without touching the trigger guard to achieve maximum mechanical advantage and lessen the movement of the entire rifle during the trigger squeeze.

4-82. To properly perform trigger control—

(1) Assume a stable position, adjust on the target, and start a breathing cycle.

(2) As you exhale the last breath before a natural respiratory pause, place your finger on the trigger.

(3) As the front blade or reticle settles at the desired point of aim, enter a natural respiratory pause and begin applying pressure.

(4) Increase pressure as long as the front blade or reticle stays close enough to the target to ensure a well-placed shot.

NOTE: If the front blade or reticle moves away from the desired point of aim on the target and if the pause is free of strain or tension, stop, wait for the front blade or reticle to return to the desired point, and resume squeezing the trigger. If the movement is too great for recovery or if the pause becomes uncomfortable because it lasts too long, carefully release pressure on the trigger and restart the respiratory cycle.

4-83. The less stable the firing position, the greater the wobble area. The greater the wobble area, the harder it is to fire the shot without overreacting in some way. Possible overreactions occur when the sniper performs any of the actions listed in Table 4-3.

Table 4-3. Overreactions.

OVERREACTION	EXPLANATION

Anticipates recoil	The firing shoulder starts to move forward just before the round fires.
Avoids recoil	The sniper tries to avoid recoil or noise by moving away from the weapon or by closing the firing eye just before the round fires. This is caused by a lack of knowledge of the weapon's actions upon firing.
Jerks trigger	The trigger finger moves the trigger in a quick or choppy attempt to fire the shot before the front blade or reticle can move away from the desired point of aim.
Flinches	Part or all of the sniper's upper body jumps at an expected noise or recoil. This is also usually due to unfamiliarity with the weapon.

FOLLOW-THROUGH

4-84. Follow-through is the continued application of marksmanship fundamentals. Throughout and immediately after firing, the sniper must—

- Maintain a stock weld (keep his head in firm contact with the stock).
- Keep his finger on the trigger all the way to the rear.
- Keep looking through the rear aperture or scope tube.
- Keep his muscles relaxed.
- Avoid reacting to recoil or noise.
- Release the trigger only after the recoil has stopped.

CALLING THE SHOT

4-85. Calling the shot means identifying verbally where the round will strike the target. The Sniper will inform the observer where his reticle pattern was located when the round was fired. This will alert the observer as to whether or not to provide a correction to the sniper. Since live targets move when hit and both scopes and iron sights are nearly useless in locating downed targets, the observer verifies where the shot hit the target and will base subsequent corrections from that observation of impact.

FINAL FOCUS POINT

4-86. To properly call shots, the sniper must know where the scope reticle or iron sight blade is located when the weapon fires. This location is called the final focus point.

Iron Sights

4-87. With iron sights, the final focus point should be on the top edge of the front sight blade. The blade is the only part of the sight picture that is moving (in the wobble area). Aligning the sights with the target requires the sniper to shift his focus from the target to the blade and back.

Telescopic Sights

4-88. The sniper can place the final focus point with the telescopic sight due to its optical qualities. A properly focused scope should present both the field of view and the reticle in sharp detail. The final focus point should then be on the target.

INTEGRATED ACT OF FIRING

4-89. Once the sniper masters the fundamentals of marksmanship, his main concern is applying them in the performance of his mission. The integrated act of firing one round develops the fundamentals logically and sequentially, helping the sniper develop habits that enable him to fire each shot the same way. The integrated act of firing has four phases:

- Preparation phase.
- Before-firing phase.
- Firing phase.
- After-firing phase.

PREPARATION PHASE

4-90. Before departing the preparation area, the sniper ensures that—

- The team is mentally conditioned and knows the mission.
- The team systematically checks equipment for completeness and serviceability.

Rifles are properly cleaned and lubricated.

Scopes are properly mounted and torqued.

Systems are zeroed, and the zero data are recorded in the sniper data book.

Weather conditions are studied to determine possible effects on mission.

BEFORE-FIRING PHASE

4-91. On arrival at the mission site, the team chooses positions carefully. The sniper ensures that the selected positions support the mission. During this phase, the sniper—

- Follows the fundamentals of position. He ensures that—

The firing position is as relaxed as possible, making use of available external support.

The support is stable, conforms to the position, and allows a correct, natural point of aim for each designated area or target.

- Once in position, removes the scope covers and checks the field(s) of fire, making any corrections needed to ensure clear, unobstructed firing lanes.

- Dry fires and checks natural point of aim.

- Double-checks ammunition for serviceability.

- Completes final magazine loading.

- Notifies the observer that he is ready to engage targets.

NOTE: The observer must constantly be aware of weather conditions that might affect the accuracy of the shots. He also stays abreast of the tactical situation.

FIRING PHASE

4-92. Upon detection or if directed to a suitable target, the sniper makes appropriate sight changes, aims, and tells the observer that he is ready to fire. The observer then gives the needed windage and observes the target. When firing, the sniper remembers the keyword BRASS:

- **B** - Breathe.

- **R** - Relax.

- **A** - Aim.

- **S** - Slack.

- **S** - Squeeze.

Breathe

4-93. The sniper inhales and exhales to the natural respiratory pause. He checks his head placement, stock weld, and eye relief. At the same time, he aligns the crosshairs or front blade with the target at the desired point of aim.

Relax

4-94. As the sniper exhales, he relaxes as many muscles as he can, while maintaining control of the weapon and position.

Aim

4-95. If the sniper has a good, natural point of aim, the rifle points at the desired target during the respiratory pause. If his aim is off, the sniper adjusts slightly to acquire the desired point of aim.

Slack

4-96. If using the M110 SASS or M107 LRSR, the sniper takes up the trigger slack. If using the M24 SWS, there should be no slack.

Squeeze

4-97. The sniper keeps squeezing as long as the sight picture is satisfactory. He applies straight rearward pressure, without disturbing the lay of the rifle or the desired point of aim.

AFTER-FIRING PHASE

4-98. The sniper must analyze his performance. If the shot hit the desired spot on the target, he can assume that he correctly performed the integrated act of firing one round. If his shot was off-call, he and the observer must check for possible errors:

- Failure to follow the keyword BRASS.
- Target improperly ranged with scope, causing high or low shots.

- Wind compensated for incorrectly, causing shots to strike right or left of target.

- Possible weapon or ammunition malfunction (used only as a last resort, when no other errors are detected).

4-99. Once he determines the probable reasons for an off-call shot, the sniper notes the errors, paying close attention to problem areas to increase the accuracy of future shots.

M107 LONG-RANGE SNIPER RIFLE

4-100. The recoil, noise, and muzzle blast of the M107 LRSR require special consideration. If the observer is not directly behind the sniper, the effects are worse on him.

RECOIL

4-101. The stronger recoil of the M107 LRSR is physically wearing to the sniper. To reduce these effects, the rifle must be properly fitted to the sniper.

MUZZLE BLAST

4-102. The air before and after a fired .50-caliber round disperses outward through the muzzle brake. Exposure to this blast of gasses, combined with the heavy recoil of the weapon, can intimidate an inexperienced sniper. Placing sandbags on either side of the weapon helps reduce the blast. They can be removed once the sniper gains confidence in his marksmanship with the M107 LRSR.

PRINCIPLES

4-103. Even minor mistakes in the execution of the following marksmanship principles cause great errors at long ranges.

Position and Hold

4-104. The sniper should lay behind the rifle where the weapon will recoil straight back. He aligns the length of his body with the axis of the bore. A right-handed shooter aligns the axis of the barrel through his right shoulder, buttocks, and leg.

NOTE: Lying at an angle so that only the shoulder receives the recoil can misalign the weapon. The sniper must avoid disturbing the lay of the rifle while firing.

Natural Alignment

4-105. As air and gas disperse through the muzzle brake during the firing of a round, this muzzle blast causes some force to be pulled in the opposite direction of the recoil. The sniper must ensure that the weapon is naturally aligned on the target. If not, these forces will pull the weapon off target.

Follow-Through

4-106. The sniper must allow the weapon to go through the complete firing cycle without being disturbed. If his muscles become tense as he fires or if he tries to get the sight back on the target too fast, he will pull the weapon off target.

SECTION II. BALLISTICS

Ballistics is a science dealing with the motion and flight characteristics of projectiles. The study of ballistics is divided into three categories:

• Internal ballistics.

• External ballistics.

• Terminal ballistics.

NOTE: Snipers should use the tables and formulas in this section as guidelines, but every rifle performs differently.

TERMS

4-107. To fully understand ballistics, the sniper should understand the terms outlined in Table 4-4.

Table 4-4. Ballistics terms.

TERM	DEFINITION
Muzzle velocity	The speed of the bullet as it leaves the rifle barrel, measured in feet per second; varies according to various factors such as ammunition type and lot number, temperature, and altitude
Line of sight	A line from the eye straight through the aiming device to the point of aim
Line of departure	The line down the bore of the rifle or the path a bullet would take without gravity
Trajectory	The actual path the bullet travels to the target

Maximum ordinate	The highest point the bullet reaches on its way to the target; must be known before the sniper can engage a target that requires firing underneath an overhead obstacle (i.e., a bridge or a tree) NOTE: Inattention to midrange trajectory could make the round hit the obstacle instead of the target.
Bullet drop	The vertical distance between the line of departure and the point of impact
Time of flight	How long it takes the bullet to reach the target from the time it exits the rifle
Retained velocity	The speed of the bullet when it reaches the target NOTE: Drag reduces velocity.

INTERNAL BALLISTICS

4-108. Internal ballistics deals with what happens to the bullet before it leaves the weapon's muzzle.

EXTERNAL BALLISTICS

4-109. External ballistics deals with factors affecting the flight path of the bullet between the weapon's muzzle and the target.

4-110. The external ballistic factors that affect bullet trajectory are—

- Spin drift.
- Gravity.
- Air resistance (drag).

- Angle fire.

NOTE: Weather also affects external ballistics. See Section III, Effects of Weather, for information.

SPIN DRIFT

4-111. When a bullet is fired out of a rifle, the lands and grooves spin the round at very high revolutions per minute, drifting the round to the right or left (dependent on the direction of the lands and grooves) as it leaves the barrel. This is known as spin drift. At normal ranges, the effect is minimal; however, at long ranges, the sniper must consider it. The sniper uses Table 4-5 to compensate for spin drift on the M107's windage sight setting.

Table 4-5. Windage sight corrections for spin drift for M107 long-range sniper rifle.

TRUE RANGE (IN METERS)	500 to 800	900 to 1,100	1,200 to 1,300	1,400	1,500	1,600	1,700 to 1,800	1,900	2,000
CORRECTIONS IN MOA	0.25	0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.25
NOTE: Correct to the left to adjust for a drift to the right.									

NOTE: Spin drift pertains to the true range, not the slant range.

GRAVITY

4-112. Gravity starts pulling the bullet down as soon as it exits the muzzle of the weapon, requiring the sniper to use an elevation adjustment. At extended ranges, the sniper actually aims the muzzle above his line of sight, and then lets gravity pull the bullet down into the target. He must always compensate for gravity by adjusting elevation or using holdoff techniques.

AIR RESISTANCE (DRAG)

4-113. Density of the atmosphere slows (drags) the bullet. Factors that affect drag and density are—

- Temperature.
- Altitude and barometric pressure.
- Humidity.
- Ballistic coefficient.
- Wind.

Temperature

4-114. Heat reduces air density. If the firing temperature is higher than the zeroing temperature, the air is less dense when the sniper fires. This increases muzzle velocity and raises the point of impact. A 20-degree change in the temperature of the ammunition can move the strike of the bullet one minute in elevation.

Altitude and Barometric Pressure

4-115. Lower air pressure at higher altitudes means less dense air. This means less resistance on the round, which means more efficient flight. If a weapon is zeroed at or near sea level and fired at a higher altitude, the round will impact higher than the point of aim. Table 4-6 shows the approximate effect of change of the point of impact from sea level to 10,000 feet for a weapon zeroed at sea level.

Table 4-6. Point of impact rise, in minutes of angle at selected altitude.

RANGE (METERS)	2,500 FEET*	5,000 FEET*	10,000 FEET*
100	0.05	0.08	0.13

200	0.10	0.20	0.34
300	0.20	0.40	0.60
400	0.30	0.50	0.90
500	0.40	0.90	1.40
600	0.50	1.00	1.80
700	1.00	1.60	2.40
800	1.30	1.90	3.30
900	1.60	2.80	4.80
1,000	1.80	3.70	6.00
* Above sea level			

Humidity

4-116. Humidity varies at different altitudes and temperatures. Extreme humidity levels can cause the point of impact to go down. However, ballistics testing shows that humidity must change by 80 percent to noticeably affect trajectory.

Ballistic Coefficient

4-117. Ballistic coefficient is a measure of a projectile's ability to overcome air resistance in flight. An ideal (imaginary) bullet is rated 1.00. In truth, even

match bullets (e.g., the most accurate bullets manufactured commercially) range only from .500 to about .600. For example, the M118 7.62-mm special ball (SB) bullet is rated at 0.530 (Table 4-7).

Table 4-7. Ballistics data for 7.62-mm special ball ammunition (M118).

RANGE (Meters)	RETAINED VELOCITY (Feet Per Second)	MIDRANGE TRAJECTORY (Inches)	BULLET DROP IN 100-METER INCREMENTS (Minutes)	TIME OF FLIGHT (Seconds)
100	2,407	0.7	N/A	0.1
200	2,233	3.0	1.5	0.2
300	2,066	7.3	3.0	0.4
400	1,904	14.0	3.5	0.5
500	1,750	24.0	4.0	0.7
600	1,603	37.6	4.5	0.9
700	1,466	56.2	5.0	1.0
800	1,339	80.6	5.0	1.3
900	1,222	112.5	6.0	1.5
1,000	1,118	153.5	7.0	1.8

Wind

4-118. Wind affects the bullet similar to the way gravity does: the farther the round travels, the farther the wind will push the round in the direction the wind is blowing. The harder the wind is blowing, the farther the wind will push the bullet.

NOTE: See Section III of this chapter for more information.

TERMINAL BALLISTICS

4-119. Terminal ballistics deals with what happens to the bullet when it comes in contact with the target.

ANGLE FIRE

4-120. Most practice firing conducted by the sniper team takes place on military ranges, which are usually fairly flat. However, snipers deployed tactically must often operate in mountainous or urban environments. This requires target engagements at extreme elevations. Firing at an angle reduces the effects of gravity, and the bullet's trajectory no longer intersects the line of sight at the desired range. Unless the sniper corrects for these conditions, the round will impact above the point of aim. How high the bullet hits is determined by the range and angle to the target (Table 4-8). The elevation change the sniper must apply to the telescope of the rifle for angle firing is called "slope dope."

Table 4-8. Bullet rise at a given angle (degree of slant) and range, in minutes.

RANGE (Meters)	DEGREES OF ANGLE											
	5	10	15	20	25	30	35	40	45	50	55	60
100	0.01	0.04	0.09	0.16	0.25	0.36	0.49	0.63	0.79	0.97	1.2	1.4
200	0.03	0.09	0.20	0.34	0.53	0.76	1.00	1.30	1.70	2.00	2.4	2.9

300	003	0.10	0.30	0.50	0.90	1.20	1.60	2.10	2.70	3.20	3.9	4.5
400	0.05	0.19	0.43	0.76	1.20	1.70	2.30	2.90	3.70	4.50	5.4	6.3
500	0.06	0.26	0.57	1.00	1.60	2.30	3.00	3.90	4.90	6.00	7.2	8.4
600	0.08	0.31	0.73	1.30	2.00	2.90	3.90	5.00	6.30	7.70	9.2	10.7
700	0.10	0.40	0.90	1.60	2.50	3.60	4.90	6.30	7.90	9.60	11.5	13.4
800	0.13	0.50	1.00	2.00	3.00	4.40	5.90	7.70	9.60	11.70	14.0	16.4
900	0.15	0.60	1.30	2.40	3.70	5.30	7.20	9.30	11.6	14.10	16.9	19.8
1,000	0.2	0.70	1.60	2.80	4.50	6.40	8.60	11.00	13.9	16.90	20.2	23.7
NOTE: Range is Line of Sight Distance (meters), not map distance. Values in table are MOA drop required.												

Compensation Factors

4-121. The sniper compensates for the differences resulting from his zero on level terrain and firing at an angle by—

(1) Estimating the line of sight distance to the target.

(2) Determining the angle to the target.

(3) Choosing the compensation factor for the angle.

(4) Multiplying the estimated range by the compensation factor.

(5) Setting the compensated range on the scope.

(6) Firing and hitting the target.

Line of Sight Distance

4-122. The line of sight distance is the actual distance from the sniper to the target (Figure 4-20), not the horizontal range. The sniper can use most of the standard range estimating methods, or he can use a laser rangefinder to determine this range. Once the range is identified, the sniper must complete the calculations necessary to successfully engage the target. The Pythagorean Theorem can be used when the sniper knows two of the distances and needs to find the third:

$$A^2+B^2=C^2$$

A: Elevation, the height of the snipers position above the target

B: Flat ground distance (FGD), the map distance from the sniper's position to the target

NOTE: This is the most critical element in this equation and is the data that will be dialed into the BDC to ensure a first round hit. It is over this distance that gravity will affect the trajectory of the round and should be compensated for.

C: Actual range, actual distance from the sniper to the target

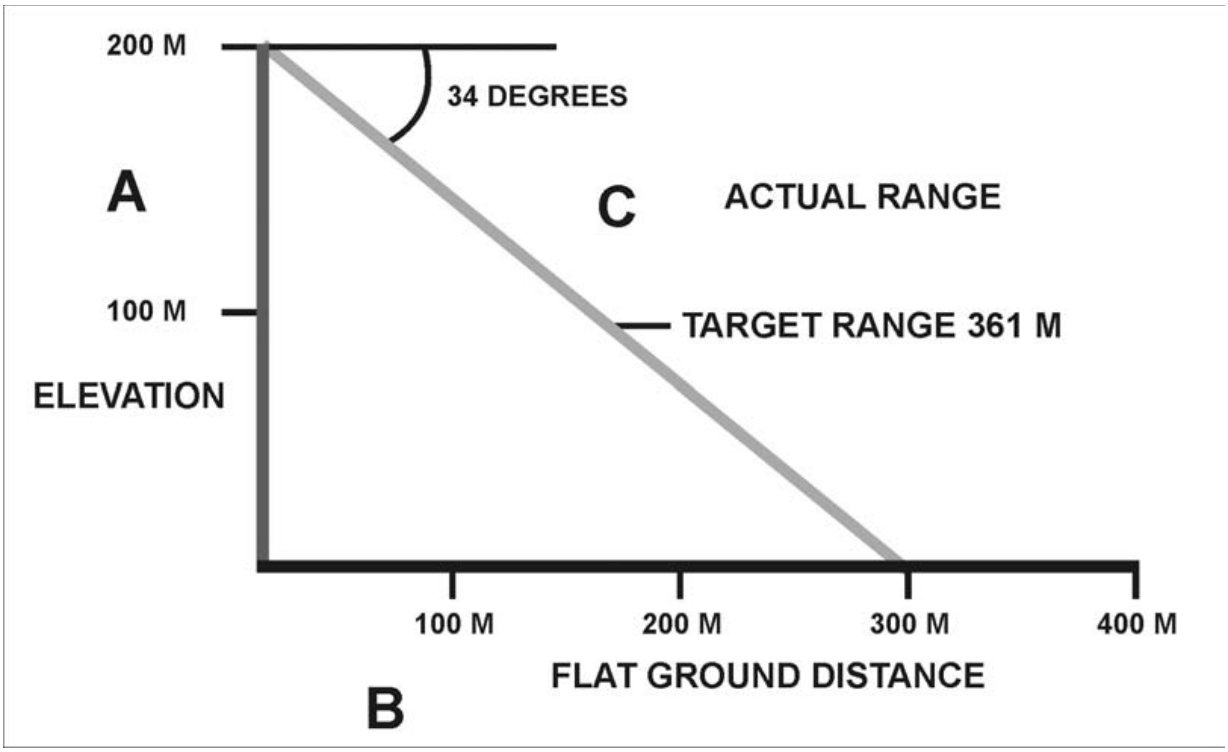


Figure 4-20. Pythagorean Theorem.

4-123. The sniper can manipulate the Pythagorean Theorem as follows:

The elevation is 200 meters. $A^2 = 200 \times 200 = 40{,}000$

The target range is 361 meters. $C^2 = 361 \times 361 = 130{,}321$

$B=(C^2 - A^2)^2$ $B = (130{,}321 - 40{,}000)^2 = 300.5$ meters

The sniper would dial 300 meters into his BDC to engage this target.

Angle to Target

4-124. The sniper can also use the angle to target method to calculate the range to the target with a given angle. The sniper can estimate the angle to his target and calculate it when making his range card. He can check angles with an angle cosine indicator (NSN 1240-01-538-2341) or mil-dot master. To determine the flat ground distance using the angle to target method—

(1) Once you determine the angle to the target, select the correct factor from Table 4-9.

Table 4-9. Compensation factors for angle fire.

ANGLE	COSINE	ANGLE	COSINE
1,8	0.99	43	0.73
9,11	0.98	44	0.72
12,14	0.97	45	0.7
15,16	0.96	46	0.69
17,18	0.95	47	0.68
19,20	0.94	48	0.67
21,22	0.93	49	0.65
23	0.92	50	0.64
24,25	0.91	52	0.6
26,27	0.89	55	0.57
28	0.88	57.5	0.53
29	0.87	60	0.5
30,31	0.86	62.5	0.46

32,33	0.84	65	0.42
34,35	0.82	67.5	0.38
36,37	0.8	70	0.34
38,40	0.78	72.5	0.3
41	0.75	75	0.26
42	0.75	77.5	0.215

(2) Multiply the estimated slant range by the selected compensation factor.

Actual range x Cosine = Flat Ground Distance (BDC setting)

EXAMPLE

For 700 meters at 60-degree slope (cosine is .50), a sniper would make the following calculations:

700 × .50 = 350 or 350 meters

COLD-BORE DATA COLLECTION

4-125. Cold-bore data collection is a method used to determine where the first round of a given day will strike the target. This data is gathered at various ranges and in different environmental conditions to determine the settings needed to hit the target at a given distance. To fire for cold-bore data collection —

(1) Select a target, and dial in the elevation and windage settings needed to hit it.

(2) Fire one round without correcting the scope.

4-126. Measuring the distance from the point of impact and the target's center of mass for the first two rounds of the day lets the sniper predetermine the corrections to apply to his scope to achieve a first-round hit. As part of this collection process, the team also gathers the data on previous engagements needed to achieve successfully engage their target.

SECTION III. EFFECTS OF WEATHER

For the highly trained sniper, weather is the main cause of error in the strike of the bullet. Wind, mirages, light, temperature, and humidity affect the bullet, the sniper, or both.

NOTE: Weather is a major factor affecting external ballistics. See paragraph 4-109 for more information on external ballistics.

WIND

4-127. Wind affects the sniper. The stronger it is, the harder it is for him to hold the rifle steady. Training, conditioning, and the use of supported positions can partly offset the negative effects of the wind.

4-128. Wind also affects the bullet. The effect of wind on a bullet increases as range increases. Not only does the wind have more time to blow the round off course, but also the bullet's velocity decreases as the range increases, making the round more susceptible to the wind.

4-129. Before adjusting the sight to compensate for wind, the sniper must determine wind classification and wind direction and velocity.

CLASSIFICATION

4-130. Since the sniper must know how much the wind will affect the bullet, he must know how to classify the wind. The best method is the clock system (Figure 4-21). To use the clock system—

(1) Identify your position as the center of the clock, with your target at 12 o'clock.

(2) Assign the wind one of three values:

Full. Full-value winds come from 3 and 9 o'clock and have a full effect on the flight of the bullet.

Half. Half-value winds are the same speed, but come from 1, 2, 4, 5, 7, 8, 10, or 11 o'clock and move the bullet only half as much as a full-value wind.

No wind. No-value winds are from 6 or 12 o'clock, and they have little or no effect on the flight of the bullet.

DIRECTION AND VELOCITY

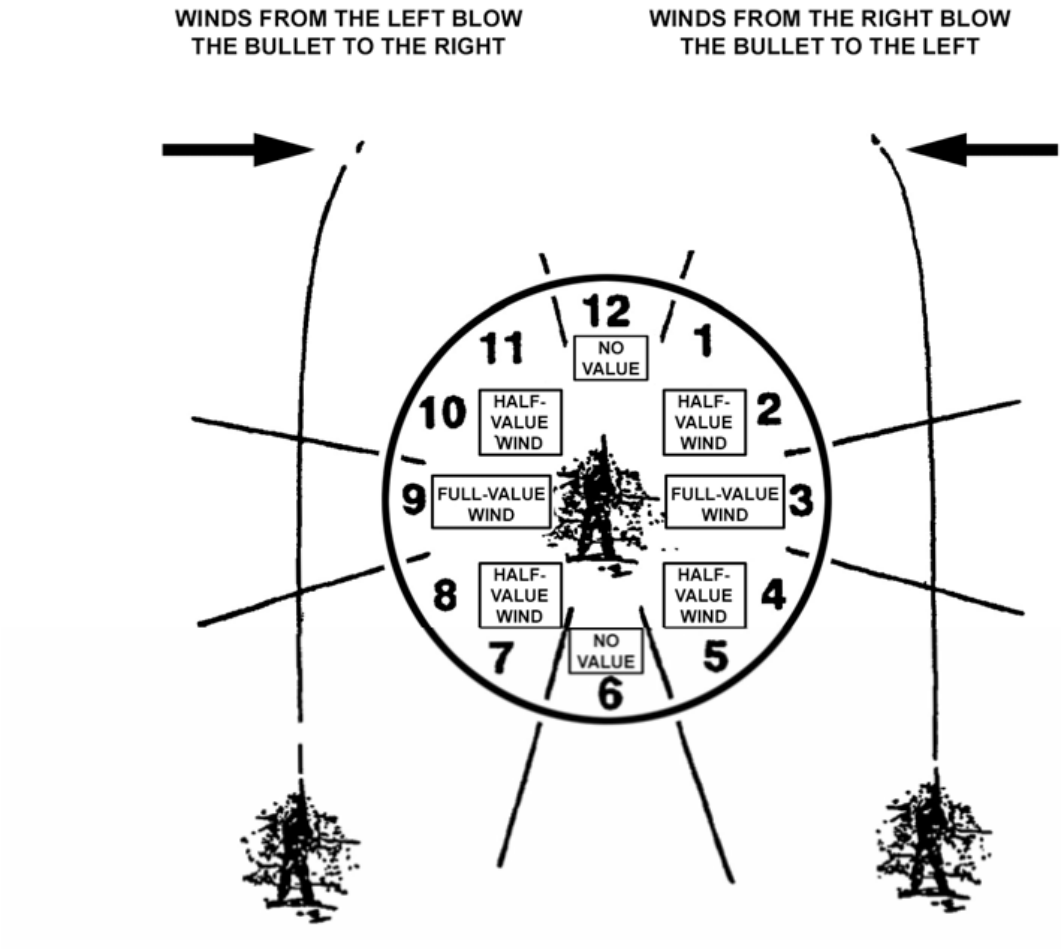


Figure 4-21. Clock system.

4-131. To determine the wind direction and velocity, the sniper can use certain indicators, such as range flags, smoke, trees, grass, rain, and his sense of feel; however, the best way to determine wind direction and velocity is to read the mirage.

Indicators

4-132. A common method of estimating the velocity of the wind during training is to watch the range flag (Figure 4-22). To use this method, determine the angle between the flag and pole, and divide by 4. The result gives the approximate velocity in miles per hour.

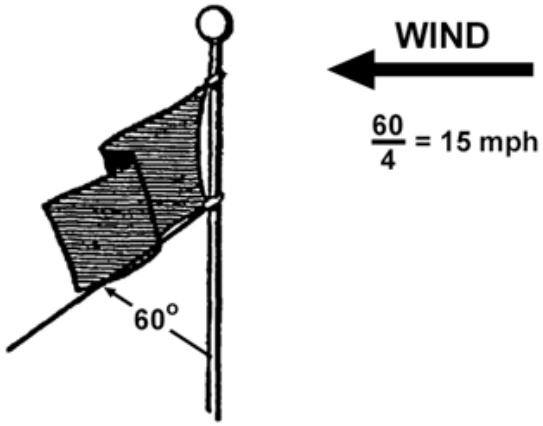


Figure 4-22. Flag method.

4-133. If no flag is visible, hold a piece of paper, grass, cotton, or some other light material at shoulder level, and then drops it. Point directly at the spot where it lands, and divide the angle between your body and arm by 4. The result gives the approximate velocity in miles per hour.

4-134. If you cannot use the previous method, use the guidelines outlined in Table 4-10.

Table 4-10. Wind velocity and indicators.

VELOCITY	INDICATOR
Under 3 miles per hour	Barely felt, although it will make smoke drift
3 to 5 miles per hour	Barely detectable on the face
5 to 8 miles per hour	Leaves in trees move constantly
8 to 12 miles per hour	Leaves and trash move
12 to 15 miles per hour	Small trees sway

Mirage

4-135. Mirages can be observed mainly on days when the ground and air are different temperatures. A mirage is simply a reflection of heat through layers of air at different temperatures and densities (Figure 4-23). Properly reading the mirage with a spotting telescope lets the sniper estimate wind speed and direction accurately for up to 12 miles per hour; winds beyond this speed cause the mirage to move too fast to detect minor changes.

4-136. Since the wind nearest midrange affects the bullet the most, the sniper tries to determine the velocity there. He can do this in one of two ways:

- He focuses on an object from midrange, and then places the scope back onto the target without readjusting the focus.

- He focuses on the target, and then backs off one-quarter turn counterclockwise. This makes the target appear fuzzy, but leaves the mirage clear.

4-137. As observed through the telescope, the mirage seems to move with the same velocity as the wind, except when the wind is blowing straight into or away from the scope. Then, the mirage seems to move straight up, with no lateral movement (a boiling mirage). The sniper might also see a boiling mirage when the wind is constantly changing direction.

NOTE: Firing during a boiling mirage can spoil shot placement; unless the wind has no value (speed), the sniper must wait until the boil disappears.

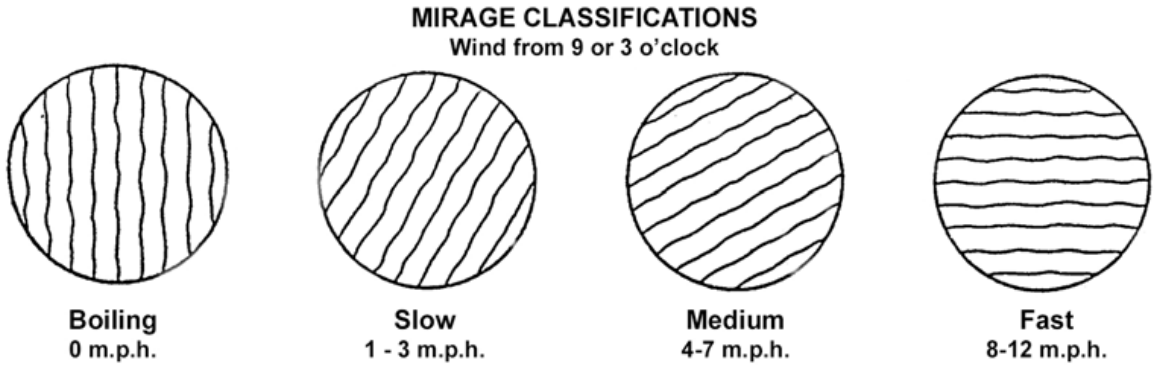


Figure 4-23. Types of mirages.

4-138. Barrel mirage is a condition that occurs when multiple successive rounds are fired allowing little time for the barrel to cool. This is most commonly occurs when firing semiautomatic or suppressed rifles, such as the M110 SASS. Heat escaping from the barrel is viewed as an additional mirage when viewed through the telescopic sight. There are two ways to reduce visible barrel mirage:

- One method is to wrap the barrel or suppressor with either heat dissipating or insulating material.

- Another is to reduce the magnification on the variable-powered scope.

NOTE: See FM 3-05.222 for more information about mirage.

Conversion of Wind Velocity to Minutes of Angle

4-139. All telescopic sights have windage adjustments that are graduated in MOA or fractions thereof. One MOA is 1/60th of a degree (Figure 4-24). This equals about 1 inch for every 100 yards (2.5 centimeters for every 100 meter).

4-140. Snipers use MOA to determine and adjust the elevation and windage on the weapon's scope. After finding the wind direction and velocity in miles per hour, the sniper converts them to MOA. He uses the wind formula as a guide only. He must remember that the range factor depends on the target's range. The wind formula is—

$$\frac{(\text{Range}/100) \times \text{Velocity}}{\text{Constant}} = \text{Minutes of angle (MOA)}$$

4-141. The constant for M118 and M118LR is 10 at all ranges. Table 4-11 outlines the constant for all other rounds.

Table 4-11. Constant for wind formula.

RANGE (METERS)	CONSTANT
100 to 500	15
600	14
700 to 800	13
900	12
1,000	11

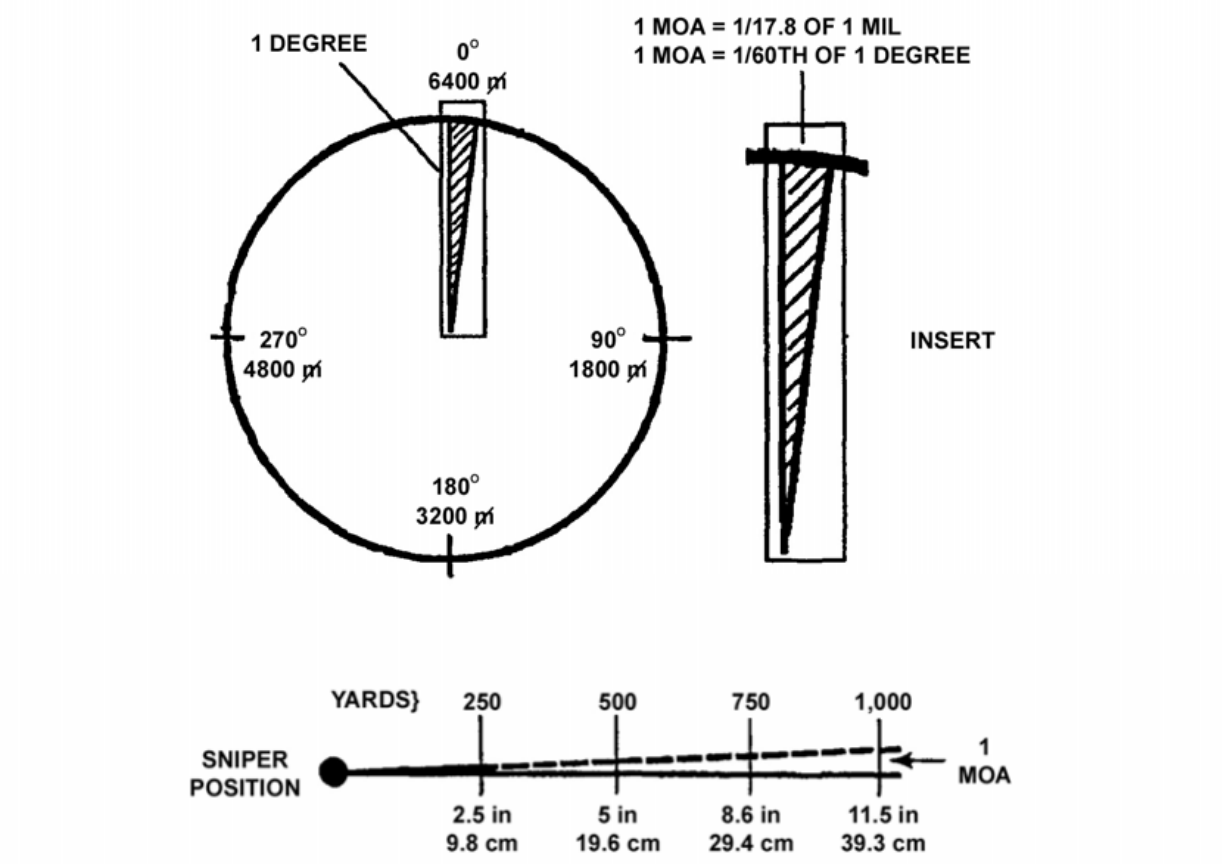


Figure 4-24. Minutes of angle.

EXAMPLE

The target is 700 meters away and the wind velocity is 10 mph.

$$\frac{700\ (\text{Range})/100 \times 10\ (\text{Velocity})}{13\ (\text{Constant})} = 5.38\ (\text{Minutes full-value wind}) = 5.5\ (\text{Minutes full-value wind})$$

4-142. The observer estimates his adjustments, and then he compares them to the appropriate wind-conversion table (Table 4-12 for the M110 SASS or Table 4-13 for the M107 LRSR). The tables provide data on wind components and half and full values for ranges from 200 to 1,000 meters and winds from 3 to 20 mph. The table can be a valuable training tool for the sniper, but because he could lose it in a tactical situation, he should learn to estimate wind speed and compute sight changes without it.

Table 4-12. Wind-conversion table for the M110 Semiautomatic Sniper System.

RANGE (meters)	WIND VALUE	3 miles per hour		5 miles per hour		7 miles per hour		10 miles per hour	
		Minutes	Inches	Minutes	Inches	Minutes	Inches	Minutes	Inches
200	Half	0.0	0.4	0.5	0.6	0.5	0.8	0.5	1.2
	Full	0.5	0.8	0.5	1.2	1.0	1.7	1.0	2.4
300	Half	0.5	0.9	0.5	1.3	0.5	1.9	1.0	2.7
	Full	0.5	1.7	1.0	2.7	1.0	3.8	1.5	5.4
400	Half	0.5	1.4	0.5	2.4	1.0	3.3	1.0	4.8
	Full	0.5	2.9	1.0	4.8	1.5	6.7	2.0	9.8
500	Half	0.5	2.3	0.5	3.8	1.0	5.3	1.5	7.5
	Full	1.0	4.5	1.5	7.5	2.5	10.5	2.5	15.0
600	Half	0.5	3.0	1.0	5.0	1.5	8.0	1.5	11.0
	Full	1.0	7.0	1.5	11.0	2.5	15.0	3.5	21.0
700	Half	0.5	4.0	1.0	7.0	1.5	10.0	2.0	15.0
	Full	1.0	9.0	2.0	15.0	3.0	21.0	4.0	29.0
800	Half	0.5	6.0	1.0	10.0	1.5	13.0	2.0	19.0
	Full	1.5	11.0	2.0	19.0	3.0	27.0	4.5	38.0
900	Half	0.5	7.0	1.0	12.0	1.5	17.0	2.5	24.0
	Full	3.5	15.0	2.5	24.0	3.5	34.0	5.0	49.0

1,000	Half Full	1.0 1.5	9.0 18.0	1.5 2.5	15.0 30.0	2.0 4.0	21.0 42.0	2.5 5.5	30.0 60.0

RANGE (meters)	WIND VALUE	12 miles per hour		15 miles per hour		18 miles per hour		20 miles per hour	
		Minutes	Inches	Minutes	Inches	Minutes	Inches	Minutes	Inches
200	Half Full	0.5 1.5	1.3 2.9	1.0 1.5	1.8 3.6	1.0 2.0	2.2 4.3	1.0 2.0	2.4 4.8
300	Half Full	1.0 2.0	3.3 6.5	1.0 2.5	4.0 8.1	1.5 3.0	4.9 9.8	1.5 3.5	5.4 10.9
400	Half Full	1.5 2.5	5.8 11.5	1.5 3.5	7.2 14.4	2.0 4.0	8.6 17.3	2.0 4.5	9.6 19.2
500	Half Full	1.5 3.5	9.0 18.0	2.0 4.0	11.3 22.6	2.5 5.0	13.5 27.5	2.5 5.5	15.0 30.0
600	Half Full	1.5 4.0	13.0 26.0	2.5 5.0	16.0 32.0	3.0 6.0	19.0 39.0	3.5 6.5	22.0 43.0
700	Half Full	2.5 4.5	18.0 35.0	3.0 6.0	22.0 44.0	3.5 7.0	26.0 53.0	4.0 7.5	29.0 59.0
800	Half	2.5	23.0	3.5	29.0	4.0	35.0	4.5	38.0

	Full	5.5	46.0	6.5	57.0	8.0	69.0	9.0	77.0
900	Half	3.0	29.0	3.5	36.0	4.5	44.0	5.0	49.0
	Full	6.0	58.0	7.5	73.0	9.0	97.0	10.0	97.0
1,000	Half	3.5	36.0	4.0	45.0	5.0	54.0	5.5	60.0
	Full	6.5	72.0	8.0	90.0	10.0	103.0	11.5	120.0

Table 4-13. Wind-conversion table for the M107 long-range sniper system.

RANGE (meters)	WIND VALUE	3 miles per hour		5 miles per hour		7 miles per hour		10 miles per hour	
		Minutes	Inches	Minutes	Inches	Minutes	Inches	Minutes	Inches
200	Half	0.5	0.5	0.5	0.7	0.5	0.9	0.5	1.4
	Full	0.5	0.9	0.5	1.4	1.0	1.9	1.0	2.7
300	Half	0.5	1.0	0.5	1.5	1.0	2.1	1.0	3.0
	Full	0.5	1.9	1.0	3.0	1.0	4.3	2.0	6.2
400	Half	0.5	1.5	0.5	3.0	1.0	4.0	1.0	5.5
	Full	1.0	3.0	1.0	5.5	2.0	4.5	2.5	11.0
500	Half	0.5	2.5	1.0	4.5	1.0	6.0	1.5	8.5
	Full	1.0	5.0	1.5	5.5	2.0	12.0	3.5	17.0
600	Half	0.5	3.5	1.0	5.5	1.5	9.0	2.0	12.5
	Full	1.0	8.0	2.0	12.5	3.0	17.0	4.0	24.0

700	Half Full	0.5 1.5	4.5 10.0	1.0 2.5	8.0 17.0	1.5 3.5	11.0 24.0	2.5 4.5	17.0 33.0
800	Half Full	0.5 1.5	7.0 12.5	1.5 2.5	11.0 21.5	2.0 4.0	15.0 30.5	2.5 5.5	21.5 43.0
900	Half Full	1.0 2.0	8.0 17.0	1.5 3.0	13.5 27.0	2.0 4.0	19.0 38.5	3.0 6.0	27.0 55.0
1,000	Half Full	1.0 2.0	10.0 20.0	2.0 3.5	17.0 34.0	2.5 5.0	24.0 47.5	3.5 7.0	34.0 68.0

RANGE (meters)	WIND VALUE	12 miles per hour		15 miles per hour		18 miles per hour		20 miles per hour	
		Minutes	Inches	Minutes	Inches	Minutes	Inches	Minutes	Inches
200	Half Full	0.5 1.5	1.5 3.3	1.0 2.0	2.0 4.0	1.0 2.0	2.5 4.8	1.0 2.5	2.7 5.4
300	Half Full	1.0 2.5	3.7 7.3	1.5 3.0	4.5 9.1	2.0 3.5	5.5 11.0	2.0 4.0	6.2 12.3
400	Half Full	1.5 3.0	6.5 13.5	2.0 4.0	8.0 16.0	2.0 4.5	10.0 19.5	2.5 5.0	11.0 22.5
500	Half	2.0	10.0	2.5	13.0	3.0	15.0	3.5	17.0

	Full	4.0	20.5	5.0	25.5	6.0	30.5	6.5	34.0
600	Half	2.5	15.0	3.0	18.0	3.5	21.5	4.0	25.0
	Full	5.0	29.5	6.0	36.0	7.5	44.0	8.0	48.5
700	Half	3.0	20.0	3.5	25.0	4.0	29.5	4.5	33.0
	Full	5.5	39.5	7.0	50.0	8.5	60.0	9.5	67.0
800	Half	3.0	26.0	4.0	33.0	5.0	39.5	5.5	43.0
	Full	6.5	52.0	8.0	64.5	10.0	78.0	11.0	87.0
900	Half	3.5	33.0	4.5	40.5	5.5	50.0	6.0	55.0
	Full	7.5	65.5	9.0	82.5	12.0	110.0	14.5	130.0
1,000	Half	4.0	41.0	5.0	51.0	6.0	61.0	7.0	68.0
	Full	8.0	81.0	10.0	102.0	12.0	116.0	14.0	136.0

LIGHT

4-143. Light does not affect the trajectory of the bullet; however, it does affect the way the sniper sees the target through the scope. This effect can be compared to the refraction (bending) of light through a medium, such as a prism or a fish bowl. The same effect, although not as drastic, can be observed on a day with high humidity and with sunlight from high angles. The only way the sniper can adjust for this effect is to refer to past firing recorded in the sniper data book. He can then compare different light and humidity conditions and their effect on marksmanship.

4-144. Light may also affect firing on unknown distance ranges since it affects range determination capabilities.

TEMPERATURE

4-145. Temperature affects the firer, ammunition, and density of the air. When ammunition sits in direct sunlight, the bum rate of powder is increased, resulting in

greater muzzle velocity and higher impact.

4-146. The greatest effect is on the density of the air. As the temperature rises, the air density drops. Since there is less resistance, velocity increases and the point of impact rises. For example, if the sniper zeros at 50 degrees and fires at 90 degrees, the point of impact rises considerably.

4-147. The change in the point of impact is best determined by referencing past firing recorded in the sniper data book. As a rule of thumb, a 20-degree increase in temperature will raise the point of impact by one minute; conversely, a 20-degree decrease will drop the point of impact by one minute.

HUMIDITY

4-148. The sniper can encounter problems if drastic humidity changes occur in his AO. Altitude and temperature impact the humidity level. As the humidity rises, the point of impact goes down; as the humidity decreases, the point of impact goes up. As a rule of thumb, a 20-percent change will equal about one minute, affecting the point of impact. The change in the point of impact is best determined by referencing past firing recorded in the sniper data book. The sniper should keep a good sniper data book during training and refer to his record.

SECTION IV. HOLDOFF

Certain situations, such as multiple targets at varying ranges and rapidly changing winds, prohibit proper windage and elevation adjustments. Therefore, the sniper should learn and practice elevation holdoff, mil hold, and windage holdoff techniques to prepare himself to meet these situations. Holdoff is a shift in the point of aim to achieve a desired point of impact.

ELEVATION

4-149. The sniper uses elevation holdoff to hit targets at ranges other than that for which the rifle is adjusted.

NOTE: This technique is used only when the sniper lacks time to reset the sight. He uses holdoff with the sniper scope only if several targets appear at various ranges, or he has no time to adjust the scope for each target.

4-150. When the sniper aims directly at a target at ranges greater than the set range, his bullet will hit below the point of aim. At lesser ranges, his bullet will hit higher than the point of aim. If the sniper knows this and understands trajectory and bullet drop, he can hit the target at ranges other than that for which the rifle is adjusted (Figure 4-25).

EXAMPLE

The sniper has adjusted the rifle for 500 meters, and a target appears at 600 meters. The holdoff is 25 inches. That is, the sniper aims 25 inches above the target's center of mass to hit the target's center of mass. If another target appears at 400 meters, he aims 14 inches below the target's center of mass to hit it. Table 4-14 translates the amount of holdoff for sights set for 300 and 500 meters to points of aim on a body.

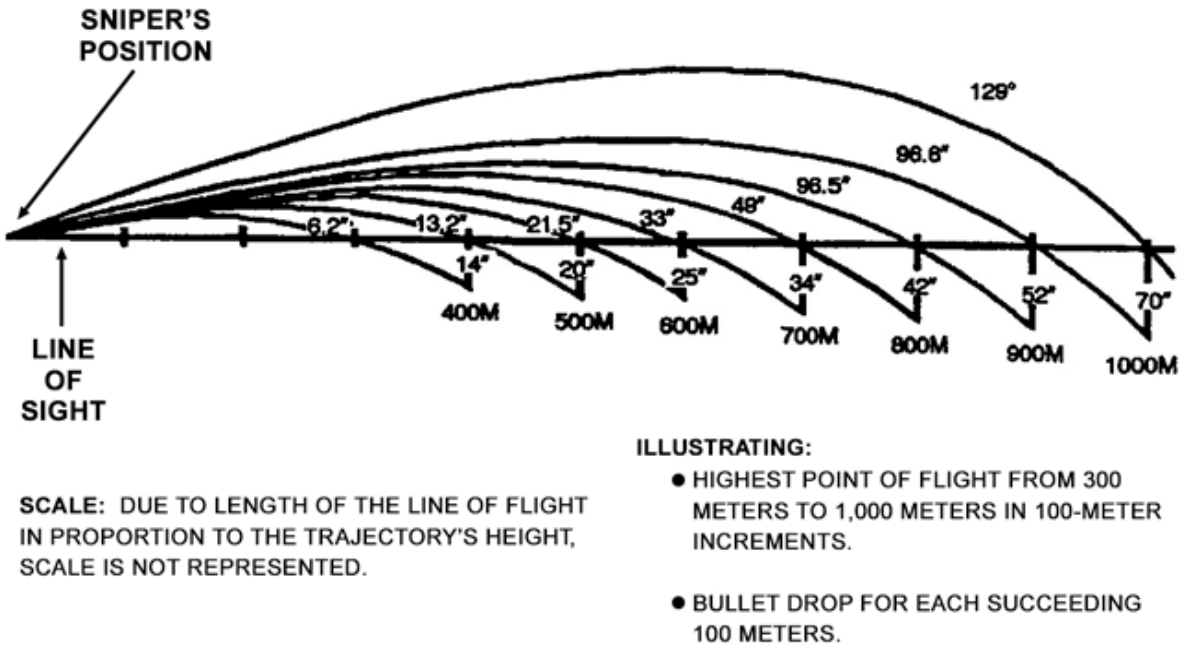


Figure 4-25. Trajectory chart.

4-151. When using elevation holdoff, the sniper can use the vertical stadia lines/hash marks on the DOS as aiming points (Figure 4-26).

EXAMPLE

The sniper must engage a target at 500 meters with the scope set to 400 meters. He places the first stadia line/hash mark 5 inches below the vertical line on the target's center of mass. This gives him a 15-inch holdoff at 500 meters (Table 4-14).



Figure 4-26. Elevation holdoff with the tactical milling reticle.

Table 4-14. Holdoff and points of aim.

SIGHT SETTING (meters)	TARGET RANGE (meters)	POINT OF AIM

300	100	Waistline
	200	Waistline
	300	Center of chest
	400	High chest
500	100	Top mil dot/stadia line
	200	2nd mil dot/stadia line from the top
	300	3rd mil dot/stadia line from the top
	400	4th mil dot/stadia line from the top
	500	Center of chest
	600	1st mil dot/stadia line below crosshair

4-152. The sniper rarely achieves pinpoint accuracy when holding off, since a minor error in range determination or a lack of a precise aiming point might cause the bullet to miss the desired point.

MIL HOLD

4-153. Mil hold is the most precise holdoff technique. The sniper should use the mil hold technique when encountering—

- Multiple targets at various ranges.
- Rapidly changing winds.
- Limited exposure of targets.
- Broken elevation or windage turret.
- All of the above.

4-154. Table 4-15 can be utilized as a quick reference guide when using elevation holdoff for a battlesight zero of 300 or 500 meters.

Table 4-15. Elevation holdoff reference guide.

RANGE	FIXED SCOPE SETTING ON ‘3’(300)	FIXED SCOPE SETTING ON ‘5’(500)
100		-3.5
200		-3
300	0	-2.1
400	+1	-1
500	+2	0

600	+3	+1.25
700	+3.5	+2.5

4-155. When performing mil hold, the sniper uses the reticle pattern, not the BDC, to correct for windage and elevation. To perform mil hold, use the mil hold formula:

(1) Divide the range by 100 (R).

(2) Divide the bullet drop in inches by R.

$$\frac{\text{bullet drop (inches)}}{\text{R (range [meters]/100)}} = \text{MOA}$$

NOTE: These actions convert the bullet drop in inches into MOA.

(3) Divide the MOA by 3.5 (mils in MOA).

$$\frac{\text{MOA}}{\text{3.5 (mils in an MOA)}} = \text{mil hold}$$

NOTE: These actions convert the bullet drop in MOA into mils.

CONVERTING MINUTES OF ANGLE INTO MILS

4-156. The ability to manipulate the DOS enables the sniper to compensate using MOA. He must simply apply this to his mil holds. To convert MOA into mils, divide the MOA by 3.5 (mils in MOA).

$$\frac{\text{MOA}}{\text{3.5 (mils in an MOA)}} = \text{mil hold}$$

EXAMPLE

Having collected data, the sniper knows that he must dial 8 MOA from his 300-meter zero to achieve a hit on a 500-meter target. He must now convert those 8 MOA to mils by dividing by 3.5, giving him an approximate hold of “up 2.28 mils.”

DETERMINING "COME UPS"

4-157. During limited visibility, a sniper will not be able to utilize a light source to adjust his scope. By knowing his “come ups,” a sniper can adjust his BDC accurately by counting the number of clicks. To determine the "come ups" for his assigned weapon, the sniper should count the number of MOA adjustments between each range marking to denote the true range of travel for each DOS.

NOTE: Due to mass production, the MOA adjustment may vary slightly between optics. The sniper must determine the “come ups” for his assigned weapon.

4-158. Table 4-16 depicts the development of a “come ups” table.

NOTE: This chart does not reflect shooter data; it serves only as a starting point for the development of “come ups.”

Table 4-16. "Come ups."

M110 SASS				M24 SWS			
Elevation	1/2 MOA Adjustment	Mils	1/2 MOA = Meters	Elevation	1 MOA Adjustment	Mils	1 MOA = Meters
0-200	4	0.59	25	100-200	2	0.59	50

200-300	6	0.88	16.6	200-300	3	0.88	33.3
300-400	8	1.18	12.5	300-400	4	1.18	25
400-500	10	1.48	10	400-500	4	1.18	25
500-600	10	1.48	10	500-600	5	1.48	20
600-700	12	1.77	8.3	600-700	6	1.77	16.6
700-800	12	1.77	8.3	700-800	7	2.07	14.28
800-900	16	2.37	6.25	800-900	7	2.07	14.28
900-1000	18	2.66	5.5	900-1000	9	2.66	12.5
(0) mark is the actual 100 meter mark							

WINDAGE

4-159. The sniper can use three techniques to holdoff to compensate for the effects of wind:

- Use of horizontal stadia lines/hash marks in the TMR.
- Aiming into the wind.

- Wind estimation.

USE OF HORIZONTAL STADIA LINES/HASH MARKS IN THE TACTICAL MILLING RETICLE

4-160. When using the TMR in the DOS, the sniper uses the horizontal stadia lines/hash marks to hold off for wind. For example, if the sniper has a target at 500 meters that requires a 10-inch holdoff, he would place the target's center of mass on the 1/2 mil stadia line halfway between the crosshair and the first mil stadia line (Figure 4-27).



Figure 4-27. Windage holdoff, wind from the right.

AIMING INTO THE WIND

4-161. When holding off, the sniper aims into the wind. If the wind is moving from the right to left, the point of aim is to the right of the target. If

the wind is moving from left to right, his point of aim is to the left.

WIND ESTIMATION

4-162. Constant practice in wind estimation is needed to adjust sights or apply holdoff correctly. If the sniper misses the target and he observes the point of impact, he notes the lateral distance of his error and refires, holding off that distance in the opposite direction. The formula used to find the holdoff distance is called the wind estimation formula. To perform the wind estimation formula—

(1) Multiply the range in meters by the wind velocity in miles per hour.

(2) Divide the product of Step 1 by the constant as determined by using Table 4-17.

$$\frac{\text{range (meters) x wind velocity (miles per hour)}}{\text{constant}} = \text{MOA}$$

NOTE: These actions convert the wind velocity in miles per hour into MOA.

Table 4-17. Constants for wind estimation formula.

RANGE	CONSTANT
100 - 500 meters	15
600 meters	14
700 - 800 meters	13
900 meters	12

1000 meters	11

(3) Divide the MOA by 3.5 (mils in MOA).

$$\frac{\text{MOA}}{\text{3.5 (mils in an MOA)}} = \text{mil hold}$$

NOTE: These actions convert the bullet drop in MOA into mils.

Table 4-18. Example of windage holdoff.

175-GRAIN BULLET (M118LR)	2571 FEET PER SECOND	10 MILES PER HOUR	
Meters	Inches	MOA	Mils
100	0.7	0.75	.22
200	3	1.5	.44
300	7	2.25	.67
400	12.9	3.25	.96
500	21	4.25	1.26
600	31.3	5.25	1.56

700	45.75	6.38	1.89
800	60.2	7.5	2.22
900	85.7	9.5	2.74
1000	111.2	11	3.26
		Drift	Adjust

NOTE: These figures are rough estimates based upon the following conditions; sea level, 59 degrees temperature, and powder burn ratio.

It is recommended that the sniper compile his own data based upon the conditions of his weapons, current ammunition, altitude, and atmospheric conditions.

SECTION V. MOVING TARGETS

Engaging moving targets not only requires the sniper to determine the target distance and wind effects on the round, but he must also consider the lateral speed and the angle of movement of the target, the round's time of flight, and the placement of a proper lead to compensate for both. These added variables increase the chance of a miss. Therefore, the sniper should only engage moving targets when it is the only option. To engage moving targets, the sniper employs the following techniques:

- Leading.
- Tracking.
- Tracking and holding.
- Trapping or ambushing.
- Firing a snap shot.

LEADING

4-163. Engaging moving targets requires the sniper to place the crosshairs ahead of the target's movement. The distance that the crosshairs are placed in front of the target's movement is called a lead. There are four factors in determine lead:

- Speed of the target.
- Angle of movement.
- Range to target.
- Wind effects.

SPEED OF THE TARGET

4-164. Fast-moving targets move farther while the bullet is in flight, so lead increases as the target's speed increases.

ANGLE OF MOVEMENT

4-165. A target moving at a 45-degree angle moves half the distance laterally than does a target moving perpendicularly (at a 90-degree angle) to the bullet's flight path.

RANGE TO TARGET

4-166. The farther away a target is, the longer the bullet takes to reach it. Therefore, the lead must increase as the distance to the target increases.

WIND EFFECTS

4-167. The sniper must consider how the wind will affect the trajectory of the round. A target with wind blowing against its direction of movement requires more lead than a target with the wind blowing in the same direction as its movement.

TRACKING

4-168. The sniper tracks the target by placing his natural point of aim ahead of the target based on the lead, moving the rifle with the target's movement, and continuing to track the target until he squeezes the trigger. Again, he uses the mil scale in the scope for a reference point.

NOTE: The sniper tracks a target from a sitting, kneeling, or standing position with a rest, because tracking requires fluid motion that is impossible with the elbows firmly planted.

4-169. Tracking is the preferred method—

- When the sniper is extremely close to the target.

- In a hostage or fire-on-command situation, when the sniper must maintain constant aim on the target so he can remove it exactly when required.

- When firing on a fast-moving target.

TRACKING AND HOLDING

4-170. The sniper uses this technique to engage an erratically moving target. That is, while the target is moving, the sniper keeps his crosshairs centered as much as possible, while adjusting his position with the target. When the target stops, the sniper quickly perfects his hold and fires. This technique requires the sniper to use concentration and discipline to keep from firing before the target comes to a complete halt.

TRAPPING OR AMBUSHING

4-171. Trapping or ambushing is the best way for a sniper to engage moving targets. Using the correct lead for wind and target speed, he establishes an aiming point ahead of the target and fires his weapon when the target reaches it. With practice, a sniper can determine exact leads and aiming points using the horizontal stadia lines and mil dots in the DOS.

4-172. This method allows him to keep his weapon and body motionless. The sniper uses trapping or ambushing when—

- The range to target is enough to give the sniper a wide enough field of view to align his crosshairs (at least 300 meters).

- The target paces constantly and steadily over a fairly well-determined route.

- Targets are in known locations, requiring the sniper only to observe and select the place and moment to fire.

FIRING SNAP SHOT

4-173. A sniper uses this method when engaging a target that presents briefly and then resumes cover. If the sniper identifies a pattern of exposure, he can aim near the target's expected appearance and fire a snap shot at the moment of exposure.

CALCULATING LEAD

4-174. Once the required lead has been determined, the sniper should use the mil scale in the scope for precise holdoff. The mil scale can be mentally sectioned into l/4-mil increments for leads. The chosen point on the mil scale becomes the sniper’s point of concentration, just as the crosshairs are for stationary targets. The sniper concentrates on the lead point and fires the weapon when the target is at this point. The sniper uses the following formulas to determine moving target leads:

Time of flight (seconds) x Target speed (feet per second) = Lead in feet

AVERAGE SPEED OF MOVING TARGET

4-175. Table 4-19 shows the speed that a moving target averages when walking and on patrol.

Table 4-19. Target speed.

TYPE OF ACTIVITY	TARGET SPEED		
	Feet per Second	Meters per Second	Miles per Hour
Slow patrol	1	0.3	0.8
Fast patrol	2	0.6	1.3

Slow walk	4	1.2	2.5
Fast walk	6	1.8	3.7
Run	10-12	4-4.8	7

4-176. The formula used to convert a lead in feet to meters is—

$$\text{Lead (feet)} \times 0.3048 = \text{Lead (meters)}$$

4-177. The formula used to convert a lead in meters to mils is—

$$\frac{\text{Lead (meters)} \times 1{,}000}{\text{Range to the target (meters)}} = \text{Lead (mils)}$$

4-178. To compute a lead edge hold, the sniper subtracts Table 4-20 from his center of mass hold.

Table 4-20. Wind compensation for a 6-inch target.

METERS	MINUTES OF ANGLE	MILS
300	2	0.6
400	1.5	0.44
500	1.2	0.35
600	1	0.3

700	.85	0.25
800	.75	0.22
900	.66	0.19
1000	.60	0.17

4-179. If the target is moving with the wind, the sniper should subtract his mil holds. If the target is moving against the wind, he should add his mil holds.

MAKING COMMON ERRORS

4-180. Moving targets give the sniper more to consider, such as maintaining a steady position and correct aiming point, and determining the speed, angle of movement, and range to the target. This increased stress can cause the sniper to make mistakes. These include the following:

- The tendency is to watch the target rather than the aiming point. The sniper must force himself to watch his lead point, and let the observer concentrate on the target.

- The thought that he must fire can cause the sniper to jerk the trigger at the moment his weapon fires. He can overcome this reflex by practicing on a live-fire range.

- The thought that he must rush can also cause the sniper to forget to adjust windage. Unless he calculates windage for moving targets, the leads will never be consistent, resulting in missed targets.

4-181. The more practice a sniper has in shooting moving targets, the more skilled he becomes.

SECTION VI. OBSERVER TRAINING

The skill of the observer makes or breaks the sniping mission. The sniper depends on the observer for information about the target and conditions, especially at distances of 300 meters or more. Observer training is vital and should be an integral part of sniper marksmanship training on all ranges, conventional and field.

TARGET INDICATION

4-182. Usually the observer spots a target first, because he scans with binoculars. When he sees a target, he says, for example, "Target - 750, reference lone tree, go right 40 mils, shrub, and sentry at right edge."

4-183. Once the sniper reports "Seen," the team determines the range to the target, but the observer makes the final decision on range. Before firing, the sniper confirms that the observer is ready to watch the fall of shot.

OBSERVATION OF SHOTS

4-184. The observer must be able to accurately tell the sniper where he has shot. Snipers expect to make first-round hits; however, should he miss, a good observer can give a correction that will almost ensure a second-round hit. The four ways to observe the point of impact include—

- Trace.
- Splash.
- Strike.
- Tracer.

TRACE

4-185. Trace is the visible trail created by the shockwave of a supersonic bullet (e.g., one that travels faster than sound). This trail, or trace, looks like small waves along the bullet's flight path. Several factors affect trace:

- Range. As range increases, so does the distance between the trace and the point of impact.
- Atmospheric conditions.
- Height above sea level.

4-186. To see trace, the observer focuses the spotting telescope about 100 meters short of the target. The observer must know where to look for trace at any given range. Being able to use a trace as an indication comes only with much practice.

SPLASH

4-187. The observer can usually see the splash of a round. He might see a piece of bark fly off a tree or a piece of earth fly up when the bullet strikes.

4-188. This splash is an excellent indicator of the fall of shot. Unfortunately, depth perception can keep the observer from determining distance between the target and the strike of the round. To compensate, he must use trace and splash together.

STRIKE

4-189. When a round hits a solid surface, the observer can see the effect of range on the target. For example, on a conventional range, when the round strikes a figure target, slivers of wood fly out the back of the target. With steel targets, the round chips off fresh paint and dings the metal target.

TRACER

4-190. Tracer rounds have a phosphorus compound in the trailing end of the bullet which glows red when fired. This allows the observer to follow the

flight of the bullet. Using tracer ammunition has some grave disadvantages:

- Differences in mean point of impact.
- Compromise.

Difference in Mean Point of Impact

4-191. Tracer ammunition is not ballistically balanced to sniper match ammunition (7.62-mm ball ammunition) and normally fires less consistently.

Compromise

4-192. Using tracer ammunition will reveal your location to the enemy.

SNIPER-OBSERVER DIALOGUE

4-193. Once in the firing position or hide, both the sniper and the observer are responsible for ensuring that the sniper hits the target with one shot. The key to success is communication. The sniper team may communicate however they feel comfortable, as long as their communications are effective and concise.

OBSERVER

4-194. The observer—

- Locates and describes the target.
- Reads the mirage.
- Sketches the field and constructs the range card.
- Determines the range to the target and calls for shots.
- Keeps an observation log.

SNIPER

4-195. The sniper—

- Receives the target indication with range and windage, or receives a "Hold" from the observer.
- Fires the shot.
- Concentrates only on the crosshairs in the scope.
- Applies the marksmanship fundamentals.
- Tells the observer when he is ready to fire.
- Fires only after the observer signals for him to do so.

EXAMPLE

Effective sniper-observer communications in a firing or hide position might sound like this:

The sniper announces, "Sniper in position."

The observer announces, "Spotter in position."

The observer announces the target and location, and then gives a brief description.

The sniper acknowledges with the remainder of the description to confirm the target, "Roger. Confirm target."

The sniper adjusts the sight based on the distance to the target. He announces the range to the observer.

The observer uses the data book to calculate the adjustments needed, based on wind direction and velocity and on the range to the target. He announces

the correction to the sniper, "Roger. Wind is left to right. Make correction three minutes left."

The sniper confirms the adjustment and responds, "Roger. Three minutes left." Once he corrects, he says to the observer, "On Target."

The sniper controls his breathing and starts applying trigger control. He concentrates on the crosshairs until the trigger breaks. He waits until he hears the spotter say, "Spotter set," to which he responds, "Sniper set. Ready." When he hears the observer say, "Send it," the sniper fires.

After the sniper fires, he calls the shot (e.g., announces where his reticle was relative to the aiming point). He might say, for example, "Center Mass" or "Pulled it 9 o'clock, 3 inches."

The observer confirms the hit or corrects for the next shot at that target or at a subsequent target.

NOTE: This is only an example. Sniper and observer are encouraged to develop and incorporate their own dialogue.

SECTION VII. SNIPER DATA BOOK

The sniper data book contains a collection of data sheets. The sniper uses the data sheets to record firing results and any factor that affects firing, such as weather or the firer's attitude. Referring to this later helps the sniper understand his weapon and himself. The sniper records everything on DA Forms 7651-R (Sniper Target Data Sheet—Stationary Target, shown in Figure 4-28) and 7636-R (Sniper Target Data Sheet—Moving Target).

NOTE: Blank copies of all forms prescribed by this publication are provided at the end of this publication for local reproduction.

SNIPER TARGET DATA SHEET
STATIONARY TARGET

For use of this form, see FM 3-22.10; the proponent agency is TRADOC.

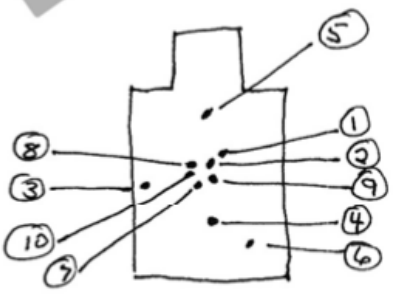
Distance to target _____ **YARDS/METERS**

Note: Draw in targets needed.

RANGE	DATE	TIME	RIFLE/SCOPE NO.	AMMO	TEMP	HUMID	LIGHT	MIRAGE
Marksmanship Range	21 Aug 08	0900 HRS			76°	70%	CLEAR	MODERATE

WIND DIRECTION	WIND VELOCITY	LIGHT DIRECTION	ELV/ USED	ELV/ CORRECT	WIN/ USED	WIN/ CORRECT
12	7 MPH	12	5-1	5-1	.5L	.5L
9 3		9 3				
6		6				

	1	2	3	4	5
ELEV	5-1	5-1	5-1	5-1	5-1
WIND	.5L	.5L	.5L	.5L	.5L
CALL	Center MASS	Center MASS	LEFT 9 o'clock	Center MASS	Center MASS
DIST	457m	457m	457m	457m	457m
	6	7	8	9	10
ELEV	5-1	5-1	5-1	5-1	5-1
WIND	.5L	.5L	.5L	.5L	.5L
CALL	RIGHT 4 o'clock	Center MASS	Center MASS	Center MASS	Center MASS
DIST	457m	457m	457m	457m	457m



EXAMPLE

REMARKS

GROUPED WITHIN 1 MINUTE OF ANGLE

Figure 4-28. Example of completed DA Form 7651-R (Sniper Target Data Sheet—Stationary Target).

ENTRIES

4-196. The sniper records information on the data sheet before, during, and after firing.

BEFORE FIRING

4-197. Before firing—

(1) Record—

Actual range used (e.g., English or Porter).

Date (YYYYMMDD).

Time (HHHH).

Rifle and scope serial numbers.

Ammunition type and lot number(s).

Temperature (Fahrenheit or Celsius).

Humidity (percent).

Light (e.g., overcast, clear).

Mirage (e.g., good, bad, or fair).

(2) Draw an arrow in the direction the wind is blowing and record its cardinal direction.

(3) Record the average wind velocity.

(4) Draw an arrow in the direction the light is shining.

DURING FIRING

4-198. While firing—

(1) Record the elevation setting used and any correction needed.

(2) Record the windage setting used and any correction needed.

(3) Record the information for each shot in Columns 1 through 10. Column 1 is for the first round; Column 10 is for the tenth.

Elevation. Record the elevation setting.

Wind. Record the windage used.

Call. Record the location of the aiming point at the time the weapon fired. Place a dot on the target or give a clock direction and distance.

(4) Record the exact impact of the round on the target. Write the shot's number in the same place as you hit the target.

AFTER FIRING

4-199. After firing, record your comments about the weapon, the firing conditions (e.g., the time allowed for firing), or your condition (i.e., emotional or physical state).

ANALYSIS

4-200. When the sniper leaves the firing line, he compares weather conditions to the information needed to hit the point of aim or point of impact. Since he fires in all types of weather conditions, he must know the temperature, light, mirage, and wind, and how to handle each. To analyze the shots—

(1) Compare sight settings with previous firing sessions.

(2) Compare ammunition.

(3) Compare all groups fired under each condition.

(4) Make corrections.

(5) Analyze a group on the target.

COMPARE SIGHT SETTINGS WITH PREVIOUS FIRING SESSIONS

4-201. If the sniper always has to fine-tune windage or elevation, he might need to change the sight (e.g., slip a scale).

COMPARE AMMUNITION

4-202. The sniper must compare ammunition by lot number for the best rifle and ammunition combination.

COMPARE ALL GROUPS FIRED UNDER EACH CONDITION

4-203. The sniper checks the low and high shots, as well as those to the left and the right of the main group. The less the dispersion, the better. Tight groups are easily moved to the center of the target. Loose groups can indicate a problem with the scope or rifle. The sniper checks the scope focus and ensures that the rifle is cleaned correctly. Checking the remarks in the sniper data book might also help him to pinpoint the problem.

MAKE CORRECTIONS

4-204. For future reference, the sniper should record corrections, such as position and sight adjustment information, in the sniper data book.

ANALYZE A GROUP ON THE TARGET

4-205. This is important for marksmanship training, but is effective only if the sniper data book has been used correctly. The firer may not notice errors

during firing, but they show up during shot group/performance analysis. These errors might include—

- Group is low and to the right. Possible causes include—

  Nonfiring hand positioned improperly.

  Slippage of firing elbow.

  Improper trigger control.

- Group is scattered about the target. Possible causes include—

  Incorrect eye relief.

  Incorrect sight picture.

  Concentration on the target (iron sights).

  Disturbance of stock weld.

  Out-of-focus scope.

  Unstable firing position.

- Group is good, but several shots are wild. Possible causes include—

  Flinching. Shots can hit anywhere.

  Bucking. Shots hit from 7 to 10 o'clock.

  Jerking. Shots can hit anywhere.

- Group is strung up and down through the target.

  Breaths taken while firing.

  Crosshairs improperly aligned vertically.

  Stock weld changed.

- Group is compact, but outside the target.

  Incorrect zero.

  Failure to compensate for wind.

  Bad natural point of aim.

  Scope shadow.

- Group is centered below the bottom of the target.

  Scope shadow.

  Position of the rifle changed in the shoulder.

- Group is arranged horizontally across the target.

  Scope shadow.

  Canted weapon.

  Bad natural point of aim.

SECTION VIII. CHEMICAL, BIOLOGICAL, RADIOLOGICAL, AND NUCLEAR CONSIDERATIONS

Placing long-range precision fire is difficult at best. Chemical, biological, radiological, and nuclear (CBRN) warfare adds more problems for the sniper. Not only must he properly execute the fundamentals of marksmanship and contend with the forces of nature, but he must also overcome the obstacles presented by his own protective equipment.

PROTECTIVE MASKS

4-206. The greatest problem in firing while wearing the M42 protective mask has been that the recoil of the rifle breaks the seal of the mask. Also, filter elements and hard eye lenses have kept the sniper from gaining and maintaining the proper eye relief and stock weld. Nor could an observer wearing the mask obtain the necessary eye relief on his spotting scope.

MISSION-ORIENTED PROTECTIVE POSTURE

4-207. Mission-oriented protective posture (MOPP) gear significantly affects the sniper's ability to deliver precision fire. The following problems have been identified:

- Eye relief.
- Trigger control.
- Vertical sight picture.
- Sniper-observer communications.

4-208. The solutions to these problems follow.

EYE RELIEF

4-209. The sniper must take care to maintain proper eye relief, to avoid scope shadow, and to keep a consistent stock weld.

TRIGGER CONTROL

4-210. Problems include limited sense of touch and stock drag.

Sense of Touch

4-211. When the sniper wears gloves, he cannot tell how much pressure he is applying to the trigger. This is especially important if he has the trigger set for a light pull. Training with gloves helps, but the sniper should adjust the trigger pull so that he can feel it with gloves on. This can help prevent an accidental discharge.

Stock Drag

4-212. While training, the observer should watch the sniper's trigger finger to ensure that the sniper's finger and glove touch only the trigger, and not any other part of the rifle. The glove or finger resting on the trigger guard moves the rifle as the trigger is pulled to the rear. For this reason, the sniper must wear a well-fitted glove that allows him to feel the trigger as much as possible.

VERTICAL SIGHT PICTURE

4-213. When firing with a protective mask, the sniper naturally cants the rifle into his cheek.

Chapter 5: Tracking and Evasion

In combat, a sniper team might have to track and kill an enemy sniper operating in the friendly AO. Success in this case depends greatly on the team’s tracking ability. The sniper team might also be deployed to an isolated position, where they must evade enemy forces and survive for some time without friendly support. A sniper must never surrender to the enemy unless continued evasion and resistance will lead only to certain death with no significant loss to the enemy. While evading capture, a sniper can continue to inflict casualties on the enemy.

"There is nothing that sharpens a man's senses so acutely as to know that bitter and determined enemies are in pursuit of him night and day."

— Frederick R. Burnham, Scouting On Two Continents

SECTION I. TRACKING

Tracking is the art of following a person or animal by the signs that they leave during their movement.

When a sniper follows a trail, he builds a picture of the enemy in his mind by asking himself these questions:

- How many people am I following?
- Are they well-trained?
- Are they well-equipped?
- Are they healthy?
- How is their morale?
- Do they know that we are following them?

The sniper answers these questions by seeking and evaluating indicators of certain actions at certain times and places. For example, a footprint and a waist-high scuff on a tree could mean that an armed person passed that way. The freshness of the scuff helps identify how much time has passed since the person brushed against the tree.

Snipers evaluate the six types of tracking indicators based on their content, cause, and conditions. Table 5-1 outlines the six types of indicators and provides some examples of each type.

Table 5-1. Six types of tracking indicators and examples.

INDICATORS	EXAMPLES
Displacement	Footprint in mud or soft dirt

	Sharp edge marks Crushed vegetation and twigs Dislodged stones Flattened vegetation in the shape of a person
Stains	Bloodstains Muddy drag marks Crushed leaf, grass, or berry stains
Weather	Smell or sound carrying downwind Rain causing mud to settle into a footprint Color of bloodstain due to exposure to air
Litter	Candy or gum wrappers Food cans Cigarette butts Evidence of fires Human feces
Camouflage	Walking backward to baffle the sniper Brushing out trails Moving over rocky ground or through streams

Immediate-Use Intelligence	Known enemy unit movement Village without men of military age

DISPLACEMENT

5-1. Displacement occurs when something moves from its original position or changes from its natural state. It can result when someone tracks mud through an area, clears a trail (resulting in crushed vegetation and broken twigs), or comes to a rest when carrying a heavy load.

5-2. The sniper can analyze the displaced substance to determine more information about the enemy. Analysis can include—

- Analysis of footprints.
- Recognition of other signs of displacement.

EXAMPLES

The sniper finds a muddy footprint. The print is left by someone with bare feet. This indicates that the person who left the print lacks proper equipment.

The sniper locates a trail that someone has cleared by breaking or cutting through heavy vegetation with a machete. Someone walking behind this person has broken trail and, without realizing it, broken more branches.

Someone carrying a heavy load stops to rest. The edge of a box has left a mark that helps the sniper identify the carrier or the load. Also, the load has crushed grass and twigs, and pushed surface stones deeper.

ANALYSIS OF FOOTPRINTS

5-3. Footprints can indicate direction, rate of movement, number, gender, and knowledge that someone is tracking him. Attributes of footprints include the following:

- If footprints are deep and the pace is long, rapid movement is apparent. Long strides and deep prints that are deeper at the toes than the heels indicate running (A, Figure 5-1).

- Short, deep, widely spaced prints with signs of scuffing or shuffling indicate someone carrying a heavy load (B, Figure 5-1).

- Prints with unnaturally deep toes and soil displaced to the rear might indicate the short, irregular, stride of someone walking backward (C, Figure 5-1). This could indicate that the person tried to hide his tracks.

- To determine the gender of the person (D, Figure 5-1), the sniper should study the size and position of the footprints. Women tend to walk with their toes pointed somewhat inward; men walk with their feet straight or pointed slightly outward. Also, women's prints are usually smaller and closer together (shorter stride) than those left by men.

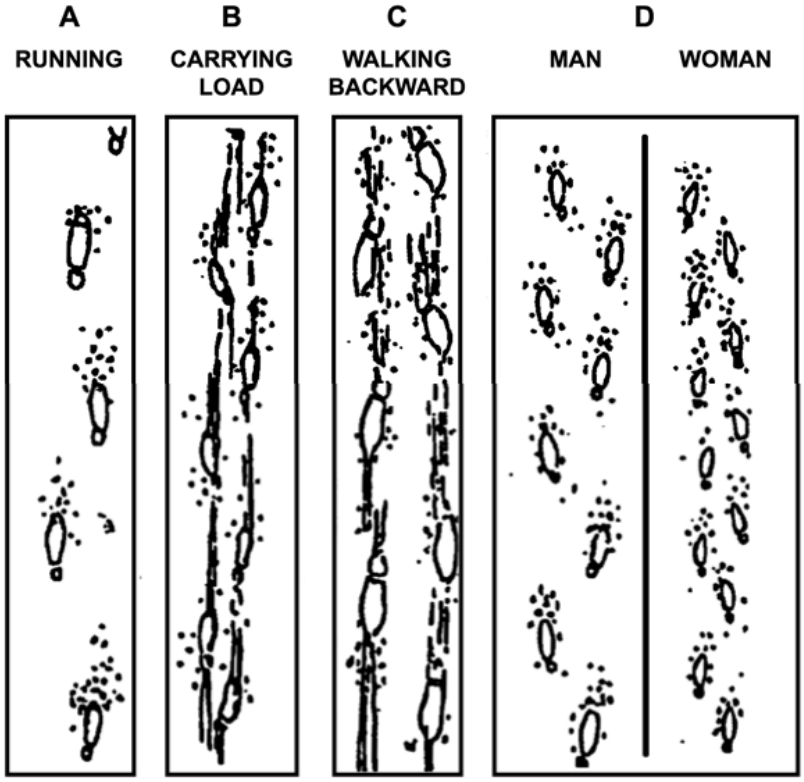


Figure 5-1. Footprint types.

Identification of Key Prints

5-4. The last person in the file usually leaves the clearest footprints. These become the key prints. To identify the key prints—

(1) Cut a stick to match the length of the print.

(2) Notch the stick to indicate the widest part of the sole.

(3) Study the angle of the key prints to the direction of march.

(4) Look for an identifying mark or feature, such as might be made by worn or frayed footwear to help him identify the key prints.

5-5. If the trail becomes vague, disappears, or merges with another, the sniper can use his stick measuring device and, with close study, can identify the key prints. This method helps the sniper stay on the trail.

Box Method

5-6. Using the box method lets the sniper count the total number of individuals being tracked. There are two ways to perform the box method:

- Stride method.
- 36-inch box method.

Stride Method

5-7. The stride method (Figure 5-2) is the most accurate method and is used when the key prints can be determined. Under the right conditions, this method is accurate for counting up to 18 persons. To perform the stride method—

(1) Use the set of key prints and the edges of the road or trail to form a box.

(2) Count the number of prints within the box.

(3) Divide by two. This is the number of personnel traveling on this road or trail.

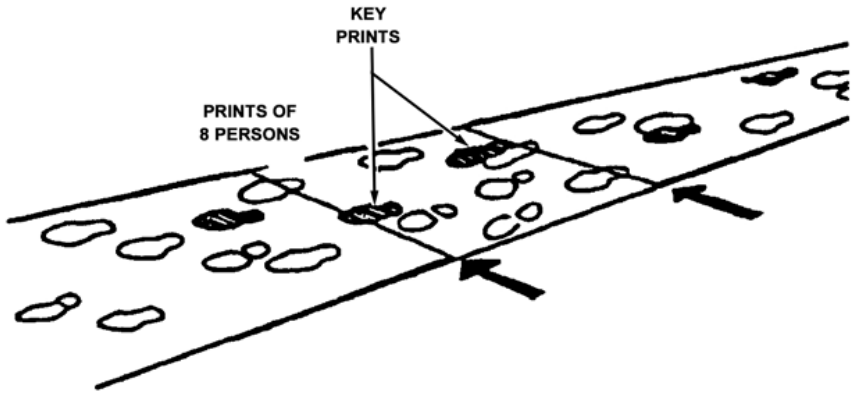


Figure 5-2. Stride method.

36-Inch Box Method

5-8. If the sniper cannot find any key prints, the sniper uses the 36-inch box method (Figure 5-3). This method gives a close estimate of the number of individuals who made the prints. However, it is less accurate than the stride method. To perform this method—

(1) Use the edges of the road or trail as the sides of the box.

(2) Measure a cross-section of the area, 36 inches long.

(3) Count each indentation in the box and divide by two.

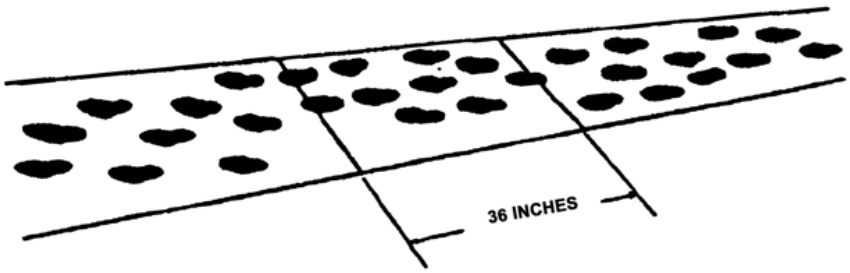


Figure 5-3. The 36-inch box method.

RECOGNITION OF OTHER SIGNS OF DISPLACEMENT

5-9. Foliage, moss, vines, sticks, or rocks that are scuffed, or that are moved or snagged from their original position are valuable indicators. Vines might be dragged, dew droplets displaced, or stones and sticks overturned, revealing a different color underneath. Grass or other vegetation can be bent or broken in the direction of movement. Indicators of displacement include —

- Bits of torn clothing, snagged threads, or dirt clumps or residue from footgear on thorns, snags, or the ground.

- Flushed animals and birds. The cries of birds or the movement of tall grass or brush on a windless day indicates a disturbing presence or an animal on the move.

• Changes in the normal life of insects and spiders. Disturbed bee nests, anthills, or spider webs are good indicators of human passage.

• Slide or scuff marks at a stream, displaced algae or water plants, or overturned rocks within a stream. A person trying to use a stream to cover his trail can create slide or scuff marks where he enters or exits a stream and displace algae or other water plants when he slips. Also, snipers might find signs of travel where the ground opens up along the banks.

STAINS

5-10. A stain is a smear or deposit on one organism or article from or by another. The best example of staining is blood from a profusely bleeding wound, but there are other types of stains.

BLOODSTAINS

5-11. Bloodstains often appear as spatters or drops and are sometimes on aboveground surfaces; they also appear smeared on leaves or twigs of trees and bushes. By studying bloodstains, the sniper can determine the wound's location (Table 5-2), its seriousness, and the distance that the wounded person can move unaided. This can lead the sniper to enemy bodies or show where they have been carried.

Table 5-2. Bloodstains left by various types of wounds.

TYPE OF WOUND	APPEARANCE OF BLOODSTAIN
Wound on the trunk of the body	Steady drip
Wound on an extremity	Appearance of blood slung to the front, rear, or sides

Arterial wound or blood from veins	Appearance of blood poured at regular intervals as if from a pitcher
Lung wound	Pink, bubbly, and frothy
Head wound	Heavy, wet, and slimy
Abdominal wound	Often mixed with digestive juices, indicated by odor and light color

OTHER STAINS

5-12. Staining can also occur when muddy footgear drags over grass, stones, and shrubs. Thus, staining and displacement combine to indicate movement and direction.

EXAMPLES

Crushed leaves can stain rocky ground that is too hard to show footprints.

Roots, stones, and vines can get stained when moving feet crush leaves or berries.

SIMILARITY OF STAINS AND DISPLACEMENT

5-13. The sniper might have trouble differentiating between staining and displacement, since both terms can apply to some indicators. For example, algae can be displaced from stones and stain other stones or the bank. Muddy water (stain) collects in new footprints (displacement) in swampy ground.

NOTE: Mud settles and water clears with time. The sniper can use this information to indicate time. Normally, mud clears in about an hour, although this varies with the terrain and weather.

WEATHER

5-14. Wind, snow, rain, and sunlight change and sometimes, sooner or later, erase sign. Knowing how these weather conditions affect soil, vegetation, and other signs can help the sniper determine time passage.

EFFECTS ON INDICATORS

5-15. By studying weather effects on tracking indicators, the sniper can determine the age of the sign. For example—

- Fresh bloodstains are bright red. Air and sunlight changes blood to a dark red, and when the moisture evaporates completely, to a dark brown crust.

- Scuff marks on trees or bushes darken with time. New scuffs might ooze sap, but the air will harden the sap in time.

- If particles of soil are just starting to fall into the print, the print was probably made within the previous half hour.

- If the edges of the print are dried and crusty, the prints are probably about one hour old.

- A light rain can round the edges of the print. Knowing when the last rain occurred can help the sniper figure out the age of the print. A heavy rain can erase all signs of a footprint.

- Trails emerging from streams might look rain-worn from the water draining from the travelers' clothing or equipment. This is worse when more than one person walks out of the stream in single file. A wet, weathered trail slowly fading into a dry one is a fresh trail.

- Wind dries tracks and blows litter, sticks, or leaves into prints. By recalling wind activity, the sniper can estimate the age of the tracks. He must distinguish between fresh litter and litter that was crushed into the tracks when they were made.

WIND

5-16. Wind affects sounds and odors. If the wind is blowing toward the sniper, sounds and odors might be carried his way. If it is blowing away, he must take care, because wind also carries sounds toward the enemy.

5-17. The sniper can determine wind direction by dropping a handful of dust or dried grass from shoulder height. By pointing in the same direction the wind is blowing, the sniper can localize sounds by cupping his hands behind his ears and turning slowly. When sounds are loudest, the sniper is facing their origin.

5-18. In calm weather (no wind), air currents too light to detect can carry sounds to the sniper. Air cools in the evening and moves downhill toward the valleys. If the sniper is moving uphill late in the day or at night, air currents will probably be moving toward him if no other wind is blowing. As the morning sun warms the air in the valleys, it moves uphill.

SUN

5-19. The sniper should also consider the sun. It is difficult to fire directly into the sun, so if the sniper keeps the sun at his back and the wind in his face, he has a slight advantage.

LITTER

5-20. A poorly trained or undisciplined unit advertises its passage with a trail of litter and other human signs. This can include food wrappers, cans, cigarette butts, the remains of fires, or human feces.

5-21. The sniper must consider weather conditions when he estimates the age of litter. Weather affects litter in the following ways:

- Rain flattens or washes away litter, and it turns paper into pulp.

- Moisture rusts cans starting at the opened edges, then moving toward the centers of the cans.

CAMOUFLAGE

5-22. The followed party might use techniques to baffle or slow the sniper. It might walk backward to leave confusing prints, brush out trails, or move over rocky ground or through streams.

IMMEDIATE-USE INTELLIGENCE

5-23. Immediate-use intelligence is information about the enemy that the snipers can use to gain surprise, to keep the enemy off-balance, or to keep the enemy from escaping the area.

5-24. The commander might have many sources of intelligence: reports, documents, or prisoners of war. Together, these sources indicate the enemy's last known location, plans, and destinations. The sniper combines these indicators, interprets them, and forms a composite for on-the-spot intelligence.

5-25. Tracking gives the commander definite information on which to act immediately. For example, a unit may report there are no men of military age in a village. This information is of value only if it is combined with other information to make a composite picture of the enemy in the area. Therefore, a sniper who interprets trail signs and reports that he is 30 minutes behind a known enemy unit, moving north from a specific location, gives the commander information on which he can act at once.

NOTE: The sniper reports facts, not his interpretation of facts. The gender and size of the party, the load, and the type of equipment, and other information can mean many things.

SECTION II. COUNTERTRACKING

If someone finds the tracks of the sniper team, they might assume that a highly trained team is operating in the area. However, having countertracking skills helps the sniper team avoid detection and survive the mission.

Immediate action drills are required to evade the tracking team. A sniper team skilled in tracking techniques can successfully employ deception drills to lessen signs that the enemy can use against them. However, it is very difficult for a person, especially a group, to move across an area without leaving signs that a trained eye would notice.

ROUTE SELECTION

5-26. The sniper team may take the most or least traveled routes to cover their movement. The team should avoid using areas where they can easily be tracked, such as lightly traveled sandy or soft trails. A sniper who tries to hide his trail moves at reduced speed, which gives the experienced tracker time. Unfortunately, taking time to reduce or avoid leaving trail sign does slow them down.

MOST-TRAVELED ROUTES

5-27. A sniper may try to confuse the tracker by moving on hard-surfaced, often-traveled roads or by merging with civilians. These routes should be carefully examined, because a well-defined approach leading to the enemy will probably be mined, secured by enemy personnel, or covered by snipers.

LEAST-TRAVELED ROUTES

5-28. Least-traveled routes avoid all man-made trails or roads and confuse the tracker. These routes are normally magnetic azimuths between two points. However, the experienced and persistent tracker can use the proper concepts to follow the sniper team.

DECEPTION TECHNIQUES

5-29. Evading a skilled and persistent enemy tracker requires skillfully executed maneuvers to deceive the tracker and to cause him to lose the trail. Sniper teams carrying equipment cannot outrun an enemy tracker, because the tracker travels light and is escorted by enemy forces designed for pursuit. The sniper team also has to think about the enemy units moving to intercept it from the flanks and front. The size of the pursuing force affects the sniper team's chances of success in employing ambush-type maneuvers.

5-30. Sniper teams use the following antitracking techniques in immediate action drills and deception drills:

- Obliterating tracks.
- Replacing foliage.
- Moving over hard rocky ground.
- Moving in water.
- Covering feet.
- Changing shoes.
- Walking backward.
- Walking on paths and trails.
- Changing direction suddenly.

NOTE: Knowing these techniques can also aid the sniper team in their tracking efforts.

OBLITERATING TRACKS

5-31. The usual method is to use a broom made of branches, twigs, or leaves. However, it takes a lot of time and energy, and cannot be used over

long distances. Sniper teams usually just sweep away their tracks after they cross a dirt road. Regardless of how carefully the sniper tries to put the trackers off the scent, the maneuver might draw attention due to the absence of spoor.

REPLACING FOLIAGE

5-32. When using this method, the sniper returns foliage to its natural state after passing through it. The sniper tries to return broken or displaced grass and branches to their original positions, possibly using a stick. He can do this over a distance of several meters. Since the sniper cannot go back to check his work, he does not know how effective it is.

NOTE: When using this method, the sniper must also obliterate his tracks, which slows him further.

MOVING OVER HARD ROCKY GROUND

5-33. This is probably the most economical antitracking method in terms of the physical effort and time required. The sniper may mislead the tracker by crossing an area of hard, rocky or pebble-strewn ground, on which little or no tracks are left.

5-34. The success achieved by the sniper using this method will depend on the extent of the hard ground. A good tracker will still be able to identify evidence of the team’s passage, noting damaged moss and displaced stones.

5-35. The disadvantage for the sniper is that he must sooner or later leave the hard ground. A tracker searching for spoor around the perimeter of hard ground will find where the sniper team left the hard ground, if the area is not too large.

MOVING IN WATER

5-36. Water does not necessarily remove all traces of human passage. The ability of water to eliminate traces of the team's movement depends on the force of the current and the composition of the riverbed. If the river or

stream is muddy and the current weak, lighter color traces of mud might reveal tracks left by the sniper. In some cases, the prints could remain visible for several days.

5-37. When moving in water—

- Avoid stepping on or disturbing aquatic plants and splashing water on exposed rocks.

- Be very careful when leaving the water to avoid tracking mud or moisture on rocks, dry ground, dirt (it does not match), or foliage.

COVERING FEET

5-38. By wearing socks on top of his boots or attaching strips of cloth, sacking, or animal skins to his footwear, the sniper can blur the outline of his soles. However, this widens the track he will still leave, in a pattern that corresponds to the stride of an adult male. His mark will be even clearer on grass or foliage.

CHANGING SHOES

5-39. This is a common technique. The sniper carries two pairs of shoes. If he comes to a heavily traveled trail and changes shoes on it, his track becomes more difficult to distinguish from those of others who have passed. However, this technique won't help in areas with light traffic because the tracker will note the change in shoes.

WALKING BACKWARD

5-40. The way the sole of a shoe contacts the ground indicates that the walker was backtracking, which suggests that he knew that he was being tracked.

WALKING ON PATHS AND TRAILS

5-41. Another common antitracking technique is to use a heavily traveled trail so that those who follow will cover his tracks.

5-42. On a well-used dirt road, the sniper can also walk in the ruts made by tires. Hopefully, subsequent vehicular traffic will erase his tracks. These two techniques are difficult to detect. Only by carefully examining the road over several hundred meters in both ways can the tracker relocate the spoor. The success or failure of this painstaking, frustrating job depends on the number of people who walked over the sniper's tracks.

5-43. The sniper can completely hide his tracks by walking on paved surfaces. This makes tracking him difficult, if not impossible. The most that a tracker can do in that case is to search along the shoulder for the spot where the sniper left the road.

CHANGING DIRECTION SUDDENLY

5-44. The sniper can suddenly change direction, preferably on hard or rocky ground. However, the tracker can relocate the tracks by using proper lost spoor procedure. Sudden changes of direction can delay follow-up, increasing the time-space gap.

SECTION III. EVASION, RESISTANCE, AND ESCAPE

Continuous operations and fast-moving battles increase the sniper's chances of either becoming temporarily separated from his unit or captured. If the sniper becomes isolated, is separated from his unit, or is captured, it is his duty as a Soldier to continue to fight, evade capture, and regain contact with friendly forces.

EVASION

5-45. Evasion is the action the sniper takes to stay out of the enemy's hands when separated from his unit and in enemy territory. There are several courses of action he can take to avoid capture and rejoin his unit. He may stay in his current position and wait for friendly troops to find him, or he may try to move and find friendly lines.

PLANNING

5-46. Planning is essential to achieve successful evasion. When planning a mission, the sniper should have an escape plan. When he operates with conventional forces, he keeps this plan simple because he will remain close to the forward line of troops (FLOT). However, the sniper's mission often places him deep behind enemy lines; this requires a more complex plan.

5-47. The following guidelines will allow for successful evasion:

- Keep a positive attitude.
- Use established procedures.
- Follow your evasive plan of action.
- Be patient.

- Drink water.
- Conserve strength for critical periods.
- Rest and sleep as much as possible.
- Stay out of sight.
- Consider—

Terrain and climate, including current conditions and terrain of the AO and the route to the objective.

Civilian population, including numbers, political beliefs, dress and customs, paramilitary forces, and controls and restrictions.

Service and support, including resupply, survival kits, special equipment, and inspections.

Reentry of friendly lines.

Evasion route. This should be a route you can remember and follow easily.

Odors

5-48. To prevent detection, the sniper should avoid the following odors:

- Scented soaps and shampoos.
- Shaving cream, after-shave lotion, or other cosmetics.
- Insect repellent (camouflage stick is least scented).
- Gum and candy (smell is strong or sweet).
- Tobacco (odor is unmistakable).

5-49. The sniper should mask his scent using crushed grasses, berries, dirt, and charcoal.

Initiate Evasion Plan of Action

5-50. The sniper should establish—

- Suitable area for recovery.
- Selected area for evasion.
- Neutral or friendly country or area.
- Designated area for recovery.

SHELTERS

5-51. When building or choosing shelters, the sniper should consider the following guidelines:

- Use camouflage and concealment.
- Locate carefully. Use the acronym BLISS.

  Blend.

  Low silhouette.

  Irregular shape.

  Small.

  Secluded location.
- Choose an area.

  Least likely to be searched (i.e., drainages, rough terrain) and blends with the environment.

With escape routes (do not corner yourself).

With observable approaches.

- Locate entrances and exits in brush and along ridges, ditches, and rocks to keep from forming paths to site.

- Be wary of flash floods in ravines and canyons.

- Conceal with minimal to no preparation.

- Take the radio direction finding threat into account before transmitting from shelter.

- Ensure overhead concealment.

MOVEMENT

5-52. A moving object is easy to spot, but if travel is necessary, the sniper should adhere to the following guidelines:

- Mask with natural cover.

- Stay off ridgelines and use the military crest (2/3 of the way up) of a hill.

- Restrict to periods of low light, bad weather, wind, or reduced enemy activity.

- Avoid silhouetting.

- At irregular intervals—

Stop at a point of concealment.

Look for signs of human or animal activity (i.e., smoke, tracks, roads, troops, vehicles, aircraft, wire, and buildings). Watch for trip wires or booby traps, and avoid leaving evidence of travel.

Listen for vehicles, troops, aircraft, weapons, and animals.

Smell for vehicles, troops, animals, and fires.

- Employ noise discipline. Check clothing and equipment for items that could make noise during movement and secure them.

- Break up the human shape or recognizable lines.

- Camouflage evidence of travel. Route selection requires detailed planning and special techniques (irregular route/zigzag).

- Conceal evidence of travel using techniques such as—

Avoid disturbing vegetation.

Do not break branches, leaves, or grass.

Use a walking stick to part vegetation and push it back to its original position.

DO NOT grab small trees or brush. This may scuff the bark or create movement that is easily spotted. In snow country, this creates a path of snowless vegetation, revealing your route.

- Mask unavoidable tracks in soft footing.

Place tracks in the shadows of vegetation, downed logs, and snowdrifts.

Move before and during precipitation. This allows tracks to fill in.

Travel during windy periods.

Take advantage of solid surfaces (i.e., logs and rocks), leaving less evidence of travel.

Tie cloth or vegetation to feet, or pat out tracks lightly to speed their breakdown or make them look old.

• Secure trash or loose equipment, and hide or bury discarded items. Trash or lost equipment identifies who lost it.

• If pursued by dogs, concentrate on defeating the handler.

Travel downwind of dog/handler, if possible.

Travel over rough terrain or through dense vegetation to slow the handler.

Travel downstream through fast-moving water.

Zigzag route, if possible.

• Penetrate obstacles as follows:

Enter deep ditches feet first to avoid injury.

Go around chain-link and wire fences. Go under fence if unavoidable, crossing at damaged areas. Do not touch fence; look for electrical insulators or security devices.

Penetrate rail fences, passing under or between lower rails. If this is impractical, go over the top, presenting as low a silhouette as possible.

Cross roads after observation from concealment to determine enemy activity. Cross at points offering concealment, such as bushes, shadows, or bends in the road. Cross in a manner leaving footprints parallel (cross-step sideway) to the road. Plan

ESCAPE

5-53. Escape is the action the sniper takes to get away from the enemy if he is captured. The sooner the escape attempt, the more likely it will succeed.

5-54. The following are some other reasons for making an early escape:

• Right after capture you will be in better physical and mental condition. The physical treatment, medical care, and rations of prison life quickly

cause physical weakness, night blindness, and loss of coordination and reasoning power.

- Friendly fire or air strikes may cause enough confusion and disorder to provide a chance to escape.

- The first guards usually have less training in handling prisoners than the next set.

- You might know something about the area where you were first captured. You might even know the locations of nearby friendly units.

5-55. There are only two conditions that the sniper should look for to optimize his attempt to escape: escape early and when the enemy is distracted. Once the sniper has escaped, it may not be easy to contact friendly troops or get back to their lines. The sniper should use his survival skills to increase his chances of survival.

NOTE: For more information about survival, see Appendix F of this manual.

LEGAL ASPECTS OF ESCAPE AND EVASION

5-56. Sniper teams must know the difference between an escapee and an evader. Under the Law of War, some of the same acts that are legal if committed by an evader are illegal if committed by an escapee. Commission of these acts could cause the escapee's prosecution and punishment.

EVADER

5-57. An evader is an armed combatant of a warring power who, while separated from the main fighting force, has never been captured. An evader has a duty to try to rejoin his unit. An evader may carry out acts of war at will, subject to the laws of land warfare. If he follows the laws of land warfare, he may not be prosecuted as a war criminal for acts committed

during his evasion. However, if he violates the laws of land warfare, he may be tried as a war criminal.

ESCAPEE

5-58. An escapee is a person who, after becoming a prisoner of war, tries to elude the custody and authority of the detaining power. All military personnel have a duty to try to escape. In his attempt to escape, an escapee is allowed to violate domestic laws or regulations of the detaining power, provided that he does so only in order to escape and only if he hurts no one. He is also allowed to wear clothing other than his uniform. Doing so does not reclassify him as a spy.

5-59. An escapee avoids committing any act of war, carrying any type of weapon, or engaging in armed resistance. The moment the escapee commits any of these actions, his status changes. He is no longer a prisoner of war and is subject to prosecution under the laws of the detaining power.

RESISTANCE

5-60. Snipers can show resistance in many forms. The Code of Conduct prescribes the manner in which every Soldier of the United States armed forces must conduct himself when captured or faced with the possibility of capture.

THE CODE OF CONDUCT

I. I am an American, fighting in the forces which guard my country and our way of life. I am prepared to give my life in their defense.

II. I will never surrender of my own free will. If in command, I will never surrender the members of my command while they still have the means to resist.

III. If I am captured, I will continue to resist by all means available. I will make every effort to escape and aid others to escape. I will accept neither parole nor special favors from the enemy.

IV. If I become a prisoner of war, I will keep faith with my fellow prisoners. I will give no information or take part in any action which might be harmful to my comrades. If I am senior, I will take command. If not, I will obey the lawful orders of those appointed over me, and will back them up in every way.

V. When questioned, should I become a prisoner of war, I am required to give only name, rank, service number, and date of birth. I will evade answering further questions to the utmost of my ability. I will make no oral or written statements disloyal to my country (and its allies) or harmful to their cause.

VI. I will never forget that I am an American, fighting for freedom, responsible for my actions, and dedicated to the principles that made my country free. I will trust in my God and in the United States of America.

Chapter 6: Mission Preparation and Execution

The sniper team uses planning factors to estimate the amount of time, coordination, and effort that must be expended to support the impending mission. Arms, ammunition, and equipment are selected based on METT-TC.

SECTION I. PLANNING AND COORDINATION

Planning and coordination are essential procedures that occur during preparation for a mission. Mission preparation is comprised of several steps:

- Mission alert.
- Warning order.
- Tentative plan.
- Coordination checklists.
- OPORD.
- Briefback.
- Equipment check.
- Final inspection.
- Rehearsals.

MISSION ALERT

6-1. The sniper team receives a mission in oral (brief) or written (FRAGO) form, outlining the mission in terms of who, what, when, where, and why/how. The team analyzes it to ensure that they understand it, and then they begin making plans.

WARNING ORDER

6-2. Normally, the sniper team receives the mission brief; however, if only the team leader receives the brief, he issues a warning order as soon as

possible afterward. He informs the sniper team of the situation and mission and gives them specific and general instructions.

6-3. If the sniper team receives the mission brief, the team leader should still present the warning order to the sniper team to clarify and emphasize the details in the mission brief.

TENTATIVE PLAN

6-4. The team leader makes a tentative plan for accomplishing the mission. This plan forms the basis for team preparation, coordination, movement, and reconnaissance. If the mission is complex and time is short, he makes a quick, mental estimate. If he has time, he makes a more thorough estimate. Since few sniper operations allow for an on-the-ground reconnaissance, the team leader uses maps, pictomaps, or aerial photographs of the objective and surrounding area to help him make the tentative plan.

6-5. The sniper team learns as much as they can about the enemy and mission requirements and apply what they learn to the terrain in the assigned area.

COORDINATION CHECKLISTS

6-6. Coordination is continuous throughout the planning phase of the operation. All parties use checklists to ensure that they cover all the required areas.

6-7. Personnel other than the team leader, such as the SEO or S3, can coordinate some aspects of the operation, such as insertion means (aircraft, parachute, or helicopter). While at the briefing location, the team leader coordinates everything else; however, he can delegate tasks (but not responsibility). Coordination with specific staff sections includes the following:

• Intelligence.

• Operations.

• Fire support.

• Forward unit.

• Adjacent units.

• Rehearsal area.

• Army aviation.

• Vehicle movement.

• Mission packing list.

INTELLIGENCE

6-8. The S2 informs the team leader of any changes in the situation from the OPORD or mission brief, and the team leader updates the tentative plan accordingly. Intelligence coordination includes—

• Identification of the unit.

• Weather and light data.

• Terrain updates (aerial photos, trails and obstacles not on map).

• Locations, strength, weapons, and the enemy's possible courses of action.

• Recent enemy activity and reaction time of reaction forces.

• Civilian activity in the area.

• Priority intelligence and information requirements.

• Challenge and password.

• TRPs.

OPERATIONS

6-9. The team leader coordinates with the operations section to receive the overall status of the mission. Operations coordination includes—

• Identification of the unit.

• Changes in the friendly situation.

• Route, landing zone (LZ), and pickup zone (PZ) selections.

• Linkup procedure.

• Transportation (other than air).

• Resupply (along with S4).

• Signal plan.

• Departure and reentry of forward units.

• Special equipment requirements.

• Adjacent units operating in the AO.

• Rehearsal areas.

• Methods of insertion and extraction.

• Frequencies, call signs, and communications security requirements.

FIRE SUPPORT

6-10. The team leader usually coordinates fire support with the fire support officer. Fire support coordination includes—

- Identification of the unit.
- Mission and objective.
- Routes to and from the objective (including alternate routes).

- Times of departure and expected times of return.
- Unit target list (fire plan).
- Fire support available, such as artillery, mortar, naval gunfire, and aerial.
- Ammunition available (to include different fuzes).
- Priority of fires.
- Control measures and communications for fire support.

FORWARD UNIT

6-11. When a sniper team must move through a friendly forward unit, the team leader coordinates his team's movement with the commander of the forward unit. This helps to ensure a smooth, orderly passage. If he is not given a time and place to coordinate, the team leader works through the S2 and S3, who work with the forward unit in his place, arranging assistance and support for the team, as needed. The team and unit exchange the following information:

- Unit identification, leader, and observer.
- Unit size.
- Time and place of departure(s) and return(s).
- Departure points, initial rally points (IRPs), and detrucking points.
- General AO.
- Information on terrain and vegetation.
- Known or suspected enemy positions or obstacles and latest enemy activity.

- Details on friendly crew-served weapons and final protective fires (FPFs).
- Type and duration of support that the forward unit can furnish.
- Call signs, frequencies, and Vinson cryptographic variables.
- Relieved unit (pass information to the relieving unit).

ADJACENT UNITS

6-12. Immediately after receiving the OPORD or mission brief, the team leader coordinates directly or indirectly (through the S3) with any other units or sniper teams in the area, exchanging the following information:

- Unit identification, leader, and observer.
- Unit size and mission.
- Time and place of departure and reentry.

REHEARSAL AREA

6-13. The sniper coordinates the following with the S2 or S3:

- Identification of the sniper team, the team leader-observer, and the sniper.
- The sniper team's mission.
- Terrain similar to objective site.
- Mockups and security.
- Aggressors.
- Blanks, pyrotechnics, and live ammunition.

- Area availability time (light conditions like expected mission conditions).

NOTE: Rehearsal with the quick reaction force is critical.

ARMY AVIATION

6-14. The team leader coordinates Army aviation support with the supporting aviation unit commander through the S3 or S3 air. Army aviation coordination includes—

- Situation (friendly and enemy forces, and weather).
- Mission task and purpose.
- Execution or concept of operation, overview of desired air outcome.
- Command and signal (frequency and call signs).
- Route plans.

VEHICLE MOVEMENT

6-15. The team leader coordinates vehicle movement with the supporting unit through the S3. Vehicle movement coordination includes—

- Identification of the sniper team and of the supporting unit.
- Number and type of vehicles and tactical preparation.
- Entrucking point (loading and departure times).
- Times and locations of vehicles for preparation, rehearsal, and inspection.
- Primary and alternate routes and checkpoints.
- Detrucking points (primary and alternate).

- March interval and speed.
- Communications frequencies, call signs, and codes.
- Emergency procedures and signals.
- React to contact SOPs.

MISSION PACKING LIST

6-16. Leaders should check the mission packing lists in Appendix B for team-specific resources. In addition to the items listed, leaders must consult with the sniper team's SEO for mission-specific resources.

NOTE: Leaders should see Appendix C for discussion of and an example leader's checklist.

COMPLETION OF PLAN

6-17. After the warning order has been issued and a thorough map reconnaissance made, most coordination should be completed.

6-18. The team leader makes an intelligence update while the team prepares themselves and their equipment for the mission. The team leader completes his plan based on his map reconnaissance and or any changes in the enemy situation. He may or may not alter the tentative plan, but he can add detail. The team leader uses the OPORD format as a guide to refine his concept. He places the main focus on actions in the objective area and carefully assigns the team specific tasks for all phases of the operation. He ensures all actions work smoothly and efficiently.

OPERATION ORDER

6-19. The team leader issues the OPORD. He uses terrain models, sketches, and chalkboards to highlight important details, such as routes, planned rally points, and actions at known danger areas. The sniper team must know all

aspects of the OPORD, and must memorize the information. The OPORD should include—

- Intelligence-acquisition tasks, including specific information requirements.
- Situation, both friendly and enemy.
- Mission.
- Execution plan.
- Administrative plans.
- Signal, including frequencies and call signs.

BRIEFBACK

6-20. The sniper team rehearses the briefback before presenting it to the S3, SEO, or commander. A good briefback indicates the team's readiness for the mission. Table 6-1 shows an outline of a sniper briefback.

Table 6-1. Outline of sniper briefback.

Team Leader--Introduction and Mission Statement

Team Leader--Execution Plan

Insertion (method, location, and time) Reconnaissance (position and method)

Extraction (method, location, time and evasion route and plan)

Observer--Administrative (S1)/Logistical (S4) Plans

Prisoners of war and wounded or killed in action

Mission logbook, camera information, film, and log

Allergies and aid kits

Customs and cultural problems

Medical evacuation plan (tactical) and abort criteria

Rations, water, and resupply procedures

Observer--Intelligence

Enemy and friendly situations

Weather

Light data (percentage of illumination)

Terrain restrictions, including restrictions on medical evacuations

Intelligence acquisition task

Observer--Communications and Electronics

Window times and format

Frequencies and call signs

Antenna-type and terrain considerations

Special equipment

Code words

Team Leader--Conclusion Restate mission Combat medical plan

Special instructions relating to the mission

Contact with civilians

Local authority point of contact (POC)

Maneuver restrictions

EQUIPMENT CHECK

6-21. Before signing out the necessary equipment, the sniper team ensures that it is operational. The team leader ensures that the weapons are clean, functional, and test-fired to confirm zeroes. The team makes a communications check with their net control station. The team also checks NVDs and double-checks all equipment. If they encounter problems, the sniper notifies the squad leader, platoon sergeant, or SEO.

FINAL INSPECTION

6-22. The sniper makes any last-minute changes and corrects any deficiencies found during equipment checks. The SEO, platoon leader, or platoon sergeant conducts the final inspection and asks team members questions about the mission. The team leader ensures that all discrepancies are corrected, that the equipment is still operational, that all needed items are present, and that the team is ready for the mission.

REHEARSALS

6-23. Rehearsals ensure team proficiency. Only through well-directed and realistic rehearsals does the team gain familiarity with their actions on the mission.

6-24. During rehearsals, the team leader rechecks and refines his plans. The sniper team uses terrain similar to that on which they will operate, rehearsing all actions if time permits. The sniper team establishes the sequence of actions to rehearse and, if time permits, rehearses in the same sequence as in the mission.

6-25. A good way to rehearse is to talk the team through each phase, describing the actions of each team member, and then perform the actions as a dry run. When the team understands all of its actions, they go through all the phases, using the signals and commands to be used during the mission.

6-26. If the team has no time for rehearsals, they brief the plan back or talk through it together. This supplements rehearsals or replaces them when security or time constraints prohibit their conduct. The team leader talks the sniper through his actions, and then has the sniper restate them.

NOTE: Rehearsal with the quick reaction force is critical.

SECTION II. MISSION EXECUTION

There are four phases of a sniper mission:

- Insertion phase.
- Execution phase.
- Extraction phase.
- Recovery/debrief phase.

All phases are subordinate to the mission and to the actions at the objective, and are planned accordingly. Each phase may involve multiple steps. The techniques used for these phases may be limited to the type of unit to which the sniper team is assigned, depending on the unit's resources.

INSERTION PHASE

6-27. Insertion is the first phase of any sniper operation. There are three types of insertion:

- Air.
- Water.
- Land.

6-28. The method of insertion selected depends on METT-TC. The team must pass through terrain where the enemy might use sophisticated detection devices; the preferred method of insertion is the one with the least chance of detection.

AIR INSERTIONS

6-29. The fastest way to infiltrate is by air. Sniper teams and equipment can insert by parachute using the static-line or free-fall technique, by fixed-wing (air landing), or by helicopter (air landing, rappelling or parachuting). Air insertions require the selections of—

- PZ or LZ.
- Air movement plan.
- Landing plan.

Pickup or Landing Zone

6-30. The selection of PZs or LZs requires adequate planning and coordination for effective use of air assets. Site selection must be coordinated face-to-face between the sniper team and the supporting aviation commander. The tactical situation is the key planning factor; others include the following:

- Size of landing points.
- Surface conditions.
- Ground slopes.
- Approach and departure directions.
- Aircraft command and control.
- PZ and LZ identification.
- Rehearsals.

Air Movement Plan

6-31. This plan coordinates the movement of the team into the zone of action in a sequence that supports the landing plan. Key considerations are flight routes, air movement tables, flight formation, in-flight abort plan, altitude, and air speed.

Special Considerations

6-32. Special considerations include—

- In-flight emergencies.
- Immediate action drills.

In-Flight Emergencies

6-33. The sniper team must know the route and the checkpoints along the route. Before boarding, the team makes simple ground-assembly plans for contingencies. In an emergency, the SEO decides whether to continue or abort. In the absence of the SEO, the sniper decides based on METT-TC, contingency plans, and the distance to the target versus back to friendly lines. The team should take contingency provisions in case they require a rescue by air or water.

Immediate Action Drills

6-34. When inserting by parachute, team members must be ready to engage the enemy at all times, especially on the drop zone (DZ) itself. The team must practice immediate-action drills to counter an enemy attack on the DZ.

Landing Plan

6-35. The landing plan introduces the team into the target area at the proper time and place. The team rehearses all contingencies before the mission. The team rapidly assembles, reorganizes, and leaves the insertion site.

Assembly Area

6-36. Because the assembly area is vulnerable to detection, the sniper team must be able to assemble and reorganize quickly and precisely. The sniper team develops assembly plans after carefully considering METT-TC, especially the location of the enemy, visibility, terrain, DZ information, dispersion pattern, and crossloading. The team can use terrain association as a backup method for designating assembly areas.

Fire Support

6-37. Fire support can include artillery, naval gunfire, attack helicopters, or United States Air Force tactical aircraft. Supporting fires must be thoroughly coordinated with the air mission commander.

Other Considerations

6-38. The team must also plan escape and evasion (E&E), actions at the last LZ, control measures, weather delays, deception plans, and operational security.

WATER INSERTIONS

6-39. Water insertion includes swimming, small boats or other surface craft, helocasting, or a combination thereof. The sniper team needs detailed information to plan and execute a small boat landing, which is the most difficult phase of a waterborne insertion. Close coordination is required with naval support units.

Planning

6-40. While on the transporting craft, the team plans for all possible enemy actions and weather. Initial planning includes the following:

- Schedule.
- Embarkation point.
- Drop site.
- Landing site.
- Loading.

Schedule

6-41. The schedule of all events is used as a planning guide. Accurate timing for each event is critical to the success of the operation.

Embarkation Point

6-42. The embarkation point is the point where the team enters the transporting craft.

Drop Site

6-43. The drop site is the site where the team leaves the primary craft and loads into a smaller boat.

Landing Site

6-44. The landing site is the site where the team beaches the boat or lands directly from amphibious craft.

Loading

6-45. Loads and lashings are in accordance with unit SOPs, with emphasis on waterproofing. Supervisors must perform inspections.

Site Selection

6-46. The beach landing site must allow for undetected approach, insertion, and exit. When possible, the team avoids landing sites that cannot be approached from several different directions. If sand beaches are used, tracks and other signs that may compromise the mission must be erased. Rural, isolated areas are preferred. Other factors considered in each selection include—

- Enemy dispositions.
- Distance to the target area.
- Characteristics of landing and exit sites.
- Availability of cover and concealment.

Tactical Deception

6-47. Plans must deny the enemy knowledge of the insertion. This may include use of electronic countermeasures (ECM) or diversionary fire support to direct the enemy's attention away from the insertion site.

6-48. The route to the drop site should be planned to deceive the enemy. If possible, the route should be similar to that used in other types of naval operations. A major route change immediately after the team's debarkation may compromise the mission.

Navigation

6-49. Ship-to-shore navigation may be accomplished by dead reckoning to a shoreline silhouette or radar.

Other Types of Water Insertions

6-50. Snipers can also be inserted by air from a ship and by helocasting.

Insertion by Air From Ship

6-51. Helicopters launched from a ship may extend the range of sniper teams. They may be vectored from ships to a predetermined LZ. Once in the air, landing and assembling are the same as for air movement operations.

Helocasting

6-52. Helocasting combines a helicopter and small boat in the same operation. It is planned and conducted much the same as air movement operations, except that the LZ is in the water. While a helicopter moves at low levels (20 feet) and low speeds (20 knots), the sniper team launches a small boat and enters the water. Members then assemble, climb into the boat, and continue the mission.

Actions at the Drop Site

6-53. Primary and alternate drop sites must be agreed upon. The drop site should be at least 1,500 meters offshore to prevent compromise by noise during loading and launching; however, some operations may permit landing directly from the transporting craft onto the shore. If the enemy has surface radar capability, the drop site may need to be several miles offshore or ECM may be required.

Actions at the Beach Landing Site

6-54. To plan actions at the landing site, the team must consider the following:

- Actions during movement to the beach.
- Noise and light discipline.
- Navigational techniques and responsibilities.
- Actions on the beach.
- Plan for unloading boats.
- Plan for disposal or camouflage of boats.

Actions on the Beach

6-55. Once on the beach, the sniper team moves to a covered and concealed security position to defend the landing site. Then, the team conducts a brief listening halt and checks the landing area for signs of enemy activity. The team may deflate, bury, or camouflage the boat near the landing site or away from it, depending on the enemy situation, the terrain, and the time available. If the boat is to be disposed of or hidden near the landing site, a member must be designated to dig a hole or cut brush for camouflage. After the boat is disposed of, a designated team member sweeps the beach to erase tracks and drag marks.

Contingency Planning

6-56. The following contingencies must be covered in the planning stage:

- Enemy contact en route.
- Hot helocast site.
- Flares.
- Aerial attack.
- Small arms.
- Indirect fire.
- Downed aircraft procedure (if applicable).
- E&E.
- High surf.
- Adverse weather.
- Separation.

Rehearsals

6-57. The team must rehearse all aspects of the amphibious insertion, including boat launching, paddling, boat commands, capsize drills, beaching, and assembly.

LAND INSERTIONS

6-58. Land insertion from a departure point to the target area may be the best or only way to accomplish a mission. The sniper team can accomplish land insertions over any type of terrain, in any climate. However, thick forests, swamps, and broken or steep terrain offer the best chance of success.

Planning

6-59. Plans for overland movement enable the sniper team to move to the target area with the least risk of detection. Planning considerations include the following:

- Select concealed primary and alternate routes based on a detailed map reconnaissance and aerial photographs, ground reconnaissance, and data on the enemy situation.

- Avoid obstacles, populated areas, silhouetting, enemy positions, main avenues of approach, and movement along heavily populated routes and trails.

- Select the time of insertion to take advantage of reduced visibility and reduced alertness. Timing is especially important while passing through populated areas.

- Identify routes, rendezvous points (and alternates), time schedules, and danger areas.

- Provide centralized coordination to ensure that members act in accordance with cover and deception plans. Insertion by land is characterized by centralized planning and decentralized execution.

Insertion Techniques

6-60. The sniper team can insert several ways, but are most likely to use the stay behind or catch a ride technique.

Stay Behind

6-61. When moving with a security patrol, the sniper team stays behind. The team sets up an ORP, caches nonessential equipment, and puts on their ghillie suits to prepare to move into the TFFP. When the team is ready, the security patrol departs for a predetermined location to act as a quick reaction force for the team or they return to their operational base. The team must plan for the following:

- Noise and light discipline.

- Avoidance of enemy contact.
- Timing.
- Rough, inaccessible terrain.
- Medical evacuation.
- Communications.
- Method of extraction.
- E&E.

Catch a Ride

6-62. When the snipers are needed to support immediate battle operations, wheeled or tracked vehicles carry them to the insertion site. To avoid noise detection, the vehicles must stop before or on the FLOT. Planning a vehicular insertion requires the same considerations as other insertion techniques, plus deception.

Actions on Enemy Contact

6-63. Once beyond the final firing line (FFL), the sniper team must remain alert to avoid detection en route to the target area. If the team detects the enemy, they must try to move away without alerting them. They fight only when they have no choice. Even then, they break contact as fast as they can and immediately contact the SEO to learn whether to abort or continue. If they are to continue, they might have to establish a temporary position for resupply, extraction, or evacuation of wounded.

Actions at the Insertion Site

6-64. The sniper team develops a detailed assembly plan, basing it on the insertion method and the terrain at the insertion site. Upon reaching the insertion site, the sniper team performs the following actions:

(1) The sniper team selects an assembly area that they can identify at night and that is near the insertion site. They use this assembly area if team members get separated during the insertion.

(2) The sniper team also designates an IRP that they can identify at night. The rally point is normally at least several hundred meters from the insertion site. If attacked on insertion or shortly after departing the insertion site, the team assembles in the IRP.

(3) When the insertion is complete, the sniper team accounts for equipment and supplies, and treats any injuries. If a team member receives a disabling injury during insertion, the sniper must decide, based on guidance from higher headquarters, whether to continue the mission or to request extraction.

(4) The sniper team's most critical task is to verify their location. The sniper either does this at the insertion site or after moving away from the site.

(5) The sniper team sterilizes the site and caches or discards nonessential equipment. The preferred method is to bury discards away from the insertion site. The sniper team must camouflage the cache site.

(6) The sniper team departs the insertion site, and then halts to listen for local sounds and sounds of pursuit. They establish a primary azimuth and immediately begin collecting information and updating their map.

EXECUTION PHASE

6-65. The execution phase includes the sniper team's movement from the insertion site to the target area, execution of the mission, and movement to the extraction site.

MOVEMENT TO TARGET AREA

6-66. After leaving the insertion site, the sniper team transmits an initial entry report as required by the unit SOP. This report ensures that radio

equipment operates properly and informs higher headquarters of the team's status.

Selection of Route

6-67. Selection of the route to the target area is critical. The sniper team plans the route the same as they would for an insertion.

6-68. When selecting the primary and alternate routes, the sniper team must consider enemy location, detection devices, defensive capabilities, terrain, weather, and man-made obstacles. Checkpoints are selected en route to help higher headquarters track the team.

Security

6-69. Each sniper team member maintains constant security. During movement, the sniper team—

- Covers an assigned security sector.
- Chooses a route makes the best use of cover and concealment.
- Conducts security or listening halts as needed.
- Maintains personal and equipment camouflage.

Arm-and-Hand Signals

6-70. The sniper uses standard arm and hand signals to reduce oral communications and to aid in control. These signals conform to the sniper SOP.

OCCUPATION OF POSITION

6-71. During mission planning, the team selects a TFFP, ORP, and route based on their map and on aerial photographs. They move close to the TFFP and set up an ORP. Then, they move forward to search for a specific FFP site, ensuring that it is suitable and that they can observe the target area at

ground level. They should reconnoiter the FFP during limited visibility. After they locate an FFP, they return to the ORP, secure all mission-essential equipment, move to the FFP, and occupy it. Before they construct the hide position (METT-TC dependent), they watch and listen for the enemy.

SELECTION OF SITE

6-72. The sniper team chooses a site that meets the minimum criteria, based on METT-TC.

NOTE: See Chapter 3 for more information about construction of the site and criteria that the site must meet.

REPORTS

6-73. The sniper team follows the communications procedures outlined in the unit SOP. The team—

- Maintains communications throughout the mission using directional antennas, masking, and burst transmissions.

- Collects and reports information based on specific information requirements (SIR). They avoid analyzing it.

- Formats information reports based on the SOP and on the type of communications equipment used.

- Reports the need for emergency resupply, communication checks, and emergency extraction. They format these reports in accordance with the SOP.

EXTRACTION PHASE

6-74. The sniper team tries to extract as soon as it accomplishes the mission. The extraction site is coordinated with supporting forces before the

mission. However, the situation dictates whether the sniper team extracts at the planned site or exfiltrates. Determining factors include—

• Distance.

• Terrain.

• Enemy.

• E&E.

DISTANCE

6-75. Distance can prohibit an all-land exfiltration. The initial phase may be by land, ending in extraction by air or water.

TERRAIN

6-76. The terrain at the extraction site must offer favorable tactical, tidal, and PZ conditions, and it must offer cover from enemy direct-fire weapons. The sniper team should use the least likely terrain for extraction, such as swamps, jungles, and mountain areas.

ENEMY

6-77. The sniper team must plan in detail for extracting under enemy pressure.

ESCAPE AND EVASION

6-78. Preinsertion planning must include a viable E&E plan. The sniper team—

• Checks survival equipment and evasion opportunities.

• Devises an E&E plan that offers the best chance of survival and return to friendly lines, despite projected hazards and mission objectives.

Escape and Evasion Plan

6-79. The E&E plan must work around mission challenges. It must exploit the skills of the sniper team and of supporting air or boat crews. The purpose of the plan is to try to save the team or team member who must abort the planned operation. E&E plans have three phases:

- Sniper team enters the target area.

- Sniper team pursues mission near the target area with a reasonable chance of success.

- Sniper team evades and escapes after accomplishing the mission.

EXTRACTION

6-80. Plans for extraction by air, ground, or water are made before the operation, with alternate plans for contingencies such as the evacuation of sick or injured personnel.

Movement to Extraction Site

6-81. In many operations, the sniper team moves to a planned extraction site. They observe the principles of route selection and movement security.

Code Words

6-82. The OPORD gives each sniper team code words to use during extraction. For example, one word means that the team is in the PZ. Another means that both the primary and alternate PZ are compromised and that the extraction must abort.

Failed Communications

6-83. When a sniper team misses a certain number of required transmissions, the operations section assumes that the team has a communications problem, is in trouble, or both. At that time, the section implements the no-communication extraction plan.

Air or Water Extraction

6-84. Extraction by air or water works only when resources are available and when using them compromises no one. These methods are used when—

- Long distances must be covered.
- The time of return is essential.
- The enemy lacks air and naval superiority.
- Heavily populated hostile areas obstruct exfiltration.
- Resupply is impossible.
- Casualties must be extracted.

6-85. Table 6-2 outlines the techniques that may be used to extract the sniper team.

Table 6-2. Techniques for air or water extraction.

TECHNIQUE	DESCRIPTION
Helicopters	These are best for air and water extractions because the team can get themselves and their equipment on board fast.
Troop Ladder	This is the second best method. The helicopter can start lifting off while the snipers are still on the ladder.
Jungle Penetrator	The jungle penetrator can retrieve up to three Soldiers from areas where helicopters cannot land.

Special Patrol Insertion/Extraction System (SPIES)	This system can extract up to ten Soldiers from areas where helicopters cannot land.

Vehicle Extraction

6-86. Snipers can also exfiltrate to an extraction site for extraction by a wheeled or tracked vehicle. This requires planning and coordinating during the preinsertion phase.

Alternatives

6-87. Despite the desirability of extracting the team by aircraft or linkup, these means can become compromised by security problems, poor communications, or enemy air defenses. Water extraction or linkup with friendly forces (offensive operations) can serve as alternatives to avoid capture or if the sniper team cannot be extracted by air. If all else fails, the sniper team must know exfiltration techniques so they can simply (using the term loosely) walk out, singly or together.

LAND EXFILTRATION

6-88. The sniper team must be prepared to exfiltrate over predetermined land routes to friendly lines together or separately and to decide whether to exfiltrate to an area for extraction by air or water.

6-89. This method is used when—

- Snipers are near friendly lines or lack other means of extraction.
- Terrain provides cover and concealment for foot movement, but limits enemy mobile units.
- Areas along exfiltration routes are uninhabited.

- The enemy force is widely dispersed or under such pressure that they have trouble concentrating against the exfiltrating team.

- The enemy force could stop an air or water extraction.

RECOVERY/ DEBRIEF PHASE

6-90. Recovery is the last phase of a sniper operation. It consists of the sniper team's return to the operations base; the debrief; the repair, maintenance, and turn-in of equipment; and stand-down. At the end of the recovery phase, the sniper team prepares for future missions.

DEBRIEF

6-91. After the mission, the SEO or S3 representative directs the sniper team where to prepare for debrief. The team stays there until called to the operations center. Then, they take with them their equipment, the sniper data book and log sheet, field sketch, range card, and road or area sketch(es).

6-92. The S3 or his representative controls the debrief and directs the team to—

- Discuss any enemy sightings since the last communications with the base radio station.

- Explain, step-by-step, each event listed in the mission logbook, including details of all enemy sightings.

6-93. The sniper team—

- Inventories and accounts for all team and individual equipment.

- Consolidates all captured material and equipment.

- Reviews and discusses the events in the mission logbook.

- Makes an overlay of the team's route, AO, insertion point, extraction point, and significant sighting locations.

6-94. After the debriefing, the S3 representative releases the sniper team to platoon control.

Chapter 7: Sniper Employment

Sniper employment is complex. When employed intelligently, skillfully, and with originality, the sniper provides a payoff far greater than would be expected from the assets used. When properly trained and employed, the sniper can be one of the commander's most versatile assets. For this to happen, the SEO must understand the capabilities and limitations of the sniper team.

SNIPER EMPLOYMENT OFFICER

7-1. Each unit with assigned snipers has a designated SEO. Who the commander makes the SEO depends on the type of unit and the level of the person's knowledge of sniper employment. The SEO can be the headquarters and headquarters company (HHC) commander, the executive officer (XO), the scout platoon leader, or any other officer. In the SEO's absence, the sniper squad leader or the sniper team leader can represent himself.

NOTE: See Chapter 1 for more information about the SEO's responsibilities.

SPECIFIC SNIPER TEAM TASKS

7-2. Each unit SEO should develop the sniper tasks based on the unit commander’s intent and on operational requirements.

7-3. The sniper supports combat operations by delivering long-range precision fire on key selected targets and targets of opportunity. Specific missions include—

- Accurate fire.
- Command posts and key enemy leaders.

- Crew-served weapons and crews.
- Selected targets just prior to an attack.
- Security or cover.
- Demolition guards and supply columns.
- Obstacles during crossing by friendly forces.
- Counterattack routes.
- Countersniping missions.
- Ambushes or harassment of withdrawing enemy.
- Covering fire for OPs or firing positions.
- Observation and control of indirect fire onto enemy positions.

7-4. The sniper team can use its concealment and observation skills and its advanced optics to collect and report detailed battlefield information to the commander.

NOTE: FM 7-92 provides for more information about the fundamentals of infantry reconnaissance and battlefield information collection and reporting.

CONSIDERATIONS

7-5. When the commander receives a mission, his decision to employ sniper teams depends on his analysis of METT-TC. The SEO helps the commander determine the exact sniper missions and the number of teams to deploy. The commander also considers—

- Rules of engagement.
- Collateral damage.
- Potential mines and unexploded ordnance.

- Shoot-on-command capability.
- Surveillance and reconnaissance missions.
- Support by quick-reaction forces.
- Sustainment.
- Communication.
- Anonymity.

RULES OF ENGAGEMENT

7-6. The ROE can restrict the use of deadly force with area fire weapons, limiting the commander’s options for employment. However, snipers might be authorized to use deadly force because they can place discriminatory fires with little or no threat of collateral damage.

NOTE: To minimize confusion, the recommended technique is to issue a separate ROE for sniper teams.

COLLATERAL DAMAGE

7-7. When dealing with collateral damage, a commander's most valuable asset is the sniper. Using their weapon systems, snipers can effectively eliminate targets while minimizing the collateral damage associated with other weapon systems or maneuver elements.

DANGER

Snipers must consider the penetration of their rounds to avoid causing serious injury or death to friendly personnel beyond the target.

POTENTIAL MINES AND UNEXPLODED ORDNANCE

7-8. The SEO must obtain updated mine overlays from the battalion S-2, engineers, brigade S-2, and task force air liaison officer.

SHOOT-ON-COMMAND CAPABILITY

7-9. If dissidents are present and the possibility of violent demonstrations exists, the sniper teams must be able to deliver accurate fire within seconds of receiving the command from the ground commander. The primary targets are those inciting the crowd to violence, or anyone causing or potentially causing harm to friendly personnel.

SURVEILLANCE AND RECONNAISSANCE MISSIONS

7-10. Given their advanced camouflage and observation skills, the sniper team must be prepared to execute various reconnaissance and surveillance missions, often in heavily populated areas. If the mission requires undetected reconnaissance or surveillance, a sniper team is a great consideration.

NOTE: See FM 7-93 for more information about long-range surveillance.

SUPPORT BY QUICK-REACTION FORCES

7-11. In both stability operations and high-intensity conflicts, sniper teams often operate alone, far from friendly units. The quick reaction force should be able to respond within minutes to a request for assistance from a sniper team. The SEO must coordinate and, if possible, rehearse with the quick reaction force commander for every mission.

SUSTAINMENT

7-12. To be most effective, sniper teams should be tactically, mentally, and physically ready for a mission. They need time to recover from a previous mission and to prepare for another. SEOs must monitor the teams' physical

and mental conditions and recommend how many can be deployed at once without degrading their capability.

COMMUNICATION

7-13. Sniper teams should have direct communication to or through the SEO, who should be with the highest level commander possible. This allows them to transmit intelligence faster. Proper communication requires all of the elements in the keyword PACE: primary, alternate, contingency, and emergency form of communication. Snipers should not cross the line of depart without a minimum of three forms of communication.

ANONYMITY

7-14. Commanders must carefully protect the anonymity of unit snipers. This is especially true of successful snipers, because dissidents will target them.

MISSION PLANS

7-15. Sniper operations should be carefully planned, coordinated, and executed. Planning for the sniper mission should account for all events—from departure from friendly lines or insertion to reentry of friendly lines or extraction. Unit SOPs and mission checklists are valuable in helping planners concentrate on the unique aspects of the operation. Planners must consider—

- Assignment and selection of targets.
- Area and target intelligence.
- Weapons.
- Selection of TFFP.
- Exfiltration and extraction.

- Multiple team missions.

- Indirect fires on target.

ASSIGNMENT AND SELECTION OF TARGETS

7-16. The commander can use different methods to designate and prioritize targets:

- He may describe the affects or results he expects and allow the snipers to select key targets.

- He may prescribe specific types of targets. For example, if he wants to disrupt an enemy's defensive preparation, he might task snipers to engage equipment operators and vehicle drivers.

- He might assign specific or key targets. These can include specific personnel, leaders, radio operators, antitank guided missile gunners, armored vehicle commanders, or weapon crews.

7-17. When selecting targets, the sniper team must stay within the commander's intent, the law of land warfare, and the ROE. Criteria for target selection includes—

- Tactical value of the target.

- Nature and type of the armor or cover.

- Active defensive measures employed by the enemy to protect the target.

- Potential collateral destruction.

- Spot on the target with the best balance of vulnerability and high payoff.

- Angle of fire relative to target.

- Maximum range from the target that will ensure penetration and the effect of the round to the area behind the target.

- Selection of ammunition that will achieve the desired effect.

AREA AND TARGET INTELLIGENCE

7-18. The decision to employ a sniper team must be based on solid intelligence of the target area. The commander must consider the current threat and whether suitable targets can be identified within the target area.

7-19. Leaders must provide the sniper team with the most current target information available. This information must include specific details about enemy locations, equipment, strengths, capabilities, and composition.

7-20. In addition to target descriptions, the team commander must also have other current information about the area, such as aerial photographs. This helps the team—

- Determine the type of terrain.

- Identify indigenous vegetation.

- Locate suitable positions that offer the maximum standoff range while allowing the sniper team to destroy the target.

- Identify the unit's planned routes to and from the target area.

- Decide on the direction of approach that offers—

  The best fields of fire.

  An effective range.

  A good angle of attack.

  Concealment and security.

Quick exfiltration route.

7-21. Data on the target area's meteorological and environmental conditions, such as prevailing winds, is also important.

WEAPON

7-22. Based on the target and area information received, the sniper team chooses the best weapon for the mission. The arms room concept and the mobile arms room concept enable the sniper to tailor his weapon system to his mission and provide the speed and flexibility necessary to accomplish the mission within the commander's intent.

SELECTION OF TENTATIVE FINAL FIRING POSITION

7-23. The sniper team must select a TFFP that meets all the requirements to ensure a successful engagement. When selecting a TFFP, the sniper team must consider meteorological and environmental conditions, and wind speed and direction.

EXFILTRATION AND EXTRACTION

7-24. During the planning phase, the commander develops contingency plans for exfiltrating and extracting the sniper team. He confirms or adjusts these plans once the team is in position. Due to unknown ground and enemy conditions, he is often unable to confirm exfiltration and extraction routes during the mission-planning phase; this can only be verified during execution.

MULTIPLE TEAM MISSIONS

7-25. When the target area has multiple high priority and well-defended targets, the commander can deploy multiple sniper teams. The unit SEO plans and coordinates multiple team missions. He gives each team a set of responsibilities and targets or sectors in the target area. On the ground, coordination and communication between the teams is vital.

INDIRECT FIRES ON TARGET

7-26. The commander should consider using indirect fire in and around the target area in conjunction with the sniper team. Indirect fires can—

- Augment the team's direct destructive engagement of specific targets, saturate the area, and inflict collateral damage on nonpriority targets.

- Divert enemy attention while the teams extract; however, the team must coordinate with the indirect-fire elements to ensure that the target is clear of smoke and dust before engagement.

SPECIFIC PLANNING ELEMENTS

7-27. Preparations, inspections, and rehearsals are vital for mission success. The following elements should be specified in the team leader’s plan—

- Security.

- Control.

- Routes.

- Navigation and navigational aids.

- Weather.

- Intelligence.

- Coordination with other units.

- Contingency plans.

- Precombat inspections.

SECURITY

7-28. Security is vital throughout the mission. At least 50 percent of the team should provide 360-degree, around-the-clock security for the entire unit.

CONTROL

7-29. Control measures include—

• Communications.

• Emergency actions.

• Team leader's control.

ROUTES

7-30. The team leader covers primary and alternate routes to and from the objective in detail. He includes all available information about the terrain, including—

• The distance to the objective and estimated time to target.

• The type of terrain and the amount of time required to cover the distance with the amount of equipment carried.

NAVIGATION AND NAVIGATIONAL AIDS

7-31. The team leader identifies primary and alternate routes to and from the target area. He checks and coordinates for the use of navigational aids, both those carried by the team and those operated by other units to support the team's movement.

WEATHER

7-32. The team leader states the percent of night illumination, the BMNT, the EENT, and other weather factors.

INTELLIGENCE

7-33. The team leader includes all available information on the enemy situation, such as known observation points and sentries.

COORDINATION WITH OTHER UNITS

7-34. The team leader states how the team will coordinate for the passage of lines, with other patrols in the area, and for direct or indirect fire. To prevent fratricide, he gives friendly elements operating in the team's AO a general location and description of the sniper team.

CONTINGENCY PLANS

7-35. The team leader prepares and rehearses contingency plans for a variety of events, such as actions on enemy contact, reaction to enemy flares, or reaction to indirect fires.

PRECOMBAT INSPECTIONS

7-36. Before the team departs friendly lines, the team leader should conduct precombat inspections and rehearsals.

7-37. Sniper teams and squads should tailor SOPs to the mission, situation, and equipment.

COMMAND AND CONTROL

7-38. Command and control of snipers is accomplished using indirect and direct control procedures. The sniper team will often operate in situations where direct control is not possible. Therefore, the sniper must execute his mission (within the parameters of the commander's intent) on personal initiative and determination.

INDIRECT CONTROL

7-39. Commanders can accomplish indirect control of snipers through a variety of methods, the simplest being ROE and fire control measures.

Rules of Engagement

7-40. The ROE will normally designate combatant forces and situations that allow the sniper to engage the enemy. One significant problem with contemporary ROE is the restrictive measures used in peacetime operations. Often, such ROE will specify enemy personnel as only those presenting a direct threat to friendly forces or will require a verbal warning before engagement. The paradox is that a sniper's modus operandi is to engage targets that are not a direct threat to him at the moment (outside effective firing range of small arms), but which later may be. It is extremely difficult for a sniper to stay within ROE because, once the enemy gets within his minimum standoff, a sniper rifle is no match for an AK47 or M16 at close quarters. Therefore, ROE must provide for the sniper's safety by adding security forces or removing him from the operation. An ROE specifically developed for sniper operations is needed.

Fire Control Measures

7-41. Fire control measures are just as important for the sniper as they are for indirect-fire weapons and aircraft. Positive target identification is difficult at extended ranges, even when using advanced optics. Establishment of no-fire zones or times, fire coordination lines, and free-fire zones or times will help establish guidelines for when and where the sniper can fire.

DIRECT CONTROL

7-42. Commanders can maintain direct control of snipers using technical and nontechnical systems. The mission and the operational environment will determine the methods of control.

Technical Systems

7-43. Snipers can use many forms of technical communication, including radio and wire. Both radio and wire offer near-instant message traffic and

two-way communications. Certain environments may allow for more flexible communication techniques, such as commercial telephones or other nontraditional tactical forms of communication.

Nontechnical Systems

7-44. Nontechnical control of snipers involves using prearranged methods, including rendezvous, message pickups and drops, and other clandestine methods of secure communication. In denied areas or those with electronic interception capabilities, these methods may be the only secure techniques for communicating with the sniper team. Although quite secure, these systems are slow and tend to be complex.

LONG-RANGE SNIPER TEAM

7-45. The destructive, antimateriel capability of the M107 LRSR allows the commander to assign tasks to the sniper team that is beyond the capability of the M110 SASS or the M24 SWS. The increased range and penetration of the round allows the commander to accurately engage and destroy high-value targets at long ranges.

MISSION PLANNING

7-46. The decision to employ a long-range sniper team must be based on the current threat and on whether suitable targets can be identified within the target area. The plan must address the following considerations:

- The long-range sniper team is larger than the M110 SASS or the M24 SWS team and requires additional support equipment. He must plan their transportation and infiltration into the target area accordingly.

- The increased size and weight of the M107 LRSR and its accessories slows down the team and reduces the distance it can travel dismounted. The plan should allow the team the time and means to insert at a reasonable distance from the objective and to conduct a thorough target area reconnaissance.

EMPLOYING THE M110 SEMIAUTOMATIC SNIPER SYSTEM, M24 SNIPER WEAPON SYSTEM, AND M107 LONG-RANGE SNIPER RIFLE

7-47. For some antimateriel missions, the commander might need to employ both long-range sniper teams and M110 SASS/M24 SWS teams at the same time. This depends on the depth of the target area, the threat, and whether suitable targets fall within the range of the M110 SASS or the M24 SWS.

OPERATING IN AN URBAN ENVIRONMENT

7-48. In an urban environment, employing the M107 LRSR depends on the availability of suitable targets and distances. Deploying a long-range sniper team on missions more suited for a regular sniper team exposes the team to a greater potential for compromise, because they might have to fire from a forward hide position. In this instance, the arms room concept coupled with the mobile arms room concept enables the sniper team to configure itself with the weapons necessary to accomplish the mission.

Outside Urban Area

7-49. The long-range sniper team's best advantage is to occupy key terrain or man-made features outside an urban area, while keeping enough standoff distance between themselves and the target area. This gives the team time for multiple engagements without the need to move often to avoid detection.

Inside Urban Area

7-50. The long-range sniper team is more likely to employ from within a large metropolis, using tall buildings and other prominent structures in friendly-held sectors to place accurate direct fire deep into enemy-dominated areas. If the long-range sniper team decides to use hide positions in prominent structures, they must reinforce the wall facing the enemy within the room they have selected. They should plan alternate firing

positions, overhead protection, and a rapid evacuation route to another part of the complex, or out of it, in case of direct or indirect fire.

MULTI-TEAM OPERATIONS

7-51. For high-priority targets and targets dispersed throughout a large, defined area, the commander might assign multiple teams to ensure complete coverage and destruction or disabling of all key targets simultaneously.

Insertion

7-52. Depending on the mission and size of the objective area, teams might insert together or individually at designated positions that offer the best approach to their target area.

Target Assignment

7-53. Each team is responsible for selecting, prioritizing, and destroying targets in its sector of fire; however, the teams must communicate their locations and intended targets to each another to reduce the chance of fratricide.

Coordination and Control

7-54. For multi-team operations to succeed, teams and resources must be well-coordinated. The unit SEO divides and assigns the target area to the teams. For command and control on the ground, the commander of the senior team is the mission commander. He assesses the tactical situation in the target area and determines the best time to initiate the engagement. Depending on the tactical situation, he might grant the teams the authority to engage their respective targets in a set period of time (unless the targets appear at different times than initially expected). This way the teams can divert, confuse, and delay the enemy’s response, and then exfiltrate to a linkup point for extraction.

Chapter 8: Sniper Operations

Snipers conduct and support activities in all operational environments. This chapter explains how the sniper supports each operation and activity.

SECTION I. COMBAT OPERATIONS

Sniper team missions support the overall accomplishment of the mission. Commanders and leaders at all levels must know the value of employing snipers and the threat posed by enemy snipers. They must understand the effects a sniper can have on unit operations, and how the enemy could counter his attack and minimize his threat.

OFFENSIVE OPERATIONS

8-1. During offensive operations, snipers help the commander accomplish his mission by obtaining information, depriving the enemy of resources, deceiving or diverting the enemy from the main effort, keeping the enemy from regrouping or repositioning, conducting preemptive attacks to gain the initiative, and disrupting enemy offensive actions. Commanders should follow these guidelines for employing sniper teams in the various types of offensive operations.

MOVEMENT TO CONTACT

8-2. This type of offensive operation is conducted to develop the situation and establish or regain contact. The fluidity that often occurs in this type of operation presents good opportunities for sniper employment.

Employment

8-3. In a movement to contact, snipers infiltrate enemy areas and engage them from unexpected directions. The teams should move out well in advance of the projected movement. This allows them to move at their own pace so they remain undetected. It also allows them to engage any targets that threaten the advance. The teams may use normal stalking methods, or they can be inserted by ground vehicle, helicopter, parachutes, or boats.

8-4. The commander must maintain radio contact with these teams.

SEARCH AND ATTACK

8-5. Search and attack missions are similar to area security missions. They are usually conducted by light and medium maneuver units.

Employment

8-6. Sniper teams are employed the same as in a meeting engagement.

ATTACK

8-7. An attack is an offensive operation that destroys or defeats enemy forces, seizes and secures terrain, or both. Snipers are best employed when there is sufficient time to properly plan and deploy them before an attack.

Hasty Attack

8-8. A hasty attack is an attack in which preparation time is traded for speed in order to exploit an opportunity. By nature, this type of attack gives snipers less time for coordination and planning.

Employment

8-9. The best way to employ snipers in a hasty attack is to let them operate on their own initiative with their supported unit. Their precision fire reduces delays or stalemates during the hasty attack.

Deliberate Attack

8-10. A deliberate attack is a type of offensive action characterized by preplanned coordinated employment of firepower and maneuver to close with and destroy or capture the enemy. The coordination and planning stages of a deliberate attack give commanders enough time to take full advantage of their snipers.

Employment

8-11. In a deliberate attack, snipers can be effectively employed near the fire support element. Their accuracy and optics allow them to reduce enemy targets in the midst of friendly forces. During a deliberate attack, the unit should take care to avoid drawing enemy attention to the sniper team's position. The team may also be deployed forward of the fire support element to support the attack with accurate selective rifle fire or deployed with a cutoff force with the same task. If time permits, they infiltrate behind the enemy positions to disrupt counterattacks or withdrawal, and to harass enemy reinforcements.

SPECIAL PURPOSE ATTACKS

8-12. Special purpose attacks, such as the sniper initiated assault and overwatch, employ distinctive methods and require extensive planning. The SEO must ensure the sniper teams are trained sufficiently to perform these tasks.

Overwatch

8-13. Overwatch is a tactical movement technique in which one element is positioned to support the movement of another element with immediate fire. Snipers are usually used with the security element to isolate the objective, to cover avenues of approach and routes of friendly withdrawal, to prevent enemy reinforcement, and to help observe the objective and surrounding areas.

Employment

8-14. The snipers can be employed with the support element to eliminate a specific enemy target. They may also be employed to initiate actions at the objective or to support the raiding force by reducing the enemy's ability to react.

Feints

8-15. A feint is an offensive action involving contact with the enemy conducted for the purpose of deceiving the enemy as to the location and time of the actual main offensive action. Forces conducting a feint seek

direct-fire contact with the enemy, but avoid decisive engagement. Snipers are perfect for feints.

Employment

8-16. Snipers may also be employed in an active sniping campaign to fix and occupy enemy forces to allow operational commanders to plan and conduct further operations.

Reconnaissance in Force

8-17. Reconnaissance in force is a deliberate combat operation designed to discover or test the enemy's strength, disposition, and reaction or to obtain other information.

Employment

8-18. The snipers' use in a reconnaissance in force is limited to general sniper team tasks in support of the main unit. During combined arms operations, snipers provide long-range protection for the tanks from concealed enemy antiarmor weapons, their crews, and tank-killer teams. The main sniper targets are the enemy antiarmor weapons crews and the enemy tank crewmembers.

DEFENSIVE OPERATIONS

8-19. Defensive operations defeat an enemy attack, buy time, economize forces, or develop conditions favorable for offensive operations. By performing tasks such as operating as an extension of normal patrols, snipers play a vital role in the commander's planning, and help the commander maintain an offensive posture while in the defense.

8-20. In the defense, the sniper team can—

- Augment the fires of front line units.

- Cover avenues of approach, obstacles, dead space, and key terrain features.

- Provide FPF to friendly forces in the absence of supporting arms.

- Deter enemy infiltration attempts to infiltrate and surprise the friendly unit.

- Go out with, operate as an extension of, and return with normal patrols.

8-21. The three types of defensive operations are area defense, mobile defense, retrograde, and counterattack. Snipers play a specific role in each type.

NOTES: 1. When the sniper team is within the defensive perimeter but away from troop positions, they should prepare hide positions, ideally with local infantry support. When time permits, they should prepare range cards for their primary, alternate and supplementary positions.

2. When operating in another unit's sector, snipers must coordinate with front line units on the forward edge of the battle area (FEBA). To avoid fratricide, the sniper team must make sure that they have been included in that unit's defensive plan as an attached security element operating in their sector.

AREA DEFENSE

8-22. An area defense denies the enemy access to designated terrain for a specific period of time. The sniper team works outside the FEBA to provide early warning of enemy approach, to disrupt it, and, if they can, to cause the enemy to deploy prematurely.

Employment

8-23. In the defense, the snipers—

- Move out at night.

- Build hide positions that overwatch likely avenues of approach.

- Warn the FEBA of impending attacks (day or night), probes, or infiltrations.

- Reduce targets of opportunity.

- Collect battlefield information.

MOBILE DEFENSE

8-24. The mobile defense concentrates on the destruction or defeat of the enemy through a decisive attack by a striking force.

Employment

8-25. Snipers are usually used with the security element to isolate the objective, to cover avenues of approach and routes of friendly withdrawal, to prevent enemy reinforcement, and to help observe the objective and surrounding areas.

RETROGRADE

8-26. This kind of defensive operation consists of organized movement away from the enemy. Snipers delay the enemy advance so that the element can make a clean break from contact, while harassing, deceiving, and confusing the enemy. Effective sniper fire can also improve the morale of withdrawing friendly troops. A sniper slows the enemy's momentum and inflicts maximum casualties. He can also cover obstacles, which is especially useful when isolated bodies of troops have been separated from follow-up forces.

Employment

8-27. During retrograde operations, the sniper team is typically employed with and moves with the rear security elements, and withdraws with or before the maneuver units. When a sniper deploys with the rear guard, plans should address the possibility that the enemy might bypass them, which would place them behind enemy lines. Sniper teams can also stay behind to

conduct sniper operations and to reconnoiter the enemy. Communications must be maintained so they can pass along information and intelligence, to control their movement, to arrange for their extraction, and allow the sniper team to call indirect fire on large enemy groups.

COUNTERATTACK

8-28. A counterattack is an attack by part or all of the defending force against an enemy attacking force.

Employment

8-29. If time permits and the distances are not too great, snipers can be effectively employed with counterattack forces. Counterattack forces are normally reserve forces or units not in contact, and are limited in size. The combat multiplying capability of the sniper can prove valuable for this type of operation.

TACTICAL ENABLING OPERATIONS

8-30. These special missions are planned and conducted as part of an offensive or defensive mission to achieve or sustain a tactical advantage. In such an operation, the sniper teams support the commander's plan by providing accurate long-range fire and observation. There are three types of tactical enabling operations: linkup, relief, and passage of lines.

LINKUP

8-31. Linkup operations join two or more friendly forces to—

- Surround enemy forces.
- Help friendly forces break out.
- Join an attacking force with another one in enemy territory.
- Join other forces on a separate battlefield.

Employment

8-32. Snipers might destroy the enemy or deny them access to a specific area before the supported unit can link up with other friendly forces. Of course, snipers can infiltrate the linkup areas beforehand and use direct or indirect fire to discourage the enemy from coming into the area. During the linkup itself, the snipers typically overwatch and provide flank security.

RELIEF

8-33. In a relief operation, one unit replaces another in combat.

Employment

8-34. Snipers and reconnaissance elements conduct their relief before the main units. Incoming snipers must be fully briefed and prepared to support the main body during the relief sequence.

PASSAGE OF LINES

8-35. This is the coordinated, forward or rearward movement of one or more units through another unit.

Employment

8-36. In a forward passage of lines, the sniper is limited to targets of opportunity or general task employment in accordance with the commander's intent.

8-37. In a rearward passage of lines, the sniper teams usually provide overwatch, as well as rear and flank security.

OTHER OPERATIONS

8-38. Inserting snipers with security elements ahead of the main body increases the effectiveness of air assault, airborne, and amphibious

operations by enabling sniper teams to support the vulnerable insertion and extraction of combat forces.

AIR ASSAULT OPERATIONS

8-39. Air assault operations are operations in which assault forces, using the firepower, mobility, and total integration of helicopter assets, maneuver on the battlefield under the control of the ground or air maneuver commander to engage and destroy enemy forces or to seize and hold control of key terrain.

Employment

8-40. Snipers can be very effective when employed in air assault operations, due to their mobility and long-range precision fire. Having air assault resources also enables the commander to insert and extract his snipers at will.

AIRBORNE OPERATIONS

8-41. Airborne operations involve moving combat forces and their logistical support into an objective area by air for execution of a tactical, operational, or strategic mission.

Employment

8-42. Using snipers in airborne operations also adds employment flexibility. Their reach and responsiveness permits the snipers to operate at will throughout his AO. Snipers inserted with airmobile units can move to the objective area, observe it until friendly forces are poised for the attack, and reduce key targets before and during the attack. Snipers may also insert with airborne units to eliminate a particular target.

AMPHIBIOUS OPERATIONS

8-43. Amphibious operations are launched from the sea by an amphibious force, embarked in ships or craft with the primary purpose of introducing a

landing force ashore to accomplish the assigned mission.

Employment

8-44. The sniper teams should go ashore before or with the preassault force, or with the first wave. Their advanced optical devices and observation techniques let them identify enemy bunkers that others would miss. Snipers can also tell by the position of the apertures which bunkers are mutually supporting. This helps the sniper teams determine the order in which they should reduce the enemy bunkers.

Operations by Encircled Forces

8-45. The snipers' primary role in supporting an encircled force is to move around as needed to take out as many attackers as they can.

NIGHT OPERATIONS

8-46. The sniper team can operate in all weather conditions, day or night. Sniper night operations include any in which the sniper team conducts surveillance, overwatches, probes, or conducts other actions in low light.

8-47. Sniper night operations often involve the use of thermal imagery and advanced NVDs. Thermal imagery and advanced NVDs enable snipers to conduct any operation by night; they increase situational awareness of a perceived threat and of the environment, increase the effective range of the eye at night, and let the sniper move greater distances in low light. Other capabilities include the following:

- Snipers can use NVDs to detect the enemy’s use of infrared light.

- Weapon-mounted NVDs can be dismounted and handheld for other purposes, such as surveillance.

8-48. The limitations of thermal imagery and advanced NVDs include the following:

- Improper use and employment of some NVDs is detectable. Detection compromises and endangers the snipers, the supported unit, and the mission.

NOTE: Sniper teams using NVDs must be familiar with operational techniques and with the limitations of the equipment.

- Since some NVDs use active light sources for illumination, the enemy can detect them with passive NVDs.

- Chemical smoke or illumination can reduce the effectiveness of infrared light.

- NVDs are line-of-sight equipment.

- NVDs are affected by bad weather conditions. For example, fog or moisture on the objective lens distorts the image.

- Some NVDs are adversely affected by bright light.

- Prolonged use of NVDs tires the eyes.

OPERATIONS IN CHEMICAL, BIOLOGICAL, RADIOACTIVE, NUCLEAR ENVIRONMENTS

8-49. Since sniper teams might be located on a flank or in front of a unit, they must occasionally serve as CBRN sentries; therefore, snipers must be able to operate in a CBRN environment. They can encounter the following problems when operating in CBRN conditions:

- Since snipers are often deployed away from other forces, they may not receive early warning of

CBRN attacks.

- Snipers cannot be expected to stalk through contaminated areas; wearing MOPP gear while stalking will cause dehydration or heat casualties.

- MOPP gear is not made to take the rigors of sniper tactical movements.

8-50. Good planning, knowledge of CBRN immediate action drills, and having good intelligence about the threat can compensate for most of these problems. The teams must carry suitable MOPP gear, and planning and time allocations should allow for the increase in weight and fatigue.

SECTION II. URBAN OPERATIONS

Snipers contribute to the urban battle by shooting selected enemy soldiers and rendering equipment useless. During urban operations, the sniper team's precision fires and advanced optics allow engagement of targets with little collateral damage and casualties.

URBAN TERRAIN

8-51. Urban terrain has many features, such as buildings, open spaces, and streets.

BUILDINGS

8-52. The distribution of building types generally reveals the layout of a city:

- Most urban areas are anchored by a core of multistory buildings, which are usually framed with steel and concrete. As centers of economic and political power, these buildings have potentially high military significance.

- Mass-construction buildings, such as modern apartments and hotels, make up about 65 percent of a typical urban area.

8-53. In urban areas, the most common building materials are concrete, masonry, and wood. All buildings offer concealment, but the amount of protection varies with the material used. At 200 meters, a 7.62mm x 51mm NATO ball cartridge can penetrate—

- Pine boards of 50 inches.

- Loose sand of 10 inches.

- Concrete or masonry of 3 inches.

Obstacles

8-54. Doors and fire barriers are common in commercial buildings. These become obstacles if they are shut and secured. Furniture and appliances can also become obstacles in a building. Barbed wire can be used effectively inside a building because it further restricts movement.

Avenues of Approach

8-55. The sniper team cannot always enter a building and gain a foothold from the top. Sniper teams can carry grappling hooks or other aids to help them get into a window or opening above the ground floor. Sometimes, they can gain access to the roof via fire escapes, drainpipes, or adjacent buildings.

8-56. When entering a building through the top, the team or an attached security team must clear and secure the floors below before establishing a hide site; however, they must avoid letting enemy personnel flee the building and compromise the team's position.

8-57. If the sniper team enters a building on the ground floor, they should clear the building from the bottom up, and, if one is available, leave a security team in place to secure it.

Key Control Points

8-58. In buildings, key control points include entrances, hallways, and stairs. The Soldiers that control these areas also control the building.

OPEN SPACES

8-59. Open spaces, such as parks, athletic fields, and golf courses, comprise about 15 percent of an average urban area. Most of these make suitable LZs and offer good fields of fire.

STREETS

8-60. Street width affects the sniper's line of sight and usually relates to the type of buildings on the street (Table 8-1).

Table 8-1. Categories of street width.

CATEGORY	SIZE	EFFECT ON SNIPER	LOCATION
Narrow	7 to 15 meters wide	This closeness makes observing and firing into windows across the street difficult, because the observer must look along the building rather than into the windows.	Old, cramped parts of European and Middle Eastern cities
Medium-wide	15 to 25 meters wide	Looking and firing into and from windows on wide streets is easier than on narrower streets.	Newer, planned sections of most cities
Wide	25 to 50 meters wide	Looking and firing into and from windows on wide streets is easier than on narrower streets.	Along other wide streets, or set apart on large parcels of land

Improvised Explosive Devices

8-61. Improvised explosive devices (IEDs) come in many shapes and sizes. They can be constructed from many materials like soda cans, meals ready-to-eat (MRE) boxes, manholes, tunnels or ditches near roads, and even animal carcasses. These devices can disrupt or limit movement within urban areas, creating major obstacles and devastating troop morale.

IMPACT ON SNIPER OPERATIONS

8-62. Terrain features impact the sniper's techniques in the following ways.

Range of Observation and Fields of Fire

8-63. Urban areas reduce the sniper's range of observation and fields of fire. Many targets are exposed briefly at medium ranges, often at 200 meters or less.

Cover and Concealment

8-64. Avenues of approach are restricted, but include covered and concealed avenues below and above ground as well as through buildings. Urban areas usually provide plentiful cover and concealment for the defender. An urban defender occupies strong positions, but an attacker often must expose himself during his advance.

Troop Density

8-65. Urban areas have reduced lines of sight, built-in obstacles, and compartmented terrain. These traits increase the troop density requirement by as much as three to five times for both the attacker and defender.

Structural Density

8-66. Structural density degrades radio communications, and limited observation capabilities make control difficult. A well-established defender can use wire communications to help offset these limitations; however, this can prove difficult and time-consuming. Satellite phones might offer another option for defenders.

Stress

8-67. Urban operations are more stressful for all troops, including snipers, than operations in other terrain. Continual close combat, high casualties, fleeting targets, and fire from unseen enemies all add stress.

URBAN TECHNIQUES

8-68. As in any operation, the sniper team must apply fieldcraft fundamentals:

• They must blend in with the urban terrain.

• They must understand and use urban to their advantage.

• They must choose, construct, and maintain positions accordingly.

CAMOUFLAGE

8-69. During urban operations, the sniper uses available terrain and alters his camouflage to suit his surroundings. Camouflaging himself and his position lets the sniper fire on the enemy with less chance of return fire.

NOTE: If the tactical situation permits, the sniper should inspect his position from the enemy's viewpoint, or request that a friendly patrol using the same radio frequency observe their position. They should repeat this step periodically to ensure that the camouflage still looks natural and provides effective concealment.

8-70. As he does in other operations, the sniper studies his surroundings and backgrounds. How and where the sniper team is employed determines the uniforms worn.

8-71. The team normally wears ACUs/BDUs and required equipment. Often, the team wears soft-soled shoes. In position, the sniper wears a bulky, lightweight, hooded smock in a color that blends with his surroundings. He keeps his shirt on, because exposed skin reflects light and attracts enemy attention.

8-72. There are various urban-camouflaged uniforms with angular patterns to match the colors found in urban areas. The sniper team can use gray (for cinder blocks), red (for brick), white (for marble), black (for granite), or any other colors that blend with stucco, clay, or wood. Snipers can obtain these uniforms through supply channels or construct them. If necessary, the team can wear their ACUs or woodland camouflage BDUs inside out, which reveals a grayish green color. Despite the existence of urban camouflage, no single camouflage color or pattern works for every part of an urban area. The sniper should consider each area individually.

NOTE: The sniper should leave the outer appearance of the building unchanged.

Cover

8-73. When operating in urban terrain, snipers should adhere to the considerations for cover listed in Table 8-2.

Table 8-2. Considerations for cover.

STRUCTURAL FEATURE	CONSIDERATION
Walls	Thick masonry and stone or brick walls protect the sniper from direct fire. A building with such walls, and with few narrow windows, balances the need for cover and concealment with restricted fields of fire.
Roofs	These offer little protection from enemy fire. Except for parking garages, lower floors are safer for snipers than roofs are.
Rooms	A floor with many small rooms offers more protection than one with fewer, larger rooms.

Concealment

8-74. Snipers should adhere to the considerations for concealment listed in Table 8-3.

Table 8-3. Considerations for concealment.

STRUCTURAL ATTRIBUTE	CONSIDERATION
Shadows	Snipers should avoid lighted areas around windows and loopholes. If curtains are used a lot in the area, the sniper can conceal himself with curtains of lace or cheesecloth. Snipers can also hang black sheets to avoid backlighting (silhouetting) himself against openings or light sources, and stay in the shadows.
Color and Texture	Burlap or canvas strips can break up silhouettes. Foliage tends to look out of place, because urban colors normally consist of cool earthy browns, tans, and grays rather than the green color provided by the foliage.
Dust	To keep dust from rising when weapons are fired, the sniper uses wet blankets or heavy cloths, water, commercial spray products, or anything else he can find.
Background	The sniper can use the deceptive camouflage of buildings and choose backgrounds that he can blend into to avoid silhouetting, or skylining himself.

MOVEMENT

8-75. Movement in urban areas is one of the first skills that a sniper must master. He must practice movement techniques until they become second nature.

8-76. Before moving from one position to another, a sniper should reconnoiter visually and select the route to the position that offers the best cover and concealment. The sniper team should avoid moving together when crossing from one building to another or across an open area.

Distraction

8-77. A sniper team has several options when moving to a planned position. For example, friendly mortar and artillery fire can be used to attract the enemy's attention and cover the sound of infiltrating sniper teams.

Outskirts

8-78. A sniper team can more easily infiltrate into the outskirts of a town because it is often poorly defended. Enemy defenders might concentrate their forces inside the urban area and have only a series of antiarmor positions, security elements covering principal approaches, or positions blocking the avenues of approach to key features in the town.

Stealth

8-79. As part of a larger force, the sniper team can move by stealth along secondary streets, alleys, or through buildings. These moves enable the team to help the force seize key terrain features and isolate enemy positions, which will help the follow-on unit in their infiltration efforts.

Infiltration and Exfiltration

8-80. Snipers should infiltrate and exfiltrate when visibility is poor (e.g., under the cover of darkness). Extreme care must be taken to avoid detection, and chances of success are greater if there are no civilians in the area. Sniper teams may also infiltrate into the city after the initial force has seized a foothold. In an urban environment, the use of transportation such as automobiles, trains, or carts to exfiltrate can help the sniper team.

Exposure

8-81. To minimize exposure to enemy fire, the sniper must—

- Avoid silhouetting himself, and keeps low at all times.
- Avoid open areas.
- Select the next covered position before moving.
- Conceal movement by using smoke, buildings, rubble, or foliage.
- Advance rapidly from one position to another.
- Avoid masking his covering fire.
- Remain alert, ready for the unexpected.

Moving Along Structures

8-82. Urban structures require unique movement techniques.

Walls

8-83. After the sniper has reconnoitered the other side of a wall, he quickly rolls over the wall, keeping a low silhouette. Rapid movement and low silhouette will deny the enemy a good target.

Corners

8-84. Corners are dangerous. When moving around corners—

- Observe the area around the corner before you move beyond the corner.
- Do not extend your weapon beyond the corner. This will expose your position.
- Do not show your head at the height an enemy soldier would expect to see it. Expose your head only enough to permit observation around the corner, preferably at ground level.

Windows

8-85. The sniper stays below the window level. An enemy gunner inside the building would then have to expose himself to fire at the sniper.

Basement Windows

8-86. The sniper stays close to the wall of the building and steps, or he jumps past the window without exposing his legs.

Doorways

8-87. The sniper should avoid using doorways as entrances or exits. If he must do so, he should go through them and to his next position as fast as he can, minimizing time in the "fatal funnel" and staying crouched to avoid silhouetting himself.

Exteriors of Buildings

8-88. At times, it may be impossible to use interiors of buildings for a route of advance. When required to advance along the exterior of a building—

- Move along the side of the building, but do not touch the building walls.
- Stay in the shadows.
- Present a low silhouette.
- Move rapidly to your next position.

Open Areas

8-89. The team should avoid open areas such as streets, alleys, and parks, whenever possible. However, they can cross these safely if they apply certain fundamentals. If the wind is right, the sniper can use smoke to conceal his movement between buildings, crossing at the shortest distance between the two. Unfortunately, smoke can compromise the team’s position. Ideally, the team should use limited visibility, available cover or concealment, and distraction to cross an open area.

Building Entry

8-90. When entering a building, a sniper might have to enter by means other than through doorways or reach top levels of buildings by means other than stairs. He can use other means of entry, such as ladders, drainpipes, vines, helicopters, or the roofs and windows of adjoining buildings, to reach the top floor or roof of a building. A sniper team may use the following aids and methods:

- Lifts.
- Ladders or grappling hooks with knotted ropes.
- Rappelling.

Lifts

8-91. The sniper team can use any one- or two-Soldier lift technique to enter a window above the ground floor. These techniques are most commonly used to gain entry into areas at lower levels.

Ladders or Grappling Hooks

8-92. By attaching a grappling hook to the end of a scaling rope, a sniper can scale a wall, swing from one building to another, or gain entry to an upstairs window.

Rappelling

8-93. Rappelling is a technique that snipers can use to descend from the roof of a tall building to other levels or to a lower window.

HIDE POSITIONS

8-94. The sniper team is assigned general areas, such as two or more buildings, where he can set up, but he chooses the best firing positions, including several alternate and supplementary positions to cover his sectors of fire. The SEO/commander needs to provide the sniper team the latitude

necessary to select an appropriate position that will be in accordance with the commander's intent.

8-95. The sniper team selects a well-concealed position that—

- Covers the AO.
- Has covered avenues of approach.
- Covers obstacles, roofs, gaps in the FPFs, and dead spaces.
- Is near to the target. Urban hide positions are normally closer to the target than rural hide positions.
- Is not too high. A high position may not allow the sniper to adequately cover his AO. He might have to expose himself to enemy fire needlessly in order to get a good shot. Generally, snipers should emplace no higher than the second floor. Second floor emplacement minimizes dead space and allows for a faster and easier exit of the hide.

NOTE: Local friendly elements must be informed of the snipers position and uniform. This lessens the risk of friendly fire incidents.

8-96. Urban areas offer a wide selection of possible hide sites or OPs:

- Derelict or condemned buildings.
- Occupied houses (last resort).
- Shops.
- Schools and churches.
- Factories and warehouses.
- Basements and between floors in buildings.
- Rural areas within range of the AO or parks and other open areas.

Characteristics

8-97. Any building or structure selected for a possible hide site or OP should have—

- Limited ground floor access.
- Suitable vantage points over intended target area.
- Natural loopholes.
- Adequate attic space.
- Windows.
- Clear escapes routes.

Types

8-98. Urban hides are either hasty or prepared.

Hasty Hide

8-99. Snipers normally occupy hasty hides in the attack or in the early stages of the defense. This position enables the sniper to place fire on the enemy while using available cover to gain protection from enemy fire. Common hasty firing positions in an urban area include—

- Corners of buildings.
- Behind walls.
- Windows.
- Unprepared loopholes.
- Peak of a roof.
- No cover is available.

Corners of Buildings

8-100. When used properly, the corner of a building provides cover for a hasty firing position. To properly fire from the corner of a building, a sniper must be capable of firing his weapon from either shoulder to minimize body exposure to the enemy.

NOTE: See paragraphs 8-74 to 8-92 for more information.

Behind Walls

8-101. When firing from behind a wall, the sniper should attempt to fire around cover rather than over it.

Windows

8-102. In a built-up area, windows provide readily accessible firing ports. When using a window as a firing port—

- Do not allow your weapon to extend beyond the window; this is an obvious sign of your position, especially at night when the muzzle flash is easily seen.

- Position yourself as far into the room as possible to prevent the muzzle flash from being seen.

- Fire from a supported position.

- Stay low enough to avoid silhouetting yourself.

- Use room shadow during darkness, and leave blinds or shades drawn to a maximum to avoid being seen.

- Be careful to prevent the drapes or curtains from moving due to muzzle blast. Tack the curtains down, or use a sufficient standoff.

- Use drop cloths behind you to cut down of silhouetting.

Unprepared Loopholes

8-103. The sniper may also fire through a hole torn in the wall or other loopholes. When firing from loopholes—

- Stay as far from the loophole as possible. Ensure that the muzzle of your weapon does not extend beyond the wall, thus concealing muzzle flash.

- If the hole is natural damage, ensure that it is not the only hole in the building.

- If you construct the loophole, ensure that the hole blends with the building, or construct multiple holes.

8-104. There are several openings that naturally occur in buildings, and the sniper can enlarge or use them.

Peak of a Roof

8-105. This position provides a vantage point that increases a sniper's field of vision and the ranges at which he can engage targets. A chimney, a smokestack, or any other object protruding from the roof of a building can reduce target exposure. However, the sniper's head and weapon break the clean line of a rooftop, making this position a last resort.

Vehicles

8-106. In an urban environment, vehicles such as minivans, trucks, and carts provide solid platforms for target engagement. These same vehicles can also aid the sniper team in E&E.

No Cover is Available

8-107. When no cover is available, target exposure can be reduced by firing from the prone position, firing from shadows, presenting no silhouette against buildings or skylines, and using tall grass, weeds, or shrubbery for concealment.

Prepared Hide

8-108. A prepared hide is one that is built or improved to allow the sniper to engage a particular area, avenue of approach, or enemy position while reducing exposure to return fire. The urban environment lends itself to various types of prepared hides.

Room Hide

8-109. In a room hide (Figure 8-1), the sniper team uses an existing room and fires through a window or loophole. When selecting a position, the team notices both front and back window positions. When in a room hide—

- Use a backdrop such as a dark-colored blanket, canvas, carpet, or screen to avoid silhouetting. Screens are useful, because they give you maximum observation, but deny observation to the enemy.

- Do not remove curtains; open windows or remove panes of glass instead.

- When removing panes of glass, remove random panes in other windows so that your position is not obvious.

- Use furniture for weapon support.

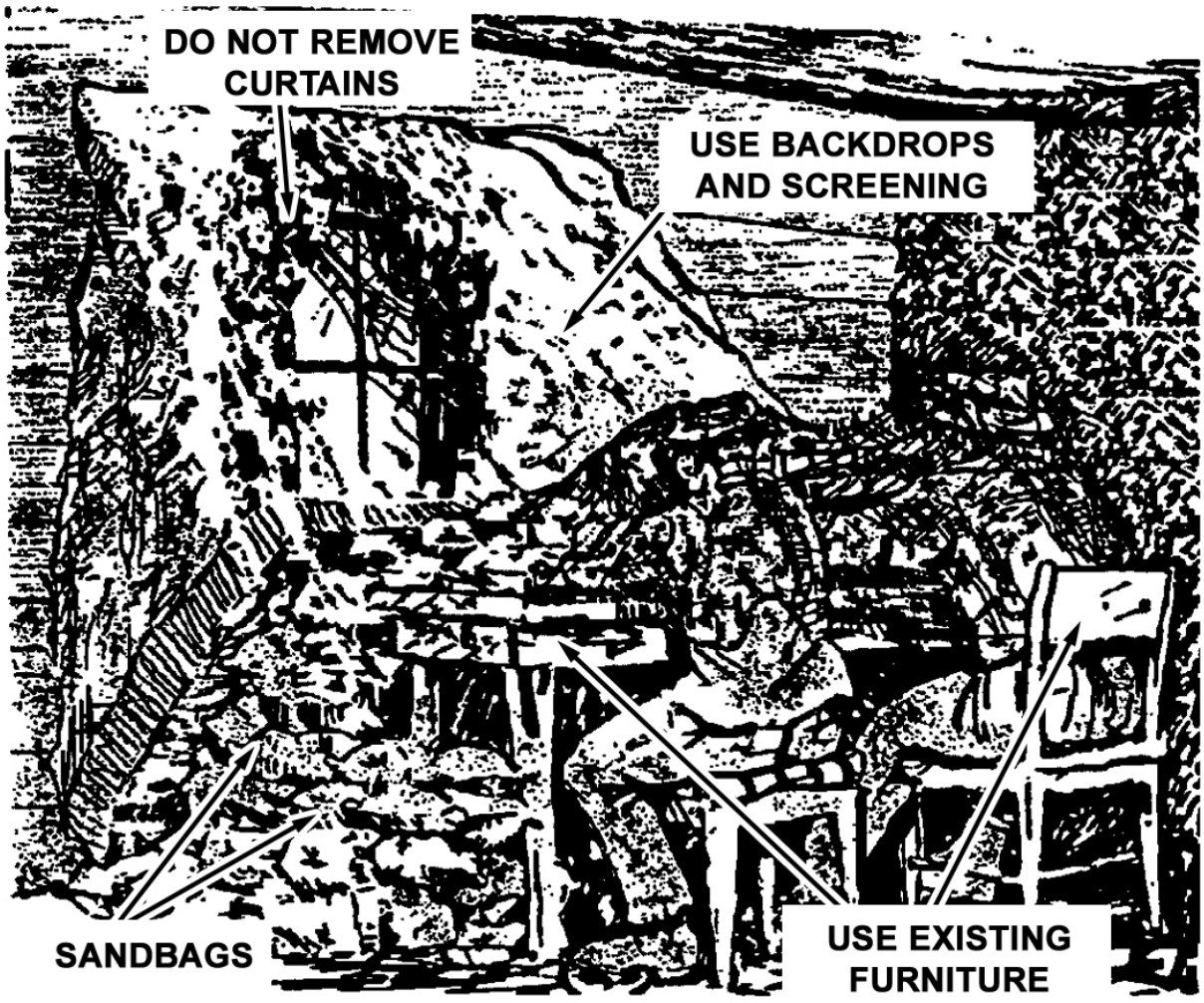


Figure 8-1. Room hide position.

Crawlspace Hide

8-110. The sniper team builds a crawlspace hide (Figure 8-2) between the floors in multistory buildings. When using a crawlspace hide—

- Make loopholes. Loopholes are difficult to build here, but building damage helps hide them.

- Knock holes in the floor or ceiling to make escape routes. Conceal these holes until the team needs to use them by placing carpet or furniture over them, or by replacing ceiling tiles.

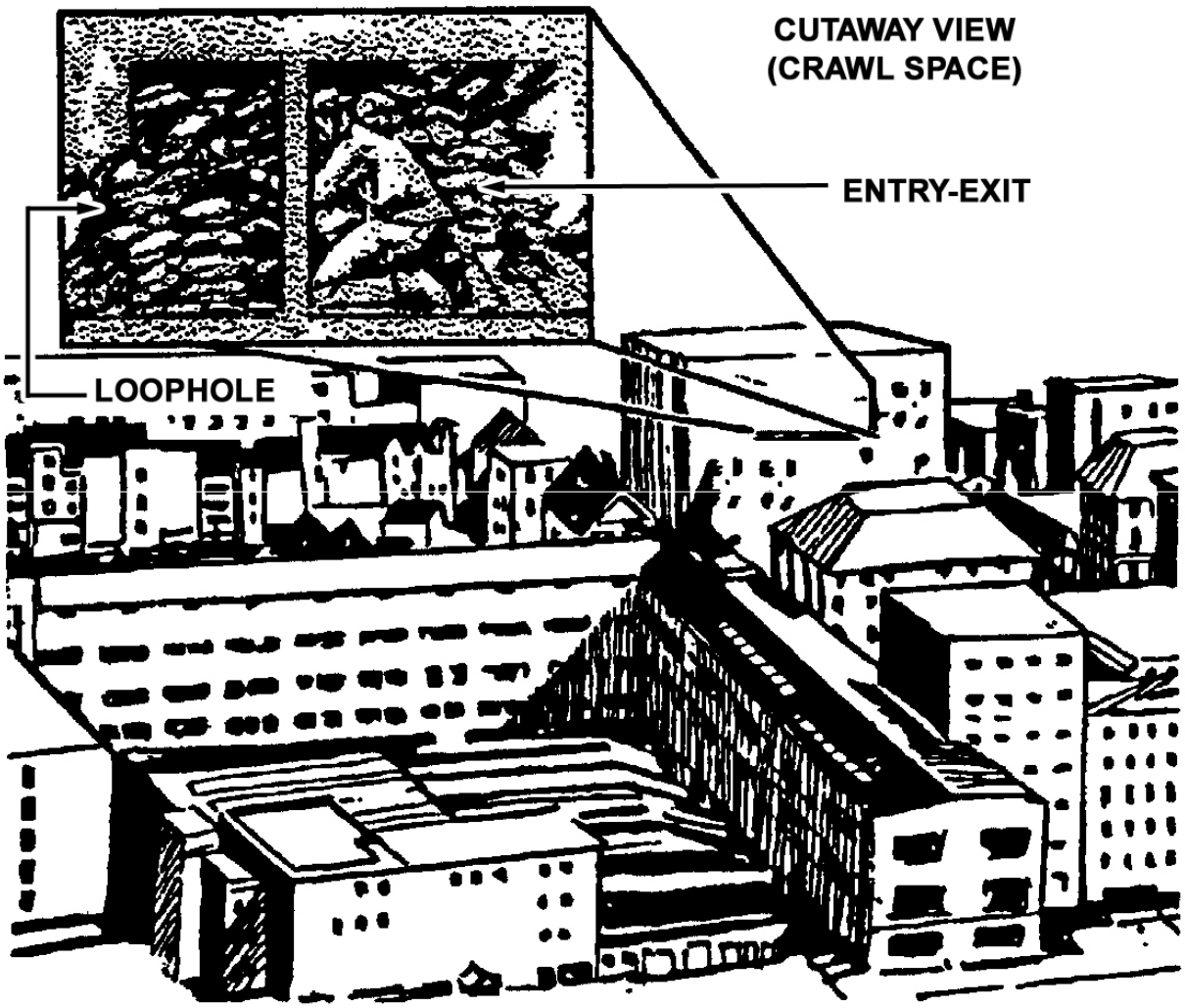


Figure 8-2. Crawlspace hide position.

Rafter Hide Position

8-111. The sniper team can construct a hide position in the rafters of an A-frame building (Figure 8-3). These buildings normally have shingled roofs. Firing from inside the attic, around a chimney or other structure helps prevent enemy observation and fire.

8-112. In a rafter, the team should—

- Take advantage of battle damage.
- Drill holes with a hand drill.

- Remove bricks or loose boards from the walls of derelict or damaged houses.

- Ensure the bullet can clear the loophole. The muzzle must be far enough from the loophole to ensure the bullet's path is not in line with the bottom of the loophole.

- If you can, change your front drops (usually netting) from dark to light colors to allow or block sunlight into the position.

- If the site just has one room, hang blankets or nets to separate the operational area from the rest and administrative areas.

- If you need sandbags, fill and carry them inside your rucksack, or fill them in the basement.

8-113. The team can also set up a position in an attic or between the ceiling and roof. When doing so—

- Use the gable ends close to the eaves. Shadows increase concealment.

- Take advantage of any battle damage to the gables or the roof.

- Remove loose tiles, shingles, or pieces of slate.

- Use any existing skylights.

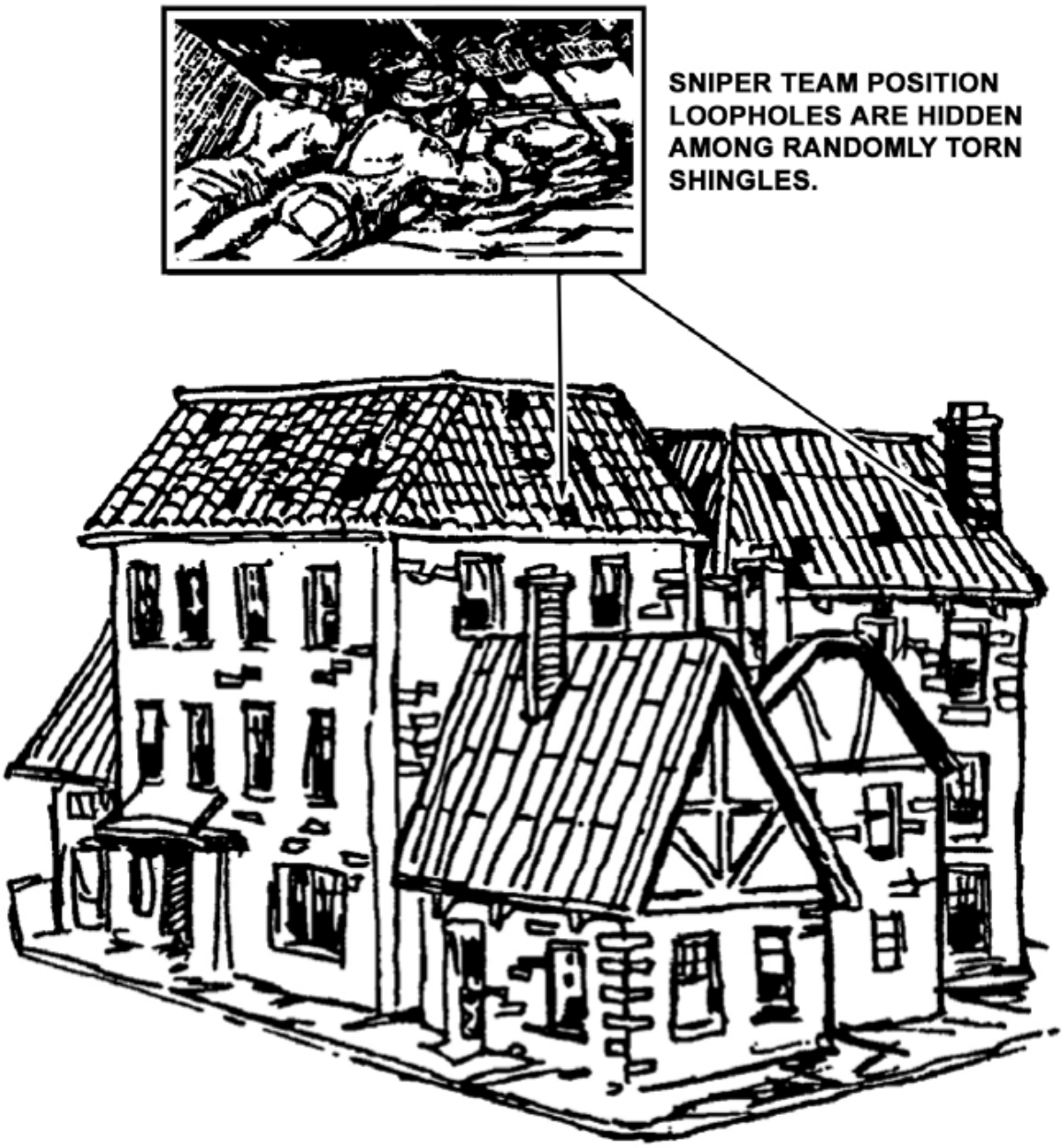


Figure 8-3. Rafter hide positions.

Construction

8-114. Positions in urban terrain are quite different from those in the field. When constructing an urban position, the sniper team should consider the following factors.

Viewing Apertures

8-115. A window normally offers the best viewing aperture. The best way to engage a target is to shoot through loopholes in barricaded windows. When firing through windows, the sniper should consider the following factors:

- Make sure that every window is barricaded to avoid drawing attention to the position.

- If the window is dirty, leave it that way; a clean window will give you away.

- Break or open several windows before occupation.

- Avoid firing through glass, because you might need more than one shot.

- If curtains are common, leave them up. You can see through lace or net curtains from the inside, but they are hard to see through from the outside.

- If strong winds blow the curtains open, then staple, tack, or weight them down.

- Firing a round through a curtain has little effect on accuracy, but make sure that the muzzle is far enough away to avoid muzzle blast.

- When other buildings have open curtains, open the ones in your position.

- Always be aware of the outside appearance of the structure.

- Avoid contrasting backgrounds and prominent buildings.

- Stay in the shadows while moving, observing, and engaging targets.

Attics

8-116. Positions in attics are also effective. When firing from attics—

- Remove selected shingles and cut out loopholes in the roof.

- Remove some of the other shingles to avoid drawing attention to the firing position.

Variation of Positions

8-117. Snipers should avoid firing continually from one position. If time and the situation allow, he should build more than one position.

Second Floors

8-118. Second-floor hide positions have the least dead space and offer increased protection, because passersby cannot easily spot them.

Improvement of Positions

8-119. The sniper should continually improve his position, reinforcing it with sandbags or other ballistics-absorbing materials. To do so—

- Carefully maintain the natural look of the area.
- Clear only what you must to obtain fields of fire.
- Locate your firing ports in inconspicuous spots.

Materials

8-120. When constructing a position, the sniper should use only what he needs, because using too much can reveal the position. He should gather materials from a wide area. For example, if a sniper is defending a city park, he should use materials from all over the park, not just those near the position.

Dummy Positions

8-121. Using dummy positions distracts the enemy and can cause him to fire, revealing his position.

Routine

8-122. Once the team commander is satisfied with the position, the team begins their hide routine:

- Except for the observer, all team members should work on the position and maintain local security. They restrict access to the hide by sealing off doorways and windows. They booby trap other entry points, such as mouse holes and stairways, to provide early warning.

- The team reports on schedule timings using consolidated situational reports (SITREPs). Snipers must be prepared to offer assessments if asked.

- All members of the team must know the withdrawal and escape plans. They must reconnoiter alternate locations, take detailed information, and designate routes.

- The team packs jars or resealable plastic bags to use for eliminating body wastes (urinating and defecating).

Escape Routes

8-123. The sniper team always plans an escape route to the ORP. When forced to vacate the position, the team can meet the security element at the ORP. Normally, the team leaves the hide position from a different point than where they entered. In an emergency, they might need a third way out. They should consider all possibilities for escape, including windows (other than the viewing apertures), anchored ropes for climbing down buildings, or holes (blown by small, preset explosive charges) in a wall or floor for access into other rooms, buildings, or the outside.

TARGET ENGAGEMENT CONSIDERATIONS

8-124. Urban structures require variations to standard target engagement considerations.

RANGE ESTIMATION

8-125. Urban areas might have standard-sized structures with standard-sized spaces between them and standard-sized openings. Most modern urban areas have street grids that specify standard lengths for city blocks. This information can help the sniper estimate range to targets.

8-126. Older urban areas lack this advantage, because buildings and blocks are different sizes. However, knowing the standard measurements for windows, doors, common vehicles, signs, lettering, and anything else that occurs at regular intervals can help the sniper estimate range and fire, especially when he must do so from a vertical or horizontal oblique angle.

ENGAGEMENT RANGES

8-127. Snipers are often limited to firing down or across streets at ranges under 200 meters. This allows little time to acquire and fire. More open spaces allow engagement at longer ranges.

ANGLE FIRE

8-128. Operating in urban areas requires the sniper to engage targets at various elevations. He might have to fire at a steep angle; for example, he might fire at a ground-level target from a roof. Unless he corrects for this on the scope, the round will hit above the intended target. How far depends on the actual range and angle to the target. The amount of elevation change that he must apply to the scope for angle fire is called slope dope. Unless he applies slope dope correctly, the bullet will miss the point of aim.

NOTE: See Chapter 4 for more information about angle fire.

WIND EFFECTS

8-129. Urban winds are confusing, and especially difficult to see and judge. Winds vary in direction and speed, and can gust at one level while blowing steadily at another (Figure 8-4). However, snipers can use the following generalities about wind.

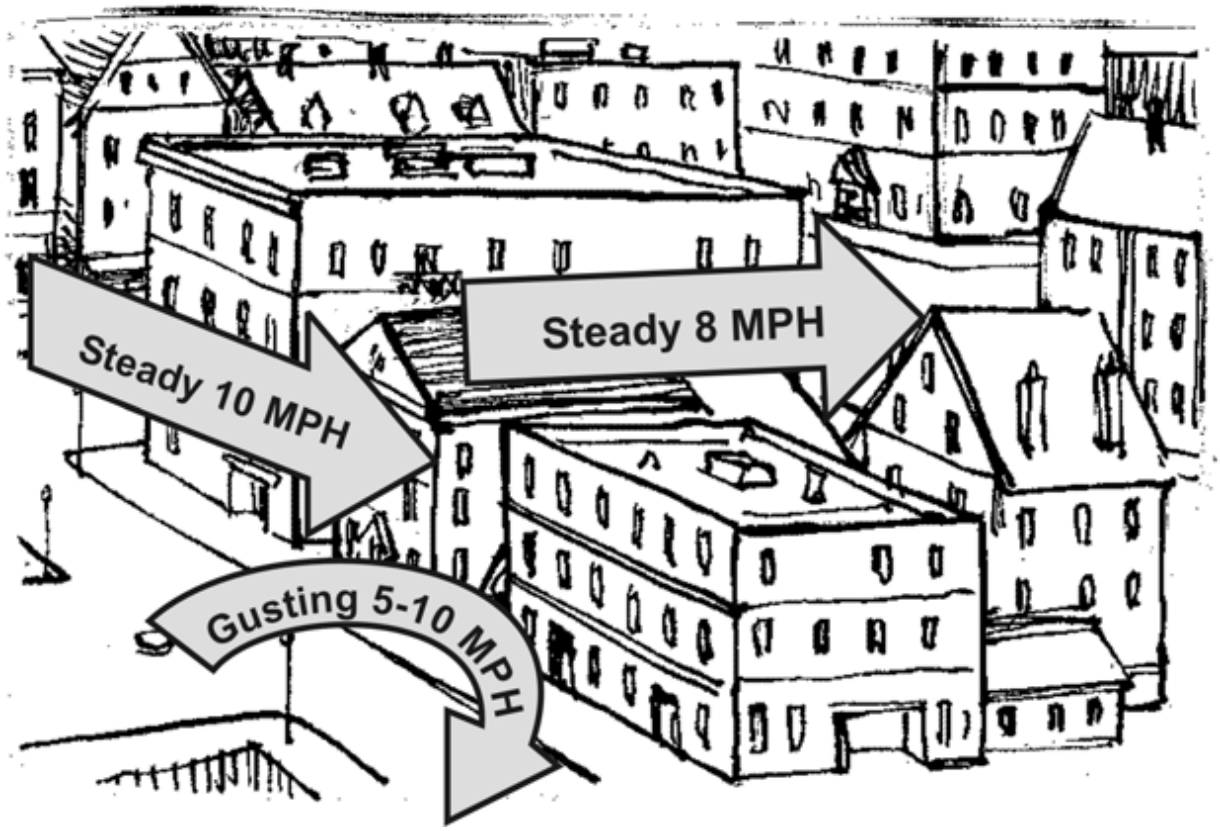


Figure 8-4. Directional variations between urban winds.

Buildings

8-130. Wind acts a certain way around buildings:

- Winds become steadier with elevation. It might gust at ground level while rooftop winds blow steadily.

- Downtown streets are man-made canyons. Low- and medium-level winds blow down them, parallel to the street.

- Contradictory winds create confusion at street intersections.

Reduction of Effects

8-131. To reduce the effects of wind—

- Avoid firing through a major urban intersection on a windy day.

- If possible, hang small strips of engineer tape or cloth all over your AO.

- Watch how smoke rises from chimneys.

- Remember that, even on the coldest days, flat roofs in urban areas produce mirages.

OBSERVATION

8-132. In addition to weather conditions that limit visibility, urban areas pose unique challenges to observation. Table 8-4 outlines how these conditions affect the sniper's ability to acquire a target.

Table 8-4. Conditions and their effect on observation.

CONDITION	EFFECT
Buildings and rubble	Increase dead space and mask targets
Smoke and dust	Obscure the sniper's observation capability
Shade	Conceals enemy personnel and equipment
Glare	Makes observing into windows difficult NOTE: A spotting scope can see through glass better than a DOS can. When scanning windows, the sniper should divide them into quarters or eighths.

FIELDS OF FIRE

8-133. The best fields of fire are normally available from buildings on the edge of a city rather than inside it. Tall buildings with numerous windows often provide the best fields of fire, especially if the buildings have spaces between them. This type of construction is often found in outlying high-rise areas.

SECTORS

8-134. To ensure quick reaction time, the sniper divides his AO into sectors. Urban sectors are normally only 5 to 10 degrees wide, compared to between 30 and 40 degrees in woodland areas. The sniper should also know the locations and sectors of other sniper teams.

MISSION PREPARATION AND EXECUTION

8-135. Like other operations, urban operations should be well-planned and coordinated.

ENGAGEMENT PRIORITIES

8-136. Engagement priorities for snipers depend on their relative importance to the enemy's success.

PLANS AND INTELLIGENCE

8-137. Urban operations require detailed intelligence. The commander, staff, SEO, and sniper team are all deeply involved in planning sniper operations. They address all of the factors of METT-TC, focusing on mission success with the least possible friendly casualties.

Effect of Enemy Strength on Sniper's Freedom of Movement

8-138. The strength of the enemy in the AO is essential to all planning phases (Table 8-5).

Table 8-5. Effect of enemy situation on sniper's environment.

ENEMY SITUATION	EFFECT ON SNIPER'S ENVIRONMENT
Weak, unorganized, easily exploited	Permissive, easy movement and many opportunities to exploit the enemy
Less weak and unorganized, but still exploitable	Semi-permissive, limited movement and fewer opportunities to exploit the enemy
Strong and difficult to exploit	Non-permissive, little movement and few opportunities to exploit the enemy

Enemy Location

8-139. Planning includes the specific or general knowledge of known or suspected enemy troop locations (area, building, floor, and room).

Friendly Situation

8-140. When planning for the friendly situation, the sniper must consider—

- Commander's intent, mission, and plans for units in the area.
- Availability of external support.
- Location and accessibility of the quick reaction force.

Local Habits

8-141. Planners must take the time to determine local habits such as foot traffic patterns, locations of known or suspected unexploded ordnance (UXO), and children’s play habits. Children pose the biggest threat of compromise.

Time

8-142. Inserting a sniper team into a position requires an extended battle procedure time, normally between 24 and 48 hours. During this time, the unit conducts a detailed reconnaissance for suitable hide sites and alternate locations, as well as for routes in and out.

Maps and Aerial Photos

8-143. Although tactical maps show very little detail about manmade objects to aid in planning unit operations, they do show useful details of terrain adjacent to the urban areas. The sniper team should supplement their tactical maps with air photos.

Civil Government and Local Military Information

8-144. Current information on nearly all details of a city can be obtained from civil governments, the internet, and local military forces. This information includes—

- Large-scale city maps.
- Diagrams of underground sewer, utility, transportation, and other infrastructures.
- Information about key public buildings and rosters of key personnel.
- Population size and density.
- Police and security capabilities.
- Civil defense, air raid shelters, and firefighting capabilities.
- Utilities.
- Medical facilities.
- Mass communications facilities.

ACTIONS

8-145. Once a suitable location(s) has been identified, leaders should—

- Coordinate with the supporting unit(s).

- Issue orders to the sniper section. The orders process and battle procedure are shorter if the entire section takes part in planning.

- Insert the snipers during the hours of darkness (between 2400 and 0400 hours local time). The security element should already be in place to cover the movement of the sniper team into position.

8-146. Once inserted, the sniper team should—

- Consider all buildings or structures to be occupied until they have physically cleared them.

- Construct a hide only after the team is in position and consider the area safe. If the room is furnished and visible from other vantage points, they leave all furniture in place.

- Begin observing and send an OP report after they complete initial hide construction.

OFFENSIVE OPERATIONS

8-147. During the attack of an urban area, sniper employment is usually divided into three phases:

(1) Isolation.

(2) Break-in.

(3) Clearance.

Isolation

8-148. This phase is designed to isolate the battle area by seizing terrain that dominates the approaches to it. During this phase, snipers deliver long-range precision fire at targets of opportunity.

Break-In

8-149. This phase consists of the advance to the built-up area and seizure of a foothold on its edge. During this period, snipers move forward and assume their initial position, from which they support continuation of the attack.

Clearance

8-150. Clearance consists of the advance of friendly units through the urban area based on the commander's intent. Sniper teams should operate in each zone of action, moving with and supporting the units. They should operate a distance away from the riflemen to avoid firefights, but near enough to kill the more distant targets that threaten the advance. Some sniper teams can operate independently to search for targets of opportunity, particularly enemy snipers.

DEFENSIVE OPERATIONS

8-151. Snipers employed in a defensive posture in an urban area should be positioned in buildings that offer the best long-range fields of fire and observation. They are assigned various missions, such as—

- Countersniper fire.
- Fire at key targets.
- Denial of enemy access to certain areas or avenues of approach.
- Fire support over barricades and obstacles.
- Surveillance.
- Support of counterattacks.

- Prevention of enemy observation.

EXTRACTION

8-152. If possible, the team should extract in the dark. A security force should be in position ahead of time to support the extraction. The team should extract to a designated linkup site, and then be returned to friendly lines.

SECTION III. CIVIL SUPPORT OPERATIONS

In civil support operations, the sniper can be employed to deliver selective, precision fire against specific targets or gather information in accordance with the ROE. A sniper team's ROE differ from those that apply to the rest of the unit. The sniper team must have clearance to reduce high-risk targets at the team's discretion, in order to save lives.

TASKS

8-153. Commanders may assign specialized tasks to snipers. For example, snipers can—

- Engage dissidents involved in such activities as hijacking, kidnapping, and holding hostages.

- Engage dissident snipers as targets of opportunity or as part of a deliberate clearance operation.

- Covertly occupy concealed positions to observe selected areas.

- Record and report all suspicious activity in the area of observation.

- Help coordinate the activities of other elements by taking advantage of hidden observation positions.

- Protect other elements of the controlling forces, including auxiliaries such as firemen and repair crews.

HOSTAGES

8-154. To engage hostage-holding terrorists with one shot, the sniper must be well-placed, undetected, and very near the target. Commanders must remember that even a well-placed hit might not instantly kill

and even a fatal hit might not keep the hostage alive. When hit, the terrorist might kill the hostage on purpose or accidentally; the terrorist's muscles can spasm, which can cause him to pull the trigger.

CIVIL SUPPORT OPERATIONS

8-155. During civil support operations, the tasks of the sniper team generally consist of gathering intelligence, overwatching, and reporting, but may also include countersniper operations. For civil support operations, snipers are employed in various types of OPs.

COVERT RURAL

8-156. A covert rural OP is just like a conventional OP, except that (depending on the nature and duration of the task) the team should have—

- Weapons and other equipment to suit the task, based on METT-TC.
- Smoke and pen flares as an alternate means of communication.
- Close support during the insertion. This might mean acting as a radio relay or providing other means of support.
- A method of insertion appropriate to the task (coordinated through the battalion S-3). Common methods include foot, vehicle, and helicopter.
- Preparation time. The team will need at least 24 hours to prepare a long-term OP.

COVERT URBAN OBSERVATION POSTS

8-157. Preparing a covert urban OP takes longer than preparing an overt OP. Reconnaissance for suitable covert urban OPs can take two to four days.

OVERT URBAN OBSERVATION POSTS

8-158. Commanders use snipers overtly in urban operations as deterrents. Overt urban OPs should cover the target area and have flank and rear security. Higher vantage points reduce sniper team exposure.

NOTE: The commander should only place snipers in overt urban OPs if the enemy sniper threat is low and if no other assets can achieve the desired results.

SECTION IV. COUNTERSNIPER OPERATIONS

The goal of countersniper operations is to eliminate enemy snipers. The sniper team must thoroughly plan any countersniper operation, because it is essentially a battle between two highly trained Soldiers. During countersniper operations, snipers perform the following steps:

(1) Determine the threat.

(2) Gather information.

(3) Determine patterns.

(4) Determine best location and time to engage the enemy.

(5) Engage the enemy.

DETERMINE THE THREAT

8-159. To determine the sniper threat and the requirement to conduct countersniper operations, the sniper must be aware when any of the following reports come in from friendly units operating in the area:

- Sightings of enemy soldiers wearing special camouflage uniforms.

- Sightings of enemy soldiers carrying weapons with long barrels, mounted scopes, or bolt action receivers, or carried in weapon cases or drag bags.

- Key personnel casualties (commanders, senior NCOs, or weapons crewmembers) and a simultaneous reduction in enemy patrol activities.

- Reports of reflections off optical lenses.

- Reports from intelligence or reconnaissance units of small groups of enemy personnel (one to three soldiers).

- Findings of single spent cartridges in sizes used by enemy snipers.

8-160. When the sniper team determines that an enemy sniper is operating in a unit's area, they ensure that the unit uses the following passive countermeasures to defend against enemy sniper fire:

- Avoid consistent routines, such as meal times, ammunition resupply times, assembly area procedures, patrol routes, routes to the ORP, or any consistent day-to-day activities.

- Gather, meet, and brief under cover or in limited visibility.

- Cover or conceal all equipment.

- Remove rank. Salute no one.

- (Leaders) avoid behaving authoritatively.

- Increase the unit's observation capabilities through means such as OPs.

- Inform patrols to look for signs of the presence of a sniper, such as single spent rounds and camouflage materials other than those your unit uses.

- Never underestimate women. Remember that about half the snipers in underdeveloped countries are women.

GATHER INFORMATION

8-161. The sniper must learn as much as possible about the times and locations of enemy sniper fire. The S2 is the best source for this information, and debriefings of the outgoing snipers by the incoming snipers are invaluable (conducted during the relief in place). Snipers should keep detailed debriefs and logs of all countersniper activity in the AO.

INTERVIEW WITNESSES

8-162. The sniper debriefs Soldiers who have come under fire by an enemy sniper. He finds out the times, locations, and possible sources of the sniper fire.

EXAMINE WOUNDS

8-163. He checks the sniper wounds of friendly Soldiers to determine the direction of fire.

DETERMINE DIRECTION OF FIRE BY CRACK-THUMP GAP

8-164. If a Soldier can remember how much time passed between the crack of the bullet and the thump of the rifle, the friendly sniper might be able to determine the sniper's distance. By shooting a bearing to the thump from different locations, the sniper might be able to triangulate the enemy sniper’s position. This method might not be the most accurate method of determining direction of fire.

NOTE: Generally, a gap of 1 second equals 300 meters.

IMPACT ANALYSIS

8-165. The sniper might be able to locate an enemy sniper by sticking a cleaning rod in a bullet hole. The rod will point toward the enemy sniper’s location, and the angle of the rod will indicate the distance: the steeper the angle, the greater the range to the enemy sniper.

DETERMINE PATTERNS

8-166. The sniper evaluates the information that he has gathered to detect any patterns in the enemy sniper's behavior. The friendly sniper conducts both a map and ground reconnaissance and studies air photographs to find movement patterns. He places himself in the enemy sniper's shoes and asks himself, "How would I accomplish the mission if it were me?”

DETERMINE BEST LOCATION AND TIME TO ENGAGE THE ENEMY

8-167. Once he finds a pattern or routine, the sniper determines the best location and time to engage the enemy sniper. The sniper should also request—

- Coordination of routes and fire plan with the unit in the area.
- Additional preplotted targets (fire support).
- Infantry support to channel or ambush the sniper.
- Additional teams for mutual supporting fire.
- Baiting of likely engagement areas to deceive the enemy sniper into commitment by firing.

NOTE: All elements should be in place no later than 12 hours before the expected engagement time.

ENGAGE THE ENEMY

8-168. During a countersniper operation, the sniper must ignore the larger battle going on around him. He must concentrate on his one objective: the enemy sniper. However, the team avoids engaging in a sustained battle with the enemy sniper. If the team is pinned down by enemy sniper fire and they are unable to determine the enemy sniper's position, the sniper team uses handheld or artillery-generated smoke to obscure the enemy sniper's view. If the smoke provides sufficient obscuration, the sniper team breaks contact, vacates the enemy sniper's kill zone, and calls for indirect fire on the enemy sniper position. If the smoke fails to obscure the view sufficiently, the sniper team calls for an immediate suppression mission against the enemy sniper position. The team then breaks contact under the cover of indirect fire.

SECTION V. COUNTER-I.E.D. AND TRACKING OPERATIONS

A sniper's extensive training in the use of optical aids and target detection makes him an effective IED deterrent.

NOTE: Snipers should examine the historical data maintained by the unit's S2 so that he can evaluate recent activity such as detonations, areas of high concentration, and patterns. This information can help the sniper develop an approach to planning, coordinating, and defeating the IED threat.

IMPROVISED EXPLOSIVE DEVICE EMPLACEMENT TECHNIQUES

8-169. There are four techniques used for IED emplacement:

• Two-man team emplacement.

• Series emplacement.

• Vehicle emplacement.

• False IED emplacement.

NOTE: These techniques are not all inclusive.

TWO-MAN TEAM EMPLACEMENT

8-170. During two-man team emplacement, one man serves as the digger, and another emplaces the IED.

SERIES EMPLACEMENT

8-171. During series emplacement, one man serves as the digger, a second emplaces the IED, a third lays wire, and a forth establishes a command post

or remote firing trigger. This is currently the primary means of IED emplacement.

VEHICLE EMPLACEMENT

8-172. During vehicle emplacement, a man drives a car with its floorboard removed over a pre-positioned hole, drops the IED into the hole, and continues driving. Subsequent vehicles may drive over and make wire connections.

FALSE IMPROVISED EXPLOSIVE DEVICE EMPLACEMENT

8-173. During false IED emplacement, a false IED is emplaced, with the actual IED emplacement located prior to the false IED. Vehicles stop to react to the false IED, and the actual IED is detonated.

IMPROVISED EXPLOSIVE DEVICE TARGET INDICATORS

8-174. Target indicators may be in the following form(s):

- Improper camouflage, shine, contrast, and wilting vegetation.
- Disturbed areas (i.e., discolored soil from recent digging, either from emplacing the IED or from covering the wire).
- Off-road aiming stakes.
- Wires or antennas on the ground.
- UXO.
- Burlap sacks near the road.
- Tires (which may contain a remote-detonated device or a pressure release device).

- Animal cutouts with reflectors simulating eyes.
- No people visible in the area.

SCANNING FOR TARGET INDICATORS

8-175. If a target indicator is identified—

(1) The area is cordoned off so that the site is preserved. This allows for back-tracking to find the control point, if the IED was command-detonated.

(2) Then, snipers scan the area (360 degrees) for the following—

Vehicles, approaching or withdrawing from the site.

Personnel in the area.

Anyone with a camera, or video camera.

Additional target indicators in the surrounding area.

NOTE: Remember slow is fluid, fluid is fast. Expect everything to be booby trapped (false IED, command wire, flanks of the command wire, flanks of the IED, command detonation point).

8-176. Once a sniper has detected and positively identified an IED, he should alert explosive ordnance disposal (EOD) and provide overwatch of the target area until the IED has been neutralized. If positive identification cannot be confirmed, he should search the area for additional boobytraps, antipersonnel (AP) mines, antitank (AT) mines, using a grappling hook to drag across the suspected IED.

8-177. Common areas that contain booby traps, AP mines, and AT mines are —

- Prior to the actual IED.
- Opposite side of the IED.

- Command wire (booby-trapped on both sides, including pressure-release detonating devices).

- Command site.

NOTE: This list is not all inclusive.

ORGANIZATION FOR MOUNTED COUNTER-IED AND TRACKING OPERATIONS

8-178. Being mounted enables snipers to control their rate of movement, moving as fast or as slow as needed to scan the designated area. The mounted team proceeds as follows:

- The command team (lead vehicle) provides security with line of sight weapon systems. This includes scanning the target area for wire, footprints, and targets of opportunity.

- The middle vehicle provides far-side security of the IED site.

- The trail vehicle provides rear security.

8-179. To address the IED threat, unit organization may need to be modified. One technique of employment is as follows.

EXAMPLE ORGANIZATION

8-180. The structure for an MSR security/clearing operations team could be completed using a three- vehicle convoy consisting of three snipers and six squad designated marksmen (SDM). This increases the overall efficiency of the mission; these nine Soldiers are trained and capable of identifying target indicators, estimating range to targets, interpreting meteorological conditions, and providing long-range precision fire when needed.

8-181. In addition to the M4/M203 combination, M9 pistol, M110 SASS, M24 SWS, M21, or M14, the vehicle should be equipped with an M107

LRSR, with an M249 SAW/M240 on a side mount, MK19, or a M2 HB machine gun.

8-182. This force will be the lead element in the convoy, followed by a quick reaction force (close enough to provide a 2- to 4-minute response time).

8-183. Once an IED is detected or detonated, the lead vehicle halts short of the kill zone in order to preserve the IED site. The lead sniper dismounts, moves toward the IED site (while being covered by an additional sniper or SDM), and begins looking for target indicators, wire, tracks, and antennas. Once the spore is identified, the sniper moves away from the IED site in an effort to locate the hide site. If targets present themselves, the overwatch position (sniper) places accurate direct fire on the target in an effort to reduce the target and minimize collateral damage.

Chapter 9: Sniper Sustainment Training

To accomplish their objectives, snipers must sustain basic Soldier skills, and they must master and sustain critical mission skills. Because sniper skills perish quickly, sniper team members must sustain and sharpen those skills regularly. Command emphasis is necessary for proper sustainment training to be conducted.

BASIC SKILLS

9-1. Based on the primary and secondary missions of the sniper, minimum skill sustainment should include observation, range estimation, concealment, concealed movement, and marksmanship. The best way to sustain these skills, short of actual combat, is with sniper training exercises, sniper competitions, or unit-level live-fire exercises.

NOTE: DA Pamphlet 350-38 outlines the frequency and ammunition requirements needed to conduct sniper training.

9-2. Sniper training exercises give snipers practical experience in detecting and engaging realistic targets. These exercises are conducted under field conditions, on ranges comparable to a battlefield. This training gives snipers a way to reinforce, often collectively, the various sniper training fundamentals. These exercises include zeroing and practice fire, field fire (unknown distance), concealment, concealed movement, target detection, range estimation, land navigation, KIM exercise, and communications.

NOTES:

1. Each sniper must participate in these training exercises.

2. These exercises might or might not be graded; however, at the end of the exercises, the trainer critiques each sniper on his performance.

ZERO AND PRACTICE FIRE

9-3. To engage targets effectively during training exercises and in combat, the sniper must first accurately zero his rifle.

Area

9-4. Zeroing exercises are normally conducted on a KD range to ensure precise adjustment, recording, and practice under ideal conditions. This eliminates variables that could prevent the sniper from achieving an effective zero.

NOTE: A bull's eye type target is used to achieve zero.

Conduct

9-5. The sniper zeroes his rifle using both the telescopic and iron sights. He must acquire a point of aim, achieve a point-of-impact zero at 100 meters, and confirm at 300 meters. As the distance increases, the sniper adjusts his telescope to allow for elevation and wind and to ensure that the rounds stay in the center of the target.

FIELD FIRE

9-6. Field firing exercises are designed to develop sniper proficiency in the accurate and rapid engagement of various combat-type targets.

Area

9-7. The course consists of engaging 20 targets with no more than 40 rounds of ammunition in no more than 30 minutes. Snipers will use no more than 2 rounds to engage each target.

NOTE: This can be modified to fit local range conditions such as the use of the multipurpose machine gun range with electronically controlled targets.

Conduct

9-8. Scenarios should incorporate multiple target engagements, as well as rapid fire engagements of multiple targets. They should also provide practical work in other fieldcraft techniques.

NOTE: To provide the most realistic training environment, trainers do not use range commands to commence fire and cease fire in sniper exercises. The only exception to this is when an unsafe condition exists. The command CEASE FIRE should be given immediately.

9-9. These scenarios should be conducted as follows:

NOTES:

1. Snipers must be given a thorough orientation on each exercise (to include safety requirements) before they are permitted to move into position. After the sniper has assumed his firing position in the designated location, he should be allowed to fire without further commands. Therefore, the range must be cleared for firing before the exercise begins.

2. An NCO (assistant trainer) must be with each sniper to keep score and to maintain safety during the exercise. When the sniper completes firing, the NCO ensures the rifle is clear and signals the range officer.

(1) Snipers should be given positions on the firing line and areas of the field fire course to conduct observation and make range cards of the area.

(2) The snipers fire the course by having one member call the wind and adjust the other member's fire.

NOTE: The ability to call the wind is as important as the successful engagement of the targets.

(3) When firing the course, snipers should start by engaging the 200-meter target. They engage the next target, then the next, out to 800 meters. Then, they engage from the 800-meter target, back to the 200-meter target.

(4) After one member completes the course of fire, they switch off and repeat it.

Scoring

9-10. Table 9-1 outlines the scoring.

Table 9-1. Field fire scoring.

POINTS	ACTION
10	First-round hit
5	Second-round hit
NOTE: A sniper can receive no more than 200 points. He must receive 140 points (70 percent) to pass.	

CONCEALED MOVEMENT (STALKING)

9-11. The concealed movement exercise develops and tests the sniper's ability to move and occupy a firing position undetected while observing and engaging an observer-instructor.

Area

9-12. When conducting concealed movement exercise, the areas used should be observable for 1,000 meters, and the left and right limits must be easily recognizable. Ideally, snipers should train in a different type of area each time they perform these exercises.

Conduct

9-13. The concealed movement exercise should be conducted as follows:

NOTE: If more than 10 snipers are training, 2 observer-instructors and 2 assistant trainers might be needed.

(1) In a cleared area with a wood line 1,000 meters away, the snipers start from a concealed location in the wood line.

(2) They move to within 800 meters of two observer-instructors, occupy a firing position, and identify the target (a white, 5-inch letter painted on an 8-inch square black panel [or the reverse], the panel is held over a vital part of the observer-instructor's body).

(3) Snipers fire two blanks at the target without being detected.

NOTE: If the observer-instructor detects a sniper, he radios the assistant trainer and directs him to the sniper.

(4) Once a sniper has successfully engaged the target, he must move undetected to a predetermined

ORP.

Scoring

9-14. Snipers are given three hours to complete the exercise. The maximum score is 20 points, with 14 points required to pass. Trainers record scores on DA Form 7640-R (Concealed Movement Exercise Scorecard, shown in Figure 9-1).

NOTE: A blank copy of this form is provided at the back of this manual for local reproduction on 8 ½- by 11-inch paper.

CONCEALED MOVEMENT EXERCISE SCORECARD

For use of this form, see FM 3-22.10; the proponent agency is TRADOC.

EXERCISE NUMBER

SNIPER'S NAME	TRAINING SITE	SCORE	DATE (YYYYMMDD)
ZANE BRADSHAW	E-7 A	18	20091208

UNIT	WEATHER/VISIBILITY	OBSERVER'S NAME
ACO 1/501ST INF	CALM / CLEAR	JAMES MORELLO

SCORING CHART

If the sniper--	GRADER ADJUSTS RUNNING TOTAL	RUNNING TOTAL
Fires first round undetected	ADD 3 POINTS	3
Avoids detection when the walker is within 5 feet	ADD 3 POINTS	3
Properly identifies the number or letter within 30 seconds	ADD 4 POINTS	3
Sets windage properly	ADD 3 POINTS	1
Sets elevation properly	ADD 1 POINT	1
Achieves proper support	ADD 1 POINT	1
Keeps muzzle unobstructed	ADD 1 POINT	1
Exfiltrates undetected to ORP (with all equipment and brass) within the 3 hour time limit	ADD 6 POINTS	5
Avoids detection when the walker is within 5 feet	SUBTRACT 2 POINTS	0

TARGET INDICATORS *(CHECK ONE)* :

- ☐ SOUND
- ☐ OUTLINE
- ☐ MUZZLE BLAST / FLASH
- ☐ CONTRAST TO BACKGROUND
- ☐ IMPROPER CAMOUFLAGE / SHINE
- ☐ IMPROPER MOVEMENT TECHNIQUES

INSTRUCTOR OBSERVATION SKETCH

GOOD CAMOUFLAGE

EXAMPLE

NOTES:

a. All snipers start this exercise with 0 points and must score at least 14 points to pass.

b. If the sniper moves after you call a freeze (to prevent detection), terminate the exercise and give the sniper 0 points.

c. Sniper School only: Drop any sniper school student from the course if he violates the honor code.

d. If the sniper fails to remain within established boundaries, to engage the target within the 3 hour time limit, or to avoid detection during movement, he earns 0 points for this exercise.

e. Explain to the sniper in detail why and how he was detected.

TRAINER'S INITIALS	DATE (YYYYMMDD)	SNIPER'S INITIALS	DATE (YYYYMMDD)
AED	20091208	ZEB	20091208

Figure 9-1. DA Form 7640-R (Concealed Movement Exercise Scorecard).

TARGET DETECTION

9-15. Target detection exercises sharpen the sniper's observation and perception skills, and his skill in using sophisticated optics. Target detection training should also focus on IEDs and countersniper operations.

Area

9-16. Areas used for target detection should be partly cleared at least 300 meters in depth and 100 meters in width, with easily definable left and right limits. The area should have at least three TRPs that are easily recognized and positioned in different locations throughout the area. Ten military items (full-sized and micro, scaled appropriately) are placed in the area. They can be radio antennas, small-scale mock vehicles, batteries, map protractors, or weapons. Items should be placed so that they are detectable but indescribable with the naked eye, detectable but indescribable with binoculars, and describable only by using the observation telescope.

Conduct

9-17. The target detection exercise should be conducted as follows:

NOTE: The trainer should sanitize the site before the exercise.

(1) Snipers are given an observation telescope, binoculars, pencil, clipboard, and scorecard.

(2) Snipers are given 20 to 25 minutes to sketch the area, depending on its size and complexity.

(3) Snipers are given 40 minutes to detect, describe, and plot each item in the area.

NOTE: Snipers remain in the prone position throughout the exercise. After 15 minutes, they will move to a different position, left or right of the center

line of observation and remain there for the next 15 minutes. For the last 10 minutes, they can choose a position anywhere along the line.

(4) When an object is detected, the sniper gives its location on the line of observation (A or B).

Next, the sniper must describe the object using the categories of size, shape, color, condition, and appearance.

Size: Always give a three-dimensional size (height, width, and length).

Shape: Draw the shape to the best of your ability.

Color: What color is the item?

Condition: Does it appear to be serviceable or unserviceable?

Appearance: What does the item appear to be?

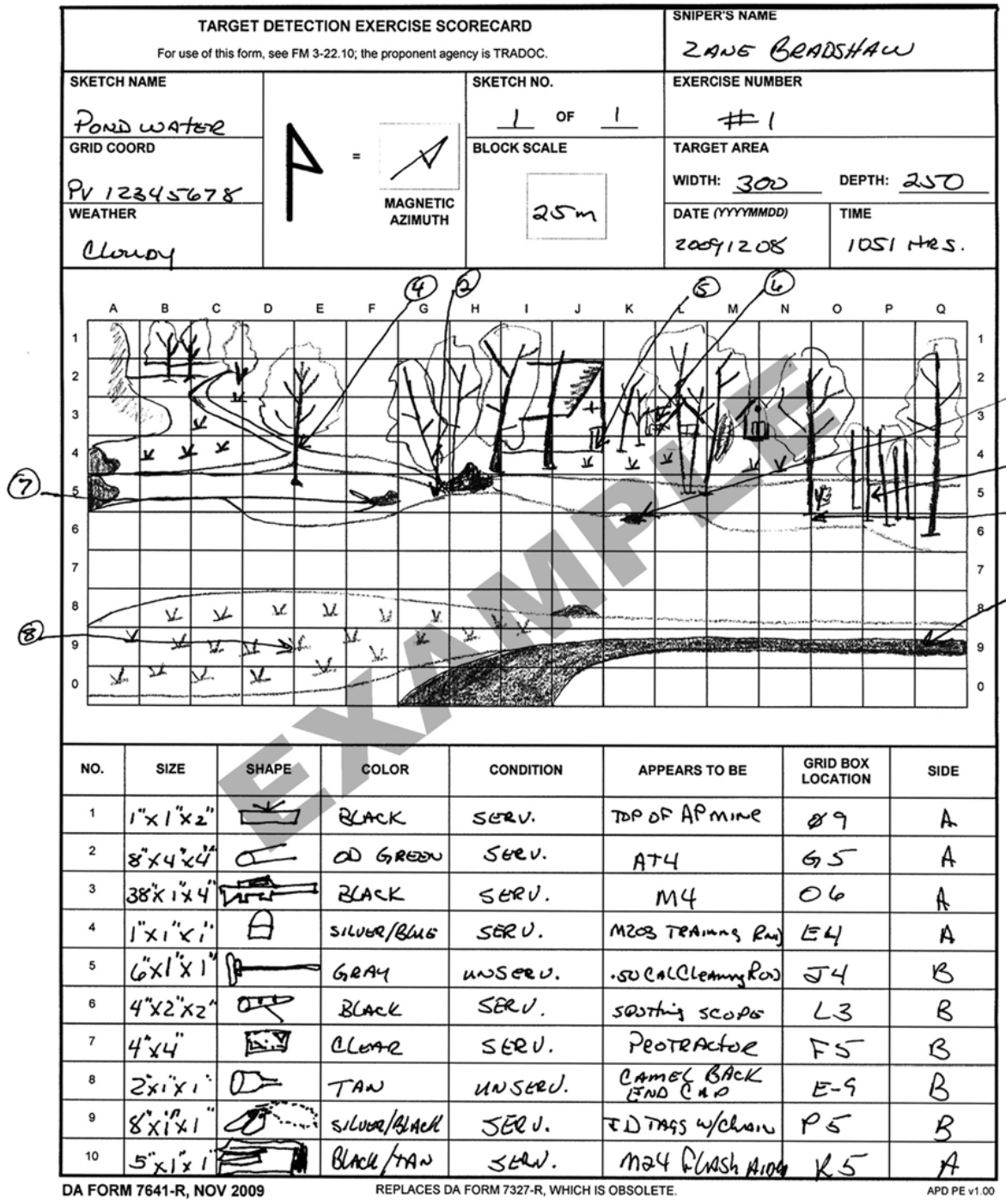
(5) If the sniper finds additional items to describe, he may use the reverse side of the scorecard. If the trainer allows, the sniper can obtain credit for observation and detection skills.

NOTE: As another target detection exercise, the section leader/sniper team leader could coordinate with a unit conducting training so that snipers could observe the unit and report what they observed.

Scoring

9-18. Snipers receive 1/2 point for correctly plotting a target and 1/2 point for correctly describing it. They must achieve 7 points to receive a GO in this area. Scores are recorded on DA Form 7641-R (Target Detection Exercise Scorecard, shown in Figure 9-2).

NOTE: A blank copy of this form is provided at the back of this manual for local reproduction on 8 ½- by 11-inch paper.



TARGET DETECTION EXERCISE SCORECARD

For use of this form, see FM 3-22.10; the proponent agency is TRADOC.

SNIPER'S NAME: ZANE BRADSHAW

SKETCH NAME: POND WATER

SKETCH NO.: 1 OF 1

EXERCISE NUMBER: #1

GRID COORD: PV 12345678

MAGNETIC AZIMUTH

BLOCK SCALE: 25m

TARGET AREA — WIDTH: 300 DEPTH: 250

WEATHER: CLOUDY

DATE (YYYYMMDD): 20091208

TIME: 1051 HRS.

EXAMPLE

NO.	SIZE	SHAPE	COLOR	CONDITION	APPEARS TO BE	GRID BOX LOCATION	SIDE
1	1"X1"X2"		BLACK	SERV.	TOP OF AP MINE	P9	A
2	8"X4"X4"		OD GREEN	SERV.	AT4	G5	A
3	38"X1"X4"		BLACK	SERV.	M4	O6	A
4	1"X1"X1"		SILVER/BLUE	SERV.	M203 TRAINING RND	E4	A
5	6"X1"X1"		GRAY	UNSERV.	.50 CAL CLEANING ROD	J4	B
6	4"X2"X2"		BLACK	SERV.	SOFTHING SCOPE	L3	B
7	4"X4"		CLEAR	SERV.	PROTRACTOR	F5	B
8	2"X1"X1"		TAN	UNSERV.	CAMEL BACK END CAP	E-9	B
9	8"X1"X1"		SILVER/BLACK	SERV.	ID TAGS W/CHAIN	P5	B
10	5"X1"X1"		BLACK/TAN	SERV.	M24 FLASH HIDE	K5	A

DA FORM 7641-R, NOV 2009 REPLACES DA FORM 7327-R, WHICH IS OBSOLETE. APD PE v1.00

Figure 9-2. DA Form 7641-R (Target Detection Exercise Scorecard).

RANGE ESTIMATION

9-19. Snipers must correctly estimate distance to fire effectively, complete accurate range cards, and report reliable intelligence.

Area

9-20. Range estimation exercises should be conducted where the snipers can see a human-sized target, without obstruction, out to 800 meters. Personnel should be placed at various ranges and stages of concealment to give the sniper a challenging and realistic exercise.

Conduct

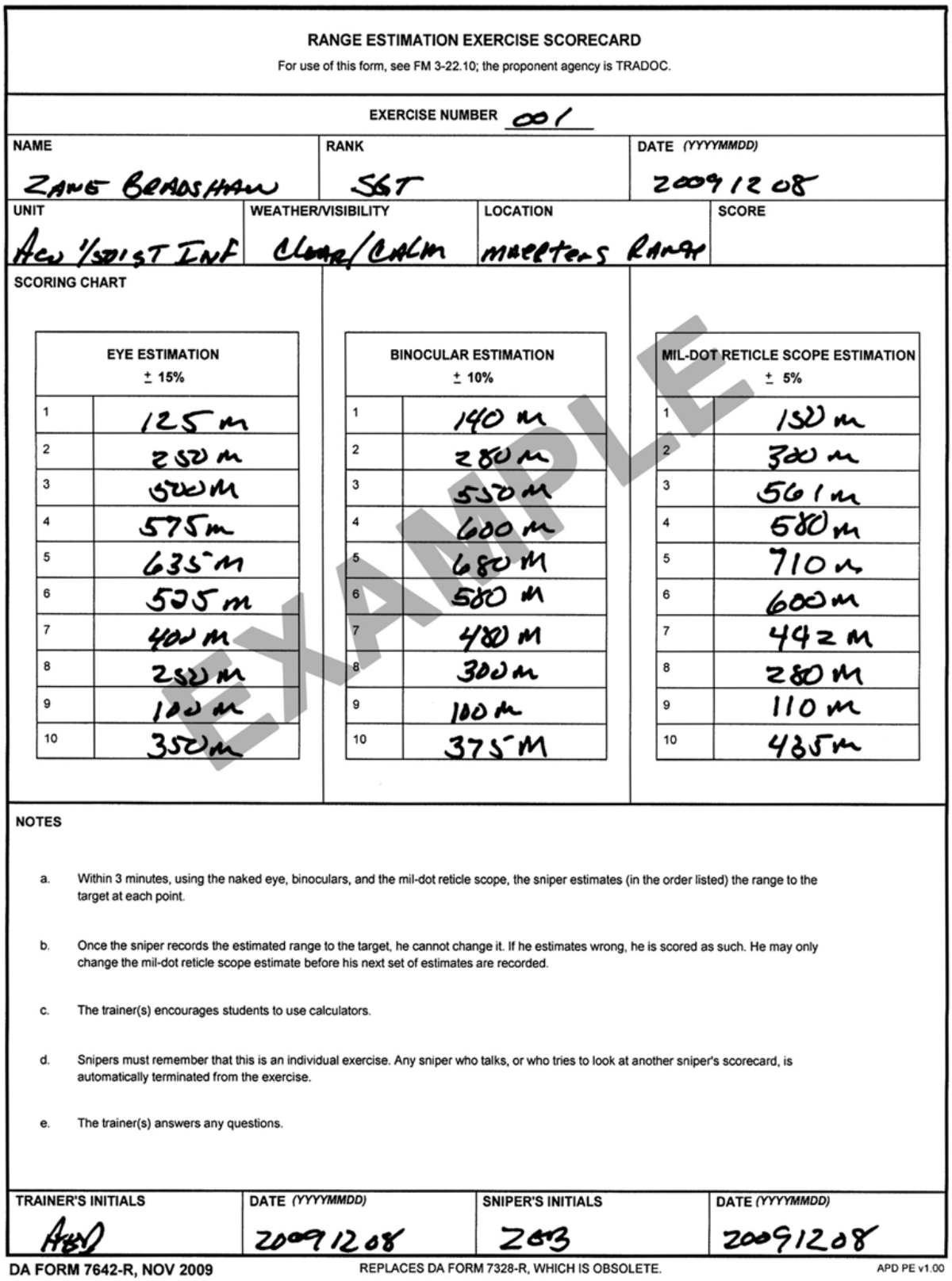
9-21. During this exercise, snipers are graded on their ability to estimate range. Within three minutes, they estimate range to the target at each point, using first the naked eye, their binoculars, and then their TMR or M3A telescope. They must also sketch their respective sectors on the backs of the forms.

NOTE: Mil relation formula manipulation needs to be continuously practiced; batteries die and equipment breaks, but the sniper's familiarity and mastery of math skills will remain.

Scoring

9-22. Scores are recorded on DA Form 7642-R (Range Estimation Exercise Scorecard, shown in Figure 9-3).

NOTE: A blank copy of this form is provided at the back of this manual for local reproduction on 8 ½- by 11-inch paper.



RANGE ESTIMATION EXERCISE SCORECARD

For use of this form, see FM 3-22.10; the proponent agency is TRADOC.

EXERCISE NUMBER 001

NAME	RANK	DATE (YYYYMMDD)
ZANE BRADSHAW	SGT	20091208

UNIT	WEATHER/VISIBILITY	LOCATION	SCORE
HHC 1/501ST INF	CLEAR/CALM	MARKERS RANGE	

SCORING CHART

	EYE ESTIMATION ± 15%	BINOCULAR ESTIMATION ± 10%	MIL-DOT RETICLE SCOPE ESTIMATION ± 5%
1	125 m	140 m	130 m
2	250 m	280 m	300 m
3	500 m	530 m	561 m
4	575 m	600 m	580 m
5	635 m	680 m	710 m
6	525 m	580 m	600 m
7	400 m	480 m	442 m
8	250 m	300 m	280 m
9	100 m	100 m	110 m
10	350 m	375 m	435 m

EXAMPLE

NOTES

a. Within 3 minutes, using the naked eye, binoculars, and the mil-dot reticle scope, the sniper estimates (in the order listed) the range to the target at each point.

b. Once the sniper records the estimated range to the target, he cannot change it. If he estimates wrong, he is scored as such. He may only change the mil-dot reticle scope estimate before his next set of estimates are recorded.

c. The trainer(s) encourages students to use calculators.

d. Snipers must remember that this is an individual exercise. Any sniper who talks, or who tries to look at another sniper's scorecard, is automatically terminated from the exercise.

e. The trainer(s) answers any questions.

TRAINER'S INITIALS	DATE (YYYYMMDD)	SNIPER'S INITIALS	DATE (YYYYMMDD)
ABD	20091208	ZB	20091208

DA FORM 7642-R, NOV 2009 REPLACES DA FORM 7328-R, WHICH IS OBSOLETE. APD PE v1.00

Figure 9-3. DA Form 7642-R (Range Estimation Exercise Scorecard).

LAND NAVIGATION

9-23. This exercise develops the sniper’s proficiency in specific field techniques, such as movement, land navigation, and radiotelephone procedures.

Area

9-24. During this exercise, snipers should be fully equipped for training in varied conditions. This exercise should be conducted at least twice, once during daylight and once in limited visibility.

NOTE: This exercise can be held at the same time as the live-fire stalk exercises. Half of the training class or group could conduct the land navigation exercise, while the other half conducts the firing exercise. When they finish, they change over.

Conduct

9-25. The land navigation exercise should be conducted as follows:

(1) Snipers are assembled at the starting point and instructed on the mission objective, the observation positions, and the radio call signs. Trainers conduct an equipment check and an exercise briefing.

(2) Snipers must move from the starting point to the designated location in less than two hours. They are instructed to avoid the observation positions, which represent the enemy. They must report their location every 20 minutes and their arrival at the destination site.

Scoring

9-26. At the end of this exercise, the trainer critiques the sniper's performance. A team starts the exercise with 100 points. Table 9-2 shows the point deductions made for errors.

Table 9-2. Land navigation scoring.

POINT DEDUCTION	ACTION
1 point per minute	Sniper takes longer than the authorized two hours.
3 points for every 5 meters	Sniper misses the designated destination.
5 points for each instance	Sniper uses improper radio procedures or reporting.
10 points for each instance	Sniper is seen by someone in the observation positions.
100 points	Sniper is lost and fails to complete the exercise.

MEMORY EXERCISE

9-27. KIM exercises develop the sniper's memory by enabling him to produce an accurate description of an object that is no longer visible.

Area

9-28. The KIM exercise consists of ten military items placed on a table. These items are covered with a blanket, a poncho, or other suitable object.

Conduct

9-29. The KIM exercise should be conducted as follows:

(1) Snipers observe the objects when uncovered.

NOTE: Snipers may not touch the items or talk during the exercise.

(2) After a prescribed time, the items are covered.

(3) The snipers write their observations on scoresheets. They write the details that accurately describe the object, omitting unnecessary words. Snipers describe each object in the following categories—

Size: The sniper describes the object by giving the three dimensions in a known unit of measure or in relation to a known object.

Shape: The sniper draws a rough sketch of the object.

Color: The sniper records the color of the object.

Condition: The sniper describes the object by giving the general or unusual condition of the object (such as new, worn, or dented).

Appearance: The sniper describes what the object appears to be (such as an AK-47 round or radio handset).

(4) At the end of the time limit, snipers turn in their score sheets and trainers identify each item.

9-30. Many variations can be incorporated into a KIM exercise. Some of these variations include extending the time between observing and recording, distractions while observing and recording, or the use of different methods to display items. For example, instead of a blanket, use a towel or slides.

Scoring

9-31. Snipers receive 1/2 point for indicating that there was an item with some sort of description and the other 1/2 point for either exactly naming the item or giving a sufficiently detailed description using the categories listed above. The description must satisfy the trainer to the extent that the sniper had never seen the object before. The total possible score is 10 points.

9-32. Experience in the exercise, time restraints, and complexity of the exercise determines a passing score. This is the trainer's judgment based on his own experience in KIM exercises (Table 9-3). The first few games should be strictly graded, emphasizing details. When the snipers are familiar with the game pattern, the trainer may make changes. The last game of the training should be identical to the first. In this way, the sniper can see if he improved.

Table 9-3. Example format for keep in memory exercise schedule.

GAME NUMBER	OBSERVE (Minutes)	RECORD (Minutes)	REMARKS
1.	2:00	3:00	No distractions
2.	2:00	3:00	Noise during recording
3.	1:50	2:50	Only blanks may be fired while recording
4.	1:50	2:50	Soldiers do PT between observe and record
5.	1:50	2:30	Two hour delay between observe and record
6.	Repeat game number 1		

COMMUNICATIONS

9-33. Maintaining communications is essential to mission success. Snipers must be highly trained in using signal operating instructions and proper communications procedures. Communications exercises can be conducted with land navigation exercises over long distances, and should emphasize—

- Operating and maintaining radios.
- Entering the net.
- Authenticating.
- Encoding and decoding.
- Encrypting and decrypting.
- Repairing antennas.
- Constructing field-expedient antennas.
- Battery conservation (i.e., through the use of communication windows).

Advanced Communications Techniques

9-34. Snipers should receive training on—

- Communication techniques that will enhance range.
- Communication windows that will enable the sniper to conserve battery life, reducing the overall load.
- Mission support sight operations, including communications, planning for follow-on operations, near and far recognition signals, and passage of friendly lines.

Communications Reporting Procedures

9-35. A lack of timely, detailed reporting of battlefield information can hinder the overall success of maneuvering units. Properly formatted

information, coordinated with communications personnel, ensures timely and accurate intelligence gathering. Snipers must train to use information reporting formats and procedures.

ADDITIONAL SKILLS

9-36. The trainer must include additional skills in the sniper sustainment training program. Once mastered, these skills enhance the sniper's chance of surviving and accomplishing the mission. These skills include—

- Response to environment.
- Fire support capabilities.
- Call for fire.
- Insertion and extraction.
- Tracking and countertracking.
- Survival.
- First aid.

RESPONSE TO ENVIRONMENT

9-37. The sniper must be able to respond appropriately to his environment. The sniper team leader/section leader needs to take into considerations the following environmental aspects:

- Mountains.
- Urban areas.
- Jungle.

Mountains

9-38. If deploying to a mountainous area, additional emphasis should be placed on the following skills:

- Mountaineering techniques and refreshers.

- Medical training due to the isolated areas the operations will take place in. Medical training should address—

Extremity injuries, such as lower leg breaks, splinting, immobilization, and tourniquet application.

High altitude pulmonary edema.

Trauma care.

Casualty evacuation.

Urban Areas

9-39. If deploying to an urban area, additional emphasis should be placed on the following skills:

- Survivability.

- Close range target engagements.

- Transition from your primary weapon system to your sidearm.

- Stay behind operations.

- Constructing, establishing, and occupying urban hide sites.

- Quick reaction force planning.

- Reaction times.

- Hard and soft compromises (should be established before deployment).

- Passage of lines.

- Increasing team size to maximize the ability to fight as an organic element.

- Basic breach training to gain access to buildings when isolated from the main element.

- Urban climbing.

- Building and climbing ladders, as well as how to gain access to roof tops without entering and clearing buildings.

9-40. Time should also be devoted to learning the atmosphere of the area once deployed. This will enhance the sniper's overall knowledge of routines and immediately alert him to changes in normal patterns of activity.

Jungle

9-41. If deploying to a jungle area, additional emphasis should be placed on all of the areas discussed in the Mountains and Urban Areas sections. Jungles present similar challenges; the sniper will encounter the same remoteness as when deployed to a mountainous region and the same survivability aspect of deploying to an urban region. Additional priorities need to be focused on—

- Stalking.

- Camouflage.

- Communications.

- Advanced medical training.

- Rotary wing training (infiltration and extraction techniques).

- Amphibious training insertion with landing crafts medium (LCM) and RB-15s, including loading, unloading, and tip drills.

- Helocasting.

- Fast Rope Insertion/Extraction System (FRIES).

FIRE SUPPORT CAPABILITIES

9-42. Snipers need to know the maximum effective ranges of all organic and inorganic resources that are available. This will not only increase the range of operation; it will also increase the sniper's survivability in the event that he is in a situation that requires him to break contact, provide immediate suppression, or engage targets that are outside of his engagement range and weapon capabilities.

CALL FOR FIRE

9-43. Snipers with a working knowledge in the use and application of artillery fire, naval gunfire, and close air support (CAS) are an asset to the commander.

Indirect Fire

9-44. Indirect fire is the secondary weapon of the sniper. Snipers should master call for fire procedures and target location methods (Table 9-4). Snipers can simulate calls for fire using the example format in Table 9-5.

NOTE: See FM 6-30 for more information.

Table 9-4. Call for fire procedures.

1. OBSERVER IDENTIFICATION

2. WARNING ORDER

a. Type of mission

(1) Adjust fire

(2) Fire for effect

(3) Suppress

b. Size of element to fire

c. Method of target location

(1) Grid

(2) Polar

(3) Shift from a known point

3. TARGET LOCATION

a. Grid. Six-digit grid coordinates to the designated target

NOTE: Determine the grid direction from the observer to the target (O-T), and ensure that the O-T direction is sent to the FDC after the call for fire is completed, but before the first correction.

b. Polar. Direction and distance from the FO to the target

c. Shift from a known point.

(1) O-T direction to the target

(2) Shift to the target

(a) Lateral L/R

NOTE: To get the width of the lateral shift in meters (W), first divide the distance to the known point by 1,000. Round to the nearest tenth. The answer is R. Then, multiply R by the measured angle between the known point and the target in mils (M). The answer is W. W = R x M (mil relation)

(b) Range shift ±

(c) Vertical shift U/D

4. TARGET DESCRIPTION

5. METHOD OF ENGAGEMENT

a. Type of adjustment

(1) Area fire *

(a) Bracketing *

(b) Creeping (Danger Close)

(2) Precision fire

b. Trajectory *

c. Ammunition

(1) Projectile *

(2) Fuze *

(3) Volume of fire *

d. Distribution *

6. METHOD OF FIRE CONTROL

a. Method of fire

(1) Center platoon/center section

(2) Battery/platoon right (left)

(3) Time interval

b. Method of control

(1) Fire when ready *

(2) At my command

(3) Cannot observe

(4) Time on target

* Indicates standard

Table 9-5. Example format for a call for fire (grid mission).

INITIAL REQUEST	
Observer	FDC
"Z57 this is Z71, adjust fire, over."	"This is Z57, adjust fire, out."
"Grid NK180513, over."	"Grid NK180513, out."
"Infantry platoon in the open, over."	"Infantry platoon in the open, out."
MESSAGE TO OBSERVER	
	"Z, two rounds, over."
"Z, two rounds, out."	
"Direction 1680, over."	
	"Direction, 1680, out."
	"Shot, over."

"Shot, out."	
	"Splash, over."
"Splash, out."	
NOTE: Corrections are made after the rounds impact the target area.	

Naval Gunfire and Close Air Support

9-45. A working knowledge of naval gunfire and CAS (helicopter and fixed-wing) enables snipers to inflict heavy damage on enemy forces. This includes being current on call for and adjust indirect fire procedures, as well as the basic CAS 9-line format. It is also recommended that the snipers are familiar with the aircraft and their individual basic loads.

NOTE: See FM 6-30 for more information about the basic CAS 9-line format.

INSERTION AND EXTRACTION TECHNIQUES

9-46. The practical application of insertion and extraction techniques allows snipers to accomplish their mission and to exfiltrate with confidence. Leaders should tailor these techniques to unit assets; however, a working knowledge of all techniques is a valuable tool.

TRACKING AND COUNTERTRACKING

9-47. Footprints found by enemy trackers might indicate that snipers are in the area. Knowledge of countertracking techniques is a valuable tool to snipers, not only to remain undetected, but also to collect battlefield information. This especially pertains to IED countertracking.

NOTE: See Chapter 5 for more information.

SURVIVAL

9-48. When combined with E&E training, survival training helps prepare the sniper to plan for contingencies during exfiltration and infiltration. For example, the sniper might have to live off the land until he can establish a linkup with friendly forces.

NOTE: Refer to Appendix F for additional information.

FIRST AID

9-49. Adequate first-aid training, particularly advanced combat lifesaver training, can mean the difference between life and death. This training enables the sniper to administer care until proper medical attention can be provided.

TRAINING NOTES

9-50. Snipers should train in accordance with DA Pamphlet 350-38. Their training should reinforce their knowledge of equipment, ammunition, range, and terrain requirements.

FREQUENCY

9-51. Qualification on all organic weapons systems should be conducted at a minimum of quarterly. Live- fire training should be conducted monthly and at a ratio of 2 (KD ranges) to 1 (unknown distance range).

EQUIPMENT

9-52. During all field training exercise (FTXs), each sniper should be equipped as described in Chapter 2. Team equipment should be available as needed.

NOTE: The arms room concept as well as the mobile arms room concept should be used.

SIMULATORS

9-53. Simulation equipment, like the Laser Marksmanship Training System (LMTS), as well as the Tactical Simulations Forward Observer (TSFO) can enhance sniper training. These and other simulators are updated often.

NOTE: Units should contact their local training support centers for simulators.

KNOWN DISTANCE RANGE REQUIREMENTS

9-54. A standard KD range, graduated in 100-meter increments from 100 to 1,000 meters, is required for zeroing and zero confirmation exercises. The target detection range facilities and procedures should permit observation and range determination to 800 meters.

ANGLE FIRE AND MOVING TARGET REQUIREMENTS

9-55. Efforts should be made to acquire all additional equipment that will enhance angle firing (i.e., angle cosine indicators [ACI, NSN 1240-01-538-2341], AN/PSQ-23 [STORM]). Snipers must deploy with knowledge of angle firing ingrained in their training and predeployment training programs. Snipers must also have a thorough understanding of moving target engagements. If a facility is available, angle fire and moving target engagement training should be combined.

PISTOL TRAINING AND FIRING REQUIREMENTS

9-56. Pistol training must focus on transitioning from the primary weapon to the sidearm, as well as clearing rooftops and windows with a pistol.

FIELD FIRING RANGE REQUIREMENTS

9-57. The ideal field firing range is on terrain left in its natural state. The range should be at least 1,000 meters deep, with provisions along the firing line for several sniper positions in each lane. This will give the snipers slightly different perspectives on the target area (Table 9-6). Where time prevents construction of a separate range, this facility might have to be adapted from an existing field firing range.

Table 9-6. Requirements for field firing range.

METERS	TYPE OF TARGET	TYPE OF TARGET
200	E-type silhouette	Hit-kill mechanism
300	Iron maiden silhouette	Hit-kill mechanism
	E-type silhouette	Moving target mechanism
325	E-type silhouette	Hit-kill mechanism
375	E-type silhouette emplaced inside a window	Hit-kill mechanism
400	E-type silhouette emplaced inside a bunker	Hit-kill mechanism

500	Iron maiden silhouette	Moving target mechanism
		Tracked vehicle with a hit-kill mechanism in the commander's cupola
600 to 1,000	Iron maiden silhouette	

9-58. Targets should be constructed and placed in such a way that they provide the sniper experience in various types of targets:

- Iron maidens can be made out of 3/8-inch steel plate with a supporting frame. They should be cut out in the form of silhouettes 20 inches wide and 40 inches high. They should be painted white so that the sniper can easily detect where the bullet impacts on the target.

- Placing targets inside of window openings gives the sniper experience in engaging targets that can be found in an urban environment. This is done by cutting a 15- by 15-inch hole in the center of a 36- by 48-inch plywood board. Then, an E-type silhouette is placed on a hit-kill mechanism

2 to 4 meters behind the plywood.

- Targets placed inside a bunker-type position allow the sniper to gain experience firing into darkened openings. This position can be built with logs and sandbags, with an E-type silhouette on a hit-kill mechanism placed inside.

- Moving targets can be used at distances between 250 and 500 meters to give the sniper practical experience and to develop skill in engaging a moving target. Targets moving laterally and at an oblique present a challenge to the sniper.

- Targets should be arranged to provide varying degrees of concealment and to show enemy personnel or situations in logical locations (Figure 9-4). The grouping of two or more targets to indicate a crew-served weapon situation or a small unit is acceptable. Such arrangements, provided the targets can be marked, may require selective engagement by the sniper.

- Automatic target devices provide for efficient range operation and scoring.

- Training should also capture holdoffs and quick exposure engagement training.

M107 LONG-RANGE SNIPER RIFLE FIELD FIRING RANGE REQUIREMENTS

9-59. The ideal field firing range for the M107 LRSR is in a natural state, with—

- Targets from 100 to 1,800 meters.

- E-type targets out to 600 meters.

- Stationary and moving targets from 600 to 1,800 meters.

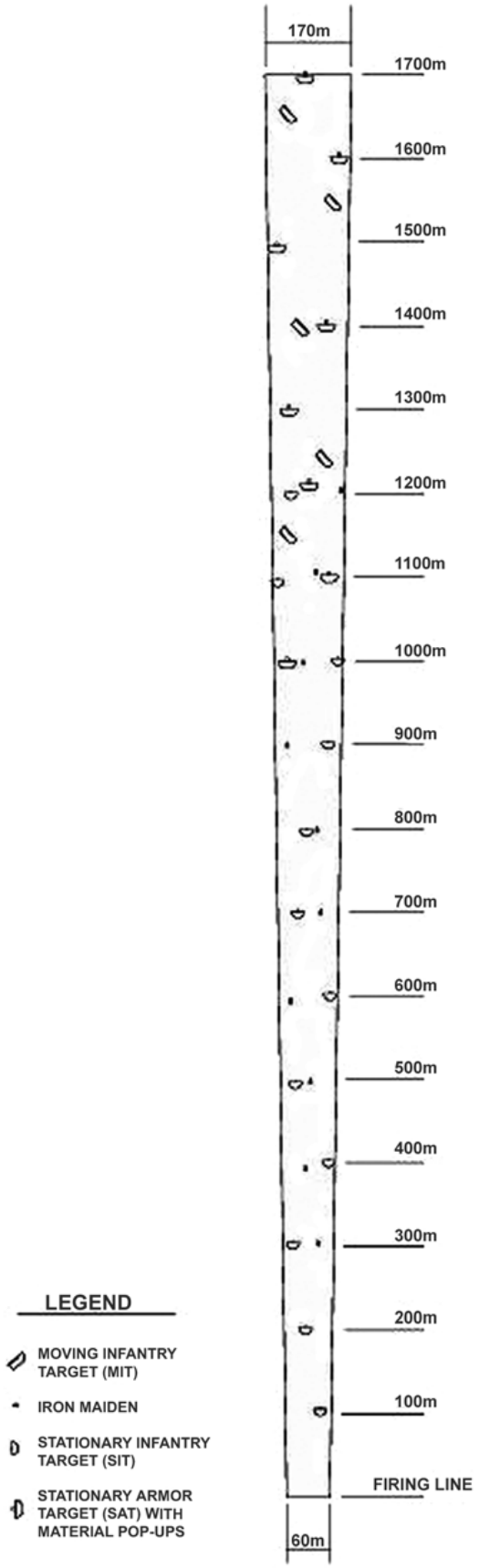

170m
1700m
1600m
1500m
1400m
1300m
1200m
1100m
1000m
900m
800m
700m
600m
500m
400m
300m
200m
100m
FIRING LINE
60m
LEGEND
MOVING INFANTRY TARGET (MIT)
IRON MAIDEN
STATIONARY INFANTRY TARGET (SIT)
STATIONARY ARMOR TARGET (SAT) WITH MATERIAL POP-UPS

Figure 9-4. Lane layout.

FIVE-DAY SUSTAINMENT TRAINING PROGRAM

9-60. Table 9-7 shows an example five-day sniper sustainment training program.

Table 9-7. Example five-day sniper sustainment training program.

DAY 1	
TASK 1 (Performance Training)	Select Sniper Team Routes and Positions.
CONDITIONS	Given a review of techniques to select routes and positions, a situational sniper mission with a target area location that requires a minimum movement of 3,000 meters, a military map, a protractor, a felt-tip pen, an 8-inch-square clear plastic overlay, and one sheet of letter size paper.
STANDARDS	Selected and plotted a primary and alternate route, ORP, and TFFP that provided the best cover and concealment. (1) Prepared an overlay with two grid reference marks, primary and alternate routes with arrows indicating direction of travel, minimum of three checkpoints (numbered in order), an ORP, and a TFFP. (2) Prepared a written log of movement. The sniper data book contained the from-to grid coordinates, magnetic azimuths, distance, checkpoint number, ORP, and TFFP.

	(3) Prepared overlay and written log of movement within 30 minutes.
TASK 2 (Performance Training)	Move Using Individual Sniper Movement Techniques.
CONDITIONS	Given a review of sniper movement techniques, a sniper weapon, a ghillie suit, and a flat, open area that allows trainers to observe movement techniques.
STANDARDS	Moved correctly while using the designated movement technique. (1) Sniper low crawl. (2) Medium crawl. (3) High crawl. (4) Hands-and-knee crawl. (5) Walking.
NOTE: Trainers designate movement techniques and critique snipers on their movement.	
TASK 3 (Performance Training)	React To Enemy Contact While Moving As a Member of a Sniper Team.

CONDITIONS	Given a review of sniper team movement techniques and reactions to enemy contact, sniper team's basic equipment and weapons, and an area of varying terrain with at least one danger area.
STANDARDS	Reacted correctly to designated situations or danger areas: Reacted to enemy contact. Ambushed. Indirect fire. Air attack. Danger area (linear and open area). Other battle drills in tactical SOP.
NOTE: Trainers designate situations and critique sniper teams on movement.	
TASK 4 (Written Exam)	Describe Target Detection, Selection, and Observation Techniques.
CONDITIONS	Given a review of target detection, selection, and observation techniques.
STANDARDS	Described in writing, techniques used to observe, detect, and select targets.

TASK 5 (Written Exam)	Identify Enemy Uniforms, Equipment, and Vehicles.
CONDITIONS	Given a review of pictures or slides of enemy uniforms, equipment, and vehicles.
STANDARDS	In writing, identified 7 of 10 enemy uniforms or rank insignia, 7 of 10 pieces of enemy equipment, and 7 of 10 enemy vehicles.
TASK 6 (Written Exam)	Describe Range Estimation Techniques.
CONDITIONS	Given a review of range estimation techniques used by snipers.
STANDARDS	Described in writing the range estimation techniques used by the sniper. Eye methods. Binocular methods. Scope methods (M3A scope and M49 observation telescope).

Table 9-7. Example five-day sniper sustainment training program (continued).

DAY 1 (continued)	
TASK 7 (Performance Training)	Prepare a Sniper Range Card.
CONDITIONS	Given a review of sniper range cards, a suitable target area, basic sniper equipment, and a sniper range card.
STANDARDS	Prepared a sniper range card complete with-- Grid coordinates of position. TRP(s) (azimuth, distance, and description). Left and right limits with azimuths. Ranges throughout area. Major terrain features. Method of obtaining range or name. Weather data.
TASK 8 (Performance Training)	Prepare a Military Sketch.
CONDITIONS	Given a review of sniper military sketching, a suitable area or object to sketch, and a blank military sketch

	sheet.
STANDARDS	Prepared a sketch complete with— Grid coordinates of position. Magnetic azimuth through center of sketch. Sketch name and number. Scale of sketch. Remarks section. Name and rank. Date and time. Weather data.
TASK 9 (Performance Training)	Maintain a Sniper Data Book.
CONDITIONS	Given a review of the sniper data book and 20 blank sheets stapled together as a booklet.
STANDARDS	Maintained a sniper data book with a chronological listing of events that take place during the next three days and containing the following: Grid coordinates of position. Observer's name.

	Date/time/visibility. Sheet number/number of total sheets. Series number/time and grid coordinate of each event. Event. Action taken.
NOTE: Trainers collect the sniper data books after three days.	
DAY 2	
TASK 1 (Written Exam)	Describe The Fundamentals of Sniper Marksmanship.
CONDITIONS	Given a review of sniper marksmanship fundamentals.
STANDARDS	Described in writing the fundamentals of sniper marksmanship. Position. Breath control. Aiming. Trigger control.
TASK 2 (Written Exam)	Describe The Effects of Weather on Ballistics.

CONDITIONS	Given a review of the effects of weather on ballistics.
STANDARDS	Described in writing the effects of weather on ballistics.
TASK 3 (Written Exam)	Describe The Sniper Team Method of Engaging Targets.
CONDITIONS	Given a review of the sniper team method of engaging targets.
STANDARDS	Described in writing the sniper team method of engaging targets.

Table 9-7. Example five-day sniper sustainment training program (continued).

DAY 2 (continued)	
TASK 4 (Written Exam)	Describe Methods Used to Engage Moving Targets.
CONDITIONS	Given a review of methods used to engage moving targets.
STANDARDS	Described in writing methods used to engage moving targets.

TASK 5 (Written Exam)	Describe Methods Used to Engage Targets at Various Ranges Without Adjusting The Scope's Elevation.
CONDITIONS	Given a review of methods used to engage targets at various ranges without adjusting the scope's elevation.
STANDARDS	Described in writing the methods used to engage targets at various ranges without adjusting the scope's elevation.
TASK 6 (Performance Training)	Zero The Rifle Scope.
CONDITIONS	Given a sniper weapon with day scope, an observation telescope, a suitable firing range, and 7 rounds of ammunition.
STANDARDS	Zeroed rifle scope within 7 rounds.
DAY 3	
TASK 1 (Performance Training)	Zero Iron Sights.

CONDITIONS	Given a sniper weapon, an observation telescope, a suitable firing range, and 12 rounds of ammunition.
STANDARDS	Zeroed iron sights on a sniper weapon within 12 rounds.
TASK 2 (Performance Training)	Engage Moving Targets.
CONDITIONS	Given a sniper weapon, an observation telescope, a suitable firing range, and 10 rounds of ammunition.
STANDARDS	Engaged 10 moving targets, from 250 to 500 meters, achieving a minimum of 8 hits.
TASK 3 (Performance Training)	Estimate Range.
CONDITIONS	Given a sniper weapon system (M24 SWS or M110 SASS), binoculars, and 10 targets out to 800 meters.
STANDARDS	Correctly estimated range to 7 of the 10 targets using eye estimation (plus or minus 15 percent), binoculars (plus or minus 10 percent), or the M24 SWS/M110 SASS (plus or minus 5 percent).

TASK 4 (Performance Training)	Detect Targets.
CONDITIONS	Given a suitable area with 10 military objects, binoculars, an observation telescope, and a scorecard.
STANDARDS	Detected, plotted, and described 7 of 10 military objects within 40 minutes.
DAY 4	
TASK 1 (Performance Training)	Qualify on Firing Table I (M24 SWS) or Firing Table V (M110 SASS).
CONDITIONS	Given a sniper weapon, an observation telescope, a suitable firing range, scorecard for Firing Table I or V, and 20 rounds of 7.62-mm M118 LR.
STANDARDS	Engaged targets from 200 to 700 meters; scored at least 70 points.
TASK 2 (Performance Training)	Engage Targets While in MOPP.

CONDITIONS	In daylight, given a sniper weapon, suitable firing range, MOPP suit, complete M25-series protective mask, an observation telescope, and 30 rounds of 7.62-mm M118 LR.
STANDARDS	While in MOPP, engaged targets at 300 to 800 meters. Scored at least 105 points.
TASK 3 (Performance Training)	Participate In a Concealed Movement Exercise.
CONDITIONS	Given a sniper weapon, ghillie suit, two 7.62-mm blank rounds of ammunition, an enemy target equipped with binoculars, an observation telescope, and a suitable, observable area 1,000 meters long.
STANDARDS	Within 4 hours, moved 600 to 800 meters without being detected; occupied a position; identified and fired two blank rounds at the enemy target. Scored 7 of 10 points.
DAY 5	
TASK 1 (Performance Training)	Qualify on Firing Table II (M24 SWS) or Firing Table VI (M110 SASS).
CONDITIONS	Given a sniper weapon, an observation telescope, a suitable firing range, scorecard for Firing Table II or VI,

	and 45 rounds of 7.62-mm M118 LR.
STANDARDS	Engaged stationary and moving targets at 300 to 600 meters; scored at least 70 points.

Table 9-7. Example five-day sniper sustainment training program (continued).

DAY 5 (continued)	
TASK 2 (Performance Training)	Call For Fire.
CONDITIONS	Given a review of call-for-fire procedures, two AN/PRC-119 radios, and a fire mission.
STANDARDS	Transmitted the fire mission using proper radio procedures and the elements of the call for fire mission in sequence: Observer identification. Warning order. Target location. Target description. Method of engagement (optional). Method of fire and control (optional).

TASK 3 (Performance Training)	Locate a Target By Grid Coordinates.
CONDITIONS	Given a review of locating targets using the grid coordinate method, a map of the target area, binoculars, compass, and a target.
STANDARDS	Determined and announced the six digits coordinate of the target plus or minus 250 meters, within 30 seconds.
TASK 4 (Performance Training)	Locate a Target By Polar Plot.
CONDITIONS	Given a review of target locating using the polar-plot method, a map of the target area, binoculars, a compass, and a target.
STANDARDS	Using the polar plot method, located the target within 250 meters of the actual location. Announced the target location within 30 seconds after identification. Expressed direction to the nearest 10 mils and within 100 mils of actual direction. Expressed distance to the nearest 100 meters.
TASK 5	Locate a Target By Shift From a Known Point.

(Performance Training)	
CONDITIONS	Given a review of locating targets using the shift from a known point method, a map of the target area, binoculars, a compass, a known point, and a target.
STANDARDS	Using the shift from a known point method, located the target within 250 meters of the actual location and announced the target location within 30 seconds after identification. Expressed direction to the nearest 10 mils and within 100 mils of the actual direction. Expressed right or left corrections to the nearest 10 meters and range corrections to the nearest 100 meters.
TASK 6 (Performance Training)	Participate In a Day Land Navigation Exercise.
CONDITIONS	Given a navigation course with at least four legs no less than 800 meters apart.
STANDARDS	Navigated the course without being detected by the observer-instructor.
NOTE: Preparing sketches, range cards, and or logs from the sniper data book can also be incorporated into the exercise.	
NIGHT 5	

TASK 1 (Performance Training)	Participate In a Night Land Navigation Exercise.
CONDITIONS	Given a navigation course with at least three legs no less than 500 meters apart.
STANDARDS	Navigated the course without being detected.
NOTE: Observer-instructors can be placed on the course to detect any violations of noise and light discipline and deduct points from the sniper's score for violations.	

EMERGENCY DEPLOYMENT READINESS EXERCISE

9-61. Table 9-8 shows an example battalion emergency deployment readiness exercise (EDRE).

Table 9-8. Example emergency deployment readiness exercise.

TIME	ACTION
0400	Battalion alerts sniper teams. 1. CQ relays uniform and packing list. 2. Sniper teams have two hours to report to battalion. 3. Sniper team leaders report to SEO when all of the team is accounted for.

	4. Sniper team receives a FRAGO from the SEO.
0600	Snipers depart battalion area by air, truck, or road march.
0800	Sniper teams arrive at range. 1. Sniper teams receive range or safety briefing. 2. Snipers receive issued ammunition. 3. Snipers zero weapons. 4. Sniper team's field or record fire on a range with targets positioned from 200 to 900 meters.
1100	Sniper teams depart range; move to concealed movement site by truck, road march, or tactical movement by teams.
1200	Sniper teams arrive at concealed movement site. 1. Sniper teams receive briefing. 2. Site should be 800 to 1,000 meters long. Observer-instructor acts as a target at one end. Site has-- • Field table • M22 binoculars • M144 observation telescope • 8-inch square black panels with white, 5-inch numbers painted on them • two radios, one each for the observer and the assistant trainer.

	3. Sniper has four hours to move into his FFP, 50 to 200 meters from observer-instructor, and fire his first shot. 4. Sniper has 30 seconds to identify number. 5. Sniper fires the second shot. NOTE: All information is to be recorded in the sniper data book. 6. The entire exercise is conducted without the sniper being detected by the observer-instructor.
1600	Sniper teams depart for day or night land navigation exercise. 1. Sniper teams start the exercise from a concealed movement site. 2. Sniper teams are required to move to three different points. At each point, they will perform one of the following: • Draw a military sketch. • Draw a range card. • Do a target detection exercise. • Collect information and data. 3. All movement is performed without being detected.
2000	Night navigation exercise. 1. Sniper teams start the exercise from the command post. 2. They move undetected to three different points.

	3. They perform a detection exercise with the use of NVDs. 4. They record all information in the sniper data book. 5. After collecting necessary data, they move to an extraction point and construct a sniper hide position. They will prepare for target reduction.
0500 to 0600	Target reduction. 1. Upon target reduction time, the sniper team prepares for extraction. 2. At extraction time, they return to the battalion area. 3. The SEO debriefs the sniper team. 4. The SEO conducts an after-action review (AAR).
NOTE: A written test could also be given as part of the EDRE.	

RECORD FIRE TABLES

9-62. In accordance with DA Pamphlet 350-38, sniper qualification should occur quarterly.

NOTE: Laser rangefinders are prohibited during qualification firing.

M24 SNIPER WEAPON SYSTEM QUALIFICATION

9-63. Sniper Firing Tables I (DA Form 7643-R), II (DA Form 7644-R), and III (DA Form 7645-R) identify the qualification standards for the M24 SWS. These tables will operate off of a 300-point system (100 possible points per table). Table 9-9 shows the qualification standards.

NOTE: A blank copy of these forms are provided at the back of this manual for local reproduction on 8 ½- by 11-inch paper.

Table 9-9. Qualification standards.

Marksman	210-237
Sharpshooter	240-267
Expert	270-300

Sniper Firing Table I

9-64. Trainers use Sniper Firing Table I to grade target acquisition, range estimation, and weapon manipulation.

Targets

9-65. Sniper Firing Table I consists of 10 target engagements with 20 rounds between 300 and 800 meters.

NOTE: Profile targets (14- by 40-inch) are used out to 500 meters. Frontal targets (20- by 40- inch) are used beyond 500 meters.

Scoring

9-66. Trainers record the sniper's performance on DA Form 7643-R (Sniper Firing Table I, Stationary Unknown Distance Targets—M24—Day [Mil-Dot Reticle Scope and AN/PVS-10]; shown in Figure 9-5). Trainers score the sniper's performance using the scoring criteria outlined in Table 9-10. The sniper must complete the firing table within 30 minutes. The sniper must earn at least 70 out of 100 possible points to pass.

Table 9-10. Sniper Firing Table I scoring criteria.

ACTION	POINTS RECEIVED
First-round hit	10
Second-round hit	5
Sniper misses on both tries	0

SNIPER FIRING TABLE I
STATIONARY UNKNOWN DISTANCE TARGETS
M24--DAY
(MIL-DOT RETICLE SCOPE AND AN/PVS-10)

For use of this form, see FM 3-22.10; the proponent agency is TRADOC.

EXERCISE NUMBER *(CHECK ONE)* QUAL 1 [X] QUAL 2 [ ] RETRAIN [ ] QUAL 3 [ ]

SNIPER NAME	LANE	DATE *(YYYYMMDD)*
ZANE BRADSHAW	#1	20091208
SPOTTER NAME	**UNIT**	**WEATHER/VISIBILITY**
JAMES MORELLO	A CO 1/501ST	CLEAR

SCORING CHART

The trainer records the first or second round hits in the appropriate column. Then, he totals each column.

TARGET [a]		FIRST ROUND HITS	SECOND ROUND HITS	MISSES
ID	RANGE (M)			
1	310	✓		
2	525	✓		
3	680	✓		
4	401		✓	
5	785	✓		
6	362	✓		
7	508	✓		
8	615		✓	
9	471	✓		
10	600	✓		
	TOTAL HITS	8	2	Ø

RATING CALCULATOR

	80	FIRST ROUND HITS X 10
+	10	SECOND ROUND HITS X 5
=	90	TOTAL POINTS

RATING SCALE

70 TO 100 TOTAL POINTS = PASS [X]

0 TO 65 TOTAL POINTS = FAIL [ ]

LEGEND

a. Trainer records the target ID number or letter and the range to the target.

b. Sniper School only: Sniper initials below to acknowledge that -

- o He has received mentoring on performance.
- o He has been given the opportunity to choose a new spotter.

TRAINER'S INITIALS	DATE *(YYYYMMDD)*	SNIPER'S INITIALS [b]	DATE *(YYYYMMDD)*
AED	20091208	ZSB	20091208

EXAMPLE

Figure 9-5. Example completed DA Form 7643-R (Sniper Firing Table I, Stationary Unknown Distance Targets—M24—Day [Mil-Dot Reticle Scope and AN/PVS-10]).

Sniper Firing Table II

9-67. Trainers use Sniper Firing Table II to grade target acquisition.

Targets

9-68. Sniper Firing Table II consists of 20 target engagements with 20 rounds (5 snap and 15 moving at 2 feet per second) at ranges between 300 and 600 meters.

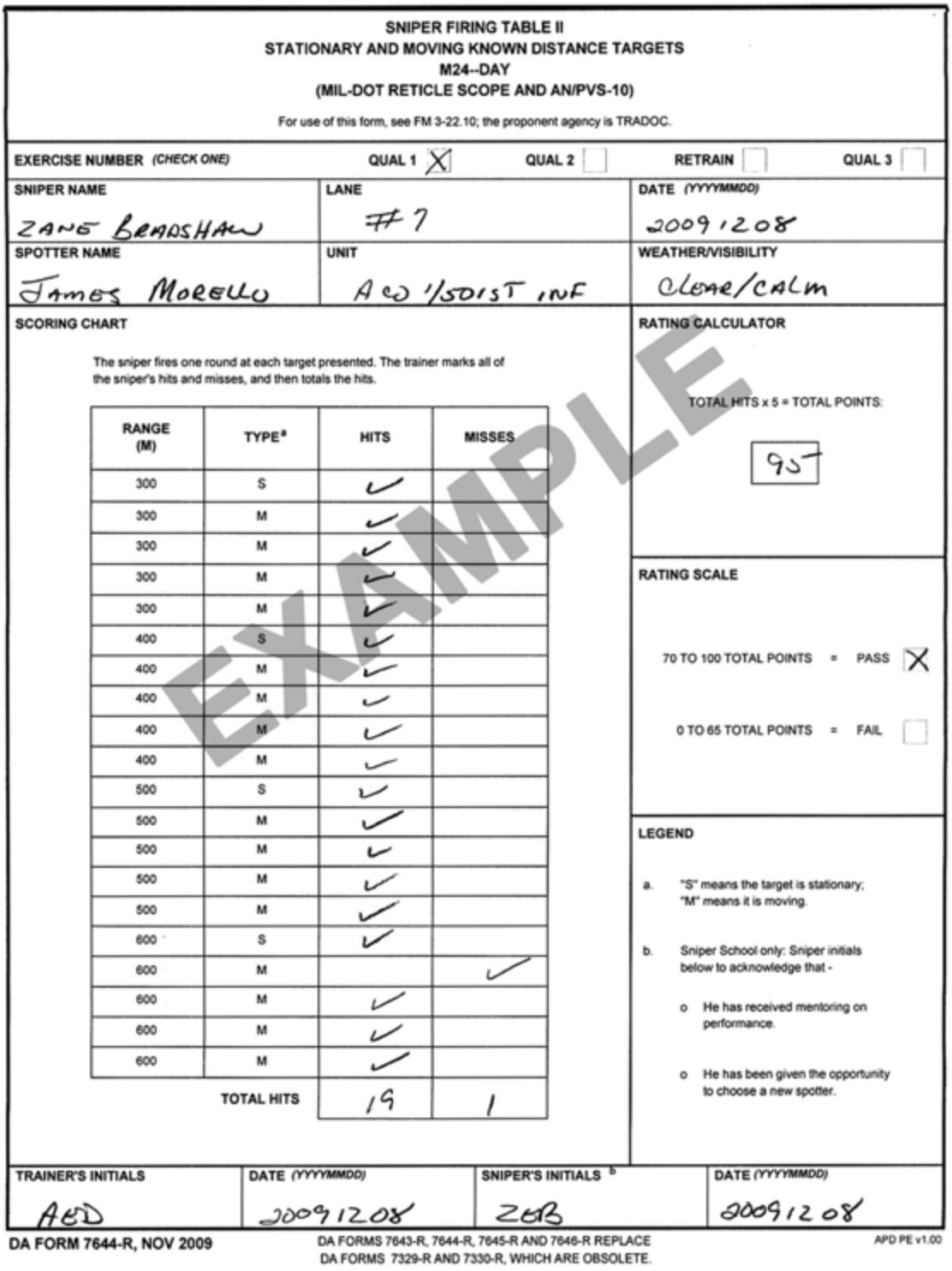
NOTE: Profile targets are used as the moving targets, and F-type silhouettes as stationary targets.

Scoring

9-69. Trainers record the sniper's performance on DA Form 7644-R (Sniper Firing Table II, Stationary and Moving Known Distance Targets—M24—Day [Mil-Dot Reticle Scope and AN/PVS-10], shown in Figure 9-6). Trainers score the sniper’s performance using the scoring criteria outlined in Table 9-11. The sniper must complete the firing table within 30 minutes. The sniper must earn at least 70 out of 100 possible points to pass.

Table 9-11. Sniper Firing Table II scoring criteria.

ACTION	POINTS RECEIVED
First-round hit	5
Miss	0



SNIPER FIRING TABLE II
STATIONARY AND MOVING KNOWN DISTANCE TARGETS
M24--DAY
(MIL-DOT RETICLE SCOPE AND AN/PVS-10)

For use of this form, see FM 3-22.10; the proponent agency is TRADOC.

EXERCISE NUMBER (CHECK ONE) QUAL 1 [X] QUAL 2 [ ] RETRAIN [ ] QUAL 3 [ ]

SNIPER NAME	LANE	DATE (YYYYMMDD)
ZANE BRADSHAW	#7	20091208
SPOTTER NAME	**UNIT**	**WEATHER/VISIBILITY**
JAMES MORELLO	A CO 1/501ST INF	CLEAR/CALM

SCORING CHART

The sniper fires one round at each target presented. The trainer marks all of the sniper's hits and misses, and then totals the hits.

RANGE (M)	TYPE[a]	HITS	MISSES
300	S	✓	
300	M	✓	
300	M	✓	
300	M	✓	
300	M	✓	
400	S	✓	
400	M	✓	
400	M	✓	
400	M	✓	
400	M	✓	
500	S	✓	
500	M	✓	
500	M	✓	
500	M	✓	
500	M	✓	
600	S	✓	
600	M		✓
600	M	✓	
600	M	✓	
600	M	✓	
	TOTAL HITS	19	1

RATING CALCULATOR

TOTAL HITS x 5 = TOTAL POINTS:

95

RATING SCALE

70 TO 100 TOTAL POINTS = PASS [X]

0 TO 65 TOTAL POINTS = FAIL [ ]

LEGEND

a. "S" means the target is stationary; "M" means it is moving.

b. Sniper School only: Sniper initials below to acknowledge that -

- He has received mentoring on performance.
- He has been given the opportunity to choose a new spotter.

TRAINER'S INITIALS	DATE (YYYYMMDD)	SNIPER'S INITIALS [b]	DATE (YYYYMMDD)
AED	20091208	ZAB	20091208

DA FORM 7644-R, NOV 2009 — DA FORMS 7643-R, 7644-R, 7645-R AND 7646-R REPLACE DA FORMS 7329-R AND 7330-R, WHICH ARE OBSOLETE. — APD PE v1.00

EXAMPLE

Figure 9-6. Example completed DA Form 7644-R (Sniper Firing Table II, Stationary and Moving Known Distance Targets—M24—Day [Mil-Dot Reticle Scope and AN/PVS-10]).

Sniper Firing Table III

9-70. Trainers use Sniper Firing Table III to grade target acquisition, speed estimation, and weapon manipulation during limited visibility.

Targets

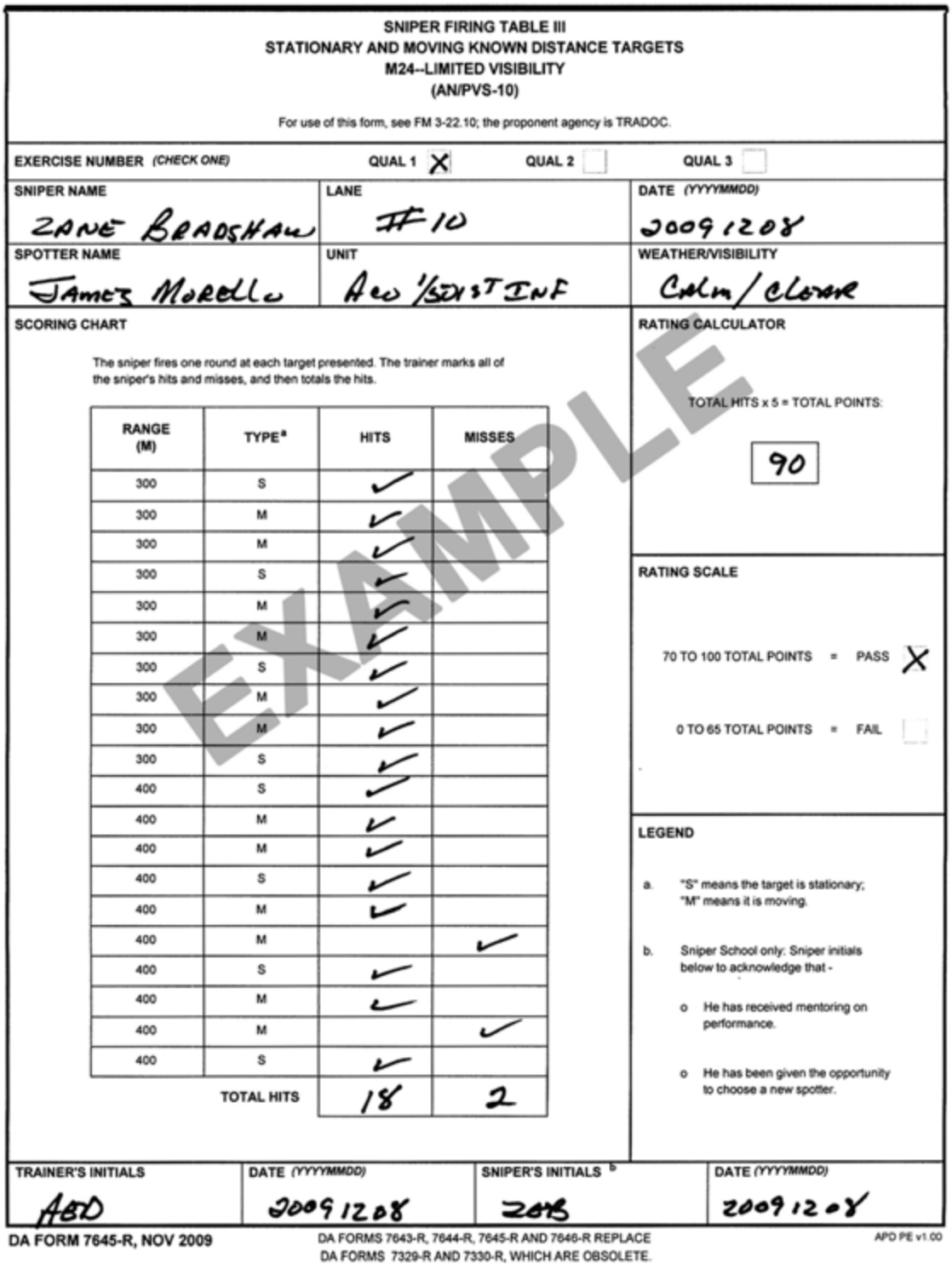
9-71. Sniper Firing Table III consists of 20 target engagements with 20 rounds during limited visibility (5 snap and 15 moving at 2 feet per second) at ranges between 300 and 400 meters (or yards, depending on range restrictions).

Scoring

9-72. Trainers record the sniper's performance on DA Form 7645-R (Sniper Firing Table III, Stationary and Moving Known Distance Targets—M24—Limited Visibility [AN/PVS-10], shown in Figure 9-7). Trainers score the sniper’s performance using the scoring criteria outlined in Table 9-12. The sniper must complete the firing table within 30 minutes. The sniper must earn at least 70 out of 100 possible points to pass.

Table 9-12. Sniper Firing Table III scoring criteria.

ACTION	POINTS RECEIVED
First-round hit	5
Miss	0



SNIPER FIRING TABLE III
STATIONARY AND MOVING KNOWN DISTANCE TARGETS
M24--LIMITED VISIBILITY
(AN/PVS-10)

For use of this form, see FM 3-22.10; the proponent agency is TRADOC.

EXERCISE NUMBER (CHECK ONE) QUAL 1 X QUAL 2 QUAL 3

SNIPER NAME: ZANE BRADSHAW
LANE: #10
DATE (YYYYMMDD): 20091208
SPOTTER NAME: JAMES MORELLO
UNIT: A CO 1/501ST INF
WEATHER/VISIBILITY: CALM / CLEAR

SCORING CHART

The sniper fires one round at each target presented. The trainer marks all of the sniper's hits and misses, and then totals the hits.

RANGE (M)	TYPE[a]	HITS	MISSES
300	S	✓	
300	M	✓	
300	M	✓	
300	S	✓	
300	M	✓	
300	M	✓	
300	S	✓	
300	M	✓	
300	M	✓	
300	S	✓	
400	S	✓	
400	M	✓	
400	M	✓	
400	S	✓	
400	M	✓	
400	M		✓
400	S	✓	
400	M	✓	
400	M		✓
400	S	✓	
	TOTAL HITS	18	2

RATING CALCULATOR

TOTAL HITS x 5 = TOTAL POINTS: 90

RATING SCALE

70 TO 100 TOTAL POINTS = PASS X

0 TO 65 TOTAL POINTS = FAIL

LEGEND

a. "S" means the target is stationary; "M" means it is moving.

b. Sniper School only: Sniper initials below to acknowledge that -

- He has received mentoring on performance.
- He has been given the opportunity to choose a new spotter.

TRAINER'S INITIALS	DATE (YYYYMMDD)	SNIPER'S INITIALS [b]	DATE (YYYYMMDD)
ABD	20091208	ZAB	20091208

DA FORM 7645-R, NOV 2009 — DA FORMS 7643-R, 7644-R, 7645-R AND 7646-R REPLACE DA FORMS 7329-R AND 7330-R, WHICH ARE OBSOLETE. — APD PE v1.00

EXAMPLE

Figure 9-7. Example completed DA Form 7645-R (Sniper Firing Table III, Stationary and Moving

Known Distance Targets—M24—Limited Visibility [AN/PVS-10]).

M110 SEMIAUTOMATIC SNIPER SYSTEM QUALIFICATION

9-73. Sniper Firing Tables V (DA Form 7668-R), VI (DA Form 7669-R), and VII (DA Form 7670-R) identify the qualification standards for the M110 SASS. These tables will operate off of a 300-point system (100 possible points per table). Table 9-13 shows the qualification standards.

NOTE: A blank copy of these forms are provided at the back of this manual for local reproduction on 8 ½- by 11-inch paper.

Table 9-13. Qualification standards.

Marksman	210-237
Sharpshooter	240-267
Expert	270-300

Sniper Firing Table V

9-74. Trainers use Sniper Firing Table V to grade target acquisition, range estimation, and weapon manipulation.

Targets

9-75. Sniper Firing Table V consists of 20 target engagements with 20 rounds between 300 and 650 meters.

NOTE: This table consists of multiple targets and limited target exposures using elevation and windage holdoff from a baseline of 300.

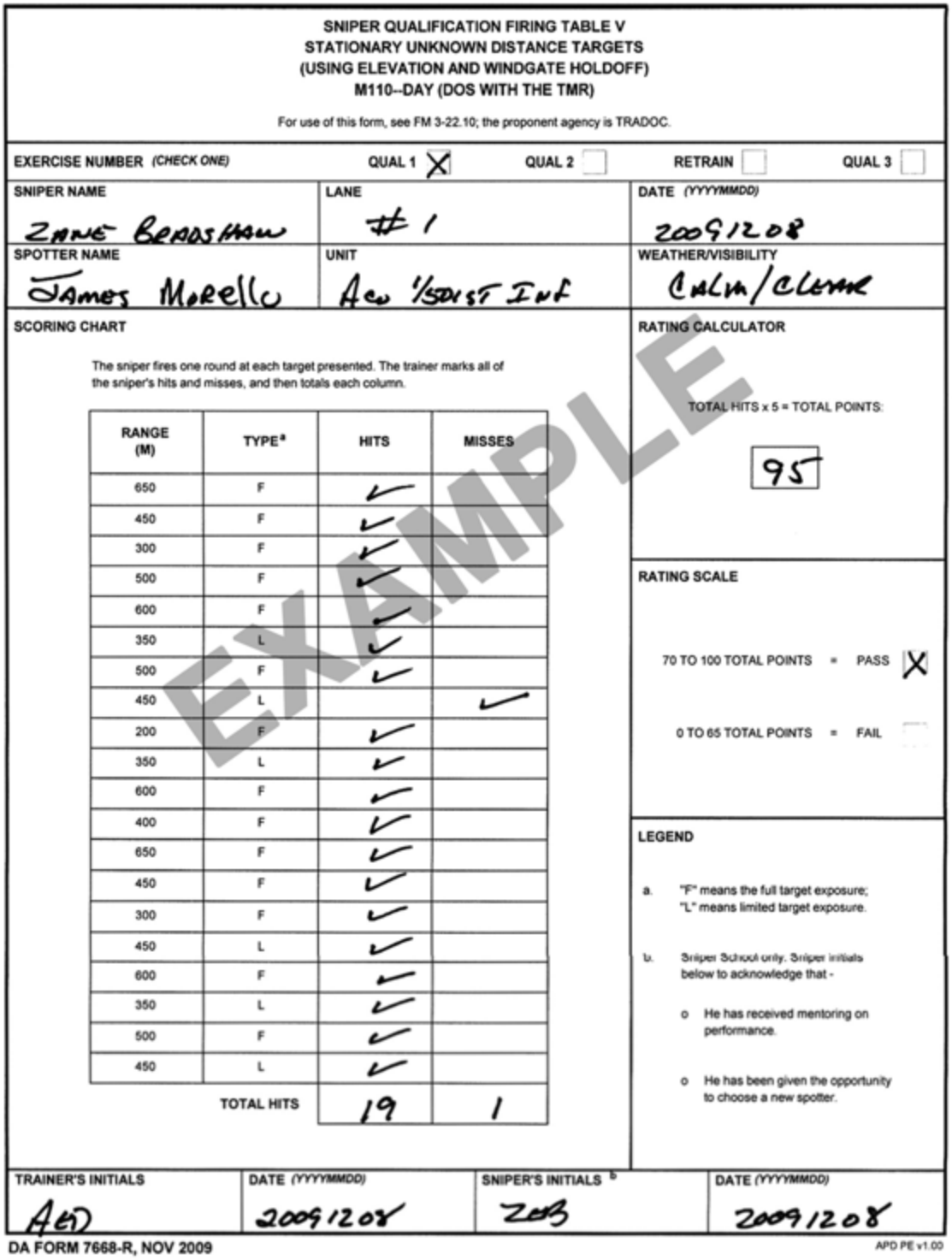
Scoring

9-76. Trainers record the sniper's performance on DA Form 7668-R (Sniper Qualification Firing Table V, Stationary Unknown Distance Targets [Using

Elevation and Windage Holdoff]—M110—Day [DOS with the TMR], shown in Figure 9-8). Trainers score the sniper's performance using the scoring criteria outlined in Table 9-14. The sniper must complete the firing table within 30 minutes. The sniper must earn at least 70 out of 100 possible points to pass.

Table 9-14. Sniper Firing Table V scoring criteria.

ACTION	POINTS RECEIVED
First-round hit	5
Miss	0



SNIPER QUALIFICATION FIRING TABLE V
STATIONARY UNKNOWN DISTANCE TARGETS
(USING ELEVATION AND WINDGATE HOLDOFF)
M110--DAY (DOS WITH THE TMR)

For use of this form, see FM 3-22.10; the proponent agency is TRADOC.

EXERCISE NUMBER (CHECK ONE) QUAL 1 X QUAL 2 RETRAIN QUAL 3

SNIPER NAME	LANE	DATE (YYYYMMDD)
Zane Bradshaw	#1	20091208
SPOTTER NAME	**UNIT**	**WEATHER/VISIBILITY**
James Morello	Aco 1/50th Inf	Calm/Clear

SCORING CHART

The sniper fires one round at each target presented. The trainer marks all of the sniper's hits and misses, and then totals each column.

RANGE (M)	TYPE[a]	HITS	MISSES
650	F	✓	
450	F	✓	
300	F	✓	
500	F	✓	
600	F	✓	
350	L	✓	
500	F	✓	
450	L		✓
200	F	✓	
350	L	✓	
600	F	✓	
400	F	✓	
650	F	✓	
450	F	✓	
300	F	✓	
450	L	✓	
600	F	✓	
350	L	✓	
500	F	✓	
450	L	✓	
	TOTAL HITS	19	1

RATING CALCULATOR

TOTAL HITS x 5 = TOTAL POINTS:

95

RATING SCALE

70 TO 100 TOTAL POINTS = PASS X

0 TO 65 TOTAL POINTS = FAIL

LEGEND

a. "F" means the full target exposure; "L" means limited target exposure.

b. Sniper School only. Sniper initials below to acknowledge that -

- He has received mentoring on performance.
- He has been given the opportunity to choose a new spotter.

TRAINER'S INITIALS	DATE (YYYYMMDD)	SNIPER'S INITIALS [b]	DATE (YYYYMMDD)
AED	20091208	ZBS	20091208

DA FORM 7668-R, NOV 2009 APD PE v1.00

EXAMPLE

Figure 9-8. Example completed DA Form 7668-R (Sniper Qualification Firing Table V, Stationary Unknown Distance Targets [Using Elevation and Windage Holdoff]—M110—Day [DOS with the TMR]).

Sniper Firing Table VI

9-77. Trainers use Sniper Firing Table VI to grade target acquisition.

Targets

9-78. Sniper Firing Table VI consists of 20 target engagements with 20 rounds (4 snap and 16 moving at 4 feet per second) at ranges between 100 and 400 yards.

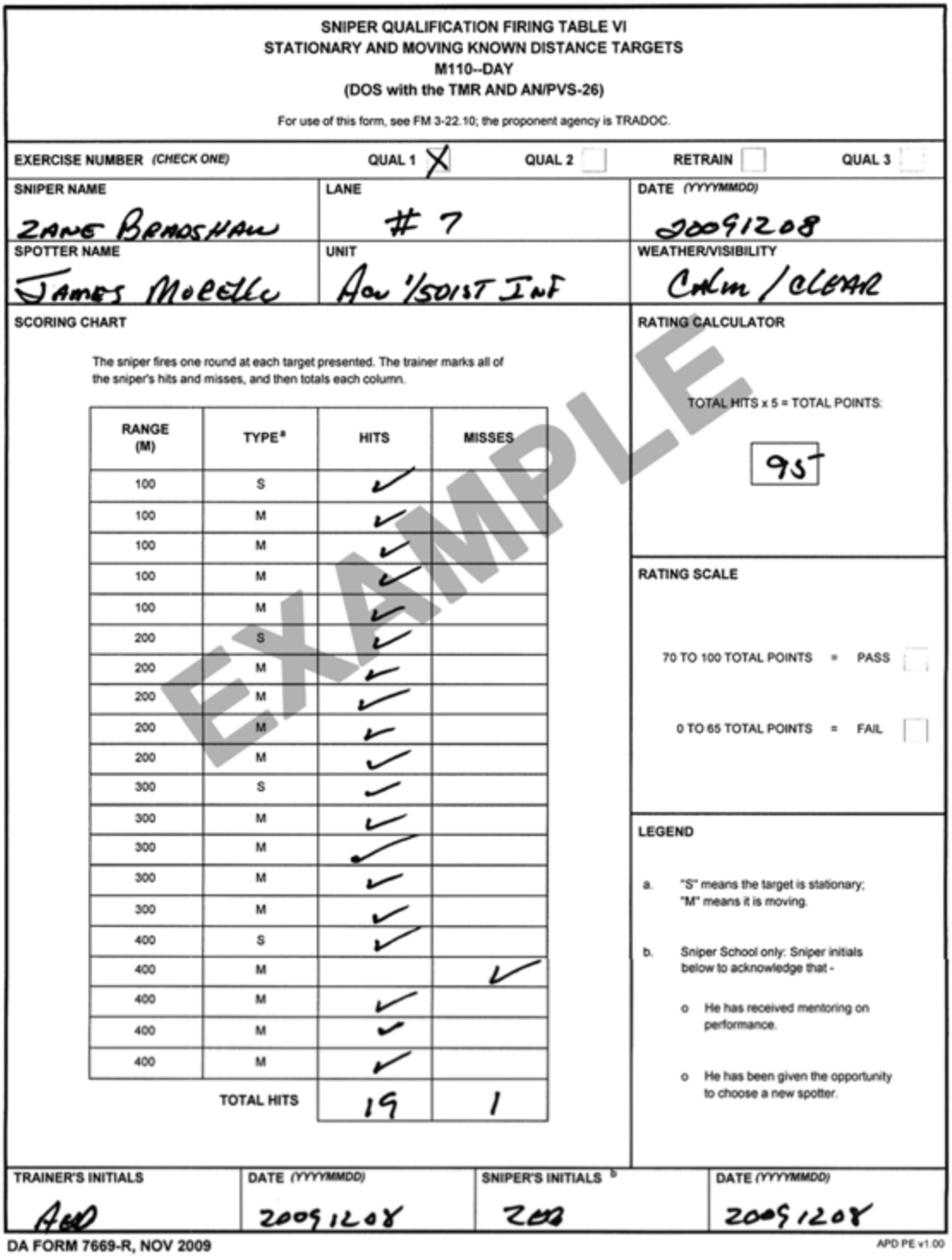
NOTE: Profile targets are used as the moving targets, and F-type silhouettes as stationary targets.

Scoring

9-79. Trainers record the sniper's performance on DA Form 7669-R (Sniper Firing Table VI, Stationary and Moving Known Distance Targets—M110—Day [DOS with the TMR and AN/PVS-26], shown in Figure 9-9). Trainers score the sniper’s performance using the scoring criteria outlined in Table 9-15. The sniper must complete the firing table within 30 minutes. The sniper must earn at least 70 out of 100 possible points to pass.

Table 9-15. Sniper Firing Table VI scoring criteria.

ACTION	POINTS RECEIVED
First-round hit	5
Miss	0



SNIPER QUALIFICATION FIRING TABLE VI
STATIONARY AND MOVING KNOWN DISTANCE TARGETS
M110--DAY
(DOS with the TMR AND AN/PVS-26)

For use of this form, see FM 3-22.10; the proponent agency is TRADOC.

EXERCISE NUMBER (CHECK ONE) QUAL 1 X QUAL 2 RETRAIN QUAL 3

SNIPER NAME	LANE	DATE (YYYYMMDD)
ZANE BRADSHAW	# 7	20091208
SPOTTER NAME	**UNIT**	**WEATHER/VISIBILITY**
JAMES MORELLI	A Co 1/501ST INF	CALM / CLEAR

SCORING CHART

The sniper fires one round at each target presented. The trainer marks all of the sniper's hits and misses, and then totals each column.

RANGE (M)	TYPE[a]	HITS	MISSES
100	S	✓	
100	M	✓	
100	M	✓	
100	M	✓	
100	M	✓	
200	S	✓	
200	M	✓	
200	M	✓	
200	M	✓	
200	M	✓	
300	S	✓	
300	M	✓	
300	M	✓	
300	M	✓	
300	M	✓	
400	S	✓	
400	M		✓
400	M	✓	
400	M	✓	
400	M	✓	
	TOTAL HITS	19	1

RATING CALCULATOR

TOTAL HITS x 5 = TOTAL POINTS:

95

RATING SCALE

70 TO 100 TOTAL POINTS = PASS ☐

0 TO 65 TOTAL POINTS = FAIL ☐

LEGEND

a. "S" means the target is stationary; "M" means it is moving.

b. Sniper School only: Sniper initials below to acknowledge that -

- He has received mentoring on performance.
- He has been given the opportunity to choose a new spotter.

TRAINER'S INITIALS	DATE (YYYYMMDD)	SNIPER'S INITIALS [b]	DATE (YYYYMMDD)
AHD	20091208	ZBB	20091208

DA FORM 7669-R, NOV 2009 APD PE v1.00

EXAMPLE

Figure 9-9. Example completed DA Form 7669-R (Sniper Firing Table VI, Stationary and Moving

Known Distance Targets—M110—Day [DOS with the TMR and AN/PVS-26]).

Sniper Firing Table VII

9-80. Trainers use Sniper Firing Table VII to grade target acquisition, speed estimation, and weapon manipulation during limited visibility.

Targets

9-81. Sniper Firing Table VII consists of 20 target engagements with 20 rounds during limited visibility (5 snap and 15 moving at 2 feet per second) at ranges between 300 and 400 yards.

Scoring

9-82. Trainers record the sniper's performance on DA Form 7670-R (Sniper Firing Table VII, Stationary and Moving Known Distance Targets—M110—Limited Visibility [AN/PVS-26], shown in Figure 9-10). Trainers score the sniper’s performance using the scoring criteria outlined in Table 9-16. The sniper must complete the firing table within 30 minutes. The sniper must earn at least 70 out of 100 possible points to pass.

Table 9-16. Sniper Firing Table VII scoring criteria.

ACTION	POINTS RECEIVED
First-round hit	5
Miss	0

SNIPER FIRING TABLE VII
STATIONARY AND MOVING KNOWN DISTANCE TARGETS
M110--LIMITED VISIBILITY
(AN/PVS-26)

For use of this form, see FM 3-22.10; the proponent agency is TRADOC.

EXERCISE NUMBER *(CHECK ONE)*	QUAL 1 X	QUAL 2	QUAL 3

SNIPER NAME	LANE	DATE *(YYYYMMDD)*
ZANE BRADSHAW	10	20091208
SPOTTER NAME	**UNIT**	**WEATHER/VISIBILITY**
JAMES MORELLO	ACO 1/501ST INF	CALM/CLEAR

SCORING CHART

The sniper fires one round at each target presented. The trainer marks all of the sniper's hits and misses, and then totals each column.

RANGE (M)	TYPE[a]	HITS	MISSES
300	S	✓	
300	M	✓	
300	M	✓	
300	S	✓	
300	M	✓	
300	M	✓	
300	S	✓	
300	M	✓	
300	M	✓	
300	S	✓	
400	S	✓	
400	M	✓	
400	M	✓	
400	S	✓	
400	M	✓	
400	M	✓	
400	S	✓	
400	M	✓	
400	M	✓	
400	S	✓	
	TOTAL HITS	20	

RATING CALCULATOR

TOTAL HITS x 5 = TOTAL POINTS:

100

RATING SCALE

70 TO 100 TOTAL POINTS = PASS X

0 TO 65 TOTAL POINTS = FAIL

LEGEND

a. "S" means the target is stationary; "M" means it is moving.

b. Sniper School only: Sniper initials below to acknowledge that -

- He has received mentoring on performance.
- He has been given the opportunity to choose a new spotter.

TRAINER'S INITIALS	DATE *(YYYYMMDD)*	SNIPER'S INITIALS [b]	DATE *(YYYYMMDD)*
NAH	20091208	ZEB	20091208

DA FORM 7670-R, NOV 2009 APD PE v1.00

EXAMPLE

Figure 9-10. Example completed DA Form 7670-R (Sniper Firing Table VII, Stationary and Moving Known Distance Targets—M110—Limited Visibility [AN/PVS-26]).

M107 LONG-RANGE SNIPER RIFLE QUALIFICATION

9-83. Sniper Firing Table IV is conducted as shown in Table 9-17. The objectives of this qualification include—

- Zero and confirm zero.
- Engage targets of unknown distance.
- Estimate the range.
- Set elevation and windage on scope.
- Engage target.

Table 9-17. Sniper Firing Table IV.

ENGAGEMENT	RANGE	ROUNDS	TYPE OF TARGET
Zero	400 to 600	2	E-Type Silhouette
Confirm zero	500	3	E-Type Silhouette
TARGET NUMBER	RANGE	ROUNDS	TYPE OF TARGET
I	325	2	E-Type Silhouette
2	410	2	E-Type Silhouette
3	590	2	E-Type Silhouette

4	590	2	Stationary
5	680	2	Stationary
6	845	2	Stationary
7	915	2	Stationary
8	960	2	Stationary
9	1,000	2	Missile
10	1,115	2	Stationary
11	1,290	2	Stationary
12	1,200	2	HMMWV-size mover
13	1,380	2	Stationary
14	1,560	2	Stationary
15	1,600	2	Truck flank mover
16	1,775	2	Stationary

17	1,550	2	Stationary
18	1,030	2	Stationary
19	1,000	2	Missile
20	1,660	2	Stationary

Ammunition

9-84. This firing exercise allows 2 rounds to zero (cold bore shot), 3 rounds to confirm zero, and 40 rounds to qualify. The sniper has 2 rounds per target.

Zero and Confirm Zero Procedures

9-85. The scorer selects a target between 400 to 600 meters. He instructs the sniper to zero (cold bore shot) his weapon using two rounds. The sniper estimates the range to the target. He sets the elevation and windage on his scope and fires the first round. If the sniper must adjust the scope, he does so after he fires the second round. To confirm the zero, he then fires another 3 rounds. The trainer randomly picks a target (1 through 20) for the sniper to engage. The sniper estimates the range to the target, sets the elevation and windage on the scope, and fires one round. If he misses, he corrects the scope and fires the second round. He repeats this until he has engaged all 20 targets.

Scoring

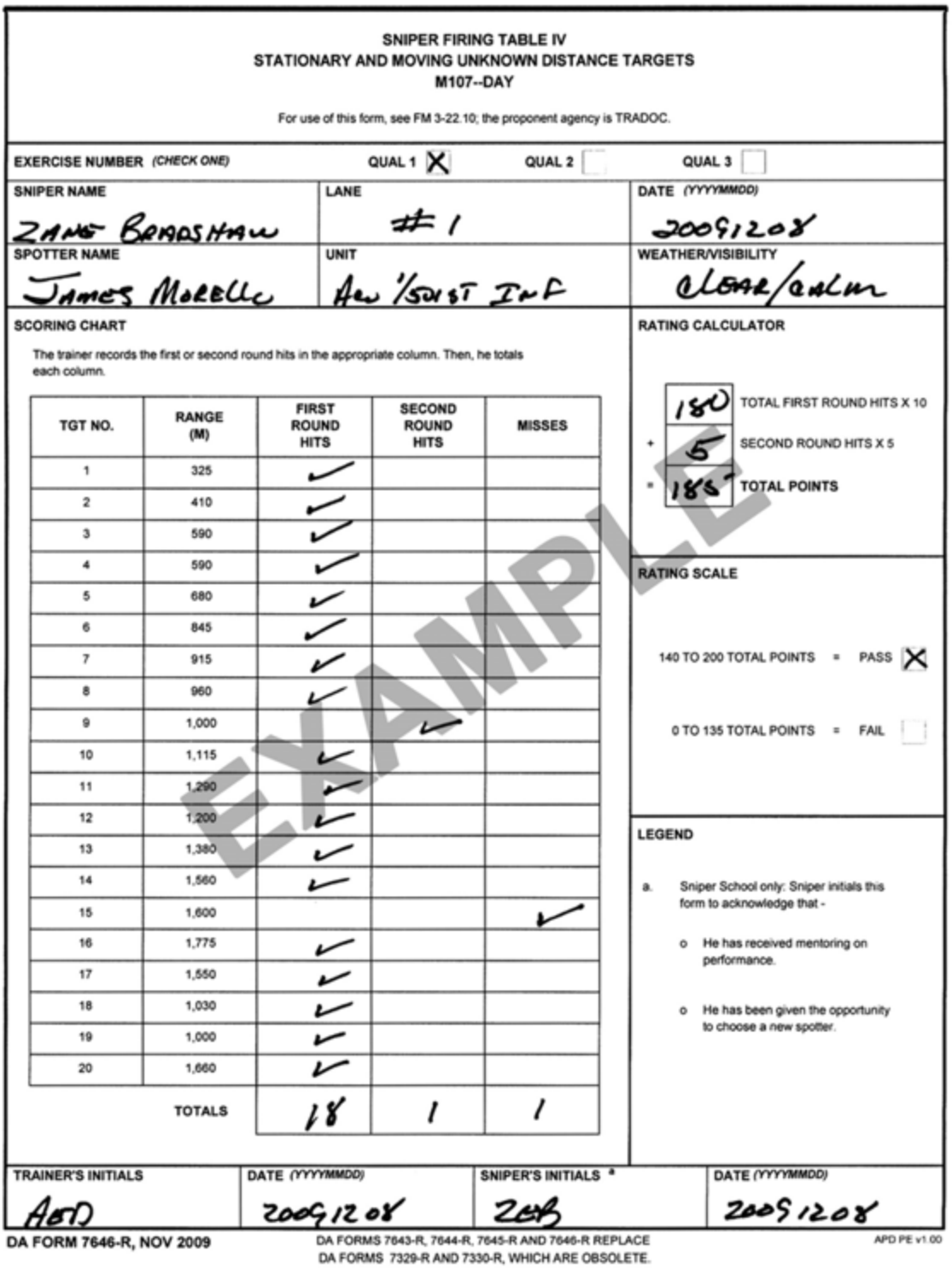
9-86. Trainers use DA Form 7646-R (Sniper Firing Table IV, Stationary and Moving Unknown Distance Targets—M107—Day, shown in Figure 9-11) to score the sniper's performance. Trainers score the sniper's performance using the scoring criteria outlined in Table 9-18. The sniper must complete

the firing table within 30 minutes. The sniper must earn at least 140 out of 200 possible points to pass.

NOTE: A blank copy of this form is provided at the back of this manual for local reproduction on 8 ½- by 11-inch paper.

Table 9-18. Sniper Firing Table IV scoring criteria.

ACTION	POINTS RECEIVED
First-round hit	10
Second-round hit	5
Sniper misses on both tries	0



SNIPER FIRING TABLE IV
STATIONARY AND MOVING UNKNOWN DISTANCE TARGETS
M107--DAY

For use of this form, see FM 3-22.10; the proponent agency is TRADOC.

EXERCISE NUMBER (CHECK ONE) QUAL 1 [X] QUAL 2 [ ] QUAL 3 [ ]

SNIPER NAME	LANE	DATE (YYYYMMDD)
ZANE BRADSHAW	#1	20091208
SPOTTER NAME	**UNIT**	**WEATHER/VISIBILITY**
JAMES MORELLI	A Co 1/506 INF	CLEAR/CALM

SCORING CHART

The trainer records the first or second round hits in the appropriate column. Then, he totals each column.

TGT NO.	RANGE (M)	FIRST ROUND HITS	SECOND ROUND HITS	MISSES
1	325	✓		
2	410	✓		
3	590	✓		
4	590	✓		
5	680	✓		
6	845	✓		
7	915	✓		
8	960	✓		
9	1,000		✓	
10	1,115	✓		
11	1,290	✓		
12	1,200	✓		
13	1,380	✓		
14	1,560	✓		
15	1,600			✓
16	1,775	✓		
17	1,550	✓		
18	1,030	✓		
19	1,000	✓		
20	1,660	✓		
	TOTALS	18	1	1

RATING CALCULATOR

180 TOTAL FIRST ROUND HITS X 10
\+ 5 SECOND ROUND HITS X 5
= 185 TOTAL POINTS

RATING SCALE

140 TO 200 TOTAL POINTS = PASS [X]

0 TO 135 TOTAL POINTS = FAIL [ ]

LEGEND

a. Sniper School only: Sniper initials this form to acknowledge that -

- o He has received mentoring on performance.
- o He has been given the opportunity to choose a new spotter.

TRAINER'S INITIALS	DATE (YYYYMMDD)	SNIPER'S INITIALS [a]	DATE (YYYYMMDD)
AGD	20091208	ZCB	20091208

DA FORM 7646-R, NOV 2009 — DA FORMS 7643-R, 7644-R, 7645-R AND 7646-R REPLACE DA FORMS 7329-R AND 7330-R, WHICH ARE OBSOLETE. — APD PE v1.00

EXAMPLE

Figure 9-11. DA Form 7646-R (Sniper Firing Table IV, Stationary and Moving Unknown Distance Targets—M107—Day).

M24 SNIPER WEAPON SYSTEM MULTIPLE INTEGRATED LASER ENGAGEMENT SYSTEM TRAINING

9-87. This training simulates realistic combat training. In fact, next to actual combat, it is the best way for the sniper to show his effectiveness as a force multiplier.

TRANSMITTER

9-88. The M24 SWS multiple integrated laser engagement system (MILES) transmitter is a modified M16 transmitter. A special mounting bracket attaches the laser transmitter to the right side of the barrel (looking from the butt end), which places it parallel with the line of the bore. The laser beam output has been amplified and tightened to provide precision fire capability out to 1,000 meters.

NOTE: See TM 9-1265-211-10 for component information and instructions on mounting, zeroing, and operation.

TRAINING VALUE

9-89. Using the M24 SWS MILES, the trainer can enhance sustainment training in target engagement.

Selection of Firing Positions

9-90. Due to transmitter modifications, the sniper must attain a firing position that affords clear fields of fire. Any obstruction (vegetation, terrain) can prevent a one-shot kill by deflecting or blocking the path of the laser beam. By attaining this type of position, the sniper will improve his observation and firing capabilities.

Target Detection and Selection

9-91. Using MILES against multiple/cluster targets requires the sniper to select the target that will have the greatest effect on the enemy. The trainer

provides instant feedback on the sniper's performance. Situations such as bunkers, hostage situations, and urban firing may be created. The hit-miss indicating aspects of MILES are invaluable in this type of training.

Range Estimation

9-92. The sniper must be highly skilled in range estimation to properly use the M110 SASS or M24 SWS. The trainer's evaluation of this ability is as simple as the sniper pulling the trigger. When the range to the target is properly computed and elevation dialed on the M3A, one shot, either hit or miss, indicates a strength or weakness in the sniper's range estimation ability (if the fundamentals of marksmanship were properly applied).

NOTE: See Chapter 4 for more information about range estimation.

Marksmanship

9-93. A target hit (kill) with MILES is the same as one with live ammunition. Applying marksmanship fundamentals results in a first-round kill.

LIMITATIONS

9-94. The concept of MILES is to provide realistic training; however, MILES is limited in its ability to train the sniper in long-range precision fire.

Lack of External Ballistics Training

9-95. A laser is a concentrated beam of light emitted by the MILES transmitter. It travels from the sniper's weapon undisturbed by outside forces such as temperature, humidity, and wind. Lack of these effects may lull the sniper into a false sense of confidence. The trainer should constantly reinforce the importance of these factors. The sniper should note changes that should be applied to compensate for these effects.

Engagement of Moving Targets

9-96. The engagement of moving targets requires the sniper to establish a target lead to compensate for flight time of his bullet. Traveling in excess of 186,000 miles per second (speed of light), the MILES laser nullifies the requirement for target lead. Again, the sniper may be lulled into a false sense of confidence. The trainer should reinforce the principles of moving target engagement by having the sniper note appropriate target lead for the given situation.

Appendix A: Range Safety and Risk Management

All personnel training on a rifle range should be briefed on the safety and local requirements of that range. Information may be added to conform to local requirements and regulations. AR 385-10, AR 385-63, and FM 5-19 should be reviewed by all range personnel before operating any range.

ALL MARKSMANSHIP TRAINING

A-1. The following safety precautions must be observed during all marksmanship training:

- During firing, display a red flag (day) or a red light (night) at the entrance to the range, or at another prominent location on the range.

- Always assume that every weapon is loaded until it has been thoroughly examined and cleared (found to contain no ammunition in the magazine, chamber, or barrel).

- Mark firing limits with red-and-white-striped poles, and place them where all firers can see them.

- Keep muzzles of weapons that are about to be fired clear of obstructions.

- Keep all weapons in a prescribed area and, when they are not in use, observe all of the safeguards described in this appendix.

- Prohibit smoking near ammunition, explosives, or flammables.

- Wear hearing protection devices during firing.

BEFORE RANGE FIRE

A-2. Before range training begins—

- Set up all prescribed roadblocks and barriers, and post necessary guards.

- Check all weapons to ensure that they are clear of ammunition and obstructions, that the bolts are open, and that the safety selector levers are in the SAFE position.

- Brief all personnel on the firing limits of the range and firing lanes.

- Obtain range clearance from the installation range control office.

- Before firing, check the downrange area to ensure that it is clear of all personnel and equipment.

- Keep a complete first-aid kit on the range.

- Place medical personnel on or near the range so you can contact them quickly.

- Have a commissioned or noncommissioned officer check all weapons to ensure they are operational.

- Handle weapons only on command of the tower operator or the officer in charge (OIC).

- Draw ammunition, and issue it only on the command of the OIC. When two or more lots of ammunition are used for firing, the OIC must ensure the lots are separate and properly marked. In case of an accident or malfunction, this allows for identification by lot numbers.

- Protect all ammunition from the direct rays of the sun.

- Allow personnel to move forward of the firing line only with the permission of the tower operator, safety officer, or OIC.

DURING RANGE FIRE, DAY OR NIGHT

A-3. During all range training—

- Immediately order CEASE FIRE if you note an unsafe condition during firing. Do not resume firing until the OIC directs.

- During firing, all personnel on the range must remember the danger of moving forward of the firing line to score their targets. Before the firing line is cleared and anyone is allowed to move forward, the OIC or the safety officer must clear all weapons.

- The OIC inspects each weapon that has fired on the firing line by ensuring the bolt is locked to the rear and the safety selector lever is in the SAFE position.

DURING NIGHT RANGE FIRE

A-4. During night fire training on the range—

- Check the downrange area to ensure all personnel and equipment are clear of the area before firing. Over a public address system, ask three times, “Is there anyone downrange?” Pause each time to permit a response.

- In addition to the red flag, display a blinking red light at the entrance to the range or at another prominent location.

- Mount two red lights on the striped poles that mark the right and left limits of fire. These lights must be visible to all firers.

- Tell Soldiers to remain in position until told to move by the OIC.

AFTER RANGE FIRE

A-5. After range fire—

- Have safety personnel inspect all weapons to ensure that they are clear.

- Check to see if the Soldiers have any brass, links, or live ammunition.

- When weapons have been cleared, keep them in a prescribed area with the bolt open or locked to the rear, and the safety selector lever in the SAFE position.

PERSONNEL AND DUTIES

A-6. To provide a safe and efficient range operation and effective instruction, certain duties may be required of personnel. The personnel may include—

- OIC.
- Range safety officer.
- Noncommissioned officer in charge (NCOIC).
- Ammunition detail.
- Armorer.
- Assistant instructor.
- Medical personnel.
- Control tower operators.
- Maintenance detail.

OFFICER IN CHARGE

A-7. The OIC is responsible for the overall operation of the range before, during, and after live-firing.

RANGE SAFETY OFFICER

A-8. The range safety officer—

- Is responsible for the safe operation of the range.

- Conducts a safety orientation before each scheduled live-fire exercise.

- Ensures that a brass and ammunition check is made before the unit leaves the range.

- Ensures that all personnel comply with the safety regulations and procedures prescribed for the conduct of a live-fire exercise.

NOTE: The range safety officer should not be assigned duties other than those of the safety officer.

NONCOMMISSIONED OFFICER IN CHARGE

A-9. The NCOIC assists the OIC and safety officer by performing duties as required; for example, he might supervise enlisted personnel who are supporting the live-fire exercise.

AMMUNITION DETAIL

A-10. This detail is composed of one or more ammunition handlers. The ammunition detail—

- Breaks down, issues, receives, accounts for, and safeguards live ammunition.

- Collects expended ammunition casings and other residue.

ARMORER

A-11. The armorer—

- Repairs rifles.

- Replaces parts.

ASSISTANT INSTRUCTOR

A-12. One assistant instructor is assigned for each one to ten firing points. Each assistant instructor—

- Ensures that all firers observe safety regulations and procedures.
- Assists firers having problems.

MEDICAL PERSONNEL

A-13. Medical personnel provide medical support, as required by regulations governing live-fire exercises.

CONTROL TOWER OPERATORS

A-14. Control tower operators—

- Raise and lower the targets.
- Time the exposures.
- Sound the audible signal.
- Give the fire commands.

NOTE: If possible, two men should be chosen to perform these functions.

MAINTENANCE DETAIL

A-15. This detail should be composed of two segments: one to conduct small arms repair and one to perform minor maintenance on the target-holding mechanisms.

AMMUNITION POSITIONING AND ISSUANCE

A-16. To provide a safe and operational range, the following are recommended procedures for handling ammunition:

- Locate all ammunition for the weapons involved at firing sites outside of the backblast area (when applicable). Store ammunition at a position that minimizes the potential for ignition, explosion, or rapid burning.

- Issue ammunition to Soldiers immediately before scheduled training exercises. Distribute ammunition to Soldiers only when they are on the ready line or firing line.

- Cover all ammunition to protect it from the elements and direct rays of the sun. For proper ventilation, provide air circulation between the ammunition and cover.

- Limit the unpacking of ammunition at the firing line to the minimum number of rounds needed. Retain packaging material until firing is complete. Units do not burn wooden containers or indiscriminately fire ammunition to preclude return to a storage site.

COMPOSITE RISK MANAGEMENT

A-17. Composite risk management (CRM) is a decision-making process used to mitigate risks associated with all hazards that have the potential to injure or kill personnel, damage or destroy equipment, or otherwise impact mission effectiveness. The guiding principles of CRM are as follows:

- Integrate CRM into all phases of the mission and operations.

- Make risk decisions at the appropriate level.

- Accept no unnecessary risk.

- Apply the process cyclically and continuously.

- Do not be risk averse.

A-18. CRM is a five-step process:

(1) Identify hazards.

(2) Assess hazards to determine risk.

(3) Develop controls, and make risk decisions.

(4) Implement controls.

(5) Supervise and evaluate.

NOTE: Steps 1 and 2 are assessment steps; Steps 3 through 5 are management steps.

STEP 1–IDENTIFY HAZARDS

A-19. Hazards may arise from any number of areas. They can be associated with enemy activity, accident potential, weather or environmental conditions, health, sanitation, behavior, and/or materiel or equipment. METT-TC factors serve as a standard format for identifying hazards, on- or off-duty.

A-20. CRM does not differentiate between the sources of the hazard. The loss of personnel, equipment, or materiel due to any hazard has the same disruptive impact on readiness or mission capabilities, no matter what the source.

STEP 2–ASSESS HAZARDS TO DETERMINE RISK

A-21. During mission analysis, course of action (COA) development, or analysis, rehearsal, and execution steps of the military decision-making process (MDMP), commanders assess hazards and assign risk in terms of probability and severity of adverse impact. During their assessment, they must consider both mission- and non-mission-related aspects that may have an impact. The end result of this assessment is an initial estimate of risk for each identified hazard as determined from the standardized application of the risk assessment matrix.

A-22. There are three substeps in this step:

(1) Assess the probability of an event or occurrence.

(2) Estimate the expected result or severity of an event or occurrence.

(3) Determine the level of risk using the standard risk assessment matrix.

Assess the Probability of an Event or Occurrence

A-23. Probability is the likelihood an event will occur based on prior experience. The probability levels estimated for each hazard are based on the mission, COA, or frequency of a similar event. There are five levels of probability (Table A-1):

- Frequent.
- Likely.
- Occasional.
- Seldom.
- Unlikely.

Table A-1. Five levels of probability.

LEVEL OF PROBABILITY	EXPLANATION
Frequent	Occurs very often, known to happen regularly.
Likely	Occurs several times, a common occurrence.
Occasional	Occurs sporadically, but is not common.

Seldom	Remotely possible, could occur at some time.
Unlikely	Can assume will not occur, but not impossible.

Estimate the Expected Result or Severity of an Event or Occurrence

A-24. Severity is the degree to which an incident will impact combat power, mission capability, or readiness. The degree of severity estimated for each hazard is based on the results of similar events. Severity is addressed in the four levels used on the risk assessment worksheet (Table A-2):

- Catastrophic.
- Critical.
- Marginal.
- Negligible.

Table A-2. Four levels of severity.

LEVEL OF SEVERITY	EXPLANATION
Catastrophic	Complete mission failure or loss of ability to accomplish a mission. Death or permanent total disability. Loss of major or mission-critical systems or equipment. Major property or facility damage. Severe environmental damage. Mission-critical security failure. Unacceptable collateral damage.

Critical	Severely degraded mission capability or unit readiness. Permanent partial disability or temporary total disability exceeding three months time. Extensive major damage to equipment or systems. Significant damage to property or the environment. Security failure. Significant collateral damage.
Marginal	Degraded mission capability or unit readiness. Minor damage to equipment or systems, property, or the environment. Lost days due to injury or illness, not exceeding three months. Minor damage to property or the environment.
Negligible	Little or no adverse impact on mission capability. First aid or minor medical treatment. Slight equipment or system damage, but fully functional or serviceable. Little or no property or environmental damage.

Determine the Level of Risk Using the Standard Risk Assessment Matrix

A-25. Using the standard risk assessment matrix (Table A-3), commanders convert probability and severity for each identified hazard into a specified level of risk. All accepted residual risk must be approved at the appropriate level of command.

NOTE: This assessment is an estimate, not an absolute. It may or may not be indicative of the relative danger of a given operation, activity, or event.

Table A-3. Risk assessment matrix.

RISK ASSESSMENT MATRIX						
Severity		Probability				
		Frequent A	Likely B	Occasional C	Seldom D	Unlikely E
Catastrophic	I	E	E	H	H	M
Critical	II	E	H	H	M	L
Marginal	III	H	M	M	L	L
Negligible	IV	M	L	L	L	L
E – Extremely High H – High M – Moderate L – Low						

A-26. Risk is addressed in the four levels listed in the lower left corner of the matrix (Table A-4):

- Extremely high risk.
- High risk.
- Moderate risk.
- Low risk.

Table A-4. Four levels of risk.

LEVEL OF RISK	EXPLANATION
Extremely High Risk	Loss of ability to accomplish the mission if hazards occur. In the example noted in Table A-3, a frequent or likely probability of catastrophic loss (IA or IB) or a frequent probability of critical loss (IIA) exists. This implies that the risk associated with this mission, activity, or event may have severe consequences. The decision to continue must be weighed carefully against the potential gain to be achieved by continuing this COA.
High Risk	Significant degradation of mission capabilities (in terms of the required mission standard), inability to accomplish all parts of the mission, or inability to complete the mission to standard will result if hazards occur during the mission. Occasional to seldom probability of catastrophic loss (IC or ID) exists. A likely to occasional probability of a critical loss (IIB or IIC) exists. Frequent probability of marginal losses (IIIA) exists. This implies that if a hazardous event occurs, serious consequences will occur. The decision to continue must be weighed carefully against the potential gain to be achieved by continuing this COA.
Moderate Risk	Expected degraded mission capabilities (in terms of the required mission standard) will result if hazards occur during the mission. An unlikely probability of catastrophic loss (IE) exists. The probability of a critical loss is seldom (IID). Marginal losses occur with a likely or occasional probability (IIIB or IIIC). A frequent probability of negligible (IVA) losses exists.

Low Risk	Expected losses have little or no impact on accomplishing the mission. The probability of critical loss is unlikely (IIE), while that of marginal loss is seldom (IIID) or unlikely (IIIE). The probability of a negligible loss is likely or less (IVB through (IVE). Expected losses have little or no impact on accomplishing the mission. Injury, damage, or illness are not expected, or may be minor and have no long-term impact or effect.

STEP 3 – DEVELOP CONTROLS, AND MAKE RISK DECISIONS

A-27. In this step, commanders develop and apply controls, reassess the hazard to determine a residual risk, and make risk decisions. This process continues until an acceptable level of risk is achieved or until all risks are reduced to a level where benefits outweigh the potential cost. This step is accomplished during the COA development, analysis, comparison, and approval of the MDMP.

STEP 4 – IMPLEMENT CONTROLS

A-28. Leaders and staffs ensure that controls are integrated into SOPs, written and verbal orders, mission briefings, and running estimates. The critical check for this step is to ensure that controls are converted into clear and simple execution orders. This step includes coordination and communication with—

- Appropriate superior, adjacent, and subordinate units, organizations, and individuals.

- Logistics Civil Augmentation Program (LOGCAP) organizations and civilian agencies that are part of the force or may be impacted by the activity, hazard, or its control.

- The media and nongovernmental organizations when their presence impacts or is impacted by the force.

STEP 5 – SUPERVISE AND EVALUATE

A-29. This step involves implementing risk controls and enforcing them to standard, and validating the adequacy of selected control measures in supporting the objectives and desired outcomes. This continuous process provides the ability to identify weaknesses and to change or adjust controls based on performance, changing situations, conditions, or events.

RESPONSIBILITIES

A-30. CRM responsibilities are spread across three levels:

- Commander.
- Leaders.
- Individual.

COMMANDER

A-31. During implementation of the CRM process, the commander—

- Ensures that warfighting functions (WFF) are performed to standard to minimize human error, materiel failure, and environmental effects.
- Establishes a force health protection policy and publishes a safety philosophy with realistic safety goals, objectives, and priorities.
- Ensures that his training assessment considers the WFF's ability to protect the force. Selects long-, short-, and near-term control actions and ensures implementation to improve force health protection.
- Ensures that his staff integrates risk management into the planning and execution of training and operational missions.
- Makes risk decisions. Selects, monitors, and enforces implementation of controls for hazards most likely to result in loss of combat power. After implementing controls, if risk remains above the tolerance level established

by higher command, he must elevate the risk decision to the appropriate command level.

- Ensures that the CRM process is evaluated during all after-action reviews (AARs).

- Determines if unit performance meets prescribed guidance. Determines effectiveness of hazard controls and necessary changes to guidance and controls. Ensures that these changes are fed back into the training management cycle and guidance for operational missions, including unit SOPs.

LEADERS

A-32. During implementation of the CRM process, leaders—

- Enforce mission-essential task list (METL) task performance to standard. Adopt the crawl—walk—run approach in planning and executing training.

- Make use of automated on- and off-duty CRM tools and surveys available from the United States Army Combat Readiness Center (USACRC).

- Execute risk reduction controls selected by the commander by developing and implementing supporting leader level controls. Apply risk management procedures to each.

INDIVIDUAL

A-33. All Soldiers must understand how to use the CRM process to enhance mission success and to reduce or eliminate loss.

A-34. During implementation of the CRM process, Soldiers—

- Support commanders and leaders in the rapid identification and communication of hazards and associated risks that may impact on the

mission.

- Provide immediate feedback to the leader as the mission progresses and hazards are encountered. Use short written messages, hand and arm signals, or radio transmissions to communicate first-hand information to leaders.

- In extreme situations, act alone or make risk decisions within the context of orders.

DA FORM 7566 (COMPOSITE RISK MANAGEMENT WORKSHEET)

A-35. DA Form 7566 (Composite Risk Management Worksheet, Figure A-1) provides a starting point to logically track the CRM process. It can be used to document risk management steps taken during planning, preparation, and execution of training and combat missions.

NOTE: For detailed CRM procedures see FM 5-19.



COMPOSITE RISK MANAGEMENT WORKSHEET

For use of this form, see FM 5-19; the proponent agency is TRADOC.

1. MSN/TASK	2a. DTG BEGIN	2b. DTG END	3. DATE PREPARED (YYYYMMDD)

4. PREPARED BY

a. LAST NAME	b. RANK	c. POSITION

5. SUBTASK	6. HAZARDS	7. INITIAL RISK LEVEL	8. CONTROLS	9. RESIDUAL RISK LEVEL	10. HOW TO IMPLEMENT	11. HOW TO SUPERVISE (WHO)	12. WAS CONTROL EFFEC-TIVE?

Additional space for entries in Items 5 through 11 is provided on Page 2.

13. OVERALL RISK LEVEL AFTER CONTROLS ARE IMPLEMENTED (Check one)

☐ LOW ☐ MODERATE ☐ HIGH ☐ EXTREMELY HIGH

14. RISK DECISION AUTHORITY

a. LAST NAME	b. RANK	c. DUTY POSITION	d. SIGNATURE

DA FORM 7566, APR 2005

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ITEMS 5 THROUGH 12 CONTINUED:

5. SUBTASK	6. HAZARDS	7. INITIAL RISK LEVEL	8. CONTROLS	9. RESIDUAL RISK LEVEL	10. HOW TO IMPLEMENT	11. HOW TO SUPERVISE (WHO)	12. WAS CONTROL EFFEC-TIVE?

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SAMPLE

Figure A-1. Sample DA Form 7566 (Composite Risk Management Worksheet).

A-36. Table A-5 outlines instructions on completing DA Form 7566.

Table A-5. Worksheet instructions.

ITEM	INSTRUCTION
1 through 4	Self-explanatory.
5	Subtask relating to the mission or task in Block 1.
6	Hazards–Identify hazards by reviewing METT-TC factors for the mission or task. Additional factors include historical lessons learned, experience, judgment, equipment characteristics and warnings, and environmental considerations.
7	Initial Risk Level–Factors include historical lessons learned, intuitive analyses, experience, judgment, equipment characteristics and warnings, and environmental considerations. Determine the initial risk for each hazard by applying the risk assessment matrix. Enter the risk level for each hazard.
8	Controls– For each hazard, develop one or more controls that will eliminate the hazard or reduce the risk of a hazardous incident. Specify who, what, where, why, when, and how for each control. Enter controls.
9	Residual Risk Level–Determine the residual risk for each hazard by applying the risk assessment matrix. Enter the residual risk level for each hazard.

10	How to Implement–Decide how each control will be put into effect or communicated to the personnel who will make it happen (written or verbal instruction; tactical, safety, garrison SOPs; rehearsals). Enter controls.
11	How to Supervise (Who)–Plan how each control will be monitored for implementation (continuous supervision, spot-checks) and reassess hazards as the situation changes. Determine if the controls worked and if they can be improved. Pass on lessons learned.
12	Was Control Effective–Indicate “Yes” or “No.” Review during AAR.
13	Overall Risk Level–Select the highest residual risk level and circle it. This becomes the overall mission or task risk level. The commander decides whether the controls are sufficient to accept the level of residual risk. If the risk is too great to continue the mission or task, the commander directs development of additional controls or modifies, changes, or rejects the COA.
14	Risk Decision Authority–Signed by the appropriate level of command.

Appendix B: Mission Packing Lists

A sniper team carries only mission-essential equipment, including certain equipment seldom associated with other Infantry Soldiers.

ARMS AND AMMUNITION

B-1. METT-TC determines the arms and ammunition that the sniper team carries. When the team cannot find items they need to carry, they must substitute or do without. As a minimum, the sniper team requires the arms and ammunition shown in Table B-1.

Table B-1. List of sniper team required arms and ammunition.

QUANTITY	EQUIPMENT
Sniper	
1	Sniper weapon system (M110 SASS or M107 LRSR) with appropriate scope
1	Survival kit
100	Rounds for the weapon system
1	M9 9-mm pistol
45	Rounds of 9-mm ball ammunition

4	M67 fragmentation grenades
2	CS grenades
2	Concussion grenades
1	M18A1 mine with time fuze, blasting cap, and fuze igniter
Observer	
1	M4 carbine or M203 grenade launcher with quadrant sight and AN/PEQ-2A target pointer, illuminator, aiming light
1	Survival kit
210 (minimum)	Rounds of 5.56-mm ball ammunition
10	Rounds 40-mm HE ammunition
5	Rounds of 40-mm AP ammunition
1	M9 9-mm pistol
45	Rounds of 9-mm ball ammunition
4	M67 fragmentation grenades

2	CS grenades
2	Concussion grenades

SPECIAL EQUIPMENT

B-2. Table B-2 shows the minimum special equipment needed by the sniper team.

Table B-2. List of sniper team special equipment.

QUANTITY	EQUIPMENT
Sniper	
1	M110 SASS or M107 LRSR deployment kit with tools and parts
1	M9 pistol cleaning kit
1	Extra radio handset
1	Set of signal operation instructions
1	AN/PVS-14 NVG
1	E-tool with carrier

1	50 feet of 550 cord
1	Green smoke grenade
1	Red smoke grenade
2	HC smoke grenades
1	25-foot, carpenter-type measuring tape
3	9-mm magazines
Observer	
1	Observation telescope with tripod
1	AN/PVS-14 monocular NVD
1	AN/PEQ-2A target pointer, illuminator, aiming light
1	M4 carbine cleaning kit
1	M203 grenade launcher cleaning kit
1	MIBTR or ASIP radio

1	Radio accessory bag
1	Long whip antenna and base
1	Tape antenna and base
1	Handset
--	Extra batteries for radio (if needed)
1	Pair M22 binoculars
1	Sniper's data book
1	Mission logbook
--	Range cards
--	Wind tables
--	Slide rules for determining range to target and adjustments to elevation and windage
7	30-round capacity 5.56-mm magazines
3	9-mm magazines

2	Calculator with extra battery
2	HC smoke grenades
1	Lineman's tool
--	Data cards
1	Red star cluster
1	Lensatic compass
1	Digital camera with spare batteries
1	GPS with spare batteries
1	Laser rangefinder with spare batteries
Team Security For A Three-Man Sniper Team	
1	ASIP radio
1	M4 carbine with advanced combat optical gunsight (ACOG) and AN/PEQ-2A target pointer, illuminator, aiming light

UNIFORMS AND EQUIPMENT

B-3. Each sniper team member should take the uniforms and additional equipment suitable for the mission and the AOR.

OPTIONAL EQUIPMENT

B-4. Table B-3 shows some of the equipment that the sniper team might need to carry for specialized tasks or tasks in different climates or operational environments.

Table B-3. List of equipment for specialized tasks or environments.

QUANTITY	EQUIPMENT
1	Rifle suppressor
1	Pepper spray
--	Desert camouflage netting
--	Natural-colored burlap
1	Roll of glint tape
1	VS-17 panel
1	Strobe light with filters
1	12-foot sling rope

2	Snap links
1	120 feet of nylon rope
1	Pen gun with flares
--	Chemical lights (to include infrared)
1	Flak jacket and interceptor body armor (IBA) with plates
1	Sniper veil
1	Rifle drag bag
1	Pistol suppressor
1	2.5-pound block of C4 with caps, cord, fuze, and igniter
1	Rifle bipod or tripod
--	Empty sandbags
--	Hearing protection (ear muffs)
1	Anemometer

1	Angle cosine Indicator
1	Reverse polarity squares 1” by 1”
1	Thermometer
1	Laser rangefinder
1	Thermal imager
1	Pocket binocular
1	Digital camera
1	1/2-inch video camera with accessories
--	Satellite communications equipment
1	Short-range radio with earphone and whisper microphone
--	Field-expedient antennas
--	Information-reporting formats
--	Automated network control device

SPECIAL TOOLS AND EQUIPMENT FOR URBAN OPERATIONS

B-5. Table B-4 shows items the sniper team will find useful in urban operations, if they can get them.

Table B-4. List of useful equipment for urban operations.

QUANTITY	EQUIPMENT
1	Pry bar
1	Pair of pliers
1	Screwdriver
1	Rubber-headed hammer
1	Masonry drill and bits
1	Pair of metal shears
1	Chisel
1	Lock pick, skeleton keys, and cobra pick
1	Pair of bolt cutters

1	Hacksaw or handsaw
1	Axe
1	Shotgun
1	Can of spray paint
1	Hot wire kit
--	Maps and street plans
--	Photographs, both aerial and panoramic
1	Whistle
1	24-volt battery-powered saws-all
1	.22-caliber nail driver
5	Pair of flex cuffs
--	Padlocks (with hasps)
1	Intrusion-detection system (booby traps)

--	Neutral-colored curtains or sheets
--	Money

ADDITIONAL EQUIPMENT TRANSPORT

B-6. The use of air and vehicle drops and caches eliminates the need for the sniper team to carry extra equipment. Another way to lighten their load is to use the stay-behind technique when operating with a security patrol. Through coordination with the security patrol leader, the sniper team's equipment can be distributed among and carried in by the members of the security patrol. On arrival at the ORP, the security patrol leaves behind all nonessential equipment, including the equipment belonging to the sniper team. After the sniper team completes the mission, they can cache the equipment for later pickup, or they can return it the same way they brought it in.

Appendix C: Leader's Checklist

The principles of METT-TC can greatly influence how a leader will employ the different elements within their unit. Sniper teams can be a significant force multiplier for the unit, if utilized correctly. Table C-1 outlines the tasks of a sniper team, how the team should be employed, and their location.

Table C-1. Leader checklist for employment of sniper teams.

MISSION	TASKS	EMPLOYMENT CONSIDERATIONS	LOCATION
Hasty attack	Destroy key personnel and equipment.	Priority of targets list given by commander	Independently or near the support by fire (SBF) element
	Suppress objective.		Independently or with security element
	Isolate objective.		

Deliberate attack	Destroy key personnel and equipment.	Priority of targets list given by commander	Independently or near the SBF element
	Suppress objective.	Attached to scouts or independently	
	Isolate objective.	Employed independently ahead of main element	Infiltrate ahead of main element
	Reconnoiter objective.		
	Identify/eliminate OPs.		
Movement to contact	Screen.	Provide early warning to the front or the flanks	Independently from the main element
	Provide flank security.		

Raid	Destroy key personnel and equipment.	Employed independently or as part of SBF element	Infiltrate ahead of main element
	Suppress objective.	Priority of targets list given by commander	
	Initiate assault.	Reconnoiter objective for commander (provide current intelligence)	
	Isolate objective.		
Reconnaissance	Provide coverage of named area of interest.	Static observation	Independently with freedom of movement

<table>
<tr><td rowspan="3">Forward edge of the battle area (FEBA)</td><td>Screen.</td><td>Counter-reconnaissance operations</td><td rowspan="5">Within the security area with freedom of movement and action</td></tr>
<tr><td>Guard.</td><td rowspan="2">Prebuild hide sites</td></tr>
<tr><td>Provide covering force.</td></tr>
<tr><td rowspan="2">Main battle area</td><td>Destroy key personnel
and equipment.</td><td rowspan="2">IED reduction/ counter-IED missions</td></tr>
<tr><td>Provide flank security.</td></tr>
<tr><td>Traffic control points</td><td>Overwatch.</td><td>Counter suicide bombers</td><td>Independently in overwatch</td></tr>
<tr><td rowspan="2">Cordon and search</td><td>Reconnoiter objective.</td><td rowspan="2">Aerial platform shooting to eliminate runners</td><td rowspan="2">N/A</td></tr>
<tr><td>Isolate objective.</td></tr>
</table>

Appendix D: M24 Sniper Weapon System

The M24 SWS (Figure D-1) is a 7.62mm, bolt-action, six-round repeating rifle, with one round in the chamber and five in the magazine. This weapon has three sights: iron sights, an M3A daysight, and an AN/PVS-10 sniper night scope (SNS).

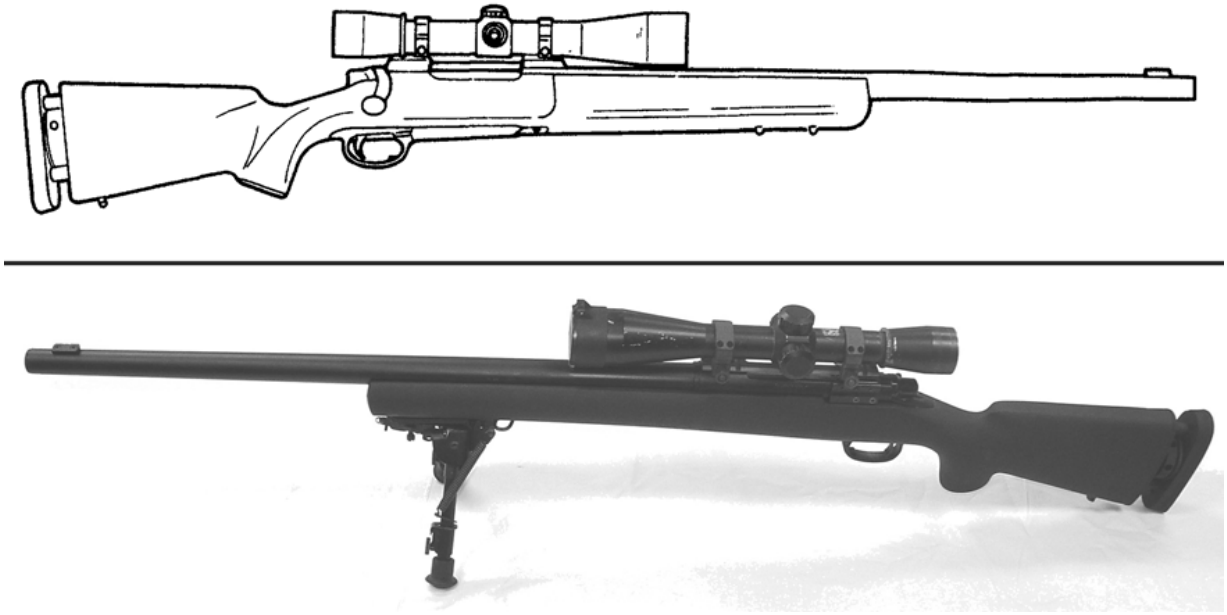


Figure D-1. M24 Sniper Weapon System.

COMPONENTS AND OPERATION

D-1. To effectively operate the M24 SWS, the sniper must understand its components and how they work, and he must be able to maintain and repair them.

NOTE: See Appendix G for maintenance and repair.

SAFETY SELECTOR

D-2. The safety selector (Figure D-2) is located on the right rear side of the receiver. When properly engaged, the safety selector, labeled "S", protects against negligent discharge.

D-3. To engage the safety selector, place it in the SAFE position, marked "S". To disengage the safety selector, place it in the FIRE position, marked "F".

CAUTION

Always place the safety selector in the SAFE position before handling, loading, or unloading the weapon; place the safety selector in the FIRE position only when you are ready to fire the rifle and your sights are on the target. Failure to do so can result in accidental firing of the weapon.

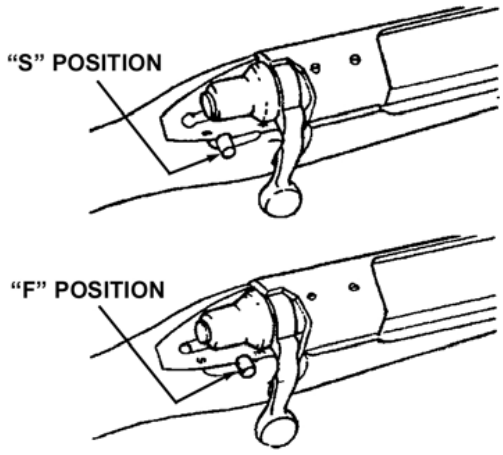


Figure D-2. Safety selector.

Clearing Procedures

D-4. To clear the weapon—

(1) Place the safety selector in the SAFE position.

CAUTION

If the weapon will not move to the SAFE position, perform the following steps with extra caution.

(2) Lift the bolt handle fully, and pull to the rear.

NOTE: Place the safety selector in the SAFE position if unable to in Step 1.

(3) Inspect the chamber and magazine for rounds.

NOTE: If a round is in the magazine, press the floorplate latch (Figure D-5), and the round will drop out of the magazine. Then, close the floorplate.

(4) The weapon is clear.

BOLT ASSEMBLY

D-5. The bolt assembly locks the cartridge into the chamber and extracts the cartridge from the chamber.

Removing the Bolt from the Receiver

D-6. To remove the bolt from the receiver—

(1) Release the internal magazine.

(2) Place the safety selector in the SAFE position.

(3) Raise the bolt handle.

(4) Pull it back until it stops.

(5) Push the bolt stop release (Figure D-3).

(6) Pull the bolt from the receiver.

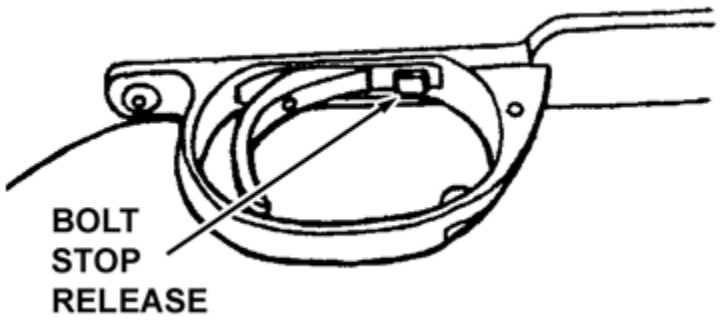


Figure D-3. Bolt stop release.

Replacing the Bolt

D-7. To replace the bolt—

(1) Ensure that the safety selector is in the SAFE position.

(2) Align the lugs on the bolt assembly with the receiver (Figure D-4).

(3) Slide the bolt all the way into the receiver.

(4) Push the bolt handle down.

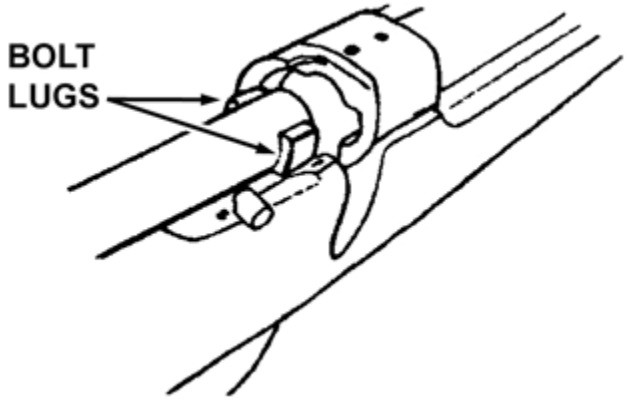


Figure D-4. Alignment of bolt.

TRIGGER ASSEMBLY

D-8. The trigger is adjusted at the factory for a 2.5-pound nominal trigger pull force. Using the 1/16-inch hex key provided in the deployment kit, the sniper can adjust the pull force to any pull force between 2 and 8 pounds. To do so, turn the adjusting screw (Figure D-5) clockwise to increase trigger pull, and counterclockwise to decrease it.

WARNING

Never remove the trigger mechanism or adjust the trigger assembly, except as described.



Figure D-5. Adjustment of trigger pull.

STOCK

D-9. The M24 SWS stock has a butt plate that adjusts for length of pull.

Adjustment

D-10. To adjust the M24 SWS stock (Figure D-6)—

(1) Turn the thin wheel on the stock counterclockwise (away from the thick wheel) to allow for adjustment.

(2) Turn the thick wheel on the stock —

Clockwise to lengthen the stock.

Counterclockwise to shorten the stock.

(3) Turn the thin wheel clockwise (against the thick wheel) to lock the stock in place.

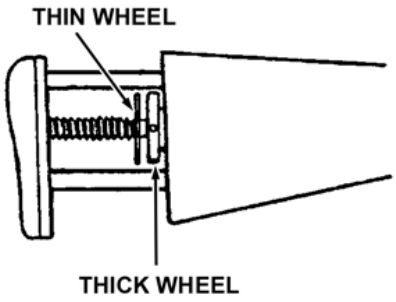


Figure D-6. Adjustment of stock.

SLING

D-11. The sling binds the parts of the body used in aiming into a rigid bone brace, enabling the sniper to hold the weapon steady without muscular effort. When properly adjusted, the sling permits part of the recoil of the rifle to be absorbed by the nonfiring arm and hand, removing recoil from the firing shoulder.

D-12. The sling consists of two different lengths of leather straps joined together by a metal D ring (Figure D-7). The longer strap is connected to the sling swivel on the rear stud on the buttstock of the rifle. The shorter strap is attached to the sling swivel on the forearm of the rifle.

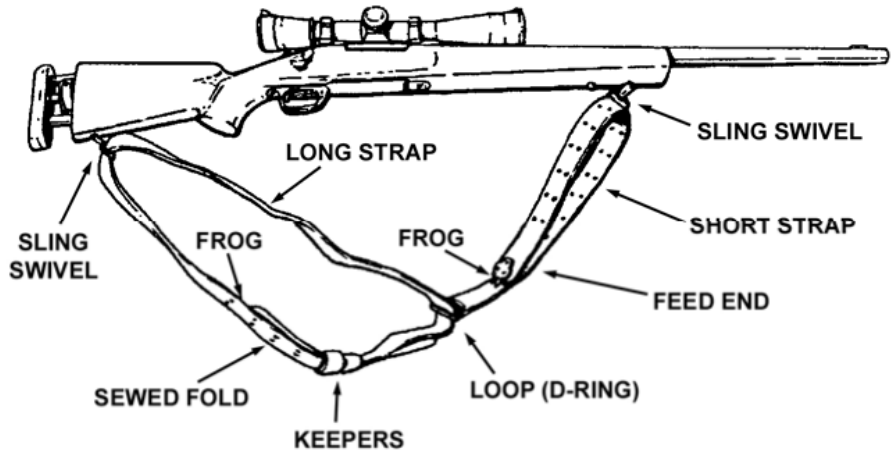


Figure D-7. Sling.

Adjustment

D-13. There are two leather loops on the long strap, known as keepers. The keepers are used to adjust the tension on the sling. The frogs are hooks that are used to adjust the length of the sling.

D-14. To adjust the sling—

(1) Ensure that the sling is only attached to the front sling swivel.

(2) Hook the two-pronged frog at one end of the long strap into whichever pair of holes (on the same strap) causes the metal D-ring to align with the comb of the stock (Figure D-8).

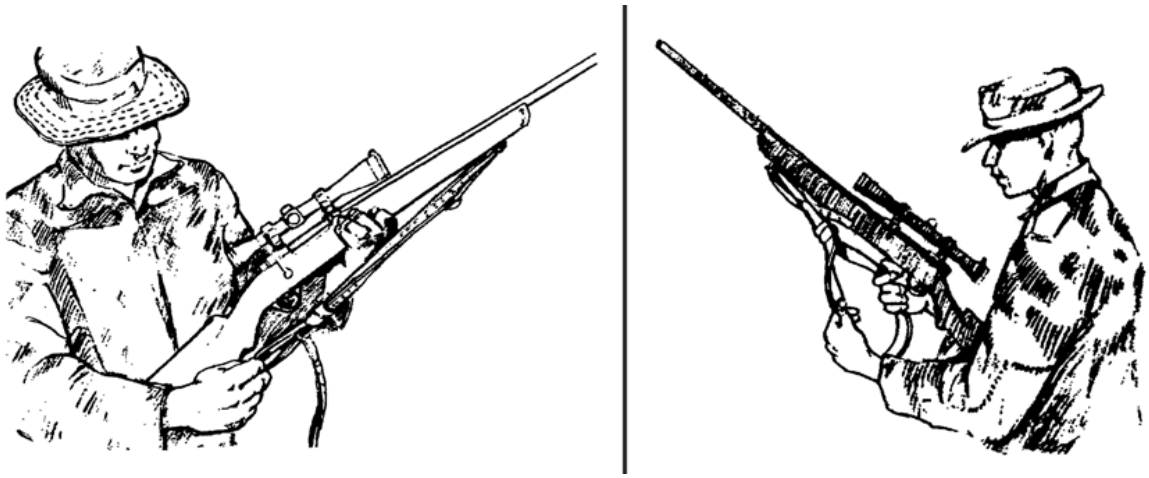


Figure D-8. Adjustment of sling.

(3) After adjusting the length of the sling, place the weapon on your firing hip and support the weapon with your firing arm. Turn the sling 90 degrees away from yourself. Insert your nonfiring arm into the loop, and then into the strap.

(4) Slide the loop in the large section of the short sling, up your nonfiring arm to just below the armpit (left, Figure D-9).

(5) Slide both leather keepers down the sling until they bind the loop snugly around the nonfiring arm.

(6) Move your nonfiring hand inside the sling, between the sling and the rifle. With the same hand, grasp the weapon just behind the front sling swivel, and force the weapon out and away from yourself (right, Figure D-9).

(7) With your firing hand, pull the butt of the weapon into the pocket of your shoulder. Grasp the weapon at the small of the stock, and begin the aiming process.

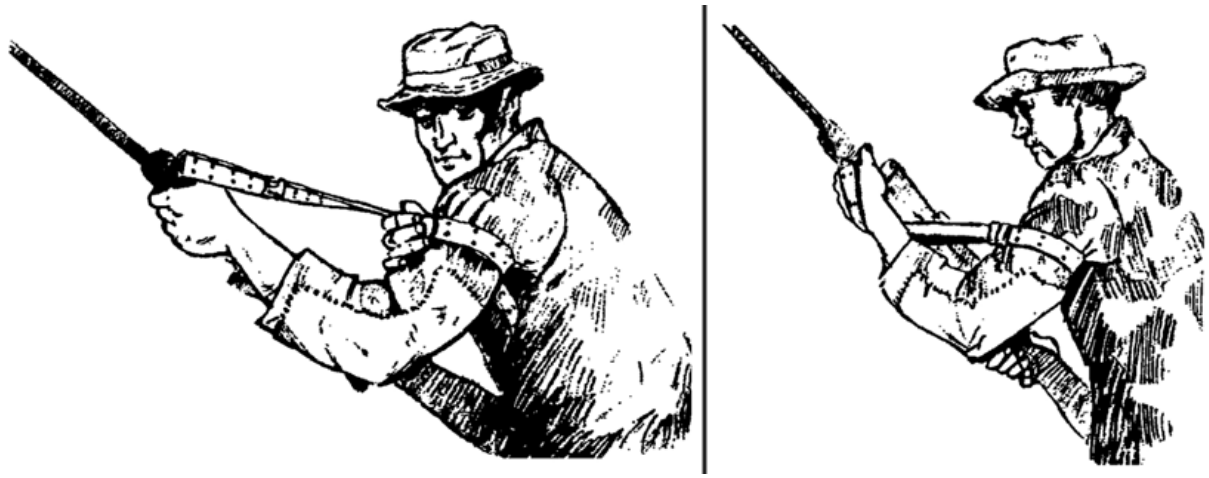


Figure D-9. Proper placement of the sling.

M3A SCOPE

D-15. The M3A scope enables the sniper to see a magnified image of the target and the crosshairs of the weapon with identical sharpness, which helps the sniper identify and engage the target. The lenses of the scope are coated with a thin material that reduces reflection.

Mounting

D-16. The M3A scope mount (Figure D-10) has a baseplate with four screws, a pair of scope rings, and two mounting ring nuts.

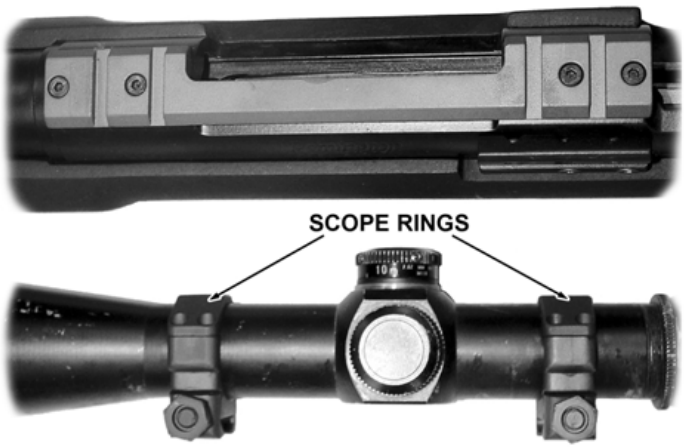


Figure D-10. M3A scope.

D-17. To mount M3A scope—

NOTE: The iron sights are removed for scope use.

(1) Mount the baseplate by screwing the four baseplate screws through it and into the top of the receiver. The screws must not protrude into the receiver and interrupt the functioning of the bolt.

(2) Mount the scope rings. Each pair of scope rings has an upper and a lower ring half and four screws. The M3A scope has two sets of mounting slots. Pick the set that gives you the best eye relief.

NOTE: Adjust the eye relief until you can see the full field of view. The average distance is 3 to

3 1/2 inches. Once you have chosen a set of slots, use the same set again in the future to maintain the zero.

(3) Lubricate the threads of each mounting ring nut.

(4) Ensure that each mounting ring nut and claw moves smoothly.

(5) Remove any burrs or foreign matter from the ring nuts and claws.

(6) Mount the sight and rings to the base.

(7) Ensure that the mounting surface is free of dirt, oil, or grease.

(8) Set each ringbolt spine into the selected mounting slot.

(9) Slide the rear mount claw against the base, and finger-tighten the mounting ring nut.

NOTE: If the scope needs adjustment, loosen each mounting ring nut, and align the ringbolts with the other set of slots on the base. Repeat Steps 8 and 9.

(10) Slide the front mount claw against the base, and finger-tighten the mounting ring nut.

(11) Use the T-handled torque wrench, which is preset to 65 inch-pounds, to tighten the front and rear mounting ring nuts.

Adjustment

D-18. The scope adjustment dials are under the adjustment dust cover. After mounting the M3A scope, the sniper can adjust for elevation, windage, and focus (Figure D-11). He can also adjust the eyepiece (Figure D-12).



Figure D-11. Adjustment of focus, elevation, and windage.

Elevation

D-19. The elevation adjustment dial is located on top of the scope barrel. The dial is indexed from 1 to 10. Each click of the elevation dial equals 1 MOA, and each numbered index mark represents 100 meters.

Windage

D-20. The windage adjustment dial is located on the right side of the scope barrel. Turning the dial in the indicated direction moves the point of impact in that direction. Each click on the windage dial equals 1/2

MOA.

Focus

D-21. The focus adjustment dial is located on the left side of the scope barrel. The dial has limiting stops. To adjust the focus adjustment dial—

- For a close target, rotate the dial to the largest dot, and focus out from there.

- For a distant target, rotate the dial to the infinity symbol (∞), and focus in from there.

Eyepiece

D-22. To focus the eyepiece (Figure D-12)—

(1) Grasp the eyepiece, and back it away from the lock ring.

NOTE: The lock ring loosens automatically, so you need no tools.

(2) Turn the eyepiece several turns to move it at least 1/8 inch. This is the smallest change that will affect the focus.

(3) Look through the scope at the sky or a blank wall to ensure that the reticle looks sharp. (4) Lock the lock ring.

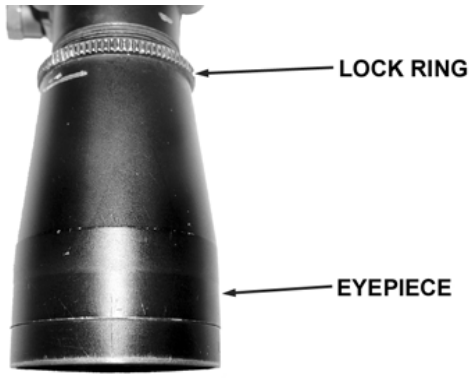


Figure D-12. Adjustment of eyepiece.

Mil-Dot Technique of Range Determination

D-23. When using the M3A scope, the sniper uses the mil dots on the reticle to determine the range to the target. The lines in the duplex-style, mil-dot reticle (Figure D-13) have thick sections near the outside of the ring and thin sections on the inside. Superimposed on the thin center of each radia is a series of dots, four to each side of the center of the reticle and four above and below the center. These dots divide the four radia into six equal sections, 1 mil apart, and 1 mil from the center and the start of the thick portion of the reticle. This lets the sniper closely estimate target range, assuming that he sees an object of known size (height or width) in the field of view. For example, at 500 meters, a 6-foot human target is 3.65 mils.

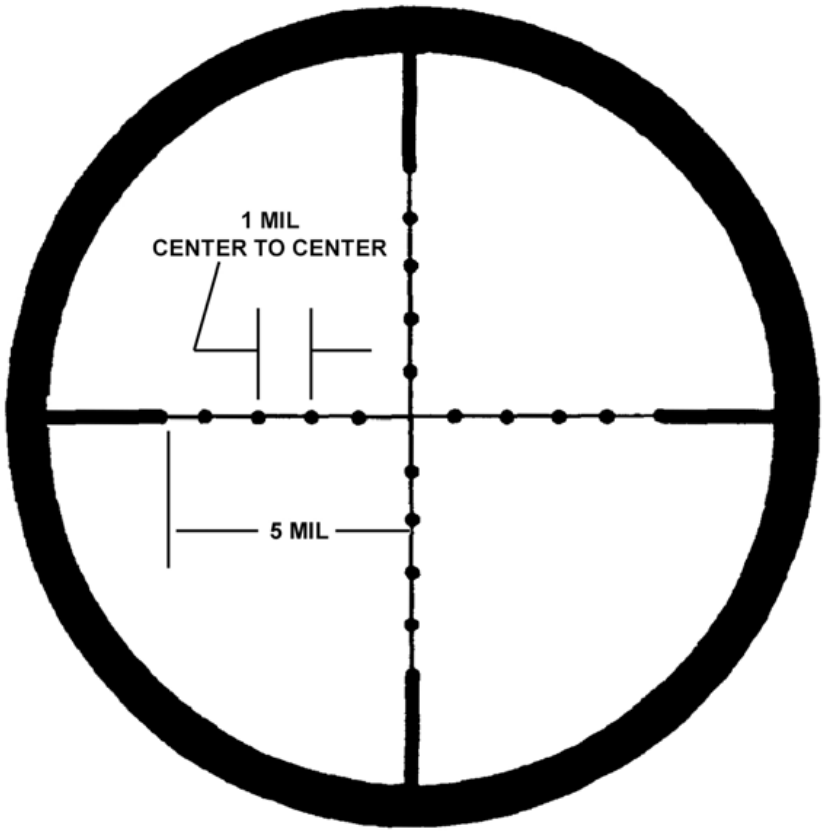


Figure D-13. Mil-dot reticle.

Zero

D-24. The sniper zeroes the M3A scope on a KD range (preferably 900 meters long) with 200-yard bull's-eye targets (NSN SR16920-00-900-8204). To zero the M3A scope—

(1) Assume a good, prone-supported position 100 meters from the target.

(2) Ensure that the "1" on the elevation dial aligns with the elevation index line, and that the "0" on the windage dial aligns with the windage index line.

(3) Fire three rounds at the center of the target, keeping the same aiming point each time.

(4) After noting the strike of the third round, triangulate the result.

(5) Turn the elevation and windage dials to bring the point of aim to the point of impact.

Each click on the elevation dial equals 1 MOA. At 100 meters, 1 MOA equals about 1 inch.

Each click on the windage dial equals 1/2 MOA. At 100 meters, 1/2 MOA equals about 1/2 inch.

(6) Once you center a shot group, loosen the hex head screws on the elevation and windage dials. If needed, turn the elevation dial to index line "1" and the windage dial to index line "0," and then tighten the hex head screws.

NOTE: After zeroing at 100 meters and calibrating the dial, confirm the zero by firing and recording sight settings through 900 meters, at 100-meter increments.

Field-Expedient Confirmation of Zero

D-25. Circumstances, such as dropping a weapon or extreme climatic changes can force the sniper to confirm zero in the field. There are two field-expedient methods to confirm zero:

- 25-yard or 900-inch method.
- Observation of impact method.

25-Yard or 900-Inch Method

D-26. To perform the 25-yard or 900-inch method—

(1) Dial the scope to 300 meters for elevation and 0 for windage.

(2) Aim and fire at a target at a distance of 25 yards.

(3) Adjust the scope until rounds impact 5/8 of an inch above the point of aim.

(4) To confirm, set elevation to 500 meters. The rounds should impact 1/4 inches above the point of aim.

Observation of Impact Method

D-27. When a KD range is unavailable, the sniper should perform the observation of impact method. To perform this method—

(1) Locate a target where the observer can see the impact of rounds clearly.

(2) Determine the exact range to the target.

(3) Dial in the appropriate range, and fire.

(4) Watch the impact of the round; the observer gives sight adjustments until round hits the point of aim.

Removal

D-28. He can easily remove and replace the scope with less than 1/2 MOA change in zero. However, he should try to leave it on the rifle.

Storage

D-29. The M3A scope is a delicate instrument that must be handled with care. Dirt, rough handling, or abuse of any optical equipment can affect accuracy and function. To properly store the M3A scope, consider the following:

- When not in use, place the scope in its case, with all lenses capped.

- Keep the lenses free of oil and grease. Avoid touching the lenses with your fingers, because body oil and perspiration can damage them. To remove oil or grease, apply a drop of lens-cleaning fluid or rubbing alcohol on a lens tissue. Use a circular motion to wipe each lens carefully, beginning at the center, and moving outward. Dry the lenses using a clean lens tissue. If you lack these supplies, breathe heavily on the glass and wipe it with a soft, clean cloth.

- When removing dust and other foreign matter, carefully brush the lenses with a clean camel hair brush.

- Check and tighten all mounting screws periodically, and always before an operation.

- Do not disturb the coarse windage adjustment.

- Do not force the elevation and windage screws or knobs.

- Keep the scope covered when not in use. The lenses will magnify and concentrate sunlight into a pinpoint of intense heat, which would fall on the mil-scale reticle. This could melt the mil dots and damage the scope internally.

- Avoid dropping the scope or striking it with another object. Not only could this affect the zero, it could also permanently damage the scope.

- In moderate temperatures, remove condensation by placing the sight in a warm place. Avoid the application of concentrated heat, because it can expand and damage the sight. Blot any moisture from the optics with a lens tissue or a soft, dry cloth.

- Thoroughly clean, dry, and lightly oil the scope after use, because perspiration is salty and can cause rust.

D-30. Further, different climates require different procedures for maintaining optical equipment:

- In extreme cold—

Avoid letting water condense or oil congeal on the sight. In cold temperatures, oil thickens and causes sluggish operation or failure. Focusing parts are vulnerable to oil seepage and their function would be greatly affected if those oils froze.

Breathing produces frost, which can accumulate on the sight. Clean it off with lens tissues preferably dampened lightly with alcohol.

- In hot, humid temperatures—

  Keep the caps on the scope when not using it.

  If moisture or fungus develops on the inside of the scope, replace the scope.

- In desert conditions, protect the scope from direct sunlight.

- When operating in salt water conditions—

  Protect the scope from direct sunlight.

  Inspect, clean, and lightly oil the scope regularly to prevent rust and corrosion.

AN/PVS-10 SNIPER NIGHT SCOPE

D-31. The AN/PVS-10 SNS is an integrated daysight and nightsight for the M24 SWS. This scope magnifies the image of the target to improve the sniper's aim. The fixed mount, mounting clamps, and nuts allow the sniper to detach and reattach the scope easily, while maintaining accuracy of the scope. The main components of this AN/PVS-10 SNS include the objective lens assembly, relay optics for both day and night viewing channels, and an eyepiece assembly.

NOTE: An identification plate on the bottom of the scope gives the serial number and other information needed for maintenance and hand receipt purposes. The 3-inch (76-mm) eye relief protects the eye from recoil injury.

D-32. Figure D-14 shows the following components of the AN/PVS-10 SNS:

A. Battery Cap—The battery cap attaches to the housing with a thumbscrew. It seals to keep the battery compartment waterproof.

B. Carrying Case—The carrying case transports and protects the scope and accessories.

C. Technical Manual—TM 11-5855-303-12&P provides unit maintenance instructions.

D. Light Interference Filter—The light interference filter (LIF) has a filter cell, filter, retainer, and O-ring. It protects the sniper from eye injury and the image intensifier tube from battlefield lasers. It is installed in front of the objective lens.

E. Objective Lens Cap—This cap protects the objective lens and acts as a sunshade when the lens cap is in the open position. A 1/8-inch pinhole in the center of the cap lets the sniper operate the night channel of the scope in daylight.

F. Batteries—The AN/PVS-10 SNS operates on either two AA alkaline batteries or two 1.5-volt AA lithium batteries. The sniper should save the lithium batteries for extremely cold conditions, when the alkaline batteries will fail to function.

G. Lens Paper—The sniper uses lens paper to clean the lens surfaces.

H. Shipping and Storage Case—The shipping and storage case protects the AN/PVS-10 SNS. It has upper and lower inserts and a nameplate.

I. Light Interference Filter Bag—The LIF bag protects the filter when not in use.

J. O-Rings—These rings, located below the dial dust covers, protect the dial from moisture.

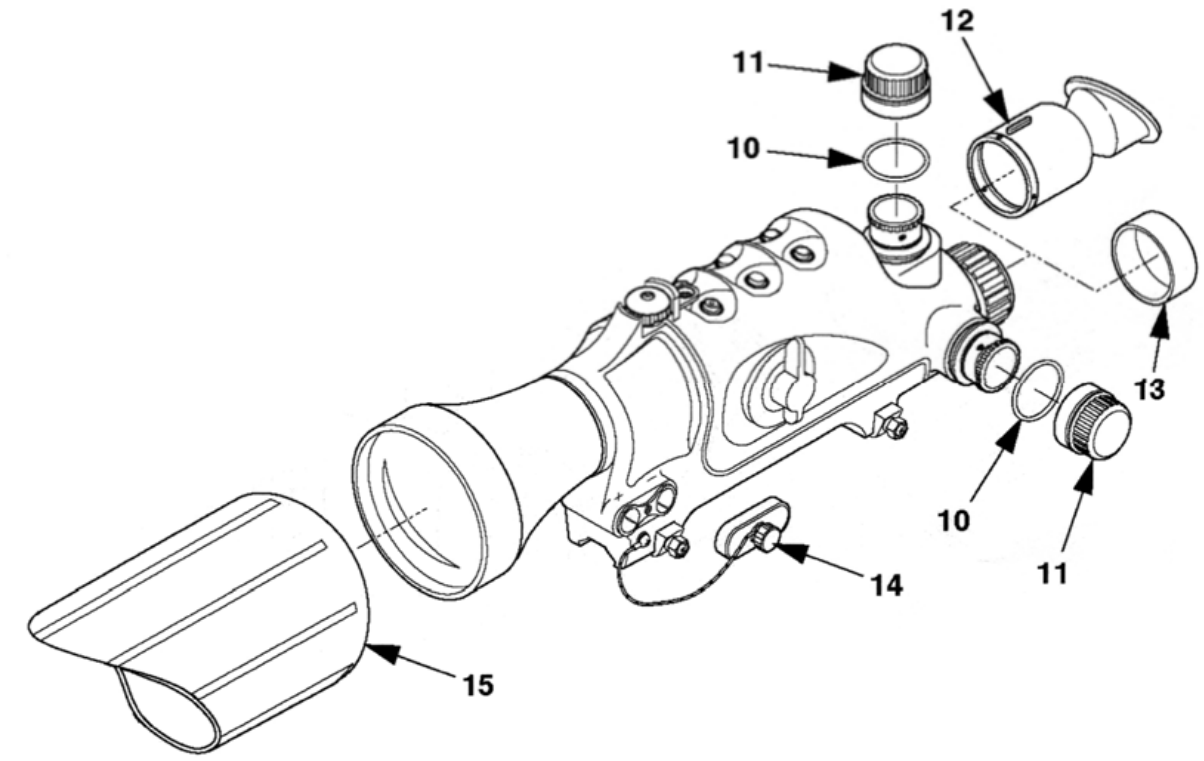
K. Dial Dust Covers—These covers protect the windage and elevation dials.

L. Eyeguard—The eyeguard has a molded rubber eyecup and an adapter ring. It protects the eye from recoil, keeps the image-intensifier tube from illuminating the sniper's face, and protects the eyepiece optics.

M. Protective Cap—This cap protects the eyepiece lens in the case and when the eyeguard is not used.

N. Sunshade—This shade reduces the reflection of the sun off the objective lens.

D-33. Not depicted is the cutoff sensor. The cutoff sensor points upward from the top of the housing. This sensor conserves battery life and protects the tube from damage in case the scope is left in NIGHT mode in daylight. When it senses light levels greater than 4 foot-candles for more than 70 seconds, it shuts off automatically and stays off until the sniper presses the TUBE ON/OFF switch.



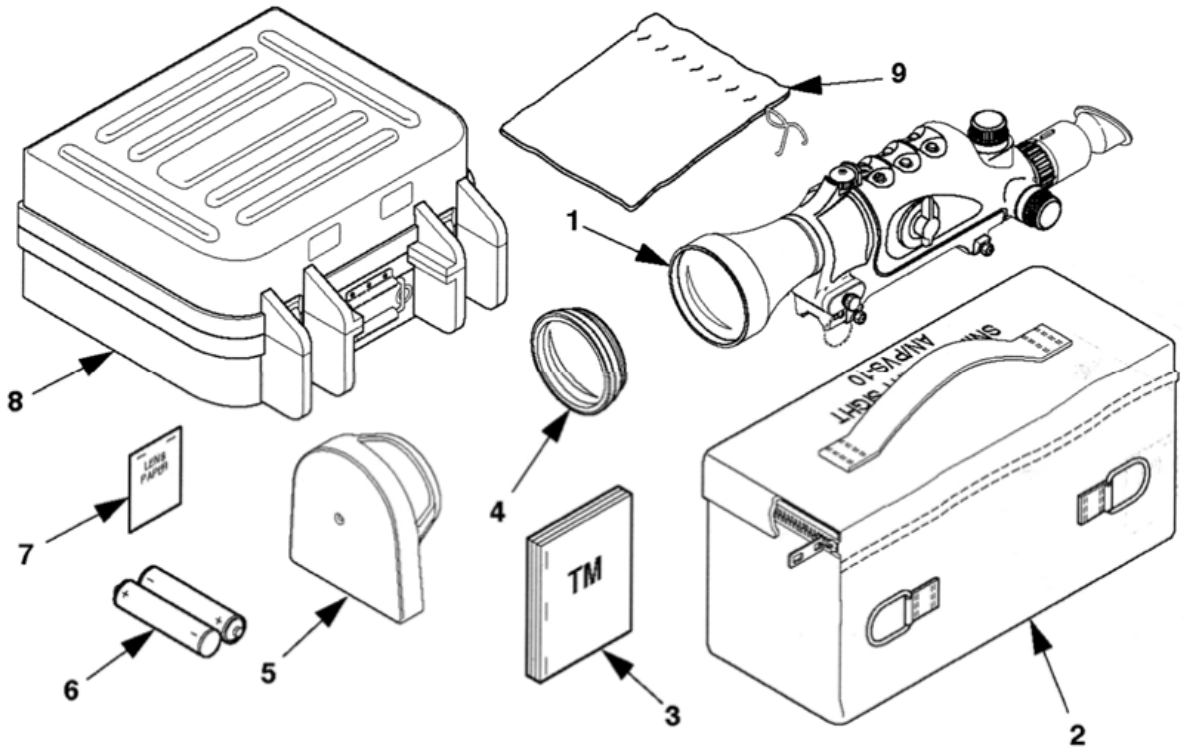


Figure D-14. AN/PVS-10 sniper night scope.

D-34. The lines in the duplex-style, mil-dot reticle (Figure D-15) each have a thick section near the outside of the ring and a thinner section near the center. An etched-glass reticle is located on an image plane shared by the eyepiece and the two relays. In NIGHT mode, the reticle is illuminated, and the objective lens assembly focuses incoming light on the image-intensifier tube. In DAY mode, the movable mirror remains up in front of the image tube. This feature protects the image tube from exposure to direct sunlight. In NIGHT mode, the mirror remains down and away from the day-mode optical path, preventing reticle illumination from projecting back through the objective lens. The image tube has automatic brightness control and manual gain control. The day-night relays send the image to the reticle.

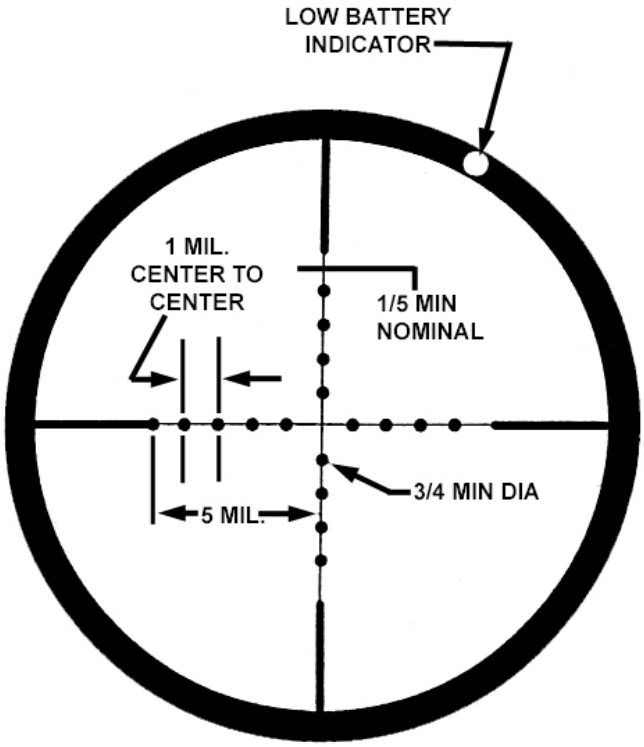


Figure D-15. Reticle and location of low battery indicator.

Controls and Indicators

D-35. Figure D-16 shows the scope's controls and indicators, and Table D-1 compares them.

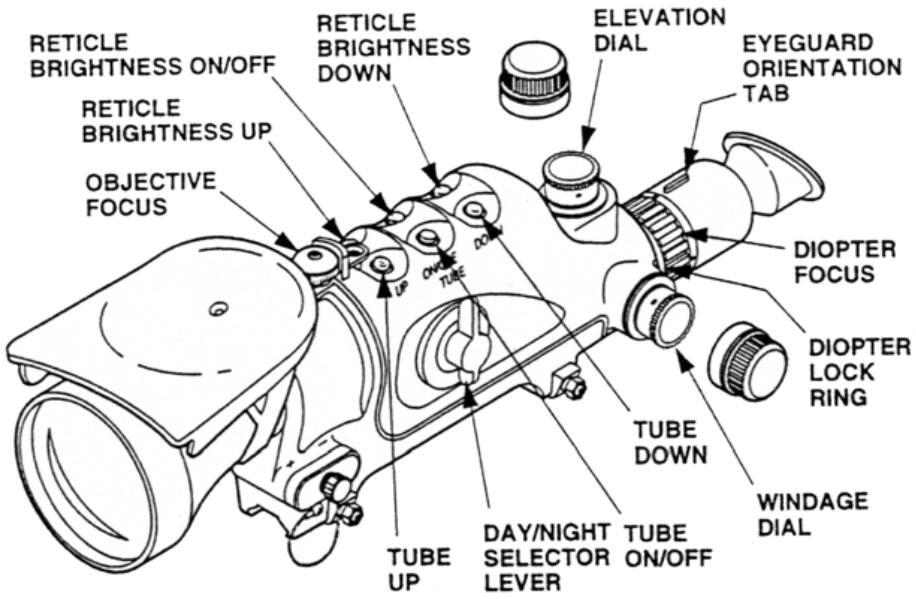


Figure D-16. Controls and indicators.

Table D-1. Controls and indicators.

DESCRIPTION	FUNCTION
DAY/NIGHT Selector Lever	Use this lever to select day or night mode.
Tube ON/OFF (night only)	When the day/night lever is in the NIGHT position, press this control to toggle the tube on and off.
Tube UP/DOWN (night only)	Press these controls to slowly increase or decrease tube brightness (gain).
Reticle Brightness ON/OFF (night only)	When the DAY/NIGHT lever is set on NIGHT and the tube is on, press this control to toggle reticle brightness on and off.

Reticle Brightness UP/DOWN (night only)	Press these controls slowly to increase or decrease the illumination of the reticle.
Windage Dial	Adjust the reticle right or left. Each click moves the round 1/2 MOA. The dial has a raised pin on the index line marked “0” to help locate battlesight zero at night.
Elevation Dial	Adjust the reticle up or down. Each click equals 1 MOA. This dial has a raised pin on the index line marked “5” to help locate battlesight zero at night.
Diopter Focus Ring (Eyepiece Focus)	Adjust this ring to focus the reticle.
Diopter Locking Ring	Turn this ring to tighten or loosen the eyepiece.
Objective Focus Knob	With this knob, adjust system focus from 25 meters to infinity.
Reticle	A mil dot reticle is provided. For night mode operations, the reticle is illuminated.
Battery Polarity Indicator	This shows how to orient the AA batteries.
Eyeguard	Push in on this to get the proper eye relief and field of view.

Eyeguard Orientation Tab	This tab marks the top of the eyeguard.
Infinity (Objective Focus)	Shows direction (clockwise) to adjust for infinity focus.
Low Battery Indicator	Check this periodically. It blinks at first, then stays on to let you know that the battery has less than two hours of power left.
Cutoff Sensor	If you leave the sight on and in the NIGHT mode in daytime light levels, this protects the tube from damage.

NOTE: The TUBE and RETICLE BRIGHTNESS controls are touch-type (button) controls. Keep pressure on the UP or DOWN control to increase or reduce a function. You might notice a short delay before the tube or reticle brightness responds. To make them easy to identify in the dark, the ON/OFF button is flat, the UP button is convex, and the DOWN button is concave.

Mounting

D-36. To mount the sight to the optical rail of the M24 SWS (Figure D-17) —

NOTE: Before mounting the SNS, lubricate the threads of each mounting nut (Figure D-18) with cleaner, lubricant, preservative (CLP). Ensure that each captive mounting nut and clamp moves smoothly. Remove any burrs and foreign matter from between each nut and clamp.

(1) Align the square spline in the mounting base of the sight in one of the two corresponding cross-slots of the optical rail.

(2) Mount the front and rear clamps against the base, and finger-tighten the mounting nuts.

(3) Remove the eyepiece protection cap and install the eyeguard.

(4) Check the eye relief.

NOTE: If the sight needs adjustment, loosen the mounting nuts and align the square spline with the other set of slots on the optical rail. Repeat the previous step.

(5) Tighten the rear mounting nut to 65 inch-pounds using the T-handled torque wrench.

NOTE: The T-handled torque wrench comes with the M24 SWS weapons deployment kit.

(6) Tighten the front mounting nut to 65 inch-pounds using the T-handled torque wrench.

(7) Repeat Steps 5 and 6 three times.

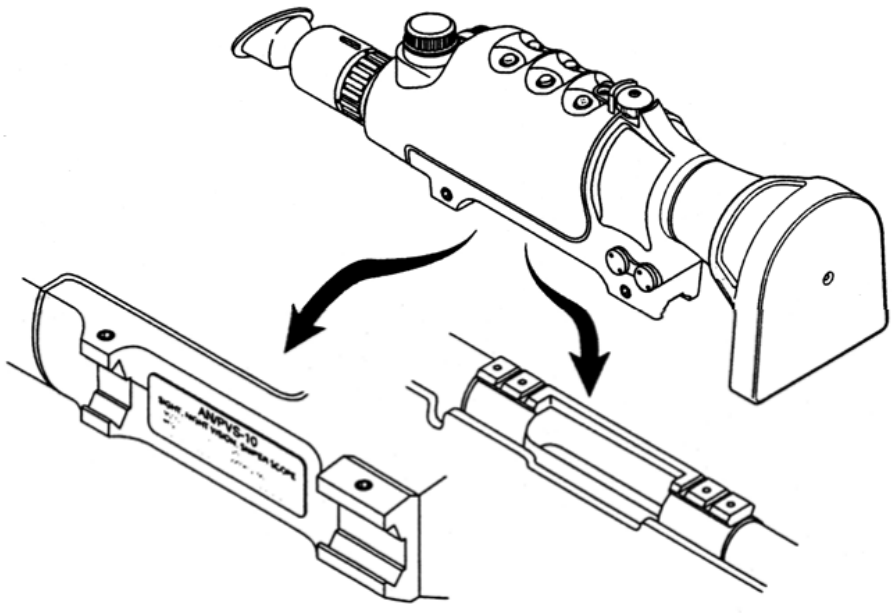


Figure D-17. Mounting base.

Installation of Batteries

D-37. To install the batteries—

(1) Remove the battery cap by turning the thumbscrew counterclockwise.

(2) Insert two AA (or lithium) batteries in battery compartment (Figure D-18).

(3) Replace the battery cap.

DANGER

Mixing alkaline and lithium batteries can result in injury or death.

CAUTION

When you are not using the sight, remove the batteries to avoid turning on the sight accidentally.

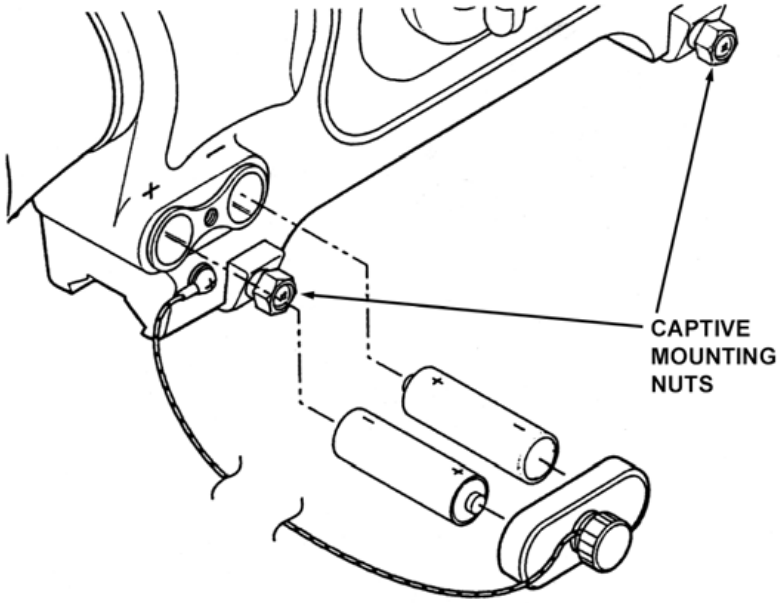


Figure D-18. Battery installation.

Preparation for Use

D-38. To prepare the sight for both day and night use under most conditions —

(1) Install the SNS.

(2) Install the batteries.

(3) Turn reticle brightness ON.

(4) Adjust the diopter focus.

(5) Check the cutoff sensor for damage.

(6) Install the LIF, when required.

(7) When operating in day mode, install the sunshade. When operating in night mode, turn the mode selector to NIGHT mode, and turn the tube ON.

(8) Adjust the objective focus. When operating in night mode, adjust the tube gain as well.

(9) Zero your weapon, when required.

(10) Adjust elevation.

(11) Adjust windage.

Zeroing

D-39. To zero the SNS to the M24 SWS—

(1) Assume a good, prone supported position 100 meters from the target.

(2) Verify that the sight is in DAY mode, and uncover the objective lens by removing the protective cap from the eyepiece.

NOTE: If the windage or elevation dials are loose or maladjusted, locate the mechanical center of the reticle travel in accordance with TM 11-5855-303-12&P.

(3) Adjust the windage and elevation dials.

(4) Fire 3 rounds, maintaining the same aimpoint each time.

(5) After determining the placement of the rounds, turn the elevation and windage dials to bring the point of aim to the point of impact.

(6) Repeat until you center a 3-round group on the aimpoint.

(7) Once you center a group, loosen the set screws on the elevation dial. Slip the dial to index line "1." Retighten the set screws.

(8) Loosen the set screws on the windage dial. Slip the windage dial to the index line "0," and retighten the set screws.

NOTE: After zeroing at 100 meters, confirm this zero at 300 meters.

IRON SIGHTS

D-40. If his scope is damaged or if he needs a wide field of view, the sniper might have to use his iron sights to make an effective shot out to about 900 meters. At most of the expected ranges, this requires him to zero with the iron sights.

D-41. The aperture insert might be the skeleton or clear plastic type (Figure D-19). Selecting an aperture can be tricky. The sniper should select an aperture that looks at least twice the diameter of the bull’s eye. Light conditions can affect the aperture selected; light can form a halo around the bull or make the bull appear indistinct or oblong. The sniper should choose an aperture with a wide line of white around the bull, clearly defining the bull against the background.

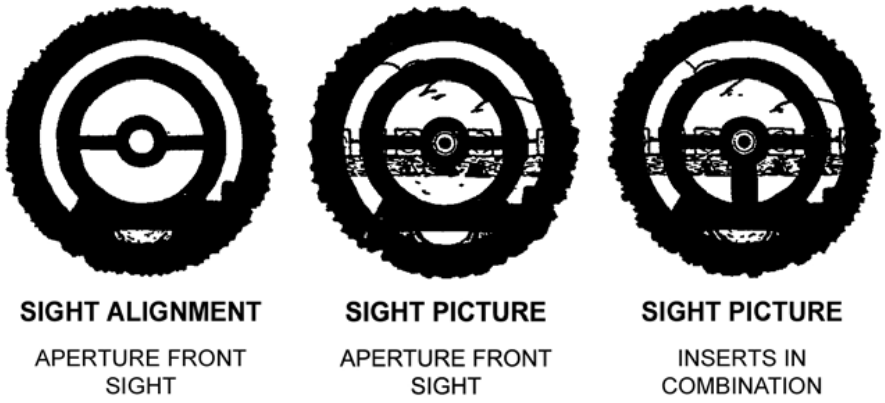


Figure D-19. Aperture insert.

Mounting

D-42. To mount the iron sights (Figure D-20)—

NOTE: Before mounting the iron sights, the sniper must remove the M3A scope.

(1) Attach the front sight to the barrel.

(2) Align the front sight and its base.

(3) Slide the sight over the base.

(4) Tighten the screw.

(5) Choose an aperture.

(6) Remove one of the three sets of screws from the rear sight base, at the left rear of the receiver.

(7) Using the hole that gives you the desired eye relief, align the rear sight with the rear sight base.

(8) Reinstall the screws to secure the rear sight to the base.

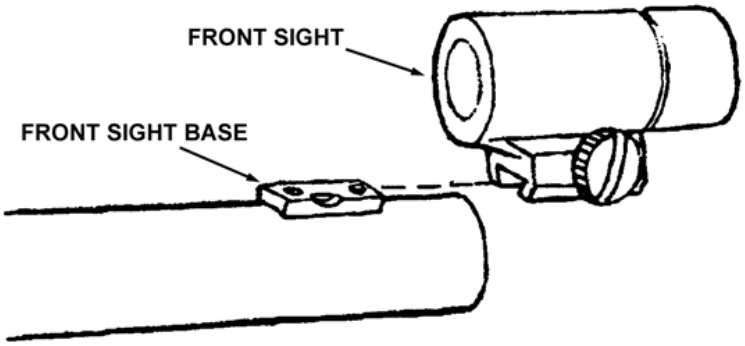


Figure D-20. Attachment of front iron sight.

Adjustment

D-43. The sight base has a vernier adjustment scale. This scale has graduations inscribed on the base and on adjustable scale plates. Each of the graduations inscribed on the base equals 3 MOA. Each of the graduations on the adjustable scale plates equals 1 MOA.

D-44. To use these scales—

(1) Note where the graduations on the inscribed and adjustable scales align.

(2) Count the number of full 3 MOA graduations from "0" on the fixed scale to "0" on the adjustable scale.

(3) Count the number of full 1 MOA graduations from "0" on the adjustable scale to the point where the two graduations align.

(4) Add this figure to the number of 1 MOA graduations from "0" on the adjustable scale to the point where the two graduations align.

Zeroing

D-45. To zero the M24 SWS using iron sights (Figure D-21)—

(1) Set a mechanical zero on the iron sights for windage:

Turn the windage dial all the way to your left or right, and then count the number of clicks required to get from one side to the other.

Divide the result by 2.

Turn the windage dial back by this number of turns, which should center the sight.

NOTE: If the two zeros on the fixed plate windage indicator fail to align, loosen the screw on the windage indicator plate and align them manually.

(2) Mechanically zero the elevation the same way.

(3) Assume a good, prone supported position 100 meters from the target.

(4) Fire three rounds at its center, using the same aiming point each time.

(5) After you note the strike of the rounds, adjust the elevation and windage dials as needed:

Each rotation of either dial equals 3 MOA.

Four clicks equal 1 MOA. 1 MOA equals about 1 inch at 100 yards.

The elevation dial will rotate 20 times, or 60 MOA. The windage dial will rotate 12 times, or 36 MOA.

Turn the elevation dial up to raise the point of impact and down to lower the point of impact. Turn the windage dial right to move the point of impact to the right, and left to move the point of impact to the left.

(6) Continue firing and adjusting shot groups until you bring the point of aim to the point of impact.

(7) After you zero the rifle sight to the preferred range, loosen the socket head screws on the

elevation and windage indicator plate using the hex key provided.

(8) Loosen the spring tension screw.

(9) Align the "0" on the plate with the "0" on the sight body.

(10) Retighten the plate screws.

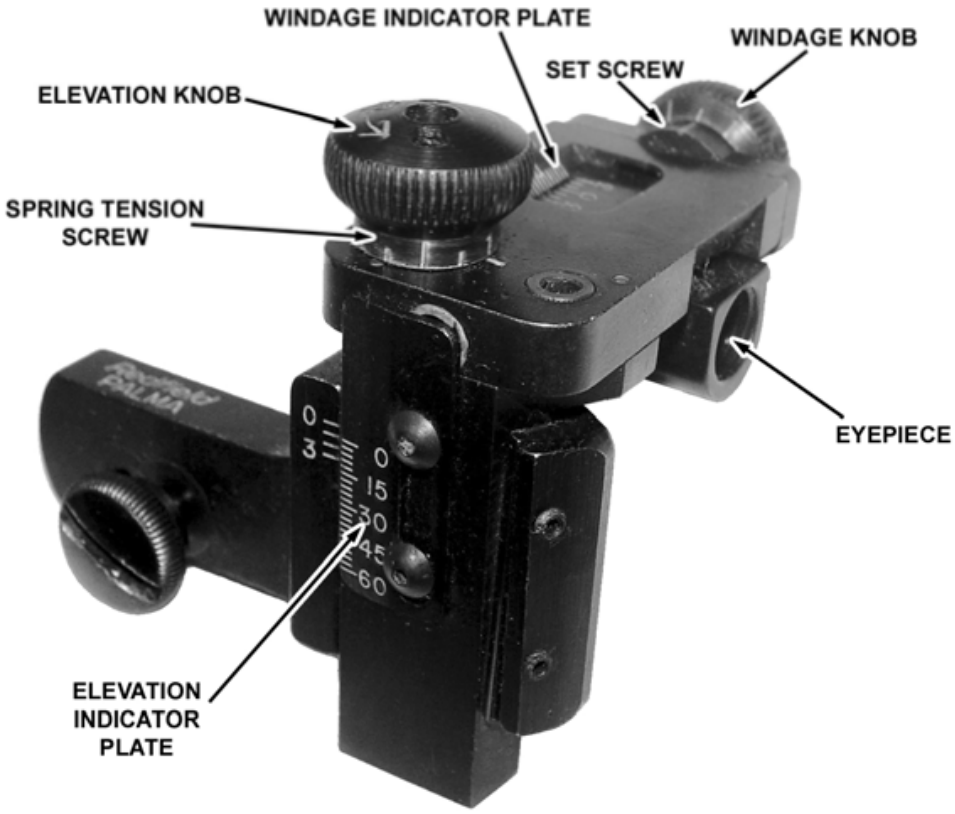


Figure D-21. Zero adjustment dials, iron sights.

(11) Loosen the spring tension and set screws in each dial.

(12) Align the "0" on the dial with the reference line on the sight.

(13) Press the dial against the sight, tighten the set screws, and equally tighten the spring tension screws until you feel a definite "click" when you turn the dial.

NOTE: Loosen or tighten the spring screws on each dial to sharpen or soften the click.

BARREL BREAK-IN PROCEDURE

D-46. When the M24 SWS is new or just rebarreled, only qualified personnel should break-in the barrel. This will increase the life of the barrel and reduce cleaning requirements. The break-in procedure consists of polishing the barrel under heat and pressure. To break in the barrel—

NOTE: Before breaking in the barrel, inspect the barrel, and remove any foreign objects, dust, or residue.

(1) Dry the barrel and fire one round.

(2) Clean the barrel with carbon cleaner and copper cleaner.

(3) Fire a second round, and repeat Step 2.

(4) Repeat Steps 1 and 2 until you have fired a total of 10 rounds.

(5) After the tenth round, test the rifle by firing five 3-round shot groups (15 rounds in all).

Completely clean the barrel between each group.

NOTE: Once the barrel is broken in, clean it at least after every 50 rounds fired. This will increase barrel life.

D-47. The barrel will now provide superior accuracy and a longer usable life. Also, the new, smoother surface will be easier to clean than before.

STORAGE

D-48. To store the M24 SWS—

(1) Clear the M24 SWS.

(2) Close the bolt, and squeeze the trigger.

(3) Open the lens caps to prevent condensation.

(4) Hang the weapon upside down by the rear sling swivel.

(5) Store all other items in the system case.

COLD CLIMATES

D-49. In temperatures below freezing—

- Keep the M24 SWS free of moisture and heavy oil, both of which will freeze. When they do, they will cause the working parts to freeze or operate sluggishly.

- Store the rifle in a room with temperatures the same those outdoors.

- When the M24 SWS is taken from a cold to warm area, condensation occurs. Clean and dry the weapon thoroughly before taking it back into the cold. Condensation will freeze any exposed metal parts and optics.

- Disassemble the firing pin, clean it thoroughly with a degreasing agent, and lubricate it with CLP. Rifle grease can harden and cause the firing pin to fall sluggishly.

AMPHIBIOUS OPERATIONS

D-50. Salty water and air will corrode the metal in the M24 SWS. When operating in an area with salt water exposure—

- Check and clean the M24 SWS as often as possible, even if it means only lubricating the weapon.

- Keep the M24 SWS (including the bore) well-lubricated.

- Before firing, run a dry patch through the bore.

JUNGLE OPERATIONS

D-51. When operating in hot, humid weather—

- Keep your weapon lubricated and cased when not in use.

- Clean the weapon, including the bore, chamber, and stock, daily.

- Keep your weapon (inside and out), carrying case, scope, and ammunition dry.

- If you can, let the weapon and case dry in the sun.

- Keep the caps on the telescope when not using it.

- If the scope gets moisture or fungus in the lenses, replace the telescope.

DESERT OPERATIONS

D-52. During desert operations—

- To cut down on the amount of sand that gets in your weapon, keep it dry and free of CLP and grease, except on the rear of the bolt lugs.

- When not using your weapon, store it in the carrying case (best) or in a sleeve to keep sand out.

- When you might need to use your weapon at any time, use a wrap. Slide the wrap between the stock and barrel, cross it over the top of the scope, cross it under the rifle (over the magazine), and secure it. This protects all critical parts.

- Keep the telescope and ammunition clean and protected from the direct rays of the sun.

- Use a toothbrush to remove sand from the bolt and receiver.

- Clean the bore and chamber daily.

- Protect the muzzle and receiver from blowing sand by covering them with clean cloths. To protect the free-floating barrel, knot each end of an 8- or 9-inch strip of cloth. Before you go on a mission, slide the cloth between

the barrel and stock all the way to the receiver, and leave it there. When you get into position, slide the cloth out, removing all restrictive debris and sand.

LOADING

D-53. To load the rifle—

NOTE: Before loading, ensure that the safety selector is in the SAFE position and that the bolt is forward.

(1) Point the M24 SWS in a safe direction.

(2) Raise the bolt handle, and pull it all the way back.

(3) Push 5 rounds of 7.62-mm ammunition through the ejection port into the magazine, one at a time. Ensure that the bullet points toward the chamber. Use a finger to push the cartridges into the magazine and all the way down and to the rear of the magazine.

(4) Slowly glide the bolt forward over the top round, and then push down the bolt handle.

NOTE: The magazine is now loaded.

D-54. The sixth round is chambered using bolt override procedures. To perform bolt override procedures—

(1) Load 5 rounds in the magazine as described in the steps above.

(2) Gently apply downward pressure on the top round until the bolt slides freely forward without engaging the top round of the internal magazine.

(3) Insert the sixth round into the chamber. (4) Close the bolt.

CHAMBERING A ROUND

D-55. To chamber a cartridge—

(1) Raise the bolt handle and pull it back until it stops.

(2) Push the bolt handle forward again.

NOTE: Each time it moves forward, the bolt picks up a round from the magazine and pushes it into the chamber.

(3) Push down the bolt handle.

(4) To fire, take off the safety and squeeze the trigger.

PROCEDURES FOR UNLOADING

D-56. To unload the rifle—

NOTE: Before unloading, ensure that the safety selector is in the SAFE position and that the bolt is forward.

(1) Point the muzzle in a safe direction.

(2) Raise the bolt handle.

(3) Put one hand over the top ejection port.

(4) Slowly pull the bolt handle back with your other hand. This removes the cartridge from the chamber.

(5) Remove the cartridge from the rifle.

(6) Put a hand under the floor plate.

(7) Push the floor plate latch to release the floor plate (Figure D-22). This releases the spring and follower from the magazine.

(8) Remove the released cartridges.

(9) Push in the magazine follower, and then close the floor plate.



Figure D-22. Floor plate latch.

SOURCES OF RIFLE ERROR IN SHOOTING

D-57. Rifle errors usually show up as some interference with the normal jump or trajectory of the bullet. Table D-2 outlines the sources of rifle error.

Table D-2. Sources of rifle error.

COMPONENT	SOLUTION
Stock	Check the barrel and receiver to be sure that the stock is set correctly and securely, but not too tightly. Too much play can throw off the natural jump of the rifle. If you cannot fix this yourself, turn the rifle in to the unit armorer.
Telescopic Sight	The scope mounts hold the sight in place on the rifle. The screws that secure the mounts can loosen. Check the screws regularly to ensure that the sight and mounts are secure.
Trigger	You can customize a single-stage trigger for your ideal trigger pull, for backlash, and for creep. A short, crisp

	trigger pull reduces the delay between thought and shot. An unbalanced trigger that has lost your settings can cause shooting errors. If you think your trigger is "off," have it examined and adjusted.
Barrel	Keeping the barrel clean and dry is extremely important. In a worn, dirty, or damaged barrel, several factors can move the trajectory of the bullet: Neglect: The effects of neglect increase friction, which decreases accuracy. Keep the barrel spotlessly clean and remember that, once a barrel is damaged, you can never fully restore it to its original condition. Oil: Oil affects the barrel much like neglect does, reducing accuracy. Even though oil burns off after the first two or three rounds have been fired, it greatly affects the first round. Nickel Deposits: Nickel from previously fired bullets gets into the lands in your barrel. These deposits show up as rough, light-colored streaks, particularly in a worn barrel. Although they have little effect on accuracy, you should still remove them regularly. Heat: When heated by firing, some barrels shoot slightly high. Even though the rate of sniper fire is rarely enough to heat a barrel, test your weapon to determine the effect of a hot barrel on the trajectory of the bullet.
Chamber or Face of Bolt	Oil in the chamber or on the face of the bolt causes altered bullet jump or abnormal chamber pressure. These effects are worse than the effects of oil in the barrel and last well past the first two or three shots.

Screws	Loose screws, especially loose bedding screws, can change the recoil of the rifle. Check screws regularly to be sure they are torqued to 65 inch-pounds.
Surface	Resting your rifle on a hard surface will change the recoil. The amount of change depends on which part of the rifle is rested. Test your weapon to determine the degree of error based on which part of the rifle is rested.

Appendix E: Communications

Communications are a vital aspect in successful mission accomplishment in any type of environment. The basic requirement of combat communications is to provide rapid, reliable, and secure exchange of information.

SECTION I. FIELD-EXPEDIENT ANTENNAS

The information in this section helps the sniper team maintain effective communications and correct any radio antenna problems.

CLASSIFICATION

E-1. Antennas are classified by the directions in which they can radiate energy. The three classifications include—

- Directional.
- Bidirectional.
- Omni-directional.

DIRECTIONAL

E-2. This antenna's single lobe of energy sends a unidirectional signal (Figure E-1). The width of the signal ranges from a narrow pencil beam to a 60-degree arc, depending on the type of directional antenna chosen.

Considerations

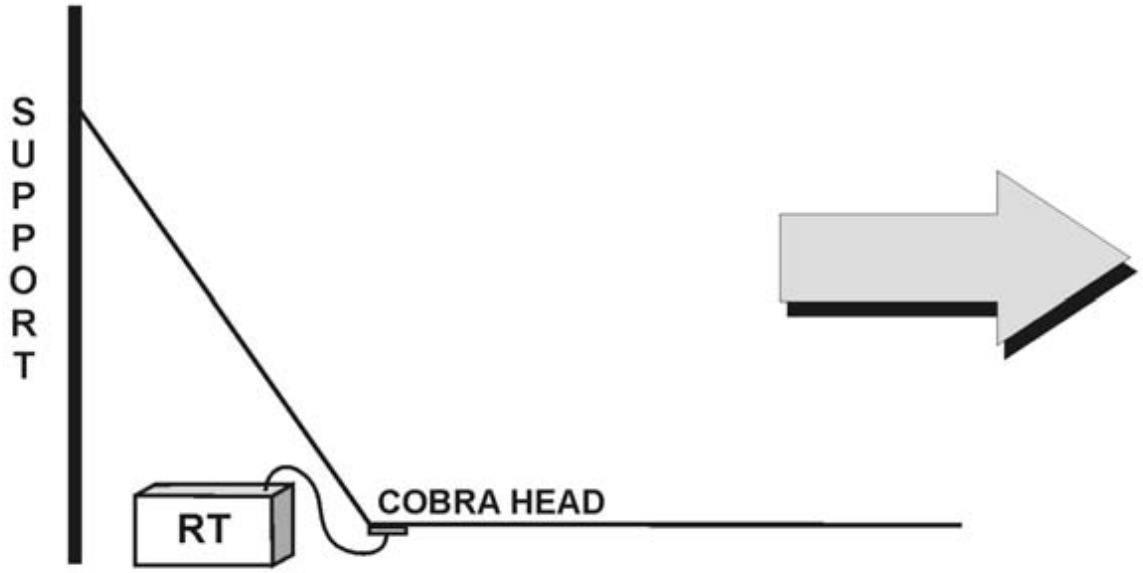


Figure E-1. Directional antenna pattern.

E-3. When using directional antennas, the sniper should consider the following:

- Directional antennas are used on long-range, point-to-point circuits that need concentrated radio energy for reliability.

- A directional antenna concentrates most of its energy in one direction, so it requires careful orientation.

- The enemy has a hard time determining the origin of directional antennas. This reduces the likelihood of interference.

Adaptation of Bidirectional Antennas for Directional Use

E-4. Adding a terminating resistor to absorb the energy of the second lobe allows directional use of a bidirectional antenna. The terminating resistor must match the antenna; it must be able to absorb one-half of the power output of the connected transmitter and provide 400 to 600 ohms of resistance.

BIDIRECTIONAL

E-5. A bidirectional antenna (Figure E-2) has two opposite lobes of radio energy, with an area of null energy (no energy) between them. The lobes produce two strong signals in opposite directions and weaker ones in all other directions. The bidirectional antennas most commonly used in tactical situations are the sloping "V", random length wire, and half-wave dipole.

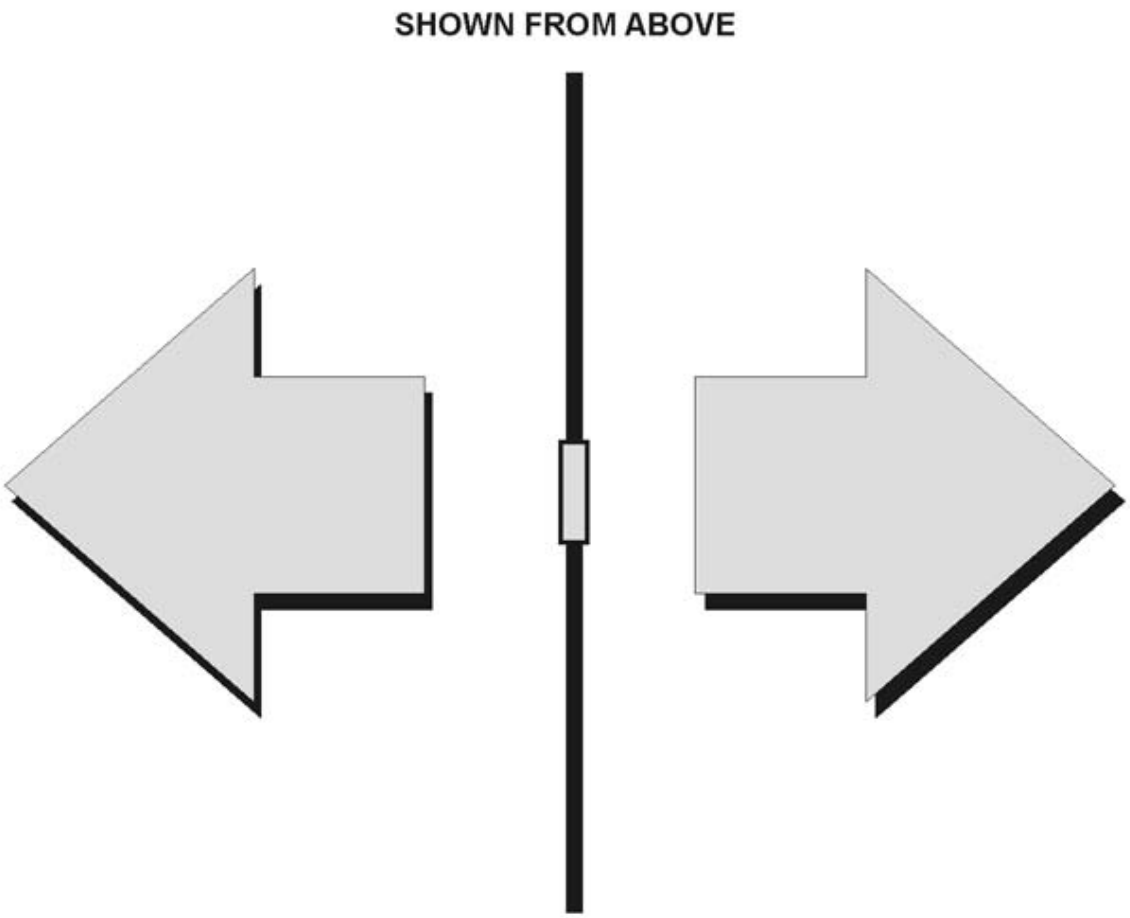


Figure E-2. Bidirectional antenna pattern.

Considerations

E-6. When using bidirectional antennas, snipers should adhere to the following considerations:

• Bidirectional antennas are usually used on point-to-point circuits and in situations where the antenna null can be positioned to reduce or block signals that could interfere with reception.

• To work properly, a bidirectional antenna must be oriented to the ground wave; this is difficult to do. Lowering the antenna to create a near-vertical incidence skywave (NVIS) effect makes this more difficult, because it increases the radiation pattern.

• A bidirectional antenna is best used near other antennas, which should be placed in its null to reduce interference and interaction between the antennas.

OMNI-DIRECTIONAL

E-7. An omni-directional antenna (Figure E-3) radiates and receives energy equally well in all directions. The most common omni-directional antenna is the whip. Others are the quarter-wave vertical (RC-292 and OE-254) and the crossed dipole (AS-2259) antennas.

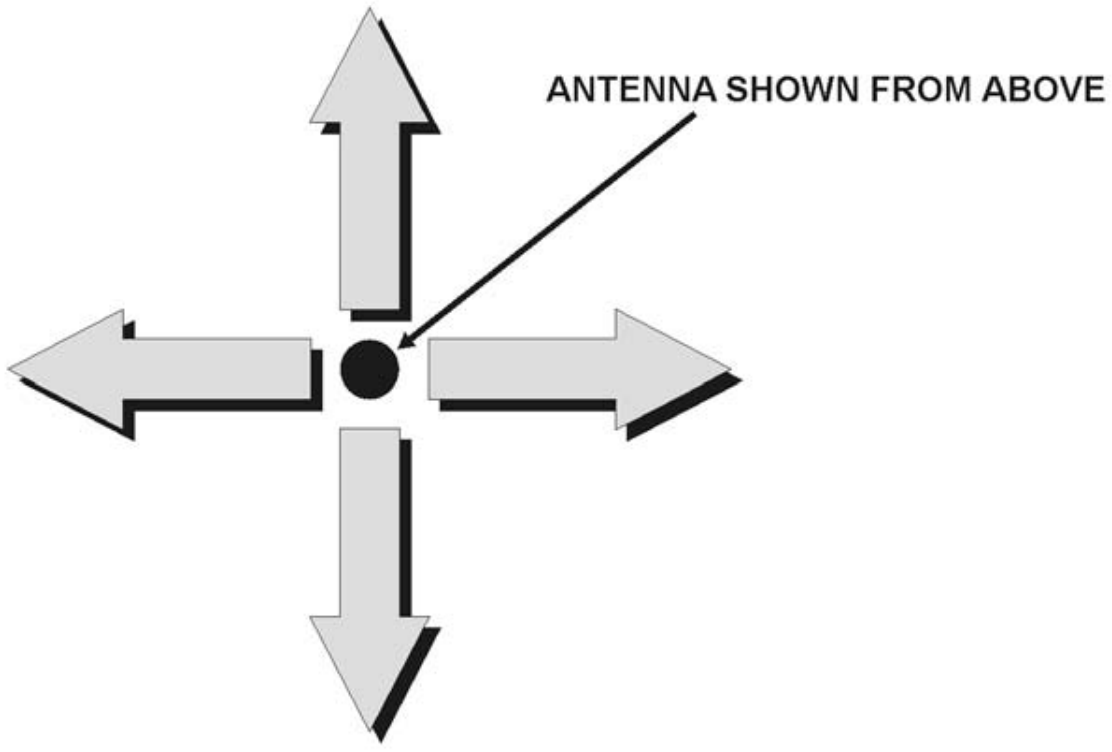


Figure E-3. Omni-directional antenna pattern.

Considerations

E-8. When using omni-directional antennas, the sniper should consider the following:

- Omni-directional antennas are used when it is necessary to communicate in separate directions at once.

- Omni-directional antennas are more susceptible to interference from all directions.

COMMON TYPES OF ANTENNAS

E-9. Common antennas include the half-wave dipole, inverted "V", long wire, and the sloping "V".

HALF-WAVE DIPOLE

E-10. The half-wave dipole antenna is a balanced resonant antenna (Figure E-4). It produces its maximum gain in a narrow range between 2 percent above and 2 percent below the design frequency. Since frequency assignments are normally several megahertz (MHz) apart, the operator must build a separate dipole for each assigned frequency.

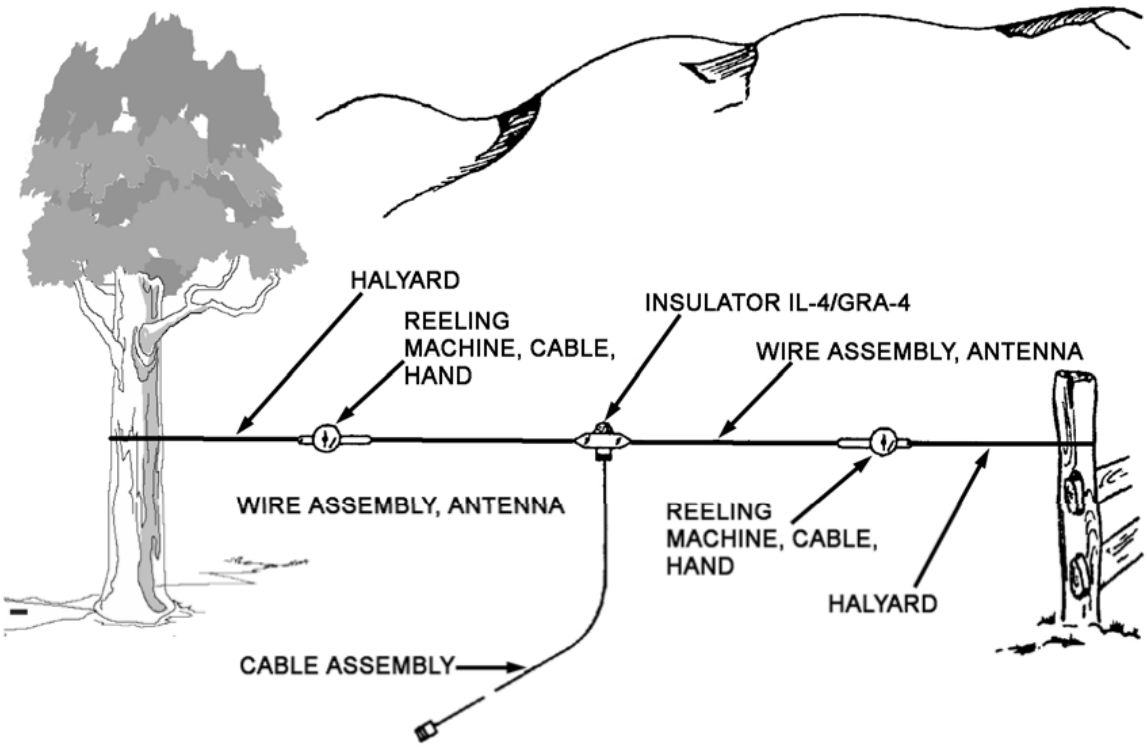


Figure E-4. Half-wave dipole antenna.

Height of Dipole

E-11. The operator normally keeps the height of a dipole between 1/4 and 1/2 wavelength above ground level for long-range skywave. For NVIS of 0 to 300 miles, and for inverted and sloping "V" antennas, the operator raises the antenna between 1/8 and 1/4 wavelengths above ground level.

INVERTED "V" (DROOPING DIPOLE)

E-12. The inverted "V", or drooping dipole, antenna (Figure E-5) is similar to a dipole antenna, except that it only requires one center support and has less gain. Like a dipole antenna, it is used for a specific frequency and has a bandwidth of plus or minus 2 percent of design frequency. Because of the inclined sides, the inverted "V" antenna produces a combination of horizontal and vertical radiation; vertical off the ends, and horizontal broadside to the antenna.

NOTE: All of the construction factors for a dipole antenna also apply for the inverted "V."

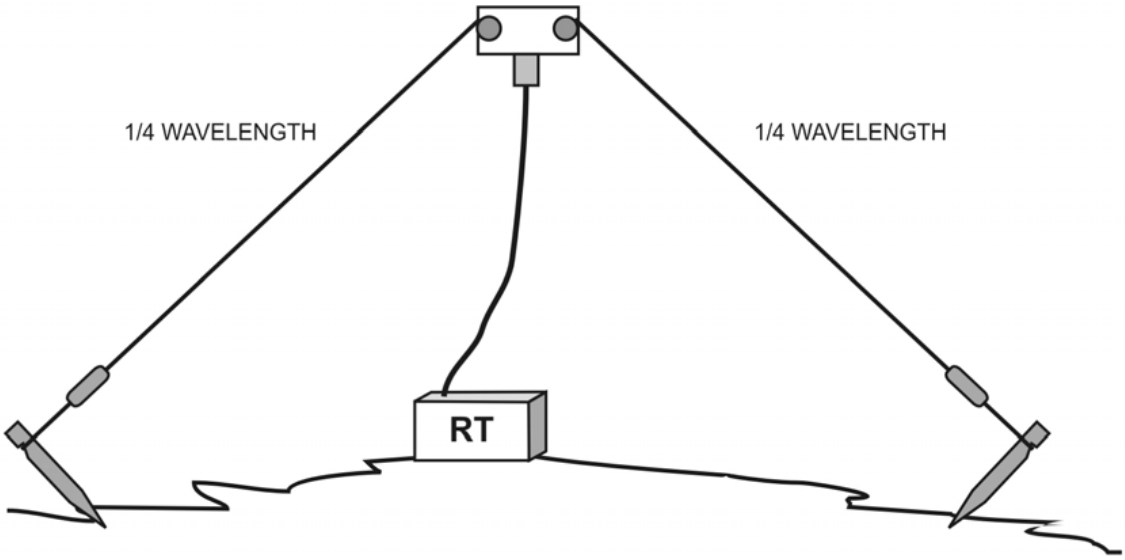


Figure E-5. Inverted "V" antenna.

LONG-WIRE ANTENNA

E-13. A long-wire antenna is one that is at least as long as one wavelength (Figure E-6). However, it should be longer to achieve good gain and directional characteristics. Constructing long-wire antennas is simple, correct dimensions and adjustments are critical to its success.

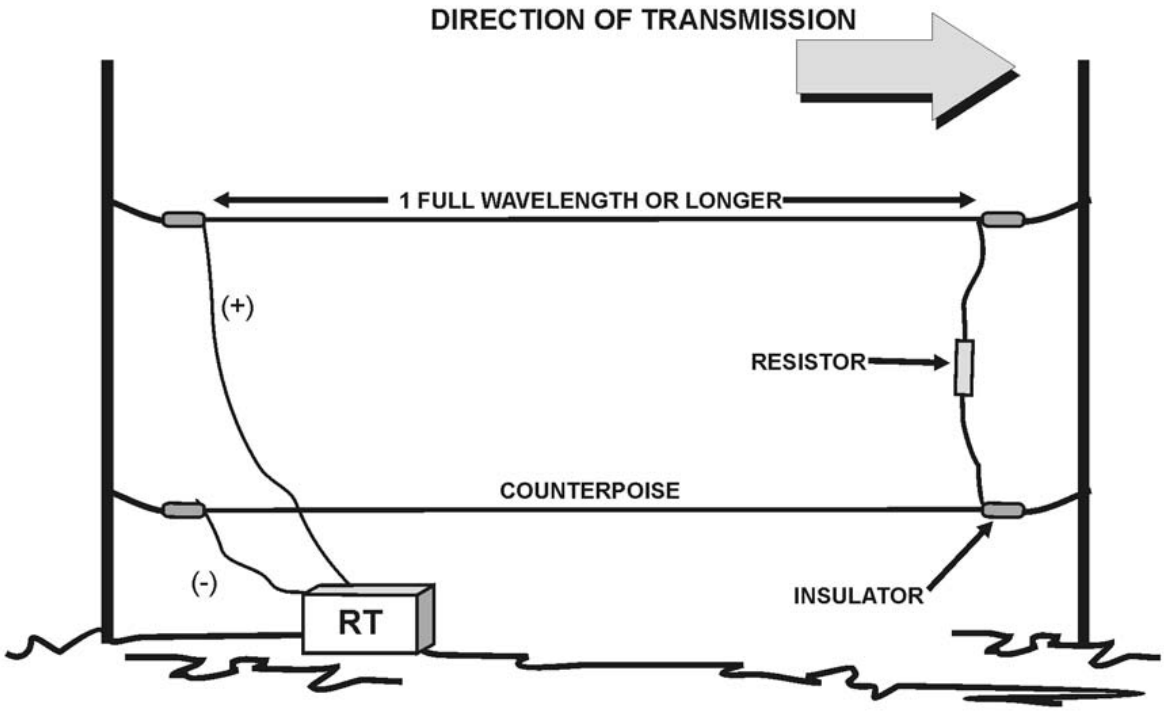


Figure E-6. Long-wire antenna.

Direction

E-14. A long-wire antenna is made directional by placing a terminating resistor at the distant station end of the antenna. The terminating resistor should be a 600-ohm, noninductive resistor that can absorb at least 1/2 of the transmitter power. Terminating resistors are part of some radio sets, but can be made locally using a 100-watt, 106-ohm resistor (NSN 5905-00-764-5573).

Construction

E-15. Building a long-wire antenna only requires wire, support poles, insulators, and a terminating resistor (if directionality is desired). The only other requirement is that the operator strings the antenna in a straight line. Because the antenna is less than 20 feet tall, it requires no tall support structures.

SLOPING WIRE

E-16. If a high frequency (HF) circuit is a single point-to-point ground link or a short skywave link and if all other stations are oriented in the same direction, the team can use a sloping wire antenna (Figure E-7). The radiating wire is normally one 1/4 of the wavelength.

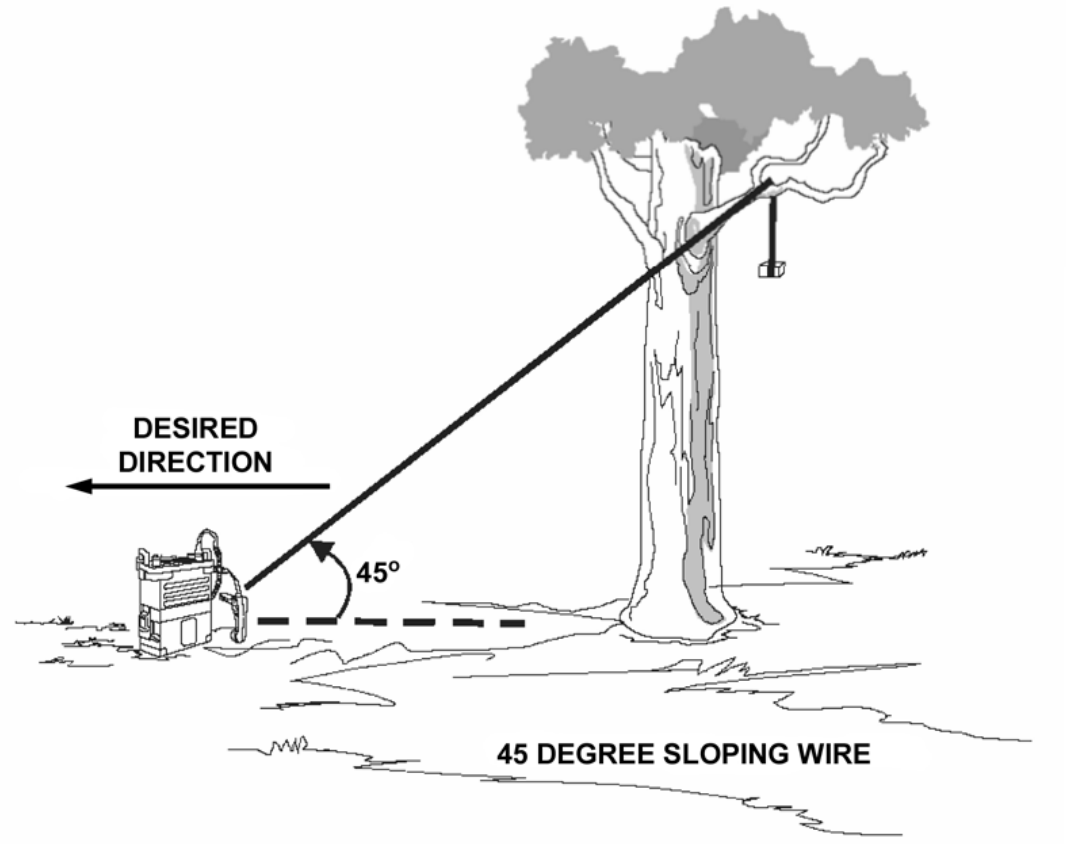


Figure E-7. Sloping wire antenna.

Construction

E-17. The far end of the antenna should be connected to a rope, with the other end tied to a nonconductive weight, such as a stone or brick. The weighted end is then thrown over a tree so that the antenna forms a 30- to 45-degree angle to the ground. Angles greater than 45 degrees are used for ground waves and those less than 30 degrees are used for skywaves. The angle formed by the wire should point in the direction opposite that of the intended receiver.

TERMINATED SLOPING "V"

E-18. The sloping "V" antenna is a short- to long-range skywave antenna (Figure E-8). Gain and directivity depend on leg length. For reasonable performance, the antenna should be at least 1/2 wavelength long.

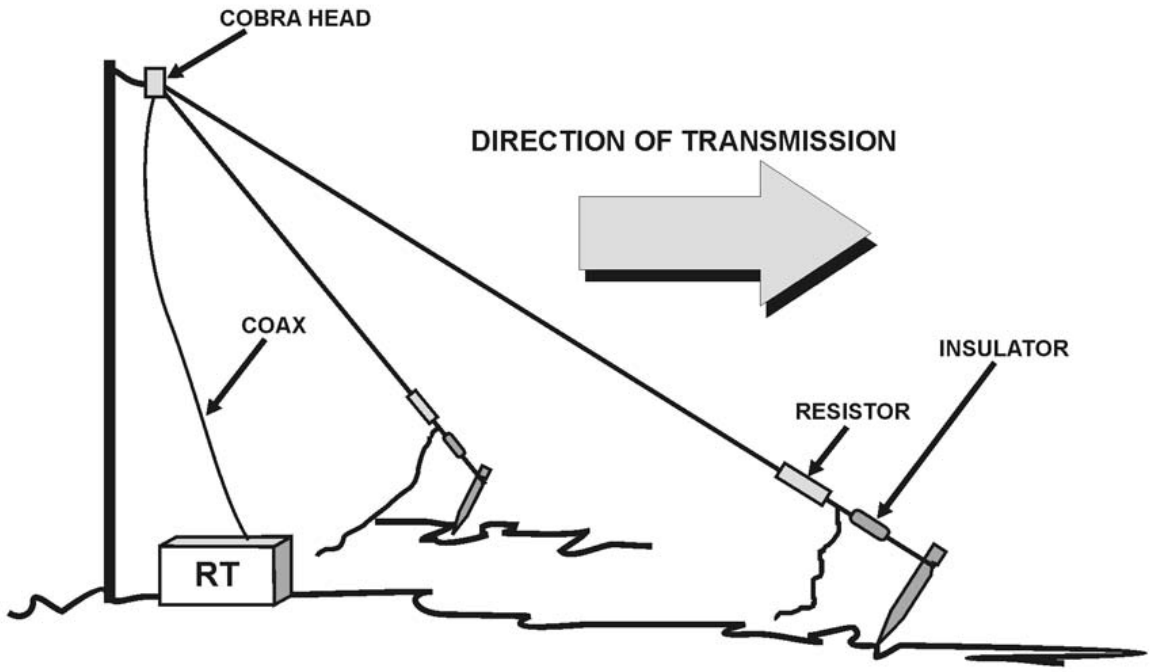


Figure E-8. Terminated sloping "V" antenna.

Direction

E-19. To make the antenna directional, the operator puts terminating resistors on each leg on the open part of the "V". The terminating resistors should be 300 ohms and be capable of absorbing 1/2 of the transmitter's power output. These terminating resistors are either procured or are locally made. Using the terminating resistors, the operator aims the antenna so that the line cutting the "V" in half points at the distant station.

CONSTRUCTION AND SELECTION

E-20. Regardless of the antenna type and configuration used, snipers should use proper construction procedures.

SITE

E-21. The tactical situation usually determines the antenna positions. The ideal area is clear and flat with no trees, buildings, fences, power lines, or mountains. Unfortunately, the tactical communicator will often have to settle for less ideal sites, and these sites usually interfere with the patterns and functioning of the antennas.

COVERAGE

E-22. The radio operator determines what type of coverage to use. If the radio circuit consists of mobile (vehicular) stations or of many stations at different directions from the transmitter, an omni-directional antenna is required. If the circuit is point-to-point, he can use a directional or bidirectional antenna. Normally, the receiving station locations dictate this choice.

CONSTRUCTION

E-23. Before he can select an antenna type, the operator must examine the materials available to build one. He needs two supports to build a horizontal dipole, and a third support in the middle for frequencies of 5MHz or less. If he has nothing he can use for a support, he cannot build a dipole antenna.

Field-Expedient Wire

E-24. If regular antenna wire is unavailable, the radio operator can use field telephone wire (WD1/TT) to build antennas. Field wire consists of two insulated wires, and each of those has four copper and three steel strands.

E-25. When making electrical connections with field wire, the operator uses the copper strands. To do this—

(1) Remove about one inch of insulation from one end of the insulated wire.

(2) Hold the wire where the insulation ends.

(3) Bend the strands to the side.

NOTE: When you release the pressure, the steel strands snap back to their original positions, but the copper strands remain bent.

(4) Wrap these copper strands around the steel strands for a good electrical connection.

E-26. If field wire is used as the radiating element of an antenna, the two insulated wires in the twisted pair must be connected at the ends so that, electrically, the two wires act as one. To do this—

(1) Tightly twist together all six steel strands from the two wires (for strength).

(2) Twist the eight copper strands together (to connect them electrically).

(3) Twist the copper strands around the steel strands.

E-27. To use field wire as a feed line for a dipole antenna—

(1) Connect each of the two insulated wires of the twisted pair to a separate leg of the dipole.

(2) At the radio, connect one wire (any wire) to the center connector of the radio antenna terminal and the second wire to a screw on the antenna case.

E-28. In an emergency, any wire of sufficient length can be used for an antenna (e.g., barbed wire, electrical wire, fence wire, or metal-cored clothesline). Communication has even been successful using metal house gutters and metal bed springs. A radio operator's mission is incomplete until he establishes communication.

Ground

E-29. All radio equipment should be grounded to prevent shock and damage to equipment during electrical storms. This protects the operator and his equipment. Also, some antennas must have a radio-frequency ground before they will function.

E-30. If the operator has no ground rod, he can use water pipes, concrete reinforcing rods, metal fence posts (with the protective paint coating removed), or any length of metal. If a water system has metal pipes, he can make a good ground by clamping the ground strap to a water pipe. He can also use underground pipes, tanks, and metal building foundations.

Insulators

E-31. The radio operator can make insulators from items that are readily available (Figure E-9). He should choose materials that do not absorb water, as those that do, such as rope or cloth, will lose their insulating characteristics and become conductors themselves if they get wet.

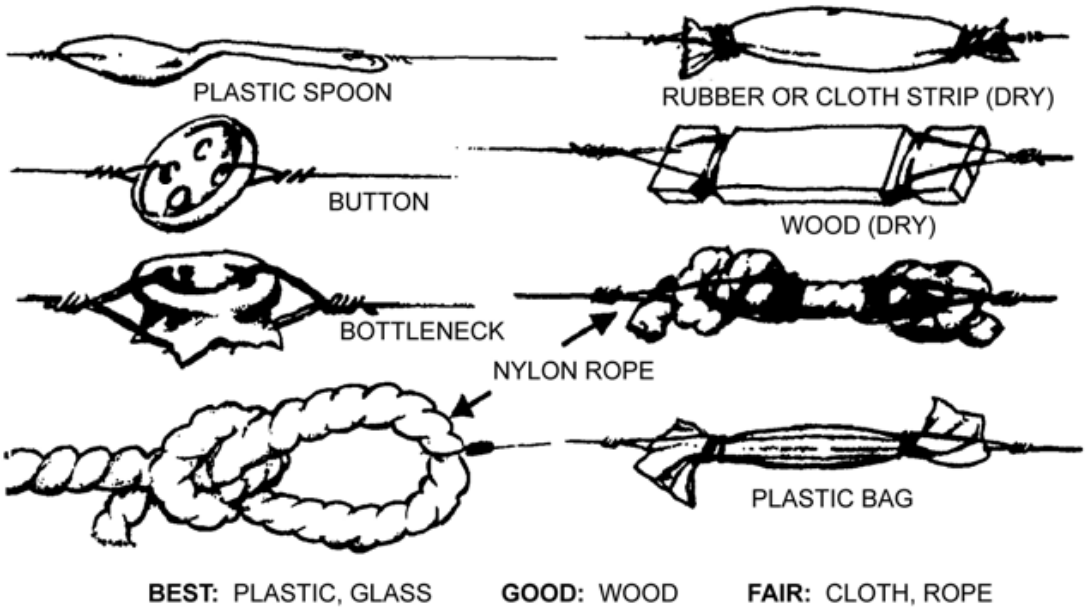


Figure E-9. Expedient insulators.

Antenna Length

E-32. An antenna has both a physical and an electrical length, and the two are never the same. Several factors make the antenna seem longer electrically than it is physically: the reduced velocity of the wave on the antenna, the ratio of the diameter of the antenna to its length, and the capacitive effect (known as end effect) of terminal equipment (i.e., insulators, clamps) used to support the antenna.

E-33. For frequencies between 3.0 and 50.0 MHz (i.e., a half-wave antenna), the operator calculates the physical length of an antenna using the formulas below:

$$\frac{150 \times .95 = 142.5}{\text{frequency in MHz}} = \text{length of the antenna in meters}$$

$$\frac{492 \times .95 = 468}{\text{frequency in MHz}} = \text{length of the antenna in feet}$$

E-34. The operator calculates the length of a long-wire antenna (one wavelength or longer) for harmonic operation using the following formulas:

$$\frac{150 \times (\text{number of half-wave lengths in the total length of the antenna} - 0.05)}{\text{frequency in MHz}} = \text{length of the antenna in meters}$$

$$\frac{492 \times (\text{number of half-wave lengths in the total length of the antenna} - 0.05)}{\text{frequency in MHz}} = \text{length of the antenna in feet}$$

ADJUSTMENT

E-35. An improvised antenna can change the performance of a radio set. If the signal is weak, the sniper should check the performance of the antenna. To check whether the antenna is operating properly—

- Adjust the height and length of the antenna and transmission line until you get the strongest signal you can at a given setting on the volume control of the receiver. This is the best way to tune an antenna when transmission is dangerous.

- Use the transmitter to adjust the antenna. Set the transmitter controls to normal. For the best signal, tune the system by adjusting the antenna height and length, and the transmission line length.

NOTE: See FM 24-18 for more information about antenna adjustment.

- Check, tighten, and tape cable connections.

- Move the antenna a short distance away from its original location.

- Add counterpoises and resisters that match the specific radio being used.

- Establish an SOP for testing, and specify when to use alternate antenna.

REPAIR

E-36. A broken whip antenna can be temporarily repaired (Figure E-10):

E-37. If the whip is broken in two sections, the operator can join the sections. To do this—

(1) Remove the paint, and clean the sections where they join to ensure a good electrical connection.

(2) Place the sections together, and secure them using bare wire or tape.

E-38. If the whip is badly damaged, the radio operator can use field wire (WD1/TT) of the same length as the original antenna. To do this—

(1) Remove the insulation from the lower end of the field wire antenna.

(2) Twist the conductors together, and stick them into the antenna base connector.

(3) Secure the conductors with a wooden block.

(4) Support the antenna wire with a tree or a pole.

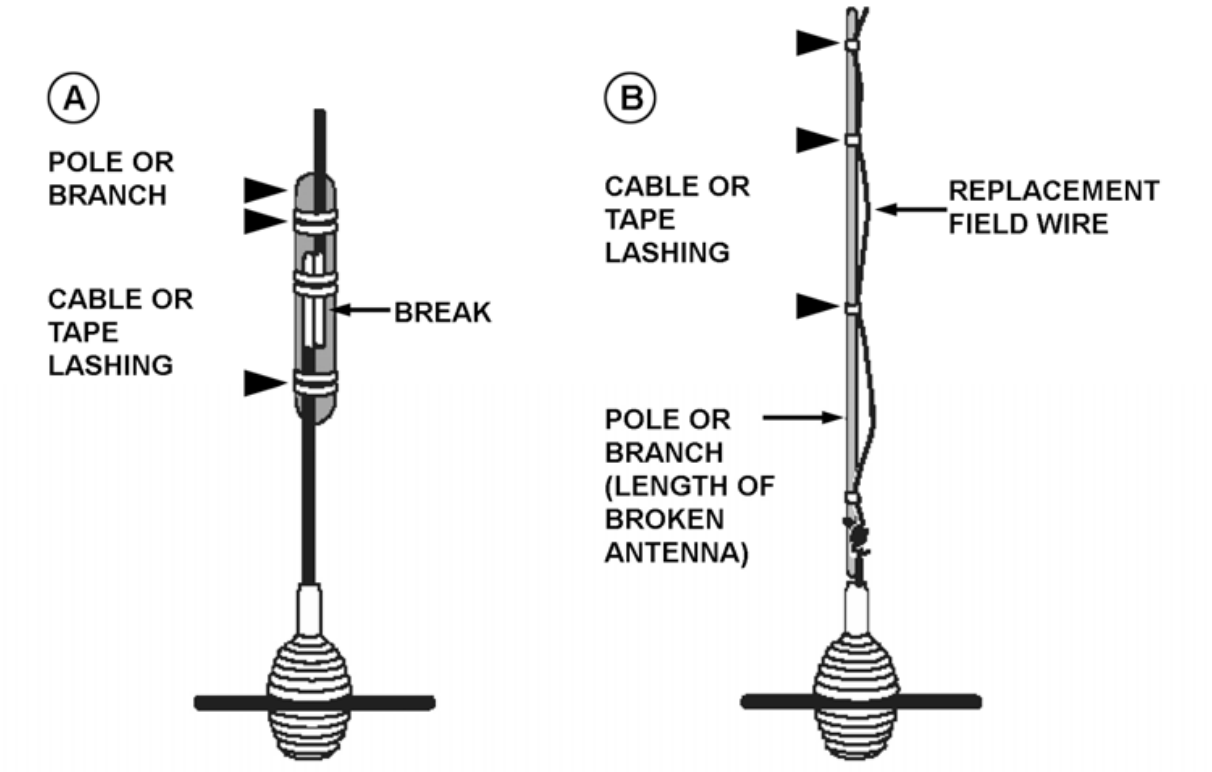


Figure E-10. Repair procedure, whip antenna.

SECTION II. UNUSUAL CONDITIONS

Sniper teams must prepare for deployment to distant areas where extremes of terrain and weather prevail. Climatic variations, such as temperature, electricity, humidity, and wind, require variations in the ways radios and antennas are set up, used, and maintained.

DESERT OPERATIONS

E-39. The factors that most affect radios and antennas in the desert are poor electrical grounding, temperature and humidity extremes, and wind-blown contaminants.

ELECTRICITY

E-40. For the best operation in the desert, the operator should locate radio antennas on the highest terrain available.

E-41. Poor electrical grounding in the desert reduces the ranges of whip antennas by 1/5 to 1/3. For this reason, complete antenna systems, such as horizontal dipoles and vertical antennas, with adequate counterpoises are generally more effective.

STATIC ELECTRICITY

E-42. Many factors in the desert cause static electricity, including wind-blown dust particles and dry air. When operating in fixed positions, the operator should—

- Ground communication equipment properly to prevent such discharges.

- Tape all sharp edges and tips of antennas to reduce wind-caused static discharges and the accompanying noise.

- Use the highest frequencies authorized for use, since static-caused noise diminishes at higher frequencies.

HEAT

E-43. The high temperatures of the desert can affect radios. Radio sets can overheat and fail, so the operator should turn them on only when necessary and keep air vents and filters clean. High temperature conditions will also degrade radio wave propagation. A station that can be reached at night may not be reachable during the day.

MOISTURE

E-44. In deserts with high humidity, condensation occurs wherever a surface is cooler than the air. To keep contacts dry, the operator should tape electrical plugs, jacks, and connectors. To prevent arcing, he should make sure these are dry before connecting.

DUST AND DIRT

E-45. Wind-blown particles (dust, dirt, sand, and grit) damage everything they touch. They cause the most damage to items with moving or electrical parts, or with vents, grids, or grilles. Because radios with servomechanisms are particularly vulnerable, extra cleaning and precautions are required.

JUNGLE OPERATIONS

E-46. Communications in jungle areas must also be carefully planned. Thick jungle growth vertically polarizes radio frequency energy, which reduces transmission ranges. Heat and humidity increase maintenance problems. To reduce the effects of these elements, the operator should—

- Keep all cables and connectors (antenna, power, and telephone) off the ground to reduce damage from moisture, fungus, and insects. After repairs or damage, paint all surfaces of equipment with fungus-resistant, moisture-proofing paint.

- If possible, clear vegetation from antenna sites. Foliage touching an antenna will ground its signal.

- If vegetation can not be removed, especially in dense or wet vegetation, always horizontally polarize the antennas.

- Keep air vents clear to help keep equipment cool and dry.

COLD WEATHER OPERATIONS

E-47. In very cold weather, ionospheric storms and night lights can degrade skywave propagation and disable radio communications. Static can block frequencies for extended periods; changes in the density and height of the ionosphere can fade a signal for weeks. When these disturbances occur, radio operators must be ready to use alternate frequencies or other means of communication. To reduce the effects of these elements, the operator should —

- Install a counterpoise far enough aboveground to prevent the snow from covering it. This improves ground wave transmission; frozen ground conducts electricity too poorly to propagate ground waves well.

- Handle the mast sections and the antenna cables carefully; they become brittle at very low temperatures.

- Run antenna cables overhead to avoid damage from heavy snow and frost. Use nylon rope for guy wires rather than cotton or hemp. Nylon absorbs less moisture, so it is less likely to freeze and break.

- Use extra guy wires, supports, and anchors to help antennas withstand heavy ice and wind loading.

- Allow radios to warm up for several minutes before use. Since extreme cold lowers the voltage output of a dry battery, try warming the battery before operating the radio set. This minimizes frequency drift.

- Cover all antenna elements with polystyrene tape and shellac. Flakes or pellets of highly electrically charged snow have been reported in northern

regions. When these particles strike the antenna, the resulting electrical discharge causes a high-pitched static roar that can blanket all frequencies.

- Before cold equipment is brought into a heated area, wrap it in a blanket or parka to ensure that it will warm gradually to reduce sweating. If the cold equipment is brought suddenly into contact with warm air, moisture will condense on its parts (e.g., sweating).

- Thoroughly dry all equipment before taking it back out into the cold. Otherwise, moisture caused by sweating will freeze equipment.

NOTE: A radio generates heat when it is operated. When it is turned off, the air inside cools and contracts, drawing cold air in. This "breathing" can bring still-hot parts into contact with subzero air. This can cool the glass, plastic, and ceramic parts too quickly, and cause them to break.

MOUNTAIN OPERATIONS

E-48. Operation in mountainous areas presents many of the same problems as operation in northern or cold weather areas. It also makes selecting transmission sites a critical task. Terrain restrictions often make relay stations necessary for good communications, and terrain obstacles often make line-of-sight transmission necessary. Also, the dirt in mountainous areas seldom conducts electricity well. To reduce the effect of these elements, the operator should use a complete antenna system, such as a dipole or ground-plane antenna, with a counterpoise.

URBAN OPERATIONS

E-49. Communications in urbanized terrain poses special problems. Some problems are similar to those encountered in mountainous areas. Obstacles can block transmission paths; pavement surfaces conduct electricity poorly; and commercial power lines cause electrical interfere.

E-50. Very high frequency (VHF) radios are generally less effective in urban terrain. Due to their power output and operating frequencies, VHF

radios require a line of sight between antennas. Urban areas sometimes prohibit the establishment of a street-level line of sight.

E-51. HF radios rely on a line of sight less than VHF radios because they use lower operating frequencies and transmit at higher powers.

E-52. When operating in urban areas, the operator should hide or blend the antenna into its surroundings to prevent discovery. Antennas can be concealed by blending them with existing structures, such as water towers, existing civilian antennas, or steeples.

SECTION III. REPORT FORMATS

Timely, accurate information reduces unknowns about the enemy and the AO. Such information improves to the commander's risk assessments and helps him successfully apply combat power. This section discusses how the sniper team can rapidly transmit complete information and reduce the chance of exposure by using standardized reporting formats.

NOTES:

1. Units can modify any of the report formats to meet their specific requirements.

2. All reports in this section comply with standardization agreement (STANAG) reporting formats.

Sniper teams should use five basic report formats (Table E-1). These reports should be sent to the tactical operations center (TOC) via tactical satellite or high frequency, high performance waveform (HF HPW). This allows for accurate reports with minimal transmission time.

Table E-1. Report formats used by sniper teams.

PROWORD	ACTUAL REPORT TITLE	PURPOSE
Angus	Initial Entry Report	To alert the TOC of the status of the insertion, the team's initial situation, and possible deviations from infiltration plan
Boris	Intelligence Report	To produce special occurrence report (SOR), priority intelligence report (PIR), and SIR

Cyril	Situation Report	To report the team's situation (excludes SOR, PIR, and SIR)
Under	Cache Report	To report an emplaced cache
Crack	Battle Damage Assessment (BDA) Report	To report battle damage on a specified target

INITIAL ENTRY REPORT (ANGUS)

E-53. The sniper team normally sends the initial entry report to the TOC as soon after the insertion as the tactical situation allows (usually within 4 hours of insertion). If the initial entry report is not transmitted within this window, the TOC may assume the mission is compromised and initiate emergency procedures. Table E-2 shows the typical format of an initial entry report.

Table E-2. Typical format for an initial entry report.

LINE NUMBER	CONTENT	EXAMPLE
1	Date-time group (DTG)	152307NOV06.
2	Team status (use code words)	Green.

3	Current location (6-digit grid with a grid zone identifier).	GL098569.
4	Possible deviations from briefed plan	Due to restrictive terrain, team will deviate more to the North on primary infiltration route.
5	Remarks	None.

INTELLIGENCE REPORT (BORIS)

E-54. The sniper team normally sends the intelligence report to the TOC as soon as the sniper team has special occurrences to report. The priority intelligence report (PIR) and special occurrence report (SOR) are normally sent to the TOC during prescribed communications windows. Table E-3 shows the typical format for the intelligence report.

Table E-3. Typical format for an intelligence report.

LINE NUMBER	CONTENT	EXAMPLE
1	DTG	131844SEP05.
2	DTG of observed activity	131506SEP05.

3	Location of observed activity	West side of hill GL96578354.
4	Observed activity	Preparing radio to transmit and receive. Manning reinforced fighting/defensive position.
5	Description of personnel, vehicles, weapons, and equipment	4 pax in military uniform outside reinforced fighting position. The pax are called A, B, C, and D. Three of them, A, B, and C, are wearing PCs. Pax D is wearing a boonie hat. Pax A is manning a radio that is carried inside a rucksack and placed on top of the fighting position. (The radio has a long, whip-type antenna.) Pax B (fair-skinned) is talking on the radio. Pax A and Pax B are both standing on the west side of the position. Pax C is standing on the north side of the position. Pax D is on the north side of the position, but is walking toward the east. Pax C and Pax D are carrying unidentifiable assault rifles. Pax D is wearing load-carrying equipment. The fighting position is a poured concrete structure, built into a berm, with a [wooden?] roof with a small overhang. About 3 feet of the structure is visible above ground. The structure is about 7 feet long (north to south). In the middle of the east and west walls are viewports. A triple-strand concertina wire obstacle runs north to south about 5 meters to the east of the fighting position. Triple-strand

		wire is set up on the west side of an 8-foot tall chain-link fence, which also runs north to south. V-shaped barbed wire runs along the top of the fence.
6	Team assessment	Believe Pax A and Pax B have weapons, though not observed. Pax B seems to be the leader of the group, because he is talking on the radio. The team seems to be preparing to man the fighting position for an unknown period of time. The team also appears to be in a nonaggressive posture, because their weapons are slung. The layout of the obstacles and the location of the position suggest the position is used for observation and early warning.

SITUATION REPORT (CYRIL)

E-55. The sniper team must send the situation report to the TOC during set communication periods, known as windows. The situation report addresses the team's situation, status (medical, team equipment, food, water, batteries), past, current, and planned activity. Table E-4 shows the typical format for a situation report.

NOTE: The team must send a Cyril report during every communications window.

Table E-4. Typical format for a situation report.

LINE NUMBER	CONTENT	EXAMPLE

1	DTG	131844SEP05.
2	Current location (8-digit grid with identifier)	JL14593487.
3	Medical status of team (code words)	Green.
4	Status of team equipment	Green.
5	Status of food, water, and batteries (food and water per person)	3xMRE/ 4x qts water/ 14x 5590/ 3x AA.
6	Team activity since last communications window	Team pulled surveillance on objective. Surveillance site had to move due to poor visibility on objective.
7	Team activity until next communications window	Team will break down equipment and prepare for exfiltrate.
8	Team leader remarks	Weather is deteriorating, dropping distance of standoff and visibility of objective.

CACHE REPORT (UNDER)

E-56. The sniper team or the TOC can send the cache report to report caches of personnel records, intelligence documents, personnel burials, and

so on. Table E-5 shows the typical format of a cache report.

Table E-5. Typical format for a cache report.

LINE NUMBER	CONTENT	EXAMPLE
1	DTG	131844SEP05.
2	Type of cache (surface, subsurface, or submerged)	Subsurface.
3	Contents	7xMREs; 1,000 rounds 5.56.
4	Location (10-digit grid with identifier)	FT 7404620956.
5	Reference points (IRP and FRP)	IRP- Intersection at 34590216 (300 meters east). FRP- Stream intersection at 34650236 (20 meters north).
6	Depth	3 feet.
7	Additional information	Cache is buried at the base of 50-foot tall oak tree that has scratch marks at knee level on the west-facing side.

BATTLE DAMAGE ASSESSMENT REPORT (CRACK)

E-57. The battle damage assessment (BDA) report is used to provide a timely and accurate estimate of damage resulting from the application of military force against a predetermined objective. Table E-6 shows the typical format of a BDA report.

Table E-6. Typical format for a battle damage assessment report.

LINE NUMBER	CONTENT	EXAMPLE
1	DTG	131844SEP05.
2	Location of target (8-digit grid with identifier)	JL14593487.
3	Type of target, such as vehicle, building, or bridge	T-72 tank.
4	Description of target Physical Damage Assessment--How much physical damage was inflicted on a particular target? This assessment is based on observed or interpreted damage. Functional Damage Assessment--To what degree were the attack objectives achieved against a particular target? This assessment is based on the degree to which the application of military force degraded or destroyed the functional or operational	Vehicle destruction is catastrophic. Vehicle is inoperable.

	ability of the targeted facility or objective to perform its intended mission.	

5	BDA analysis (This represents confidence level in the accuracy of the assessment and whether re-attack is necessary)	Confirmed. No re-attack necessary.

	Confirmed	This refers to data that has been confirmed visually or otherwise assured through imagery intelligence, weapon system (aircraft cockpit) video, signal intelligence, measurement and signature intelligence, or human intelligence.	
		Confidence level of 95 percent that assessment is accurate.	
		Data requires no additional intelligence.	
	Probable	Confidence level at least 50 percent.	
		Data sources are reliable; data requires little additional intelligence.	
	Possible	Confidence level at most 50 percent.	
		Data requires considerable additional intelligence.	

MEDICAL EVACUATION REQUEST

E-58. When air assets are available and medical evacuation is necessary, the sniper team uses the air evacuation format shown in Table E-7.

Table E-7. Example format for medical evacuation request.

LINE NUMBER	CONTENT
1	Location
2	Radio frequency, call sign, and suffix

3	Precedence category	
	Urgent	This applies to patients who will lose their lives, limbs, or eyesight unless treated within two hours. Patients in this category are evacuated as soon as possible.
	Priority	This applies to patients whose medical condition will deteriorate to urgent status if not evacuated within four hours.
	Routine	This applies to patients who require evacuation, but whose condition should remain stable over the next 24 hours.
	Tactical immediate	This category is assigned to patients whose condition is neither urgent not priority, but who must be evacuated as soon as possible to avoid endangering the requesting unit's tactical mission.
4	Special equipment	
5	Number of patients by mobility type: litter or ambulatory	
6	Security of pickup site	
7	Method of marking pickup site	

8	Patient's nationality and status
9	CBRN contamination

Appendix F: Survival

Survival depends on the person. Equipment and techniques can help, but only if the sniper has the fortitude and will to survive.

PSYCHOLOGICAL ASPECTS

F-1. Survival situations numb the sniper's ability to think clearly. Improved survival equipment, food, and medicine help, but the sniper's survival depends most on his ability to handle the psychological stresses. Studies have shown that knowing ahead of time what psychological challenges he will face in a survival situation gives him confidence in his ability to survive. Self-confidence, in turn, helps the sniper combat the enemies to survival.

ENEMIES TO SURVIVAL

F-2. The enemies to survival are—

• Fear and panic.

• Pain.

• Heat.

• Cold.

• Thirst.

• Hunger.

• Fatigue.

• Boredom and loneliness.

F-3. The enemies to survival are best conquered by confrontation. Once a sniper realizes that these enemies exist, he can deal with them.

Fear and Panic

F-4. The greatest enemies to survival are fear and panic. If uncontrolled, they can destroy a sniper's ability to make intelligent decisions or cause him to react to feelings and imagination rather than the situation. These emotions can drain his energy and cause other negative emotions.

F-5. The sniper must learn to accept his fear and use that energy instead for behaviors that will help him survive (Table F-1).

Table F-1. Factors that affect fear.

Increase Fear	Helplessness
	Hopelessness
Decrease Fear	Confidence in the equipment
	Confidence in technical ability
	Concentration on the job at hand

Pain

F-6. Pain, even minor, short-term pain, can get to the best sniper if he allows it. The best way to beat pain is to remain hopeful and keep busy.

Heat

F-7. Weakness is the principal symptom of unaccustomed exposure to heat. A sniper can become accustomed to high temperatures by covering his head when in direct sunlight in hot climates. If the situation allows, he should not exert himself during the hottest hours of the day.

Cold

F-8. Cold is treacherous; it numbs the mind and the body, makes movement difficult and painful, and increases the desire to sleep. There are four ways the body loses heat:

• Conduction.

• Convection.

• Evaporation.

• Radiation.

Conduction

F-9. This occurs when the body comes in contact with a medium which causes a rapid loss in body temperature (i.e., wind, water).

Convection

F-10. This occurs when the body comes in contact with a substance that allows body heat to be transferred to a colder surface (i.e., metal, concrete, the ground).

Evaporation

F-11. This is a cooling process that occurs when water evaporates from the skin.

Radiation

F-12. This refers to the loss of temperature when the sun sets. Some areas of the earth endure rapid temperature fluctuations between day and night.

Thirst

F-13. Even when thirst is not extreme, it can dull the mind. As with pain and cold, the sniper can nearly forget his thirst if his will to survive is strong enough. Also, he should avoid depriving himself of water unnecessarily, as dehydration can occur.

Hunger

F-14. Both thirst and hunger increase a person's susceptibility to the weakening effects of cold and fear. There are edible plants and animals in every area of operation; however, they may appear distasteful.

Fatigue

F-15. Fatigue can cause carelessness and reduce motivation. Certainly, overexertion can present a real danger, but hopelessness, aimlessness, dissatisfaction, frustration, and boredom can all cause fatigue.

Boredom and Loneliness

F-16. Boredom and loneliness creep into the stillness, quiet, or solitude that occurs when nothing happens or when something fails to happen. The sniper should not act for the sake of action; he should plan all movements and wait for the opportune moment, then act.

Survival

WILL TO SURVIVE

F-17. Survival depends more on personality and attitude than on external conditions, such as danger, weather, terrain, or type of emergency.

Attitude

F-18. Attitude can impact a sniper's chance of survival. Soldiers must adopt an attitude of "that can happen" and then prepare for it. Thinking "it can't

happen to me" or "this can't be happening" can prevent the sniper from helping himself and causes panic, even in apparently calm people.

NOTE: Instructional posters, movies, and lectures help instill an attitude of survival that guides the sniper's actions. Often, knowing how others handled survival situations helps prepare him in case he finds himself in a similarly dangerous situation.

F-19. Personal issues need to be resolved before a deployment; this enables the sniper to think of nothing else except the task at hand: survival.

Personality

F-20. The survival of a sniper depends on certain personality traits:

• Decisiveness.

• Improvisational ability.

• Comfortability with solitude.

• Adaptability.

• Cool head.

• Patience.

• Attention to detail.

TRAINING AND EQUIPMENT

F-21. Thorough training and equipment greatly improve the sniper’s confidence in his ability to survive any situation and return to friendly lines.

TRAINING

F-22. Unit SEOs should conduct evasion and survival exercises to enable the sniper to train for survival situations. Service courses in survival

provide high-quality, realistic training.

NOTE: Service courses are available at Army and Air Force training establishments. See FM 3-05.70 for more information about survival training.

INDIVIDUAL SURVIVAL KIT

F-23. The mission environment determines the types of items required in a sniper's survival kit; mode of transportation dictates the quantity. The sniper should select items that can perform more than one function, give him the most flexibility, and come from the categories outlined in Table F-2.

Carrying Kit

F-24. The sniper should carry a small kit on his person, a little larger one on his web belt, and a fairly well- stocked kit in his pack. The sniper can use anything—a military issue first aid case, an ammunition pouch, or an empty smoke grenade canister—to hold his survival gear, as long as it is—

- Water-repellent.
- Easy to carry.
- Able to hold items of different size and shapes.
- Durable.

Table F-2. Categories and examples of survival kit items.

CATEGORY	EXAMPLE ITEMS
Water purification and collection	Water-purification tablets

Fire ignition	Fire-lighter Metal match Matches in waterproof container or waterproof matches Magnesium bar Magnifying lens Candle Flint and steel
Shelter or shelter construction	550 parachute cord Knife Machete Hatchet Poncho Space blanket Hammock Wire saw Wood and metal files
Food or food-gathering	Food knife Snare wire Fishhooks Fishing (18-kilogram or 40-pound test) and snare line Bouillon cubes Soup packets

First aid	Medical-surgical blades Butterfly sutures Antidiarrheal medication Eye drops Bandages Chitosan dressing Antibiotic pills Salt tablets or oral rehydration salts Lip balm
Signal	Signaling mirror Strobe light Pen flares Whistle US flag Glint tape Flashlight Laser pointer Solar blanket
Miscellaneous	Wrist compass Needle and thread Money (sufficient local currency for bribes or to buy food and equipment) Knife sharpener Camouflage stick Plastic bags Non-lubricated condoms to store water, keep tinder dry, and waterproof wounds

Appendix G: Maintenance

Proper maintenance contributes to weapon effectiveness, as well as unit readiness. This appendix discusses maintenance tasks, including clearing, inspection, lubrication, storing, and function checks.

SECTION I. MAINTENANCE INSTRUCTIONS

To ensure the readiness of the sniper weapon systems and equipment, preventive maintenance procedures are performed in accordance with appropriate technical manuals. Preventive maintenance procedures include inspection, cleaning, and lubrication.

WARNING

Clear and place the weapon system on SAFE before performing any maintenance or cleaning actions. Clearing procedures can be found in Chapter 2.

CLEANING, INSPECTION, AND LUBRICATION

G-1. To ensure proper care of the sniper weapon systems, it is necessary to have a system of maintenance or an SOP for the frequency of cleaning. Each weapon system should be cleaned as soon after firing as possible and each time it is exposed to field conditions. Under combat conditions, each weapon system should be cleaned and oiled daily. Under extreme climatic and combat conditions, it may be necessary to clean and lubricate more frequently. Under ideal conditions, where the weapon system is not used and is stored in a clean, dry place, it may only be necessary to inspect, clean, and lubricate every five days. The weapon system should be disassembled, cleaned, and oiled in a clean, dry location.

ROUTINE CARE AND CLEANING

G-2. Before firing (when the situation permits), take the following steps to ensure efficient functioning of the sniper weapon system:

- Disassemble the weapon system into its major groups or assemblies.
- Clean the bore and chamber, and lightly oil them.

- Clean all metal parts thoroughly with prescribed cleaners and lubricants.

G-3. Cleaning is the removal of all old lubricant, firing residue, dirt, debris, foreign matter, and corrosion from the sniper rifle and its associated accessories.

CARE AND CLEANING UNDER UNUSUAL CONDITIONS

G-4. Extremely cold, hot, dry, and tropical climates affect the weapon system and its functioning. Care should be taken under these climatic conditions to ensure that the weapon system is cleaned daily with the prescribed lubricants and protected from the elements by some sort of cover if possible.

MAINTENANCE AND INSPECTION

G-5. Units must establish guidelines and conduct regular maintenance and inspection to keep the sniper weapon system in operational conditions.

Maintenance

G-6. The importance of a thorough knowledge of care, cleaning, and maintenance of the sniper weapon system cannot be overemphasized because these actions determine whether or not the weapon system will function properly when needed. The bore and chamber must be properly maintained to preserve accuracy. Because of the close fit of working surfaces and the accuracy necessary for effective sniper fire, the receiver and moving parts must be kept clean, correctly lubricated, and free from burrs, rust, dirt, or grease.

Inspection

G-7. An inspection should be performed on components, assemblies, and parts of each sniper weapon system used. The purpose of the inspection is to determine if the item is damaged or deteriorated to the extent that it should be replaced or repaired. When inspected, the sniper weapon system

should be completely disassembled. Inspecting personnel should look for dirt, cracks, burrs, and rust.

LUBRICATION

G-8. Snipers should use the prescribed lubricants to clean the sniper weapon system. Over-lubrication should be avoided at all times. A light to medium coat of lubricant is all that is required to prevent rust.

G-9. CLP deposits a thin coating on the metal, which minimizes carbon buildup and prevents foreign material from sticking. It is this coating that provides the frictionless operation of the weapon parts, not liquid oil deposited on them. A weapon system treated with CLP will operate better and remain clean longer than one treated with any other cleaning material. Use of CLP will reduce maintenance costs and extend the life of the weapon.

NOTE: Always shake CLP prior to and during use to maintain its suspension.

Key Definitions

G-10. The following are definitions key to proper lubrication:

- Lightly Lubed: A thin film of oil barely visible to the eye. Wetting a cleaning patch with 5 to 10 drops of oil and then wiping the area over several times with the same patch should produce this effect and spread the oil thinly and evenly.

- Generously Lubed: A medium thick film of oil that can be spread or dabbed-on with a finger. This can be applied with the fingers or a patch wetted with 20 to 30 drops of oil.

MAINTENANCE PROCEDURES

G-11. Certain actions must be taken before, during, and after firing to properly maintain the sniper weapon system.

NOTE: If CBRN contamination is anticipated, the sniper should apply oil to all outer metal surfaces of the weapon and keep the weapon covered as much as possible. If the weapon is contaminated, he should decontaminate it as prescribed by FM 3-11.5, and then clean and lubricate it.

FUNCTION CHECK

G-12. A function check must be performed as soon as the weapon is assembled to ensure that the weapon has been assembled correctly.

STORAGE

G-13. The sniper should use the following procedures when placing the weapon into temporary storage in the unit armory, the arms room, or other storage facility:

- Ensure that the weapon system is unloaded and clear.
- Ensure that the weapon system is cleaned and lubricated as described.
- If possible, store the weapon system vertically with muzzle pointed down.
- Never store ammunition or loaded magazines with the weapon system.

DISPERSION RATIOS AND CHECKS FOR SNIPER WEAPON SYSTEMS

G-14. If a sniper weapon system is fired regularly, dispersion checks should be conducted semiannually. If the weapon is fired minimally, annual checks will suffice. Snipers should use the following procedures for each weapon system.

M110 SEMIAUTOMATIC SNIPER SYSTEM

G-15. To check dispersion ratios on the M110 SASS, three shooters fire a three-round shot group with the same weapon at 100 yards. If two of the

three shooters fire a shot group larger than 1 MOA or 1 inch, the weapon should be turned in for barrel wearout.

M24 SNIPER WEAPON SYSTEM

G-16. To check dispersion ratios on the M24 SWS, three shooters fire a three-round shot group with the same weapon at 100 yards. If two of the three shooters fire a shot group larger than 1 MOA or 1 inch, the weapon should be turned in for barrel wearout.

M107 LONG-RANGE SNIPER RIFLE

G-17. To check dispersion ratios on the M107 LRSR, three shooters fire a three-round shot group with the same weapon at 100 yards. If two of the three shooters fire a shot group larger than 2.5 MOA or 2.5 inches, the weapon should be turned in for barrel wearout.

SECTION II. M110 SEMIAUTOMATIC SNIPER SYSTEM

The M110 SASS (Figure G-1) is a semiautomatic, direct gas-operated, air-cooled, magazine-fed, precision 7.62-mm direct line of sight weapon system equipped with the MIL-STD-1913 rail system. To ensure the readiness of the M110 SASS, the sniper should perform preventive maintenance procedures in accordance with TM 9-1005-342-10. Preventive maintenance procedures include inspection, cleaning, and lubrication.

WARNING

Clear and place the rifle on SAFE before performing any maintenance or cleaning actions.



Figure G-1. M110 Semiautomatic Sniper System.

INSPECTION

G-18. Clean and inspect parts before lubrication. Inspect the following parts as described in Table G-1.

WARNING

Do not interchange or switch the bolt assembly from one rifle to another. This could damage the rifle and injure the user.

Table G-1. Inspection guide.

ITEM INSPECTED	PROCEDURE
Bolt	Check for cracks or fractures, especially in the cam pin hole area and around the locking lugs. Bolts that have pits in the bolt face extending into the firing pin hole (hole out of round) need to be replaced.
Firing pin	Check the firing pin to ensure that it does not have a bent, cracked, flattened or sharply pointed tip. The firing pin tip should be rounded and smooth. Check firing pin protrusion by inserting the firing pin through the bolt and observing the tip protruding from the face of the bolt.
Cam Pin	Ensure that the cam pin is not cracked, chipped, or pitted.
Firing Pin Retaining Pin	Ensure that the firing pin retaining pin is not bent or badly worn. It should withdraw to its stop freely, but not come loose from the carrier body.
Extractor and Extractor Spring	Ensure that there are no chipped or broken edges in the area of the extraction lip that engages the rim of the cartridge. The extractor spring should be seated properly.
Extractor Spring Buffer	Ensure that there are no broken edges. Ensure that the extractor spring buffer is present and seated properly.

Chamber and Bore	Visually inspect for excessive oil. Ensure that it is not pitted or dirty, and that there are no obstructions. Ensure that the locking lugs of barrel extension are not fouled with excess lubricant.
NOTE: Several of the above parts may be carried as spares in the deployment kit. Periodically inspect these parts and lubricate them so they don't rust.	

FIELD-STRIPPING

G-19. The sniper should field-strip the rifle as described in TM 9-1005-342-10. Figures G-2 and G-3 depict the M110 SASS and the bolt and carrier assembly completely field-stripped for cleaning, inspection, and lubrication.

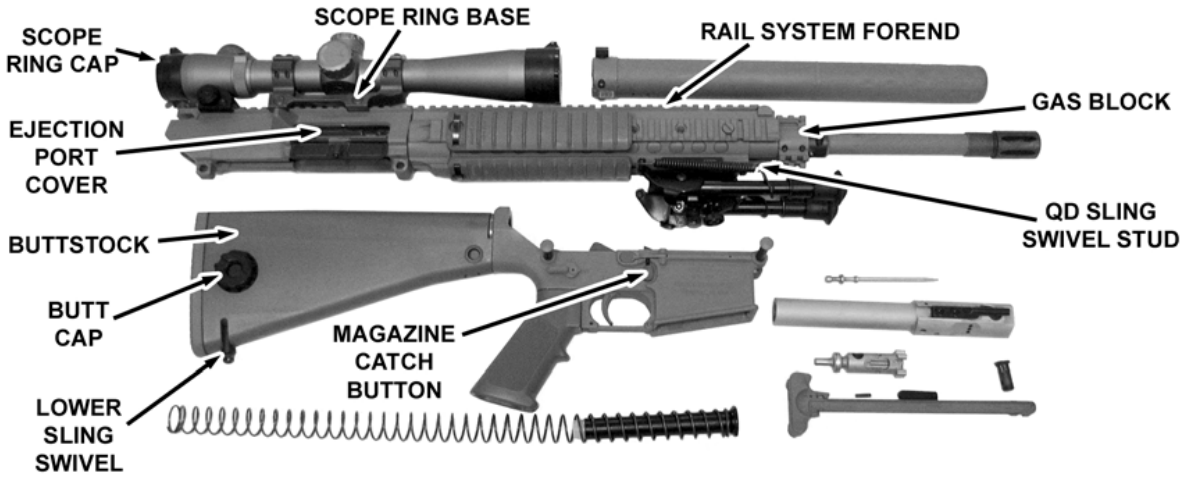


Figure G-2. M110 Semiautomatic Sniper System field-stripped for cleaning, inspection, and lubrication.

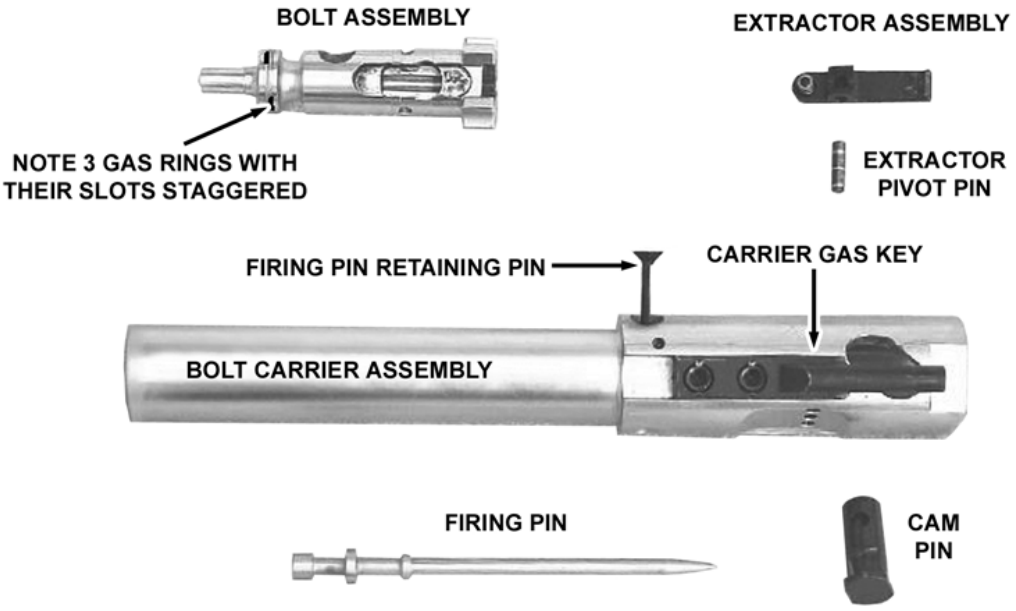


Figure G-3. M110 Semiautomatic Sniper System bolt and carrier assembly field-stripped for cleaning, inspection, or lubrication.

CLEANING

G-20. The following procedures refer to CLP; however, the M110 SASS requires no special CLP products for proper and reliable functioning under normal conditions. Any good grade of commercial bore cleaner may be used, but the sniper should avoid heavy greases or excessive use of oils with this rifle.

BORE

G-21. There are 3 main steps in cleaning the bore:

(1) Remove the carbon.

(2) Defoul the bore of copper residue.

(3) Keep the bore from rusting.

G-22. When cleaning the bore, snipers should consider the following:

- If possible, use the one-piece cleaning rod and the M110 SASS bore rod guide provided with the weapon system. The rod is stored in the rifle carrying case lid, and the M110 SASS bore rod guide is in the box for the cleaning kit components.

- Always clean the bore from the chamber end—through to the muzzle end utilizing the M110 SASS bore rod guide and the bore rod pilot guide with the straightest one-piece rod available. Insert the bore rod pilot guide into the rear opening of the bore rod guide as the rod is pushed into the bore to help keep the rod centered. Do not reverse direction of the bore rod until the rod tip or bore brush has cleared the muzzle. The fingers of your free hand may need to keep the bore rod pilot guide in place when the rod is pulled back out of the bore.

- When the bore is dirty, do not pull dirty patches back through the bore because it reintroduces fouling to the bore, chamber, and bore rod guide.

- Only push wet patches one way. The one-way cleaning process with wet patches requires lots of patches, but it reduces cleaning time. It also helps the bore brush stay clean, last longer and perform better.

- After each use of a cleaning brush, wipe or blot the brush clean with a dry rag.

- Do not dip the bore or chamber brush into the solvent or CLP bottle because the brush will contaminate the liquid.

G-23. Before cleaning perform the following steps:

- Brush and wipe the rifle and its parts as clean as possible with a clean rag.

- If so equipped, lock down the flip-up scope covers or otherwise cover both ends of the scope to protect the lens surfaces from bore cleaning solvents.

Remove the Carbon

G-24. The sniper should clean the carbon from the bore using a quality bore cleaner. To remove the carbon—

(1) Insert the M110 SASS bore rod guide in receiver, and rotate to the left to lock in place. Slide the bore rod pilot guide over the rod. Screw the brass bore rod jag onto the end of the rod, and insert into the bore rod guide.

(2) Wrap a patch wet with bore cleaner around the brass jag, and insert at the rear opening of the M110 SASS bore rod guide.

NOTES:

1. As the patch enters the bore rod guide, slide the bore rod pilot guide into the rear opening of the bore rod guide, and then hold it in place to provide additional “dead center” bore rod support as it is being pushed back and forth through the barrel.

2. If your cleaning patches are too large, they may be difficult to push through the bore. Either cut the patch to reduce its size, or remove the bore rod tip or jag from the rod and use the rod end to push patches though.

(3) Push the jag completely through the bore with the rod.

(4) Remove the patch from the jag as it clears the muzzle, and then pull the rod out from the rear.

(5) Wipe the bore rod dry with a dry patch wrapped around the jag.

(6) Repeat Steps 2 through 5 with clean wet patches through the bore at least four times or until the patches appear clean.

(7) Replace the jag with a bore brush/bore brush adapter from the cleaning kit, and push this through the bore and back 8 or 10 times.

(8) Remove bore brush, and reattach the jag.

NOTE: Roll the bore brush between the layers of a clean rag after each use to remove carbon and solvent residue from the brush bristles.

(9) Repeat Steps 2 through 5 with clean wet patches at least four times or until the patches appear clean.

(10) Repeat Steps 7 and 8.

(11) Repeat Steps 2 through 5 with clean wet patches at least four times or until the patches appear clean

(12) Dry patch bore thoroughly. This requires 3 or 4 clean dry patches.

Defoul the Bore of Copper Residue

G-25. The sniper should defoul the bore of copper residue with copper removing compound. To defoul the bore of copper residue—

(1) Wrap a patch wet with a copper remover around the brass jag, and insert at the rear opening of the bore rod guide.

(2) Push the patch completely through the bore with the rod using short, jerking motions until clear of the muzzle.

(3) Repeat Steps 1 and 2, and follow the directions printed on the bottle.

NOTE: The blue/green color is caused by the chemical reaction of the copper remover against the copper fouling.

(4) Remove the patch as it clears the muzzle, and then pull the rod out from the rear.

(5) Wipe the bore rod and jag dry with a clean rag.

(6) Wait 5 to 10 minutes for the defouling chemical to attack the copper.

CAUTION

Do not allow the copper remover to remain in the bore for more than 10 minutes because it may attack the barrel steel.

(7) Wrap a patch wet with bore cleaner around the brass jag, and insert at the rear opening of the bore rod guide.

(8) Push the patch completely through the bore with the rod.

(9) Remove the patch as it clears the muzzle, and then pull the rod out from the rear.

(10) Repeat Steps 7 through 9 with clean patches wetted with bore cleaner two more times.

NOTE: The blue/green color indicated on the patches caused by the chemical reaction of the Copper remover against the copper fouling. If significant blue/green discoloration is shown on the patches, continue as follows:

(11) Dry patch bore thoroughly. This requires 3 or 4 clean/dry patches.

(12) Repeat Steps 1 through 6 with clean patches wetted with copper remover.

(13) Repeat Steps 7 through 9 with clean patches wetted with bore cleaner two more times.

Keep the Bore from Rusting

G-26. The sniper should keep the bore from rusting by neutralizing the copper-removing compound and wiping with preservative oil. To keep the bore from rusting—

(1) Dry patch bore and chamber thoroughly. This requires 3 or 4 clean/dry patches.

(2) Remove and wipe bore rod guide clean and dry (to include its bore and bore rod pilot guide).

NOTE: Drying the chamber requires removal of the M110 SASS bore rod guide from the upper receiver. It also requires the slotted bore rod tip to be

installed on the bore rod and smaller size cleaning patches doubled-up for a snug fit in wiping the chamber.

(3) Double-up on patches in the slotted bore rod tip, and apply a light coat of CLP or rust preventative oil to the chamber.

(4) Reinsert the M110 SASS bore rod guide in the upper receiver and the bore jag on the end of the bore rod.

(5) Wrap a patch wet with CLP or rust preventative oil around the brass jag, and insert at the rear opening of the bore rod guide.

(6) Push the patch completely through the bore with the rod.

(7) Remove the patch as it clears the muzzle, and then pull the rod out from the rear.

(8) Repeat Steps 3 through 7 with clean, oiled patches twice.

(9) Remove the bore guide, and clean the remainder of rifle system.

CHAMBER

G-27. Any time the bore needs cleaning, so does the chamber. The chamber can be cleaned with either bore cleaner or CLP. To clean the chamber—

(1) Close the scope caps to protect the lenses from solvent.

(2) Apply bore cleaner or CLP to cleaning patches.

(3) Swab out the chamber with the cleaning patches.

(4) Using the M110 SASS chamber brush assembled to the chamber and brass brush rod, scrub out the chamber in a clockwise direction with the brush fully inserted into the chamber.

NOTE: Turning the chamber brush clockwise will keep the brush from unscrewing from the rod.

(5) Use a general purpose (GP) brush, toothbrush, pipe cleaners from the cleaning kit, or cotton swabs; additional bore cleaner or CLP; and a piece of rag to clean residue from the barrel extension locking recesses. Wipe the chamber and bore dry with clean, dry patches.

NOTE: Since the chamber is much larger in diameter than the bore, you may need to double-up the patches when wiping the chamber. Two patches will usually fit the slotted bore rod tip when cleaning the chamber.

BOLT CARRIER GROUP

G-28. To clean the bolt carrier group—

(1) Generously coat the bolt carrier group with CLP, and scrub thoroughly with a GP brush. Use the small end of a GP brush to clean the cam pin hole, and use a doubled-over pipe cleaner to clean the firing pin recess.

(2) Scrub the extractor, cam pin, and firing pin in similar manner. Ensure that the brush does not dislodge the extractor spring. If necessary to reseat the extractor spring, place the larger diameter end-coil into the recessed hole in the extractor body, and press the opposite end with a section of the cleaning rod.

(3) Wipe all parts with a clean, dry rag. Repeat Steps 1 and 2 if carbon is still present or as necessary to remove fouling, and then wipe clean and dry.

Bolt Carrier and Gas Key

G-29. To clean the bolt carrier and gas key—

- Generously coat the inside and outside of the bolt carrier with CLP, and scrub thoroughly with a GP brush. Place two or three drops of CLP down the gas key. Use a GP brush to clean the inside surfaces where the bolt rides.

- Scrub the straight section of the gas key with a doubled-over pipe cleaner. Pass a straight pipe cleaner wetted with CLP back and forth completely through the gas key, into the inside area of the carrier.

• Use the small end of a GP brush to scrub the cam groove. Wipe all parts clean and dry with rags, patches, and pipe cleaners.

• Clean the small inside diameter of the carrier with the diagonal-half of a cleaning patch attached to a bore rod tip. Pay particular attention to the bolt recess in the carrier and the gas key.

NOTE: Do not use cotton swabs in the gas key.

UPPER RECEIVER

G-30. To clean the upper receiver—

(1) Wipe the inside of the upper receiver with a clean rag wetted with CLP. Wipe away the CLP

with a clean, dry rag. Repeat as necessary.

(2) Use both ends of the GP brush to clean around the area where the gas tube enters the receiver and the charging handle track.

LOWER RECEIVER

G-31. To clean the lower receiver—

(1) Use GP brush wrapped with pieces of rag, pipe cleaners, or bore rod with cleaning patches to wipe interior of lower receiver (trigger area) clean.

CAUTION

Do not use wire brushes or any abrasive material to clean aluminum surfaces.

(2) Use a pipe cleaner to clean drain hole at end of buffer tube.

(3) Clean interior of the buffer tube with a large piece of rag slightly wet with CLP attached to the end of the bore rod. Wipe buffer tube dry with a

clean rag in the same manner.

(4) If absolutely necessary, have an armorer remove hammer and trigger when detailed cleaning is required.

OTHER AREAS

G-32. To clean the other areas of the weapon—

(1) Clean the metal surfaces with CLP and a rag or GP brush. Wipe the surfaces dry with a clean rag.

(2) Clean plastic or rubber surfaces with a small amount of water, and then wipe dry. Do not let water enter the inside of the stock or lower receiver.

SPECIAL OPERATOR MAINTENANCE PROCEDURES

G-33. Special disassembly procedures are those not normally required each time the rifle is cleaned. These parts should only be disassembled and cleaned when their proper functioning is in question or suspected of causing malfunctions. This will usually require an armorer's assistance or supervision.

LUBRICATION

NOTE: The following lubricating instructions are for before operations and firing, not storage.

G-34. Snipers should consider the following when lubricating the M110 SASS:

- Use the basic issue cleaning kit and expendable supplies provided through the supply system or one obtained from the manufacturer.

- Ensure a good supply of patches.

- Obtain several absorbent cotton rags.

G-35. Before lubricating the M110 SASS, the sniper should perform the following procedures:

(1) Field-strip the rifle.

(2) Wipe the rifle and its parts as clean as possible with a clean rag wetted with CLP.

(3) Wipe the chamber and bore with a CLP-wetted patch, and then wipe dry.

UPPER RECEIVER

G-36. To lubricate the upper receiver—

(1) Lightly lube the inside of the upper receiver (including the locking lugs and feed ramps) with an oiled patch or an angle-headed, soft-bristle brush.

NOTE: A soft-bristle toothbrush works best for the locking lugs of the barrel extension.

(2) Place one drop of oil on the dust cover detent. Push the detent in several times to work the oil past the detent into the spring area. Brush or wipe away excess oil.

(3) Place one drop of oil on each end of the dust cover hinge. Work the oil in by opening and closing the dust cover. Brush or wipe away excess oil.

(4) Insert the bore rod guide into the upper receiver. Attach a clean patch to the cleaning rod tip.

Push the patch through the receiver, into the chamber, and through to clear the muzzle. Remove the patch before withdrawing the rod. Repeat several times as necessary. Repeat this with another clean patch, paying particular attention to wiping the chamber clear of old lubricant by rotating the rod clockwise. Then with a lightly lubed patch, push the rod through to the muzzle and back again 2 or 3 times, leaving just a trace coating of oil.

(5) Lightly lube the charging handle. Apply one drop of oil to the catch and spring. Squeeze the catch several times, and then brush or wipe away excess oil. Place the charging handle into the upper receiver, but do not push it fully forward.

BOLT CARRIER GROUP

G-37. To lubricate the bolt carrier group—

(1) Lightly lube the firing pin. Apply only a trace of lubricant to the firing pin recess hole with a lightly lubed, doubled-over, pipe cleaner. Push the pipe cleaner back and forth through the firing pin recess hole. Pass an end of the pipe cleaner through the extractor pin hole once or twice.

(2) Push the same pipe cleaner listed in Step 1 into the straight section of the gas key two or three times.

(3) Lightly lube the inner and outer surfaces of the bolt carrier. Generously lube the four (4) carrier slide ribs. Two are located on either side of the gas key (10 and 2 o'clock, and 5 and 7 o'clock). Generously lube the cam pin groove, and lightly lube the carrier's hammer-cocking surface.

(4) Lightly lube the extractor and extractor pin. Assemble the extractor to the bolt.

(5) Generously lube the cam pin and the outside of the bolt's mid-point bearing, bolt ring, and tail-piece.

NOTE: If old 3-piece bolt rings are used, stagger the bolt rings. Newer bolt rings do not have grooves to stagger, only a zigzag cut.

(6) Insert the bolt into the carrier, with the extractor to the right.

(7) Insert the cam pin with firing pin hole aligned front to rear. Ensure that the firing pin retaining pin is fully withdrawn to its stop. Drop in the firing pin, and push it fully forward with a cleaning rod section or the small end of a GP cleaning brush, if necessary. Push the retaining pin flush with the carrier body to lock the firing pin. Shake the bolt and carrier assembly to

ensure that the firing pin is retained. Be ready to catch the firing pin if it falls out. Work the bolt back and forth several times to spread the lubricant.

(8) Pull the bolt to its unlocked position, and place in the upper receiver with the charging handle. Push the bolt carrier and charging handle fully forward.

(9) Close the dust cover.

LOWER RECEIVER

G-38. To lubricate the lower receiver—

(1) Wipe the buffer and the inside of the receiver extension (buffer tube) dry.

(2) Lightly lube the action (recoil) spring.

(3) Place one drop of oil to buffer detent, and push the detent several times to work the lube past the detent to the detent spring.

(4) Brush or wipe away the excess oil.

(5) Assemble the buffer and action spring in the receiver extension.

(6) Generously lube the takedown and pivot pins. Apply one drop of oil to their detent grooves. Work the pins in and out several times to spread the lubricant. Wipe away all excess oil.

(7) Apply one drop of oil to the bolt catch, trigger guard detent, and magazine catch button areas. Work these controls in and out several times. Brush or wipe away any excess oil.

(8) Hold the hammer down (to rear). Apply one drop of oil to each end of the trigger pin. Pull the trigger to the rear several times to work the oil between the trigger pin and receiver. Wipe away excess oil.

CAUTION

When the receivers are open or separated, never pull the trigger and let the hammer spring forward against the receiver wall/bolt catch. Without the bolt installed and the receivers assembled, this can damage the receiver and bolt catch. When it is necessary to lower the hammer, keep it from springing forward with your non-firing hand as you pull the trigger.

(9) Apply one drop of oil to each end of the hammer pin. Rotate the hammer back about 1 inch several times while keeping the trigger pulled. Repeat this several times to work the oil between the hammer pin and receiver. Wipe away excess oil.

(10) Rotate the hammer back fully with the trigger pulled, and note the action of the disconnector and rear hammer hook. Apply one small drop of oil to each contact surface of the hammer hook and disconnector and in between the sear and the disconnector.

(11) When the hammer is forward, the hammer's sear notch can be observed within the lower receiver. Apply one small drop of oil to the notch, and with your finger off the trigger, cock the hammer. Hold the hammer with your thumb, and release the hammer by squeezing the trigger. Do this several times to spread the oil down to the sear where you cannot see. Remove any excess oil with a dry, bent pipe cleaner.

(12) From inside of the receiver, apply one drop of oil to both visible round ends of the safety selector lever shaft (not the midsection/cut-out portion) and to the end of the safety selector lever shaft on the right side of the receiver. Rotate the safety selector lever from FIRE to SAFE several times. Wipe away excess oil. Check the tightness of the right side of the ambidextrous selector with the wrench from the cleaning kit.

(13) Generously lube the face of the hammer.

(14) Assemble lower and upper receivers. Check the action of the charging handle, bolt catch, and dust cover. Dry-fire the rifle once or twice, and listen for the hammer to fall. Close the dust cover.

(15) Place the safety selector lever in the SAFE position. It is now ready for loading and firing.

EXTERNAL SURFACES

G-39. When lubricating the external surfaces of the weapon, the sniper should consider the following:

- A light coating of oil or rust preventative oil should be applied to all external metal areas.

- Plastic, rubber, or glass surfaces should be kept dry. They may be dry-brushed with a soft brush (a dry paint brush), and then wiped clean with a slightly water-dampened absorbent cloth.

BORE AND CHAMBER

G-40. When lubricating the bore and chamber, the sniper should perform the steps listed in paragraphs G-20 to G-33.

MAGAZINE DISASSEMBLY AND REASSEMBLY

G-41. Proper maintenance of the magazine is equally important as weapon maintenance.

DISASSEMBLY

G-42. To disassemble the magazine—

(1) Unload the magazine carefully.

CAUTION

Do not bend, deform, or gouge the feed lips while unloading (stripping rounds from magazine).

(2) Turn the magazine base plate up. Push up on the rear of the base plate with one thumb, while covering the bottom of the magazine with the other hand to catch the spring as you slide the base to the rear and free of magazine body.

NOTE: The base is under spring tension.

(3) Jiggle the spring while pulling it gently from the magazine body to the spring and follower assembly. The magazine follower and spring are attached. Do not separate the follower from the spring if at all possible.

REASSEMBLY

G-43. Before reassembling the magazine—

(1) Clean all foreign matter from magazine components.

(2) Lightly lubricate the magazine spring with a cleaning patch wetted with two to three drops of oil.

G-44. To reassemble the magazine—

(1) Orientate the follower and the spring to the magazine body, and carefully insert them through the bottom of the magazine body.

(2) Jiggle the spring, while pushing gently until the follower is seated under the feed lips.

(3) Push the remainder of the spring into the magazine.

(4) Hold the spring under the tabs with thumb pressure.

(5) Orientate the base so its raised central surface is on the outside.

(6) Slide the base under the rear and front tabs until the rear of the base catches on the magazine body.

QUICK-DETACH SOUND SUPPRESSOR MAINTENANCE

NOTE: The QD sound suppressor should be removed from the M110 SASS as soon as possible after every use. The QD suppressor should be removed while it is still warm because carbon fouling solidifies as the unit cools, making it more difficult to remove if cold. If the weapon/suppressor combination is to be repeatedly used over a period of time, the sniper should remove the suppressor temporarily, thereby minimizing the buildup of metal and carbon fouling.

OPERATOR CLEANING

NOTES:

1. The QD sound suppressor should be cleaned after every use.

2. When used with a suppressor, the M110 SASS requires a thorough cleaning after every use, even after firing just a few rounds. The rifle's bolt carrier assembly and chamber are heavily fouled by the addition of a suppressor.

G-45. To clean the barrel and the QD sound suppressor—

(1) Dismount the suppressor from the weapon.

(2) Dry-brush carbon-fouled parts using the GP brush from the weapon cleaning kit.

NOTE: Take care to orientate the parts so that carbon does not fall into the weapon bore, the handguard tube, or the suppressor body.

(3) Use CLP and a rag to remove carbon fouling from the barrel surfaces normally covered by the suppressor.

(4) If carbon fouling remains, use a GP brush and CLP to scrub the parts clean. Remounting and dismounting the suppressor (with the muzzle pointed down) once wet with CLP may also help remove residue.

CAUTION

Do not allow CLP to flow into the suppressor body and contaminate the internal baffle areas. CLP and other oily residues will cause excessive smoke when the suppressed rifle is fired. If the user suspects that CLP or copper cleaner has entered the suppressor, the suppressor should be thoroughly soaked and agitated vigorously in warm soapy water, and then rinsed in clear fresh water and allowed to air dry for several hours or overnight.

NOTE: Orientate the suppressor "muzzle up" when brushing with the GP brush or if soaking the locking latch contact area at the rear of the suppressor body.

(5) Clean and dry the CLP from affected parts with an absorbent cloth.

G-46. If the barrel and suppressor are exposed to salt water, mud, or corrosive chemicals, the QD suppressor should be removed from the M110 SASS, and the assembly should be thoroughly rinsed with fresh water and completely dried internally using compressed air or an oven (at 250 degrees F) if available.

CAUTION

The interior of the QD suppressor must be thoroughly dry before using. The use of compressed air, an electric fan, or even an oven set on low heat (250 degrees F) is recommended, if available. Any solvent or other cleaning agent remaining in the suppressor could alter the path of the projectile and/or foul the gas system and moving parts of the rifle.

LUBRICATION

G-47. Proper lubrication procedures follow:

(1) Wipe the QD suppressor body dry with a clean cloth.

CAUTION

The sniper must not oil the QD suppressor body.

(2) Each time the weapon is cleaned, apply a light coat of CLP to the latch contact area of the barrel to prevent corrosion.

(3) Apply a very light coat of CLP to the suppressor latch components to smooth their operation.

CAUTION

As soon after firing suppressor as possible, clean and lightly re-lubricate the rifle bore thoroughly. Also clean firing residue from the flash suppressor, barrel exterior, and gas block suppressor interface areas. This residue is very hydroscopic and will absorb moisture quickly. This residue also contains a barium salt that, when combined with moisture in the air, will corrode and pit the barrel steel within a matter of days and possibly ruin the barrel's accuracy.

ARMORER CLEANING

G-48. Powder residue and unburned granules can degrade a QD suppressor's performance. Every 500 to 1,000 rounds, or when the suppressor is no longer reducing the decibel level appropriately, the armorer should soak the QD suppressor body in oil-free cleaning solvent to remove powder residue or unburned granules.

MALFUNCTIONS AND CORRECTIONS

G-49. Table G-2 shows select malfunctions and their corrections. If the sniper cannot correct a weapon malfunction, he must turn in the weapon through the proper supply or maintenance channel for return to the manufacturer.

NOTE: TM 9-1005-342-10 provides shipment information.

Table G-2. Malfunctions and corrections.

MALFUNCTION	CAUSES	CORRECTIONS

Failure To Fire	Safety selector in the SAFE position	Move safety selector to the FIRE position.

Defective ammunition	Eject round
Improper assembly of firing pin	Retaining pin passes behind large diameter of firing pin.
Excess lube	Wipe firing pin dry, and use pipe cleaner in firing pin recess.
Short firing pin protrusion	Replace firing pin.
Round not fully chambered.	Clear obstruction from chamber. Clean and lube bolt, cam pin, and carrier.
Hammer not cocking, or “hair trigger”	Check correct hammer spring reassembly. Check sear engagement screw for adjustment. Left screw may need to be tightened slightly. (See armorer for re-adjustment or new hammer and/or sear.
Trigger fails to release hammer	Disconnector screw may need to be tightened slightly. Check adjustment. Check correct trigger spring assembly. See armorer for re-adjustment.

	Rifle (pistol) grip screw is too long or washer is missing.	Loosen rifle grip screw, and retest hammer cocking and trigger pull.
Failure to Unlock	Clogged gas key	Use pipe cleaner to check and clear the gas key.
Failure to Extract	Dirty chamber or ammunition	Clean chamber, and wipe ammunition clean.
	Weak extractor spring	Replace spring and silicone rubber insert.
	Extractor lip worn	Replace extractor.
	Extractor stuck (frozen in place)	Remove, clean, and lubricate extractor.

Failure to Eject	Frozen ejector	Clean brass flakes from ejector and clean/lubricate ejector.
	Not enough gas pressure	Stagger gas rings or replace with new ones. Clean gas key. Replace ammunition.
	Restricted movement of bolt carrier group	Remove, clean, and lubricate. Check gas key fit and gas tube.
	Restricted buffer	Remove, clean, and lubricate.
Failure to Cock	Hammer spring in wrong place	Check correct hammer spring assembly.
	Disconnector hook worn	Replace disconnector.
	Disconnector spring weak	Replace spring.
	Hammer hook worn	Take to armorer for replacement.
	Hammer spring broken	Replace hammer spring.

Failure to Feed	Dirty or corroded ammunition	Clean or replace.
	Magazine not fully seated	Adjust magazine catch.
	Double feed	Replace magazine.
	Bolt overrides cartridge	Replace magazine.
	Restricted movement of bolt carrier group	Remove, clean, and lubricate.
	Restricted buffer	Remove, clean, and lubricate.
	Too many rounds in magazine	Remove excess.
	Dirty magazine	Disassemble, clean, and lubricate magazine spring.
Failure to Chamber	Obstruction in chamber	Clear chamber.
	Dirty or corroded ammunition	Replace ammunition.

Failure to Lock	Dirty bolt or locking lugs	Remove, clean, and lubricate.
	Dry or dirty cam pin or cam pin groove	Remove, clean, and lubricate.
	Burrs on bolt locking lugs	Take to armorer.

SECTION III. M107 LONG-RANGE SNIPER RIFLE

The M107 LRSR (Figure G-4) is a man-portable, direct line of sight weapon system capable of providing precision fire on targets at a distance of up to 1000 meters. To ensure the readiness of the M107 LRSR, the sniper should perform the preventive maintenance procedures in accordance with TM 9-1005-239-10. Preventive maintenance procedures include inspection, cleaning, and lubrication.

WARNING

Clear and place the rifle on SAFE before performing any maintenance or cleaning actions.

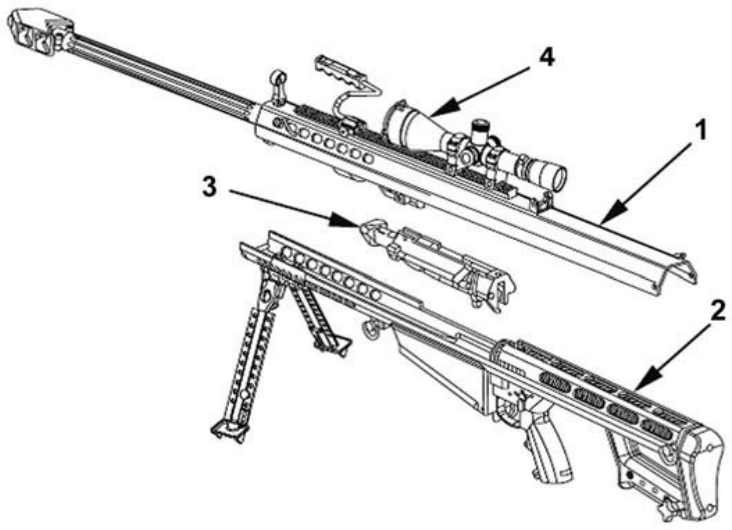


Figure G-4. M107 long-range sniper rifle.

INSPECTION

G-50. Table G-3 lists the required inspections and acceptable/unacceptable conditions for the M107 LRSR.

Table G-3. Inspection guide.

ASSEMBLY	ITEM INSPECTED	PROCEDURE
Upper Receiver Assembly	Upper Receiver Assembly	Visually inspect the upper receiver assembly to ensure that it is not cracked, bent, or burred. Pay special attention to the hinge lip at the front of the receiver.
	Barrel Springs	Visually inspect the barrel springs to ensure that they are not over-stretched. Each coil should be tight, with no spaces between coils when barrel springs are relaxed.
	Barrel	Visually inspect the barrel to ensure that it is clean and free of obstructions.
	Impact Bumpers	Visually inspect the impact bumpers to ensure that they are in good condition (not frayed, cracked, or twisted).
	Front Sight	Traverse the front sight through the complete range of motion. The front sight should have fluid motion throughout traverse and have positive retention in the upright position.

Barrel Assembly	Muzzle Brake	Visually inspect the muzzle brake. The muzzle brake should be tight and fully screwed on, and properly positioned.
	Scope Mountings	Visually inspect the scope mountings. The scope mountings should be tight and in good condition.
	Iron Sights	Traverse the iron sight through the complete range, and lightly lubricate the iron sight to prevent corrosion.
Bolt Assembly	Extractor and Ejector	Check the spring tension. Extractor and ejector springs must not be over-stretched. Visually inspect for chips or wear. There should be no chips and wear on the extractor or ejector.
	Firing Pin	Push the bolt into the carrier, using the midlock pin. De-cock before inspecting firing pin protrusion. Check firing pin hole (on bolt face) for erosion/pitting.
	Bolt Latch	Visual inspect the bolt latch for deformations.
	Sear	Swing the cocking lever forward. The sear should capture the firing pin extension before the cocking lever is fully depressed.

Carrier Assembly	Bolt Assembly	With firing mechanism de-cocked, depress the bolt latch, and manually work the bolt in and out, feeling for any roughness, which may indicate wear, corrosion or grit in the carrier. The bolt assembly should be smooth.
Lower Receiver Assembly	Mainspring	With the bolt and carrier assemblies in position, pull them rearward, and check to see that the mainspring moves freely (full travel). If there is any binding, take the weapon to the armorer for further inspection.
	Mainspring Housing	Hold the bolt and carrier assemblies back and down approximately 1/4 inch inside the receiver. With the safety selector lever in the FIRE position, pull the trigger. The firing mechanism should function. If the housing is bent, the bolt and carrier assemblies will rise as the trigger is pulled, preventing proper function.
	Lower Receiver Assembly	Visual inspect the lower receiver assembly to ensure that it is not cracked, bent, or burred.
	Bipod assembly	Check the bipod assembly and mounting hardware. Ensure that the legs extend and the hardware functions properly.

FIELD-STRIPPING

G-51. The M107 LRSR is field-stripped into four major components (Figure G-4):

- Upper receiver assembly (1).
- Lower receiver assembly (2).
- Bolt and carrier assemblies (3).
- Telescopic sight assembly (4).

NOTE: Unless there is something wrong with the telescope, it will not be removed for normal field-stripping.

WARNING

Ensure that the weapon is unloaded and on SAFE before performing these procedures.

G-52. To field-strip the M107 LRSR—

(1) Remove the rear lock (1) and midlock (2) pins (Figure G-5).

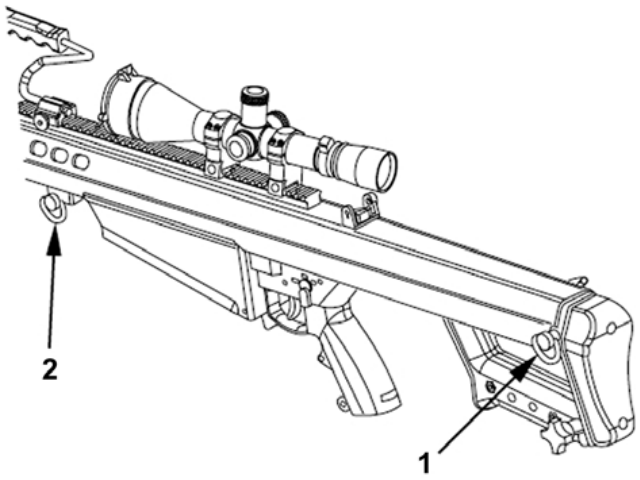


Figure G-5. Rear lock and midlock pins.

(2) Grasp the charging handle (3) on the bolt carrier (4), and pull to the rear until the bolt (5) clears the barrel extension (Figure G-6).

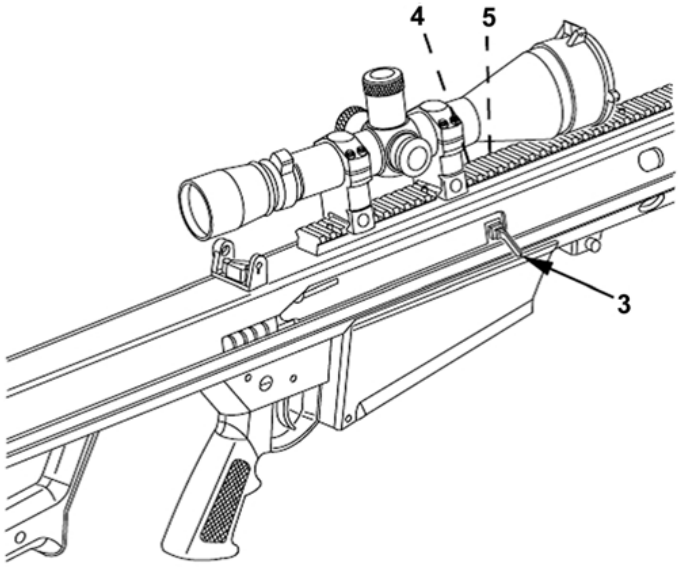


Figure G-6. Charging handle on the bolt carrier and bolt.

(3) While holding the charging handle (3) to the rear, lift the back end of the upper receiver assembly (6) until it clears the bolt (5). Slowly allow the bolt carrier (4) to return to its forward position (Figure G-7).

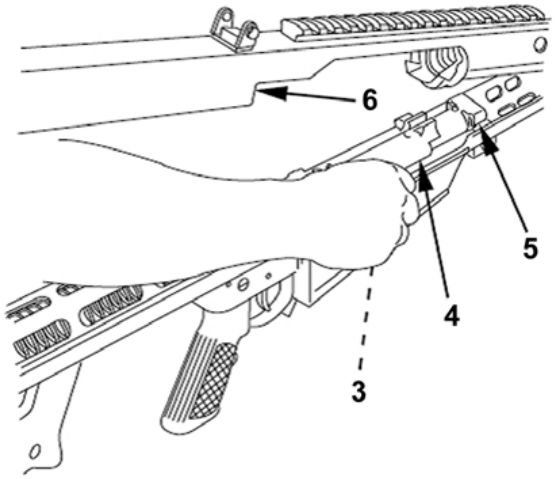


Figure G-7. Lifting the back end of the upper receiver assembly.

(4) Disengage the front hook (7) from the front hook pin (8) on the lower receiver (9), and lift the upper receiver assembly (6) clear of lower receiver assembly (Figure G-8).

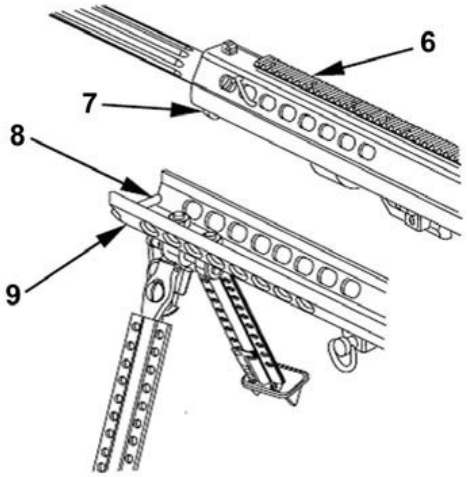


Figure G-8. Lifting the upper receiver assembly clear of the lower receiver assembly.

(5) Pull the bolt carrier (4) rearward, and insert the rear lock pin (1) through the buffer (10) and buffer spring (11) (Figure G-9).

NOTE: Buffer and spring are under heavy tension.

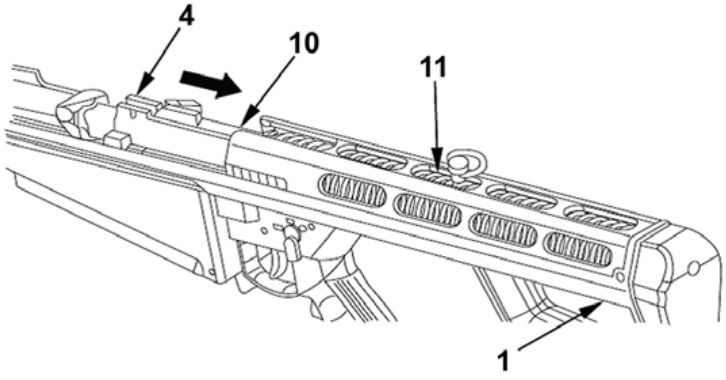


Figure G-9. Pulling the bolt carrier rearward.

(6) Gently pull the bolt carrier (4) forward, and lift out of the lower receiver assembly (9) (Figure G-10).

CAUTION

When removing the bolt carrier from the lower receiver assembly, ensure that the carrier is completely forward of the housing before lifting the bolt to avoid damaging the lower receiver assembly.

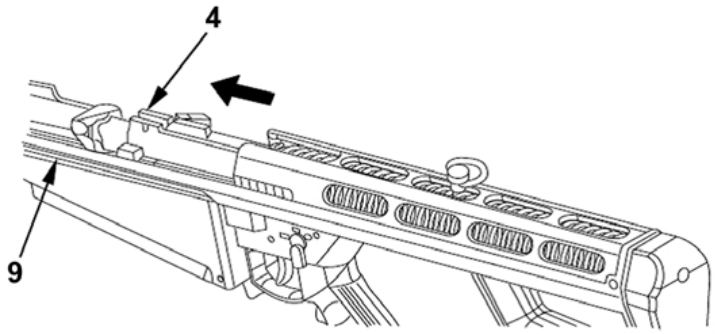


Figure G-10. Pulling the bolt carrier forward, and lifting out of the lower receiver assembly.

BOLT AND CARRIER ASSEMBLIES

WARNING

If the spring-loaded cam is lifted too far, the spring may lose tension. If this occurs, the weapon could malfunction, or it could allow the weapon to fire when unlocked, potentially injuring personnel.

G-53. If the bolt assembly (1) and bolt spring (2) are being removed separately (Figure G-11)—

(1) Use the rear lock pin or a 1/8 inch punch to disengage the cam pin assembly (3) (Figure G-11).

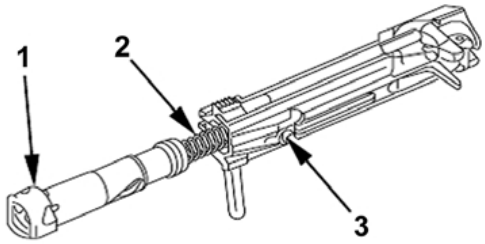


Figure G-11. Disengaging the cam pin assembly.

(2) Lift or pry the cam pin spring (4) up just far enough to clear the cam groove (Figure G-12).

(3) Depress the bolt latch (5) on its rearward portion (Figure G-12).

NOTE: At this point the bolt assembly (1) should spring forward (Figure G-12).

(4) Grasp the bolt assembly and remove it from the carrier (6), being careful not to lose or deform the bolt spring (2) (Figure G-12).

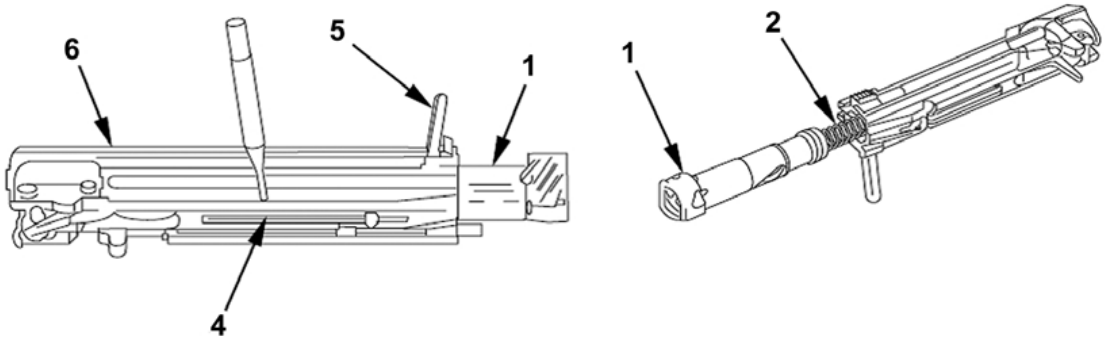


Figure G-12. Removing the bolt assembly from the carrier.

G-54. The sniper disassembles the bolt only if the extractor, extractor plunger, or extractor spring fails. To remove the extractor (1) from the bolt (2) (Figure G-13)—

WARNING

Always point the bolt away from face and eyes to avoid possible injury if parts fly free.

CAUTION

Cover the plunger and plunger spring with the thumb while sliding the extractor out of slot to prevent loss or damage.

(1) Depress the extractor plunger (3) by inserting a 1/16-inch punch through the extractor hole (4) (Figure G-13).

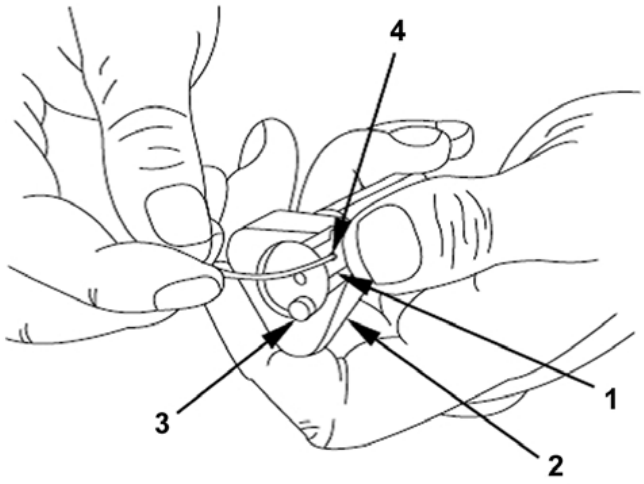


Figure G-13. Depressing the extractor plunger.

(2) Slide the extractor (1) out of the slot. Remove the extractor plunger (3) and extractor spring (5) (Figure G-14).

(3) Visually inspect all components for damage. (4) Reassemble the bolt in reverse order.

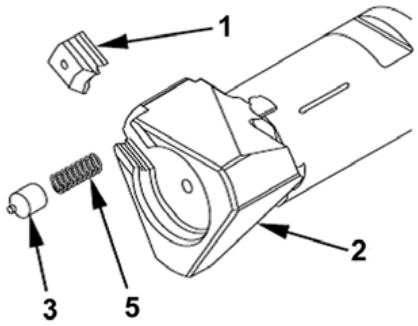


Figure G-14. Removing the extractor plunger and the extractor spring.

Reassembly

G-55. To reassemble the bolt and carrier assemblies (Figure G-15)—

(1) While lifting cam pin assembly (4), insert the bolt assembly (1) into position.

(2) Compress the bolt assembly against the bolt spring (2) until the cam (3) slips into the cam groove.

(3) Release the cam pin assembly (4).

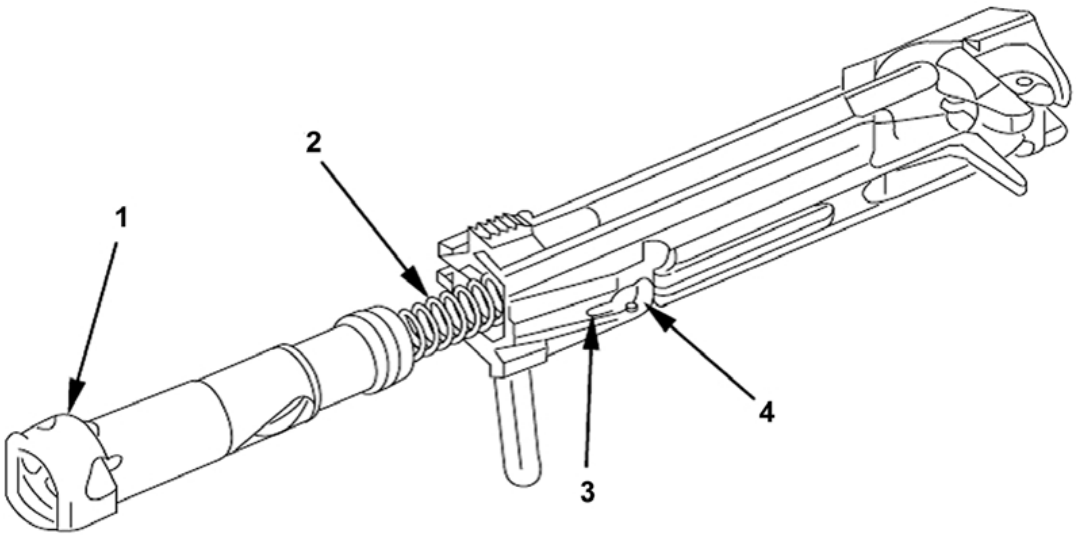


Figure G-15. Reassembling the bolt and carrier assemblies.

BUFFER AND BUFFER SPRING

G-56. The sniper removes the buffer and buffer spring only when he must repair or replace parts. To remove the buffer and buffer spring—

(1) Using your finger, push the buffer (1) to the rear (Figure G-16).

(2) Place the rear lock pin (2) through the coils of the buffer spring (3) and the ports in the buffer spring housing (4) (Figure G-16).

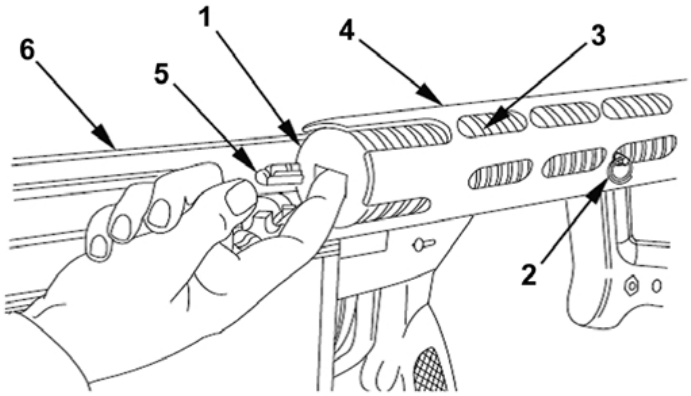


Figure G-16. Removing the buffer and buffer spring.

(3) Place your finger into the slot on the lower end of the buffer (1), and turn the buffer so that the groove on the flange lines up with the buffer stop (5) on the lower receiver assembly (6) (Figure G-16).

(4) Remove the rear lock pin (2) (Figure G-16).

(5) Slowly and carefully remove the buffer (1) and buffer spring (3) (Figure G-16).

Reassembly

G-57. To reassemble the buffer and buffer spring—

(1) Slide the buffer spring (1) into the lower receiver assembly (2) (Figure G-17).

(2) Place the buffer (3) into the buffer spring (Figure G-17).

(3) Guide the buffer spring into the housing (4) until the buffer is even with the housing (Figure G-17).

(4) Place your finger into the slot on the buffer, and turn the buffer so that the groove in its flange lines up with the buffer stop (5) on the lower receiver assembly (Figure G-17).

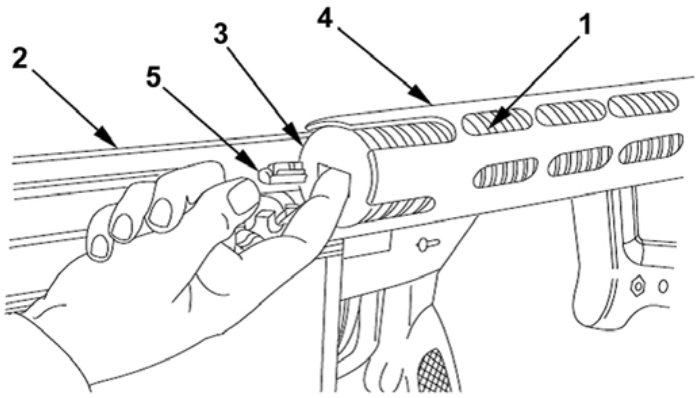


Figure G-17. Turning the buffer to align the groove in its flange with the buffer stop.

(5) Push the buffer (3) to the rear of the housing (4), and secure it by placing the rear lock pin (6) through coils of the buffer spring (1) and the ports in the buffer spring housing (Figure G-18).

NOTE: Using your finger, ensure that the groove and slot are NOT aligned.

(6) Remove the rear lock pin (Figure G-18).

(7) Ease off the pressure until the buffer stops on the buffer stop (5) (Figure G-18).

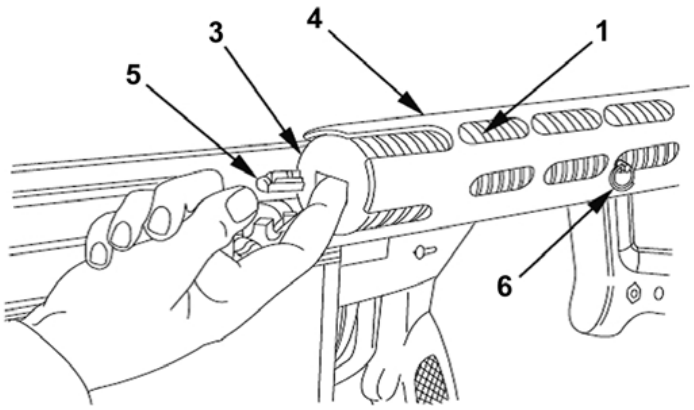


Figure G-18. Using your finger to ensure that the groove and slot are not aligned.

CLEANING

G-58. The rifle should be cleaned and lubricated as soon as possible after each shooting session to prevent the corrosive effects of moisture, and buildup of debris, grit, and carbon in the action and barrel.

CHAMBER

G-59. The sniper should use the tools in the deployment cleaning kit to clean the chamber. To clean the chamber—

(1) Insert a section of the five-piece cleaning rod through the ratchet handle of the chamber brush.

(2) Apply cleaning solvent to the brush, and vigorously scrub the chamber.

(3) Turn the cable and brush in a clockwise direction in order to remove residue from the corner of the neck.

MUZZLE AND MUZZLE BRAKE

G-60. To clean the muzzle and muzzle brake—

(1) On one end of the cleaning cable, attach the T-handle body. Insert the rod handle through the hole in the T-handle body. Pass the opposite end of the cable through the muzzle end of the barrel until the end exits the chamber.

(2) Attach the cleaning tip with two patches dipped in cleaning solvent, and pull the patches out through the muzzle to remove powder residue. Repeat with the bore brush dipped in solvent. Attach two clean patches to the cleaning tip, and repeatedly pull clean patches out through the muzzle end until they come out clean.

(3) Clean the muzzle brake with a small brush and bore solvent.

NOTE: It is best to clean the muzzle brake at the same time the barrel is being cleaned, as the bore solvent will help in loosening the carbon that builds up on the interior walls.

BOLT ASSEMBLY

G-61. To clean the bolt assembly—

(1) Clean the bolt face with bore solvent.

(2) Use a brush and scraper to remove carbon and brass shavings from both the extractor and the ejector.

(3) Depress the ejector and extractor by hand to test their smooth motion.

(4) If they hang up or their motion is not smooth, remove them and clean the parts, springs, and holes.

(5) Apply lubrication before assembly, and test their motion by hand.

MAGAZINE

WARNING

Wear eye protection to prevent injury from spring-loaded parts, particularly when removing the magazine base plate.

G-62. Disassembling the magazine is not recommended as a matter of routine maintenance, but it may become necessary for repairs. To clean the magazine—

(1) Hold the magazine tube upside down on a firm surface, and place the end of a 1/8-inch punch in the hole located on the base plate. Gently pry upward to clear the locking flange on the base plate, and slide the base plate off the magazine tube.

NOTE: It may be necessary to tap the base plate a few times with the punch to get it started.

(2) Control the magazine spring as the base plate is removed. Withdraw the magazine spring and magazine follower from the magazine tube.

(3) Wipe clean all parts of the magazine.

(4) Ensure that the loop of the magazine spring is wrapped around the protrusion located on the bottom of the magazine follower.

(5) Install the magazine follower and magazine spring into the magazine tube. Secure with the base plate. After the cartridge magazine has been reassembled, check for proper functioning by loading it with five dummy rounds and pushing downward on the dummy rounds. They should move freely.

OPTICS

CAUTION

Use extreme care to avoid scratching the lenses. Do not allow solvents to touch the lenses.

G-63. To clean the optics—

(1) Remove dust, lint, and dirt from the lens and exterior of the scope using a clean camel hair artist brush.

(2) Remove smudges from the lens by breathing heavily on them and wiping away moisture with lens paper. If lens paper is not available, use a soft, clean, dry cloth.

(3) Keep all hex screw fittings clear of mud and dirt. If they become clogged, use a safety pin or similar item to dig out the debris.

(4) Keep the lens free of oil and grease. If there are fingerprints or oil spots on the lens, use rubbing alcohol with lens paper to remove. Pat the lens, do not scrub.

(5) After cleaning, apply a light coat of lubricant to the scope body.

LUBRICATION

WARNING

Never mix lubricants on the weapon, always completely remove one lubricant before using another. Mixing lubricants can cause viscosity change, resulting in weapon damage or malfunction, which can cause injury.

G-64. Lubricant, small arms (with Teflon) (LSAT); lubricant, small arms (LSA); and CLP are the authorized lubricants to use on the M107 LRSR at normal temperatures to -10°F (-27°C). At temperatures below -10°F (-27°C), snipers should use lubricant, arctic weather (LAW). Table G-4 outlines operational climates and proper lubrication application.

NOTE: Remember to remove excessive oil from the bore before firing.

Table G-4. Operational climates and proper lubrication application.

CLIMATE	APPLICATION

Hot, Dusty, and Sandy Areas	Clean often, lightly lube. Wipe oil from exposed surfaces with clean wiping rag. Keep sand out of parts. Keep the rifle covered when possible. Use CLP, LSA, or LSAT sparingly. NOTE: Dust and sand can get into rifle and cause malfunctions and excessive wear on component contact surfaces during firing.
Extremely Cold Climate	When operating rifle in extremely cold climate clean and lubricate rifle inside at room temperature if possible. Apply a light coat of LAW to all functional parts. To prevent freezing, keep the rifle covered when moving from a warm to a cold area. This will allow gradual cooling. Always keep the rifle dry. Keep ammunition dry; moisture will cause malfunctions. Do not lubricate ammunition. Always keep snow out of the bore of the barrel. If snow should get into the bore, clean the bore using a swab and cleaning rod before firing.
Hot, Wet Climate	Use LSAT, LSA, or CLP and inspect often. Use LSAT, LSA, or CLP lightly. Keep rifle dry.

	Perform maintenance more frequently. Inspect hidden surfaces for corrosion. If corrosion is found, clean and lubricate with CLP, LSA, or LSAT. To help prevent corrosion, remove handprints with wiping rag. Dry off, and then lubricate the rifle.
Heavy Rain and Fording Operations – All Climates	Perform maintenance in accordance with cleaning procedures in TM 9-1005-239-10 and apply a thin coat of CLP, LSA, or LSAT. DO NOT lubricate ammunition. Always attempt to keep rifle dry. After exposure to water, make sure the rifle is dry before lubricating. Always drain any water from barrel prior to firing. Dry the bore with a swab and cleaning rod.

G-65. To lubricate the M107 LRSR—

(1) Put LSAT, LSA, or CLP on a clean swab and generously lubricate:

Bolt – locking lugs and cam slot.

Bolt Carrier – receiver bearing surfaces.

Barrel – bolt locking surfaces.

Receiver – rails that bolt carrier rides on.

(2) Lightly lubricate all other areas, including the bore.

(3) Generously lubricate (meaning obvious to visual inspection) the following areas:

Behind the bolt locking lugs.

Bolt body.

Bolt cam pin.

Moving parts of the bolt and carrier assemblies.

The receiver rails which the bolt and carrier assemblies ride in, in the lower receiver assembly.

The barrel extension where it rides in the weapon.

G-66. Before firing—

- Using a clean wiping rag, wipe the bore dry.
- Ensure the weapon is properly lubricated.

BARREL EXTENSION AND COLLAPSE

G-67. A collapsed M107 LRSR is 19 inches shorter than one that is fully extended.

EXTENSION

G-68. To extend the M107 LRSR barrel—

(1) Carefully pick up the upper receiver assembly (1). The barrel (2) will be nested inside the receiver for compact storage and transit. Move the impact bumpers (3) into position on either side of the receiver's central barrel bushing, so that they rest snugly against the bushing (Figure G-19).

(2) Align the barrel (2) so that its feed ramp (slanted entry to the firing chamber) is on the bottom. Keeping fingers away from the barrel, hold the upper receiver assembly (1) horizontally, and then tilt it in the direction of the muzzle (4). The barrel should fall into place, at its full forward extension into the upper receiver assembly (Figure G-19).

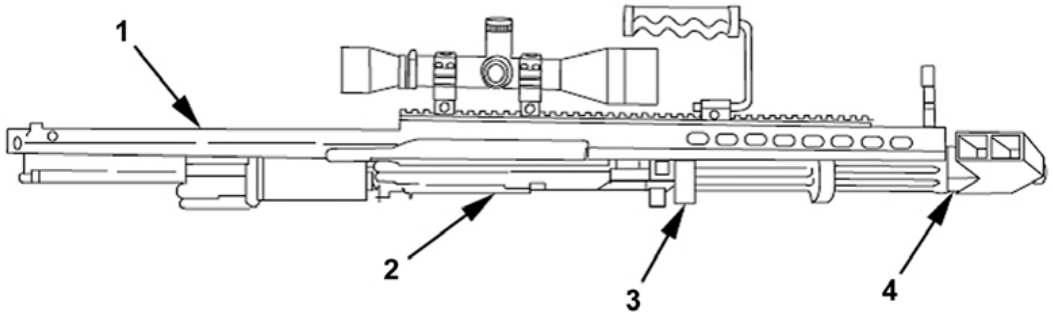


Figure G-19. Extending the barrel.

WARNING

The tension on the barrel springs is about 70 pounds. Serious injury may result if springs are released suddenly. Incomplete or improper assembly may result in injury.

(3) The barrel springs (5) at the front of the upper receiver assembly (1) are held together by the barrel key (6), which acts as a spring yoke. While maintaining the downward tilt of the upper receiver assembly (to keep the barrel in place), firmly grasp the barrel key—not the springs— and pull it into place on the forward slot of the barrel (Figure G-20).

(4) Work the barrel key from side to side until it is firmly seated in the barrel slot (Figure G-20).

NOTE: The upper receiver assembly is now fully assembled.

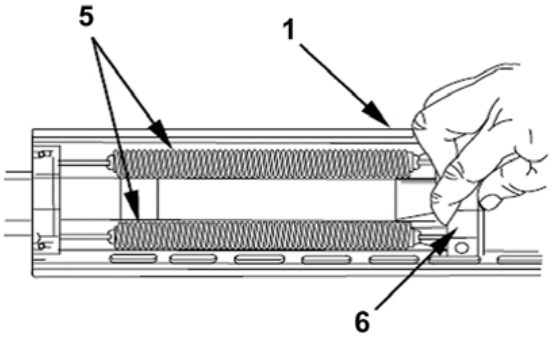


Figure G-20. Holding the springs in place.

COLLAPSE

CAUTION

Do not pull on barrel springs to remove the barrel key. Doing so may damage the springs. Barrel spring is under tension.

G-69. The sniper collapses the M107 LRSR to nest the barrel for storage and transit. To nest the barrel (Figure G-21)—

(1) Withdraw the barrel key (2) from the slot in the barrel (1) by slowly working it out.

(2) Slide the barrel out the rear of the upper receiver assembly (3).

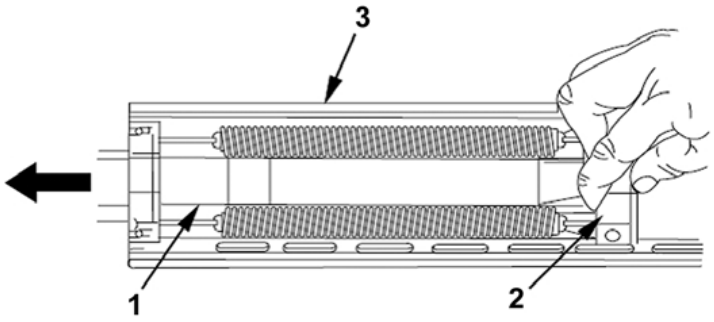


Figure G-21. Nesting the barrel.

DEPLOYMENT KIT

G-70. The deployment kit is made up of five separate kits:

- Weapons cleaning kit.
- Optics cleaning kit.
- Deployment tool kit.
- Deployment parts kit.

- Five-piece cleaning rod.

WEAPONS CLEANING KIT

G-71. Table G-5 lists the items that are included in the weapons cleaning kit. The item number in the table corresponds with the callout number in Figure G-22.

Table G-5. Weapons cleaning kit components.

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	RW-316	Cleaning brush	1
2	RW-970	Panoply patches	10
3	RW-CLP-16	2/3 ounces break free	1
4	IP-9098-5	Extension rod	1
5	IP-557-S-SCRW	Cleaning eye patch rod	1
6	IP-555-5	T-handle obstruction remover	1
7	IP-C-40-50-2	Cleaning cable	1
8	558-B-3-132	Bronze bore brush	1

9	7790737	Bronze chamber brush	1
10	82135-B	Case, maintenance equipment, small arms	1

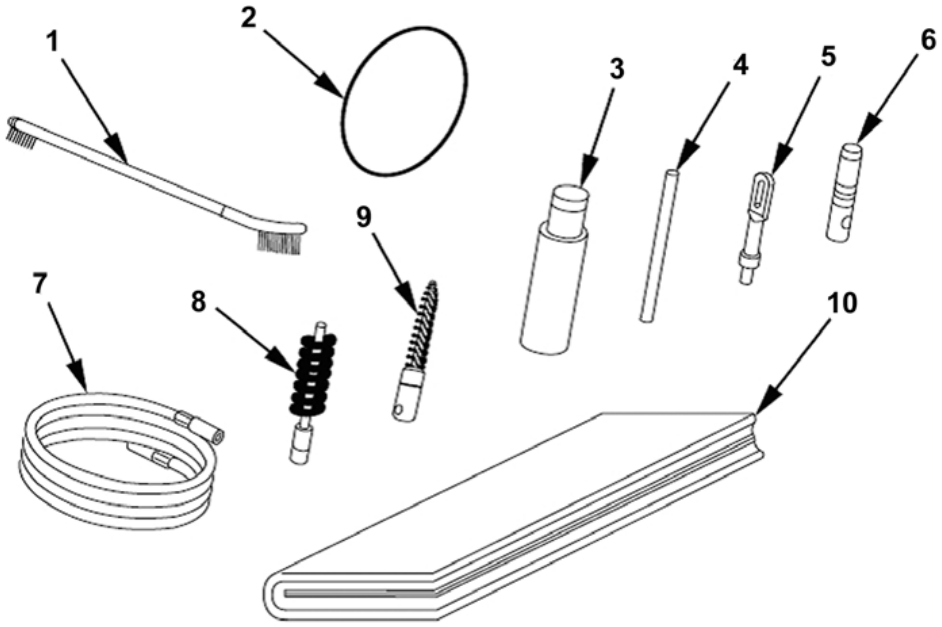


Figure G-22. Weapons cleaning kit.

OPTICAL CLEANING KIT

G-72. Table G-6 lists the items that are included in the optical cleaning kit. The item number in the table corresponds with the callout number in Figure G-23.

Table G-6. Optical cleaning kit components.

ITEM	PART NUMBER	DESCRIPTION	QUANTITY

1	A-A-3191	Brush, artist (cleaning brush)	1
2	96041	Case, lens cleaning	1 each
3	L-B-56A	Bottle (for containing isopropyl alcohol)	1
4	NNN-P-40	Paper, lens (cleaning tissue)	1 package
5	362	Applicator (cotton swabs) (100 per pack)	1 box

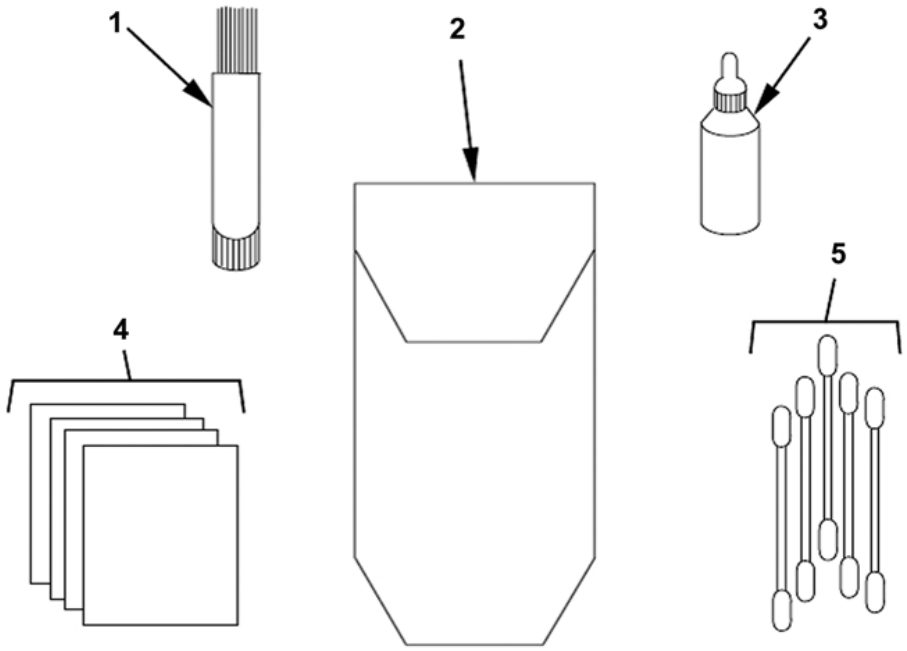


Figure G-23. Optical cleaning kit.

DEPLOYMENT TOOL KIT

G-73. Table G-7 lists the items that are included in the deployment tool kit. The item number in the table corresponds with the callout number in Figure G-24.

Table G-7. Deployment tool kit components.

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	96059	65 pound/inch torque wrench (3/8 drive) w/socket 1/2 inch socket (3/8 drive) (for use with torque wrench): B107.1 CL1STA	1
2	1162	1/2-inch short handle combination wrench	1
3	T-33	1/16 roll pin punch	1
4	T-5	T-30 L-shaped torque wrench	1
5	T-46	T-15 L-shaped torque wrench	1
6	T-45	T-10 L-shaped torque wrench	1
7	T-47	0.050 L-shaped hex key wrench	1
8	T-51	3/32-inch L-shaped hex key wrench	1

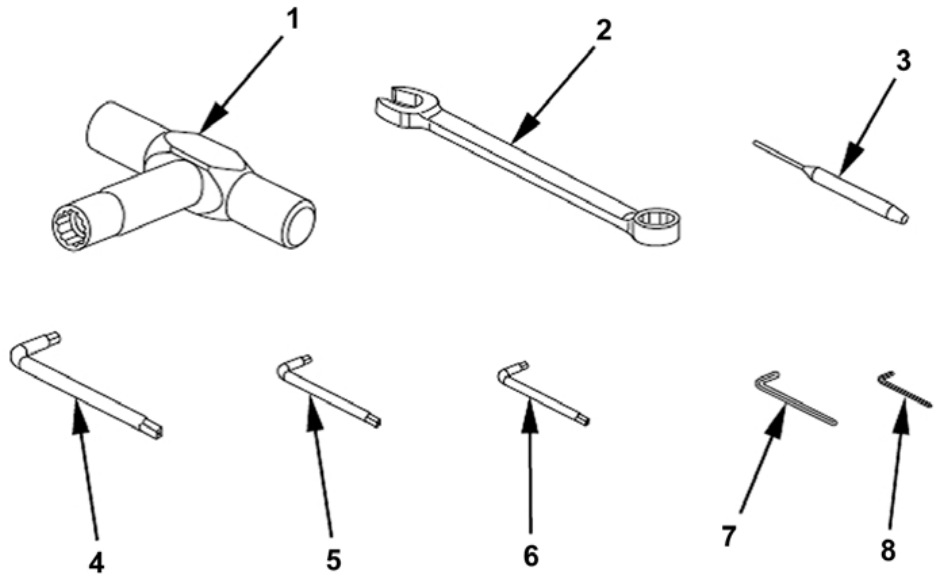


Figure G-24. Deployment tool kit.

DEPLOYMENT PARTS KIT

G-74. Table G-8 lists the items that are included in the deployment parts kit. The item number in the table corresponds with the callout number in Figure G-25.

Table G-8. Deployment parts kit components.

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	13EYE	Cover, eyepiece lens	1
2	403BJ	Cover, objective lens	1
3	82114-A	Bipod or rear lock pin	1
4	82115-A	Midlock pin	1

5	51503	Cover, turret	1
6	82125	Cap screw	2
7	82108	Plunger, extractor	1
8	82107	Spring, extractor	1
9	82106	Extractor	1
10	82128	Nut, scope ring	1
11	82129	Lock washer, scope	1
12	82127	Cap ring screw	2
13	82102	Bolt spring	1

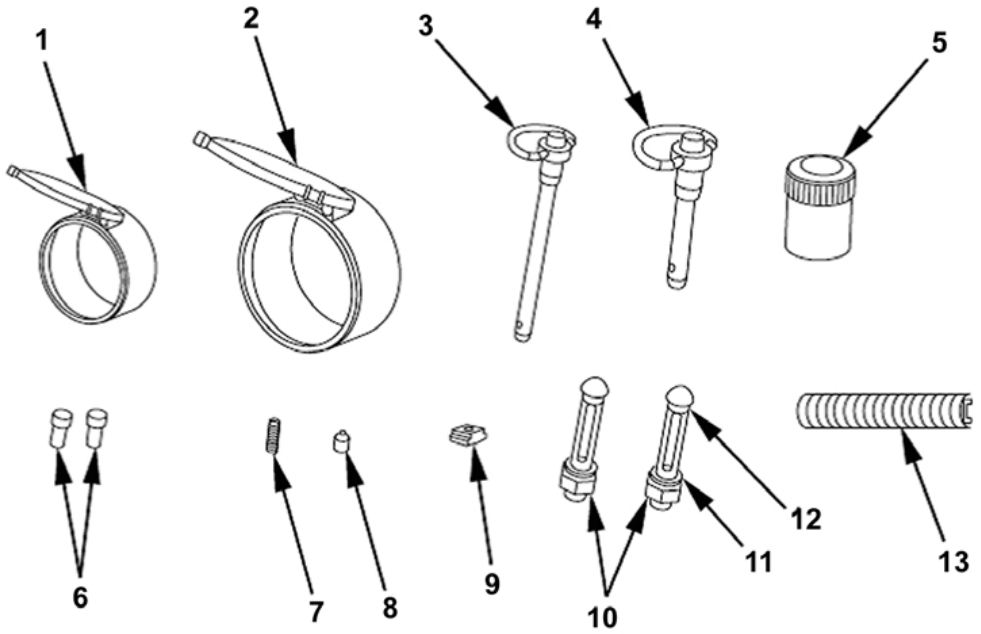


Figure G-25. Deployment parts kit.

FIVE-PIECE CLEANING ROD

G-75. Table G-9 lists the items that are included in the five-piece cleaning rod. The item number in the table corresponds with the callout number in Figure G-26.

Table G-9. Five-piece cleaning rod components.

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	6535441	Five-piece cleaning rod.	1
A removable handle is included with the five-piece cleaning rod.			

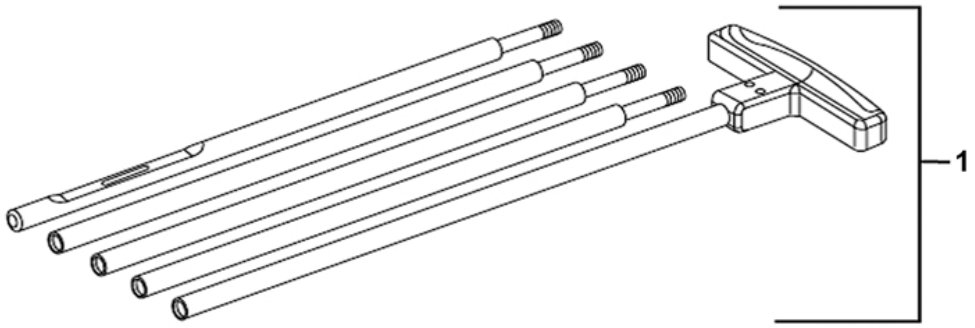


Figure G-26. Five-piece cleaning rod.

MALFUNCTIONS AND CORRECTIONS

G-76. Table G-10 shows how to correct some of the more common malfunctions of the M107 LRSR. If something else happens, the sniper notifies unit maintenance.

Table G-10. Common malfunctions and corrective actions.

SYMPTOMS	MALFUNCTIONS	CORRECTIVE ACTIONS
Failure to feed	Sluggish action	Clean and lubricate, or (in cold weather) check for excess lubricant.
	Magazine not seated	Reinsert properly.
Failure to chamber	Damaged cartridge	Remove and reload.
	Dirty chamber	Clear and clean.

Failure to fire	Faulty ammunition	Replace ammunition.
	Improper installation of firing mechanism	Assemble properly.
	Broken firing pin	Turn in for repair.
	Firing spring(s) broken or weakened	
	Cocking piece bent or broken	
Failure to extract	Broken extractor	Replace.
	Extractor not moving freely in slot	Remove and clean.
	Dirty chamber	Clean.
Failure to eject	“Frozen” or damaged ejector or spring	Turn in for repair.

Very hard recoil	Faulty or hot ammunition	Replace or cool ammunition.
	Muzzle brake missing, damaged, or clogged	Turn in for repair.
	Buffer spring weak	Replace buffer spring.

NOTES:

1. When in a firing position, the sniper might have to move back to a concealed position to clear his weapon.

2. If a cartridge or round jams in the chamber, the sniper uses a cleaning rod to carefully push it out.

3. In an emergency, the sniper can fire the weapon without the magazine. To do so, he inserts a single cartridge through the magazine well and directly into the chamber. After he closes and locks the bolt, he can fire.

SECTION IV. M24 SNIPER WEAPON SYSTEM

The M24 SWS (Figure G-27) is a 7.62mm, bolt-action, six-round repeating rifle, with one round in the chamber and five in the magazine. This weapon has three sights: iron sights, an M3A daysight, and an AN/PVS-10 SNS.

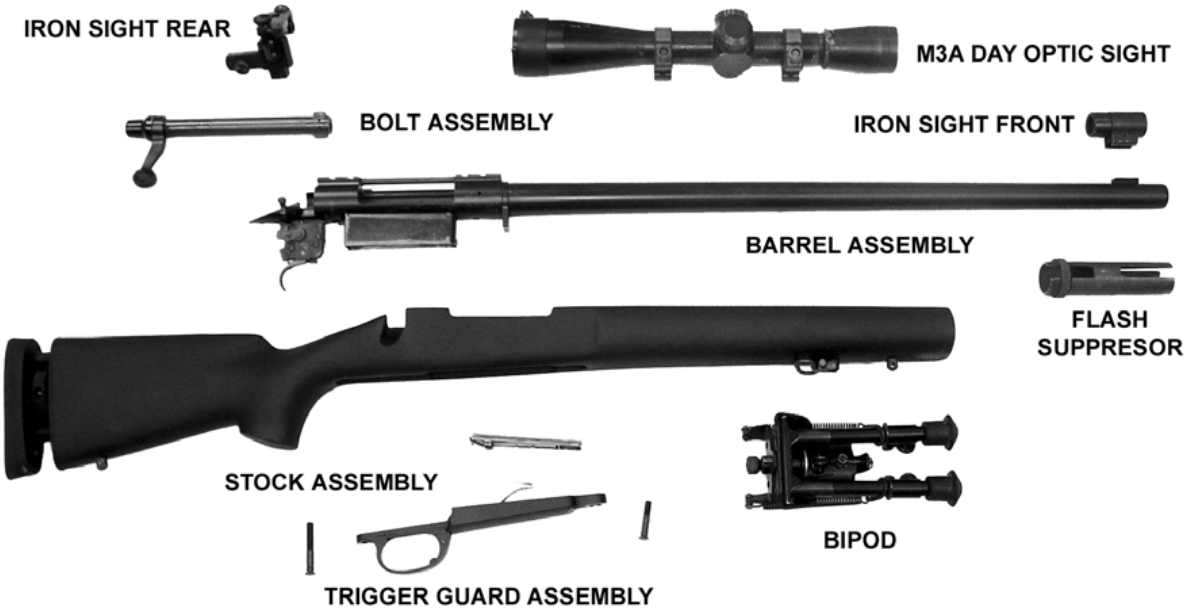


Figure G-27. M24 Sniper Weapon System.

INSPECTION

G-77. To keep his weapon operational, the sniper should know TM 9-1005-306-10, which is furnished with each M24 SWS. If he lacks the means to repair his weapon, he must turn it in for repair by the manufacturer. Before each mission, the sniper must—

- Check the appearance and completeness of all parts.
- Check the bolt to ensure that it locks, unlocks, and moves smoothly.

- Check the safety selector to ensure it can be fully and smoothly (but not too easily) placed in the SAFE and FIRE positions.

- Check the trigger to ensure that, when the safety selector is in the SAFE position, the trigger will not pull, and the weapon will not fire. Also, ensure that when the safety selector is in the FIRE position, the trigger pull is smooth and crisp.

- Check the trigger guard screws (rear of trigger guard and front of internal magazine) for proper torque (65 inch-pounds).

- Check the scope mounting ring nuts for proper torque (65 inch-pounds).

- Check the stock for any cracks, splits, or contact with the barrel.

- Inspect the rail system. Ensure it is tightly mounted and that there are no obstructions between the rings and the rails.

- Inspect the scope for obstructions such as dirt, dust, moisture, or loose or damaged lenses.

FIELD-STRIPPING

G-78. The sniper only disassembles the weapon when he absolutely has to, such as when he must remove an obstruction stuck between forestock and barrel. This procedure is excluded from daily maintenance. To disassemble the M24 SWS—

(1) Clear the rifle.

(2) Point it in a safe direction.

(3) Move the safety selector to the SAFE position.

(4) Remove the bolt assembly.

(5) Use the 1/2-inch combination wrench to loosen the front and rear mounting ring nuts on the scope (Figure G-28), and remove the scope.

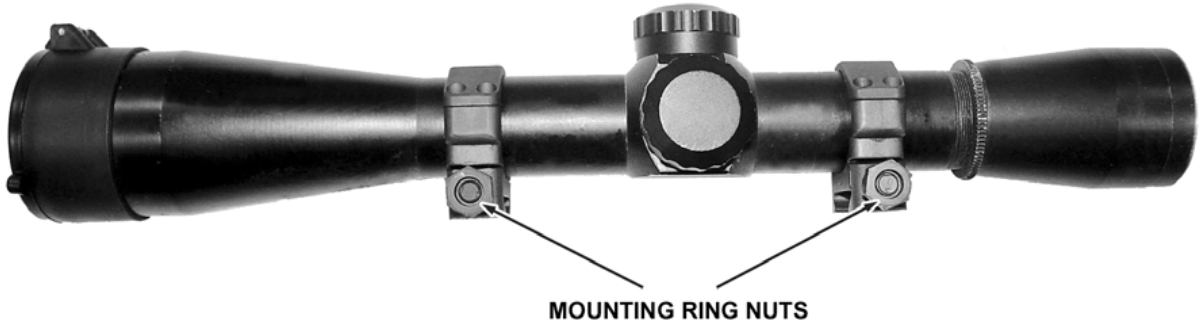


Figure G-28. Mounting ring nuts.

(6) Loosen the front and rear trigger guard screws (Figure G-29) using a 5/32-inch hex key.



Figure G-29. Trigger guard screws.

(7) Lift the stock assembly from the barrel assembly.

NOTE: Reassemble in reverse order. Torque the guard screws using the T-handled torque wrench and the socket wrench attachment.

CLEANING

G-79. Before a mission, the sniper must clean and dry the bore and chamber, and then make sure he keeps the rifle clean and dry en route to the

objective area. The sniper cleans the weapon before firing because firing a weapon with a dirty bore or chamber speeds corrosion. Further, the M24 SWS is stored with oil in the bore and chamber. Firing the weapon before cleaning can vary the pressure, which interferes with first-round accuracy, and can cause a smoky signature.

G-80. The sniper cleans the weapon as soon as he can after firing because firing leaves primer and metal fouling (which require separate solvents to remove), powder ash, and carbon in the barrel. Although ammunition for the M24 SWS has a noncorrosive primer that makes cleaning easier, the residue left by the ammunition can rust the barrel.

NOTE: Repeated firing will not damage the rifle if properly cleaned before firing.

G-81. When cleaning the M24 SWS, snipers should consider the following:

- Always clean the bore from the chamber to the muzzle, and keep the muzzle lower than the chamber to keep the bore cleaner from running into the receiver or firing mechanism.

- Avoid getting any fluid between the stock and receiver, because this would make the whole receiver slide on the bedding during recoil. This, in turn, decreases accuracy and increases wear and tear on the receiver and bedding material.

G-82. To clean the M24 SWS—

NOTE: Shake the bottles of cleaner often to keep the ingredients mixed.

(1) Lay your weapon on a table or other flat surface with the muzzle pointing away from you and the sling down. Avoid striking the muzzle or the sight on the table.

NOTE: The cleaning cradle is ideal for holding the rifle.

(2) Use a bore guide to center the cleaning rod. Push several patches saturated with carbon cleaner through the barrel to loosen the powder

fouling.

(3) Saturate the bronze-bristle brush with carbon cleaner. Make sure the bronze-bristle brush passes completely through the barrel in the direction of bullet travel.

NOTE: Use a medicine dropper to avoid contaminating the carbon cleaner.

CAUTION

Use only bronze-bristle bore brushes, because stainless steel brushes will scratch the barrel.

(4) Once it is all the way through, remove the bristle brush, pull out the cleaning rod, reattach the bristle brush to the rod, and repeat as needed (about 20 times). Make sure to push it completely through and out of the barrel before you reverse the direction. Otherwise, the bristles will break off.

(5) Use a pistol cleaning rod and a .45-caliber, bronze-bristle bore brush. Clean the chamber by rotating the patch-wrapped brush 8 to 10 times.

(6) Push several clean patches saturated with carbon cleaner through the bore to clean out the loosened powder fouling. Continue running the brush and saturated patches through the bore until the patches have no traces of black or gray powder fouling and are green-blue. This shows that the powder fouling has been removed and that only copper fouling remains.

(7) Run the brush through several more times with clean patches to remove the remaining carbon cleaner from the barrel. This is important, because solvents should never mix in the barrel.

(8) Push several clean patches saturated with copper cleaner through the bore using a light scrubbing motion to work the solvent into the copper.

(9) Let the chemicals do most of the work. Leave the solvent on for 10 to 15 minutes.

(10) Push several patches saturated with copper cleaner through the barrel. The patches will appear dark blue at first, indicating the amount of copper fouling removed. Continue until the saturated patches come out clean, with no trace of blue-green.

NOTES:

1. If the patches continue to come out dark blue after several treatments with copper cleaner, use the bronze brush saturated with copper cleaner to increase the scrubbing action.

2. If left on long enough, copper cleaner will dissolve the bristles of the bronze bore brush, because bronze has copper in it. Therefore, you must clean the bronze brush thoroughly using a quick-scrub cleaner or degreaser if you have it. If not, you can use hot running water.

(11) Moisten the GP brush with carbon cleaner, and scrub the bolt with it.

(12) Wipe down the rest of the weapon with a cloth.

(13) When the barrel is clean, dry it with several tight-fitting patches. Also, dry the chamber using the .45-caliber bronze-bristle bore brush with a patch wrapped around it.

LUBRICATION

WARNING

Never mix lubricants on the weapon, always completely remove one lubricant before using another. Mixing lubricants can cause viscosity change, resulting in weapon damage or malfunction, which can cause injury.

G-83. When lubricating the M24 SWS, the sniper should consider the following:

• Over-lubrication should be avoided at all times. A thin coat of appropriate lubricant is all that is needed to prevent the possibility of corrosion.

• When the rifle is to be stored, it should be carefully cleaned thoroughly oiled. Coat the bolt face, extractor, ejector, bore, chamber, and exterior of the trigger assembly with CLP/LSA. Further lubrication is not necessary.

• When the rifle is to be used, all lubrication must be removed from the chamber and bore.

NOTE: Remember to remove excessive oil from the bore before firing.

• Lubricate the bolt lugs and cocking cam to prevent wear.

• If the exterior of your weapon is unpainted, wipe it down with a CLP-saturated cloth to protect it during storage.

DEPLOYMENT KIT

G-84. A deployment kit allows operator-level maintenance and repair. Table G-11 lists the items that are included in the deployment kit. The item number in the table corresponds with the callout number in Figure G-30.

Table G-11. Deployment kit components.

ITEM	DESCRIPTION	ITEM	DESCRIPTION
1	Deployment case	22	Day optic sight elevation dial with screws
2	Firing pin assembly	23	Day optic sight focus dial with screws

3	Front guard screw	24	Day optic sight adjustment dial dust cover
4	Rear guard screw	25	Day optic sight ring screws
5	Front sight base screw	26	Day optic sight base screw, front
6	Swivel screw	27	Day optic sight base screw, rear
7	Swivel, sling	28	Day optic sight dust cover, front
8	Front sight insert kit	29	Day optic sight dust cover, rear
9	Rear sight base screw	30	Brush, chamber
10	Trigger pull adjustment screw	31	Brush, bore
11	Brush, cleaning small	32	Oil bottle
12	Socket wrench attachment 3/8-inch drive hex bit 5/32-inch	33	Magazine spring

13	.050-inch key, socket head screw	34	Magazine follower
14	1/16-inch key, socket	35	Socket, socket wrench head screw, 1/2-inch
15	5/64-inch key, socket head screw	36	T-handled torque wrench
16	3/32-inch key, socket head screw	37	Wrench, combination, 1/2-inch
17	7/64-inch key, socket head screw	38	Rear sight base plug screw
18	1/8-inch key, socket head screw	39	Day optic sight sunshade
19	5/32-inch key, socket head screw	40	Swabs, cleaning, small arms
20	T-handled combination wrench	41	Cleaning rod kit
21	Day optic sight windage dial with screws	42	Lens cleaning kit

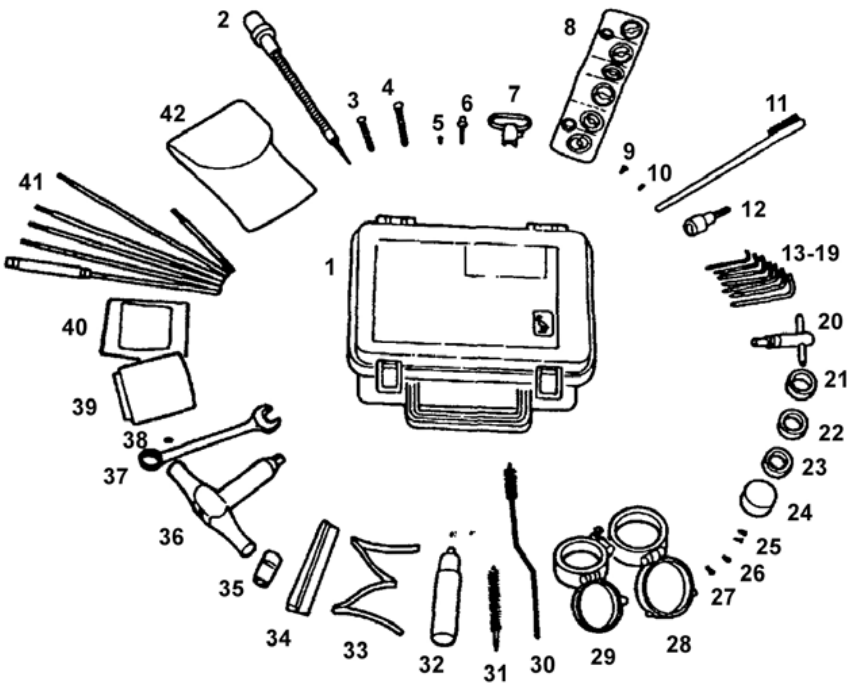


Figure G-30. Deployment kit.

MALFUNCTIONS AND CORRECTIONS

G-85. Table G-12 shows select malfunctions and their corrections. If the sniper cannot correct a weapon malfunction, he must turn in the weapon through the proper supply or maintenance channel for return to the manufacturer.

NOTE: TM 9-1005-306-10 provides shipment information.

Table G-12. Malfunctions and corrections.

MALFUNCTION	CAUSES	CORRECTIONS

	The safety selector is in the SAFE position.		Move the safety selector to the FIRE position.
	Ammunition is defective.		Eject the cartridge.
	Firing pin—	Binds.	Change the firing pin assembly.
		Protrudes.	Change the firing pin.

Fails to fire

	The firing control is out of adjustment.	Turn in the complete system to maintenance or supply for return to the manufacturer.
	The trigger is out of adjustment.	
	The trigger fails to retract.	
	The trigger binds on the trigger guard.	
	The firing pin fails to remain in the cocked position with the bolt closed.	
Fails to extract	The extractor is broken.	
Fails to eject	The ejector is broken.	
	The ejector plunger is fouled.	Inspect and clean the bolt face. If the malfunction continues, turn in the complete system to maintenance or supply for return to the manufacturer.

Fails to feed	The bolt overrides the cartridge.	Seat cartridge fully rearward in the magazine.
	The cartridge stems the chamber.	Pull the bolt fully rearward. Remove the stemmed cartridge from the ejection port. Reposition the cartridge fully in the magazine.
	The magazine follower is in backward.	Remove the magazine spring. Reinstall the spring with the long leg follower.
	The magazine spring is weak or broken.	Replace the spring.
Bolt binds	The guard screw protrudes into the bolt track.	Reverse the guard screws.

Appendix H: Primary Sniper Weapon Systems of the World

Several countries have developed sniper weapon systems comparable to the U.S. systems. The designs and capabilities of these weapon systems are similar. Tables H-1 and H-2 describe the characteristics of sniper weapon systems that could be encountered on deployments. This is not an all-inclusive list, and not all weapons are current issue. The country listed is either the last country of issue or that of the manufacturer.

Table H-1. Foreign sniper weapon systems.

AUSTRIA	
Steyr Scharfschutzen Gewehr 69 (SSG-69)  The SSG-69 is the current sniper weapon of the Austrian army and several foreign military forces. It has a well-deserved reputation for accuracy.	
System of operation	Bolt-action
Caliber	7.62- x 51-millimeter NATO, .243 Winchester

Overall length	44.5 inches
Barrel length	25.6 inches
Rifling	4-groove, 1/12-inch right-hand twist
Weight	10.3 pounds
Magazine	5- or 10-round detachable magazine
Sighting systems	Kahles ZF69 6- x 42-millimeter telescope (BDC [100 to 800 meters] and reticle [a post with broken crosshairs]); iron sights (permanently affixed to the rifle for emergency use), front—hooded post, rear—notch NOTE: The Kahles ZF69 telescope is zeroed using the same procedure as those used for Soviet telescopes.
Ammunition	NATO ball ammunition (147-/150-grain full-metal jacket ballistic tip [FMJBT] at 2,800 feet per second) NOTE: Some models of this telescope were designed for export to the United States. On these models, the BDC is calibrated for Federal's 308M load (168-grain hollow point ballistic tip [HPBT] at 2,600 feet per second).
Features	Synthetic stock (green or black) that is adjustable for length of pull by a simple spacer system; hammer-forged, medium-heavy barrel; two-stage trigger, adjustable for weight of pull (a set trigger system is frequently seen);

	machined, longitudinal rib on top of the receiver that accepts several types of optical mounts NOTE: The mounting rings have a quick-release lever system that allows removal and reattachment of the optics with no loss of zero.

Table H-1. Foreign sniper weapon systems (continued).

BELGIUM	
FN Model 30-11  The FN Model 30-11 is the current sniper weapon of the Belgium army.	
System of operation	Mauser bolt-action
Caliber	7.62- x 51- millimeter NATO
Overall length	45.2 inches
Barrel length	20.0 inches

Rifling	4-groove, 1/12-inch right-hand twist
Weight	15.5 pounds
Magazine	10-round detachable magazine
Sighting systems	FN 4-power, 28-millimeter telescope with post reticle, range-finding stadia, and BDC (100 to 600 meters); aperture sights with 1/6 MOA adjustment capability, front —hooded, rear— Anschutz match-aperture micrometer adjustable for windage/elevation and fitted to mount on the rifle's scope base with a QD mount
Ammunition	7.62- x 51-millimeter NATO ball (147-/150-grain FMJBT at 2,800 feet per second)
Features	Heavy barrel; stock with an adjustable length of pull; and accessories, including the bipod of the machine gun, butt-spacer plates, sling, and carrying case
CANADA	
Parker-Hale Model C3	



The Parker Hale Model C3 is a modified target rifle (commercial Model 82 rifle, Model 1200 TX target rifle).

System of operation	Mauser bolt-action
Caliber	7.62- x 51-millimeter NATO
Overall length	48.0 inches
Barrel length	26.0 inches
Weight	12.8 pounds
Magazine	4-round internal magazine
Sighting systems	Kahles ZF69 6- x 42-millimeter, BDC (100 to 800 meters); Parker-Hale 5E vernier rear sight; front— detachable hooded post, rear— detachable aperture

Ammunition	7.62- x 51- millimeter NATO ball (147-/150-grain FMJBT at 2,800 feet per second)
Features	Receiver fitted with two male dovetail blocks to accept either the Parker-Hale 5E vernier rear sight or the Kahles 6- x 42- millimeter telescope, a stock with a spacer system to adjust the length of pull

Table H-1. Foreign sniper weapon systems (continued).

CZECH REPUBLIC	
CZ 700 M1  The CZ 700 M1 is an accurate rifle, with accuracy (with quality civilian match ammunition) down in the .5 MOA class. With the US standard M118 ammunition, those groups will open up.	
System of operation	Bolt-action

Caliber	7.62- x 51-millimeter NATO (.308 Winchester)
Overall length	44.96 inches
Barrel length	25.59 inches
Rifling	4-groove, 1/12-inch right-hand twist
Weight	11.9 pounds
Magazine	10-round detachable box magazine, fits flush to the stock to prevent awkward handling
Features	Laminated wood stock (better than standard wood, but still flexes more in changing weather than a synthetic stock); easy stock adjustment using external knobs; fully adjustable trigger (external adjustment); large bolt handle; bolt has six locking lugs; permanently attached weaver-style site rail; accessory rail on the forearm of the stock (for a hand stop with spigot for Parker-Hale or Versa Pod bipods or other accessories)
FINLAND	
Sako TRG-21, -22, -41, and -42 	

Sako TRG-22 Sako TRG-42

The Sako TRG-21 was designed to be the most accurate sniper rifles in the world. The rifle is commonly seen in long-range competition where it has done very well. The TRG-41 is chambered in the high-power .338 Lapua, which effectively extends the range of the rifle out beyond 1100 meters. In 1999, the TRG-21/41 was replaced by the new TRG-22 and TRG-42. These rifles have a new stock design with improved contour.

System of operation	Bolt-action
Caliber	7.62- x 51-millimeter (.308) (TRG-22), .300 Winchester Magnum (TRG-42), 8.60- x 70-millimeter (.338 Lapua) (TRG-42)
Overall length	46.5 inches
Barrel length	26 inches (TRG-22), 27 inches (TRG-42)
Weight	10.4 pounds (TRG-22), 11.2 pounds (TRG-42)
Magazine	Detachable 5- or 10-round box magazine
Features	Aluminum base stock; polyurethane fore stock; polyurethane buttstock with aluminum skeleton; fully adjustable cheek piece (height, windage, and pitch); fully adjustable butt plate (distance, angle, height, and pitch); advanced stock design for right- and left-handed shooters; independently removable

	trigger assembly and trigger guard; double-stage trigger pull adjustable for length, pull (2 to 5 pounds), and pitch (horizontal or vertical); silent safety catches inside the trigger guard (safety locks the trigger mechanism and the bolt in closed position with firing pin blocked from the primer) Extra accessories: muzzle brake/flash-hider, silencer (.308 Winchester), foldable bipod, match sight mounting set, nightsight adapter, different slings and swivels, cleaning sets, heavy-duty transit case

Table H-1. Foreign sniper weapon systems (continued).

FRANCE	
MAS-GIAT FR-F1  The MAS-GIAT FR-F1 sniping rifle, known as the Tireur d'Elite (sniper), is based on the MAS 1936 bolt-action rifle. This weapon has a muzzle velocity of 2,794 feet per second and a maximum effective range of 800 meters.	
System of operation	Bolt-action

Caliber	7.62- x 51-millimeter NATO, 7.5- x 54-millimeter French
Overall length	44.8 inches
Barrel length	22.8 inches
Weight	11.9 pounds
Magazine	10-round detachable box magazine
Sighting systems	Model 53 BIS 3.8x telescopic sight and integral metallic sights with luminous spots for night firing, front— hooded post, rear—notch
Features	Adjustable length of pull with the removable butt-spacer plates, permanently affixed bipod with legs that may be folded forward into recesses in the fore-end of the weapon, integral muzzle brake or flash suppressor
MAS-GIAT FR-F2	



The MAS-GIAT FR-F2 sniping rifle is an updated version of the F1. Dimensions and operating characteristics remain unchanged; however, functional improvements have been made.

System of operation	Bolt-action
Caliber	7.62- x 51-millimeter NATO
Overall length	47.2 inches
Barrel length	22.9 inches
Rifling	3-groove, 1/11.6-inch right-hand twist
Weight	13.6 pounds
Magazine	10-round detachable box magazine

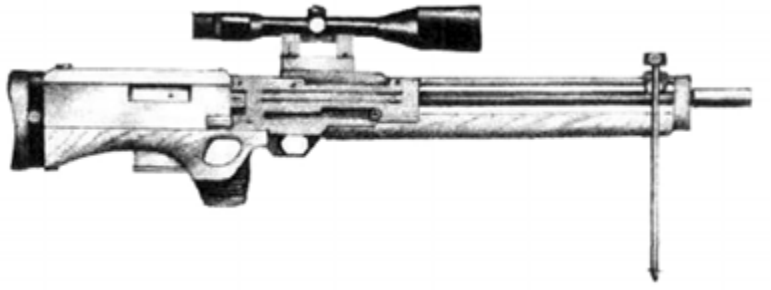
Sighting systems	6- x 42-millimeter or 1.56- x 42-millimeter Schmidt and Bender (BDC: 100 to 600 meters); front— post, rear— notch
Ammunition	150-grain FMJBT at 2,690 feet per second
Features	Heavy-duty bipod mounted more toward the butt-end of the rifle (adding ease of adjustment for the firer); thick, plastic thermal sleeve around and along the length of the barrel (eliminates or reduces barrel mirage and heat signature)

Table H-1. Foreign sniper weapon systems (continued).

GERMANY	
Mauser Model SP66  The Mauser Model SP66 is used by the Germans and also by about 12 other countries.	
System of operation	Mauser bolt-action
Caliber	7.62- x 51-millimeter NATO

Barrel length	26.8 inches
Magazine	3-round internal magazine
Sighting systems	Zeiss-Diavari ZA 1.5-6x; front—detachable hooded post, rear—detachable aperture
Features	Completely adjustable thumbhole-type stock, muzzle equipped with a flash suppressor and a muzzle brake, heavy barrel

Walther WA 2000



The Walther WA 2000 is built specifically for sniping.

System of operation	Semiautomatic, gas-operated, bull-pup design
Caliber	.300 Winchester Magnum; 7.62- x 51-millimeter NATO; 7.5- x 55-millimeter Swiss
Overall length	35.6 inches

Barrel length	25.6 inches
Weight	18.3 pounds
Magazine	3-round detachable magazine
Sighting systems	Schmidt and Bender 2.5-10- x 56-millimeter, BDC (100 to 600 meters), front—none, rear—none NOTE: The scope can be dismounted and mounted without loss of zero.
Features	Single- or two-staged trigger, can be fitted with various optics

Heckler and Koch PSG-1

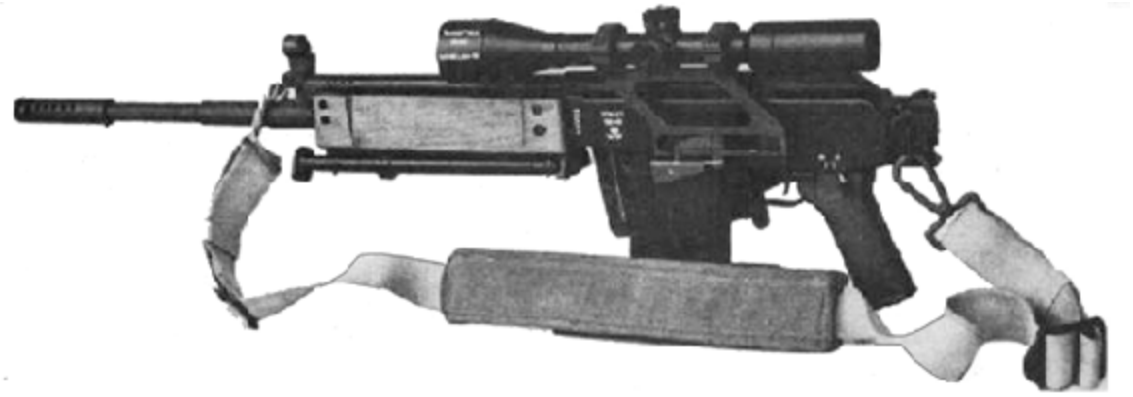


The Heckler and Koch PSG-1 is popular in some special operations units and antiterrorist units. However, when used for sniping, it exhibits two flaws. First, it ejects the shells about 10 meters; this can give away a position and complicates the sniper's efforts to police brass (to prevent leaving a target identifier). Second, it can be fitted with the Hensoldt 6x42 sight only; this sight is designed for use out to 600 meters (the optimal engagement range for military snipers is from 600 to 700 meters).

System of operation	Semiautomatic
Caliber	7.62- x 51-millimeter NATO
Overall length	47.5 inches
Barrel length	25.6 inches
Rifling	Polygonal, 1/12-inch right-hand twist
Weight	17.8 pounds
Magazine	5- and 20-round detachable magazine
Sighting systems	6- x 42-millimeter Hensoldt with illuminated reticle, BDC (100 to 600 meters)
Ammunition	Lapua 7.62- x 51-millimeter NATO match; 185-grain FMJBT D46/D47 at 2,493 feet per second

Table H-1. Foreign sniper weapon systems (continued).

ISRAEL
Galil Sniper Rifle



The Israelis copied the basic design, operational characteristics, and configuration of the Soviet AK-47 assault rifle to develop an improved weapon to meet the demands of the Israeli Army. The Galil sniping rifle is a further evolution of this basic design. When firing FN match ammunition, the weapon has a muzzle velocity of 2,672 feet per second; when firing M118 SB ammunition, it has a muzzle velocity of 2,557 feet per second.

System of operation	Semiautomatic
Caliber	7.62- x 51-millimeter NATO
Overall length	43.9 inches
Barrel length	20 inches
Rifling	4-groove, 1/12-inch right-hand twist
Weight	18.3 pounds
Magazine	5- or 20-round detachable magazine

Sighting systems	6- x 40-millimeter Nimrod (BDC: 100 to 1,000 meters); fixed metallic sights, front—hooded post with tritium night sight, rear—aperture with flip-up tritium night sight
Ammunition	FN match ammunition; M118 SB ammunition (173-grain FMJBT at 2,610 feet per second)
Features	Heavier barrel fitted with a flash suppressor, can be equipped with a silencer and fired with subsonic ammunition, pistol-grip-style stock, fully adjustable cheekpiece, rubber recoil pad, two-stage trigger, adjustable bipod mounted to the rear of the fore-end of the rifle
M21 Sniper Rifle  The specifications on the M21 can be found in the US section of this table.	

Table H-1. Foreign sniper weapon systems (continued).

ITALY

Beretta M501 Sniper Rifle



The design of the Beretta M501 sniper rifle was based the Beretta sporting rifle, and was intended for military and police use. Manufacturing began in 1985 and is now discontinued; the rifle is replaced in service with Italian army with Accuracy International Arctic Warfare Magnum rifles.

System of operation	Manual, bolt-action
Caliber	7.62- x51-millimeter NATO
Overall length	45.9 inches
Barrel length	23 inches (586 millimeters)
Rifling	4-groove right-hand twist
Weight	15.8 pounds (with a bipod), 13.75 pounds (without a bipod)
Magazine	5-round detachable box magazine

Barrel Length	23 inches (586 millimeters)
Sighting systems	Zeiss-Diavari ZA 1.5–6x variable telescope; fully adjustable iron sights, front—hooded, rear—V-notch
Features	Harmonic balancer; flash hider; bipod; wooden thumbhole-type stock with adjustable cheekpiece and rubber recoil pad; heavy, free-floating barrel; NATO-standard telescope mount that allows almost any electro-optical or optical sight to be mounted to the weapon

CHINA

Norinco Type 79



The Norinco Type 79 is a virtual copy of the Soviet Dragunov SVD. In many instances, these rifles are nothing more than refinished and restamped Soviet Dragunov SVDs that were once sold to the People's Republic of China. They have been imported into the US under the designation of NDM-86. The specifications can be found under the Soviet Dragunov SVD in this table.

ROMANIA

Romanak Model FPK



Romanian designers based the Romanak Model FPK on the Soviet Dragunov SVD.

System of operation	Semiautomatic
Caliber	7.62- x 54-millimeter rimmed
Overall length	45.4 inches
Barrel length	26.7 inches
Weight	10.6 pounds
Magazine	10-round detachable box magazine
Sighting systems	LSP (Romanian copy of the Soviet PSO-1) (BDC: 100 to 1,000 meters with 1,100-, 1,200-, and 1,300-meter reference points); front—hooded post, rear—sliding U-shaped notch

Ammunition	Mosin/Nagant M1891 cartridge
Features	Skeleton stock from laminated wood, molded cheek rest, two steel reinforcing plates to the rear of the receiver (to help absorb the increased recoil forces of the more powerful M1891 cartridge), muzzle brake, telescopic sight with English language markings, lengthened RPK-type gas piston system, altered bolt face to take the larger-rimmed base of the M1891 cartridge NOTE: The standard AKM wire cutter bayonet will attach to this sniper rifle.

Table H-1. Foreign sniper weapon systems (continued).

SWITZERLAND
Sig Sauer SSG 3000 

Made in Switzerland, the SSG 3000 is a extremely well made rifle. The manufacturer has made a few modifications to the rifle and now imports the SSG 3000 into the US.	
Caliber	7.62- x 51-millimeter (.308 Winchester)
Overall Length	46.46 inches (1180 millimeters)
Barrel Length	24 inches (610 millimeters)
Rifling	4-groove, 1/12-inch twist
Weight	Without scope: 11.9 pounds (5.4 kilograms); with scope: 13.6 pounds (6.2 kilograms)
Magazine	5-round magazine
Sighting systems	Hendsoldt 1.5-6-x42-millimeter
Features	Modular design, ventilated stock of laminated wood, rail under the forearm to take accessories, standard scope rings so that scopes can be switched out
Sig Sauer SSG 550	



Made in Switzerland, the SG 550 is one of the few 5.56-millimeter sniper rifles out there. Developed from the SG 550 assault rifle, accuracy is improved by the addition of a sensitive double-pull trigger and a heavy barrel.

Caliber	5.56- x 45-millimeter (.223)
Operation	Semiautomatic, gas-operated
Overall Length	With stock extended: 44.5 inches (1130 millimeters); With stock folded: 35.7 inches (905 millimeters)
Barrel Length	25.6 inches (650 millimeters)
Rifling	6-groove, 1/10-inch twist
Weight	Without scope: 11.9 pounds (5.4 kilograms); with scope: 13.6 lbs (6.2 kilograms)
Magazine	20- or 30-round box

Sighting systems	Hendsoldt 1.5-6- x 42-millimeter
Features	Sensitive double-pull trigger, heavy barrel, bipod, fully adjustable stock

Table H-1. Foreign sniper weapon systems (continued).

UNITED KINGDOM	
Lee-Enfield No. 4 Mark 1 (T)  The Lee-Enfield No. 4 Mark 1 (T) is obsolete but still found in use around the world. These rifles started as standard No.4 Mark 1s that were handpicked for their above average accuracy. They were then shipped to Holland and Holland, where they were restocked, scope mounts added, and a scope fitted to the rifle. While the rifle was not very accurate by today's standards (the requirement was a 3-inch group at 100 yards), rifles get more accurate at greater distances (3 MOA at 100 meters will drop to 1.5 MOA at 600 meters).	
System of operation	Bolt-action

Caliber	303 British
Overall length	44.5 inches
Barrel length	25.19 inches
Rifling	5 grooves, left-hand twist
Weight	Without scope: 9.13 pounds, with scope: 11.63 pounds
Magazine	10-round detachable magazine
Sighting systems	No. 32, 3x (BDC: 100 to 1,000 yards); front— blade with protecting ears, rear—vertical leaf with aperture battlesight or L-type
Ammunition	.303 ball with a muzzle velocity of 2,440 feet per second

Lee-Enfield L42A1



The L42A1 is the current standard sniper rifle. It is a conversion of the Lee-Enfield No. 4 Mark 1 (T) .303. The original No. 32 markings are usually still visible, cancelled out, and painted over.

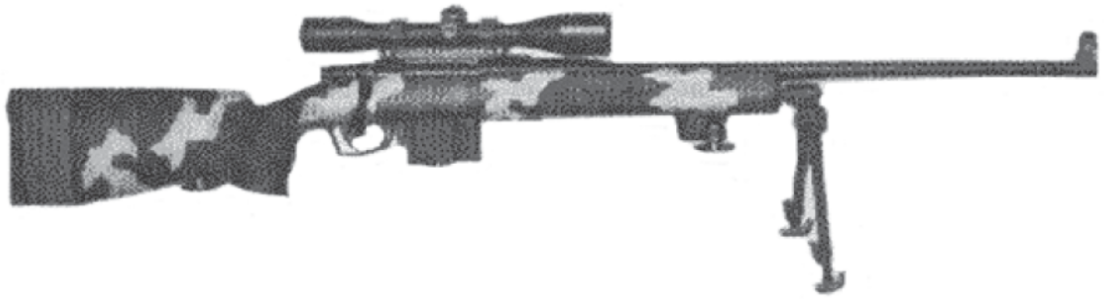
System of operation	Bolt-action
Caliber	7.62- x 51-mm NATO
Overall length	46.5 inches
Barrel length	27.5 inches
Rifling	4-groove, 1/12-inch right-hand twist
Weight	12.5 pounds
Magazine	10-round detachable magazine
Telescope	3x L1A1 (scope is marked with a part number [O.S. 2429 G.A.]), BDC: 0 to 1,000 meters); front—blade with protecting ears, rear—leaf-type aperture
Ammunition	NATO ball, 147-/150-grain FMJBT at 2,800 feet per second
Features	Heavy barrel with the fore-end cut back, screw-on wooden cheek piece (as was used with the No. 4 Mark 1 (T)), new range graduations (meters instead of yards), receiver from No. 4 Mark 1 (T) or Mark 1* (T), telescope bracket on the left side of the receiver

Table H-1. Foreign sniper weapon systems (continued).

UNITED KINGDOM (CONTINUED)	
Parker-Hale Model 82  The Parker-Hale Model 82 is a militarized version of the Model 1200 TX target rifle.	
System of operation	Mauser 98 bolt-action
Caliber	7.62- x 51-mm NATO
Overall length	48 inches
Barrel length	26.0 inches
Weight	12.8 pounds
Magazine	4-round internal magazine

Sighting systems	Pecar V2S 4–10x variable telescope; metallic target sights, front—detachable hooded post, rear— detachable aperture
Ammunition	7.62- x 51-mm NATO ball (147-/150-grain FMJBT at 2,800 feet per second)
Features	Optional, adjustable bipod

Parker-Hale Model 85



The Parker-Hale Model 85 sniper rifle is a bolt-action 7.62- x 51-mm rifle designed for extended use under adverse conditions.

System of operation	Bolt-action
Caliber	7.62- x 51-mm NATO
Overall length	47.5 inches
Barrel length	24.8 inches

Rifling	4-groove, 1/12-inch right-hand twist
Weight	12.5 pounds
Magazine	10-round detachable magazine
Sighting systems	Swarovski ZFM 6- x 42-millimeter (BDC: 100 to 800 meters) or ZFM 10- x 42-millimeter (BDC: 100 to 1,000 meters); front—protected blade, rear—folding aperture (graduated from 100 to 900 meters)
Ammunition	NATO ball, 147-/150-grain FMJBT at 2,800 feet per second
Features	McMillan fiberglass stock that is adjustable for length of pull, telescope mounted on a QD mount that can be removed in emergencies to reveal a flip-up rear aperture

Table H-1. Foreign sniper weapon systems (continued).

UNITED KINGDOM (CONTINUED)
Accuracy International Model PM/L96A1 

The Accuracy International Model PM/L96A1 sniper rifle is built using a unique bedding system designed by Malcolm Cooper. The reported accuracy of this weapon is 0.75 MOA at 1,000 meters.	
System of operation	Bolt-action
Caliber	7.62- x 51-mm NATO, .243 Winchester, 7-millimeter Remington Magnum, 300 Winchester Magnum
Overall length	47.0 inches
Barrel length	26 inches
Rifling	1/12-inch right-hand twist
Weight	15 pounds
Magazine	10-round detachable magazine
Sighting systems	6- x 42-millimeter or 12- x 42-millimeter Schmidt and Bender; front—none, rear—none The rifle is equipped with metallic sights that can deliver accurate fire out to 700 meters and can use the L1A1 telescope.

Features	An aluminum frame; a high-impact plastic, thumbhole-type stock; a free-floating barrel; a lightweight-alloy, fully adjustable bipod; a spring-loaded, fully adjustable monopod concealed in the butt
RUSSIA	
Dragunov Snayperskaya Vintovka Dragunova (SVD)  The Dragunov SVD is not a true sniper rifle in today's terms, but it performs exceptionally well for what it was designed for, a weapon to extend the range of the average rifle squad. It can be expected to shoot 2 MOA with quality ammunition.	
System of operation	Semiautomatic
Caliber	7.62- x 54-millimeter rimmed
Overall length	47.9 inches
Barrel length	24.5 inches
Rifling	4 grooves, 1/10-inch right-hand twist

Weight	9.7 pounds
Magazine	10-round detachable magazine
Sighting systems	4x PSO-1 (BDC: 0 to 1,300 meters); front—hooded post, rear—tangent with notch
Ammunition	LPS ball (149-grain FMJBT at 2,800 feet per second)

Table H-1. Foreign sniper weapon systems (continued).

FORMER YUGOSLAVIA	
Model M76  The Yugoslav armed forces use the M76 semiautomatic sniping rifle. It is believed to be based upon the FAZ family of automatic weapons.	
System of operation	Semiautomatic

Caliber	7.92 x 57 mm (8-mm Mauser), 7.62- x 54-mm R, 7.62- x 51-mm NATO
Overall length	44.7 inches
Barrel length	21.6 inches
Weight	11.2 pounds
Magazine capacity	10-round detachable
Sighting systems	4-power telescope (BDC: 100 to 1,000 meters, graduated in 100-meter increments); permanently affixed metallic sights, front—hooded post, rear—tangent
Ammunition	7.92- x 57-millimeter (2,361 feet per second), 7.62- x 51-millimeter NATO (2,657 feet per second)
Features	Pistol-grip-style wood stock, optical sight mount allows the mounting of passive night sights

Table H-2. United States sniper weapon systems.

UNITED STATES
US Army M21 Sniper System



In September 1968, the Army Materiel Command was directed to produce 1,800 national match M-14s for immediate shipment to Vietnam. From 1968 until 1975, several NM M-14 variants with different telescopes were shipped to Vietnam for use.

System of operation	Semiautomatic
Caliber	7.62- x 51-millimeter NATO
Overall length	44.3 inches
Barrel length	22 inches
Rifling	4-groove, 1/12-inch right-hand twist
Weight	14.4 pounds

Magazine	20-round detachable magazine
Sighting systems	Auto-ranging telescope (ART) I or ART II (BDC: 300 to 900 meters) or M3A Ultra; national match iron sights, front—protected post, rear—hooded aperture
Ammunition	M118 match or SB (173-grain FMJBT at 2,610 feet per second)
Features	Epoxy-impregnated walnut or birch stock, elevation and windage adjustments provide 1/2 MOA corrections, scope mount on the side of the receiver with a large knurled knob, two points of attachment with an additional knob threaded into a modified clip guide

Table H-2. United States sniper weapon systems (continued).

UNITED STATES (CONTINUED)
US Marine Corps M40A1 

The M40A1 is an outstanding system, very capable of extreme levels of accuracy. Many sources list 800 meters as the maximum effective range, but the USMC lists it as 1000 yards (915 meters).	
System of operation	Bolt-action, manually operated, air-cooled
Caliber	7.62- x 51-millimeter NATO (.308 Winchester)
Length	43.97 inches (1117 millimeters)
Weight	14.45 pounds (6.57 kilograms)
Barrel Length	24 inches (610 millimeters)
Rifling	6-groove, 1/12-inch right-hand twist
Magazine	5-round capacity
Sight	Unertl 10x with mil-dots and BDC
Ammunition	M118 (2550 feet per second, accuracy of 1 MOA), M118LR (2580 feet per second, accuracy of about .5 MOA)
Features	3- to 5-pound trigger weight, McMillan fiberglass A1 stock with epoxy filler, 50000 psi chamber pressure

US Marine Corps M40A3



The Marine Corps has upgraded the M40A1, replacing it with a new and improved M40A3. Each rifle is hand-built by precision weapons repairmen at Weapons Training Battalion in Quantico, Virginia. The M40A3 was tested in 1996 and was finally issued as an official Marine Corps weapon in 2000. During the rifle testing, surveys showed shooters enjoyed greater accuracy and increased comfort. Further, this weapon is designed to shoot beyond 1,000 yards (915 meters).

System of operation	Bolt-action, manually operated, air-cooled
Caliber	7.62- x 51-millimeter NATO (.308 Winchester)
Length	44.25 inches (1124 millimeters)
Weight	16.5 pounds (7.5 kilograms)
Barrel Length	24 inches (610 millimeters)
Magazine	5-round capacity

Sight	Unertl 10x with mil-dots and BDC (enables snipers to see up to 800 meters); AN/PVS-10 night scope (enables snipers to see up to 600 meters)
Ammunition	M118LR
Features	Adjustable cheek piece and recoil pad on the buttstock, giving the shooter the chance to position the weapon more comfortably; the rail system, allowing snipers to change out a fixed 10-power scope for an AN/PVS-10 night scope; fiberglass stock (McMillan Tactical A4) with a stainless-steel barrel (Schneider Match Grade SS #7), a steel floor plate, and trigger guard assembly; six quick- detach sling swivel mounts; removable, swivel bipod; 3- to 5-pound trigger weight

Table H-2. United States sniper weapon systems (continued).

UNITED STATES, OBSOLETE
M1903A4 Springfield  The M1903A4 Springfield was adopted in December 1942 as a sniper rifle during WW II. The only modification to the standard service rifle was the addition of a pistol grip and optical sight. There are a few 1903s that were

meticulously assembled with selected parts for sniper use, but as a general rule, the majorities were standard service rifles.	
System of operation	Bolt-action
Caliber	.30 M1/M2 ball (7.62 x 63 mm/30-06)
Overall length	43.5 inches
Barrel length	24 inches
Rifling	4-groove and 2-groove, 1/10-inch right-hand twist
Weight	9.4 pounds
Magazine	5-round internal magazine
Sighting systems	2.2x M84, M73B1 Weaver (Model 330C), or the M73 Lyman Alaska (BDC: 0 to 900 yards)
Ammunition	Caliber .30 M1/M2 ball (150 FMJ flat base at 2,800 feet per second)
Garand M1C And M1D	



M1C Cal. .30-06 Sniper Rifle with M84 Telescope



M1D Cal. .30-06 Sniper Rifle with M84 Telescope

The M1 was the first self-loading rifle that withstood battlefield use. The M1C and M1D were developed for designated marksman use. Like the M1903A4, nothing was done to the majority of the rifles to accurized them. Eventually, hand- assembled M1Ds and M1Cs were made and used.

System of operation	Semiautomatic
Caliber	.30 Caliber M1/M2 ball (7.62 x 63 mm/30-06)
Overall length	43.6 inches
Barrel length	24 inches
Rifling	4-groove, 1/10-inch right-hand twist
Weight	11.8 pounds
Magazine	8-round en-bloc metallic clip

Sighting systems	M84 2.2x telescope (BDC: 0 to 900 yards); front—protected post, rear—aperture
Ammunition	M1/M2 ball (150-grain FMJ flat base bullet at 2,800 feet per second)
Features	Specially fabricated leather extension (affixed to the left side of the stock to provide a solid stock weld, to accommodate the side-mounted telescope, and to enable the sniper to rest his cheek when firing left-eyed), designed to be fired left-eyed, prong-flash hider M1C: side mount on the left side of the receiver (tapped into directly instead of using a collar around the barrel) M1D: steel collar around the barrel in front of the receiver (tapped for side-mounted scope mount because the weapon loads through the top of the receiver)

Appendix I: Critical Task List

These tasks can be found on the DTMS website.

Task	071-028-0001 Maintain an M24 Sniper Weapon System (SWS).
Conditions	Given an unloaded M24 Sniper Weapon System (SWS), internal magazine, cleaning kit, and cleaner, lubricant and preservative (CLP).
Standards	Unload and clear the M24 Sniper Weapon System (SWS) in the prescribed sequence prior to disassembly. The weapon must be pointed in a safe direction at all times to prevent any incidents. Disassemble the M24 SWS and magazine in the prescribe sequence. Clean the M24 SWS and magazine to ensure there is no carbon residue in the barrel or bolt and the weapon and magazine has a coat of lubricate and assemble the M24 SWS and magazine.
Task	071-028-0002 Perform a Function Check on the M24 Sniper Weapon System.

Conditions	Given an M24 Sniper Weapon System (SWS) that you must confirm is operable.
Standards	Perform a function check and ensure that the M24 Sniper Weapon System (SWS) operates properly with the selector switch in each position.
Task	071-028-0003 Load an M24 Sniper Weapon System.
Conditions	Given an unloaded M24 Sniper Weapon System (SWS), internal magazine, and 5 rounds of 7.62mm ammunition.
Standards	Correctly load the internal magazine of the M24 Sniper Weapon System (SWS) with ammunition; ensure the safety lever is in the safe position.
Task	071-028-0004 Unload an M24 Sniper Weapon System.
Conditions	Given a loaded M24 Sniper Weapon System (SWS), internal magazine, and 7.62mm ammunition.
Standards	Correctly unload the internal magazine of the M24 Sniper Weapon System (SWS); ensure the safety lever is in the safe position.
Task	071-028-0005

	Correct Malfunctions of an M24 Sniper Weapon System.
Conditions	Given a loaded M24 Sniper Weapon System (SWS), internal magazine, and 7.62mm ammunition.
Standards	Perform immediate action to eliminate stoppage of the M24 Sniper Weapon System (SWS) so that firing is resumed.
Task	071-028-0006 Mount the Day Optic Sight to an M24 Sniper Weapon System.
Conditions	Given an unloaded M24 Sniper Weapon System (SWS) and day optic sight.
Standards	Attach and secure the day optic sight to the M24 Sniper Weapon System (SWS).
Task	071-028-0007 Zero an M24 Sniper Weapon System (SWS).
Conditions	Given an M24 Sniper Weapon System, internal magazine, day optic sight, and 18 rounds of 7.62mm ammunition.
Standards	Zero the M24 Sniper Weapon System to within 1 MOA with iron sights and the day optic sight within: Day optic - 18 rounds of ammunition.

Task	071-028-0008 Zero an M24 Sniper Weapon System (SWS) with an AN/PVS-10.
Conditions	Given an M24 Sniper Weapon System with a mounted AN/PVS-10 sniper night sight, internal magazine, and 18 rounds of 7.62mm ammunition.
Standards	Zero the M24 Sniper Weapon System with the AN/PVS-10 within 18 rounds of ammunition.
Task	071-028-0009 Engage Targets with a Sniper Weapon System.
Conditions	Given a loaded Sniper Weapon System (M24, M110, M107) with magazine, ammunition, individual combat equipment, and stationary or moving targets (personnel or equipment) at engageable ranges.
Standards	Detect stationary or moving targets in assigned sector, compute and make necessary rifle adjustments and achieve a score of 70% or better. NOTE: First round hit counts as 10 points and a second round hit counts as 5 points.
Task	071-028-0010 Maintain an M110 Semi-Automatic Sniper System (SASS).

Conditions	Given an unloaded M110 Semi-Automatic Sniper System (SASS), magazine, cleaning kit, and cleaner, lubricant and preservative (CLP).
Standards	Unload and clear the M110 Semi-Automatic Sniper System (SASS) in the prescribed sequence prior to disassembly. The weapon must be pointed in a safe direction at all times to prevent any incidents. Disassemble the M110 SASS and magazine in the prescribe sequence. Clean the M110 SASS and magazine to ensure there is no carbon residue in the barrel or bolt and the weapon and magazine has a coat of lubricate and assemble the M110 SASS and magazine.
Task	071-028-0011 Perform a Function Check on the M110 Semi-Automatic Sniper System.
Conditions	Given an M110 Semi-Automatic Sniper System (SASS) that you must confirm is operable.
Standards	Perform a function check and ensure that the M110 Semi-Automatic Sniper System (SASS) operates properly with the selector switch in each position.
Task	071-028-0012 Load an M110 Semi-Automatic Sniper System.
Conditions	Given an unloaded M110 Semi-Automatic Sniper System (SASS), 20 round magazine, and 20 rounds of

	7.62mm ammunition.
Standards	Correctly load the magazine and ammunition into the M110 Semi-Automatic Sniper System (SASS); ensure the safety lever is in the safe position.
Task	071-028-0013 Unload an M110 Semi-Automatic Sniper System.
Conditions	Given a loaded M110 Semi-Automatic Sniper System (SASS), magazine, and 7.62mm ammunition.
Standards	Correctly unload the magazine and ammunition from the M110 Semi-Automatic Sniper System (SASS); ensure the safety lever is in the safe position.
Task	071-028-0014 Correct malfunctions of an M110 Semi-Automatic Sniper System.
Conditions	Given a loaded M110 Semi-Automatic Sniper System (SASS), magazine, and 7.62mm ammunition.
Standards	Perform immediate/remedial action to eliminate stoppage of the M110 Semi-Automatic Sniper System (SASS) so that firing is resumed.
Task	071-028-0015

	Mount the Day Optic Sight to an M110 Semi-Automatic Sniper System.
Conditions	Given an unloaded M110 Semi-Automatic Sniper System (SASS) and day optic sight.
Standards	Attach and secure the day optic sight to the M110 Semi-Automatic Sniper System (SASS).
Task	071-028-0016 Zero an M110 Semi-Automatic Sniper System.
Conditions	Given an M110 Semi-Automatic Sniper System (SASS), day optic sight (DOS 3.5 x 10), magazine, and 30 rounds of 7.62mm ammunition.
Standards	Zero the M110 Semi-Automatic Sniper System to within 1 MOA with iron sights and the day optic sight within: Iron sights - 12 rounds of ammunition Day optic - 18 rounds of ammunition
Task	071-028-0017 Maintain the M107 Long-Range Sniper Rifle.
Conditions	Given an M107 Long-Range Sniper Rifle (LRSR), magazine, cleaning kit, 5/32 inch torque screw key, phillips head screwdriver, flat tip screwdriver, 5/32 inch punch, 1/8 inch punch, 1/16 inch punch, 1/4 inch punch, hammer, 1/8 inch

	hex wrench, inch pound torque wrench, socket wrench, 11/16 inch socket, trigger pull tester, and TM 9-1005-239-10.
Standards	Clear the M107 Long-Range Sniper Rifle (LRSR) in the prescribed sequence prior to disassembly. The weapon must be pointed in a safe direction at all times to prevent any incidents. Disassemble the M107 LRSR in the prescribe sequence. Clean the M107 LRSR and ensure there is no carbon residue in the barrel or bolt and the rifle has a coat of lubricate and assemble the M107 LRSR. Disassemble and reassemble the magazine.
Task	071-028-0018 Perform a Function Check on the M107 Long-Range Sniper Rifle.
Conditions	Given an M107 Long-Range Sniper Rifle (LRSR) that you must confirm is operable.
Standards	Perform a function check and ensure that the M107 Long-Range Sniper Rifle (LRSR) operates properly with the selector switch in each position.
Task	071-028-0019 Load an M107 Long-Range Sniper Rifle.
Conditions	Given an unloaded M107 Long-Range Sniper Rifle (LRSR), magazine, and 8 rounds of .50 caliber ammunition.

Standards	Correctly load the magazine and ammunition into the M107 Long-Range Sniper Rifle (LRSR); ensure the safety lever is in the safe position.
Task	071-028-0020 Unload an M107 Long-Range Sniper Rifle.
Conditions	Given a loaded M107 Long-Range Sniper Rifle (LRSR), magazine, and .50 caliber ammunition.
Standards	Correctly unload the magazine and ammunition from the M107 Long-Range Sniper Rifle (LRSR); ensure the safety lever is in the safe position.
Task	071-028-0021 Correct Malfunctions of an M107 Long-Range Sniper Rifle.
Conditions	Given a loaded M107 Long-Range Sniper Rifle (LRSR), magazine, and .50 caliber ammunition.
Standards	Perform immediate/remedial action to eliminate stoppage of the M107 Long-Range Sniper Rifle (LRSR) so that firing is resumed.
Task	071-028-0022 Zero an M107 Long-Range Sniper Rifle.

Conditions	Given an M107 Long-Range Sniper Rifle (LRSR), day optic, magazine, and 19 rounds of .50 caliber ammunition.
Standards	Zero the M107 Long-Range Sniper Rifle with iron sights and the day optic sight within: Iron sights - 12 rounds of ammunition Day optic - 7 rounds of ammunition
Task	071-028-0030 Perform Preventive Maintenance Checks and Services (PMCS) for the AN/PVS-6 Mini Eyesafe Laser infrared Observation Set (MELIOS).
Conditions	Given an AN/PVS-6 Mini Eyesafe Laser Infrared Observation Set (MELIOS) and TM 11-5860-202-10.
Standards	The Soldier will perform Preventive Maintenance Checks and Services (PMCS) for the AN/PVS-6 Mini Eyesafe Laser Infrared Observation Set (MELIOS) in accordance with TM 11-5860-202-10.
Task	071-028-0031 Prepare the AN/PVS-6 Mini Eyesafe Laser Infrared Observation Set (MELIOS) for Operation.

Conditions	Given an AN/PVS-6 Mini Eyesafe Laser Infrared Observation Set (MELIOS).
Standards	Prepare the AN/PVS-6 Mini Eyesafe Laser Infrared Observation Set (MELIOS) for operation.
Task	071-028-0032 Perform an Operational Test on the AN/PVS-6 Mini Eyesafe Laser Infrared Observation Set (MELIOS).
Conditions	Given an AN/PVS-6 Mini Eyesafe Laser Infrared Observation Set (MELIOS).
Standards	Perform an operational test on the AN/PVS-6 Mini Eyesafe Laser Infrared Observation Set (MELIOS).
Task	071-028-0033 Perform Borelight Verification Procedures on the AN/PVS-6 Mini Eyesafe Laser Infrared Observation Set (MELIOS).
Conditions	Given an AN/PVS-6 Mini Eyesafe Laser Infrared Observation Set (MELIOS).
Standards	Perform Borelight Verification Procedures on the AN/PVS-6 Mini Eyesafe Laser Infrared Observation Set (MELIOS).

Task	071-028-0034 Perform Compass/Vertical Angle Measurement (C/VAM) Zero Procedures for the AN/PVS-6 Mini Eyesafe Laser Infrared Observation Set (MELIOS).
Conditions	Given an AN/PVS-6 Mini Eyesafe Laser Infrared Observation Set (MELIOS).
Standards	Perform Compass/Vertical Angle Measurement (C/VAM) Zero Procedures for the AN/PVS-6 Mini Eyesafe Laser Infrared Observation Set (MELIOS).
Task	071-028-0035 Perform Handheld Ranging Operations on the AN/PVS-6 Mini Eyesafe Laser Infrared Observation Set (MELIOS).
Conditions	Given an AN/PVS-6 Mini Eyesafe Laser Infrared Observation Set (MELIOS).
Standards	Perform Handheld Ranging Operations on the AN/PVS-6 Mini Eyesafe Laser Infrared Observation Set (MELIOS) in accordance with TM 11-5860-202-10.
Task	071-028-0036

	Perform Shutdown Procedures on the AN/PVS-6 Mini Eyesafe Laser Infrared Observation Set (MELIOS).
Conditions	Given an AN/PVS-6 Mini Eyesafe Laser Infrared Observation Set (MELIOS).
Standards	Perform Shutdown Procedures on the AN/PVS-6 Mini Eyesafe Laser Infrared Observation Set (MELIOS) in accordance with TM 11-5860-202-10.
Task	071-028-0037 Perform Preventive Maintenance Checks and Services (PMCS) for the AN/PVS-10 Sniper Night Set.
Conditions	Given an AN/PVS-10 Sniper Night Sight (SNS) and TM 11-5855-303-12&P.
Standards	The Soldier will perform Preventive Maintenance Checks and Services (PMCS) for the AN/PVS-10 Sniper Night Sight (SNS) in accordance with TM 11-5855-303-12&P.
Task	071-028-0038 Prepare the AN/PVS-10 Sniper Night Set for Operation.
Conditions	Given an unloaded M24 Sniper Weapon System (SWS) and AN/PVS-10 Sniper Night Sight (SNS).

Standards	Prepare the AN/PVS-10 Sniper Night Sight (SNS) for operation.
Task	071-028-0039 Mount the AN/PVS-10 Sniper Night Sight to an M24 Sniper Weapon System.
Conditions	Given an unloaded M24 Sniper Weapon System (SWS) and AN/PVS-10 Sniper Night Sight (SNS).
Standards	Attach and secure the AN/PVS-10 Sniper Night Sight (SNS) to the M24 Sniper Weapon System (SWS).
Task	071-028-0040 Dismount the AN/PVS-10 Sniper Night Sight from an M24 Sniper Weapon System.
Conditions	Given an unloaded M24 Sniper Weapon System (SWS) with a mounted AN/PVS-10 Sniper Night Sight (SNS) and carrying case with basic issue items. The tube is OFF and the batteries have been removed.
Standards	Remove the AN/PVS-10 Sniper Night Sight (SNS) from the M24 Sniper Weapon System (SWS) without damage to the equipment, and stow the AN/PVS-10 correctly in the carrying case.
Task	071-028-0041

	Perform Preventive Maintenance Checks and Services (PMCS) for the AN/PAS-13B Thermal Weapon Sight (TWS).
Conditions	Given an AN/PAS-13B(V)2 or 3 Thermal Weapon Sight (TWS) and TM 11-5855-312-10.
Standards	The Soldier will perform Preventive Maintenance Checks and Services (PMCS) for the AN/PAS-13B(V)2 or 3 Thermal Weapon Sight (TWS) in accordance with TM 11-5855-312-10.
Task	071-028-0042 Prepare the AN/PAS-13B Thermal Weapon Sight (TWS) for Operation.
Conditions	Given an unloaded M24 Sniper Weapon System (SWS) and AN/PAS-13B Thermal Weapon Sight (TWS).
Standards	Prepare the AN/PAS-13B Thermal Weapon Sight (TWS) for operation.
Task	071-028-0043 Mount the AN/PAS-13B Thermal Weapon Sight (TWS) to an M24 Sniper Weapon System.
Conditions	Given an unloaded M24 Sniper Weapon System (SWS) and AN/PAS-13B(V)2 or 3 Thermal Weapon Sight

	(TWS).
Standards	Attach and secure the AN/PAS-13B Thermal Weapon Sight (TWS) to the M24 Sniper Weapon System (SWS).
Task	071-028-0044 Dismount the AN/PAS-13B Thermal Weapon Sight (TWS) from the M24 Sniper Weapon System.
Conditions	Given an unloaded M24 Sniper Weapon System (SWS) and AN/PAS-13B(V)2 or 3 Thermal Weapon Sight (TWS).
Standards	Remove and secure the AN/PAS-13B Thermal Weapon Sight (TWS) to the M24 Sniper Weapon System (SWS).
Task	071-028-0045 Zero the M24 Sniper Weapon System (SWS) with the AN/PAS-13B Thermal Weapon Sight (TWS).
Conditions	Given an M24 Sniper Weapon System (SWS), 7.62mm ammunition, and AN/PAS-13B Thermal Weapon Sight (TWS).

Standards	Zero the M24 Sniper Weapon System (SWS) with the AN/PAS-13B Thermal Weapon Sight (TWS).
Task	071-028-0046 Perform Preventive Maintenance Checks and Services (PMCS) for the AN/PVS-22 Universal Night Sight.
Conditions	Given an AN/PVS-22 Universal Night Sight and the manufacturer's manual.
Standards	The Soldier will perform Preventive Maintenance Checks and Services (PMCS) for the AN/PVS-22 Universal Night Sight in accordance with the manufacturer's manual.
Task	071-028-0047 Prepare the AN/PVS-22 Universal Night Sight for Operation.
Conditions	Given an unloaded Sniper Weapon System (SWS) and AN/PVS-22 Universal Night Sight (UNS).
Standards	Prepare the AN/PVS-22 Universal Night Sight for operation.
Task	071-028-0048 Mount the AN/PVS-22 Universal Night Sight to a Sniper Weapon System.

Conditions	Given an Sniper Weapon System (SWS), AN/PVS-22 Universal Night Sight, two batteries, one 3/32 hex head, and one 1/8 hex head wrench.
Standards	Correctly mount the AN/PVS-22 Universal Night Sight to the Sniper Weapon System tightly, ensuring that the secondary latch is engaged and the sight's front lens is not making contact with the flip-up iron sight.
Task	071-028-0049 Dismount the AN/PVS-22 Universal Night Sight from a Sniper Weapon System.
Conditions	Given a Sniper Weapon System (SWS) with an AN/PVS-22 Universal Night Sight mounted, one 3/32 hex head and one 1/8 hex head wrench.
Standards	Dismount the AN/PVS-22 Universal Night Sight from the Sniper Weapon System (SWS) without damage to the equipment, and stow the AN/PVS-22 correctly in the carrying case.
Task	071-028-0050 Perform Preventive Maintenance Checks and Services (PMCS) for the AN/PVS-26 Sight, Night Vision Scope.
Conditions	Given an AN/PVS-26 Sight, Night Vision Sniper Scope and manufacturer's manual.

Standards	The Soldier will perform Preventive Maintenance Checks and Services (PMCS) for the AN/PVS-26 Sight, Night Vision Sniper Scope in accordance with the manufacturer's manual.
Task	071-028-0051 Prepare the AN/PVS-26 Sight, Night Vision Scope for Operation.
Conditions	Given an unloaded Sniper Weapon System (SWS) and AN/PVS-26 Sight, Night Vision Sniper Scope.
Standards	Prepare the AN/PVS-26 Sight, Night Vision Sniper Scope for operation.
Task	071-028-0052 Mount the AN/PVS-26 Sight, Night Vision Scope to a Sniper Weapon System.
Conditions	Given an Sniper Weapon System (SWS), AN/PVS-26 Sight, Night Vision Sniper Scope, two batteries, one 3/32 hex head, and one 1/8 hex head wrench.
Standards	Correctly mount the AN/PVS-26 Sight, Night Vision Sniper Scope to the Sniper Weapon System tightly, ensuring that the secondary latch is engaged and the sight's front lens is not making contact with the flip-up iron sight.

Task	071-028-0053 Dismount the AN/PVS-26 Sight, Night Vision Scope from a Sniper Weapon System.
Conditions	Given a Sniper Weapon System (SWS) with an AN/PVS-26 Sight, Night Vision Sniper Scope mounted, one 3/32 hex head and one 1/8 hex head wrench.
Standards	Dismount the AN/PVS-26 Sight, Night Vision Sniper Scope from the Sniper Weapon System (SWS) without damage to the equipment, and stow the AN/PVS-26 correctly in the carrying case.
Task	071-028-0060 Detect Targets Based on Target Indicators.
Conditions	Given standard observation consisting of binoculars and spotting scope and an observable area of responsibility to observe.
Standards	Detect all enemy personnel and/or equipment, to include signs of previous site occupation and/or activities by enemy forces, using the four target indicators of olfactory, tactile, visual, and auditory.
Task	071-028-0061 Produce a Panoramic Sketch.

Conditions	In a field environment with a sector that allows visibility from 0-300 meters in depth, and 0-400 meters in width, given binoculars and a spotting Scope, clip board, pencil, straight edge, and grade sheet.
Standards	Prepare a Panoramic Field Sketch of an assigned sector within a 30 minute time period. The prepared sketch must be drawn from the snipers perspective and include; detail shading, marginal data, and TVST (comments pertaining to the following areas; terrain, vegetation, structures, tactical importance). Reasonable accuracy must be shown when depicting manmade and natural objects including additional objects that are located within your sector. The items must be labeled in standardized format including item, size, shape, color, condition, and ATB (what the item appears to be).
Task	071-028-0062 Construct a Ghillie Suit.
Conditions	Given a basic uniform, netting, natural and artificial camouflage material and other accessories (canvas, jute, shoe goo, flat paint of various colors, green, brown, tan, etc.).
Standards	Construct a Ghillie suit that blends in with the operational environment and denies the enemy the ability to detect you through casual observation from a minimum of 200 meters.
Task	071-028-0063 Construct Sniping Hides.

Conditions	Given an operational area, and the appropriate tools and equipment (e-tool, shovels, pick ax, hand saw, hand drill, hammer, black out cloth, PVC piping, tubular nylon, 550 parachute cord, brick, sand bags, etc.).
Standards	Construct a sniper hide that is conducive to the operational requirements, that blends in with the operational environment, and denies the enemy the ability to detect your position through casual observation from a minimum of 200 meters, while affording you protection from direct and/or indirect hostile fire.
Task	071-028-0064 Employ Stealth Movement Techniques (Stalking).
Conditions	Given a target area, a target, standard sniper equipment (drag bag, tripod, bipod, sand sock, pruning shears, hand saw, map, compass, laser rangefinder, binoculars, camouflage stick, gloves, veil, GPS, etc.), and an M110 Semi-Automatic Sniper System (SASS) or M24 Sniper Weapon System (SWS).
Standards	Move throughout the operational area using stealth techniques without being detected by the enemy.
Task	071-028-0065 Maintain a Sniper Data book.
Conditions	Given a Sniper Data book.

Standards	The student will record the marginal information, enemy activity using the keyword SALUTE, and details of the terrain using the keyword OAKOC in the Sniper Data book.
Task	071-028-0066 Provide Observation Data to a Sniper.
Conditions	While performing the duties as a sniper spotter/observer, given an area of responsibility to observe and spotter scope.
Standards	The student will, using only necessary dialogue and reference points, direct sniper onto targets, provide the sniper with the correct windage and elevation adjustments to ensure a first round engagement.

Glossary

ACRONYMS AND ABBREVIATIONS

AAR after-action review

ACOG advanced combat optical gunsight

ACU Army combat uniform

AM amplitude modulation

AO area of operation

AP antipersonnel, armor-piercing

API armor-piercing incendiary

API-T armor-piercing incendiary, tracer

ARNG Army National Guard

ARNGUS Army National Guard of the United States

ASI-B4 additional skill identifer - sniper

ASIP advanced system improvement program

AT antitank

BDA battle damage assessment

BDC bullet drop compensator

BDU battle dress uniform

BLISS blend, low silhouette, irregular shape, small, secluded location

BMNT begin morning nautical twilight

BRASS breath, relax, aim, slack, and squeeze

BUIS backup iron sight

CAS close air support

CBRN chemical, biological, radiological, and nuclear

CLP cleaner, lubricant, preservative

cm centimeter

COA course of action

CRM composite risk management

CS ortho-cholorobenzalmalomonitril (irritant agent or tear gas)

DCU desert combat uniform

DOS day optic sight

DTG date-time group

DZ drop zone

E&E escape and evasion

ECM electronic countermeasures

EDRE emergency deployment readiness exercise

EENT end evening nautical twilight

EOD explosive ordnance disposal

FDC fire direction center

FEBA forward edge of the battle area

FFL final firing line

FFP final firing position

FLIR forward-looking infrared (radar)

FLOT forward line of troops

FM field manual / frequency modulation

FMJBT full-metal jacket ballistic tip

FO forward observer

FPF final protective fire

fps feet per second

FRAGO fragmentary order

FRIES Fast Rope Insertion/Extraction System

FSK frequency shift keying

FTX field training exercise

gal gallon

GP general purpose

GPS global positioning system

GSAK ghillie suit accessory kit

HBCT heavy brigade combat team

HC hexacholorethane-zinc (burning type white smoke compound)

HE high-explosive

HF high frequency

HHC headquarters and headquarters company

HMMWV high mobility multipurpose wheeled vehicle

HPBT hollow point ballistic tip

HPW high performance waveform

HTWS heavy thermal weapon sight

IBA inteceptor body armor

IBCT infantry brigade combat team

IED improvised explosive device

IR infrared

IRP initial rally point

JEM Joint Tactical Radio System enhanced multiband inter-/intra-team radio

KACTIS-D knowledge, advise, coordinate, training, issue, supervise, debrief

KD known distance

kg kilogram

KIM keep in memory

LCM landing crafts medium

LED light-emitting diode

LFU laser filter unit

LIF light interference filter

LMTS Laser Marksmanship Training System

LOGCAP Logistics Civil Augmentation Program

LR long-range

LRSR long-range sniper rifle

LSA lubricant, small arms

LSAT lubricant, small arms (with Teflon)

LZ landing zone

m meter

MASINT measurement and signature intelligence

MDMP military decision-making process

MELIOS mini eyesafe laser infrared observation set

METL mision-essential task list

METT-TC mission, enemy, terrain and weather, troops and support available, time available, civil considerations

MHz megahertz

MILES multiple integrated laser engagement system

MIL-SPEC military specification

MIL-STD military standard

mm millimeter

MOA minute of angle

MOPP mission-oriented protective posture

MRE meal ready to eat

MSR main supply route

MTOE modified table of organization and equipment

NATO North Atlantic Treaty Organization

NCO noncommissioned officer

NCOIC noncommissioned officer in charge

NOD night observation device

NSN national stock number

NVD night vision device

NVG night vision goggles

NVIS near-vertical incidence skywave

O-T observer to target

OIC officer in charge

OP observation post

OPORD operation order

ORP objective rally point

PACE primary, alternate, contingency, and emergency

PIR priority intelligence report

PMCS preventative maintenance checks and services

psi pounds per square inch

PZ pickup zone

QD quick-detach

ROE rules of engagement

RSTA reconnaissance, surveillance, and target acquistion

S2 intelligence staff officer

S3 operations staff officer

SALUTE size, activity, location, unit, time, and equipment

SASS Semiautomatic Sniper System

SAW squad automatic weapon

SB special ball

SBCT Stryker brigade combat team

SBF support by fire

SDM squad designated marksman

SEO sniper employment officer

SINCGARS single-channel ground-to-air radio system

SIR specific information requirements

SITREP situation report

SLAP saboted light armor penetrator

SLAP-T saboted light armor penetrator, tracer

SNS sniper night scope

SOP standing operation procedure

SOR special occurrence report

SPIES Special Patrol Insertion/Extraction System

SSG Steyr Scharfschutzen Gewehr (foreign weapon system)

STANAG standardizatrion agreement

SVD Snayperskaya Vintovka Dragunova (foreign weapon system)

SWS Sniper Weapon System

TACSAT tactical satellite

TFFP tentative final firing position

TIS tactical intervention specialist

TM technical manual

TMR tactical milling reticle

TOC tactical operations center

TRADOC Training and Doctrine Command

TRP target reference point

TSFO Tactical Simulations Forward Observer

TVST terrain, vegetation, structures, tactical importance

TWS thermal weapon sight

UNS universal night sight

USACRC United States Army Combat Readiness Center

USAIS United States Army Infantry School

USAR United States Army Reserve

USASS United States Army Sniper School

UXO unexploded ordnance

VHF very high frequency

WFF warfighting functions

XO executive officer

TERMS

aiming A marksmanship fundamental, refers to the precise alignment of the rifle sights with the target

ballistics A science that deals with the motion and flight characteristics of projectiles

breath control The third marksmanship fundamental, refers to the control of breathing to help keep the rifle steady during firing

bullet drop How far the bullet drops from the line of departure to the point of impact

clock method The method of calling shots by referring to the figures on an ordinary clock dial assumed to have the target as its center, also used as a method of determining the strength and direction of wind

convergence lines The lines which appear to converge on a single point (the vanishing point)

counterpoise A conductor or system of conductors used as a substitute for a ground in an antenna system

crack and thump A method to determine the general direction and distance to an enemy firer who is shooting at you

cradle A vise-like mechanism that holds a weapon in a secured position during test firing

dipole A radio antenna consisting of two horizontal rods in line with each other with their ends slightly separated

elevation adjustment Rotating the front sightpost to cause the bullet to strike higher or lower on the target

external ballistics What happens to the bullet between the time it leaves the rifle and the time it arrives at the target

eye relief The distance from the firing eye to the rear sight, a function of stock weld

fleeting target A moving target that remains within observing or firing distance for such a short period that it affords little time for deliberate adjustment and fire against it

gun bore line A reference line established by the linear extension of the bore axis of a gun

half-wave antenna An antenna with an electrical length is half the wavelength of the transmitted or recieved frequency

horizon line Also known as the horizon, is always considered to be at eye level

horizontal dispersion The left-to-right displacement of bullets on a target

insulator A device or material that has a high electrical resistance

internal ballistics What happens to the bullet before it leaves the muzzle of the rifle

lead Distance ahead of a moving target that a rifle must be aimed to hit the target

line of departure The line defined by the bore of the rifle or the path the bullet would take without gravity

line of sight A line between the rifle and the aiming point, extending from the firing eye through the center of the rear aperture, across the tip of the front sightpost, and onto the target

midrange trajectory/maximum ordinate The highest point the bullet reaches on its way to the target; must be known to engage a target that requires firing underneath an overhead obstacle

MILES Multiple Integrated Laser Engagement System, a tactical shooting device that uses a low-powered laser to activate detectors placed on individuals and vehicles

minute of angle An angle that would cover 1 inch at a distance of 100 yards, 2 inches at 200 yards, and so on; each click of sight adjustment is equal to one minute of angle

muzzle velocity The speed of the bullet as it leaves the rifle barrel, measured in feet per second

optical sight A sight with lenses, prisms, or mirrors used in lieu of iron sights

point of aim The exact spot on a target the rifle sights are aligned with

point of impact The point that a bullet strikes, usually considered in relation to point of aim

probability of hit The odds of a given round hitting the target at a given range, ranges from 0 to 1.0

quarter-wave antenna An antenna with an electrical length that is equal to one-quarter wavelength of the signal being transmitted or recieved

retained velocity The speed of the bullet when it reaches the target

rifle cant Any leaning of the rifle to the left or right from a vertical position during firing

shot group A number of shots fired using the same aiming point

sight alignment Placing the center tip of the front sightpost in the exact center of the rear aperature

single sideband A system of radio communications in which the carrier and either the upper or lower sideband is removed from AM transmission to reduce the channel width and improve the signal-to-noise ratio

steady position The first marksmanship fundamental, refers to the establishment of a position that allows the weapon to be held still while it is being fired

stock weld The contact of the cheek with the the stock of the weapon

terminal ballistics What happens to the bullet when it comes in contact with the target

time of flight The amount of time it takes for the bullet to reach the target from the time the round exits the rifle

tracking Engaging moving targets where the lead is established and maintained; moving with the target as the trigger is squeezed

trajectory The flight path the bullet takes from the rifle to the target

trigger squeeze The fourth marksmanship fundamental; squeezing the trigger so that the movement of firing is a surprise, the lay of the weapon is not disturbed, and a large target hit can be expected

unidirectional In one direction only

vanishing point Point where all convergence lines meet, located on the horizon line

wind value The effect the wind will have on the trajectory of the bullet

windage adjustment Moving the rear sight aperture to cause the bullet to strike left or right on the target

References

SOURCES USED

These sources were used to prepare this publication.

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These documents must be available to the intended users of this publication.

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AR 600-9, The Army Weight Control Program. 27 November 2006. DA Pam 350-38, Standards in Training Commission. 13 May 2009. FM 3-05.70, Survival. 17 May 2002.

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FM 7-92, The Infantry Reconnaissance Platoon and Squad (Airborne, Air Assault, Light Infantry). 23 December 1992.

FM 20-3, Camouflage, Concealment, and Decoys. 30 August 1999. FM 27-10, The Law of Land Warfare. 18 July 1956.

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TM 9-1005-306-10, Operator's Manual for 7.62 mm M24 Sniper Weapon System (SWS) (NSN 1005-01-240-2136). 23 June 1989.

TM 9-1005-342-10, Operator's Manual for M110 Semi-Automatic Sniper System (SASS) 7.62mm (NSN 1005-01-534-2841). 31 October 2007.

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AN/PSQ-23 (NSN 5855-01-535-1905). 30 January 2007.

TM 11-5820-890-10-1, Operator's Manual for SINCGARS Ground Combat Net Radio, ICOM Manpack Radio AN/PRC-119A (NSN 5820-01-267-9482) (EIC: L22), Short Range Vehicular Radio AN/VRC-87A, Short Range Vehicular Radio With Single Radio Mount AN/VRC-87C (5820-01-

304-2045) (EIC: GDC), Short Range Vehicular Radio With Dismount AN/VRC-88A, Short Range Vehicular Radio With Dismount and Single Radio Mount AN/VRC-88C, Short Range/Long Range Vehicular Radio AN/VRC-89A, Long Range Vehicular Radio AN/VRC-90A, Short Range/Long Range Vehicular Radio With Dismount AN/VRC-91A (5820-01-267-9478) (EIC: L26), Long Range/Long Range Vehicular Radio AN/VRC-92A (5820-01-267-9477) (EIC: L27). 01 September 1992.

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TM 11-5855-301-12&P, Operator's and Unit Maintenance Manual (Including Repair Parts and Special Tools List) for Light, Aiming, Infrared AN/PAQ-4B (NSN 5855-01-361-1362), AN/PAQ-4C (5855-01-398-4315). 15 May 2000.

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TM 11-5855-306-10, Operator's Manual for Monocular Night Vision Device (MNVD) AN/PVS-14 (NSN 5855-01-432-0524) (EIC: IPX). 15 May 2007.

TM 11-5855-308-12&P, Operator's and Unit Maintenance Manual (Including Repair Parts and Special Tools List), Target Pointer Illuminator/Aiming Light AN/PEQ-2A (NSN 5855-01-447-8992). 15 May 2000.

TM 11-5855-312-10, Operator's Manual Sight, Thermal AN/PAS-13B(V)2 (NSN 5855-01-464-3152); AN/PAS-13B(V)3 (5855-01-464-3151). 15 February 2005.

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TM 11-5860-202-10, Operator's Manual for Mini Eyesafe Laser Infrared Observation Set (MELIOS) AN/PVS-6 (NSN 5860-01-350-8551). 01 September 1995.

ARMY FORMS

DA Forms are available on the APD website (www.apd.army.mil).

DA Form 2028, Recommended Changes to Publications and Blank Forms

DA Form 7566, Composite Risk Management Worksheet

DA Form 7636-R, Sniper Target Data Sheet—Moving Target

DA Form 7637-R, Sniper's Range Card

DA Form 7638-R, Military Sketch—Panoramic and Topographic Views

DA Form 7639-R, Sniper's Observation Log

DA Form 7640-R, Concealed Movement Exercise Scorecard

DA Form 7641-R, Target Detection Exercise Scorecard

DA Form 7642-R, Range Estimation Exercise Scorecard

DA Form 7643-R, Sniper Firing Table I, Stationary Unknown Distance Targets—M24—Day [Mil-Dot Reticle Scope and AN/PVS-10]

DA Form 7644-R, Sniper Firing Table II, Stationary and Moving Known Distance Targets— M24—Day [Mil-Dot Reticle Scope and AN/PVS-10]

DA Form 7645-R, Sniper Firing Table III, Stationary and Moving Known Distance Targets— M24—Limited Visibility [AN/PVS-10]

DA Form 7646-R, Sniper Firing Table IV, Stationary and Moving Unknown Distance Targets—M107—Day

DA Form 7651-R, Sniper Target Data Sheet—Stationary Target

DA Form 7668-R, Sniper Qualification Firing Table V, Stationary Unknown Distance Targets [Using Elevation and Windage Holdoff]—M110—Day [DOS with the TMR]

DA Form 7669-R, Sniper Qualification Firing Table VI, Stationary and Moving Known Distance Targets—M110—Day [DOS with the TMR and AN/PVS-26]

DA Form 7670-R, Sniper Firing Table VII, Stationary and Moving Known Distance Targets—M110—Limited Visibility [AN/PVS-26]

RECOMMENDED READINGS

These readings contain relevant supplemental information.

FM 3-05.210, Special Forces Air Operations. 27 February 2009.

FM 3-05.212, Special Forces Waterborne Operations. 31 August 2004.

FM 3-06.11, Combined Arms Operations in Urban Terrain. 28 February 2002. FM 3-07, Stability Operations. 06 October 2008.

FM 3-09.12, Tactics, Techniques, and Procedures for Field Artillery Target Acquisition. 21 June 2002.

FM 3-21.75, The Warrior Ethos and Soldier Combat Skills. 28 January 2008. FM 3-22.9, Rifle Marksmanship, M16-/M4-Series Weapons. 12

August 2008. FM 3-97.6, Mountain Operations. 28 November 2000.

FM 4-02.4, Medical Platoon Leader's Handbook Tactics, Techniques, and Procedures. 24 August 2001.

FM 4-25.11, First Aid. 23 December 2002.

FM 6-02.72, Tactical Radios Multiservice Communications Procedures for Tactical Radios in a Joint Environment. 14 June 2002.

FM 6-99.2, US Army Report and Message Formats. 30 April 2007. FM 90-3, Desert Operations. 24 August 1993.

FM 90-4, Air Assault Operations. 16 March 1987. FM 90-5, Jungle Operations. 16 August 1982.

TC 2-33.4 (FM 34-3), Intelligence Analysis. 1 July 2009.

BLANK FORMS

SNIPER TARGET DATA SHEET
MOVING TARGET

For use of this form, see FM 3-22.10; the proponent agency is TRADOC.

Distance to target _____ **YARDS/METERS**

Note: Draw in targets needed.

RANGE	DATE	TIME	RIFLE/SCOPE NO.	AMMO	TEMP	HUMID	LIGHT	MIRAGE

WIND	WIND	LIGHT
	_____ MPH	
DIRECTION	VELOCITY	DIRECTION

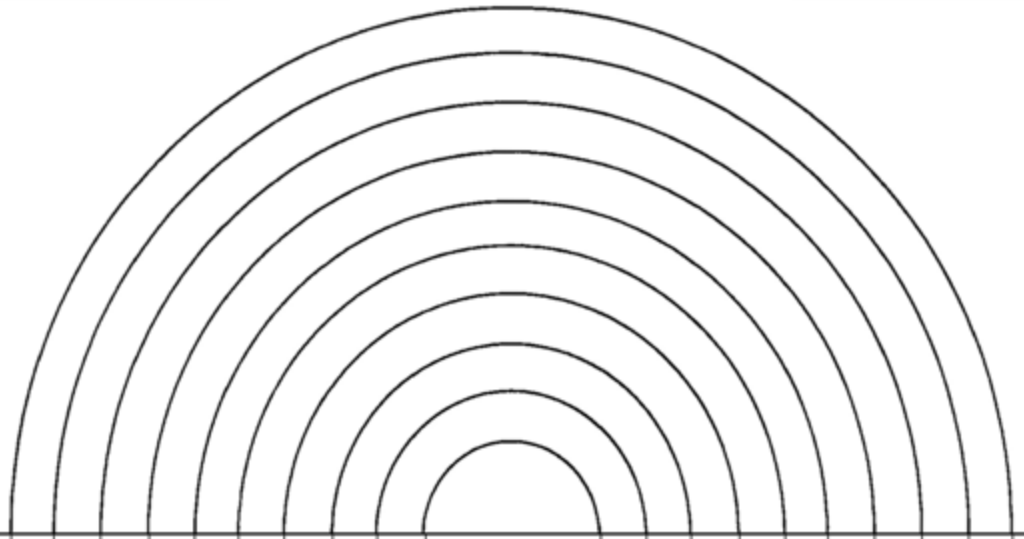
	1	3	5	7	9	
ELEV						
WIND						CORRECT LEAD
LEAD						
MILS						
DIR						
	2	4	6	8	10	
ELEV						
WIND						CORRECT LEAD
LEAD						
MILS						
DIR						

REMARKS

SNIPER'S RANGE CARD

For use of this form, see FM 3-22.10; the proponent agency is TRADOC.

POSITION IDENTIFICATION	METHOD OF OBTAINING RANGE



RANGE																				RANGE
ELEVATION																				ELEVATION
WINDAGE																				WINDAGE

TEMP		WIND		TRP 1		TRP 2		TRP 3	
HIGH	LOW	VELOCITY	DIRECTIONS	AZIMUTH	DISTANCE	AZIMUTH	DISTANCE	AZIMUTH	DISTANCE
				DESCRIPTION		DESCRIPTION		DESCRIPTION	

MILITARY SKETCH
PANORAMIC AND TOPOGRAPHIC VIEWS

For use of this form, see FM 3-22.10; the proponent agency is TRADOC.

REMARKS	PANORAMIC VIEW	REMARKS

SKETCH NAME		MAGNETIC AZIMUTH	SKETCH NO. OF	NAME	
GRID COORD		=		RANK	
WEATHER			SCALE ::	DATE/TIME	

REMARKS	TOPOGRAPHIC VIEW	REMARKS

SKETCH NAME		MAGNETIC AZIMUTH	SKETCH NO. OF	NAME	
GRID COORD		=		RANK	
WEATHER			SCALE ::	DATE/TIME	

SNIPER'S OBSERVATION LOG For use of this form, see FM 3-22.10; the proponent agency is TRADOC.	SHEET ____ OF ____ SHEETS

ORIGINATOR'S NAME	DATE *(YYYYMMDD)*	LOCATION

SERIAL	TIME	GRID COORD	EVENT	ACTIONS OR REMARKS

CONCEALED MOVEMENT EXERCISE SCORECARD

For use of this form, see FM 3-22.10; the proponent agency is TRADOC.

EXERCISE NUMBER			
SNIPER'S NAME	**TRAINING SITE**	**SCORE**	**DATE** *(YYYYMMDD)*
UNIT	**WEATHER/VISIBILITY**	**OBSERVER'S NAME**	

SCORING CHART

If the sniper--	GRADER ADJUSTS RUNNING TOTAL	RUNNING TOTAL
Fires first round undetected	ADD 3 POINTS	
Avoids detection when the walker is within 5 feet	ADD 3 POINTS	
Properly identifies the number or letter within 30 seconds	ADD 4 POINTS	
Sets windage properly	ADD 3 POINTS	
Sets elevation properly	ADD 1 POINT	
Achieves proper support	ADD 1 POINT	
Keeps muzzle unobstructed	ADD 1 POINT	
Exfiltrates undetected to ORP (with all equipment and brass) within the 3 hour time limit	ADD 6 POINTS	
Avoids detection when the walker is within 5 feet	SUBTRACT 2 POINTS	

TARGET INDICATORS *(CHECK ONE)* :

- ☐ SOUND
- ☐ OUTLINE
- ☐ MUZZLE BLAST / FLASH
- ☐ CONTRAST TO BACKGROUND
- ☐ IMPROPER CAMOUFLAGE / SHINE
- ☐ IMPROPER MOVEMENT TECHNIQUES

INSTRUCTIOR OBSERVATION SKETCH

NOTES:

a. All snipers start this exercise with 0 points and must score at least 14 points to pass.

b. If the sniper moves after you call a freeze (to prevent detection), terminate the exercise and give the sniper 0 points.

c. Sniper School only: Drop any sniper school student from the course if he violates the honor code.

d. If the sniper fails to remain within established boundaries, to engage the target within the 3 hour time limit, or to avoid detection during movement, he earns 0 points for this exercise.

e. Explain to the sniper in detail why and how he was detected.

TRAINER'S INITIALS	DATE *(YYYYMMDD)*	SNIPER'S INITIALS	DATE *(YYYYMMDD)*

TARGET DETECTION EXERCISE SCORECARD

For use of this form, see FM 3-22.10; the proponent agency is TRADOC.

SNIPER'S NAME

SKETCH NAME

SKETCH NO. ____ OF ____

EXERCISE NUMBER

GRID COORD



= MAGNETIC AZIMUTH

BLOCK SCALE

TARGET AREA

WIDTH: _____ **DEPTH:** _____

WEATHER

DATE *(YYYYMMDD)*

TIME

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	
1																		1
2																		2
3																		3
4																		4
5																		5
6																		6
7																		7
8																		8
9																		9
0																		0

NO.	SIZE	SHAPE	COLOR	CONDITION	APPEARS TO BE	GRID BOX LOCATION	SIDE
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							

RANGE ESTIMATION EXERCISE SCORECARD

For use of this form, see FM 3-22.10; the proponent agency is TRADOC.

EXERCISE NUMBER _____

NAME	RANK	DATE *(YYYYMMDD)*

UNIT	WEATHER/VISIBILITY	LOCATION	SCORE

SCORING CHART

EYE ESTIMATION ± 15%	
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

BINOCULAR ESTIMATION ± 10%	
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

MIL-DOT RETICLE SCOPE ESTIMATION ± 5%	
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

NOTES

a. Within 3 minutes, using the naked eye, binoculars, and the mil-dot reticle scope, the sniper estimates (in the order listed) the range to the target at each point.

b. Once the sniper records the estimated range to the target, he cannot change it. If he estimates wrong, he is scored as such. He may only change the mil-dot reticle scope estimate before his next set of estimates are recorded.

c. The trainer(s) encourages students to use calculators.

d. Snipers must remember that this is an individual exercise. Any sniper who talks, or who tries to look at another sniper's scorecard, is automatically terminated from the exercise.

e. The trainer(s) answers any questions.

TRAINER'S INITIALS	DATE *(YYYYMMDD)*	SNIPER'S INITIALS	DATE *(YYYYMMDD)*

SNIPER FIRING TABLE I
STATIONARY UNKNOWN DISTANCE TARGETS
M24--DAY
(MIL-DOT RETICLE SCOPE AND AN/PVS-10)

For use of this form, see FM 3-22.10; the proponent agency is TRADOC.

EXERCISE NUMBER *(CHECK ONE)* **QUAL 1** ☐ **QUAL 2** ☐ **RETRAIN** ☐ **QUAL 3** ☐

SNIPER NAME	**LANE**	**DATE** *(YYYYMMDD)*
SPOTTER NAME	**UNIT**	**WEATHER/VISIBILITY**

SCORING CHART

The trainer records the first or second round hits in the appropriate column. Then, he totals each column.

TARGET [a]		**FIRST ROUND HITS**	**SECOND ROUND HITS**	**MISSES**
ID	**RANGE (M)**			
TOTAL HITS				

RATING CALCULATOR

	☐	FIRST ROUND HITS X 10
+	☐	SECOND ROUND HITS X 5
=	☐	**TOTAL POINTS**

RATING SCALE

70 TO 100 TOTAL POINTS = PASS ☐

0 TO 65 TOTAL POINTS = FAIL ☐

LEGEND

a. Trainer records the target ID number or letter and the range to the target.

b. Sniper School only: Sniper initials below to acknowledge that -

- o He has received mentoring on performance.
- o He has been given the opportunity to choose a new spotter.

TRAINER'S INITIALS	**DATE** *(YYYYMMDD)*	**SNIPER'S INITIALS** [b]	**DATE** *(YYYYMMDD)*

SNIPER FIRING TABLE II
STATIONARY AND MOVING KNOWN DISTANCE TARGETS
M24--DAY
(MIL-DOT RETICLE SCOPE AND AN/PVS-10)

For use of this form, see FM 3-22.10; the proponent agency is TRADOC.

EXERCISE NUMBER *(CHECK ONE)*	QUAL 1 ☐	QUAL 2 ☐	RETRAIN ☐	QUAL 3 ☐

SNIPER NAME	LANE	DATE *(YYYYMMDD)*
SPOTTER NAME	**UNIT**	**WEATHER/VISIBILITY**

SCORING CHART

The sniper fires one round at each target presented. The trainer marks all of the sniper's hits and misses, and then totals the hits.

RANGE (M)	TYPE [a]	HITS	MISSES
300	S		
300	M		
300	M		
300	M		
300	M		
400	3		
400	M		
400	M		
400	M		
400	M		
500	S		
500	M		
500	M		
500	M		
500	M		
600	S		
600	M		
600	M		
600	M		
600	M		
	TOTAL HITS		

RATING CALCULATOR

TOTAL HITS x 5 = TOTAL POINTS:

☐

RATING SCALE

70 TO 100 TOTAL POINTS = PASS ☐

0 TO 65 TOTAL POINTS = FAIL ☐

LEGEND

a. "S" means the target is stationary; "M" means it is moving.

b. Sniper School only: Sniper initials below to acknowledge that -

- He has received mentoring on performance.
- He has been given the opportunity to choose a new spotter.

TRAINER'S INITIALS	DATE *(YYYYMMDD)*	SNIPER'S INITIALS [b]	DATE *(YYYYMMDD)*

SNIPER FIRING TABLE III
STATIONARY AND MOVING KNOWN DISTANCE TARGETS
M24--LIMITED VISIBILITY
(AN/PVS-10)

For use of this form, see FM 3-22.10; the proponent agency is TRADOC.

EXERCISE NUMBER *(CHECK ONE)* **QUAL 1** ☐ **QUAL 2** ☐ **QUAL 3** ☐

SNIPER NAME	**LANE**	**DATE** *(YYYYMMDD)*
SPOTTER NAME	**UNIT**	**WEATHER/VISIBILITY**

SCORING CHART

The sniper fires one round at each target presented. The trainer marks all of the sniper's hits and misses, and then totals the hits.

RANGE (M)	TYPE [a]	HITS	MISSES
300	S		
300	M		
300	M		
300	S		
300	M		
300	M		
300	S		
300	M		
300	M		
300	S		
400	S		
400	M		
400	M		
400	S		
400	M		
400	M		
400	S		
400	M		
400	M		
400	S		
	TOTAL HITS		

RATING CALCULATOR

TOTAL HITS x 5 = TOTAL POINTS:

☐

RATING SCALE

70 TO 100 TOTAL POINTS = PASS ☐

0 TO 65 TOTAL POINTS = FAIL ☐

LEGEND

a. "S" means the target is stationary; "M" means it is moving.

b. Sniper School only: Sniper initials below to acknowledge that -

- o He has received mentoring on performance.
- o He has been given the opportunity to choose a new spotter.

TRAINER'S INITIALS	**DATE** *(YYYYMMDD)*	**SNIPER'S INITIALS** [b]	**DATE** *(YYYYMMDD)*

SNIPER FIRING TABLE IV
STATIONARY AND MOVING UNKNOWN DISTANCE TARGETS
M107--DAY

For use of this form, see FM 3-22.10; the proponent agency is TRADOC.

EXERCISE NUMBER *(CHECK ONE)* **QUAL 1** ☐ **QUAL 2** ☐ **QUAL 3** ☐

SNIPER NAME	**LANE**	**DATE** *(YYYYMMDD)*
SPOTTER NAME	**UNIT**	**WEATHER/VISIBILITY**

SCORING CHART

The trainer records the first or second round hits in the appropriate column. Then, he totals each column.

TGT NO.	RANGE (M)	FIRST ROUND HITS	SECOND ROUND HITS	MISSES
1	325			
2	410			
3	590			
4	590			
5	680			
6	845			
7	915			
8	960			
9	1,000			
10	1,115			
11	1,290			
12	1,200			
13	1,380			
14	1,560			
15	1,600			
16	1,775			
17	1,550			
18	1,030			
19	1,000			
20	1,660			
	TOTALS			

RATING CALCULATOR

	☐	TOTAL FIRST ROUND HITS X 10
+	☐	SECOND ROUND HITS X 5
=	☐	**TOTAL POINTS**

RATING SCALE

140 TO 200 TOTAL POINTS = PASS ☐

0 TO 135 TOTAL POINTS = FAIL ☐

LEGEND

a. Sniper School only: Sniper initials this form to acknowledge that -

- o He has received mentoring on performance.
- o He has been given the opportunity to choose a new spotter.

TRAINER'S INITIALS	**DATE** *(YYYYMMDD)*	**SNIPER'S INITIALS** [a]	**DATE** *(YYYYMMDD)*

SNIPER TARGET DATA SHEET
STATIONARY TARGET

For use of this form, see FM 3-22.10; the proponent agency is TRADOC.

Distance to target _____ **YARDS/METERS**

Note: Draw in targets needed.

RANGE	DATE	TIME	RIFLE/SCOPE NO.	AMMO	TEMP	HUMID	LIGHT	MIRAGE

WIND	WIND	LIGHT	ELV/ USED	ELV/ CORRECT	WIN/ USED	WIN/ CORRECT
12 9 3 6 DIRECTION	_____ MPH VELOCITY	12 9 3 6 DIRECTION				

	1	2	3	4	5	
ELEV						
WIND						
CALL						
DIST						

	6	7	8	9	10	
ELEV						
WIND						
CALL						
DIST						

REMARKS

SNIPER QUALIFICATION FIRING TABLE V
STATIONARY UNKNOWN DISTANCE TARGETS
(USING ELEVATION AND WINDGATE HOLDOFF)
M110--DAY (DOS WITH THE TMR)

For use of this form, see FM 3-22.10; the proponent agency is TRADOC.

EXERCISE NUMBER *(CHECK ONE)*	QUAL 1 ☐	QUAL 2 ☐	RETRAIN ☐	QUAL 3 ☐

SNIPER NAME	LANE	DATE *(YYYYMMDD)*

SPOTTER NAME	UNIT	WEATHER/VISIBILITY

SCORING CHART

The sniper fires one round at each target presented. The trainer marks all of the sniper's hits and misses, and then totals each column.

RANGE (M)	TYPE[a]	HITS	MISSES
650	F		
450	F		
300	F		
500	F		
600	F		
350	L		
500	F		
450	L		
200	F		
350	L		
600	F		
400	F		
650	F		
450	F		
300	F		
450	L		
600	F		
350	L		
500	F		
450	L		
	TOTAL HITS		

RATING CALCULATOR

TOTAL HITS x 5 = TOTAL POINTS:

RATING SCALE

70 TO 100 TOTAL POINTS = PASS ☐

0 TO 65 TOTAL POINTS = FAIL ☐

LEGEND

a. "F" means the full target exposure; "L" means limited target exposure.

b. Sniper School only: Sniper initials below to acknowledge that -

- o He has received mentoring on performance.
- o He has been given the opportunity to choose a new spotter.

TRAINER'S INITIALS	DATE *(YYYYMMDD)*	SNIPER'S INITIALS [b]	DATE *(YYYYMMDD)*

SNIPER QUALIFICATION FIRING TABLE VI
STATIONARY AND MOVING KNOWN DISTANCE TARGETS
M110--DAY
(DOS with the TMR AND AN/PVS-26)

For use of this form, see FM 3-22.10; the proponent agency is TRADOC.

EXERCISE NUMBER *(CHECK ONE)*	QUAL 1 ☐	QUAL 2 ☐	RETRAIN ☐	QUAL 3 ☐
SNIPER NAME	LANE	DATE *(YYYYMMDD)*		
SPOTTER NAME	UNIT	WEATHER/VISIBILITY		

SCORING CHART

The sniper fires one round at each target presented. The trainer marks all of the sniper's hits and misses, and then totals each column.

RANGE (M)	TYPE[a]	HITS	MISSES
100	S		
100	M		
100	M		
100	M		
100	M		
200	S		
200	M		
200	M		
200	M		
200	M		
300	S		
300	M		
300	M		
300	M		
300	M		
400	S		
400	M		
400	M		
400	M		
400	M		
	TOTAL HITS		

RATING CALCULATOR

TOTAL HITS x 5 = TOTAL POINTS:

RATING SCALE

70 TO 100 TOTAL POINTS = PASS ☐

0 TO 65 TOTAL POINTS = FAIL ☐

LEGEND

a. "S" means the target is stationary; "M" means it is moving.

b. Sniper School only: Sniper initials below to acknowledge that -

- He has received mentoring on performance.
- He has been given the opportunity to choose a new spotter.

TRAINER'S INITIALS	DATE *(YYYYMMDD)*	SNIPER'S INITIALS [b]	DATE *(YYYYMMDD)*

SNIPER FIRING TABLE VII
STATIONARY AND MOVING KNOWN DISTANCE TARGETS
M110--LIMITED VISIBILITY
(AN/PVS-26)

For use of this form, see FM 3-22.10; the proponent agency is TRADOC.

EXERCISE NUMBER *(CHECK ONE)*	QUAL 1 ☐	QUAL 2 ☐	QUAL 3 ☐
SNIPER NAME	**LANE**		**DATE** *(YYYYMMDD)*
SPOTTER NAME	**UNIT**		**WEATHER/VISIBILITY**

SCORING CHART

The sniper fires one round at each target presented. The trainer marks all of the sniper's hits and misses, and then totals each column.

RANGE (M)	TYPE[a]	HITS	MISSES
300	S		
300	M		
300	M		
300	S		
300	M		
300	M		
300	S		
300	M		
300	M		
300	S		
400	S		
400	M		
400	M		
400	S		
400	M		
400	M		
400	S		
400	M		
400	M		
400	S		
	TOTAL HITS		

RATING CALCULATOR

TOTAL HITS x 5 = TOTAL POINTS:

☐

RATING SCALE

70 TO 100 TOTAL POINTS = PASS ☐

0 TO 65 TOTAL POINTS = FAIL ☐

LEGEND

a. "S" means the target is stationary; "M" means it is moving.

b. Sniper School only: Sniper initials below to acknowledge that -

- He has received mentoring on performance.
- He has been given the opportunity to choose a new spotter.

TRAINER'S INITIALS	DATE *(YYYYMMDD)*	SNIPER'S INITIALS [b]	DATE *(YYYYMMDD)*