1. What is the M249 Machine Gun?
2. What is the maximum rate of fire of the M249?
3. How does it feed ammunition?
    a. The M249 is a gas-operated, air-cooled, belt- or magazine-fed, automatic weapon that fires from the open-bolt position.
    b. Its maximum rate of fire is 850 rounds per minute.
    c. Ammunition feeds into the weapon from a 200-round ammunition box containing a disintegrating, metallic, split-link belt.
4. What positions can the M249 be fired from?
    a. The gunner can fire the M249 machine gun from the shoulder, hip, or underarm; with a bipod; or with a tripod.
5. When should 20 or 30 round rifle magazine be used?
    a. Only in emergencies do M249 gunners use a 20- or 30-round M16 rifle magazine, in part because this increases the chance of stoppages.
6. What is the length of the M249?
    a. 40.87 inches
7. What is the height of the M249 on a tripod?
    a. 16.00 inches
8. What is the weight of the M249?
    a. 16.41 pounds
9. What is the weight of the M122 Tripod Mount with T&E?
    a. 16.00 pounds
10. What ammunition does the M249 use?
    a. The M249 uses 5.56-mm ball and tracer (4:1 mix) ammunition-delivered in 200-round drums, each of which weighs 6.92 pounds. Separate ball, tracer, blank, and dummy ammunition also available
11. What is the sustained rate of fire for the M249.
    a. 50 rounds a minute in 3- to 5-round bursts, with 4 to
    b. 5 seconds between bursts (barrel change every 10
    c. minutes).
12. What is the rapid rate of fire for the M249?
    a. 100 rounds per minute, fired in 8- to 10-round bursts, 2 to 3 seconds between bursts (barrel change every 2 minutes).
13. What is the cyclic rate of fire for the M249?
    a. 650 to 850 rounds per minute, continuous burst, barrel changed every minute.
14. What is the basic combat load for the M249?
    a. 1,000 rounds in five 200-round drums
15. What is the tracer burnout range for 5.56?
    a. 900 meters (+)
16. What is the maximum range of the M249?
    a. 3600m
17. What is the maximum effective range of the M249?
    a. 1000m with tripod and T&E

18. What is the maximum effective range of the M249 for grazing fire over uniformly sloping terrain?
    a. 600m
19. What is the maximum effective range of the M249 on an area target with a tripod?
    a. 1000 meters
20. What is the maximum effective range of the M249 on a bipod?
    a. 800 meters
21. What is the maximum range of the M249 on a point target using a tripod?
    a. 800 meters
22. What is the maximum effective range of an M249 on a point target using a bipod?
    a. 600 meters
23. What is the maximum effective range of the M249 for suppressive fire?
    a. 1000 meters
24. What is the purpose of the M249's barrel assembly?
    a. Houses cartridges for fire; directs the projectile; supports gas regulator.
25. What is the purpose of the M249's heat shield assembly?
    a. Protects the hand from the hot barrel.
26. What is the purpose of the M249's rear sight assembly?
    a. Adjusts for windage and elevation.
27. What is the purpose of the M249's feed tray and cover assembly?
    a. Feeds linked, belted ammunition. Positions and holds cartridges in position for stripping, feeding, and chambering.
28. What is the purpose of the M249's feed tray assembly?
    a. Positions belted ammunition for fire.
29. What is the purpose of the M249's cocking handle assembly?
    a. Moves on a guide rail fixed to the right side of the receiver. Pulls moving parts rearward.
30. What is the purpose of the M249's buttstock and buffer assembly?
    a. Folding buttplate and shoulder rest enhance aiming and firing. Hydraulic buffer absorbs recoil.
31. What is the purpose of the M249's bolt assembly?
    a. Feeds, strips, chambers, fires, and extracts round. Powered by projectile gasses.
32. What is the purpose of the M249's slide assembly?
    a. Houses firing pin and roller assembly.
33. What is the purpose of the M249's return rod and transfer mechanism assembly?
    a. Absorbs recoil for bolt and operating rod assembly at the end of recoil movement.
34. What is the purpose of the M249's receiver assembly?
    a. Supports all major components, houses the action, and, by use of cams, controls weapon function.
35. What is the purpose of the M249's trigger assembly?
    a. Controls fire. Grip has storage for lubricant.

36. What is the purpose of the M249's handguard assembly?
    a. Thermal insulation protects against temperature extremes; assembly houses cleaning equipment.
37. What is the purpose of the M249's sling and snap hook assembly?
    a. Simplifies carriage of weapon.
38. What is the purpose of the M249's bipod assembly?
    a. Supports gun in prone position. Legs telescope to three lengths.
39. What is the purpose of the M249's gas cylinder assembly?
    a. Locks bipod and allows gasses to escape.
40. What is the purpose of the M249's piston assembly?
    a. Holds bolt and slide assemblies and houses return spring.
41. What is the purpose of the M249's return assembly?
    a. Locks bolt, slide, and piston during counterrecoil.
42. What is the purpose of the M122 tripod?
    a. Tripod, T&E mechanism, and pintle stabilize weapon for accuracy and control.
43. What is the purpose of the M145 telescope?
    a. Allows target acquisition and identification at increased ranges.
44. What is the M249's front sight?
    a. Hooded and semifixed front sight. Its rear sight assembly mounts on the top of the cover and feed mechanism assembly. The elevation knob drum has range settings from 300 meters to 1,000 meters. For large range changes, the gunner rotates the elevation knob to the desired range setting.
45. How do you make fine changes in elevation or range?
    a. Rotate the rear sight aperture. Each click of the elevation knob moves it 180 degrees, or one-half turn. This equals a one-half-mil change in elevation, which is 0.5 cm at 10 meters. Obviously, the gunner uses the windage knob to adjust windage. Each click of the knob also equals a one-half-mil change, which again is 0.5 cm at 10 meters. An indexed, sliding scale allows the gunner to center the rear sight aperture.
46. How does the M249's safety mechanism function?
    a. The M249's safety control is in the trigger housing. The gunner pushes it left or right to hide or reveal the red ring. Pushing it from the left to the right hides the red ring and places the weapon on safe. This prevents the bolt from going forward. Pushing the safety from right to left reveals the red ring, indicating that the weapon is ready to fire. The gunner uses the cocking handle on the right side of the weapon to pull the bolt to the rear.

47. How does the M249 utilize different types of ammunition?
    a. The M249 machine gun uses several different types of standard 5.56-mm military ammunition. Soldiers should only use authorized ammunition manufactured to US and NATO specifications. The 5.56- mm NATO cartridge is recognizable by its painted projectile tips, stamped manufacturer's initials, and year of manufacture (base of cartridge case) as well as by the markings on the packing containers. Two M16 rounds, the M193 and the M196 cartridges, will fire through the M249, but with reduced accuracy. The gunner should only resort to this when he is out of M855 and M856 rounds.
48. What are the characteristics of the 5.56-mm Ball M855 Cartridge?
    a. The NATO standard round for the M249 machine gun is the M855 cartridge, which has a metal- jacketed, lead-alloy-core bullet with a steel penetrator (point). The primer and case are waterproof. A disintegrating metallic split-link belt links this ammunition so that the ammunition can feed from the ammunition box (Figure 1-6). In an emergency, the M855 round can also be fired from the M16A2, A3, or A4 when loaded in a 20- or 30-round magazine. A green tip identifies this round, whose projectile weighs 62 grains, and whose length is 2.3 cm. It is effective only against personnel and light materials.
49. What are the characteristics of the 5.56-mm Tracer M856 Cartridge?
    a. The projectile on the M856 cartridge weighs 63.7 grains. An orange tip identifies this round, which lacks a steel penetrator. The gunner fires this tracer for adjustments after observation, incendiary effects, and signaling. When the gunner fires tracer rounds, they mix with ball ammunition in a ratio of four ball rounds to one tracer round. The DODAC for ball and tracer mix is A064.
50. What are the characteristics of the 5.56-mm Dummy M199 Cartridge?
    a. Six grooves along the side of the case, beginning about one-half inch from its head, identify this cartridge. It contains no propellant or primer. The primer well is open to prevent damage to the firing pin. The gunner uses the dummy round during mechanical training, dry-fire exercises, and function checks.
51. What are the characteristics of the 5.56-mm Blank M200 Cartridge?
    a. The blank cartridge has no projectile. A seven-petal rosette crimp closes the mouth of the case, which has a violet tip. The original M200 blank cartridge had a white tip. Field use of this cartridge resulted in residue buildup, which caused malfunctions. The gunner should only use the violet-tipped M200 cartridge. The gunner uses the blank round to simulate live fire during training. The gunner must use the M249 blank-firing adapter (NSN 1005-21-912-8997) to fire this ammunition. A buildup of carbon inside the weapon causes friction between the moving parts. Carbon deposits build rapidly when the gunner fires blanks. When these deposits become excessive, stoppages occur. Therefore, you must keep the weapon—especially the gas system and chamber—clean during blank firing.

52. How do you get the best performance out of your weapon when using the BFA?
    a. Inspect the weapon for damaged parts, excessive wear, cleanliness, and proper lubrication before firing. When feasible, test fire the weapon with ball ammunition before attaching the BFA. Adjust the BFA to fit the weapon. Apply immediate action when stoppages occur. Clean the gas system after firing 500 rounds. Clean and lubricate the entire weapon after firing 1,000 rounds.
53. The first step in maintenance is to clear the weapon. How do you properly clear the M249?
    a. Moves the safety to the fire "F" position by pushing it to the left until the red ring is visible. With his right hand, palm up, pulls the cocking handle to the rear, locking the bolt in place. While holding the resistance on the cocking handle, moves the safety to the safe position by pushing it to the right until the red ring is not visible. (The gunner can only place the weapon on safe with the bolt locked to the rear.) Returns and locks the cocking handle to the forward position.
54. A "hot" weapon, that is, one through which 200 or more successive rounds have just been fired, can "cook off" a round without any action by the firer. How should you clear the M249 when it is still hot?
    a. If a "hot" weapon fails to fire, and you must clear it while the
    b. barrel is still hot--
    c. 1. Keep the feed tray cover closed, get the weapon off your
    d. shoulder, and point it downrange.
    e. 2. Place the weapon on safe (no red showing).
    f. 3. Place the weapon on the ground, still pointed downrange.
    g. 4. Before clearing and applying immediate or remedial action,
    h. you must first wait--
    i. • Training situations: 15 minutes.
    j. • Tactical situations: 5 seconds.
55. Before opening the feed tray cover on a hot gun, why should you place the weapon on the ground away from your face?
    a. If a round cooks off while your weapon is on your shoulder, and the feed tray cover is open, you could suffer injury or death.
56. How should you conduct the five-point safety check for brass, links, or ammunition?
    a. 1) Checks the feed pawl assembly under the feed cover.
    b. 2) Checks the feed tray assembly.
    c. 3) Lifts the feed tray assembly and inspects the chamber.
    d. 4) Checks the space between the bolt assembly and the chamber.
    e. 5) Inserts two fingers of left hand into magazine well to extract ammunition or brass.
57. What does the operating rod group consist of?
    a. operating rod spring, slide assembly, piston assembly, and bolt assembly consists of the spring guide rod.

58. How do you remove the operating rod?
    a. Pull the upper retaining pin at the rear of the receiver to the left. Allow the buttstock to pivot downward and place it on a surface to support the weapon for disassembly.
59. How do you release the operating rod assembly from the positioning grooves inside the receiver?
    a. Hold the weapon with one hand on the buttstock assembly. Use the thumb of the other hand to push in and upward on the rear of the operating rod assembly. Pull the operating rod, spring from the receiver group, and separate the parts. Hold the buttstock assembly with your left hand to stabilize the weapon. With your right hand, pull the cocking handle to the rear to lock the bolt. Return the cocking handle to the forward position. Place a finger on the face of the bolt and push until your finger makes contact with the bridge at the end of the receiver. This leaves the piston, slide, and bolt assemblies exposed.
60. How do you separate the components of the operating rod group?
    a. Hold the piston assembly in one hand, place your other hand on the bolt assembly, and rotate the bolt to disengage it bolt from the slide assembly. Then, although you may remove the firing pin spring from the firing pin, doing so is strongly discouraged, because it can damage the spring and affect operation of the weapon.
61. How do you remove the barrel from the receiver?
    a. Close the cover and feed mechanism assembly. Depress the barrel-locking lever with your left hand, then lift the carrying handle using your right hand and push the barrel forward. To remove the heat shield, place the barrel with the muzzle end on a hard, flat surface, with the heat shield facing away from your body. Place the index fingers of each hand inside the chamber. Use your thumbs to push up on the top clip.
62. How do you remove the trigger mechanism group?
    a. After the release of the support, the trigger mechanism automatically comes out, because the lowermost retaining pin holds it on.
63. How do you remove the gas cylinder group?
    a. To remove the gas cylinder from the receiver, grasp the gas cylinder at the top of the bipod legs, turn it to the left or right to release the locking spring, and then pull the cylinder away from receiver.
64. How do you remove the bipod group?
    a. Once the gunner removes the gas cylinder group, he removes the bipod group by pulling it away from the receiver. Once the gunner removes the bipod group, only the receiver group remains. Disassembly is complete.

65. What does inspection of the M249 begin with?
    a. Inspection begins with the weapon disassembled in its major groups. Shiny surfaces do not mean the parts are unserviceable. The gunner inspects the parts of the weapon and related equipment. He repairs or replaces any broken or missing parts IAW TM 9-1005-201-10. Every 90 days, he performs preventive maintenance checks and services (PMCS). If he has not used the weapon has in 90 days, he performs PMCS IAW the operator's manual.
66. What should you look for during a PMCS of the M249?
    a. Check the bolt assembly for visible damage.
    b. The cartridge extractor should not be cracked or chipped. Check the slide assembly for visible damage.
    c. Check the feed roller for spring tension when compressed, and to ensure that the pivot slide is locked onto the slide assembly. Check the firing pin for straightness and cracks.
    d. Ensure the tip is completely rounded.
    e. Ensure the firing pin spring is not crushed or bent.
    f. Ensure the beveled end is not stretched.
    g. Check the sear notch on the piston assembly for signs of excessive wear or burring.
    h. Slight rotation of the piston on its housing is normal and is not cause for rejection.
    i. The operating rod should not be bent, broken, or cracked.
    j. The buffer spring should not have breaks.
    k. Lug pins should protrude equally on both sides of the buffer spacer.
    l. The operating rod spring should not have kinks, or separated or broken strands.
    m. It can have a maximum of one break on any one strand.
    n. The flash suppressor should not be cracked, and it should be fastened securely.
    o. The front sight post and front sight base must not be bent, cracked, or broken.
    p. Weapons already zeroed should not be adjusted.
67. What is the gunner supposed to check for during PMCS?
    a. Inspects the heat shield assembly for damage, cracks, or broken retaining clamps.
    b. Checks the gas regulator and collar for cracks or burrs.
    c. Checks the barrel for bulges, cracks, bends, obstructions, or pits in the chamber or bore.
    d. Checks the gas plug for obstructions, cracks, and bulges.
    e. Checks the carrying handle is checked to ensure it is not cracked, broken, or missing; that it can be folded under spring pressure to the right and left; and that it remains locked in an upright position.
68. What are you supposed to look for on the buttstock and buffer assembly group?
    a. Checks the buttstock for cracks, bends, or breaks, and for missing components.
    b. Checks for linkage and tension on the buffer rod.
    c. Checks the shoulder rest to ensure it is not bent or broken and that it locks in both positions.

69. What should be checked during inspection of the trigger mechanism group?
    a. The shoulder of the sear should not show excessive wear. The safety should function properly. That is, the sear should move only slightly when the safety is on "S" and freely when the safety is on "F." The sear pin should not protrude from the trigger mechanism, because, if it does protrude, the trigger mechanism will not go back in place.
70. What should be checked during inspection of the gas cylinder?
    a. The gas cylinder should not be cracked, bent, or broken.
71. What should be checked during inspection of the bipod?
    a. The bipod group should not be cracked, bent, or broken. The bipod legs should extend and collapse easily.
72. What should be checked during inspection of the receiver group?
    a. The cover latch should work properly. All parts inside the cover assembly should move under spring tension. The gunner checks all spot welds for cracks. The cover assembly should remain open without support. The belt-holding pawl must be under spring tension. The receiver should not be bent or cracked. The cocking handle should slide freely within its guide and lock in its forward position. The windage and elevation knobs on the rear sight should be movable and legible. The windage scale screws should not be worn or burred.
73. What should be used to clean metal components of the M249?
    a. All metal components and surfaces that have been exposed to powder fouling should be cleaned using CLP on a bore-cleaning patch. The gunner uses the same procedure to clean the receiver.
    b. Clear and disassemble the weapon.
    c. Clean the bore and chamber using CLP and fresh swabs.
    d. Clean the gas regulator with the special tool (scraper). Remove all carbon dust. Do not use CLP on the collar, gas block, or body.
74. How should the components of the M249 be lubricated?
    a. After the M249 machine gun is cleaned and wiped dry, a thin coat of CLP is applied by rubbing it on with a cloth. This lubricates and preserves the exposed metal parts during all normal temperature ranges. The gunner also lubricates all moving parts with CLP, which he then rubs into the components by hand.
75. How should the operating rod group of the M249 be lubricated?
    a. Use CLP on the operating rod and spring, the slide assembly, the feed roller, and the bolt-locking lug.
76. How should the barrel group of the M249 be lubricated?
    a. Use CLP on the cam surfaces of the bolt-locking lugs, the heat shield, and along the outer surfaces of the barrel clamp.

77. What are lubricating procedures for the M249 in different conditions?
    a. Extreme heat–use CLP, grade 2.
    b. Damp or salty air–use CLP, grade 2. Clean and apply frequently.
    c. Sandy or dusty areas–use CLP, grade 2. Clean and apply frequently. Remove excess with a rag after each application.
    d. Temperature below minus 18 degrees Celsius (0 degrees Fahrenheit)–use CLP grade 2 generously. Lubricate heavily enough to spread the lubricant with a finger. Although CLP
    e. provides effective between 0 degrees Fahrenheit and minus 35 degrees Fahrenheit, it will not flow from a 1/2-ounce bottle at temperatures below 0 degrees Fahrenheit.
78. How should the bipod group be placed onto the M249 receiver?
    a. Place the bipod group on the receiver group with the bipod legs open and pointed downward.
79. How should the gas cylinder group be placed into the receiver during assembly?
    a. Push the gas cylinder through the bipod yoke into the receiver. Push the cylinder to the rear while countering the pressure of the locking spring and guiding the end of the cylinder into the receiver with the other hand applying downward pressure. Position the recess in the cylinder near the spring. Turn the cylinder until the spring clicks into the recess at the rear of the gas cylinder.
80. How do you install the trigger mechanism group on the M249?
    a. Align the trigger mechanism with the slot on the bottom of the receiver. Hold the trigger mechanism in position to accomplish the next step.
81. How do you install the buttstock and buffer assembly group on the M249?
    a. Align the lower hole in the buttstock and buffer assembly with the rear hole in the trigger mechanism; then push the lower retaining pin to the right (Figure 1-27).
82. The gunner must perform a function check to ensure that the M249 machine gun has been assembled correctly. What are the procedures for conducting a functions check on an M249?
    a. Grasp the cocking handle with the right hand, palm up, and pull the bolt to the rear, locking it in place.
    b. While continuing to hold the resistance on the cocking handle, use the left hand to move the safety to the safe position.
    c. Push the cocking handle forward into the forward lock position.
    d. Pull the trigger (The weapon should not fire).
    e. Grasp the cocking handle with the right hand, palm up, and pull and hold it to the rear.Move the safety to the fire position. While continuing to hold resistance on the cocking handle, use the left hand to pull the trigger and ease the bolt forward to prevent it from slamming into the chamber area and damaging the face of the bolt.If the weapon fails the function check, check for missing parts or repeat the reassembly procedures. Before disassembling the weapon, make sure it is positioned where the guide rod and spring cannot cause bodily harm if the bolt is locked to the rear. The cover and feed mechanism assembly can be closed with the bolt in either the forward or the rearward position.

83. To properly maintain the M249 machine gun, the gunner must perform certain actions before, during, and after firing. What are these actions?
    a. Before firing–
    b. - Wipe the bore dry.
    c. - Inspect the weapon as outlined in the operator's TM.
    d. - Lubricate the weapon.
    e. During firing–
    f. - Inspect the weapon periodically to ensure that it remains lubricated.
    g. - When malfunctions or stoppages occur, follow the procedures in Section IV.
    h. After firing–
    i. - Immediately clear and clean the weapon.
    j. - Every 90 days during inactivity, clean and lubricate the weapon, unless inspection reveals more frequent servicing is necessary.
84. If the M249 machine gun is contaminated by chemical, biological, or radiological (nuclear) agents, the appropriate action must be taken to reduce exposure and penetration. What should be done to minimize exposure to CBRN agents?
    a. CHEMICAL - Use towelettes from the M258A1 kit to wipe off the weapon. If these are not available, wash the
    b. weapon with hot, soapy water, and rinse.
    c. BIOLOGICAL - Use towelettes or hot, soapy water and rinse the weapon as above.
    d. RADIOLOGICAL OR NUCLEAR - Brush or wipe the weapon, or wash with water, and rinse.
85. How do you load the M249?
    a. The gunner must first clear it as described. (With the feed cover raised, the gunner makes sure his face is not exposed to the open chamber area while loading.).
    b. When loading belted ammunition, always cant the weapon to the right. Make sure the open side of the links is facing down, and place the lead link tab or first round of the belt in the tray groove against the cartridge stop. Place the rounds flat across the feed tray. With your left hand, count five to six rounds down to hold ammunition in place on the feed tray, while at the same time closing the feed cover with your right hand. When closing the feed cover, always place your hand in front of the rear sight to prevent accidentally changing the sight adjustment.
86. How do you unload the M249?
    a. Grasp the cocking handle with the right hand, palm facing upwards. Pull the cocking handle to lock the bolt to the rear. Hold the cocking handle with your right hand, and place the weapon on safe. With your left hand, push the cocking handle to the forward locked position.

87. Depending on whether you are using belt-fed or magazine-fed ammunition, do the following:
    a. - Raise the feed cover and remove any ammunition or links from the feed tray.
    b. - Perform the five-point safety check.
    c. - Push the magazine release tab down and pull the magazine from the magazine well.
    d. - Raise the feed cover and perform the five-point safety check.
88. What makes it easier for gunners to recognize and correct stoppages during operation?
    a. When they know how the M249 machine gun functions. The weapon functions automatically as long as ammunition feeds into it, and the gunner holds the trigger to the rear.
89. Each time a round is fired the parts of the weapon function in a cycle or sequence. Many of the actions occur at the same time. When does the cycle begin?
    a. The cycle begins when the gunner places the first round of the belt in the tray groove, or when he inserts the magazine into the magazine well. Then, the gunner pulls the trigger, which releases the sear from the sear notch. When the gunner pulls the trigger to the rear, the rear of the sear lowers and disengages from the sear notch. This procedure allows the expansion of the operating rod spring to drive the piston and bolt forward. The cycle stops when the gunner releases the trigger, and the sear again engages the sear notch on the piston.
90. What occurs during the feeding phase of the M249?
    a. The forward movement of the bolt forces the feed lever to the right, causing the feed-pawl assembly to turn in the opposite direction. This in turn forces the feed-pawl assembly over the next round in the belt. The feed-pawl assembly is ready to place the next round into the tray groove when the rearward action occurs again. As the bolt moves to the rear after firing, the feed roller forces the feed lever to turn to the left, which moves the feed pawl to the right, placing a round in the tray groove.
91. What occurs during the chambering phase of the M249?
    a. As the bolt travels forward, the upper stripping (belt-fed or magazine-fed) lug engages the rim of the round. The pressure of the front and rear cartridge guides holds the round so that it makes positive contact with the upper stripping lug of the bolt. The front cartridge guide prevents forward movement of the link as the round is stripped from the belt. The upper locking lug carries the round forward. The chambering ramp causes the nose of the round to be cammed downward into the chamber. When the round fully seats in the chamber, the extractor snaps over the rim of the round, depressing the ejector on the rail inside the receiver.
92. What occurs during the locking phase of the M249?
    a. As the round chambers, the bolt enters the barrel socket. The upper and lower locking lugs contact the bolt camming surfaces inside the barrel and start the bolt turning clockwise. The action of the bolt into the slide assembly, as the piston continues forward, turns the bolt to complete its 90-degree (one-quarter turn) clockwise rotation. Locking is now complete.

93. What occurs during the firing phase of the M249?
    a. After the bolt travels fully forward and locks, the piston continues to move forward independently of the bolt for a short distance. The piston assembly carries the firing pin through the face of the bolt. The firing pin strikes the primer of the round, and the primer fires the round.
94. What occurs during the unlocking phase of the M249?
    a. After the round fires and the bullet passes the gas port, part of the expanding gases go into one block (new style) or into the gas regulator through the gas plug. The rapidly expanding gases enter into the gas cylinder from the gas regulator, forcing the piston to the rear. As the piston continues to the rear, the slide assembly's simultaneous movement to the rear causes the bolt to begin its counterclockwise rotation. The upper and lower locking lugs of the bolt contact the bolt camming surfaces inside the barrel socket and, as the bolt continues toward the rear, it completes a one-quarter turn counterclockwise. The rotation and movement to the rear unlocks the bolt from the barrel socket.
95. What occurs during the extracting phase of the M249?
    a. Extracting begins during the unlocking cycle. The rotation of the bolt loosens the cartridge case in the chamber. As the piston and bolt move to the rear, the extractor pulls the cartridge case from the chamber.
96. What occurs during the ejecting phase of the M249?
    a. As the cartridge case is pulled from the chamber, the bolt passes by the ejector. This procedure causes the ejector clip to expand, forcing the ejector to push the expended cartridge. The extractor grips the right side of the cartridge and causes it to spin from the weapon as it reaches the ejection port. The empty belt links are forced out of the link ejection port as the rearward movement of the bolt causes the next round to be positioned in the tray groove.
97. What occurs during the cocking phase of the M249?
    a. The piston assembly acts against the firing pin, pulling the firing pin from the primer of the spent cartridge case. The action of the piston assembly, continuing to the rear with the firing pin, releases the compression of the firing pin spring. As long as the gunner holds the trigger to the rear, the M249 will continue to complete the eight steps of functioning automatically. When the gunner releases the trigger and the sear again engages the sear notch, the cycle of functioning stops and the weapon is cocked. To prevent undue wear to the sear and sear notch, the automatic rifleman must hold the trigger firmly to the rear during firing.
98. What does the M122 tripod provide for the M249?
    a. Provides a stable mount for the M249, and permits accuracy and control. The tripod is recommended for all marksmanship training and defensive employment, unless the newer M192 tripod is available, in which case see Appendix C. (See also Appendix A for employment.) When available, the gunner can use the M192 lightweight ground mount

99. How does the traversing portion of the T&E mechanism function?
    a. As the traversing handwheel is turned, the muzzle of the weapon will turn to the left or right, depending on the direction it is turned. Each click of the traversing handwheel represents a 1-mil change in direction of the muzzle, that is, one click equals 1 mil. The weapon can traverse 100 mils: 50 mils right and 50 mils left of center.
    b. How does the elevating portion of the T&E function?
    c. The elevating handwheel has a mil-click device built into it (1 click equals 1 mil). A scale engraved into the handwheel is divided into 5-mil divisions and 1-mil subdivisions, for 50
    d. mil increments. There are 200 mils above and 200 mils below the zero mark, for a total of 400 mils in elevation change. The gunner reads elevation in two parts. He takes the major reading from the elevation screw plate. He takes the minor reading from the handwheel. When he records the two readings, he separates them with a slash ("/").
100. How does the elevating portion of the T&E function?

    a.

101. What does the traversing slide lock lever do?
    a. The traversing slide-lock lever allows rapid lateral adjustments along the traversing bar. Direction readings are taken from the scale on the traversing bar, using the left side of the traversing slide as an index. The direction of the reading comes from the position of the muzzle, not the position of the slide.
102. How do you set up a tripod?
    a. unfold the front leg and spread the rear legs until the leg lock engages. Insert the pintle assembly and rotate the pintle lock-release cam to lock. Ensure that the locking lever of the pintle is facing forward toward the front leg
103. How do you attach the traversing and elevating mechanism?
    a. Ensure that the adapter pin is to the right and the opening between it is to the rear. Center the elevating and traversing handwheels. To do this, he rotates the elevation handwheel until about 1-1/2 inches (two fingers) are visible on the upper elevating screw; he rotates the traversing slide until about two fingers are visible on the lower elevating screw. With the T&E roughly centered, he lowers the traversing slide on to the traversing bar with the locking lever to the rear, and the traversing handwheel to the left, and secures it by turning the locking lever clockwise The weapon attaches to the M122 tripod. First, he extends the bipod legs forward. Then, he engages the mounting pins (Located between the front of the handguard and the bipod legs) of the M249 into the pintle of the tripod by squeezing the locking lever of the pintle. He lowers the rear of the weapon so that the hole above the trigger guard engages the locking pin of the T&E adapter. He aligns the hole with the pin of the adapter and pushes the pin from right to left to secure the M249 to the M122 tripod (Figure 1-34). After the gunner attaches the M249 and secures it to the tripod, he attaches a special ammunition adapter to the M249. He inserts the adapter into the magazine well, as if inserting

b. a magazine. This procedure allows the gunner to use the 200-round drum of ammunition

104. How does the gunner dismount the M249 from the M122 tripod?
    a. The gunner dismounts the M249 from the M122 tripod by first removing the traversing and elevation mechanism from the weapon.
    b. He pulls the locking pin of the adapter to release the T&E from the trigger guard. He grasps the carrying handle with his left hand and squeezes the pintle-locking lever with his right hand. He lifts the weapon from the pintle assembly and the tripod.
105. How do you lower the bipod legs on a M249?
    a. Hold the legs together and pull down and away from the handguard. Release the legs so that they lock in the vertical position.
106. How do you extend the bipod legs?
    a. Grasp the foot of each leg and pull down
107. How do you retract the bipod legs?
    a. Push in the latches and push in the legs.
108. What is the standard vehicular mount for the M249 machine gun?
    a. The M6 pedestal mount used on the (HMMWV). One component of the pedestal mount is the M197 machine gun mount (travel lock). This mount also adapts to other vehicles (Figure 1-37).
109. How do you mount the M249 onto the vehicle mount?
    a. To mount the weapon, the gunner ensures that the release lever of the pintle is facing forward. To extend the bipod legs forward, he places the front mounting pins of the M249 into the pedestal by squeezing the locking lever of the pintle.
    b. He ensures that the M60 machine gun adapter assembly pivots away from the M249 fork (clevis). He lowers the rear of the weapon so that the locking pin of the machine gun mount can engage the hole above the trigger guard. The gunner engages this part of the weapon into the fork of the mount and pushes in the locking pin.
110. How do you dismount the weapon?
    a. To dismount the weapon, the gunner pulls the locking pin of the mount. He raises the rear of the weapon slightly and squeezes the locking lever of the pintle. Once he releases the front mounting pins, the gunner lifts the weapon from the mount.
111. How does the M122 benefit the M249?
    a. The M122 tripod provides a stable mount for the M249, and it permits a high degree of accuracy and control.
    b. To use a tripod, the gunner unfolds the front leg and positions it toward the target. Then, he spreads the rear legs of the tripod until the leg lock engages. When available, the gunner can use the M192 lightweight ground mount
112. When do weapon malfunctions occur?
    a. A malfunction occurs when a mechanical failure causes the M249 to fire improperly.

b. Defective ammunition or improper operation by the automatic rifleman is not considered a malfunction. If cleaning and lubricating the weapon fails to fix the problem, then the gunner turns it in to the unit armorer. Table 1- 4 shows the types of malfunctions, their probable causes, and corrective actions.

113. What are stoppages?
    a. A stoppage is any interruption in the cycle of functioning caused by faulty action of the weapon or faulty ammunition.
    b. Stoppages are classified by their relationship to the cycle of functioning.

114. What should you do if ammunition is in the chamber when you experience a malfunction?
    a. If any part of a round is in the chamber, then before applying immediate or remedial action on a cold or hot gun, first remove the ammunition from the feed tray, then close the cover and try to fire. If the weapon fires, the gunner reloads and continues firing. If it fails to fire, clear the weapon. To do so, use a clearing rod (only) and remove the round with the cover closed. Then, inspect the weapon and ammunition.

115. What is a misfire?
    a. the failure of a chambered round to fire. Such failure can be due to an ammunition defect or faulty firing mechanism.

116. What is cook off?
    a. the firing of a round due to the heat of a hot barrel and not to the firing mechanism. Cook offs can be avoided by applying immediate action within 10 seconds of a failure to fire.

117. One effective memory aid is POPP. What does it stand for?
    a. - Pull and lock the cocking handle to the rear while you
    b. - Observe the ejection port to see if a cartridge case, belt link, or round ejects. Ensure that the bolt remains to the rear to prevent double feeding if a round or cartridge case is not
    c. ejected. If a cartridge case, belt link, or round ejects
    d. - Push the cocking handle to its forward position, take aim on the target, and
    e. - Press the trigger. If the weapon does not fire, take remedial action. If a cartridge case, belt link, or round fails to eject, take remedial action.

118. If immediate action fails to return a cold weapon to operational condition, what should you do?
    a. With the weapon still on your shoulder, grasp the cocking handle with your right hand,
    b. palm up.
    c. Pull the cocking handle to the rear to lock the bolt.
    d. Keep resistance on the cocking handle, put the weapon on safe, and then return the
    e. cocking handle.
    f. Place the weapon on the ground or away from your face.
    g. Open the feed cover and perform the five-point safety check.
    h. Reload and continue to fire.

i. If the weapon fails to fire, clear it, and inspect it and the ammunition.

119. What is considered a hot weapon? How do you clear malfunctions for hot weapon systems?
    a. A hot weapon is one through which at least 200 rounds have been fired in a 2 minute period, or as noted previously for training. Put the weapon on safe. Let it cool for 5 seconds in combat or 15 in training Continue as you would for a cold weapon.
120. If a stoppage occurs, whether the bolt is fully forward and locked, or only partially forward, and the cocking handle resists your attempts to pull it to the rear, what steps should you take?
    a. Try again to pull the cocking handle by hand. If the weapon is hot enough to cause a cook off, move all Soldiers a safe distance from the weapon and keep them away for 15 minutes. After the gun has cooled, open the cover and disassemble the gun. Keep rearward pressure on the cocking handle until after you and the assistant gunner remove the buffer. Remove the round or fired cartridge. If needed, use the cleaning rod or ruptured cartridge extractor.
121. Destruction of any military weapon is only authorized as a last resort to prevent enemy capture or use. In combat, the commander may destroy weapons, but must report doing so through channels. What are field expedient methods of destroying weapon systems?
    a. Disassemble the weapon as completely as time permits.
    b. Use the barrel to destroy the bolt, operating rod group, bipod, sights (rear and front), and
    c. receiver.
    d. Bury the disassembled weapon or dump the parts into a stream, sump, or latrine.
    e. Burn the weapon.
    f. Find a place near cover,
    g. Lay the weapon down.
    h. Place an incendiary grenade on the receiver group over the bolt.
    i. Let the feed cover rest on the grenade.
    j. As soon as you pull the pin, take cover.
122. What is the M240B tracer burnout range?
    a. 900 METERS
123. What is the length of an M240B?
    a. 49 INCHES
124. What is the weight of the M240B?
    a. 27.6 POUNDS
125. What is the maximum range of the M240B?
    a. 3,725 METERS
126. What is the maximum effective range of the M240B?
    a. 1,100 METERS

127. What is the maximum effective range of the M240B for an area target using a M122A1 tripod?
    a. 1,800 METERS
128. What is the maximum effective range of the M240B for an area target using a M122A1 bipod?
    a. 800 METERS
129. What is the maximum effective range of the M240B for a point target using a tripod?
    a. 800 METERS
130. What is the maximum effective range of the M240B for a point target using a bipod?
    a. 800 METERS
131. What is the maximum suppression distance for a M240B?
    a. 1,800 meters
132. What is the sustained rate of fire for the M240B?
    a. 100 ROUNDS PER MINUTE, 6 to 9 round bursts every 4-5 seconds apart, barrel change every 10 minutes
133. What is the rapid rate of fire for the M240B?
    a. 200 rounds per minute, 10- to 13-round bursts 2 to 3 seconds apart, barrel change every 2 minutes.
134. What is the cyclic rate of fire for the m240B?
    a. 650 to 950 rounds per minute
    b. barrel change every minute
135. What is the purpose of the M240 barrel assambly?
    a. Holds the cartridge and directs the projectile. Includes the barrel, flash suppressor, carrying handle, heat shield, front sight assembly, and gas-regulator plug.
136. What is the purpose of the Heat shield assembly?
    a. Protects the gunner's hand from a hot barrel.
137. What is the purpose of the buttstock and buffer assembly; and buffer and spade-grip assembly?
    a. Houses a buffer whose inner spring washers absorb recoil.
138. What is the purpose of the receiver assembly?
    a. Supports all major components (receiver, handguard, bipod, and rear sight assembly) and action; uses cams to control function of weapon.
139. What is the purpose of the M240 Handguard assembly?
    a. Insulation protects gunner's hands from heat and cold.
140. What is the purpose of the cocking handle assembly?
    a. Pulls moving parts rearward along a rail fixed to the right side of the receiver.
141. What is the purpose of the M240 Trigger housing assembly?
    a. Controls fire.
142. What is the purpose of the M240 Sling and snap hooks?
    a. Simplifies carrying the weapon.
143. What is the purpose of the M240 Bipod?
    a. Supports the M240B barrel in prone position.
144. What is the purpose of the M240 Drive spring rod assembly?

a. Forces the bolt and operating rod assembly back to firing position.

145. What is the purpose of the M240 Bolt and operating rod assembly?
    a. Feeds, strips, chambers, fires, extracts, and ejects cartridges using propellant gasses for power.
146. What is the purpose of the M240 Cover assembly?
    a. Feeds linked belt, and positions and holds cartridges while the bolt and operating rod assembly strips, feeds, and chambers them. Has a sight mounting rail on the top exterior.
147. What is the purpose of the M240 Feed tray?
    a. Guides cartridges into chamber. Slotted top allows air to circulate around (and thus cool) the barrel.
148. What is the purpose of the M240 Tripod assembly?
    a. Provides a stable, flexible mount, and improves accuracy.
149. What is the purpose of the M240 Ejection port?
    a. Guides ejecting cartridges out of the weapon.
150. What is the purpose of the M240 Sights?
    a. The front sight attaches to the barrel and can be adjusted for elevation and windage to let the gunner zero the weapon. Since the gunner adjusts the sight on the barrel to zero the machine gun, the gunner must zero both barrels before combat and training. The rear sight is attached to the rear of the receiver and is marked for each 100 meters of range, from 200 to 800 meters on the upper surface of the leaf, and from 800 to 1,800 meters on the reverse (Figure 3-1). (Appendix B discusses the 10-meter bore light and 25-meter target offsets.)
151. How does the M240 Safety Mechanism function?
    a. The safety mechanism is on the pistol grip just behind the trigger well. To place the weapon on safe, push the selector from left to right until the letter "S" is visible. To place it in the fire mode, push the selector switch from right to left until the letter "F" is visible. The safety can only engage the bolt in the rear position. When the "S" is showing, the bolt cannot release to go forward (Figure 3-1).
152. The M240B machine gun uses what types of ammunition?
    a. Cartridge, 7.62-mm Ball M80—for use against light materials and personnel, and for range training.
    b. Cartridge, 7.62-mm Armor-Piercing M61—for use against lightly armored targets.
    c. Cartridge, 7.62-mm Tracer M62—for observation of fire, incendiary effects, signaling, and for training. When the gunner fires tracer rounds, they mix with ball ammunition in a ratio of four ball rounds to one tracer round.
    d. Cartridge, 7.62-mm Dummy M63—for use during mechanical training.
    e. Cartridge, 7.62-mm Blank M82—for use during training when simulated live fire is desired. The gunner should use a BFA to fire this ammunition.
153. What are the proper storage procedures for M240 ammunition?
    a. Store ammunition under cover. If in the open, keep it at least 6 inches above the ground and cover it with two tarp layers. Ensure that the tarps protect the

ammunition, but allow for ventilation. Dig trenches to divert water away from the ammunition.

154. To avoid corrosion, especially in damp climates, keep ammunition in its airtight containers until ready for use. What are other guidelines for maintaining weapons ammunition?
    a. Keep mud, dirt, and moisture away from ammunition. Before you load ammunition, wipe off debris and moisture. Anytime you find light corrosion on ammunition, wipe it off at once. However, never fire rounds with heavy corrosion, dents, or loose projectiles. Keep oil away from ammunition. Oil attracts dust and other abrasives. Dirty ammunition could damage the operating parts of the weapon, that is, anywhere the ammunition goes. Protect ammunition from the direct rays of the sun. Excessive internal pressure caused by heat can detonate the round prematurely.
155. What is the process of attaching the ammunition adapter to the M240?
    a. The ammunition adapter fits on the left and under the feed tray of the receiver. Look at the left side of the receiver, and you will see a slot and a button under the feed tray (Figure 3-5). To attach the bandoleer holder to the base of the adapter, insert the tapered end (green plastic) of the holder into the adapter. Open the cover assembly and raise the feed tray. Insert the curved lip of the adapter assembly into the slot in the rail (left of the receiver), below the feed tray. Depress the lever on the adapter assembly, and push the assembly towards the receiver until it reaches the receiver. Release the lever. This allows the adapter assembly to secure itself to the button on the receiver (Figure 3-5).
156. Over time, the moving parts in the adapter, including the plastic parts, will wear and break. What are the inspection procedures for the ammo adapter?
    a. Inspect the adapter to determine whether it is clean, undamaged, for damaged parts, excessive wear, and cleanliness when every the weapon is taken out of the arms room. When feasible, test-fit the adapter. After using the adapter, inspect to ensure it is still operational.
157. How do you install the M240 BFA?
    a. The BFA supports MILES force-on-force operations by simulating live-fire exercises. The BFA fits any M240B barrel. The BFA tube fits inside the flash suppressor. The other portion of the BFA fits over the outside, flush with the forward end of the flash suppressor, and flush against the gun muzzle. Secure the BFA as follows:
    b. Attach the Attachment
    c. Unscrew the shaft (1, Figure 3-7) until it slides all the way to the rear. Install the chamber device
    d. (2, Figure 3-7) over the flash suppressor (3, Figure 3-7). Slide the shaft (1) into the throat of the flash suppressor. Engage the threads on the shaft into the body of the chamber device (2). Turn clockwise until hand tight.

158. How do you get the best performance with the BFA?
    a. Inspect the weapon for damaged parts, excessive wear, cleanliness, and proper lubrication before firing.
    b. When feasible, test fire the weapon with ball ammunition before you attach the BFA.
    c. Adjust the BFA to fit the weapon.
    d. Apply immediate action when stoppages occur.
    e. Clean the weapon including barrel assembly, gas cylinder, gas piston, gas port, chamber bore, and BFA.
    f. Clean and lubricate the entire weapon after firing 400 blank rounds.
159. How do you clear the M240 of all ammunition?
    a. Move the safety to the fire "F" position.
    b. With his right hand, (palm up) pull the cocking handle to the rear, ensuring that the bolt locks to the rear (bipod mode).
    c. Return the cocking handle to its forward position.
    d. Place the safety on "S."
    e. Raise the cover assembly and conduct the four-point safety check for brass, links, or ammunition.
    f. - Check the feed pawl assembly under the cover.
    g. - Check the feed tray.
    h. - Lift the feed tray and inspect the chamber.
    i. - Check the space between the face of the bolt and chamber as well as the space under the bolt and operating rod assembly.
    j. Close the feed tray and cover assembly. Place the safety on "F." Pull the cocking handle to the rear, and pull the trigger while manually riding the bolt forward. Close the ejection port cover.
160. How do you remove the M240 buttstock and buffer assembly?
    a. Find the backplate latch under the buttstock where it joins the receiver. Slide the buttstock straight upward, and remove it from the receiver (Figure 3-10).
161. How do you remove the drive spring and rod assembly?
    a. Push the drive-spring rod assembly forward and up to disengage its retaining stud from inside the receiver (Figure 3-11). Pull rearward on the drive spring rod assembly, removing it from the receiver (Figure 3-12).
162. How do you remove the Bolt and Operating Rod Assembly?
    a. Pull the cocking handle to the rear to start the rearward movement of the bolt and operating rod assembly inside of the receiver. With the index finger, reach inside the top of the receiver and push rearward on the face of the bolt until the bolt and operating rod assembly are exposed at the rear of the receiver. Grasp the bolt and operating rod and remove them from the rear of the receiver. Return the cocking handle to the forward position (Figure 3-13).

163. How do you remove the Trigger Housing Assembly?
    a. Depress spring pin and remove. You may need to use the back of the back plate of the buttstock to tap on the spring pin, then remove pin with fingers. All pins go from right to left (Figure 3-14). Rotate the rear of the trigger-housing group assembly down, disengage the holding notch at the front of the assembly from its recess on the bottom of the receiver, and remove the assembly from the receiver (Figure 3-15).
164. How do you remove the Cover Assembly?
    a. Close the cover.
    b. Depress and remove the spring pin . If needed, use the back of the back plate of the buttstock to tap on the spring pin. Then remove it with your fingers. (All pins go from right to left.)
    c. Depress the cover latches, then lift up and remove the cover assembly.
    d. Remove the feed tray.
165. How do you remove the Barrel Assembly?
    a. Make sure that the barrel-carrying handle is to the right side (A).
    b. Depress the barrel-locking latch located on the left side of the receiver where the barrel joins the receiver and hold.
    c. Grasp the barrel carrying handle and rotate the carrying handle to the upright position (without pulling up on the barrel release) (B).
    d. Push forward and pull up, separating the barrel from the receiver (C) (Figure 3-17).
166. How do you Disassemble the Barrel Assembly?
    a. Hold the barrel at the point where the gas system attaches to it (A).
    b. Grasp and rotate the gas collar clockwise until it releases from the gas plug (B).
    c. Remove the collar from the gas plug.
    d. Slide the gas regulator plug from front to rear, removing it from the gas hole bushing (C).
    e. Remove heat shield (D).
    f. Lift the rear of heat shield assembly off the barrel, and then pry one of the front metal tabs out of hole on gas hole bushing.
    g. Rotate the heat shield towards the other metal tab, and remove heat shield from the barrel (Figure 3-18).
167. How do you disassemble the Barrel Assembly?
    a. Check the barrel for bulges, bends, burrs, obstructions and obstructions or pits in the chamber or bore.
    b. Disassemble, inspect, and clean the gas collar and plug.
    c. Ensure the flash suppressor is fastened securely. Inspect the front sight for damage or looseness.
    d. Inspect carrying handle assembly for bent, broken, or missing parts.
    e. Ensure that the heat shield is present and on the barrel assembly, that it is neither bent nor broken, and that it has all of its parts.

168. How do you maintain the Buttstock and Buffer Assembly?
    a. Check for burrs and rough edges on mating grooves and flanges.
    b. Check to ensure the back plate latch locks the buffer assembly securely to the receiver assembly
    c. when installed.
    d. Ensure the buffer plug sticks out through the back plate and is flush or higher than the protrusion
    e. below it.
    f. Ensure nothing rattles when he shakes the buffer, and that he cannot rotate the plug by
    g. finger pressure.
    h. Inspect the butt stock for cracks.
    i. Ensure the back plate locks the butt stock securely to the receiver assembly when installed.
169. How do you maintain the Drive-Spring Rod Assembly?
    a. Check the spring for broken strands. Ensure the rod assembly is not bent.
170. How do you maintain the bold and operating rod assembly?
    a. Inspect the entire area of the bolt and operating rod assembly for missing parts, broken or cracked areas, burrs, bends, or pits on the surface. Looking at the bolt, you can see if the firing pin is broken. The extractor should not move. The operating rod piston should have a slight movement from left to right (about 1/8-inch turn). When you pull the bolt and operating rod to the rear, the piston should move freely without binding.
171. How do you maintain the Trigger Mechanism and Housing Assembly?
    a. Inspect the tripping lever and sear for burrs on edges. Push the tripping lever back to raise the sear, put the safety on "S," and pull the trigger. The sear should not drop down far enough to lock in the downward position. Place the safety on "F," and pull the trigger. The sear should drop down and lock in the downward position. Check the sear spring, ensuring the leg of the spring is behind the trigger pin and not between the trigger and the pin. Check grip assembly for loose or missing grip screws. Check trigger guard for bends or cracks. Check trigger spring pin for bends, and or broken or missing spring.
172. How do you maintain the Cover Assembly?
    a. Pivot the feed lever back and forth to ensure it operates smoothly without binding. Push in on the cover latches to make sure the retaining clip is not weak or missing and that they do not bind in the housing. Push down on the cartridge guides and feed pawls to make sure the springs are not weak or missing. Inspect accessory mounting rail for nicks or burrs.
173. How do you maintain the Feed Tray?
    a. Check for cracks, deformation, broken welds, or loose rivets.
174. How do you maintain the Handguard?
    a. Check handguard for cracks, broken or missing parts.

175. How do you maintain the Receiver Assembly?
    a. Check that the rear sight assembly is securely mounted to the receiver and operates properly. Check that the cocking handle operates the slide properly. Pull the cocking handle to the rear and allow it to slowly return forward, making sure that the slide does not bind in the receiver. Check for damaged or missing ejection port cover, spring, and pin. Lower and raise the bipod legs, ensuring they move freely without binding. Check bipod legs for cracks, or twisted or incomplete assembly. Check the exterior surface of the M240B for the exterior protective finish.
176. What are thing to look over when assembling the M240 Machine Gun?
    a. Assemble the weapon. Be sure parts are installed correctly and are in good working condition. When installing the barrel, move the barrel release slowly to the right and count the number of clicks. Fewer than two and more than seven clicks indicate defective parts. Check both barrels. Check weapon functioning with belted dummy ammunition by performing a function check. If weapon does not function properly and the cause cannot be determined using troubling shooting procedures, notify direct-support maintenance.
177. What are thing to look for when inspecting your T&E assembly?
    a. You should hear distinct clicks when you turn the handwheels. Calibrate the index lines with the indicator-pointer. Ensure that the pintle fits snugly in the pintle bushing, and that the pintle lock holds the pintle securely. Ensure that the sleeve latch functions properly, and that the traversing bar is tight when you extend and latch the tripod legs.
178. When should the gunner should clean the M240B machine gun?
    a. At a minimum, he should clean it after firing a basic load of 900 to 1,200 rounds. He disassembles the M240B into its major groups for cleaning. He should clean all metal components and surfaces that have been exposed to powder fouling using CLP on a bore-cleaning patch. He uses CLP on the bristles of the receiver brush to clean the receiver. After he cleans and wipes dry the M240B, he rubs a thin coat of CLP on it with a cloth. This lubricates and preserves the exposed metal parts during all normal temperature ranges.
179. What is the procedure for cleaning the M240 bore?
    a. - Run the brush through the bore several times until most of the powder fouling and other foreign matter has been removed.
    b. - Swab out the bore several times using a cleaning rod and a swab wet with CLP.
    c. - Swab out the bore several times using a cleaning rod and a dry swab.
180. What is the procedure for cleaning the M240 chamber?
    a. Clean the chamber using CLP and a chamber brush attached to a cleaning rod.
    b. - Run the brush through the chamber several times until most of the powder fouling and other foreign matter has been removed.
    c. - Swab out the chamber several times using a cleaning rod and a swab wet with CLP.

d. - Swab out the chamber several times using a cleaning rod and a dry swab.

181. What is the procedure for cleaning the M240 receiver?
    a. - Brush the receiver until most of the powder fouling and other foreign matter is removed.
    b. - Swab out the receiver several times using a cleaning rod section and a swab wet with CLP.
    c. - Swab out the receiver several times using a cleaning rod section and a dry swab.
182. How do you clean the M240 gas regulator?
    a. Clean the gas regulator plug with special tools (cleaning reamers and combination regulator scraper). Remove all carbon dust. Do not use CLP on the collar, gas block, or body.
    b. Clean each gas inlet hole of the gas regulator plug. Insert the small reamer into each hole and twist back and forth to remove the carbon (apply hand pressure only) (Figure 3-19).
    c. Clean the central hole of the gas plug by inserting the scraper tool down to the bottom of the hole and twisting firmly (Figure 3-20). Clean the two grooves by inserting the scraper tool into the grooves and applying pressure as firmly as possible (Figure 3-20).
183. What parts should be lubricated with CLP?
    a. - Drive-spring rod assembly.
    b. - Bolt.
    c. - Receiver inner walls.
    d. - Cover assembly (springs, and feed pawls).
    e. - Trigger housing (inside only). After you lubricate the weapon, cycle the components by hand to spread the CLP. If you fire a weapon infrequently or store it for prolonged periods, keep a light film of CLP on it. Apply it to the inside of the gas cylinder and to the gas piston right after you clean or inspect the weapon. Do preventive maintenance every 90 days, unless your inspection reveals a need for more frequent servicing.
184. What must you de after ensuring your weapon is cleaned and lubricated?
    a. Even when you keep a weapon lubricated, you must still clean and inspect it for corrosion. Before you use the weapon, clean the gas system and components, and ensure they are free of oil and lubricants. Clean all exposed surfaces of the M122A1 tripod, flex-mount assembly, and complete pintle and T&E mechanism. Wipe them down with a clean rag. Loosen dirt in stubborn areas (except the flex mount) with a steel or bore brush. Use a clean rag to wipe them down. Finish by lubricating them with CLP.
185. In unusual conditions, what are cleaning and lubrication protocols for the M240?
    a. - Below 0 degrees Fahrenheit—use lubricating oil, arctic weather (LAW). Oil lightly to
    b. avoid freeze-up.
    c. - Extreme heat—use light coat of CLP.

d. - Damp or salty air—use CLP. Clean and apply frequently.
e. - Sandy or dusty areas—use CLP. Clean and apply frequently, and wipe with a clean rag after each application to remove excess.

186. How do you install the Cover Assembly and Feed Tray?
    a. Position the feed tray on the receiver to align the feed tray guides with the receiver brackets. Place the cover assembly onto the receiver, aligning its mounting holes with the mounting brackets on the receiver, and then close the cover assembly. Then, insert the spring pin into the holes to affix the cover and feed tray to the receiver (insert the spring of the spring pin into the hole than push in from right to left).
187. How do you install the Trigger Housing Assembly?
    a. Insert the holding notch on the front of the trigger housing into the forward recess on the bottom of the receiver. Rotate the rear of the trigger housing upwards and align the holes of the trigger housing with the mounting bracket on the receiver. Hold the trigger housing assembly and insert the spring pin into the hole, securing the assembly to the receiver. Insert the spring of the spring pin into the hole than push in from right to left (Figure 3-24).
188. How do you install the Bolt and Operating Rod Assembly?
    a. Ensure that the bolt and operating rod are fully extended (unlocked position). Insert the bolt and operating rod into the rear of the receiver (bolt upward, operating rod beneath bolt) ensuring the bolt is on top of the rails located on the left and right inner walls of the receiver. Push the entire bolt and operating rod assembly into the receiver as far forward as possible. Pull the trigger to allow the sear to drop and the group to slide all the way into the receiver (Figure 3-25).
189. How do you install the Drive-Spring Rod Assembly?
    a. Insert the drive-spring rod assembly into the receiver, sliding it all the way forward against the recess in the rear of the operating rod. Push in and lower the drive-spring rod assembly to engage the retaining stud into the hole located on the bottom of the receiver (Figure 3-26).
190. How do you install the Butt stock and Buffer Assembly?
    a. Position the bottom recess grooves of the butt stock onto the top of the receiver recess grooves. Slide the butt stock down until it locks in place on the receiver. Ensure the butt stock is secure. Line the handguard on the bottom of the gas cylinder and push upwards. The handguard snaps in place.
191. The gunner must perform a function check to ensure that the M240B is correctly assembled by performing what steps in order?
    a. Place the safety on "F."
    b. Pull the cocking handle to the rear, locking the bolt to the rear of the receiver.
    c. Return the cocking handle to the forward position.
    d. Place the safety on "S" and close the cover.
    e. Pull the trigger. (Bolt should not go forward).
    f. Place the safety on "F."
    g. Pull the cocking handle to the rear, pull the trigger, and ride the bolt forward.
    h. Close the ejection port cover.

192. What should you do before firing your M240?
    a. - Wipe the bore dry.
    b. - Inspect the weapon as outlined in operator's TM.
    c. - Inspect the spare barrel.
    d. - Lubricate the weapon.
193. What should you do during firing?
    a. - Change the barrels. Changing the barrel prolongs the life of both barrels.
    b. - Periodically inspect the weapon to ensure that it is properly lubricated.
    c. - When malfunctions or stoppages occur, follow the procedures in Section IV.
194. What should you do after firing?
    a. - Clear and clean the weapon immediately.
    b. - Every 90 days during inactivity, clean and lubricate the weapon unless inspection reveals more frequent servicing is necessary (TM 9-1005-313-10).
195. What are the operation procedures of the M240?
    a. The gunner loads the M240B machine gun from the closed bolt position. He fires, unloads, and clears it from the open bolt position. Before he can pull the bolt to the rear, he must first place the safety on "F." Before he can fire belted ammunition, he must first link it with the double link at the open end of the bandoleer. He must ensure that it is free of dirt and corrosion. The M240B machine gun usually works best when fired from a tripod, which makes the most of this gun's continuous, accurate fire and control manipulation. However, if needed, the gunner may use the bipod mount.
196. What are loading procedures of the M240?
    a. The gunner makes sure the weapon is clear. He places the safety on "F." With his palm facing up, he pulls the cocking handle to the rear. This puts the bolt assembly in the rear position. While the sear holds the bolt to the rear, the gunner manually returns the cocking handle to the forward position and places the safety on "S." He raises the cover assembly and ensures the feed tray, receiver assembly, and chamber are clear. He lowers the feed tray, places the safety on "F," and pulls the cocking handle to the rear. While maintaining rearward pressure on the cocking handle, he pulls the trigger and eases the bolt assembly forward. He places the first round of the belt in the feed tray groove with the double link leading, and with the open side of links face down. While closing the cover assembly, he holds the belt about six rounds from the loading end. Ensure that the round remains in the feed tray groove, and close the cover assembly (Figure 3-27).
197. What are the M240 loading procedures?
    a. The gunner unloads the M240B by pulling and locking the bolt to the rear position, if it is not already there. He manually returns the cocking handle to its forward position. He places the safety on "S." He raises the cover assembly and removes any ammunition or links from the feed tray. He performs the four-point safety check (Section III).

198. What is the cycle of operations of the M240?
    a. Crewmembers can recognize and correct stoppages when they know how the weapon functions. The weapon functions automatically as long as ammunition is fed into it and the trigger is held to the rear. Each time the gunner fires a round, the parts of the weapon function in a cycle or sequence. Many of the actions occur at the same time. (This paragraph discusses these actions separately only for teaching purposes.) This sequence is called the "cycle of functioning," which starts when the gunner places the first round of the belt in the tray groove. Then he pulls the trigger, releasing the sear from the sear notch. When he pulls the trigger, the back of the sear lowers and disengages from the sear notch. This allows the expansion of the drive-spring rod assembly to drive the bolt and operating rod assembly forward. The cycle stops when the gunner releases the trigger and the sear again engages the sear notch on the bolt and operating rod assembly:
199. What occurs during the feeding stage of the M240?
    a. The actuating roller moves the feed lever side to side, which in turn moves the feed pawls. The forward movement of the bolt forces the outer pawls to the right, fully feeding the round. The inner pawl rides over the round and settles behind it. The rearward movement forces the inner pawl to the right, fully feeding the round. The action of fully feeding a round pushes the link of a fired round out of the side of the gun. The gunner cannot push out the last link in a belt, so he must clear it while unloading.
200. What occurs during the chambering stage of the M240?
    a. The gunner positions the first round in line with the chamber. The cartridge stop and cartridge guide pawl hold it in position. When the gunner squeezes the trigger, the nose of the sear depresses, which frees the piston rod extension. The drive-spring rod assembly pushes the working parts forward. The feed horn strikes the base of the round. The bolt strips the round from the belt link. The chambering ramp angles downward and, along with the spring tension of the cartridge guide pawl, forces the round toward the chamber. The cartridge guide pawl also holds back the belt link. When the round seats fully in the chamber, the extractor snaps over the extractor rim of the cartridge, and the ejector depresses.
201. What occurs during the locking stage of the M240?
    a. During chambering, as soon as the piston begins to move, the firing pin is withdrawn into the bolt block. The breech remains locked during the primary movement. The bolt enters the barrel breech as the drive spring drives the operating rod forward, and as the locking lever, which the bolt is riding on, swings forward, pushing the bolt forward and locking it to the barrel breech. Although the term "locking" is used here, in the M240B, the bolt and barrel do not physically interlock. This way, the barrel can be removed when the bolt is forward.

202. What occurs during the firing stage of the M240?
    a. As the working parts come forward and the round feeds into the chamber, the locking cams force the locking lever down. This slows the forward movement of the bolt assembly. The piston rod extension, still moving forward, causes the locking lever link to rotate downward and back. This forces the arms down to their fullest extent in front of the locking shoulder. The extractor rises over the base of the round and the ejector is compressed. The round is now fully home with the breech locked. The final forward movement of the piston extension drives the firing pin through the bolt assembly onto the cartridge primer and fires the round. The working parts are now fully forward.
203. What occurs during the unlocking stage of the M240?
    a. When the gunner fires a round, some of the gasses pass through the gas plug regulator into the gas cylinder. The rapidly expanding gases enter the hollow end cap of the gas piston and force the operating assembly to the rear. This powers the last four steps in the cycle of functioning. During the primary movement of the operating rod assembly, it moves independently of the bolt for a short distance. At this point, the locking lever begins to swing toward the rear, carrying the bolt with it into its unlocked position, and clearing the barrel breech. When the bolt assembly has been jerked back, slightly enough to unlock the breech, the primary effort is extraction of the empty case.
204. What occurs during the extracting stage of the M240?
    a. When the breech is fully unlocked and the bolt assembly starts its rearward movement, the extractor withdraws the empty case from the chamber.
205. What occurs during the ejecting stage of the M240?
    a. As the cartridge case is withdrawn from the chamber, the ejector pushes from the top, and the extractor pulls from the bottom. The casing falls down from the face of the bolt as soon as it reaches the cartridge-ejection port. The empty belt links are forced out the link ejection port as the rearward movement of the bolt causes the next round to be positioned in the tray groove.
206. What occurs during the cocking stage of the M240?
    a. As the working parts continue toward the rear, the return spring compresses and the gunner maintains his trigger squeeze. The gas regulator adjustment makes sufficient gas available, which causes the working parts to rebound off the buffer; continuing the cycle of feeding and firing continues. When the gunner releases the trigger, the sear remains down, but the tripping lever rises. As the working parts come to the rear, the end of the piston rod extension hits the tripping lever, which, in turn, allows the sear to rise and engage the sear notch, which holds the working parts to the rear.

207. The M7 HMMWV pedestal and platform mount consists of what components?
    a. The pedestal and column assembly (NSN 1005-01-518-9037),
    b. The ammunition adapter (NSN 1005-01-431-8324),
    c. A deflector kit (NSN 1005-01-468-0552),
    d. The platform mount, floor plate assembly, securing pins, and depression stop (NSN 1005-01-413-4098).
208. How do you mount the weapon on the M7 pedestal?
    a. Places the weapon's bipod legs down in the locked position.
    b. Pulls out and holds the spring pin on the cam follower.
    c. Slides the cam follower under the forward rail assembly.
    d. Aligns the forward mounting holes of the weapon with the cam follower.
    e. Releases the spring pin to lock the weapon to the mount.
    f. Positions the weapon with the cam follower attached over the pintle.
    g. Aligns the rear mounting holes of the cam follower and weapon with the pintle.
    h. Inserts the quick release pin.
209. How does the gunner dismount the weapon from the mount?
    a. Takes out the quick release pin.
    b. Grasps the carrying handle with one hand.
    c. Raises the rear of the weapon slightly.
    d. Lifts the weapon from the mount.
210. Uncontrolled fire (the weapon continues to fire after the gunner releases the trigger). This is usually caused by the gunner's failure to pull and hold the trigger all the way to the rear. What is the procedure for dealing with a runaway gun?
    a. The gunner holds the weapon on target and fires the remaining ammunition.
    b. The assistant gunner stops the weapon from firing by breaking the belt of ammunition.
    c. The gunner as a last resort pulls the cocking handle to the rear thus, locking the bolt to the rear of the receiver.
211. What causes sluggish operation of the M240?
    a. Sluggish operation is due to excessive friction caused by carbon build-up, improper lubrication, or burred parts. Corrective action includes cleaning, lubricating inspecting, and replacing worn parts. The gunner may adjust the gas regulator to maintain the rate of fire until he has a chance to clean the machine gun.
212. What can cause a misfire?
    a. is the failure of a chambered round to fire. Such failure can be due to an ammunition defect or faulty firing mechanism.

213. What causes a weapon cook off?
    a. is the firing of a round due to the heat of a hot barrel and not to the firing mechanism. Cook offs can be avoided by applying immediate action within 10 seconds of a failure to fire.
    b. If a stoppage occurs and the gunner cannot pull the cocking handle to the rear by hand (the bolt might be fully forward and locked, or only partially forward), the gunner must do what?
    c. Try again to pull the cocking handle by hand.
    d. If the weapon is hot enough to cause a cook off, move all Soldiers a safe distance from the weapon and keep them away for 15 minutes.
    e. After the gun has cooled, pull the cocking handle to the rear. Keep rearward pressure on the cocking handle until you remove the drive-spring rod assembly. Open the cover and
    f. disassemble the gun. (The assistant gunner will help you.)
    g. Removes the round or fired cartridge. Uses cleaning rod or ruptured cartridge extractor if necessary.
214. Stuck barrel is the result of the machine gun crew not properly cleaning the gas cylinder and gas regulator plug. During training or range firing, clear, disassemble, and clean the M240B immediately. In combat, clean it as soon as possible. If they cannot properly clean the weapon in these situations, then what can the crew do?
    a. Pull the cocking handle to the rear, locking the bolt. Return the cocking handle and place the safety on "S."
    b. Place the weapon on the ground or away from his face and open the cover, and then perform the four-point safety check.
    c. (Gunner only) ensure that the barrel is still locked to the receiver with the carrying handle to the right.
    d. (Assistant gunner only) place the heat protective mitten on your right hand and remove the gas regulator collar from the barrel, which is secured to the receiver. With the gas regulator collar removed, remove the barrel (Section II).
    e. (Assistant gunner only) After removing the barrel, remove the gas regulator collar and gas regulator plug from the spare barrel.
    f. Insert the barrel into the socket of the receiver. Ensure that the gas regulator plug is going into the gas hole bushing.
    g. (Assistant gunner only) Once the barrel is secured to the receiver, secure the gas regulator collar on the gas regulator plug.
    h. (Gunner only) After ensuring the barrel is secured to the receiver (2 to 7 clicks) and the collar is secure, reload and continue firing.
215. Why is an accurate initial burst important for effective fire?
    a. Obtaining an accurate initial burst of fire on the target is essential to good marksmanship. This requires the gunner to estimate range to the target, set the sights, and apply the fundamentals of marksmanship while engaging targets.
216. Why is adjusting fire important for accuracy?

a. The assistant gunner must observe the strike of the rounds when the initial burst is fired. If the gunner misses the target, then he manipulates the T&E mechanism until he hits it. The assistant gunner must be proficient in observing the strike of rounds and in observing and using tracers. This helps the gunner re-lay the machine gun back on target.

217. Why is speed important for effective marksmanship?
    a. Speed is also essential to good marksmanship; it is attained by practice in both dry-fire and live- fire exercises. Speed develops through extensive training that combines other skills when delivering fire. However, speed is less important than accuracy.

218. The trainer must realize that qualification is just a step toward reaching combat requirements. To reach this goal, the gunner considers his position, the use of his weapon, and some of the following combat conditions as well:
    a. Most engagements are within 300 meters. However, the gunner must still engage targets out to the maximum range of the machine gun.
    b. Enemy personnel are seldom visible except when assaulting.
    c. The gunner directs most combat fire where he has detected the enemy or where he suspects the enemy of being, but where the gunner cannot see him. Area targets consist of objects or outlines of men irregularly spaced along covered and concealed areas (ground folds, hedges, borders of woods).
    d. Most combat targets can be detected by smoke, flash, dust, noise, or movement, but the targets remain visible only for a moment.
    e. Some combat targets can be engaged using reference points, predetermined fire, or range card data.
    f. The nature of the target and irregularities of terrain and vegetation might require a gunner to move from one position to another to place effective fire on the target. The most stable position for the gunner is the prone tripod-supported position.
    g. Most combat targets have low-contrast outlines and are obscure. Therefore, choosing an aiming point in elevation is difficult.
    h. Time-stressed fire in combat includes fire at a single, fleeting target that must be engaged quickly; at distributed targets that must be engaged while they are available; and a surprise
    i. target that they must engage at once, with instinctive, accurate fire.

219. What is the most important aspect of marksmanship?

a. In automatic fire, position is the most important aspect of marksmanship. If the gunner has a good zero, correctly aims his weapon, and properly applies a steady hold in firing a burst of automatic fire, the first round of that burst hits the target at the point of aim. However, this procedure might apply only to the first round fired. The first round hits the aiming point the same as when a single round is fired. The recoil from the first and subsequent rounds progressively disturb the lay of the weapon with each round of the burst. The relationship between the point of impact of the first and subsequent rounds of the burst depends on the stability of the gunner's position. His body, directly behind the weapon, serves as the foundation, and his grip serves as a lock to hold the weapon against the foundation. The better the body alignment and the steadier the grip, the less dispersed the rounds of a burst of automatic fire will be.

220. What is the method of aiming a machine gun?
    a. To aim the machine gun, the gunner must align the sights, focus his eye, obtain a correct sight picture, control his breathing, and maintain trigger control.
221. How can you obtain proper sight alignment with a machine gun?
    a. To obtain correct alignment, the gunner centers the front sight post in the aperture of the rear sight. For a correct sight picture, the gunner centers the target over the front sight post so that it appears to rest lightly on top of the sight. The aspects of obtaining an accurate initial burst through sight alignment and sight picture, trigger manipulation, and zeroing are the same for tripod training as for bipod training.
222. How does the focus of the eye impact marksmanship?
    a. A good firing position places the eye directly on line with the center of the rear sight. The gunner must focus on the tip of the front sight post. The natural ability of the eye to center objects in the rear sight, and to seek the point of greatest light, helps the gunner align the sights correctly.
223. How does Sight Picture impact marksmanship?
    a. A correct sight picture has the target, front sight post, and rear sight aligned. The sight picture has sight alignment and placement of the aiming point on the target. The gunner aligns the front sight post in the center of the rear sight and then aligns the sights with the target. The top of the front sight post aligns on the center base of the target (Figure 4-2).
224. How does breath control impact marksmanship?
    a. When firing in bipod-mounted mode, two types of breath control are used. When firing single shots, as in zeroing, the gunner stops breathing after most of the air has been exhaled during the normal breathing cycle. He fires before he feels any discomfort. During automatic fire, ideally, the gunner exhales and stops his breath when pressing the trigger. He lacks the time to take deep breaths between bursts. He must either hold his breath before each burst, or he must adapt his breathing. He can do this by taking quick shallow breaths or by taking deeper breaths between several bursts.

225. How does trigger control impact marksmanship?

a. Pressing the trigger straight to the rear and releasing it helps control the number of rounds in each burst and prevents disturbing the lay of the weapon. To do this, the gunner must learn how to manipulate the trigger in order to get the desired burst that he wishes to obtain.

226. How do you assume a bipod supported prone position?
   a. Spread your legs a comfortable distance apart with your heels as close to the ground as possible. Grasp the pistol grip with your firing hand. Rest the fleshy end of your index finger lightly on the trigger. Place your nonfiring hand on the small of the stock, with your thumb curled underneath. Then, slide your nonfiring hand forward until your little finger touches the receiver, so that the aiming point remains the same. Place your cheek against the forefinger of your nonfiring hand to form a stock weld. Try to position your nonfiring hand and cheek at the same spot on the stock each time you fire the weapon. The stock weld should provide for a natural line of sight through the center of the rear sight aperture to the front sight post and to the target. Relax your neck so that your cheek rests on your forefinger naturally. Apply a firm, steady pressure rearward and down, holding the weapon tightly into the hollow of your shoulder while aiming and firing. Keep your shoulders level and elbows about an equal distance from the receiver of the weapon.

227. How do you get into a bipod supported fighting position?
   a. Extend the bipod legs and place the machine gun in front of the position.
   b. Place your right (firing side foot) foot sideways against the rear of the fighting position and lean forward until your chest is squarely against the forward wall.
   c. Raise the folding shoulder rest and place it on your firing shoulder (M249 and M60 only). Keep your shoulders level or parallel to the ground.
   d. Grasp the pistol grip with your firing hand. place the fleshy end of the index finger resting lightly on the trigger. Place your nonfiring hand on the small of the stock and ensure that your thumb curls underneath.

228. How does the gunner get into a tripod supported prone position?
   a. Spread his legs a comfortable distance apart with his heels as close to the ground as possible and still be comfortable. Grasp the pistol grip with his right hand with the fleshy end of his index finger resting lightly on the trigger. When he uses the tripod, he must fire the machine gun right-handed, because turning the traverse handwheel with the right hand is difficult. Grasp the elevating handwheel with his left hand, palm down. Exert a firm downward pressure with both hands while aiming and firing. Place both elbows on the ground between the tripod legs and his body. The position of his elbows raises or lowers his body relative to the machine gun. Lean forward and to the right, into the buttstock, eliminating play in the weapon (from the T&E mechanism), and push forward with his toes to obtain a stable firing platform. Place his shoulder lightly against the stock, without applying pressure. Rest his cheek lightly (if at all) against the stock (Figure 4-5).

229. How does the gunner get into a tripod supported fighting position?

a. Grasp the pistol grip with his firing hand, with the fleshy end of his index finger resting lightly on the trigger. Place his left hand on the elevating handwheel, palm down, exerting a firm downward pressure to make either minor or major adjustments in deflection or elevation. (The tripod stabilizes the weapon.) Place his elbows on the inside and avoids touching the tripod. Lean forward and to the right, into the buttstock, eliminating play in the weapon (from the T&E mechanism). This gives him a stable firing platform. Place his shoulder lightly against the stock, without applying pressure. Rest his cheek lightly, if at all, against the stock.

230. How does Steady Position impact machine gun use at night?
    a. When firing unaided, changes in head position and stock weld are necessary especially when using weapon-target alignment techniques. Normally, the gunner positions his head so that he can align the weapon on the target and look over the sights. In some cases, the lower part of his jaw makes firm contact with his nonfiring hand on the stock, with his eyes an inch or so above the sights. The key is to use the natural pointing ability to align the machine gun on the target. When using NVDs, the gunner must alter his head position and stock weld. Sometimes, the height of the NVD can make this impossible. NVDs also alter the machine gun's weight and center of gravity. The gunner must compensate by exerting greater pressure and control with his firing hand on the pistol grip and his nonfiring hand on the stock. Firing at predetermined targets at night, with the weapon laid on each target, is the same as in the daytime. However, firing at night at targets of opportunity is different. The gunner must align the weapon on the target and look over the sights. His head is higher and his lower jaw only lightly rests on the stock, if at all. When using NVDs, the gunner positions his head so that his firing eye aligns with the device.
231. How does aim impact machine gun use at night?
    a. Various modifications are necessary when aiming the machine gun at night. When firing unaided the gunner uses off-center vision instead of pinpoint focus. Both eyes are open and focused downrange on the target, rather than on the sights. Rather than aim using the sights, the gunner looks over the sights and points the machine gun where he is looking. The normal tendency is to fire high so the gunner must improve weapon-target alignment by pointing slightly low to compensate. When using NVDs, the gunner uses the necessary aiming process to use the device.
232. How does Breath Control impact machine gun use at night?
    a. This fundamental remains the same during night firing; however, because NVDs magnify the field of view, wobble is more pronounced.
233. How does Trigger Control impact machine gun use at night?
    a. This remains the same during night firing. The objective is to keep the weapon aligned with the target.

234. How can you lead moving targets using a machine gun?

a. To hit a moving target, the machine gun must be aimed ahead of the target far enough to cause the bullet and target to arrive at the same time at the same point. This distance is measured in target lengths. One target length as seen by the gunner is one lead. Leads are measured from the center of mass. Table 4-1 gives the amount of lead needed to hit a target moving at right angles, to the gunner, and at speeds and ranges indicated. The gunner makes adjustments as conditions change. If target speed is 7 1/2 mph, the amount of lead is half that shown on the table; at 30 mph, double that shown. The angle at which the target moves also changes the lead. If the target is moving on an oblique angle, only half the lead is required. For a target moving directly at the gunner, the aiming point is below the center base of the target depending on range and slope of the ground. For a target moving directly away from a gunner, the aiming point is above the center base of the target (Figure 4-7). Too much lead is better than too little because the target moves into the beaten zone, and observation of the strike of the rounds is easier relative to the target.

235. What are tracking techniques for targets?
    a. The gunner aims at a point ahead of the target equal to the estimated number of leads, maintains this lead by tracking the target (manipulates the weapon at the same angular speed as that of the target), and then fires. Tracking allows the gunner in position for a second burst if the first one misses.
236. What are trapping techniques?
    a. The gunner establishes an aiming point forward of the target and along the target path. He pulls the trigger as the target reaches the appropriate point in regard to lead.
237. How should machine gun fires be applied?
    a. The gunner must aim, fire, and adjust on a certain point of the target. He always keeps the center of his beaten zone at the center base of the target for maximum effect from each burst of fire. When he uses this procedure, bullets in the upper half of the cone of fire run through the target if it has height, and the bullets in the lower half of the beaten zone ricochet into the target.
238. How is machine gun fire adjusted?
    a. The gunner initially sets his sights with the range to the target, lays on the target (sight alignment and sight picture on the center base of the target), fires a burst, and observes the strike of the rounds or flight of the tracers. When the initial burst is correct, he continues to fire until the target is covered. He must regain a good sight picture before each burst when using the bipod. When using the tripod, the gunner makes a rapid check of the sight picture after each traverse and search adjustment.
239. What is the sight correction method of adjusting fire?
    a. A gunner must observe and adjust fire rapidly to be effective. He observes bursts of fire by noting the strike of the rounds in the target area and the tracers in flight. The technique to adjust fire depends on time, range, and amount of adjustment. These factors assist the gunner in determining whether to make sight corrections or adjust position and point of aim. When the initial burst is placed incorrectly, the

gunner may change the elevation and windage on the sights and fire another burst on the target. This method is time-consuming, even for the well-trained Soldier.

240. What is the adjusted aiming point method?
    a. In this method of fire adjustment, the gunner uses his sight, but leaves the sight alone. This method is quick. If the gunner misses the target with his initial burst, he must rapidly select a new aiming point the same distance from the target as the center of impact of the initial burst, but in the opposite direction. For example, if the initial burst is 20 meters beyond and 10 meters to the right of the target, the gunner rapidly selects an aiming point about 20 meters short and 10 meters to the left of the target, lays on that aiming point, and fires (Figure 4-8).

241. When selecting a new aiming point from bipod mode, he may have to shift his shoulders slightly to the left or right for windage corrections. For elevation changes, what does the gunner do?
    a. He moves his elbows closer together (lowers the impact) or farther apart (raises the impact). For large corrections, he must move his elbows and realign his body to remain directly behind the weapon. He does this by redistributing weight to his elbows and toes and raises his body off the ground. He shifts his body using his toes, to the right or left, pivoting on his elbows until he is on line with the target. Then he assumes a steady position, obtains the sight picture, and engages the target.

242. How can you use the clock system to evaluate wind?
    a. Winds that blow from the left (9 o'clock) or right (3 o'clock) are called full-value winds, because they have the most effect on the round. Winds that blow at an angle from the front or rear area are called half-value winds, because they have about one-half the effect on the round as full-value winds. Winds that blow straight into the gunner's face or winds that blow straight into the target are termed no-value winds, because their effect on the round is too small to be a concern. Effects of the wind increase as the range increases. Figure 4-10 shows the effects of a 10-mph wind at varying ranges. A 20-mph wind doubles the effect. Winds at other than right angles have less effect. As Table 4-2 shows, the wind has little effect up to 300 meters.

243. What are methods for measuring wind magnitude?
    a. Wind can vary greatly between the firing position and the target. Even though the wind blows hard at the firing position, trees, brush, or terrain could protect the path of the round. Also, wind can change several miles per hour between the time the Soldiers measure it and when they fire. However, they should tell Soldiers that, even though wind can affect trajectory, they can overcome its effects by simply adjusting their fire. Also, a wind gauge measures wind velocity precisely, but in the absence of a gauge, they can estimate velocity by using one of two methods.

244. What are some facts that help gunners asses wind?
    a. Knowing the following facts about the wind can help the gunner determine wind velocity.

b. A person can barely feel wind under 3 mph, but the presence of a slight wind can be determined by drifting smoke.
c. A wind of 5 to 8 mph constantly moves the leaves of trees.
d. A wind of 8 to 12 mph raises dust and disturbs loose papers.
e. A wind of 12 to 15 mph causes small trees to sway.

245. What is the point method of assessing wind?
a. A Soldier can drop a piece of paper or other light material from shoulder height. By pointing directly at the spot where it lands, he can estimate the angle. As shown in Figure 4-10, the angle is also divided by 4 to determine wind speed in miles per hour. However, this only indicates the conditions at the firing position; conditions at the target might differ.

246. Dry-fire exercises train the techniques of loading, unloading, immediate action, remedial action, fundamentals of marksmanship, sight settings, and T&E manipulation. What do these exercises allow the gunner to do?
a. These exercises allow the gunner to use blank or dummy ammunition, and the trainer to use fire commands when appropriate. When the gunner uses the blank firing attachment, the trainer must enforce safety restrictions for its use.

247. While the gunner performs the tasks, what should the AG do?
a. Check the sight setting and initial lay. Check the gunner's position. Ensure the gunner simulates firing before adjusting his position. Check for proper body adjustment or manipulation of the traversing and elevating mechanism. Critique the gunner at the end of the exercise.

248. How does the gunner change elevation?
a. The gunner makes large elevation (range) adjustments on the rear sight. He makes fine adjustments by rotating the elevation knob.

249. What are barrel changing procedures on a tripod?
a. The gunner ensures that the bolt is to the rear and puts the safety on "S." He also helps the assistant gunner change the barrel, if needed. The assistant gunner (wearing the heat-protective mitten) unlocks the barrel locking lever, removes the barrel, and places the barrel on the spare barrel case. He secures the spare barrel and inserts it into the machine gun. To ensure that it locks to the receiver, he rotates the carrying handle to the right (M240B). The gunner ensures that the barrel is locked and secured in the receiver of the machine gun. He moves the safety lever to "F," assumes the correct firing position, and reports "Up." The assistant gunner signals "Ready" to the squad leader.

250. What is trajectory?
a. The trajectory is the path of the round in flight (Figure 5-1). The gunner must know the trajectory of each machine gun round to effectively fire the weapon throughout its full range. For example, the path of a round is almost flat at ranges up to 300 meters; then it begins to curve, and the curve becomes greater as the range increases.

251. What is maximum ordinate?
a. Maximum ordinate is the highest point of the trajectory between the muzzle of the weapon and the base of the target. It occurs about two-thirds of the distance from

the weapon to the target. The maximum ordinate increases as the range increases (Figure 5-1).

252. What is the cone of fire?
    a. When several rounds are fired in a burst from any machine gun, each round follows a slightly different trajectory. The pattern these rounds form on the way to the target is called the "cone of fire" (Figure 5-2). This pattern is caused mostly by the vibration of the machine gun and the variations in ammunition and atmospheric conditions.
253. What is the beaten zone?
    a. This area (Table 5-1 and Figure 5-2) is the elliptical pattern formed on the ground or target by the striking rounds. The length of the beaten zone changes when the range to the target changes or when the machine gun is fired on different types of terrain. Shorter ranges and downward slopes produce lengthen beaten zones, and vice versa.
254. What is the danger space?
    a. This is the space between the machine gun and the target where the trajectory rises less than 1.8 meters (the average height of a standing Soldier) from the ground. This space includes the beaten zone. When the machine gun is fired on level or uniformly sloping terrain at a target within 700 meters, the trajectory remains at or below the average height of a standing Soldier. When targets are engaged on level or uniformly sloping terrain at ranges greater than 700 meters, the trajectory rises above the average height of a standing Soldier. Therefore, only part of the distance between the machine gun and the target is automatically danger space.

255. What is grazing fire?
    a. Grazing fire occurs when the center of the cone of fire rises less than 1 meter aboveground. When firing on level or uniformly sloping terrain, the gunner can only graze fire out to 600 meters.
256. What is plunging fire?
    a. Plunging fire occurs when the danger space is within the beaten zone. Plunging fire also occurs when firing at long ranges, from high ground to low ground, into abruptly rising ground, or across uneven terrain, resulting in a loss of grazing fire at any point along the trajectory
257. What is frontal fire?
    a. Fire occurs when the long axis of the beaten zone is at a right angle to the front of the target. An example is when firing at the front of a target.
258. What is flanking fire?
    a. Flanking fire occurs when the gunner fires at the side of a target.
259. What is oblique fire?
    a. Oblique fire occurs when the long axis of the beaten zone is at an angle other than a right angle to the front of the target.
260. What is enfilade fire?

a. Enfilade fire occurs when the long axis of the beaten zone coincides or nearly coincides with the long axis of the target. This type of fire is either frontal or flanking. This is the most desirable type of fire with respect to a target, because it makes the best use of the beaten zone.

261. What is fixed fire?
    a. This is fire delivered against a point target when the depth and width of the beaten zone covers the target. Fixed fire also means only one aiming point is necessary to provide coverage of the target.
262. What is traversing fire?
    a. This is fire distributed in width by successive changes in direction. The gunner selects successive aiming points throughout the width of the target. These aiming points must be close enough to ensure adequate coverage but not so close as to waste ammunition.
263. What is searching fire?
    a. This is fire distributed in depth by successive changes in elevation. The gunner selects successive aiming points in depth. The changes made in each aiming point will depend on the range and slope of the ground.
264. What is traversing and searching fire?
    a. This is fire distributed in width and depth by successive changes in direction and elevation. Combining traversing and searching fire provides good coverage of the target. Adjustments are made in the same manner as described for traversing and searching fire.
265. What is free gun fire?
    a. This is fire delivered against targets requiring rapid major changes in direction and elevation that cannot be applied with the T&E mechanism. To deliver this type of fire, the gunner removes the T&E mechanism from the traversing bar on the tripod so he can move the weapon freely in any direction.
266. What is fixed fire for point targets?
    a. Point targets, such as enemy troops, bunkers, weapons emplacements, and lightly armored vehicles, require the use of a single aiming point.
267. What is traversing and searching fire for area targets?
    a. Area targets can be very wide and deep. When they are, they require extensive traversing or searching fire. Area targets include those whose exact locations are unknown.
268. What are linear targets?
    a. Linear targets are wide enough to require successive aiming points delivered via traversing fire. The beaten zone effectively covers the depth of the target area (Figure 5-7).
269. What are deep targets?
    a. Deep targets require successive aiming points delivered via searching fire (Figure 5-8).
270. What are linear targets with depth?
    a. Linear targets with depth have sufficient width requiring successive aiming points in which the beaten zone does not cover the depth of the target area. A

combined change in direction and elevation, delivered by traversing and searching fire, is necessary to effectively cover the target (Figure 5-9).

271. What does distribution, concentration, and rate of fire mean?
    a. The size and nature of the target determine how the gunner applies his fire. He must manipulate the machine gun to move the beaten zone throughout the target area. He must control the rate of fire to adequately cover the target, but at the same time to conserve ammunition and preserve the barrel.
272. What does distribution of fire mean?
    a. Distribute fire in width and depth on large targets such as enemy formations.
273. What does concentration of fire mean?
    a. Concentrate fire on point targets such as automatic weapons or an enemy fighting positions.
274. What does rate of fire mean?
    a. Use sustained, rapid, and cyclic rates of fire with the machine gun (Table 5-2). These rates enable leaders to control and sustain your fire and to help you avoid destroying your barrel. More than anything else, the size of the target and ammunition supply dictate your rate of fire.

275. What does sustained fire mean?
    a. This is the normal rate of fire for the gunner. Sustained fire for the M249 is 50 rounds per minute in bursts of 3 to 5 rounds, with 4 to 5 second intervals between bursts. The M60 and M240B are 100 rounds per minute in bursts of 6 to 9 rounds. The gunner pauses 4 to 5 seconds between bursts. The barrel should be changed after firing at sustained rate for 10 minutes.
276. What does rapid fire mean?
    a. For all three weapons, the barrel should be changed after firing at a rapid rate for 2 minutes. This allows an exceptionally high volume of fire, but for only a short period of time. Specifics for each weapon follow:
277. What is rapid fire for the M249?
    a. Rapid fire for the M249 is 100 rounds per minute in bursts of 8 to 10 with an interval of 2 to 3 seconds between bursts.
278. What is rapid fire for the M60 AND M240B?
    a. For the M60 and M240B, rapid fire is 200 rounds per minute in bursts of 10 to 12 rounds again with an interval of 2 to 3 seconds between bursts.
279. What is cyclic fire?
    a. Cyclic fire uses the most ammunition that can be used in 1 minute. The cyclic rate of fire with the machine gun is achieved when the trigger is held to the rear and ammunition is fed into the weapon uninterrupted for one minute. Normal cyclic rate of fire for the M249 is 850 rounds, M60 is 550 rounds, and for the M240B it is 650 to 950 rounds. Always change the barrel after firing at cyclic rate

for 1 minute. This procedure provides the highest volume of fire that the machine gun can fire, but this adversely affects the machine gun, and should only be fired in combat under emergency purposes only.

280. What is the application, rate of fire, and maintenance of rapid fire? What are the disadvantages of rapid fire?
    a. Application: This rate of fire works best when the gunner is trying to establish fire superiority.
    b. Rate: 100 rounds per minute M249 in bursts of 6 to 8 rounds
    c. 200 rounds per minute M240 or M60 in bursts of 10 to 12 rounds
    d. Maintenance: Pause for 2 to 3 seconds between bursts.
    e. Barrel: Change after firing 2 minutes at rapid rate.
    f. Advantage: Exceptionally high volume of fire.
    g. Rapid Rate of Fire Disadvantages: Feasible only for short periods of time. Requires frequent barrel changes.

281. What is the application, rate of fire, and maintenance of cyclic fire? What are the disadvantages of cyclic fire?
    a. Application: This rate of fire should only be used in combat emergencies.
    b. Method: Hold trigger to the rear; feed ammunition uninterrupted for 1 minute.
    c. Normal Rate:
    d. • M249 850 rounds per minute.
    e. • M60 550 rounds per minute.
    f. • M240B 650 to 950 rounds per minute.
    g. Advantage: Places the most possible rounds on the enemy in one minute.
    h. Disadvantage: Damaging to barrel.
    i. Barrel: Change after firing 1 minute at cyclic rate.

282. What fire should you use when engaging a point target?
    a. the gunner uses fixed fire (Figure 5-10). If the target moves after the initial burst, he adjusts fire onto the target by following its movement.

283. What fire should the gunner use when engaging an area target?
    a. the gunner fires in the center of mass, then traverses and searches to either flank (Figure 5-11). Upon reaching the flank, he reverses direction and traverses and searches in the opposite direction. A leader may indicate the width and depth of the target.

284. What is an effective method of engaging a linear target?
    a. When engaging a linear target, the gunner traverses the machine gun to distribute fire evenly onto the target. He must cover the entire width of a linear target. His initial point of aim is the midpoint, and then he manipulates fire to cover the rest of the target. If the gunner has trouble identifying a linear target, then a leader may designate one with a reference point (Figure 5-12). With this method, the leader determines the target's center mass and announces the distance between that point and the reference point in meters. The reference point might be either within or adjacent to the target (Figure 5-13). However, it (the reference point) should lie on line with the target for the most accurate

results. After the leader issues the fire command, he maintains and controls the fire by subsequent fire commands.

285. What is an effective method of engaging deep targets?
    a. the gunner must use searching fire. If the range is announced, he initially aims on the midpoint of single deep targets, unless another portion seems more critical or threatening. He then searches down to one aiming point in front of the near end, and back up to one aiming point beyond the far end. If the gunner cannot identify a deep target, then the leader uses reference points to designate the target's center mass. He gives the extent (depth) of the target in meters.

286. What is an effective method of engaging linear targets with depth?
    a. When engaging a linear target with depth, the gunner traverses and searches. He starts by engaging the midpoint of his target unless another portion seems more critical or threatening. He traverses and searches to the near flank, then back to the far flank. When engaging a hard-to-identify linear target with depth, the leader designates the flanks and midpoints of the target with rifle fire. He avoids using the reference-point method, because he would need at least two points to show the angle to the target.

287. What is an effective method for utilizing a pair of machine guns to engage area targets?
    a. When a pair of machine guns engages area targets, each gunner fires on his half (side) of area. Their initial points of aim and adjustment are the midpoints of their respective halves. After adjusting fire on the center of mass, both gunners distribute fire by applying direction and elevation changes for best coverage. The right gunner traverses to the right, applies the necessary amount of search, and fires a burst. Then, he traverses and searches up and down until the right flank of the area target has been reached. The left gunner just reverses the procedure for his side. Both then reverse their directions and return to the center mass, firing a burst after each combined direction and elevation change (Figure 5-14).

288. What is an effective method for utilizing a pair of machine guns to engage linear targets?
    a. When a pair of machine guns engages a linear target, the gunners divide the target at midpoint, with each firing on his half, starting with adjusting on his respective midpoint (Figure 5-15). Then, each gunner traverses to the outside of the target on his side, then in to his inner boundary, firing a burst after each change in direction. This ensures complete target coverage. For each burst fired, the gunner must select an aiming point rather than just spraying his half of the target. However, if one part of the target poses a greater threat, the leader can designate unequally sized sectors to allow a greater concentration of fire on the

greater threat. To avoid confusion, the gunners always start with their respective midpoints, regardless of the size of their sector.

289. What is an effective method for utilizing a pair of machine guns to engage deep targets?
    a. When using a pair of machine guns to engage a deep target, the initial point of aim is also on the midpoint for both gunners. Normally, the gunner on the right has the near half and the gunner on the left has the far half. Since they are using enfilade fire, they need not adjust on the midpoint of the target, because the long beaten zone compensates for range errors. After the initial burst, the gunner on the right searches down to one aiming point in front of the near end of the target. The gunner on the left searches up to one aiming point beyond the far end. Both gunners then reverse their direction of search and return to the midpoint (Figure 5-16).

290. What is an effective method of using a pair of machine guns to engage a linear target with depth?
    a. the gunners use the same initial point of aim and extent of manipulation as described for linear targets (Figure 5-17).
    b. What are problems gunners face when operating machine guns in limited visibility? Gunners have problems detecting and identifying targets during limited visibility. The leader's ability to control the fires of his weapons is also reduced, therefore, he may instruct the gunners to fire without command when targets present themselves.
    c. Gunners should only engage targets they can identify, unless ordered otherwise. For example, if one gunner detects and engages a target, the other gunner observes the area fired upon and only adds his fire if he can also identify the target, or on order.
    d. Tracer ammunition helps gunners engage targets during limited visibility, so they should use it, if possible. If firing unaided, gunners must train to fire low at first, and then adjust upward. This helps them overcome the tendency to fire high.
    e. When two or more gunners engage linear targets, linear targets with depth, or deep targets, they do so differently than they would in good visibility. With limited visibility, the center and flanks of these targets may be poorly defined. Therefore, each gunner observes his tracers and covers what he believes to be the entire target.

291. Fire delivered over the heads of friendly Soldiers is called overhead fire. What are considerations for providing overhead fire?
    a. During training, gunners only fire overhead after Soldier safety is checked and verified. Terrain and visibility also help dictate when overhead fire is safe. (AR 385-63 summarizes training safety requirements.) Gunners can deliver overhead fire with any machine gun mounted on a tripod, because machine guns deliver stable, accurate fire, and because elevating mechanisms allow measurement in vertical mils. Ideally, gunners fire overhead only when friendly Soldiers to the front are positioned in a depression between the machine gun and the target.

The depression should be deep enough that the line of aim is well above the heads of the Soldiers in the depression.

292. Who controls overhead fire? When should fires be shifted or lifted?
    a. The squad leader normally controls overhead fire. He lifts or shifts fire when friendly Soldiers reach an imaginary line, parallel to the target, where the terrain rises, placing the Soldiers in harm's way. This imaginary line is called the "safety limit." The leader can direct the lifting of fire by prearranged signals transmitted by radio, wire, or visual means. He can determine the safety limit by observing fire or by using the gunner's rule (targets between 350 and 850 meters only) (Figure 5-18). To determine the safety limit by observation, the leader uses binoculars to see how close the fire is to advancing friendly Soldiers. Before the weapon is fired, the leader selects a safety limit using the gunner's rule. The accuracy and safety of this method depends on using a zeroed machine gun and on knowing the range to the target.
293. What is the procedure for providing overhead fire?
    a. Determine the range to the target. Set the range on the rear sight.
    b. - Aim the machine gun to hit the target.
    c. - Set the rear sight to 1,000 meters.
    d. - Using the elevating handwheel (one click equals 1 mil), depress the muzzle 10 mils.
    e. - Look through the rear sight and note where the new line of aim strikes the ground. (Draw an imaginary line through this point and parallel to the target to determine the safety limit.)
    f. - On the rear sight, reset the range to the target. Aim on the target and prepare to fire.
    g. - Cease or shift fire when Soldiers reach the safety limit.
294. Gunners must follow what safety measures when delivering overhead fire?
    a. - Firmly emplace the tripod mount.
    b. - Use field-expedient depression stops to avoid dipping muzzle, and therefore the line of
    c. fire, below the safety limit.
    d. - Keep overhead fire out of the trees.
    e. - Before delivering fire over the heads of friendly Soldiers, inform their commanders.
    f. - Ensure that all members of the crew know the safety limit.
    g. - Deliver overhead fire only between 350 and 850 meters.
    h. - Use only barrels that are in good repair.
    i. - During training exercises, avoid aiming any machine guns where their trajectories will
    j. cross over the heads of friendly Soldiers. (AR 385-63 and local safety regulations discuss overhead fire further.)
295. What is a machine gun in defilade?
    a. the weapon and its crew are completely behind terrain that masks them from the enemy (usually on the reverse slope of a hill). An observer controls fire from

defilade positions. He can be either the leader or a member of the crew, as long as he can both see the target and communicate with the gunner

296. How can machine gunners provide fires over a hill?
    a. The machine gun must fire up and over the hill. An observer adjusts fire from a higher position to the flank or rear of the weapon. A defilade position allows little opportunity to engage new targets. Gunners use the tripod mount when firing from defilade, because they can use the mount to help them measure vertical angles. This simplifies elevation changes. Also, if the crew obtains the data in daylight, it can fire from the same position after dark. A machine gun is in partial defilade when it is positioned just back of the crest of a hill, which offers some protection from enemy direct-fire, but that allows the machine guns to engage by direct-lay techniques.

297. What are advantages for engaging targets behind defliade?
    a. The crew has cover and concealment from enemy direct-fire weapons. It has some freedom of movement near the position. Control and supply are easier. The smoke and flash of the machine gun are hidden from the enemy.
298. What are disadvantages for engaging targets behind defilade?
    a. Rapidly moving ground targets are hard to engage, because an observer is needed for adjustment of fire. Also, targets close to the mask are seldom engageable, and the concept of a "final protective line" is hard to understand.
299. What are important factors for engaging targets behind defilade?
    a. Essential to target engagement from defilade are mask clearance, direction, and adjustment of fire. If possible, determine a minimum mask clearance (minimum elevation) for the entire sector of fire. However, you might have to determine a mask clearance for each target, depending on the slope of the mask. Read elevation as follows to determine the minimum elevation for the sector or target(s).
300. How does the distance of the mask from the gun position impact its use?
    a. If the mask is 300 meters or less from the machine gun position, the gunner places a 300-meter range setting on the rear sight, aims on the top of the mask, and adds 3 mils (clicks) of elevation with the elevating handwheel. If the mask is over 300 meters from the machine gun position, the gunner places the range setting to the mask on the rear sight, aims on the top of the mask, and adds 3 mils (clicks) of elevation.
301. Where should the observer be in relation to the gun?
    a. The observer places himself to the rear of the machine gun on the gun-target line and where he can see the machine gun and the target. He aligns the machine gun for general direction by directing the gunner to shift the gun until it aligns on the target. The observer selects as an aiming point a prominent terrain feature or landmark that the gunner can see through his sights. The aiming point should be farther out than the target and at higher elevation. When laying the machine gun

on the aiming point, the gunner ensures that the range setting on the rear sight corresponds to the range to the target (Figure 5-20).

302. If the aiming point is on the gun-to-target line, the gunner simply lays on the aiming point. What needs to be done if the gun is off of the gun-target line?
    a. If the aiming point is off the gun-target line, then the observer determines the horizontal distance in mils using the best means available (usually binoculars), and announces it to the gunner. The gunner then applies this setting using the traversing handwheel. The observer uses the best means available to measure the vertical distance from the aiming point to the base of the target. Then, he directs the gunner to depress the muzzle of the machine gun by the number of mils measured. This should lay the machine gun right on the target.
303. How do predetermined fires impact the use of machine guns?
    a. Predetermined fires organize the battlefield for the gunners. They allow the leader and gunner to select the most likely or tactically significant potential targets or target areas. These targets or areas include dismounted enemy avenues of approach, likely positions for automatic weapons, and probable enemy assault positions. Leaders allocate gunners individual sectors of fire, designate final protective lines, or specify a principal direction of fire and selected target areas. These preparations maximize the effectiveness of the machine gun in all visibility conditions. They enhance fire control by reducing the time required to identify targets, determine range, and manipulate weapons onto targets.
304. What is a sector of fire?
    a. This is a target area assigned to an individual, a weapon, or a unit. Leaders normally assign each gunner a primary and a secondary sector of fire.
305. What is a final protective fire?
    a. An FPF is an immediately available, prearranged barrier of fire. It is used to stop enemy movement across defensive lines or areas.
306. What is a final protective line?
    a. An FPL is a predetermined line along which grazing fire is placed to stop an enemy assault. If an FPL is assigned, the machine gun sights along it, except when engaging other targets. An FPL becomes the machine gun's part of the unit's final protective fire. Although an FPL is fixed in direction and elevation, the gunner must make a small shift for searching. This keeps the enemy from crawling under the FPL, and compensates for terrain irregularities or the sinking of tripod legs in soft soil. Gunners fire on FPLs as needed, regardless of visibility conditions.
307. What is the principal direction of fire?
    a. A PDF is just what it sounds like: the main direction of fire, usually into an area with good fields of fire or with a likely dismounted avenue of approach. Gunners firing on a PDF may also provide fire support to an adjacent unit. Machine guns are sighted on the PDF only in the absence of an assigned FPL. If a PDF is assigned and other targets are unengaged, machine guns continue to sight on the PDF. A PDF has the following characteristics.
308. What are the characteristics of a good FPL?

a. A good FPL covers the maximum area with grazing fire, which is effective over various types of terrain out to 600 meters. To graze fire as far out as possible over level or uniformly sloping terrain, the gunner sets the rear sight at 600 meters; selects a point on the ground that he estimates to be 600 meters from the machine gun; aims; fires; and adjusts on that point. To prevent enemy troops from crawling under grazing fire, he searches (downward) by lowering the muzzle of the weapon. To do this, he must separate his elbows.

309. How is the extent of grazing fire and dead space determined?
    a. The extent of grazing fire and dead space is determined in two ways. Ideally, the gunner adjusts the machine gun for elevation and direction. A member of the squad then walks along the FPL, while the gunner aims through the sights. Anyplace that the Soldier's waist (midsection) falls below the gunner's point of aim is dead space. The leader or gunner uses arm-and-hand signals to direct the walking Soldier and to accurately record the dead space and its location. Another way to designate dead space is to stand behind and to the flank of the weapon and watch while the gunner fires tracer ammunition.
310. What is the primary sector of fire?
    a. The primary sector of fire is the area to be covered by an individual gunner or unit.
311. What is the secondary sector of fire?
    a. The secondary sector of fire is a separate area covered by the same gun team. To establish a secondary sector of fire, the Soldier or unit moves the gun to an alternate firing platform. He does this by removing the gun from the tripod, and firing the secondary sector from the bipod-supported position.
312. What form helps assign sectors of fire?
    a. The standard range card (DA Form 5517-R, FM 7-8) provides a record of firing data and helps the leader plan defensive fires. Using a range card improves fire control and expedites the engagement of predetermined targets. It also helps the gunner estimate ranges to other targets in the sector of fire. Each gunner makes two copies—one for his position and one for the squad leader. The squad leader uses his copy of each of the gunners' range cards to prepare his squad sector sketch.
313. The gunner prepares the range card as soon as he occupies the position, and he revises it constantly. What information is included on the range card?
    a. - Weapon symbol (Figure 5-21).
    b. - Sector of fire.

c. - Primary direction of fire or final protective line.
d. - Range, azimuth, and number label to predetermined targets.
e. - Dead space.
f. - Distance and azimuth from a known point or coordinates (reference point).
g. - Magnetic North arrow.
h. - Data section.

314. The gunner uses the tripod to emplace the machine gun where he will be firing it. What does the gunner do immediately after?
    a. He sketches the appropriate machine gun symbol on the range card, and orients (points) it toward the most dangerous target in the sector.
315. What does the gunner do when using a FPL?
    a. If using the FPL, the gunner aims the machine gun along the FPL, which is the same as either the left or right limit of the sector of fire. To set the limit, he slides the T&E mechanism all the way to the left or right end of the traversing bar. Then, he moves the tripod until the barrel lines up on the FPL. The sector of fire is now set up with the FPL along one limit (side). The gunner always identifies the FPL as target number 1.
316. How does the gunner determine range for all targets in the sector?
    a. To determine the range for all targets in the sector, the gunner ensures each circle, except the first one, represents a range (circumference) increment of 100 meters. The lowest setting on the M249 and M60 is 300 meters; the lowest on the M240B is 200 meters. Therefore, the innermost (first) circle represents a range from the gun (circumference) of either 200 or 300 meters. The gunner marks the range in the data section, just below the circles. On the top half of the range card, he draws the left or right limits from the weapon position to the machine gun's maximum effective range.
317. What should the gunner and leader do when assigning sectors of fire using a FPL?
    a. If the leader assigns an FPL, the gunner draws the machine gun symbol along that line (left or right limit, Figure 5-22). The leader determines the extent of grazing fire and the gunner sketches a shaded blade inside the FPL to represent it. He indicates dead space along the FPL, if any, by breaks in the shaded area. He records the ranges to the near and far edges of the dead space above the FPL, and the extent of the grazing fire along the FPL. The leader determines the magnetic azimuth of the FPL, and the gunner records it below the shaded blade of the FPL. He also records the elevation reading and other data in the data section.
318. What should the gunner do when assigning sectors of fire using a PDF?
    a. If the leader does not assign an FPL, then the gunner locks the T&E mechanism on "0" on the traversing bar scale, and shifts the tripod until the muzzle points to the PDF. He sketches the machine gun symbol in the center of the left and right limits, pointed toward the PDF (Figure 5-23). The gunner then draws the opposite primary sector limit. If a target lies on this line, he adds the target information to the data section. If he cannot use the opposite side of the traversing bar to mark the opposite side of the primary sector, then he must record a direction reading in

the sketch section. - Next, he draws a broken line to represent the left and right limits of the secondary sector. He labels the area between the primary and secondary sectors as dead space. - He draws an arrow in the magnetic North block (upper right hand corner), pointing in the direction of magnetic north.

319. What tools can you use to assign sector limits?
    a. Use a base stake to define sector limits and provide the lay for the FPL or predetermined targets along a primary or secondary sector limit. This technique is effective in all visibility conditions. Define the sector limits by laying the gun for direction along one sector limit and emplacing a stake along the outer edge of the folded bipod legs. Rotate the legs slightly on the receiver so you can take up the "play." Use the same procedure to place a stake on the opposite sector limit. Lay the machine gun along the FPL by moving the muzzle of the machine gun to a sector limit. Adjust for elevation by driving a stake into the ground, so that the top of the stake is under the gas cylinder extension. Allow a few mils of depression to cover irregularities in the terrain. Lay the machine gun to engage other targets within a sector limit in a primary sector the same as previously described, but keep the elevation fixed.
320. What technique allows you to engage predetermined targets within a sector?
    a. Use the notched-stake or tree-crotch technique (Figure 5-24) with the bipod mount to engage predetermined targets within a sector or to define sector limits. This technique is effective during all levels of visibility, and it requires little additional material. Drive either a notched stake or tree crotch into the ground where you expect targets to appear. Place the stock of the machine gun in the nest of the stake or crotch. Adjust the weapon to hit the selected targets and to define your sector limits. Dig shallow, curved trenches or grooves for the bipod feet. The trenches let you rotate the bipod feet as you move the stock from one "X" or stake to another.
321. What are considerations for using verbal fire commands?
    a. Noise and distance reduce the effectiveness of verbal fire commands.
322. What are considerations for using hand and arm signal fire commands?
    a. This method obviously requires that the leader and gunner be able to see each other, and that the gunner know standard arm-and-hand signals. The leader gets the gunner's attention, and then points to the target. When the gunner signals "Ready," the leader commands FIRE.
323. What are examples of prearranged fire signals?
    a. These include visible or audible signals such as casualty-producing devices and pyrotechnics (visible and audible), whistle blasts (audible), or tracers (visible). These signals should be defined in the unit SOP. For example, if a leader wants

to shift fire at a certain time, he gives the prearranged signal such as smoke or pyrotechnics. On seeing the signal, the gunner shifts his fire to a prearranged point.

324. When is personal contact used to issue orders?
    a. In many situations, the leader must issue orders directly to individual Soldiers. A small-unit leader uses personal contact more often than any other method. However, he must make maximum use of cover and concealment to keep from compromising his own location or those of the Soldiers.

325. What are other considerations for use of range cards?
    a. When using this method of fire control, the leader must ensure all range cards are current and accurate. Once he does this, he can designate certain targets for certain weapons using limiting stakes or fire commands. He should also designate no-fire zones or restricted fire areas to others. For range cards to work well, each gunner must exercise self-discipline and must pay attention to detail.

326. Standing operating procedures (SOPs) are actions to be executed without command. These procedures are developed during squad training. Using SOPs eliminates the need for many commands and simplifies fire control. What are examples of SOPs?
    a. Observation
    b. Gunners continuously observe their sectors.
    c. Fire
    d. Gunners open fire without command on appropriate targets that appear within their sectors.
    e. Check
    f. While firing, the gunners periodically check with the leader for instructions.
    g. Return Fire
    h. The gunners return enemy fire without order, concentrating fire on enemy automatic weapons.
    i. Shift Fire
    j. Gunners shift their fires without command when more dangerous targets appear.
    k. Rate of Fire
    l. 5-79. When gunners engage a target, they initially fire at the rate necessary to gain and maintain fire superiority.
    m. Mutual Support
    n. 5-80. When two or more gunners engage the same target, and one gunner stops firing, the other increases his rate of fire and covers the entire target. When only one gunner is needed to engage a target, and the leader has alerted two or more, the gunner not firing aims at and follows the movements of the target. This way, he is ready to fire immediately if the other machine gun malfunctions or ceases fire before the target is destroyed.

327. What is the purpose of a fire command?
    a. The leader gives a fire command to deliver effective fire on a target quickly and without confusion. When the leader decides to engage a target that is not

obvious to the squad, he must provide them with the information they need to engage it effectively. He must alert them; give them the direction and range to and a description of the target, name the desired method of fire; and give the command to fire. The first time he gives a command to fire on a particular target, it is an initial fire command. Any changes to that command are considered subsequent fire commands.

328. What is the purpose of an alert?
    a. This element prepares the gunners for further instructions. The leader may alert both gunners in the squad and might have only one fire, depending upon the situation. To alert and have both gunners fire, the leader commands FIRE MISSION. If he wants to alert both gunners, but he has only one fire, he commands GUN NUMBER ONE, FIRE MISSION. In all cases, upon receiving the alert, the gunners load their machine guns and place them on FIRE.
329. How do you verbally signal target directions?
    a. The leader verbally announces the direction to the target relative to the position of the gunner, for example, FRONT, LEFT FRONT, RIGHT FRONT.
330. What are methods for pointing out targets?
    a. The leader designates a small or obscure target by pointing with his finger or aiming with a weapon. When the leader points with his finger, a Soldier standing behind him should be able to look over his shoulder, along the leader's arm and index finger, and see the target. When aiming his weapon at a target, a Soldier looking through the sights should be able to see the target. (Appendix J discusses advanced optics and lasers.) Tracer ammunition is a quick and sure method of designating a target that is not clearly visible. When using this method, the leader should first give the general direction to direct the gunner's attention to the target area. To preserve the element of surprise when using tracer ammunition, the leader gives all the elements of the fire command except the actual command to commence fire. His command can specify that he will fire tracers to signal the gunners to commence fire.
331. Another way to designate obscure targets is to use:
    a. Reference points. All leaders and gunners must know the terrain features and the terms used to describe them (FM 3-25.26). When the leader uses a reference point, he precedes the description of the target with the word REFERENCE. This avoids confusion, and gives the general direction to the reference point.
332. What does the leader always announce?
    a. The leader always announces the estimated range to the target. This indicates how far the gunner must look for the target and tells him roughly what range setting to put on the rear sight. The leader announces the range in meters. However, since the meter is the standard unit of range measurement, he need not say the word "meters." Thus, with machine guns, the leader announces the

range to the nearest hundred or thousand meters, for example, THREE HUNDRED, or ONE THOUSAND.

333. How is the method of fire announced?
    a. This element includes manipulation and rate of fire. Manipulation prescribes the class of fire with respect to the weapon. The leader announces it as FIXED, TRAVERSE, SEARCH, or TRAVERSE AND SEARCH. Rate refers to the volume of fire (sustained, rapid, or cyclic). Normally, the gunner uses a sustained rate of fire, so the leader omits the rate of fire from the fire command. The method of fire for the machine gun is usually 3- to 5-round bursts for the M249 or 6- to 9-round bursts for the M60 or M240B.
334. How is the fire command announced?
    a. When the leader wants the gunners to withhold fire so that they can surprise a target, or to ensure that both gunners open fire at the same time, he can start the command to commence fire with AT MY COMMAND or AT MY SIGNAL. When the gunners are ready to engage the target, they report "Ready" to the leader, who then commands FIRE when he desires.
335. What is range estimation?
    a. determining the distance between two points. In most situations, one of these points is the gunner's own position. The other point might be a target or prominent terrain feature. To set the sights and place effective fire with the first burst, the gunner must accurately determine the range to the target. Not only does accurate estimation of range affect marksmanship, but it is also necessary for reporting information and adjusting artillery and mortar fires
336. What factors affect range estimation?
    a. Clarity of target outline and details.
    b. Nature of terrain or position of gunner.
    c. Light and atmosphere.
337. What factors cause range underestimation?
    a. When most of the target is visible
    b. When looking across a depression that is mostly hidden from view.
    c. When looking downward from high ground.
    d. When looking down a straight, open road or along a railroad.
    e. When looking over uniform surfaces like water, snow, desert, or grain fields.
    f. In bright light or when the sun is shining from behind the
    g. gunner.
    h. When the target is in sharp contrast with the silhouette
    i. because of its size, shape, or color.
    j. When seen in the clear air of high altitudes.
338. What factors cause range overestimation?
    a. When only a small portion of the target is small in relation to its
    b. surroundings.
    c. When looking across a depression that is totally visible.
    d. When looking from low ground toward high ground.
    e. When vision is narrowly confined as in streets, draws, or forest

f. trails.
g. In poor light such as dawn and dusk; in rain, snow, fog; or when the sun is in the gunner's eyes.
h. When the target blends into the background or terrain.

339. How does the gunner estimate range with a tripod?
a. With a tripod mount, he aims on a reference point, turns the traversing handwheel, and counts the clicks between the two points of aim. Each click is 1 mil, or 1 meter width (laterally) at 1,000 meters range, or half (that width) at half (that range), in other words, half a mil at 500 meters.

340. How does a gunner estimate range using a tripod mount?
a. With a bipod mount, he uses his fingers to measure the lateral distance between the reference point and target. He extends his arm and locks his elbow with his hand out, fingers straight, and palm down. Then, he closes one eye, raises his index finger, and sights along its edge, placing the edge of his finger so that it appears to be along the flank of the target or reference point. He fills the space remaining between the points by raising his fingers one by one until he covers the space. He states the measurement from the reference point to the target by giving the number of fingers raised.

341. When should you fire from the underarm firing position?
a. Put the bipod legs and rear sight down so you can drop to the prone position and fire with the bipod at a moment's notice. Face the target with your feet spread about shoulder width apart. Place your left foot in front of your right foot, with most of your weight on your left foot. Bend both legs at the knees and lean forward at the waist. With your right hand, firmly grasp the pistol grip. With your right forearm, holds the stock firmly against the side of your body, between your armpit and waist. With your left hand, grasp the handguard firmly. Point your left foot in the direction of the target, and stabilize yourself with your right. Depress (lower) the muzzle of the machine gun slightly so you can see the strike of the rounds. This helps keep you from shooting high, and it uses ricochets. Lean toward the target before and during firing.

342. When should you fire from the hip?
a. Use this position when closing with the enemy, when placing a heavy volume of fire in the target area, and when you can move slowly (Figure 5-29). This position differs from the underarm position only in that you: Hold the rear of the stock firmly against the forward position of your right thigh. Extends your arms fully downward.

343. What do the potential for air and ground attacks mean?
a. The potential increase of air and ground attacks on the unit demands every possible precaution for maximum security while on the move. Where this situation exists, the machine gun crew must be thoroughly trained in the hasty delivery of antiaircraft fire and of counterfires against enemy ground forces. The distribution of the machine guns in the formation is critical. The machine gun crew is constantly on the alert, particularly at halts, ready to deliver fire as soon

as possible. If the leader expects a halt to exceed a brief period, he carefully chooses machine gun positions to avoid unduly tiring the machine gun crew. If he expects the halt to extend for a long period, he can have the machine gun crew take up positions in support of the unit. They cover the direction from which he expects enemy activity as well as the direction the unit came from. He selects positions that permit the delivery of fire in the most probable direction of attack, such as into valleys, draws, ridges, and spurs.

344. What is the cause of successful operations?
    a. Successful offensive operations result from the employment of fire and maneuver. Each is essential and greatly depends upon the other. Without the support of covering fires, maneuvering in the presence of enemy fire can result in disastrous losses. Covering fires, especially those that provide fire superiority, allow maneuvering in the offense. However, fire superiority alone rarely wins battles. The primary objective of the offense is to advance, occupy, and hold the enemy position.
345. How can the presence of a machine gun impact the success of combat opeations?
    a. The machine gun delivers an accurate, high-volume rate of fire on large areas in a brief time. It is a great power to have on any offensive operation. When accurately placed on the enemy position, machine gun fires secure the essential element of fire superiority for the duration of the firing. Troops advancing in the attack should take full advantage of this period to maneuver to a favorable position from which to facilitate the last push against the enemy. In addition to casualties, machine gun fire destroys the enemy's confidence and neutralizes his [actions in the?] defense.
346. What are important factors for effective MG use in the offense?
    a. The early entry of machine guns in the offense is, with rare exceptions, highly desirable. Their continued action up to the moment of the assault enhances the probability of success. One desirable feature for employment of machine guns in the offense requires a proper handling of the ammunition for each machine gun. The other feature is to determine the actions of the machine gun crew to handle their weapon on the battlefield in order to deliver fire with the objective to support the maneuver unit at the time it is needed, regardless of physical difficulties encountered
347. Machine guns accompany what element?
    a. The machine guns seldom accompany the maneuver element. The gun's primary mission is to provide covering fire. The machine guns are only employed with the maneuver element when the area or zone of action assigned to the assault or company is too narrow to permit proper control of the guns. The machine guns are then moved with the unit and readied to employ on order from the leader and in the direction needing the supporting fire.
348. When is the unit assigned additional machine gun assets?
    a. Where the area or zone of action is too wide to allow proper coverage by the machine guns, the unit is assigned additional machine guns or personnel from within the battalion to permit the unit to accomplish its assigned mission. The

machine guns are assigned a zone or a sector to cover and they move with the maneuver element.

349. How are machine guns used when in the assaulting unit?
    a. When machine guns move with the unit undertaking the assault, the unit brings its machine guns to provide additional firepower. These weapons are fired either from the bipod or in an assault mode, from the hip or underarm position. They target enemy automatic weapons anywhere on the unit's objective. Once the enemy's automatic weapons have been destroyed, or if none remain, the gunners distribute their fire over their assigned zone or sector. In terms of engagement ranges, the machine gun in the assault engages within 300 meters of its target and frequently at point blank ranges.
350. How are machine guns supposed to be used in company level operations?
    a. Machine guns organic to the company can help battalion machine guns lay the base of fire. In this case, the leader positions and controls the fires of all machine guns in the element. Machine gun targets include key enemy weapons or groups of enemy targets, either on the objective or attempting to reinforce or counterattack. In terms of engagement ranges, machine guns in the base-of-fire element may find themselves firing at targets within 800 meters of the target. These ranges are simply a practical average. The nature of the terrain and desire to achieve some standoff, leads the leader to the correct tactical positioning of the base-of-fire element.
351. How is the machine gun fire distributed?
    a. Machine gun fire is distributed in width and depth in a defensive position. The leader can use machine guns to subject the enemy to increasingly devastating fire from the initial phases of his attack, and to neutralize any partial successes the enemy might attain by delivering intense fires in support of counterattacks. The machine gun's tremendous firepower is what enables the unit to hold ground. This is what makes them the backbone or framework of the defense.
352. What is the epicenter of a unit's defense?
    a. The units' defense centers around the platoon's machine guns. The platoon leader sites the rifle squad to protect the machine guns against the assault of a dismounted enemy formation. The machine gun provides the requisite range and volume of fire to cover the squad front in the defense.
353. What is the primary requirement of a suitable machine gun position?
    a. The primary requirement of a suitable machine gun position in the defense is that the machine gun be able to accomplish its specific missions. Secondarily, the position should be accessible and afford cover and concealment. Machine guns are sited to protect the front, flanks, and rear of occupied portions of the defensive position, and to be mutually supporting. Attacking troops usually seek

easily traveled ground that provides cover from fire. This is not to say that they will avoid marshes, rough grounds, wooded areas, or any other type of terrain. Every machine gun should have three positions: primary, alternate, and supplementary. All of these positions should be chosen by the leader to ensure his sector is covered and that the machine guns are protected on their flanks. The leader sites his machine gun to cover the entire sector or to overlap sectors with the other machine gun. The engagement range of a leader's weapon may extend from the last 300 meters where the enemy begins his assault to point-blank range.

354. What may targets include?
    a. Machine gun targets include enemy automatic weapons and command and control elements.
355. What are the components of security?
    a. Security includes all command measures to protect against surprise, observation, and annoyance by the enemy. The principal security measures against ground forces include employment of security patrols and detachments covering the front flanks and rear of the units' most vulnerable areas. The composition and strength of these detachments depends on the size of the main body, its mission, and the nature of the opposition expected. The presence of machine guns with security detachments augments their firepower to effectively delay, attack, and defend, by virtue of their inherent firepower.
    b. When the machine guns are used as part of the security detachments in battalion trains or larger, the number of machine guns in such a detachment varies according to the situation. The main mission of the machine gun is to protect and defend through both defensive and offensive missions. For defense, the unit's main mission is to position the machine guns throughout the assigned area. For offense, the second mission, after a successful delay against an enemy attack, the unit expands its security outpost as needed to prevent another enemy attack.
356. What is the M192 LWGM is designed as?
    a. A defensive ground mount for the M240B machine gun and the M249 squad automatic weapon (SAW, in the machine gun role). Table C-1 shows the M192 LWGM. This tripod's lightness, and its new T&E levers, allow the Soldier to set up the weapon and acquire targets quickly. The M192 has a frame assembly, mounting bracket assembly, legs, and a T&E mechanism (Figure C-1).
357. What are passive measures for aircraft defense?
    a. Passive measures are those that help the unit identify enemy aircraft before the aircraft locates the unit, make the unit difficult to locate, and make the unit less vulnerable when attacked. The unit must develop and practice camouflage as a passive measure. Concealment from the air must be considered when selecting routes, transportation means, or defensive positions. The use of air guards is important to give the unit time to react. Air guards should cover interlocking sectors of visible airspace.
358. What are active measures for aircraft defense?

a. Active measures for appropriate reactions to an air attack should be prescribed in unit SOPs. Each of the two techniques for applying lead is based on delivering a heavy volume of fire ahead of the target. The idea is to have every Soldier in the unit engage the target. To achieve volume fire, Soldiers armed with machine guns should fire at the cyclic rate.

359. If an aircraft is attacking his position, the Soldier sees the aircraft in a head-on or diving view. To engage this aircraft, the Soldier would fire slightly above the nose of the aircraft. How would adjacent positions see the aircraft?
    a. Adjacent positions would see the aircraft in a crossing view. To engage the aircraft, these units would have to apply a proper lead. The method of applying lead depends on the technique used.

360. What are techniques for engaging high performance aircraft?
    a. When engaging high-performance aircraft (those flying in excess of 200 mph), gunners should apply a one-football-field lead in front of the target and fire at the rapid rate until the target passes through the tracer stream. If the target is a low-performance aircraft, such as a helicopter, with a speed of 200 mph or less, gunners should apply half a football-field lead in front of the target, firing the cyclic rate. With all Soldiers firing, a curtain of fire is formed because of slight differences in each Soldier's estimate of the distance and lead.