

APPENDIX H CREW DRILLS

The purpose of a crew drill is to build precision, speed, skill, and teamwork in checking equipment, placing the MK 19 into and out of action, and moving the MK 19 to a new position. The main goal is achieved by following prescribed procedures. Precision, speed, skill, and teamwork grow with practice. During the crew drill, all oral and visual signals are repeated. Once crewmembers can perform their duties well, they rotate to allow each member of the crew to learn the duties of others. The ground-mounted MK 19 has three crewmembers: the gunner, the assistant gunner, and the ammunition bearer. The vehicle-mounted MK 19 also has three crewmembers: the squad leader, the gunner, and the driver. Normally the crew is not required to carry the MK 19 and ammunition over long distances. A vehicle usually carries the crew, ammunition, and equipment to the firing position. The terrain and the enemy situation dictate how close the vehicle may be brought to the firing position.

H-1. CREW EQUIPMENT AND DRILL AREA

Dismounted crew drills are conducted with a gunner, assistant gunner, and ammunition bearer. For drills involving a vehicle, the squad leader, gunner, and driver are crewmembers. In addition to individual weapons and equipment, each crewmember for dismounted drills carries specific equipment used with the tripod-mounted MK 19 (Table H-1).

CREW MEMBER	SUGGESTED MINIMUM EQUIPMENT
Gunner	MK 19, binoculars, and compass
Assistant Gunner	M3 tripod, MK 64 gun cradle, with T&E mechanism attached
Ammunition Bearer	One box of ammunition

Table H-1. Equipment.

A crew drill is conducted in an area large enough to allow crewmembers to move freely with equipment and without interfering with the movements of other crewmembers.

WARNING

Each soldier must wear all the protective equipment required by range safety regulations. This may include helmet, earplugs, and protective vest.

H-2. FORMATION FOR CREW DRILL

To form the crew for crew drill, the leader commands FORM FOR CREW DRILL. Upon hearing the leader's command, the crew repeats the command and forms into a column, five paces apart, in the following order: assistant gunner, gunner, and ammunition bearer (Figure H-1).

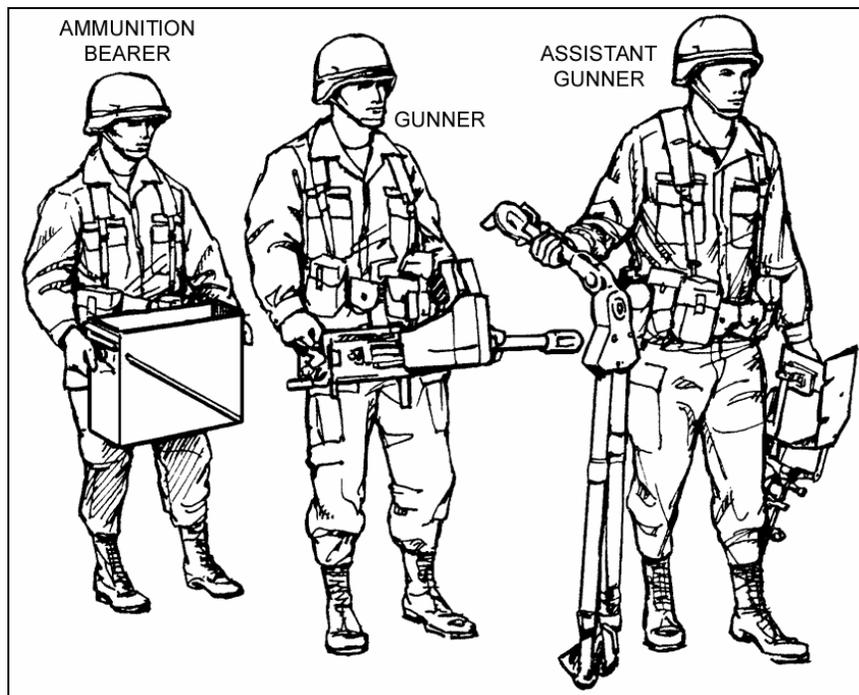


Figure H-1. Three-man MK 19 crew.

Each crewmember carries the following equipment in the specified manner:

- The assistant gunner carries the tripod, with the front leg positioned at a 60-degree angle and the trail legs collapsed, in his right hand; he carries the gun cradle, with the T&E mechanism attached, in his left hand.
- The gunner carries the MK 19, binoculars, and compass.
- The ammunition bearer carries one can of ammunition.

H-3. INSPECTION OF EQUIPMENT

The leader commands CHECK EQUIPMENT. All crewmembers repeat the command and inspect the components. The equipment is inspected and verified by the following crewmembers.

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- a. The assistant gunner inspects the M3 tripod, gun cradle, and T&E mechanism and ensures:
 - (1) The indexing levers and clamps on the front and trail legs work, and that the legs are in the “short (low)” position.
 - (2) The front leg is placed at a 60-degree angle and the trail legs are closely folded and the front leg clamp is tight.
 - (3) The sleeve lock latch and pintle lock release cam work.
 - (4) The pintle bushing is clean and has no burrs.
 - (5) The cradle pintle is clean, and all pins and bolts are seated.
 - (6) The T&E mechanism is centered.
 - b. The gunner inspects the MK 19 and ensures:
 - (1) The weapon is clean.
 - (2) The bolt is forward, the top cover is closed, and the weapon is on S (SAFE).
 - (3) The charger handles are forward and locked in the “up” position.
 - (4) The binocular lenses are clean and the focus mechanism works.
 - (5) The compass magnetic arrow and bezel ring work freely.
 - c. The ammunition bearer inspects the ammunition and ensures:
 - (1) The correct type of ammunition is on hand.
 - (2) The ammunition can is dent-free.
 - (3) All ogives are tight and the ammunition is clean.
 - d. The crewmembers report when the inspections are finished in the following manner:
 - (1) The ammunition bearer reports “Ammunition correct,” or any defects.
 - (2) The gunner reports “Gun and ammunition correct,” or any defects.
 - (3) The assistant gunner reports, “All correct,” or any defects.

H-4. PLACING THE MK 19 INTO ACTION

The leader commands and signals GUN TO BE MOUNTED, and points to the position where the gun is to be mounted; FRONT, and points in the direction of fire; ACTION, and indicates with his fist the MK 19’s direction in the chosen position. Crewmembers take the following steps to place the gun into operation.

- a. The assistant gunner:
 - (1) Drags the tripod to the firing position by its front leg with his right hand, and carries the gun cradle with the T&E mechanism attached in his left hand.
 - (2) When he arrives at the firing position, aligns the front tripod leg for direction and, with one quick motion, snaps the trail legs apart. This action makes the sleeve lock-latch snap in place (Figure H-2).
 - (3) Stamps each leg into the ground and secures the gun cradle to the tripod by using the pintle lock release cam (Figure H-3).
 - (4) Secures the T&E mechanism to the tripod, by locking the traversing slide lock lever (Figure H-4).
 - (5) Helps the gunner mount and load the MK 19.

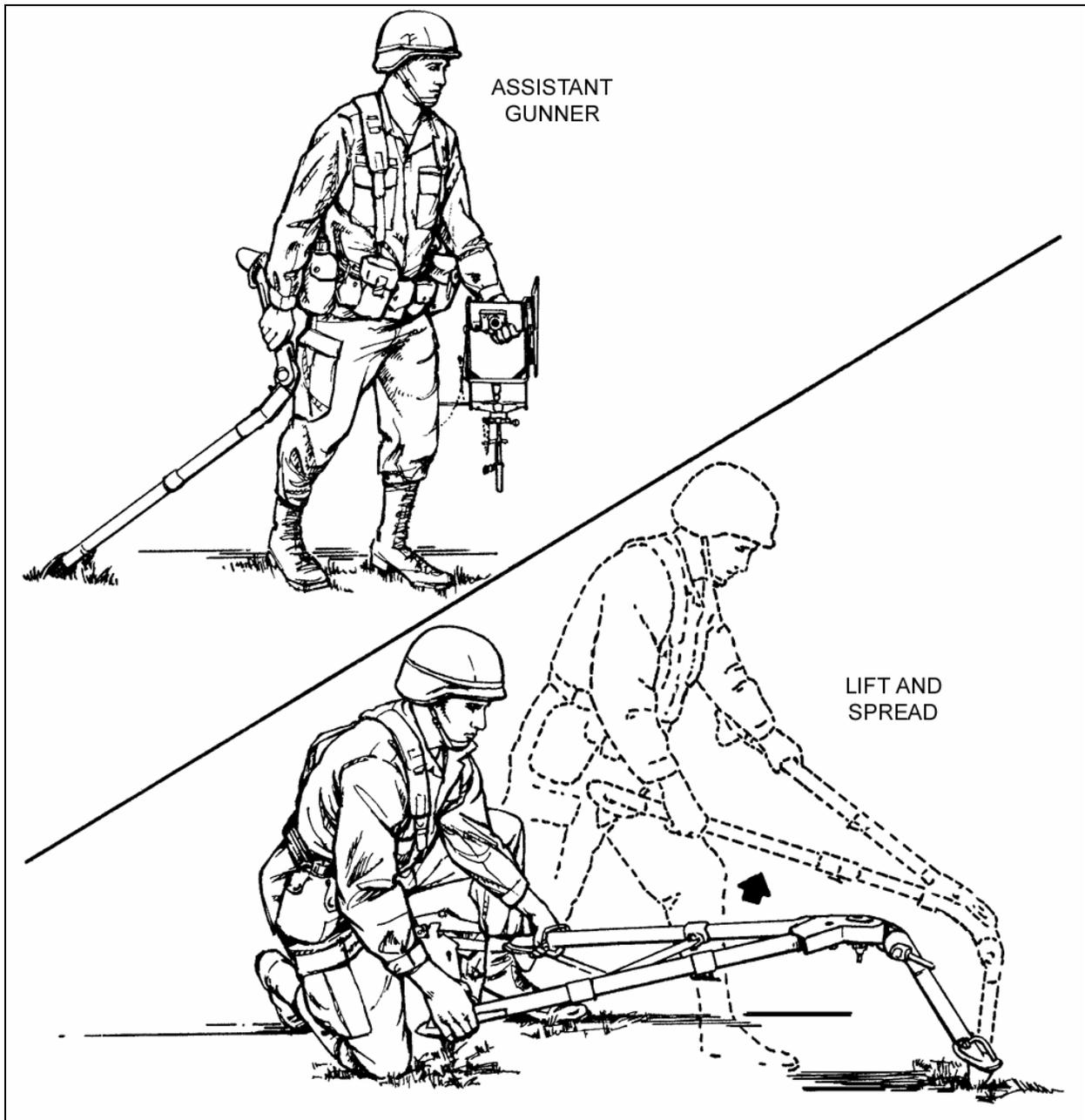


Figure H-2. Positioning the tripod.

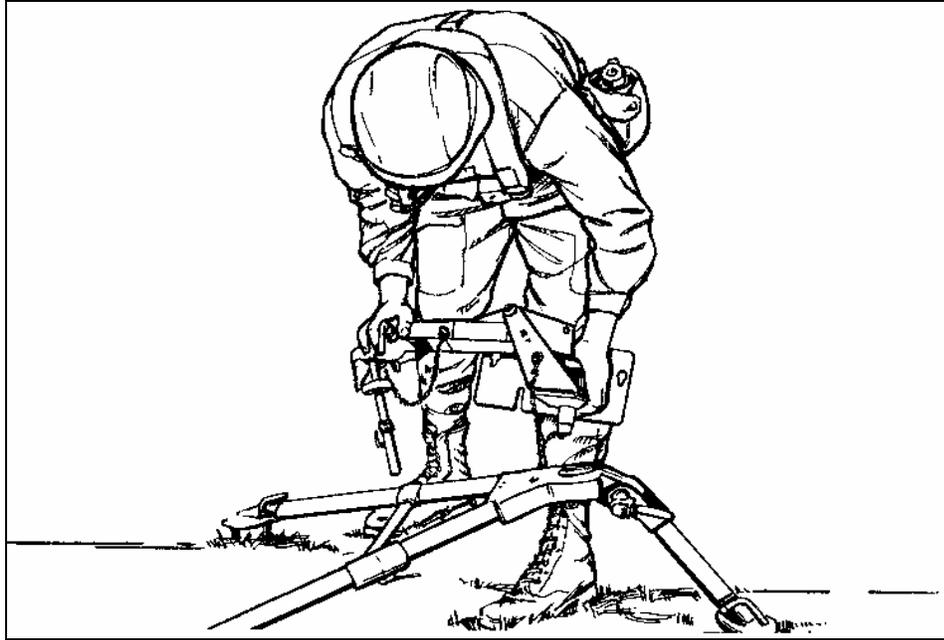


Figure H-3. Mounting the MK 19 mount on the tripod.

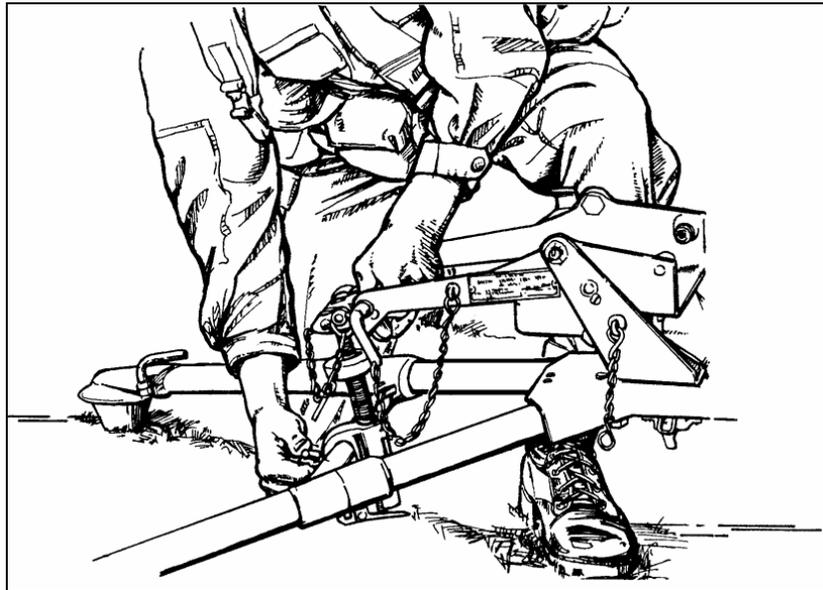


Figure H-4. Securing the T&E mechanism.

- b. The gunner:
- (1) Carries the MK 19 receiver to the tripod, with the barrel in his left hand, and the control grip in his right hand (Figure H-5).
 - (2) At the tripod, the assistant gunner grasps the barrel while the gunner holds the grips.

(3) The gunner and assistant gunner align the grooves on the receiver with the lugs in the gun cradle, and slide the receiver forward (Figure H-6).

(4) Secures the rear of the weapon by inserting the retaining pin through the cradle and sear assembly (Figure H-7).



Figure H-5. Gunner moving into position.

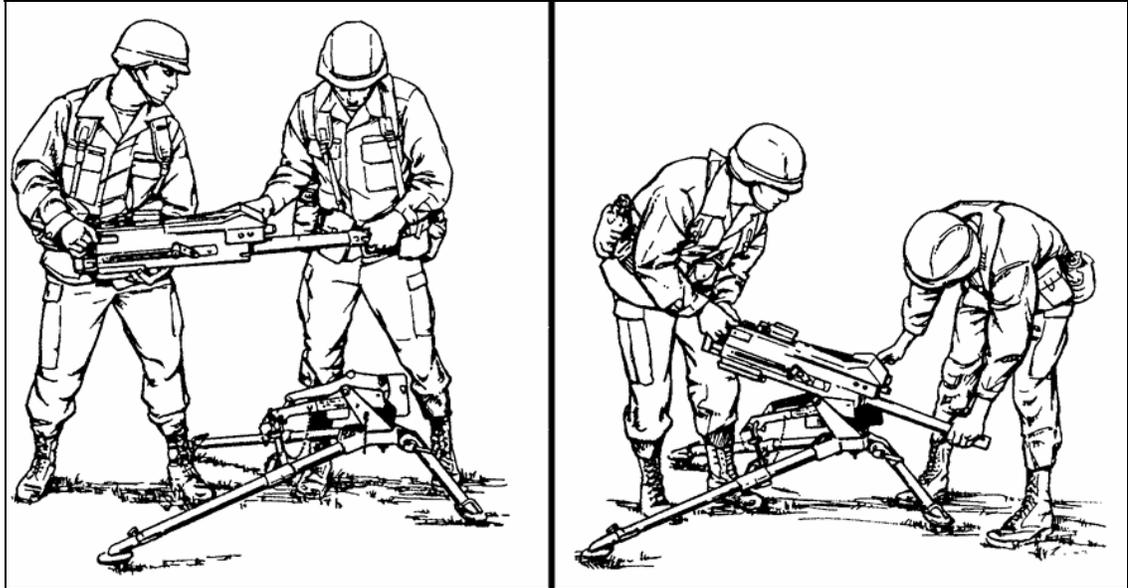


Figure H-6. Placing the MK 19 in the cradle.

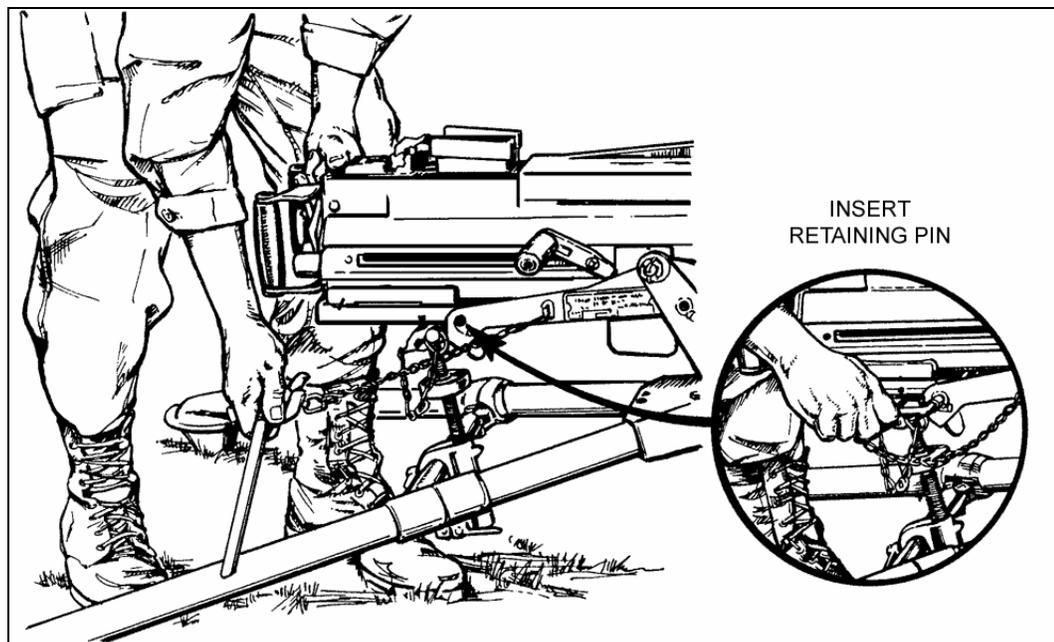


Figure H-7. Securing the MK 19 to the cradle.

- c. The ammunition bearer:
- (1) Carries the ammunition can to the MK 19 position (Figure H-8).
 - (2) Takes the lid off and ensures the ogive ends of the rounds are pointed downrange (Figure H-9).
 - (3) Gives the can to the assistant gunner.
 - (4) Returns to the ammunition point and stands by to do whatever is needed to complete the mission.



Figure H-8. Ammunition bearer with ammunition can.

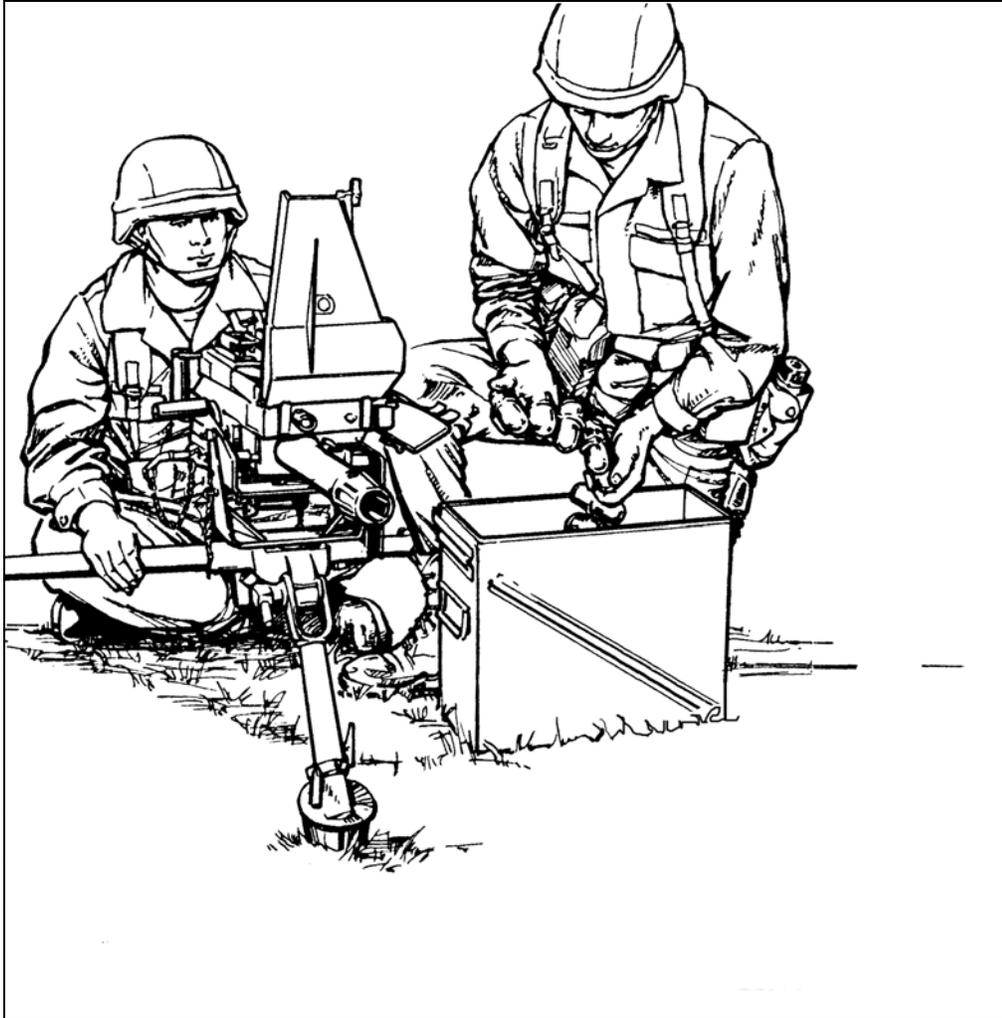


Figure H-9. Alignment of ammunition belt.

d. The gunner opens the top cover. The assistant gunner inserts the first round into the feeder (female link first), pushes the first round across the primary feed pawl (Figure H-10), and moves the feed slide assembly to the left by pushing the secondary drive lever to the right (Figure H-11).

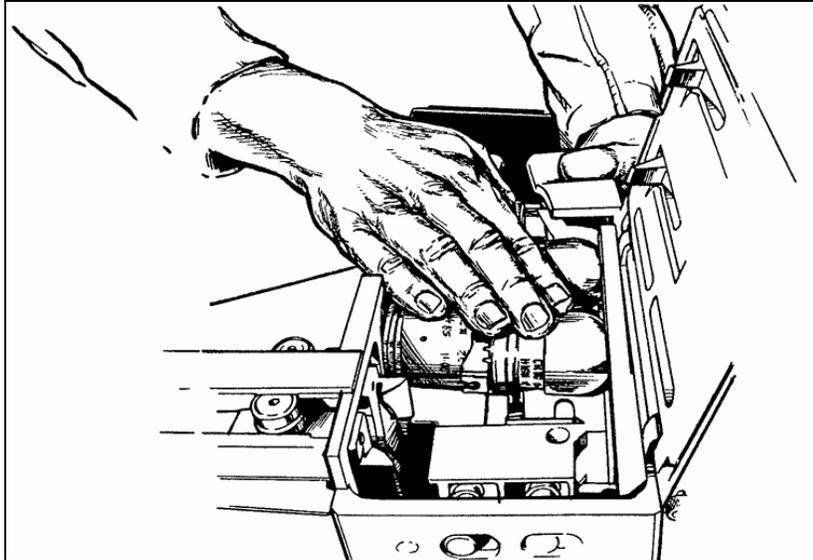


Figure H-10. Placement of the round across the primary feed pawl.

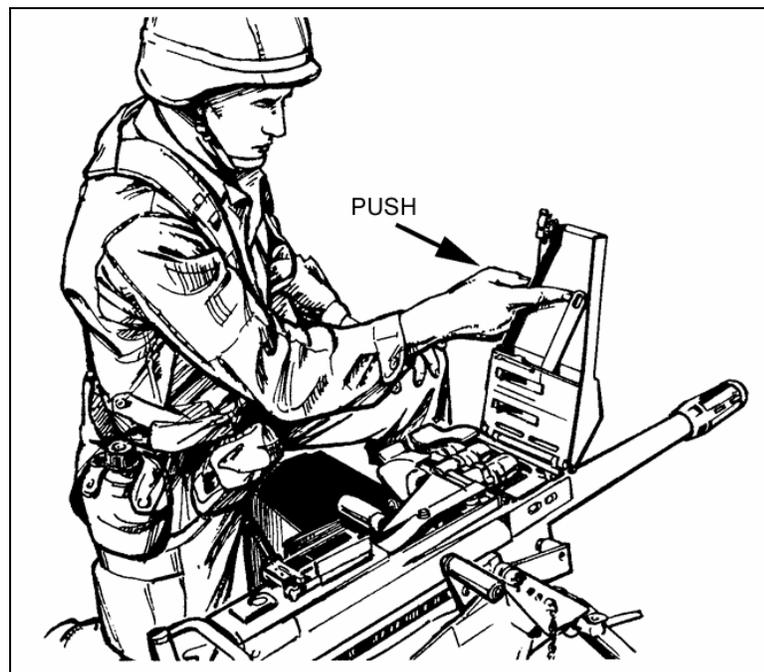


Figure H-11. Feed slide assembly moved to the left.

e. The gunner closes the top cover and charges the weapon (Figure H-12). The gunner presses the trigger, which places the lead round in the bolt extractor. He charges the weapon a second time, forcing the lead round from the bolt extractors into the bolt fingers. The weapon is ready to fire. When the assistant gunner raises the rear sight, the gunner calls "Up" (Figure H-13).

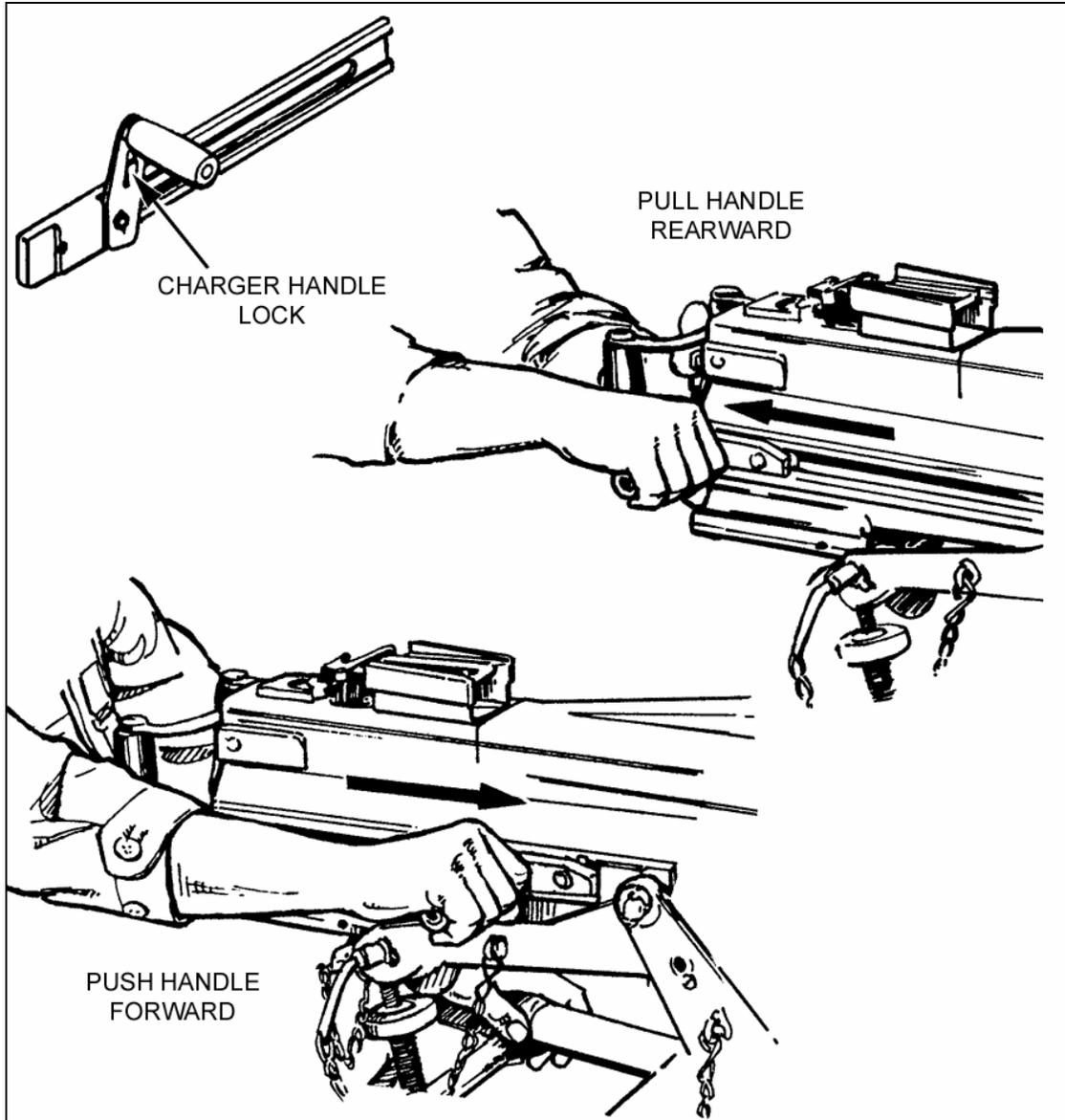


Figure H-12. Gunner charging the MK 19.

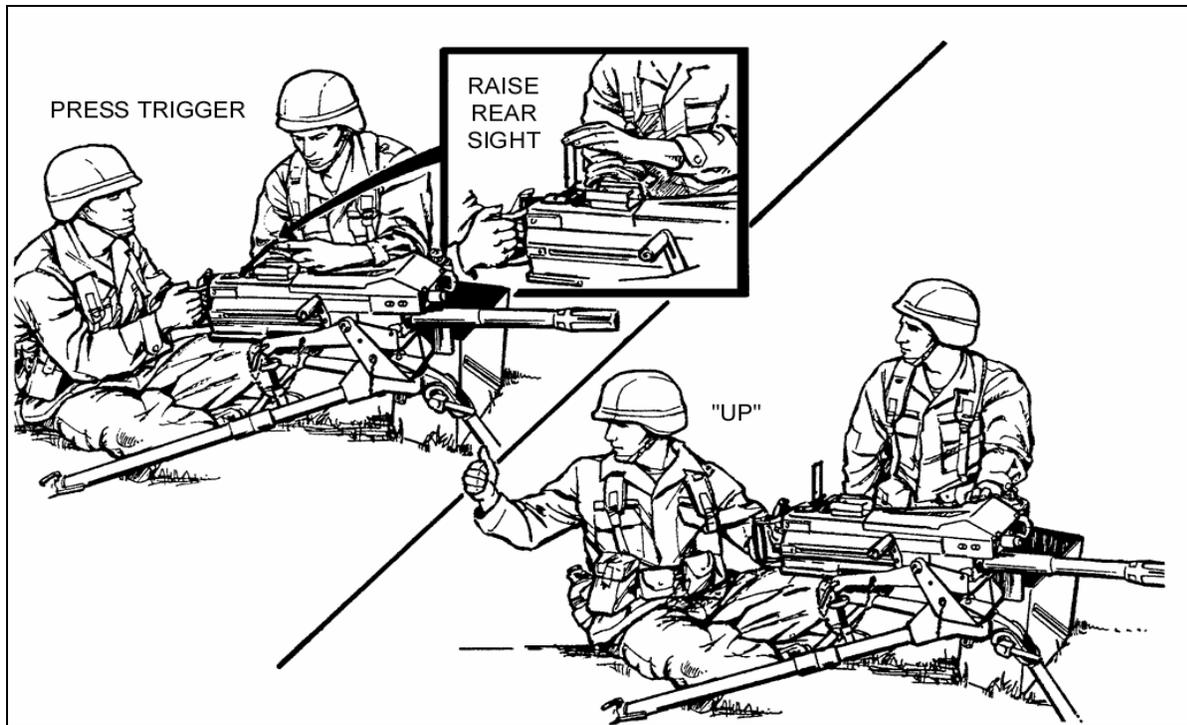


Figure H-13. Raising the rear sight.

H-5. TAKING THE MK 19 OUT OF ACTION

To take the gun out of action, the leader commands OUT OF ACTION. Each crewmember accomplishes the following in sequence.

a. The gunner raises the top cover of the MK 19. The assistant gunner releases the ammunition belt from the feed tray and places it in the ammunition can. The gunner takes the round or spent cartridge case from the bolt fingers, places it in the ammunition can, and closes the top cover.

b. The assistant gunner releases the MK 19 from the gun cradle. The gunner lifts the MK 19 off the mount and moves to a position 10 paces behind the tripod. He places the MK 19 on the ground in front of him with the flash suppressor to the left and with the sights on the top.

c. Once the gunner has moved away from the tripod, the assistant gunner:

- (1) Releases the T&E mechanism and takes off the gun cradle/ T&E mechanism.
- (2) Releases the tripod sleeve lock latch.
- (3) Grasps the front leg and rotates the tripod to a vertical position.
- (4) Releases the sleeve latch, and collapses the trail legs.
- (5) Loosens the front leg clamp, folds down the front leg to a 60-degree angle, and tightens the clamp.

(6) Returns, with the tripod and gun cradle, to a position five paces in front of the gunner.

d. The ammunition bearer comes forward and gets the ammunition can(s) or any other loose equipment, and returns to a position five paces behind the gunner.

e. The gunner announces "Up."

H-6. TRANSPORT OF THE TRIPOD-MOUNTED MK 19

To move the MK 19 and equipment a short distance, the gunner commands SECURE EQUIPMENT, FOLLOW ME. The MK 19 can be moved using one of three methods:

- a. **Dragging.** The gunner grasps the front leg and pulls the MK 19 to the new position, and the assistant gunner secures any loose equipment.
- b. **Two-man Carry.** The gunner stands behind the tripod with a trail leg in each hand. The assistant gunner grasps the front leg and avoids touching the barrel if it is hot. The gunner and assistant gunner carry the mounted MK 19. The assistant gunner returns to secure any loose equipment.
- c. **Three-man Carry.** The gunner and assistant gunner each holds a trail leg just above the traverse bar. The ammunition bearer grasps the front leg and avoids touching the barrel if it is hot. The crew moves to the new position. The ammunition bearer and the assistant gunner go back and get the ammunition or loose equipment, and return to the new position.

H-7. DISMOUNT THE MK 19

To dismount the MK 19 from the vehicle-mounted or stowed position, each member of the crew performs the following steps in order within four minutes.

- a. To dismount the MK 19 from the mounted position the crew performs the following actions.
 - (1) The squad leader:
 - (a) Dismounts the vehicle with binoculars and compass.
 - (b) Obtains the M3 tripod from the stow position.
 - (c) Takes the M64 gun cradle and T&E mechanism from the gunner and moves to the ground firing position.
 - (d) At the firing position, the gunner aligns the front tripod leg for direction and snaps the trail legs apart.
 - (e) Stamps the tripod legs into the ground.
 - (f) Zero's the T & E mechanism, if it is not zeroed.
 - (g) Secures the gun cradle to the M3 tripod and the T&E mechanism to the traverse bar and gun cradle.
 - (h) Assists the gunner in mounting the MK 19.
 - (2) The gunner:
 - (a) Raises the top cover, releases the ammunition belt from the feed tray, and places it in the ammunition can.
 - (b) Takes the round or spent cartridge case from the bolt fingers, places it in the ammunition can, and closes the top cover.
 - (c) Lifts the MK 19 from the gun cradle after the driver releases it, and hands it to the driver.
 - (d) Releases the T&E mechanism from the pedestal with the train lock handle and removes the empty case catch bag assembly.
 - (e) Removes the gun cradle with the T&E mechanism attached and hands it to the squad leader.
 - (f) Takes the MK 19 from the driver and moves to the firing position.
 - (g) With the squad leader's assistance, the gunner secures the MK 19 to the gun cradle.
 - (3) The driver:

- (a) Dismounts the vehicle and assists the gunner in clearing the weapon.
 - (b) Removes the ammunition can and releases the MK 19 and takes it from the gunner.
 - (c) Gives the MK 19 to the gunner when the gunner is ready.
 - (d) Stows the empty case catch bag assembly and takes the ammunition can to the firing position, while also removing the lid and ensuring the ogive ends of the rounds are pointed downrange.
 - (e) Returns to the vehicle and monitors the radio and/or takes more ammunition to the firing point, and maintains rear security.
- (4) The squad leader and the gunner load the weapon (as in a crew drill), and place the MK 19 into action.
- b. To dismount the MK 19 from the stowed position the crew performs the following actions.
 - (1) The squad leader:
 - (a) Secures the binoculars and compass.
 - (b) Obtains the M3 tripod, the M64 gun cradle, and the T&E mechanism from their stowed position.
 - (c) Moves to the ground firing position where he aligns the front tripod leg for direction and snaps the trail legs apart.
 - (d) Stamps the tripod legs into the ground.
 - (e) If required, zeros' the T&E mechanism to the traverse bar and gun cradle.
 - (f) Assists the gunner in mounting the MK 19.
 - (2) The gunner:
 - (a) Dismounts the vehicle and obtains the MK 19 from its stowed position.
 - (b) Moves to the firing position with the MK 19.
 - (c) Secures the MK 19 into the gun cradle with the squad leader's assistance.
 - (3) The driver:
 - (a) Dismounts the vehicle and moves to the firing position with a can of ammunition.
 - (b) Assists in obtaining both the M3 tripod and the MK 19 from the stowed position.
 - (c) Removes the lid from the ammunition can and ensures the ogive ends of the rounds are pointed downrange.
 - (d) Returns to the vehicle, monitors the radio and/or takes more ammunition to the firing position, and maintains rear security.
 - (4) The squad leader and the gunner load the weapon as in the crew drill and place the MK 19 into action.

H-8. REMOUNT THE MK 19

The vehicle crew must be able to mount the MK 19 from the ground-mount to a vehicle-mount or stowed position within four minutes.

- a. To mount the MK 19 from the ground to the vehicle the crew performs the following actions.
 - (1) The squad leader assists the gunner in clearing the weapon by releasing the ammunition belt from the feed tray, and placing it in the ammunition can. He then:
 - (a) Removes the ammunition can and places it on the ground.
 - (b) Releases the MK 19 from the gun cradle.

(c) Releases the T&E mechanism from the tripod traverse rod and takes off the gun cradle and T&E mechanism, after the gunner removes the MK 19.

(d) Grasps the front leg of the tripod and rotates the tripod to vertical position, releases the sleeve latch, and collapses the trail legs.

(e) Loosens the front leg clamp, folds down the front leg, and tightens the clamp.

(f) Returns to the vehicle, gives the gun cradle/T&E mechanism to the gunner, and stows the M3 tripod.

(g) Stows the binoculars and compass in the vehicle and resumes his duties.

(2) The gunner raises the top cover of the MK 19 and takes the round or spent cartridge case from the bolt fingers, and places it in the ammunition can, and closes the top cover. He then:

(a) Lifts the MK 19 off the gun cradle when the squad leader releases it and moves to the vehicle.

(b) Gives the MK 19 to the driver and mounts the vehicle.

(c) Takes the gun cradle and T&E mechanism from the squad leader and mounts the gun cradle to the pedestal.

(d) Zeros' the T&E mechanism if needed and reattaches it to the gun cradle.

(e) Attaches the T&E mechanism to the pedestal and clamps it with the train lock handle.

(f) Takes the MK 19 from the driver and installs it on the gun cradle.

(g) Attaches the travel lock assembly if movement is imminent.

(h) Takes the empty case catch bag assembly from the driver and attaches it to the gun cradle.

(3) The driver receives the MK 19 from the gunner and gives it to him when he is ready. He then:

(a) Assists the gunner in installing the MK 19 in the gun cradle.

(b) Moves to the firing position, retrieves the ammunition can and any loose equipment, and returns to the vehicle.

(c) Places the ammunition can on top of the vehicle, with the ogive ends of the rounds pointed down range.

(d) Hands the empty case catch bag assembly to the gunner.

(4) The squad leader and the gunner load the weapon (as in the crew drill) and place the MK 19 into action.

b. To dismount the MK 19 from the ground mount to a stowed position, the crew performs the following actions.

(1) The squad leader:

(a) Assists the gunner in clearing the weapon by releasing the ammunition belt from the feed tray, and places it in the ammunition can.

(b) Removes the ammunition can and places it on the ground. He then releases the MK 19 from the gun cradle.

(c) Releases the T&E mechanism from the tripod traverse rod and takes off the gun cradle/T&E mechanism after the gunner removes the MK 19.

(d) Grasps the front leg of the tripod and rotates the tripod to a vertical position, releases the sleeve latch, collapses the trail legs, loosens the front leg clamp, folds down the front leg, and tightens the clamp.

(e) Returns to the vehicle and stows the M3 tripod, T&E mechanism, binoculars, and compass.

(f) Resumes his duties.

(2) The gunner:

(a) Raises the top cover of the MK 19 and takes the round or spent cartridge case from the bolt fingers.

(b) Places the round in the ammunition can, and closes the top cover.

(c) Lifts the MK 19 off the gun cradle when the squad leader releases it and moves to the vehicle.

(d) Stows the MK 19 in its stowage position.

(3) The driver:

(a) Moves to the firing position.

(b) Collects the ammunition can and any loose equipment.

(c) Stows the ammunition can and assists the squad leader and gunner in stowing any of their equipment.

H-9. CONVERT THE M966 HMMWV TOW MISSILE CARRIER FROM MK 19 MODE TO TOW 2 MODE

To convert the M966 weapon system from the MK 19 mode to the TOW 2 mode, the crew performs the following actions.

a. The squad leader:

(1) Places the traversing unit in the traveling position.

(2) Obtains the nightsight and collimation cases from the stowed position and places them on top of the vehicle near the gunner.

(3) Stows the gun cradle/ammo bracket, T&E mechanism, and empty case catch bag assembly.

(4) Unstraps the missile guidance system (MGS), unlatches its cover, and stows the MGS in the commander's footwell.

(5) Connects the J-1 cable and the battery power conditioner cable to the MGS and MGS battery power conditioner.

(6) Connects the nightsight power conditioner cable to the TOW vehicle power cable (TVPC), uncoils the cable and hands it up to the gunner.

(7) Ensures that the power cable is connected to the TVPC, and that the TVPC switch is on.

(8) Assists the gunner in boresighting the system.

b. The gunner :

(1) Raises the top cover and releases the ammunition belt from the feed tray and places it in the ammunition can.

(2) He takes the round or spent cartridge case from the bolt fingers, places it in the ammunition can, and closes the top cover.

(3) The gunner releases the MK 19 from the gun cradle, lifts the MK 19 out of the gun cradle, and gives it to the driver.

(4) The gunner releases the T&E mechanism from the pedestal with the train lock handle.

(5) Removes the empty case catch bag assembly and gives it to the squad leader. The gunner moves the ammo can and gives it to the driver.

- (6) Removes the gun cradle with the T&E mechanism attached and hands it to the squad leader.
 - (7) Opens the pedestal mount cover and secures it. Lifts the traversing unit with adapter from the stowage base and secures the traversing unit to the pedestal mount with the coupling clamp.
 - (8) Receives the launch tube from the driver and secures it to the traversing unit.
 - (9) Receives the optical sight from the driver and installs it on the traversing unit.
 - (10) Opens the nightsight case, removes nightsight device and installs it on the optical sight and hands the case to the driver.
 - (11) Takes the TVPC cable from the squad leader and installs the nightsight device.
 - (12) Opens the collimation case, removes the collimator, attaches to nightsight, and connects collimator power cable.
 - (13) Assists the squad leader in boresighting.
 - (14) Collimates sights, removes collimator and power cable, stores collimator and cable in case, and hands case to the driver.
 - (15) Receives the missile from the driver and loads it in the system.
- c. The driver:
- (1) Dismounts the vehicle and enters the right rear passenger door and then unlocks and opens the cargo hatch.
 - (2) Stows the MK 19 when received from the gunner.
 - (3) Stows the ammunition can when received from the gunner.
 - (4) Places the optical sight on top of the vehicle for the gunner.
 - (5) Unstraps a missile, inspects the missile, and gives the missile to the gunner.
 - (6) Ensures every item in the cargo hatch is secure, closes the cargo hatch, exits the vehicle through the right rear passenger door and takes his place as driver.

H-10. CONVERT THE M966 HMMWV TOW MISSILE CARRIER FROM TOW 2 MODE TO MK 19 MODE

This exercise requires the crew to accomplish its task within three minutes. To convert the M966 weapon system from the TOW 2 mode to the MK 19 mode and put the TOW 2 into its stowed position, the crew performs the following actions.

- a. The squad leader:
- (1) Disconnects the J-1 cable from the MGS, coils the cable and stows in the traversing unit.
 - (2) Disconnects the battery power conditioner cable from the MGS battery power cable, and winds it on the stowage handle.
 - (3) Disconnects the MGS battery cable, recovers the MGS cover, stows the cable in the MGS, replaces the cover on the MGS, and straps the MGS down.
 - (4) Disconnects the nightsight power cable from the TVPC, and winds and stows the cable.
 - (5) Receives the nightsight case from the gunner and stows it in the vehicle.
 - (6) Gives the gunner the gun cradle/ammo bracket, T&E mechanism, and empty case catch bag assembly.

b. The gunner:

- (1) Arms the missile (if armed), unlocks the bridge clamp, removes the missile and hands it to the driver.
- (2) Disconnects the TVPC power cable from the night sight and drops down the hatch.
- (3) Disconnects the nightsight and places it in the case, and hands the case to the squad leader.
- (4) Disconnects the optical sight and hands it to the driver.
- (5) Disconnects the launch tube, and hands it to driver.
- (6) Unclasps the traversing unit, lifts the traversing unit out of the pedestal mount, and takes it through the gunners hatch.
- (7) Secures it to the TU stowage base, and closes the pedestal mount access cover.
- (8) Takes the gun cradle/ammo bracket and T&E mechanism from the squad leader.
- (9) Installs the cradle/ammo bracket on the heavy interdiction missile system (HIMS) mount.
- (10) Ensures the T&E mechanism is zeroed, installs the T&E mechanism to the gun cradle and the pedestal mount on the HIMS.
- (11) Takes the MK 19 from the driver and installs it on the gun cradle.
- (12) He installs the empty case catch bag assembly on the gun cradle.
- (13) Receives ammunition can from the driver, while ensuring that the ogive ends are pointing down range, and loads the MK 19.

c. The driver:

- (1) Dismounts the vehicle and enters the right rear passenger door, and unlocks and opens the cargo hatch.
- (2) Takes the missile from the gunner and stows it in the missile rack.
- (3) Unstraps the nightsight case and gives it to the gunner.
- (4) Takes the optical sight from the gunner and stows it in the vehicle.
- (5) Takes the launch tube from the gunner and stows it in the vehicle.
- (6) Unstraps the MK 19 from its stowage, and gives it to the gunner.
- (7) Unstraps one can of ammunition and places it on top of the vehicle near the gunner.
- (8) Replaces the forward handling ring and dust cover on the missile.
- (9) Ensures that every item in the cargo hatch is secure and closes the cargo hatch.
- (10) Exits the vehicle through the right rear passenger door and takes his place as the driver.

H-11. ENGAGE TARGETS WITH THE MK 19

The MK 19 squad must be able to successfully engage a target while occupying a firing position. This crew drill is based on the procedures found in Section III of Chapter 5, Application of Fire. The purpose of this drill is to exercise proper fire techniques to successfully engage a target while not hitting friendly troops or attempting to hit a target out of range. The crew occupies a dismounted position when the squad leader announces, "Fire mission."

a. The squad leader then performs the following tasks:

- (1) Announces direction using one of the following methods: orally (example: "Right front," or "Left flank"), by a reference point (example: "TRP 1," "Lone tree."), fires tracer from a weapon or another MK 19, or by laying the gun on the target himself.

(2) Announces target description “Troops,” “Tank,” or if more than one type of target, designated target, “Lead truck,” “Right building, far end.”

(3) Announces target range, for example, “Four five zero,” “One one hundred.”

(4) Takes the following corrective actions, as required. If the gunner announces, “Cannot identify,” the squad leader attempts to identify and gives further instructions. If the gunner announces “Lost,” the squad leader gives additional target location. If the gunner announces “Friendly,” the squad leader gives new target description or gives end of mission.

(5) Announces the method of engagement by announcing the class and rate of fire.

(6) Announces method of control.

(7) Issues subsequent fire commands as needed.

(8) Terminates the alert: CEASE FIRE, END OF MISSION.

b. The gunner performs the following tasks:

(1) Attempts to acquire target. If he cannot, the gunner announces “Cannot identify,” “Lost,” or “Friendly.”

(2) When identified, announces “Identified,” or “Up.”

(3) Makes an adjustment to the lay of the gun as the squad leader gives new data.

c. The driver performs the following tasks:

(1) Provides security for the vehicle or position.

(2) Prepares to get more ammunition to the gun as required.

(3) Prepares to move if the squad leader announces “Cease fire,” or “End of mission.”