ST 3-22.6

STRYKER BRIGADE COMBAT TEAM ANTIARMOR COMPANY AND PLATOON LEADERS' HANDBOOK

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Stryker Brigade Combat Team, Antiarmor Company, and Platoon Leaders' Handbook

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Preface

This handbook discusses the antiarmor company, including its characteristics, organization, capabilities, and all aspects of training, vehicles, personnel, and weaponry. It also discusses all aspects of training, employing, deploying, and operating the Stryker antitank guided missile vehicle (ATGMV) safely and effectively, including characteristics, capabilities and limitations, and tactics, techniques, and procedures (TTP). Furthermore, it supports the Stryker brigade combat team (SBCT) missions from the mission essential task list (METL) in ST 3-22.4. In accordance with DA Pamphlet 350-38, *Standards in Training Commission* (STRAC), this handbook also provides annual qualification standards for ATGMV gunners.

The target audience for this handbook is the SBCT antiarmor platoon leader and the Mobile Gun System (MGS) platoon leader.

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Unless this publication states otherwise, masculine nouns and pronouns may refer either to men or to women.

Some or all of the uniforms shown in this manual were drawn without camouflage to improve the clarity of the illustration.

Chapter 1

SBCT Antiarmor Company

"The most impressive thing about any army is the individual Soldier. He will always be the one responsible for taking and holding the ground in support of our foreign policy, mission, goals, and objectives. Even with sophisticated technology and advanced equipment, an army cannot fight, sustain, and win a war without individual, quality Soldiers." --*Glen E. Morrell, Sergeant Major of the Army*

This chapter introduces training for the Stryker brigade combat team (SBCT) antiarmor company (Section I), discusses the capabilities of the Stryker antitank guided missile vehicle (ATGMV, Section II), and outlines the roles of Stryker BCT antiarmor company personnel (Section III).

The antiarmor company is assuming an increasing role in modern warfare. The Stryker BCT (SBCT) antiarmor company employs long-range direct fires to destroy enemy armor and Infantry forces. The company deploys in the Stryker ATGMV and supports combat operations with the tube-launched, optically tracked, wire-guided (TOW) weapon system. The ATGMV's mobility, heavy weaponry, and Modified Improved Target Acquisition System (MITAS) make it a formidable weapon and key component of the SBCT.

Terrain analysis products developed by SBCT S-2 and maneuver support cells enable antiarmor company commanders to identify appropriate force battle positions and enemy avenues of approach. As required in stability and support operations, the antiarmor company can execute its tactical mission in small scale contingency and major theater war scenarios. Working within the framework of an SBCT mission, the antiarmor company can reduce the enemy's ability to interfere with the brigade's maneuver forces, and assist in the destruction of the enemy's ability to fight.

SECTION I. ORGANIZATION

The SBCT antiarmor company (Figure 1-1) is a highly mobile and effective combat organization. Its ability to fight as a unified company or in support of SBCT maneuver battalions as separate platoons renders it a key force in effective combined arms operations. Possessing substantial firepower and unique capabilities, each company is organized with a headquarters section (HQ) and three platoons. It fights as part of the SBCT, augmenting brigade infantry battalions at the discretion of the brigade commander. HQ sections provide command, control, and supervision to the unit's three platoons.

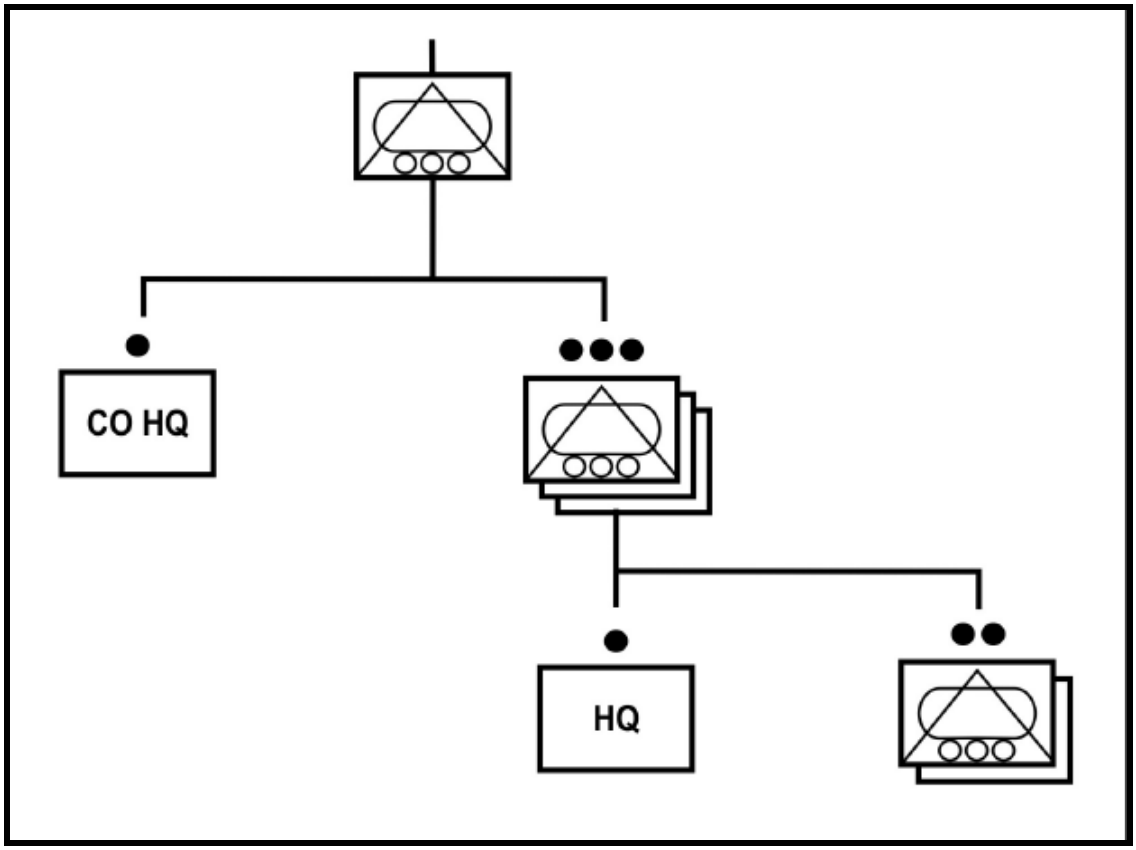


Figure 1-1. Organization of the SBCT antiarmor company.

HEADQUARTERS

1-1. The SBCT antiarmor company headquarters consists of a company commander, executive officer (XO), first sergeant (1SG), fire support officer (FSO), company medic, and nine enlisted Soldiers.

COMPANY COMMANDER

1-2. The company commander supervises HQ. With the assistance of the XO and 1SG, he positions HQ elements to best support the brigade's concept of operations. He positions himself where he can best observe the battlefield to communicate orders and guidance to subordinate leaders.

EXECUTIVE OFFICER AND FIRST SERGEANT

1-3. The XO and 1SG are the primary assistants to the company commander. The XO serves as second in command and oversees the tactical employment of the company, usually from a location the commander deems as the second most critical. In the event of the commanding officer's (CO's) absence or incapacitation, the XO is responsible for commanding the company. The 1SG is the CO's primary enlisted advisor; he performs the functions deemed critical by the commander. Among others, these functions include resupply, casualty evacuation operations, coaching, teaching, and mentoring other company noncommissioned officers (NCOs).

FIRE SUPPORT TEAM

1-4. The fire support team (FIST) includes the company FSO, the fire support noncommissioned officer (FSNCO), and a fire support specialist. The team is transported on a Stryker fire support vehicle (FSV) to

provide combat laser designation capability for delivery of precision artillery or aerial delivered munitions. The (FIST) assists the commander with planning, integration, coordination, and execution of all types of supporting fires during tactical operations. The FSO serves as the commander's primary fire support coordinator. Assisted by the FIST, the FSO provides the company commander with a direct link to all indirect fire support systems at the disposal of the SBCT.

COMPANY MEDICAL TEAM

1-5. The company medical team consists of a senior company medic and three platoon medics attached from the battalion medical platoon. The company medic advises the commander on the medical readiness of his Soldiers, and supervises the three platoon medics. He also assists the commander with planning and executing company and platoon medical training, and monitors the health and hygiene of company personnel. During tactical operations, he organizes (in conjunction with the 1SG) and coordinates casualty treatment and evacuation operations.

OTHER PERSONNEL

1-6. Other headquarters personnel consist of communications and supply noncommissioned officers. These Soldiers sustain the unit's logistics supplies and conduct resupply operations.

OTHER ASSETS

1-7. The company may be augmented during tactical operations with a medical evacuation ambulance from the brigade support medical company within the brigade special troops support battalion (BSTB, see FM 3-90.6). This team collects casualties from the antiarmor company's casualty collection point, stabilizes the casualties during transit, and delivers them to the nearest casualty collection point (CCP). The company may also receive medical evacuation support on an area basis from an adjacent maneuver element.

ANTIARMOR PLATOONS

1-8. The antiarmor company's three platoons (Figure 1-2) can defeat any heavy armor targets. Each vehicle is maintained and operated by a crew of four: vehicle commander, gunner, driver, and loader. The platoon leader and platoon sergeant serve as two of the three vehicle commanders within the platoon. Each platoon also has a combat medic.

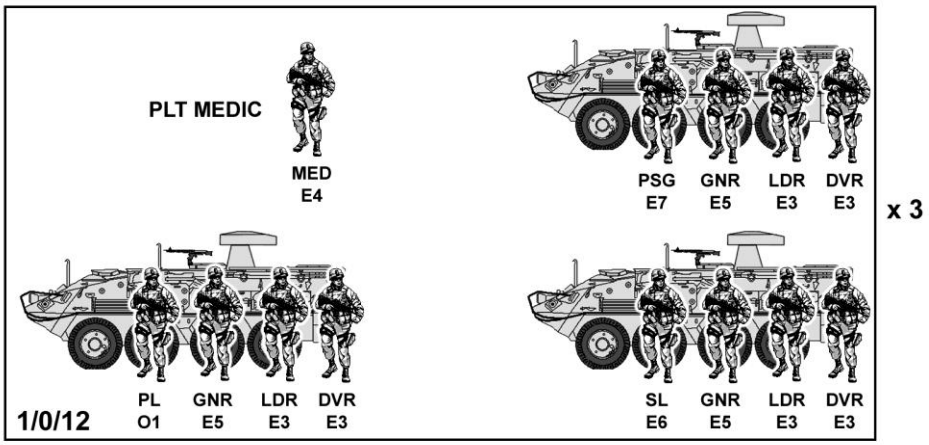


Figure 1-2. Antiarmor platoon.

SECTION II. DUTIES AND RESPONSIBILITIES

Thinking and acting are simultaneous antiarmor leader activities when engaged in battle. Leadership duties and responsibilities require expert knowledge of all techniques and procedures necessary to control operations. Also required are skills that motivate Soldiers to accomplish assigned missions. The leader visualizes the current and future states of the battlefield during an operation. He must formulate concepts of operations that allow his unit to progress from one state to the other at the least cost. To accommodate this complex and flexible role, each ATGM crewmember must receive cross training to perform his own and others' duties.

PLATOON LEADER

1-9. The platoon leader is responsible for all the platoon does or fails to do. This includes the tactical employment, collective training, administration, personnel management, and logistics of his platoon. He must know his Soldiers and how to employ them. He alone bears personal responsibility for the positioning and employment of all assigned or attached weapons. Platoon leader responsibilities include–

- Leading the platoon in support of company and brigade missions. He bases his actions on the mission assigned, the concepts of his company and brigade commanders, and his own estimate of the situation.
- Planning operations with the help of the platoon sergeant, squad leader, and other key personnel.
- Analyzing tactical situations and employing the full capabilities of his platoon's equipment to accomplish the mission.
- Managing command and control information.
- Keeping the commander informed of his actions.
- Serving as vehicle commander (VC) on one of the platoon ATGMVs, which means–
- Detecting and identifying targets.
- Issuing fire commands.
- Controlling fire and movement.
- Assisting the gunner when necessary.

PLATOON SERGEANT

1-10. The senior and most experienced NCO in the platoon; the platoon sergeant assists and advises the platoon leader. He supervises the platoon's administration, logistics, and maintenance, and leads the platoon in the platoon leader's absence. He also supervises individual training and advises the platoon leader on appointments, promotions, reductions, assignments, and Soldier discipline. His tactical expertise in platoon operations includes the maneuver of the platoon and employment of all weapons. In addition to these responsibilities, the platoon sergeant:

- Coordinates and supervises company directed platoon resupply operations.
- Collects, prepares, and forwards logistical status updates and requests to company headquarters.
- Sets up casualty collection points, coordinates and supervises medical evacuation, and sends casualty reports to higher headquarters.
- Maintains platoon strength information, and receives and orients replacements.
- Ensures ammunition and supplies are properly and evenly distributed.
- Ensures Soldiers maintain all equipment.
- Monitors the morale, discipline, and health of platoon members.
- Serves as vehicle commander (VC) on one of the platoon ATGMVs.

SECTION LEADER

1-11. The ATGM section leader is responsible for the combat readiness and tactical employment of his section. Responsibilities include the health; welfare, discipline, and training of section Soldiers. Other duties include–

- Supervising equipment maintenance.
- Keeping the platoon leader and platoon sergeant informed of events that affect the tactical situation and status of the section.
- Employing the section according to the orders of the platoon leader.
- Requesting section resupply.
- Serving as VC on one of the platoon ATGMVs.

GUNNER

1-12. The gunner observes the battlefield to detect enemy targets. He operates the TOW launcher as directed by the vehicle commander. He also maintains the M240B machine gun and serves as the M240B machine gun alternate gunner. Specific duties include–

- Verifying identification of targets before engaging.
- Determining target engagement feasibility.
- Engaging targets.
- Recognizing and eliminating firing angle limitations.
- Conducting TOW launcher operational checks.
- Preparing range cards for the TOW and M240B machine gun.
- Maintaining TOW weapon system and M240B machine gun.
- Providing assistance in navigation and communications.
- Preparing the system for loading the launcher, engaging targets, and reloading.

LOADER

1-13. The loader loads the TOW launchers in cooperation with the gunner and commander. Specific responsibilities include–

- Inspects and stows encased TOW missiles.
- Prepares missiles for loading.
- Loads the launcher.
- Helps driver maintain and camouflage the vehicle.
- In the event of a misfired missile, removes it from the launcher.
- Provides vehicle security as needed.

DRIVER

1-14. The driver maneuvers the carrier in accordance with the vehicle commander's directions. General duties include driving the carrier tactically, performing evasive maneuvers, and positioning the carrier in a firing position. Specific responsibilities include–

- Maintaining the vehicle.
- Observing sectors of fire.
- Repositioning the vehicle when required by the vehicle commander or gunner.
- Camouflaging the carrier and firing position as needed.
- Helping the loader store missiles and ammunition, and providing vehicle security as needed.

SECTION III. ANTITANK GUIDED MISSILE VEHICLE

The ATGMV is a configuration of the Infantry carrier vehicle (ICV). The hull, power pack, and suspension system are the same as those on the ICV. However, the ATGMV has an extendable mast TOW launcher system, and it carries a four-man crew. TM 9-2355-311-10-7 focuses on maintenance and operation for the ATGMV. The ATGMV is an effective mobile platform for the MITAS. The combined TOW and machine gun fire support capabilities have proven the ATGMV lethal in destroying armored vehicles and in defeating enemy infantry ambushes and assaults. The vehicle's primary mission is to provide precision, long-range fire to destroy enemy armor beyond tank gun effective range, day and night. The ATGMV's accurate launch capability and specialized arsenal of TOW missile munitions, which allow it to provide close in, lethal support for dismounted Infantry, make it a formidable tactical asset in urban environments.

CARRIER

1-15. The ATGMV can carry the MITAS plus a basic load of ten TOW missiles or combat load of twelve TOW missiles (ten in the storage racks and two in the launcher). The crew includes a vehicle commander, gunner, driver, and loader. The ATGMV has the following capabilities and features:

ELEVATED TOW SYSTEM

1-16. The elevated tow system (ETS) mounts on a motor operated mast. When and if the mast is raised or lowered depends on the mission. The system is raised for firing and lowered during extended travel or when transported on transport conveyances over land, air, or sea. The ETS has twin-tube TOW missile launchers. Each can fire the whole TOW family of missiles. The gunner operated ETS mast elevates to 21.6 inches (30 degrees) above the vehicle deck, depresses to -20 degrees, and rotates a full 360 degrees. During loading, the ETS can elevate to +40 degrees. It can rotate completely in 40 seconds, and it holds four banks of M6 smoke grenade launchers.

SKATE MOUNTED M240B MACHINE GUN

1-17. The M240B is a secondary weapon on the Stryker ATGMV. It can be fired from the vehicle skate mount or from a tripod. When mounted, the M240B can cover 240 degrees to the front of the vehicle, and elevate from -20 to +60 degrees.

Note: For the primary weapon to fire, the secondary weapon must be in the stowed position.

MODIFIED IMPROVED TARGET ACQUISITION SYSTEM

1-18. The MITAS (Chapter 3) operates remotely on a platform above a wheeled chassis. The MITAS increases the system's target detection, acquisition, recognition, and engagement ranges. It fires all versions of the TOW missile, and it can be upgraded to accommodate future missiles. The MITAS' advanced forward-looking infrared (FLIR) technology adds the highly mobile, adverse weather, day and night capability needed to destroy advanced threat armor at greater standoff ranges.

KEY MISSION ENHANCEMENT FEATURES

1-19. The MITAS' key mission enhancement features improve crew survivability by extending standoff ranges, and by enhancing performance in a dirty battlefield environment. Following are key mission enhancement features of the MITAS

- Auto-boresighting.
- Aided target tracking.
- Embedded training.
- Built-in test.
- Traversing unit improvements.

COMPONENTS

1-20. The MITAS has the following components:

Target Acquisition Subsystem

1-21. The TAS integrates direct view (day), second-generation forward-looking infrared (FLIR, night), and a laser range finder.

Fire Control Subsystem

1-22. The FCS includes processing, aided target tracker, and embedded training capabilities.

Battery Power Source

1-23. The BPS uses four rechargeable, silver zinc batteries, which are connected in series. These batteries power the MITAS when vehicle power drops below 23.5 VDC.

Modified Traversing Unit

1-24. The modified TU includes a brake to dampen TOW launch transients. It also includes switch-operated pistol grips that link with visible TAS symbology on a menu driven display.

TOW MISSILES

1-25. Six variations of the TOW missile have been fielded. The current variation is the top attack TOW 2. The capabilities of TOW missiles evolve as their firing systems evolve. Threat and mission needs have also led to changes in TOW missiles, such as increased range and bunker busting missiles. Table 2-1 lists TOW missile characteristics:

Table 2-1. TOW missile performance characteristics.

Missile	***TOW***	***ITOW***	***TOW 2***	***TWO 2A***	***TOW 2B***	***TOW 2BB***
	BGM (71A, A1)	***BGM (71C)***	***BGM (71D)***	***BGM (71E)***	***BGM (71F)***	***BGM (71H)***
Weight (out of tube)	40.7 pounds	41.9 pounds	47.2 pounds	49.9 pounds	49.8 pounds	
Weight (in tube)	54.8 pounds	56.0 pounds	61.3 pounds	64.0 pounds	63.9 pounds	
Length (out of tube)	45.8 inches	45.6 inches	46.2 inches	46.1 inches	46.2 inches	
Tube Diameter	8.6 inches	8.6 inches	8.6 inches	8.6 inches	8.6 inches	
Maximum Ranges	3,000 and 3,750 meters	3,750 meters	3,750 meters	3,750 meters	3,750 meters	3,750 meters
Warhead Size	5-inch HE	5-inch HE	6-inch HE	6-inch HE	Two 5-inch explosively formed penetrators	Two 6-inch explosively formed penetrators
Arming Distances						
Minimum	30 meters	30 meters	30 meters	30 meters	110 meters	65 meters
Best	NA	NA	NA	NA	150 meters	
Maximum	65 meters	65 meters	65 meters	65 meters	200 meters	

M240B MACHINE GUN

1-26. The M240B machine gun is a general-purpose weapon that supports antiarmor crews in offensive and defensive operations. The M240B is a fully automatic, gas operated, air-cooled, belt fed machine gun that fires from the open bolt position. Ammunition is weapon fed from a metallic split link belt. Gas expended from firing one round provides the energy for firing the next. The gun functions automatically as long as it has ammunition and the gunner holds the trigger to the rear. Belt links separate and eject from the side during firing. Empty round cases are ejected from the bottom of the gun. The M240B's standard issue spare barrel can be changed quickly. The barrel bore is chromium plated, reducing barrel wear to a minimum. See FM 3-22.68 and TM 9-1005-313-10 for more information on M240B operation.

Chapter 2

Weapons Training Strategy

To succeed in combat, the Army trains continually. It must develop and maintain combat ready units who can perform assigned tasks to specific standards. Training requirements continue even during wartime–especially in a combat zone. Training builds self-confidence, promotes teamwork and esprit de corps, and increases professionalism in Soldiers and leaders.

MISSION-ESSENTIAL TASK LIST

2-1. The heart of any effective training program is the mission essential task list (METL). The Soldier, leader, and all collective tasks support the METL. Driven by battle focus, the METL is based on the wartime mission of a training unit and is developed as it plans to fight. Doctrine established in FM 7-0 and FM 7-1 guides the process. (FM 7-0 contains doctrine that FM 7-1 applies.) The METL also assists leaders in the development and execution of training programs. Training strategy integrates the required resources that can shape the individual and collective skills needed to perform a unit's wartime mission. The overall training strategy is multifaceted incorporating supporting resources such as publications, ranges, ammunition, and training aids, devices, simulators, and simulations (TADSS). These strategies focus on developing critical Soldier and leader skills required for combat success.

INITIAL AND SUSTAINMENT TRAINING

2-2. Initial and sustainment training form the two primary components of training strategy that incorporate individual and collective skills.

Initial Training

2-3. Initial training is critical, because a task that is taught correctly and learned well is retained longer. Tasks effectively taught and learned can also be more quickly regained and sustained if an interim of nonuse occurs.

Sustainment Training

2-4. Without concurrent training, individual units can lose proficiency skills, so sustainment training should be regularly arranged. Learning decay of basic skills and turbulence caused by personnel turnover are two primary reasons for proficiency retraining.

LEARNING DECAY

2-5. Degradation of learned skills will occur when left dormant for too long a period. The level of decay depends on many factors such as difficulty and complexity of the task.

TURBULENCE

2-6. Since the loss of critical team members requires retraining to regain proficiency of collective skills, personnel changes should be examined regularly and alternate solutions should be sought.

STABILITY MANAGEMENT

2-7. The greatest problem a unit leader must contend with in developing a training plan is the cause and effect of personnel changes. Unit leaders must therefore develop a plan to reduce and control turbulence before developing and executing their training plans.

Short-Term Solutions

2-8. Some possible short-term solutions for turbulence related problems follow.

Review Key Personnel Retention

2-9. In most cases, commanders are aware of the officer status within their command and will devote the necessary time it takes to mentor subordinate replacements. Time must be spent with those who inherit responsibilities. However, commanders must rely on their subordinate leaders to alert them to personnel changes that can impact unit readiness.

Identify Key Soldier Positions

2-10. Some Soldier positions vital to the integrity of the unit include–

- Soldiers in positions of leadership.
- Soldiers who operate essential unit equipment.
- Soldiers assigned as primary operators of unit weapon systems.

Train an Alternate for Each Key Position

2-11. Cross-train personnel assigned to key positions within the unit. Example: Set up a vehicle driving course and have all Soldiers attend. Other recommendations:

- Train NCOs two levels up.
- Train Soldiers one level up.
- Set up a vehicle driving course just for squad members.
- Have alternates trained and qualified on weapon systems.

Note: Training aids can be used instead of live ammunition when training alternates.

Long-Term Solutions

2-12. Possible long-term solutions to counteract turbulence include the following:

- Plan time and required resources for cross training personnel. Experienced Soldiers are easier to train than new Soldiers are.
- Form complete teams/crews as personnel come into the unit. Match the loss dates (ETS, PCS, and DEROS) within the same team/crew. Soldiers all come in at the same time and leave around the same time forcing unit leaders to draw from other platoons until replacements come in. Therefore, there are drawbacks to this turbulence control method. Soldier promotions can also cause turbulence. Unit leaders can control this type of turbulence through cross training. Unplanned turbulence such as absences due to family emergencies or injuries can cause major problems.

PLATOON LEADER'S RESPONSIBILITY

2-13. The commander develops his training strategy after assessing the strengths and weaknesses of his unit. During this assessment, he considers how his strategy must reflect any personnel changes. Crew turbulence, which is inevitable, is the greatest problem a commander and platoon leader must contend with when developing a training plan. Commanders and platoon leaders must, therefore, understand and plan for short- and long-term solutions for reducing and controlling its effects.

TRAINING STRATEGY

2-14. The platoon leader's strategy must focus on the company METL to sustain platoon strengths and correct any weaknesses. To conduct an effective training program, the platoon leader must determine the current proficiency level of all assigned personnel.

Observing Unit Effectiveness

2-15. To check the effectiveness of a platoon training program, constant evaluation is required. Observing and accurately recording performance reveals the status, quality, and abilities of each Soldier. This also allows platoon leaders to identify Soldiers who need special assistance to reach required standards, and to recognize Soldiers who exceed these standards. Based on this evaluation, training programs can be developed and executed. The more difficult and complex the task, the harder it is to sustain the skill.

Assessments

2-16. Leader assessments must be continuous, and the program must be modified as required. Spot checks of individual performance such as interviews and evaluations of Soldiers provide valuable information as to whether the Soldier knows how to perform tasks.

Spot Checks

2-17. In addition to spot checks and direct observation of training, assessment includes a review of past training, which provides valuable information for training plan development. It also takes into consideration how training was conducted, what resources were used, and how often the platoon conducted collective training. The results are reviewed to determine platoon weaknesses, and which Soldiers need special attention.

Regular Training Events

2-18. Based on leader's evaluation, unit goals, and missions, training exercises should be identified for quarterly, semiannual, or annual events. While the unit may only qualify its Soldiers annually or semiannually, test results show that sustainment training is required at least quarterly to maintain skills.

Sustain Critical Tasks

2-19. Once a platoon leader has thoroughly assessed his training proficiency, he must structure individual and collective training strategies to sustain the commander's critical mission essential tasks. Sustainment is the key to maintaining platoon proficiency, so it must occur often enough to train newly assigned Soldiers and to minimize skill decay. ARTEP mission training plans (MTPs) and individual training plans help achieve and sustain collective and individual proficiency. Infrequent unit event training such as combat training center rotations do not sustain wartime proficiency. To accomplish its wartime mission, many of the METL tasks a unit trains to are the same as required for stability and support operations. This prepares a unit for the entire spectrum of missions it may execute.

SUSTAINMENT TRAINING AND EVALUATION

2-20. Figure 2-1 shows an example unit evaluation guide that platoon leaders can use to assess their platoon's proficiency.

- Have you clearly stated the priority of proficiency in your platoon? What is it? Do subordinates support this priority?
- Is it based on company METL?
- Have you clearly stated your intent?
- Are platoon leaders evaluating performance based on accurately recorded data and results?
- Have you clearly stated that weapons qualification or record fire is one of the commander's opportunities to assess several skills relating to readiness?
- What qualification courses will be used to evaluate your platoon's readiness?
- Have you clearly stated the purpose and intent of primary weapons instruction training?
- During individual and collective training, do Soldiers demonstrate their ability to manage allocated ammunition and to engage all targets?
- Based on your on-site observations and analysis of training and firing performance, what skills or tasks show a readiness deficiency?
- What skills need training emphasis?
- Individual emphasis?
- Leader emphasis?
- What are your performance goals?
- Who has trained or will train your trainers?
- Who are the subject matter experts in the platoon?
- Are they actually training the critical skills?
- What aids and devices are being used?
- What administrative constraints or training distracters can you overcome for your NCOs?
- At what levels of leadership are required resources controlled (time, aids, weapons, ammunition, ranges)?
- Are your NCOs doing the job they are charged with?

Figure 2-1. Example unit evaluation guide.

TRAINING CONDITIONS

2-21. Training should be conducted under realistic conditions. To develop combat skills, combat preparation must be conducted in a tactical environment with emphasis on the type of threat a crew can expect to face. When possible, tactical training should be conducted with the type of SBCT units that the antiarmor company platoon supports. The ATGMV platoon must be able to interface with every unit in the field; therefore, multiechelon training should be conducted to save time and resources.

CREW SKILLS

2-22. The vehicle commander is the principal trainer for efficient crew skills. The ATGMV has unique capabilities and training requirements. Antiarmor platoon leaders are more involved in crew training than

Infantry platoon leaders. Not only do antiarmor platoon leaders plan and oversee platoon training, each is an intricate part of the crew, and each leader trains his crew.

WEAPONS TRAINING

2-23. Preliminary weapons training should focus on the technical aspects of weapon systems, weapon operations, and elementary firing techniques. Trainers should combine group instruction with hands-on training to provide crewmen knowledge of the ATGMV characteristics, capabilities, and limitations.

TRAINING RESOURCES

2-24. General training resources should include the following:

- Training support packages.
- TMs.
- FMs.
- STPs.
- Crew drills.
- Battle drills.

FOCUS

2-25. Weapons training must use all available resources to raise and sustain the proficiency level of METL tasks. Training must consist of a continuous and progressive program that is intensified two to three months before a major scheduled event. It must be well constructed, realistic, effective, and safe. The planning starts at battalion, but the company executes the plan.

- Weapons training should focus on—
  - Orienting Soldiers to the technical aspects of the Stryker.
  - Exposing Soldiers to the most fundamental of Stryker weapons techniques.
- Integrating Stryker crews as an efficient team during device engagements, before live fire.
- Major events should focus on—
  - Orienting Soldiers in the fundamental aspects of Stryker LFXs.
  - Refining Soldier skills with live ammunition on full-scale ranges.
- Qualifying crews and squad personnel.
- Integrating Stryker crews as an efficient platoon in live fire training and qualifications.

LEVELS

2-26. A unit must achieve four levels to have a successful weapons program. Each is more difficult. Crews or platoons should advance only once they achieve proficiency at the previous level. The four levels are—

LEVEL 1: PRELIMINARY

2-27. Preliminary weapons training introduces Soldiers to Stryker vehicle systems and develops individual and crew skills. Operation of the Stryker, its associated weapons, and weapon systems are all covered at this level. Methods of training involve both classroom and hands-on applications.

LEVEL 2: TRAINING DEVICES AND SIMULATORS

2-28. Weapons engagements using training devices and simulators instead of live ammunition enable commanders and platoon leaders to observe and evaluate personnel in assigned positions. Training devices and simulators also allow critical assessments of crew and platoon collective tasks. Training devices and simulators enable Stryker operators to practice defensive and offensive maneuvers by allowing crewmembers to engage single, multiple, stationary, and moving targets. Platoon leaders can develop command and control skills while identifying platoon strengths and weaknesses for future training emphasis.

LEVEL 3: CREW

2-29. Using live ammunition, crew weapons training refines and evaluates those crew skills developed during preliminary and device weapons training. It consists of crew practice and qualification.

LEVEL 4: PLATOON

2-30. Platoon weapons' training integrates the platoon in live fire tactical scenarios. At this level, platoons refine and verify tactics and techniques developed during previous training. They are also evaluated on collective abilities during qualifying exercises. Too often Soldiers disregard the fundamentals while under the pressure of combat. Therefore, the Soldier must receive feedback on his use of fundamentals during collective live fire exercises.

- Training conditions should vary (inclement weather and other degraded modes) to ensure Soldiers are trained to fight in any battlefield environment.
- Training should also discuss Multiple Integrated Laser Engagement System (MILES) rehearsals at crawl, walk, and run paces to learn standing operating procedures (SOP) and other proper procedures.
- Enough evaluators must be present during training to observe and provide performance feedback to each Soldier.

CROSS-TRAINING

2-31. Army doctrine defines cross training as the systematic training of Soldiers on tasks related to another duty position. Sections and squads will not always be at full strength. Once a crewman becomes skilled in his crew position, he should cross train in other crew positions. This helps to ensure that the loss of one member leaves the squad combat effective. A unit's combat and training mission can be effectively accomplished if under strength units are organized with the following cross training rules in mind:

- Always fill key leader positions (the gunner may have to fill the squad leader position).
- Man the primary weapon system.
- If the loader becomes a casualty, the squad leader may have to load the TOW and control the squad at the same time.
- If the gunner becomes a casualty, the squad leader, driver, or loader must operate and fire the TOW.

Note: As individual TOW crewmen, squads, and sections become qualified, the commander should maintain that status by sustainment training, evaluation, and crew stabilization. Personnel changes are inevitable. So before TOW squads lose crew integrity and combat readiness, personnel changes should be examined and, when possible, alternate solutions sought.

2-32. Company commanders, platoon leaders, and senior noncommissioned officers manage all training to ensure that every Soldier is trained in individual and collective tasks for mounted and dismounted skills. SBCTs must focus on developing tough, combat ready platoons with balanced, simultaneous dismounted and mounted plans.

ALTERNATES

2-33. A diagnostic weapons skills test given by platoon leaders (supported by Soldiers in primary assigned squad and platoon positions) can help identify individuals who are proficient enough to serve as alternates. It can also ensure cross training for instances that require a last minute crew position. Cross training should occur during preliminary and device weapons training as often as possible, because of its critical contribution to countering combat and peacetime personnel losses.

KEY POSITIONS

2-34. Cross training should center on key squad personnel such as vehicle drivers, vehicle commanders, and system operators. All vehicle crewmembers should cross train on vehicle operations.

STANDARDS OF TRAINING

2-35. Soldier selection for cross training is based on observation and chain of command recommendation. DA 350-38, *Standards in Training Commission*, requires alternate crews to train regularly on Stryker systems and crew served weapons. When planning cross training, direct observation and recommendation through the chain of command are the best ways to select Soldiers. Cross training should include competition in the following areas:

- Weapons.
- Navigation.
- Communications.

Chapter 3

Modified Improved Target Acquisition System

This chapter provides the gunner with an in-depth understanding of the controls, indicators, and features of this targeting system.

The MITAS gives Stryker antitank gunners target sighting capabilities in any visibility conditions. It boresights automatically, integrates day TV (thermal view) and a thermal sight (TS) in a single housing, and detects and isolates faults. Embedded training helps gunners retain proficiency.

DESCRIPTION AND OPERATION

3-1. The MITAS has a target acquisition system (TAS), Fire Control System (FCS), and battery power source (BPS). The purpose of MITAS is to detect and acquire targets, and to give the gunner the fire control to take advantage of TOW missile features, while remaining under armor protection. The MITAS can operate day or night in all weather conditions. It enables the gunner to see the target through a day video sight or a thermal vision sight. The system includes a laser rangefinder (LRF) to accurately determine the range to a target. Other capabilities of MITAS includes–

- ***Aided Target Tracking***. This capability, also called ATT, provides improved probability of hit by allowing the gunner to smooth out normal jitter associated with a TOW missile when tracking a target at maximum range.
- ***Built-in, Gunner Initiated Boresight***. This provides better accuracy and faster boresight time.
- ***Identification of System Failure***. This feature provides system information on the gunner's display.
- ***Eye-Safe Laser Rangefinder and Passive Ranging***. The eye safe LRF and passive ranging provide the gunner with improved means of determining range to a target.
- ***High First-Round Hit Capability***. This capability improves success against stationary or moving targets.
- ***Two Sights***. The availability of a thermal sight and a day video sight, each with both a narrow field of view (NFOV) and a wide field of view (WFOV), offers four views.
- ***Zoom.*** The zoom doubles the MITAS image, taking the WFOV from 4X to 8X and the NFOV from 12X to 24X.
- ***Embedded Training***. The ET feature helps maintain gunner proficiency and is independent of the tactical circuitry and software.

TARGET-ACQUISITION SUBSYSTEM

3-2. The MITAS employs a thermal sight infrared system. Thermal systems display changes in temperature rather than changes in light or color. These temperature changes are referred to as "*delta-t.*" ("D*elta*" means difference in "*t*," or temperature.) The thermal sight is sensitive to a *delta-t* (change) as small as 1° F (-17° C). The TAS provides high-power telescopic and camera views in both thermal and day video sight modes. It also enables the gunner to track targets in darkness and periods of limited visibility using vehicle power and battery power.

CHARACTERISTICS AND CAPABILITIES

3-3. The TAS power switch (Figure 3-1, see arrow) is located on the gunner's control panel. The switch has three positions: OFF, STBY and ON. Each position brings different components of TAS into operation. When the TAS power switch is set to OFF, no power is supplied. With the power off, the gunner can use the day video sight in WFOV to surveil an area, but while the sight is off, he cannot launch a missile.

Figure 3-1. TAS power switch on ATGMV gunner's control panel.

3-4. When the TAS power switch is set to STBY, power is supplied only to the thermal sight to start the cool down cycle. This mode takes about 10 minutes to power up and conserves power while the thermal sight cools. The gunner can conduct surveillance using the day video in WFOV while in STBY mode, but cannot use the thermal sight or engage a target. When the TAS power switch is set to ON, a power up built-in test (PBIT) is automatically activated. After activation of the PBIT, day video sight capability is immediately available to the gunner. The gunner may switch between day video sight WFOV and NFOV using the FOV switch on the gunner's control panel (Figure 3-2). He can range and engage targets, but ATT capabilities are unavailable when switching between WFOV and NFOV.

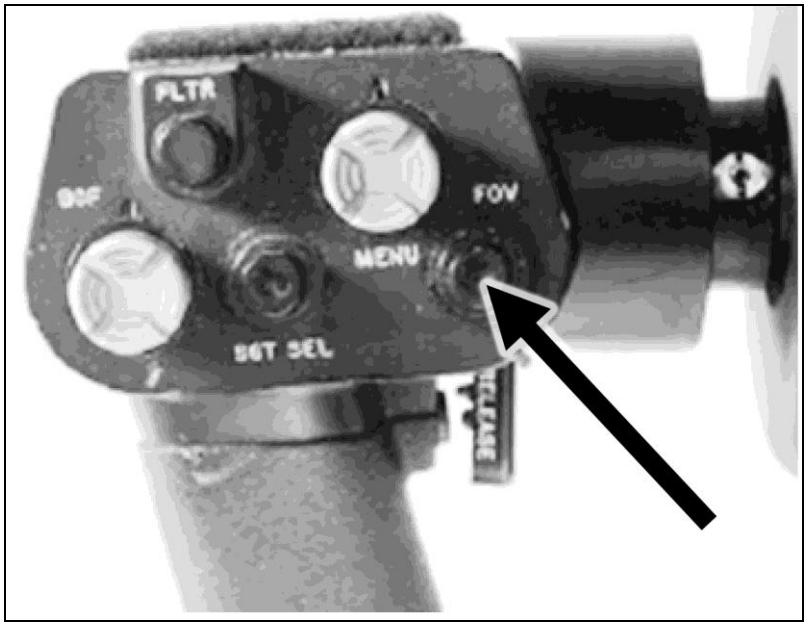


Figure 3-2. Gunner's left hand control.

DISPLAY

3-5. The gunner views the TAS indicators on his display. These indicators update him on changes that occur during system operation. The indicators offer a variety of information to the gunner about the system. When one of the hand grip control switches is pressed, an indicator light on the gunner's display illuminates. Various other gunners' display indicators will also illuminate to warn of malfunctions or certain maintenance actions that should be performed. Some of these indicators include–

Adjustment Indicator

3-6. This indicator (Figure 3-3) shows on the gunner's display what adjustments the gunner is making to brightness, contrast, and focus. A small cursor on the left side of the adjustment indicator box shows whether the function selected for adjustment is increasing or decreasing.

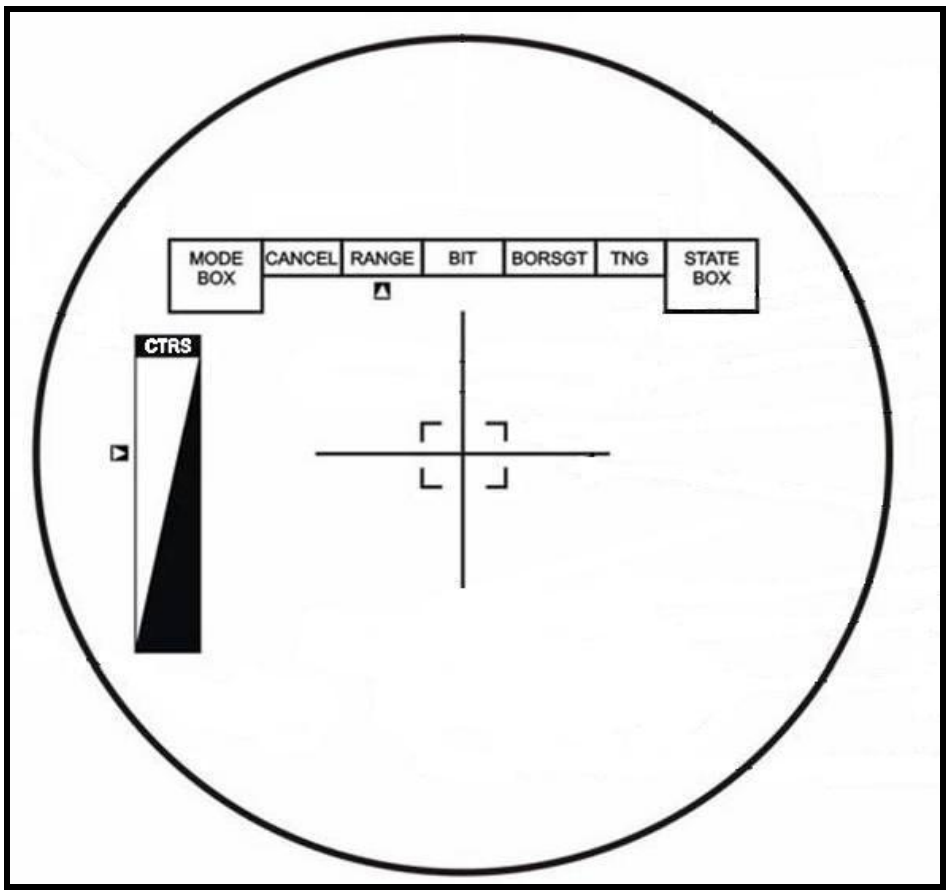


Figure 3-3. Adjustment indicator.

Operational Mode or Training Mode Indicators

3-7. Any of the five operational mode or three training mode indicators selected by the gunner will appear in the mode indicator box on the right side of the gunner's display.

Built-In Test Indicator

3-8. This indicates that BIT has been initiated and is in progress.

Boresight Indicator

3-9. The BORSGT indicator shows when boresighting is in progress.

TRACKER ENGAGE Indicator

3-10. The TRACKER ENGAGE indicator shows when track gates are locked on target.

MANUAL ENGAGE Indicator

3-11. The MANUAL ENGAGE indicator shows when the missile is armed and that the track gates have not been activated.

SURV Indicator

3-12. The SURV indicator shows that the missile has not been armed and that the track gates have not been activated.

Embedded Training Indicator

3-13. The ET indicator shows when embedded training has been initiated and when the simulated missile fly-out will occur.

Sensor Acquired Objects Indicator

3-14. Sensor acquired objects (SAO) indicates that ET was initiated and use of a missile simulation round (MSR) is not required.

Tactical Engagement Simulation Indicator

3-15. Tactical engagement simulation (TES) indicates that TES has been initiated.

State Indicators

3-16. Four STATE INDICATORS provide information about the system once it is operating (Figure 3-4). The gunner can change the system state with the switches on the gunner's hand controls.

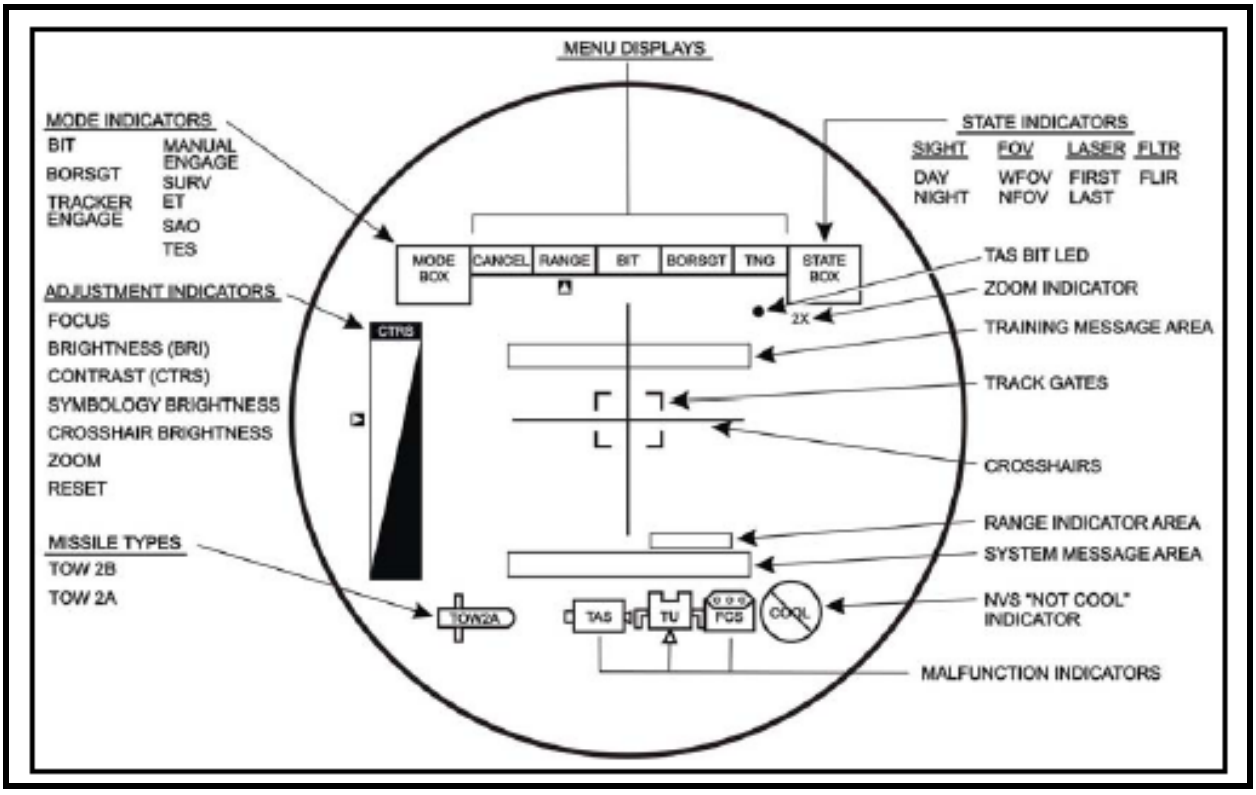


Figure 3-4. Indicator boxes.

Missile Type Indicator

3-17. A missile type indicator located on the left side of the gunner's display is generated by the TAS. This indicator appears on the gunner's display when the LAUNCHING EQPT switch is set to ENABLE TRIGGER.

System Message

3-18. System messages are displayed in the message display area located in the lower center section of the gunner's display.

Ranging Indicator

3-19. When the gunner uses active or passive ranging in the LRF range menu, the range to the target displays in meters in the range indicator area.

Malfunction Indicator

3-20. Malfunction indicators are not normally illuminated during system operation. However, if a system BIT finds a faulty component, the appropriate indicator will appear on the gunner's display.

Crosshairs

3-21. The crosshairs (Figure 3-5) provide a reference point to align the TAS with a target. In video sight mode, crosshairs are generated using TAS backlighting. In thermal sight mode, crosshairs are part of symbology generated by the FCS.

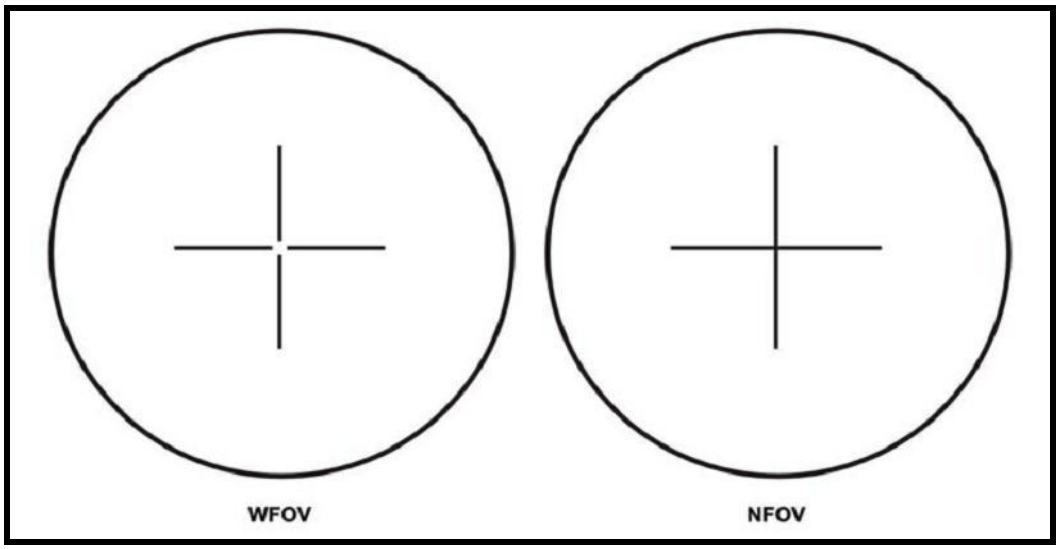


Figure 3-5. System sighting crosshairs.

Field of View Indicator

3-22. The WFOV crosshairs cover one third of the display and include the area that will comprise the NFOV; the NFOV crosshairs cover the whole display, and intersect where the missile will hit.

Track Gates

3-23. The gunner presses the TRK GATE switch to make these appear on his display (Figure 3-6). The TAS generates the track gates, which are then controlled by the FCS. The gunner uses the gates to lock the tracker on target. Track gates normally appear as flashing indicators, and are sized to a tank at 1,500 meters. This is true, unless the gunner has ranged or tracked a target within the last two minutes. When the

gunner presses the TRK GATE switch a second time, the track gates stop flashing, which means that the FCS tracker has locked onto a selected target.

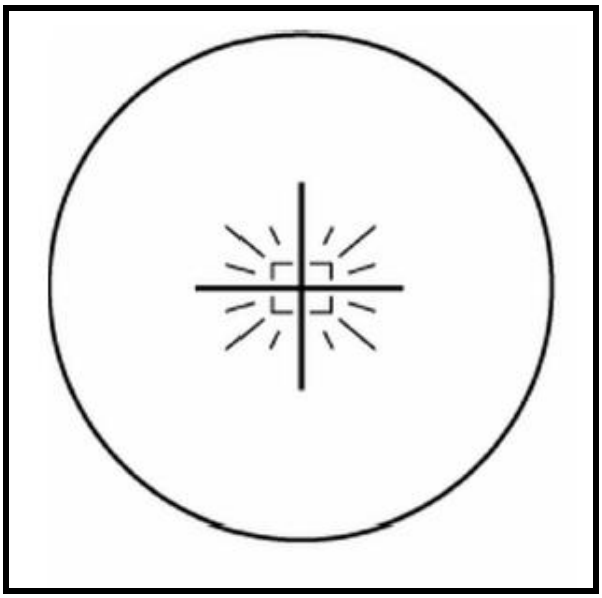


Figure 3-6. System tracking gate.

ANTITANK GUIDED MISSILE MAST

3-24. The ATGMV mast (Figure 3-7) is telescopic and provides 0.5 meter of vertical elevation to the TOW missile launcher. The mast is a tubular telescopic assembly that can be raised to provide clearance to the vehicle, and can enable full 360-degree observation and missile launch capability. Lowering and stowing the mast lowers the overall vehicle height. The mast will not operate in the stowed position. It is electrically operated by the FCS and is manually locked in the operating position.

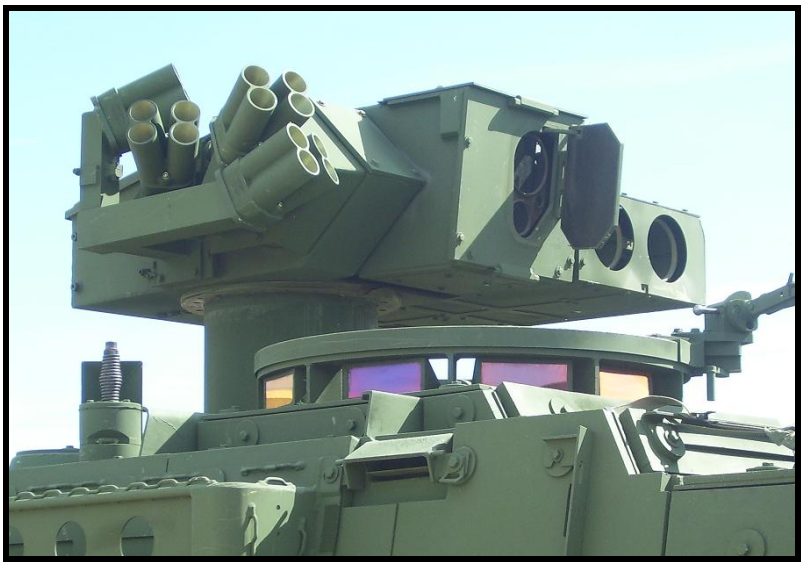


Figure 3-7. ATGM mast.

TURRET DRIVE LOCK

3-25. The turret drive lock (1, Figure 3-8) engages the ring bearing (2, Figure 3-8) to lock the mast in azimuth position when set to lock. When set to unlocked it allows the turret to traverse by power or manual drive.

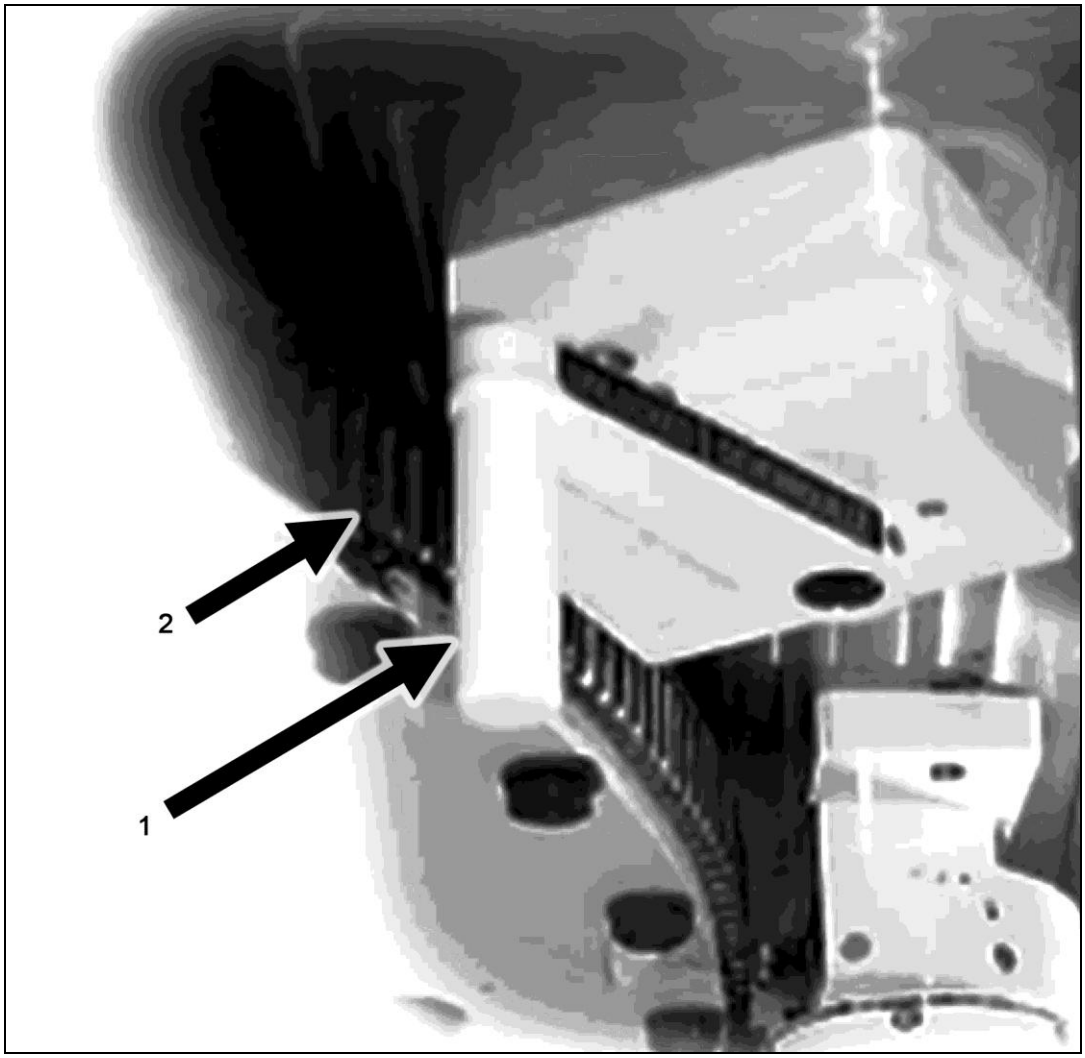


Figure 3-8. Turret drive lock.

DRIVE

3-26. The mast has a manual drive capability in case of power failure. On the elevation drive assembly (3, Figure 3-9), the gearbox (4, Figure 3-8) also has manual drive (5, Figure 3-8), enabling it to be operated with a standard wrench ratchet.

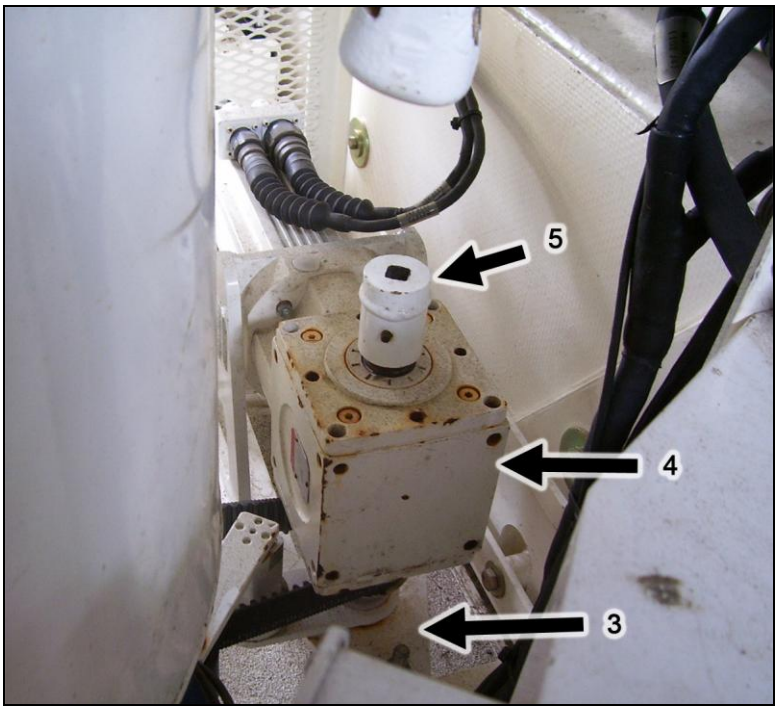


Figure 3-9. Manual operation.

GUNNER'S HAND CONTROLS

3-27. The gunner's hand controls in Figure 3-10 consist of a left and right-hand grip with thumb switches on each. The gunner's hand controls are enabled only when both platform enable switches are depressed on the left and right-hand grip. The platform switches are located on the front side of each handgrip.

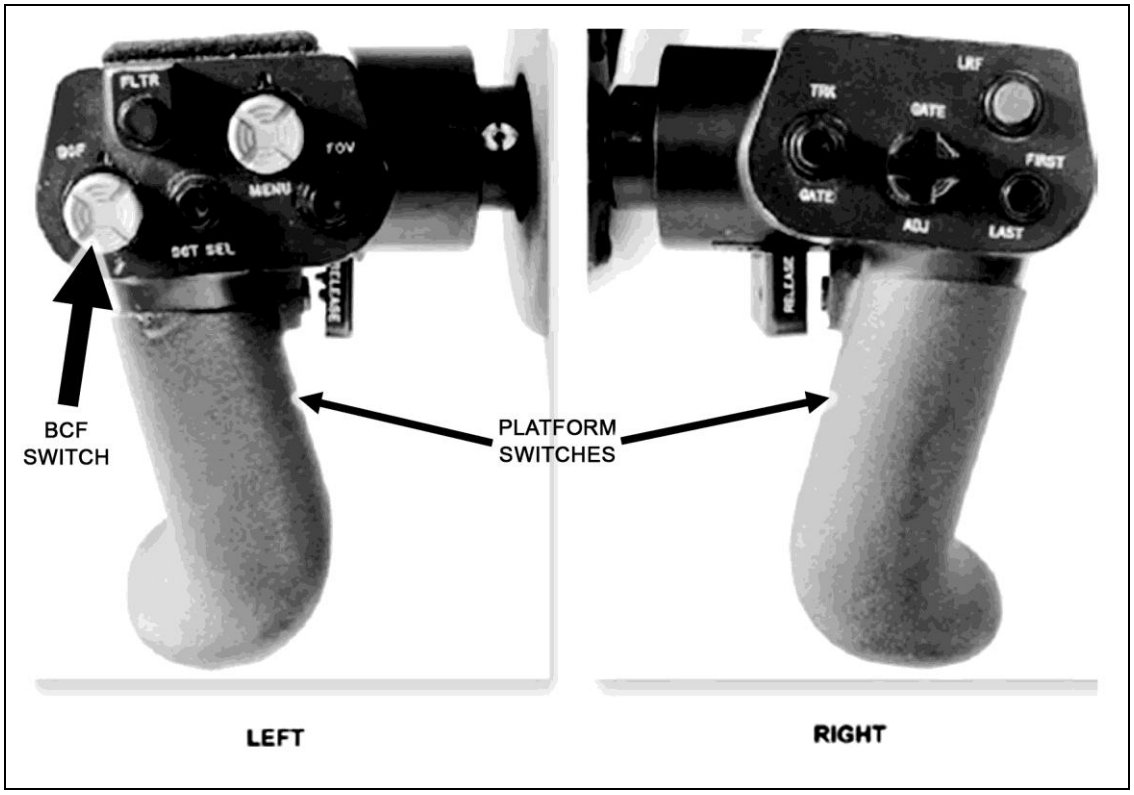


Figure 3-10. Gunner's hand controls.

BRIGHTNESS, CONTRAST, FOCUS MENU

3-28. The gunner presses the brightness, contrast, and focus (BCF) switch once, as shown in Figure 3-10, to activate the BCF menu (Figure 3-11) for the appropriate sight. The BCF switch controls the selection cursor. Pressing the BCF switch again allows selection of a function for adjustment.

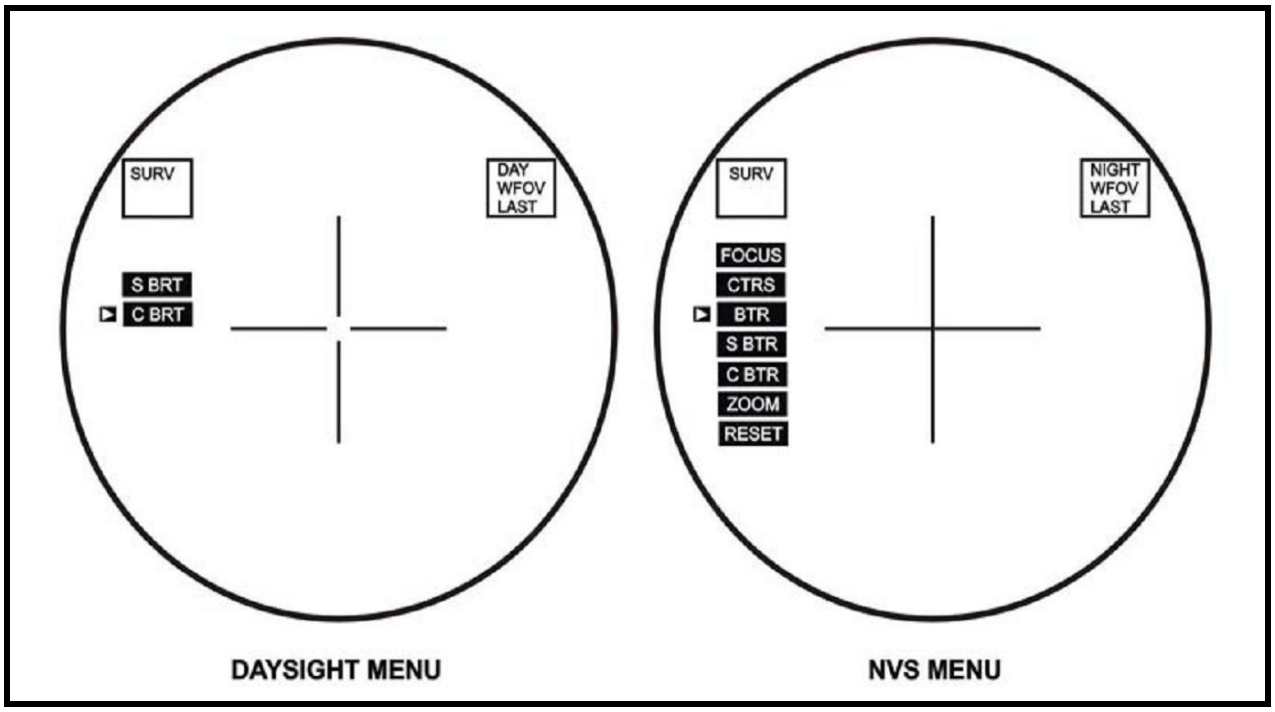


Figure 3-11. BCF menu.

FOCUS

3-29. The gunner presses the BCF switch on the gunner's handle to activate the BCF menu (Figure 3-12) to select FOCUS. When the focus adjustment function is selected, the gunner moves the BCF switch up until the target appears fuzzy, and then moves the BCF switch down until the target appears sharp.

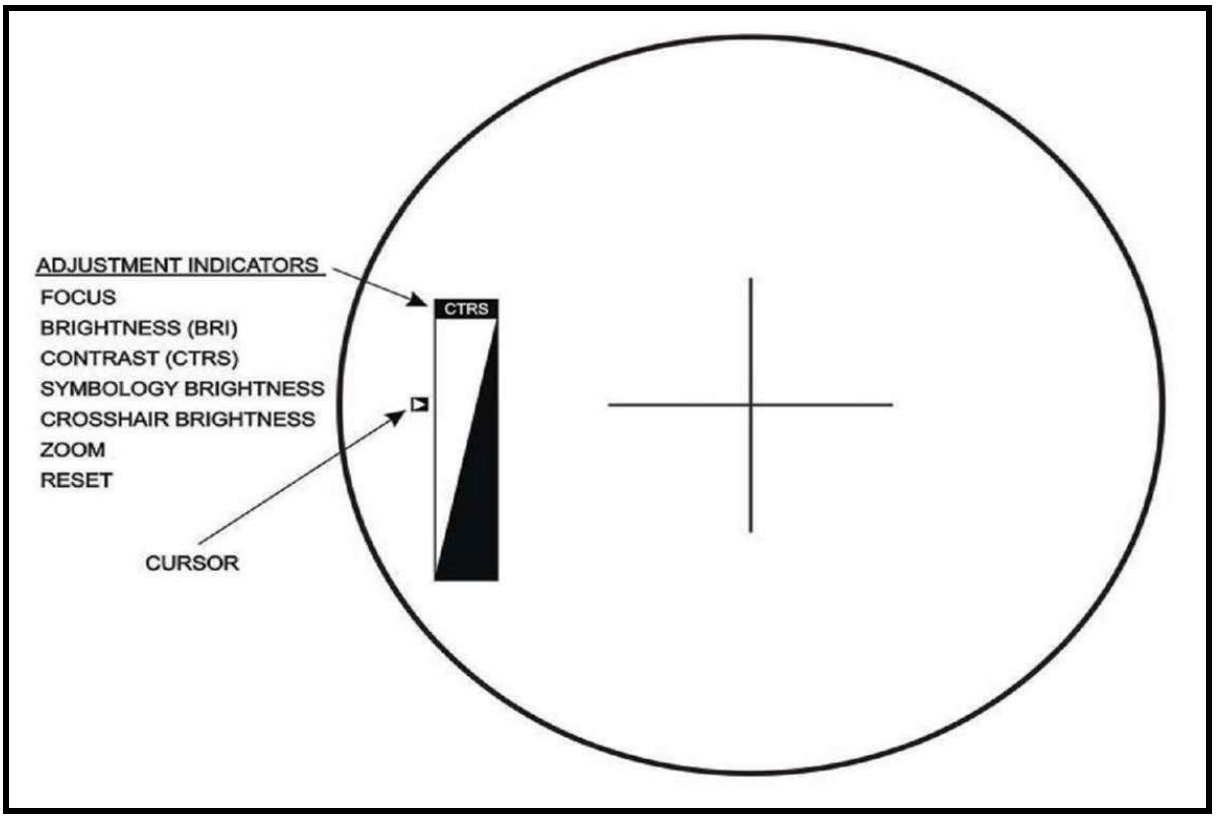


Figure 3-12. Focus adjustment.

BCF FOV SWITCHES

3-30. When contrast adjustment (CTRS) is selected on the BCF menu, the gunner can make adjustments by looking at the brightest (hottest) object in his field of view. He then moves the BCF switch up on the FOV until the brightest object will not get any brighter, and then moves the BCF switch down until the object begins to darken.

BRIGHTNESS

3-31. When the brightness adjustment (BRT) is selected on the BCF menu, adjustments can be made by looking at the darkest (coldest) object in the field of view (FOV). The BCF switch can be moved down until the darkest object will not get any darker, and up until the object begins to lighten.

CROSSHAIR BRIGHTNESS

3-32. The crosshair brightness (C-BRT) adjusts the intensity of the crosshairs and track gates. When this adjustment is selected, the gunner must move the BCF switch up to increase or down to decrease crosshair brightness. Once the desired brightness is achieved, he releases the BCF switch and waits 5 seconds for settings to be retained in memory.

SYMBOLOGY BRIGHTNESS

3-33. The symbology brightness (S-BRT) adjusts the intensity of the text and symbols appearing in the display. The gunner must press BCF switch on the gunner's hand controls to activate the BCF menu and select S-BRT. He can move the BCF switch up to increase brightness or move the BCF switch down to decrease brightness. The gunner should observe the words in the state indicator box and mode indicator box to use as a reference. He can then release the BCF switch and wait 5 seconds for the setting to be retained in memory.

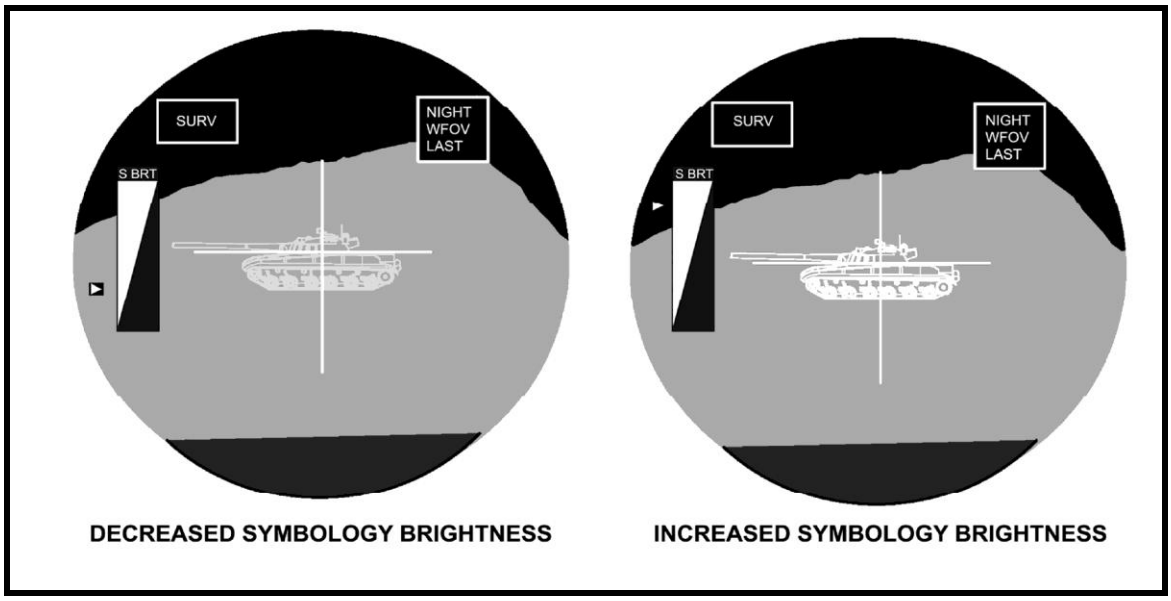


Figure 3-13. Symbology brightness.

ZOOM ADJUSTMENT

3-34. When the gunner presses the BCF switch to adjust the zoom magnification, the FOV should double in size and appear as 2X under the state indicator box (Figure 3-14). The STATE BOX in the TAS display will indicate which field of view has been selected. The zoom feature can be removed by pressing the BCF switch again.

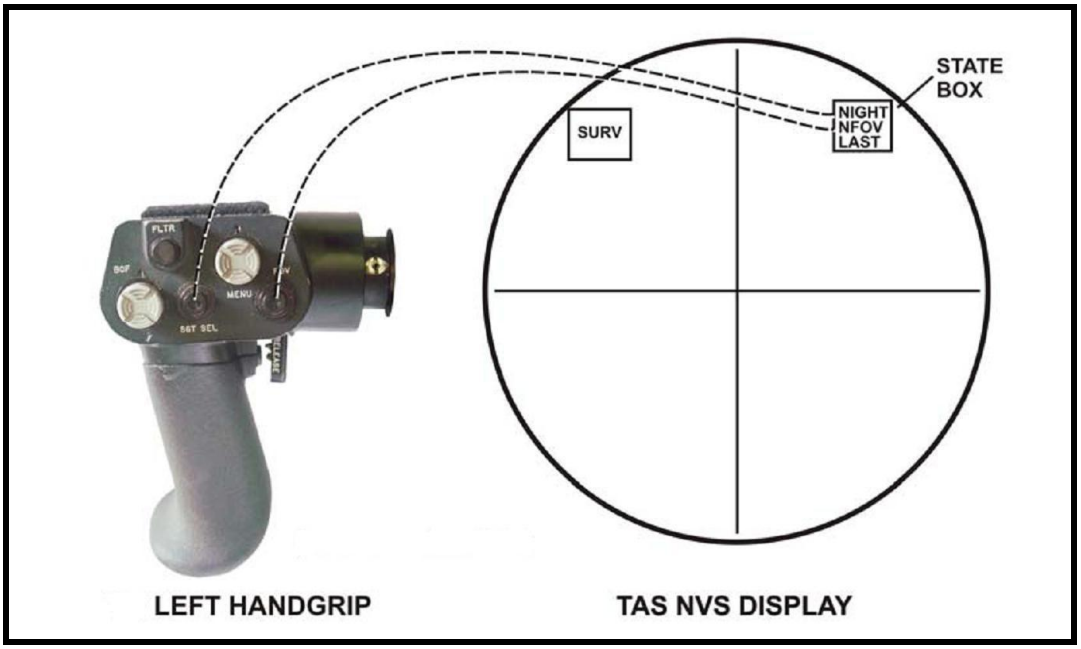


Figure 3-14. Zoom adjustment.

BRIGHTNESS, CONTRAST, AND FOCUS

3-35. Selecting RESET from the BCF menu returns the brightness, contrast, and focus to their default settings.

GUNNER'S HAND CONTROL

3-36. Pressing other switches on the gunner's hand control allows the gunner to make other adjustments.

Sight Select Switch

3-37. The sight select switch (1, Figure 3–15) lets the gunner choose either the day video sight or thermal camera modes.

Field of View Switch

3-38. Pressing the field of view switch (2, Figure 3–15) changes FOV from WFOV to NFOV for both the day and thermal cameras.

Filter Switch

3-39. The FLTR switch (3, Figure 3-15) is a push button used to activate an optical countermeasure by physically placing a filter into the optical path during NVS use. When the filter is inserted, the gunner will see a slight darkening of the display, and the word FLTR will show in the state box. This filter is not available when using the daysight.

MENU Switch

3-40. The menu switch (4, Figure 3–15) activates the main menu screen on the gunner's display (2). This switch allows the gunner to select any of the five options displayed on the menu.

Figure 3-15. Sight and menu select switches.

TRK GATE Switch

3-41. The track gate switch (1, Figure 3-16) activates a flashing tracking gate (2) on an engageable target seen on the gunner's display after the target has been lased. After pressing the TRK GATE switch once (1), the gunner uses the gate adjustment (GATE ADJ) switch (3) to adjust the track gates (4) to the size of the target.

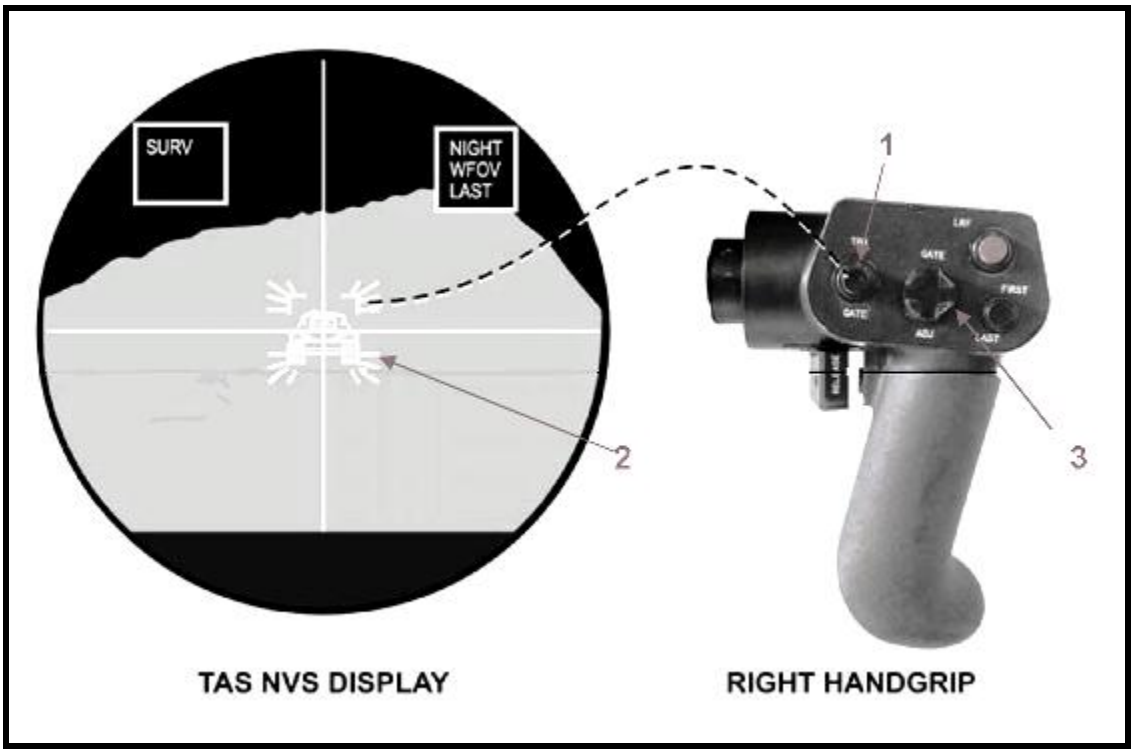


Figure 3-16. Track gate switch.

Laser Rangefinder Switch

3-42. Press and release the LRF switch (Figure 3-17) to obtain the distance to a target. The range will appear on the gunner's display in the system state box.

FIRST/LAST Switch

3-43. The FIRST/LAST switch (Figure 3-17) is used to verify the laser range reading. By default, LAST always displays unless FIRST is selected before pressing LRF switch.

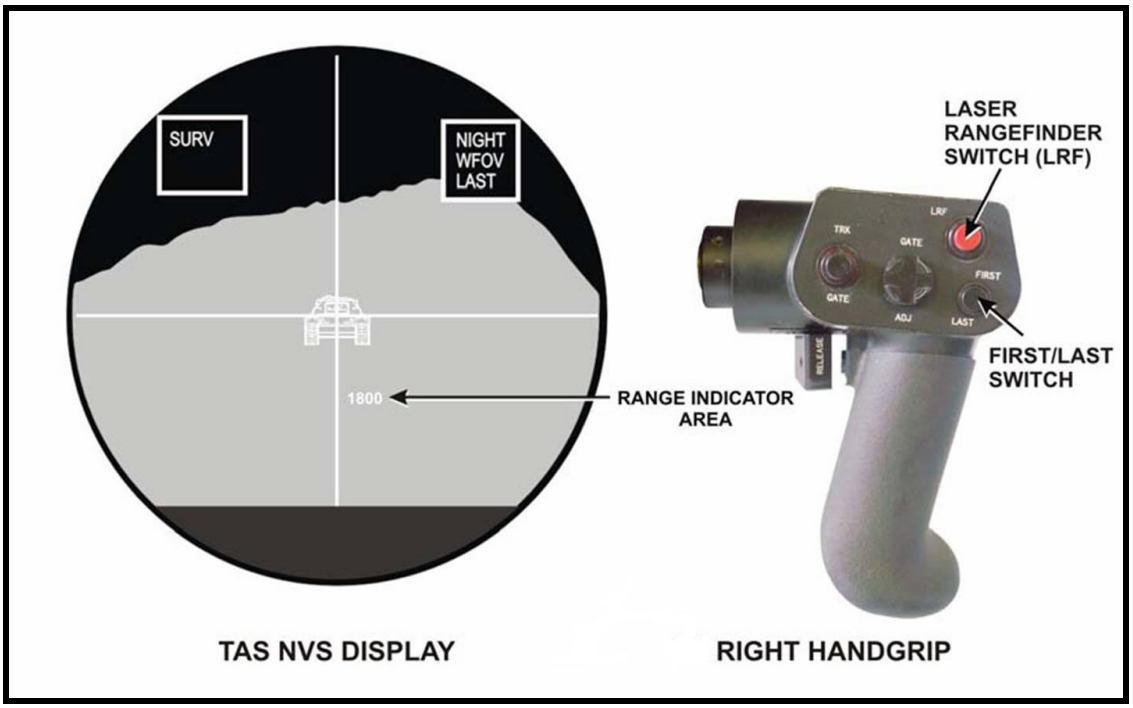


Figure 3-17. Laser range finder/first and last switches.

Platform Enable Switches

3-44. While engaging the platform enable switches (1, Figure 3-18) the gunner can rotate the gunner's hand control (2) right to slew the elevated TOW system (ETS) clockwise; or left to slew the ETS counterclockwise. The maximum traversing rate is achieved at +60° for clockwise rotation and -60° for counterclockwise rotation. While engaging the platform enable switches (1, Figure 3-18) the gunner can push the gunner's handle (2) forward to depress the ETS platform or pull the gunner's hand controls backward to raise the ETS platform.

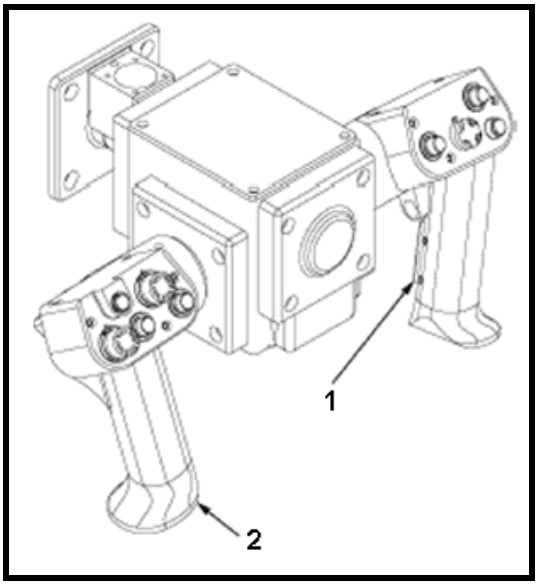


Figure 3-18. Gunner's hand controls.

3-45. To raise or store the ETS platform, the gunner must ensure the PLATFORM MODE switch (Figure 3-19) is set to RAISE TOW on the gunner's GCP. While engaging the platform enable switches, the gunner can push the gunner's handle forward to lower the ETS platform or pull back on the gunner's handle to raise the ETS stage.

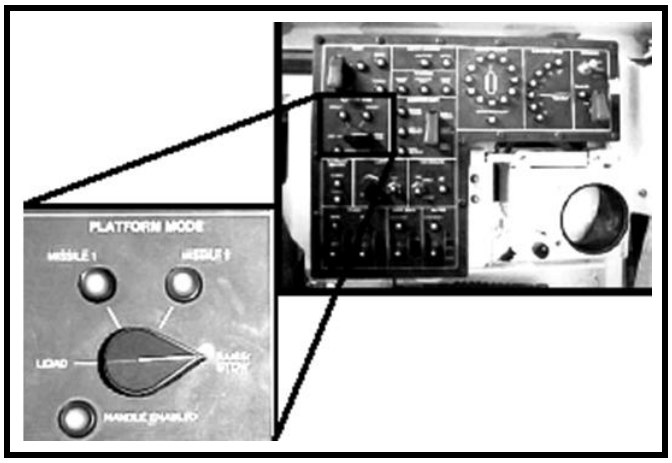


Figure 3-19. Platform mode switch.

Chapter 4

Combat Techniques Of Fire

This chapter discusses firing techniques for the TOW bunker buster missile and M240B machine gun. Topics include techniques and procedures for fire control, fire commands, target tracking techniques, and limited visibility firing conditions. These techniques and procedures greatly enhance the performance of the TOW Weapon System in combat and increase its chances of survival.

SECTION I. FIRE CONTROL MEASURES

Battlefield survival of platoons and squads often depends on how quickly and effectively they can fire on the enemy. Even when fighting outnumbered, platoons, squads and sections must distribute their fires over an enemy force. To make every shot count, these fires must be controlled.

TARGET ENGAGEMENT DETERMINATION

4-1. Range to target is the determining factor. This decision to fire or not is based on the TOW's wire guided system, which limits the distance a missile can be fired. Determining the range to a target will enable the crew to know whether the target is engageable (too close or far away), and determine if the exposure time (the time a vehicle remains in an opening between positions) is long enough to allow a missile to reach its target. To determine when a potential target is within range of the TOW, the gunner or squad leader can use active target ranging, passive target ranging, or the binocular method.

Note: Minimal arming range varies between the different types of TOW missiles.

ACTIVE TARGET RANGING

4-2. Performing active target ranging allows the gunner to use the MITAS LRF to determine if a target is within range. To determine the range to a target the gunner must—

- Place the crosshairs on the target and press the LRF switch on his right handgrip (Figure 4-1). The range displays in the range indicator area for 5 seconds. He rounds this range to the nearest 5 meters.
- Press the FIRST/LAST switch on the gunner's right-hand grip (Figure 4-1) to verify the laser range reading.
- Select either the first or last laser return for range verification. The laser return selected is displayed in the system state box in the upper right corner of the TAS display. The icon LAST (Figure 4-1), which is the default setting, will always be displayed unless the gunner selects the icon FIRST before pressing the LRF Switch.

Note: The range is verified when the gunner gets a second reading by repeating the steps for the first reading, and when both readings are the same or within plus or minus 5 to 10 meters.

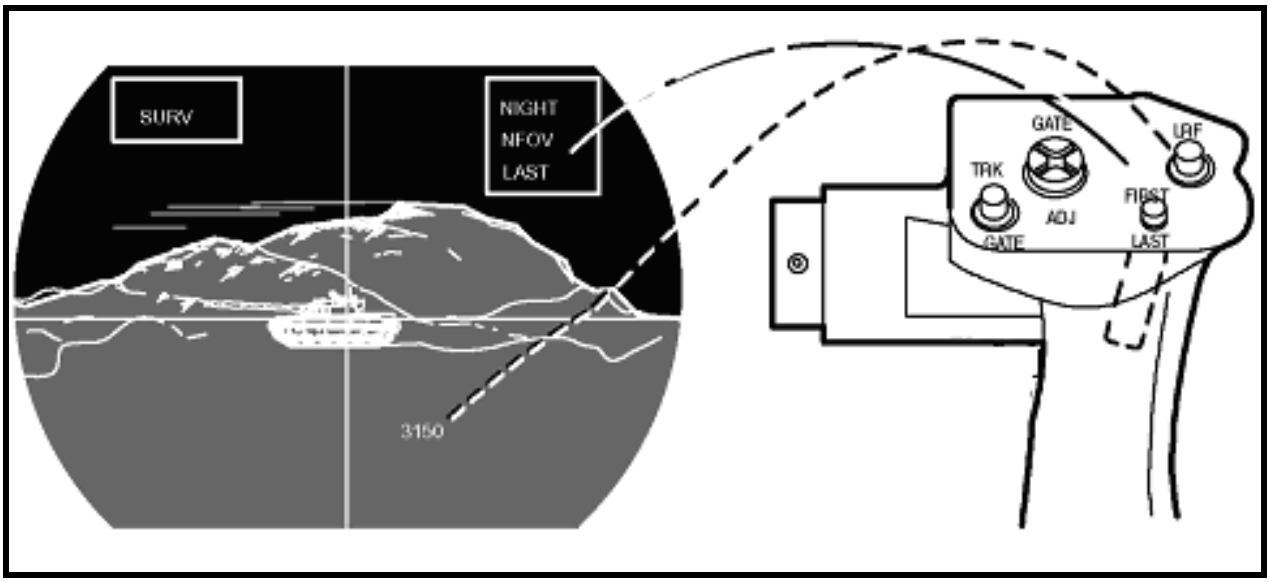


Figure 4-1. Active ranging using LRF controls.

PASSIVE TARGET RANGING

4-3. Passive ranging is determined by preset parameters based on the size of the track gates, where upon activation, the default range for the passive range box is 1,640-yards (1500-meters). The passive range box was developed to mathematically maintain a ratio of the sides of the box to the top and bottom. This ratio varies depending on the aspect of the target such as flank, front, or defilade. Each aspect the gunner selects will have a different ratio and look differently. This is due to a flank aspect being wider than a frontal and a defilade aspect being smaller. All these target aspects have a different size when located at the same range. To determine the range to a target using passive target ranging, the gunner must—

- Place the crosshairs on the target and press the MENU switch (Figure 4-2) on the gunner's handle.
- Select RANGE (Figure 4-2) from the main menu and select FLANK, FRONT or DEFILADE.

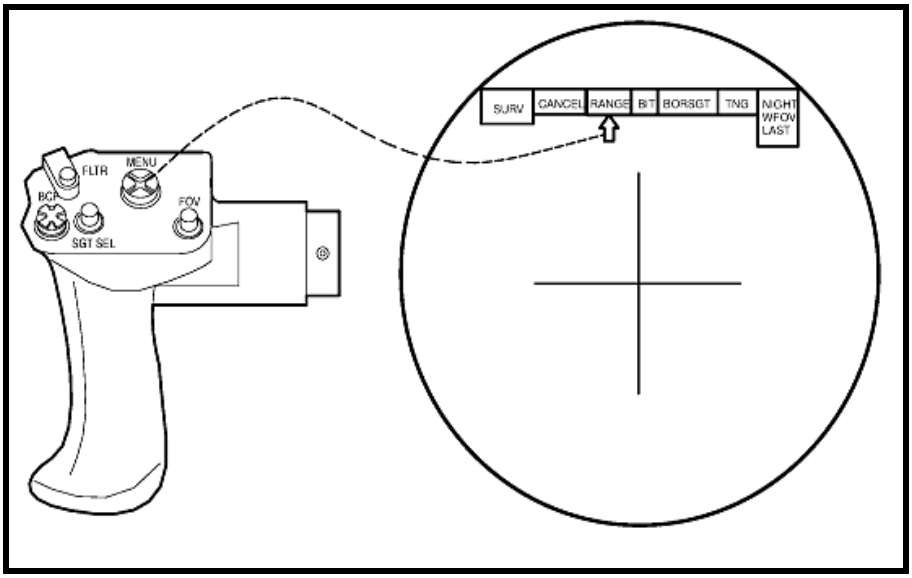


Figure 4-2. Passive target ranging

- Match the target as seen in the gunner's display, and press the MENU switch.

Note: The range box was designed to work on a standard size T-72 tank, at 1,500 meters. Remember this when selecting and sizing the range box on any target. For instance, if a target is a wheeled vehicle smaller than a T-72, the range box will give an incorrect range if sized to touch the entire wheeled vehicle. The gunner must visualize a T-72 over the target, and size the range box accordingly.

- Verify that the passive range box appears at the crosshairs center.
- Operate the GATE ADJ switch (Figure 4-3) on the gunner's handle to adjust the passive range box around the target. The range to the target will be displayed in the range indicator area on the gunner's display, as shown Figure 4-4.

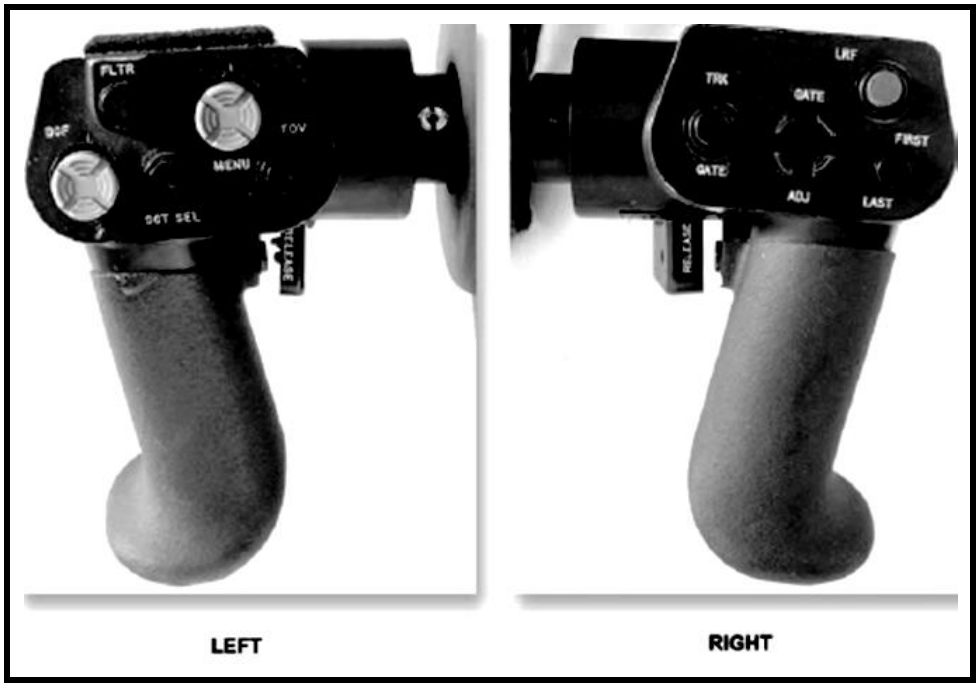


Figure 4-3. Gate adjustment switch.

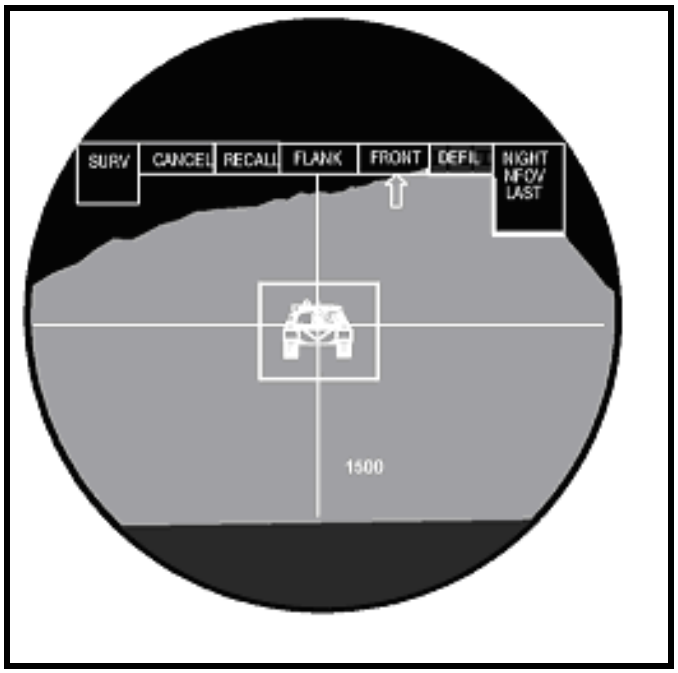


Figure 4-4. Passive target ranging with the thermal sight.

BINOCULAR METHOD

4-4. The gunner uses the reticle in his binoculars to determine if a target is within range. He does this by looking at the length, width, or height of the vehicle. Even though the reticles differ slightly, he uses the same procedures when using the M1, M17, and M19 binoculars. The M17 tick marks are only 1.7 mils long, while the tick marks on the M19 reticle are 5 mils long (2.5 mils on each side of the horizontal and vertical scales). To determine if a target is within range based on the length, width, or height of the target, the gunner must–

DETERMINE RANGE BASED ON LENGTH

4-5. Place the length of the target on the vertical scale. If one third or more of the vehicle extends beyond the tick mark, the vehicle is in range (A, Figure 4-5).

Note: A vehicle 6.5 meters long will measure about 2.2 mils at 3,000 meters and about 1.7 mils at 3,750 meters.

DETERMINE RANGE BASED ON WIDTH

4-6. Place the target on the small tick mark on the vertical scale. If the target covers two thirds or more of the tick mark, the vehicle is within range (B, Figure 4-5). A vehicle 3.4 meters wide will measure 1.1 mils at 3,000 meters and .85 mils at 3,750 meters.

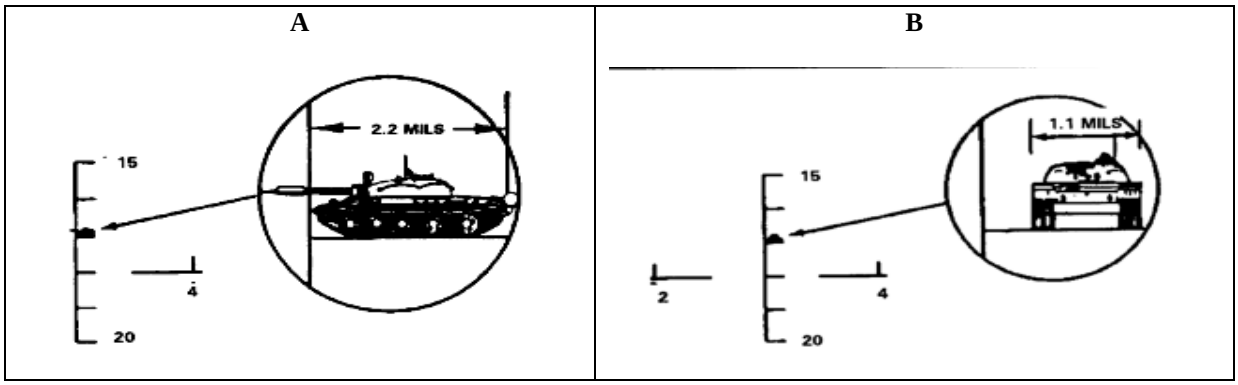


Figure 4-5. Target ranging with M17 binocular scale for target length and height.

Note: Most Warsaw Pact armored personnel carriers (APCs) are less than 3.4 meters wide and can be engaged at smaller mil values.

DETERMINE RANGE BASED ON HEIGHT

4-7. Place the target on one of the tick marks on the horizontal scale. If the height of the vehicle is one-half or more of the height of one of the tick marks, the vehicle is within range. A vehicle 2.4 meters high (the size of most Warsaw Pact vehicles), will measure .8 mils at 3,000 meters and .6 mils at 3,750 meters (C, Figure 4-5).

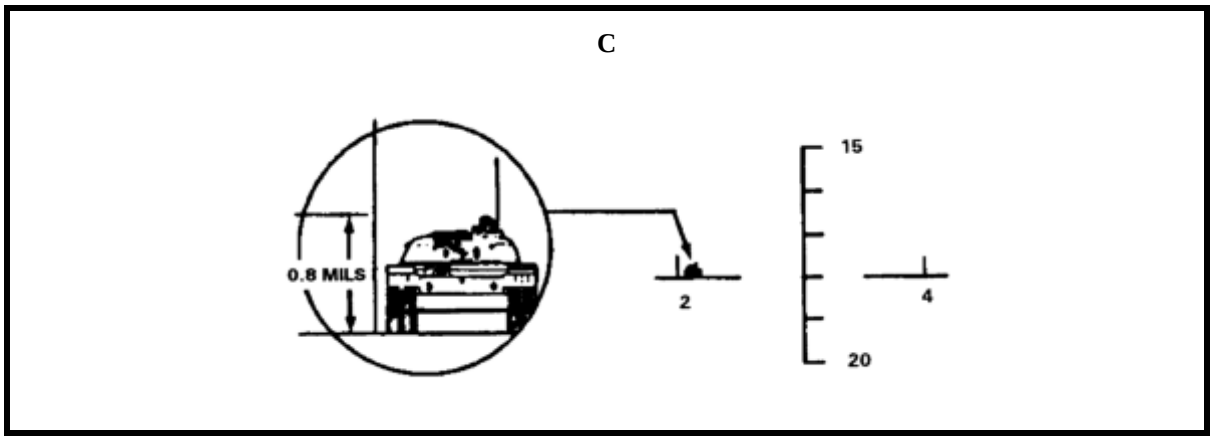


Figure 4-5. Target ranging with M17 binocular scale for target height (continued).

EXPOSURE TIME

4-8. Ranging a target is only one step in determining if a target is engageable or not engageable. After the gunner determines the range to the target, before missile launch, he must determine the exposure time of the target. Considerations for stationary targets apply only to selecting the correct missile, and target condition; fully or partially exposed. Moving targets require engagements that are more precise. The gunner must determine that the target will not reach cover before missile impact. To determine if moving targets are engageable or not, the gunner—

- Places the crosshairs on center of visible mass, and if the area between the vertical crosshair and the edge of the FOV in the direction of travel is clear of obstructions, as shown in [side A] of Figure 4-6, the target is engageable.
- Places the crosshairs on center of visible mass, and if the area between the vertical crosshair and the edge of the FOV in the direction of travel is not clear of obstructions, as shown in [side B] of Figure 4-6, the target is not engageable. The target will reach cover before the missile reaches the target.

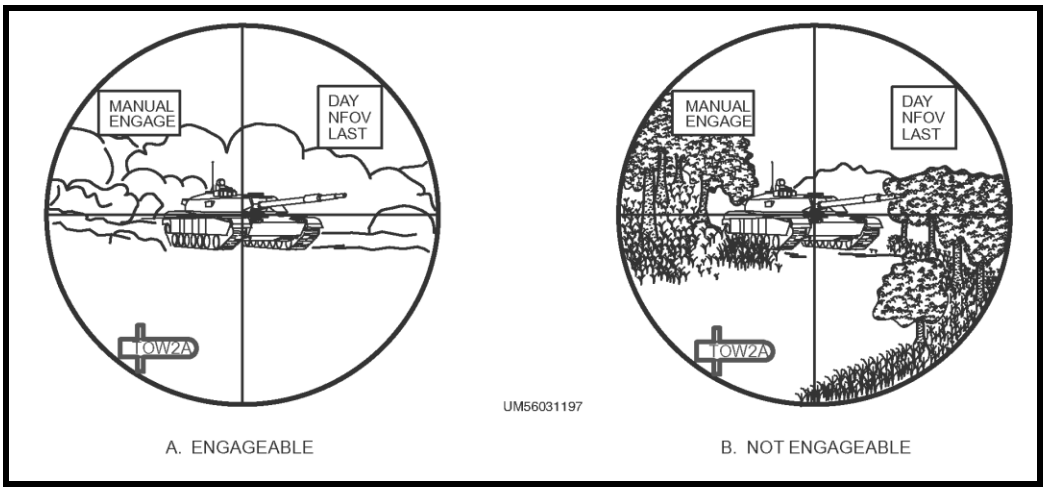


Figure 4-6. Determination of target exposure time with MITAS sights.

TOW FIRE COMMANDS

4-9. Fire commands are the language of an engagement that alerts the crew to initiate target engagement actions. The vehicle leader initiates the fire command to engage a target, and once initiated, monitors all actions taken by the crew. Although each member of the crew has engagement responsibilities, the vehicle commander retains total command and control over the engagement. There are six elements in TOW 2 system fire commands, but only five for ITAS and MITAS systems. Crews on TOW 2 systems must determine range to target, whereas ITAS and MITAS have LRF capability. The five elements of the ATGMV TOW fire command are–

ALERT

4-10. The first element of the fire command alerts the crew for an immediate engagement. The vehicle leader commands *SQUAD*, and the gunner begins observing the target area. The term "*Squad"* is the standard language used by antiarmor sections/platoons to alert a TOW crew to perform an action.

TARGET DESCRIPTION

4-11. The second element identifies the target for the gunner (Figure 4-7). If several similar targets are present, the vehicle leader will specify the target, and the platoon leader will specify order of fire. Example: Engage the first tank or right track. When the gunner locates the target, he announces, "*Identified*." Most targets can be described by using the terms listed in Table 4-1.

4-12. If the gunner announces, "*Cannot identify*," the vehicle commander must reconfirm the target, or request confirmation from other Stryker ATGMVs nearby. The vehicle commander has the final decision when to fire.

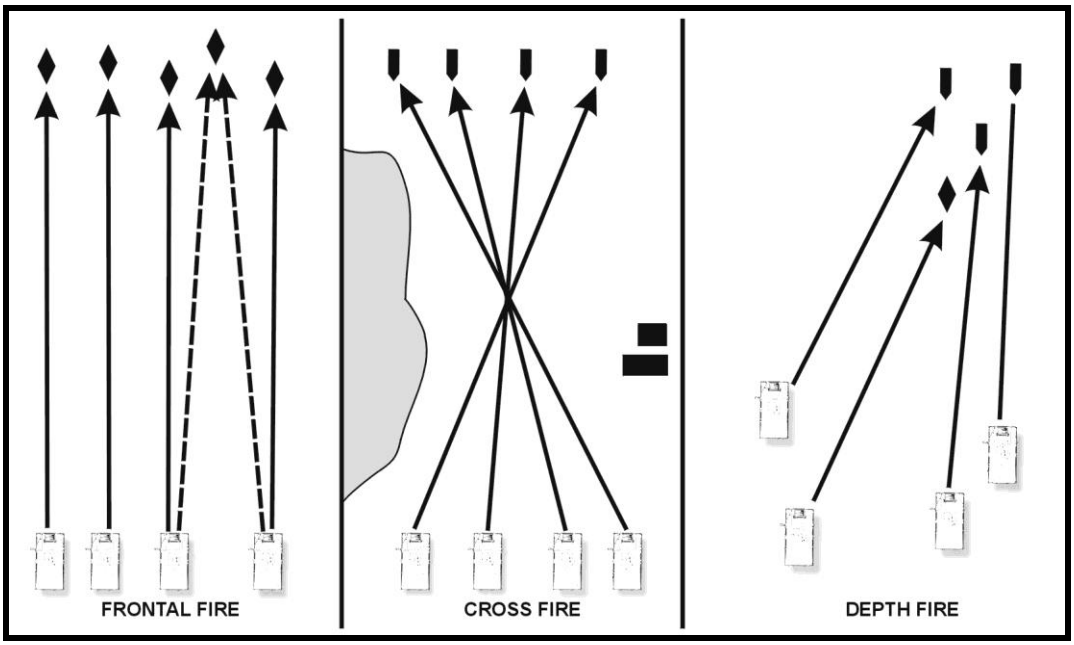


Figure 4-7. Example fire patterns.

Table 4-1. Target descriptions.

Target	*Announced As*
Any tank or tank-like vehicle	Tank
Several tanks	Tank formation
Any unarmored vehicle	Truck
Any halftrack or armored personnel carrier	Track
Helicopters	Chopper/helicopter
All fixed wing aircraft	Plane
Personnel	Troops
Any machine gun	Machine gun
Any antitank gun or towed artillery piece	Antitank
Any other target	Short word or phrase that clearly describes the target.

TARGET DIRECTION

4-13. If the target is moving, the vehicle commander gives the direction of movement right after the description to aid the gunner in locating the target. The vehicle gunner can also use the following to help the gunner locate a target:

Target Reference Points

4-14. A TRP is an easily recognizable feature or point on the ground (either natural or manmade) used for identifying targets and controlling direct and indirect fires. For more information on TRPs, see Appendix F, standard range card.

Prominent Features

4-15. The vehicle commander may give the distance and direction from a prominent feature of terrain instead of a TRP, for example, from the left wood line, right 200, or from bridge, right 400.

4-16. The vehicle commander can give directions to target using the *clock method*. The front of the vehicle is always 12 o'clock. This means that target direction is given as, for example, from 9 to 12 o'clock or from 1 to 3 o'clock. The vehicle commander ignores targets between 3 and 9 o'clock. Those targets should be engaged by other vehicles during their movement to a better firing position.

Reference Materials

4-17. The vehicle commander can use a map to find the range between the firing position and the target. To do this, he counts the grid lines from the firing position to a known point on the map. He should only use maps when time is too short to draw a range card.

TYPE OF MISSILE

4-18. A TOW crew in battle will probably have a mix of different missiles and a wide variety of target threats to engage. Chapter 1 covers the types and capabilities of TOW missiles, for example–

- If the target is a light armored vehicle, the vehicle leader may command, TOW 2A.
- If the target is a heavy armored vehicle with reactive armor protection, he may command TOW 2B.
- If the vehicle is used in support of dismounted Soldiers threatened by an enemy strongpoint, he may ask for a bunker buster.

COMMAND OF EXECUTION

4-19. Two commands are necessary for execution: a preparatory command and a command of execution.

AT MY COMMAND	This is a preparatory command that warns the gunner not to fire until given the command of execution.
FIRE	This is the only command of execution used to fire a missile.

ADDITIONAL COMMANDS

4-20. In addition to the five elements of the fire command, the following elements are also needed:

- The command CEASE TRACKING or CEASE TRACKING, OUT OF ACTION is issued after seeing the round detonate or when the squad or section leader wants to halt firing.
- CEASE TRACKING tells the crew that the squad or section leader intends to stay in position and engage another target immediately or when one appears.
- CEASE TRACKING, OUT OF ACTION tells the crew that the squad or section leader intends to move to another position.
- To determine the method of engagement, the section leader (or above) selects a fire pattern depending on the opposing force's formation. When the gunner is faced with multiple targets, the section leader directs FRONTAL, DEPTH, or CROSSFIRE.
- When the target is identified, the gunner announces, "*Identified*."
- If the gunner cannot see the target, he announces, "*Lost*."
- If the gunner cannot identify the target, he announces, "*Cannot identify*."
- The loader announces, "*Backblast clear*," before the command of execution is given.

ENGAGEMENT OF TRACKED AND WHEELED VEHICLES

4-21. FM 3-21.91 explains and shows a detail of antiarmor fire patterns. These patterns are based on a platoon of four collectively engaging threat forces. The SBCT antiarmor company has three vehicles per platoon; however, the same fire patterns can be used at all levels. Command and control will dictate the size of elements involved. To determine the method of engagement, the platoon leader selects a fire pattern depending on the opposing force's formation. The vehicle leader commands *FRONTAL*, *DEPTH*, or *CROSSFIRE* when the gunner is faced with multiple targets. FM 3-21.91 states–

"Fire patterns are a threat based fire control measure designed to distribute the fires of a unit at once among multiple, similar targets. They are most often used by platoons to distribute fires across an enemy formation. Leaders designate and adjust fire patterns based on terrain and the anticipated enemy formation."

4-22. The basic fire patterns, shown in Figure 4-8, follow:

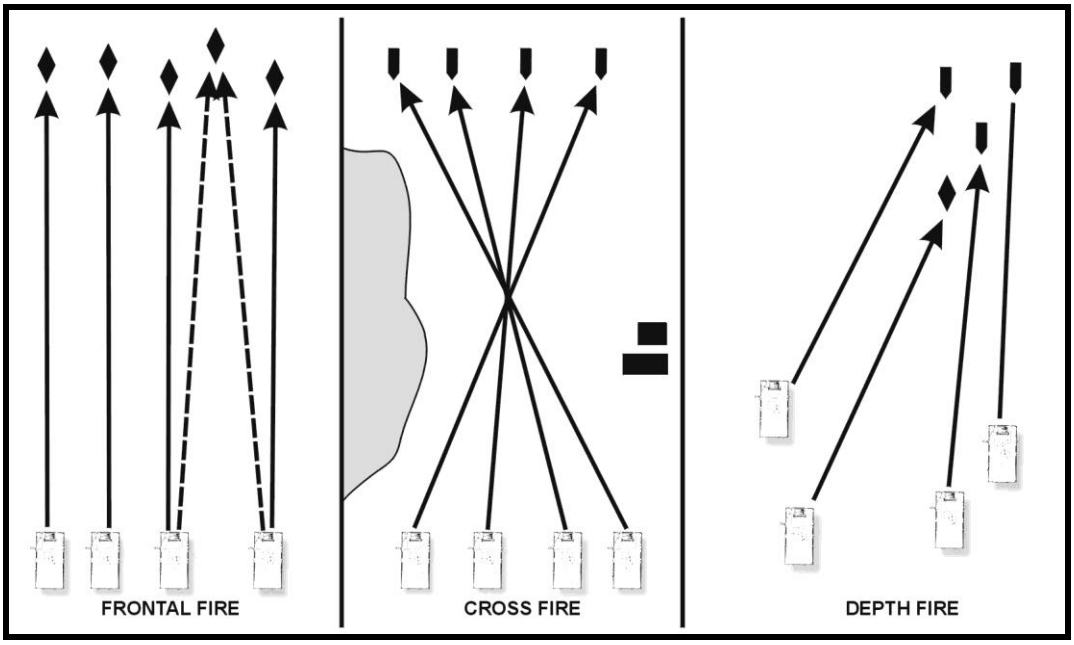


Figure 4-8. Example fire patterns.

Frontal Fire

4-23. Leaders may initiate frontal fire when targets are arrayed in front of the unit in a lateral configuration. Weapon systems engage targets to their respective fronts. For example, the left flank weapon engages the leftmost target; the right flank weapon engages the rightmost target. As the unit destroys targets, weapons shift fires toward the center of the enemy formation and from near to far targets.

Crossfire

4-24. Leaders initiate crossfire when targets are arrayed laterally across the unit's front in a manner that permits diagonal fires at the enemy's flank or when obstructions prevent the unit's weapon systems from firing frontally. Right flank weapons engage the leftmost targets; left flank weapons engage the rightmost targets. Firing diagonally across an engagement area provides more flank shots, thus increasing the chance of kills; it also reduces the possibility that friendly elements will be detected if the enemy continues to move forward. As the unit destroys targets, weapons shift fires toward the center of the enemy formation.

Depth Fire

4-25. Leaders initiate depth fire when targets are dispersed in depth, perpendicular to the unit. Center weapons engage the closest targets; flank weapons engage deeper targets. As the unit destroys targets, weapons shift fires toward the center of the enemy formation.

Target Identified

4-26. When the target is identified, the gunner announces, "*Identified*."

Target Lost

4-27. If the gunner cannot see the target, he announces, "*Lost*."

Cannot Identify

4-28. If the gunner cannot identify the target, he announces, "*Cannot identify*.**"**

Backblast Clear

4-29. The loader announces, "*Backblast clear*," before the command of execution is given.

DANGER

Although ATGMV crews are protected from backblast heat and overpressure, Soldiers on the ground can be harmed severely, and support vehicles can be damaged. Crews must check for Soldiers and other vehicles that may be within TOW line of sight and backblast danger zones. The bunker busting TOW missile backblast and debris at target impact is the most dangerous to Soldiers.

CEASE TRACKING or CEASE TRACKING, OUT OF ACTION

4-30. The vehicle commander issues the command, *CEASE TRACKING* or *CEASE TRACKING, OUT OF ACTION* after seeing the round detonate or when the crew or platoon wants to halt firing.

Cease Tracking

4-31. This command informs the crew that they will be engaging another target immediately or when one appears.

Cease Tracking, Out ofAction

4-32. This informs the crew they will be moving to another position.

REPEATING FIRE COMMANDS

4-33. When a crewmember fails to hear or understand any element of a fire command, he announces the element in question. For example, if the gunner asks, "*Location?*" the squad leader repeats the target direction element such as, *FROM LEFT WOOD-LINE, RIGHT TWO HUNDRED*, or, from the bridge, *RIGHT FOUR HUNDRED*.

CORRECTING FIRE COMMAND ERRORS

4-34. To correct an error in a fire command, the squad leader announces, "*Correction*," and corrects only the element in error. He completes the command by announcing all elements after the corrected element. He does not try to correct an element that has been needlessly included, such as the direction element. He corrects the omission of an element by announcing "*Correction*," followed by the omitted element, and then he continues with the command.

Note: Although directions to the driver are not part of the fire command, they are given by the vehicle leader or gunner in short terms. For example, when the gunner says, "*Check backblast area*," the driver ensures no one and nothing is in his line of sight, and announces either "*Clear*" or "*Not clear*." When the command *CEASE TRACKING, OUT OF ACTION* is given, the driver prepares the vehicle for moving.

TARGET TRACKING

4-35. To track a target, the gunner first visually acquires the target through the MITAS day camera or thermal sight. Once acquired, the gunner operates the gunner's hand controls to keep the sight reticles aligned with the target. The sight system is attached to and aligned with the TOW mast. The mast stabilizes the exit of the missile from the launcher for initial alignment during missile flight. On achieving target alignment, the gunner fires the missile by manually depressing the trigger switch. Thereafter, all operations are automatic and the gunner's only task is to maintain alignment of the sight reticle on the target until missile impact.

4-36. Deviations of the missile from the line-of-sight trajectory are sensed in the launcher sight by infrared means that receive information from infrared radiators attached to the missile. This information is processed in the form of electrical signals to produce error signals proportional to the azimuth and elevation displacements of the missile from the intended trajectory. Correction commands are derived from these error signals and are sent to the missile over the command link wires, which are dispensed from the missile. The missile performs corrective maneuvers using aerodynamic control surfaces that deflect in response to the command signals from the launcher. This process is continuous until missile impact.

SECTION II. LIMITED VISIBILITY CONDITIONS

Modern technology has produced devices that Soldiers and leaders can use to reduce the effects of limited visibility. Several of these devices are organic to the platoon. However, poor visibility adds to command and control problems, and leaders must recognize and overcome every problem that makes it difficult to detect targets, distinguish between friendly and enemy units, fire weapons effectively, and navigate.

TARGET RECOGNITION

4-37. A thermal sight allows the TOW gunner to view targets during limited visibility conditions such as darkness, and manmade smoke. Some conditions, such as fog, rain, and snow can distort thermal imaging, and reduce observation distance. The sight produces images called thermal target signatures or infrared target signatures, which are different from the images seen in the day camera. Targets stand out in these infrared images. They can be recognized at long ranges on a clear night and at reduced ranges in poor visibility. Recognizing these targets requires trained and experience gunners.

TEMPERATURE AND THERMAL IMAGES

4-38. Most objects have a radiated temperature either higher or lower than their background. Even if the radiated temperature differences are less than a degree, they appear on the thermal display. The object will only appear in the display if the temperature of an object and its background differ.

High Temperature

4-39. If an object has a high temperature, it will appear black. Usually, targets are easier to identify at night, because their radiated temperature is hotter than their background.

Internal Temperature Variations

4-40. Some targets, such as tanks and APCs, have internal temperature variations that form visible patterns. These patterns are the basis of target signature cues. Cold stationary targets, especially defilade targets, take time to detect. Look for a pattern or IR signature that resembles a silhouette of a wheeled or tracked vehicle. Remember, a cold target may be cooler than the surrounding area. Thus, it may be a dark green or black against a lighter green background when viewed in the thermal sight. In a thermal sight, the shapes of the hottest vehicle parts, such as engines and exhausts, appear white on black. Objects with a medium temperature, such as the warm tracks, appear a dim white on black. Objects with a cool temperature, such as the cool hull and other cool parts, appear black.

SOURCES OF INFRARED ENERGY

4-41. Infrared energy comes from different sources such as solar heat, fuel combustion heat, frictional heat, and reflected radiance.

Solar Heat

4-42. Solar heat comes from the sun and affects the exterior surface of objects. This heating highlights the outline of the object, which provides recognition cues to the gunner. These cues are usually similar to the overall appearance of the target. (For example, a solar heated M113 appears box-like with a sloping front; a solar heated M60 tank appears as a small oval atop a larger oval.) These shape cues are recognizable out to medium (1,000 to 2,500 meters) and long (beyond 2,500 meters) ranges. Since the sides have more defined contours, the side view shapes are usually easier to recognize than the front view. In addition to atmospheric variables and surface reflections, the solar heating rate is also affected by the object's ability to absorb sunlight. Generally, dark colored objects are better absorbers of sunlight than light-colored objects.

Fuel Combustion Heat

4-43. Fuel combustion heat comes from operating engines. The heat from operating engines is conducted to the surfaces of the surrounding engine compartment. Because engine compartment temperatures can reach up to 200° F, the surfaces of this compartment will be hotter than other surrounding body parts. Engine muffler and exhaust pipe temperatures are high, providing the gunner with good cues. Although the engine, heated compartments, and exhaust features themselves do not appear in the thermal sight, their cue value is not any less. A trained and experienced gunner can determine much about the vehicle from these cues.

Frictional Heat

4-44. Frictional heat is produced by the moving parts of vehicles. These features usually appear a brighter white on black yet the heat is less intense than the high temperature from the engine combustion. Frictional heat is generated only when the vehicle is in motion. Frictional heat provides long-range cues to classify the vehicle as wheeled or tracked. At medium range to short-range, these cues can be used to identify the vehicle. The vehicle's transport systems are the source of most frictional heat cues. Tracked vehicles have frictional heat in the tracks, road wheels, drive sprockets, support rollers and shock absorbers, drive shafts, transmissions, axles, and differentials. The tires, shock absorbers, and differentials can be detected at medium range to long-range.

Reflected Radiance

4-45. Certain smooth, glossy surfaces, such as windshields and glossy painted fenders, reflect radiation images from other sources. These reflections can produce odd images. For example, the fenders of a T-62 appear black, because of thermal reflection. An overcast sky can cause warmer thermal reflections. Generally, surface reflections are different in nature and do not usually cause problems.

EFFECTS OF WEATHER AND OBSCURANTS

4-46. Variations in solar heat, fuel combustion heat, frictional heat, and thermal reflection affect infrared signatures and infrared target recognition cues. In addition, some atmospheric conditions degrade the thermal, while others can enhance it. Some of these factors are discussed below.

FALLING PRECIPITATION

4-47. Infrared energy does not transmit well through falling precipitation (rain, snow, and fog). The temperature of targets and background objects are decreased. The basic signature cues themselves do not change, because of atmospheric transmission losses. Falling precipitation restricts thermal sight visibility more than fallen precipitation.

Effect on Background Objects

4-48. During rain or snow, background objects and frictionally heated and solar heated target features lose heat. Frictional heat loss is caused by water density and mud accumulating on vehicle body parts. Landmarks, such as tree lines, and contour features, are often lost. The loss of heat in background objects reduces scene clutter, such as trees and rocks, and can increase target detection. Target recognition cues are usually reduced, because of the loss of heat in certain target features.

Effect on Display Settings

4-49. Because rain and snow have a cooling effect on the target's contrast, thermal contrast controls must be increased to compensate for the condition. However, a higher contrast setting produces a "snowy" image.

FALLEN SNOW

4-50. Fallen snow tends to make all ground temperatures the same. Depth perception by size comparison becomes difficult because of lack of terrain features with which to reference size.

DUST, DIESEL FOG, AND OIL SMOKE

4-51. Dust particles from artillery rounds greatly reduce thermal sight visibility. Only the hotter objects and target features show through the obscurants. Oil based smoke can reduce thermal sight visibility.

SECTION III. M240B MACHINE GUN

Engagement and adjustment techniques are those actions taken by the crew to place effective fire on the target. The crew must be able to place effective fire on moving, stationary, point, and area targets. The crew's goal is to hit a target and destroy it as fast as possible.

ENGAGEMENT TECHNIQUES

4-52. Proper engagement techniques will allow the crew to place enough fire on the target to destroy it. The method of engagement chosen (searching, traversing, or using the Z-pattern) depends on the terrain, target presentation, type of target, and tactical situation.

SEARCH METHOD

4-53. The searching method of engagement is used to engage targets arrayed in depth. The gunner moves the beaten area through the target, continually increasing and decreasing in range. The searching method is used to engage area targets moving toward or away from the firer.

TRAVERSING METHOD

4-54. The traversing method of engagement is used to engage area targets along their front or length. The gunner moves the beaten area across the length of the target area. The traversing method is also used to engage area targets moving across the sector of fire.

Z-PATTERN METHOD

4-55. The Z-pattern method of engagement is preferred to engage area targets, or to suppress a target while the target is moving or stationary. The size and shape of the target and the engagement technique should dictate the pattern of fire used to engage an area target. To engage an area target, the gunner fires a killing burst center mass at the target area, to try to kill as many targets as possible. Once he has fired a killing burst, he suppresses the target by first firing the second burst of machine fire horizontally across the front of the target area. The gunner than fires a third burst diagonally across the target area. He fires the fourth burst horizontally across the rear of the target area.

METHODS OF ADJUSTMENT

4-56. Adjustments may be made before or after firing. Machine gun fire is adjusted by observing the strike of the round, observing the flight of tracers, re-laying frequently, or by a combination of these. The use of tracer ammunition provides a means of adjusting fire. At night, it aids in illuminating the objective area and has a demoralizing effect on the enemy. Observation and adjustment of fire is the most important and is continuous throughout the action. The gunner is trained to observe and adjust fire without command and to check the lay of the gun frequently.

BURST-ON-TARGET

4-57. The burst-on-target (BOT) method is the fastest method of adjustment for a moving target. The gunner moves the strike of the round to the target. To use the BOT method on a stationary or moving target, the gunner uses the following methods of engagement.

Stationary Target

4-58. The gunner fires his sensing rounds or burst, and observes the strike of the rounds while maintaining his initial point of aim. If needed, he adjusts his point of aim enough to move the strike of the round to the target and fires a killing burst. He continues to adjust and fire a killing burst until he destroys or suppresses the target, or until given the command *CEASE FIRE*.

Moving Target

4-59. To engage a target that is moving perpendicular to the gun, the gunner must lead (aim in front of) the target to compensate for the movement. The amount of lead depends on the velocity of the ammunition, target speed, and target angle. Applying the proper lead to a moving target will dramatically increase the chance of getting target effects with the first burst. If the ATGMV and the target are parallel and moving in the same direction, no lead is required. The lateral motion of the projectiles compensates for any lead requirements. If the ATGMV and the moving target are parallel but moving in opposite directions, target lead is required.

TRACER-ON-TARGET METHOD OF ADJUSTMENT

4-60. The tracer-on-target (TOT) method is the easiest method of adjustment for the gunner. The gunner walks the strike of the round onto the target, and then fires a killing burst. TOT is extremely effective against stationary targets. To use the TOT method, the gunner fires an initial burst, observes the strike of the round in relation to the target and fires a second long burst while at once moving the weapon until the rounds impact on the target. He fires a killing burst until the target is destroyed or the command *CEASE FIRE* is given.

TARGET FORM METHOD OF ADJUSTMENT

4-61. Target form is a simple method of adjustment. One form is the visible height or width of the target. Since the target's visible size in width and height differ, the visible height is used to adjust elevation and the visible width is used to adjust azimuth. Target form can be used with all weapons (except TOW). The word form may be added after an announced change, or the change may stand alone if target form is the standard adjustment technique in the unit SOP. Form changes are always given in full or half form increments.

SECTION IV. TOW BUNKER-BUSTER TECHNIQUES

Urban operations present unique and complex challenges to Army forces. The TOW bunker-buster (TOW-BB) missile can defeat field fortifications, bunkers, and urban structures. This missile has added new dimensions to SBCT antiarmor company missions, enabling these units to join the close fight with Infantry.

MISSILE CAPABILITIES AND LIMITATIONS

4-62. The TOW-BB missile system provides the SBCT with an urban warfare weapon for contingency forces. The missile incorporates a fragmenting, high explosive, bulk charge warhead onto the existing, TOW 2A missile airframe. TOW-BB has the launch and flight characteristics and limitations of standard TOW missiles. The missile does have additional limitations based on its use at close proximity to ground mounted Infantry.

CAPABILITIES

4-63. The TOW-BB can be successfully fired from the Stryker ATGM platform over a range of 65 to 3,750 meters. It can be used to support a close tactical Infantry assault against bunkers, field fortifications, and wall structures hardened to a level of 8-inches of double reinforced concrete (DRC) or the equivalent (triple brick).

Note: Two or more missiles may be required to defeat bunkers attacked obliquely, or to create a man-sized entry point in an 8-inch DRC wall.

LIMITATIONS

4-64. The missile can only be fired under armor due to the potential for short round airburst. The missile warhead arms after launch between 35 and 65 meters. The TOW-BB has a 400-meter surface danger zone (SDZ) minimum safety requirement for missile and target debris.

CONSIDERATIONS

4-65. Ground forces need to be informed of the minimum distance they must maintain from the target under attack to avoid fratricide. The battlefield commander and TOW operators must ensure that ground forces near the intended target are down behind reinforced structures. Communication must be maintained between the TOW operators and the ground forces, when permitted, to reduce the probability of fratricide.

DANGER

To reduce the chance of fratricide, friendly forces must remain at least 400 meters from the target under attack. Otherwise, fragments of the warhead could injure or kill them.

The operator must be trained to identify friendly forces using TOW platform systems. Misidentification of friendly forces near the target could result in injury or death.

WALL BREACH

4-66. The TOW BB missile creates an average hole in the concrete of an 8-inch DRC wall (Figure 4-8) of about 22 to 23 inches in diameter. However, for a Soldier to enter the hole while encumbered with assault equipment, it must be at least 48 inches high and 22 inches wide.

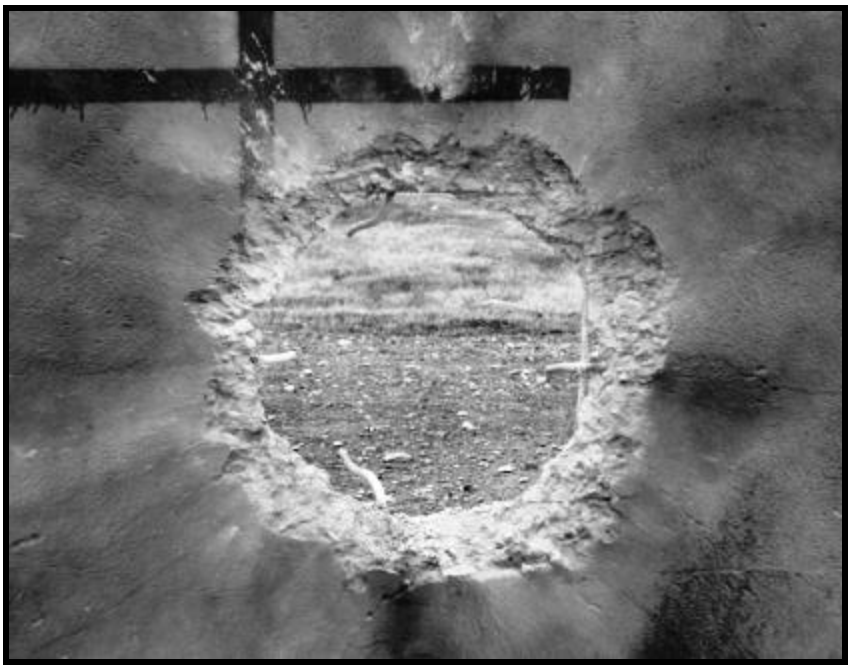


Figure 4-8. Reinforced 8-inch thick concrete wall.

Note: The gunner will need to fire as many shots as needed to enlarge the wall entry hole to these dimensions.

4-67. The following procedure is recommended to create a man-sized breach in a DRC wall in a contemporary urban environment using two TOW-BB missiles (Figures 4-9 through 4-13):

- The gunner identifies the target, places the crosshairs on the center of mass of the target, selects the outboard missile, presses the trigger, and tracks the target until missile impact.
- The gunner selects the inboard missile, places the aim point for the second missile on a point based on the hole created by the first missile. The aim point is 10 inches to the outer diameter of the hole created by the first missile. The 10-inch aim point is based on previous TOW bunker buster missile test firings and MITAS 6-DOF simulation. The gunner may find himself in a "quick draw" scenario or that he cannot distinguish 10 inches off the outer diameter of the side of the original hole. In this case, he aligns the second missile aim point off the outer diameter of the side of the original hole he wants to breach. Then, he presses the trigger and tracks until missile impact.
- To create a larger breach to the left of the first missile hole, the gunner places the MITAS crosshairs 10 inches to the right outer diameter of the original hole. He then presses the trigger and tracks the target until missile impact. The impact should produce a breach hole in the DRC wall large enough for a Soldier to pass through. Missile capability to cut through the double reinforcing rebar grid in the concrete wall depends on the precise location of the missile impact. Some or all of the rebar could remain intact (Figure 4-9).

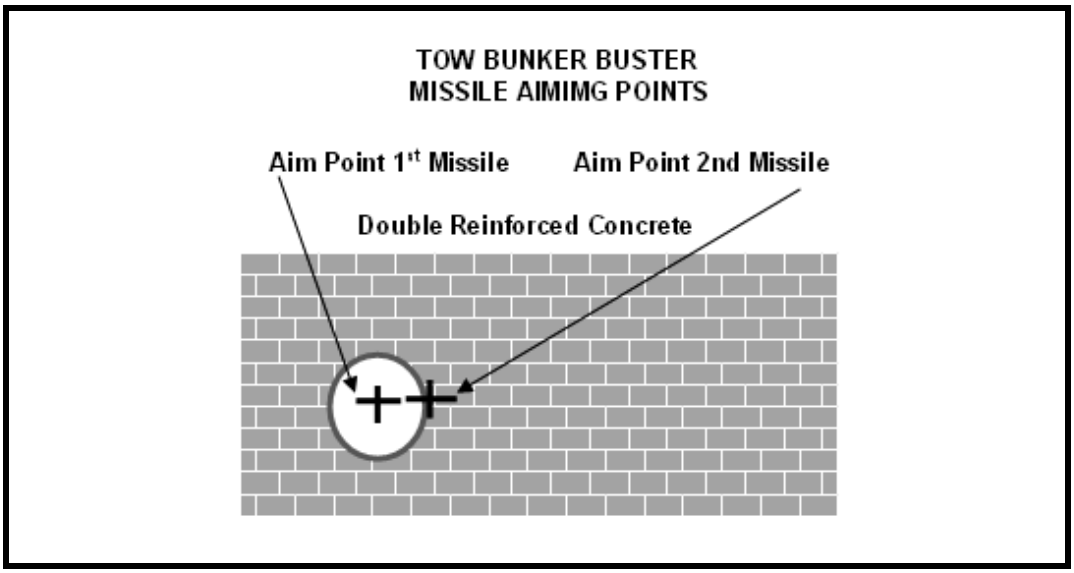


Figure 4-9. Concrete wall with two aiming points.

- The TOW BB provides overmatch against a standard earth and timber bunker (Figure 4-10), with one missile between 65 and 3,750 meters if the bunker were to be attacked frontally. If the bunker were to be attacked obliquely, two missiles are required to ensure defeat (Figure 4-11). The first missile clears the sandbags (Figure 4-12) and the second missile defeats the timber structure (Figure 4-13).

Figure 4-10. Sandbag bunker.

Figure 4-11. Standard earth and timber bunker (frontal).

Figure 4-12. Standard earth and timber bunker (flank), first shot.

Figure 4-13. Standard earth and timber bunker (flank), second shot.

Chapter 5

Conduct of Training

The Stryker ATGMV training program is a comprehensive program. This chapter describes how to assess and plan training (Section I); outlines preliminary (Section II), basic (Section III), and platoon (Section IV) gunnery; and covers training for field tracking (Section IV). Training itself begins with individual Skill Level 1 and progresses through gunner qualification.

Mandatory TOW training and testing support collective squad and platoon level exercises. ATGMV training skill requirements support situational training exercises (STXs) and company external evaluations (EXEVALs). All program requirements follow DA Pam 350–38, *Standards in Training Commission* (often simply called "The STRAC") and individual/collective training tasks available at Reimer Training and Doctrines Digital Library at (www.train.army.mil)

SECTION I. TRAINING ASSESSMENT AND PLANNING

Differences between required and available training resources can affect a unit's ability to meet required standards. Resources and maintenance assistance should be planned and requested well in advance. Nothing should be left to chance. Leaders must adjust their training program to meet the changing needs of the unit. SBCTs deployed in support of Operation Iraqi Freedom (OIF) today are employing TOW weapon systems differently than prescribed in its conventional doctrinal mission of defeating heavy armor threats. Urban warfare has necessitated this TOW mission change. Development of new ATGMV weapons munitions capabilities and the vehicle's use of the mounted M240 machine gun in support of urban terrain ground forces has provided commanders with a more versatile weapon system. Ammunition needed for training and qualifying ATGMV crews on the vehicle mounted M240 machine gun is not STRAC supported. However, the amount of 7.62–mm ammunition STRAC provides for unit M240 machine guns should support ATGMV crew and combined arms training.

LEADER TRAINING

5-1. Light unit platoon leaders focus more on tactical employment than vehicle operations. SBCT leaders are an integral part of the gun crew, so they must be both technically and tactically proficient. Light units have four high mobility, multipurpose wheeled vehicle (HMMWV) TOW weapon carriers to a platoon, two per section. The platoon leader and platoon sergeant usually have cargo type vehicles for transport, and may or may not travel with TOW weapon carriers. SBCT platoons have three ATGMVs per platoon, commanded by the platoon leader, platoon sergeant, and section sergeant. SBCT platoon leaders in an antiarmor company regularly remain with the ATGMV when employing as a platoon or separate from the platoon.

TRAINING OPPORTUNITIES

5-2. The following courses were developed by the Infantry School to train leaders and key personnel en route to SBCT units:

Infantry Precommand Course

5-3. The IPCC course provides instruction for brigade/battalion command designees and SBCT command sergeant major designees on the capabilities, operation, maintenance, and employment of the Stryker family of vehicles and Stryker brigade combat team.

Stryker Leaders' Course

5-4. This course was designed to train leaders for SBCTs. Subjects include–

- Introduction to the SBCT.
- SBCT systems that provide situational awareness.
- SBCT fires and effects.
- SBCT intelligence preparation of the battlefield.
- SBCT deployment and employment.
- SBCT small scale contingency operations.
- SBCT digitization capability (including Army Battle Command Systems [ABCS], and Force XXI battle command brigade and below [FBCB2].

5-5. Course instruction also covers TTP on subjects including integrated combined arms; applying combat power; threat analysis; sniper and squad designated marksman employment; MGS platoon in the urban environment; mounted battle drills; and close quarters marksmanship.

Stryker Master Trainer Course

5-6. This course is designed to train selected noncommissioned officers who assist unit leaders in planning and implementation of Stryker weapon, gunnery, and vehicle maintenance training. The Master Trainer Course trains basic and advanced marksmanship and training management techniques required for SBCT in the following areas:

- Stryker family of vehicle weapon systems training; SBCT weapons training; preliminary gunnery; and target engagement.
- Advanced Infantry marksmanship strategies and skills (AIMSS).

Stryker Transition Course

5-7. This course provides instruction for junior leaders en route to SBCT assignments. Students develop Stryker Remote Weapon Station (RWS) gunnery skills necessary to acquire and defeat threat targets. Subjects include–

- Stryker operation and maintenance.
- Stryker capabilities.
- Communications.
- Safety.
- SBCT and Stryker tactical employment.

Antiarmor Leader's Course

5-8. The AALC courses provide excellent training for SBCT leaders and ICV crews. Precommand and leader course instruction focuses more on tactics with some vehicle training. Stryker operations are limited to introduction and demonstrated fire power exercises. The Transition Course is ICV centric. The Master Trainer Course instructs Stryker systems operations and training sustainment. The four SBCT courses are assignment oriented for new SBCT officers, ICV gunners, and squad leaders. Infantry or antiarmor leaders (11B E6, E7) have some understanding of ATGMV capabilities, characteristics, and system limitations. They also have some tactical use insight. However, they do not generally have the technical skills to train ATGMV crews. Therefore, antiarmor company leaders should be aware of the following:

- AALC target audience varies, including NCOs from sergeant to sergeant first class, and officers from second lieutenant to captain. Light units equipped with ITAS send selected Soldiers for training at the United States Army Infantry School (USAIS). Major commands are responsible for Soldier temporary duty (TDY) funding at AALC.
- SBCT Soldiers attending this course will receive all training common to HMMWV platform mounted and ground mounted ITAS operations, and .50 caliber and MK 19 machine gun operations and employment.

LEADER DEVELOPMENT

5-9. The following is recommended training for antiarmor company leaders (squad/section/and platoon). Commanders should reinforce comprehension of leader tasks during preliminary and basic gunnery through evaluations on the following subjects during advanced gunnery (see appropriate FMs in References):

- FBCB2.
- Communications (crew and higher).
- Operation of leader tactical display.
- Land navigation (digital/map).
- Call for fire.
- Call for close air support (CAS).
- Development and sending of situational reports.
- Soldier training on crew/battle drills.
- Tactical maneuver.
- Weapons control.
- Weapons engagement techniques.

CREW TRAINING

5-10. In the past TOW crewmembers received initial antiarmor training during Advanced Individual Training and were military operational specialty (MOS) classified 11H (antiarmor specialist). Today, 11Bs are performing duties once held by institutionally trained 11Hs. The training that the institutions once provided to lower enlisted antiarmor crewmembers is no longer available. Stryker new equipment training (NET) answered some of the training needs of new ATGMV crewmembers. The NET training support package (TSP) for unit training sustainment should have been left with the trained unit. Units that experience more than normal training turbulence could be revisited by the Stryker NET team and in the interim should submit a request to the Infantry School for an AALC mobile training team (MTT, which is funded by the unit) of TOW antiarmor instructors.

GUNNERY PROGRAM

5-11. The ATGMV gunnery training program is a condensed and unified version of the current TOW gunnery program that consists of three phases (preliminary-basic-advanced). The ATGMV training program mirrors the Infantry squad and platoon training program. (FM 3-22.3 compares this to the ATGMV training program shown in Figure 5-1.) Commanders have more flexibility in planning resources and time by mirroring Infantry squad and platoon planned training for individual/crew certification and qualification, and squad and platoon combined arms STXs. Commanders can evaluate crew and platoon proficiency as ATGMV training progresses from individual training to collective exercises.

5-12. DA PAM 350-38 TOW standards are the same as those applied to light Infantry units equipped with HMMWV mounted TOW-II and ITAS systems. These units perform crew–section–and platoon gunnery exercises, while ATGMV platoons (having only three vehicles per platoon) conduct crew, and platoon gunnery exercises. Current light Infantry units conduct a gunner skills test and gunnery Exercises 1 through 12. SBCT antiarmor company platoons will only conduct an ATGM skills test (AST) and gunnery Exercises 1 through 8 (crew gunnery). DA Pam 350-38 sets the frequency of a unit's training requirements based on its training readiness condition (TRC).

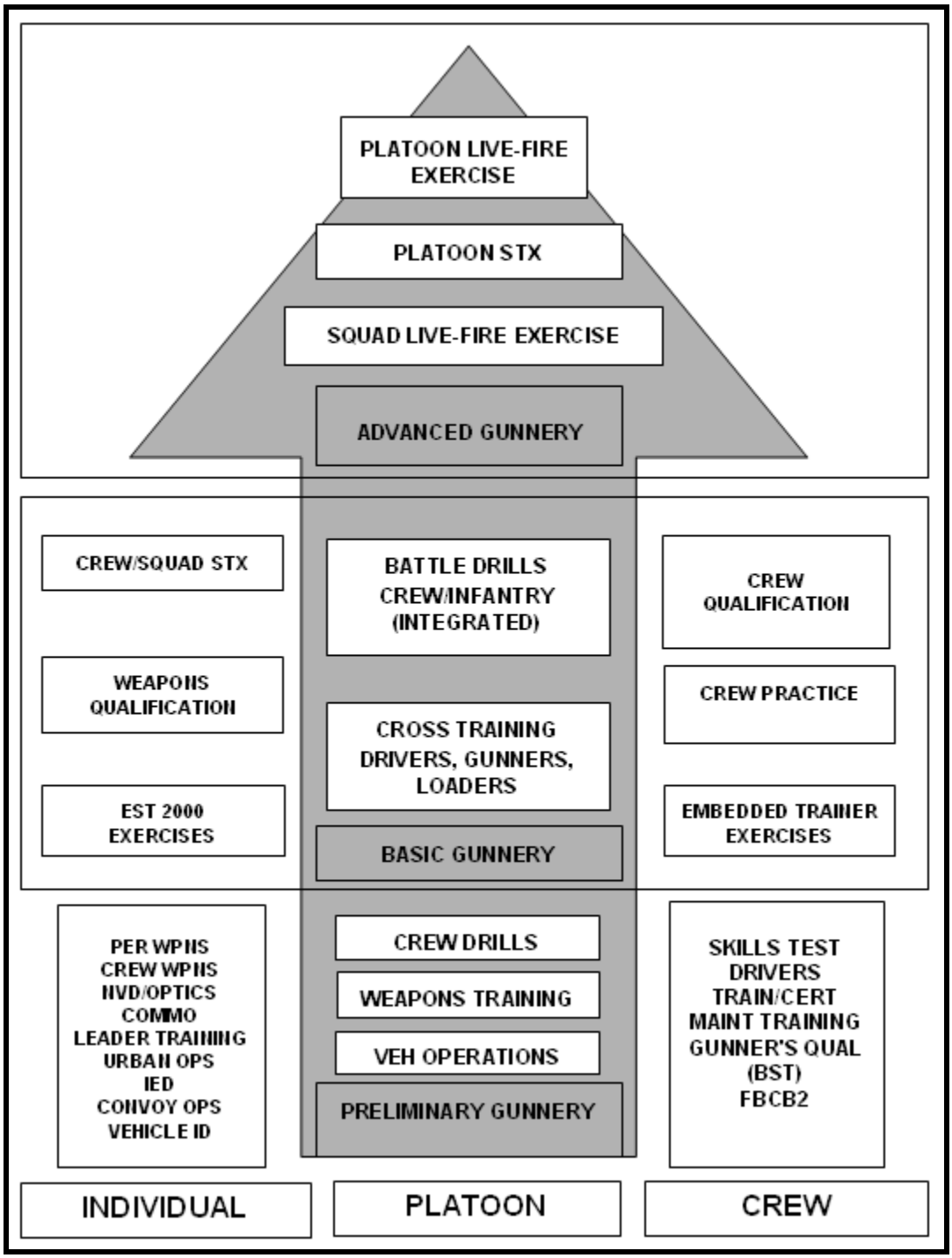


Figure 5-1. ATGMV gunnery training outline.

TOW STANDARDS

5-13. All Soldiers assigned to SBCT antiarmor company ATGMV platoons must meet basic skills trainer (BST) qualification standards and qualify on Exercises 1, 2, 5, and 6 quarterly. All gunners must qualify on Exercises 3 and 4 quarterly. Eighty-five percent of assigned ATGMV platoon members must have qualified on Gunnery Exercise 8 within the six months before qualification (Table 5-1 defines the exercises). TOW

standards are IAW DA PAM 350-38. If the commander's intent is to conduct section gunnery, he should see FM 3-21.91, FM 3-22.34, and FM 3-22.32 for individual, section, and platoon gunnery exercises.

Table 5-1. Gunnery exercises.

Event [2]	*Device*	*Annual Frequency* [1]		
		Active Army	*Reserve*	*Guard*
ATGM Skills Test14	N/A	4	1	1
Exercise 1—Individual Practice	BST	4	1	1
Exercise 2—Individual Qualification	BST	4	1	1
Exercise 3—Advanced Practice	BST	4	1	1
Exercise 4—Advanced Qualification	BST	4	1	1
Exercise 5—A/B-Crew Baseline Practice	TFTT [3]	4	1	1
Exercise 6—A/B-Crew Baseline Qualification	TFTT [3]	4	1	1
Exercise 7—A/B-Crew Qualification Practice	TFTT [3]	2	1	1
Exercise 8—A/B-Crew Qualification	TFTT [3]	2	1	1

[1] Number of times exercises are conducted each year.

[2] A/B means day/night.

[3] TOW Field Tactical Trainer.

5-14. The three levels of training–basic, preliminary, and advanced–are designed to test Soldier, crew, and platoon proficiency at each level before each progresses to the next level. Commanders should schedule platoon STXs to coincide with Infantry. This provides advantages in training by–

- Combining use of training resources.
- Combining mutual use of maneuver space.
- Conducting fire power integration.

SECTION II. PRELIMINARY GUNNERY

Preliminary gunnery consists of continual initial performance testing and equipment/weapons training for all assigned crewmembers prior to basic gunnery. This phase of training is dedicated to developing individual crewmember skills required to operate the vehicle and TOW missile launcher system. Preliminary gunnery should cover, but is not limited to–

- Driver training.
- Gunner training.
- Loader training.
- Trainer orientation and training.

SUBTRAINING LEVELS

5-15. Preliminary gunnery has two subtraining levels, initial training and training evaluation. Initial training encompasses ATGMV crew training and Soldier tasks. Individual training covers all tasks that are performed by a single ATGMV crew man. These tasks include Skill Level 1, 11B Soldier's manual tasks, and individual gunnery. They form the foundation of TOW training. Training evaluation gives the commander insight to unit preparedness prior to squad and platoon collective gunnery exercises.

INITIAL TRAINING

5-16. In his training briefing, the commander should cover Soldier and equipment safety and the unit's mission, and he should introduce the ATGMV. Initial training is performed in stages. Soldiers learn and demonstrate all tasks associated with their assigned positions and crew tasks until the commander is satisfied with training outcomes. Initial training is time consuming, and if not planned well, can cause stand around. Conducting initial training at platoon level is more efficient and will eliminate stand around.

5-17. Training integrity is encouraged, but is not feasible when conducting platoon level initial Soldier training. Training new crewmembers can be accomplished at squad level, but requires more training time. Only one man at a time can be trained at squad level, requiring other members to follow along. This training technique can be improved by involving several soldiers in the training at once. When many are involved in new gunnery training, instruction time is reduced, and instructors are relieved from the frequency of constant repetition. This method relies on a Soldier's ability to retain information, when his turn comes. Whatever method of organized training the commander chooses, the following events should be considered:

- Scheduling new drivers to attend the unit's driver training program. Assigned licensed drivers are not needed during the initial training of gunners and assistant gunners. However, certified unit drivers should assist during new driver training.
- Establish a unit training site. This allows more than one type of training to occur at once. At a minimum, the site should have the following stations:
- Gunner station.
- Loader station.
- M240B machine gun station.
- FBCB2 station.
- Communications station.

TRAINING EVALUATION

5-18. Commanders can evaluate crew proficiency at the individual squad level or at set-up test sites. Training evaluation should occur prior to scheduling basic gunnery. Soldier evaluations should include–

ADVANCED DRIVER TRAINING

5-19. Driver training should include maneuvering in limited visibility conditions and recovery operations (towing or winching). The driver is evaluated on offensive and defensive driving techniques (day/night) on urban terrain and cross-country with–

- Driver hatch open.
- Driver hatch closed.
- Driver vision enhancer.

TOW LAUNCHER OPERATIONS

5-20. TOW launcher operations. This time can be used to conduct ATGM skills test (MITAS/M240). (See Appendix G for ATGM skills test requirements and tasks.)

BASIC SKILLS TRAINER

5-21. The BST (Figure 5-2) is a computer based appended training device that can be installed inside the ATGM vehicle. Its purpose is to train initial entry systems gunner skills training, basic and advanced individual gunnery, sustainment training in the unit, and ATGM gunner qualification. During training, the ATGM gunner station components are disconnected from the tactical system and reconnected to the ATGM BST interface assembly. The interface assembly is then connected to the BST instructor station. Exercises incorporate interactive, three-dimensional simulations of tactical engagements that are designed to train gunners in all aspects of target engagement. The gunner is shown a variety of targets as he scans his

sector of fire. When they appear on the BST screen he is tasked to detect, classify, identify, and choose to engage (or not) as appropriate for the particular exercise. At the end of the exercise, an after-action review (AAR) is conducted. The instructor station provides an objective, numeric scoring of various aspects of gunner performance, such as consistency and accuracy of tracking, sizing of track grates, and engagement timeline. The gunner's official score is displayed in the exercise critique where the instructor/trainer can also enter comments and corrective actions. The instructor station stores the exercise, which can be replayed during the gunner's AAR, or later at the leader's discretion.

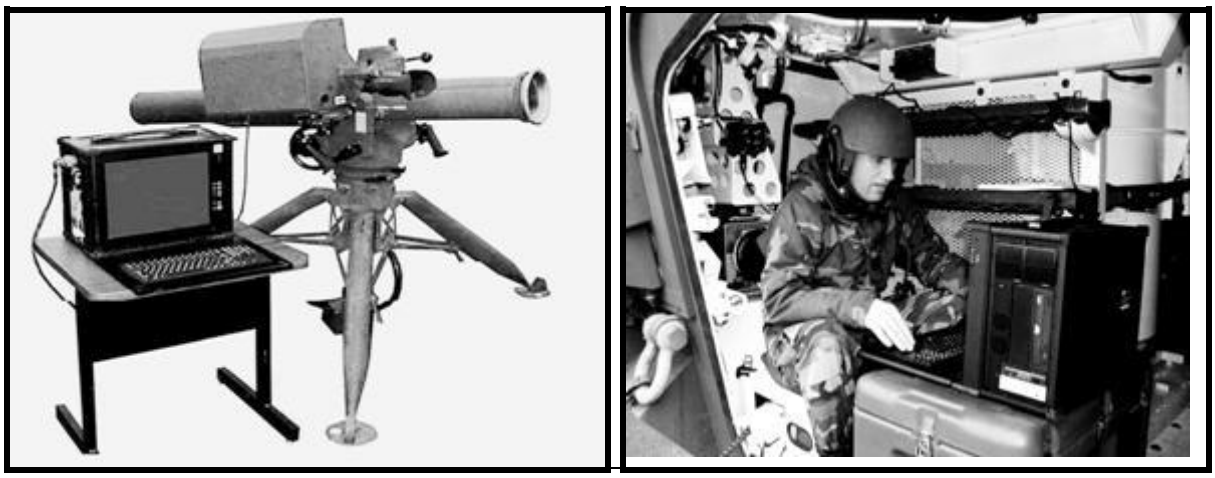


Figure 5-2. Basic Skills Trainer.

CAUTION

Never mount the BST on a moving ATGMV. Assemble and operate it according to the instructions in the BST operator's manual.

LEADER DUTIES

5-22. BST instructor/trainers are usually squad leaders or platoon sergeants. Other members of the crew should be occupied with concurrent training and should not be allowed to watch during conduct of the event.

5-23. The leader should complete at least two years of antiarmor operations training and have received basic skills trainer new equipment training (BST NET) certification. The leader must complete and pass all exercises he will be teaching, so he must be familiar with all exercise details including target positions, types, and overall training objectives.

5-24. The leader must ensure that the gunner understands the training objective for each exercise, and must confirm that the objective is accomplished. He is responsible for monitoring the gunner's ATGM systems operation during each exercise and for critiquing the gunner in an after-action review (AAR). During the AAR, the leader reviews the exercise critique and examines details outlined in the system comments section. During initial or sustainment training, the gunner can repeat a particular exercise as many times as necessary to master his gunnery skills and fully comprehend the training objective. After all exercises in a qualification training exercise are performed and the exercise is passed, the leader is responsible for printing the record for that exercise and storing the hard copy in the gunner's training records.

5-25. Although other crewmembers will test on BST exercises, time and resources must be dedicated to gunner training. Before beginning the event, the vehicle leader should prepare and deliver his briefing to the gunner. He should cover—

- Safety considerations.

- Use of obscuration—tell the gunner the obscuration setting used.
- Sight selection—tell the gunner which sight he will use.
- Special conditions—tell the gunner any special conditions (multiple targets and so forth) that apply.

CONDUCT OF TRAINING

5-26. The trainer begins the exercise when the BST is ready for operation, the gunner is briefed and in place, and a 10-shot plan group has been constructed. Before the trainer starts each mission, he commands the gunner to fire when ready. During the mission, the vehicle leader does not coach the gunner in any way. The vehicle leader must present a fire command to the gunner that clearly states what the gunner must do. For example, if a particular mission involves prioritizing targets (such as tanks are higher priority targets than APCs), the vehicle leader gives the command—

GUNNER! TARGETS TO YOUR FRONT! ENGAGE TANKS FIRST! FIRE WHEN READY!

5-27. In some missions, the task involved may not require specific fire commands. Such tasks could include, determining a target's engageability, engaging evasive/obscured targets, and identifying targets (including friend or foe). When giving fire commands for these missions, the vehicle leader must give clear general instructions such as—

GUNNER! TARGETS TO YOUR FRONT! FIRE WHEN READY!

5-28. The gunner must determine when to fire and at which target. After each mission, the vehicle leader gives the gunner the results and then proceeds to the next mission. The sequence of missions in each 10-shot event should be changed continuously to prevent the gunner from becoming familiar with them.

5-29. The vehicle leader can thoroughly debrief the gunner on his performance at the end of each mission. He may also choose to conduct all ten missions and review them once the firing exercise is complete.

SCORING

5-30. The scoring for each ATGM BST exercise is based on a combination of manual tracking performance, ATT performance, critical gunner errors, and instructor evaluation. The overall numeric score is half manual tracking and half ATT performance. If the gunner misses the target completely or commits a critical gunner error, the overall score is set to zero. The leader directly determines some PASS/FAIL criteria such as the requirement that the gunner scan the entire sector before engaging a target. If appropriate, the leader can also override the BST score to pass or fail the gunner. In that case, the leader must enter a comment on the exercise critique before he can continue training. After each exercise, the leader uses the exercise critique to summarize the engagements in detail.

Manual Tracking Score

5-31. The manual tracking score, 0 to 100, is the percentage of missile flight time during which the gunner maintains ATGM crosshairs on the target center of mass.

Aided Target Tracker Score

5-32. The ATT score is determined by comparing the size, shape, and location of the track gate (when the gunner tries to lock on the target) with the size, shape, and location of the ideal "school" track gate solution for that particular target. The ATT score, 0 to 100, is the percentage of similarity between the school track gate and the last track gate that the gunner locks before missile launch.

Critical Gunner Error

5-33. A system operation error that could potentially endanger the gunner or friendly forces, and that is caused by the gunner, is called a critical gunner error. Such an error could also cause the missile to miss or to fail to kill the target. A gunner who commits a critical gunner error receives a zero on the exercise.

CONDUCT OF EXERCISES

5-34. All initial training, sustainment training, and qualification exercises are to be performed sequentially; none are to be skipped. The exercises progress from very simple to difficult. All exercises are PASS/FAIL. The leader decides whether a gunner passes each exercise, and has the option to override the automatic BST scores.

Initial Training and Sustainment Exercises

5-35. Initial training and sustainment exercises must be completed to the specified standard before advancing to the next exercise. If a gunner fails an exercise, the leader must reiterate the exercise objective and allow him to try it again. A gunner may repeat an initial training or sustainment exercise an unlimited number of times. Initial training exercises give gunners active, hands-on training for target engagement and operating procedures directly related to all other ATGM training received.

Sustainment Training

5-36. Each month crews must perform training on the BST. Commanders may choose from all missions available for this training. They must remember that they are preparing their Soldiers for quarterly gunnery exercises and should, therefore, choose scenarios that train their crews in their weakest skills and engagements areas. Sustainment training exercises are designed to enhanced Soldier skills by offering more advanced and difficult scenarios. Sustainment exercises include scenarios in which Soldiers must make decisions based on training they have received from the initial training exercises and experience gained from using the tactical system. The leader may also allow the Soldier to use initial training exercises for practice in conjunction with sustainment training.

Qualification Exercises

5-37. The qualification exercises are used to qualify gunners on the ATGM system. The exercises are based on easy scenarios that evaluate the gunner's ability to acquire, lock, track, and engage enemy targets according to standard. The gunner should fire qualification exercises only after receiving initial ATGM training; after successfully passing all initial training exercises and after having been designated as a gunner for the ATGM crew. Before he can qualify as an ATGM gunner on the BST, he must earn at least a score of 700 out of 1,000 (the sum of the scores of the ten qualification exercises). He must also pass at least seven of the ten exercises using the ATT. ATGM BST gunners are rated according to their final score as follows:

- Expert (900 to 1,000 points).
- Gunner first class (800 to 899 points).
- Gunner second class (700 to 799 points).

5-38. Gunners who fail to qualify might have to repeat some or all of the initial training exercises at the leader's discretion or be given an alternate qualification event of ten comparable exercises.

SECTION III. BASIC GUNNERY

Basic gunnery is the second level in ATGMV gunnery training. This phase includes basic crew gunnery practice and qualification, crew situational exercises, and battle drills. Because crew tasks are collective, they are not scored based on any individual's ability, but on the overall ability of the crew. If one crewmember fails, the crew fails. Gunnery Exercises 5 and 6 are static gunnery exercises from a baseline. Gunnery Exercises 7 and 8 are moving gunnery exercises where the vehicle moves from point to point and engages a series of targets. These gunnery exercises train and evaluate the ATGMV unit's combat capability.

ORGANIZATION

5-39. Each element has two exercises: a practice training exercise and a qualification exercise for evaluation. Each is performed once during the day and once during the night under simulated, but realistic, battlefield conditions. Point scores for target engagements factor into a combat model that predicts success from target detection to target engagement, based on the type of and range to target. The scores come from

the live fire point calculation sheet. Major or minor crew errors can reduce point scores. The rating is calculated by adding the scores for the day and night phases, then dividing them by two to get an average score.

5-40. During move out scenarios, the commander or representative is normally to the rear of the leader's vehicle for evaluation and training purposes. An assistant evaluator of appropriate rank and experience is normally assigned to each additional vehicle taking part in the same exercise. Evaluators must monitor crew conversations and fire commands.

EXERCISES

5-41. Basic gunnery exercises include Exercise 5, A/B *Crew Baseline Practice*; Exercise 6 -A/B, *Crew Baseline Qualification*; Exercise 7 -A/B, *Crew Movement Practice*; and Exercise 8 -A/B, *Crew Movement Qualification.*

EXERCISE 5--A/B, CREW BASELINE PRACTICE

5-42. Gunnery Exercise 5 reacquaints crews with the TOW field tactical trainer (TFTT, Figure 5-3) and allows them to troubleshoot the equipment. This exercise refreshes crews on TFTT gunnery and target engagement techniques to prepare them for practice and qualification exercises that follow. To complete Gunnery Exercise 5 and progress to Gunnery Exercise 6, the crew must successfully acquire, engage, and destroy six out of ten targets presented in Exercise 5 in both daytime and nighttime.

Figure 5-3. Tow Field Tactical Trainer.

Conduct

5-43. In Gunnery Exercise 5, the system and carriers are set up in static positions on a baseline. A range with pop-up or moving targets equipped with TFTT retro reflectors should be used if available. (Use of MILES harness or LTIDs is optional.) If such a range is not available, tactical vehicles equipped with TFTT retro reflectors may be used. (Use of tactical vehicles equipped with MILES harness or LTIDs is optional.) TOW systems during this gunnery exercise do not move while engaging from the baseline a series of moving and or pop-up targets. Gunnery Exercise 5 is performed twice, once during daylight, and once at night. Some of the engagements are designated as chemical, biological, radiological, nuclear, and high-yield explosives (CBRNE) engagements that are performed with the crew in MOPP4.

Scoring

5-44. To count as a successful engagement, the target must be killed within 30 seconds or less after exposure. Use DA Form 7541-R (Gunnery Exercises 5 and 6, *Baseline TFTT Gunnery Practice and Qualification Scorecard* (Figure 5-4) to record the crew's score—day or night).

ITAS GUNNERY EXERCISE 5 AND 6: BASELINE FTT GUNNERY
For use of this form, see FM 3-22.32; the proponent agency is TRADOC.

☐ PRACTICE ☐ QUALIFICATION

SQUAD:	SECTION:	PLATOON:	COMPANY:
1ST	1ST	1ST	C 3/60 IN

DATE:	TIME:	CHECK ONE
2 MAY 04	1045	☒ DAY ☐ NIGHT

ENGAGEMENT	TARGET DISCRIPTION	HIT / MISS / TIME	GO	NO GO
TARGET 1	STATIONARY TANK / FLANK / 1,000 - 1,500 METERS ± 200M	HIT (circled) TIME: 21 SEC. / MISS	X	
TARGET 2	STATIONARY TANK / FLANK / 2,100 - 3,750 METERS ± 200M	HIT (circled) TIME: 25 SEC. / MISS	X	
TARGET 3	STATIONARY TANK / FRONTAL / 2,100 - 3,750 METERS ± 200M	HIT (circled) TIME: 23 SEC. / MISS	X	
TARGET 4	STATIONARY TANK / DEFILADE / 2,100 - 3,750 METERS ± 200M	HIT (circled) TIME: 24 SEC. / MISS	X	
TARGET 5	STATIONARY TANK / FLANK / 800 - 1,500 METERS ± 200M	HIT TIME: / MISS (circled) 21 SEC.		X
TARGET 6	MOVING TANK / FLANK / L-R, 30 KPH 1,600 - 2,000 METERS ± 200M / NBC	HIT (circled) TIME: 28 SEC. / MISS	X	
TARGET 7	MOVING TANK / FLANK / L-R, 30 KPH 1,600 - 2,000 METERS ± 200M / NBC	HIT (circled) TIME: 26 SEC. / MISS	X	
TARGET 8	MOVING TANK / FLANK / L-R, 5 KPH 1,000 - 1,500 METERS ± 200M	HIT (circled) TIME: 27 SEC. / MISS	X	
TARGET 9	MOVING TANK / FLANK / L-R, 10 KPH 2,100 - 3,750 METERS ± 200M	HIT (circled) TIME: 26 SEC. / MISS	X	
TARGET 10	MOVING TANK / FLANK / L-R, 40 KPH 1,600 - 2,000 METERS ± 200M	HIT (circled) TIME: 23 SEC. / MISS	X	
IN ORDER TO RECEIVE A GO ON ANY TARGET ENGAGEMENT, THE GUNNER MUST HIT THE TARGET WITHIN 30 SECONDS AFTER THE TARGET IS EXPOSED. TO RECEIVE A GO ON EXERCISE 5, THE CREW MUST RECEIVE A GO ON "INSTALL THE FTT" AND A GO ON AT LEAST 6 OUT OF 10 TARGET ENGAGEMENTS, BOTH DAY AND NIGHT.		OVERALL GO / NO GO: 9		

DA FORM 7541-R, JAN 2005 APD V1.00

Figure 5-4. Example completed DA Form 7541-R, *Gunnery Exercise 5 and 6*.

Suggested Support Requirements

5-45. The following support requirements are recommended when conducting Gunnery Exercises 5 through 6:

- Minimum evaluators (evaluators may not help the gunner find or identify targets):
- One evaluator per squad.
- One evaluator in the range tower to record scores on engagements.
- Opposing forces: none.
- Support troops: none.
- Vehicles and communications:
- One radio per squad evaluator.
- Two radios for the tower evaluator (one primary, one spare).
- Two frequencies (one for the tower and squad evaluator and one for the antiarmor squad).
- Maneuver area.
- Multipurpose range complex.
- Route from assembly area to first firing point.

Note: Route should avoid damaging underground wiring.

- Firing area.
- Clear TOW backblast area (75 meters by 90 degrees).
- Use smoke if needed.
- Training aids, devices, and special equipment.
- TFTT system.
- Sufficient TFTT retro reflectors to cover targets (MILES harness and LTIDs optional).
- Ammunition: not applicable.
- Key references.
- FM 3-21.91
- FM 3-22.34
- FM 3-22.32
- Live fire point calculation sheet.

Trainer/Evaluator Guidelines

5-46. Because Gunnery Exercises 5 and 6 are conducted on a multipurpose range complex (MPRC), marking the firing positions may be necessary. At night, the roads must be marked with luminous tape.

EXERCISE 6--A/B, CREW BASELINE QUALIFICATION

5-47. Gunnery Exercise 6 is conducted according to the same conditions and standards as Gunnery Exercise 5. DA Form 7541-R (TOW Gunnery Exercises 5 and 6, *Baseline TFTT Gunnery Practice and Qualification Scorecard*, Figure 5-4, page 5-14) is used to score the exercise.

EXERCISE 7—A/B, CREW QUALIFICATION PRACTICE

5-48. This exercise trains the ATGMV crew to engage stationary and moving targets in simulated battlefield scenarios. It prepares the ATGMV crew for Gunnery Exercise 8, *Crew Qualification*, by presenting engagement scenarios and task requirements similar to those for evaluation.

Conduct

5-49. All firings should be from the hull-down position. Reloading procedures should be executed from a defilade position, if available. All stationary targets should be mounted on pop-up mechanisms to facilitate

target acquisition and scoring. If pop-up mechanisms are not available, exposed stationary targets will be placed in an appropriate array. If exposed targets must be used, the exercise should be designed so that targets are presented only to the position from which they should be engaged. Moving targets should be presented at speeds from 5 to 40 kilometers per hour.

Scoring

5-50. The crew is rated based on the total point score. For scoring gunnery, time will start for the first target when the target is raised and will stop when the target is hit. Time for the second target begins when the vehicle reoccupies the firing position. Time ends when the target is hit. DA Form 7542-R (Gunnery Exercise 7, *Squad Gunnery Practice*, Figure 5-5) will be used to record scores. (The scoring process is the same for Exercises 7 through 12.)

TOW GUNNERY TABLE 7: SQUAD GUNNERY PRACTICE

For use of this form, see FM 3-22.34. The proponent agency is TRADOC.

TC: SSG MARK LDR: _____ GNR: SPC ERICKSON DVR: SPC MAXWELL DATE: 5 AUG 03 TIME: 1645

PLATOON: 2D COMPANY: B BATTALION: 2/2 IN. LAB

TASK	CONDITIONS/ TARGETS/ SITUATION	TOTAL TARGET EXPOSURE TIME	HITS	ENGAGEMENT TIMES	POINTS	CREW/ LDR CUTS	TOTAL POINTS
1. ENGAGE A SINGLE TARGET	FIRED FROM BASELINE. 3,000 - 3,750 METERS 1 STATIONARY TANK	TFTT 25 SECS ALL VEHICLES	①	ST TK-17	92		92
2. ENGAGE MULTIPLE TARGETS	FIRED FROM PHASE LINE 2. 2,000 - 2,500 METERS 1 - ST TANK, 1 - MV TANK, 1 - MV BMP	TFTT HMMWV/2:30	① ② ③	ST TK-18 MV TK-40 MV BMP-35	86 83 24		64
3. ENGAGE MULTIPLE TARGETS	FIRED FROM PHASE LINE 3. 2,500 - 3,000 METERS 1 - MV TANK, 1 - ST BMP	TFTT HMMWV/1:40	① ②	ST TK-0 ST BMP-18	0 86	-5 IMPROPER FIRE COMMAND	38
4. ENGAGE MULTIPLE TARGETS	FIRED FROM PHASE LINE 2. 2,500 - 3,000 METERS 1 ST TANK, 1 - MV TANK (NBC)	TFTT HMMWV/1:40	① ②	ST TK-18 MV TK-34	86 94		90
5. ENGAGE MULTIPLE TARGETS	FIRED FROM BASELINE. 2,500 - 3,000 METERS 1 - MV TANK, 1 - MV BMP (NBC)	TFTT HMMWV/1:40	① ②	MV TK-34 MV BMP-18	94 86		60

TOTAL SCORE 344

NOTES:

1. ENGAGEMENT TIMES ARE CALCULATED FROM THE TIME THE TARGET IS EXPOSED TO THE TIME THE TARGET IS HIT. USE THE LIVE-FIRE POINT CALCULATION SHEET FOR SECOND AND THIRD ENGAGEMENTS FROM THE SAME POSITION. THE TIME BEGINS WHEN THE VEHICLE REOCCUPIES ITS FIRING POSITION (STOPS MOVING) AND ENDS WHEN THE TARGET IS HIT.
2. EACH TASK IS WORTH 100 POINTS. EACH TARGET IS ALSO WORTH 100 POINTS FOR TASKS WITH MULTIPLE ENGAGEMENTS. TOTAL THE NUMBER OF POINTS AND DIVIDE BY THE NUMBER OF TARGETS PRESENTED.
3. CREW/LEADER CUTS: SEE FM 3-22.34, CH 4.
4. SCORING TABLE 7: TABLE 7 IS PERFORMED TWICE, ONCE DURING THE DAY AND ONCE AT NIGHT. EACH EVENT IS WORTH A MAX OF 500 POINTS. ADD THE TWO SCORES TOGETHER FOR A POSSIBLE TOTAL OF 1,000 POINTS. SQUADS MUST ACHIEVE A MINIMUM TOTAL OF 700 POINTS TO VERIFY ON TABLE 7 AND PROGRESS TO TABLE 8.

EXAMPLE

DA FORM 7336-R, AUG 2003 APD V1.00

Figure 5-5. Example completed DA Form 7542-R, *Gunnery Exercise 7*.

Time

5-51. For ranges that have no hull down firing positions or positions that offer full defilade, add the time delay that would result if the crew moved from a hull down position to a defilade, reloaded, and then moved back into a hull down position before they conducted a second engagement.

Tasks

5-52. The exercise consists of five tasks. Each task consists of one or more target engagements from one firing position. Each target engagement is worth a maximum of 100 points. The point score is determined by the time taken to kill the target using the live fire point calculation sheet. Each task is also worth a maximum of 100 possible points. This score is calculated by adding the scores for all engagements made during the task and dividing by the number of targets engaged. For example, three targets were engaged. The scores were 75, 82, and 93 for a total of 250 points divided by 3 (the number of targets presented). The total task score is 81 points.

Day/Night

5-53. Each exercise is performed once during the day and once at night. Scoring for day engagements are made by the evaluator in the range tower. Scoring for night engagements are made by both evaluators. Scores of the two events are added together for a maximum possible score of 1,000 points. This is the final score for the gunnery exercise.

Scoring Infractions

5-54. Evaluators will deduct points from the overall point score for the following crew errors:

Major

5-55. Deduct 30-points each for–

- Failing to be in MOPP4 and closing all hatches during CBRNE engagements.
- Engaging friendly targets (if friendly targets are presented).

Minor

5-56. Deduct 5-points each for–

- Giving improper fire commands.
- Firing before receiving command to fire.
- Incorrect engagement techniques (such as engaging the least dangerous threat target before the most dangerous target).
- Failing to give SITREPs to higher.

EXERCISE 8—A/B, CREW QUALIFICATION

5-57. The ATGMV training and gunnery program is based on SBCT antiarmor company platoon assets. It focuses on individual, crew, and platoon proficiency. Gunnery Exercise 8 evaluates the ATGMV crew on its ability to engage stationary and moving targets in the simulated battlefield scenario. The conduct, scoring, suggested support requirements, and trainer evaluator guidelines are the same as for Gunnery Exercise 7. The crew's scores will be recorded on DRAFT DA Form 7543-R, (Gunnery Exercise 8, *TOW Squad Gunnery Qualification*, Figure 5-6). Antiarmor company platoons have three ATGMVs. Light antiarmor company platoons have four HMMWV mounted TOW systems. If the commander's intent is to conduct crew, sections, and platoon gunnery, see the applicable TOW references. FM 3-22.32 and FM 3-22.34 have individual, section, and platoon gunnery exercises. FM 3-21.91 contains TOW vehicle section deployment.

TOW GUNNERY TABLE 8: SQUAD GUNNERY QUALIFICATION

For use of this form, see FM 3-22.34. The proponent agency is TRADOC.

TC: SSG MAXWELL LDR: _____ GNR: SPC COOK DVR: PFC ASHLEY DATE: 6 AUG 03 TIME: 1945

PLATOON: 1 ST COMPANY: D BATTALION: 1/502 IN

TASK	CONDITIONS/ TARGETS/ SITUATION	TOTAL TARGET EXPOSURE TIME	HITS	ENGAGEMENT TIMES	POINTS	CREW/ LDR CUTS	TOTAL POINTS
1. ENGAGE A SINGLE TARGET	FIRED FROM BASELINE. 1,500 - 2,000 METERS 1 STATIONARY TANK	TFTT 25 SECS ALL VEHICLES	①	ST TK - 20	74		74
2. ENGAGE MULTIPLE TARGETS	FIRED FROM PHASE LINE 1. 2,000 - 2,500 METERS 1 - MV TANK, 1 - ST BMP	TFTT HMMWV/1:40	① ②	MV TK - 34 ST BMP - 18	94 86		90
3. ENGAGE MULTIPLE TARGETS	FIRED FROM PHASE LINE 2. 3,000 - 3,750 METERS 2 - MV TANK, 1 - ST BMP	TFTT HMMWV/2:45	① ② 3	MV TK - 30 MV TK - 25 ST BMP - 0	96 98 0	-5 IMPROPER FIRE COMMAND	60
4. ENGAGE MULTIPLE TARGETS	FIRED FROM PHASE LINE 1. 1,500 - 2,000 METERS 1 - ST TANK, 1 - MV TANK (NBC)	TFTT HMMWV/1:40	② ③	ST TK - 20 MV BMP - 19	74 84		79
5. ENGAGE MULTIPLE TARGETS	FIRED FROM BASELINE. 2,500 - 3,000 METERS 1 - MV TANK, 1 - MV BMP (NBC)	TFTT HMMWV/1:40	① ②	MV TK - 34 MV BMP - 18	94 86	-5 IMPROPER FIRE COMMAND	85
					TOTAL SCORE		388

NOTES:

1. TABLE 8 IS CONDUCTED AND TIMED IN EXACTLY THE SAME MANNER AS TABLE 7.
2. TABLE 8, UNLIKE TABLE 7, IS FOR QUALIFICATION. THE SQUAD IS RATED ON ITS FINAL SCORE, RATHER THAN SIMPLY HAVING TO MEET A MINIMUM STANDARD.
3. CREW/LEADER CUTS: SEE FM 3-22.34, CH 4.
4. SCORING TABLE 8: TABLE 8 IS PERFORMED TWICE, ONCE DURING THE DAY AND ONCE AT NIGHT. EACH EVENT IS WORTH A MAX OF 500 POINTS. ADD THE TWO SCORES TOGETHER FOR A POSSIBLE TOTAL OF 1,000 POINTS. SQUADS ARE RATED ON THE FOLLOWING BASIS:

DISTINGUISHED: 900 - 1,000 POINTS SUPERIOR: 800 - 899 POINTS QUALIFIED: 700 - 799 POINTS UNQUALIFIED: 0 - 699 POINTS

DA FORM 7337-R, AUG 2003 APD V1.00

Figure 5-6. Example completed DA Form 7543-R, *Gunnery Exercise 8*.

SECTION IV. PLATOON GUNNERY

The third level of the ATGMV Gunnery Training Outline is platoon level situational training exercises (STXs). These exercises will train and evaluate the ATGMV unit's combat capability and vehicle movements from point to point while engaging a series of course targets. Commanders are encouraged to develop scenarios that challenge leader command and control of TOW fires and supporting fires; TOW pure—and as part of combined forces that support ground elements. Platoon collective tasks link directly to platoon operations in ARTEP 7-5 MTP and to the combat drills in FM 3-21.91 and ARTEP 7-91 Drill. The commander selects and develops tactical operations based on his METL and on the contingency AO. He uses MTP T&EOs to assess overall performance.

EXERCISES

5-58. Stryker ATGMV Platoons will conduct two training exercises: platoon practice and platoon evaluation. The MTP and platoon gunnery exercises establish a standard for training and evaluation for Stryker ATGMV platoons. At the same time, they allow unit commanders to tailor tactical and gunnery tasks based on their particular missions and training emphasis. This section identifies the training requirements needed to support the platoon collective tasks IAW with the MTP. Units determine specific threat target types and engagement distances or range bands.

PLATOON PRACTICE

5-59. This exercise trains the ATGMV platoon to control fire and distribution. It contains offensive and defensive engagements in simulated battlefield scenarios. The platoon practice exercise prepares the ATGMV platoon for the evaluation exercise by presenting engagement scenarios and task requirements similar to those for platoon evaluation.

Conduct

5-60. All firings should be from the hull-down position. Reloading procedures should be executed from a defilade position, if available. All stationary targets should be mounted on pop-up mechanisms to facilitate target acquisition and scoring. If pop-up mechanisms are not available, exposed stationary targets will be placed in an appropriate array. If exposed targets must be used, the exercise should be designed so that targets are presented only to the position from which they should be engaged. Moving targets should be presented at speeds from 5 to 40 kilometers per hour.

Scoring

5-61. The platoon will be scored on the platoon practice exercise and the platoon evaluation exercise. Each exercise is performed once during the day and once during the night under realistic (simulated) battlefield conditions. Point scores for target engagements are factored into a combat model that predicts success based on the time from target detection to target engagement, type of target, and range to target. Point scores are also affected by major or minor crew errors that can reduce the point score for a target engagement. The actual rating is calculated by adding the scores from both day and night phases, then dividing them by two to get an average score. The commander then assesses the results of all evaluated collective tasks and rates the platoon "T" (trained), "P" (needs practice), or "U" (untrained).

5-62. During movement scenarios, the commander or his representative is normally to the rear of the platoon leader’s vehicle for evaluation and training purposes. An assistant evaluator of appropriate rank and experience is normally assigned to each additional vehicle that takes place in the exercise. Evaluators must monitor crew conversations and fire commands. Deductions are also made when a major or minor crew error or a platoon leader error is made.

Infractions

5-63. Evaluators deduct points from the overall point score for the following crew/platoon errors:

- Minor infractions; deduct 10-points each for—
- Giving improper fire commands
- Firing before receiving command to fire.
- Incorrect engagement techniques (such as engaging the least dangerous threat target before the most dangerous target).
- Failing to give SITREPs to higher.
- Major infractions; deduct 30-points each for—
- Failing to be in MOPP4 and closing all hatches during CBRNE engagements.
- Engaging friendly targets (if friendly targets are presented).
- Failing to properly distribute and control platoon fires.

Note: Commanders are encouraged to add mission essential tasks that require leader decisions during offensive and defensive platoon fires. Some examples would be calling for CAS, use of indirect fires, and conducting casualty evacuation.

Suggested Support Requirements

5-64. The following support requirements are recommended when conducting Platoon Practice and Platoon Evaluation Exercises. Key references are FMs 3-21.91, 3-22.32, 3-22.34, ARTEP 7-5 MTP, and ARTEP 7-91 Drills, plus a point calculation sheet created by the unit:

- Minimum evaluators (evaluators may not help the gunner find or identify targets):
- One evaluator per platoon (IAW commander's intent).
- Two evaluators in the range tower to record scores on engagements.
- Opposing forces: TBD.
- Support troops: TBD.
- Vehicles and communications:
- One radio per platoon, section, and squad evaluator.
- Two radios for the tower evaluator (one primary, one spare).
- Two frequencies (one for the tower and platoon evaluator and one for the antiarmor platoon).
- One radio for OPFOR, if available.
- Maneuver area:
- Multipurpose range complex (If not available, an LTA may be used.)
- Urban training site, if available.
- A route for the element to move from the assembly area to the first firing point without damaging the underground wiring.
- Firing area:
- Clear the TOW backblast area (75 meters by 90 degrees).
- You may use smoke.
- Training aids, devices, and special equipment:
- TFTT system.
- Obtain sufficient TFTT retro reflectors to cover the targets.
- Use MILES harness and LTIDs if desired.

Trainer and Evaluator Guidelines

5-65. Because both platoon exercises may be conducted on an MPRC or urban training site, marking the firing positions may be necessary. At night, the roads must be marked with luminous tape.

PLATOON EVALUATION

5-66. Platoon evaluation evaluates the ATGMV platoon on controlling fire and distribution. It contains offensive and defensive engagements in a simulated battlefield scenario. The conduct, scoring, suggested support requirements, and trainer/evaluator guidelines are the same as platoon practice.

SECTION V. FIELD TRACKING

Field tracking (or tracking in a field environment) provides practice and experience in tracking uncooperative targets and should be performed in conjunction with FTXs and LFXs. Though excluded from the required ATGMV gunnery exercises, field tracking is useful in preparing for them—especially Exercises 7 and 8. Other tactical employment tasks, such as occupying a firing position or completing a range card, should be performed at the same time. Careful planning by unit commanders will result in effective training that makes the best use of time, equipment, and personnel.

RESOURCES REQUIRED

5-67. The tracking range should include an area more than 3,000 meters deep and at least 500 meters wide with hills and valleys, dead space, covered terrain, and urban terrain (if available). Battlefield target conditions should be simulated as follows:

VARIED TARGETS

5-68. Commanders should employ a variety of tanks, APCs, and other tactical vehicles to include urban type conveyances (cars and small trucks). Commanders should also employ a variety of personnel targets (half size and full size) of enemy and friendly targets. Many training installations now have various types of actual threat vehicles. These vehicles should be used when possible.

TARGET BEHAVIOR

5-69. Target vehicles should behave as much like real enemy vehicles on the battlefield as possible. Vehicles should change directions constantly and quickly. They should back up (for short distances as is common) and should vary their speed. They should move within the gunner's sight picture from left to right, top to bottom, and bottom to top. In addition, they should move at angles to and from the weapon position, and directly toward and away from the weapon.

- Gunners should see tanks, APCs, and truck type targets in full and partial frontal, flank, and rear exposures.
- Gunners must engage vehicle targets at all ranges with the day TV and night vision sight. To do so, they must be able to determine if a target is in range. Targets should move in and out of range so gunners can gain experience in target range determination.
- Armored vehicles should limit their exposure by moving quickly from one covered area to another to escape TOW fires. The vehicle leader must direct the gunner to acquire and fire at the target while it is exposed. Field tracking reduces target vehicle exposure time to a minimum by having targets use covered areas during halts. This gives the gunner experience in tracking targets that disappear and reappear.

PERSONNEL TARGETS

5-70. Gunners should see enemy personnel targets on open terrain at 100 to 1,000 meters, stationary and moving.

- Gunners should receive fire from building rooftops and windows. Targets should limit their exposure by randomly popping up and down inside of windows and on top of rooftops to simulate covered area movement (in escape of M240 machine gun fire).
- Gunners should engage targets at all ranges with M240 iron sights and thermal sights or night vision devices.
- Leaders should assist gunners in locating enemy personnel targets using laser aiming devices.

FIELD CONDITIONS

5-71. Field tracking should be performed under conditions that normally occur on the battlefield. These conditions include limited visibility caused by darkness, smoke, or fog; the discomfort of MOPP gear; and the noise and distraction caused by indirect and small arms fire around the firing positions. Battlefield tracking conditions should be simulated as follows:

REDUCED VISIBILITY

5-72. The TOW crewmembers should train to engage targets during reduced visibility conditions using the daysight tracker and nightsight. Training should be conducted with the day TV during daylight and the NVS at night (and during other limited visibility conditions). The night vision system is a thermal sight, ***not*** just a nightsight. It offers many advantages in searching for and tracking targets in all kinds of weather and at any time of day. The thermal sight should be used extensively in conjunction with the day TV to

maximize the system's abilities. Smoke should be applied to test gunner and leader reactions when switching from day to thermal sights, and to test vehicle leaders' use of machine gun thermal sights when controlling platoon fires.

REACTION TO CBRNE

5-73. Enemy capabilities include the use of nuclear, biological, and chemical (NBC) munitions. These munitions may not affect the weapon, but a gunner's ability to track will be degraded if he has never tracked while wearing a protective mask and protective clothing. Training is more realistic when the entire crew wears protective masks and clothing during part of the field tracking exercises.

COMBAT DISTRACTERS

5-74. The enemy will try to suppress TOW fires with direct and indirect fires. A gunner's ability to keep the sight crosshairs on a target may be affected (flinching) under these conditions, especially if he has not been properly trained. Distracters should, therefore, be used in training to accustom gunners to such conditions. Grenade and artillery simulators are effective distracters. Small arms fire can also be expected, but gunners should not be seriously distracted by its noise. Therefore, the simulation of small arms fire is not required.

5-75. Distracter effects will cause gunners to flinch more often when firing from an open platform system than from a closed platform system.

TRAINING AIDS

5-76. If facilities and equipment are not available to conduct a field tracking exercise, gunners should be allowed to track any uncooperative targets such as military or civilian vehicles traveling on a nearby highway. Any means available should be used to give gunners moving target tracking practice. This can be done often in any location that has vehicle traffic. TOW crews must also be proficient in combat vehicle identification to gain the most benefit from field tracking. Combat vehicle identification skills have been standardized in GTA 17-02-011, *Combat Vehicle Identification Cards*. The front side of each card shows the vehicle in color in one or more of three positions: front, oblique right, or oblique left. The back describes the vehicle. These cards provide sustainment training for vehicle recognition and may be used by Soldiers of all military occupational specialties. Also, a model set of armored vehicles (BVCT 17-102), is used to train Soldiers on armored vehicle recognition.

Chapter 6

Transportation

The ATGMV is transportable by rail, air, sea, and road. It has suitable tie down and lifting points integral to the chassis. These points are reinforced to permit loading and securing for transportation by alternate methods. Stencils identify the location and use of tie downs and lifting points. FM 4-01.011, *Unit Movement Operations*, provides guidelines for conducting air, land, and sea movements.

SECTION I. MILITARY TRANSPORTATION

FM 4-01.011 provides guidelines for conducting air, land, and sea movements. This section describes preparation, execution, and departure of the ATGMV for and from transport vessels.

UNIT PREPARATIONS

6-1. Stryker technical manuals and Stryker related field manuals have sections and chapters covering forms of transportation and how to prepare Strykers for air, land, and sea transport. A Stryker pocket guide and performance worksheet, "Vehicle Transport Information", is provided in each copy of the Stryker technical manual; another means a leader has of ensuring vehicles are ready for transport.

UNIT LOAD TEAMS

6-2. Each unit is required to have an appropriate number of personnel trained in vehicle preparation and aircraft, rail, and truck loading/unloading techniques. Specific skills required include—

- Preparing and activating vehicle load plans.
- Preparing vehicles for shipment (purging, protecting fragile components, weighing, and marking for movement).
- Executing aircraft, truck, and railcar tie down procedures.
- Loading and unloading unit vehicles on and off aircraft, trucks, and railcars.
- Palletizing cargo on 463L pallets (see FM 3-35.4).

6-3. Load team composition is tailored to type and quantity of equipment to be loaded and the time available for loading. In general-—

- For rail movement, a well trained team of five operators, using prefabricated tie down devices, can complete loading of equipment on a flatcar in about 15 minutes.
- For air movement, a six person team can provide efficient loading and tie down of equipment.

6-4. There are many references available for help and direction on the loading of equipment. Some of these include Department of Defense (DOD) Military Standards (MIL-STDs) 209, 669, 810, 814, 910, 913, and 1791.

RESPONSIBILITIES

6-5. The commander ensures that all equipment is ready for deployment. This is a time consuming process because a myriad of requirements must be addressed, among them the type of equipment being moved, to where it is being moved, and how it is being moved.

6-6. The installation is responsible to procure and store blocking, bracing, packing, crating, and tie down material. Vessel captains provide tie down chains for their ships. The Air Force normally provides tie down

chains for equipment moved on its aircraft. Therefore, it is imperative that the unit determine its needs and convey them via chain of command to the appropriate support agency.

UNIT MOVEMENT OPERATIONS SOP

6-7. Figure 6-1 provides ideas, data, and a template for the deployment of a unit movement SOP, and is not intended to be all inclusive, rather it intends to identify those things that a unit must consider and plan for when preparing for deployment. Use only those items that apply.

STANDING OPERATING PROCEDURES

Unit Movement Operations

_____

Unit

1. **APPLICATION:** Identify operations that are applicable to this SOP.

2. **PURPOSE:** Define the purpose of this SOP and how it will be used to support movement operations within the unit.

3. **REFERENCES:** Identify any FMs, TMs and any higher headquarters SOPs that may be applicable to developing your unit's SOP.

4. **RESPONSIBILITY FOR PREPARATION, CHANGES, and REVISIONS:** Identify the section or individual responsible for preparation of this SOP and to whom recommended changes or revisions should be routed.

5. **EFFECTIVE DATE:**

6. **MOTOR MOVEMENT:**

   a. Vehicles. Preparation for movement.

   b. Motor marches.

      (1) Strip maps.

      (2) Route reconnaissance.

      (3) Messing and refueling.

      (4) Night marches.

      (5) Makeup of march units and serials.

      (6) Vehicle gap.

      (7) Speed and rate of march.

         (a) Column rate of march.

         (b) Lead vehicle speed.

         (c) Permissible catch-up speed.

         (d) March unit or serial time length.

      (8) Posting traffic guards during halt.

Figure 6-1. Unit movement operations SOP.

c. Infiltration.

d. Personnel. Conduct during movement.

(1) Passengers.

(2) Drivers.

7. **VEHICLE AND EQUIPMENT OPERATIONS:**

a. Motorpool.

(1) Dispatch.

(2) Service.

(3) Maintenance.

b. Administrative vehicles. Regulations.

8. **RAIL MOVEMENT:**

a. S-1 Action. Movement policy.

b. S-2 Action.

(1) Reconnaissance report.

(2) Security.

c. S-3 Action.

(1) Troop list.

(2) Rail guards.

(3) Transportation movement teams.

d. S-4 or UMO Action.

(1) Transportation request.

(2) Troop and guard mess.

(3) Blocking and dunnage.

(4) Shipping documents.

(5) Rolling stock.

(6) Loading schedules and area.

(7) Load teams.

9. **AIR MOVEMENT:**

a. S-1 Action.

b. S-2 Action.

c. S-3 Action.

(1) Aircraft required.

(2) Drivers.

(3) Loading schedule and areas.

(4) Air transportability technique.

Figure 6-1. Unit movement operations SOP (continued).

d. S-4 or Unit Maintenance Officer (UMO) Action.
   (1) Transportation request.
   (2) Availability of tie down devices or material.
   (3) Equipment weight data for loading computation.
   (4) Shipping documents.
   (5) Vehicles required to load and unload aircraft.
   (6) Load plans.
   (7) Passenger manifests.
   (8) Cargo manifests.
   (9) Loading teams.
   (10) Marshaling area actions.
   (11) Alert holding area actions.
   (12) Loading ramp area actions.
   (13) Actions at the aerial port of debarkation (APOD).

10. **WATER MOVEMENT:**

a. S-1 Action. Movement policy.
b. S-2 Action.
   (1) Reconnaissance report.
   (2) Security.
c. S-3 Action.
   (1) Troop list.
   (2) Loading plan.
   (3) Supercargoes.
d. S-4 or UMO Action.
   (1) Transportation request.
   (2) Troop mess.
   (3) Shipping documents.
   (4) Vessels required.
   (5) Loading schedule and area.
   (6) Passenger manifests.
   (7) Cargo manifests.
   (8) Marshaling area actions.
   (9) Staging area actions.
   (10) Actions at the seaport of debarkation.

Figure 6-1. Unit movement operations SOP (continued).

SECTION II. MOVEMENT BY MODE

Commanders and leaders must ensure all prerequisites are strictly followed during transport operations. Loading and unloading transport vessels leaves little room for mistakes. Soldiers must practice as often as possible, develop or request mock-ups, and ensure preparing for movement is a unit mission essential task.

RAIL MOVEMENT

6-8. Responsibility for planning and executing rail movements is split between the unit and the installation transportation officer (ITO). The unit determines movement requirements and submits them to the brigade movement coordinator (BMC). The BMC validates and consolidates the movement requirements prior to forwarding them to the supporting unit movement coordinator (UMC).

PREPARATION

6-9. Units are responsible for preparing their equipment for rail loading. This includes packing, crating, banding, and blocking and bracing secondary loads. Units are also responsible for actual loading and tie down of all equipment loaded. Units load railcars under the technical supervision of the UMC. Units can generate automated rail load plans using TC-AIMS II (https://www.tis.army.mil). The ITO and the railway agent are ultimately responsible for approving all rail loads.

FLATCARS

6-10. The preferred types of flatcars for unit moves are chain equipped flatcars. These flatcars usually reduce the need for blocking and bracing material and reduce loading times and line haul transportation costs. Flatcars without side rails are easier to load and wider vehicles more easily accommodated.

CIRCUS METHOD

6-11. The most common and expeditious method of loading vehicles on flatcars is the circus method. This method uses flatcars as a roadbed with spanners placed between cars.

PLANNING GUIDANCE

6-12. After the loading sequence for the trail has been determined, the vehicles are staged in order. All vehicles are loaded onto the rearmost car and moved forward to their assigned locations. The following is general rail movement planning guidance for units:

- Fill equipment with fuel to capacities as directed.
- Do not load ammunition and fuel, other than fuel already in the vehicle fuel tanks, together on any unit vehicle of a rail movement.
- Place warning placards on all sides of hazardous cargo loads. Do not stencil permanent placards on vehicles.
- Load unit equipment in organic vehicles as much as possible. Secure equipment loads properly.
- Lock and seal sensitive arms, ammunition, and explosives in approved security containers. If railcar design permits, place security containers door-to-door to prevent unauthorized access to sensitive material. If containers doors do not match, place an empty container against the loaded container to ensure there is a door-to-door match.
- Do not cover headlights, windshields, or mirrors with tape.
- At the railhead, an officer is appointed to oversee rail loading operations. The railcar loading site includes a medical aid station and should include command and control facilities, warming tents and other needed life support services.

AIR MOVEMENT

6-13. The Army and Air Force reached an agreement enabling the Stryker family of vehicles to be deployed via the military's three major transport aircraft.

PREREQUISITES

6-14. Commanders and leaders must ensure all US Air Force prerequisites are strictly adhered to when conducting air transport operations.

GUIDANCE

6-15. Loading aircraft leaves little room for mistakes.

- Practice as often as possible.
- Develop or request aircraft mock-ups.
- Add, "preparing for air movement" to the unit METL.

6-16. Air Force crews responsible for airlift of the Stryker family of vehicles will ensure Soldiers are aware of emergency evacuation procedures prior to loading the aircraft and before liftoff.

- Air crewmen must prepare the aircraft before any vehicle or equipment is loaded; they will notify personnel when the aircraft preparation is complete and ready for loading.
- Complete preparation before and after air transport procedures can be found in the appropriate TM for the specific vehicle variant.

SEA MOVEMENT

6-17. Battalions and companies deploy unit personnel, supplies, and equipment by sea through a port that is commanded or contracted by the Military Traffic Management Command (MTMC). Before being loaded on vessels, unit personnel, supplies, and equipment are held in the port staging area to prepare for shipment. Before moving to the port staging area, the unit, its supplies and equipment may be assembled in a marshaling area. The two areas differ, although they serve like purposes. In a marshaling area, the owning command retains responsibility and accountability for the shipment. Once in the staging area, the port commander assumes custody of equipment and supplies. Complete preparation before and after sea transport procedures can be found in the appropriate TM for the specific vehicle variant. The following are preparations and checks conducted prior to loading on vessels:

UNIT EQUIPMENT AND SUPPLIES

6-18. These are checked to ensure they are properly labeled and tagged and accompanied by proper documentation.

CARGO LASHING AND HEIGHT LIMITATIONS

6-19. Cargo lashing and height limitations are checked to ensure that the loads are within parameters for shipment.

SECONDARY LOADS

6-20. Secondary loads (unit supplies and equipment on vehicles) are checked to ensure they are properly blocked, braced, and secured.

PREVENTIVE MAINTENANCE CHECKS AND SERVICES

6-21. Preventative maintenance checks and services (PMCS) are conducted, and any required unit or direct support maintenance accomplished, and fuel levels in vehicles and equipment being shipped adjusted to proper levels.

HAZARDOUS CARGO

6-22. Hazardous cargo is checked to ensure it is segregated, properly classified, described, packaged, marked, labeled, and in proper condition for transportation IAW Code of Federal Regulation (CFR) 49 and other prescribed regulations or directives.

TRUCK MOVEMENT

6-23. Movement by trucks or heavy equipment transports (HETs) resembles movement by rail. Preparation and follow up after transport require the same procedures.

6-24. Complete preparation before and after truck transport procedures can be found in the appropriate TM for the specific vehicle variant.

Appendix A

Safety and Risk Management

This appendix recommends safety precautions for the ranges described in this manual, but it does not replace AR 385-63 or local regulations. Range safety requirements vary because of differing requirements of varied ranges. All personnel training on a range or training site, and those who have responsibility for Army training range operations, should be briefed on safety and local requirements. The briefing should fulfill the minimum requirements of a range safety briefing and include any information relating to local requirements and safety regulations. Army Regulations 210-21, 385-10, and 385-63 should be reviewed by all range personnel (OIC, safety officer, NCOIC) before operating any range.

SECTION I. SAFETY

The first priority at any range is training with safety first and last as SOP objectives.

BRIEFINGS

A-1. Every safety briefing should prescribe precautions necessary to minimize the possibility of accidents caused by careless weapon discharge. The proper handling of ammunition must also be covered and repeated throughout the course of range operations.

PERSONNEL AND DUTIES

A-2. To provide a safe and efficient range operation with effective instruction, the following personnel and duties must be professionally overseen.

OFFICER IN CHARGE

A-3. The OIC is responsible for all range operations before, during, and after live firing.

RANGE SAFETY OFFICER

A-4. The range safety officer is responsible for safety during range operations. He conducts the safety orientation before each scheduled live fire exercise, and oversees the brass and ammunition check before a unit leaves the range. He also observes to ensure that all personnel comply with the safety regulations and procedures prescribed for live fire exercises. This officer should not be assigned any other duties.

NONCOMMISSIONED OFFICER IN CHARGE

A-5. The NCOIC assists the OIC and safety officer by supervising all personnel in support of live fire exercises. He also oversees OIC and safety officer needs as they arise.

AMMUNITION DETAIL

A-6. This detail is composed of one or more ammunition handlers, whose responsibilities include the breaking down, issuing, receiving, accounting for, and safeguarding of all live ammunition. The detail also collects expended ammunition casings and other residue.

UNIT ARMORERS

A-7. Unit armorers repair weapons as required.

ASSISTANT INSTRUCTOR

A-8. Assistant instructors are assigned up to 10 firing positions to ensure that every Soldier in their range section observes range safety procedures. They also assist firers with problems.

MEDICAL PERSONNEL

A-9. Medical personnel provide medical support as required by regulations governing live fire exercises.

CONTROL TOWER OPERATORS

A-10. Control tower operators raise and lower targets, time target exposures, sound the audible signal, and give the fire commands. If possible, two men should be selected for these functions.

MAINTENANCE DETAIL

A-11. 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.

PRECAUTIONS

A-12. The following safety precautions must be observed during all gunnery training:

- Display a red flag (red light for night firing) at the range entrance or in some other prominent location during range firing.
- Always assume weapons are loaded until they have been thoroughly examined to ensure their magazines and barrels are clear.
- Mark firing limits with red-and-white-striped poles visible to all firers.
- Always check for obstructions in the muzzles of weapons ready to be fired.
- Keep all weapons in a prescribed area and proper safeguards when not in use.
- Do not permit smoking near ammunition, explosives, or flammables.
- Wear hearing-protection devices during firing.

RANGE PROCEDURES

A-13. The range can be a dangerous place, especially if safety procedures are not followed. Everyone must stay alert and adhere to the following precautions.

BEFORE FIRING

A-14. Close all prescribed roadblocks or barriers and post necessary guards.

- Check all weapons to ensure they are clear of ammunition and obstructions, and that cover feed mechanism assemblies are up to show they are cleared.
- Brief all personnel on range firing limits and firing lanes.
- Obtain range clearance from the installation range control office.
- Check the downrange area before firing to ensure that all personnel and equipment are clear of the area.
- Keep a complete first aid kit on the range.
- Locate medical personnel on or near the range where they can be contacted quickly.
- Have all weapons checked by an officer or noncommissioned officer to ensure they are operational.
- Do not handle weapons except on command from the tower operator or the OIC.

A-15. Following are recommended procedures for handling ammunition.

- Locate all ammunition at firing sites outside the back-blast area (when applicable) for weapons involved.
- Store ammunition in a position that will minimize any potential for ignition, explosion, or rapid burning.
- Issue ammunition to firing units immediately before scheduled training exercises. Distribute ammunition to troops only when they are on the ready or firing line.
- Cover all ammunition to protect it from the weather (especially direct rays of the sun). Provide air circulation between the ammunition and cover for proper ventilation.
- Limit unpacking ammunition at the firing line to the minimum number of rounds needed for efficient exercise firing. Retain packaging material until firing is complete. The burning of wooden containers and firing of excess ammunition to make up for poor planning before returning to the ammunition storage site is strictly prohibited.

DURING FIRING

A-16. Immediately order CEASE FIRE when an unsafe condition is observed during firing. Do not resume firing until directed to by the OIC.

- The OIC or safety officer must clear all weapons and authorize movement down range before anyone can move forward to score their targets. Moving forward of the firing line is dangerous. All firing training personnel must be made thoroughly aware of this.
- The safety officer or NCO inspects each weapon that was fired on the firing line by making sure the bolt is locked to the rear and the safety is on. They also make sure each barrel is clear by running a cleaning rod through it until they can see the end of the rod in the receiver.

NIGHT FIRING

A-17. Check the downrange area before firing to ensure all personnel and equipment are clear of the area. This is accomplished by asking three times over a public address system, "*Is there anyone downrange?*" Always Pause each time to permit a response.

- Post a blinking red light at the range entrance or some other prominent location to signal range live fire use.
- Mount two red lights on the striped poles marking the right and the left limits of fire. They must be visible to all firers.
- Do not allow anyone to move from his position until told to do so by the OIC.

AFTER FIRING

A-18. Have safety staff inspect all training personnel to ensure their weapons are clear and that no brass, links, or live ammunition is on their person when they leave the firing line. When weapons have been cleared, keep them in a prescribed area with the bolt forward and safety on.

SECTION II. RISK MANAGEMENT

This section describes how risk management is integrated into the Army training management cycle and training planning. FM 100-14 provides the doctrinal framework for this critical aspect of safe training and operations, providing detailed guidance on its implementation across a wide range of Army applications.

Risk management and training and operations assessment will be performed in accordance with the requirements of AR 385-10, TRADOC Reg. 385-2, FM 7-0, FM 7-1, FM 5-19, and this manual. This paragraph assigns responsibilities for risk management and assessment.

SAFETY OFFICER

A-19. The safety officer will—

- Provide overall coordination of the risk management program.

- Provide guidance and assistance to facilitate effective implementation of the program.
- Review the risk management worksheet for operations and training determined to have high or extremely high residual risk factors.
- Check worksheet during range and training inspections.

COMMANDERS

A-20. Commanders will—

- Develop, in writing, and implement a comprehensive risk management program that meets the requirements of this manual.
- Integrate risk management into all operations and training.
- Train all leaders in risk management concepts, the requirements of this manual, and the organizational risk management program.
- Ensure a formal, documented risk management worksheet is completed for each training activity and operation using the procedures and form described in this manual. This document will be completed during the planning phase of any operation or training.
- Ensure worksheets are reviewed and accepted in writing by the leader at the appropriate level as designated in this manual.
- Maintain copies of all worksheets in the appropriate organizational files and at the training or operation site.
- Develop a comprehensive daily risk assessment checklist that addresses those factors, which may change from day-to-day or iteration-to-iteration, and identify new hazards not addressed in the risk management worksheet.
- Ensure a daily risk assessment checklist is completed before beginning the training or operation. This document will be completed immediately before the execution phase of an operation or training. For those operations conducted on a repetitive basis, the checklist must be completed before each day's activities. If conditions change significantly during an operation, the checklist should be reevaluated.
- Require the leader conducting the operation or training to consult with and receive approval from the individual who accepted the risk on the risk management worksheet. This must be done when the daily risk assessment checklist indicates the overall rating for the operation or training is high or extremely high, when any factor is rated as extreme risk, or when more than one factor is rated as high risk.
- Ensure daily risk assessment checklists are maintained at the operation or training site until the event is completed. If an accident occurs during an operation, the checklist should be maintained until the investigation is complete.
- In coordination with the daily risk assessment checklist by the people responsible for the operation or training, ensure risk management worksheets are reevaluated before each operation or training event.
- Ensure the worksheet and daily risk assessment checklists are used as the basis for preoperational or training safety briefings with involved personnel.

PROCEDURES

A-21. Risk management will be integrated into every operation and training event conducted on an installation, or by installation organizations at other locations.

- A formal, documented, risk management worksheet and daily risk assessment checklist will be prepared for every operation and training event.
- The worksheet and daily risk assessment checklists will be prepared and risks will be assessed using the methodology and form described in this manual.
- For those training events or operations conducted on a repetitive basis, there is no requirement to complete a new worksheet before a new iteration. The initial worksheet is sufficient unless changes have been made to the training scenario or operation plan. Any changes would pertain

to personnel safety, equipment, the environment, or new hazards identified on the daily risk assessment checklist that are not on the initial risk management worksheet.

- Whenever there is a change of command or supervision, risk management worksheets accepted by the outgoing commander or manager will be revised, updated, and submitted to the new commander or manager for acceptance of risks.
- The worksheet will be revised whenever a change in the training or operation could affect the safety of personnel, equipment, area environment, or identified hazards not listed on a current risk management worksheet.

RULES

A-22. No unnecessary risk will be accepted. Leaders with authority to accept risks are responsible for protecting their personnel from unnecessary ones. Unnecessary risks are those that could be reduced or eliminated without hindering mission accomplishment.

- Risk decisions must be made at a level consistent with the risk involved. The leader ultimately responsible for the mission should make the risk decision.
- An identified risk is acceptable if it benefits or outweighs any costs. Leaders must understand that risk taking is a decision-making process that balances mission benefits and costs. They must be prepared to take acceptable risks to accomplish a mission.

PROCESS

A-23. The process of risk management involves a complete cycle that feeds back to its start point in a logical manner. A key consideration when assessing risk options is to match process considerations with the extent of any risk probability. If the risk is high, the process should be complete and detailed. If the risk level is low, the process may be shortened not by eliminating steps, but by performing them in less detail. Leaders must document the steps they take on risk management worksheets and daily risk assessment checklists. For each of the following steps, leaders must–

Identify the Hazards

A-24. Leaders must try to identify any potential hazards during operations or training planning. Pay special attention to identifying hazards with the potential for change, such as weather, Soldier alertness, supervision, level terrain, and equipment conditions. Identify every possibility.

Assess the Hazards

A-25. Assess identified hazards to determine their cumulative effect on an operation. You can then develop controls to reduce or eliminate hazard risk. Determine the risk level for each hazard as it relates to the overall operation *before* implementing control measures (initial) and *after* you implement controls (residual).

Make a Risk Decision

A-26. Weigh all identified risks against the benefits of conducting training and operations. Consider initial risk levels, controls, and residual risk levels when making a risk acceptance decision. Make risk decisions at a level that corresponds with the degree of risk.

Implement Controls

A-27. Implement controls established in the risk management process that prescribe subordinate leader action to reduce or eliminate hazards. Integrate specific controls into plans, orders, SOPs, training performance standards, and rehearsals. You must know the controls down to individual Soldier or employee level.

Supervise

A-28. Supervision goes beyond ensuring personnel do what is expected of them. It includes following up during and after an action to ensure all went according to plan, reevaluating the plan or making adjustments as required to accommodate unforeseen issues, and incorporating lessons learned for future use.

WORKSHEET

COMPLETION

A-29. Complete this form during the planning phase of any operation or training:

Identify Hazards

A-30. Note each identified hazard in column 1.

Analyze Hazards

A-31. Analyze each hazard using the risk assessment matrix. Determine the level and probability of a particular accident, and the most likely severity of the consequences should one occur. First, apply the matrix to the hazard, before you implement controls. Note the initial probability of accident occurrence from each hazard in column 2 of the form. Also, note the initial effect of the accident and determine an initial risk level, either extremely high, high, medium, or low, for each hazard in column four. At the bottom of the form, circle the initial overall risk for the operation. This overall initial risk should equal the highest initial risk identified in column four.

Specify Controls

A-32. Specify controls for each hazard. Controls should be keyed to each identified hazard, and when appropriate, should address differing hazard levels. For example, when heat is listed as a hazard, general and specific measures for each heat category level should be addressed. Taking wet bulb readings at the operation site instead of depending on readings taken at another part of the installation is one specific control a hazard may require.

Reanalyze Hazards

A-33. Each of the hazards will be analyzed again using the risk assessment matrix (Figure A-1) to determine its accident probability and the most likely severity of consequences should an accident occur. The matrix will be applied to the hazard after controls are implemented. The residual probability of an accident occurring from each hazard will be noted in column six of the form, residual effect in column seven, and a residual risk level of extremely high, high, medium, or low for each hazard, in column eight. The residual overall risk for the operation should be circled at the bottom of the form. The overall residual risk equals the highest residual risk identified in column eight.

Record Signatures

A-34. The signature of the appropriate risk acceptance authority should be recorded in the lower right section of worksheet, page one.

APPROVAL

A-35. The residual risk level determines who may accept the risk and sign the risk management worksheet. Acceptance of a risk, as confirmed by signature on the worksheet will be accompanied with the following information, based on the overall level of residual risk:

Extremely high

A-36. Commander of the major command.

High

A-37. Installation commander.

Medium or Low

A-38. Major subordinate commander, director, or activity chief.

A-39. The first colonel level commander in their chain of command or the Directorate of Operations and Training will approve medium- or low risk training conducted by Reserves or other units.

A-40. The signature of the individual accepting the risk is entered at the bottom of worksheet, page one. Requests for risk acceptance decisions at the installation or major command level must be properly staffed through the Safety Office, the Directorate of Public Safety (DPS), and the Directorate of Operations and Training at least 30 days before the event.

A-41. Safety Office personnel consult during the preparation of all risk management worksheets and during range inspections to ensure all hazards are identified, and appropriate control measures are implemented. Risk management worksheets that have been assigned a residual overall risk level of medium or lower must be signed by the appropriate individual authorized to accept the risk.

DAILY RISK ASSESSMENT CHECKLIST

A-42. The purpose of this checklist is to evaluate those conditions that may have changed since the worksheet was completed, to identify any new hazards not addressed on the worksheet, and to serve as a final check to ensure the safety of an operation. The daily risk assessment checklist is completed right before the execution phase of the operation or training. For repetitive operations, the checklist is completed before each day's training.

RISK MANAGEMENT MATRIX

A-43. The daily risk assessment checklist is used in conjunction with the risk management matrix (Figure A-1). The factors listed represent key concerns that may affect the risk level of an operation between the planning and execution phases, or that may change from iteration to iteration for those operations and training events of a repetitive nature. The assessing organization may tailor the factors and point totals for categorizing the operation or training as *extreme*, *high*, *medium*, or *low* risk to fit the mission of the particular organization. For example, the unit may want to add additional factors. They may want to change the *extreme*, *high*, *medium*, or *low* criteria for one or more factors, or increase the point total requirements in the last row.

CONSULTATION AND APPROVAL

A-44. The following conditions require consultation with and approval by the individual who signs the risk management worksheet before a planned training or operation begins:

- The overall risk level for the operation or training, as determined using the checklist, is extreme or high.
- Any factors are rated as extreme risk, or more than one factor is rated as high.
- Any controls listed on the worksheet are missing.
- Hazards are present that are not listed on the worksheet.

READ RISK LEVEL AT INTERSECTION OF PROBABILITY AND EFFECT			PROBABILITY				
			FREQUENT	LIKELY	OCCASIONAL	REMOTE	UNLIKELY
			A	B	C	D	E
EFFECT	CATASTROPHIC	I	EXTREMELY HIGH	EXTREMELY HIGH	HIGH	HIGH	MEDIUM
	CRITICAL	II	EXTREMELY HIGH	HIGH	HIGH	MEDIUM	LOW
	MARGINAL	III	HIGH	MEDIUM	MEDIUM	LOW	LOW
	NEGLIGIBLE	IV	MEDIUM	LOW	LOW	LOW	LOW

EFFECT	
CATASTROPHIC	Death or permanent total disability, system loss, major property damage.
CRITICAL	Permanent partial disability, temporary total disability in excess of three months, major system damage, significant property damage.
MARGINAL	Minor injury lost work accident, minus severity injury or illness, minor system damage, minor property damage.
NEGLIGIBLE	First aid or minor supportive medical treatment, minor system impairment.

PROBABILITY		
FREQUENT	Individual soldier, employee, or item	Occurs *often* in career or equipment service life.
	All personnel or inventory	*Occurs continuously.*
LIKELY	Individual soldier, employee, or item	Occurs *several times* in career/equipment life.
	All personnel or inventory	*Occurs frequently.*
OCCASIONAL	Individual soldier, employee, or item	Occurs *sometime* in career/equipment life.
	All personnel or inventory	*Occurs sporadically* or several times in inventory life.
REMOTE	Individual soldier, employee, or item	*Could possibly occur* in career/equipment life.
	All personnel or inventory	*Remote chance* of occurrence; expected to occur sometime in inventory service life.
UNLIKELY	Individual soldier, employee, or item	*Can assume will not occur* in career/equipment life.
	All personnel or inventory	*Possible, but improbable*; occurs very rarely.

Figure A-1. Example format for daily risk assessment checklist.

Appendix B

Stryker Antitank Crew Drills

SBCT Infantry battle and crew drills describe how platoons and squads apply immediate action, fire, and maneuver to commonly encountered situations and equipment malfunctions. Drills require leaders to make decisions rapidly and to issue brief oral orders quickly. A platoon's ability to accomplish its mission often depends on Soldiers, leaders, squads, and sections that execute key actions quickly.

SECTION I. OVERVIEW

The goal of training is to produce combat ready units that respond to known or suspected enemy activity and defeat the enemy. Drill training is a key factor in achieving this goal. Drill training requires proficiency in individual tasks, leader tasks, and collective tasks prior to conducting critical wartime missions. Leaders should therefore tailor training to be realistic and challenging while increasing the difficulty of conditions as the unit becomes more efficient. Drills are published in MTPs and drill books. A drill is a disciplined, repetitious exercise that teaches and perfects a skill or procedure (action), a collective task, or task step. There are two types of drills; battle drills and crew drills.

CREW DRILLS

B-1. A crew drill, as defined by TRADOC Regulation 350-70, *The Army's Systems Approach to Training* (ASAT), is—

> *"...A critical collective action (or task) performed by a crew of a weapon or piece of equipment to use the weapon or equipment successfully in combat or to preserve life, initiated on cue, accomplished with minimal leader orders, and performed to standard throughout like units in the Army. This action is a trained response to a giver stimulus, such as an enemy action, a leader's brief order, or the status of the weapon or equipment."*

B-2. The following crew drills are for mounted elements, dismounted crew drills can be found in ARTEP 7–91–Drill. Drills have the following advantages:

- They are based on specific tasks, standards, and performance measures required to support mission proficiency.
- They build from simple to complex, and focus on the basics.
- They link how-to-train and how-to-fight at small-unit level.
- They provide an agenda for continuous coaching.
- They develop leaders and build teamwork under stress.
- They improve the chances of individual and unit survival on the battlefield.

BATTLE DRILLS

B-3. A battle drill–

- Is a critical collective action (or task) performed by a platoon or smaller element.
- Is performed without the application of a deliberate decision-making process.
- Starts on cue such as a particular enemy action or a brief order.
- Is performed to standard throughout like Army units.
- Is vital to success in combat or critical to preserving life.
- Usually involves fire or maneuver.
- Is a trained response to a given stimulus.

TRAINING GUIDANCE

B-4. Battle and crew drill training is conducted with the use of the talk through, walk-through, run-through method. Trainers must be masters of a drill to train others in it. They may wish to periodically talk their Soldiers through the drill—explaining each Soldier's role; then have them go through it slowly, on open ground, correcting any mistakes as they go. The following concepts should be applied when developing training:

TRAIN AS YOU FIGHT

B-5. The goal of combat level training is to achieve combat level standards. Every effort must be made to attain this difficult goal. Within the confines of safety and common sense, leaders must be willing to accept less than perfect initial results, and demand realism in training. Integrated realistic conditions should include—smoke, noise, simulated CBRNE, battlefield debris, loss of key leaders, and cold weather.

TRAIN USING APPROPRIATE DOCTRINE

B-6. Training must conform to Army doctrine. FM 3–0 (100–5), *Operations*, describes common procedures and uniform operational methods that permit leaders and organizations to adjust rapidly to changing situations.

USE PERFORMANCE ORIENTED TRAINING

B-7. Soldiers learn best by using a hands-on approach. Leaders are therefore responsible to provide these opportunities. All training assets and resources including simulators, simulations, and training devices must be included in the strategy.

TRAIN TO CHALLENGE

B-8. Tough, realistic, training challenges the intellect and body, while exciting and motivating Soldiers and leaders. It builds competence and confidence by developing and honing skills.

TRAIN TO SUSTAIN PROFICIENCY

B-9. Once individuals have been trained to a required level of proficiency, leaders must structure training plans to repeat critical drill tasks at the minimum frequency necessary for sustainment.

FORCE PROTECTION (SAFETY)

B-10. Risk assessment is the thought process of making operations safe without compromising the mission. Unit leaders must continuously perform risk assessments of the conditions in which training is conducted to prevent the unnecessary loss of Soldiers and equipment. The degree of risk varies with the conditions at the time of training. In reality, risk management is smart decision-making. Assessment concepts should answer the questions–

- Have the Soldiers done this training before?
- Will the training be done for the first time at night?
- Are the Soldiers fatigued?

B-11. A well trained unit is normally accident free. However, accidents can occur through no fault of a Soldier or equipment operator. Most accidents result from inadequately trained, unsupervised, or complacent personnel. Training must be tough and realistic, but it must also be safe. Unit leaders should consider the following points as they integrate risk assessment into their training:

- Accept no unnecessary risks.
- Make risk decisions at the proper level.
- Accept risks if mission benefits outweigh the costs.

B-12. Although the commander is the safety officer, *all* Soldiers and leaders are responsible for safe training. All leaders must–

- Identify the risks using the factors of METT-TC.
- Assess possible loss, cost, and probability.
- Make decisions and develop controls to reduce risks.
- Implement controls by integrating them into plans, orders, SOPs, training performance standards, and rehearsals.
- Supervise and enforce safety controls and standards at all times. (Leaders should make on-the-spot corrections when an unsafe act is observed.)

B-13. Leaders use the safety checklist of the United States Army Safety Center, Fort Rucker, Alabama, in conjunction with local unit safety checklists, to enhance the overall safety practices of Soldiers during training.

SECTION II. CREW AND SQUAD DRILL TRAINING

Crew and squad drill training emphasizes rapid response to critical situations involving enemy action, weapons, or equipment failure. When training is effective, Soldiers respond immediately to cues that alert them to the action needed. Crew drills, like battle drills, must be trained so that Soldiers can accomplish them without the application of a deliberate decision-making process. They are initiated on cue with minimal leader orders and are performed to standard. The squad leader explains and demonstrates the drill duties and responsibilities of each squad member. He walks his Soldiers through each squad drill to ensure each member can perform their assigned positions as rifleman or crew served weapons teams.

VEHICLE OPERATIONS

B-14. Vehicle operations add another dimension to squad training. Many of the techniques are similar, but with differing procedures. The squad leader assigns vehicle positions to the crew/squad and trains each Soldier in his assigned position. The crew/squad should be given the opportunity to observe individual instruction of other assigned positions. This way, every squad member has situational understanding of each other's position duties and can assume the responsibilities of those positions if required. No drill should be done collectively until each member of the crew/squad can perform his individual duties and responsibilities, perform drill steps, and accomplish drill standards.

TEAMWORK

B-15. Teamwork is essential when performing crew drills because it requires each squad member to be proficient in his assigned position for the good of every team member. Every Soldier in the squad must be trained independently on his assigned position on the vehicle and must perform the drill to standard before a crew drill is performed collectively. The squad leader should have the Soldier demonstrate his functioning part of the drill several times, first for proficiency, and finally, for time. Leaders conduct crew drills collectively when every Soldier within the squad has met the standard at his assigned position.

Note: The squad must demonstrate proficiency in each crew drill before conducting a drill for time.

DRILLS

B-16. The drills on the following pages cover actions such as mounting and dismounting from a vehicle, with or without equipment organic to the vehicle; preparing the vehicle for combat operations; and performing emergency procedures. The Soldier's actions will differ by type of vehicle, organic equipment, and issued equipment. Soldiers should be trained on each crew drill until they are proficient on their assigned vehicle position and can execute the steps to standard. Crew drills should be performed during all hours of the day and at least once in MOPP4:

WARNING

To avoid injury and equipment damage when operating from a vehicle, follow all cautions and warnings.

Perform crew drills using the crawl, walk, and run method of training. Walk the Soldiers through each drill before running them for time.

REACT TO ROLLOVER WHILE MOUNTED ON STRYKER ATGMV

ACTION: React to a rollover on an ATGMV.

CONDITIONS: As a member of a mounted squad or crew, given individual equipment, assigned individual weapons and ammunition, and a fully equipped ATGMV.

Situation 1: The driver has maneuvered off-road and lost control of the vehicle on the side slope of a hill, causing the vehicle to turn over. The M240B is mounted and ready to fire. All hatches are closed.

Situation 2: The driver has maneuvered onto the side of a roadway and the shoulder of the road has given way causing the vehicle to turn over. The M240B is mounted and ready to fire, all hatches are open, and crew or squad personnel are standing up in the hatches.

Situation 3: The driver has maneuvered off-road alongside a body of water and loses control of the vehicle causing the vehicle to turn upside down into the water.

STANDARDS: When the command *ROLLOVER* is given, the crew/squad takes appropriate actions to–

1. Move the vehicle with all hatches closed.
2. Move the vehicle with all hatches open, with crew/squad personnel standing up in the hatches.
3. Move the vehicle alongside a body of water.

WARNINGS

1. **During a rollover, gas from batteries can explode and cause serious injuries. It can also spill and cause serious burns or blindness. If the driver must exit through the crew compartment, he must be careful to avoid contact with battery acid.**
2. **Jumping from the top of a Stryker Vehicle with or without slat armor can cause injury to personnel.**

TASK STEPS AND PERFORMANCE MEASURES:

1. HATCHES CLOSED

[Vehicle Commander] Command *ROLLOVER*. You are seated in your position, and brace for impact. The gunner and squad members also brace for impact and hold onto hand straps for stability. The driver braces for impact.

2. HATCHES OPEN

[Vehicle Commander] Command *ROLLOVER*. You are standing up in your hatch, and you drop down in the seated position and brace for impact. The gunner drops his seat and braces for impact. Soldiers move back to seats and brace for impact, holding hand straps for stability. The driver drops his seat and braces for impact.

3. VEHICLE HAS ROLLED OVER

[Vehicle Commander] Check for fires and account for personnel. The gunner ensures weapon system is on SAFE and engages travel lock, if possible. All Soldiers check themselves for injuries and report to you. The driver engages the fuel shutoff and turns accessories off. If a fire is present in the engine compartment, he sets off the engine compartment fire extinguishing system.

4. EVACUATION

[Vehicle Commander] Check for injured personnel and report the incident. The gunner helps the driver get out of the vehicle. The squad members leave through the nearest open hatch, extinguishing fires if needed. The driver leaves the vehicle through his hatch or, if it is blocked, through the crew compartment or other closest exit.

DRILL NOTES

1. [Vehicle Commander] Determines if it is safe to exit the vehicle, and commands, BAIL OUT.

2. [Vehicle commander] If you determine that it is unsafe to exit the vehicle, then have personnel wait for recovery, and try to contact other platoon vehicles or higher.

3. Rollover drill steps are not timed. They are drills the crew/squad should know and practice if time permits, before vehicle movement.

4. The hinges of the ramp door are on the bottom of the door, which is very heavy. If the vehicle rolls onto its top, two crewmembers might be needed to open the ramp door and keep it open.

5. If the vehicle rolls onto its left side, the weight of the troop door, heavier due to the slat armor installed on its outer surface, might also require two crewmembers to open and keep open.

EVACUATE A STRYKER ATGMV

ACTION: Vacate a Stryker ATGMV.

CONDITIONS: As a member of an ATGMV crew, given individual equipment, assigned individual weapons and ammunition, and a fully equipped ATGMV. The vehicle has been engaged by enemy fire and is burning out of control. The M240B is loaded and ready to fire, and the ramp and all hatches are closed.

STANDARD: When the vehicle commander commands BAIL OUT, the crewmembers must take the appropriate actions to vacate the vehicle safely.

TASK STEPS AND PERFORMANCE MEASURES:

1. The vehicle commander commands, BAIL OUT and disconnects his CVC helmet. The vehicle gunner and driver disconnect their CVC helmets and exit their respective hatches. The loader releases the emergency ramp release lever and exits the rear of the vehicle.
2. The vehicle commander exits behind the vehicle gunner, and then moves away from the vehicle. Vehicle commander takes charge of crewmembers as they exit and lead them away from the vehicle. The driver exits through his hatch, climbs off the vehicle, and then relocates with the vehicle commander, gunner, and loader.

WARNING

Jumping from the top of a Stryker--whether it has either equipped with or not equipped with slat armor can cause injury to personnel.

DRILL NOTES

1. The gunner and driver should simulate some actions, such as raising and lowering the ramp and M240B operations, to avoid wear and tear on the equipment.

2. If the driver's hatch is clear, the driver can get out of it faster than he can out the back of the vehicle.

3. All Stryker vehicles have seat belts. Allow time for crewmembers to adjust seat belts during crew drills.

4. Each crew/squad member knows the location and operation of all exits in case the nearest one is blocked in an emergency evacuation.

5. When slat protective armor is mounted on the vehicle, evacuating crewmembers might need to climb over and down the armor to get out of the vehicle quickly.

DISMOUNT M240B MACHINE GUN FROM STRYKER ATGMV

ACTION: Remove an M240B MG from the Stryker ATGMV.

CONDITIONS: Given an M240B machine gun, mounted on an ATGMV, ground mounted components including the M3 tripod, T&E mechanism, a MK64 pintle mount, a Mod 9 gun cradle, a full can of 7.62-mm ammunition (200 linked rounds), individual weapons and ammunition, individual equipment, and an ATGMV. The crew has received the order to dismount the

machine gun from the ATGMV and mount it on its tripod at a designated point on the ground in a given direction of fire.

STANDARDS: Dismount the M240B MG from the MK 93 gun mount. Place the machine gun in a ready-to-fire tripod-mounted configuration, in the correct position, and then orient it in the appropriate direction of fire.

TASK STEPS AND PERFORMANCE MEASURES:

1. [Vehicle Commander] Commands, "DISMOUNT THE M240B MACHINE GUN."
2. [Gunner] Move to the vehicle commander's hatch and secures the M240B machine gun.
3. [Driver] Lower the ramp, exit through your hatch, and move to the dismounted M240B to help the gunner.
4. [Vehicle Commander] Move to the rear of the vehicle, secure the ground mount components from their stowed positions, and then move to the dismounted firing position.
5. [Loader] Remove and secure the M240B ammunition box from its stowed positions; move to the dismounted firing position.
6. [Gunner] Unload and clear the M240B machine gun.
7. [Driver] Stay with and provide security for the vehicle.
8. [Gunner] Remove the machine gun and move to the dismounted firing position.
9. [Vehicle Commander] Place the ground mount components at the firing position; set up the tripod in the direction of firing.
10. [Gunner] Mount the M240B on the M3 tripod.
11. [Loader] Set the box of ammunition beside the machine gun position.
12. [Squad leader] Move away from the machine gun position and observe the engagement area.
13. [Gunner] Perform a function check, load and place the weapon on SAFE, and then announced "*Up."*
14. [Driver] Secure all hatches and ramp and announce "*Up*."

DRILL NOTES

1. Time stops when both the driver and gunner have said "*Up*."

2. If needed, the machine gun can be passed over the side of the vehicle rather than through the squad leader's hatch.

3. Some actions, such as raising and lowering of the ramp, should be simulated to avoid wear and tear on the equipment.

4. All Stryker vehicles have seat belts. Allow time for crewmembers to adjust seat belts during crew drills.

MOUNT M240B MACHINE GUN ON STRYKER ATGMV

ACTION: Install an M240B machine gun on a Stryker ATGMV MK93 machine gun mount.

CONDITIONS: Given an M240B machine gun, ground mount components including the M3 tripod, T&E mechanism, MK64 pintle mount, Mod 9 gun cradle, full can of 7.62-mm ammunition (200 linked rounds), individual weapons and ammunition, individual equipment, and an ATGMV. The machine gun have been mounted on the tripod and loaded with the belt of linked ammunition. Ensure the weapon is on SAFE. [Gunner] has received the order to install the M240B machine gun on the MK93 mount from a tripod mounted position.

STANDARDS: Mount the M240B MG on the MK93 mount in the ready-to-fire configuration.

TASK STEPS AND PERFORMANCE MEASURES:

1. [Vehicle Commander] Command, INSTALL THE M240B MACHINE GUN.
2. [Gunner] Ensure the machine gun is on SAFE, unload, and clear it.
3. [Loader] Secure the ammunition can and return to the vehicle.
4. [Driver] Lower the ramp and stand by.
5. [Gunner] Remove the machine gun from the M3 tripod and return to the ATGMV.
6. [Vehicle Commander] Break down the machine gun ground mounted components, and take the components to the vehicle.
7. [Driver] Move to the top of the ATGMV and help the gunner install the M240B machine gun on the MK93 mount.
8. [Vehicle Commander and loader] Restow the machine gun ground mount components and the 7.62-mm ammunition can, and prepare to move.
9. [Gunner] Perform a function check, reloads, and then arms the weapon.
10. [Vehicle Commander and loader] Restowed the ammunition and the ground mount components of the machine gun.
11. [All personnel] Secure their CVC helmets and return to their stations for movement.
12. [Vehicle Commander] Commands, RAMP CLEAR.
13. [Driver] Start the engine and secure the ramp.
14. [Vehicle Commander] Assumed the extended travel mode.
15. [Gunner] Assume the extended travel mode and announce "*Up"*
16. [Driver] Assume the extended travel mode and announce "*Up*."

DRILL NOTES

1. Time stops when the gunner and driver say "*Up*."

2. Extended travel mode is when the squad leader, gunner, and driver are observing vehicle movement from an open hatch position.

3. Some actions such as raising and lowering the ramp should be simulated by the gunner and driver due to the wear and tear on the equipment, which is caused by repetitive training.

4. All Stryker vehicles have seat belts. Allow time for crewmembers to adjust seat belts during crew drills.

EXTINGUISH A FIRE ON THE STRYKER ATGMV

ACTION: Put out a fire on the Stryker ATGMV.

CONDITIONS: As a member of an ATGMV crew, given individual equipment, assigned individual weapons and ammunition, and a fully equipped ATGMV. The vehicle commander is maneuvering the Stryker to a designated position when the vehicle fire alarm alerts the crew that a fire is present aboard the vehicle.

STANDARDS: When the command FIRE is given, the vehicle commander and driver maneuvers the vehicle to a safe location. The crew dismounts the vehicle, and the crew immediately extinguishes the fire minimizing injury to soldiers and damage to equipment within seven minutes by using the following actions:

1. Acknowledge fire indicator in the annunciator panel by pressing the Automatic Fire Extinguishing System (AFES) reset button.
2. Engage the fire suppression system manually before exiting the vehicle.
3. Suppress fire using portable fire extinguisher as needed.

DRILL NOTES

1. While in training, if the vehicle is in motion, the driver will stop the vehicle, place the transmission into neutral, and engage parking brake.

2. Do not manually engage fire suppression system if the AFES fire indicator light remains off after pressing the reset button.

3. When the reset button is pushed, the light comes on and stays on, indicating that the fire is still going. Light will illuminate periodically, indicating that a fire was present and has been extinguished. Light will also indicate that the fire extinguisher is partially discharged or empty and needs to be replaced as soon as possible.

4. The AFES will activate all fire extinguishing bottles in an effort to extinguish the fire. If the fire indicator light remains ON, activate the manual toggle switch to ensure all fire extinguishers were fully discharged prior to dismounting vehicle.

5. Each crew/squad member must be familiar with the location and operations of all hatches and egress doors in the event that one escape route is blocked during an emergency evacuation.

6. When slat armor is mounted, evacuating crew/squad members may need to climb over and down it to get out.

7. Stop time-keeping after the crew/squad has vacated the ATGMV, and after the fire extinguishers have been applied.

8. Simulate some actions, such as raising and lowering the ramp, to avoid wear on the equipment.

9. During training, simulate the use of fire extinguishers.

10. All Stryker vehicles have seat belts. Allow time for crewmembers to adjust seat belts during crew drills.

DANGER

1. **HFC 25 (FE25) is a health hazard. It can freeze the skin on contact, and if inhaled can cause respiratory effects such as shortness of breath, which can in turn cause arrhythmia (irregular heartbeat) and possible death.**
2. **FM-200 is a health hazard. It can freeze the skin on contact, and if inhaled can cause respiratory effects such as shortness of breath, which can also cause arrhythmia (irregular heartbeat) and possible death.**

DANGER

If fire extinguishing chemicals are discharged into the engine compartment while the engine is running, engine exhaust becomes poisonous. Poisonous gas can cause injury or death.

WARNINGS

1. **Before trying to close the ramp, ensure that the area between the seats and ramp opening is clear. Hands, feet, and equipment can be pinched against the seats when the ramp closes. This could cause injuries or equipment damage.**
2. **Before trying to lower the ramp, ensure that the area behind the vehicle is clear. Personnel can be injured and equipment damaged when the ramp opens. Ensure ramp door is in closed and locked position.**
3. **Discharge from fire extinguishers can freeze skin. An unsecured fire extinguisher can move violently when it discharges. This can seriously injure personnel and damage equipment.**
4. **Jumping from the top of a Stryker vehicle with or without slat armor can cause injury to personnel.**

CAUTION

Even though the CBRNE decontamination bottle and the portable fire extinguishing bottles are stored in different areas, you might grab the wrong one under stress, especially when the compartment is full of smoke.

So, before you use either, make sure it is the right one. For example, to put the fire out, make sure you have the portable fire extinguisher rather than the CBRNE decontamination bottle.

TASK STEPS AND PERFORMANCE MEASURES:

1. ENGINE COMPARTMENT FIRE

a. [Driver] Alert crew/squad by saying, "ENGINE ON FIRE." Acknowledge the fire by pressing the AFES reset button.
b. [Squad leader] Direct the driver to a safe position.
c. [Driver] Move the vehicle to a safe position. Stop the vehicle, shut down the engine, place the transmission in neutral, and engage the parking brake.
d. [Gunner] Turn off the power to the TOW.
e. [Vehicle Commander] Disconnect your seat belt and CVC helmet, and secure your personal weapon.
f. [Gunner] Disconnect your CVC helmet and secure your personal weapon. Open your hatch and climb off the front slope of the vehicle.
g. [Loader] Disconnect your seat belt. Secure your personal weapon. Push the emergency ramp button and lower the ramp.
h. [Driver] Open the driver's hatch and disconnect your CVC helmet. Secure your personal weapon and the portable fire extinguisher.
i. [Vehicle Commander] Secure the rear portable fire extinguisher, exit the vehicle behind the loader, and then move to the front of the vehicle to supervise the extinguishing of the engine compartment fire.
j. [Driver] Check the AFES indicator light and manually discharge the AFES (if the light remains ON) by raising the engine toggle guard on the AFES panel and pushing up on toggle switch. Turn off all vehicle power, exit through driver's hatch, and climb off the front slope of the vehicle.
k. [Vehicle Commander] Account for all personnel and supervise extinguishing of the fire.
l. [Driver and gunner] Extinguish the fire using the portable fire extinguishers (as needed).

DRILL NOTE

[Vehicle Commander] Check for location and condition of the fire before allowing the crew near the vehicle; then report the fire to higher.

m. [Vehicle Commander] Check the engine compartment to assess the condition of the fire.

DRILL NOTE

[Crewmembers] Wait 3 to 5 minutes before opening the engine access hatch to assess the condition of the fire.

2. TROOP COMPARTMENT FIRE

a. [Driver] Alert crew/squad by announcing "Troop compartment fire." Then, acknowledge the fire by pressing the AFES reset button.
b. [Vehicle Commander] Direct the driver to a safe position.
c. [Driver] Move the vehicle to a safe position, stop, shut off the engine, place the transmission in neutral, and engage the parking brake.
d. [Vehicle gunner] Turn off power to the TOW.
e. [Vehicle Commander and gunner] Disconnect your CVC helmets and secure your personal weapons.
f. [Driver] Open your hatch, disconnect your CVC helmet, secure your personal weapon, and the portable fire extinguisher.
g. [Loader] Disconnect your seat belt, secure your personal weapons, release the emergency ramp lever, and exit the vehicle.
h. [Vehicle Commander] Secure the portable fire extinguisher and exit the vehicle behind the loader.
i. [Gunner] Exit the vehicle through your hatch and climb off the front slope of the vehicle.
j. [Driver] Check the AFES indicator light and manually discharge AFES (if the light remains ON) by raising the toggle guard on the AFES panel and pushing up on the TROOP toggle switch.
k. [Driver] Turn off all vehicle power, exit through the driver's hatch, and climb off the front slope of the vehicle.
l. [Driver and gunner] Position yourselves depending on where the fire is located.
m. [Vehicle Commander] Before allowing anyone near the vehicle, account for everyone and check for the location and condition of the fire. Report the incident to higher.
n. [Driver] Extinguish the fire with the aid of the gunner.
o. [Squad leader] Supervise the extinguishing of the fire.

DRILL NOTE

[Vehicle Commander] If the hull is on fire, investigate the location and condition of the fire before you try to extinguish it.

PERFORM MISFIRE/HANGFIRE PROCEDURES ON THE STRYKER ATGMV

ACTION: Perform immediate action for the TOW Launcher in the event of a misfire/hangfire on the Stryker ATGMV.

CONDITIONS: As crewmembers on the Stryker ATGMV, you are engaging targets and the launcher fails to fire.

STANDARDS: When the command misfire/hangfire is given, the crewmembers take the appropriate actions to correct or remove the malfunctioning missile IAW TM 9-2355-311-10-7.

TASK STEPS AND PERFORMANCE MEASURES:

1. HANGFIRE PROCEDURES

a. [Gunner] If the missile fails to fire, alert the crew by announcing "HANGFIRE".
b. [Gunner] Continue to track the target for one minute.
c. [Gunner] Toggle the LAUNCHING EQPT switch to the down position.
d. [Gunner] Flip the LAUNCHING EQPT switch cover down.
e. [Loader] Set the TRAVERSE LOCK into the locked position.
f. [Loader] From the top of the vehicle open the LAUNCHER locking lever and remove the missile from the launcher
g. [Loader] Keep the missile pointed toward the engagement area and move the missile a safe distance away from the firing position (minimum 100 meters).
h. For training only:
   (1) In training wait 30 minutes before attempting to remove missile.
   (2) On a firing range, keep the missile pointed downrange at all times. Move the missile a safe distance away (minimum 100 meters) and place it on the ground, preferably in a dud pit and notify EOD personnel.

2. MISFIRE PROCEDURE

a. [Gunner] If the missile fails to fire, pull the trigger and continue to track the target for one minute.

WARNING

All crewmembers must remain inside the vehicle for 30 minutes after firing attempt in the event of a possible faulty TOW missile. Keep personnel at least 75 meters away from TOW blast area. Failure to do so could result in death or injury to personnel.

CAUTION:

If two unsuccessful firing attempts of the Elevated TOW System (ETS) occur concurrently, notify maintenance. To prevent further damage to firing circuit do not attempt to fire again.

b. [Gunner] Alert the crew by announcing "MISFIRE."
c. [Gunner] Continue to track the target for one minute.
d. [Gunner] Toggle the LAUNCHING EQPT switch to the down position.

e. [Gunner] Verify that WARNINGS MOTOR TEMP lamp, WARNINGS LINE-OF-FIRE DISABLED lamp and TAS HOT lamp are not illuminated.
f. [Gunner] Check for malfunction indicators in the GCP.
g. [Commander] Check the backblast area to ensure no personnel are in the danger zone.
h. [Gunner] Momentarily toggle LAUNCHING EQPT switch to ENABLE TRIGGER, then release back to INSERT UMBILICAL. Verify that the TRIGGER ENABLED lamp illuminates.
i. [Gunner] Raise trigger guard and squeeze trigger again.
j. [Gunner] If the missile still fails to launch, announce "MISFIRE" and continue to track the target for one minute.
k. [Gunner] Toggle the LAUNCHING EQPT switch to the down position.
l. [Gunner] Flip the LAUNCHING EQPT switch cover to the down position.
m. [Loader] Set the TRAVERSE LOCK into the locked position.
n. [Loader] From the top of the vehicle open the LAUNCHER locking lever and remove the missile from the launcher.
o. [Loader] Keep the missile pointed toward the engagement area and move the missile a safe distance away from the firing position (minimum 100 meters).
p. For training only:
   (1) In training wait 30 minutes before attempting to remove missile.
   (2) On a firing range, keep the missile pointed downrange at all times. Move the missile a safe distance away (minimum 100 meters) and place it on the ground, preferably in a dud pit and notify EOD personnel.

SECTION III. BATTLE DRILLS

TRADOC Regulation 350–70, the Army's systems approach to training (ASAT), defines a battle drill as "a critical collective action (or task) performed by a platoon or smaller element without the application of a deliberate decision making process, initiated on cue, accomplished with minimal leader orders, and performed to standard throughout like units in the Army. The action is vital to success in combat or critical to preserving life. It usually involves fire or maneuver. The drill is initiated on a cue, such as an enemy action or a leader's brief order, and is a trained response to a given stimulus." The following battle drills are for mounted elements:

REACT TO A BIOLOGICAL OR CHEMICAL ATTACK

ACTION: React to a biological and or chemical attack while dismounted/mounted on a Stryker ATGMV.

CONDITIONS: As a member of a dismounted/mounted squad or crew, given individual equipment, assigned individual weapons and ammunition, and a fully equipped ATGMV. The squad/crew is in a defensive position near a contaminated area. Personnel hear a chemical alarm or are ordered to mask.

STANDARDS: When the command GAS is given, the squad or crewmember does the following:

1. Within 15 seconds, dons your protective masks and hoods, mounted or dismounted.
2. Within 60 seconds, connect your breathing apparatus to the vehicle M13A1 gas particulate filtration unit (GPFU).
3. Within 90 seconds, begins self decontamination.
4. Within 8 minutes, assumes MOPP4.
5. Within 15 minutes, completes decontamination.
6. Decontaminates vehicle and equipment.

CAUTION

Although the CBRNE decontamination bottle and the portable fire extinguishing bottles are stored in different areas, Soldiers still might use one instead of the other. So, especially when the compartment is filled with smoke, they should check the label to be sure they are using the right one.

TASK STEPS AND PERFORMANCE MEASURES:

1. CHEMICAL ALARM SOUNDS

a. [Vehicle Commander] Stop breathing and, within 9 seconds, don, clear, and seal your protective mask. Within 6 more seconds, pull the hood over your head and zip it up. Alert the vehicle crew by giving the alarm "GAS" either with arm and hand signals or by radio.

b. [Crew] Stop breathing and, within 9 seconds, don your protective masks, clear them, and seal them. Within 6 more seconds, pull the hoods over your heads and zip them up.

c. [Crew] Give the alarm "GAS" or give the arm and hand signal for a chemical attack.

DRILL NOTE

[Gunner and driver] While mounted, keep your hatches closed, and keep the M240B in the ready-to-fire configuration.

d. [Crew] If dismounted, take shelter on vehicle.

e. [All squad members] Connect your protective mask breathing apparatus to the vehicle M13A1 gas particulate filtration unit (GPFU).

DRILL NOTE

If squad is in a mounted configuration, squad leader, vehicle commander/gunner, driver hatches, and ramp are closed.

2. COMMAND PERFORM SELF-DECONTAMINATION AND REPORT

a. [Crew] Decontaminate with M258A1/M291 kit and provide buddy aid as needed.

b. [Squad leader] Reestablish your chain of command and communications, and report the situation to your company commander. Ask for an "*Up"* from the crew/squad when decontamination is complete. Send a SITREP to the commander.

c. [Gunner, driver, and loader] Reply with "*Up*" when finished with the decontamination process.

3. INITIATE MOPP4

a. [Vehicle Commander] Command DON MOPP4.

b. [All personnel] Don MOPP4 using buddy aid if necessary.

4. IDENTIFY CHEMICAL AGENT

a. [All personnel] Use chemical detector paper and the M256 detector kit.

b. [Vehicle Commander] Command CHECK FOR CHEMICAL AGENTS.

c. [Gunner] Disconnect your protective mask breathing apparatus from the vehicle M13A1 GPFU, exit through your hatch, and then check the top of the vehicle and the M240B machine gun. Report your findings to the vehicle commander.

c. [Driver] Disconnect your protective mask breathing apparatus from the vehicle M13A1 GPFU, exit through your hatch, and then help the gunner check the top of the vehicle and the driver's compartment. Report your findings to the squad leader.

d. [Loader] Disconnect your protective mask breathing apparatus from the vehicle M13A1 GPFU. Exit the vehicle using the ramp door. Check the inside and outside of vehicle. Report your findings to the vehicle commander.

DRILL NOTE

Keep the ramp closed.

5. DETERMINE IF DECONTAMINATION IS REQUIRED AND REQUEST SUPPORT, IF NEEDED

a. [Vehicle Commander] Command PREPARE TO DECONTAMINATE VEHICLE.

b. [Crew] Report chemical presence on vehicle, if any, and then report findings to commander.

c. [Loader] Locate the M11 or the M13 decontamination apparatus and pass it on to the driver.

6. DECONTAMINATE EQUIPMENT USING M11 OR M13

a. [Vehicle Commander] Command DECONTAMINATE THE VEHICLE, and then report to the commander when the decontamination process is completed.

b. [Gunner] Aid in the decontamination process, and report to the squad leader when the decontamination process is completed.

c. [Driver] Decontaminate the vehicle using the M11 or the M13 decontamination apparatus.

d. [Gunner and loader] If needed, help the driver. Disconnect your protective mask breathing apparatuses from the vehicle M13A1 GPFU.

7. [DESIGNATED PERSONNEL] BEGIN MONITORING WITH EQUIPMENT

a. [Vehicle Commander] Command PERFORM MONITORING, and then disconnect your protective mask breathing apparatus from the vehicle M13A1 GPFU. Supervise the use of equipment to monitor the environment in and around vehicle, and report your findings to the commander.

b. [Gunner] Use monitoring equipment to monitor the environment in and around vehicle. Report to the squad leader when the monitoring process is completed.

c. [Driver and loader] Assist in monitoring, if needed.

d. [Loader] Exit the vehicle through the ramp door.

DRILL NOTE

Keep the ramp closed.

e. [Crew] Move and displace as appropriate, or continue your mission.

DRILL NOTE

[Crew] Remain in MOPP4 and stay connected to the vehicle M13A1 GPFU until the squad leader commands ALL CLEAR.

f. [Vehicle Commander] Command MOUNT UP, and then connect your protective mask to the vehicle M13A1 GPFU.

g. [Crew] perform drill steps IAW "*Mount an ATGMV"* Connect your protective masks to the vehicle M13A1 GPFU.

DRILL NOTES:

1. Simulate some actions, such as raising and lowering the ramp, to avoid wear on the equipment due to repetitive training.

2. Simulate the use of decontaminants and monitoring equipment.

3. All Stryker vehicles have seat belts. Allow time for crewmembers to adjust seat belts during crew drills.

REACT TO AMBUSH (MOUNTED)

ACTION: React to ambush while mounted on an ATGMV.

CONDITIONS: As a member of an ATGMV crew with individual equipment, individual weapons and ammunition, and a fully equipped ATGMV. The ATGMV is in a platoon traveling formation with driver and gunner hatches open, the M240B traversed left/right for flank security, and the weapon loaded and on SAFE. The platoon has entered a kill zone, and the enemy has initiated an ambush with a light antiarmor weapon and a high volume of fire.

STANDARDS: Move out of the kill zone or to a covered and concealed position, return fire, and force the enemy to withdraw, with no casualties sustained by the squad, no damage to the ATGMV, and no harm to friendly assets.

TASK STEPS AND PERFORMANCE:

1. [Vehicle Commander] Commands AMBUSH, and then direct the driver to seek cover. Use the radio to alert the squad as to the direction of ambush (front, left/right flank, or rear).
2. [Driver] Move the vehicle out of the kill zone or to a covered and concealed position, stops, and secure the driver's hatch.
3. [Gunner] Secure your hatch, and prepares the TOW for firing.
4. [Vehicle Commander] Return suppressive fire in the direction of the ambush.
5. [Driver] Observe the area through viewing ports, and alert the squad leader to enemy activity.
6. [Vehicle Commander] Call in a SITREP to the platoon leader, and then call for and adjust indirect fire, if needed.

DRILL NOTES

1. Time stops when the ATGMV has moved out of the kill zone and the squad leader has called in a SITREP to the platoon leader.

2. Some actions such as raising and lowering the ramp should be simulated due to the wear and tear on the equipment, which is caused by repetitive training.

3. All Stryker vehicles come with seat belts that should be used to prevent injuries during vehicle movement. Adjusting time for seat belt hookups is therefore recommended when conducting crew drills.

REACT TO DIRECT FIRE (MOUNTED)

ACTION: React to direct fire or antitank guided missiles while mounted on an ATGMV.

CONDITIONS: As a member of an ATGMV crew with individual equipment, individual weapons and ammunition, and a fully equipped ATGMV. The ATGMV is in a platoon traveling formation with the M240B traversed left or right for flank security, and with the weapon loaded and on SAFE. The platoon has detected the signature of an antitank weapon or heavy machine gun fire.

STANDARDS: The vehicles immediately returns fire (if possible) with TOW or 240B at known or suspected enemy position. The drive takes evasive actions. The vehicle is not destroyed.

TASK STEPS AND PERFORMANCE MEASURES:

1. [Driver] Take evasive action by seeking a covered and concealed position.
2. [Vehicle Commander/Gunner] Return fire using the TOW or M240B machine gun at known or suspected enemy positions, forcing enemy withdrawal, with no damage to the vehicle, and no friendly casualties or damage.
3. [Vehicle Commander] Command *ENEMY FIRE*, and direct the driver to seek cover. Use the radio to alert the squad as to the direction of enemy fire (front, left/right flank, or rear).
4. [Driver] Move the vehicle out of the kill zone using evasive action, stop, and then secure the driver's hatch.

DRILL NOTE

Evasive actions involve varying speeds, zigzagging, and changing direction frequently, while moving to a covered and concealed position.

5. [Vehicle Commander] Return fire in the direction of enemy fire
6. [Driver] Observe the area through viewing ports and alert the squad to enemy activity.
7. [Squad leader] Call in a SITREP to the platoon leader, and if needed, call for and adjust indirect fire.

DRILL NOTES

1. Time stops when the ATGMV has moved out of the kill zone and the squad leader has called in a SITREP to the platoon leader.
2. Some actions such as raising and lowering the ramp should be simulated due to the wear and tear on the equipment, which is caused by repetitive training.
3. All Stryker vehicles are issued seat belts that should be used to prevent injuries during vehicle movement. Adjusting time for seat belt hookups is therefore recommended when conducting crew drills.

REACT TO INDIRECT FIRE (MOUNTED)

ACTION: React to indirect fire while mounted on an ATGMV.

CONDITIONS: As a member of an ATGMV crew individual equipment, individual weapons and ammunition, and a fully equipped ATGMV, during either day or periods of limited visibility. The ATGMV is in a platoon traveling formation, with the M240B traversed left or right for flank security, and with the weapon loaded and on SAFE or in a secured halt position. The platoon has been engaged with indirect fire.

STANDARDS: Any dismounted soldiers return to their vehicle or seek nearby cover. On round impact, the vehicle commander designates the direction and the distance to move. The unit moves to the specified location. The platoon sustains no more than four casualties, and no more than one vehicle loss.

TASK STEPS AND PERFORMANCE MEASURES:

1. [Vehicle Commander] On round impact, have the driver move the ATGMV out of the impact area.
2. [Vehicle Commander] Commands INCOMING, and secure the squad leader's hatch. Direct the driver to move as quickly as possible away from the engagement area, for example, "Move out at three o'clock, two hundred meters."
3. [Driver] Secure your hatch and move the vehicle as fast as possible out of the impact area in the direction given by the squad leader.
4. [Gunner] Secure your hatch.
5. [Vehicle Commander] Direct the driver to an alternate firing position or rally point
6. [Driver] Stop the vehicle in a covered and concealed position.
7. [Vehicle Commander] Call in a SITREP to the platoon leader.

DRILL NOTES:

1. Time stops when the ATGMV has moved out of the kill zone and the squad leader has called in a SITREP to the platoon leader.

2. Some actions such as raising and lowering the ramp should be simulated due to the wear and tear on the equipment, which is caused by repetitive training.

3. All Stryker vehicles are issued seat belts that should be used to prevent injuries during vehicle movement. Adjusting time for seat belt hookups is recommended when conducting crew drills.

Appendix C

Stryker Protective Armor

Strykers need extra protection against antiarmor weapons. Reactive armor tiles and SLAT armor both offer increased protection.

BACKGROUND

C-1. The Stryker family of vehicles is currently the main combat platform for the SBCT. Add-on-armor kits (AoA) are being developed for use with the Stryker system; however, the kits are not ready for fielding. As an interim solution, a slat armor kit has been designed and installed to help mitigate hand held anti-tank weapons effects of RPG class munitions.

C-2. The slat armor kit consists of a series of modules, which are mounted to all four sides of the vehicle with the use of various support assemblies. Plates made of 0.25–inch thick rolled homogenous armor (RHA) are fastened to the upper sides of the ICV to support existing storage racks for the ICV and the support brackets for the slat armor. The modules consist of spaced steel slats, which are oriented parallel to the ground with a built-in standoff distance of 10 inches from the vehicle surface and any stowed items. The slat armor kit adds 4,920 pounds to the weight of the vehicle bringing the gross vehicle weight of a fully stowed ICV to about 45,440 pounds.

SLAT ARMOR

C-3. Slat armor is designed to protect vehicle crew/squad members from handheld antitank weapons. Slat armor consists of blast plates and louver assemblies installed around the perimeter of the vehicle. The louvers are fabricated of steel bars spaced a nominal 2.5 inches apart.

Note: To work as designed, a standoff distance of 10 inches must be maintained between the inside surface of the louver assemblies and the vehicle structure, vehicle components, and exterior BII/storage.

C-4. The kits are packaged and shipped in two crates, which will contain all the modules, mounting brackets and required hardware for one vehicle. A set of instructions for installation of the slat armor kit has been prepared and will be provided with each kit. Various support assemblies and hardware is used to secure the armor. Blast plates fabricated of 0.25–inch steel are fastened to the upper sides of the vehicle to allow existing storage racks and brackets to be used with slat armor. Some of these existing vehicle components, such as the side bustle storage racks, must be removed prior to the installation of slat armor. The blast plates also increase ballistic protection from small caliber ammunition. Also included are skirts to protect the lower sides of the vehicle and access doors in the slat armor to permit refueling, hookup of outside electrical power or air, and so on.

VEHICLE PREPARATION

C-5. Numerous mounting fixtures (storage racks, brackets, and so on) used to hold BII/storage items must be removed from the exterior of the vehicle before slat armor can be installed. Some of these components will not be used after slat armor is mounted and should, therefore, be stored accordingly. The remaining components will be re-installed on top of the slat armor.

- Remove all exterior BII and storage from the vehicle. Lay aside for re-installation on the vehicle following installation. Stowage items located on the roof need not be removed.
- Remove lower storage rails and brackets, pioneer tool rack, and bustle storage rack from the sides of the vehicle. Stowage rail and brackets will not be used after installation, therefore, store accordingly. Lay all other parts aside for re-installation.

- Remove headlight brush guard from the front and right corners of the vehicle. The brush guards will not be used after armor is installed, therefore, store accordingly.
- If in place on the vehicle, remove hook and pile strips from the emergency hatch to back of vehicle on left side and from the chain box to the back of the vehicle on the right side.
- The following items do not get re-installed and need to be stored accordingly:
- Driver's handgrip
- Stowage rails
- Brackets
- Brush guards

SLAT ARMOR INSTALLATION

C-6. Slat armor will be installed in groups based on vehicle location (front, left side, right side, and rear). Unpack the shipping crates and lay the blast plates and louver assemblies out in their respective groups.

C-7. New hardware is supplied for installation of the armor. Some existing vehicle components, such as the side bustle storage racks, are impacted by the installation of the armor. The installation instruction guide packed with the armor explains any changes required. Reuse storage rack and bracket mounting hardware taken from the vehicle to remount these items once the slat armor is installed. The following tools and expendable supplies are required for installation:

- 1/2-inch drive ratchet.
- 18-mm 1/2-inch drive socket.
- 18-mm 1/2-inch drive deep well socket.
- 18-mm crowfoot wrench, 3/8 in. drive.
- 30-mm 1/2-inch drive socket.
- 5-inch long 1/2-inch drive extension.
- 10-inch long 1/2-inch drive extension.
- Torque wrench, 1/2-inch drive (12 foot pounds or 144 inch pounds).
- Torque wrench, 1/2-inch drive (85 foot pounds).
- Cyanoacrylate adhesive.

C-8. For complete installation instructions see the Stryker Slat Armor Installation Instruction Guide packaged with the slat armor kit.

SLAT ARMOR EXTRA CHECKS AND SERVICES

C-9. The following PMCS checks are supplemental to the vehicle PMCS. When slat armor is installed, both the vehicle PMCS and the following must be used:

- Front of Vehicle: (Driver), visually check front of vehicle for damage, loose or missing hardware. Inspect mounting bolts for looseness. If bolts are loose, tighten. At first chance, have the maintenance CRT tighten the mounting bolts to the proper torque value.
- Left side of Vehicle: (Driver), visually check left side of vehicle for damage, loose or missing hardware. Inspect mounting bolts for looseness. If bolts are loose, tighten. At first chance, have the maintenance CRT tighten the mounting bolts to the proper torque value.
- Rear of Vehicle: (Driver), visually check rear of vehicle for damage, loose or missing hardware. Inspect mounting bolts for looseness. If bolts are loose, tighten. At first chance, have the maintenance CRT tighten the mounting bolts to the proper torque value.
- Right Side of Vehicle: (Driver), visually check right side of vehicle for damage, loose or missing hardware. Inspect mounting bolts for looseness. If bolts are loose, tighten. At first chance, have the maintenance CRT tighten the mounting bolts to the proper torque value.

UNEXPLODED ORDNANCE PROCEDURES

C-10. Once the operator knows that a round is lodged in the armor, he should–

- Immediately evacuate the vehicle.
- Call for EOD support.
- Mark off the area around the vehicle at a safe distance.
- Never try to dislodge the round.

SAFETY PRECAUTIONS

C-11. Safety related precautions identified with the installation of slat armor are as follows:

- To prevent injuries during installation of the slat armor kit, three personnel must handle/install the modular assemblies.
- Slat armor may have sharp edges, which could cause injury. Leather work gloves must be worn when handling the armor.
- The lower front portion of the slat armor hangs low enough to impact the ground during the crossing of ditches or depressions during cross-country operations. Caution must be observed by the driver under these driving conditions.
- The emergency escape hatch opens rapidly outward when unlatched. During an emergency escape situation, the crewmen must quickly release the hatch and allow it to open without trying to restrict the outward motion.
- Due to the weight of the emergency escape hatch, opening and closing the hatch during non-emergency situations is a three-man operation which requires two crewmen on the outside to control/hold the hatch and a third person inside the vehicle to operate the latch.
- The addition of slat armor to the rear access door increases the weight of the door. Opening and closing the door is now a two-man operation and will require the addition of a strap to the inside handle, so closing the door can be accomplished by two personnel.
- The means for climbing on and off the vehicle can be a hazard for the possibility of a fall. A three step means consisting of a cable loop on the bottom of the slat armor with a metal rectangular shaped step about 20 inches above that, with the third step being onto the top of the front of the vehicle has been provided. The slats in the front module are to be used for handholds.
- The possibility of injury from slipping or falling from the slat armor during deployment of the winch cable exists. Caution must be observed.
- Use of the standard tow bar for the Stryker vehicle during towing or recovery operations provides only 4.5 inches between the slat armor on the towing vehicle and the vehicle being towed. The standard tow bar is not to be used unless the front slat armor on the towed vehicle and the rear of the towing vehicle is removed. With the armor removed, only 21 degrees of turning capability is provided. This condition is inadequate, except under emergency towing or recovery conditions. Use of the M984A1 HEMTT wrecker with PLS tow bar extension is recommended.
- The slat armor causes visibility degradation to the headlight capabilities for both the right and left front area of the vehicle. The driver will need to use caution and direct more attention to observance of the edge of the road, and to the recognition of objects and obstructions along the side of the roadway during nighttime operations.
- Training and guidance provided to the crewmen for the Stryker equipped with slat armor must emphasize that a minimum standoff distance of 10 inches MUST be maintained between the inside surface of the slat armor and the vehicle structure and any components or stowed items. No gear or other items are to be hung or attached to the outside or inside of the slat armor kit.

Appendix D

Unit Maintenance Program

With the introduction of SBCTs to the force structure, the Army has embarked on the first step in a process that will doctrinally redefine warfighting in the new war-fighting era. Beginning with the Stryker brigades and culminating in the future force, the Army has updated doctrine to place more responsibility on these units to be self-sustaining. It is departing from the "iron mountain" support concept that has previously applied to deployed units. Sustainment will be accomplished with a maintenance structure condensed from four levels (organizational, direct support, general support, and depot maintenance) to two levels (field and sustainment maintenance).

MAINTENANCE TRAINING STRATEGY

D-1. Maintenance training in the SBCT is the responsibility of the BSB, but maneuver units should encourage maintenance personnel to train with the maneuver unit at every opportunity possible.

TWO-LEVEL MAINTENANCE STRUCTURE

D-2. The two level maintenance concept is part of the Army's transformation process, and the SBCT will be at the forefront. Unlike the current four level structure, the two level structure (Figure D-1) combines the organizational and direct support levels of maintenance as field level maintenance (on system maintenance) and combines the general and depot levels of maintenance as sustainment level maintenance (off system maintenance). SBCTs come under a two level maintenance concept. All SBCT mechanics are assigned to a forward maintenance company (FMC), brigade support battalion (BSB). (Under the four level structure, battalion and company commanders have a maintenance force assigned.) The BSB is responsible for all actions regarding maintenance assets and is monitored by a MCO. The MCO coordinates all SBCT maintenance and manages FMC activities. Figure D-1 provides an FMC breakout of assigned personnel. The mission of the BSB is providing scheduled and unscheduled maintenance service and recovery; automotive and armament support; and ground support, missile, and electronic maintenance to SBCT units. The maintenance warrant officer and maintenance NCO assist battalion commanders in developing a unit maintenance program that supports their unit readiness.

Note: FMC combat repair teams (CRTs) manage and operate all SBCT recovery assets and equipment needed to conduct recovery for the supported unit.

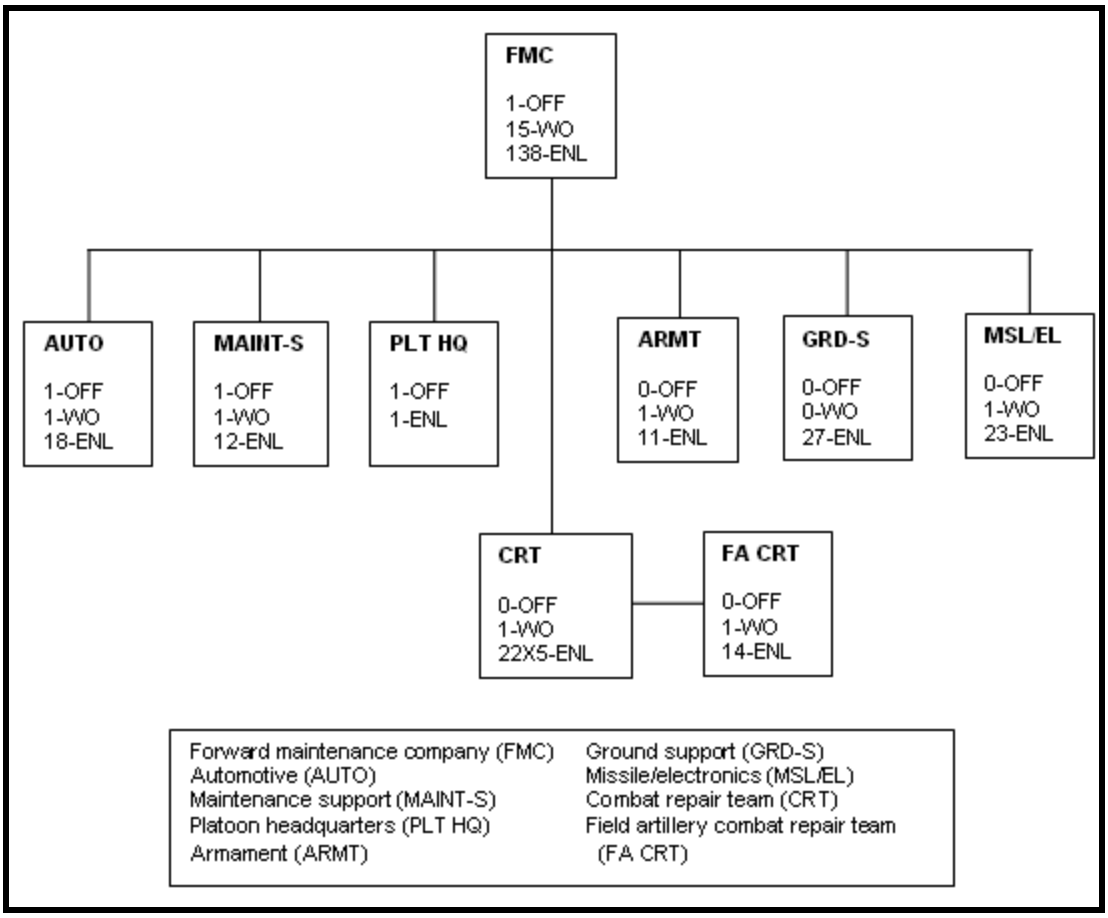


Figure D-1. Two level concept, forward maintenance company structure.

PROGRAMS

D-3. Programs such as the targeted fleet overhaul program and the ready-to-fight vehicle program are built in to assist in maintaining the unit's fleet of Stryker vehicles. The targeted Fleet Overhaul Program is designed to rebuild a battalion size element of Stryker vehicles in which all vehicles are exchanged one for one. The ready-to-fight vehicle program is designed for replacing damaged vehicles beyond repair. These vehicles are replaced one-for-one by the BSB from a stockpile of operational readiness floats (ORFs) of each type of Stryker vehicle platform listed on the SBCT property book. ORFs will come fully equipped to replace disabled or destroyed vehicles during combat.

CONSIDERATIONS

D-4. Not having an organic maintenance force is one major drawback to the two level concept; another major drawback is the drastic drawdown of mechanics within SBCTs. Under this concept, Stryker operators perform 10-level maintenance and conduct higher-level maintenance functions that have been pushed down to Stryker crews while in garrison and during field operations. In garrison, the Stryker crew performs preventive maintenance checks and services (PMCS), and in the field the Stryker crew performs battle damage assessment and repair (BDAR) and recovery operations. The distinction between the two duties is in garrison, they perform operator maintenance and in the field they perform combat maintainer (CM) duties.

COMBAT MAINTAINER

D-5. The two level maintenance concept defines a CM as a crewmember trained to perform limited diagnostics, remove and replace line replacement units (LRUs), perform BDAR, and conduct self recovery operations. Systems diagnostics and parts removal and replacement actions, commonly referred to as "plug and play" replacement, will be conducted through the use of a robust diagnostic system embedded in the Stryker vehicle platform that identifies system errors. Although there is no maintenance asset located at company and battalion, leaders at these levels should designate a maintenance representative to manage unit readiness of vehicles and equipment, and coordinate with the brigade MCO for CRTs. This level of responsibility will be helpful, especially during deployments or during exercises when only a portion of the battalion deploys. Battlefield situations may at times limit CRT support, due to their primary modes of transportation being soft skin vehicles that have very limited protection. Safety of field level maintenance support personnel and equipment must be considered when requesting their aid; vehicles must be positioned in an area that has been secured, if possible.

MAINTENANCE SUPPORT

D-6. The BSB is responsible for all maintenance personnel and assets. Proper and timely coordinations leave the MCO the flexibility to shift entire CRTs where needed, or add additional maintenance personnel to units that have more severe maintenance related issues.

FORWARD MAINTENANCE COMPANY

D-7. The following is a description of all assets within the FMC and type of support provided by the FMC.

Maintenance Control Section

D-8. This is the nerve center for maintenance operations within the SBCT. The MCO runs it, assisted by a senior maintenance sergeant and equipment records/parts specialists.

Maintenance Classification Section

D-9. This section is responsible for quality assurance, quality control, and technical inspections of all field maintenance functions. The MCS classifies inoperative and damaged equipment based on Army condition codes.

Maintenance Support Teams

D-10. Maintenance support teams operate from a fixed location within the FMC, providing back-up support for the CRTs.

Maintenance Recovery Section

D-11. This section can haul, tow, and recover all of the SBCT's wheeled assets.

Wheeled Vehicle Repair Platoon

D-12. This platoon maintains SBCT organic wheeled vehicles and provides back-up maintenance to the forward support CRTs.

Armament Repair Section

D-13. This section maintains SBCT armament related equipment such as gun turrets, fire control systems, small arms weapons, sighting units, and artillery pieces.

Ground Support Equipment Repair Section

D-14. This repair section provides field maintenance for SBCT nonvehicular environmental control equipment such as power generation; water purification; petroleum, oil, and lubricants; and engineer equipment. This section works primarily from a fixed location in the FMC.

Missile and Electronics Repair Section

D-15. This section has two missions: missile weapons system maintenance and communications and electronics maintenance.

COMBAT REPAIR TEAMS

D-16. The MCO will dispatch CRTs as needed to SBCT elements to conduct maintenance; they will then return to the BSB. These teams are composed of mechanics with MOSs needed to conduct organizational and direct-support-level maintenance. Their equipment consists of an FRS, two HEMTTs, and two HMMWVs.

OPERATOR AND COMBAT MAINTAINER

D-17. Initial CM training is conducted by contractor MTTs at Stryker universities located at all installations that have the Stryker vehicle. At the completion of the initial training phase, the maneuver unit commander will be responsible for assuring that he has a sufficient amount of CMs trained.

TRAINING CONSIDERATIONS

D-18. Coordination should be made with the BSB for assistance in developing a driver/CM sustainment program. The brigade maintenance cell can provide personnel to train drivers on maintenance related CM tasks. Scheduling of such training should also be considered when incorporating new changes to the CM task list, keeping vehicle crews current as tasks are eliminated or added to the program. CMs should be given every opportunity to practice BDAR-related skills during normal training exercises to become proficient at making minor fixes and performing recovery operations.

Appendix E

Firing Positions

A firing position must provide protection for the weapon system and its crew, but it also must allow for unhindered target engagement. Due to the fluid nature of offensive operations, occupation of an unprepared defilade position normally characterizes antiarmor fighting positions. While platoons and sections move, their leaders search for these firing positions and the best covered and concealed routes to them. When the leaders cannot make a visual reconnaissance of the terrain, they select tentative firing positions and routes from a thorough map reconnaissance. In the defense, antiarmor squads use firing positions with improved frontal and overhead protection. As the defender, they have more time to learn the terrain and to increase their protection and concealment.

PLANNING AND SELECTING OF FIRING POSITIONS

E-1. Stryker antiarmor units employ their TOW weapon systems on the carrier. Indirect fires present the greatest danger to antiarmor squads. For this reason, covered and concealed locations are critical for an antiarmor squad's survival. Squads avoid firing positions that could be easily identified by an enemy map reconnaissance. The enemy normally fires artillery and mortar fires to support an attack based on a schedule. Enemy forces in an offense have limited ability to fire on targets of opportunity; therefore, choosing firing positions carefully will help antiarmor squads avoid much of these indirect fires.

E-2. Squad leaders select firing positions that afford maximum protection yet allow the gunner to effectively engage the targets. Firing position selection begins when each section is assigned a mission, a sector of fire or a portion of an engagement area, and a general location. The section leader then designates a firing position for each of his two antiarmor squads.

E-3. Leaders select positions below ridgelines and crests, preferably on the sides of hills. Positions, along with the routes to them, should be as dry and as level as possible. Leaders should avoid choosing positions such as swampy areas, steep hillsides, and on or near prominent terrain features.

E-4. Leaders select firing positions during daylight, and position antiarmor squads at night to reduce the chance of enemy detection. Leaders must not assume that darkness provides concealment for their firing positions. Through the use of night vision devices, enemy forces see almost as well in darkness as in daylight. Thermal imagery devices sense the heat emitted by vehicles and personnel. These devices provide the enemy with a capability to see through smoke, light foliage, and camouflage. Antiarmor squads continuously improve their positions throughout mission preparation.

E-5. Each antiarmor squad's firing position must offer–

- Cover to the front, flank, and overhead.
- Concealment from ground and aerial observation.
- Good observation and fields of fire into the assigned portion of an engagement area.
- Covered and concealed routes to, and between, positions.
- Mutual support between antiarmor squad positions and with other elements.

TYPES OF FIRING POSITIONS

E-6. Each antiarmor squad must have a primary firing position. Leaders may assign any number of alternate, supplementary, and successive positions as a result of their analysis of the factors of METT-TC.

PRIMARY POSITION

E-7. The initial firing position where an antiarmor squad covers an assigned sector of fire or portion of an engagement area is called the squad's primary position (Figure E-1). This is the best position for engaging enemy vehicles. The company commander or platoon leader usually designates the general location of this position.

ALTERNATE POSITION

E-8. An antiarmor squad's alternate position (Figure E-1) must allow the gunner to cover the same enemy avenue of approach or sector of fire as he can from the primary position. The company commander or platoon leader designates alternate positions. When squads have time and resources, they construct an alternate position to the same level of preparation as a primary position.

- As a guideline, an alternate position should be located 300 meters or more from the primary position to reduce the chance that indirect fire that suppresses the primary position also will affect the alternate position. Though terrain may not allow this much space, leaders should always consider this guideline when selecting alternate positions.
- If the antiarmor squad leader selects alternate positions, he should report the locations of each alternate position to the section leader and platoon leader.

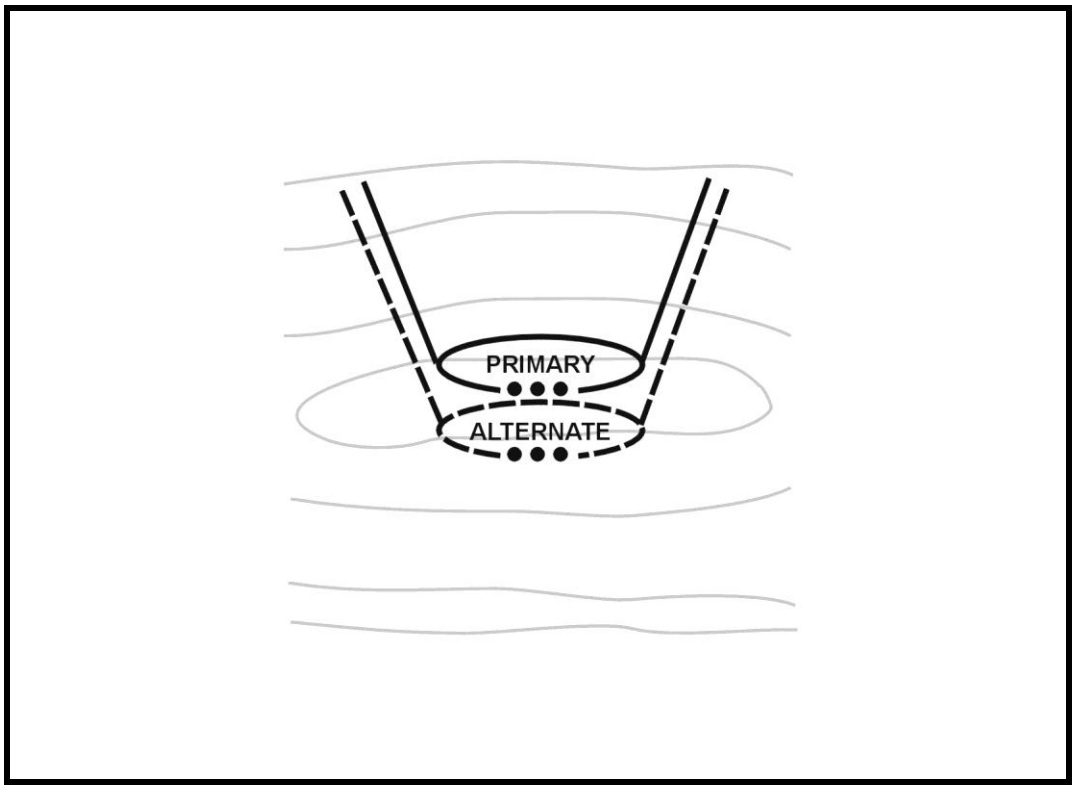


Figure E-1. Primary and alternate positions.

SUPPLEMENTARY POSITION

E-9. The supplementary position (Figure E–2) allows the antiarmor squad to cover an enemy avenue of approach or sector of fire that is different from that covered by the primary or alternate positions. It usually is chosen to cover avenues of approach to the flank or rear of a unit. The antiarmor squad reconnoiters this position and prepares a range card. Leaders will typically base occupation of a supplementary position on specific enemy actions.

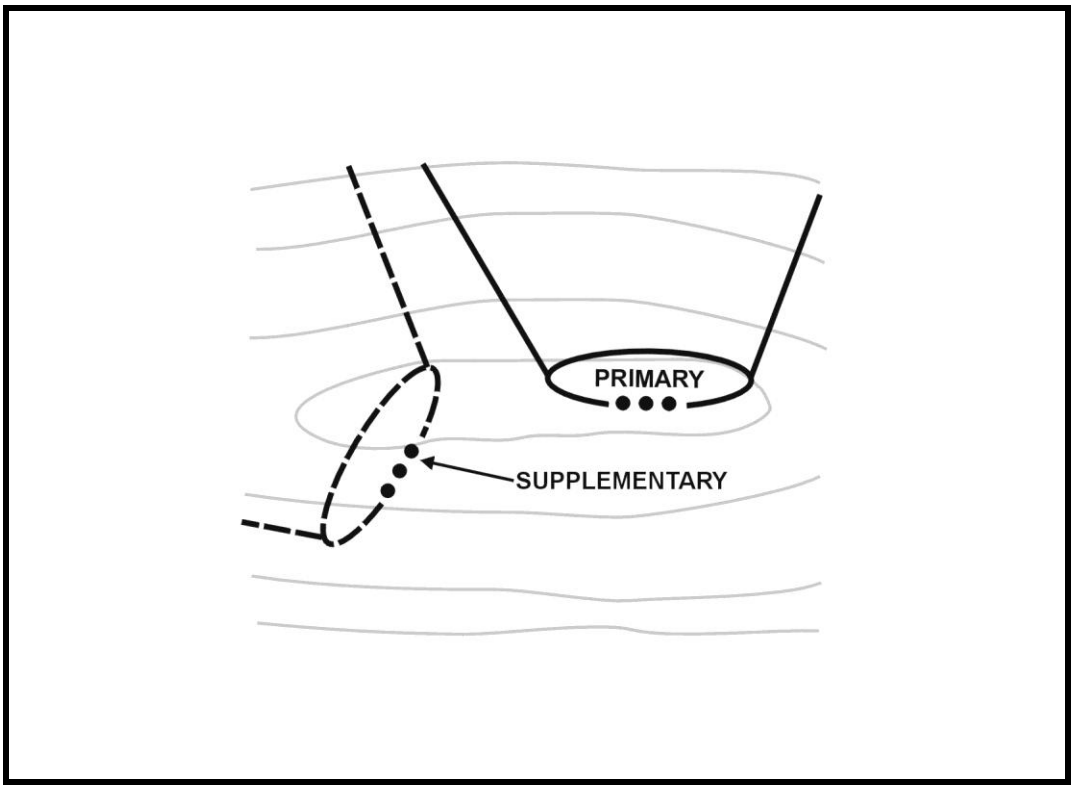


Figure E-2. Supplementary position.

SUCCESSIVE POSITION

E-10. A successive position (Figure E-3) covers in depth the same avenue of approach as a primary or supplementary position. Leaders will typically base occupation of a successive position on specific enemy actions or as part of a planned scheme of maneuver.

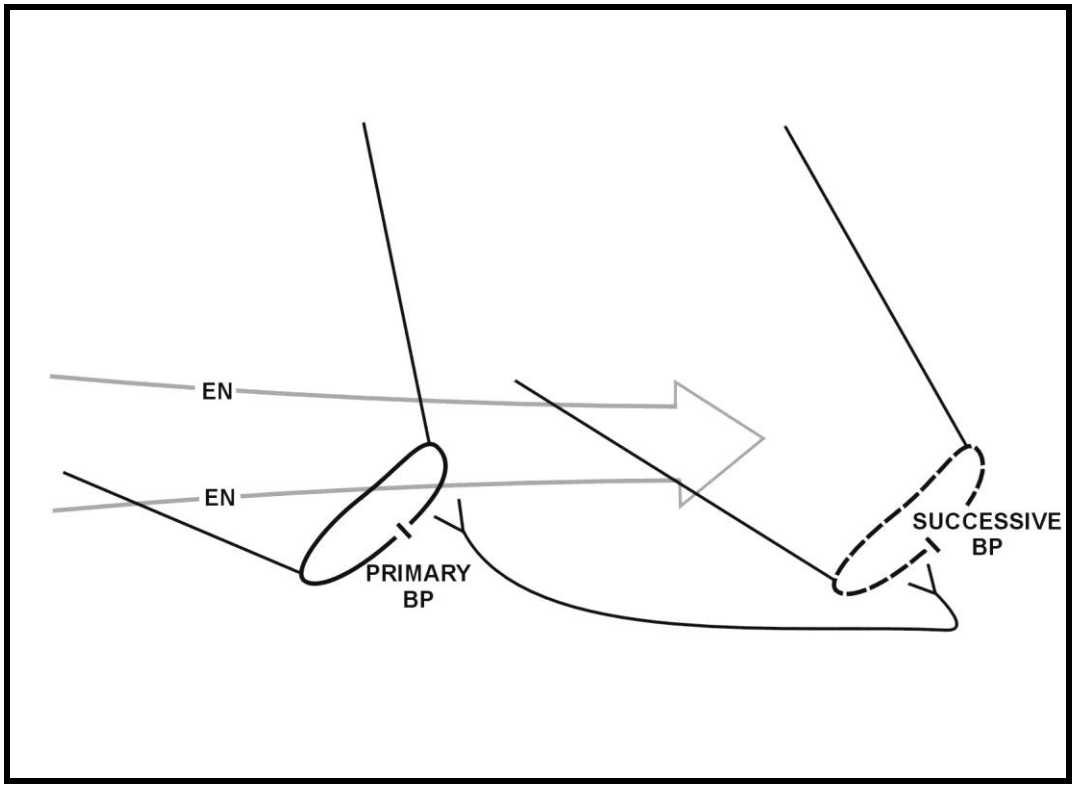


Figure E-3. Successive position.

PREPARATION OF FIRING POSITIONS

E-11. The company commander or platoon leader will designate the level of preparation for each firing position based on the factors of METT-TC, with emphasis on the time available. There are three levels of preparation: reconnaissance, preparation, and occupation.

RECONNAISSANCE

E-12. Leaders must reconnoiter the EA or AO and firing positions. They must get on the ground to physically inspect the terrain and determine its effects on antiarmor weapons employment and on enemy weapons employment. In the offense, this reconnaissance will typically occur through a detailed map reconnaissance. General positions with limited fire control measures must be identified during reconnaissance.

PREPARATION

E-13. The platoon or section begins preparing a firing position as soon as the leaders complete their reconnaissance. The leaders call the vehicles forward and guide them into position. They may consider having drivers back the vehicles into position so they can leave quickly without moving toward the enemy or using time to turn around. The unit removes or camouflages all signs that the enemy could detect (such as wheel tracks). Antiarmor squads continue to improve the position until it is vacated. Preparation includes, but is not limited to–

- Marking the position.
- Emplacing fire control measures (as required).
- Digging the position.
- Identifying and digging ammunition caches.
- Preparing a range card.
- Emplacing protective obstacles.
- Camouflaging the position.

E-14. The antiarmor squad occupies the general position identified by the platoon leader or section leader and establishes security. Each antiarmor squad must be prepared to fight while it prepares the position. Maintaining security during preparation allows the antiarmor squad to react quickly if the enemy appears before the position has been completed.

- After selecting a firing position, the leaders mark the position with stakes and prepare a range card. This enables the squad or another squad to occupy the firing position and use the data from the range card for the position. They use three stakes to mark a mounted firing position. One stake is placed in front of and centered on the vehicle. It should be long enough so that the driver can see it as he moves the vehicle into position. The other two stakes are placed parallel to the left side of the vehicle and lined up with the hub on the front and rear wheels. The stakes are placed close to the vehicle with enough clearance to allow the driver to move into the position without knocking the stakes down. The stakes are driven solidly into the ground. Engineer tape or luminous tape can be placed on the friendly side of the stakes to make it easier to see them during limited visibility.
- Once the antiarmor squad has dug the position, it camouflages it. Squad members use sod, leaves, brush, grass, or any other natural material to do so. The items should not be taken from the immediate area of the position. Camouflage nets or other man-made materials also are used, but these work best if used with natural materials. The position should look as natural as possible.

OCCUPATION

E-15. The company commander or platoon leader must establish triggers for occupation of the position.

- Vehicles approach the firing position from the rear using terrain-driving techniques on a rehearsed route.
- To reoccupy a marked position, the driver aligns his vehicle on the front stake and moves forward slowly until the two stakes on the left of his vehicle are centered on the front and rear wheels.
- Antiarmor units must develop an SOP for occupying a firing position. The SOP must include the sequence of action and the priority of work. This ensures that all squad members know what is expected of them.

RANGE CARD

A range card is a sketch or diagram of the terrain that a weapon must cover by direct fire. It shows planned target areas and terrain features, each of which is plotted relative to that weapon's firing position. The information on a range card is used to plan and control fire, to rapidly detect and engage targets, and to orient replacement personnel and units. Instructions for completing a range card are found in FM 3–21.8, FM 3–22.1, FM 3–22.34, and FM 3–22.65.

Appendix F

Standard Range Card

This appendix describes the various parts of a standard range card (DA Form 5517–R). FM 3–21.8, *The Infantry Rifle Platoon and Squad*, provides an example and a detailed discussion of how to complete a range card.

DESCRIPTION

F-1. A range card is a sketch of the terrain a weapon system has been assigned to cover by fire. It contains information that assists in the planning and controlling of fires, the rapid detection and engagement of targets, and the orientation of replacement personnel or units. By using a range card, a gunner can quickly and accurately determine the information he needs to engage targets.

SECTOR OF FIRE

F-2. A sector of fire is a part of the battlefield within which a gunner is responsible for engaging targets. Sectors of fire are assigned to ensure weapon systems will cover target approaches. Leaders should strive to overlap sectors to cover areas that cannot be engaged by one system. The leader gives a gunner boundaries running between prominent terrain features, or by left and right limits indicated by terrain features or azimuths. If needed, the leader also assigns a gunner more than one sector of fire, designating one sector as primary and others as secondary. The section/squad leader may also designate anticipated target engagement locations within the sector of fire. Those are recognizable terrain features on or near likely enemy avenues of approach. This information is placed on the range card.

TARGET REFERENCE POINTS

F-3. Leaders may pick out natural or man-made terrain features that can be used as reference points for locating targets and adjusting direct/indirect fires. Those features are called target reference points (TRPs). TRPs are requested through the mortar or artillery fire support team (FIST) or fire support officer (FSO). If TRPs are in or near the sector of fire, the leader should point them out and tell the gunner their numbers. If he does, the gunner shows the TRPs on his range card. Normally, a gunner has at least one TRP, but not more than three, in his sector of fire.

DEAD SPACE

F-4. Natural or man-made terrain features, such as hills, draws, or buildings, may be within the sector(s) of fire that prevent the gunner from firing in that area. The area blocked by these features is called dead space. All dead space in the sector(s) of fire must be determined so leaders can plan other weapon systems or other types of fire to cover the area (for example, mortars, artillery, or mines). Dead space is indicated on the range card.

MAXIMUM ENGAGEMENT LINE

F-5. The length of the sector of fire is normally limited by the maximum engagement range of the antiarmor weapon, but it can be less if any natural or man-made terrain features (trees, fences) prevent the gunner from engaging targets at maximum range. Regardless of what affects it, the maximum engagement range is shown on the card as a maximum engagement line. The squad leader uses a map or laser range finder to determine the distance to the maximum engagement line.

F-6. All TRPs, anticipated target engagement areas, azimuth and distance to a known point, and left and right limits are numbered on the sector sketch and in the data section with corresponding numbers for quick reference.

PREPARATION

EXAMPLE SECTION/SQUAD LEADER'S BRIEFING

"Our mission is to cover a sector of fire that begins at our present position and goes in the direction of the windmill to the maximum engagement range of 3,750 meters; it extends to the right across the high ground behind the houses and hill, to the right edge of the orchard, and returns here. The enemy should approach from the north and will probably use both Marshall Road and Lewis Road to enter our sector. We must plan on engaging the enemy in this area as soon as he is within range. There are two target reference points within your sector; the road intersection of Marshall Road and Duffel Road is TRP Charlie One and the road junction of Lewis Road and Duffel Road is TRP Charlie Two. Use the road junction of Campbell Road and Lewis Road to your left as a reference point to locate your position. The distance from the road junction is 633 meters on an azimuth of 85 degrees." (See Figure F–1.)

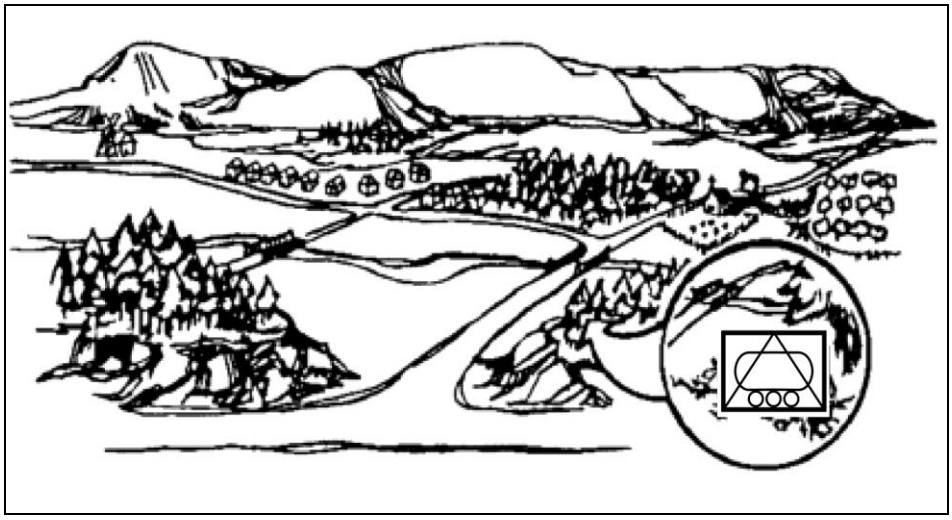


Figure F-1. Target engagement area.

F-7. After the leader has given the necessary information, the gunner begins preparing DA Form 5517–R, *Standard Range Card*. If he is assigned alternate and supplementary firing positions, he prepares a range card for them also. The gunner prepares the range card by performing the following steps:

- Draw a sector sketch of the entire sector. Make the sketch as large as possible, not to exceed the largest circle. For a large area covered by trees or woods, draw only the outline and label the area, for example, "*Woods*," or "*Orchard"* (Figure F–2).

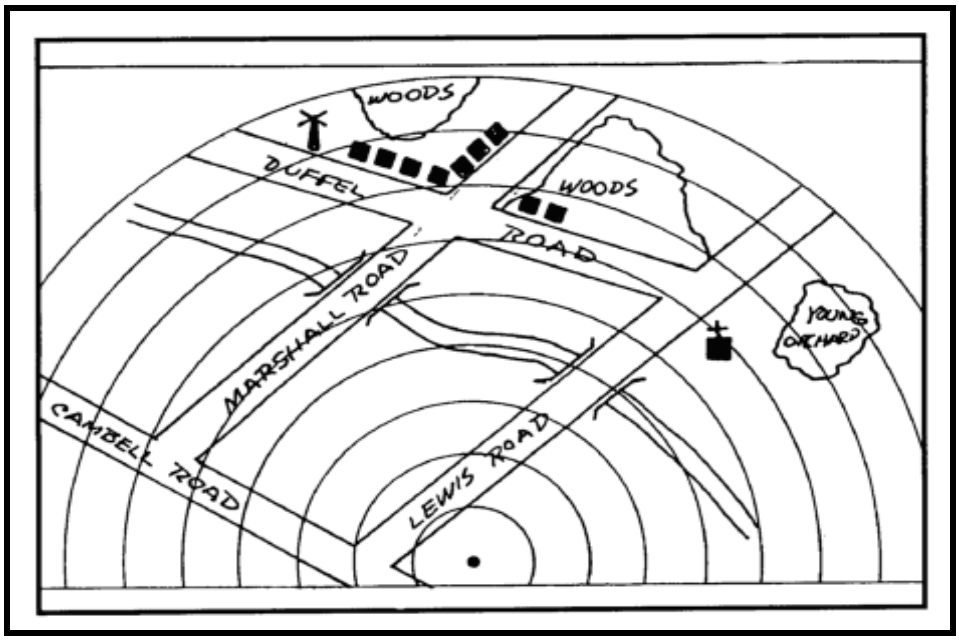


Figure F-2. Sketch of area on range card.

- Draw lines from the weapon position (indicated by the black dot at lower center of range card) to show the right and left limits. Place a number 1 at the end of the left limit line and draw a circle around the number. Place a number 2 at the end of the right limit line and draw a circle around the number (Figure F–3).

Note: After drawing left and right limit lines, the weapon symbol can be drawn over the black dot.

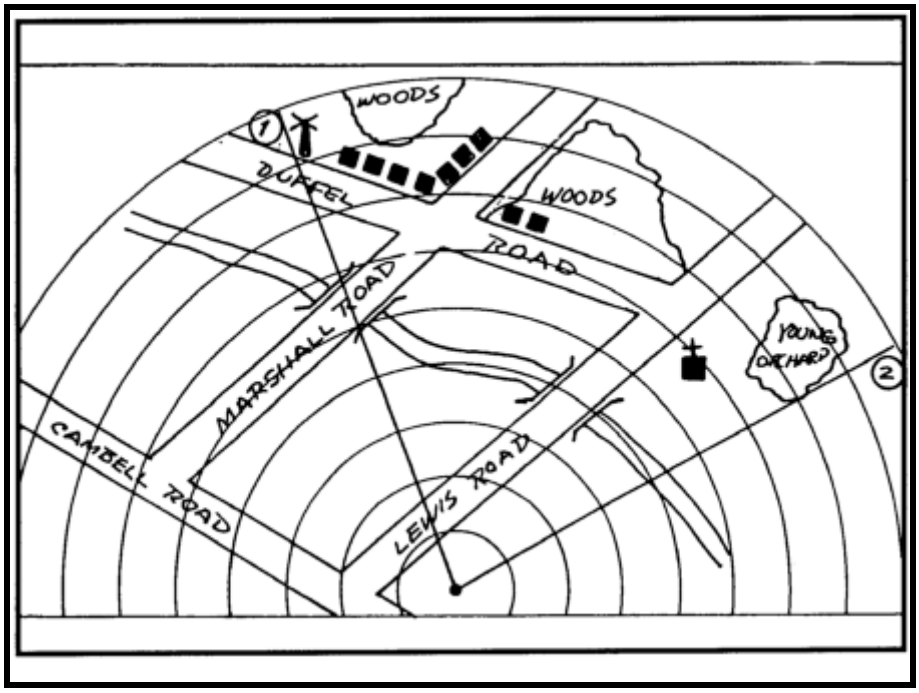


Figure F–3. Label for sector of fire.

- If there are no limitations, the maximum engagement line is curved and joins the left and right sector of fire boundaries at the maximum engagement range (Figure F-4). If there are limitations, the maximum engagement line is drawn in front of the limiting terrain feature.

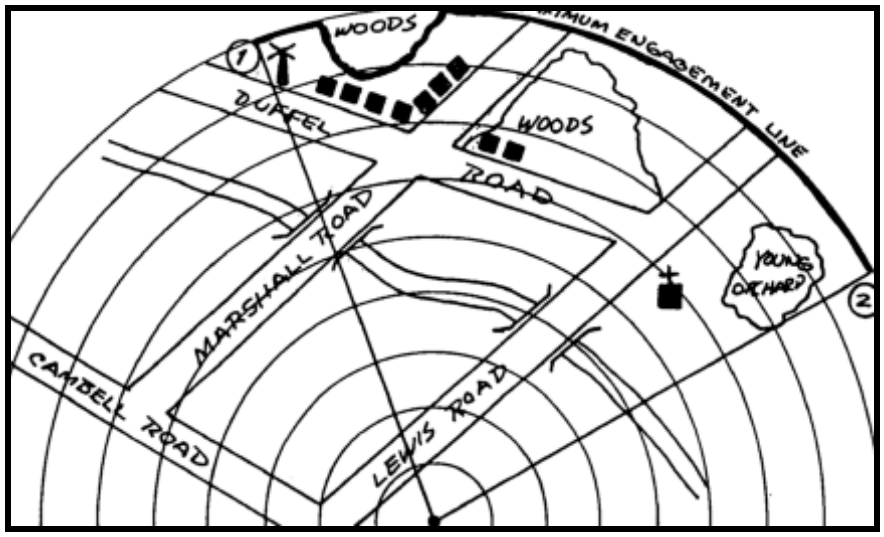


Figure F–4. Maximum engagement line.

- Number the anticipated target engagement areas (ATEAs) from left to right, starting with number 3. Place a number at the maximum engagement range of the target on the range card and circle the number (Figure F–5).

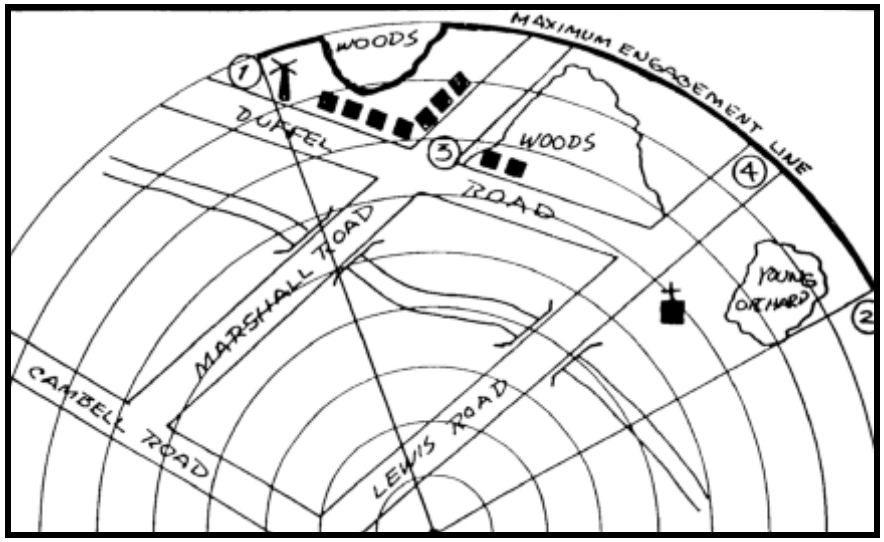


Figure F-5. Anticipated target engagement areas.

- Number the TRPs from left to right. Place the number below or next to the TRP on the range card and circle the number (Figure F–6).

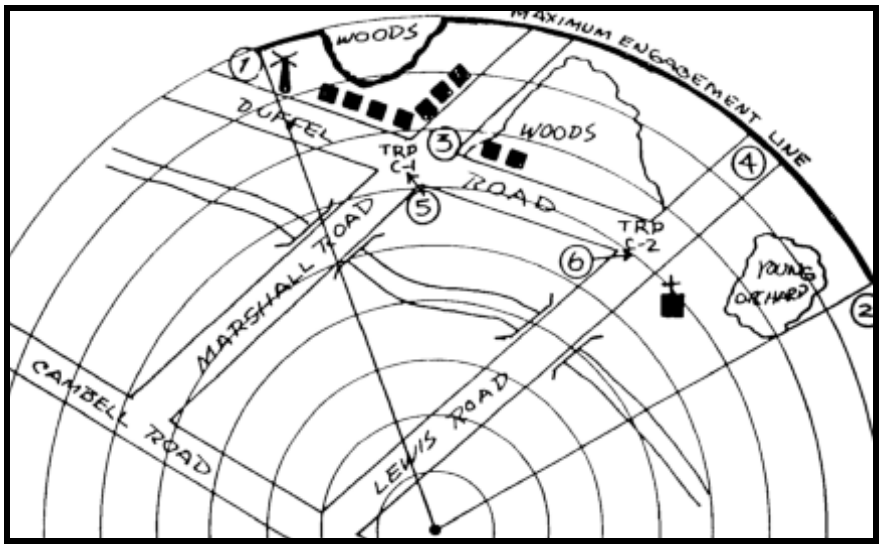


Figure F–6. Target reference points.

- Place diagonal lines, or the words "dead space," where dead space occurs (Figure F–7).

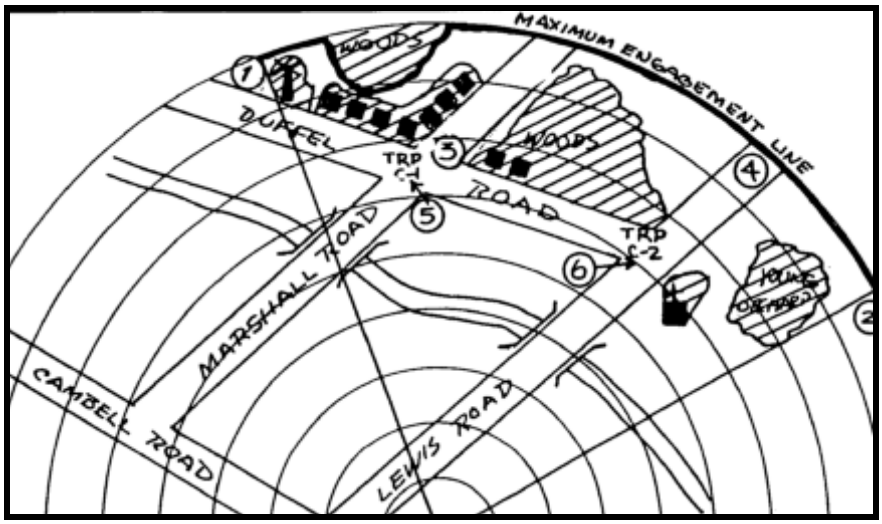


Figure F-7. Dead space.

- Use a compass to determine the azimuth from the firing position to the known point. Convert the direction to a back azimuth. Draw a line with multiple arrows from the known point to the firing position. Place a number at the known point and circle the number (Figure F–8).

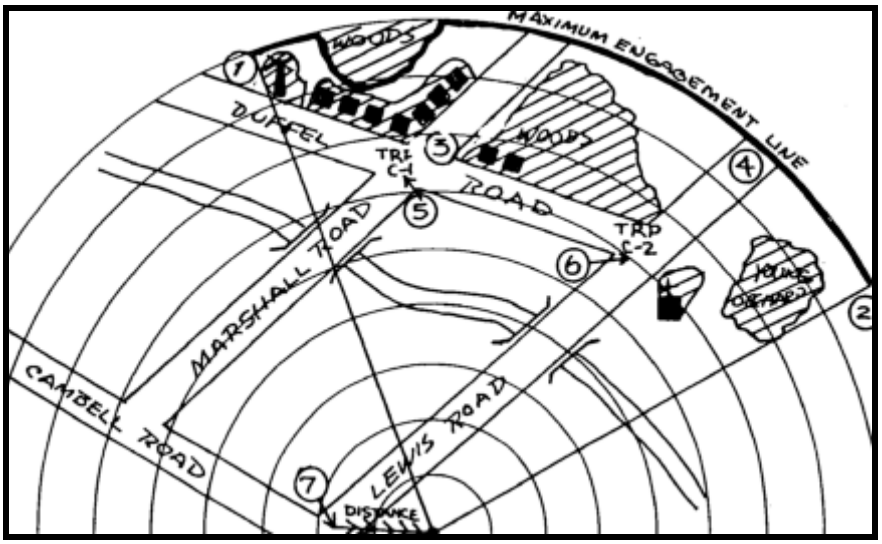


Figure F-8. Distance and azimuth to known point.

- Fill in the marginal information at the top of the card.
  - *Unit description.* Squad, platoon, company commander. Never reveal a unit higher than company level.
  - *Magnetic north.* Orient the range card with the terrain. Place the compass on the range card. Determine the direction of magnetic north arrow and mark it on the card.
- Fill in the data section at the bottom of the card.
  - Position *identification*. List either primary, alternate, or supplementary.
  - *Weapon*. See Figure F-9 for weapon symbol.

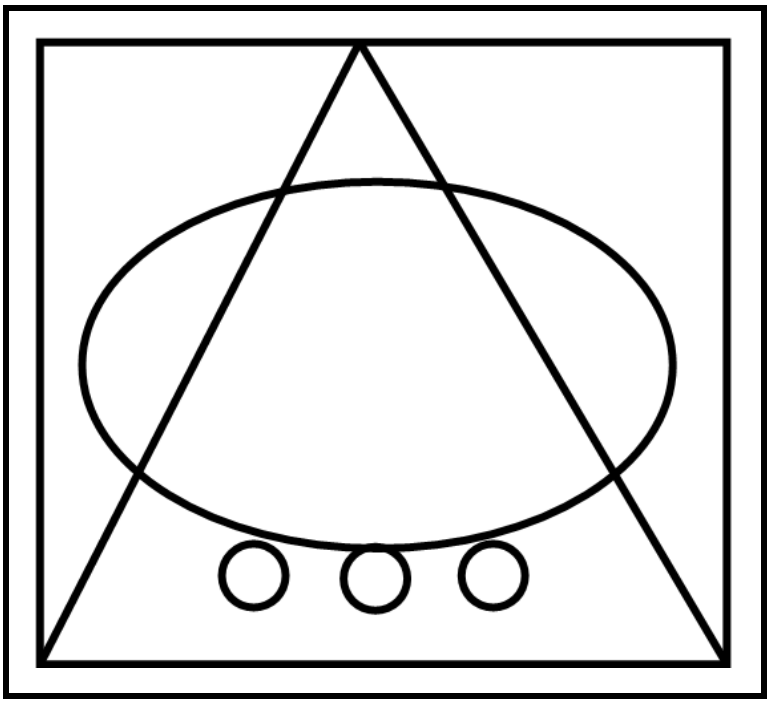


Figure F–9. Symbol of antitank guided missile vehicle.

- *Date.* List the day and month.
- *Each circle equals _____ meters.* Write the distance between the circles in meters. To determine the distance, count the intervals from the weapon to the maximum engagement line (as determined by the squad leader). Divide the amount of intervals into the range of the maximum engagement line. This will give the distance between circles (Figure F–10), for example, 9 intervals into 3,750 meters = 416 meters between circles.

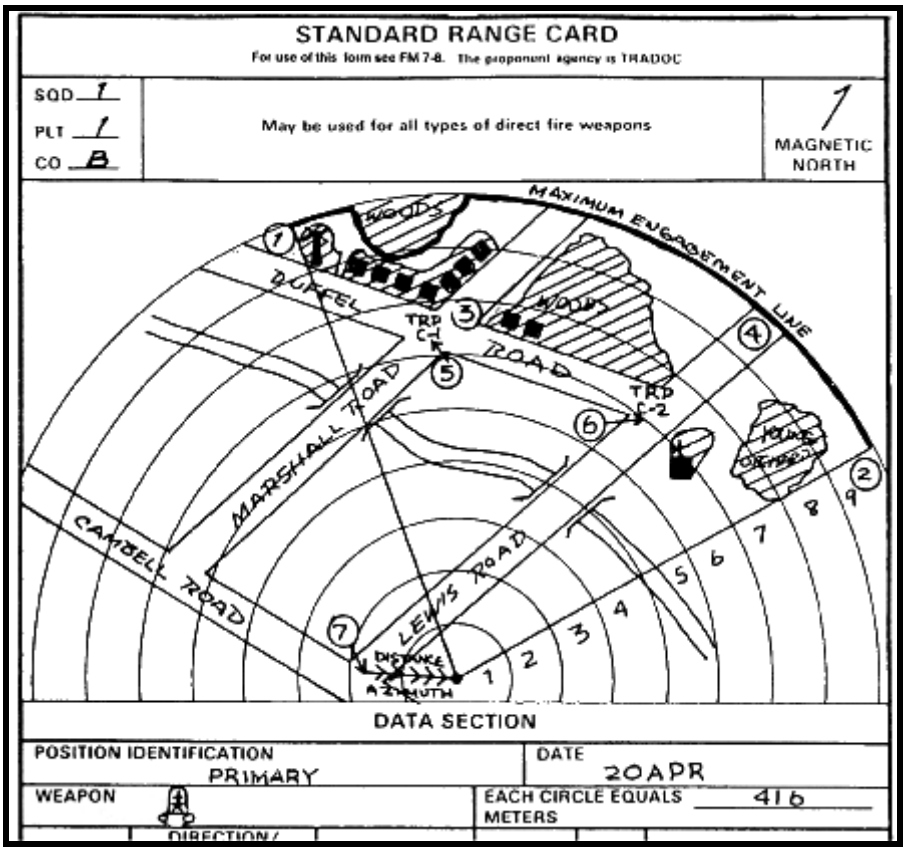
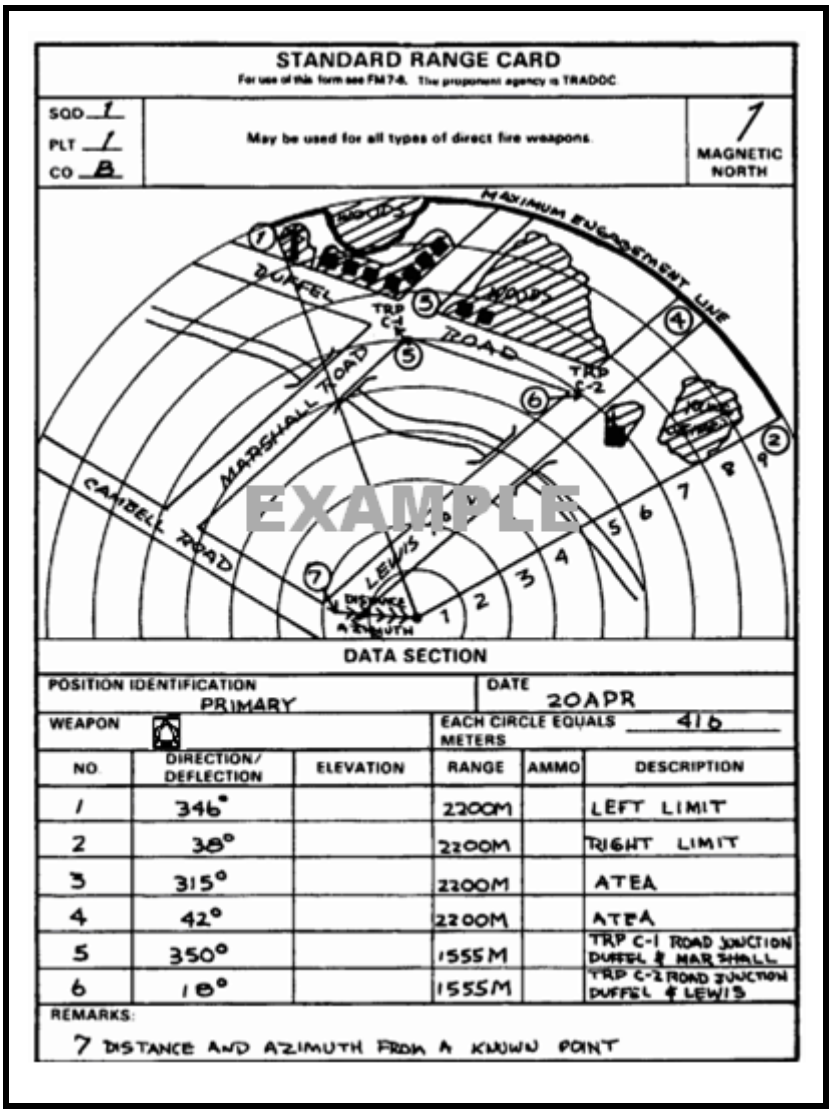


Figure F–10. Determination of range interval on range card.

- *No (number).* Starting with number 1, list the left limit, the right limit, and locations of ATEAs and TRPs shown on the sector.
- *Direction/deflection.* Only degrees or the azimuth from the azimuth bevel ring is listed. Line through the word that does not describe the information listed.
- *Elevation.* This is only used with a ground mounted machine gun using the traverse and elevation mechanism.
- *Range.* Distance in meters from the weapon to the TRP or target engagement area.
- *Ammunition.* List the type of ammunition used, if applicable.
- *Description.* List the name of the object; for example, road, windmill, church. If the item is a TRP, also list the TRP number.
- *Remarks.* Enter the weapon's reference point and any additional information not listed in the range card section. If more space in the data section is needed, use the reverse side of the range card.

- Make two range cards. Keep one at the firing position and give one to the squad or section leader for preparation of fire plans and final coordination of fires. (See Figure F-11 for a completed TOW range card.)



STANDARD RANGE CARD

For use of this form see FM 7-8. The proponent agency is TRADOC

SQD 1
PLT 1
CO B

May be used for all types of direct fire weapons.

1 MAGNETIC NORTH

DATA SECTION

POSITION IDENTIFICATION: PRIMARY
DATE: 20APR
WEAPON:
EACH CIRCLE EQUALS METERS: 416

NO	DIRECTION/ DEFLECTION	ELEVATION	RANGE	AMMO	DESCRIPTION
1	346°		2200M		LEFT LIMIT
2	38°		2200M		RIGHT LIMIT
3	315°		2200M		ATEA
4	42°		2200M		ATEA
5	350°		1555M		TRP C-1 ROAD JUNCTION DUFFEL & MARSHALL
6	18°		1555M		TRP C-2 ROAD JUNCTION DUFFEL & LEWIS

REMARKS:
7 DISTANCE AND AZIMUTH FROM A KNOWN POINT

Figure F–11. Example completed DA Form 5517–R.

EXPEDIENT RANGE CARD

F-8. In combat, a DA Form 5517-R may not be available. The gunner must then draw a range card on anything available (Figure F–12). Preparation of the expedient range card follows the same procedures provided for the standard range card, but the weapon symbol must be used to indicate the location of the weapon position. The range card must include the following eight items:

- Weapon symbol.
- Sector of fire.
- Maximum engagement line.
- Range and azimuth to TRP or ATEA.
- Dead space.
- Distance and azimuth from a known point.
- Magnetic North arrow.
- Data section.

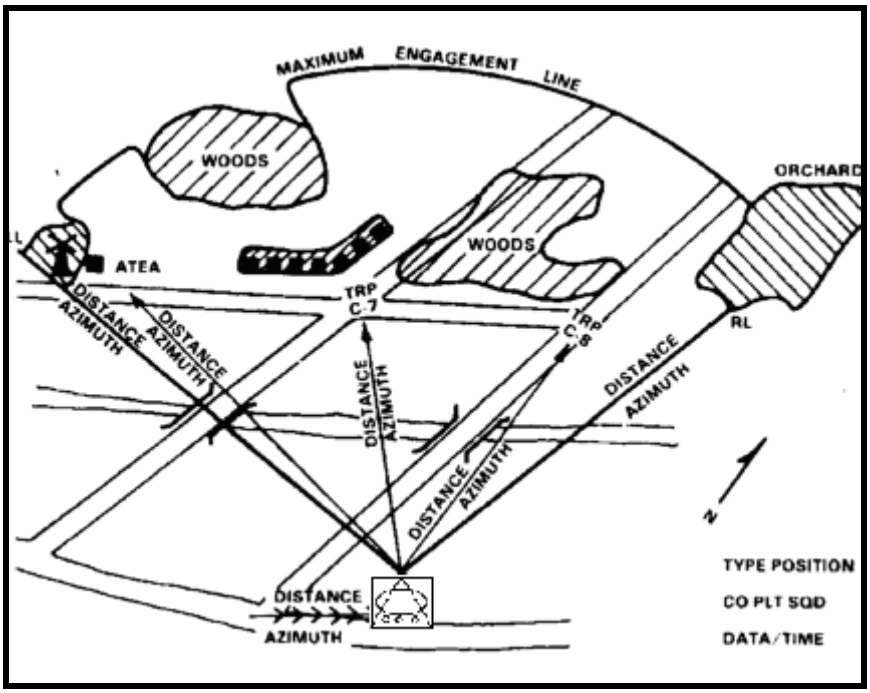


Figure F–12. Field expedient range card.

Appendix G

Test Guide and Scoring Checklist

The antiarmor gunner's skills test is an evaluation tool used to determine unit training level of proficiency and readiness for live fire gunnery. It evaluates crewmember task proficiencies associated with gunnery related skills. It supplements the tasks in the Soldier's manual.

ADMINISTRATION

G-1. As a minimum, the ATGM skills test must be administered—

- Semiannually (AC) or annually (RC).
- When crewmembers (other than driver) have changed positions.
- Before ATGM qualification, unless qualified within the past 6 months in current vehicle positions.

G-2. The ATGM skills test is administered using actions, conditions, standards, administrative guidelines, and performance checklists. ATGM tasks are "critical tasks" that call for firing live TOW missiles, but for training purposes, commanders should use available TOW missile simulation rounds as training aids for all forms of crew training and testing.

G-3. The ATGM skills test should be used as a diagnostic tool to determine the level and effectiveness of sustainment training within the unit.

G-4. Commanders may add to, but not delete from, tasks on the ATGM skills test, for example, once basic proficiency has been attained, commanders can include special conditions such as CBRNE or limited visibility.

G-5. Crewmembers must receive a GO on the skills test before assuming their assigned crew positions. Crews failing to meet standards will be barred from ATGM live fire exercises.

EVALUATION

G-6. The ATGM skills test is evaluated IAW the following procedures:

EVALUATORS

G-7. Either internal or external evaluators can evaluate the ATGM skills test. Internal evaluators come from the owning unit, whereas external evaluators come from another unit in the same organization. External evaluation is recommended. All evaluators must have qualified on the ATGM skills test within one year before testing crewmembers. Evaluators must have achieved a GO on the task they are evaluating within 30 days before testing crewmembers.

EVALUATION CRITERIA

G-8. The crewmember must complete all actions outlined in the performance checklist within the specified time limit to achieve a GO for each task. To achieve an overall GO on the ATGM skill test, the crewmember must receive a GO on all tasks. A NO-GO rating is given for–

- Failure to complete the task.
- Incorrect performance of task steps.
- Failure to meet time standards, if any.

G-9. At the end of each task, the evaluator critiques the crewmember. If the crewmember fails the task, the evaluator critiques the crewmember's performance and provides corrective steps for all cited mistakes. The

evaluator conducts a retest as soon as possible after a Soldier receives additional training for the failed task. Soldiers who fail retests are barred from participating in ATGM live fire exercises, and should be considered for reassignment.

SCORING

G-10. Each Soldier's scoresheets are kept on file by the unit until the Soldier is reassigned. Commanders may, at their discretion, forward the completed scoresheets to the gaining unit. The unit's performance scoresheet must include, as a minimum-

- Soldier's name.
- Unit.
- Grade.
- Duty position.
- Evaluator's name.
- Test date.
- Overall score: GO/NO-GO.
- Remarks.

NO-GOS

G-11. As previously stated, if a crewmember fails to achieve the task standard(s), the evaluator gives him a NO-GO. Then, the evaluator critiques the crewmember and gives him corrective steps for all cited mistakes. The crewmember is retested only after his immediate supervisor initials the scoresheet to indicate that the crewmember has been retrained and is ready for retesting. If a crewmember again receives a NO-GO on the same task, he must go through the retrain/retest cycle a third time. This is his last chance to qualify as an antiarmor gunner. If he fails to pass on the third try, he should be considered for another position.

G-12. ATGMV tasks standards are based less on speed and more on teamwork and precision. Some standards are performance oriented, while others are time oriented. Performance oriented tasks are not battle drill type, time critical steps. Speed comes with increased knowledge and skills. Every crewmember must be proficient in performing the skills associated with his assigned position before the crew can perform an ATGM task collectively. Performance steps and procedures come from the ATGM vehicle TM 9–2355–311–10–7 for preparing and firing the TOW (MLS).

STATION 1

TEST ADMINISTRATIVE GUIDE

Action: Load the Elevated TOW System (ETS) on a Stryker ATGMV.

Conditions: Given a Stryker ATGMV, complete crew, operator's technical manuals, ETS mast is raised; ETS and MITAS are powered up; all three mast locking levers are locked; gunner has placed the ETS into the load position with the hatch clear lamp illuminated and announced "gunner up."

Standard: Load two TOW BGMs or MSRs in the missile launcher within 2 minutes.

Evaluation Procedures

Administrative Process

At this station, log the crewmember's information on a roster. Give him all materials and equipment, and display them as described for this station. Use performance checklist criteria for this task. Tell the crewmember how well he performed the task, and then either direct him to the next station or disclose further training needs. Test only one crewmember at a time in his assigned position.

Administrative Procedures for Personnel Receiving a NO-GO

If the crewmember fails to achieve the task standard, give him a NO-GO. When you give him a NO-GO, critique him and provide corrective steps for all cited mistakes. Then, retest the crewmember IAW local SOP.

Personnel, Equipment, and Material Required

- Operational Stryker with basic issue items.
- TM 9–2355–311–10–7 (or appropriate Stryker variant TM).
- Two BGMs or MSRs.
- Clipboard with pen.
- Performance checklist.
- ATGM gunner.
- Stopwatch.

Pretest Preparation

- Place the launcher in the correct loading position and verify that the elevation angle load LED is on.
- Release the traverse and elevation transport locks.

Pretest Conditions for Each Examinee

- Strap two BGMs in the ready rack.
- Ensure the loader is in his assigned seat.
- Ensure the gunner is in his assigned position.
- Ensure the crew is wearing CVC helmets.
- Ensure the vehicle intercom is on and operational.

Test Planning Time

Administrative—Allow 15 minutes for setup.

Test—Allow 2 minutes for each Soldier.

Total—Multiply by 2 minutes for each Soldier tested.

INSTRUCTIONS TO EXAMINEES

"Let me have your attention."

Pause.

"At this station, you will be tested on your ability to load the missile launcher system on a Stryker antitank guided missile vehicle, or ATGMV.

Pause. "When I say begin, you must load the missile launcher system in accordance with steps outlined in the ATGMV technical manual. You have two minutes to complete this task. Do you understand these instructions?"

Pause five seconds and then command—

BEGIN.

Start timing now. If the examinee has not completed the task after two minutes command loud enough for the examinee to hear—

STOP.

If at any time during the performance of the task you think that the examinee might cause bodily harm or damage the equipment, command—

STOP.

PERFORMANCE CHECKLIST, STATION 1

Load the Elevated TOW System (ETS) on a Stryker ATGM Vehicle

NAME _____ **UNIT** _____

GRADE _____ **DUTY POSITION** _____

PERFORMANCE MEASURES	GO	NO GO
1. Upon hearing "gunner up," visually confirmed hatch clear lamp was illuminated.		
2. Pushed the loader control button until loader control lamp illuminated.		
3. Opened the loader's hatch.		
4. Pressed and held left ready button until left ready lamp illuminated.		
5. Unlocked TOW locking handle and discarded any used TOW missiles..		
6. Removed a TOW missile from the ready rack and removed the protective cover over the electrical connector.		
7. Loaded the first TOW missile into the left cavity of the missile launcher.		
8. Loaded the second TOW missile into the right cavity of the missile launcher.		
9. Locked the missile locking lever into the ETS.		
10. Pressed and held hatch clear button until hatch clear indicator illuminated.		
11. Closed and secured loader's hatch		
12. Pressed gunner button on and announced "Loader Up!"		

EVALUATOR'S NAME: _____

TEST DATE: _____

OVERALL SCORE (GO/NO-GO): _____

REMARKS: _____

STATION 2

TEST ADMINISTRATIVE GUIDE

Action: Engage targets (tracker or manual) with the Stryker ATGMV Elevated TOW System (ETS).

Conditions: Given a Stryker ATGMV with basic skills trainer installed, two TOW missile simulation rounds loaded in the missile launcher, basic issue items (BII), appropriate TMs, and an order to engage targets within the sector of fire during day and periods of limited visibility. The MITAS has been placed into operation and a systems check completed. The MITAS has cooled to operating temperature.

Standard: Engage and destroy a target within the sector of fire.

Evaluation Procedures

Administrative Process

At this station, log the crewmember's information on a roster. Give him all materials and equipment, and display them as described for this station. Use performance checklist criteria for this task. Tell the crewmember how well he performed the task, and then either direct him to the next station or disclose further training needs. Test only one crewmember at a time in his assigned position.

Administrative Procedures for Personnel Receiving a NO-GO

If the crewmember fails to achieve the task standard, give him a NO-GO. When you give him a NO-GO, critique him and provide corrective steps for all cited mistakes. Then, retest the crewmember IAW local SOP.

Personnel, Equipment, and Material Required

- Operational Stryker ATGMV with basic issue items.
- TM 9–2355–311–10–7.
- MITAS basic skills trainer.
- Stopwatch.
- Clipboard with pen.

Pretest Preparation

- Install MITAS basic skills trainer.
- Load two missile simulation rounds in the launcher.

Pretest Conditions for Each Examinee

- Ensure the gunner is seated with his CVC helmet on.
- Ensure the MASTER and AUX power switches are OFF.

Test Planning Time

Administrative—Allow 5 minutes for setup.
Test—Allow 1 minute per Soldier.
Total—Allow a total of 6 minutes for the performance of the task.

INSTRUCTIONS TO EXAMINEES

"Let me have your attention."

Pause.

"At this station, you will be tested on your ability to engage targets with the TOW missile launcher system on a Stryker antitank guided missile vehicle, or ATGMV. "

Pause, and then say—

"When I say begin, you must engage and destroy a target with the missile launcher system in accordance with steps outlined in the ATGMV technical manual. You have one minute to complete this task. Do you understand these instructions?"

Pause five seconds and then command—

BEGIN.

Begin timing now. If the examinee has not completed the task after one minute, command loud enough for the examinee to hear—

STOP.

If at any time you think that the examinee might damage the equipment or cause injury to himself or others, command—

STOP.

PERFORMANCE CHECKLIST, STATION 2

Engage targets (tracker or manual) with the Stryker ATGMV Elevated TOW System (ETS).

NAME _____ **UNIT** _____

GRADE _____ **DUTY POSITION** _____

PERFORMANCE MEASURES	GO	NO GO
1. Prepared the ATGMV to fire a TOW missile.	_____	_____
2. Verified that the WARNINGS/LINE-OF-FIRE and HATCH OPEN lamps were not illuminated..	_____	_____
3. Boresighted the Target Acquisition System (TAS).	_____	_____
4. Verified that TURRET DRIVE LOCK was set to UNLOCKED.	_____	_____
5. Set PLATFORM MODE switch to MISSILE 1 or MISSILE 2 and verified lamp illuminated..	_____	_____
6. Toggled MOTION switch to NULL and released. Verified the GYRO READY lamp flashed for 3 seconds then illuminated steadily.	_____	_____
7. Acquired the target.	_____	_____
8. Determined the Range to target.	_____	_____
9. Armed the TOW Missile.	_____	_____
10. Determined method of engagement – manual or tracker.	_____	_____
11. Locked the target. (Skip this step for a manual engagement —this step is for tracker engagements.)	_____	_____
12. Fired Tow Missile.	_____ _____	_____ _____
13. Kept the crosshairs centered on the target as best as possible by using smooth corrective movements of the GHC until engagement complete.	_____	_____
14. If missile misfire occurred, performed immediate action for a TOW launcher misfire.	_____	_____
15. Once the TOW engagement was complete, the gunner stopped tracking, released the palm switches, and toggled the LAUNCHING EQPT switch to SAFE/ABORT.	_____	_____
16. Continued the mission as required.	_____ _____	_____ _____

EVALUATOR'S NAME: _____

TEST DATE: _____

OVERALL SCORE (GO/NO-GO): _____

REMARKS: _____

STATION 3

TEST ADMINISTRATIVE GUIDE

Action: Perform immediate action for a TOW launcher misfire on a Stryker ATGMV Missile Launcher System (MLS).

Conditions: Given a Stryker ATGMV with basic skills trainer installed and loaded with two missile simulation rounds in the MLS; and an order to engage targets within the sector of fire during day and periods of limited visibility. The MITAS has cooled to operating temperature. The trigger has been pressed and a misfire has occurred.

Standards: Perform immediate action for a misfired TOW missile.

Evaluation Procedures

Administrative Process

At this station, log the crewmember's information on a roster. Give him all materials and equipment, and display them as described for this station. Use performance checklist criteria for this task. Tell the crewmember how well he performed the task, and then either direct him to the next station or disclose further training needs. Test only one crewmember at a time in his assigned position.

Administrative Procedures for Personnel Receiving a NO-GO

If the crewmember fails to achieve the task standard, give him a NO-GO. When you give him a NO-GO, critique him and provide corrective steps for all cited mistakes. Then, retest the crewmember IAW local SOP.

Personnel, Equipment, and Material Required

- Operational Stryker with basic issue items.
- Basic skills trainer installed.
- TM 9–2355–311–10–7 (or appropriate Stryker variant TM).
- Stopwatch.
- Clipboard with pen.
- Two missile simulation rounds (MSRs).

Pretest Preparation

- Ensure the vehicle has two MSRs loaded in the missile launcher.
- Power up the fire control unit.

Pretest Conditions for Each Examinee

- Ensure the gunner is seated with CVC helmet on.

Test Planning Time

Administrative—Allow 5 minutes for setup.

Test—Allow 1 minute for performance of the task.

Total—Allow 6 minutes altogether.

INSTRUCTIONS TO EXAMINEES

"Let me have your attention."

Pause.

"At this station, you will be tested on your ability to perform immediate action on a TOW missile launcher, on a Stryker antitank guided missile vehicle, or ATGMV."

Pause then say—

"When I say begin, you must perform immediate action on the missile launcher system in accordance with steps outlined in the ATGMV technical manual. You have 1 minute to complete this task. Do you understand these instructions?"

Pause five seconds and then command—

BEGIN.

Begin timing now. If the examinee has not completed the task after one minute, command, loud enough for the examinee to hear—

STOP.

If at any time you think that the examinee might damage the equipment or cause injury to himself or others, command—

STOP.

PERFORMANCE CHECKLIST, STATION 3

Perform Immediate Action on the TOW Launcher, on a Stryker ATGMV

NAME _____ **UNIT** _____

GRADE _____ **DUTY POSITION** _____

PERFORMANCE MEASURES	GO	NO GO
1. Alerted the crew by announcing, "*TOW misfire*."		
2. Ensured the launcher was pointed downrange to a safe location.		
3. Continued holding palm switch in on the gunner's hand controller for 5 seconds, and then released and resqueezed it.		
4. If missile failed to fire, released the palm switch, and then rearmed the system by toggling the ARMED switch on the gunner's control panel.		
5. Selected second missile and verified that MSL1 or MSL2 (the remaining missile) was indicated in the sight reticle.		
6. Placed sight reticle crosshairs on the target and pressed the trigger on the gunner's hand control to fire the second missile.		

EVALUATOR'S NAME: _____

TEST DATE: _____

OVERALL SCORE (GO/NO-GO): _____

REMARKS: _____

STATION 4

TEST ADMINISTRATIVE GUIDE

Action: Unload the Elevated TOW System (ETS) on the Stryker ATGMV.

Conditions: Given a Stryker ATGMV with two TOW ballistic guided missiles (BGMs) or missile simulation rounds (MSRs) loaded in the MLS; and a command to unload the missiles from the launcher. The MLS is in the load position.

Standards: Remove both missiles from the MLS in the sequence described in TM 9–2355–311–10–7. Within 2 minutes, take the appropriate action for an unfired missile or an expended missile.

Evaluation Procedures

Administrative Process

At this station, log the crewmember's information on a roster. Give him all materials and equipment, and display them as described for this station. Use performance checklist criteria for this task. Tell the crewmember how well he performed the task, and then either direct him to the next station or disclose further training needs. Test only one crewmember at a time.

Administrative Procedures for Personnel Receiving a NO-GO

If the crewmember fails to achieve the task standard, give him a NO-GO. When you give him a NO-GO, critique him and provide corrective steps for all cited mistakes. Then, retest the crewmember IAW local SOP.

Personnel, Equipment, and Material Required

- Operational Stryker with basic issue items.
- TM 9–2355–311–10–7 (or appropriate Stryker variant TM).
- Stopwatch.
- Clipboard with pen.
- One helper.

Pretest Preparation

- Load two BGMs or MSRs in the MLS.
- Position one assistant outside the vehicle to help retrieve the expended missile.

Pretest Conditions for Each Examinee

- Set the MAST switch guard to OFF.
- Set the LAUNCHING EQPT switch to SAFE/ABORT.
- Ensure the GRENADES FIRE switch guard is down.
- Set the GRENADES switch to DISABLE.
- Ensure the UMBILICAL INSERTED lamp is off.
- Ensure the TRIGGER ENABLED lamp is off.
- Ensure the GRENADES ENABLED lamp is off.
- Position the MLS in the LOAD position.
- Ensure the LOADER HATCH CLEAR lamp is lit.

Test Planning Time

Administrative—Allow 15 minutes for setup.

Test—Allow 2 minutes for each Soldier.

INSTRUCTIONS TO EXAMINEES

"Let me have your attention."

Pause.

"At this station, you will be tested on your ability to unload TOW missiles from the missile launcher system (MLS) mounted on a Stryker antitank guided missile vehicle or ATGMV."

Pause and then say—

"When I say begin, you must unload both missiles from the missile launcher system in accordance with steps outlined in the ATGMV technical manual. You have two minutes to complete this task. Do you understand these instructions?"

Pause five seconds and then command—

BEGIN.

Begin timing now. If the examinee has not completed the task after two minutes, command loud enough for the examinee to hear—

STOP.

If you think that the examinee might damage the equipment or cause injury to himself or others, command—

STOP.

PERFORMANCE CHECKLIST, STATION 4

Unload the Elevated TOW System (ETS) on the Stryker ATGMV

NAME _____ **UNIT** _____

GRADE _____ **DUTY POSITION** _____

PERFORMANCE MEASURES	GO	NO GO
1. Upon hearing "gunner up" visually confirmed hatch clear lamp was illuminated.		
2. Pushed the loader control button until loader control lamp illuminated.		
3. Opened the loader's hatch .		
4. Pressed and held left ready button until left ready lamp illuminated .		
5. Unlocked TOW locking handle and discarded any used TOW missiles.		
6. Removed the first live TOW missile from the launcher, inspected it, then returned it to the ready rack.		
7. Removed the second live TOW missile from the launcher, inspected it, then returned it to the ready rack .		
8. Locked the missile locking lever.		
9. Pressed and held hatch clear button until hatch clear indicator illuminated.		
10. Closed and secured loader's hatch.		
11. Pressed gunner button on and announced "Loader Up!"		

EVALUATOR'S NAME: _____

TEST DATE: _____

OVERALL SCORE (GO/NO-GO): _____

REMARKS: _____

STATION 5

TEST ADMINISTRATIVE GUIDE

Action: Unload, clear, and disassemble an M240B machine gun.

Conditions: Given a Stryker ATGMV with the appropriate TMs, and an M240B machine gun.

Standards: Within 2 minutes, unload, clear and disassemble an M240B machine gun IAW TM 9–1005–313–10 without causing injury to personnel or damage to equipment.

Evaluation Procedures

Administrative Process

At this station, log the crewmember's information on a roster. Give him all materials and equipment, and display them as described for this station. Use performance checklist criteria for this task. Tell the crewmember how well he performed the task, and then either direct him to the next station or disclose further training needs. Test only one crewmember at a time in his assigned position.

Administrative Procedures for Personnel Receiving a NO-GO

If the crewmember fails to achieve the task standard, give him a NO-GO. When you give him a NO-GO, critique him and provide corrective steps for all cited mistakes. Then, retest the crewmember IAW local SOP.

Personnel, Equipment, and Material Required

- Operational Stryker with basic issue items.
- TM 9–2355–311–10–7 (or appropriate Stryker variant TM).
- TM 9–1005–313–10 (machine gun 7.62mm, M240).
- M240B machine gun.
- Five round belt of dummy ammunition.
- Stopwatch.
- Clipboard with pen.

Pretest Preparation

- Load the weapon.

Pretest Conditions for Each Examinee

- Lay the machine gun on the lowered ramp.

Test Planning Time

Administrative—Allow 15 minutes for setup.

Test—Allow 2 minutes per Soldier.

INSTRUCTIONS TO EXAMINEES

"Let me have your attention."

Pause.

"At this station, you will be tested on your ability to unload, clear and disassemble the M240B machine gun." Pause, and then say--

"When I say go, you must unload, clear, and disassemble the M240B machine gun on the Stryker antitank guided missile vehicle in accordance with steps outlined in the ATGMV technical manual. You have two minutes to complete this task. Do you understand these instructions?"

Pause five seconds and then command—

BEGIN.

Begin timing now. If the examinee has not completed the task after two minutes, command loud enough for the examinee to hear—

STOP.

If you think that the examinee might damage the equipment or cause injury to himself, command—

STOP.

PERFORMANCE CHECKLIST, STATION 5

Unload, Clear and Disassemble an M240B Machine Gun

NAME _____ **UNIT** _____

GRADE _____ **DUTY POSITION** _____

PERFORMANCE MEASURES	GO	NO GO
1. Cleared an M240B machine gun.		
a. Placed safety on "F."		
b. Pulled cocking handle assembly to rear to lock bolt back.		
c. Returned cocking handle to forward position.		
d. Placed safety on "S."		
e. Opened feed tray cover assembly.		
f. Removed any ammunition.		
g. Raised the feed tray and feed tray cover and ensured it was empty.		
h. Lowered feed tray and feed tray cover.		
i. Placed safety on "S."		
j. Held cocking handle to rear, depressed trigger, and eased bolt forward to close and lock.		
2. Disassembled the M240B machine gun.		
a. Depressed and held barrel locking latch.		
b. Turned barrel release/carrying handle to upright position.		
c. Removed barrel.		
d. Removed heat shield assembly from barrel.		
e. Depressed trigger housing spring and removed spring pin.		
f. Pulled trigger housing assembly down and back.		
g. Depressed back plate latch and lifted buffer/butt stock assembly straight up.		
h. Pressed drive spring in, up and then pulled it from operating rod assembly.		
i. Depressed cover latches and raised cover assembly. Pulled cocking handle assembly back. Pulled bolt and operating rod assembly from receiver.		
j. Closed feed tray cover.		
k. Used the back of the buffer/butt stock to push out feed tray retaining pin as far as possible.		
l. Removed feed tray retaining spring pin with fingers.		
m. Removed feed tray and cover assembly from receiver.		
n. Extended bipod legs to the down and locked position.		
o. Pulled hand guard straight down and off gas cylinder.		

EVALUATOR'S NAME: _____

TEST DATE: _____

OVERALL SCORE (GO/NO-GO): _____

REMARKS: _____

STATION 6

TEST ADMINISTRATIVE GUIDE

Action: Reassemble and perform a function check on an M240B machine gun.

Conditions: Given a Stryker vehicle with basic issue items (BII), operator's TM(s), and a disassembled M240B machine gun.

Standards: Within 2 minutes, reassemble and perform a function check on an M240B machine gun IAW the appropriate TMs.

Evaluation Procedures

Administrative Process

At this station, log the crewmember's information on a roster. Give him all materials and equipment, and display them as described for this station. Use performance checklist criteria for this task. Tell the crewmember how well he performed the task, and then either direct him to the next station or disclose further training needs. Test only one crewmember at a time in his assigned position.

Administrative Procedures for Personnel Receiving a NO-GO

If the crewmember fails to achieve the task standard, give him a NO-GO. When you give him a NO-GO, critique him and provide corrective steps for all cited mistakes. Then, retest the crewmember IAW local SOP.

Personnel, Equipment, and Material Required

- Operational Stryker with basic issue items.
- TM 9–2355–311–10–2 (or appropriate Stryker variant TM).
- TM 9–1005–313–10.
- M240B machine gun.
- Stopwatch.
- Clipboard with pen.

Pretest Preparation

- Disassemble an M240B machine gun.

Pretest Conditions for Each Examinee

- Lay the machine gun on the lowered ramp.

Test Planning Time

Administrative—Allow 15 minutes to set up this test.

Test—Allow 2 minutes for each Soldier.

INSTRUCTIONS TO EXAMINEES

"Let me have your attention."

Pause.

"At this station, you will be tested on your ability to reassemble and perform a function check on an M240B machine gun."

Pause and then say—

"When I say begin, you must reassemble and perform a function check on the M240B machine gun in accordance with steps outlined in the ATGMV technical manual. You have two minutes to complete this task. Do you understand these instructions?"

Pause five seconds and then command—

BEGIN.

Begin timing now. If the examinee has not completed the task after two minutes command, loud enough for the examinee to hear—

STOP.

If you think that the examinee might damage the equipment or cause injury to himself or others, command—

STOP.

PERFORMANCE CHECKLIST, STATION 6

Reassemble and Perform Function Check on an M240B Machine Gun

NAME _____ **UNIT** _____

GRADE _____ **DUTY POSITION** _____

PERFORMANCE MEASURES	GO	NO GO
1. Reassembled an M240B machine gun.		
a. Positioned the feed tray and cover assembly on receiver.		
b. Closed cover and inserted spring pin from the right side of the receiver.		
c. Opened cover assembly.		
d. Set bolt and operating rod assembly on top of rails (receiver).		
e. Extended bolt to the unlocked position and pushed bolt assembly all the way into receiver.		
f. Closed and locked cover assembly.		
g. Inserted and pushed drive spring fully into operating rod assembly to seat.		
h. Installed buffer assembly.		
i. Installed trigger housing assembly.		
j. Snapped hand guard over gas cylinder and ensured tabs were to the front of the M240B.		
k. Inserted barrel fully into socket and pushed barrel release to the right as far as it would go to lock.		
2. Performed function check.		
a. Placed safety on "F."		
b. Pulled cocking to rear and locked bolt.		
c. Returned cocking handle to the forward position.		
d. Placed safety on "S."		
e. Depressed trigger (nothing should have happened).		
f. Placed safety on "F."		
g. Held cocking handle to the rear, depressed trigger and eased bolt forward to closed and locked position.		

EVALUATOR'S NAME: _____

TEST DATE: _____

OVERALL SCORE (GO/NO-GO): _____

REMARKS: _____

STATION 7

TEST ADMINISTRATIVE GUIDE

Action: Install the M240B on the Stryker ATGMV.

Conditions: Given a Stryker ATGMV with the appropriate TMs, basic issue items (BII), and an M240B machine gun lying on the vehicle's top deck.

Standard: Install the M240B on the Stryker ATGMV IAW TM 9-2355-311-10-7.

Evaluation Procedures

Administrative Process

At this station, log the crewmember's information on a roster. Give him all materials and equipment, and display them as described for this station. Use performance checklist criteria for this task. Tell the crewmember how well he performed the task, and then either direct him to the next station or disclose further training needs. Test only one crewmember at a time in his assigned position.

Administrative Procedures for Personnel Receiving a NO-GO

If the crewmember fails to achieve the task standard, give him a NO-GO. When you give him a NO-GO, critique him and provide corrective steps for all cited mistakes. Then, retest the crewmember IAW local SOP.

Personnel, Equipment, and Material Required

- Operational Stryker with basic issue items.
- TM 9–2355–311–10–7 (or appropriate Stryker variant TM).
- Stopwatch.
- Clipboard with pen.
- One storage strap.

Pretest Preparation

- Place M240B machine gun on deck of Stryker beside the M93 mount.

Pretest Conditions for Each Examinee

- Soldier must wear the CVC helmet.

Test Planning Time

Administrative—15 minutes

Test—Allow 2 minutes per Soldier

INSTRUCTIONS TO EXAMINEES

"Let me have your attention."

Pause.

"At this station, you will be tested on your ability to install the M240B machine gun on the M93 gun mount on a Stryker antitank guided missile vehicle. "

Pause and then say—

"When I say begin, you will install the M240B machine gun on the M93 gun mount on a Stryker antitank guided missile vehicle in accordance with steps outlined in the ATGMV technical manual. You have two minutes to complete this task. Do you understand these instructions?"

Pause five seconds and then command—

BEGIN.

Begin timing now. If the examinee has not completed the task after two minutes, command loud enough for the examinee to hear—

STOP.

If you think that the examinee might damage the equipment or cause injury to himself or others, command—

STOP.

PERFORMANCE CHECKLIST, STATION 7

Install an M240B Machine Gun on the ATGMV

NAME _____ **UNIT** _____

GRADE _____ **DUTY POSITION** _____

PERFORMANCE MEASURES	GO	NO GO
1. Installed an M240B machine gun on an ATGMV.		
a. Removed quick release pin from the pintle mount.		
b. Slid the pintle mount onto the M240B machine gun. Installed quick release pin and verified free movement and security.		
c. Lifted pintle lock on the pintle arm to place in open position.		
d. Grasped M240B machine gun at butt group and a pintle mount and placed pintle mount into pintle arm.		
e. Ensured the M240B machine gun moved freely and that pintle mount was securely seated in the pintle arm.		
f. Placed pintle lock on the pintle arm into locked position.		
g. Removed quick release pin from rear securing arm.		
h. Placed rear securing arm up into deployed position on the M240B machine gun, and inserted the quick release pin.		
i. Slid ammunition box into position on to the ammunition box securing clamp.		
j. Grasped ammunition box and lightly shook it to ensure that it was locked into the ammunition box securing clamp.		
2. Placed the M240B in the stowed position.		
a. Rotated the weapon until M240B machine gun faced the center of the vehicle.		
b. Installed the travel lock on the bearing ring.		
c. Aligned the M240B machine gun with the pintle arm.		
d. Pulled the locking pin out and folded the M240B machine gun and pintle arm down onto the hull of the vehicle.		
e. Released the locking pin.		
f. Tied the M240B machine gun and pintle arm into position, and secured the gun to the nearest footman loop with a storage strap.		
3. Placed the M240B in the deployed position.		
a. Untied the M240B machine gun and pintle arm from the footman loop.		
b. Pulled the locking pin out and lifted the M240B machine gun and pintle arm into stowed position.		
c. Released the locking pin.		
d. Unlocked the travel lock on the bearing ring.		
e. Rotated the weapons station until the M240B machine gun faces the center of the vehicle.		

EVALUATOR'S NAME: _____

TEST DATE: _____

OVERALL SCORE (GO/NO-GO): _____

REMARKS: _____

STATION 8

TEST ADMINISTRATIVE GUIDE

Action: Load, fire, and perform misfire procedures on the M240B machine gun on a Stryker ATGMV.

Conditions: Given a Stryker ATGMV with BII, the appropriate TMs, and linked 7.62-mm dummy ammunition.

Standards: Within two minutes, load, fire, and perform misfire procedures on an M240B machine gun on the ATGMV IAW TM 9–2355–311–10–7 and TM 9–1005–313–10.

Evaluation Procedures

Administrative Process

At this station, log the crewmember's information on a roster. Give him all materials and equipment and display them as described for this station. Use performance checklist criteria for this task. Tell the crewmember how well he performed the task, and then either direct him to the next station or disclose further training needs. Test only one crewmember at a time in his assigned position.

Administrative Procedures for Personnel Receiving a NO-GO

If the crewmember fails to achieve the task standard, give him a NO-GO. When you give him a NO-GO, critique him and provide corrective steps for all cited mistakes. Then retest the crewmember IAW local SOP.

Personnel, Equipment, and Material Required

- Operational Stryker with basic issue items.
- TM 9–2355–311–10–7 (or appropriate Stryker variant TM).
- TM 9–1005–313–10.
- Five round belt of dummy ammunition.
- Stopwatch.
- Clipboard with pen.

Pretest Preparation

- Ensure M240B machine gun is installed on M93 Mount.

Pretest Conditions for Each Examinee

- Not applicable.

Test Planning Time

Administrative—Allow 15 minutes for setup.

Test—Allow 2 minutes per Soldier.

INSTRUCTIONS TO EXAMINEES

"Let me have your attention."

Pause.

"At this station, you will be tested on your ability to load, fire, and perform misfire procedures on the M240B machine gun. "

Pause and then say—

"When I say begin, you must load, fire, and perform misfire procedures on the M240B machine gun missile launcher system in accordance with steps outlined in the ATGMV technical manual. You have two minutes to complete this task. Do you understand these instructions?"

Pause five seconds and then command—

BEGIN.

Begin timing now. If the examinee has not completed the task after two minutes, command loud enough for the examinee to hear—

STOP.

If you think that the examinee might damage the equipment or cause injury to himself or others, command—

STOP.

PERFORMANCE CHECKLIST, STATION 8

Load, Fire, and Perform Misfire Procedures on a Stryker ATGMV M240B Machine Gun

NAME _____ **UNIT** _____

GRADE _____ **DUTY POSITION** _____

PERFORMANCE MEASURES	GO	NO GO
1. Loaded the M240B machine gun.		
a. Pulled the cocking handle assembly to the rear to the lock bolt.		
b. Returned the cocking handle to the forward position.		
c. Placed the safety on "S."		
d. Opened the cover assembly and remove any ammunition.		
e. Raised the feed tray and looked into the chamber to ensure it was clear.		
f. Lowered the feed tray.		
g. Placed the safety on "F."		
h. Held the cocking handle assembly to the rear, squeezed the trigger, and let the bolt close and lock.		
i. Placed link belt in feed tray with the first round against the cartridge stop.		
j. Closed the cover assembly.		
2. Fired the M240B machine gun.		
a. Pulled cocking handle assembly to the rear to charge the machine gun.		
b. Returned cocking handle to forward position.		
c. Squeezed trigger and tried to fire the M240B machine gun.		
3. Performed misfire procedures on an M240B machine gun.		
a. Pulled the cocking handle assembly to the rear to recharge the machine gun.		
b. Returned cocking handle to the forward position.		
c. Squeezed the trigger and tried to retire the M240B machine gun.		
d. If the gun did not fire, pulled the cocking handling assembly to the rear, and placed the M240B on "S."		

EVALUATOR'S NAME: _____

TEST DATE: _____

OVERALL SCORE (GO/NO-GO): _____

REMARKS: _____

STATION 9

TEST ADMINISTRATIVE GUIDE

Action: Clear the M240B machine gun mounted on a Stryker ATGMV.

Conditions: Given a Stryker ATGMV with BII, the appropriate TMs, an M240B machine gun mounted on the M93 gun mount, and linked 7.62 dummy ammunition. The commander's station has been prepared for operation.

Standards: Within 2 minutes, clear the M240B machine gun mounted on an M93 gun mount on Stryker ATGMV in accordance with the appropriate TMs.

Evaluation Procedures

Administrative Process

At this station, log the crewmember's information on a roster. Give him all materials and equipment, and display them as described for this station. Use performance checklist criteria for this task. Tell the crewmember how well he performed the task and then either direct him to the next station or disclose further training needs. Test only one crewmember at a time in his assigned position.

Administrative Procedures for Personnel Receiving a NO-GO

If the crewmember fails to achieve the task standard, give him a NO-GO. When you give him a NO-GO, critique him and provide corrective steps for all cited mistakes. Then retest the crewmember IAW local SOP.

Personnel, Equipment, and Material Required

- Operational Stryker with basic issue items.
- TM 9–2355–311–10–7 (or appropriate Stryker variant TM).
- TM 9–1005–313–10.
- M240B machine gun.
- Five round belt of 7.62 dummy ammunition loaded in the machine gun.
- Stopwatch.
- Clipboard with pen.

Pretest Preparation

- Install an M240B machine gun on the M93 gun mount.
- Load the M240B with dummy ammunition.

Pretest Conditions for Each Examinee

- Not applicable.

Test Planning Time

Administrative—Allow 15 minutes for setup.

Test—Allow 2 minutes per Soldier

INSTRUCTIONS TO EXAMINEES

"Let me have your attention."

Pause.

"At this station, you will be tested on your ability to unload and clear the M240B machine gun mounted on an M93 gun mount on a Stryker antitank guided missile vehicle, or ATGMV. "

Pause and then say—

"When I say begin, you must unload and clear the M240B machine gun in accordance with steps outlined in the ATGMV technical manual. You have two minutes to complete this task. Do you understand these instructions?"

Pause and then command—

BEGIN.

Begin timing now. If the examinee has not completed the task after two minutes, command loud enough for the examinee to hear—

STOP.

If you think that the examinee might damage the equipment or cause injury to himself or others, command—

STOP.

PERFORMANCE CHECKLIST, STATION 9

Clear an M240B Machine Gun Mounted on a Stryker ATGMV M93 Gun Mount

NAME _____ UNIT _____

GRADE _____ DUTY POSITION _____

PERFORMANCE MEASURES	GO	NO GO
1. Removed ammunition from an M240B machine gun.		
a. Pulled cocking handle assembly to rear and locked bolt.		
b. Placed safety on "S."		
c. Pushed latches to open cover assembly.		
d. Removed all ammunition, links, and brass from the chamber area.		
2. Cleared an M240B machine gun.		
a. Confirmed that no ammunition, links or brass were in the chamber.		
b. Closed the cover.		
c. Placed the safety to "F."		
d. Pulled the cocking handle to the rear and held it.		
e. Pulled the trigger and eased the bolt forward.		

EVALUATOR'S NAME: _____

TEST DATE: _____

OVERALL SCORE (GO/NO-GO): _____

REMARKS: _____

STATION 10

TEST ADMINISTRATIVE GUIDE

Action: Remove an M240B machine gun from a Stryker Antitank Guided Missile Vehicle.

Conditions: Given a Stryker ATGMV with BII, operator's TM, and an M240B machine gun mounted on an M93 gun mount. The vehicle commander's station has been prepared.

Standards: Remove the M240B machine gun from an ATGMV IAW TM 9–2355–311–10–7, without causing injury to personnel or damage to equipment.

Evaluation Procedures

Administrative Process

At this station, log the crewmember's information on a roster. Give him all materials and equipment, and display them as described for this station. Use performance checklist criteria for this task. Tell the crewmember how well he performed the task, and then either direct him to the next station or disclose further training needs. Test only one crewmember at a time in his assigned position.

Administrative Procedures for Personnel Receiving a NO-GO

If the crewmember fails to achieve the task standard, give him a NO-GO. When you give him a NO-GO, critique him and provide corrective steps for all cited mistakes. Then retest the crewmember IAW local SOP.

Personnel, Equipment, and Material Required

- Operational Stryker with basic issue items.
- TM 9–2355–311–10–7 (or appropriate Stryker variant TM).
- TM 9–1005–313–10.
- M240B machine gun.
- Five round belt of dummy ammunition.
- Stopwatch.
- Clipboard with pen.

Pretest Preparation

- Install an M240B machine gun on an M93 gun mount.

Pretest Conditions for Each Examinee

- Not applicable.

Test Planning Time

Administrative—Allow 15 minutes for setup.

Test—Allow 2 minutes per Soldier

INSTRUCTIONS TO EXAMINEES

"Let me have your attention."

Pause.

"At this station, you will be tested on your ability to remove an M240B machine gun from an M93 gun mount on a Stryker antitank guided missile vehicle. "

Pause and then say—

"When I say begin, you must remove an M240B machine gun from the M93 gun mount on a Stryker antitank guided missile vehicle in accordance with steps outlined in the ATGMV technical manual. You have two minutes to complete this task. Do you understand these instructions?"

Pause and then command—

BEGIN.

Begin timing now. If the examinee has not completed the task after two minutes, command loud enough for the examinee to hear—

STOP.

If you think that the examinee might damage the equipment or cause injury to himself or others, then command—

STOP.

PERFORMANCE CHECKLIST, STATION 10

Remove an M240B on the Stryker ATGMV

NAME _____ **UNIT** _____

GRADE _____ **DUTY POSITION** _____

PERFORMANCE MEASURES	GO	NO GO
1. Depressed the spring clip on the ammunition box and slide the ammunition box off the securing clamp.		
2. Opened the pintle lock on the pintle arm and lifted it up.		
3. Removed the quick release pin from the rear securing arm.		
4. Placed rear securing arm down into stowed position on top of pintle arm and inserted quick release pin.		
5. Grasped the M240B at the butt group and at pintle mount and removed pintle.		

EVALUATOR'S NAME: _____

TEST DATE: _____

OVERALL SCORE (GO/NO-GO): _____

REMARKS: _____

STATION 11

TEST ADMINISTRATIVE GUIDE

Action: Load the M6 smoke grenade launcher on a Stryker ATGMV.

Conditions: Given a Stryker ATGMV with four L8A3 drill grenades. The primary weapon is unloaded and cleared.

Standards: Within 2 minutes, load four L8A3 drill grenades in the smoke grenade launcher in accordance with TM 9-2355-311-10-7.

Evaluation Procedures

Administrative Process

At this station, log the crewmember's information on a roster. Give him all materials and equipment, and display them as described for this station. Use performance checklist criteria for this task. Tell the crewmember how well he performed the task, and then either direct him to the next station or disclose further training needs. Test only one crewmember at a time in his assigned position.

Administrative Procedures for Personnel Receiving a NO-GO

If the crewmember fails to achieve the task standard, give him a NO-GO. When you give him a NO-GO, critique him and provide corrective steps for all cited mistakes. Then retest the crewmember IAW local SOP.

Personnel, Equipment, and Material Required

- An operational Stryker with basic issue items.
- TM 9–2355–311–10–7 (or appropriate Stryker variant TM).
- Primary weapon (cleared).
- Four L8A3 drill grenades.
- Stopwatch.
- Clipboard with pen.
- One helper.

Pretest Preparation

- Ensure the vehicle and the FCU power are both OFF.
- Place the L8A3 drill grenades in their storage container.
- Place an object such as a stick or a piece of paper into one launch tube each on the left and right launchers.
- Open the ramp.
- Close the driver's hatch.
- Close the squad leader and troop hatches.

Pretest Conditions for Each Examinee

- Not applicable.

Test Planning Time

Administrative—Allow 5 minutes for setup.

Test—Allow 2 minutes for each Soldier.

Total—Allow 7 minutes total.

INSTRUCTIONS TO EXAMINEES

"Let me have your attention."

Pause.

"At this station, you will be tested on your ability to load the M6 smoke grenade launcher on the Stryker antitank guided missile vehicle. The primary weapon is unloaded and cleared."

Pause and then say—

"When I say begin, you must load the M6 smoke grenade launcher on the Stryker antitank guided missile vehicle in accordance with steps outlined in the ATGMV technical manual. You have two minutes to complete this task. Do you understand these instructions?"

Pause five seconds and then command—

BEGIN.

Begin timing now. If the examinee has not completed the task after two minutes, command loud enough for the examinee to hear—

STOP.

If you think that the examinee might damage the equipment or cause injury to himself or others, command—

STOP.

PERFORMANCE CHECKLIST, STATION 11

Load the M6 Smoke Grenade Launcher on a Stryker ATGMV

NAME _____ **UNIT** _____

GRADE _____ **DUTY POSITION** _____

PERFORMANCE MEASURES	GO	NO GO
1. Ensured vehicle AUTO MASTER and AUX MASTER are set to OFF position.		
2. Ensured C4ISR is powered down.		
3. Ensured main power switch on GCP is set to OFF and that main power lamp is not illuminated.		
4. Removed protective covers from grenade launchers.		
5. Checked to ensure each launcher tube was free of damage and debris.		
6. Removed smoke grenades one at a time from storage bin and inspected for damage.		
7. Loaded four smoke grenades in launch tubes (on one launcher pod) one at a time using the following steps: a. Ensured no portion of body is in front of launch tube. b. Grasped smoke grenade around sides and carefully pushed metal end first all the way into tube until two clicks are either heard or felt. c. Turned smoke grenade one-half turn clockwise to ensure electrical contact. d. Pulled gently on grenade to ensure it properly seated.		
8. Completed all performance measures in sequence within 2 minutes.		

EVALUATOR'S NAME: _____

TEST DATE: _____

OVERALL SCORE (GO/NO-GO): _____

REMARKS: _____

STATION 12

TEST ADMINISTRATIVE GUIDE

Action: Unload the M6 smoke grenade launcher on a Stryker ATGMV.

Conditions: Given a Stryker ATGMV, an assistant, and four L8A3 drill grenades loaded in the M6 smoke grenade launcher. The primary weapon is unloaded and cleared.

Standards: Unload four L8A3 drill grenades in the smoke grenade launcher without exposing any part of the your body in front of the launcher tubes. Unload a misfired smoke grenade without causing damage to equipment or injury to personnel. Secure the drill grenades in the grenade storage bin within 2 minutes.

Evaluation Procedures

Administrative Process

At this station, log the crewmember's information on a roster. Give him all materials and equipment, and display them as described for this station. Use performance checklist criteria for this task. Tell the crewmember how well he performed the task, and then either direct him to the next station or disclose further training needs. Test only one crewmember at a time in his assigned position.

Administrative Procedures for Personnel Receiving a NO-GO

If the crewmember fails to achieve the task standard, give him a NO-GO. When you give him a NO-GO, critique him and provide corrective steps for all cited mistakes. Then retest the crewmember IAW local SOP.

Personnel, Equipment, and Material Required

- Operational Stryker with basic issue items.
- TM 9–2355–311–10–7 (or appropriate Stryker variant TM).
- Primary weapon (cleared).
- Four L8A3 drill grenades loaded in an M6 smoke grenade launcher.
- Stopwatch.
- Clipboard with pen.
- One helper.

Pretest Preparation

- Load four L8A3 drill grenades in one M6 smoke grenade launcher pod.
- Open the ramp.
- Close the driver's hatch.
- Close the squad leader and troop hatches.

Pretest Conditions for Each Examinee

- Not applicable.

Test Planning Time

Administrative—Allow 5 minutes for setup.
Test—Allow 2 minutes for each Soldier.
Total—Allow 7 minutes total.

INSTRUCTIONS TO EXAMINEES

"Let me have your attention."

Pause.

"At this station, you will be tested on your ability to unload the M6 smoke grenade launcher on the Stryker antitank guided missile vehicle, or ATGMV, and to dispose of a misfired smoke grenade without damaging equipment or injuring personnel. The primary weapon is unloaded and cleared."

Pause and then say—

"When I say begin, you must unload the M6 smoke grenade launcher on a Stryker antitank guided missile vehicle in accordance with steps outlined in the ATGMV technical manual. You have two minutes to complete this task. Do you understand these instructions?"

Pause five seconds and then command—

BEGIN.

Begin timing now. If the examinee has not completed the task after two minutes, command loud enough for the examinee to hear—

STOP.

If you think that the examinee might damage the equipment or cause injury to himself, command—

STOP.

PERFORMANCE CHECKLIST, STATION 12

Unload the M6 Smoke Grenade Launcher on a Stryker ATGMV

NAME _____ **UNIT** _____

GRADE _____ **DUTY POSITION** _____

PERFORMANCE MEASURES	GO	NO GO
1. Ensured vehicle AUTO MASTER and AUX MASTER is set to OFF position.	_____	_____
2. Ensured C4ISR is powered down.	_____	_____
3. Ensured main power switch on GCP is set to OFF and that main power lamp is not illuminated.	_____	_____
4. Unloaded drill grenades from the M6 smoke grenade launcher one at a time using the following steps:	_____	_____
a. Grasped grenade with thumb and first finger and pulled while twisting grenade counterclockwise. b. Lifted grenade from launch tube. c. Secured grenade in grenade storage bin. d. Repeated steps a through c to unload all four grenades from launcher pod. e. If a misfired grenade was unloaded, handed it to driver. Moved it at least 200 meters from vehicle and personnel. Marked it and notified his chain of command of its location.		
5. Installed protective covers on smoke grenade launchers.	_____	_____
6. Completed all performance measures in sequence within 2 minutes.	_____	_____

EVALUATOR'S NAME: _____

TEST DATE: _____

OVERALL SCORE (GO/NO-GO): _____

REMARKS: _____

STATION 13

TEST ADMINISTRATIVE GUIDE

Action: Identify combat vehicles.

Conditions: Given pictures or a slide presentation of 30 combat vehicles at ranges between 500 and 1200 meters, day or night environment.

Standards: Within 11 minutes, identify by nomenclature 27 of 30 combat vehicles using day or night sights.

Evaluation Procedures

Administrative Process

At this station, log the crewmember's information on a roster. Give him all materials and equipment, and display them as described for this station. Use performance checklist criteria for this task. Tell the crewmember how well he performed the task, and then either direct him to the next station or disclose further training needs. Test only one crewmember at a time in his assigned position.

Administrative Procedures for Personnel Receiving a NO-GO

If the crewmember fails to achieve the task standard, give him a NO-GO. When you give him a NO-GO, critique him and provide corrective steps for all cited mistakes. Then retest the crewmember IAW local SOP

Personnel, Equipment, and Material:

- Qualified CPL or above.
- Thirty vehicle pictures or slides.
- Twenty percent viewed through night sights.
- Twenty pictures taken from the prescribed list; the rest at commander's discretion.
- Stopwatch.
- Clipboard and pen or pencil for each crewmember.
- One helper (qualified E4 or below).

Pretest Preparation

- Ensure the pictures include 20 from the required list and 10 from the optional list, and that at least 6 are viewed through a nightsight (Table A–2).

Pretest Conditions for Each Examinee

- Not applicable.

Test Planning Time

Administrative—Allow 5 minutes for setup.

Test—Allow 11 minutes for each Soldier.

Total—Allow 16 minutes total.

INSTRUCTIONS TO EXAMINEES

"At this station, you will be tested on your ability to identify combat vehicles. You must correctly identify 27 of 30 combat vehicles by nomenclature. You will have 12 seconds to view each vehicle and 10 seconds to write your answer on the performance checklist provided. Make sure you do not get out of sequence, or your answers will be incorrect. You have 11 minutes to complete this test. Do you understand these instructions?"

Answer questions, and then say—

"You may begin."

Start the timer. If the examinee has not completed the task after 11 minutes, command loud enough for the examinee to hear—

STOP.

Table A-2. Combat vehicle slides.

Required Vehicles						
AMX40	BRDM2	T-80	LAV25	M1 Abrams	Marder	Bradley M2A2
ZSU23-4	Challenger	BTR60PB	BMP1	T-62	Merkava	Warrior
T-72M1	2S1	Leopard 2	M113	BMP2	T-72	

Optional Vehicles								
Main Battle Tanks		**Other Tanks**			**Antitank Systems**			
T64	Type 62	AMX13	Leopard 1	T-80U	ASU57	AT5 Spandrel	MT12	Type 52 75 mm
T64A	Type 69	AMX30	M48A5	T34 Medium	ASU85	AT6 Spiral	RPG2	Recoilless Rifle
T64B	Type 79	AMX30 SA	M551 Sheridan	T54	AT1 Snapper	B10	RPG7	Type 56 RPG-2
T64K	Type 80	Centurion	M60A1	T55	AT2 Swatter	PANHARD VCR	SPG9	Type 70-1 62 mm
T-72 M84	Type 90	Centurion 155	M60A3	T55K	AT3 Sagger	HOT	SS11 Harpoon	Rocket Launcher
Type 59		Centurion RE	PT76		AT4 Spigot	ITV M901	ATGM	Type 86
		Chieftain	PT76 Type 60			Milan ATGM	Swingfire ATGM	

Artillery (Self-Propelled or Towed)					
2S3	Astros (MRL) 180mm	GHN-45 155 mm (towed)	M1972 122mm	M1985 MRL 122mm (SP)	Type 59 130mm
2S4	BM21	M107	M1973 152mm	M1985 MRL 240mm (SP)	Type 85 122mm
2S5	CGT F1	M109A1	M1974 152mm (SP)	M1989 170mm	
2S7	Dana 152mm (SP)	M109A2	M1975 130mm (SP)	Majnoon 155mm (SP)	
2S9	G-5 155mm (towed)	M109A3	M1977 122mm (SP)	MKF3	
AL FAO 210mm	G-6 155mm (SP)	M109A6	M1978 170mm (SP)	MLRS	
Astros (MRL) 127 mm	GCT 155mm (SP)	M110A2	M1981 122mm (SP)	Type 54-1 122mm	

Antiaircraft									
AMX DCA 30-2	Chaparral	Gepard	M163A1 Vulcan	Roland	S60	ZPU4	2S6	ZSU57-2	ZU23

Self-Propelled Mortar						
M106 107mm	M125 81mm	T54 160mm	Type 85 82mm	Type 85 120mm	YW304 82mm	YW381 120mm

Miscellaneous							
Artillery Command and Reconnaissance Vehicle	FOX, CBRNE Reconnaissance	AVLB	M88A1	M728 CEV	M9 ACE	PRP-3	

Light Armor (APC/IFV/Reconnaissance)							
AML	BMP1KSH	AT3BRM2 AT5	BTR50PK	Cascavel	Luchs	OT64	Striker
AMX10	Bradley M2	BRDM2 RKH	BTR60PA Cmd	EE-11	M113A3	OT65	VAB
AMX10P	Bradley M2A1	BRDM2 SA9	BTR70	FOX	M3 APC (Fr)	PSZH-IV	WZ523
AMX10RC	Bradley M3	BRDM2 U	BTR80	FV432	MCT (S)	Ratel	WZ551
BMD1	Bradley M3A1	BRM	BTRD	IPR	Ferret MK1	Rooikat	YW531
BMD 1979/3	Bradley M3A2	BRM1	Charrua	IRM	Ferret MK2	Saxon	YW534
BMD2	BRDM1	BTR152	Condor	Jaquar 1	MTLB	Scimitar	
BMP1K	BRDM2	BTR152K	Cougar EE-9	Jaquar 2	NFV-1NVH-1	Scorpion	

PERFORMANCE CHECKLIST, STATION 13

Identify Combat Vehicles

NAME _____ **UNIT** _____

GRADE _____ **DUTY POSITION** _____

PERFORMANCE MEASURES	GO	NO GO
Within 11 minutes, identified by nomenclature 27 of 30 combat vehicles, using daysights or nightsights.	_____	_____

EVALUATOR'S NAME: _____

TEST DATE: _____

OVERALL SCORE (GO/NO-GO): _____

REMARKS: _____

ANSWER SHEET, STATION 13

NAME _____ **UNIT** _____

GRADE _____ **DUTY POSITION** _____

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____
19. _____
20. _____
21. _____
22. _____
23. _____
24. _____
25. _____
26. _____
27. _____
28. _____
29. _____
30. _____

STATION 14

TEST ADMINISTRATIVE GUIDE

Action: Prepare a Stryker Range Card.

Conditions: Given a fully operational Stryker, sector of fire, compass, paper, pencil, map (1:50,000), three marking stakes, and a standard range card (DA Form 5517-R).

Standards: Within 15 minutes, prepare a range card that shows the target area to include—

- Weapon symbol.
- Circle value.
- Sectors of fire.
- Target reference points or reference points.
- Dead space.
- Weapon reference point.
- Magnetic north.
- Identification data.
- Target or sector data.

Evaluation Procedures

Administrative Process

At this station, log the crewmember's information on a roster. Give him all materials and equipment, and display them as described for this station. Use performance checklist criteria for this task. Tell the crewmember how well he performed the task, and then either direct him to the next station or disclose further training needs. Test only one crewmember at a time in his assigned position.

Administrative Procedures for Personnel Receiving a NO-GO

If the crewmember fails to achieve the task standard, give him a NO-GO. When you give him a NO-GO, critique him and provide corrective steps for all cited mistakes. Then, retest the crewmember IAW local SOP.

Personnel, Equipment, and Material Required

- Operational Stryker with basic issue items.
- TM 9–2355–311–10–2 (or appropriate Stryker variant TM).
- Stopwatch.
- Compass.
- Clipboard with pencil.
- Three stakes per vehicle.
- One helper.

Pretest Preparation

- Ensure all equipment is operational

Pretest Conditions for Each Examinee

- Issue a blank range card.
- Issue a pencil and compass.
- Turn on auxiliary power.
- Point out left and right limits and reference points.

Test Planning Time

Administrative—Allow 5 minutes for setup.

Test—Allow 10 minutes for performance of the task.

Total—Allow 15 minutes altogether.

INSTRUCTIONS TO EXAMINEES

"Let me have your attention."

Pause.

"At this station, you will be tested on your ability to prepare a Stryker range card."

Pause and then say—

"When I say go, you must prepare a range card for a Stryker antitank guided missile vehicle in accordance with ST 3-22.6. You have 10 minutes to complete this task. Do you understand these instructions?"

Pause for five seconds, and then command—

BEGIN.

Begin timing now. If the examinee has not completed the task after 10 minutes, command loud enough for the examinee to hear—

STOP.

If you think that the examinee might damage the equipment or cause injury to himself, command—

STOP.

PERFORMANCE CHECKLIST, STATION 14

Prepare a Stryker Range Card

NAME _____ **UNIT** _____

GRADE _____ **DUTY POSITION** _____

PERFORMANCE MEASURES	GO	NO GO
1. Completed top marginal data.		
a. Inserted squad, platoon, and company designations.		
b. Inserted magnetic North arrow (The range card is oriented with the terrain and the direction of magnetic North arrow.)		
2. Completed sector sketch section.		
Note: You need not draw the sketch to scale, but make sure the data referring to the targets is accurate.		
a. Drew the weapon symbol in the center of the small circle.		
b. Drew the left and right limits from the position.		
c. Determined the value of each circle by using the terrain feature farthest from the position that was still within the weapon's capability.		
Note: Determine the distance to the terrain feature. Round it off to the next even hundredth, if needed. Determine the maximum number of circles that will divide evenly into the distance and divide it to obtain the value for each circle.		
d. Drew the terrain feature on the appropriate circle.		
e. Drew all TRPs and reference points in the sector. (Number them consecutively and circle them.)		
f. Drew dead spaces in the sector.		
g. Drew a maximum engagement line for antiarmor weapons.		
h. Marked and numbered the weapon reference point.		
Note: When there is no terrain feature to designate, show the location as an eight digit grid coordinate.		
3. Completed data section.		
a. POSITION IDENTIFICATION: Identified the position as either primary, alternate, or supplementary.		
b. DATE: Entered the date and time the range card was completed.		
c. WEAPON: Identified the type of weapon.		
d. EACH CIRCLE EQUALS ____ METERS: Indicated the distance in meters between circles.		
e. NO: Starting with left and right limits, listed TRPs and reference points in numerical order.		
f. DIRECTION/DEFLECTION: Listed the direction in degrees, and the deflection in mils.		
g. ELEVATION: Listed the elevation in mils.		
h. RANGE: Marked the distance in meters from the position to the left and right limits and to TRPs and reference points.		
i. AMMO: Listed the type of ammunition used.		
j. DESCRIPTION: Wrote the name of the object, for example, farmhouse, wood line, or hilltop.		
k. REMARKS: Listed the weapon reference point data and any additional information.		
4. Completed the range card within 15 minutes.		

EVALUATOR'S NAME: _____

TEST DATE: _____

OVERALL SCORE (GO/NO-GO): _____

REMARKS: _____

Appendix H

Initial, Sustainment, and Qualification Exercises

All initial training, sustainment training, and qualification exercises are to be performed sequentially; none are to be skipped. The exercises progress from very simple to increasingly difficult. All exercises are scored on a pass/fail basis. The instructor always makes the final judgment as to whether or not a gunner passes a given exercise, and may override the automatic scoring of the BST when he deems appropriate.

TABLES

H-1. Initial training and sustainment exercises must be completed to the specified standard before advancing to the next exercise. If a gunner fails an exercise, the instructor must reiterate the exercise objective and allow the gunner to try the exercise again. There is no limit on the number of times a gunner may repeat an initial training exercise.

INITIAL TRAINING EXERCISES

H-2. Initial training exercises are designed for gunners who have recently received initial ATGM classroom training. They are intended to help gunners perform all recently learned ATGM operational tasks. These exercises begin with the simplest target engagements (short range, stationary) and progress to increasingly difficult multiple target and problematic scenarios. Initial training exercises give gunners active, hands-on training for engaging targets and practicing operating procedures directly related to all other ATGM training received. Table H-1 shows the 25 initial training exercises.

Table H-1. Initial training exercises.

No.	*Action*	*Description*
1	ENGAGE STATIONARY TARGET (MANUAL, DAY)	The gunner acquires the basic skills necessary to engage a target using the daysight tracker. The gunner will also learn proper scanning techniques, target recognition, target acquisition, and engaging a target in a daylight scenario with the night vision sight (NVS) not cooled.
2	ENGAGE STATIONARY TARGET (NVS) 1	There are 4 stationary T-72s. The gunner must engage one target using the ATT in the NVS mode. The gunner practices sizing and locking onto targets with the ATT.
3	ENGAGE STATIONARY TARGET (NVS) 2	There are 7 stationary T-80s. The gunner must engage 1 target using the ATT in the NVS mode. The gunner practices sizing and locking onto targets.
4	ENGAGE STATIONARY TARGET (NVS) 3	There are 3 stationary targets consisting of a T-80 and 2 BMPs. The gunner must prioritize the targets and engage the T-80.
5	TARGET ENGAGEABILITY	The gunner will have multiple targets moving from outside the engagement area into the engagement area. The gunner will use passive ranging and the Narrow Field of View (NFOV) reticle lines to determine if a target can be engaged.

Table H-1. Initial training exercises (continued).

No.	*Action*	*Description*
6	ENGAGE MOVING TARGET (MANUAL, DAY)	The NVS Not Cool indicator will be on. Gunner will be forced to use the daysight tracker to engage. Gunner is introduced to engaging a moving target with the daysight tracker. There are 3 wheeled vehicles moving slowly along a wood line. The gunner must engage and destroy 1 moving target.
7	ENGAGE MOVING TARGET (NVS 1)	Targets will not appear immediately. There are 4 vehicles moving at fast speed into the engagement area. This exercise will force the gunner to use scanning techniques until targets arrive. The gunner must engage 1 target in the NVS/ATT mode.
8	ENGAGE MOVING TARGET (NVS 2)	There are multiple targets moving through cover. Targets eventually become engageable. Gunner will have to determine if targets can be engaged and prioritize them.
9	ENGAGE MOVING TARGET (NVS 3)	There is a convoy of wheeled vehicles moving at high speed. Gunner will have to adjust the TAS display before continuing with acquisition procedures.
10	QUICK REACTION ENGAGEMENT 1	Multiple targets suddenly move into the engagement area at close range. Gunner must quickly prioritize the targets and engage the greatest threat. Gunner must use the daysight, because the NVS is not cool.
11	QUICK REACTION ENGAGEMENT 2	Friendly vehicles will be moving into positions around the village. Four enemy armored vehicles will appear in the sector and begin to move toward the village. The gunner must quickly engage 1 of the enemy targets.
12	ENGAGE TARGET IN IR CLUTTER	The gunner will learn to overcome and engage a target with IR clutter on the battlefield. The targets will travel through IR clutter forcing the gunner to determine whether a tracker or manual engagement is necessary and perform accordingly.
13	ENGAGE TARGET IN IR CROSSOVER	Although this exercise occurs during the day, the gunner will use the correct engagement procedures and try to lock onto the target using the NVS. The IR crossover may prevent a tracker lock. Gunner should abandon the tracker after recognizing the high IR crossover and engage the target manually. Gunner should use the mode (day or night) that allows him to best see the target.
14	ENGAGE TARGET IN LIMITED VISIBILITY 1	Gunner must engage a target in limited visibility conditions (rain). There are several moving targets that are obscured by rain. The gunner must overcome the limited visibility and destroy 1 target.
15	ENGAGE TARGET IN LIMITED VISIBILITY 2	Weather conditions are degraded and the gunner will have limited visibility. The gunner must prioritize and acquire 1 target in these conditions. There are main battle tanks (MBTs) and wheeled vehicles in the sector.
16	ENGAGE MULTIPLE TARGETS 1	There are 2 convoys of armored vehicles moving through the gunner's sector of fire. The gunner must engage all MBTs and Air Defense Artillery (ADA) vehicles.
17	ENGAGE MULTIPLE TARGETS 2	There are friendly and enemy vehicles in the gunner's sector of fire. There are SCUD missile launchers, escorted by MBTs in the sector. Gunner must identify, prioritize, and engage the proper targets.
18	ENGAGE MULTIPLE TARGETS 3	There are 2 bunkers and a MBT in the gunner's sector of fire. The gunner must first destroy the MBT and then engage a bunker with TOW 2B line of sight (LOS).
19	ENGAGE MULTIPLE TARGETS 4	There are 2 MBTs behind a distant berm that pop up long enough to scan for a target, fire, and move back behind cover. There is 1 MBT moving in the open. The gunner must engage all 3 MBTs.
20	ENGAGE TARGETS IN A CBRNE ENVIRONMENT	There is a convoy or armored vehicles moving through the gunner's sector of fire. There is a potential CBRNE threat and the gunner is in MOPP4 posture. The gunner must engage multiple targets while wearing a protective mask.
21	ENGAGE TARGETS IN A CBRNE ENVIRONMENT	There is a convoy or armored vehicles moving through the gunner's sector of fire. There is a potential CBRNE threat and the gunner is in MOPP4 posture. The gunner must engage 2 MBTs while wearing a protective mask.
22	REACT TO INDICATOR LIGHT 1	The gunner will be given a false traversing unit (TU) indicator light 20 seconds into the exercise. The gunner must perform the proper immediate action to clear the indicator light and engage the target.

Table H-1. Initial training exercises (continued).

No.	*Action*	*Description*
23	REACT TO INDICATOR LIGHT 2	There is 1 armored vehicle moving through the gunner's sector of fire. Gunner will get a TAS indicator light that will not be clearable. Gunner must perform the correct immediate action for the indicator light.
24	REACT TO INDICATOR LIGHT 3	There is an armored vehicle heading toward the gunner's position. The gunner will get an FCS indicator light. The gunner must take the appropriate action to clear the indicator light and engage the target.
25	REACT TO INDICATOR LIGHT 4	There is an ADA vehicle moving across the gunner's sector of fire. 25 seconds into the exercise, the gunner will get a TU indicator light that is not correctable. The gunner must perform the proper immediate action procedures to correct the indicator light.

SUSTAINMENT TRAINING EXERCISES

H-3. Sustainment training exercises are designed for trained ATGM gunners and to enhance gunner skills by offering more advanced and difficult scenarios. The sustainment exercises include scenarios where gunners must make decisions based on training they received from the initial training exercises, as well as the experience gained from using the tactical system. The instructor may also allow the gunner to use initial training exercises for practice in conjunction with sustainment training. Table H-2 shows the 20 sustainment training exercises.

Table H-2. Sustainment training exercises.

No.	*Title*	*Description*
1	ENGAGE MULTIPLE TARGETS 1	There are 4 BMPs and 2 T-72s moving down the roads toward the village. The gunner must quickly locate and prioritize hid targets and engage 2 MBTs.
2	ENGAGE MULTIPLE TARGETS 2	There are 2 convoys consisting of 2 BMPs, 1 ZSU, and 1 artillery piece each. The gunner must destroy the ZSUs and 1 artillery piece.
3	ENGAGE MULTIPLE TARGETS 3	There are 2 ZSUs and 2 T-80s in stationary positions. Only the ZSUs should be engaged.
4	ENGAGE MULTIPLE TARGETS 4	There is a SCUD missile launcher, 2 BMPs, and 2 cargo vehicles moving through the sector. The gunner is instructed to destroy the SCUD missile launcher and then resort back to the usual priority targets.
5	ENGAGE MULTIPLE TARGETS 5	There are 2 convoys, each consisting of a T-72, T-80, BRDM, and BMP that are moving through the sector. The gunner must destroy 3 enemy MBTs.
6	ENGAGE MULTIPLE TARGETS 6	There is a widely dispersed convoy consisting of 3 MBTs and 3 APCs entering the sector. The gunner will engage the targets as quickly as possible.
7	ENGAGE MULTIPLE TARGETS 7	There are 2 convoys of vehicles containing MBTs entering the sector. The gunner is instructed to engage first lead vehicles of convoys and second trail vehicles on convoys. Gunner must destroy 3 enemy MBTs.
8	ENGAGE MULTIPLE TARGETS 8	A supply convoy will move into the sector of fire. The gunner is instructed to first engage any over watching MBTs and then engage any moving MBTs. The gunner must destroy 3 enemy MBTs.
9	ENGAGE MULTIPLE TARGETS 9	There are 4 stationary MBTs and 2 stationary ZSUs in sector. The gunner has 4 rounds and has to engage MBTs as quickly as possible.
10	ENGAGE MULTIPLE TARGETS 10	There are 3 convoys, each one consisting of 1 MBT and 1 APC. Gunner must prioritize and engage the MBTs.
11	ENGAGE MULTIPLE TARGETS 11	There are 2 MBTs, 1 bunker, and an ADA vehicle in your sector. One of the MBTs is moving and one is stationary. The ADA vehicle is stationary and the bunker is located outside the city. The gunner must prioritize and engage the targets as quickly as possible.
12	ENGAGE MULTIPLE TARGETS 12	There is a convoy consisting of 2 T90s and 2 BMPs moving toward the gunner's sector of fire. The gunner must destroy 2 enemy MBTs.
13	ENGAGE MULTIPLE TARGETS 13	There are 4 MBTs moving through the gunner's sector of fire. Only enemy MBTs should be engaged.

Table H-2. Sustainment training exercises (continued).

No.	*Action*	*Description*
14	ENGAGE MULTIPLE TARGETS 14	There are 2 T-72s and 2 T-80s moving toward the gunner's sector of fire.
15	ENGAGE MULTIPLE TARGETS 15	There are 3 MBTs and 1 support vehicle that have moved into the sector. MBTs are the priority targets.
16	ENGAGE MULTIPLE TARGETS 16	There are 2 T90s and 2 BMPs moving into the sector, heading toward the unit's tactical operations center. The gunner must engage and destroy the MBTs as quickly as possible.
17	ENGAGE MULTIPLE TARGETS 17	There is a convoy of 2 BTR80s and 1 T-80 along with another T90 and BTR80 moving into the gunner's sector. The gunner must destroy the MBTs.
18	ENGAGE MULTIPLE TARGETS 18	There are 4 ZSUs that have taken up stationary positions within the gunner's sector. The gunner must destroy 2 enemy ZSUs.
19	ENGAGE MULTIPLE TARGETS 19	There are 2 T-72s in stationary positions within the sector and 1 T-72 moving into the sector to reinforce the 2 that are already set. The gunner must destroy 2 enemy MBTs.
20	ENGAGE MULTIPLE TARGETS 20	There is a bunker within the sector, and an enemy MBT moving into the sector. The gunner must engage the MBT first.

QUALIFICATION EXERCISES

H-4. The gunner can only try each qualification exercise once. If he does not achieve a passing score for the 10 exercises in the qualification table (a total score sum of 700 out of 1,000 where the aided target tracker (ATT) was used in 7 of 10 passed exercises), the gunner will be permitted to retry an alternate qualification table with 10 comparable exercises.

H-5. The qualification exercises are used to qualify gunners on the ATGM system. The exercises are based on easy scenarios and evaluate only the gunner's ability to acquire, lock, track, and engage enemy targets according to standard while using the proper acquisition and engagement procedures. Gunners should not fire qualification exercises until they have received ATGM initial training and have successfully passed all of the initial training exercises and have been designated as gunner for the ATGM crew.

H-6. To qualify as an ATGM gunner on the BST, students must achieve a minimum of 700 out of 1,000 points for the sum of the scores of the 10 qualification exercises and conduct and pass at least 7 of the 10 exercises using the ATT. Gunners are rated according to their final score as follows: Table H-3 shows the qualification exercise tables:

- Gunner 2d Class (700 to 799 points)
- Gunner 1st Class (800 to 899 points)
- Expert (900 to 1,000 points)

Table H-3. Qualification exercises.

No.	*Title*	*Description*
1	SINGLE ENGAGEMENT	A ZSU is being escorted by 2 BRDMs. The gunner must engage and destroy the ZSU.
2	SINGLE ENGAGEMENT	There is a large convoy of vehicles moving through the sector. The gunner must prioritize and engage an MBT.
3	SINGLE ENGAGEMENT	There are 2 BMPs performing forward security for 1 T-72. The targets will bound across the sector. The gunner must destroy 1 T-72.
4	MULTIPLE ENGAGEMENT	There is a friendly convoy moving across the sector. 2 BMPs and 2 BRDMs move into the sector behind the friendly convoy. The gunner must engage 2 enemy vehicles.
5	MULTIPLE ENGAGEMENT	There are 2 bunkers and a T-80, dug in and over watching a supply route. There is an enemy supply convoy moving along the supply route. The gunner must locate and destroy the T-80, and then destroy 1 of the bunkers in the LOS mode.

Table H-3. Qualification exercises (continued).

No.	*Title*	*Description*
6	SINGLE ENGAGEMENT	There are 2 cargo trucks escorted by 4 BMPs and 2 T-80s. The T-80s move into an over watch position and then start bounding with the convoy as it moves into the sector. The gunner must destroy 2 enemy T-80s.
7	SINGLE ENGAGEMENT	There are 4 ZSUs with 4 BRDM escorts that are hidden in the sector. Only 1 ZSU and 1 BRDM can be engaged. The gunner must locate and destroy the engageable ZSU.
8	SINGLE ENGAGEMENT	There are 4 BRDMs bounding across the sector. The gunner must destroy 1 enemy MBT.
9	MULTIPLE ENGAGEMENT	2 T-80s, 2 T-72s, 2 BRDMs and 2 BMPs storm into the sector. The gunner must quickly acquire and engage 2 targets.
10	MULTIPLE ENGAGEMENT	There is an ADA battery setting up in the gunner's sector. There are 2 trucks, 2 ZSUs, and 3 BRDMs in the sector. The gunner must destroy both ZSUs.

H-1. Gunners who fail to qualify may be required to repeat some or all of the initial training exercises at the instructor's discretion. Gunners may retry qualification using an alternate qualification table of 10 comparable exercises. Exercise descriptions for the table of alternate qualification table exercises (1A to 10A) are shown in Table H-4.

Table H-4. Alternate qualification exercise tables.

	Engagement		
No.	*Single*	*Multiple*	*Description*
1A	X		A ZSU is being escorted by 2 BRDMs. The gunner must engage and destroy the ZSU.
2A	X		There is a large convoy of vehicles moving through the sector. The gunner must prioritize and engage an MBT.
3A	X		There are 2 BMPs performing forward security for 1 T-72. The targets will bound across the sector. The gunner must destroy 1 T-72.
4A		X	There is a friendly convoy moving across the sector. 2 BMPs and 2 BRDMs move into the sector behind the friendly convoy. The gunner must destroy 1 enemy vehicle.
5A		X	There are 2 bunkers and a T-80 dug in and over watching a supply route. There is an enemy supply convoy moving along the supply route. The gunner must locate and destroy the T-80, and then destroy 1 of the bunkers in the LOS mode.
6A	X		There are 2 cargo trucks escorted by 4 BMPs and 2 T-80s. The T-80s move into an over watch position and then start bounding with the convoy as it moves into the sector. The gunner must destroy 1 enemy MBT.
7A	X		There are 4 ZSUs with 4 BRDM escorts that are hidden in the sector. Only 1 ZSU and 1 BRDM can be engaged. The gunner must locate and destroy the engageable ZSU.
8A	X		There are 4 BRDMs bounding across the sector. The gunner must destroy 1 enemy MBT.
9A		X	2 T-80s, 2 T-72s, 2 BRDMs and 2 BMPs storm into the sector. The gunner must quickly acquire and engage 2 targets.
10A		X	There is an ADA battery setting up in the gunner's sector. There are 2 trucks, 2 ZSUs, and 3 BRDMs in the sector. The gunner must destroy both ZSUs.

Glossary

Section I. ACRONYMS AND ABBREVIATIONS

1SG	first sergeant
AALC	antiarmor leader's course
AAR	after-action review
ABCS	Army Battle Command Systems
ADA	Air Defense Artillery
AFES	Automatic Fire Extinguishing System
AIMSS	advanced Infantry marksmanship strategies and skills
AoA	add-on-armor
ASAT	Army's Systems Approach to Training
AST	ATGM Skills Test
ATEA	anticipated target engagement areas
ATGMV	antitank guided missile vehicle
ATT	aided target tracker
AVLB	armored vehicle-launched bridge
BCF	brightness, contrast, and focus
BDAR	battle damage assessment and repair
BGM	ballistic guided missile
BII	basic issue items
BMC	brigade movement coordinator
BOT	burst on target.
BPS	battery power source
BMPs	Boyevaya Mashina Pehoti (Soviet mechanized infantry vehicle)
BRDM	Boyevaya Razvedyuatel'naya Dozornaya Meshina (Russian combat reconnaissance patrol vehicle)
BRT	brightness
BSB	brigade support battalion
BST	basic skills trainer
BSTB	brigade special troops support battalion
C4ISR	command, control, communications, computers, and intelligence
CAS	close air support
CBRNE	chemical, biological, radiological, nuclear, and high-yield explosives
C-BRT	cross brightness
CCP	casualty collection point
CEV	combat engineer vehicle
COEI	component of end item
CFR	Code of Federal Regulation
CMO	configuration management officer

CM	combat maintainer
CO	commanding officer
COEI	components of end item
CRT	combat repair team
CTA	common table of allowances
CTRS	contrast
CVC	combat vehicle crewman helmet
DAP	decontamination apparatus, portable
DPS	Department of Public Safety
DROS	date eligible for return from overseas
DRC	double-reinforced concrete
DVE	driver's vision enhancer
EOD	explosive ordinace disposal
EPLRS	Enhanced Position-Location Reporting System
ESML	expendable supplies materials list
ETS	Elevated TOW System
EXEVAL	external evaluation
FBCB2	force XXI battle command battalion/brigade and below
FCS	Fire Control System
FCU	fire control unit
FIST	fire support team
FLIR	forward looking infrared
FMC	forward maintenance company
FOB	forward operating base
FOV	field of view
FSNCO	fire support noncommissioned officer
FSO	fire support officer
FSV	fire support vehicle
GCP	gunners control platform
GPFU	gas particulate filtration unit
GTA	graphic training aid
HET	heavy equipment transport
HEMTT	heavy expanded mobility tactical truck
HMMWV	high mobility mulitpurpose wheeled vehicle
IAW	in accordance with
ICV	Infantry carrier vehicle
IPCC	Infantry Pre-Command Course
ITAS	Impoved Target Acquisition System
ITO	installation transportation officer
ITOW	improved TOW
LFX	live fire exercise

LOS	line of sight
LRF	laser rangefinder
LRU	line replacement unit
LTA	local training area
LTID	laser target interface device
MBT	main battle tank
MCO	mission combat operations
METL	mission essential task list
METT-TC	mission, enemy, terrain, troops, time available, and civilian considerations
MGS	Mobile Gun System
MIL STD	military standard
MILES	Multiple Integrated Laser Engagement System
MITAS	Modified Improved Target Acquisition System
MLS	Missile Launcher System
MOPP	mission oriented pretective posture
MOS	military occupational specialty
MPRC	multipurpose range complex
MRE	meal, ready to eat
MSR	missile simulation round
MTMC	Military Traffic Management Command
MTP	mission training plans
MTT	mobile training team
OIC	officer in charge
OIF	Operation Iraqi Freedom
OPFOR	opposing force
NBC	nuclear, biological, and chemical
NCO	noncommissioned officer
NCOIC	noncommisioned officer in charge
NET	new equipment training
NFOV	narrow field of view
NVS	night vision sight
ORF	operational readiness float
PBIT	power up built in test
PCS	permanent change of station
PMCS	preventive maintenance checks and services
POL	petroleum, oils, and lubricants
RHA	rolled homogenous armor
ROC-V	recognition of combat vehicles
RWS	remote weapon station
SAO	sensor-acquired objects
SBCT	Stryker brigade combat team

SBRT	symbology brightness
SDZ	surface danger zone
SITREP	situation report
SOP	standing operating procedures
STRAC	Standards in Training Commission
STXs	situational training exercises
T&E	test and evaluation
TADSS	training aids, devices, simulators, and simulations
TAS	Target Acquisition System
TC-AIMS II	Transportation Coordinators' -Automated Information for Movements System II
TDY	temporay duty
TES	tactical engagement simulation
TFTT	TOW field tactical trainer
TOT	tracer on target
TOW	tube launched, optically tracked, wire guided
TOW BB	TOW bunker buster
TRC	training readiness condition
TRPs	target reference points
TS	thermal sight
TSP	training support package
TTP	tactics, techniques, and procedures
TU	traversing unit
TV	thermal view
UMC	unit movement coordinator
UMO	unit movement officer
USAIS	United States Army Infantry School
VC	video conference
WFOV	wide field of view
XO	executive officer

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