FM 3-19.6

ARMORED SECURITY VEHICLE

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No. 3-19.6

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Armored Security Vehicle

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Preface

This manual provides MP forces with the tactics, techniques, and procedures (TTPs) and related information for the contemporary operating environment. This manual will optimize the capabilities of our MP forces as they conduct area security, maneuver, and mobility support operations. The ASV equips MP forces with a unique platform unmatched by other combat support (CS) or combat service support (CSS) branches. The ASV enables MP forces to mitigate a host of contemporary threats while affording maximum protection to the crew.

Employing the ASV in Army and joint operations expands the ability of the maneuver commander to project force protection and sustainment operations throughout the area of operations (AO). Army and joint operations (such as Operation Iraqi Freedom and Operation Enduring Freedom) have spawned an increase in interest and production of the ASV to support such operations. Accordingly, this doctrine is drawn largely from lessons learned in those operations. Specifically, the contents of this manual are a direct product of veterans with ASV operational experience in Operations Iraqi Freedom and Enduring Freedom.

This manual applies to the Active Army, the Army National Guard (ARNG)/Army National Guard of the United States (ARGNUS), and the United States Army Reserve (USAR) unless otherwise stated. It focuses on platoon level and below.

The proponent of this manual is the U.S. Army Training and Doctrine Command (TRADOC). Send comments and recommendations on DA Form 2028 (*Recommended Changes to Publications and Blank Forms*) directly to Commandant, U.S. Army Military Police School, ATTN: ATSJ-DD, 401 MANSCEN Loop, Suite 2069 (Doctrine Division), Fort Leonard Wood, MO, 65473.

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Chapter 1

Mission and Characteristics

The ASV enables MP forces to observe the battlefield and engage the enemy while remaining secure behind vehicle armor. The armor protection provided by the ASV is considerable. It is, however, vulnerable, especially to tanks and fighting vehicles. Armor provides limited protection against antitank guns, missiles, or rockets. This means that the MP leader must carefully analyze every situation and weigh the advantages and disadvantages of mounted combat. The ASV allows MP forces to fight mounted in both offensive and defensive scenarios. Deciding whether to fight mounted or dismounted depends on the factors of METT-TC. These fundamental factors are synonymous with the five basic rules of combat: secure, move, shoot, communicate, and sustain.

- Secure
  - Use cover and concealment.
  - Establish local security and reconnoiter.
  - Protect the unit.
- Move
  - Establish the moving element.
  - Obtain the best position to fire.
  - Gain and maintain initiative and momentum.
  - Move fast, strike hard, and finish rapidly.
- Shoot
  - Establish base of fire.
  - Maintain mutual support.
  - Kill or suppress the enemy.
  - Maintain a situational understanding of adjacent friendly units (prevent fratricide).
- Communicate
  - Ensure all Soldiers remain informed.
  - Inform Soldiers what is expected and why.
- Sustain
  - Maintain the engagement.
  - Ensure Soldiers have the classes of supply available to sustain the engagement.

MISSION

1-1. The ASV supports the MP in conducting the five MP functions across the full spectrum of military operations. The MP functions are area security, maneuver and mobility support, police intelligence, law and order enforcement, and internment/resettlement operations. The ASV can also support countermortar and counter-IED patrols, cordon and searches, and raids as part of a quick response force. In addition, the

ASV assists the maneuver commander with enhanced force protection and sustainment capabilities. ASV support to the five MP functions include the following:

- Area security operations.
  - Reconnaissance operations.
  - Response force operations.
  - Area damage control.
  - Base/air base defense.
  - Critical site, asset, and high-risk personnel security.
- Maneuver and mobility support operations.
  - Route reconnaissance and surveillance.
  - Main supply route regulation and enforcement.
  - Support to resettlement operations (dislocated civilian control.)
  - Support to river crossing, breaching operations, and passage of lines.
- Police intelligence operations.
  - Intelligence preparation of the battlefield (IPB).
  - Criminal intelligence support.
  - Active and passive role.
  - Law and order operations.
  - Law enforcement.
  - Criminal investigation.
- Internment and resettlement operations.
  - Detainee operations.
  - Dislocated civilian operations.
  - U.S. military prisoner handling.
- Law and order operations.
  - Support customs operations.
  - Support to law enforcement operations.
  - Support to host-nation police agencies.

CHARACTERISTICS AND CAPABILITIES

1-2. The ASV is a four-wheel drive vehicle with exceptional maneuverability and versatility. It can negotiate barricades, climb up to a 60-percent grade, travel cross-country over challenging terrain, and traverse deep mud, snow, or water with equal ease. The ASV is lightweight and air-transportable by C-130 and larger aircraft. This section discusses the vehicle's characteristics and gives a brief overview of its capabilities.

MOBILITY

1-3. The lightly armored, four-wheel drive ASV is equipped with a powerful 8.3 liter Cummins diesel engine and an Allison 6-speed automatic transmission. It provides power sufficient to climb 60-percent slopes and maintain highway speeds up to 63 miles per hour. A propeller shaft couples the transmission with the drive transfer unit. Output from the transfer unit drives the rear differential when in two-wheel drive mode and the front and rear differentials when in four-wheel drive mode. Operators can engage four-wheel drive "on the fly" by actuating a shift lever at the driver's station. The four-wheel independent suspension allows smooth cross-country operation that easily negotiates 15-inch vertical obstacles and enhances the ease of power steering and power braking. This modern design provides the mobility, agility, and durability required for the wide range of missions encountered by MP Soldiers.

1-4. The ASV fords hard bottom waterways up to 5 feet deep without any preparation. The ASV also includes a central tire inflation system that enhances mobility by allowing tire pressure adjustment to

accommodate four different terrain types—highways, secondary roads, off-road, and emergency conditions. In addition to the central tire inflation system, the ASV's run-flat capability prevents vehicle immobilization due to tire failure. The central tire inflation system may also provide additional operational capabilities when tires are punctured by small arms fire or shrapnel and tire pressure is not reduced enough to allow run-flat capability. The ASV also includes a winch capable of conducting retrieval operations at 15,000 pounds with a snatch block and cable for self-recovery operations.

ASV PROTECTIVE ARMOR

1-5. The ASV provides greater ballistic protection than any other wheeled vehicle of its size in the world. The modular armor system provides ballistic protection for the crew, ammunition, fuel tanks, and storage areas against 12.7-millimeter armor-piercing ammunition. The ASV provides overhead protection against 155-millimeter ammunition at 15 meters. It provides under body protection against antipersonnel and antitank mines up to 12 pounds TNT or equivalent explosive. This superior ballistic protection also includes a spall liner on the interior surfaces of the vehicle. The ASV minimizes the threat of antiarmor weapons by—

- Reducing exposure time.
- Suppressing or destroying enemy weapons.
- Using the cover and concealment offered by the terrain.

FIREPOWER

1-6. The ASV's firepower consists of a one-person, turreted primary weapons station with a mounted 40-millimeter automatic grenade launcher (MK-19) and .50-caliber machine gun (M2/M48). The turret traverses 360 degrees and allows for elevation of 45 degrees. The day/night target acquisition and fire control system allows the gunner to engage targets at the maximum effective ranges of both weapon systems. The ammunition ready racks hold 96 rounds of 40-millimeter ammunition and 200 rounds of .50-caliber ammunition. The vehicle also includes a M249 squad automatic weapon mount and multisalvo smoke grenade system. The ASV team's weapons includes the following:

- M249 machine guns.
- M16/M4 rifles.
- M203 grenade launchers.
- AT-4 antitank weapon.
- M9 pistol.

COMMUNICATIONS

1-7. The ASV's communication system provides the team with communication capabilities during mounted operations. The communication system of the ASV includes single channel, ground to air radio system (SINCGARS), vehicle intercom system, and provisions for mounting a global positioning system. The ASV also includes the battlefield combat identification system as well as the planned integration of the enhanced position location reporting and high frequency and tactical satellite communication systems. Additional radio systems may include the advanced system improvement program (ASIP) radio.

1-8. The ASIP radio is a new manpack radio that has been adapted from the SINCGARS airborne radio. ASIP radios will replace the AN/PRC-119 SIP radios in the Army units. The ASIP radio incorporates programmable digital signal processing technology and is significantly smaller than the existing radio. The ASIP radio reduces the weight of a manpack SINCGARS radio from 18 pounds to 7.6 pounds (including the battery), improves reliability, and extends the battery life by incorporating low power technology.

1-9. The ASIP radio incorporates a redesigned and more user-friendly, man-machine interface via flat-panel technology. A new feature of the SINCGARS ASIP provides a retransmission capability while operating in the packet data mode and will employ a new, fast-channel access protocol for improved operations in shared voice or data nets.

1-10. SINCGARS SIP and ASIP units are interchangeable with previous SINCGARS versions, including the capability to be mounted in older vehicular adapter assemblies. SIP radios can be upgraded to the same features as ASIP radios, and ASIP SINCGARS is backward compatible with the SIP version. The already fielded radios in inventory and new versions of SINCGARS have been fully interoperable.

1-11. The SIP increased the communications functionality and capability of the SINCGARS. The SIP radio incorporated features such as an interface to an external precision lightweight global positioning system receiver (PLGR), improved FEC, and packet routing. These improvements, along with the introduction of the Internet controller (INC) card, provided the mechanics for Internet protocol routing between radio nets and other communications systems enhanced position location reporting system (EPLRS), local area networks (LANs), and so forth. The introduction of Internet protocol routing revolutionized the way data is moved across the battlefield.

WATER-CROSSING CAPABILITY

1-12. The ASV can ford hard bottom water crossings up to 60 inches. It can travel through ditches and climb vertical obstacles up to 22 inches in height. The ASV is equipped with an electric bilge pump rated at 46 gallons per minute that removes water that may enter the vehicle during extended fording operations.

LIMITED VISIBILITY CAPABILITY

1-13. The ASV is equipped with six view blocks. Four large view blocks are located at the driver's and commander's station. A smaller view block is located on each side of the vehicle in the crew compartment. View blocks provide ballistic protection comparable to the hull armor system. Each view block contains a spall lining that affords additional ballistic protection. The ASV is also equipped with a limited visibility observation device for the gunner. This sophisticated surveillance, target acquisition, and night observation (STANO) device increases the team's ability to accomplish its mission during limited visibility. The ASV also has provisions for mounting the driver's viewer enhancement system. Other STANO devices that may be available to the team include the following:

- Binoculars—superior to the naked eye, daytime or night.
- AN/PVS-7 and AN/PVS-5 night vision goggles—goggles used for performing tasks at night (such as map reading, driving, and maintenance).

Note. Operators must take extra precautions during periods of limited visibility to ensure proper fit and focus of night vision goggles to minimize glare. Gunners, however, are limited to STANO techniques.

CREW STATIONS

1-14. The ASV crew stations are designed for functionality, operability, and Soldier comfort. The climatic controls include an auxiliary personnel heater and an air conditioner to sustain continuous operations under all environmental extremes. The cooling system consists of a radiator with an integral surge tank, coolant recovery system, and two thermostats. The limited space within the interior of the ASV makes it difficult for larger individuals to function adequately. Thus, crew proficiency and training in and around the vehicle is important.

1-15. The ASV can accommodate a crew of three plus one passenger. However, the ability to accommodate the passenger is omitted when the vehicle is configured for combat operations with a full complement of ammunition, water, sustenance, and combat equipment. The vehicle provides air conditioning to the crew. It is equipped with a four-station intercom system. Additionally, it incorporates a collective chemical, biological, radiological, and nuclear (CBRN) protection system (M13A1) consisting of four gas particulate ventilated face pieces with interface for radio and crew intercommunications.

Crew Responsibilities

1-16. The ASV is a turreted weapons platform operated by a three-person MP team. ASV crews must receive certification and training before they can safely conduct MP operations with the ASV.

- The driver must have experience in all types of operating conditions.
- The gunner must have the skills to identify threat vehicles and aircraft and the ability to estimate distance.
- The team leader (crew chief) must be an experienced noncommissioned officer (NCO) tactically proficient in mounted MP operations.

All three members of the team must be able to communicate using arm and hand signals. Crews that routinely train and practice their arm and hand signals can reduce communications requirements, build teamwork, and save time and lives.

Note. Cross training of the duties and responsibilities within the ASV is critical to the survival of the crew and the weapons systems.

Up-Gun Weapons Station

1-17. The following weapons and associated systems are found in the ASV gunner's station. (See figure 1-1.)

- MK-19. It allows the gunner to engage direct and indirect targets to a maximum effective range of 4,920 feet or 1,500 meters.
- M2/M48 .50 caliber machine gun. It is used for direct targeting operations at a maximum effective range of 6,002 feet (1,830 meters).

Note. METT-TC determines which weapon system is primary. For example, during urban operations, the M2 is most often the primary weapon enabling the crew to engage point targets in a congested area. Gunners must be mindful of collateral damage to civilian infrastructure and personnel.

- M-249. The ASV has a pintle mount that allows for exterior mounting of a squad automatic weapon with a maximum effective range of 3,281 feet (800 meters).
- M-257 LVOSS. This consists of eight grenade launch tubes that can fire a 180-degree smoke pattern 35 meters from the vehicle.
- M-36E3 day/night sight. This allows the gunner to detect and identify targets day or night.

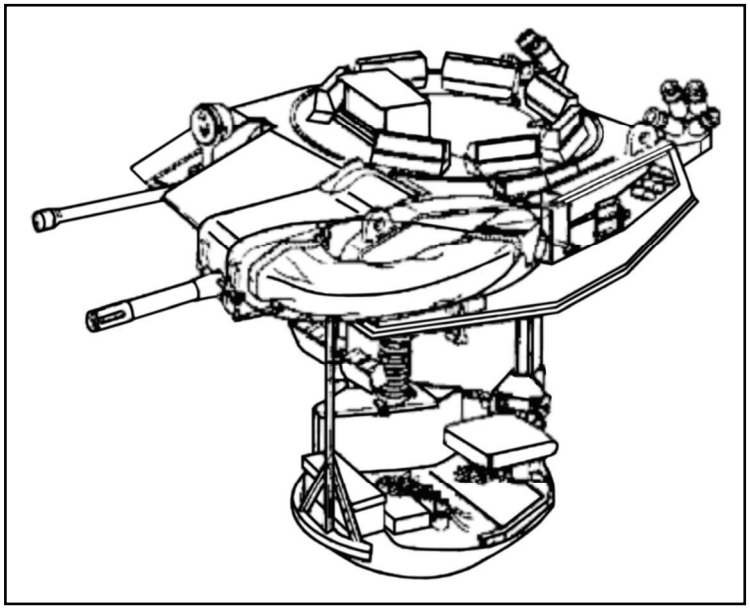
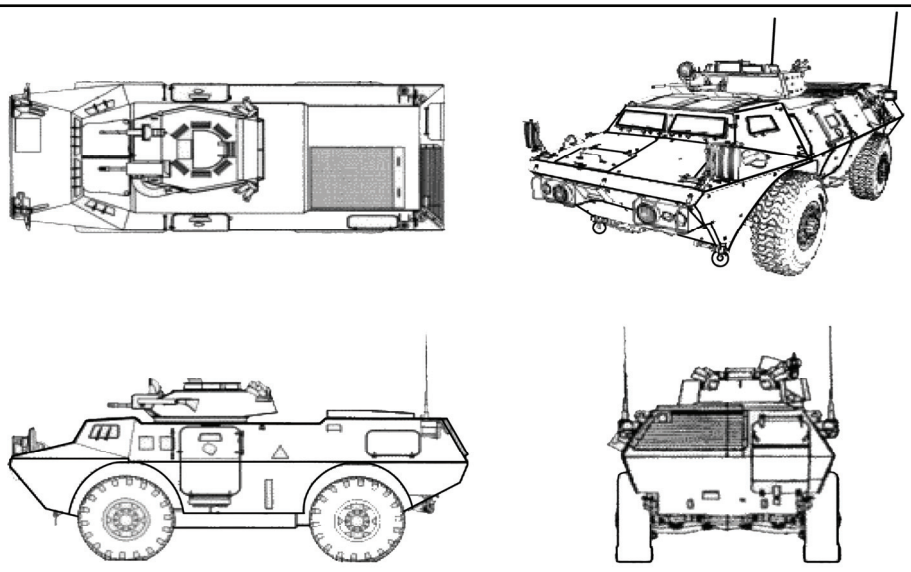


Figure 1-1. Up-gun weapons station

SPECIFICATIONS

1-18. Figure 1-2 shows the ASV and lists its specifications.



Maximum Speed	63 mph (100 kph)
Maximum Gradient Climbable	60 percent
Maximum Side Slope Operation	30 percent
Maximum Vertical Obstacle	24 in (0.6 m)
Turning Radius	55 ft (16.7 m)
Range at 40 mph (64 kph)	440 mi (708 km)
Fording	60 in (1.5 m)
Gross Vehicle Weight	29,560 lb (13,408 kg)
Payload	3,360 lb (1,524 kg)
Wheelbase	121 in (3.80 m)
Tread	84.3 in (2.14 m)
Overall Length	246 in (6.22 m)
Overall Width	101 in (2.56 m)
Overall Height (over turret)	102 in (2.59 m)
Overall Height (over hull)	81 in (2.06 m)

Figure 1-2. Specifications of the ASV

TASK ORGANIZATION

1-19. At a point in the future, each MP company will have 12 ASVs assigned. The current concept is for the companies to source each squad with one ASV. (See figure 1-3.) MP commanders should task organize the ASV teams and employ them with the greatest economy of force. The ASV team, supported by HMMWV teams, provides the lethality needed to conduct most MP combat support operations.

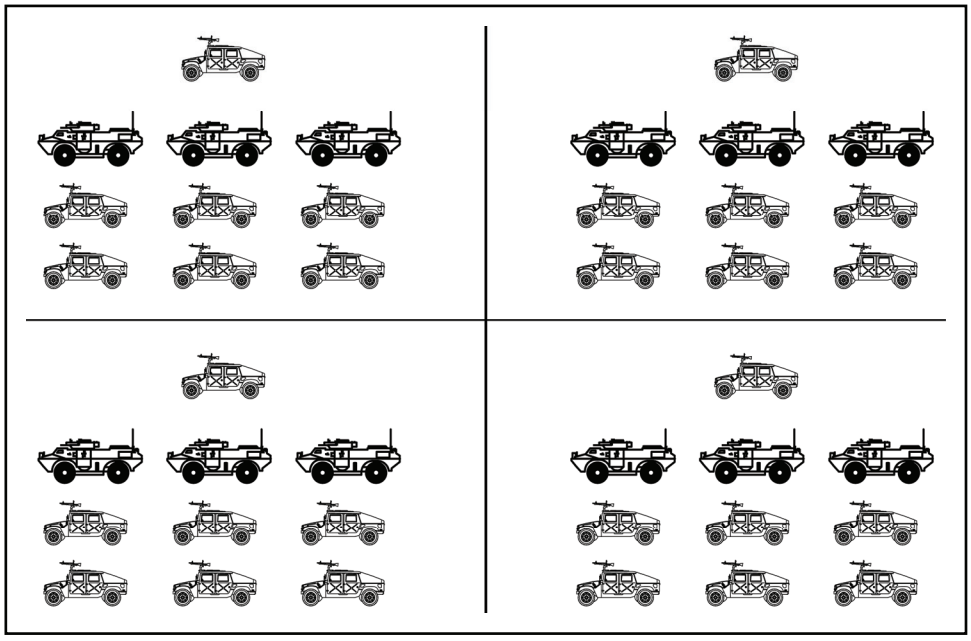


Figure 1-3. Task organization

1-20. In a more direct combat support role, ASV-mounted MP teams (as opposed to HMMWV teams), assist combat arms forces conducting rear and flank guard operations. In this capacity, the ASV provides the increased firepower and protection needed to—

- Destroy enemy reconnaissance patrols.
- Provide early warning.
- Prevent enemy ground observation.

The expectation is that MP teams participating in screening operations will—

- Maintain surveillance.
- Impede and harass the enemy with indirect fire.
- Provide reaction time, maneuver space, and protection to the main body.

1-21. When MP teams encounter threats beyond their defeat capability, the ASV provides the survivability needed for the team to maintain contact with the enemy and to continue to develop the situation until the arrival of the response force or the tactical combat force.

1-22. The right mix of ASV teams and HMMWV teams will depend on the type of missions conducted. MP commanders should prioritize missions and employ the ASV to take full advantage of its mobility and firepower.

Chapter 2

Target Acquisition

Target acquisition is the timely detection, location, and identification of targets in enough detail to attack accurately by either direct fire or supporting weapons. This chapter describes the target acquisition process. This process is a series of progressive and interdependent actions by the ASV team to acquire targets. These actions are ASV team search, detection, location, identification, classification, and confirmation. Although all ASV team members observe continuously, effective target acquisition requires the combined effort of all ASV team members.

ASV TEAM SEARCH

2-1. ASV team search (observation) is the act of watching the area of operations carefully. ASV team members use the naked eye as well as optics to search or scan the predetermined sector to acquire targets.

SECTORS OF OBSERVATION

2-2. Sectors of observation are areas assigned to each ASV team member for target acquisition to facilitate total visual coverage of the AO. The vehicle commander assigns each ASV team member a specific sector of observation. The gunner has a 360-degree responsibility.

Note. When operating as a squad, fields of observation for each vehicle will overlap with other vehicles in the squad to ensure all-around coverage.

CBRN OPERATIONS

2-3. Wearing the protective mask hampers target acquisition. Therefore, in a CBRN environment, the vehicle commander's and gunner's abilities to acquire targets are significantly reduced. Their acquisition responsibilities must be adjusted to compensate for this reduction.

DISMOUNTED OBSERVER

2-4. When the vehicle is in a concealed position, an observer, equipped with binoculars and communications equipment, should dismount and locate forward of the vehicle position and observe the AO. Depending on the area of responsibility, more than one observer position may be required.

GROUND SEARCH TECHNIQUES

2-5. ASV team members scan their areas of observation at all times to detect targets or possible target locations. There are three ground search techniques:

- Rapid scan.
- Slow (50 meter) scan.
- Detailed search.

All three techniques may be used by ASV team members. They may use the naked eye, binoculars, or other optics during good and limited visibility conditions. These techniques are modified at night by using the off-center vision method.

Note. While using a ground search technique, ASV team members should always search near to far for possible targets.

Rapid Scan

2-6. The rapid-scan method is used to detect obvious signs of enemy activity quickly. It is usually the first method used, whether stationary or moving. The vehicle commander may use optics or the naked eye. The gunner may use the up-gun weapons station (UGWS) sights (day or night mode) in low magnification, if available, or the naked eye.

- Initiate the scan in the center of the sector and rapidly scan from the nearest to the farthest visible point.
- Subsequently, orient left or right and conduct a rapid scan, near to far. (This sweep must overlap the center area of the previously scanned sector.)
- Lastly, once one side (from center) is completed, scan the remaining side in the same manner.

Slow Scan

2-7. If no obvious targets are identified in the rapid scan, ASV team members will conduct a more deliberate scan of the terrain by using the vehicle optics (day or night mode) or binoculars. The slow (50 meter) scan method is used for this task. The slow scan is best used by the vehicle commander or gunner when in a defensive position or from a short halt.

- Pausing at short intervals to give the eyes time to focus, search a strip of the target area 50 meters deep from right to left.
- Then, search a strip farther out from left to right overlapping the first area scanned.
- When a suspicious area or possible target signature is detected, stop and search the immediate area thoroughly, using the detailed search technique.

Detailed Search

2-8. If no targets are found using the rapid or slow scan techniques and time permits, ASV teams should use the optics (day and night) to make a careful, deliberate search of specific areas in their assigned sector. This method is also used to search, in detail, small areas or locations with likely or suspected avenues of approach.

- Concentrate on one specific area or location and study that area intensely.
- Look for direct and indirect target signatures in a clockwise manner around the focal point (terrain feature) of the area. The following are examples of target signatures:
  - Dust created by movement of vehicles.
  - Tracks or tire marks.
  - Reflections (flash) from glass or metal.
  - Angular objects that do not conform to the surrounding area.
  - Vegetation that appears out of place.
  - Flash or smoke from a weapon or missile.
  - Entrenchments or earthworks.

Off-Center Vision Method

2-9. Day and night scan techniques (rapid, slow, and detailed) are similar, with one exception: At night when using daylight optics or the naked eye, do not look directly at an object; look a few degrees off to the side of the target object. When scanning with off-center vision, move the eye in short, abrupt, irregular movements. At each likely target area, pause a few seconds to attempt to detect a target or any movement. If an object is detected as a possible target, use off-center vision to observe it. While observing the object, frequent eye movement is necessary to prevent object fadeout. Cupping the hands around the eye will also increase night vision.

AIR SEARCH TECHNIQUES

2-10. There are two air search techniques used to detect aerial targets quickly: flat terrain scan and hilly terrain scan. Both of these methods are based on slow (50 meter) scan techniques.

Note. When using an air search technique, ASV team members should always search far to near.

Note. Air search at night is similar to searching for ground targets at night.

Note. Threat aircraft may operate in pairs. If aircraft are acquired, a second pair of aircraft should be expected, and possibly another pair. There may be one to four pairs of aircraft.

Flat Terrain Scan

2-11. In flat terrain, search the horizon by moving the eyes in short movements from object to object. Do not attempt to stay focused on one object too long.

Hilly Terrain Scan

2-12. In hilly terrain, search the sky beginning just below the horizon and move upward. Use prominent terrain features as points of reference to ensure overlapping areas of search.

Note. When using the air search technique, concentrate just below the tops of the trees or vegetation to detect helicopters in hide positions. Combine ground and air search techniques as required. This allows ASV team members to scan for targets in the air and on the ground at the same time. (Combinations used will depend on the area of operations and METT-TC.)

ASV TEAM SEARCH TIPS

2-13. All of the surveillance, target acquisition, and night observation (STANO) devices on the vehicle can be used to acquire targets. These devices include binoculars, night vision goggles, night vision scopes, and the UGWS sights in either the day or night mode.

- Always scan without optics first, then with optics (such as binoculars or sights).
- Continuously search for targets. Any targets missed on the first or second scan may be seen on the third or fourth scan.
- Ensure the entire ASV team scans for targets and target locations using proper scanning techniques within their assigned sectors of observation.
- Ensure gunners use the rapid scan technique while on the move. They should constantly scan sector limits from the right limit to the left limit.

- Use care when scanning the peripheral field of view; targets there are harder to detect and locate.
- Use caution when scanning while wearing protective masks; the field of view is greatly narrowed limiting the ability to acquire targets.
- Concentrate the search in areas where targets are more likely to appear:
  - Identified avenues of approach.
  - Wood lines.
  - Reverse slope-firing positions.
- Always keep the dominant eye closed when scanning areas illuminated by flares. Never look directly at the flare.

TARGET DETECTION

2-14. Target detection is the discovery of any target or object (such as personnel, vehicles, equipment) of potential military significance on the battlefield. Target detection occurs during ASV team search as a direct result of observation.

TARGET SIGNATURES

2-15. Target signatures are indicators or clues that aid an observer in the search to detect the presence of potential targets. Most weapons and vehicles have identifiable signatures. These signatures may be the result of the design of the equipment or the environment in which the equipment is operating. For example, firing a vehicle's main weapon system could produce blast, flash, noise, smoke, and dust. The movement of vehicles through a built-up area causes more noise than the movement of the same vehicle in an open field. Different types of aircraft have different signatures (the signature of a hovering helicopter is not the same as that of a fixed-wing aircraft). Other factors (such as visibility, temperature, and weather conditions) also affect target signatures.

2-16. Search for targets where they are most likely to be employed. Tracked vehicle signatures are most likely to be detected in open areas and rolling terrain. For threat antitank positions, visually cover primary avenues of approach where BMP/BRDMs and armored personnel carriers (APC) are likely to be used. Look for helicopters on the backside of wood lines, ridgelines, and significant folds in the terrain.

2-17. ASV teams must be familiar with these as well as other possibilities. Sight, hearing, and smell can all assist in detecting signatures that will lead to target location and identification. Target signatures include—

- Soldier signatures.
  - Entrenching or earthworks.
  - Broken vegetation.
  - Footprints.
  - Light from fires, cigarettes, or flashlights.
  - Noise.
  - Trash.
- Tracked vehicle signatures.
  - Vehicle tracks.
  - Engine noise.
  - Exhaust smoke.
  - Dust clouds from movement.
  - Weapons firing reports, muzzle flashes, and smoke.
- Antitank missile signatures.
  - Missile launching reports, flashes, and smoke.

  - Long, thin guidance wires from previously fired missiles.
  - Destroyed armored vehicles.
- Artillery signatures.
  - Firing reports, muzzle flashes, and smoke.
  - Grayish-white smoke cloud.
  - Bright, orange flash and black smoke from air bursts.
  - Rushing noise several seconds before round impacts.
- Aircraft signatures.
  - Glare of sun reflecting off aircraft canopies and wings.
  - Engine noise.
  - Exhaust trails from engine
  - Exhaust trails from fired missiles.
  - Blowing dust and vegetation from hovering helicopters.
- Obstacles and mine signatures.
  - Loose or disturbed dirt.
  - Wires along the ground.
  - Destroyed or disabled vehicles.
  - Behavior and traffic patterns of local populace.
  - Suspicious objects along the roadside
  - Absence of local populace along a specific part of a road.

DETECTION CHALLENGES

Difficult Targets

2-18. Some targets are more difficult to detect than others. Increased ASV team sustainment training and greater concentration are required to detect and locate targets. Some examples of these more difficult targets are—

- Targets on the peripheral edge of the field of view.
- Targets that are camouflaged or in shadows.
- Targets that can be heard but not seen.
- Targets illuminated by flares.
- Small targets such as individual personnel or single firing positions.
- Natural conditions (weather and terrain).
- Man-made conditions (smoke and battlefield clutter).

Reduced Visibility Conditions

2-19. In winter, about 12 hours are spent in the dark. The threat makes the most of these conditions by moving forces in the dark. The threat also digs in or continues the attack during the night. Even during the day, the threat uses every means possible to cover its intentions. Camouflaged targets in wood lines or behind buildings are difficult to acquire with day optics. These targets can sometimes be detected more easily with night sights or other night vision equipment. For example, a vehicle in a wood line will be seen as an irregular shape compared to surrounding vegetation. A vehicle behind a building with its engine running may give off a heat plume from the exhaust, thus alerting the ASV team to the target. The gunner must be able to use night sights, if available, to acquire targets during limited visibility and during daylight. Night sights operate by sensing heat radiation or temperature changes. Thermal night sights can sense any

source of heat that is at least one degree above the surrounding temperature. Thermal night sights may detect the following primary heat sources:

- Solar heat. Energy from the sun is absorbed by the exterior surface of an object. The night sight then senses the heat radiated from that object. During daylight, targets are hotter and easier to detect. It is necessary, as the sun goes down and the temperature drops, to note how the object form changes.
- Fuel combustion. Heat is created through the operation of a vehicle engine. Most vehicles will show one or more image(s). Vehicles will show a plume of heat from the exhaust and another around the engine compartment.
- Friction. Moving parts of a vehicle will cause friction. These areas will then appear as images in the sight: tracks, road wheels, drive sprockets, and support rollers. (Vehicles driving through mud or snow will not show as sharp an image.)
- Night reflections. Glossy, smooth surfaces (such as the windshield of a vehicle) may reflect radiated heat.
- Body heat. The night sight also senses body heat.

TARGET LOCATION

2-20. Target location is determining where a potential target is on the battlefield. A target is located as a result of observation and detection during ASV team search. Once a target is located by an ASV team member, the target location must be communicated to all other personnel. Target location methods used to announce a target depend on the individual's specific position, unit SOP, and time available. Descriptions of the three most common target location methods follow.

CLOCK METHOD

2-21. The clock method is commonly used to get the vehicle commander or gunner on target. Twelve o'clock is based on the direction of vehicle movement while traveling, and the front of the vehicle when stationary. The vehicle commander or gunner can use the vehicle front direction to assist in accurately announcing target location (for example, "BMP–9 o'clock.").

SECTOR METHOD

2-22. The sector method is similar to the clock method; it is quick and easy to use. It is best used to indicate a direction from the direction of movement (moving) or vehicle orientation (stationary) using the terms center, left, right, and rear. Center sector is always to the direct front (for example, "Three BMP/BRDMS–left rear").

GRID METHOD

2-23. The grid method is giving a target location by providing a six-digit grid coordinate from a known position to the position of the target; determine a 2-character, 6-digit grid for the target. Then, determine a grid direction to the target.

2-24. The grid method is the least desired technique because of the length of time it takes to bring the gunner on target. The vehicle commander receives the location of a target by map grid (usually from an observation post). He then uses the map to orient the gunner toward the target area.

TARGET IDENTIFICATION

2-25. Target identification is recognizing a potential military target as being a particular target (such as a specific vehicle by type). As a minimum, the identification must determine if the target is friendly or a

threat (friend, foe, or neutral). ASV teams must know what to engage and what not to engage. The ASV team's only method of positive vehicle identification is visual. The ASV team's ability to visually identify targets greatly decreases as engagement ranges increase, camouflage techniques become more effective, and battlefield obscuration increases.

2-26. Target identification training is an essential part of any weapon system proficiency training program. ASV teams must be able to identify targets quickly to have the advantage of engaging first when necessary and destroying the threat at the weapon system's maximum engagement range; therefore, ASV teams must continuously train and evaluate on target identification.

TARGET CLASSIFICATION

2-27. Target classification is categorizing potential targets by the level of danger they represent. To defeat multiple targets on the battlefield, the most dangerous targets must be engaged first. This requires a quick determination of which target is the most dangerous. All ASV team members must know the engagement priorities of their unit and be able to classify priority targets; however, the vehicle commander is responsible for classifying targets and deciding what and when to shoot. Targets are classified by the level of danger based on the following criteria.

MOST DANGEROUS

2-28. When the ASV team observes a threat target with ASV-defeating capabilities that appears to be preparing to engage them, the target is classified as most dangerous. This type of target is the greatest threat and must be engaged immediately. When faced with multiple most dangerous targets, the vehicle commander must further classify the targets based on which one of the most dangerous targets is the greatest immediate threat.

2-29. It depends on the distance, but generally, helicopters, BMP/BRDMs, and BMPs within their effective ranges have a greater kill probability against ASVs than hand-held high-explosive antitank (HEAT) weapons (for example, RPGs).

2-30. Stationary targets can fire more accurately (and are therefore more dangerous) than moving targets. If two or more targets are of equal threat, engage the closest one first. When engaging more than two most dangerous targets from a stationary (weapons down) position, the ASV team should use an alternate firing position. Smoke (indirect fire or onboard) may also be used to keep the enemy from observing the vehicle. Minimizing the number of rounds fired from any one position (primary, alternate) aids in confusing the enemy and avoiding detection caused by a firing signature.

DANGEROUS

2-31. When the ASV team sees a target with ASV-defeating capabilities but the target is not preparing to engage them, the target is classified as dangerous. This type of target should be engaged after all most dangerous targets have been destroyed, unless otherwise specified by the priority of engagements. Multiple dangerous targets are engaged in the same manner as most dangerous targets—engage the target that presents the greatest threat; if the targets are of equal threat, engage the closest one first.

LEAST DANGEROUS

2-32. A target that does not have a weapon system capable of defeating an ASV is classified as a least dangerous target. Engage this type of target after all most dangerous and dangerous targets have been destroyed, unless it has a higher priority of engagement.

ENGAGEMENT PRIORITIES

2-33. Engagement priorities are also used to classify targets. Unit operation orders (OPORDs) or SOPs will designate certain types of targets as priority targets for destruction, regardless of their threat to the military police.

- Classify special targets. Targets are selected based on their impact on the total threat force (command and control vehicles, engineer vehicles, reconnaissance vehicles, and artillery). Destroying these targets breaks up the combined arms capability of the threat force.
- Establish a specific type target priority for specific friendly vehicles (friendly BMP/BRDMs might classify BMP/BRDMs as most dangerous, while military police classifies threat BRDMs and other infantry carriers as most dangerous).
- Establish a specific type target priority for specific elements in the unit (one MP unit might prioritize enemy BRDMs while another prioritizes BMPs).

2-34. Information to assist ASV teams in classifying targets includes—

- The most likely threat vehicles to be engaged by military police.
- Threat vehicle primary and secondary armament capability of penetrating ASVs.
- The armor penetration data, with no angle of slope at 1,000 meters (except where noted as 500 meters).

TARGET CONFIRMATION

2-35. Target confirmation is the rapid verification of the initial identification and classification of the target. It is the final step in the target acquisition process and is completed during conduct of fire. Confirmation takes place after the vehicle commander has issued all elements, except the execution element, of the fire command and as the gunner is completing the lay. (Gunners also go through a confirmation step. As they make their final lay, the gunners assure themselves that the target is hostile.)

2-36. The vehicle commander completes the evaluation of the nature of the target based on the target's appearance and the commander's knowledge of the tactical situation. If the vehicle commander—

- Determines that the target is hostile, the vehicle commander continues the engagement.
- Determines the target is friendly or neutral, the vehicle commander commands "cease fire."
- Cannot confirm the nature of the target, the vehicle commander continues to observe until confirming the target.

2-37. If the gunner—

- Confirms the target is hostile, the gunner completes the final lay and engages the target, on order.
- Determines the target is friendly or neutral, the gunner announces confirmation to the vehicle commander ("Confirmation friendly" or "Confirmation neutral").
- Cannot determine the nature of the target, the gunner announces "Confirmation doubtful." The vehicle commander then determines whether to continue or terminate the engagement.

2-38. The vehicle commander must be kept informed on the tactical situation in order to assist in target confirmation. For example, the vehicle commander must be aware of friendly element movement within or between battle positions, the forward passage of lines, status of the withdrawal of any covering force, or the movement of civilian vehicle traffic in the area of operations.

ACQUISITION REPORTS

2-39. Targets acquired by an ASV team member must be reported to the vehicle commander immediately by ASV team acquisition report. This target hand-over technique must take place before the classification step of the target acquisition process continues. An acquisition report consists of three elements: alert

(optional), description, and location (for example, "Driver report–two moving APCs–left flank"). The acquisition report is given internally between the ASV team members who can identify each other by voice recognition. Therefore, the description element of the report usually serves as the alert element also (for example, "Two moving APCs–11 o'clock").

TARGET ACQUISITION AND CONDUCT OF FIRE

2-40. ASV teams must be proficient in the techniques and procedures of both target acquisition and conduct of fire to engage the enemy successfully in combat.

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Chapter 3

Range Determination

Range determination significantly affects target engagement accuracy. Errors in range determination will cause more first round misses than an error in deflection. Range errors causing the first round to go over the target are particularly serious because of the difficulty of observing and adjusting from a round that goes high.

VEHICLE COMMANDER

3-1. The vehicle commander is responsible for navigation, command, and control and is primarily responsible for determining range. When choosing the target, the vehicle commander must rapidly and accurately determine the range to the target. The vehicle commander usually has more options for determining range and a better knowledge of the terrain and tactical situation. In most cases, the vehicle commander can make a range determination more quickly and easily than the gunner or driver who has limited means of determining range. This section details range determination methods available to each ASV team member.

3-2. Vehicle commanders use their knowledge of the terrain, the tactical situation, the friendly control measures on their map and on the ground, and their experience to determine range. They may determine range using the unassisted eye, assisted by optics, a map, or one of the other methods of range determination. These methods can be used separately or in combination.

RANGE DETERMINATION METHODS

UNASSISTED METHOD

3-3. The vehicle commander, with practice, can estimate distances out to about 1,000 meters. This is particularly useful in close-in, immediate engagement situations where time is not available for using sights, binoculars, or maps. A technique for accomplishing this is the football field method. The vehicle commander counts 100-meter increments, estimating the number of football fields that could fit between the ASV and the target.

3-4. The vehicle commander must know that light, weather, and terrain conditions can make a target look nearer or farther than it is. Conditions that make a target appear to be nearer are—

- Bright, clear day.
- Sun in front of the target.
- High elevations.
- Large targets.
- Bright colors (white, red, yellow).
- Contrast.
- Targets across ravines, hollows, rivers, and depressions.

Conditions that make a target appear to be farther are—

- Fog, rain, haze, smoke, dusk, and dawn.
- Sun behind the target.
- Low elevations.
- Small targets.

- Dark target colors (brown, black, green).
- Camouflaged targets (paint, netting).

ASSISTED METHOD

3-5. The binoculars and mil relation are used in the assisted method of range determination. To use this method, the vehicle commander must know the width or height of the target. Using the known threat vehicle width or height with the binocular mil scale, the vehicle commander substitutes the mil relation and computes the range.

- When measuring the frontal width, the vehicle commander measures only the vehicle's front slope (from left front corner to right front corner).
- When measuring flank width, the vehicle commander measures the entire vehicle.

Accuracy of this method depends on the target dimensions and the vehicle commander's ability to make precise measurements with the binoculars (see figure 3-1).

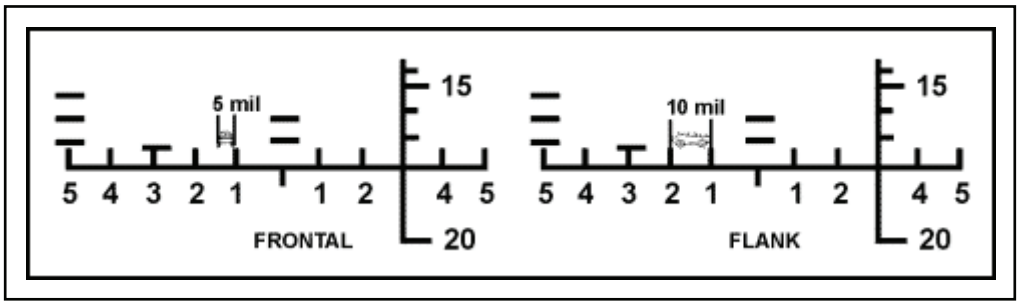

Figure 3-1. Target measurement using binocular reticles

Understanding Mils

3-6. The mil is a unit of angular measurement equal to 1/6400 of a circle. There are 18 mils in one degree. One mil equals the width (or height) of 1 meter at a range of 1,000 meters. This relation is constant as the angle increases from one mil to two mils, and the range increases from 1,000 meters to 2,000 meters. Because the mil relation is constant, other units of measurement (such as yards, feet, or inches) can be substituted to express width or range; however, both width and range must be expressed in the same unit of measurement. For example, if the sides of a one-mil angle are extended to 1,000 yards, the width between the ends of the sides is 1 yard.

3-7. Since the relationship of the target width in mils (m) to the target width (W) in meters is constant at varying distances, accurate range determination is possible. The mil relation holds true whether the W factor is length, width, or height; therefore, the range can be determined if the target dimensions are known.

Determining range

3-8. To determine the range I, the m and W factors must be known. The m comes from reading the target width (height or length) on the mil scale in the binoculars. The W comes from table 3-1 or other vehicle identification aid and is expressed in meters.

3-9. The known target width (W) is then divided by the mil (m) width; this equals the range R factor. Multiply R by 1,000 to determine the target range. For example, a BMP is 6.75 meters long (W). Using binoculars, the vehicle commander determines that a BMP measures 5 mils in length (W/m=R). Substitute the two known values for W and m and round to the nearest tenth (6.75/5=1.35 or 1.4). Since R is expressed in thousands of meters, multiply by 1,000 (1.4 X 1,000 = 1,400 meters, the range to the BMP).

3-10. Table 3-1 shows the results of that computation for threat vehicles at various ranges.

- Determine the width of the target in mils. The range to the target is listed in the column below the mil measurement.
- Make sure to use the correct range, depending on whether the vehicle is viewed from the front or the flank.

Table 3-1. Mil relation for various targets

Group 1 (BMP, Tank, BTR, ZSU, OT, MT-LB, and TAB)									
Target width (mils)	5	4.5	4	3.5	3	2.5	2	1.5	1
Flank 6.75 meters	1,400	1,600	1,800	2,000	2,300	2,800	3,400	4,600	6,900
Front 3.0 meters	600	700	800	900	1,000	1,200	1,600	2,000	3,000
Group 2 (BMD and BRDM)									
Target width (mils)	5	4.5	4	3.5	3	2.5	2	1.5	1
Flank 5.5 meters	1,200	1,300	1,400	1,600	1,800	2,200	2,800	3,800	5,500
Front 2.35 meters	400	500	600	700	800	1,000	1,200	1,600	2,400
Group 3 (HIND-D Helicopter)									
Target width (mils)	22.5	20	17.5	15	12.5	10	7.5	5	2.5
Flank 17.255 meters	800	900	1,000	1,200	1,400	1,800	2,400	3,600	7,000
Target width (mils)	5	4.5	4	3.5	3	2.5	2	1.5	1
Front 6.9 meters	1,400	1,600	1,800	2,000	2,400	2,800	3,600	4,600	6,900

MAPS

3-11. The vehicle commander must have a map to navigate. The map can also be used to determine range. In both offense and defense, the vehicle commander must continuously assess the likely enemy locations, engagement areas, and engagement ranges. This information gives the vehicle commander the capability to determine rapidly the best battle sight setting for the terrain and enemy situation and to adjust the battle sight when the situation changes.

OTHER METHODS

Target Reference Points

3-12. TRPs are used as fire control measures for both direct and indirect fire and entered in the sector sketch to help the vehicle commander determine range and control fires.

Range Cards

3-13. The primary use of the range card is to assist the ASV team in engaging targets during limited visibility. The vehicle commander may also use the range card to determine range, since ranging data is recorded on the range card. (For more information on range cards, see paragraph 5-53.)

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Chapter 4

Fire Commands and Engagement Techniques

Fire commands are the means by which fire control is exercised within the MP platoon. Fire commands are the instructions issued to the MP gunners that enable them to properly engage the desired targets. A good fire command is as brief as the situation will dictate. It contains all necessary elements given in proper sequence. This section discusses fire commands (including terminology, definitions, and the various formats), ASV team duties in response to fire commands, and direct-fire adjustment techniques.

FIRE COMMAND

4-1. Fire commands are the language of gunnery. Leaders use fire commands to deliver effective fire on a target quickly and without confusion. They also sustain and control the engagement until the crew destroys the target or receives the command to terminate fire. The sequence and elements of a fire command are alert, weapon and ammunition, description, direction, range, execution, and termination.

ALERT

4-2. In this first element, the vehicle commander alerts the crew to an immediate engagement and tells them who must conduct it. The vehicle commander can alert the team members by name or position, by some type of visual or sound signal, by personal contact, or by any other practical way. The vehicle commander alerts the ASV team by announcing "Gunner."

WEAPON AND AMMUNITION

4-3. In this second element, the vehicle commander tells the crew what weapon or ammunition to use. (See table 4-1.)

Table 4-1. Weapons and ammunition

Weapons and Ammunition	*Announced as (term)—*
M2/M48	Machine gun
MK-19	Grenade

DESCRIPTION

4-4. In this third element, the vehicle commander identifies the target. To properly apply fire, the ASV team must know the type of target they are to engage. The target description is used to create a picture of the target in the minds of the ASV team. The vehicle commander should use the briefest possible term to clearly describe the target (see table 4-2). For example, the vehicle commander—

- Uses the term "PC" to refer to most lightly armored targets—such as self-propelled artillery, self-propelled antiaircraft systems, command-and-control vehicles, and self-propelled ATGMs (antitank guided missile vehicle).
- Can identify combination targets by combining terms—such as truck-mounted ATGM systems.
- Can add the term "Moving" as part of the descriptive element.

- For multiple targets, tells the crew which to engage first. If there are several similar targets, this element also tells the gunner which target to engage first ("Two trucks–left truck").

Table 4-2. Target description

Type of Target	*Announced as (term)—*
Tank or tank-like target	"Tank"
Infantry fighting vehicle or armored personnel carrier	"PC"
Unarmored vehicle	"Truck"
Helicopter	"Chopper"
Fixed-wing aircraft	"Plane," "jet," or "UAV" (ADA)
Personnel	"Troops"
Machine gun	Machine gun"
Antitank gun or missile	"Antitank"
Any other target	Briefest term possible

DIRECTION

4-5. In this fourth element, the vehicle commander guides the gunner to lay the weapon for direction or elevation. The vehicle commander uses directional terms to guide the gunner's aim to the target area.

- Clock Method. The vehicle commander announces the target direction using the hour positions from the face of a clock with "12 o'clock" being the direction of the front of the vehicle.
- Traverse. The vehicle commander uses this term when targets are located outside of the gunner's field of vision (FOV). In this case, the vehicle commander commands, "Traverse right"" (or "Traverse left"). The gunner then traverses rapidly in the direction commanded. As the gunner's aim nears the target, the vehicle commander commands "Steady", and the gunner slows the traverse. As soon as the gunner lays on the target, the vehicle commander announces "On." By now, the target should fall within the gunner's FOV, so the gunner stops traversing. If the target is still outside of the FOV, the gunner searches the target area until identifying the target or until the vehicle commander corrects the direction.
- Shift. The vehicle commander uses this term when seeing two or more targets at the same time. The vehicle commander commands "Shift left" (or "Shift right") then "PC." The gunner shifts quickly to the target given in this last command and engages.
- Reference Point and Deflection. The gunner must be able to recognize the reference point easily. So, the vehicle commander uses binoculars to measure the deflection from the reference point to the target, then announces how much and toward which direction the gunner must shift. For example, the vehicle commander might command "Reference point–bridge–right three zero." The gunner lays the sight reticle on the reference point, estimates and traverses 30 mils to the right, then tries to identify the target. The vehicle commander may also give the direction to the target using successive reference points; for example, "Reference point–red roof house–left to haystack–left to barn."
- Range Card Data. During limited visibility conditions, the vehicle commander might not be able to see the target. When this happens, the vehicle commander gets the deflection, elevation, and range from the range card and commands "Deflection." The gunner lays the turret for direction and repeats the deflection reading back to the vehicle commander, who then reads the elevation from the range card and commands "Elevation." The gunner lays the weapon for elevation and repeats the elevation reading back to the vehicle commander. The vehicle commander gets the range setting from the range card and commands "Range." The gunner indexes the range and repeats it back to the vehicle commander.

RANGE

4-6. In the fifth element, the vehicle commander tells the gunner what range to select. The vehicle commander announces range in 100-meter increments. He rounds odd numbers down to the next lower hundred-meter range to simplify identification of short rounds. Table 4-3 shows examples of announced ranges. As long as the crew understands the terminology, the vehicle commander may use any of the examples shown in table 4-3.

Table 4-3. Range to target

Range to Target	*Announced as (term)—*
800 meters	"Eight hundred" or "Eight"
1,200 meters	"One two hundred," "Twelve," or "Twelve hundred"
3,040 meters	"Three thousand" or "Thirty"

EXECUTION

4-7. When the crew has responded to the first five elements and the gunner is ready to engage the target, the vehicle commander reconfirms that the target is hostile, and then tells the gunner to execute. The vehicle commander uses one of two terms to command the gunner to execute the fire command:

- "Fire." If immediate fire is required, the command "Fire" tells the gunner to fire the weapon as soon as the gunner is ready.
- "At my command." The vehicle commander uses this command to delay firing. Specifically, "At my command" is given when the vehicle commander wants the gunner to kill a target at a specific location, or when the platoon leader wants more than one gunner to shoot at the same time. For example, the vehicle commander might use this command when the commander's METT-TC determines that killing a BMP on a bridge would halt an enemy column. The vehicle commander might also use it when the platoon leader would like to surprise the enemy with cross, depth, or frontal fire.

Note. During Operation Iraqi Freedom most engagements were initiated by the gunner and thus the command "Fire" was not required. The gunner would automatically return fire. In the event the target was identified by a team leader, the gunner would move onto target and engage unless told to hold.

TERMINATION

4-8. In this element, the vehicle commander tells the gunner to stop firing or, in a multiple engagement, to shift fires to another target. To terminate an engagement, the vehicle commander commands "Cease fire." This stops the gunner from firing.

FIRE COMMAND TERMS

RESPONSE TERMS

4-9. The gunner can respond to the fire command in various ways:

- "Identified." The gunner says this to confirm that the gunner has located the target(s). Saying "Identified" by itself tells the vehicle commander that the gunner has confirmed the target as stated in the description. If appropriate, the gunner adds, "Friendly," "Neutral," or "Doubtful."

- "Cannot identify." The gunner uses this term to inform the vehicle commander that the gunner cannot find the target. The vehicle commander must either re-lay the weapon or engage the target.
- "Cannot engage." The gunner uses this term to inform the vehicle commander that the gunner can identify the target but, for some reason, cannot engage it.
- "Up" The gunner uses this term to inform the commander that the gunner is ready to engage the target.
- "On the way." The gunner uses this term to inform all crewmembers that the weapon has been fired, and alerts crewmembers to observe the round.
- "Target destroyed." The gunner uses this term to inform the commander that the target has been destroyed. The commander confirms this.

REPEAT TERMS

4-10. When any crewmember misses part of the fire command, crewmembers name the element that was missed. For example, if the crewmember says "Ammo," the vehicle commander repeats only the ammunition or weapon element.

CORRECTION TERMS

4-11. To correct an error in a fire command, the vehicle commander says "Correction" and corrects only the element in error (for example, "Gunner–HE–truck–one six hundred." "Correction–one eight hundred–fire.")

INITIAL FIRE COMMAND

4-12. All engagements begin with an initial fire command. When the vehicle commander decides to engage a target that is not obvious to the gunner, the vehicle commander must provide the gunner with the information needed to engage the target effectively. For a machine gun fire command, the vehicle commander must alert the ASV team and give the target description, direction, and execution. (See table 4-4.)

Note. Fire commands are the same during defensive and offensive operations, however during defensive operations, gunners will automatically identify and return incoming fire.

Table 4-4. Initial fire command machine gun

Element	*Gunner*	*Commander*
Alert		"Gunner–
Weapon		machine gun–
Description		troops–
Direction		1 o'clock"
	"Identified"	
Execution		"Fire"
	"On the way"	
	"Target destroyed"	
Termination		"Cease fire"

4-13. The UGWS fire command differs from a machine gun fire command. Once the target is identified, the vehicle commander aligns the vehicle for direction and announces the fire command. (See table 4-5.)

Table 4-5. Initial fire command UGWS

Element	*Gunner*	*Commander*
Alert		"Gunner–
Weapon		MK-19–
Description		APC–
Direction		2 o'clock–reference: hill seven six two–from hill–left two hundred"
	"Identified"	
Execution		"Fire"
	"On the way"	
	"Target destroyed"	
Termination		"Cease fire"

4-14. If an engagement is fired from a short halt, the vehicle commander commands "Driver–stop" before giving the execution element. When the engagement is completed, the vehicle commander commands "Driver–move out," if necessary. Whenever hull-defilade positions are available, the vehicle commander commands "Driver–seek hull down" and initiates the fire command. The vehicle commander must then direct the driver into position while ensuring the gun has clearance. Once the vehicle is in position and the gunner has identified the target, the vehicle commander issues the execution command.

4-15. When the vehicle is in a defensive position with complete defilade, the vehicle commander initiates the fire command by ordering "Driver–move out" to unmask the weapon. Upon destruction of the target, the vehicle commander terminates the engagement by commanding "Cease fire–driver–move back." The driver moves back to the defilade position.

MULTIPLE TARGET FIRE COMMAND

4-16. In combat, ASV teams may be required to engage multiple arrays of targets. These engagements require speed and accuracy to suppress or destroy all targets. When engaging multiple targets, some of the elements of the fire command for the first target will not have to be repeated for the second target. Although each target engaged requires essential parts of the fire command, depending on the type of fire command used (machine gun, UGWS), the fire commands will become shorter as the battle progresses. See the following examples:

- The vehicle commander acquires two trucks to the front. While laying the vehicle for direction, the vehicle commander issues a machine gun fire command. To complete the engagement, only the description and execution elements are needed for the second target (table 4-6).
- The vehicle commander acquires one BTR and one BMP to the front and issues a UGWS fire command (table 4-7).

Table 4-6. Multiple targets machine gun

Element	*Gunner*	*Commander*
Alert		"Gunner–
Weapon		Machine gun–
Description		Two trucks–left truck
Direction		11 o'clock"
	"Identified"	
Execution		"Fire"
	"On the way"	
	"Target destroyed"	
Description/Execution		"Target–right truck–fire–
	"Identified"	
	"On the way"	
	"Target destroyed"	
Termination		"Cease fire"

Table 4-7. Multiple targets UGWS

Element	*Gunner*	*Commander*
Alert		"Gunner–
Weapon		MK-19–
Description		Two APCs–right APC
Direction		front"
	"Identified"	
Execution		"Fire"
	"On the way"	
		"Target–left APC–fire"
	"Identified"	
Execution	"On the way"	
Termination		"Cease fire"

4-17. When a range card has been prepared, the vehicle commander can place fire on targets the gunner cannot see using only the alert, description, and execution elements. The vehicle commander describes the target by its number, saying the word "Target" before the number of the target ("Gunner–target number three–at my command–fire").

SUBSEQUENT FIRE COMMANDS

4-18. Subsequent fire commands are used to make adjustments in direction and elevation, change rates of fire after an engagement is in progress, interrupt fires, or terminate the alert.

DIRECT FIRE OBSERVATIONS AND ADJUSTMENTS

4-19. If the gunner fails to engage a target properly, the vehicle commander must promptly correct the gunner by announcing or signaling the desired changes (using subsequent fire commands). When these changes are given, the gunner makes the corrections and resumes firing without further command. When

the vehicle commander cannot observe the target, the gunner will engage the target without command. Only the elements necessary to continue the engagement are announced.

4-20. Alert. The vehicle commander announces the fire adjustment as the alert. This notifies the gunner that a subsequent fire command follows. Direction adjustments are based on the vehicle commander's observation. If the round went left of the target, the correction would be to the right. The vehicle commander also bases the range correction on observation. If the round went over the target, the vehicle commander subtracts range. If the round landed short of the target, the vehicle commander adds range. If determining that the necessary correction is less than 200 meters, the vehicle commander may use the target form method. To execute a range correction, the gunner must index a different range or change range lines.

4-21. Execution. The vehicle commander completes the subsequent fire command with the execution command "Fire." Changes in the rate of fire are given orally. To interrupt firing, the vehicle commander announces "Cease fire" or signals to cease-fire. The ASV team remains on alert and resumes firing when given the command "Fire."

DOUBTFUL ELEMENTS AND CORRECTIONS

4-22. When in doubt about any element of the fire command, the gunner replies, "Say again–target (or element in doubt)." The vehicle commander then announces, "The command was– (repeats the element in question)" and continues with the fire command. When making an error in the initial fire command, the vehicle commander corrects it by announcing "Correction" then giving the corrected element ("Gunner–troops–2 o'clock; correction–truck–2 o'clock–at my command"). When making an error in the subsequent fire command, the vehicle commander may correct it by announcing "Correction" then repeating the entire subsequent fire command ("Left three degrees–drop one; correction–left five degrees–drop one zero ").

ASV TEAM DUTIES IN RESPONSE TO THE FIRE COMMAND

4-23. In response to each element of a fire command, the vehicle commander, the gunner, and the driver have specific ASV team duties to perform. ASV team duties common to ASV teams are shown in table 4-8. Even though commands for the driver are not essential elements of the fire command, the driver's actions are very important during an engagement. After giving the fire command, the vehicle commander's primary focus must be on retaining control and observing the sector. The gunner should take over the engagement, destroy or suppress the target, and report when completing the engagement. The vehicle commander assists only as necessary, giving subsequent commands to shift targets, organizing other targets, and planning the vehicle's next activity. If an engagement is fired while on the move, the driver attempts to provide the gunner with a stable platform. When the situation and terrain permit, the front of the vehicle should be oriented toward the target.

Table 4-8. ASV team duties

Element	*Commander*	*Gunner*	*Driver*
Alert	Alerts the gunner and driver to the target. (Alert may be given by any team member.)	Starts searching for the target as the driver moves the vehicle.	If moving, is prepared to stop, looks for a hasty defensive position, and gives the gunner as stable a platform as possible
Description	Informs the gunner of the type of target.	Readies the weapon. Observes through sights and tries to identify the target.	Orients the front of the vehicle toward the target. (Helps to identify targets if stationary.)
Direction	Informs the gunner of the target direction. If needed, talks gunner into the target area.	Traverses turret in search of the target. On identifying the target, announces "Identified."	
	Commands "Driver–stop."	Command to stop may also be given by the gunner.	Stops on command.
Execution	Commands "Fire." Assumes the position to observe rounds and prepares to give subsequent fire commands or adjustments.	Uses correct sight picture and fires. Announces "On the way."	Attempts to observe rounds.
Termination	Ends engagement. Announces "Cease fire."	Ceases firing	
	Commands "Driver–move out."		Resumes movement

DIRECT FIRE ADJUSTMENT

4-24. The ASV team's goal is to hit a target and destroy it as fast as possible and then move out. If the first burst of rounds is not on target, an observation and an adjustment is made to hit the target. There are many techniques of direct fire adjustment. A few of them are burst on target (BOT), tracer on target (TOT), and other adjustment techniques.

Burst on Target

4-25. BOT is the fastest method of adjustment. BOT is moving the burst of the rounds impacting on the ground onto the target. It is most effective when engaging from a stationary firing vehicle or a firing vehicle that is moving toward the target.

4-26. After the gunner has made the initial lay on the target and fired, to apply BOT, the gunner must—

- Announce "On the way" and fire a burst.
- Concentrate on the target, noting the aiming point of the sight and where the tracer rounds appear as they pass over, fall short of, or strike the target.
- Announce the observation and BOT.
- Immediately adjust the aiming point of the sight, based on the impact of the initial burst, to bring the next burst on target.

4-27. The gunner continues to fire, adjusting each burst onto the center of mass until the target is destroyed. The vehicle commander orders "Cease fire" or the vehicle commander takes over adjustment of fire. When the gunner applies BOT, the vehicle commander acts as an observer, observing the first burst fired and subsequent bursts for deflection and range.

4-28. Accuracy of the BOT method of adjustment depends on the ability of the gunner to maintain correct sight pictures and to make precise observations. To engage moving targets accurately using BOT, the gunner must continuously track before, during, and after the engagement.

Tracer on Target

4-29. As the name implies, the gunner adjusts the strike of the rounds, based on observed tracers, onto the target area (machinegun only).

OTHER ADJUSTMENTS

4-30. Target form is the simplest method of adjustment. One form is the visible height or width of the target. Since the visual size in width and height differ, the visual height is used for adjusting in elevation and the visual width is used in azimuth adjustments. Target form can be used with all weapons. The word "form" may be added after the announced change or the change may stand-alone if target form is the standard adjustment technique in the unit's SOP. Form changes are always given in full or half-form increments.

SECTORS OF FIRE

4-31. A sector of fire is a piece of the battlefield for which a gunner is responsible. A sector of fire is assigned to ensure that weapon systems cover all possible enemy avenues of approach. Vehicle commanders should strive to overlap sectors to provide the best use of overlapping fire and to cover areas that cannot be engaged by a single weapon system. The vehicle commander assigns left and right limits of a primary sector of fire (including principal direction of fire [PDF] and final protective line [FPL] of fire using prominent terrain features or easily recognizable objects (such as rocks, telephone poles, fences, or stakes). The vehicle commander may also assign the gunner more than one sector of fire, designating each sector as primary, alternate, or supplementary.

MAXIMUM ENGAGEMENT LINE (MEL)

4-32. The depth of the sector of fire is normally limited to the maximum engagement range of the vehicle's weapon system. However, it can be less if there are any natural or man-made objects or features that prevent the gunner from engaging targets at maximum engagement range (for example, hills, ridgelines, trees, urban areas). MELs are—

- Shown in the sketch portion of the range card by a heavily drawn line for each weapon system.
- Not drawn through dead space.
- Drawn behind dead space when the terrain beyond the dead space is of a higher elevation. This represents terrain that can be covered by direct-fire weapon systems.
- Drawn along the side and in front of dead space extending out to the farthest MEL. This represents terrain that cannot be covered by direct-fire weapon systems beyond the nearest point of dead space, in relation to the position for which the range card is drawn.

Note. To assist in determining the distance of each MEL, the gunner or vehicle commander should use a map to make sure the MELs are shown correctly on the sketch portion of the range card.

DEAD SPACE

4-33. Dead space is any natural or man-made terrain feature (such as hills, draws, buildings, or depressions) that cannot be observed or covered by direct-fire systems within the sector of fire. All dead space within the gunner's sector of fire must be determined to allow the vehicle commander and squad leader to plan other weapon systems or other types of fire (M203 or artillery) to cover the area.

4-34. Dead space—

- Is indicated in the sketch portion of the range card by an irregular circle with a series of diagonal lines.
- Within the MELs for the weapon system is circled with diagonal lines drawn in the circle.
- That extends out to or past the farthest MEL is drawn as an encased area with diagonal lines.

TARGET REFERENCE POINTS

4-35. Vehicle commanders choose natural or man-made terrain features to be designated as RPs to assist the gunner in target acquisition and range determination during limited visibility. There will also be predesignated TRPs.

4-36. A TRP is usually designated by the commander using the standard target symbol and target. If TRPs are located within the sector of fire, the vehicle commander points them out and tells the gunner their designated reference numbers.

4-37. The gunner shows TRPs by a cross with an abbreviated designation reference number in the upper right quadrant of the cross (in the sketch portion of the range card). The reference numbers are listed in the description column of the data portion of the range card. (See chapter 5 for range card information.)

4-38. The vehicle commander should assign additional RPs for the commander's vehicle, to assist in the target acquisition and the range determination process. RPs are shown as a number within a circle. Normally, a gunner has at least one TRP but should not have more than four. The range card should show only pertinent data for RPs or TRPs.

4-39. The weapons RP is an easily recognizable terrain feature on the map. The weapon's RP is used to assist the vehicle commander in plotting the vehicle's position, and to assist replacement personnel and units in finding the vehicle's position. Its location is given as a six-digit grid.

Chapter 5
Weapon Employment Techniques

The ASV possesses tremendous firepower that greatly increases combat power and survivability if properly employed. The UGWS combines the outstanding support capabilities of the M2/M48 HB .50 caliber machine gun and the MK-19 40-millimeter automatic grenade launcher into a single, nonstabilized turret operated by one person. The safe and effective employment of the ASV's weapons station depends on the sound understanding by the ASV team of its capabilities, techniques of employment, and fire control.

WEAPONS

5-1. To properly engage a target, the ASV team must fully understand the weapon's effects of the UGWS. Gunners must select the weapon to be fired and whether or not fires must be massed to gain proper effect. The UGWS of the ASV is not stabilized, so firing on the move is minimally effective at best. (Firing on the move may at best provide area suppression or at worst, waste ammunition.) Destroying point targets will require firing from the halt. Appendix E contains example firing tables that may be modified based on the range configuration and requirements for the unit.

UP-GUN WEAPONS STATION

5-2. The UGWS is composed of the weapons, sight, and fire control. The M36 sight provides the gunner with a 7-power sight with a reticle calibrated for both weapons to include right hand drift of the 40-millimeter grenade downrange. The sight is laser protected but there is no laser range finder in this turret. A properly bore sighted UGWS in the hands of a trained gunner can provide first round hits on targets within maximum effective range. However, the sight does not take into account dynamic cant of the vehicle. That is the off level attitude of the vehicle that may arise from being on a front, rear, or side slope. This is when the art of gunnery is required to manipulate the weapons on target using intuitive adjustment of the reticle in relation to the target. Once the weapon has been bore sighted and verified, gunners should not change the reticle controls unless the bore sight is lost. If the gunner changes the reticle controls, the gunner loses the bore sight and subsequently the first BOT.

M2/M48 HB .50 CALIBER MACHINE GUN

5-3. The ASV normally fires armor piercing ammunition at a maximum effective range of 1,830 meters and a maximum range of 6,800 meters. The M2/M48 is not effective against tanks or the frontal armor of the BMP infantry combat vehicle. The M2/M48 is the weapon of choice for immediate suppression of ATGM launchers because of its fast time of flight and high rate of fire when compared to the MK-19. The M2/M48 can also be used to range targets for the MK-19 using the BOT method. This is extremely effective in marking and suppressing the target and passing the correct range to the rest of the section for killing the target with their MK-19s.

MK-19 AUTOMATIC GRENADE LAUNCHER

5-4. The MK-19 is an area weapon principally designed to destroy infantry, materiel, and lightly armored vehicles. The ASV mounted MK-19 normally fires the high explosive/dual purpose (HE/DP) ammunition which provides excellent fragmentation and blast effect against infantry (up to 15 meter effective casualty radius (ECR), while possessing a shaped charge capable of penetrating 2 inches of rolled, hardened armor. The MK-19 is an automatic grenade launcher, and therefore, has a relatively high angle of fire when compared to the M2/M48. The ballistic qualities of the MK-19 can be characterized as relatively flat out to 1,000 meters with plunging characteristics past 1,000 meters to its maximum range of 2,200 meters. (See table 5-1.)

Table 5-1. MK-19 time of flight table

Range	*HE/DP*	*HE*	*TP*
500 meters	500 meters	2.43 seconds	2.38 seconds
1,000 meters	1,000 meters	5.74 seconds	5.50 seconds
1,500 meters	1,500 meters	10.53 seconds	9.77 seconds
2,000 meters	2,000 meters	17.44 seconds	16.82 seconds

5-5. The 40-millimeter HE/DP round can penetrate the armor of most infantry fighting vehicles. Despite the degree of adjustment at longer ranges and long time of flight, the MK-19 is the ASV's weapon of choice for the frontal engagement of BTR-type and BMP-type armored vehicles at ranges up to 1,000 meters. The MK-19, fired off an ASV, can be massed to engage tanks with high angle plunging fires at ranges exceeding 1,000 meters in order to achieve penetrations of the turret or engine compartment roof. Under extreme circumstances, the MK-19 may be effective against the rear armor of older tanks. Under no circumstances should the ASV be employed as an antitank weapon (except in its own defense).

Note. Most units operating in Iraq indicated that a full "belt" of 400-mm HE/DP was too heavy. Incorporating 75 rounds worked more smoothly for the overall operation of the weapon system.

AREA TARGET ENGAGEMENTS

5-6. The pattern of fire used to engage an area target should be dictated by the size and shape of the target and the engagement technique to be used. Engage area targets with a killing burst (the initial burst on target, designed to kill as many as possible before the enemy goes to the ground). Sweep through the forward edge of the target area with a killing burst, then switch to suppressive fires using intermittent bursts (20- to 30-round bursts for light machine guns, 5- to 7-round bursts for heavy machine guns, and 3- to 5-round bursts for MK-19) to suppress the target.

POINT TARGET ENGAGEMENTS

5-7. A point target is a target of such small dimension that it requires the accurate placement of ordnance in order to neutralize or destroy it. It is more difficult to engage point targets on the move; therefore, when the tactical situation will allow, stationary or moving point targets should be engaged from a short halt.

5-8. Targets such as jeeps, trucks, RPG (rocket-propelled grenade) teams, and ATGM teams may be engaged/suppressed from either a moving or a stationary vehicle. For personnel consolidated in a small area (1 to 10 meters), use the point target engagement technique. To engage a point target, the gunner makes a precise lay on target, and fires a killing burst (20- to 30-round bursts for light machine guns, 5- to 7-round bursts for heavy machine guns, and 3- to 5-round bursts for MK-19s). A killing burst kills as many

enemy targets as possible with the initial burst of fire. The gunner fires additional bursts until the target is destroyed.

5-9. If the initial killing burst is short or long of the target, the gunner adjusts by walking the tracers onto the target. This is called the TOT method of adjustment. Once on target, the gunner continues to fire killing bursts until the target is destroyed or until the gunner is told to cease-fire.

SUPPRESSIVE FIRE ENGAGEMENTS

5-10. Suppressive fire is direct fire placed on known or likely enemy locations to degrade one or more of the enemy's basic combat functions—moving, shooting, observing, or communicating. Suppressive fire is most effective when fired at a sustained rate of 20- to 30-round bursts (4 to 6 tracers) for light machine guns, 5- to 7-round bursts for heavy machine guns, and 3- to 5-round bursts for MK-19s every 10 seconds. No specific pattern or engagement technique is prescribed; however, each burst should strike within 12 meters of the suspected target area. In dense terrain or areas of high enemy troop activity, over watching vehicles can cover maneuvering vehicles with suppressive fire.

RECONNAISSANCE BY FIRE

5-11. Use machine guns in reconnaissance by fire to cause a hidden enemy to react. Fire a single burst (20- to 30-round bursts for light machine guns, 5- to 7-round bursts for heavy machine guns, and 3- to 5-round bursts for MK-19s) while constantly observing for enemy movement, return fire, or the flash of your rounds striking metal. Reconnaissance by fire is the least desired method of acquiring targets. It is used when other means of enemy detection have been unsuccessful or are not available. It is best employed with a squad of ASV/HMMWV mix. The HMMWV can fire on a suspected enemy position or suspicious area to cause the enemy to react and compromise their position. The ASV can then engage and destroy the enemy from a different location.

AIRCRAFT ENGAGEMENT TECHNIQUES

5-12. The M2/M48 can be used to engage low flying aircraft and helicopters, particularly when several vehicles are firing at the aircraft at the same time. It is difficult to track and hit aerial targets; therefore, a volume of fire should be established in front of the aircraft, forcing the aircraft to fly through the rounds.

ENGAGING HIGH-PERFORMANCE AIRCRAFT

5-13. A general rule of thumb is not to engage high-performance aircraft due to—

- Their great speed.
- Limited amounts of machine gun ammunition available to the gunner.
- Brief exposure time of the aircraft within effective machine gun range.

5-14. The decision to engage should be made if the aircraft is a direct threat to the ASV team or unit (actually making an attack run) or mission guidance includes active engagements of high-performance aircraft.

5-15. Criteria for engaging high-performance aircraft also apply to helicopters; however, helicopters exposed on the ground and slow-moving or hovering helicopters are targets of opportunity that should be engaged if within effective machine gun range.

5-16. Engage aircraft using a continuous burst. The aiming points for aircraft engagement are shown in table 5-2.

Table 5-2. Methods of engagement

Type of Aircraft	*Aiming Point*
Jet aircraft, flank target	Football field to front
Jet aircraft, frontal target	Slightly above fuselage
Helicopter, flank target	Half of a football field to front
Helicopter, frontal target	Slightly above fuselage

AIRBORNE AND HELIBORNE INFANTRY

5-17. Airborne troops are difficult to engage because of their rapid descent (approximately 10 feet per second). When using machine guns, lead the descending troops by two body lengths below their feet. Infantry rappelling from a hovering helicopter should be destroyed by engaging the helicopter first, using volume fire.

Note. The Geneva Convention of 1949 prohibits engaging personnel parachuting from a disabled aircraft.

SPECIAL USE OF MACHINE GUNS

5-18. Machine guns are effective weapons that also serve the ASV team in different ways. ASV teams are limited only by their ingenuity in using these weapons. Some special uses are—

- Ranging. Machine guns can be used as ranging guns out to their maximum effective range.
- Designating targets. Machine gun fire can be used effectively by squad leaders to designate targets for other fire support. Since this technique reveals the gunner's position, it must be used with discretion.
- Firing through cover. Mounted machine guns can be used effectively to penetrate most cover (such as small trees, hasty barricades, or lightly constructed buildings) used by dismounted personnel.
- Firing for incendiary effect. Machine gun tracers or incendiary ammunition can be used to set fire to any readily combustible material such as dry grass, grain, dried brush, or wood. Fire will deny a particular area to enemy use; smoke from a burning field can be used to screen movement.
- Firing for ricochet effect. Use ricochet fire when fighting in built-up areas. Machine gun fire can be directed around corners by bouncing rounds off buildings, walls, or streets. Although not particularly accurate, it can suppress sniper fire and produce significant psychological effects.

FIRE CONTROL AND DISTRIBUTION

5-19. The MP unit will probably face a numerically superior force on the battlefield. To ensure the defeat of the enemy, the efficient use of available firepower is a must. Training to use firepower efficiently can be accomplished through ASV team drills that emphasize proper use of fire commands and techniques of fire.

PRINCIPLES

5-20. Fire control and distribution is achieved through the proper use of boundaries, fire plans, pyrotechnics, and weapons-ready posture. In movement to contact, information about the enemy is scarce; therefore, proper use of fire control and distribution becomes increasingly important.

5-21. Survival of the MP unit often depends on how quickly and effectively fires can be distributed on the enemy. If fires are not controlled, ammunition will be wasted and targets cannot be effectively engaged. When fighting in a surprise meeting engagement, there may not be time to give subordinates detailed fire missions. Reliable standing operating procedures (SOPs) must be established for distributing fires. These procedures and the initiative of the ASV leader must be relied on during the first minutes of contact. Then, when time permits, fires can be redistributed if needed.

5-22. Accuracy is important in combat. Firing first with accurate fire is the most important. The side firing first greatly increases its chances of winning the engagement. If the initial burst misses, the first to fire can probably shoot again and hit the target before receiving return fire. If surprised by the enemy and unable to fire first, return fire as quickly as possible. Fire placed in the enemy's area will lessen the enemy's effectiveness and give friendly weapons time to adjust. Continue to engage the enemy as fast as possible.

STANDING OPERATING PROCEDURES

5-23. A well-rehearsed platoon SOP ensures quick reaction times. Area coverage responsibilities and weapons-ready postures for different situations (such as road marches, halts, and various battle drills) should be in the SOP. Battalion or company SOPs should prescribe the combat load of ammunition, by type and amount. The squad leader should prescribe the weapons-ready posture that makes the best use of available firepower in the present situation.

5-24. Situations the squad leader should plan for when forming the squad SOPs are—

- React to contact.
- React to ambush.
- React to air attack.
- React to indirect fire.
- React to mines/IEDs.
- Set a deliberate ambush.
- Set a hasty ambush.

5-25. The squad should be prepared to engage personnel carriers and suppress ATGMs with machine guns and to engage BMP/BRDMs with UGWS. The UGWS is fired from covered and concealed positions. The weapons-ready posture may have to be adjusted or ammunition redistributed, after an engagement to make sure that vehicles have the ammunition needed (consolidating and reorganizing).

Fire Planning Measures

5-26. Fire control and distribution measures must be simple and clear. Their use must be routine, with no need for detailed or lengthy instruction. A description of some simple measures that can be used to distribute and control fires effectively follows.

Sector of Fire and Engagement Area

5-27. Each ASV team or squad is assigned a specific area (sector of fire) to cover. The sector of fire must be covered by observation and fire. A sector of fire is designated by easily recognizable terrain features (such as roads, streams, hills, or ridgelines) that outline the sector. ASV gunners must maintain situational understanding at all times when engaging targets. Rounds fired over the intended target may end up in populated areas or in another friendly unit's AO.

5-28. Each sector of fire can extend from a firing position to the maximum engagement range of the weapons on the vehicle, or it can be an enclosed area away from the firing position (an engagement area). If a weapon is assigned an enclosed sector (engagement area), the terrain between the sector of fire and the firing position must be covered by other weapons.

5-29. In most situations, the terrain and the number and type of weapons available to cover an area will dictate how sectors of fire are assigned. Sectors should be assigned so an area is completely covered with the appropriate type of fire and mutual support is established among the vehicles in the area. To ensure mutual support, each vehicle is assigned a primary sector of fire and a secondary sector of fire corresponding to another vehicle's primary sector of fire.

5-30. Fire is shifted to the secondary sector, on order, when there are no targets in the primary sector or to cover another vehicle (for example, when a vehicle is forced to move to an alternate position or is out of action to reload its weapons).

5-31. If a mounted avenue of approach is narrow, or if there is a need to concentrate the fires of an entire squad in a critical area (such as a choke point), overlapping sectors of fire can be assigned. Because this increases the problem of control and the probability of target overkill, additional control measures (such as engagement priorities, fire patterns, or TRPs) are needed. Vehicle commanders must select positions that allow them to observe and coordinate fires.

Target Reference Points

5-32. A TRP is an easily identifiable point on the ground—natural or man-made. It is used to designate targets of opportunity, shift fire, or assign sectors of fire.

5-33. In the defense, TRPs are assigned for vehicles along avenues of mounted approach. In the offense, TRPs are assigned on likely enemy locations or on prominent terrain features. To avoid confusion, the number of TRPs should be limited to the number required to distribute and control fire.

5-34. When using a TRP to hand off targets, compass directions—north, east, south, west—are used rather than right or left because each vehicle may be viewing the TRP from a different direction. TRPs are indirect-fire targets that may also help control direct fires. The fire support team (FIST) will assign each TRP a target identification number. The target identification number consists of two letters and four numbers (for example, AB5010). These identification numbers are recorded on range cards in the data squad for easy reference and control. To simplify fire commands, TRPs may be referred to by the last three digits (for example, TRP AB5010 may be referred to as TRP 010).

Phase Lines

5-35. A phase line is a simple and effective linear control measure normally used to control movement; it can also be used to control and distribute the fire of several widely separated vehicles. The squad leader uses phase lines to indicate to the ASV teams when to fire and when to displace to an alternate position. Any prominent (natural or man-made) linear terrain feature—ridgeline, river or stream, road, or railroad track-can be used as a phase line.

5-36. In either offensive or defensive operations, phase lines can be used to start or stop firing simultaneously, shift fire to another sector, or indicate when vehicles are to move to alternate or supplementary positions.

Engagement Priorities

5-37. Targets that present the greatest threat, and the ones that could break the momentum of an attack if destroyed, (such as command vehicles, mine-clearing vehicles, and bridging vehicles) should be engaged first. Usually, targets seen in formations on the battlefield will be of various types (such as BMP/BRDMs, personnel carriers, and air defense vehicles). Engagement priorities are used when no sectors of fire have been assigned and when overlapping sectors of fire have been designated.

Fire Patterns

5-38. There are three basic fire patterns that can be used to distribute the squad's fire when multiple targets appear and no other measures have been assigned—frontal fire, cross fire, and depth fire.

Frontal Fire

5-39. Frontal fire is used when targets are positioned in front of the vehicles in a lateral configuration. The squad leader fires first to delineate sectors of fire. The left flank vehicle engages the left-most target; the right flank vehicle engages the right-most target. As targets are destroyed, friendly fires are shifted toward the center of the enemy formation.

Cross Fire

5-40. Cross fire is used when targets are positioned laterally and obstructions prevent vehicles from firing to the front. The squad leader fires first to delineate sectors of fire. The left wing vehicle engages the right-most target; the right wing vehicle engages the left-most target. As targets are destroyed, vehicles automatically shift their fires toward the center of the enemy formation.

Depth fire

5-41. Depth fire is used when targets are in a column configuration. The squad leader fires first to delineate sectors of fire. The left wing vehicle engages the target farthest to the rear; the right wing vehicle engages the closest target. As targets are destroyed, vehicles shift fires to the center of the enemy formation.

SQUAD FIRE CONTROL

5-42. While mounted, one of the following three methods of fire control may be used: simultaneous fire, observed fire, or alternating fire.

Simultaneous Fire

5-43. Simultaneous fire is used when all vehicles of a squad are firing into their assigned sectors at the same time. This technique is used when moving unprotected or when surprised by many enemy vehicles, requiring immediate massed fires.

Observed Fire

5-44. In observed fire, the firing vehicle of a squad engages targets while the nonfiring vehicle observes the effects of the fire and helps to spot and call fire corrections. The nonfiring vehicle is also responsible for local security while the firing vehicle concentrates on the engagement area. If a weapon malfunctions or ammunition is low, the nonfiring vehicle immediately assumes firing duties. This technique is also used when the firing vehicle has a target in its sector and the other vehicle does not have a target in its sector. This technique is normally used when vehicles are in protected defensive positions and firing at or near maximum range of their weapon systems.

Alternating Fire

5-45. Alternating fires allow one vehicle to shift firing positions while the other engages targets. This method provides constant fire into the engagement area while hindering the enemy's attempts to acquire and suppress firing vehicles. (In the defense, continuous fire from the same location will allow the enemy to locate the vehicle's position.) At extended ranges (at least 1,100 meters) the vehicles can alternate firing and observing until both are satisfied they are delivering effective fire. At this point, simultaneous fires can be employed.

SQUAD FIRE PLANNING

5-46. The primary goal of fire planning is to prescribe how fire is to be distributed and controlled to best support the scheme of maneuver. The squad fire plan provides the squad leader with the information needed to distribute and control the fire of all available weapons. Squad fire planning begins when the squad leader receives a mission. (It is an integral part of the squad leader's troop-leading procedures.) Squad fire planning is a continuous process. It does not stop until the squad mission is accomplished. Fire planning also includes indirect fires.

Defensive Fire Planning

5-47. Defensive fire planning is normally deliberate and detailed because sufficient time is available to consider the following:

- Individual vehicle targets.
- Squad targets.
- Indirect fire targets.
- Fire distribution and control measures.
- Primary, alternate, and supplementary defensive positions.
- Location of populated areas and friendly units.

5-48. To develop a defensive fire plan, the squad leader—

- Assigns primary, alternate, and supplementary firing positions to each vehicle, and assigns to each position a primary and secondary sector of fire.
- Designates possible squad point or area targets and other control measures (such as TRPs and RPs, phase lines, or target priorities) to coordinate the fire when more than one vehicle is firing into the same target area or sector.
- Receives information from vehicle commanders (provided on sector sketches and individual weapon range cards). The squad leader then reviews this information to ensure that fire is properly distributed across the entire squad sector and that sufficient control measures are met. This will assist the squad leader in determining if positions must be adjusted, minefields and obstacles emplaced, and additional indirect-fire support requested.
- Completes the squad fire plan and, if practical, gives a copy of the squad sector sketch to the platoon leader and has each vehicle commander make a copy of the sector sketch. (If time is short, the squad leader may only be able to give the vehicle commander a quick briefing on the sector sketch.)

Offensive Fire Planning

5-49. In offensive fire planning, time is normally not available to plan fire in the same detail as in defensive fire planning. The squad leader relies more on fire commands and prearranged SOP signals to bring effective fire on enemy targets rapidly. Offensive action requires planning. A squad leader must plan how to engage known or suspected enemy targets, where suppressive fire may be needed, and how to control squad fires against both planned targets and targets of opportunity.

Squad Fire Commands

5-50. Speed and accuracy are vital when engaging targets; therefore, commands must be clear and concise. In the stress of battle, the squad leader or vehicle commander must analyze a situation quickly and issue concise and complete fire commands immediately. During battle most gunners have a tendency to shoot low. Thus, leaders should continually emphasize to aim low.

5-51. A standard format for squad fire commands ensures that all necessary information is given in minimum time, even under the worst conditions. The elements of a squad fire command issued in proper sequence are shown in table 5-3.

Table 5-3. Standard squad fire commands

Element	***Example***
Alert	"Tango–This is tango four zero–
Weapon (optional):	MK-19–
Description	Two APCs, one truck–
Direction (optional)	East of TRP zero zero four–
Control (optional)	At my command"
Execution	"Fire."

5-52. The weapon element may be given when BMP/BRDMs and BMPs appear together. Control may be given to identify the fire pattern to be used by the squad. Examples of squad fire commands are shown in table 5-4.

Table 5-4. Combined squad fire commands

Squad engages trucks with all vehicles of the squad.	"Tango (complete squad) This is tango four zero–four trucks–1 o'clock–two hundred (optional)–depth, fire."
Squad engages trucks and dismounted infantry. The squad leader alerts the entire squad, indicating that all vehicles are to fire, but specifying that the second squad will engage the infantry. The other vehicles will engage the trucks.	"Tango–This is tango four zero–trucks and infantry. Tango four two–troops–2 o'clock (optional)–five hundred (optional)–cross fire."
Squad leader's command to end the engagement.	"Tango–this is tango four zero–cease fire."

RANGE CARDS

5-53. A range card is a rough sketch or drawing which serves as both a record of firing data and a document for defensive fire planning. Each ASV commander makes a range card in duplicate using the available DA Form 5517-R (Standard Range Card), which has been modified for the ASV and UGWS. The range card provides spaces for the vehicle bumper number, squad and platoon, the Global Positioning System grid for the ASV, and the azimuth of the ASV. The dot represents the ASV. These cards are clearly marked indicating primary, alternate, or supplementary defensive positions. Regardless of how long an ASV team plans to occupy a position, a range card is prepared immediately. Complete range cards are prepared for primary positions and partially complete range cards are prepared for alternate or supplementary positions. The gunner uses the card to recall the data to fire at predetermined targets and as an aid in estimating ranges to other targets. One copy remains with the ASV and a second copy is sent higher. (See figure 5-1.)

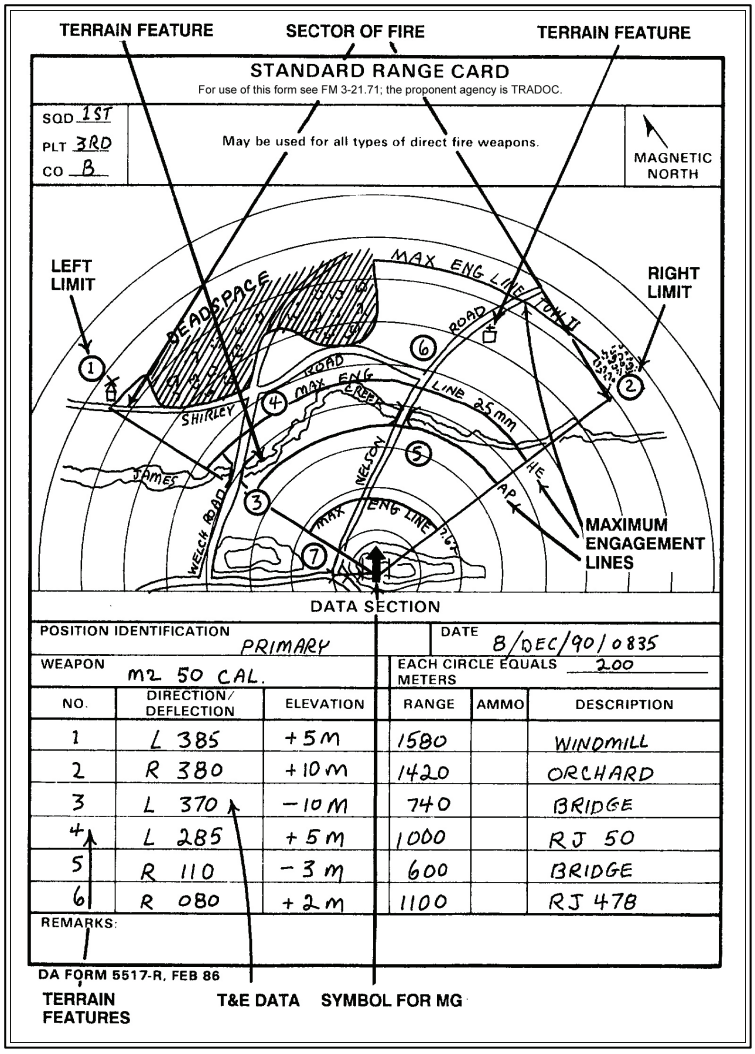

Figure 5-1. Example of a completed DA Form 5517-R

5-54. The elevation for the M2/M48 and MK-19 is separated to allow the gunner to place the range from the sight in each block and to place the range from the ASV to the target in the range block. For example, an ASV that is in a defilade position may be sitting with its nose canted at 10 degrees. This creates dynamic cant in an upward angle and provides an additional angle of elevation for the UGWS. The target is physically 1,000 meters from the vehicle. Due to this added angle to the ASV and the UGWS, the range to the target when looking through the reticle of the sight for the M2/M48 is 800 meters on the reticle to hit the target. If the gunner looked through the sight and elevated to 1,000 meters on the reticle, the gunner would end up shooting high. Through experience and training, the gunner can look at the elevation of the barrel and see if it is too high or too low to hit the target. One rule to remember is that it is better to shoot low on a target than high. Low rounds can be observed and walked on target. High rounds are more commonly not seen and, therefore, cannot be adjusted quickly.

Appendix A

Tactics, Techniques, and Procedures

TTP 1—PREPARE FOR COMBAT OPERATIONS (SQUAD)

1. The ASV crew receives the warning order from the squad/mission leader
2. The ASV driver and gunner conduct basic maintenance checks and turret checks.
3. The ASV crew checks all communications equipment.
4. All members perform checks on their assigned weapons and equipment.
5. All members draw ammunition and other supplies from the platoon sergeant as needed.
6. All members camouflage the vehicle, themselves, and equipment according to the unit SOP and under the leader's supervision.
7. ASV commander inspects the load plan.
8. The ASV crew receives the OPORD from the squad/mission leader.
9. The ASV crew conducts precombat checks with the squad leader according to the platoon SOP.
10. The ASV crew conducts rehearsals with the squad leader.
11. Squad moves at time specified in OPORD.

TTP 2—MOVE TACTICALLY (TEAM/SQUAD)

When moving, whether in contact with the enemy or not, ASV teams should know the following rules:

1. Use the terrain for protection.
   a. Use available cover and concealment.
   b. Avoid silhouette.
   c. Do not move directly forward from firing positions.
   d. Cross open areas quickly using an over watch.
2. Avoid possible kill zones. ASV's should avoid wide open spaces, especially where high ground dominates, or where terrain can cover and conceal the enemy; they must also avoid areas that would inhibit the maneuverability of the ASV and obvious avenues of approach into enemy territory.
3. Take active countermeasures. ASV commanders should use smoke to cover movement and observation by the enemy, for direct and indirect fire to suppress known and suspected hostile positions.
4. Maximize the ASV's capabilities: Good speed, weapons capabilities, and maneuverability and survivability aspects. The smoke grenade launchers can also be used to create an immediate smoke screen to hide movement and/or mask halted vehicles.
5. Know ASV's limitations: Limited visibility (both drivers and gunners), weapons' systems use according to METT-TC. Ensure the mobility of the crew inside the vehicle. Maintain situational understanding of crew.

Methods of Movement:

1. M1114 as lead vehicle, ASV middle, M1114 trail vehicle (allows for quick response to hostile action).
2. ASV as lead vehicle (provides show of force and allows easier movement through traffic).

TTP 3—ESTABLISH SECURITY DURING A SHORT HALT (TEAM)

1. ASV commander directs the driver to halt the vehicle.
2. ASV driver maneuvers the vehicle into position using available cover and concealment and leaves the engine running unless otherwise directed by the vehicle commander. Driver scans the area in front and to the driver's side of the vehicle for possible threats.
3. Gunner positions turret weapons to cover likely threat avenues of approach. Gunner scans the area on the passenger side and rear of the vehicle for possible threats.
4. Crewmembers will not leave the ASV weapons station unmanned. Should the gunner move from the turret weapons station for any reason, the ASV driver will assume the duties of the gunner in the turret; ASV commander will move into the driver's position.
5. Crewmembers will not leave unmanned vehicle hatches or doors opened. Should the ASV commander exit the vehicle, the vehicle exit will be closed immediately after the commander exits.

TTP 4—ESTABLISH SECURITY DURING A SHORT HALT (SQUAD)

1. Squad leader gives command for herringbone or coil formation, by either radio or hand and arm signal.
2. Squad halts in herringbone or coil formation.
3. Vehicle commanders ensure their vehicles are correctly positioned, using available cover and concealment.
4. Gunners orient their turrets to assigned sectors of fire.
5. Squad members observe their sectors of fire and prepare for combat.

Note. If possible, team members should not perform dismounted security. The ASV requires all team members to successfully engage and adjust fire.

TTP 5—ACQUIRE TARGETS AND DISTRIBUTE FIRE (TEAM/SQUAD)

1. Team/squad members scan sectors of responsibility and acquire targets. (See operational techniques below.)
2. Team/squad members engage or report targets according to the SOP/OPORD.
   a. Team/squad members engage targets in their sector and fire across sector only when ordered by their leader or the situation dictates.
   b. ASV gunners will engage and destroy the enemy within the squad sector. Once heavy weapons are eliminated, the squad leader identifies a primary fire gunner, who places fire on enemy positions across the width and depth of the occupied enemy area.
   c. ASV/HMMWV gunners work together. Upon initial firing, all ASV/HMMWV gunners fire until their identified targets are eliminated. Once the initial target engaged is eliminated, ASV/HMMWV gunners reload and standby.

Note. When needing to reload while engaged, the primary fire gunner announces "Primary–reload," and provides the target, direction, and distance to the secondary gunner. The secondary gunner locates the target identified by the primary fire vehicle and begins firing. Once the secondary gunner begins firing, the primary gunner stops firing and reloads. Once reloaded, the primary gunner becomes the secondary gunner and waits for the primary gunner firing to announce "Primary–reload." The secondary gunner scans enemy positions and fires on enemy targets that pose a serious threat and/or targets identified by team/squad leaders.

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   d. Squad/mission leaders provide timely SALUTE and spot reports as the situation permits to higher headquarters.
   e. Rounds fired over the intended target are redirected back onto the target. Team and squad leaders must maintain situational understanding of nearby populated areas or friendly units.

OPERATIONAL TECHNIQUES

1. Target acquisition techniques.
   a. Straight lines (unnatural).
   b. Broken foliage or foliage that does not match.
   c. Movement.
   d. Glare or shine.
   e. Smoke, flash, or dust.
   f. Vehicle and/or personnel movement noises.
   g. Metal on metal noises.
2. Weapons and engagement technique(s).
   a. M249 (dismounted troops).
   b. M203 (light armored vehicles and dismounted troops).
   c. AT4 (light to medium armored vehicles).
   d. MK-19 (dismounted troops and light armored vehicles).
   e. M2/M48 (dismounted troops and light armored vehicles).

ELEMENTS OF FIRE COMMAND

- Alert "Gunner"
- Weapon/Ammunition "MK-19"
- Target description "Truck"
- Direction "2 o'clock"
- Range "Six hundred"
- Command to Fire "Fire"

TTP 6—PROVIDE A BASE OF FIRE (TEAM)

1. Squad leader orders the ASV crew to provide a base of fire; indicates primary direction.
2. ASV commander directs the driver to move the vehicle into available cover and concealment and to keep the engine running.
3. ASV commander instructs the gunner on sectors of fire, ensuring that sectors of fire do not mask fires or cause fratricide.
4. Squad leader orders the ASV crew to place a heavy volume of fire on the objective to achieve fire superiority.
5. ASV commander directs concentrated fires to suppress and destroy specific enemy positions.
6. ASV commander observes impact of rounds and adjusts fires.
7. ASV commander may reposition the ASV to improve cover and concealment and/or obtain better fields of fire.
8. Squad leader orders the shifting of fires from the objective area and controls the shifting of fires across the objective in front of the assault element.

TTP 7—CONDUCT FIRE AND MOVEMENT (SQUAD)

1. Squad leader orders the squad to attack an objective—indicates primary direction of fire, indicates support by fire element and maneuver element, and then initiates fire and movement.

Note. Maneuver element should be the vehicle with the best ballistic protection and greatest firepower).

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2. Maneuver element assaults (without masking fires of over-watch element) along designated direction of attack to maximize its fires up to the limit of advance.
3. Support by the fire element provides suppressive fires; fire element also acquires and engages targets to provide cover for the maneuver elements.

Note. The support by the fire element must maintain momentum and position necessary to support the movement of the assaulting element.

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4. Squad leader signals lift or shift of fires when necessary on securing the objective.
5. The support by fire element lifts or shifts fires (left, right, beyond objective) to other known enemy positions. Fire element must be aware of adjacent friendly units and civilians on the battlefield when shifting fires.
6. The maneuver element fights through the objective to the limit of advance.
7. The squad leader positions the maneuver element to cover likely avenues of approach and to destroy the withdrawing enemy.
8. The support by fire element moves to link up with the maneuver element and sweeps over the objective thus securing the objective.
9. The squad leader gains the status of personnel, equipment, and ammunition. The squad leader dispatches special teams (aid and litter, demolitions, and detainee teams).

TTP 8—ESTABLISH A HASTY FIGHTING POSITION (TEAM)

1. ASV commander halts short of the defensive position in the best covered and concealed position available and establishes local security.
2. ASV commander dismounts the vehicle; driver secures the door/exit hatch. ASV commander conducts a visual reconnaissance of the intended position and immediate area, and then guides the vehicle into position (preferably in a hull-defilade position).
3. ASV commander designates sectors of fire for the gunner.
4. ASV gunner provides security over watch with weapons ready at all times. ASV commander and driver provide security from open hatches.
5. ASV commander checks and improves position.

Note. Continuous operation of the ASV will drain the batteries if the ASV is not running. When the ASV is required to remain in a static position, the driver should periodically start the vehicle to prevent the batteries from draining.

TTP 9—ESTABLISH A HASTY FIGHTING POSITION (SQUAD)

1. The squad halts short of the defensive position in the best covered and concealed position available and establishes local security.
2. The squad leader and team leaders conduct a visual reconnaissance of the intended position and the immediate area.
3. Squad leader designates the squad sector and locations for the key weapons. The squad leader and ASV commander designate the vehicle position and sectors of fire for the gunner, preferably with hull defilade. Squad leader coordinates with higher headquarters to gain authorization to position an OP. The squad leader positions HMMWV dismount Soldier to the front and flanks of the vehicle, METT-TC dependent.

   Note. ASV team members should not perform dismounted security. The ASV requires all team members to successfully engage targets and adjust fire.

4. The ASV commander attempts to guide the vehicle into position (preferably a defilade position) ensuring that sectors of fire support other mounted weapons systems.
5. Security and approved OP teams move to designated positions.

   Note. The squad leader ensures antifratricide measures by coordinating proper command and signal information.

6. The team leaders and drivers move to prepare hasty fighting positions.
7. Squad leader inspects and continuously enforces improvement of positions.

TTP 10—PREPARE AND OCCUPY A BATTLE POSITION (TEAM)

1. ASV commander halts short of the defensive position in the best covered and concealed position available and establishes local security.
2. ASV commander dismounts the vehicle; driver secures door/exit hatch. ASV commander conducts a visual reconnaissance of the intended position and immediate area, and then guides the vehicle into position (preferably in a hull-defilade position).
3. ASV commander designates sectors of fire for the gunner to cover the most likely enemy avenues of approach. ASV gunner provides security over watch with weapons ready at all times.
4. Team members prepare fighting positions as follows:
   a. Designate fighting positions and assign sectors of fire.
   b. Clear fields of fire and prepare range cards.
   c. Coordinate with adjacent units.
   d. Develop fighting positions.
   e. Emplace obstacles and mines.
   f. Rehearse engagements.
   g. Stockpile ammunition, food, and water.
   h. Continue to improve positions.
5. ASV commander prepares the sector sketch and forwards a copy to the squad leader.

TTP 11—PREPARE AND OCCUPY A BATTLE POSITION (SQUAD)

1. Squad halts short of the defensive position in the best covered and concealed position available and establishes local security.
2. The squad leader and team leaders conduct a visual reconnaissance of the intended position and immediate area. The squad leader signals the squad forward and into position.
3. Squad leader develops a fire plan to cover enemy avenues of approach, known or likely enemy positions, and final protective fires. Squad leader designates squad sector and locations for the key weapons. The squad leader and ASV commander designate the vehicle position and sectors of fire for the gunner, preferably with hull defilade. Squad leader designates positions for the OP. The squad leader directs dismounted HMMWV members or other squad members to the front and flanks of the vehicle.
4. Squad members prepare fighting positions as follows:
   a. Designate fighting positions and assign sectors of fire.
   b. Clear fields of fire and prepare range cards.
   c. Coordinate with adjacent units.
   d. Develop fighting positions.
   e. Emplace obstacles and mines.
   f. Rehearse engagements.
   g. Stockpile ammunition, food, and water.
   h. Continue to improve positions.
5. Squad leader prepares sector sketch and forwards a copy to the platoon leader.

TTP 12—ESTABLISHING A BLOCKING POSITION (SQUAD)

Note. The blocking position is intended to deflect the enemy from its current route of travel onto another route, in order to ambush the enemy element with another force.

1. Squad halts short of the defensive position in the best covered and concealed position available and establishes local security.
2. The squad leader and team leaders conduct a visual reconnaissance of the intended position and immediate area. The squad leader signals the squad forward and into position.
3. Squad leader develops a fire plan to cover enemy avenues of approach, known or likely enemy positions, and final protective fires. Squad leader designates squad sector and locations for the key weapons. The squad leader and ASV commander designate the vehicle position and sectors of fire for the gunner, preferably with hull defilade. Squad leader coordinates with higher headquarters for authorization to position OP. The squad leader directs dismounted HMMWV members to the front and flanks of the vehicle.
4. Squad members prepare fighting positions as follows:
   a. Designate fighting positions and assign sectors of fire.
   b. Clear fields of fire and prepare range cards.
   c. Coordinate with adjacent units.
   d. Develop fighting positions.
   e. Emplace obstacles and mines.
   f. Rehearse engagements.
   g. Stockpile ammunition, food, and water.
   h. Continue to improve positions.
   i. Squad leader ensures availability of response routes for reserve forces and for withdrawal
5. Squad leader prepares the sector sketch and forwards a copy to the platoon leader.
6. Squad leader initiates engagement with a high volume of fire and controls fire using standard commands. Squad leader reports contact to the platoon leader.
7. Squad members maintain a heavy volume of fire to cause the enemy to turn from the current route of travel.
8. Squad leader requests reserve forces if needed and coordinates the approach of reserve forces.
9. Squad leader maintains position until enemy forces bypass the area or until the squad leader receives orders to withdraw.
10. Squad leader consolidates and reorganizes positions.

TTP 13—CONDUCT CRITICAL SITE SECURITY

1. Squad leader coordinates with the site commander to determine likely threats and known enemy operating in the area.
2. Squad leader and ASV commander designate the vehicle position, preferably with hull defilade, in areas of greatest threat such as high-speed avenues of approach, key intersections in urban environments, and access points in site perimeters. Squad leaders may also place the ASV in position to use optics to detect standoff weapons launch. Squad leader and ASV commander also designate alternate and supplementary positions.
3. Squad leader and ASV commander designates sectors of fire for the gunner.
4. ASV commander establishes standoff measures around the ASV to prevent a close-in attack.
5. Squad leader coordinates with higher headquarters for authorization to position Ops on supporting terrain such as hilltops and ridges overlooking the site and the upper floors of buildings in urban terrain. If the supported element is located in a large open area, the squad leader positions Ops one terrain feature away.
6. Squad leader establishes communications with the supported headquarters to ascertain new threats and to apprise subordinates of approaching threats (when necessary).
7. Squad leader determines likely infiltration routes and establishes mounted and dismounted patrols.
8. Squad leader moves ASV to alternate and supplementary positions on a random basis to prevent enemy targeting.
9. ASV crew rehearses battle drills.

TTP 14—CONDUCT SQUAD SCREENING OPERATIONS

1. Squad receives a mission from the platoon leader to include IS&R to specified tasks.
2. Squad leader develops a plan for the squad to conduct reconnaissance (zone or area) of squad sector in support of the platoon IS&R matrix.
3. Squad leader examines likely enemy avenues of approach.
4. Squad leader assigns surveillance responsibilities to team members, based on the employment considerations of the ASV.
5. Squad leader coordinates with higher headquarters to position Ops.
6. Squad leader identifies the enemy's most likely avenues of approach. The squad leader should refer to control measures contained in the platoon IS&R matrix (NAIs and PLs).
7. Squad leader conducts mounted and dismounted patrols. The squad leader uses all methods of reconnaissance (aerial, ground, or a combination of both).
8. On detecting the enemy, the squad leader commands the gunner(s) to engage.
9. If the squad cannot achieve fire superiority, the squad leader will report to higher headquarters to request additional combat power or to break contact.
10. During limited visibility, the squad leader should use all available night observation devices, increase the number of Ops and their placement, plan for illumination (both indirect and direct), emphasize vehicle recognition, and enforce noise and light discipline.

TTP 15—CONDUCT A VIP ESCORT (SQUAD)

1. Platoon leader receives designated principal(s) itinerary and issues the order to the squad leader performing the mission.
2. The squad advance team conducts reconnaissance of the locations for the scheduled visit.
3. Personnel selected for the mission receive a mission brief from the squad leader with the following considerations:
   a. Give guidance on restricting individuals approaching the principal and escort vehicles.
   b. Develop and rehearse contingency plans for evacuating the principal.
   c. Develop control measures.
   d. Develop crowd control measures (take cultural considerations in to account).
   e. Identify alternate routes.
   f. Develop and rehearse emergency medical evacuation procedures.
   g. Develop a contingency to respond to a media presence.
   h. Identify a route to "safe haven" along the designated route.
4. Squad conducts detailed rehearsals.

> ***Note.*** The most secure location for the VIP is in the ASV. VIP or the personal security detail will make the decision as to where the VIP will ride. If the VIP chooses own transportation, the ASV should be located directly behind the VIP vehicle.

5. Security of VIPs will adhere to FM 3-19.12 and in coordination with USACIDC (if necessary).

TTP 16—ESTABLISH/CONDUCT CHECKPOINT OPERATIONS (TEAM/SQUAD) HASTY OR DELIBERATE

1. Squad leader receives a mission to establish a checkpoint (hasty or deliberate) to monitor/inspect vehicles/personnel moving along a given route.
2. Squad and team leaders initiate troop-leading procedures.
3. Squad leader identifies and places each team in position to include defensive positions, directing fields of fire positions, and security positions. Squad leader positions the ASV to maximize its utility.
4. Squad leader verifies teams are in their correct positions and reports to higher headquarters that the checkpoint is operational.
5. On visual confirmation of an approaching vehicle or personnel, the squad leader assesses the threat potential and notifies all team members of the approaching elements. In the event that personnel/vehicles breakthrough the checkpoint, squad leader or senior member at the security element dictates actions or response based on ROE.
6. The squad leader then directs the search of vehicle or personnel according to the unit SOP.
7. Squad leader, upon completion of checkpoint, checks the status on ammunition, equipment, and sensitive items. Notifies higher headquarters that the mission has been completed.

TTP 17—CONDUCT OPERATIONS IN AN URBAN ENVIRONMENT

1. Squad leader receives mission and conducts troop-leading procedures.
2. Squad leader incorporates police intelligence operations as required
3. Squad leader planning considerations may contain the following:
   a. Actions if vehicle(s) becomes separated from the main body.
   b. Actions if confronted by an obstacle/barrier.
   c. Actions upon enemy contact.
   d. Incorporation of hand and arm signals for any form of dismounted operation.
   e. Actions with a disabled vehicle to include recovery operations.
   f. Actions upon encountering a mine strike, IED, or VBIED.
   g. Actions upon contact with a hostile crowd.
   h. Designated rally points.
   i. Routes of ingress and egress.
   j. Verify call signs, frequencies, and passwords.
4. Squad leader completes the plan on reconnoitering the area and issues the final plan to subordinates. Squad leader conducts rehearsals.
5. Squad leader places vehicles in movement order according to METT-TC. Placing the ASV in the middle of the formation allows for quick response to hostile action; placing the ASV as lead vehicle provides a show of force and allows easier movement through traffic.
6. Cordon and search considerations include—
   a. Placing ASVs on the cordon to cover high-speed avenues of approach.
   b. Using ASV optics to detect personnel attempting to break the cordon.
   c. Using ASV to breach doors, gates, or walls. If the situation permits, ASV crew may use a winch to open doors or gates. ASV crew may attach tires or impact absorbing material to the front of the vehicle to reduce damage during the breach.
   d. Using ASV to provide suppressing fire during initial entry.
7. Squad maintains full 360-degree security focusing on rear threats, narrow streets with tall buildings adjacent, and road obstacles/barriers that prohibit movement.
8. Squad leader maintains communications with entire squad throughout the movement. Reports any significant incidents and PIRs to higher headquarters.
9. Squad completes patrol mission and provides a summary of information to higher headquarters.

TTP 18—CONDUCT A DELAY (SQUAD)

1. Squad leader receives a mission to conduct delay operations. Squad leader conducts troop-leading procedures.
2. Squad leader considers the following elements:
   a. Area of operation.
   b. Phase lines and adjacent units in the AOR.
   c. Potential locations for subsequent battle positions.
   d. Coordination points.
   e. Checkpoints.
   f. Engagement areas.
   g. TRPs.
   h. Disengagement criteria.
3. Squad leader conducts the initial movement and conducts reconnaissance (ground or map) of enemy likely avenue of approach. Squad/team leader identifies subsequent delaying positions on key terrain throughout the depth of the AOR.
4. Squad leader completes the plan and issues the final order to subordinates ensuring squad members understand control measures identified in the order (area of operation, phase lines, potential subsequent battle positions, coordination points, checkpoints, engagements areas, TRPs, and disengagement lines).
5. Squad leader supervises the organization and placement of squad members in preparation for the mission. Squad leader designates one MP team with HMMWV in the squad as a support by fire element, one MP team with ASV as main body, and one MP team as the squad's mobile reserve.
6. Squad leader conducts rehearsals on the following battle drills/tasks:
   a. Using traveling over-watch technique.
   b. Using bounding over-watch technique.
   c. Disengagement criteria.
   d. Sequence of disengagement.
   e. Bounding from successive positions.
   f. Bounding from alternate positions.
   g. Reacting to indirect fire.
   h. Reacting to an ambush.
7. Squad moves along enemy suspected avenue of approach using bounding over-watch technique with the security element leading, main body following, and the mobile reserve in the trail.
8. Upon contact with the enemy, the security element remains in contact and assumes support by fire with the enemy until directed or until delays to designated location. The support by fire element then disengages, moves to the rear of the main body, and establishes a subsequent delay position to over watch the main body while it engages the enemy. The main body remains in contact with the enemy until directed or until delays to designated location, and then disengages, moves to the rear of the security element, and establishes a subsequent position to over watch the security element while it engages the enemy. The mobile reserve element overwatches the security element and the main body while they delay from alternate or subsequent positions to ensure the enemy does not penetrate between delaying positions and to assist the element with disengaging the enemy.
9. Squad leader terminates delaying operation upon arrival and coordination with the TCF to hand over engagement or when directed by higher headquarters. Squad should prepare for future combat operations integrated into the TCF's fight with the enemy.
10. Squad/team leader, upon completion of delay, evacuates casualties if needed, redistributes ammunition, checks equipment and sensitive items, and prepares for the next mission.

TTP 19—CONDUCT AN AMBUSH (SQUAD)

1. Squad leader receives a mission to conduct an ambush within the AO. The squad leader initiates troop-leading procedures.
2. Considerations that the squad leader must take into account while formulating the plan include the following preliminary tasks:
   a. Organizing the squad for the conduct of the ambush:
      - Assault team (conduct of the ambush to kill the enemy and gain PIR).
      - Support team (provides support by fire for the assault team; ensures direct fire and total coverage established kill zone).
      - Security team (provides security for the conduct of the entire ambush to ensure the squad's flanks do not become compromised).
   b. Organizing the squad's special teams (aid and litter, demolitions, EPW, and search).
   c. Conducting rehearsals for actions on contact, receipt of indirect fire, and counter ambush.
   d. Determining the best use TIF operations of the ASV as part of the support and/or security element; identifying the primary and alternate routes for each element.
   e. Identifying a tentative ORP.
   f. Identifying a tentative release point.
   g. Verifying call signs, passwords, recognition signals.
   h. Verifying coordination with adjacent units.
3. On completing the plan, the squad leader issues the OPORD to the squad. Optimally, the squad leader should consider using a terrain model, map, or other device that will better enable the squad leader to deliver the order while providing immediate reference depicting the concept of the operation. The squad leader must ensure completion of the following critical tasks:
   a. Squad leader supervises the team leaders as they conduct precombat inspections of the squad's equipment and personnel; squad leader verifies the status of the squad's equipment and personnel.
   b. Squad leader conducts mission rehearsals canvassing each phase of the mission:
      - Passage of lines and movement from the assembly area/LD to the ORP.
      - Actions at the ORP.
      - Movement from the ORP to the assault position.
      - Actions during the ambush (assault, support, security, and so forth).
      - Movement from the assault position to the ORP.
      - Movement from the ORP to the assembly area/passage of lines.
   c. The squad leader conducts rehearsals using any combination of available methods including rock drill, map drills; terrain talk-through, crawl-through, walk-through, and run-through.
   d. The squad leader conducts back briefs among the squad members to ensure they are thoroughly familiar with every aspect of the entire mission and that the squad members are prepared to assume any position within the squad as the situation may dictate.
4. Squad leader conducts movement to the ORP by accomplishing the following:
   a. Moves the squad to the attack position; conducts final checks.
   b. Conducts passage of lines; verifies tentative time for return, call signs, passwords, and visual signals.
   c. Conducts tactical movement ensuring the use of the appropriate movement technique based on the threat assessment and moves toward the ORP.
   d. Conducts a security halt short of the ORP; dispatches the security element forward to secure the ORP; moves the remainder of the squad into the ORP.

e. Squad leader enforces activities in the ORP—security, maintenance, and rest.

5. Squad leader conducts a leaders' reconnoiter by accomplishing the following:
   a. Prior to conducting the leaders' reconnoiter, the squad leader designates someone to assume command of the ORP during the squad leader's absence. The person assuming command of the ORP must know the five-point contingency depicting, as minimum, the following:
      - Going – Where?
      - Others – Who is going with the leaders?
      - Time – What is the expected time of return? How long should the patrol/team wait?
      - What – What is the reconnaissance mission? What is the mission of the ORP elements?
      - Actions – What actions must be conducted by both parties? What actions occur if the reconnaissance element does not return? What actions occur in the face of enemy contact?
   b. The squad leader identifies an exit and re-entry point from the ORP.
   c. Once again, squad leader verifies passwords, call signs, and visual signals.
   d. Squad leader and team leaders (or other designated personnel) depart the ORP to conduct a leaders' reconnoiter to verify the following:
      (1) The location of the squad release point. Once verified, the squad leader should consider positioning a two-person security element to wait for the return of the leaders' reconnoiter.
      (2) Leaders verify the location and suitability of the assault positions to support the assault, support, and security elements.
      (3) Squad leader verifies the location of the objective and the "kill zone."
      (4) Upon verifying the location and suitability of each element's assault position, the squad leader positions a Soldier in each position to occupy the position and maintain security until the arrival of the respective element.
   e. Leaders' reconnoiter returns to the ORP, halts at the release point, and updates security personnel of the situation and findings.
   f. Leaders' reconnoiter departs the release point for the ORP. (Release point security team remains in its position and maintains its eyes on the objective area.)
6. Squad leader moves the squad to the release point.
   a. Prior to departing the ORP for the release point, the squad leader verifies the five-point contingency plan with the designated ORP commander.
   b. The squad leader identifies an exit and re-entry point from the ORP.
   c. Once again, squad leader verifies passwords, call signs, visual signals, and so forth.
   d. Squad leader moves the squad from the ORP; leaving the ORP commander and at least one Soldier for security.
   e. At the release point, each element (assault, support, and security) moves to its assigned assault position.
7. Assault, support, and security elements occupy their assigned assault positions and accomplish the following:
   a. Squad leader is positioned with the assault element and supervises the positioning of claymores, early warning devices, and so forth.
   b. Squad leader takes additional precautions to cover dead space with booby traps and claymores.
   c. On occupying their respective assault positions, the element's squad leader and team leaders assign sectors of fire.
   d. Team leader ensures that elements maintain adequate security (often at 100 percent).
8. Squad leader initiates the ambush by accomplishing the following:

a. Once the target moves into the predesignated "kill zone," the squad leader initiates the ambush by ordering the support element to engage the target with a mass casualty producing weapon, such as claymore or AT-4.

b. The remainder of the supporting element engages the target in the kill zone until the squad leader commands cease-fire (the squad leader commands cease-fire using a prearranged signal, such as whistle, star cluster).

c. On achieving a cease-fire, the assault element assaults through the objective to the limit of the advance.

d. After securing the far side of the objective, the squad leader dispatches the special teams (aid and litter, EPW search, and demolitions).

e. Assault element canvasses the objectives for all PIR.

f. Upon finalizing the activities of the special teams and securing the PIR, the squad leader orders the assault element to return to the release point.

9. Squad returns to the release point by accomplishing the following:

a. The support element covers the withdrawal of the assault element.

b. The security element continues to provide flank security.

c. Once the assault element arrives at the release point, the squad leader orders the support element to move to the release point.

d. Once the support element closes on the release point, the squad leader orders the security element to withdraw to the release point.

e. Upon accounting for the squad members and their equipment, the squad leader forms the entire squad and begins movement returning the squad to the ORP.

10. Squad returns to the ORP by accomplishing the following:

a. On the return to the ORP (METT-TC dependent), squad leader conducts a security halt and makes initial contact with the ORP to inform of the pending return of the squad (beyond small arms fire range).

b. Upon receiving confirmation from the ORP, the squad leader moves the squad into the ORP's pre-established entry point.

c. The ORP commander verifies the authenticity of the squad leader by exchanging prearranged challenge and password or other visual signals.

d. The squad leader moves the squad into the ORP.

e. The ORP commander verifies the return of all members.

f. Once the consolidation of the squad is complete, the squad leader ensures that all squad members are thoroughly familiar with the collected PIR and actions at the objective.

11. Squad returns to the assembly area/attack position by accomplishing the following:

a. Squad moves to the assembly area; on approach to the assembly area, the squad conducts a security halt (beyond small arms fire range of the assembly area).

b. Squad leader confirms the challenge and password or other prearranged signal with the outer security elements positioned at the predesignated return point.

c. On confirmation of the prearranged challenge and password, the squad leader moves the squad through the RP, conducts passage of lines, and accounts for all personnel and equipment.

d. Squad leader and the entire squad conduct a debriefing with a designated intelligence specialist.

Note. ASV Considerations: Squad leader must determine how best to employ the ASV based on METT-TC. The squad leader must determine if the ASV would better serve the mission as the security and/or support element or not at all. The probability of enemy contact is the key consideration in determining whether the squad leader includes the ASV as part of the ambush patrol.

TTP 20—SECURE A CONVOY

1. Squad leader receives the mission to conduct a convoy escort of critical assets along a designated MSR. The squad leader initiates troop-leading procedures.
2. In formulating the plan and conducting preliminary pre-mission tasks, the squad leader considers the following:
   a. Squad leader identifies the primary and alternate routes.
   b. Squad leader conducts a route reconnoiter of both the primary and alternate routes selecting the best means available (air, ground, or map). The most preferred method is for the squad leader to conduct an air reconnoiter (in this instance, company commander must provide assistance in coordinating the necessary air assets). The least preferred method is for the squad leader to conduct a map reconnoiter.
   c. Squad leader verifies that the movement clearance is in place before beginning any movement (typically, movement clearance is the responsibility of the company commander).
   d. The squad leader must bear in mind that the movement clearance is specific and prescriptive in terms of identifying exact times and coordinating instructions that must take place beforehand.
   e. Squad leader tentatively identifies rest halts, refueling points, start point (SP), RP, and checkpoints.
   f. Squad leader verifies the status of the communication assets.
   g. Squad leader verifies all relevant call signs, passwords, and visual recognition signals.
   h. Squad leader has at least one portable radio system configured for dismounted operations.
   i. Squad leader undertakes coordination and synchronization with the convoy commander verifying and identifying the following:
      (1) Actions at the halt, battle drills, actions on contact, and actions on receiving indirect fire.
      (2) Squad leader identifies the organization, composition, and weapons mix of the convoy.
      (3) Squad leader determines the availability of fire support and tactical air support.
3. Squad leader completes the plan and issues the OPORD/movement order according to the format outlined in FM 5-0 and FM 6-0. Squad leader then supervises the escort elements as they conduct their precombat checks prior to movement. Leaders ensure that equipment, weapons, and vehicles are fully mission capable. Additionally, the squad leader ensures the completion of the following premovement tasks:
   a. Vehicle floors are covered with protective materials (for example, double layer of sandbags).
   b. Unless otherwise directed, windows are up.
   c. Vehicles are serviced and deficiencies corrected.
   d. Radios are operational.
   e. There is enough ammunition for the mission.
   f. CBRN equipment is operational.
4. Squad leader receives brief backs from scout and trail element leaders and conducts, at a minimum, rehearsals of actions on enemy contact during movement. At a minimum, the squad leader should rehearse the following:
   a. Near ambush (all elements).
   b. Far ambush (all elements).
   c. Rollover/fire evacuation drills.
   d. Reaction to IED/VBIED.
   e. Vehicle recovery.
   f. Casualty evacuation.

5. Prior to departure from the rehearsal area, squad leader request an intelligence update to ensure he understands the current situation along the escort route(s). The squad leader disseminates changes to existing intelligence to the squad, and revises the plan when necessary.
6. Squad leader moves to the SP and conducts a link-up with the convoy commander. After exchanging information with the convoy commander and the element, the squad leader conducts a final check and executes the movement as rehearsed.

Note. **ASV Considerations*:*** The squad leader must consider, based on METT-TC, if the ASV should be used as only the scout element or for all three security elements—scout, lead, and trail. The probability of enemy contact along the convoy route will determine the exact composition of the escorting elements.

Appendix B

Fording Operations

There may be occasions when platoons and squads, moving in the attack or the defense, must cross water obstacles where bridges or ferries are not available. With only minor preparation, the ASV can ford small water obstacles such as streams, creeks, or ponds. This appendix explains in general terms how to ford and swim with the ASV.

BEFORE FORDING

B-1. Platoons and squads should prepare their vehicles for fording before arriving at the ford site so that action is not stopped at a critical point in the operation. Preparation should be in a covered and concealed location, a short driving distance (1 kilometer or less) from the fording site. To prepare the vehicle for fording—

- Inspect the hull drain plugs to ensure that the plugs are in place and tight.
- Secure and lock doors and hatches.

DURING FORDING

B-2. The entry and exit sites should be on firm ground that is free of rocks, stumps, deep drops, and underwater obstacles. The driver—

- Should turn on the bilge pumps and ease the ASV into the water.
- When the ASV is level, drives slowly (as driving on dry land).
- If the vehicle begins to lose traction, should stop and abort the ford.
- As the vehicle nears the exit point, should slow down and exit at a constant speed.
- After exiting, turns off the bilge pumps.

CAUTION

Do NOT run bilge pumps without water as that will lead to equipment failure.

AFTER FORDING

B-3. To avoid congestion at the ford site, the driver immediately moves the ASV away from the exit. The driver conducts the after-water operations checks as soon as the tactical situation permits by—

- Checking the exterior drive train for debris.
- Inspecting the differentials to ensure that the differential fluid is not contaminated.
- Greasing all fittings to force water out of the steering/suspension components.

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Appendix C

Evacuation of Personnel from an ASV

Military police move and fight mounted whenever possible. If team members are wounded or injured while in the ASV, they will require evacuation. To evacuate casualties quickly, every Soldier in the team must know the evacuation procedures for different crew positions and different vehicle positions—such as vehicle upright, turned on either side, or overturned. This appendix covers the procedures to follow for different situations.

EVACUATION PROCEDURES

C-1. If the ASV is disabled by hostile fire, the vehicle commander uses the intercom system or voice to alert the crew and commands, "Bail out." The crew does the following:

- The gunner—
  - Clears the weapons, rotates the turret so the weapons are not blocking the driver's and commander's hatches, turns the turret power switch off, and announces, "Weapons clear."
  - Disconnects the CVC helmet and unfastens the seat belt.
  - Secures individual weapon, Kevlar® helmet, LCE, and any sensitive items.
  - Evacuates the vehicle through the side door opposite the hostile fire.

Note. Personnel should use the ASV as cover from hostile fire when evacuating. Weapons, if possible, should be placed on "safe" to ensure triggers are not pulled without the knowledge of those evacuating the vehicle.

- The driver—
  - Shuts down the vehicle and announces, "Vehicle secure."
  - Checks for an engine fire and, if necessary, activates the fire suppression system. If there is no power, manually activates the engine compartment fire extinguisher.
  - Disconnects the CVC helmet and unfastens the seat belt.
  - Secures individual weapon, Kevlar® helmet, LCE, and the manpack radio.
  - Evacuates the vehicle through the side door opposite the hostile fire.
- The vehicle commander—
  - Verifies the status of the crew and checks for injuries. Radios for assistance and, if necessary, for medical evacuation.
  - Turns off the master power to the turret when the gunner announces, "Weapon clear" and turns off the vehicle master power switch when the driver announces, "Vehicle secure."
  - Assesses the vehicle position, determines exits, identifies a rally point outside the vehicle, and directs the evacuation of injured crewmembers.
  - Disconnects the CVC helmet, unfastens the seat belt, secures weapon, Kevlar® helmet, and LCE.
  - Evacuates the vehicle through the side door opposite the hostile fire.

  - Once clear of the vehicle, accounts for all personnel, weapons, equipment, and sensitive items.
  - Sends a SITREP to higher headquarters.
- Passenger—
  - Exits the ASV through the exit identified by the vehicle commander.
  - Assists injured personnel, administers first aid, and secures individual weapon and equipment.
  - Exits the ASV.

The crew and passengers proceed to the designated rally point and establish defensive positions. Remaining squad vehicles provide security and evacuate the crew and passengers.

ROLLOVER PROCEDURES

C-2. If the ASV enters an unstable attitude and appears to be overturning, the first crewmember to identify that the ASV is about to rollover shouts, "Rollover." At this command—

- If riding at name tape defilade, the driver immediately drops into the ASV, releases the accelerator, pulls the engine stop T-handle, grasps the steering wheel with arms extended but not locked, and tucks the chin into the chest.
- If riding at name tape defilade, the gunner immediately drops into the ASV, braces against the back of the seat, grasps the top of the M36 night sight with arms extended but not locked, and tucks chin into chest.
- If riding at name tape defilade, the vehicle commander immediately drops into the ASV, grasps the front bar with arms extended but not locked, and tucks chin into chest.
- The passengers immediately grasp the troop straps above their heads, plant their feet firmly on the floor, and tuck their chins into their chests.

Note. All ASV personnel should be wearing seat belts and all cargo should be tied down during vehicle movement. Riding at name tape defilade may only be recommended while inside a safe and secure area.

C-3. Once the ASV comes to a complete stop, the crew and passengers evacuate the ASV using the procedures listed above. The driver surveys the damage. The driver also checks for fuel spills and fire hazards and attempts to contain them (if possible).

CASUALTY EVACUATION PROCEDURES

OBSERVE THE ASV FOR FIRE

C-4. When an ASV has been hit by enemy fire or damaged by a mine, it should be inspected to determine the extent of damage and to find out if there is a danger of fire. If the threat of fire exists, shut off the engine, push the external fire extinguisher button (under the winch hatch) and ready a portable fire extinguisher. Identify accessible hatches and exit points to evacuate casualties.

Note. To extinguish a fire in the engine compartment, activate the engine fire extinguisher using the toggle switch located on the right center portion of the commander's control panel.

Note. To extinguish a fire in the crew compartment, use the portable fire extinguisher.

Note. When activating the FM-200 (engine fire extinguisher) to suppress fire in the engine, first shut off the engine. Failure to do so may result in the engine fan blowing all FM-200 out of the exhaust area.

MOVE THE ASV TO A SAFE LOCATION

C-5. If the ASV can operate under its own power, move it to a safe place before evacuating casualties. If the ASV cannot operate under its own power, remaining squad vehicles pull security and evacuate the crew.

Note. If the driver is wounded and cannot operate the ASV, remove the driver through the hatch, replace the hatch, and drive the vehicle to a safe location.

CHECK AND TREAT THE CASUALTY

C-6. Before evacuating injured crewmembers, check them thoroughly to determine the full extent of their injuries. (Evacuating injured crewmembers without regard to their injuries may cause further injury.) Then do the following:

- Administer first aid to those wounds requiring immediate attention. In extreme cases of fire or enemy action, injured crewmembers may require immediate evacuation before a thorough check can be completed. In such cases, use as much caution evacuating injured crewmembers as the situation will allow.
- After administering the necessary first aid, disconnect or remove the crewmember's CVC helmet and release the seat belt. (If the ASV is on its side or overturned, support the crewmember before releasing the seat belt to prevent additional injuries.)
- Remove any LCE.

EVACUATE THE CASUALTY FROM THE ASV

C-7. Evacuate the casualty using the most accessible exit. The ASV has six exits: gunner's hatch, driver's hatch, cargo hatch, commander's hatch, and two side doors.

- When possible, the gunner's hatch and driver's hatch will be the evacuation exit for the gunner and driver. If one or both of these exits is blocked, or if the tactical situation prohibits their use, casualties from these positions will be evacuated through the crew compartment and out the side door.
- The side doors will be the main exit used to evacuate casualties from the crew compartment.
- Casualties may also be evacuated through the cargo hatch if the side doors do not work.

Note. Prompt, sure action on the part of fellow Soldiers to evacuate crewmembers will help increase their chances of survival and speed their return to duty.

C-8. Crewmembers must rehearse the following procedures to effectively evacuate casualties from their respective positions.

Driver /Vehicle Commander

C-9. The driver and vehicle commander may be evacuated through their respective hatches.

- If the hatches can be fully opened from the inside, Soldiers will—

- Lean headfirst into the hatch to make sure that the engine is off.
- Remove the driver's and commander's seat belts, and disconnect the CVC helmets.
- Remove the driver and commander from the ASV. (If their injuries permit, use two Soldiers to lift the driver and commander out, assisted by another from inside the vehicle.)
- Once the driver and commander are outside the vehicle, pass them down to personnel on the ground.

- If the hatches are inoperable or the vehicle is receiving enemy fire, Soldiers may evacuate the driver and commander through the crew compartment and out the side doors. Soldiers will—
  - Check to make sure that the engine is shut off. (The Soldier closest to the driver's or commander's position will do the check.)
  - Lower the driver's and commander's seats by activating the emergency relief valve centered behind the seats, and pull the seats to the rear.
  - Remove the driver's and commander's seat belts and disconnect their CVC helmets.
  - Grasp the driver under the arms; ease the driver into the crew compartment and out the side doors.
  - Ease the commander into the driver's seat and then into the crew compartment. (The weapons station blocks the access to the crew compartment from the commander's seat.)
  - Use care to avoid further injuries because of close quarters or protruding objects.

Gunner

C-10. Ease the gunner into the crew compartment and evacuate from the vehicle through the side doors. If turret orientation, damage to the basket, or inability to open the side doors prevents using this exit, evacuate the gunner from above through the gunner's hatch.

Personnel in the Crew Compartment

C-11. Evacuate injured Soldiers in the crew compartment through the side doors or the cargo hatch. Remove the casualty's seat belt before evacuating through the most accessible exit. When loading, attempt to displace the weight evenly. Too much weight on one side may disrupt maneuverability when operating on rough terrain. Ensure all equipment is secured and does not block any doors.

Appendix D

Vehicle Recovery

This appendix describes a few of the more common field vehicle recovery procedures. ASV crews can perform these operations with limited resources. Crews must use caution and include reasonable safety factors to avoid injuries and damage to vehicles and equipment.

RECOVERY PROCEDURE

D-1. The following steps will improve chances of vehicle recovery:

- Reconnoiter the area.
- Estimate the situation.
- Calculate the ratio.
- Obtain the resistance.
- Verify the solution.
- Erect the rigging.
- Recheck the rigging.
- Recover the vehicle.

TOWING VEHICLES

D-2. Before towing any vehicle, refer to the vehicle's technical manual/order. The following are general rules for towing:

- Use a recovery vehicle whenever possible.
- Use a tow bar instead of chains, ropes, or cables to keep the towed vehicle from running into the towing vehicle. However, only use a tow bar as a last resort as it could lead to damaging the vehicle.
- When using a tow bar, connect a chain between the two vehicles for safety in case the tow bar fails.
- Connect chains, ropes, or cables securely to the front lifting shackles of the towed vehicle and to the rear lifting shackles of the towing vehicle.
- Move towed vehicles at low speeds, especially through turns to keep the towed vehicle from skidding.
- Avoid quick stops.
- Mark towing vehicles with warning lights or flags.
- Place a driver in the towed vehicle to control it, unless towing with a wrecker.

CAUTION

Always use rigger's gloves when handling chains, cables, and wire rope.

ANCHORING VEHICLES

D-3. Trees, stumps, and rocks are natural anchors. Always attach your lines near the ground when using a tree or a stump as an anchor. You should lash the first tree or stump to a second one to provide added support for the line. When using a rock as an anchor, be sure it is large and firmly embedded in the ground.

D-4. Construct anchors when natural ones are not available. The deadman (figure D-1) is one of the best types of constructed anchors and can be used for heavy loads. It consists of a log timber, steel beam, or other similar object buried in the ground with a dead line connected to it at the center. To construct a deadman—

- Select a place where the direction of pull is as nearly horizontal as possible. Take advantage of sharp banks or crests to increase the holding power with less digging.
- Dig a trench large enough for the deadman and as deep as necessary for good bearing. When digging, slant the bank at least 15 degrees from the vertical and undercut toward the disabled vehicle.
- Drive stakes in front of the deadman at each end to hold it in place.
- Tie the dead line to the center of the deadman so the main part of the line leads to the bottom. (This will keep the deadman from rotating out of the hold.) Dig a narrow, inclined trench to decrease the angle of the dead line. If the dead line cuts into the ground, place a log or plank under the line at the outlet from the inclined trench. The strength of the deadman depends on the strength of the log and the holding power of the earth.

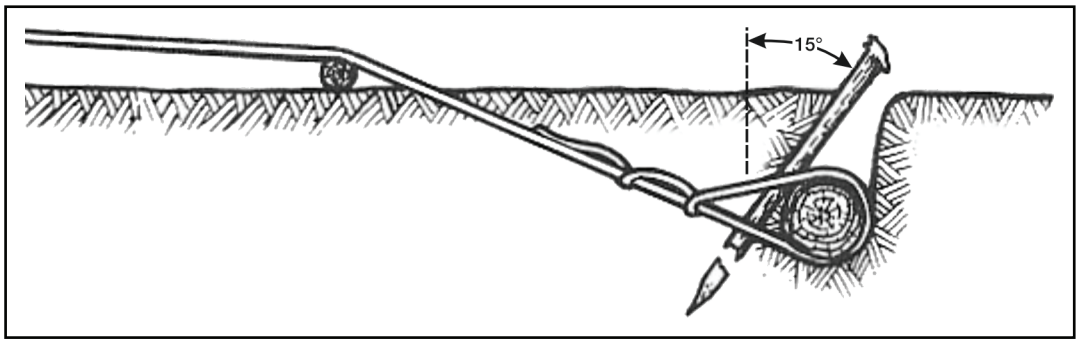

Figure D-1. Log deadman (anchor)

WINCHES

RECOVERY GUIDELINES

D-5. Many military trucks are equipped with winches (see figure D-2). To ensure the safety of personnel, protect vehicles and equipment, and ensure the success of recovery operations, use the following as a guide:

- Check the capacity of the winch. The capacity shown on the manufacturer's plate is the maximum with one layer of cable on the drum. Each successive layer increases the diameter of the drum and reduces the winch capacity to as little as 50 percent of the rated capacity when the last layer is being wound on the drum.
- Check the cable for rust, kinks, or frays.
- Estimate the total resistance. Consider the slope, weight of the vehicle, and type of terrain. Then add a reasonable factor for safety.
- Select or construct a suitable anchor.

- Rig the load. Inspect all rigging and equipment to ensure it will support the load. Do not tighten the winch cable before inspecting the rigging.
- Clear personnel from the danger area away before tightening the winch cable. All personnel observing the operation should stand outside the angle formed by the cable under stress at a distance at least equal to the distance between the two most distant points in the rigging.

SINGLE-VEHICLE RECOVERY

D-6. If the vehicle loses traction, use the winch and suitable rigging to recover the vehicle (figure D-2).

- Select or construct a strong anchor.
- If available, attach a snatch block to the anchor with the tow chain.
- Run the winch cable through the block and back to the truck.
- Take up the slack gradually and pull the truck forward with its winch. Power may be applied to the wheels at the same time.

Note. The vehicle's technical manual/technical order gives details on the operation.

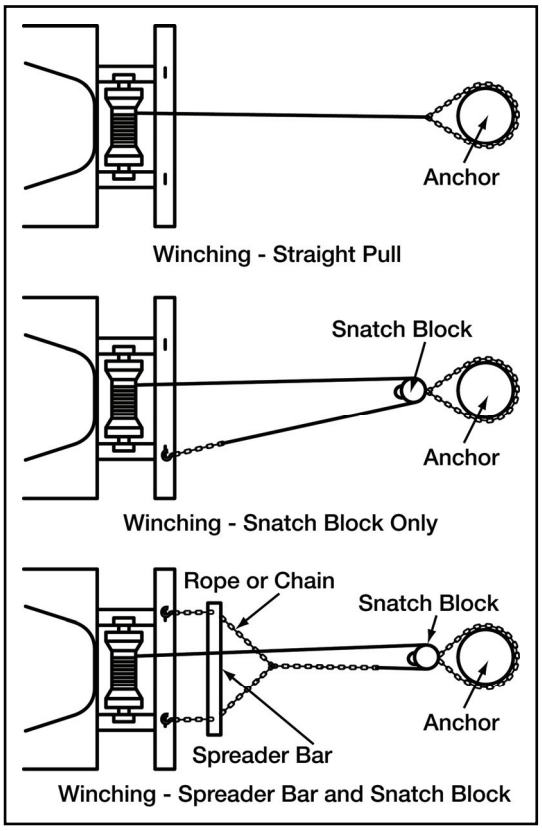

Figure D-2. Vehicle winching

SAFETY GUIDELINES

Cable

D-7. Recovery operations take time. Do not hurry. A broken winch line reacts like a whip. When hooking to a vehicle, use both shackles whenever possible so effort is applied equally and damage to the vehicle is

minimized. Always have the snatch block on the winch. A single line out stresses the cable so when in doubt- double line to save time and potential problems. Use the following guidelines:

- Never bend the wire cable at a sharp angle.
- Straighten out all kinks and twists while taking up the slack.
- Do not let the tracked vehicles run over the cable. Such abuse flattens the cable, exposes the Manila hemp core, and lets water enter, causing internal rust and weakening of the cable.
- After using the winch, have one person, or preferably two, pull back on the cable while it is wound slowly and evenly on the drum according to the appropriate vehicle TM. (One Soldier should watch the cable to ensure it spools correctly.)
- Keep the cable lubricated according to the vehicle lubrication order.

WARNING

Stand clear of a winch cable before it is tightened. A cable being tightened may break and whip back with enough force to seriously maim or kill. A stand off distance applied could be double the length of the exposed cable. If recovery vehicle with exposed windshield blocks the driver's position, raise the hood to protect the driver.

Shear Pin

D-8. When the winch is overloaded, the shear pin breaks to protect the cable. Use the following guidelines:

- Never use a makeshift shear pin of unknown strength to replace a broken pin. Too strong a pin may snap the cable and damage the winch. Use only authorized replacement pins.
- Do not depend on the shear pin for protection. Even with the proper pin installed, a kinked, damaged, or weakened cable may snap.

Note. Vehicles with electric winches have circuit breakers to protect the winch from overloading. Check the appropriate vehicle TM for details on its operation.

A-FRAME

D-9. Narrow ditches, slit trenches, and shell holes can quickly stop a vehicle. They are common obstacles to off-road movement and may be hard to see. If the front wheels should drop into one, the A-frame is a very useful recovery tool (figure D-3.) It is neither difficult to assemble nor complicated to use. Use the following procedure:

- Support the front end of the vehicle.
- Lash two 8-foot poles of sufficient diameter together near the top with a figure eight or girth knot.
- Dig two 10-to 12-inch holes 5 or 6 feet apart to hold the legs in position when power is applied.
- Rest the upper end of the A-frame on the hood of the truck with the legs in the anchor holes.
- Select a suitable anchor in front of the truck.
- Tie a line from the A-frame joint to the anchor, bringing the frame up to a position where the frame joint is directly over or slightly to the rear of the bumper.
- Move the winch line through a snatch block fastened to the A-frame joint and secure it to the front bumper.

- Winch up the front end of the truck until the wheels clear the ditch. Then slowly back the vehicle off to solid ground.
- When safely away from the edge of the ditch, lower the wheels and unhitch the rigging.

Note. If the vehicle has no winch, another vehicle may be used for power, though more rigging will be required.

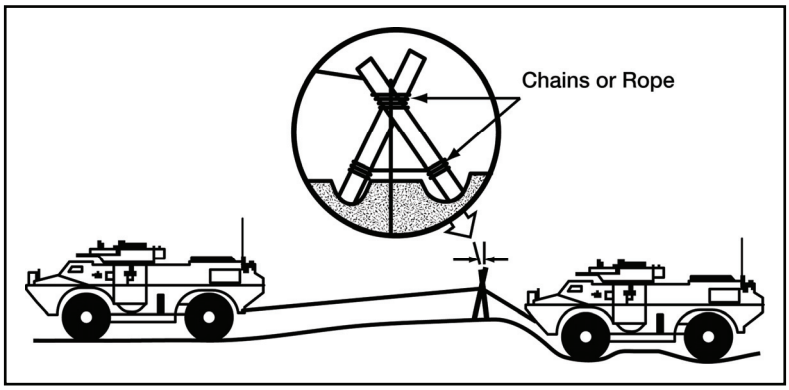

Figure D-3. A-frame supplying the lifting force

TIRE CHAIN SUBSTITUTES

D-10. Rope or tow chains can be wrapped around the wheels as tire chain substitutes. Fasten them securely, but leave enough slack around the tires to prevent damage. Remember, these are only temporary substitutes. Remove them as soon as possible.

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Appendix E

Firing Table Examples

Tables E-1 through E-38 are examples of firing tables. Figure E-1 is an axample of an ammunition requirements sheet and figures E-2 and E-3 are examples of scorecards.

Table E-1. M48 machine gun—ASV adjust/familiarization: battle position 3.1

Target	*Distance*	*Standard*	*Rounds*
Personnel RPG team	280 meters	Impact one burst	28 rounds
Vehicle BRDM flank	830 meters	Impact one burst	28 rounds
Personnel ATGM team	310 meters	Impact one burst	28 rounds
Vehicle motorcycle flank	940 meters	Impact one burst	28 rounds
Vehicle truck flank	1,260 meters	Impact one burst	28 rounds
Vehicle BRDM front	1,610 meters	Impact one burst	28 rounds
Vehicle truck flank (moving)	1,380 meters	Impact one burst	28 rounds
			196 rounds

Table E-2. M48 machine gun—ASV adjust/familiarization: battle position 3.7

Target	*Distance*	*Standard*	*Rounds*
Personnel full silhouette	300 meters	Impact one burst	28 rounds
Vehicle BRDM flank	960 meters	Impact one burst	28 rounds
Personnel partial silhouette	320 meters	Impact one burst	28 rounds
Vehicle BRDM flank	960 meters	Impact one burst	28 rounds
Vehicle truck front	1,300 meters	Impact one burst	28 rounds
Vehicle motorcycle flank	1,610 meters	Impact one burst	28 rounds
Vehicle BRDM flank (moving)	1,570 meters	Impact one burst	28 rounds
			196 rounds

Table E-3. MK-19 grenade launcher—ASV adjust/familiarization: battle position 3.1

Target	*Distance*	*Standard*	*Rounds*
Personnel RPG team	280 meters	Impact 2 rounds – 5 meters	6 TP
Vehicle BRDM flank	830 meters	Impact target 2 rounds	8 TP
Personnel ATGM Team	310 meters	Impact 2 rounds – 5 meters	6 TP
Vehicle motorcycle	940 meters	Impact 2 rounds – 5 meters	8 TP
Vehicle truck flank	1,260 meters	Impact 2 rounds – 15 meters	8 TP
Vehicle BRDM front	1,610 meters	Impact 2 rounds – 15 meters	8 TP
Vehicle truck flank (moving)	1,380 meters	Impact 2 rounds – 15 meters	8 TP
			52 TP

Table E-4. MK-19 grenade launcher—ASV adjust/familiarization: battle position 3.7

Target	*Distance*	*Standard*	*Rounds*
Personnel full silhouette	300 meters	Impact 2 rounds – 5 meters	6 TP
Vehicle BRDM flank	960 meters	Impact target 2 rounds	8 TP
Personnel partial silhouette	320 meters	Impact 2 rounds – 5 meters	6 TP
Vehicle BRDM flank	960 meters	Impact target 2 rounds	8 TP
Vehicle truck front	1,300 meters	Impact 2 rounds – 15 meters	8 TP
Vehicle motorcycle flank	1,610 meters	Impact 2 rounds – 15 meters	8 TP
Vehicle BRDM flank (moving)	1,570 meters	Impact 2 rounds – 15 meters	8 TP
			52 TP

Table E-5. M48 machine gun—day fire qualification: table I. battle position 3.1

Target	*Distance*	*Standard*	*Time*	*Rounds*
Vehicle BRDM frontal	860 meters	Impact one burst	25 seconds	14 rounds
Personnel RPG team	310 meters	Impact one burst	15 seconds	14 rounds
Vehicle truck flank	830 meters	Impact one burst	25 seconds	14 rounds
Vehicle motorcycle flank	980 meters	Impact one burst	25 seconds	14 rounds
Personnel RPG team/BRDM	310/830 meters	Impact one burst	45 seconds	21 rounds
Personnel ATGM/BRDM flank	280/850 meters	Impact one burst	45 seconds	28 rounds
Personnel RPG team/2 trucks	310/830/1,260 meters	Impact one burst	55 seconds	28 rounds
Vehicle moving truck frontal	1,570 meters	Impact one burst	35 seconds	21 rounds
				154 rounds

Table E-6. M48 machine gun—day fire qualification: table I. battle position 3.7

Target	*Distance*	*Standard*	*Time*	*Rounds*
Vehicle BRDM frontal	960 meters	Impact one burst	25 seconds	14 rounds
Personnel RPG team	320 meters	Impact one burst	15 seconds	14 rounds
Vehicle truck flank	1,050 meters	Impact one burst	25 seconds	14 rounds
Vehicle motorcycle flank	1,130 meters	Impact one burst	25 seconds	14 rounds
Personnel RPG / BRDM flank	320/930 meters	Impact one burst	45 seconds	21 rounds
Personnel ATGM / BRDM flank	300/960 meters	Impact one burst	45 seconds	28 rounds
Personnel RPG / truck front	320/1,130/1,300 meters	Impact one burst	55 seconds	28 rounds
Vehicle truck frontal (moving)	1,380 meters	Impact one burst	65 seconds	21 rounds
				154 rounds

Table E-7. M48 machine gun—CBRNE fire stationary targets: table II. firing point F

Targets	*Distance*	*Standard*	*Time*	*Rounds*
Vehicle truck flank	650 meters	Impact one burst	25 seconds	21 rounds
Vehicle BRDM frontal	800 meters	Impact one burst	25 seconds	21 rounds
Vehicle truck frontal	1,100 meters	Impact one burst	30 seconds	21 rounds
				63 rounds

Table E-8. M48 machine gun—CBRNE fire stationary targets: table II. firing point G

Targets	*Distance*	*Standard*	*Time*	*Rounds*
Vehicle truck flank	770 meters	Impact one burst	25 seconds	21 rounds
Vehicle BRDM frontal	930 meters	Impact one burst	25 seconds	21 rounds
Vehicle truck frontal	1,100 meters	Impact one burst	25 seconds	21 rounds
				63 rounds

Table E-9. M48 machine gun—night fire stationary targets: table III. firing point F

Target	*Distance*	*Standard*	*Time*	*Rounds*
Vehicle truck flank	650 meters	Impact one burst	25 seconds	21 rounds
Vehicle BRDM frontal	800 meters	Impact one burst	25 seconds	21 rounds
Vehicle truck frontal	1,100 meters	Impact one burst	35 seconds	21 rounds
				63 rounds

Table E-10. M48 machine gun—night fire stationary targets: table III. firing point G

Target	*Distance*	*Standard*	*Time*	*Rounds*
Vehicle truck flank	770 meters	Impact one burst	25 seconds	21 rounds
Vehicle BRDM frontal	930 meters	Impact one burst	25 seconds	21 rounds
Vehicle truck frontal	1,100 meters	Impact one burst	25 seconds	21 rounds
				63 rounds

Table E-11. MK-19 grenade launcher—day fire qualification: table I. battle position 3.1

Target	*Distance*	*Standard*	*Time*	*Rounds*
Personnel full silhouette	310 meters	2 rounds – 5 meters	60 seconds	4 rounds
Vehicle BRDM frontal	940 meters	Impact 2 rounds	90 seconds	6 rounds
Personnel RPG team	950 meters	2 rounds – 5 meters	60 seconds	4 rounds
Vehicle motorcycle flank	980 meters	2 rounds – 5 meters	120 seconds	6 rounds
Vehicle truck frontal	1,260 meters	2 rounds – 15 meters	120 seconds	6 rounds
Vehicle BRDM flank	1,470 meters	2 rounds – 15 meters	120 seconds	8 rounds
Vehicle truck front	1,610 meters	2 rounds – 15 meters	120 seconds	8 rounds
Vehicle moving truck frontal	1,380 meters	2 rounds – 15 meters	70 seconds	8 rounds
				50 rounds

Table E-12. MK-19 grenade launcher—day fire qualification: table I. battle position 3.7

Target	*Distance*	*Standard*	*Time*	*Rounds*
Personnel full silhouette	320 meters	2 rounds – 5 meters	60 seconds	4 rounds
Vehicle BRDM frontal	1,050 meters	Impact 2 rounds	90 seconds	6 rounds
Personnel RPG team	930 meters	2 rounds – 5 meters	60 seconds	4 rounds
Vehicle motorcycle flank	1,130 meters	2 rounds – 5 meters	120 seconds	6 rounds
Vehicle truck frontal	1,520 meters	2 rounds – 15 meters	120 seconds	6 rounds
Vehicle BRDM flank	1,610 meters	2 rounds – 15 meters	120 seconds	8 rounds
Vehicle truck front	1,230 meters	2 rounds – 15 meters	120 seconds	8 rounds
Vehicle truck frontal (moving)	1,570 meters	2 rounds – 15 meters	70 seconds	8 rounds
				50 rounds

Table E-13. MK-19 grenade launcher—CBRNE fire stationary targets: table II. firing point F

Target	*Distance*	*Standard*	*Time*	*Rounds*
Vehicle truck flank	650 meters	Impact 2 rounds	90 seconds	4 rounds
Vehicle BRDM flank	1,100 meters	Impact 2 rounds	20 seconds	6 rounds
Vehicle truck frontal	800 meters	Impact 2 rounds	120 seconds	6 rounds
				16 rounds

Table E-14. MK-19 grenade launcher—CBRNE fire stationary targets: table II. firing point G

Target	*Distance*	*Standard*	*Time*	*Rounds*
Vehicle truck flank	770 meters	Impact 2 rounds	90 seconds	4 rounds
Vehicle BRDM flank	930 meters	Impact 2 rounds	120 seconds	6 rounds
Vehicle truck frontal	1,100 meters	Impact 2 rounds	120 seconds	6 rounds
				16 rounds

Table E-15. MK-19 40-mm grenade launcher—night fire stationary targets: table III. firing point F

Target	*Distance*	*Standard*	*Time*	*Rounds*
Vehicle BRDM frontal	650 meters	Impact 2 rounds	120 seconds	4 rounds
Vehicle truck flank	1,100 meters	Impact 2 rounds	120 seconds	6 rounds
Vehicle truck frontal	800 meters	Impact 2 rounds	120 seconds	6 rounds
Vehicle BRDM frontal	1,410 meters	2 rounds – 15 meters	120 seconds	6 rounds
				22 rounds

Table E-16. MK-19 40-mm grenade launcher—night fire stationary targets: table III. firing point G

Target	*Distance*	*Standard*	*Time*	*Rounds*
Vehicle BRDM frontal	770 meters	Impact 2 rounds	120 seconds	4 rounds
Vehicle Truck flank	930 meters	Impact 2 rounds	120 seconds	6 rounds
Vehicle Truck frontal	1,100 meters	Impact 2 rounds	120 seconds	6 rounds
Vehicle BRDM frontal	1,420 meters	2 rounds – 15 meters	120 seconds	6 rounds
				22 rounds

Table E-17. Maneuver exercise—MK-19 40-mm grenade launcher and M48 machine gun: start point

Target	*Distance*	*Time*	*Rounds*
Personnel RPG team	300 meters	90 seconds	6 rounds – 40 mm
Vehicle BRDM frontal	840 meters	90 seconds	6 rounds – 40 mm

Table E-18. Maneuver exercise—MK-19 40-mm grenade launcher and M48 machine gun: firing point F

Target	*Distance*	*Time*	*Rounds*
Vehicle BRDM flank	900 meters	90 seconds	6 rounds – 40 mm
Vehicle truck frontal	1,110 meters	120 seconds	6 rounds – 40 mm

Table E-19. Maneuver exercise—MK-19 40-mm grenade launcher and M48 machine gun: firing point G

Target	*Distance*	*Time*	*Rounds*
Personnel RPG team	1,030 meters	120 seconds	21 rounds -. 50 cal.
Vehicle truck front	1,410 meters	120 seconds	21 rounds - .50 cal
Vehicle truck frontal (moving)	1,370 meters	65 seconds	8 rounds – 40 mm

Ammunition Requirements Sheet		
Range Table	M48 (.50 cal 4/1 mix)	MK-19 (40-mm TP)
Adjust/Familiarize	196	52
Table I Qualification	154	50
Table II CBRN	63	16
Table III Night	63	22
Table IV Combined	42	32
Totals	518	172
Total number of primary gunners X 518 = _____ Total number of assistant gunners X 196 = _____ Total of two lines above = _____ (.50 cal 4/1 mix)		
Total number of primary gunners X 172 = _____ Total number of assistant gunners X 52 = _____ Total of two lines above = _____ (40-mm TP)		
Requirements: ▪ Primary gunners fire full qualification twice yearly. ▪ Assistant gunners fire full qualification once yearly and the adjust/familiarize table once yearly.		

Figure E-1. Ammunition requirements sheet

Table E-20. M48 machine gun—ASV adjust/familiarization: battle position 1.1

Target	*Distance*	*Standard*	*Rounds*
Personnel RPG team	700 meters	Impact one burst on target	28 rounds
Vehicle BRDM flank	1,170 meters	Impact one burst on target	28 rounds
Personnel ATGM team	1,130 meters	Impact one burst on target	28 rounds
Vehicle truck flank	1,420 meters	Impact one burst on target	28 rounds
Vehicle truck flank	1,800 meters	Impact one burst on target	28 rounds
Vehicle BRDM front	1,470 meters	Impact one burst on target	28 rounds
Vehicle truck flank (moving)	1,280 meters	Impact one burst on target	28 rounds
			196 rounds

Table E-21. M48 machine gun—ASV adjust/familiarization: battle position 1.2

Target	*Distance*	*Standard*	*Rounds*
Personnel full silhouette	750 meters	Impact one burst on target	28 rounds
Vehicle BRDM flank	1,080 meters	Impact one burst on target	28 rounds
Personnel full silhouette	1,120 meters	Impact one burst on target	28 rounds
Vehicle BRDM flank	1,400 meters	Impact one burst on target	28 rounds
Vehicle truck front	1,820 meters	Impact one burst on target	28 rounds
Vehicle truck flank	1,420 meters	Impact one burst on target	28 rounds
Vehicle BRDM flank (moving)	1,180 meters	Impact one burst on target	28 rounds
			196 rounds

Table E-22. MK-19 grenade launcher—ASV adjust/familiarization: battle position 1.1

Target	*Distance*	*Standard*	*Rounds*
Personnel RPG team	700 meters	Impact target	6 TP
Vehicle BRDM flank	1,170 meters	Impact target	8 TP
Personnel ATGM team	1,130 meters	Impact target	6 TP
Vehicle truck flank	1,420 meters	Impact target	8 TP
Vehicle truck flank	1,800 meters	Impact target	8 TP
Vehicle BRDM front	1,470 meters	Impact target	8 TP
Vehicle truck flank (moving)	1,280 meters	Impact target	8 TP
			52 TP

Table E-23. MK-19 grenade launcher—ASV adjust/familiarization: battle position 1.2

Target	*Distance*	*Standard*	*Rounds*
Personnel full silhouette	750 meters	Impact target	6 TP
Vehicle BRDM flank	1,080 meters	Impact target	8 TP
Personnel full silhouette	1,120 meters	Impact target	6 TP
Vehicle BRDM flank	1,400 meters	Impact target	8 TP
Vehicle truck front	1,820 meters	Impact target	8 TP
Vehicle truck flank	1,420 meters	Impact target	8 TP
Vehicle BRDM flank (moving)	1,180 meters	Impact target	8 TP
			52 TP

Table E-24. M48 machine gun—day fire qualification: table I. battle position 1.1

Target	*Distance*	*Standard*	*Time*	*Rounds*
Vehicle BRDM flank	1,170 meters	Impact one burst on target	25 seconds	14 rounds
Personnel RPG team	1,130 meters	Impact one burst on target	25 seconds	14 rounds
Vehicle BRDM flank	1,170 meters	Impact one burst on target	25 seconds	14 rounds
Vehicle truck flank	1,420 meters	Impact one burst on target	25 seconds	14 rounds
Personnel RPG team/ BRDM Flank	1,130/1,170 meters	Impact one burst on target	45 seconds	21 rounds
Personnel ATGM team/ BRDM	700/1,120 meters	Impact one burst on target	45 seconds	28 rounds
Personnel RPG team/ 2 trucks	1,130/1,170/1,800 meters	Impact one burst on target	55 seconds	28 rounds
Vehicle moving truck flank	1,280 meters	Impact one burst on target	60 seconds	21 rounds
				154 rounds

Table E-25. M48 machine gun—day fire qualification: table I. battle position 1.2

Target	*Distance*	*Standard*	*Time*	*Rounds*
Vehicle BRDM flank	1,400 meters	Impact one burst on target	25 seconds	14 rounds
Personnel full silhouette	1,120 meters	Impact one burst on target	25 seconds	14 rounds
Vehicle BRDM flank	1,080 meters	Impact one burst on target	25 seconds	14 rounds
Vehicle BRDM flank	1,400 meters	Impact one burst on target	25 seconds	14 rounds
Personnel silhouette/ BRDM flank	1,120/1,080 meters	Impact one burst on target	45 seconds	21 rounds
Personnel silhouette/ BRDM flank	750/1,180 meters	Impact one burst on target	45 seconds	28 rounds
Personnel full silhouette/ 2 trucks	750/1,080/1,820 meters	Impact one burst on target	55 seconds	28 rounds
Vehicle moving BRDM flank	1,180 meters	Impact one burst on target	60 seconds	21 rounds
				154 rounds

Table E-26. M48 Machine gun—CBRN fire stationary targets: table II. battle position 1.1

Target	*Distance*	*Standard*	*Time*	*Rounds*
Vehicle BRDM flank	1,170 meters	Impact one burst on target	25 seconds	21 rounds
Vehicle Truck frontal	1,420 meters	Impact one burst on target	25 seconds	21 rounds
Vehicle BRDM frontal	1,470 meters	Impact one burst on target	30 seconds	21 rounds
				63 rounds

Table E-27. M48 Machine gun—CBRN fire stationary targets: table II. battle position 1.2

Target	*Distance*	*Standard*	*Time*	*Rounds*
Vehicle BRDM flank	1,180 meters	Impact one burst on target	25 seconds	21 rounds
Vehicle BRDM flank	1,420 meters	Impact one burst on target	25 seconds	21 rounds
Vehicle truck frontal	1,470 meters	Impact one burst on target	30 seconds	21 rounds
				63 rounds

Table E-28. M48 machine gun—night fire stationary targets: table III. battle position 1.1

Target	*Distance*	*Standard*	*Time*	*Rounds*
Vehicle truck flank	1,170 meters	Impact one burst on target	25 seconds	21 rounds
Vehicle BRDM frontal	1,420 meters	Impact one burst on target	25 seconds	21 rounds
Vehicle BRDM frontal	1,410 meters	Impact one burst on target	35 seconds	21 rounds
				63 rounds

Table E-29. M48 machine gun—night fire stationary targets: table III. battle position 1.2

Target	*Distance*	*Standard*	*Time*	*Rounds*
Vehicle truck flank	1,180 meters	Impact one burst on target	25 seconds	21 rounds
Vehicle BRDM frontal	1,420 meters	Impact one burst on target	25 seconds	21 rounds
Vehicle truck frontal	1,470 meters	Impact one burst on target	35 seconds	21 rounds
				63 rounds

Table E-30. MK-19 grenade launcher—day fire qualification: table I. battle position 1.1

Target	*Distance*	*Standard*	*Time*	*Rounds*
Personnel RPG team	700 meters	2 rounds – 5 meters	45 seconds	4 rounds
Vehicle BRDM frontal	1,430 meters	2 rounds – 15 meters	50 seconds	6 rounds
Personnel RPG team	1,130 meters	2 rounds – 15 meters	45 seconds	4 rounds
Vehicle truck flank	1,420 meters	2 rounds – 15 meters	60 seconds	6 rounds
Vehicle BRDM flank	1,170 meters	2 rounds – 15 meters	60 seconds	6 rounds
Vehicle BRDM front	1,470 meters	2 rounds – 15 meters	60 seconds	8 rounds
Vehicle truck flank	1,800 meters	2 rounds – 15 meters	60 seconds	8 rounds
Vehicle moving truck flank	1,280 meters	2 rounds – 15 meters	60 seconds	8 rounds
				50 rounds

Table E-31. MK-19 grenade launcher—day fire qualification: table I. battle position 1.2

Target	*Distance*	*Standard*	*Time*	*Rounds*
Personnel full silhouette	750 meters	2 rounds -5 meters	45 seconds	4 rounds
Vehicle BRDM frontal	1,080 meters	Impact 2 rounds	50 seconds	6 rounds
Personnel RPG team	1,120 meters	2 rounds -15 meters	45 seconds	4 rounds
Vehicle truck front	1,320 meters	2 rounds -15 meters	60 seconds	6 rounds
Vehicle BRDM flank	1,400 meters	2 rounds -15 meters	60 seconds	6 rounds
Vehicle truck front	1,820 meters	2 rounds -15 meters	60 seconds	8 rounds
Vehicle truck flank	1,420 meters	2 rounds -15 meters	60 seconds	8 rounds
Vehicle moving truck flank	1,180 meters	2 rounds -15 meters	60 seconds	8 rounds
				50 rounds

Table E-32. MK-19 grenade launcher—CBRNE fire stationary targets: table II. battle position 1.1

Target	*Distance*	*Standard*	*Time*	*Rounds*
Vehicle BRDM flank	1,170 meters	2 rounds -15 meters	60 seconds	4 rounds
Vehicle Truck flank	1,420 meters	2 rounds -15 meters	45 seconds	6 rounds
Vehicle BRDM frontal	1,470 meters	2 rounds -15 meters	45 seconds	6 rounds
				16 rounds

Table E-33. MK-19 grenade launcher—CBRN fire stationary targets: table II. battle position 1.2

Target	*Distance*	*Standard*	*Time*	*Rounds*
Vehicle BRDM flank	1,180 meters	2 rounds -15 meters	60 seconds	4 rounds
Vehicle BRDM flank	1,420 meters	2 rounds -15 meters	45 seconds	6 rounds
Vehicle truck frontal	1,470 meters	2 rounds -15 meters	45 seconds	6 rounds
				16 rounds

Table E-34. MK-19 grenade launcher—night fire stationary targets: table III. battle position 1.1

Target	*Distance*	*Standard*	*Time*	*Rounds*
Vehicle BRDM flank	1,170 meters	2 rounds -15 meters	50 seconds	4 rounds
Vehicle Truck flank	1,470 meters	2 rounds -15 meters	60 seconds	6 rounds
Vehicle BRDM frontal	1,430 meters	2 rounds -15 meters	60 seconds	6 rounds
Vehicle BRDM frontal	1,420 meters	2 rounds -15 meters	45 seconds	6 rounds
				22 rounds

Table E-35. MK-19 grenade launcher—night fire stationary targets: table III. battle position 1.2

Target	*Distance*	*Standard*	*Time*	*Rounds*
Vehicle BRDM flank	1,170 meters	2 rounds -15 meters	50 seconds	4 rounds
Vehicle truck flank	1,470 meters	2 rounds -15 meters	60 seconds	6 rounds
Vehicle truck frontal	1,430 meters	2 rounds -15 meters	60 seconds	6 rounds
Vehicle BRDM frontal	1,420 meters	2 rounds -15 meters	45 seconds	6 rounds
				22 rounds

Table E-36. Maneuver exercise—MK-19 40-mm grenade launcher and M48 .50 caliber machine gun: start point–battle position 2

Target	*Distance*	*Time*	*Rounds*
Personnel RPG team	400 meters	60 seconds	42 rounds.50 cal

Table E-37. Maneuver exercise—MK-19 40-mm grenade launcher and M48 .50 caliber machine gun: start point–battle position 3

Target	*Distance*	*Time*	*Rounds*
Vehicle BRDM flank	1,200 meters	60 seconds	9 rounds 40 mm
Vehicle truck frontal	1,180 meters	60 seconds	8 rounds 40 mm

Table E-38. Maneuver exercise—MK-19 40-mm grenade launcher and M48 .50 caliber machine gun: start point–battle position 4

Target	*Distance*	*Time*	*Rounds*
Vehicle truck frontal	750 meters	60 seconds	6 rounds 40 mm
Vehicle moving truck frontal	1,080 meters	60 seconds	10 rounds 40 mm

M1117 ASV—Machine Gun Scorecard for M48

NAME (Last, First, Middle Initial) | SSN | GRADE | UNIT | DATE

Table I - Day Fire

TASK	RANGE	TIME	RDS	HIT	MISS
1	860	25	14		
2	310	15	14		
3	830	25	14		
4	980	25	14		
5	310 830	45	21		
6	280 850	45	28		
7	310 830 1260	55	28		
8	1570	35	21		
TOTALS			154		

Table II - CBRN Fire

TASK	RANGE	TIME	RDS	HIT	MISS
1	650	35	21		
2	800	35	21		
3	1100	40	21		
TOTALS			63		

Table III - Night Fire

TASK	RANGE	TIME	RDS	HIT	MISS
1	650	35	21		
2	800	35	21		
3	1100	40	21		
TOTALS			63		

- Qualification is based on table I, day firing only.
- Table I is scored on total targets hit and requires a minimum of 8 target hits out of 12 targets to qualify. The standard for table I is shown below.
- Table II and table III are scored as GO/NO-GO events. Table II and table III require two target hits out of three to score a GO.

Table I		
Total Hits	Total Miss	Rating

Table II	
Targets Hit	GO/NO-GO

Table III	
Targets Hit	GO/NO-GO

OIC SIGNATURE: | SCORER: | FIRER:

Table I Scoring

Expert	11-12
Gunner First Class	9-10
Gunner Second Class	8
Unqualified	7 and Below

Figure E-2. Machine gun scorecard for M48

M1117 ASV—Grenade Launcher Scorecard for MK-19

NAME (Last, First, Middle Initial)	SSN	GRADE	UNIT	DATE

Table I - Day Fire

TASK	RANGE	TIME	RDS	HIT	GO/NO GO
1	300	60	4		
2	1000	90	6		
3	950	60	4		
4	1050	120	6		
5	1300	45	6		
6	1500	120	8		
7	1400	120	8		
8	1500	65	8		
Totals			50		

Table II - CBRN Fire

TASK	RANGE	TIME	RDS	HIT	MISS
1	650	90	4		
2	800	120	6		
3	1100	120	6		
Totals			16		

Table III - Night Fire

TASK	RANGE	TIME	RDS	HITS	MISS
1	650	120	4		
2	800	120	6		
3	1100	120	6		
4	1400	120	6		
Totals			22		

- Qualification is based on table I, day firing only.
- Table I is scored on total targets hit and requires a minimum of 5 target hits out of 8 targets to qualify. The standard for table I is shown below.
- Table II and table III are scored as GO/NO-GO events. Table II requires two target hits out of three targets. Table III requires three target hits out of four targets.
- Target hit standards: Point targets ? 1000 meters within 5 meters of troops or direct hit on vehicle targets. Area targets > 1000 meters within 15 meters of troops or vehicle targets.

Table I

Total Hits	Total Miss	Rating

Table II

Targets Hit	GO/NO-GO

Table III

Targets Hit	GO/NO-GO

OIC SIGNATURE: SCORER: FIRER:

Table I Scoring

Distinguished	7-8
Qualified	5-6
Unqualified	4 and below

Figure E-3. Grenade launcher scorecard for MK-19

Glossary

SECTION I – ACRONYMS AND ABBREVIATIONS

AA	assembly area
ADA	air defense artillery
AOR	area of responsibility
APC	armored personnel carriers
ASIP	advanced system improvement program
ASV	armored security vehicle
AT	antitank
ATGM	antitank guided missile
BCT	brigade combat team
BOT	burst on target
CBRN	chemical, biological, radiological, and nuclear
CP	checkpoint
CS	combat support
CSS	combat service support
CTIS	central tire inflation system
CVC	combat vehicle crewman
ECR	effective casualty radius
EPW	enemy prisoner of war
FIST	fire support team
FM	field manual
FOV	field of vision
FPL	final protective line
ft	feet
GPM	gallon per minute
HB	heavy bore
HE/DP	high explosive/dual purpose
HEAT	high-explosive antitank
HMMWV	high-mobility multipurpose wheeled vehicle
HRP	high risk personnel
IED	improvised explosive device
IPB	intelligence preparation of the battlefield
IS&R	intelligence, surveillance, and reconnaissance
LCE	load-carrying equipment
LD	line of departure
LVOSS	light vehicle obscurant smoke system

m	mils
MEL	maximum engagement line
METT-TC	mission, enemy, time, terrain and weather, troops and support available, civil considerations
mm	millimeter
MP	military police
mph	miles per hour
MSR	main supply route
NAI	named area of interest
NCO	noncommissioned officer
NVG	night vision goggle
OP	observation post
OPORD	operation order
ORP	ojective rally point
PC	personnel carrier
PDF	principal direction of fire
PIR	priority information requirements
PL	phase lines
r	range
ROE	rules of engagement
RP	release point
RPG	rocket propelled grenade
SALUTE	size, activity, location, unit, time, equipment
SAW	squad automatic weapon
SINCGARS	single channel, ground to air radio system
SITREP	situation report
SOP	standing operating procedure
SP	start point
sqd	squad
STANO	surveillance, target acquisition, and night observation
TCF	tactical combat force
tm	team
TM	technical manual
TNT	trinitrotoluene
TOT	tracer on target
TP	target practice
TRADOC	United States Army Training and Doctrine Command
TRP	target reference point
TTP	tactics, techniques, and procedures
U.S.	United States
UAV	unmanned aerial vehicle

UGWS	up-gun weapons station
USACIDC	United States Army Criminal Investigative Division Command
VBIED	vehicle borne improvised explosive device
VIP	very important person
w	width
WRP	weapons reference point

SECTION II – TERMS

BMP	(*Boyevaya Mashina Pekhoty)* (Боевая Машина Пехоты) combat vehicle of the infantry
BRDM	(Boyevaya Razvedyvatelnaya Dozornaya Mashina) (Боевая Разведывательная Дозорная Машина) combat reconnaissance/patrol vehicle
BTR	(Bronetransporter) (БТР, Бронетранспортер) armored transporter

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References

SOURCES USED

The following lists the sources quoted or paraphrased in this publication.

AR 190-8. *Enemy Prisoners of War, Retained Personnel, Civilian Internees and Other Detainees {OPNAVINST 3461.6; AFJI 31- 304; MCO 3461-1}. 1 October 1997.*

AR 190-11. *Physical Security of Arms, Ammunition and Explosives*. 12 February 1998.

AR 190-12. *Military Police Working Dogs*. 30 September 1993.

AR 190-14. *Carrying of Firearms and Use of Force for Law Enforcement and Security Duties*. 12 March 1993.

DA Form 2028. *Recommended Changes to Publications and Blank Forms*.

DA Form 5517-R. *Standard Range Cards (LRA).*

DA Pamphlet 190-12. *Military Working Dog Program*. 30 September 1993.

DA Pamphlet 190-51. *Risk Analysis for Army Property*. 30 September 1993.

FM 2-11. *First Aid for Soldiers*. 27 October 1988.

FM 3-3. *Chemical and Biological Contamination Avoidance {FMFM 11-17}*.16 November 1992.

FM 3-4. *NBC Protection {FMFM 11-9}*. 29 May 1992.

FM 3-5. *NBC Decontamination {MCWP 3-37.3}*. 28 July 2000.

FM 3-6. *Field Behavior of NBC Agents (Including Smoke and Incendiaries*) {AFM 105-7; FMFM 7-11-H}. 3 November 1986.

FM 3-19.1. *Military Police Operations*. 22 March 2001.

FM 3-19.12. Protective Services. 11 August 2004.

FM 3-19.30. *Physical Security*. 8 January 2001.

FM 3-19.40. *Interment/Resettlement Operations*. 1 August 2001.

FM 3-34.2. *Combined-Arms Breaching Operations*. 31 August 2000.

FM 5-0. *Army Planning and Orders Production*. 20 January 2005.

FM 5-170. *Engineer Reconnaissance*. 5 May 1998.

FM 6-0. *Mission Command: Command and Control of Army Forces.* 11 August 2003.

FM 6-30. *Tactics, Techniques, and Procedures for Observed Fire*. 16 July 1991.

FM 7-8. *Infantry Rifle Platoon and Squad*. 22 April 1992.

FM 7-10. *The Infantry Rifle Company*. 14 December 1990.

FM 17-95. *Cavalry Operations*. 24 December 1996.

FM 17-98. *Scout Platoon*. 10 April 1999.

FM 19-10. *The Military Police Law and Order Operations*. 30 September 1987.

FM 19-15. *Civil Disturbances*. 25 November 1985.

FM 19-25. *Military Police Traffic Operations*. 30 September 1977.

FM 20-32. *Mine/Countermine Operations*.29 May 1998.

FM 21-26. *Map Reading and Land Navigation*. 7 May 1993.

FM 21-60. *Visual Signals*. 30 September 1987.

FM 21-75. *Combat Skills of the Soldier*. 3 August 1984.
FM 23-25. *Light Antiarmor Weapons*. 17 August 1994.
FM 25-100. *Training the Force*. 15 November 1988.
FM 25-101. *Battle Focused Training*. 30 September 1990.
FM 27-10. *The Law of Land Warfare*. 18 July 1956.
FM 34-2. *Collection Management and Synchronization Planning*. 8 March 1994.
FM 34-130. *Intelligence Preparation of the Battlefield*. 8 July 1994.
FM 41-10. *Civil Affairs Operations*. 14 February 2000.
FM 44-8. *Combined Arms for the Air Defense*. 1 June 1999.
FM 55-10. *Movement Control*. 9 February 1999.
FM 55-20. *Rail Transport in a Theater of Operations*. 1 June 2000.
FM 90-10-1. *An Infantryman's Guide to Combat in Built-Up Areas*. 12 May 1993.
FM 90-40. *Multiservice Procedures for the Tactical Employment of Nonlethal Weapons (NLP)(S&I, CDR, USATSC, ATTN: ATIC-TMSD-T (Bldg {MCRP 3-15.8; NWP 3-07-31; USCG Pub 3-07.31}*. 6 October 1998.
FM 100-14. *Risk Management*. 23 April 1998.
FM 101-5. *Staff Organization and Opera*tions.31 May 1997.
FM 101-5-1. *Operational Terms and Graphics {MCRP 5-2A}*. 30 September 1997.

TC 25-10. *A Leader's Guide to Lane Training*. 26 August 1996.

DOCUMENTS NEEDED

These documents must be available to the intended users of this publication.

None

READINGS RECOMMENDED

These readings contain relevant supplemental information.

None

Index

FM 3-19.6
24 May 2006

By order of the Secretary of the Army:

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