UNITED STATES MARINE CORPS
SCHOOL OF INFANTRY - EAST AND WEST
TRAINING COMMAND
CAMP LEJEUNE, NC 28542-0161
CAMP PENDLETON, CA 92055-5101

STUDENT OUTLINE

CONDUCT FIELD CRAFT

MCT0109

01/20/2021

LEARNING OBJECTIVES FOR THIS LESSON

    a. **LEARNING OUTCOME**.

        (1) Marines will be capable of conducting individual field craft by applying basic decision making while operating in all terrains utilizing position selection, packing techniques, observation, shelter construction, and camouflage. (11)

    b. **ENABLING LEARNING OBJECTIVES**.

        (1) Given a list of choices, identify considerations for using streams in accordance with MCIP 3-10A.4i W/Ch 1. (11A)

        (2) Given a list of choices, identify elements of a tarpaulin in accordance with MCIP 3-10A.4i W/Ch 1. (11B)

STUDENT INFORMATION

OVERVIEW: In this lesson, Marines will learn the basics of Field Craft. This will cover procurement of water, food, and heat as well as shelter construction.

CLASS PREPARATION: Read this outline prior to the start of this class. Ensure you have all materials provided for this class.

<u>**OUTLINE.**</u>

1. <u>**WATER PROCUREMENT**</u>.

    a. <u>**Water Sources**</u>. The below are several examples of water sources to collect from:

        (1) Surface water (e.g., streams, lakes, and springs).

        (2) Precipitation (e.g., rain, snow, dew, or sleet).

        (3) Subsurface (e.g., wells and cisterns).

        (4) Ground Water. In an arid or desert environment, look for the following indicators of water.

            (a)An abundance of lush, green vegetation.

            (b)Drainages and low-lying areas.

            (c)"V" intersecting game trails.

            (d)Swarming insects.

            (e)Croaking frogs.

            (f)Birds. (They fly to water in early morning and away from it in late afternoon.)

    b. <u>**Water Purification**</u>.

        (1) Untreated water can contain pathogenic agents which may include protozoa, bacteria, viruses, and some larvae of higher-order parasites, such as liver flukes and roundworms. Chemical pollutants such as pesticides, heavy metals, and synthetic organics may be present. Other components may affect taste, odor, and general appeal, including turbidity from soil or clay, color from acids or microscopic algae, odors from certain type of bacteria (particularly actinomycetes, which produce an earthy flavor), and saltiness from brackish or sea water.

        (2) Pathogenic viruses may also be found in water. The larvae of flukes are particularly dangerous in areas frequented by sheep, deer, or cattle. If such microscopic larvae are ingested, they can form potentially life-threatening cysts in the brain or liver.

(3) In general, more human activity in an area, the greater the potential for contamination from sewage, surface runoff, or industrial pollutants. Groundwater pollution may occur from human activity or might be naturally occurring. Water should be collected as far upstream as possible above all known or anticipated risks. Pollution poses the lowest risk of contamination and is best suited to portable treatment methods.

(4) Marines typically have the ability to purify water through the following methods: boiling, chemicals (e.g., purification tablets, iodine, or chlorine), or by using portable water filters. Marines should not rely on only one method to render water safe to drink. A combination of these methods—boiling, filtering, and chemical disinfection—is recommended whenever possible.

(a) <u>Boiling</u>. Heat kills disease-causing micro-organisms, with higher temperatures and/or duration of boiling required to kill some pathogens. Sterilizing water (i.e., killing all living contaminants) is not necessary to make water safe to drink; Marines only need to render harmless enteric (i.e., intestinal) pathogens. Boiling does not remove most pollutants. Marines should boil water for a period of at least three minutes at altitudes below 6,000 feet, adding one minute for every 1,000 feet above that.

(b) <u>Filtration</u>. When Marines utilize their issued pump-actuated hand-held filters, they must be aware of the following:

<u>1</u>. The filters must be changed on a regular basis to ensure effectiveness.

<u>2</u>. The pump's filter must be of the correct size (usually 0.2 to 0.3 micrometers) to remove pathogens.

<u>3</u>. Filtering must be incorporated with chemicals (e.g. iodine, bleach, or chlorine) to remove bacteria.

(c) <u>Chemical Disinfection</u>. Chemical disinfection, chiefly using chlorine and iodine, results from the oxidation of cellular structures and enzymes. The primary factors that determine the killing effect of chemicals are the number of microorganisms in the water compared to the concentration and the exposure time. Secondary factors include the pathogen species, water temperature, and organic contaminants.

Warning: Many species are extremely resistant to chemicals, and field inactivation may not be practical with bleach and iodine.

      1. <u>Iodine</u>. Iodine is commonly added to water as a solution (typically found in Marines' first aid kits) to purify it. The iodine kills many (but not all) of the most common pathogens present in natural fresh water sources. Carrying iodine for water purification is an imperfect but lightweight solution for those who need to field-purify drinking water. This requires 30 minutes in relatively clear, warm water, but is considerably longer if the water is muddy or cold. **Note:** The prolonged use of iodine is not recommended, as it can have adverse effects over an extended period.

      2. <u>Bleach</u>. The recommended dose of bleach is two drops of sodium hypochlorite solution (i.e. regular, unscented chlorine bleach) mixed per one quart of water. Once mixed, the water must be allowed to stand for 30 minutes. The amount of bleach should be doubled if the water is cloudy, colored, or very cold. Afterwards, the water should have a slight chlorine odor. If it does not, repeat the dosage and allow the water to stand for another 15 minutes before use.

2.   **<u>FLAT TOP SHELTERS</u>**.

   a. A flat-top shelter is the preferred technique when the purpose of construction is to escape from the sun, or from excessive dew or frost from condensation that forms due to changing temperatures between day and night. The tarpaulin should be laid out flat over an area of terrain on which Marines intend to establish their bivouac. Parachute cord is tied to the grommets on the corners of the tarpaulin, and then tied to anchors (e.g., trees, brush, stakes) so that the tarpaulin is raised off the ground. To maximize protection from condensation and to aid in preventing detection, the tarpaulin should be close to the ground (between 12 to 18 inches), high enough for the Marine to store their gear and enter/exit by crawling.

   b. When selecting a site for a flat-top shelter, the covered area should be relatively flat. Due to the larger area it covers, care should be taken to avoid detection by air through the use of natural and artificial camouflage.

   c. **Warning:** In high temperate areas, the shelter should be constructed in two layers to avoid creating an oven effect that causes overheating. A second tarpaulin is laid over the first with at least 12 inches of space between the two, creating an

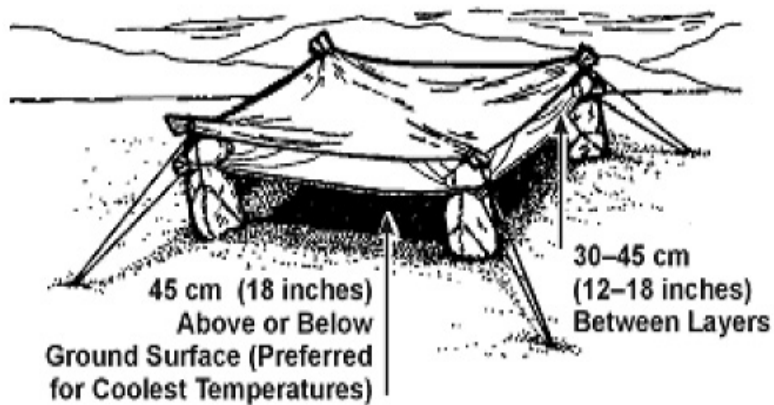"air cavity" for heat to accumulate and dissipate out the sides (see figure F-3).

Figure F-3. Flat-Top Shelter (with desert heat barrier).

3. **FOOD PROCUREMENT**.

a. **Food Sources**.

(1) Plants.

(a) Eat plants that are easily identifiable globally. (See figure 60 for a depiction of some common edible plants.) These include:
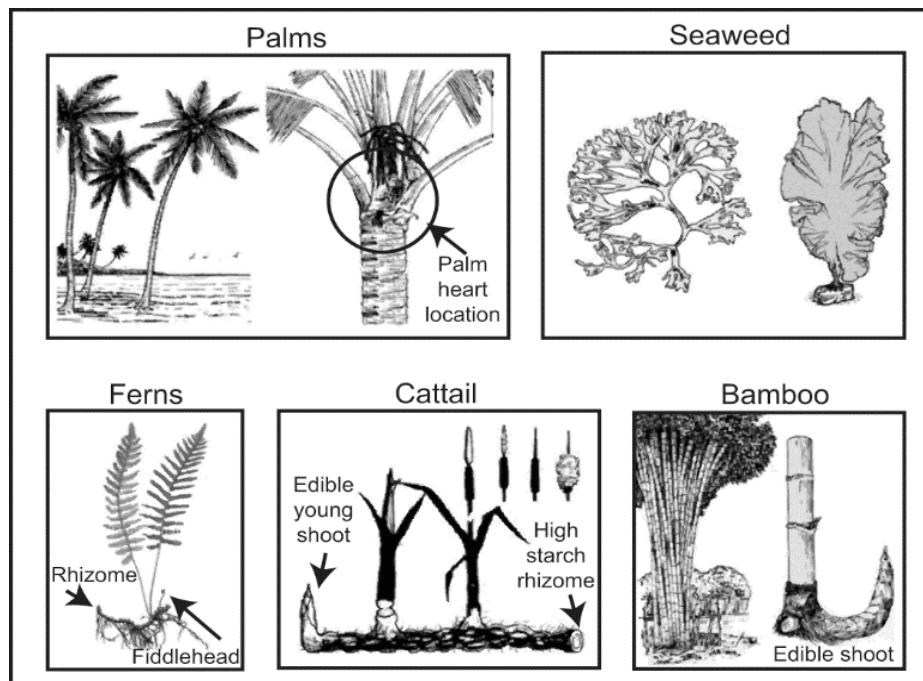

Figure 60. Common Edible Plants

1. Cattails.

2. Palm.

3. Seaweed.

4. Ferns.

5. Bamboo.

6. Other Edible Plants. Dandelion, grasses, aggregate berries (e.g., raspberries (see figures 61, table 24)), clover, and plantains are easily identifiable food sources. Check borders of an evasion chart for other edible plants in the region.
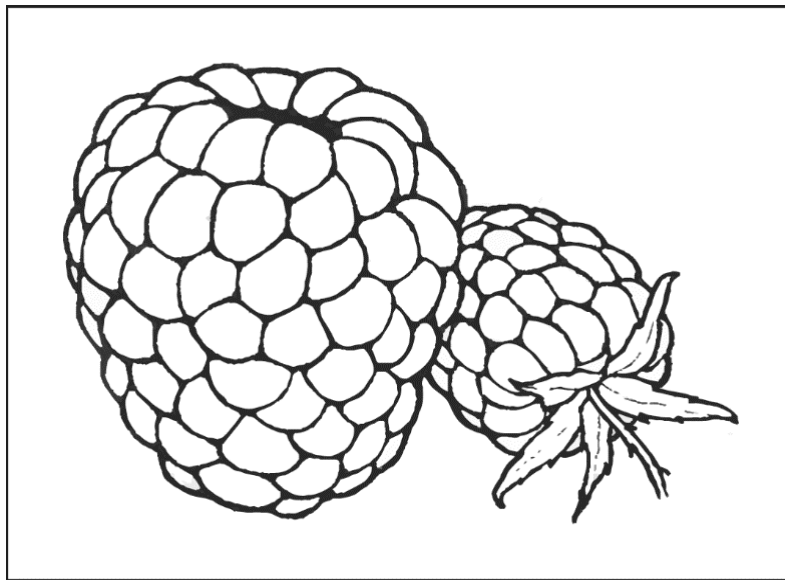

Figure 61. Aggregate Berry

Table 24. Berry Rules of Thumb		
Aggregate berries	Never poisonous if sweet	These need no test (see table 25).
Black, blue, red berries	Sometimes poisonous	Always test them (see table 25).
White, yellowish, transparent, green berries	Often poisonous	Never test them.

(2) Animals.

(a) The following animals may be obtained with minimal effort and minimal disturbance to surroundings:

1. Earth worms (found in rich dark soil).

2. Grubs (found in decaying logs).

3. Insects (found in decaying matter and standing water).

4. Shelled Animals (e.g., mussels, snails, or oysters).

5. Amphibians and Reptiles (eat only the muscles in frogs, lizards, or snakes).

4. **HEAT PROCUREMENT**.

a. The three essential elements for starting a fire are heat, fuel, and oxygen.

b. **Heat Sources**.

(1) Matches, lighters, spark devices, batteries, magnifying glasses, and flashlight reflectors.

(2) Pyrotechnics, such as flares, are a last resort due to their heat signature.

c. **Fuel Sources**. Fuel is divided into three categories: tinder, kindling, and fuel. (Figure 48 depicts the three categories of fuel sources.) Gather large amounts of each category before igniting a fire.

Tinder   Kindling   Sustaining Fuel

Figure 48. Fuel Sources with a Fire Platform/Brace

(1) <u>Tinder</u>. Examples of tinder include dry bark, cotton, dry grass, gun powder, pitch (sap-saturated coniferous wood), and candle wicks.

(a) Finely shave or shred dry tinder to provide a low combustion point and fluff it to allow oxygen to flow through it.

(b) To get tinder to burn hotter and longer, saturate it with petroleum or alcohol-based products (e.g., Vaseline, chap stick, insect repellant, or fuel).

(2) <u>Kindling</u>. Kindling is pencil-lead to pencil-sized dry wood that is small enough to ignite from a small flame or tinder. Start with small kindling. Gradually add larger kindling.

(3) <u>Fuel</u>. Use dry wood, dead branches, bamboo (open its chambers, as needed, to prevent an explosion), and dry dung. Remove bark and use hardwoods to reduce smoke.

REFERENCES:

NUMBER	TITLE	PAGE
MCTP 3-01A	Scouting and Patrolling	Chapter 11
TC 4-02.3	Field Hygiene and Sanitation	Entire Manual
MCRP 12-10A.3	Mountain Leaders Guide, Mountain Warfare Operations	Entire Manual
MCRP 3-10A.4	Marine Rifle Squad	Appendix F
MCRP 3-05.1	MTTP for Survival, Evasion, and Recovery	Entire Manual

NOTES:

Rope Suspension Techniques

MCT0112

01/12/2021

LEARNING OBJECTIVES FOR THIS LESSON

a. **LEARNING OUTCOME(S)**.

(1)   Marines will be capable of applying systems and usage of rope suspension techniques in order to increase freedom of movement and to overcome obstacles or facilitate insertion and/or extraction in accordance with commander's intent.(15)

b. **ENABLING LEARNING OBJECTIVES**.

(1) 15A. Given a rope in a controlled environment, demonstrate the techniques required to tie designated knots in support of rope suspension techniques

1. **Introduction of Rope Suspension Techniques**

a. Rope suspension techniques are a high-risk operation that can be conducted safely if the contents of this publication are adhered to and current directives are followed. Noncompliance with this publication or current directives and any unauthorized modifications or installation of unauthorized HRST equipment can result in injury or death to personnel and/or damage to equipment.

2. **Maintenance and Care of a Rope**

a. Inspection. A new rope is physically inspected for any signs of damage or defects. After passing inspection, both ends of the rappel rope are burnt. All ropes are checked for wear, cuts, frays, burns, mildew, and rotten areas both before and after every use. All ropes used in HRST must be free of splices.

b. Storage. The unit stores and maintains all HRST ropes in a clean, well-ventilated, dry area. If a rope becomes soiled, shake it clean or rinse it with fresh water and lay it out to dry before storage. If a rope becomes wet, either in storage or during use, dry it as soon as possible. To dry a rope, uncoil it and lay it in a well-ventilated area. If possible, suspend the rope off the deck, on wooden pegs, or on a rack to reduce drying

time. If any part of a rope comes in contact with any type of petroleum products (e.g., fuel, oil) the rope is considered unserviceable as a lifeline and is removed from service. If a fast rope comes in contact with salt water rinse it with fresh water and clean with a nonmetallic brush. Never keep a rope knotted or stretched longer than necessary because it stretches and weakens the rope. Never stand, walk, or step on a rope or smoke within 50 feet of a rope, all these can weaken the rope. Protect nylon rope and webbing from direct sunlight as much as possible to avoid ultraviolet deterioration.

        1. To stow ropes, ensure the following:

            (a) Ropes and equipment are at least 4 inches from walls when stored on shelves

            (b) Ropes and equipment are at least 4 inches from the floor when stored in bins.

            (c) Storage areas are well ventilated and free from oil, acid, cleaning compounds, and other contaminants.

            (d) Ropes and equipment are not stowed above or near hot water pipes, heating apparatuses, or direct sun light.

    c. Coiling Rope: All HRST ropes should be coiled when not in use and hung from a wooden peg or cylindrical object. Ropes will not be hung on any type of metal or steel object because of the possibility of rust. When coiling a rope, avoid knots and entanglements and provide maximum ventilation to the rope surface.

        1. Mountain Coil: The mountain coil is the least preferred method of coiling a rope because the rope tends to tangle up during uncoiling (see fig. 2-2).
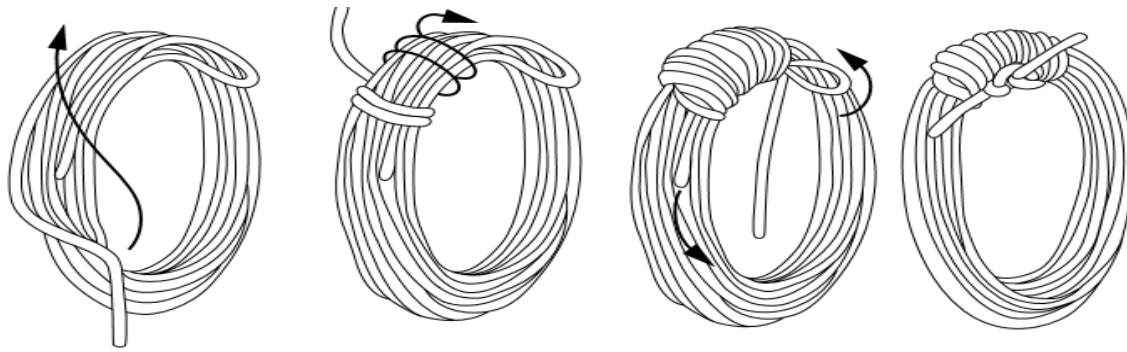
Figure 2-2. Mountain Coil.

 2. <u>Butterfly Coil</u>: The butterfly coil is the most preferred method of coiling because it tangles less and can be tied across the back (see fig. 2-3).
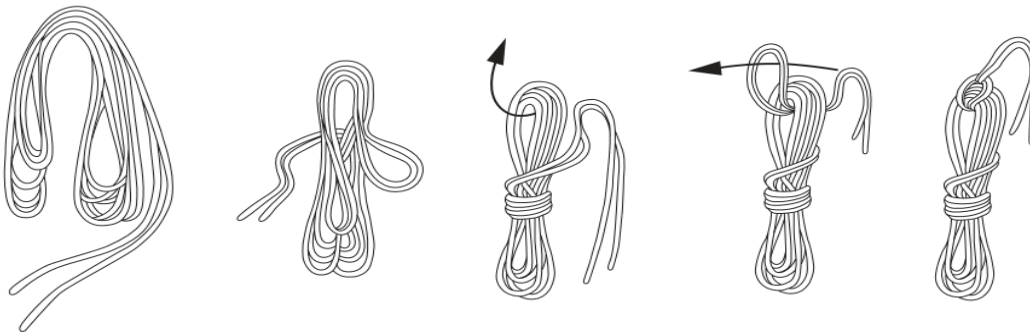

Figure 2-3. Butterfly Coil.

3. **<u>Core TRST Knots</u>**

 a. <u>Overhand Knot</u>. The overhand knot is used to secure pigtails at the end of a primary knot (see fig. 2-26).
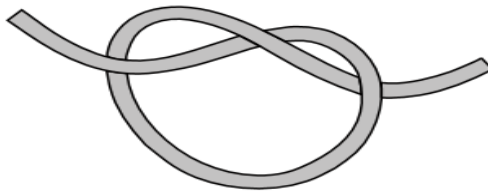

Figure 2-26. Overhand Knot.

 b. <u>Square Knot</u>. The square knot is used to join two ropes of equal diameter together. This knot is secured on each side by an overhand knot. Pigtails will be a minimum of 4 inches (see fig. 2-19).
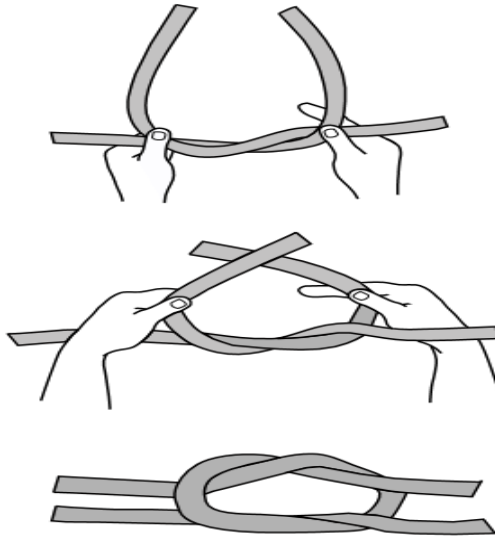
Figure 2-19. Square Knot.

    c. <u>Bowline</u>. A bowline creates a loop at the end of a rope that can be used to secure the end of the rope around an object or anchor point. The pigtail must be inside and secured with an overhand knot. Pigtails will be a minimum of 4 inches. Rope loop size will be approximately 1 to 12 inches in diameter (see fig. 2-22).
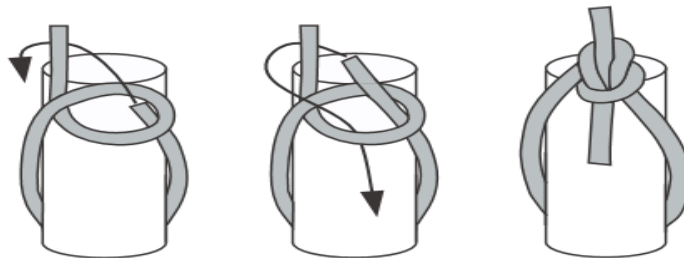

Figure 2-22. Bowline Knot.

    d. <u>Around the Body Bowline with Figure Eight</u>. Around the body bowline is used as a secondary anchor point for SPIE rigging and also as a safety line for HRST operations. Pigtails will be a minimum of 4 inches (see fig. 2-30).

Figure 2-30. Around the Body Bowline with Figure Eight.

    e. <u>Military Rappel Seat</u>. The military rappel seat is made from a sling rope:

    (a) Take the center of the sling rope and place it on the left hip so that the running ends of the rope wrap around the waist just below the hip bone.

    (b) Bring both ends together in front of the body.

    (c) Tie an overhand knot with two wraps in front.

    (d) Bring the two running ends down through the legs, up over the buttocks, and over the original waist wrap and the waist.

    (e) Bring the rope over itself forming a bight, then cinch the rope up tightly. Note: The rope should run along the outside of the buttocks.

    (f) Take the two running ends and make a square knot with two overhands on the left hip.
    (g) Any loose rope from the square knot is tucked into a pocket. Pigtails will be a minimum of 4 inches (see fig. 2-29).
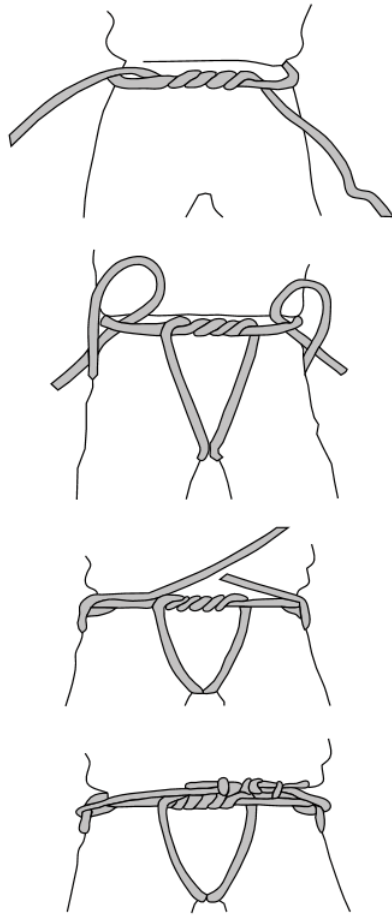
Figure 2-29. Military Rappel Seat.

REFERENCE - TITLE	PUBLICATION ID	CHAPTER/PAGE
Helicopter Rope Suspension Techniques	MCRP 3-01B.1	Chapter 2

CONDUCT SURVEILLANCE

MCT0113

01/19/2021

LEARNING OBJECTIVES FOR THIS LESSON

a. **LEARNING OUTCOME**.

(1) Marines will be able to conduct persistent and systematic observation within their area of operation, identifying features, capabilities, limitations and methods of employment for widely proliferated threat systems specific to their region of employment, while organizing collected information into corresponding report formats and transmitting reports. (16)

b. **ENABLING LEARNING OBJECTIVES**.

(1) Given a list of choices, identify anomalies to determine if the anomalies are threats in accordance with MCTP 3-01A. (16A)

STUDENT INFORMATION

OVERVIEW: In this lesson, Marines will learn the basics of Combat Hunter and Surveillance techniques. This will cover hasty and detailed searches, military sketch, recording information, and format of the SALUTE report for transmission to higher.

CLASS PREPARATION: Read this outline prior to the start of this class. Ensure you have all materials provided for this class.

OUTLINE.

1. **Introduction of Combat Hunter and Surveillance Techniques**

a. The observation technique selected by a Marine depends on several factors. These include the Marine's skill in observation, the tactical situation, the observer's position relative to threats (i.e., in positive or negative space), the capabilities of the optics available for use, and the time available to observe. Marines employed as observers must balance the requirements for observation against tactical requirements and the capabilities of their optics. Observation techniques include the hasty search and the detailed search.

2. **Hasty Search**

    a. A hasty search is used when an observer initially moves into a location, or when time is limited and tactical actions must progress quickly. A Marine conducts a hasty search by scanning for approximately ten seconds, looking for threats by making quick glances at specific points, terrain features, or other areas that could conceal a threat (focusing on both positive and negative space). Marines should refrain from sweeping their eyes across the terrain in one continuous movement, as it may prevent them from detecting motion and cause them to miss smaller details. The hasty search should begin by viewing the area closest to their own position first, since it could pose the most immediate threat. The search then expands farther out until the entire area has been effectively searched. The hasty search is effective because the eyes are sensitive to the slightest movement, and are focused on specific points, which increases the degree of sensitivity. When Marines see or suspect a potential threat, they use optics to gain a more detailed view of the area. Refer to the figure below.
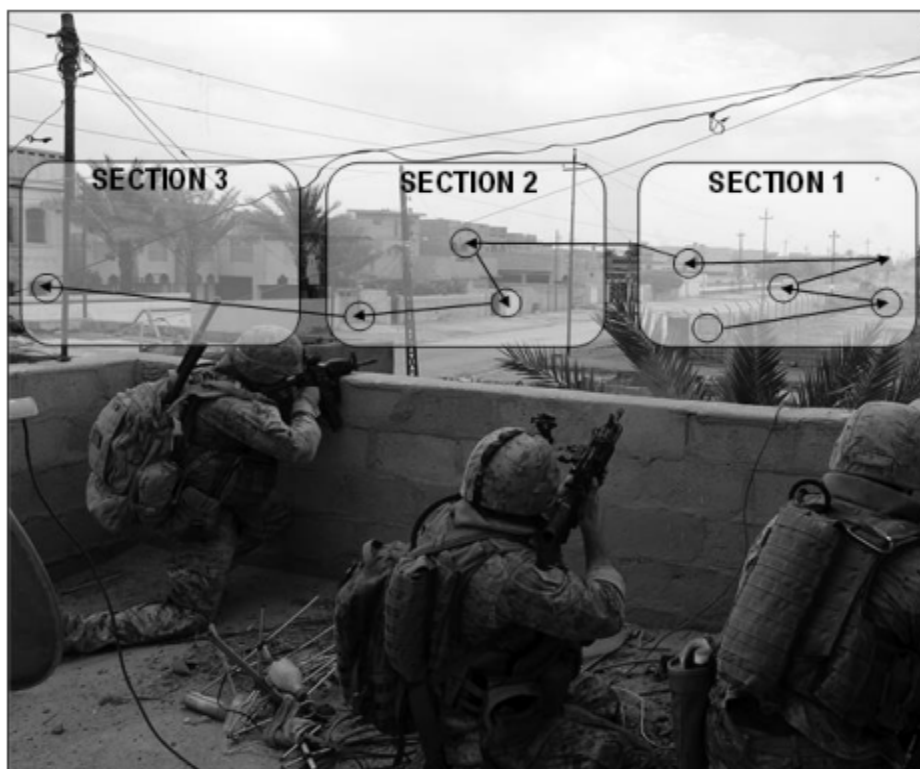
Hasty Search Technique—Scanning Right to Left.

    b. The following should be considered when conducting a hasty search:

(1) From years of learning to read a language by scanning from the left to the right side of a page, the brain becomes conditioned to skip details. Therefore, surroundings should be scanned from right to left to avoid missing details. Doing so allows the brain to identify details in the environment that may otherwise be missed if observing from left to right.

(2) Marines makes their searches either unaided (i.e., naked eye) or with optics, making quick overlapping glances from right to left at specific points throughout the area, not by viewing the terrain in one continuous panoramic sweep. Marines should pay attention to their peripheral vision to detect motion.

(3) Binoculars should be used in this type of search instead of a higher-powered optic, because they afford the observer with a wider field of view and allow them to cover a larger area in a shorter period of time.

(4) The hasty search is meant to be an immediate search of the area. The Marine must therefore immediately prioritize threats or areas from which threats have the potential to appear and search the most dangerous areas first, then moving to less threatening areas. The most dangerous areas should always be searched first.

3. **Detailed Search**

a. After the hasty search, the Marine should conduct a detailed search using the overlapping strip method. Since the area nearest to them normally offers the greatest danger, the search should begin there. The Marine systematically searches the terrain from the right flank in a 180-degree arc up to 50 meters deep. After reaching the left flank, they search the next 50-m area from left to right. The search should be in overlapping strips of at least ten meters to ensure total coverage of the area. The search should cover as far out as the Marine can see, always including areas of interest that attracted the observer during the hasty search. Refer to the figure below.

Detailed Search Technique

   b. The following should be considered by Marines when conducting detailed searches:

      (1) Optics used should be stable and supported.

      (2) One of the dangers of detailed searches is "focus lock," where Marines become fixated on an object. It is important to maintain peripheral vision to prevent this.

      (3) When a threat is detected, a transition to a higher power optic should be made, if available.

      (4) Obstacles to observation such as bushes and shadows may conceal a threat position. Marines should "burn" through these obstacles by focusing on a part of the object, such as the edge of the bush or its shadow, and adjusting focus until the obstacle becomes blurry. This provides a clearer picture of what is beyond the obstacle.

   c. In an urban environment, an observer may only be able to see through a small crack or hole in a wall. By placing one of the barrels of binoculars up to the hole, the observer can observe the entire area.

4. **Military Sketches and Cameras**

   a. The observer uses a military sketch to record information about a general area, terrain features, or man-made structures that is not shown on a map or imagery. These sketches provide higher commands or intelligence sections a detailed, on-the-ground view of an area or object that is otherwise

unobtainable. Due to their portability and ease of data transfer to other devices, cameras have become the primary choice for quickly recording the unique characteristics of an area. The photographs that they take can be rapidly transferred over communications devices (without having to physically deliver them), printed, or imported for use in operations and intelligence briefs to clarify information and provide detail.

5. **Reporting Information**

    a.   The Marine conducting observation must determine when it is appropriate to report the information that is recorded. This is based on three factors:

        (1) First, is the Marine observing something related to an intelligence requirement which must be immediately reported?

        (2) Second, is the information that the Marine is receiving of immediate use to the tactical situation?

        (3) Third, will it immediately prevent an event or provide friendly forces a tactical advantage over the threat?

    b.   While it is important to report pertinent information, excessive information can overload and confuse higher and adjacent units. It is critical that Marines distinguish between fact and opinion when reporting. It is very rare that an observer can ever see all the facts of what they are seeing. Marines must report the facts first, then report their own opinions of what they are observing. If information is second hand, this should also be distinguished in the report. When reporting (or receiving) information, Marines should consider the impact of who the information may be critical to by using the "HASS principle," which stands for higher, adjacent, supporting, and security. This principle can apply both internally and externally. A Marine does not always report up the chain of command, but must be able to determine if the information is of value to other individuals or units in the area. Central to this determination is Marines questioning themselves:

        (1) What do I know? (i.e., fact, assumption, or opinion).

        (2) Who needs to know it? (i.e., element leaders, HHQ, adjacent, supporting, or security units).

(3) Have I told them? (i.e., timeliness of reporting, reporting format used, and supporting material).

c. When observing an area for extended periods of time, it is crucial that Marines record the information that they gather for later reporting and processing. Typically, an observer uses an observation log and observation sketch to record such information.

6. **Reporting Format**

a. While units may develop or modify their own specific reporting formats to meet their requirements, the general acronym used for reporting threats is SALUTE (i.e., size, activity, location, unit, and time). This may also be further abbreviated to SALT (i.e., size, activity, location, and time), which is commonly used in environments in which threats are indistinguishable from the civil populace, such as insurgents who do not typically wear readily identifiable uniforms.

REFERENCES:

NUMBER	TITLE	PAGE
MCTP 3-01A	Scouting and Patrolling	8-13 through 8-19

NOTES:

Defend a position

FMCT0104

03/11/2020

a. **LEARNING OUTCOME(S)**.

(1)   Marines will be able to prepare defensive positions, identify and develop an engagement area, coordinate efforts with adjacent units and higher headquarters in order to synchronize fires and effects to repel an enemy assault. (5)

b. **LEARNING OBJECTIVES**.

(1) Given a list of choices, identify elements of a fighting position in accordance with MCRP 3-10A.4.

(2) Given a list of choices, identify the considerations for cover/concealment of a hasty fighting position in accordance with MCRP 3-10A.4.

STUDENT INFORMATION

OVERVIEW: In this lesson, Marines will learn the basics of how to defend a position.

CLASS PREPARATION: Read this outline prior to the start of this class. Ensure you have all materials provided for this class.

OUTLINE.

1. **MISSION AND PURPOSE OF THE DEFENSE**.

a. The mission of the infantry in the defense is to stop the enemy by fire as he approaches the battle position, to repel his assault by close combat if he reaches the battle position, and to destroy him by counterattack if he enters the battle position.

(1) To destroy the enemy by fire once he comes into small arms range of the squad's fighting position. The enemy is destroyed as far forward of the squad's fighting position as

possible. The closer the enemy comes to the squad's fighting position, the more friendly casualties he will inflict.

(2) If the enemy continues to press the attack to the point where he launches an assault, the squad repels this assault by continuing to deliver fire as part of their unit's final protective fires and, if necessary, by hand-to-hand combat.

(3) If the enemy succeeds in penetrating the platoon battle position, the squad holds its fighting position, delivering fire on the intruding enemy and participating in counterattacks to destroy the enemy and restore the battle position.

b. **Battle Position.** A battle position is the position on which the main effort of the defense is concentrated. A battle position is assigned to battalions, companies, and platoons.
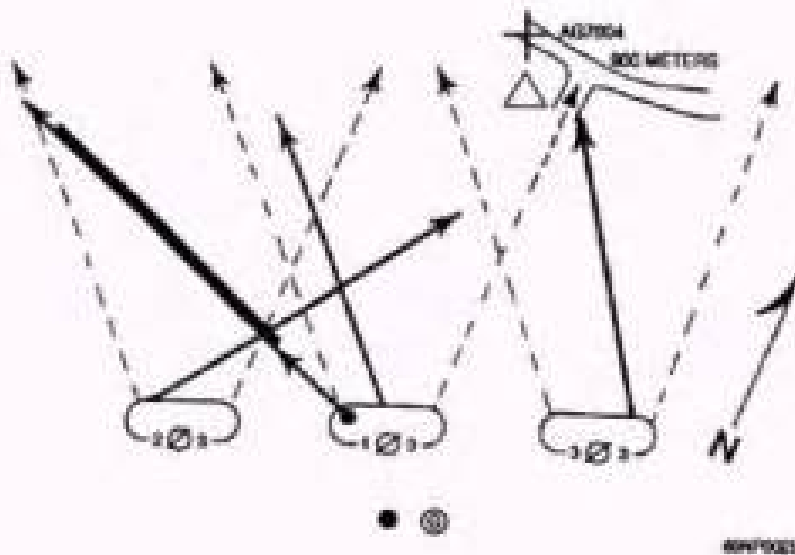
c. **Purpose Of The Defense**. The purpose of defensive action is to defeat an enemy attack, protect the force, stabilize a situation, gain time, economize forces and resources and gain the initiative for offensive operations.

2. **PRIORITIES OF WORK.**
The organization on the ground begins as soon as individual members of the squad have been assigned sectors of fire. It consist of: Posting security, positioning automatic weapons, clearing fields of fire, digging fighting positions, selecting supplementary fighting positions, constructing obstacles, and camouflage measures. This is commonly referred to as "SAFESOC"

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Security
Automatic weapons placement
Fields of fire
Entrenchment
Supplementary positions
Obstacles
Camouflage
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a. **Security.** Local security consists of measures taken to prevent surprise and to deny the enemy information concerning the plan of defense. All-round security and protection against surprise are achieved by:

(1) Initially post listening post/observation post (LP/OP) for extended security.

(2) Each individual will be placed by the unit leader to cover initial sectors within their battle position.

(3) You will not begin to entrench at this point, your initial placement is a hasty position within the battle position.

b. **Automatic Weapons Placement**. Automatic rifles are positioned to cover the most likely avenues of approach into the squad area based on the enemy's most likely course of action. An Avenue of Approach is a route, which could be used by an attacking force leading to its objective or to key terrain.

c. **Fields Of Fire.**

(1) Sector Of Fire. A sector of fire is an area, which is required to be covered by an individual, a unit (squad or fire team), or a crew-served weapon. It is a pie-shape area enclosed by two lateral limits and a forward limit. A sector of fire is assigned to individual weapons, fire teams, and squads. The squad sector of fire is covered by the overlapping sectors of fire of the fire teams.

(a) Lateral Limits. Readily identifiable terrain features are selected to indicate the line of sight along each side of the sector of fire. Limiting devices, are placed near the position of the weapon and are used to indicate the lateral limits during periods of restricted visibility. These should be emplaced prior to darkness.

(b) <u>Forward Limit</u>. The forward limit is established at the range at which the Marine will open fire. For rifles and automatic rifles, this may extend up to their maximum effective ranges. When possible, a terrain feature is selected to locate the forward limit.

(c) <u>Seven Sand Bag Method</u>. This is a common method of establishing a protective position for the Marine while also establishing the lateral limits for the position. It is conducted by placing three sandbags on the ground in a triangle shape with one closest to the fighting position and the other two towards the forward limit. The remaining four sand bags are placed two on either side so that they line up with that fighting position's left and right lateral limit, serving in the role of the limiting stakes.
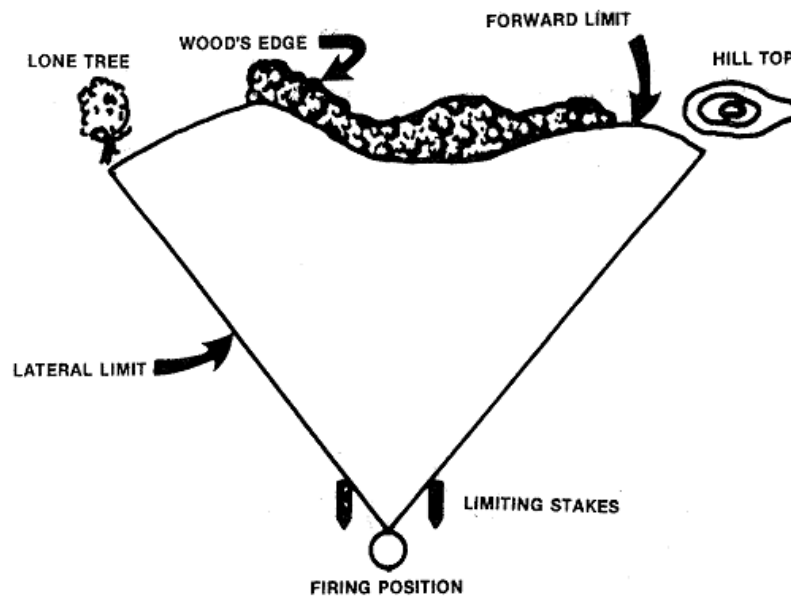
Sector of Fire.

     (2) <u>Principal Direction Of Fire (PDF)</u>. A specific direction of fire within a sector of fire is given to a flat trajectory weapon and which is designated as its primary fire mission. It is selected based on the enemy, mission, terrain, and weapons capability.
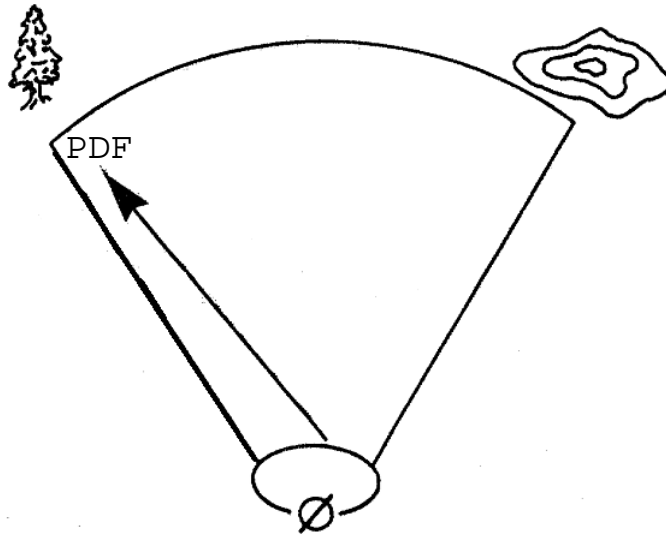
The Fire Team Sector of Fire.

   (3) <u>Final Protective Line (FPL)</u>. A final protective line is a predetermined line along which grazing fire is placed to stop an enemy assault. Where terrain allows, the platoon leader assigns a machine gun an FPL. Once in position, one Marine from the machine gun team walks the FPL to identify both dead space and grazing fire along its length.

   (4) <u>Dead Space</u>. An area within the maximum effective range of a weapon, or observer, that cannot be covered by direct fire or observation from a given position because of intervening obstacles, the nature of the ground, or the characteristics of the trajectory. Dead space affords cover and concealment to the attacking force.

   (5) <u>Clearing Fields Of Fire</u>. In clearing fields of fire forward of each position, the following guidelines should be observed:

    (a) Do not disclose the squad's fighting position by excessive or careless clearing.

    (b) Start clearing near the fighting position and work forward to the limits of effective small arms fire.

    (c) In all cases, leave a thin natural screen of foliage to hide fighting positions.

    (d) In sparsely wooded areas, remove the lower branches of scattered large trees. It may be desirable to

remove entire trees which might be used as reference points for enemy fire.

ORIGINAL TERRAIN
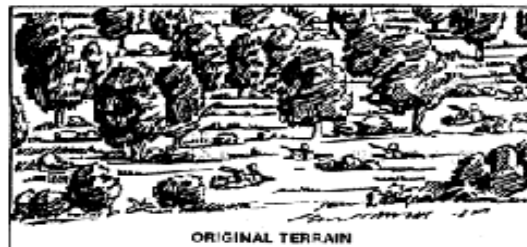
AFTER IMPROPER CLEARING

AFTER PROPER CLEARING

   d. **Entrenchment.**

      (1) Marines will begin construction of their fighting positions upon the unit leader confirming sectors of fire within the battle position. The unit will be given the order to begin entrenching.

      (2) This should be a relatively short time from when the position is occupied.

      (3) Fighting Positions. A fighting position is a location on the ground from which fire is delivered by an individual, fire unit (squad or fire team), or a crew served weapon. The three types of fighting positions are: primary, alternate, and supplementary.

      (4) Fighting Holes. Fighting holes are dug by Marines at their fighting positions. Fighting holes provide excellent protection against small arms fire, shell fragments, aircraft strafing and bombing, artillery, nuclear detonations and the crushing actions of tanks. The type of fighting hole used is based upon squad strength, fields of fire, size of the squads

sector of fire, morale, and time available. The following are the three basic types of fighting holes: Hasty Fighting Position, One-man Fighting Hole, and Two-man Fighting Hole.

(a) Hasty Fighting Position. A hasty fighting position is used when there is little time for preparation. It should be behind whatever cover is available. The purpose of the hasty fighting position is it gives frontal cover from enemy direct fire but allows firing to the front and the oblique with a minimal amount of preparation. The term hasty does not mean that there is no digging. If there is a natural hole or shell crater available that is 2-3 feet wide, use it. If not, dig a prone shelter (skirmishers trench) that will give some protection. Use the dirt from the hole to build cover around the edge of the position.

(b) Occupying a position quickly does not mean there is no digging; Marines can dig skirmishers trenches in only a few minutes. A fighting position just 18 inches deep can provide a significant amount of protection from direct fire and even fragmentation. The skirmishers trench can be improved over time to a more elaborate and protective position. The squad may normally construct one or a combination of primary, alternate, or supplementary positions. Movement to alternate or supplementary positions should be by covered and concealed routes when possible.

(c) Skirmishers Trench Dimensions.

1. Depth. Minimum 6 inches from the front sloping to 18 inches to the rear.

2. Width. Wide enough to accommodate the individual occupying the position.

3. Length. Body size of individual.

(d) <u>One-Man Fighting Hole</u>. This type of fighting hole should be as small as practical in order to present a minimum target to the enemy. The main advantage of a one-man fighting hole is that in most types of soil it will protect the Marine from the crushing action of tanks.

      1. <u>Width</u>. Wide enough to permit the use of an entrenching tool.

      2. <u>Length</u>. Long enough to accommodate the shoulders of a man sitting on the fire step.

      3. <u>Depth</u>. At least 4 feet deep to the fire step. The Marine should be able to aim and fire his weapon, while standing on the fire step, arm pit deep is a good reference.

      4. <u>Parapet</u>. Minimum 6 inches high by 36 inches wide.

      5. <u>Water Sump</u>. A water sump is dug at one side of the fighting hole, below the firing step, to collect water and provide a space for the Marine's feet while he's seated on the firing step and is approximately 18 inches deep.

      6. <u>Grenade Sump</u>. A circular grenade sump dug into the wall of the fighting hole, at the lower part of the water sump, facing the enemy. The grenade sump is cone-shaped with the opening measuring approximately as wide as the spade of the entrenching tool, narrowing to about 5 inches in diameter at the end; it should be sloped downward at a 30 degree angle and is dug as deep as the Marine can make it.
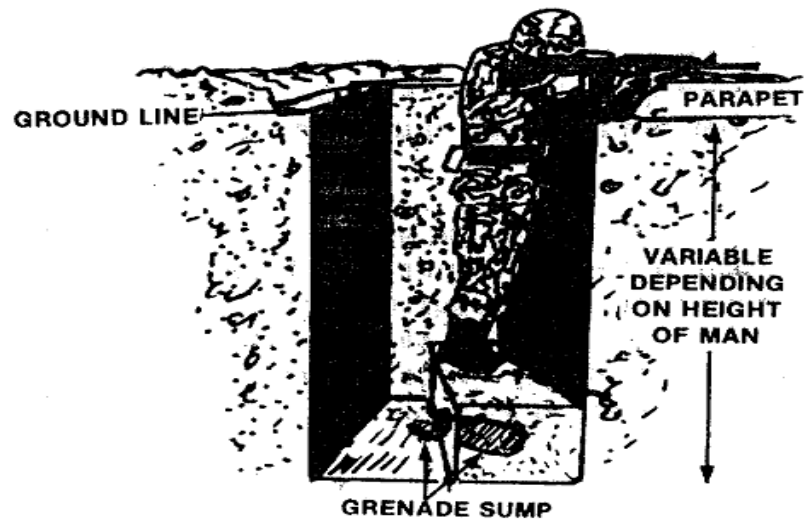
One-Man Fighting Hole.
(Horizontal View)
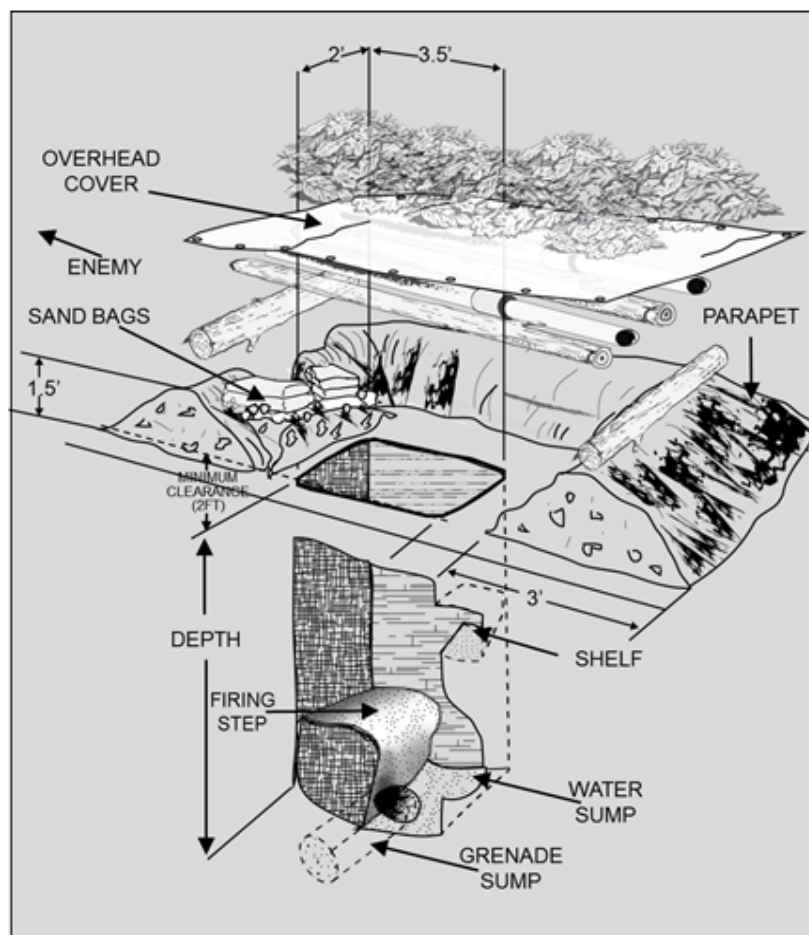
7. <u>Overhead Cover</u>. Marines should begin preparing overhead cover and concealment. Due to the proliferation and increased capability of small UASs to conduct reconnaissance, surveillance, and target acquisition missions, squad leaders must enforce the construction of overhead cover and concealment, combined with employing deception measures to conceal the squad's fighting positions from aerial observation and fires. Terrain often allows the construction of positions with overhead cover and concealment that protects Marines from indirect fire, fragmentation, and observation, while still allowing the ability to return fire. In some occasions, especially on open terrain, this may not be possible, and the entire position must be built below ground level. Although this type of position offers excellent protection and concealment, it limits their ability to return fire from within a protected area. To prepare overhead cover and concealment Marines should:

<u>a</u> Always provide solid lateral support. The support should be built with 4- to 6-inch logs (or equivalent materials) on top of each other running the full length of the front and rear cover.

<u>b</u> Five or six logs that are four to six inches in diameter and two service rifles long (about seven feet) should be placed over the center of the position, resting on the overhead cover support (not on the sandbags).

<u>c</u> Waterproofing material (e.g. plastic bags, ponchos) should be placed on top of these logs.

<u>d</u> A minimum of 18 inches of packed dirt or sandbags should be emplaced on top of the logs.

<u>e</u> The overhead cover and the bottom of the position should be camouflaged with natural or artificial materials.

<u>f</u> Leaders must inspect the positions.

(e) <u>Two-Man Fighting Hole</u>. Essentially this is (2) one-man fighting holes. One Marine can provide protection while the other digs. The two-man fighting hole should be dug as small as practical. Because of its size, it offers somewhat less protection from the crushing action of tanks as well as less protection against strafing, bombing, and shell fragments. The advantages of the two-man fighting hole are that it allows

continuous observation, mutual assistance and reassurance, and the redistribution of ammunition between the occupants.

        1.   <u>Width</u>. 2 feet. (Approximately 2 Kevlar's)

        2.   <u>Length</u>. 6 feet long. (Approximately 2 M16's)

        3. <u>Depth</u>. It should be deep enough to permit both Marines to fire their weapons while standing on the fire steps. Armpit deep to the tallest Marine is a good reference.

        4.   <u>Parapet</u>. Same as an one-man fighting hole.

        5.   <u>Water Sump</u>. The water sump is dug in the middle of the fighting hole between the two firing steps and is 18 inches deep.

        6.   <u>Grenade Sump</u>. A circular grenade sump dug into the wall of the fighting hole, at the lower part of the water sump, facing the enemy. The grenade sump is cone-shaped with the opening measuring approximately as wide as the spade of the entrenching tool, narrowing to about 5 inches in diameter at the end; it should be sloped downward at a 30 degree angle and is dug as deep as the Marine can make it.
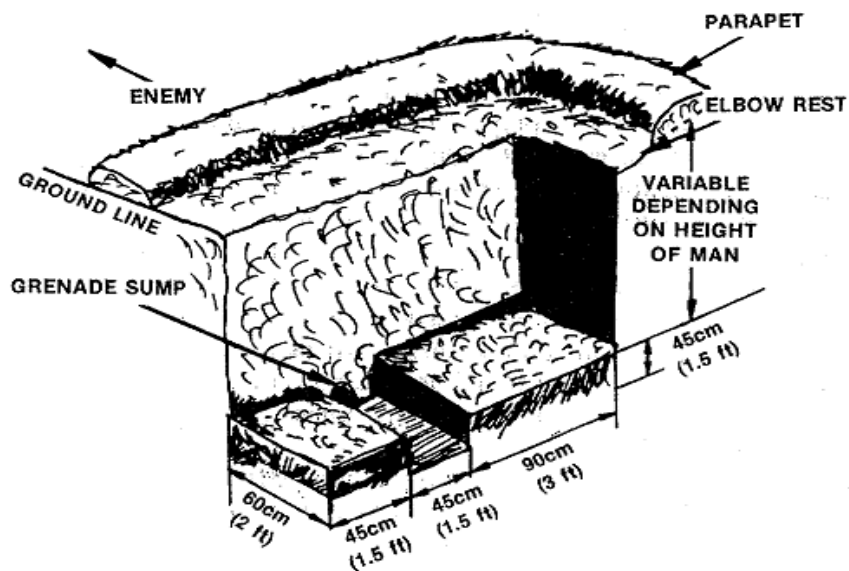
Two-Man Fighting Hole.
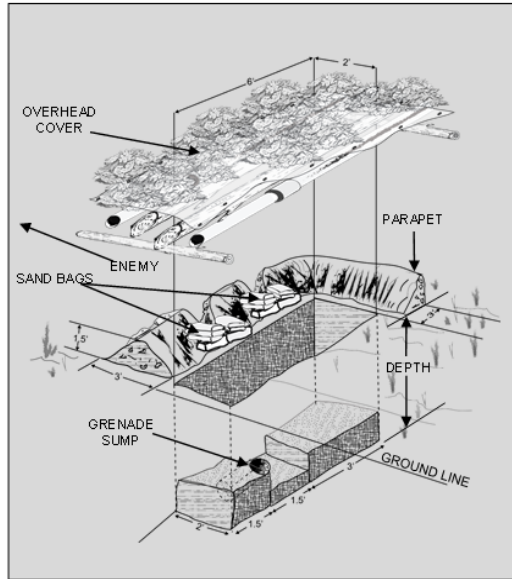
          7 Marines should begin preparing overhead
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               d A minimum of 18 inches of packed dirt
or sandbags should be emplaced on top of the logs.

               e The overhead cover and the bottom of
the position should be camouflaged with natural or artificial
materials.

               f Leaders must inspect the positions.

(Logs should be at least 2 rows high)

Frontal Cover

Flank Cover

Flank Cover

Rear Cover

Logs (Overhead cover)

SQD_135

   e. **Supplementary Positions.**

       (1) <u>Primary Fighting Position</u>. The primary position is the best available position from which the assigned sector of fire can be covered. Individuals, fire teams, squads and crew-served weapons are assigned primary positions.

       (2) <u>Alternate Fighting Position</u>. An alternate position is located so that a crew-served weapon can continue to accomplish its original mission when the primary position becomes untenable or unsuited for carrying out that mission. (primarily used for crew served weapons) **"Different Position Same Mission"**

       (3) <u>Supplementary Fighting Position</u>. Supplementary positions are prepared to guard against attack from directions other than those from which the main attack is expected. It is a secondary position and is oriented in a different direction than the primary position. **"Different Position Different Mission"**

   f. **Obstacles.** Obstacles are designed to break up the enemy's attack, canalize him into heavy weapons fire, and disorganize his assault. The squad may be ordered to construct obstacles such as barbed wire, log, and brush barriers, ditches, and hasty protective minefields. They may also be ordered to

improve natural obstacles such as creek beds and riverbanks. When ordered to construct obstacles the squad leader ensures that the obstacle is located beyond hand grenade range of the individual fighting positions of squad members and the obstacle is covered by fire. The squad will make extensive use of barbed wire entanglements classified as tactical, protective, or supplementary depending upon their use.

       (1) <u>Tactical Wire</u>. Tactical wire entanglements are designed to break up enemy attack formations and to hold the enemy in areas covered by the most intense defensive fires. They are sited along the friendly sides of machine gun final protective lines. Tactical wire has a high priority of construction.

       (2) <u>Supplementary Wire</u>. Supplementary wire entanglements are used to break up the patterns of tactical wire, thus deceiving the enemy as to the location of the final protective fires. They are also used to connect platoon defense areas when gaps exist. Supplementary wire may be used in any locality to canalize enemy movement into areas covered by intensive fire.

       (3) <u>Protective Wire</u>. Protective wire entanglements are located to prevent surprise assaults from points close to the defensive positions. They are close enough to be observed day and night and far enough from friendly positions to keep the enemy beyond normal hand grenade range. Protective wire is normally positioned from 50 to 75 meters from friendly positions.

TACTICAL WIRE

SUPPLEMENTARY WIRE   SUPPLEMENTARY WIRE

PROTECTIVE
WIRE
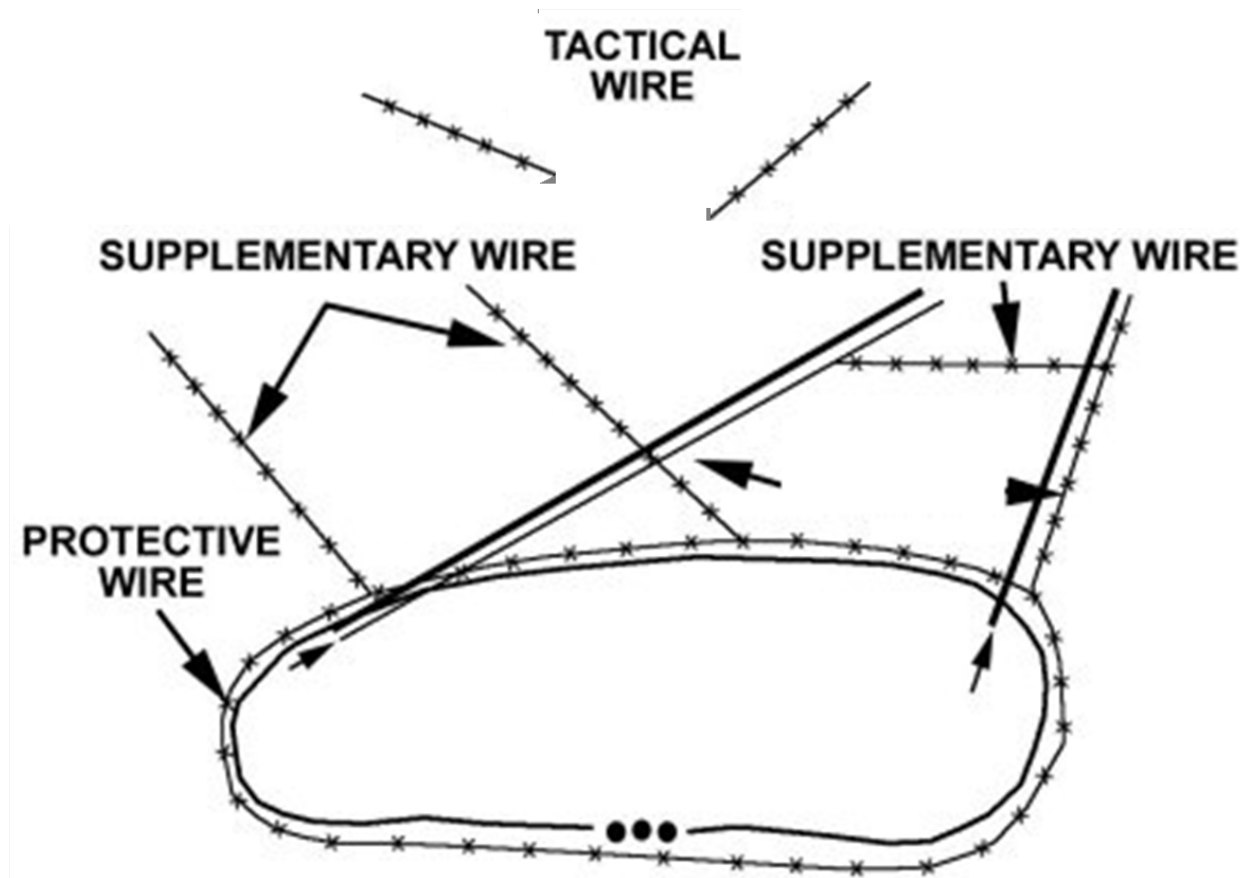
g. **Camouflage.** Concealment from enemy ground and aerial observation is very important in selecting and organizing each fighting position. The squad must take advantage of natural concealment whenever possible. Camouflage measures begin the moment the position is occupied and continues as long as the Marines are there. Specific camouflage measures are:

(1) Do not disclose the position by excessive or careless clearing of fields of fire.

(2) Use the same turf or topsoil that had been removed from the area of the fighting hole to camouflage the parapet.

(3) Dispose of all soil from the fighting hole not used on the parapet. Carry the soil away in sandbags or shelter halves. Dispose of it under low bushes, on dirt roads or paths, in streams or ponds, or camouflage it.

(4) Avoid digging in next to an isolated bush, tree, or clump of vegetation.

(5) Conceal the fighting hole from observation by the use of a camouflage cover. Construct the cover from natural materials.

(6) Replace natural material used in camouflage before it wilts or changes color.

(7) Avoid creating fresh paths near the defensive position. Use old paths or vary the route followed to and from the position.

(8) Avoid littering the area near the position with paper, tin cans, and other debris.

(9) Natural, undisturbed concealment is better than man-made concealment because:

(a) It is already prepared.

(b) It usually will not attract the enemy's attention.

(c) It need not be replaced.

3. **DEFENDING A POSITION.**

a. **Challenge And Passwords.**

(1) Do not allow unidentified personnel to closely approach your position. Halt and identify them before they are close enough to be a danger to you. This precaution is important at night and during other periods of poor visibility.

(a) Challenge. Any process carried out by one unit or person in order to determine the friendly or hostile identity of another.

(b) Reply. An answer to a challenge.

(c) Password. A secret word or distinctive sound given by a sentry.

(d) Countersign. A secret reply given in response to a sentry who has presented a password; for example, Nuts (password), wine (countersign).

b. **Conduct Of The Defense.**

(1) Forward Edge Of Battle Area (FEBA). The foremost limits of a series of areas in which ground combat units are deployed

(2) Enemy Preparatory Bombardment. The enemy will normally precede his attack with fire from any of all of the following weapons; artillery, naval gunfire, mortars, machine guns, tanks and aircraft. During this incoming enemy fire, the squad will take cover in its fighting holes, maintaining surveillance to the front, flanks and rear to determine if the enemy is advancing closely behind their supporting fires.

(3) Opening Fire And Fire Control. The squad withholds its fire on approaching enemy troops until they come within the maximum effective range of small arms of the squad's fighting positions. Squad members open fire on the approaching enemy on command of the squad leader, or when the enemy reaches a predetermined line, normally the forward limit of the fire team sector of fire. When the squad opens fire, rifles are fired at the average rate. When the enemy enters the range of the M-203, the fire team leader delivers grenade launcher fire at the average rate. Automatic riflemen normally fire at the sustained rate. The squad leader determines the appropriate rate of fire for the situation. Automatic riflemen's priority of fire goes to the enemy automatic weapons, rocket launchers, and other crew-served weapons. Once the squad opens fire, direct control passes to the fire team leaders. The fire team leaders, in accordance with the squad leader's previous plan, designate new targets, change rates of fire when necessary, and give the order to cease fire when the attack is defeated. The goal of the squad is to defeat the enemy attack as far forward of the squad fighting position as possible. If the enemy is not stopped and he continues to close on the squad fighting position, the automatic riflemen will continue to increase their rate of fire as the enemy comes closer.

(4) Final Protective Fires. If the enemy's attack is not broken and he begins his assault, final protective fires are called. Final protective fires are the final attempt to stop the enemy attack before he reaches the platoon's battle position. When final protective fires are called for, all squad members fire in their assigned sectors (normally the fire team's sector of fire). Rifles and M-203s continue to fire at the average rate; the automatic riflemen will increase their volume of fire to the rapid rate, if they have not yet reached this

rate prior to the calling for final protective fires. Riflemen
engage enemy personnel within the fire team sector. Fire team
leaders fire the M-203 at the largest concentration of enemy
personnel within the fire team sector. Normally, the largest
concentrations will be along the PDF's of the automatic rifles
if the PDF's were properly positioned.

    (5) Enemy Reaches The Squad's Position. Enemy infantry
reaching the squad's fighting position are driven out by fire,
grenades, the bayonet, and hand-to-hand combat. The success of
the defense depends upon each rifles squad defending in place.
A stubborn defense by front line squads breaks up enemy attack
formations and makes him vulnerable to counterattacks by reserve
units. The squad does not withdraw except when specifically
directed by higher authority.

    c. **Engaging The Enemy**. Since enemy troops are trained in
the use of cover and concealment, targets are often indistinct
or invisible, seen only for a short time, and rarely remain
uncovered for long. When a target is discovered leaders and
squad members must define its location rapidly and clearly.
Squad members are trained to identify the target area quickly
and accurately and to place a high volume of fire on it even
though no enemy personnel may be visible. A small point target
like an enemy sniper might be assigned to only one or two
riflemen, while a target of considerable width like an enemy
skirmish line requires the combined fires of the entire squad.
The leader directs and controls the fire of his unit by fire
commands.

    (1) Fire Commands. A fire command contains six basic
elements that are always announced or implied. Fire commands
for all weapons follow a similar order and include similar
elements. Only essential elements are included. The six
elements (**ADDRAC**) of the fire command are:

        (a) **A**LERT.

        (b) **D**IRECTION OF THE TARGET.

        (c) **D**ESCRIPTION OF THE TARGET.

        (d) **R**ANGE TO THE TARGET.

        (e) **A**SSIGNMENT.

        (f) **C**ONTROL.

d. **Alert.** This element alerts the fire unit to be ready to receive further information. It may also tell who is to fire. Usually, it is an oral command, SQUAD or FIRE TEAM. The leader may alert only a few individuals by calling them by name. The alert may also be given by signals, personal contact, or by any other method the situation may indicate.

e. **Direction.** The direction element tells which way to look to see the target. The direction of the target may be indicated orally or by utilizing tracer ammunition.

(1) Orally. The general direction to the target may be given orally and should indicate the direction to the target from the unit for example, RIGHT FRONT. The direction may also be given orally with the use of reference points and finger measurements.

(a) Reference Points. To help the members of the fire unit locate 1 indistinct target, the leader may use reference points to give direction to the target. He selects a reference point that is near the target and easy to recognize. When using a reference point, the word REFERENCE in describing the reference point and the word TARGET in describing the target are used. This prevents the members of the fire unit from confusing the two; for example:

1. SQUAD.

2. FRONT.

3. REFERENCE: ROCK PILE IN DRAW.

4. TARGET: SNIPER IN FIRST TREE TO THE RIGHT, ONE FIVE ZERO.

(b) Finger Measurement. Distances across the front, known as lateral distances, are difficult to estimate in terms of meters. To measure the distance right or left of a reference point, or to measure the width of a target from one flank to another, finger measurements may be used. The method of using finger measurements is as follows:

1. Hold the hand at arm's length directly in front of your face, palm facing away from you, index finger pointing upward.

        <u>2</u>. Close one eye.

        <u>3</u>. Select a reference point.

        <u>4</u>. Place one finger between the reference point and the target and then fill that space by raising more fingers until the space is covered.

An example of the use of finger measurement is as follows:

        <u>1</u>. <u>SQUAD</u>.

        <u>2</u>. <u>FRONT</u>.

        <u>3</u>. <u>REFERENCE</u>: TALL TREE AT EDGE OF HEDGEROW, RIGHT TWO FINGERS.

    f. **Description.** The third element in a fire command is a brief and accurate description of the target to be engaged.

    g. **Range.** Range gives the information needed to set the sight or to adjust the point of aim. The Word RANGE is not used. Examples of range are ONE SEVEN FIVE, TWO FIVE ZERO, or FOUR HUNDRED.

    h. **Target Assignment.** The target assignment element tells who is to fire on the target and is broken down into two sub elements as follows:

        (1) First, the squad leader prescribes whether the entire squad will fire on the target or whether only one or two fire teams will fire. If the unit to fire is the same as announced in the alert element, it may be omitted from the target assignment element.

        (2) The squad leader also uses this element to determine what weapons will be fired and the rate of fire for the automatic rifle.

    i. **Fire Control.** The fire control element consists of a command or signal to open fire. If surprise fire is not required, the command, **COMMENCE FIRING** normally is given without a pause as the last element of the fire command. When the leader wants all his weapons to open fire at once in order to achieve maximum surprise and shock effect, he will say, **AT MY**

COMMAND or **ON MY SIGNAL**. When all men are ready, the leader gives the command or signal to commence firing.

An example fire command is as follows:

> (1) Squad.

> (2) Front.

> (3) Enemy skirmishers.

> (4) Three hundred.

> (5) On my signal.

REFERENCES:

NUMBER	TITLE	PAGE
MCTP 3-01A	**Scouting and Patrolling**	**Entire Manual**
MCIP 3-10A.4	**Marine Rifle Squad**	**Entire Manual**
MCWP 3-01	**Offensive and Defensive Tactics**	**Entire Manual**

Command, Control, Communication, Computers, and Intelligence (C4I)

MCT0110

01/18/2021

LEARNING OBJECTIVES FOR THIS LESSON

a. **LEARNING OUTCOME(S)**.

1. Marines will be capable of handling, inspecting, preparing, and employing various communication assets in order to provide a continuous flow of information to higher and adjacent units. The Marine also employs pyrotechnics in order to signal, obscure, and screen a threat/target to facilitate communication means, mark locations, chart enemy courses, and provide illumination for search and rescue missions and to meet commander's intent. (14)

b. **ENABLING LEARNING OBJECTIVES**.

STUDENT INFORMATION

OVERVIEW: In this lesson, Marines will learn how to employ the AN/PRC-152 Radio with the ability to transmit across the UHF/VHF/HF spectrums and employ pyrotechnics in order to signal, obscure, and screen.

OUTLINE.

1**.** **Introduction**: The purpose of C4I is to allow the Marine Corps to effectively communicate information across the battlefield. Effective communication is more than just talking face to face with someone, and includes radios, markings, pyrotechnics, signals, and other auditory or visual cues that facilitates communication in the battlespace.

2. **Pyrotechnic Signals**: Pyrotechnic signals range from trip flares to simulators. Pyrotechnics supplement or replace normal communications means, are used to mark locations, and provide illumination.

a. Communication Signals: There are two types of communications signals that the Marine Corps uses: handheld signals and ground smoke signals. These signals come in a variety of colors and patterns, and can be used to coordinate

troop movements, designate locations or as other immediate action signals.

(1) Handheld Signals. Handheld signals, also known as "pop-ups", include star clusters, star parachutes, and smoke parachutes. These signals come issued in an expendable launcher that comprises a launching tube and a firing cap.


(a) Star Clusters. Star clusters are used for signaling and illuminating. When fired, a star cluster will rise 200 to 215 meters from the muzzle in the direction of fire before scattering colored sparks that will burn for 6 to 10 seconds. Types of star clusters include green star clusters, red star clusters, and white star clusters.

(b) Star Parachutes. Star parachutes are used for signaling and illuminating. When fired, a star parachute will rise 200 to 215 meters from the muzzle in the direction of fire before deploying a single illuminant light suspended from a parachute that will burn for 25-50 seconds. The signals are visible for 50 to 58 kilometers at night, and will descend at a rate of 2.1 meters per second. Types of star parachutes include green star parachutes, red star parachutes, and white star parachutes. An important consideration when firing is the direction and speed of wind when using star parachutes, as the wind will carry the parachute.

(c) Smoke Parachutes. Smoke parachutes are used for signaling only. When fired, a smoke parachute will rise 200 to 215 meters from the muzzle in the direction of fire before deploying a colored smoke canister suspended from a parachute that will form a smoke cloud that lasts about 60 seconds. Smoke parachutes descend at an average rate of 4 meters per second. An important consideration is the visibility of smoke at night, and particularly whether cloud cover will obscure or degrade the visibility of the smoke.

(d) <u>Prep for Combat</u>. Handheld signals will come shipped in metal containers similar to ammunition cans, or sealed in barrier bags that are packed into wooden crates. Upon receipt, inspect the container to ensure that the container has not been damaged and the seal on the containers is not broken, missing, or tampered. Once removed from the shipping container, the individual signal will come in a sealed metal or plastic container.

1. Opening a steel container. To open a steel container, use the key attached to the container. Remove the sealing strip, remove the top of the container, remove any padding, then remove the signal.

KEY LOCATED IN STORED POSITION
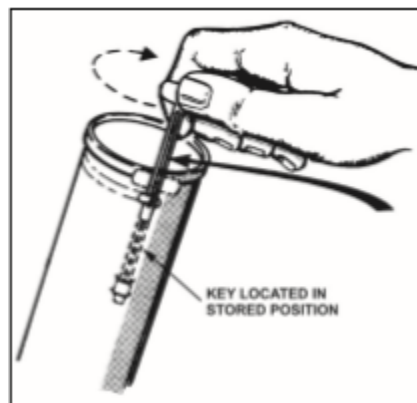
2. Opening a plastic container. To open a plastic container, hold the container in one hand, twist the end cap counter-clockwise, and remove the signal.

3. Inspecting the signal. Once the signal has been removed, inspect the signal and identify any of the following discrepancies: corrosion, holes or dents on the launcher tube, broken forward end seal, missing or damaged firing pins or primers, color coded seal does not match the color listed on the data plate.

(e) <u>Employment Considerations</u>. When choosing pyrotechnic signals, consider the intensity and color. Different signals will burn at different intensities. Different colors may blend with ambient light depending on the operating environment. It can be difficult to differentiate between white and green in daylight conditions, and red signals may be difficult to identify when launched in a position that may blend with a vivid sunrise or sunset. Avoid using red or green star clusters near aircraft, as these can be confused with marking lights on aircraft.

(f) Firing. To fire the signal, follow these steps.

                1.   Check for overhead clearance. This will
prevent the signal from hitting material that might cause fires,
injury, or death.

                2.   Grasp the signal firmly with your non-
firing hand, with the red band down. Inverting your non-firing
hand while maintaining the same orientation of the signal is
highly encouraged for both safety and accuracy.

                3.   With your firing hand, remove the firing
cap from the upper end of the signal.

                4.   Point the ejection end of the signal up and
away from your body, and push the firing cap onto the signal
until the open end of the cap lines up with the red band.

                5.   Hold the signal away from your body and at
the desired trajectory angle.

                6.   Turn your head away from the signal to
avoid injury to your face and eyes, and with the meaty portion
of your firing hand, strike the bottom of the cap with a sharp
blow.

7. After firing, retain the launcher tube and firing cap and dispose of appropriately.

(e) Misfire Procedures.

1. In the event of a misfire, keep the signal aimed in the desired direction, pull the cap back to the red band, and rotate the cap 90 degrees.

2. Make two more attempts to fire the signal.

3. If it still does not fire, wait 30 seconds, keeping the arm rigid and the signal aimed overhead. Return the cap to the ejection end of the signal and dispose according to unit SOP.

(2) Ground Smoke Signals. Ground smoke signals, or "smoke grenades", are self-contained units used to signal aircraft, ground forces, or to screen unit movements. Smoke grenades have a 0.7 to 2 second delay and produce a smoke cloud that lasts approximately 25 to 90 seconds. Ground smoke signals come in violet, yellow, green, and red, and are operated similar to a standard hand grenade.

(a) <u>Common Characteristics</u>. Smoke grenades are composed of a body, filler, and fuze.

    1. <u>Body</u>. This part of the grenade functions as the container and is typically a cylinder made of a thin sheet of metal, with a hole at the bottom to allow smoke to escape. The body of the smoke grenade will be forest green, with light green markings and a colored top to indicate the color of smoke.

    2. <u>Filler</u>. This part of the grenade is made of a colored smoke mixture that burns in either violet, yellow, green, or red.

    3. <u>Fuse</u>. The fuse is the component of grenade that ignites the smoke mixture.

(b) <u>Safeties</u>. Smoke grenades have two safeties:

    1. <u>Safety Pin</u>. This is the first safety on a smoke grenade. It also serves to hold the safety lever to the fuze assembly. Once the safety pin is pulled, using the pull ring, the grenade is ready to be thrown. DO NOT ATTEMPT TO REPLACE THE SAFETY PIN IF IT IS PULLED OUT OF THE GRENADE.

    2. <u>Safety Lever</u>. This is the last safety device on the grenade. Once the pin is pulled, the safety lever must be held in place by the thrower. When the grenade is thrown, the striker located on top of the fuze assembly moves up, pushing the safety lever away from the body and igniting the primer.

(c) <u>Prep for Combat</u>. One grenade can be carried in a pouch. When stored in a pouch, ensure the safety lever is secured inside the pouch with the grenade. If more grenades are issued than can fit in pouches, marines may use pockets or additional ammunition pouches to store and carry the grenades. Hand grenades are never secured with the pull ring or the safety lever. Before use, inspect the grenade to ensure it is ready for use according to the following procedure:

    1. Remove the tape and top cover from the shipping canister.

    2. Look down into the canister, if the grenade is upside down, return the canister to the issuing person, NCOIC or OIC.

3. Ensure both safeties are properly attached to the grenade.

4. Check for rust or holes on the body or fuse. If any rust or holes are visible, return the grenade.

5. If the grenade seems to be in order, remove the grenade from the canister and make a visual check for proper fitting of safety pins. Once verified for proper fit, secure the grenade in a pouch. Do not modify the safety pin or safety lever for storage.

(d) Employment Considerations. Marines must consider wind direction and speed before throwing smoke grenades. Grenades should be thrown upwind of the desired location for obscuration or signaling. Low winds and heavy humidity can cause smoke to linger. Smoke grenades should not be thrown on dry tinder, as the grenade can initiate a brush fire. A typical Marine can throw a smoke grenade 35 meters, approximately the distance that a Marine can accurately throw a baseball.

(e) Smoke Grenade Gripping. When the grenade is held in the throwing hand with the safety lever placed between the first and second joints of the thumb. The throwing hand should always form a firm letter "C" around the body of the grenade with the thumb maintaining continuous contact between the safety lever and the grenade body.

(f) Throwing A Smoke Grenade. The first step in every position is estimate the distance to the target. This should take no more than two seconds to minimize exposure time.

1. Standing Position. This position is the most desirable and natural one from which to throw grenades. The standing position is normally used when occupying a fighting position or during operations in fortified positions or urban terrain. Throwing from this position is accomplished in the following manner:

a. Estimate the distance to the target.

b. With your non-throwing side facing towards the target, assume a natural stance with your weight balanced equally on both feet.

c. Hold the grenade firmly chest high, using the appropriate grip with the safety lever beneath your thumb between the first and second joint.

d. Hook the index finger of the non-throwing hand into the pull ring on the safety pin.

e. Remove the safety pin by using a twisting and pulling motion away from the grenade body while maintaining a firm grip on the smoke grenade.

f. Cock the throwing arm behind the helmet with the grenade held 4 to 5 inches from the helmet and extend the non-throwing arm towards the target.

g. Throw the grenade with a natural motion and follow through by stepping forward as you throw.

2. <u>Kneeling Position</u>. The kneeling position is used when you have a low wall, shallow ditch, or similar cover for protection. This position reduces the distance that a grenade can be thrown. Throwing from this position is accomplished in the following manner:

a. Estimate the distance to the target.

b. With your non-throwing side facing towards the target, assume a kneeling position with the majority of your weight on your forward knee. Extend the opposite leg rearward and plant your foot firmly for balance.

c. Hold the grenade firmly chest high, using the appropriate grip with the safety lever beneath your thumb between the first and second joint.

d. Hook the index finger of the non-throwing hand into the pull ring on the safety pin.

e. Remove the safety pin by using a twisting and pulling motion away from the grenade body while maintaining a firm grip on the smoke grenade.

f. Cock the throwing arm behind the helmet with the grenade held 4 to 5 inches from the helmet and extend the non-throwing arm towards the target.

g. Throw the grenade with a natural motion and push off with your trailing foot to give added force to your throw.

3. <u>Prone Position</u>. This position reduces both distance and accuracy. It is only used when an individual is pinned down by fire and is unable to rise to engage his target. Throwing from this position is accomplished in the following manner:

a. Estimate the distance to the target.

b. Lie on your back with your body perpendicular to the grenade intended line of flight.

c. Hold the grenade firmly chest high, using the appropriate grip with the safety lever beneath your thumb between the first and second joint.

d. Hook the index finger of the non-throwing hand into the pull ring on the safety pin.

e. Remove the safety pin by using a twisting and pulling motion away from the grenade body while maintaining a firm grip on the smoke grenade.

f. Cock the throwing arm behind the helmet with the grenade held 4 to 5 inches from the helmet and extend the non-throwing arm towards the target.

g. Cock your right leg (left leg for a left-handed thrower) with your foot firmly braced against the ground.

h. With your non-throwing hand, grasp any object that is capable of giving you added leverage to increase your throwing distance. When throwing the grenade, push off with your rearward foot to give added power to your throw.

i. When the grenade is released, roll over onto your stomach and press yourself flat against the ground.

b. <u>Surface Trip Flares</u>

(1) The M49A1 surface trip flare resembles a smoke grenade in size and shape, and comes with a bracket provided for attachment to a tree or post and a trigger mechanism for firing.

Trip flares can be used to provide early warning of infiltration of enemy troops, illuminating the immediate area, ignite fires, and force the enemy to withdraw. To use the trip flare as a warning, a trip wire should be attached to the trigger or pull pin to arm the flare. A graphic is included in the packaging with trip flares to facilitate mounting and arming.

    (2) <u>Characteristics</u>. The M49A1 surface trip flare has an aluminum body and weighs 0.75 pounds. The trip flare is filled with an illumination composition and is activated with a trip wire that is 50 feet long and comes with the flare. When activated, the trip flare immediately produces 35,000 candlepower of illumination for 55 seconds, and illuminates a 300 meter radius. The trip flare has an olive drab body with black markings. The minimum safe distance from the flare is 2 meters due to sparks thrown off by burning magnesium. Never look directly at a burning trip flare, as it can damage night vision devices and your eyes. DO NOT attempt to cook off a trip flare, as the fuze has no delay.

3. **RADIO THEORY**.

    a. The equipment and path that a radio signal follows between two stations is called a radio link. A radio link consists of seven components: the transmitter, power supply, transmission lines, transmitting antenna, propagation path, receiving antenna, and receiver.
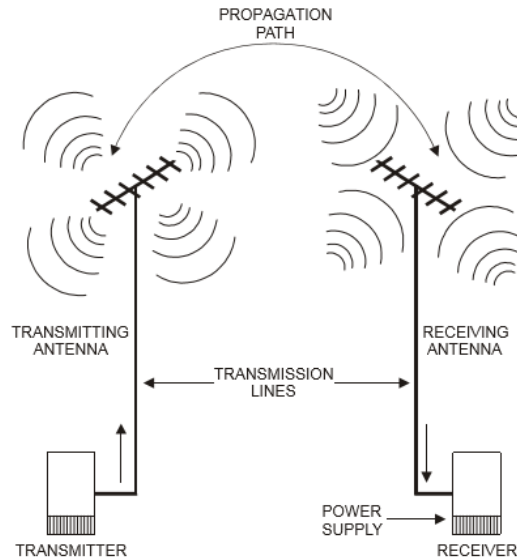
     b.   When a transmission takes place, the transmitting
antenna sends the radio signal into space along the propagation
path, which is then caught by the receiving antenna, sent to the
receiver, and processed so the human ear can hear it.

     c.   To transmit the best possible signal, users must
consider the optimum frequency, the best antenna to use that
frequency, and the propagation path.

     d.   Radio Frequency. The frequency of a radio wave is the
number of complete radio waves that occur in one second. Lower
frequency waves are able to travel further because they lose
less energy to the atmosphere, but transmit information slower.
Higher frequency waves travel less well because they lose more
energy to the atmosphere, but they transmit information faster
and clearer.

          (1) In the radio frequency spectrum, frequencies are
divided into groups or bands of frequencies. Most tactical radio
sets operate within a 2 to 400 MHz range within the frequency
spectrum.

RADIO				IR	VISIBLE	UV	X-RAY	GAMMA-RAY	COSMIC-RAY
HF	VHF	UHF							

3 MHz   30 MHz   300 MHz   3 GHz
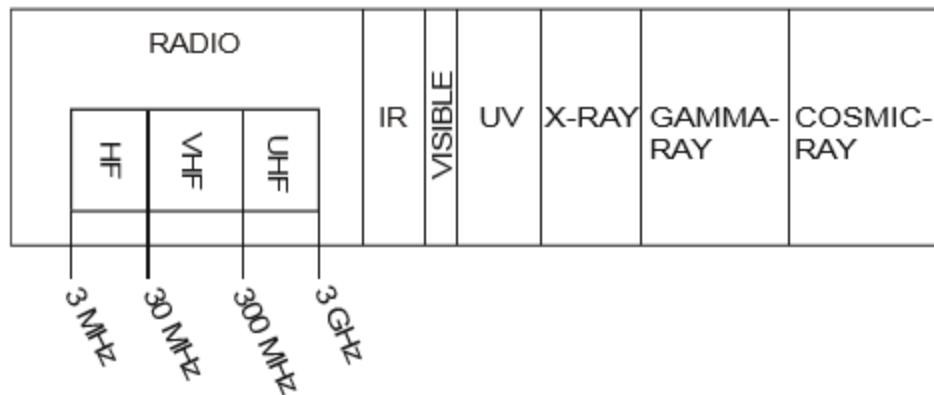
4. **AN/PRC-152 RADIO**: The AN/PRC-152, or simply PRC-152, is a tactical handheld radio that is used for personnel that require secure voice and data communications. The radio is capable of transmissions in Very High Frequency (VHF), which is used in short-range ground communications, and Ultra High Frequency (UHF), which is used for communication with aircraft.

    a. Characteristics: The PRC-152, when man packed, has a transmission range of 0 to 5 km in VHF communications when it is set to transmit in high power mode. In UHF communications, the radio requires a direct line of sight with the aircraft, which will affect how far the radio can transmit. The radio is capable of both voice and data communications, and can be programmed to "frequency hop" for encryption. To ensure that all radios are hopping to the correct frequencies at the same time, all radios using the nets must be programmed to have a matching Global Time Of Day (GTOD), which is typically established using a piece of equipment issued by the Marine Corps known as a Defense Advanced GPS Receiver (DAGR). The radio has 99 programmable preset net IDs, which facilitates rapid selection of the net that the user wants to communicate on. The radio weighs 2.6 pounds.
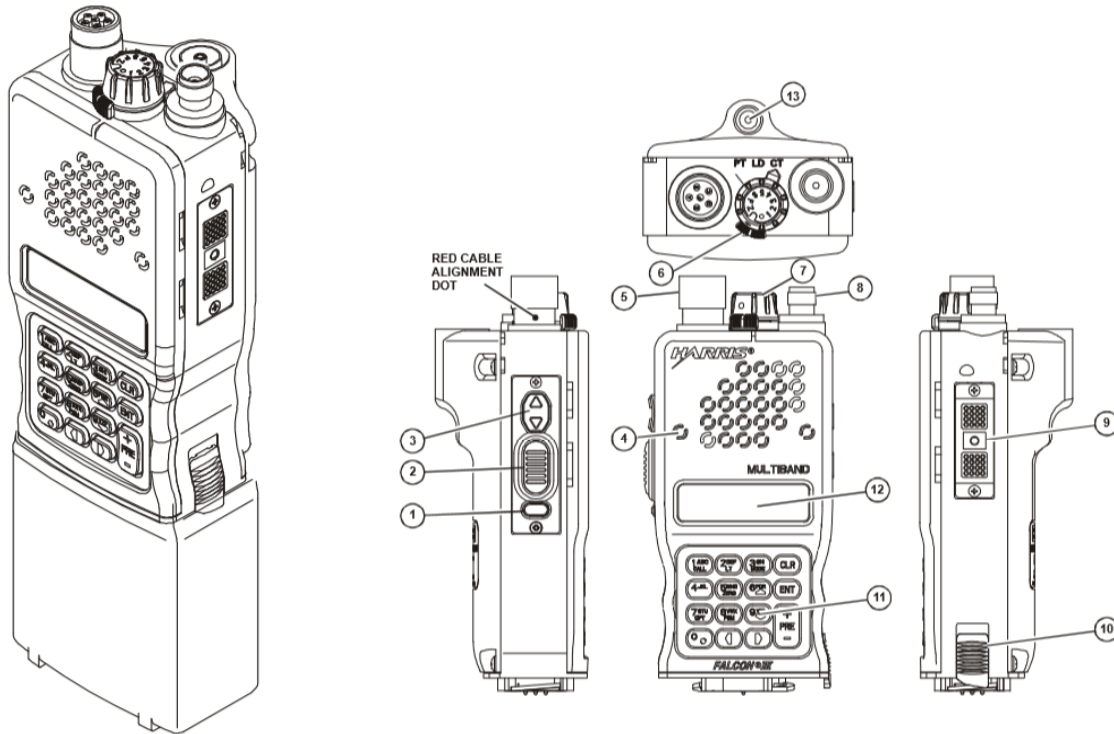
b. **User Interface Components**

      (1) **Squelch Control**: This button toggles radio squelch on and off.

      (2) **Push-to-talk Switch**: This button is used to allow the user to speak into the radio and transmit. If this button is not pushed, the radio will not transmit anything that the user says.

      (3) **Volume Control**: These buttons control the volume of the radio speaker or handset speaker. The up arrow increases volume, the down arrow decreases it.

      (4) **Microphone**: A built-in microphone for the radio.

      (5) **6-pin audio/fill connector**: This port provides a connection point for an optional handset or for a device to load crypto onto the radio.

      (6) **Cipher Switch**: This switch is used to turn crypto on or off for the radio, and also can put the radio into a mode where crypto can be loaded into the radio. Plain text, or "PT", turns off the crypto in normal radio operation. This setting unencrypts transmissions to and from the radio. The radio will not be able to receive encrypted transmissions. Load, or "LD",

places the radio in load mode so that crypto can be loaded into the radio from an appropriate device. Cipher Text, or "CT", turns on crypto for radio operation. In this mode, the radio is only able to transmit and receive encrypted information. The radio will not be able to receive unencrypted transmissions. Most operations will require the use of CT to ensure network security.

(7) Function Knob: The function knob is one method of controlling the operation of the radio. It also controls whether the radio is powered on or off. The function knob has the numbers 1 through 5 on it, which correspond to pre-programmed Net IDs. This allows the user to rapidly switch between Net IDs without having to look at the display screen. When the function knob is on a number, the keypad is unable to be used to switch Net IDs. The knob also has "S", "F", and "Z" on it, which, respectively, allow the user to scan across unencrypted nets, control the net ID using the "PRE +/-" button on the keypad, and initiate the first step in zeroizing the radio.

(8) Antenna Port: The antenna port is where the antenna is attached to the radio. There are 2 major types of antennas that are used with the PRC-152. Most commonly, the radio uses a 3 foot whip antenna, which allows the radio to transmit in in both the VHF and UHF spectrum. The radio also uses the 1 foot blade antenna, which is used for VHF communication with aircraft. Because the blade is a shorter antenna, it will typically have a smaller transmission range than the 3 foot whip.

(9) Side Connector: Provides interface for connecting various remote data devices.

(10) Battery Latch: Used to unlock a battery for removal. To operate, slide the latch up and twist the battery to remove it.

(11) Keypad: The keypad has numbered buttons on it, each of which also corresponds to a particular function for the radio. Particularly important ones are:

(a) "LT" Button: Allows the user to access keypad and display backlight settings.

(b) "ZERO" Button: Provides access to menus to zeroize the radio.

(c) "PGM" Button: Provides access to programming menus.

(d) "CLR" Button: Returns a field to the previous value, and activates the previous menu or screen.

(e) "ENT" Button: Selects scroll field choices or locks in entry field data.

(f) "PRE +/-": Allows the user to scroll through programmed nets when the function knob is in the "F" position.

(12) <u>Display</u>: Displays operational and programming screens.

(13) <u>GPS Antenna Port</u>: Attachment port for a GPS antenna.

c. <u>Common Operations</u>

(1) <u>Set GTOD</u>: To set GTOD on a PRC-152, follow these steps:

(a) With the radio on and at the home display, press the OPT (#7) key.

(b) Scroll to SINCGARS OPTIONS and press ENT.

(c) Select SINCGARS GTOD and press ENT.

(d) Select USER ENTRY and press ENT.

(e) Manually input GTOD using the numbers on the keypad. When the GTOD on all radios match, press ENT at the same time to ensure they begin counting at the same time.

(f) Press CLR three times.

(g) Put your radio on the appropriate preset.

(2) <u>Hasty Net ID Entry</u>: To put a PRC-152 on a specific net ID without loading the net ID as a preset, follow these steps:

(a) With the radio on and at the home display, ensure the keypad is unlocked.

(b)   Scroll until the "Net ID" number is highlighted and press ENT.

(c)   Manually input the desired net ID to transmit and receive on and press ENT.

(d)   Conduct a radio check on the net ID.

(3)   Other common operations are detailed below.

STEP	ACTION
Loading AN/PRC-152 with a single channel (VULOS) frequency	
1	RT can either be on PT or CT to program but CANNOT be on LD
2	Once at main screen select PGM, ENTER
3	Scroll to VULOS CONFIG, ENTER
4	Scroll to VINSON COMPATIBILITY, ENTER
5	Set to VINSON COMPATIBILITY ON, ENTER
6	CLR back to PGM menu, scroll to SYSTEM PRESETS, ENTER
7	Got to SYSTEM PRESET CONFIG, ENTER
8	SYSTEM PRESET NUMBER (enter channel number you want to config), ENTER
9	PRESET DESCRIPTION (this is a description of this net). It is NOT NEEDED to enter anything. Can be left at default.
10	PRESET WAVEFORM (select appropriate waveform ie: VULOS, HAVEQUICK, HPW). Select VULOS, ENTER
11	Next programming menu for that specific net will appear, select GENERAL CONFIG, ENTER
12	PRESET NAME (program appropriate channel name), ENTER
13	PRESET TYPE, select LOS, ENTER
14	Next RT will take you back to PRESET CONFIG menu, a checkmark will appear next to GENERAL CONFIG telling you that this portion of programming is done. Highlight FREQUENCY, ENTER
15	Input RCV FREQ, ENTER
16	RECEIVE ONLY, NO, ENTER
17	TRANSMIT FREQ, use RECEIVE FREQ, ENTER. RT will show TRANS FREQ, hit ENTER
18	RT goes back to PRESET CONFIG menu with a check next to FREQUENCY stating it has been programmed
19	Select COMSEC, ENTER
20	RT will ask for COMSEC mode, select VINSON, ENTER
21	RT will ask for CRYPTO key, select appropriate THE, ENTER
22	RT goes back to PRESET CONFIG menu with checkmark next to COMSEC
23	Scroll to TRAFFIC, ENTER
24	TRAFFIC MODE VX or DATA, ENTER
25	Next RT will scroll through defaults given by TRAFFIC MODE and Frequency Range selected, ENTER through to PRESET CONFIG menu and checkmark will appear next to TRAFFIC
26	Select TX PWR, ENTER. Select desired PWR level, ENTER. RT goes back to PRESET CONFIG MENU
27	Scroll through SQUELCH, make changes if desired other than default and hit EXIT

	Loading AN/PRC-152 COMSEC	
STEP	**ACTION**	
1	**Prep the Radio**	
	Step	**Action**
	1	PWR on RT by turning large knob to FP (System will run self test)
	2	Once at main screen, looking down from top of RT change from PT to LD
	3	Radio will change to FILL menu
	4	Under fill menu, select FILL, ENTER
	5	Select waveform for Single Channel CT, select VULOS, ENTER
	6	Select FILL device, KYK 13, ENTER
	7	Go to Step 2 Load COMSEC
	8	Press ENTER to initiate fill
	9	Once key has transferred RT will ask what CRYPTO mode, select VINSON, ENTER
	10	Key type, select TEK and set key number, ENTER
	11	RT will ask for classification of key. Select what classification the key is, ENTER
	12	RT will say completing fill and will then ask you if you need to LD another key. If yes it will kick you back to step 5. If no, RT will kick you back to FILL menu. From there roll small knob to CT (**These steps apply to all Single Channel Programming IE: VHF, UHF, SATCOM VX and DATA)** Available selections for waveform are SINCGARS for FREQ HOPPING, VULOS for VHF and UHF LOS and HPW for SATCOM DATA
2	**Load COMSEC**	
	Step	**Action**
	1	Turn "DTD" on.
	2	Select "RADIO" and press enter.
	3	Select "COMSEC" and press enter.
	4	Select "LD" and press enter.
5	Select desired segment by paging up or down and press enter at desired segment.	
6	"XMIT" will show on the screen to the right of the segment.	
7	Arrow over to "QUIT" and press enter.	
8	Connect DTD to RT-1619 and arrow down.	
9	DTD will display "SENDING TEK."	
10	DTD will display "PRESS LOAD ON RT."	
11	Go to step 8 of radio setup	
	Loading COMSEC/HOPSET in the AN/PRC-152 using the DTD	
STEP	**ACTION**	
1	Set RT knobs to FP and FILL	
2	Highlight FILL, ENTER	
3	Scroll to SINCGARS, ENTER	

	Loading COMSEC/HOPSET in the AN/PRC-152 using the DTD (CONT)
4	Select DTD / KYK 20, ENTER
5	Fill port type MODE 2/3, **(AT THIS TIME, MAKE SURE CYZ 10 IS AT INCLUDE TIME YES/NO OR OPERATION WILL NOT WORK FOR UPLOADING COMSEC INTO RT)**
6	Press ENTER on RT and then press ENTER on CYZ 10. RT will automatically begin to upload Loadset
7	Once completed, ENTER classification of loadset. RT will then ask you if you want to fill another key. **(NOTE) SINCGARS time hack will be set during NET ID configuration**
8	Set RT smaller knob to CT and configure NET ID's
	Load COMSEC
STEP	ACTION
1	Turn "DTD" on.
2	Press ENT on APPL.
3	Select "RADIO" and press enter.
4	Press ENT on SEND. Then send to: RADIO.
5	Press ENT on ICOM.
6	Then follow directions on AN/CYZ-10. Do not include time from CYZ-10.
	Programming Frequency Hopping for the RT1619
STEP	ACTION
1	Programming is as follows **assuming ICOM was already loaded** into RT
2	Insure RT is on in either PT or CT. RT also has to be on FP
3	From main screen, select PROGRAM, ENTER
4	Scroll to SINCGARS CONFIG, ENTER
5	Scroll to HOPSET/LOCKOUT, ENTER
6	Select COPY HOPSETS, ENTER
7	COPY HOPSET from 01, ENT
8	COPY HOPSET to 01, ENTER. NEW HOPSET ID will show on RT. Program appropriate NET ID and hit ENTER
9	RT then goes to SINCGARS HOPSET LOCKOUT menu. Repeat all steps for additional NET ID's just remember to program NET ID's sequentially. **You can program 25 NET ID's on PRC 152**. Net ID's can be programmed in any of the available channel spaces on RT
10	Once all HOPSET COPIES and NET ID's have been programmed CLR out to main menu
11	Select PROGRAMMING MENU, ENTER
12	Select SYSTEM PRESET CONFIG, ENTER
13	Select appropriate NET for NET ID, ENTER
14	PRESET DESCRIPTION (leave as default), ENTER
15	PERSET WAVEFORM, select SINCGARS, ENTER
16	OP MODE, select FREQUENCY HOPPING, ENTER
17	PRESET NAME (type in channel name), ENTER
18	CRYPTO TEK 01, ENTER (**TEK 01 WILL WORK for all NET ID's**)

	Programming Frequency Hopping for the RT1619 (CONTINUED)
19	TX PWR LEVEL, default is HIGH, ENTER
20	TRAFFIC MODE, VOICE, ENTER
21	SELECT HOPSET COMPARTMENT (select appropriate NET ID for net being programmed), ENTER
22	SINGLE CHANNEL FREQUENCY (leave as DEFAULT), ENTER
23	SINGLE CHANNEL SQUELCH TYPE (leave as DEFAULT), ENTER
24	Repeat steps for follow on NET ID's
	Programming Frequency Hopping Time for RT1619
STEP	ACTION
1	Make sure RT is in main screen **AND ALSO MAKE SURE MAIN SCREEN IS ON ANY SINCGARS NET**
2	Enter on OPTIONS
3	Select SINCGARS OPTIONS, ENTER
4	Select SINCGARS GTOD, ENTER
5	Select USER ENTRY, ENTER
6	Input appropriate time and day, ENTER
7	CLR out to main screen

5. **RADIO EMPLOYMENT CONSIDERATIONS**.

    a. <u>HF Radios</u>. The primary advantage of HF radio is its capability to provide long-range, over the horizon (OTH) communication. Successful transmission over the HF range depend on many factors, but include equipment location, proper grounding, type of antenna used, and atmospheric conditions. To send a successful transmission over the horizon, HF radios rely on the ability for radio waves to bounce off the ground and the atmosphere. Many variables, including the weather and solar storms, can affect the quality of these transmissions.

        (1) Poor grounding is the most important cause for a weak HF signal. Communication distances can be cut in half when antennas and radios are not properly grounded. Additionally, the hazards involved with improper grounding coupled with high transmission power include burns, shocks, and death.

        (2) To properly ground a radio, the ground stake should be driven deeply into the soil, and all connections should be tight and clean. Soil moisture and salinity are critical for good grounding. It is a good practice, if operating in dry soil, to pour water around the grounding stake. Adding salt to the soil will also help with grounding.

        (3) If a regulation grounding stake is not available, field expedient grounding is an option. Useful grounds include metal posts, pipes, plumbing, and metal building frames. Ensure that the metal is not touching flammable liquids or gas, and attempt to make the grounding wire as short as possible.

        (4) It is also possible for HF radios to use field expedient antennas in order to propagate their signal. The most common of these is the horizontal half-wave dipole, which are capable of short to medium HF transmission distances (approximately 1,500 kilometers). A significant drawback to the dipole is that the antenna length can be as long as 71 meters in order to achieve the desired transmission.
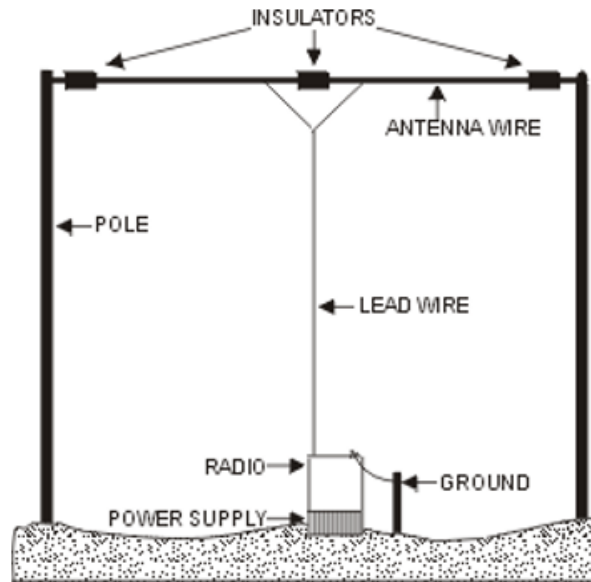
b. <u>VHF Radios</u>. The primary advantage of VHF radios is their balance between communication speed, transmission distances, portability, and interoperability. VHF radios are most commonly used for tactical communication between ground units, but can be used for communication with naval vessels if planned and configured appropriately. Factors that can affect the quality of transmission include terrain that might block the signal, vegetation, and distance between radios.

c. <u>UHF Radios</u>. Because UHF radios rely on line of sight for communication, they are most commonly employed in ground to air communication, as there is no ground and significantly less vegetation in the propagation path between transmitters and receivers. The primary limiting factor for UHF radios is range. If you physically cannot see the receiver for your radio transmissions, you are unlikely to be able to communicate with them.

6. **<u>ELECTRONIC PROTECTION TECHNIQUES</u>**.

a. Communications Security (COMSEC) is the protection resulting from measures designed to deny unauthorized persons information of value that might be derived from the possession and study of telecommunications, or to mislead unauthorized persons in the interpretation of the results of such study.

b. The goal of COMSEC and electronic protection is to protect friendly communications from enemy exploitation while ensuring that we can still use the electronic spectrum.

c. Transmission Security (TRANSEC) is a critical skill for any radio operator. Transmission times must be kept below 20 seconds. Preplan every message you send to avoid compromising essential information. Unless you are in an emergency situation where all other means of communication have failed, all transmissions should be encrypted. If using an unencrypted net, develop authentication systems to ensure you are not communicating with unauthorized persons. Use the minimum power and antenna settings to communicate with other units. Promptly report any indications of enemy jamming radio signals. Minimize the number of transmissions sent as best able. Maximize your use of communications that do not propagate in the electromagnetic spectrum, such as messengers, visual and audible sound signaling, and hard-line communications. Leave personal electronic devices behind, as these can be detected with ease, even if they are not being used. If a radio has been lost, or is known to have been captured by the enemy, assume that they are listening to your transmissions. Observe radio silence until corrective action can be taken. Never say an individual or a unit's name over the radio; always use a callsign.

7. **PHONETIC ALPHABET**. The military phonetic alphabet is used when saying individual letters, as opposed to complete words or sentences. The phonetic alphabet limits confusion that may take place if a transmission contains letters that sound similar and the transmission signal is degraded. For example, if your radio signal is not perfectly clear, a radio operator might hear "T" when the transmitted letter was "B". The operator will not be confused if he or she hears "Tango" or "Bravo". The chart that follows indicates the letter, the word that is used for that letter, and the pronunciation of that word.

Letter	Word	Pronunciation	Letter	Word	Pronunciation
A	ALPHA	AL FAH	N	NOVEMBER	NOVEMBER
B	BRAVO	BRAH VOH	O	OSCAR	OSS CAR
C	CHARLIE	CHAR LEE	P	PAPA	PAH PAH
D	DELTA	DELL TAH	Q	QUEBEC	KEH BECK
E	ECHO	ECK OH	R	ROMEO	ROW ME OH
F	FOXTROT	FOKS TROT	S	SIERRA	SEE AIR RAH
G	GOLF	GOLF	T	TANGO	TANG GO
H	HOTEL	HOH TELL	U	UNIFORM	YOU KNEE FORM
I	INDIA	IN DEE AH	V	VICTOR	VIK TAH
J	JULIET	JEW LEE ETT	W	WHISKEY	WISS KEY
K	KILO	KEY LOH	X	X-RAY	ECKS RAY
L	LIMA	LEE MAH	Y	YANKEE	YANG KEY
M	MIKE	MIKE	Z	ZULU	ZOO LOO

8. **COMMON EXPRESSIONS**. Often, radio operators will use abbreviations or shortened expressions to facilitate rapid communication. There are a variety of standard and non-standard abbreviations, and they will vary from unit to unit based on SOP. Some expressions that are common across the Marine Corps are:

    (a) "Break": Used after saying a phrase to indicate that you have unkeyed the radio, but intend to send another transmission. Note that this is different from "Break Break Break", which is used when an operator must interrupt the current conversation because there is an emergency situation to report.

    (b) "Correction": An error has been made in this transmission or a previous transmission. What comes after is the correct information.

    (c) "I read back…" or "I copy…": Used when the operator has received critical information and wishes to verify that they copied the information down correctly.

    (d) "I say again": Used when the operator is repeating information in a transmission. Note that this is critically different from "I repeat". The word "repeat" is used only when you are calling for indirect fire.

    (e) "Out": Used to indicate the transmission is complete and no response is necessary.

    (f) "Over": Used to indicate the transmission is complete and a response is necessary.

    (g) "Roger": Used to indicate that you understand the last transmission that was sent to you.

    (h) "WILCO": Used to indicate that you Will Comply with the last transmission that was sent to you.

REFERENCES:

NUMBER	TITLE	PAGE
Multi-Service TTP for Tactical Radios	MCRP 3-30B.3	Entire Manual
Grenades and Pyrotechnic Signals	TC 3.23.30	Entire TM
Techniques for Tactical Operations	ATP 6-02.53	Entire TM
AN/PRC 152 Multi-Band Hand-Held Radio Quick Reference Guide	TM 11496A-OI	Entire TM

Employ a Machine Gun

MCT0114

03/11/2020

LEARNING OBJECTIVES FOR THIS LESSON

a. **LEARNING OUTCOME(S)**.

   (1) Marine is able to operate, maintain, and select position for the M240B as well as engage targets and or direct fires in support of the commander's intent and the unit scheme of maneuver. (17)

b. **ENABLING LEARNING OBJECTIVES**.

   a. Given an SL-3 complete M240B medium machinegun, tripod, authorized cleaning gear, and lubricants, perform operator maintenance for a M240B medium machinegun to ensure the weapon and components are operational. (17a)

   b. Given an SL-3 complete medium machinegun, fire command, ammunition, while wearing a fighting load, engage targets with a M240B medium machinegun to engage target(s) in accordance with the fire command(s). (17b)

   c. Given a list of choices, identify the characteristics of a M240B Medium Machine Gun in accordance with MCTP 3-01C. (17c)

   d. Given a list of choices, identify the nomenclature of a M240B Medium Machinegun in accordance with TM 08670A/09172A-10/1B. (17d)

STUDENT INFORMATION

OVERVIEW: In this lesson, Marines will learn about the employment of the M240B Machine Gun. The outcome for the lesson is for the Marine to understand how to operate, maintain, and select position for the M240B and/or direct fires in support of the commander's intent and the unit scheme of maneuver.

CLASS PREPARATION: Read this outline prior to the start of this class. Ensure you have all materials provided for this class.

OUTLINE.

1**. Introduction**: The purpose of the Marine is able to operate, maintain, and select position for the M240B as well as engage the enemy. Here at FMCT you will do this through classes, discussions, dry fire, and live firing training.

2. **M240B Medium Machine Gun:** The M240B is an air-cooled, belt-fed, gas-operated, crew served, fully automatic weapon that fires from the open-bolt position. The M240 fall into the medium machine gun class. The weapon system, like most machine guns, requires a crew of three personnel. This consist of a gunner, assistant gunner (a-gunner), and an ammunition bearer. Generally, the M240B can be used against personnel and light materials (e.g., light-skinned vehicles) at ranges of 1500 meters or less, however the ammunition may alter this due to speed and penetration power.

3. **Characteristics and Nomenclature.**

1. **CHARACTERISTICS**.

   a. **General Characteristics.**
   b. **Equipment Data**.

      (1) Weights.

         (a) Weight of machine gun...............27 pounds.

         (b) Weight of barrel ....6.6 pounds.

         (c) Weight of spare barrel case, complete with spare

barrel and all SL-3 components......................12.9 pounds.

         (d) Weight of tripod (with T&E and pintle). 14.8 pounds.

      (2) Dimensions.

         (a) Length of machine gun ....49 inches.

         (b) Height of machine gun on tripod......17.5 inches.

      (3) Operational Data.

(a) <u>Ranges</u>.

<u>1</u>.   Maximum ....3,725 meters.

<u>2</u>.   Maximum effective area ....1,800 meters.

<u>3</u>.   Maximum effective point........800 meters

<u>4</u>.   Grazing fire ....600 meters.

<u>5</u>.   Tracer burnout (approximate). 900 meters.

(b) <u>Rates of Fire</u>. Rate of fire is the frequency at which a specific weapon can fire or launch its projectiles. It is usually measured in rounds per minute.

<u>1</u>.   <u>Sustained</u>: 100 RDS/M, 6-8 round burst (4-5 seconds between burst) -Change barrel every 10 minutes.

<u>2</u>.   <u>Rapid</u>:   200 RDS/M, 10-12 round burst (2-3 seconds between burst) – Change barrel every 2 minutes.

<u>3</u>.   <u>Cyclic</u>: 550 to 650 RDS/M continuous burst – change barrel every 1 minute.

(c) <u>Muzzle velocity</u> ....2,800 feet per second

(d) <u>Rifling</u>: 4 lands and grooves with a uniform right hand twist, one turn in 12 inches.

2. **<u>NOMENCLATURE</u>**.

The nomenclature has eight main assemblies. They are the barrel assembly, buttstock and buffer assembly, driving spring rod assembly, bolt and operating rod assembly, trigger housing assembly, cover assembly, feed tray, and receiver assembly.

a. **<u>Barrel Assembly</u>**. Houses cartridge for firing and directs projectile.

FRONT SIGHT

GAS REGULATOR   BARREL

FLASH HIDER

GAS COLLAR

GAS REGULATOR PLUG

CARRYING HANDLE

BARREL BRACKET

BARREL RELEASE
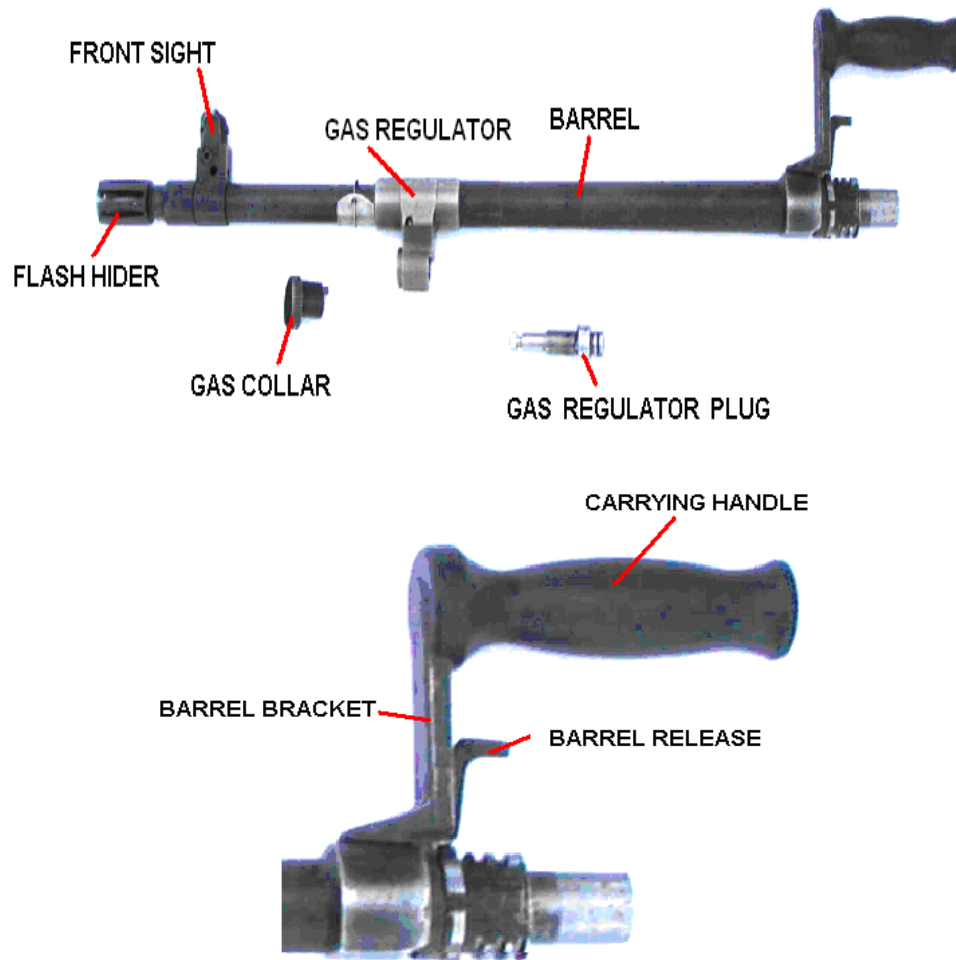
b. **Buttstock and Buffer Assembly**. Absorbs recoil for bolt and operating rod assembly at the end of recoil movement.

REAR SLING ATTACHMENT   STOCK RAILS   HYDRALIC BUFFER

BUTT PLATE

BUTTSTOCK   BUTTSTOCK LATCH
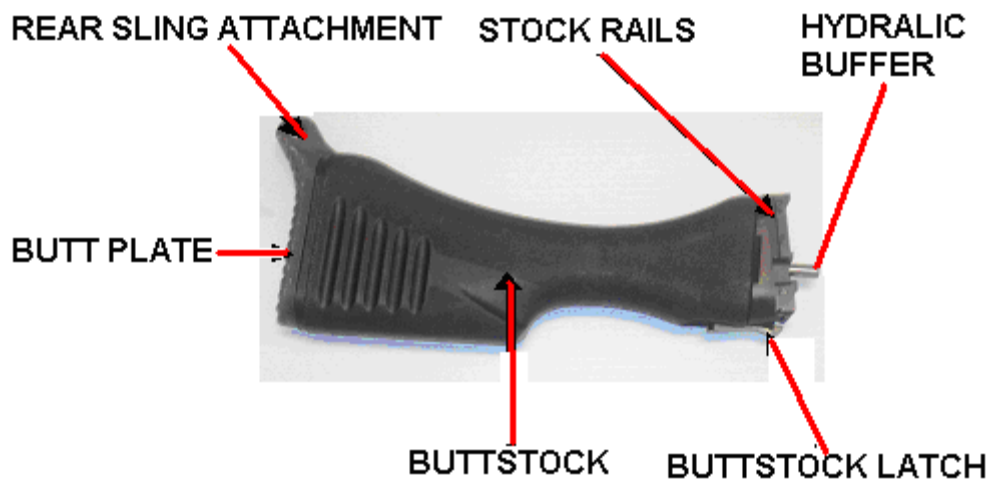
d. **Driving Spring Rod Assembly**. Provides energy for returning bolt and operating rod assembly to firing position.

DRIVING SPRING ROD ASSEMBLY
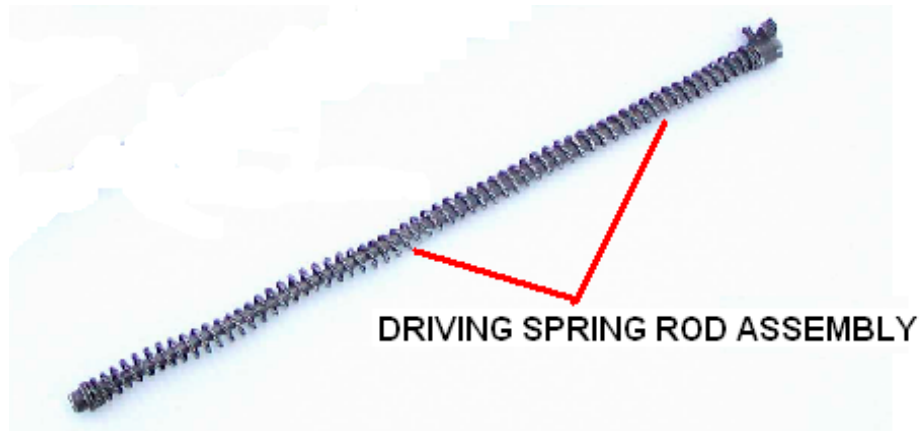
e. **Bolt and Operating Rod Assembly**. Provides feeding, chambering, firing, extraction, and ejection of cartridges using the projectile propelling gases for power.

BOLT HINGE PIN
PISTON POST
BOLT ASSEMBLY
FIRING PIN
SEAR NOTCH
PISTON EXTENSION
GAS PISTON
OPERATING ROD

LINEAR ROLLER
BOLT RAILS
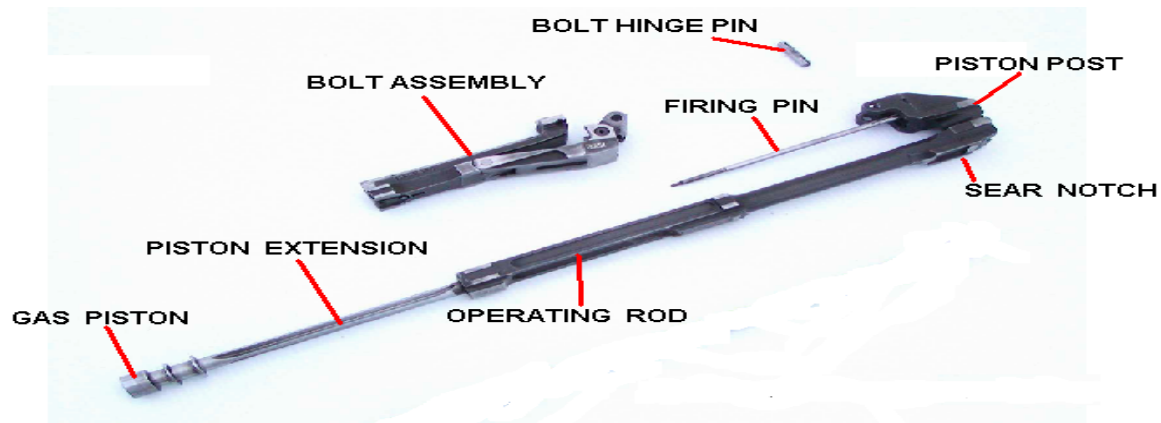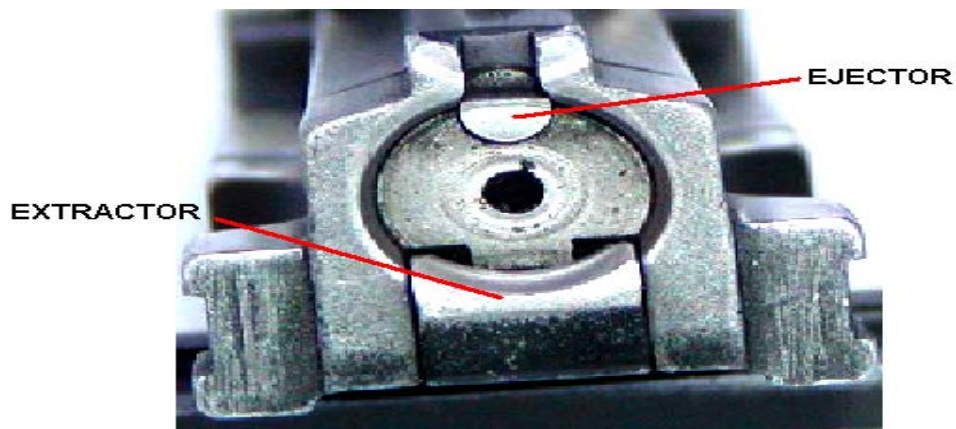
    c. **Trigger Housing Assembly**. Controls the firing of the machine gun.
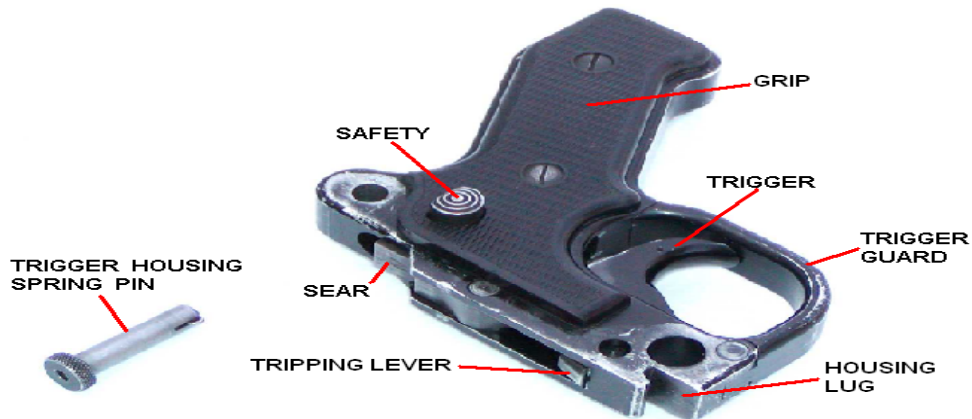
    g. **Cover Assembly**. Feeds linked belt, positions and holds cartridges in position for stripping, feeding and chambering. Cover has integral sight mounting rail for current/future accessories.
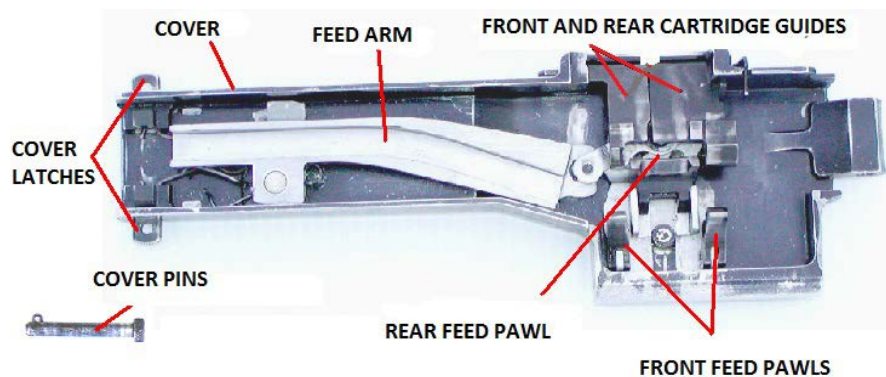
f. **Feed Tray**. Serves as a guide for positioning cartridges to assist in chambering.
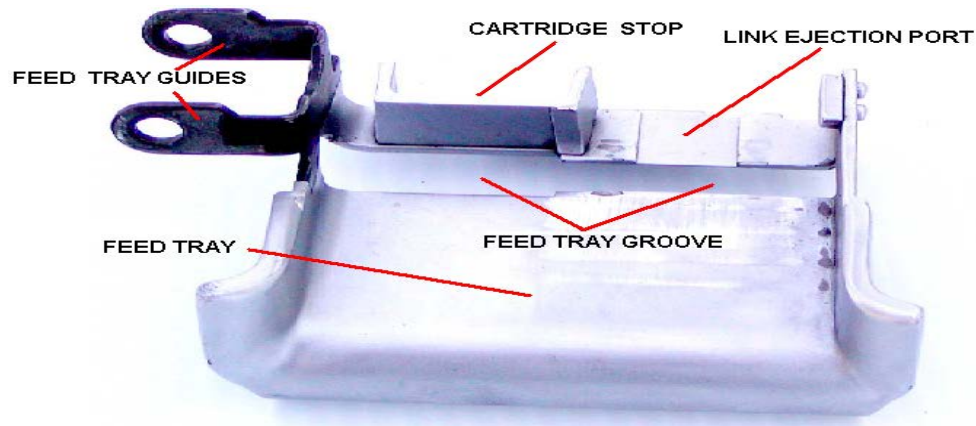
e. **Receiver Assembly**. Serves as a support of all major components. The receiver houses action of weapon, and controls functioning of weapon through a series of cam ways. Receiver has a forward integral mounting rail for current/future accessories.

REAR SIGHT ASSEMBLY

MOUNTING POINT

CHARGER SLIDE

COCKING HANDLE ASSEMBLY
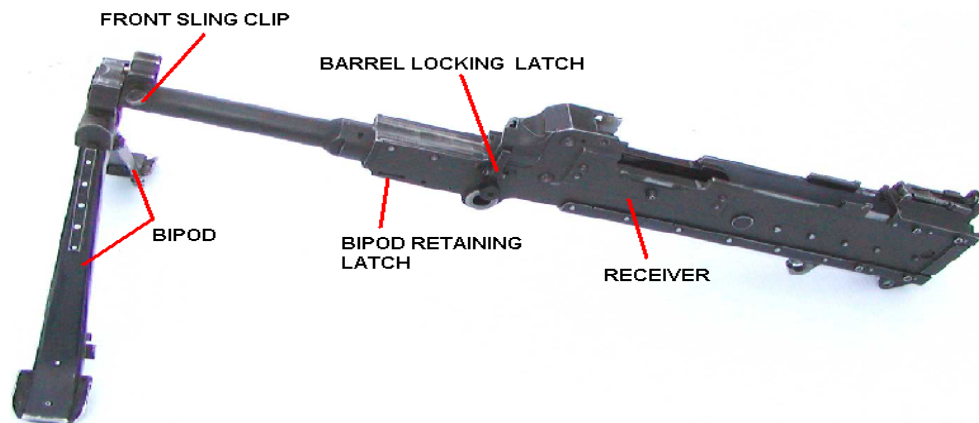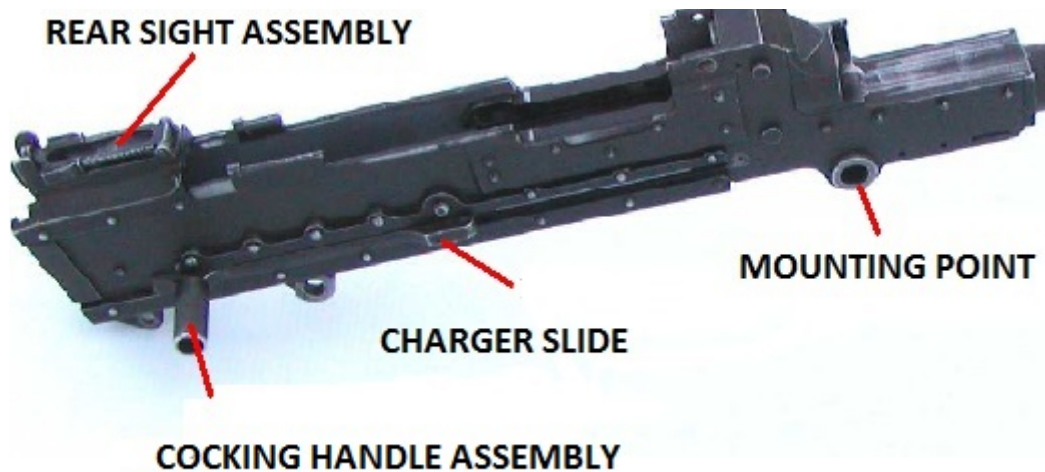
3. Cycle of Operations. The cycle starts when the first round of the belt is placed in the feed tray groove. Then the trigger is pulled, releasing the sear from the sear notch. When the trigger is pulled to the rear, the rear of the sear lowers and disengages from the sear notch. This allows the bolt and operating rod assembly to be driven forward by the expansion of the driving spring rod assembly. The cycle stops when the trigger is released and the sear again engages the sear notch on the bolt and operating rod assembly. The details of the cycle of functioning are as follows:

     a. **Feeding**. This step is completed when the round is positioned in the feed tray groove either by hand or by the action of the cover parts.

     b. **Chambering**.

          (1) This is accomplished when the bolt moves forward, strips the round from the link and pushes it forward into the chamber.

          (2) The round is forced down by the chambering ramp as the bolt travels forward.

          (3) As the round is fully chambered the extractor snaps over the base of the cartridge and the ejector is depressed.

     c. **Locking**. Actually, takes place the same time as chambering.

(1) The bolt enters the barrel socket by the swinging of the locking lever locking into the barrel socket.

(2) The bolt and the barrel do not actually lock. That is why you can remove the barrel with the bolt forward.

(3) The casing is ejected as soon as it is in line with the cartridge ejection port.

d. **Firing.** After the bolt is locked, the operating rod moves freely carrying the firing pin through the firing pin aperture, striking the primer, and firing the round.

e. **Unlocking**.

(1) Unlocking is accomplished by the action of the gas, on the gas piston, which forces the operating rod to the rear.

(2) The locking lever swings backwards unlocking the bolt.

f. **Extracting**. The extractor grips the rim of the cartridge as the bolt and operating rod pull the case from the chamber.

g. **Ejecting**. Ejecting is accomplished by the push of the ejector on the top of the casing.

h. **Cocking**. This is the process of placing the parts of the gun in position to fire the next round.

(1) Firing pin removed from the face of the bolt.

(2) Bolt has moved far enough back to pick up the next round.

(3) This completes one cycle of functioning of the machinegun. If the trigger is depressed again the cycle will begin again.

4. **WEAPONS CONDITIONS.**

a. **Condition 4**: The bolt is forward, the safety is OFF and the feed tray is clear of ammunition. The chamber is empty and the cover is closed.

b. **Condition 3**: The bolt is forward. The chamber is empty and the safety is OFF. The cover is closed. The source of ammunition is on the feed tray.

c. **Condition 2**: Does not apply to the M240B.

d. **Condition 1**: The bolt is locked to the rear. The safety is on. Rounds are positioned in the feed tray open link down first round in the feed tray groove. Cover is closed.

e. **Half-Cocking:** Although the design of the trigger group of the M240B will not normally allow the safety to be engaged with the bolt forward, some Marines bypass the weapon design by the practice of "half-cocking."

(1) "Half-cocking" is accomplished by pulling the bolt to the rear just far enough to engage the safety, then returning the bolt partially forward. Half-cocking is an inherently dangerous practice because Half-cocking places the weapon into a mechanically unstable safe Position. The weapon really isn't "safe."

(2) MARADMIN 173/01 states that when the M249 LMG or M240B machine gun is "half-cocked," a jammed condition may occur where the operating rod is wedged against the sear causing the operating rod to remain forward.

(a) If the bolt is pulled to the rear while the safety is engaged, the safety will prevent the bolt from being locked to the rear.

(b) If the machine gunner inadvertently lets the cocking handle slip forward again, the operating rod can be jarred loose from its jammed position. The drive spring has enough tension to send the operating group forward to feed, chamber, and fire the next round resulting in a negligent discharge.

(c) As the sear remains blocked in the "up" position, a runaway gun is likely.

(d) Additionally, the practice of "half-Cocking" can potentially cause damage to the operating rod, sear, safety, trigger frame mounting pin, and trigger frame.

CORRECT

Roller

Guide
Post

INCORRECT

Roller

Guide
Post
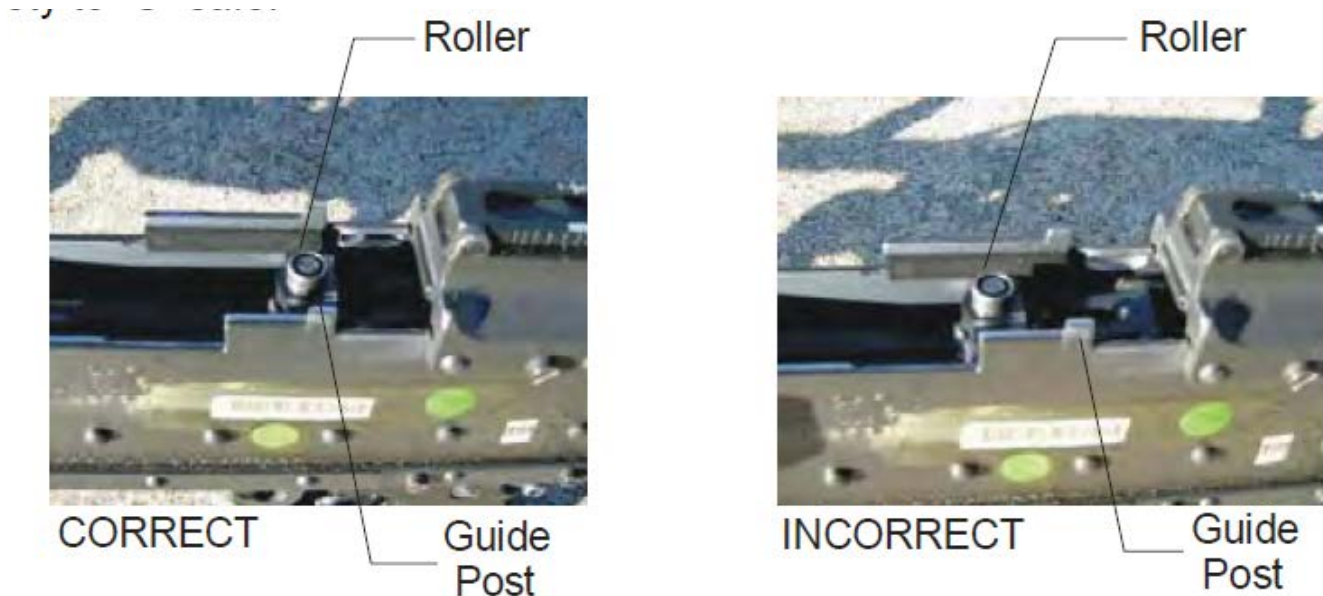
5. **CLEANING AND LUBRICATING MATERIALS.**

   a. **Authorized Cleaning Materials**. The only authorized cleaning materials for use at the unit level are CLP, RBC, dry cleaning solvent, and hot soapy water. Use CLP or bore cleaner for daily maintenance and to remove minor carbon buildup after firing. Dry cleaning solvent will dry out the metal and it is recommended for cleaning during change from one lubricant to another.

   b. **Authorized Lubricants**. The lubricants authorized for field use on the M240B are CLP, LSA, LSA-T, and LAW. They are used to lubricate certain operating parts before, during, and after firing. Each type is best used in specific climatic and environmental conditions. Do not mix lubricants on the same weapon. The weapon must be thoroughly cleaned during change from one lubricant to another.

      (1) Between 10 degrees F (-12 degrees C) and -10 degrees F (-23 degrees C) use CLP, LSA, LSA-T, or LAW.

      (2) Below -10 degrees F (-23 degrees C) use only LAW.

   c. **Climatic Considerations**. Under unusual conditions, clean and lubricate the machinegun more often.

      (1) Hot, Dusty, And Sandy Areas. Clean often. Wipe oil from exposed surfaces with clean wiping rag. Cover weapon as

much as possible to keep dust and sand out of parts.

        (2) <u>Hot, Wet Climate</u>. Inspect often. Dry, clean and lubricate lightly as necessary.

        (3) <u>Extreme Cold Climate</u>. Keep free of moisture. Lightly oil with LAW.

        (4) <u>After Exposure to Water</u>. Disassemble, clean, oil and reassemble as soon as possible. Make sure the weapon is dry.

6. **<u>OPERATOR MAINTENANCE OF SL3 COMPONENTS</u>.**

    a. **<u>M122A1 Tripod</u>**. The M122A1 tripod mount consists of the tripod assembly, T&E mechanism and pintle assembly. The tripod assembly provides a stable and relatively lightweight base that is far superior to the bipod. The tripod may be extended and collapsed easily.

        (1) It consists of a tripod head, one front and two rear legs, and a traversing bar. The traversing bar connects the two rear legs. It is hinged on one side with a sleeve and on the other side with a sleeve latch. This allows the tripod to collapse to a closed position for carrying or storage or to lock in an open extended position for use. The traversing bar also supports the T&E mechanism. Engraved on the bar is a scale that measures direction in mils. It is graduated in 5-mil increments. It is numbered every 100 mils from 0 in the center to 450 mils (26 degrees) on the left side and 425 mils (24 degrees) on the right side. 6400 mils (360 degrees) of traverse are possible when employing the free gun technique.
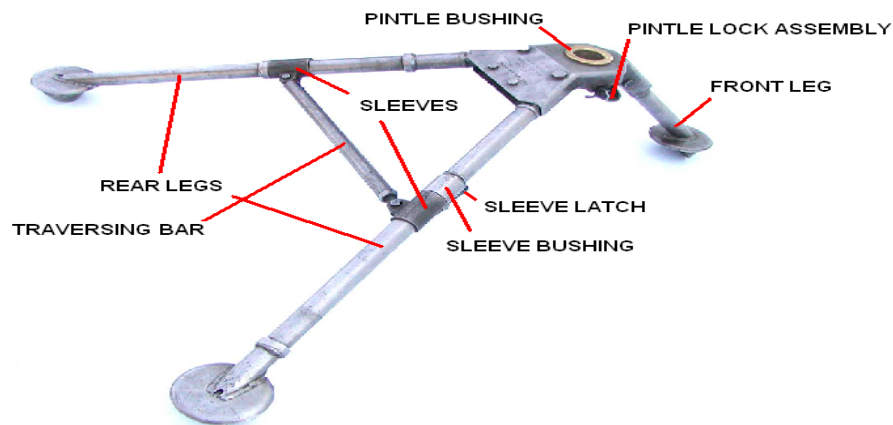
(2) The pintle should fit snugly in the pintle bushing, and the pintle lock should hold the pintle securely.

(3) The sleeve latch should function properly, and the traversing bar should be tight when the tripod legs are extended and latched.

   b.   **Traversing and Elevating Mechanism**.   The purpose of the T&E mechanism is to provide controlled manipulation and the ability to engage predetermined targets.

(1) The traversing portion of the mechanism consists of the traversing hand wheel, traversing screw, offset head, and traversing slide with lock lever.

(2) The traversing screw has 100 mils of traverse. One click on the traversing handwheel indicates a 1 mil change in direction of the barrel.

(3) The elevating portion of the mechanism consists of the upper elevating screw with scale, elevating hand wheel, and lower elevating screw.

(4) The scale on the upper elevating screw is graduated in 50-mil increments from 0 to +200 and 0 to -200, for a total of 447 mils of elevation change.

(5) The elevating hand wheel also has a scale. It is marked in 1 mil increments from 0 to 50. One click on the elevating hand wheel indicates a 1 mil change in elevation of the barrel.

(6) The traversing and elevating mechanism should not bind.

(7) The numbers on the scales and dials must be legible.

(8) Distinct clicks must be heard when the handwheels are turned.

(9) Index lines should be calibrated with the stationary indicator.

OFFSET HEAD
TRAVERSING HANDWHEEL
TRAVERSING SCREW
STATIONARY INDICATOR
UPPER ELEVATING SCREW
ELEVATING HANDWHEEL
LOWER ELEVATING SCREW
ELEVATING MECHANISM SLEEVE
TRAVERSING SLIDE LOCK LEVER
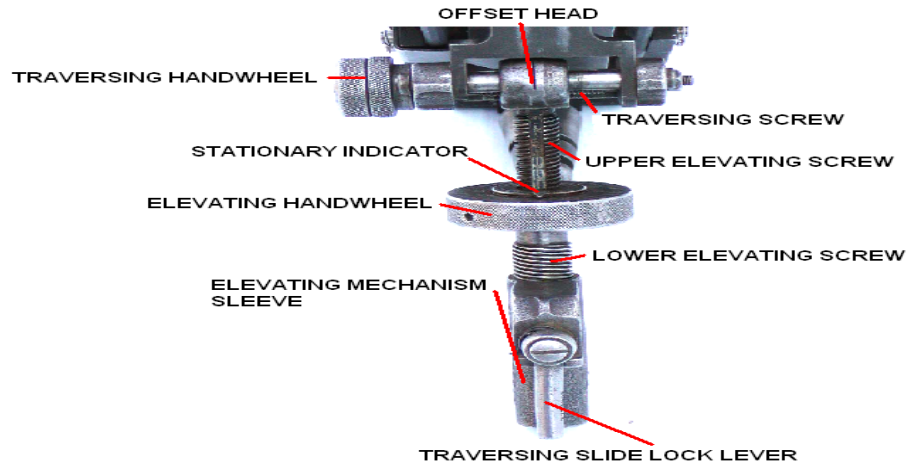
c. **Cleaning Gear**.

(1) Cleaning Rods. Cleaning rods allow the operator to clean the bore, chamber, and gas cylinder of the M240B. A set of five cleaning rods is sufficient to run the entire length of the bore. Various brushes and a swab holder are attached to the end of the last cleaning rod by screwing them into position.
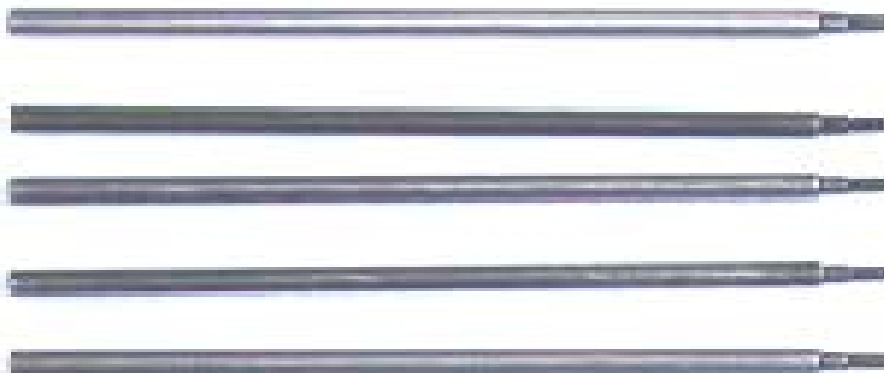
(2) Cleaning Rod Handle. The cleaning rod handle allows the operator to maintain a better grip on the connected cleaning rods.

(3) <u>Swab holder</u>. The swab holder connects to the end of a cleaning rod and is used to hold small arms cleaning patches. The patch is inserted through a slit in the middle of the swab holder, which is then ran through the bore to remove dirt, carbon, and excess CLP.
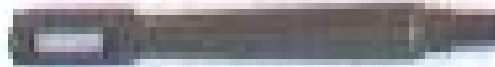
(4) <u>Chamber brush</u>. The chamber brush enables the operator to clean the chamber of the M240B.

(5) <u>Bore brush</u>. The bore brush is attached to the end of a set of erected cleaning rods and ran through the bore of the barrel in order to remove dirt and carbon.

(6) <u>Gas Cylinder Brush</u>. The gas cylinder brush is used to clean carbon out of the gas cylinder. It attaches to cleaning rods similarly to a bore brush.

(7) <u>Combination Tool Scraper and Extractor</u>. The combination tool is used to clean the gas piston. Ordnance personnel use the combination tool to remove the ejector and extractor.

        (8) <u>Scraper.</u> The scraper tool is the primary tool used to clean the gas regulator plug.

        (9) <u>Reamer</u>.   The reamer cleans the small holes in the gas plug and the gas regulator.

        (10) <u>Receiver brush</u>.   The receiver brush allows the operator to clean hard to reach spots in the receiver.

(11) <u>Ruptured Cartridge Extractor.</u> Used to remove ruptured cartridge.

(12) <u>Combination Front Sight adjusting tool with 5/32 hex wrench.</u> Used to adjust windage and elevation of front sight.

7. **<u>DISASSEMBLY OF THE M240B</u>**.

   a. **<u>Clearing the M240B</u>.** Be sure to clear weapon before disassembling, inspecting, transporting, or storing. **Detailed disassembly of main groups is only authorized.**

   (1) Place weapon on FIRE "F".

   (2) Pull cocking handle assembly to rear in order to lock the bolt to the rear. Hold the cocking handle to the rear.

   (3) Place weapon on SAFE "S".

(4) Push in cover latches to open the cover assembly.

(5) Remove ammunition belt (if present).

(6) Raise feed tray.

(7) Look into the chamber to ensure it is empty. If a round is present in the chamber, refer to ruptured cartridge/stuck cartridge case or live round procedures.

(8) Place weapon on FIRE "F".

(9) Holding the cocking handle assembly to the rear, depress trigger, and ease the bolt forward to the closed and locked position.

(10) Close cover assembly. Make sure it locks shut. Be sure the bolt is forward with the safety in "F" position when the gun is not in use.

b. **Remove the Barrel Assembly**.

STUDENT NOTE
Do not interchange barrel assembly or bolt assembly from one machine gun to another without being head spaced/gauged. Doing so may result in injury to, or death of, personnel.

(1) Close the cover assembly.

(2) Depress the barrel locking latch and hold.

(3) Turn the carrying handle to upright position.

(4) Remove the barrel and pull straight out.

c. **Remove the Trigger Housing Assembly**.

(1) Depress the spring and remove trigger housing spring pin.

(2) Pull trigger housing assembly down and back to remove.

d. **Remove the Butt Stock and Buffer Assembly**.

(1) Depress butt stock latch and lift the butt stock and buffer assembly to remove.

e. **Remove the Driving Spring**.

(1) Press the drive spring in and up, and then pull it out.

f. **Remove the Operating Rod Assembly**.

(1) Depress cover latches and raise cover assembly.

(2) Pull cocking handle assembly to the rear and remove the bolt and operating rod assembly.

g. **Remove the Gas Regulator Plug**.

(1) Rotate the collar until it releases, then pull it out.

(2) Pull the gas plug from gas regulator.

8. **MAINTENANCE OF THE M240B**.

a. **Operational Maintenance Checks and Services**.

(1) Before Firing Checks. Inspect for cleanliness, proper mechanical condition, and missing or broken parts. Remove excess oil from the bore, chamber, barrel socket, and face of the bolt. Lubricate the gun by placing a light coat of CLP on the following parts:

(a) Operating Group. Apply CLP on those recesses along the side that make contact with the receiver rails.

(b) Bolt. A very small amount of CLP should be placed on the spring pin, the roller, and other moving parts.

(c) Receiver. With the bolt to the rear, apply a line of CLP on either side of the bolt. Manually pull the bolt back and forth, so that CLP is spread over the bolt and receiver rails. Headspace should also be checked before firing. To do this, rotate the barrel-changing handle and count the number of

clicks heard. There must be a minimum of two clicks, but not more than seven. If this is not the case, the weapon should not be fired. It should be turned in for higher echelon maintenance/inspection.

(2) <u>During Firing Checks</u>. During firing, maintain a light coat of CLP on the parts listed in before firing, and ensure that the gas system's connections remain tight. Change barrels when necessary.

(3) <u>After Firing Checks</u>. After firing, clean the gun with CLP, RBC, or dry-cleaning solvent. Even the most careful initial cleaning will not remove all carbon deposits; therefore, it is necessary to clean the gun for 3 consecutive days after firing. After cleaning each day, wipe off all cleaning materials and place a light coat of CLP on all metal parts. If the gun is fired daily, remember that repeated detailed disassembly will cause unnecessary wear. Adequate cleaning can be performed on a gun that has been disassembled into its five main groups. It is essential to perform detailed disassembly only after prolonged firing. Ensure that cleaning materials such as CLP and RBC are not used on the nonmetallic portions of the gun, such as the buttstock. Hot water, rags, and nonabrasive brushes can be used to remove dirt from the nonmetallic portions of the gun.

b. **Clean the Gas Regulator Plug**.

(1) Remove the cover from the scraper tool.

(2) Insert the scraper into the center hole of the plug. Twist the scraper back and forth to remove carbon from the center hole.

(3) Fold the scraper and press the point into the groove. Twist the scraper back and forth to remove carbon from the groove on the plug.

(4) Pivot the scraper blade and place the tip of the scraper into the groove of the plug and twist back and forth to remove carbon from the groove on the plug.

(5) Utilizing the tip of the scraper, scrape carbon from the surfaces of the plug.

(6) Utilizing the small reamer, insert reamer into each gas inlet hole of the plug, twisting the reamer as it is lowered into the holes to remove carbon buildup from the holes.

c. **Clean and Inspect the Barrel**.

(1) Utilizing the large reamer, insert reamer through hole into the gas port hole in the barrel, twisting reamer as it is lowered into the hole to remove the carbon buildup from the hole.

(2) Utilizing a cleaning rod and swab dampened with RBC, remove dirt and corrosion from the bore.

(3) Remove dirt and corrosion from other parts using a wiping rag dampened with CLP or RBC.

(4) Inspect for cracks, dents, burrs, or other damage on flash hider, barrel adapter, and carrying handle.

d. **Clean and Inspect the Receiver**.

(1) Lightly oil parts with CLP, LAW, or LSA in accordance with climatic considerations.

(2) Check the cover assembly for smooth operation, spring tension, bent parts, or excessive wear.

(3) Check the cocking handle for bends and cracks, free movement, excessive wear, burrs, or chipped rails.

(4) Check the barrel locking latch and cover detent for proper tension.

(5) Insert the combination tool carefully into the fore end of the gas cylinder of the receiver body.

(6) Ensure the combination tool shoulder is fully inserted and seated against the fore end of the gas cylinder in receiver body.

(7) Apply slight pressure to the handles and twist back and forth to remove carbon.

(8) Clean the gas cylinder bore with the gas cylinder cleaning brush dampened with CLP or RBC.

(9) Utilizing a wiping rag dampened with CLP or RBC, remove dirt and corrosion from the area under the front access cover of the receiver and all other parts.

e. **Clean and Inspect the Trigger Housing Assembly**.

(1) Inspect the trigger assembly for broken grips, bent, cracked, or broken trigger actuating assembly, loose nut or bolt, and chipped or cracked trigger housing holding lug.

(2) Check the tripping lever and sear for burrs, cracks, chips, and wear.

(3) Check the cocking action by pushing back on the tripping lever, and sear will rise. Pull the trigger and the sear will lower.

(4) Check safety functions. When safety is placed to "S," pull the trigger and the sear will not lower. When safety is placed to "F," pull the trigger and the sear will lower.

(5) Lightly lubricate the tripping lever and sear surfaces.

f. **Clean and Inspect the Operating Rod**.

(1) Utilizing the combination tool, insert into the bottom of the cavity of the piston end of the operating rod. Squeeze handles firmly and twist the combination tool back and forth to remove carbon.

(2) Insert the screwdriver end of the combination tool into the cavity of the piston end of the operating rod to remove carbon residue in the bottom cavity.

(3) Clean all other areas of the operating rod, firing pin, and spring pin with wiping rag dampened with CLP or RBC. Lightly oil the operating rod with CLP after cleaning.

(4) Check the bolt and operating rod assembly for burrs, cracks, broken pins, or frozen roller.

(5) Push down on the roller to ensure it retracts.

(6) Check the driving spring for broken strands.

9.   **ASSEMBLY OF THE M240B.**

     a.   **Replace the Gas Regulator Plug**.

          (1) Place the plug with the gas inlet setting number 1
hole facing the barrel.

          (2) Install collar on the plug and rotate until collar
slips onto the plug. Press and rotate to lock in place.

     b.   **Replace the Bolt and Operating Rod Assembly**.

          (1) Set the bolt and operating rod assembly on top of
the rails.

          (2) Extend the bolt to the unlocked position and push
the assembly all the way in the receiver.

          (3) Close the cover assembly and lock.

     c.   **Replace the Driving Spring**.

           (1) Insert the driving spring into the operating rod
assembly.

          (2) Push the driving spring in fully and lower it to
seat the stud in the hole of the receiver.

     d.   **Replace the Buttstock and Buffer Assembly**.

          (1) Install the butt stock and buffer assembly ensuring
it locks.

     e.   **Replace the Trigger Housing Assembly**.

          (1) Position the trigger housing into place and insert
the trigger housing spring pin.

     f.   **Replace the Barrel Assembly**.

           (1) Insert the barrel fully into the socket and push
the carrying handle to the right as far as it will go to lock
while counting the clicks. There should be between 2 to 7
clicks.

g. **Performing A Function Check.**

    (1) Place weapon on fire "F."

    (2) Pull the cocking handle to rear to lock the bolt back. (Hold the cocking lever to the rear)

    (3) Place the weapon on safe "S."

    (4) Depress the trigger – nothing should happen.

    (5) Place the weapon on fire to "F."

    (6) Hold the cocking handle assembly to the rear.

    (7) Depress the trigger and ease the bolt forward to close and lock.

10. **Ammunition of the M240B**. Ammunition is issued in a disintegrating metallic split linked belt. The members of machine gun teams must be able to recognize the types of ammunition and know how to care for them.

    a. **Components of A Cartridge**.

    (1) Projectile. This is the part of the round that travels down range.

    (2) Cartridge Case. Houses the propellant and the projectile.

    (3) Propellant. The powder, when ignited by the primer, that sends the projectile down range.

    (4) Primer. The device that ignites the propellant.

    b. **Types of Ammunition**.

    (1) Ball Cartridge. Used against targets of light material, personnel, and during marksmanship training.

    (2) Tracer Cartridge. Used for observation of fire, incendiary effect, signaling, and marking targets.

    (3) Blank Cartridge. Used during training when simulated fire is desired.

(4) <u>Dummy Cartridge</u>. Used during training, such as gun a drill. It is completely inert but simulates service ammunition for practice in loading the gun.

(5) <u>Armor Piercing Cartridge</u>. Used against light armored targets.

(6) <u>Blue Practice.</u> Used in local and urban training areas where range restrictions preclude the use of full range standard service ammunition.

(7) <u>Blue Practice Tracer</u>. Used for observation of fire in situations where range restrictions prevent the use of full range standard service ammunition.

c. **<u>Identification</u>.** The type, caliber, model, and ammunition lot number, including the symbol of the manufacturer, are necessary for complete identification of small arms ammunition. The 7.62mm NATO cartridge is completely identifiable by its appearance; the painting of the bullet tip, the manufacturer's initial and year of manufacture on the base of the cartridge case, and the markings on the packing containers. When removed from their original packing containers, the cartridges may be identified by the following physical characteristics:

(1) <u>Ball (M80)</u>. Plain bullet tip.
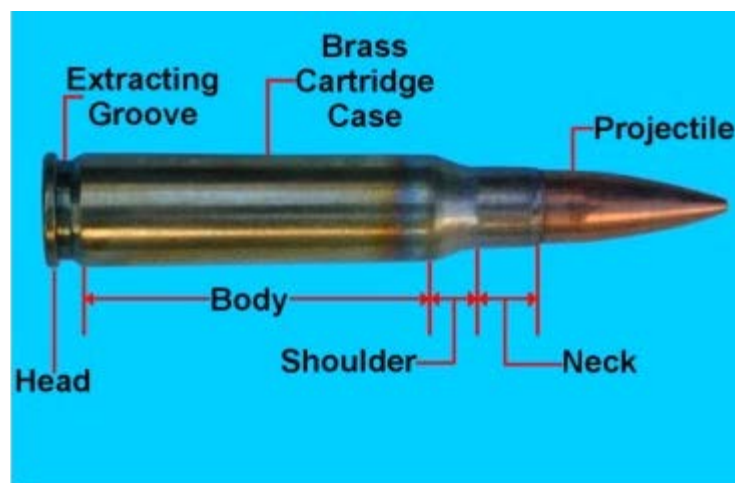
**Cartridge, 7.62mm Ball M80
(DODIC A131)**

(2) <u>Tracer (M62)</u>. Tip of bullet is painted orange or red.
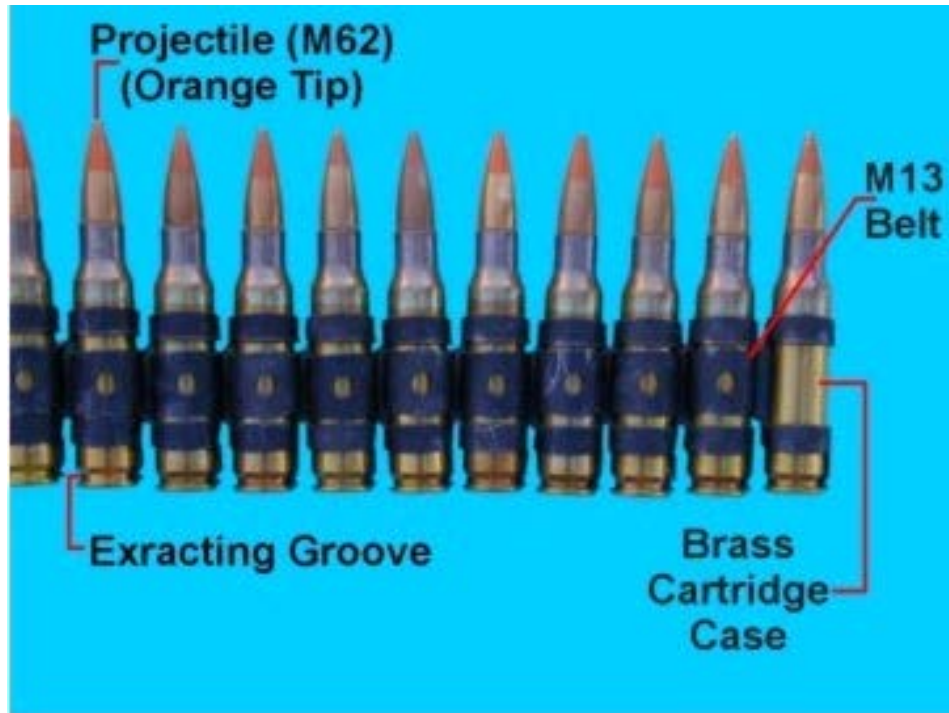
(2) <u>Armor- Piercing (M61)</u>. Identified by a Black Tip.
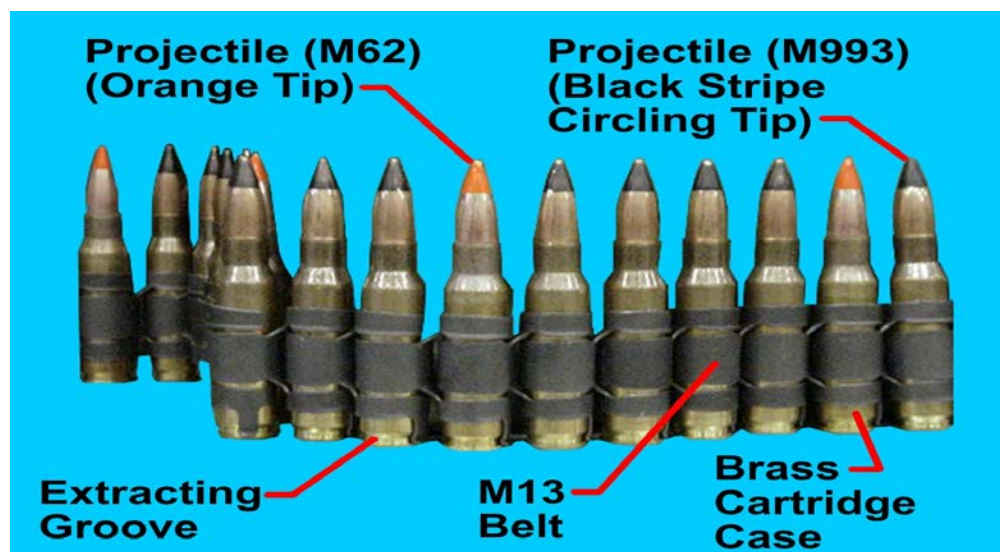
(4) Blank (M82). The case is shaped approximately to
the configuration of the combat cartridge with no bullet. The
propellant is held in the case by a wad, and on newer lots the
mouth is sealed with purple lacquer and crimped for protection
against air and moisture.

Cartridge, 7.62mm Blank M82 Linked
(DODIC A111)

(5) Dummy (M63A1). Six longitudinal corrugations
(flutings) on the cartridge. Also, there is no primer or vent
hole in the primer pocket.
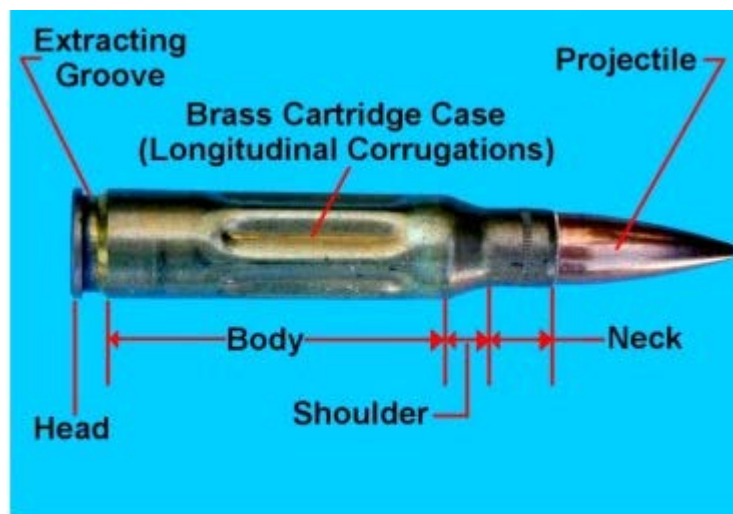
Cartridge, 7.62mm Dummy M63
(DODIC A135)

d. **Ammunition Packaging**. Ammunition is packaged in a metal box containing two bandoleers. Each box weighs approximately 16 pounds. Each bandoleer contains 100 linked rounds and weighs approximately 7 pounds. The bandoleer is made up of a cardboard carton held inside a cloth bag with a carrying strap. Ammunition in the bandoleers may be hooked together and fired from the metal containers, or the bandoleers may be removed for firing.

e. **Storage**. Store ammunition of all classes away from heat sources, such as open flame, radiators, heaters, and hot water pipes. Ammunition should be stored under cover. If it is necessary to leave ammunition in the open, keep it at least 6 inches from the ground and covered with a double thickness of tarpaulin. Place the tarpaulin so it gives maximum protection and allows free circulation of air. Dig suitable trenches to prevent water from flowing under the ammunition pile.

f. **Care, Handling, And Preservation of Ammunition**. Ammunition containers should not be opened until the ammunition is to be used. Ammunition removed from the airtight containers, particularly in damp climates, is likely to corrode. Protect ammunition from mud, dirt, and water. If the ammunition gets wet or dirty, wipe it off prior to use. Wipe off light corrosion as soon as it is discovered. Heavily corroded cartridges should be replaced. Use caution during firing to ensure that ammunition is kept out of the dirt. Dirt picked up during firing will act as an abrasive in the chamber and could cause a malfunction that can result in injury to personnel and/or damage to equipment.

(1) DO NOT expose ammunition to direct rays of the sun. If the powder is hot, excessive pressure may be developed when the gun is fired.

(2) DO NOT oil or grease ammunition. Dust and other abrasives will collect on it and could damage the operating parts of the gun.

(3) DO NOT fire dented cartridges, cartridges with loose projectiles, or other defective rounds.

(4) DO NOT fire over friendly troops any ammunition graded and marked FOR TRAINING USE ONLY.

(a) Only specially approved lots of ammunition can be used for overhead fire. The packaging of this ammunition is clearly stamped FOR OVERHEAD FIRE.

(5) DO NOT fire ammunition (other than blank ammunition) until it has been positively identified by ammunition and grade.

11. **Operating the M240B**.

   a. **Position and Grip**.

(1) <u>Gunner</u>. The gunner is in a prone position to the *rear of the gun with his right shoulder against the butt stock* group. A straight line extending through the barrel and receiver passes through his right shoulder and hip. His legs are comfortably spread, and his heels are down (if possible). The gunner's left hand grasps the elevating hand wheel, palm down. His right hand is on the grip with his index finger on the trigger. The gunner exerts a firm pressure to the rear with both hands while aiming and firing. His cheek rests against the cover. Breath control is practiced during aiming and firing.

(2) <u>Team Leader</u>. The team leader assumes a prone position on his left side to the left of the gun. His head and eyes are even with the feed way. He loads, unloads, and changes barrels from this position.

   b. **Position and Grip- Bipod.**

(1) <u>Gunner.</u> Assume a prone position behind the gun with the right shoulder into the weapon. The right hand grasps the pistol grip and manipulates the trigger. Place the left hand on the bottom of the stock, palm up, with the cheek resting lightly against the comb of the stock. Both hands exert a firm, steady pressure to the rear during aiming and firing.

(2) <u>Team Leader.</u> The team leader assumes a prone position on his left side to the left of the gun. His head and eyes are even with the feed way. He loads, unloads, and changes barrels from this position.

   c. **Operation of The Safety**. When the safety is placed in the FIRE "f" position, the cutaway portion of the safety bar is aligned with the safety lug on the sear. This allows the sear to move downward when the trigger is pulled.

12. **Tripod mounting procedures.**

    a. Inspect the M240B medium machinegun and associated components for serviceability.

    b. Emplace the tripod in the desired location.

    c. Attach the M240B medium machinegun receiver to the tripod.

        (1) Attach the pintle to M240B medium machinegun.

        (2) Attach the pintle-to-pintle bushing.

        d. Attach the appropriate associated components.

        (1) Center the T&E.

        (2) Attach the T&E to M240B medium machinegun.

        (3) Attach the T&E to MK125 tripod.

        (4) Center the traversing slide locking lever on traversing bar.

        (5) Secure the traversing slide locking lever on direction of zero.

13. **Loading and unloading the M240B.**

    a. **Loading Cover Raised.**

        (1) Pull cocking handle assembly to rear and ensure bolt locks to rear. Maintain positive control of the cocking lever.

        (2) Place weapon on SAFE "S."

        (3) Open the cover assembly.

        (4) Swipe and raise feed tray. Look into chamber, make sure no round is chambered and area is free of obstructions. Lower feed tray.

        (5) Place weapon on FIRE "F". and ride bolt forward.

        (6) Place first round against cartridge stop, links facing up and close cover (Condition 3).

(7) Pull cocking handle assembly to the rear and place weapon on "S" safe. Return the cocking handle assembly forward (Condition 1).

b. **Loading Cover Closed**.

(1) Place link belt into the feed tray with the open side of the links down.

(2) Ensure the first round of the belt is engaged by the belt feed pawl (2 clicks) and held in place to make a condition 3 weapon.

(3) Pull the bolt to the rear position.

(4) Place the weapon on SAFE "S".

(5) Return the cocking handle assembly to the forward position (Condition 1).

c. **Unloading**.

(1) Place weapon on FIRE "F".

(2) Pull cocking handle assembly to rear in order to lock the bolt to the rear (if not already to the rear). Hold the cocking handle assembly to the rear.

(3) Place weapon on SAFE "S".

(4) Push in latches to open the cover assembly.

(5) Remove ammunition belt, or link if present.

(6) Raise feed tray.

(7) Look into the chamber to ensure it is empty. If a round is present in the chamber, refer to ruptured cartridge/stuck cartridge case or live round procedures.

(8) Lower the feed tray.

(9) Place the weapon on FIRE "F".

(10) Holding the cocking handle assembly to the rear, depress trigger, and ease the bolt forward to close and lock.

(11) Close cover assembly. Make sure it locks. Be sure the bolt is forward with the weapon on FIRE "F" position when the gun is not in use.

13. **Firing the M240B**.

a. **Trigger Manipulation**. The trigger is not squeezed as with other small arms; it is pulled to the rear and then released. This enables the gunner to control the number of rounds in each burst and prevents excessive wear to the sear and sear notch. Bursts of less than six rounds should not be fired.

b. **Firing from The Bipod**. When firing from the bipod, the rear sight is raised to the range to the target. Unlike the tripod, the bipod mount is relatively unstable (elbows and upper torso may move). A good sight picture must be regained before firing each burst.

(1) Changing Direction. To manipulate the gun for minor changes in direction (moving the muzzle to the right or left), shift the shoulders and upper torso slightly. The weapon's bipod is mounted on a ball joint, allowing relatively easy minor changes in direction through approximately 45 degrees. To make a major change in direction, the entire body must be moved until it is realigned directly behind the weapon. Thus, rapid, major changes in direction are difficult with the bipod.

(2) Changing Elevation. To manipulate the gun in elevation (moving the muzzle up or down), move the elbows closer together or farther apart.

c. **Firing from The Tripod**. When firing from the tripod, the rear sight is lowered. Assume a prone position behind the gun with the right shoulder into the weapon. Manipulate the trigger with the right hand and the T&E with the left. Exert a steady rearward pressure during firing with both hands (left hand on the elevating handwheel, palm down).

(1) Firing. Point the muzzle of the gun in the general direction of the target by releasing the slide lock lever and pulling the T&E along the traversing bar. Secure the slide lock lever and raise the rear sight. Place the estimated range on the rear sight and manipulate the gun until there is a good sight picture. The assistant gunner then lowers the rear sight and begins firing. Unlike the bipod, the MK125 tripod provides a stable base and controlled manipulation, making the use of the

sight not only redundant, but it also blocks the gunner's view of the target and impacting rounds.

   (2) <u>Manipulation</u>. All manipulation is accomplished by turning the two handwheels with the left hand. If both direction and elevation changes are required to engage a target, manipulate direction is first, then elevation. To traverse, place the left hand on the traversing handwheel, thumb on top. To move the muzzle to the right, the gunner pushes away with the thumb: PUSH RIGHT. To move the muzzle to the left, the gunner pulls to the rear with the thumb: PULL LEFT. To search, rest the left hand on the elevating handwheel. To move the muzzle up, the gunner pushes away with the thumb: PUSH UP. To move the muzzle down, the gunner pulls to the rear with the thumb: PULL DOWN.

   d. **Changing Barrels**. The ability to change the barrels of the M240B quickly provides a great advantage. It allows one barrel to be used while the other is cooling. This increases the life of each barrel and ensures a continuous rapid rate of accurate fire. Barrels should be changed when they are beginning to overheat. Changing a barrel only takes a few seconds and significantly improves the rate of fire and accuracy. As a guide, a barrel change is required after firing the sustained rate for 10 minutes and after firing the rapid rate for 2 minutes. The procedures outlined below are for a tripod-mounted gun; they are very similar to those for a bipod-mounted gun`. The barrel can be changed with the bolt forward or to the rear. If the Bolt is to the rear and there is ammunition on the feed tray, ensure the Gunner has positive control and the weapon is on (S) Safe. The gunner depresses the barrel locking latch with his left hand and keeps his hand at that position. The team leader grasps the barrel by the changing handle, rotates it to its upright position, pushes forward and pulls up, separating the barrel from the receiver. He then grasps the spare barrel by the carrying handle, inserts the barrel socket into the receiver, aligns the gas plug with the gas cylinder, and pulls to the rear until the barrel is fully seated. Once the barrel is fully seated, the team leader lowers the barrel carrying handle, counting the clicks (minimum two, maximum seven) to ensure proper headspace.

14. **Zeroing Procedures**.

   a. **Sight Setting**. All adjustments (windage and elevation) are made to the front sight assembly. The advantage of this system is that it allows each spare barrel to be individually

zeroed to the machine gun and then locked down with the
adjustment tools. This avoids accidental loss of zero through
inadvertent manipulation during cleaning or inspections.

   b. **Adjusting for Elevation BZO**. For the initial firing
groups, do not unlock or change the elevation setting of the
front sight post.

      (1) Set the rear sight elevation at 500 meters.

      (2) With a target at 12.7 meters, first correctly align
the sights, then hold a tight/well-supported point of aim, point
of impact sight picture and fire three rounds, one round at a
time, taking time to realign the sight picture between shots.

      (3) If the shot group is above or below the aim point,
the front sight needs adjustment.

      (4) The combination tool is used to unlock the front
sight retaining strap. Unlock the retaining strap and rotate it
upward. The front sight post is now free to rotate.

      (5) Apply two to three drops of lubricant (CLP, LSA, or
LSA-T) around the base of the front sight to lubricate the
threaded shaft of the front sight post. This will make it
easier to rotate.

      (6) Rotating the front sight post counterclockwise
brings the point of impact down on the target, while rotating
the front sight post clockwise brings the point of impact up on
the target. At a range of 12.7 meters, one half turn of the
post blade, will move the strike of the bullet by approximately
1/5 of an inch (5mm). One full turn of the post blade will move
the strike of the bullet by approximately 3/8 of an inch (10mm).

(7) After rotating the post blade, the required amount, lower the retaining strap, but do not lock it down until the BZO elevation is confirmed. Continue the above procedure until the elevation BZO is confirmed. If the post blade is required to be rotated counterclockwise to a point where its base is more than halfway out of the assembly, it should be replaced with a Number 2 front sight blade, which is taller than the Number 1 or normal sight. Once BZO elevation is confirmed, lock the retaining strap down to its detent.

100 meters—one full turn moves strike 10.8 cm (4.25 inches)

200 meters—one full turn moves strike 21.6 cm (8.5 inches)

300 meters—one full turn moves strike 32.4 cm (12.75 inches)

400 meters—one full turn moves strike 43.2 cm (17 inches)

500 meters—one full turn moves strike 54 cm (21.25 inches)

600 meters—one full turn moves strike 64.8 cm (25.5 inches)

700 meters—one full turn moves strike 75.6 cm (29.75 inches)

800 meters—one full turn moves strike 86.4 cm (34 inches)

900 meters—one full turn moves strike 97.2 cm (38.25 inches)

c. Adjusting for Windage BZO. The windage adjustment screws will break with the slightest application of excess torque. Be careful not to over tighten the adjustment screws. The 5/32 hex wrench is used to make windage adjustments.
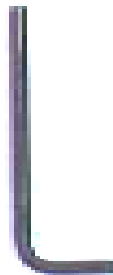
(1) Moving the front sight post to the right moves the strike of the projectile to the left on the target. Moving the front sight post to the left moves the strike of the projectile to the right on the target.

(2) To move the group to the left, use a tight-fitting hex wrench to loosen (turn counterclockwise) the adjusting screw on the right side of the front sight assembly the desired amount. Then tighten (turn clockwise) the opposite side screw (the one on the left side) exactly the same amount.

(3) To move the group to the right, loosen (turn counterclockwise) the adjusting screw on the left side of the front sight assembly the desired amount. Then tighten (turn clockwise) the opposite side screw (the one on the right side) exactly the same amount.

(4) At a range of 12.7 meters, complete rotation (360 degrees) of the adjusting screws will move the point of impact approximately 1/3 inch (8mm).

(5) As the adjusting screws are turned, noticeable clicks (eight per revolution) should be detected. If this is not the case, an armorer should replace the protector assembly or the detente spring.

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100 meters—one full turn moves strike 8 cm (3.15 inches).

200 meters—one full turn moves strike 16 cm (6.3 inches).

300 meters—one full turn moves strike 24 cm (9.45 inches).

400 meters—one full turn moves strike 32 cm (12.6 inches).

500 meters—one full turn moves strike 40 cm (15.75 inches).

600 meters—one full turn moves strike 48 cm (18.9 inches).

700 meters—one full turn moves strike 56 cm (22 inches).

800 meters—one full turn moves strike 64 cm (25.2 inches).

900 meters—one full turn moves strike 72 cm (28.35 inches).

d. **Field Zero**. A gunner must know how to zero the machine
gun at distance. He should select a known distance target
between 300 and 700 meters. As the range increases, it becomes
more difficult to determine where the center of the beaten zone
is in relation to the target. Therefore, the 500-meter target
on the transition range is recommended because of the ease of
determining adjustments.

        (1) Setting of The Sights. The gunner uses the same
procedures as for 12.7-meter zeroing except that he places the
rear sight on the range to the target. The recommended range is
500 meters.

        (2) Burst. The gunner assumes a good stable position
and fires bursts of 6 to 8 rounds at the center base of the
target and notes where the burst strikes.

        (3) Correction for Windage. If the center of the beaten
zone is to the left or right of the target, he corrects for
windage. He adjusts the windage accordingly.

        (4) Correction for Elevation. If the center of the
beaten zone is high or low in relation to the target, he
corrects for elevation. Because determining that relationship
is difficult, the gunner relies on trial and error to gain
sufficient experience in making reliable estimates. He makes
corrections in the same manner as 10-meter zeroing.

        (5) Confirmation. After making corrections for windage
and elevation, the gunner fires confirming bursts of 6 to 8
rounds. If the target is not hit, he repeats the procedures.

15. **Troubleshooting Procedures**.

    a. **Stoppage.** An interruption in the cycle of function.

    b. **Malfunction.** A malfunction is a failure of the gun to
function satisfactorily; the gun will fire, but it fires
improperly. Defective ammunition or improper operation of the
gun by a crewmember is not considered a malfunction. Two of the
more common malfunctions are sluggish operation and runaway gun.

        (1) Sluggish operation. This is normally caused by
excessive friction or excessive loss of gas. You can fix this
by:
                (a) Check gas setting.

(b) Clean, inspect, and re-lubricate.

(2) <u>Runaway gun</u>. This is when the gun continues to fire after the trigger is released usually caused by a worn, broken, or burred sear, sear notch, or tripping lever.

(a) The gunner should consider the situation and the number of rounds remaining on the belt. This will help him to determine the safest course of action.

(b) If the situation permits, for instance in training when there is no danger of hitting an individual, let the machinegun fire the remaining rounds on the belt.

(c) If the requirement is to cease-fire immediately, break the belt by grasping and twisting it firmly, approximately twelve inches from the feed way.

(d) Pull the cocking handle assembly to the rear, attempt to place the weapon on safe, wait for cold barrel (15 minutes).

(e) Clear the machinegun.

NOTE
The remedy for a runaway gun is to replace worn parts.

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c. **Hang Fire**. A round that goes off some time after the firing pin strikes the primer. 5 seconds is allotted for this before investigating a stoppage.

d. **Cook-off**. A cook off occurs when the heat of the barrel is high enough to cause the propellant powder inside the round to ignite even though the primer is not struck. Immediate action is completed in a total of 10 seconds to ensure that the round is extracted before the heat of the barrel affects it.

e. **Hot or Cold Barrel.** This is a peacetime classification only. The gun will be classed as a hot or cold gun only in the interest of safety. The classification of a hot gun is as follows:

(1) More than 200 rounds fired within a 2-minute period.

The climate temperature in different regions will make a difference as to what constitutes a hot gun. A hot, sunny day can cause a cook-off within 50 rounds if the weapon and ammunition are in the sun.

     (2) A long continuous burst or repeated firing of the weapon even though you do not reach 200 rounds in 2 minutes.

     (3) Less than 15 minutes have lapsed without a round being fired from a hot gun.

     (4) If the Vehicle Commander for any reason decides the weapon is hot.

16. **Immediate Action.**

The prompt action taken by the gunner to reduce a stoppage of the gun without investigating the cause.

   a. **Weapon Feeds And Ejects.**

     (1) Sound off "Misfire", wait 5 seconds for a hang fire. The gunner has an additional 5 seconds to pull the bolt to the rear to prevent a cook off, checking for feeding and ejecting.

     (2) The weapon feeds and ejects, the gunner puts the cocking handle assembly forward and continues on with the mission.

     (3) If the weapon fails to fire a second consecutive time you sound off "Misfire" and wait 5 seconds for a hang fire, assume there is a live round in the chamber and determine if the barrel is hot or cold.

     (4) If the barrel is hot you wait fifteen minutes for the barrel to cool. If the barrel is cool or you waited the fifteen minutes for the barrel to cool you can continue on to cold barrel procedures.

     (5) The cold barrel procedures are unload and clear the gun then go to remedial action which is inspect the weapon and the ammunition.

b. **Weapon Fails To Feed And Eject.**

(1) Sound off "Misfire", wait 5 seconds for a hang fire. The gunner has an additional 5 seconds to pull the bolt to the rear checking for feeding and ejecting.

(2) The weapon fails to feed and eject. Place the weapon on SAFE and assume there is a live round in the chamber and determine if the barrel is hot or cold.

(3) If the barrel is hot you wait fifteen minutes for the barrel to cool. If the barrel is cool or you waited the fifteen minutes for the barrel to cool you can continue on to cold barrel procedures.

(4) The cold barrel procedures are unload and clear the gun then go to remedial action, which is, inspect the weapon and the ammunition.

c. **Bolt Stuck**:

(1) Sound off "Misfire", wait 5 seconds for a hang fire. The gunner has an additional 5 seconds to pull the bolt to the rear checking for feeding and ejecting.

(2) The gunner attempts to pull the bolt to the rear and the bolt is stuck. The gunner sounds off "Bolt stuck", and assumes there is a live round in the chamber and determines if the barrel is hot or cold.

(3) Once the barrel is cold the team leader leans onto the gunner and attempts to assist the gunner in pulling the bolt to the rear. If the bolt is still stuck the gunner and team leader put their heads down below the cover of the gun. The gunner will maintain positive control of the cocking handle, while the team leader opens the cover and sweeps the ammunition from the feed tray and then closes the cover. The gunner attempts to pull the bolt to the rear again. If the bolt still does not come to the rear, the gunner and the team leader then lower their heads below the cover of the gun, the gunner will maintain positive control of the cocking handle assembly and the team leader lifts the cover. Once the cover is open the gunner attempts to pull the bolt to the rear. If bolt is still stuck the team leader will take the barrel off and remove any obstructions then put the barrel back on and gunner will pull bolt to the rear.

(4) The gunner unloads and clears the gun then goes into remedial action, which is, inspect the weapon and ammunition.

17. **Remedial Action.**

The action taken to inspect, identify, and correct the problem with the weapon or ammunition, may include disassembly and replacement of broken parts. This action is taken after utilizing immediate action and the weapon is unloaded and clear. The procedures to follow are called troubleshooting procedures. You should perform those procedures in order as follows.

   a. **The Weapon Fails To Fire On The Initial Burst.**

      (1) Check to see if the weapon is on safe. If it is, move the safety to fire.

      (2) Check to ensure the belt is properly inserted. If it is not, remove the belt and insert it properly.

      (3) Check for defective ammunition. If the ammunition is defective switch it out for good ammunition.

   b. **The Weapon Fails To Feed.**

      (1) Inspect for proper lubrication and lubricate as required.

      (2) Check for defective ammunition/links or inverted link belt. Remove the defective ammunition/links and install new ammunition/links.

      (3) Check for an obstruction in the receiver and remove it.

      (4) Check gas regulator and gas regulator plug for carbon build up. If so, utilize reamers to clear gas holes.

      (5) Check for long/short rounds. If so, align the rounds in the belt.

      (6) Check for an unlatched cover and latch it.

      (7) Inspect for damaged, weak, or worn operating parts. Notify unit maintenance.

c. **Stops Firing**.

       (1) Check for a defective round in the chamber and eject the round.

       (2) Check that the bolt assembly is fully forward and locked. Remove obstruction or clean and lubricate as required.

       (3) Check for an unfired round with a dented primer. Eject the round and notify unit maintenance.

       (4) Check for sticking feed mechanism. Clean and lubricate the feed mechanism and if the problem still exists, notify unit maintenance.

       (5) Check for short recoil. Clean and lubricate bolt and operating rod assembly. If problems still exist, notify unit maintenance.

d. **Sluggish Operation**:

       (1) Check for dirty receiver. Clean and lubricate.

       (2) Inspect for sufficient lubricant and lubricate as needed.

       (3) Inspect gas regulator and plug for carbon build up, if carbon build up is identified utilize reamers to clear obstructions in gas holes.

e. **Double feed:**

       (1) Check for dirty ammunition or chamber. Wipe ammunition off with a clean, dry rag, or clean the chamber.

f. **Failure to Cock or Runaway Weapon**.

       (1) Check for broken, worn, or burred sear, sear notch, tripping lever. Notify unit maintenance.

       (2) Check for short recoil and notify unit maintenance.

       (3) Check for broken extractor/springs. Notify unit maintenance.

g. **Failure to Chamber**.

      (1) Check for stuck/ruptured cartridge case. Remove cartridge.

      (2) Check for dirty ammunition. Wipe ammunition off with a clean dry rag.

      (3) Inspect gas cylinder for carbon buildup. If carbon buildup is present clean gas cylinder.

      (4) Inspect receiver for carbon buildup. Clean receiver if necessary.

      (5) Check for damaged round. Remove round and charge weapon.

      (6) Check for damaged or weak drive spring. Notify unit maintenance.

      (7) Inspect chamber for dirt and clean chamber.

      (8) Check for a damaged gas regulator plug and notify unit maintenance.

g. **Failure To Fire**.

      (1) Check for faulty ammunition and replace.

      (2) Check for broken or damaged firing pin. Notify unit maintenance.

      (3) Check for broken or weak drive spring. Notify unit maintenance.

h. **Failure To Extract**.

      (1) Check for short recoil and notify unit maintenance.

      (2) Check for damaged extractor/spring and notify unit maintenance.

i. **Failure To Eject**.

      (1) Check for short recoil and notify unit maintenance.

(2) Check for damaged ejector or spring and notify unit maintenance.

(3) Check to see if spent casings are piled to high. Level the pile down.

k. **Stuck Cartridge**:

(1) Ensure the bolt is to the rear and close the cover.

(2) Place weapon on safe "S".

(3) Wait until the barrel is cool, remove the barrel, utilize a multi-tool to grasp the base of the cartridge case and remove it from the chamber

(4) If cartridge will not come out, connect cleaning rods and insert cleaning rod through muzzle end of barrel pushing round out of the chamber.

l. **Ruptured Cartridge.**

(1) Charge the weapon.

(2) Place weapon on safe "S".

(3) Ensure the cover is raised and the ammunition is removed.

(4) Wait until the barrel is cool and remove barrel.

(5) Push threaded end of extractor post through ruptured case. Pull on handle to remove case.

m. **Stuck Barrel.**

(1) During training or range firing, clear, disassemble, and clean the M240B immediately.

(2) In combat, clean as soon as possible. If the crew cannot clean in these situations, then the crew must:

a. Clear the weapon.

b. Team leader use heat protective mitten to remove gas collar from the barrel.

c. Remove stuck barrel from the weapon.

d. Remove gas regulator plug and gas collar from the spare barrel, place spare barrel on the weapon and replace gas collar (from original barrel).

e. Ensure barrel is secured to the receiver (2-7 clicks), the collar is secured, reload, and continue firing.

Sight Setting and Battlesight Zero Procedures

The sights of the M240G are rugged and reliable. When setting battlesight zero (BZO), all adjustments (windage and elevation) are made to the front sight assembly. The advantage of this system is that it allows each spare barrel to be individually zeroed to the machine gun and then locked down with the adjustment tools. This avoids accidental loss of zero through inadvertent manipulation during cleaning or inspections. BZO is normally established at 12.7 meters in preparation for qualification firing as described in this reference. The upper row of aiming points (A-D) on the qualification target is designed for this purpose. However, any point of aim–point of impact type of target can be used as a field expedient.
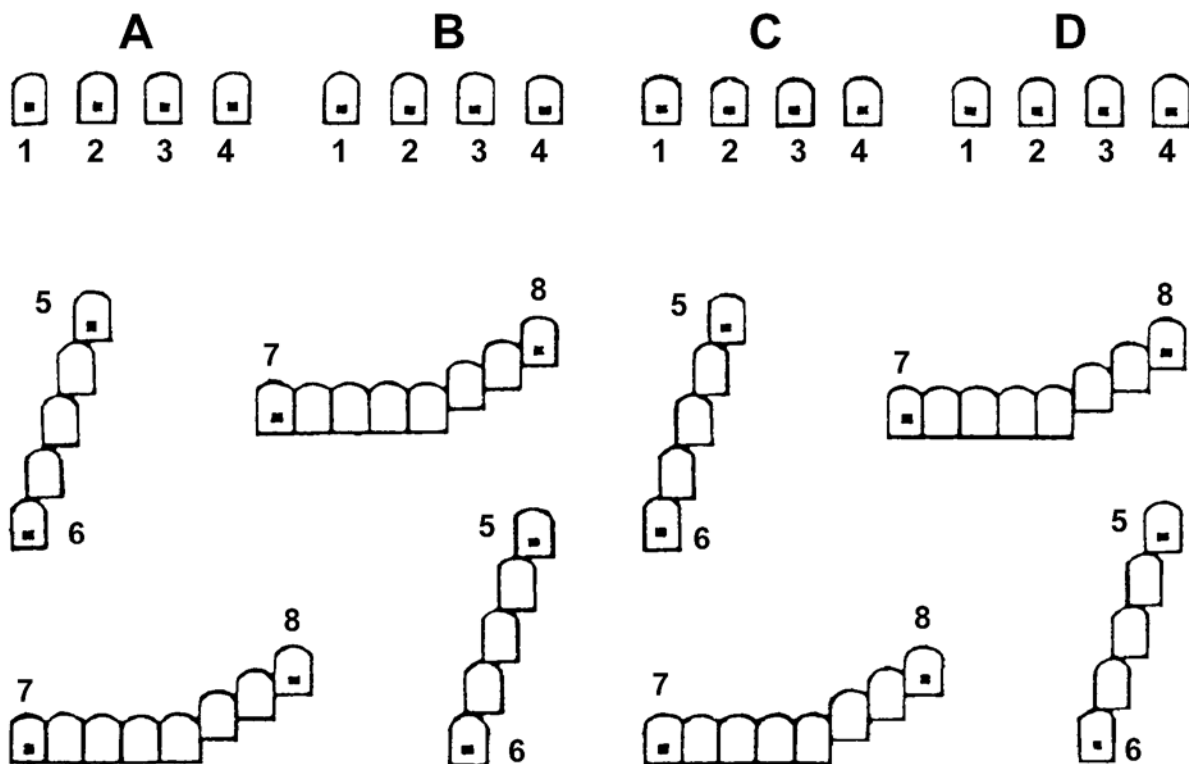
The combination front sight-adjusting tool is used for elevation and windage adjustments. This tool unlocks the front sight blade-retaining strap and has a special slotted end piece to turn the front sight blade for elevation changes. In addition, a hex wrench is included on another section of the tool. This hex wrench is designed to turn the socket head windage adjustment screws; however, it should not be used for this unless it fits the socket heads of the windage screws tightly. a. Adjusting for Elevation BZO. For the initial firing groups, do not unlock or change the elevation setting of the front sight post. Begin with the front sight post set at the position in which it is delivered. Set the rear sight elevation at 500 meters. With a target at 12.7 meters, first correctly align the sights, then hold a tight/ well-supported point of aim, point of impact sight picture and fire three rounds, one round at a time, taking time to realign the sight picture between shots. If the shot group is above or below the aim point, the front sight needs adjustment. The combination tool is used to unlock the front sight retaining strap. Unlock the retaining strap and rotate it upward. The front sight post is now free to rotate. Apply two to three drops of lubricant (CLP, LSA, or LSA-T) around the base of the front sight to lubricate the threaded shaft of the front sight post. This will make it easier to rotate. NOTE The following sight adjustments are given from the gunner's perspective at the rear of the machine gun with the individual in a normal firing position or positioned above the gun. Basic Machine Gun Qualification Target. Combination Front Sight Adjusting Tool. Machine Guns and Machine Gun Gunnery

If the shot group is above the aim point, rotate the sight post counterclockwise as if it were being unscrewed. If the group is below the aim point, rotate the sight post clockwise as if it were being screwed in or down. NOTE Rotating the front sight post counterclockwise brings the point of impact down on the target, while rotating the front sight post clockwise brings the point of impact up on the target. At a range of 12.7 meters, one half turn of the post blade, will move the strike of the bullet by approximately 1/5 of an inch (5mm). One full turn of the post blade will move the strike of the bullet by approximately 3/8 of an inch (10mm). After rotating the post blade, the required amount, lower the retaining strap, but do not lock it down until the BZO elevation is confirmed. Continue the above procedure until the elevation BZO is confirmed. If the post blade is required to be rotated counterclockwise to a point where its base is more than halfway out of the assembly, it should be replaced with a Number 2 front sight blade which is taller than the Number 1 or normal sight. Once BZO elevation is confirmed, lock the retaining strap down to its detent. b. Adjusting for Windage BZO as above, fire a group(s) to determine if a windage adjustment is required. If the group is to the left of the point of aim, the front sight protector assembly must be moved to the left to shift the point of impact to the right (towards the point of aim). If the group is to the right of the point of aim, the front sight protector must. Correct Sight Alignment. Unlocking the Front Sight Retaining Strap. Correct Sight Picture be moved to the right to shift the point of impact to the left (towards the point of aim).

NOTE Moving the front sight post to the right moves the strike of the projectile to the left on the target.

Moving the front sight post to the left moves the strike of the projectile to the right on the target. To move the group to the left, use a tight-fitting hex wrench to loosen (turn counterclockwise) the adjusting screw on the right side of the front sight assembly the desired amount. Then tighten (turn clockwise) the opposite side screw (the one on the left side) the same amount. At a range of 12.7 meters, one complete rotation (360 degrees) of the adjusting screws will move the point of impact approximately 1/3 inch (8mm). As the adjusting screws are turned, noticeable clicks (eight per revolution) should be detected. If this is not the case, an armorer should replace the protector assembly or the detente spring.

CAUTION!! The windage adjustment screws will break with the slightest over torqueing. Be careful not to over tighten the adjustment screws.

To move the group to the right, loosen (turn counterclockwise) the adjusting screw on the left side of the front sight assembly the desired amount. Then tighten (turn clockwise) the opposite side screw (the one on the right side) the same amount. At a range of 12.7 meters, complete rotation (360 degrees) of the adjusting screws will move the point of impact approximately 1/3 inch (8mm).

Sight picture

Target
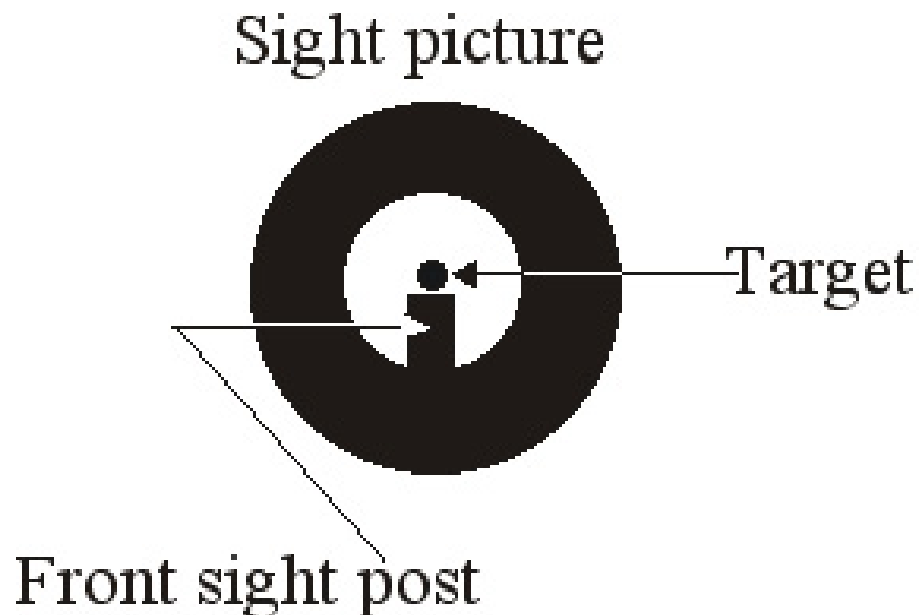
Front sight post

NOTE The front sight windage adjustment procedure is the combination of creating slack on one side, and then taking up that slack from the opposite side.

Therefore, the front sight protector assembly should always be clamped tight between the heads of the two opposing screws. Each time one screw is loosened, the opposite one must be tightened the same amount. Once the shot group is confirmed to be centered, check for play in the front sight assembly by lightly clamping between finger and thumb and attempting to move the sight assembly laterally. If there is no play evident, the windage adjustment is completed. If play is evident, carefully check both screws for looseness. The 12.7-meter qualification course is fired with the BZO established as above with the rear sight set for 500 meters. Since the BZO procedure above calibrates the rear sight for all targets within the effective range of the machine gun, the estimated range to any other target should be placed on the rear sight and a good sight picture obtained before firing. If confirmation of the BZO is desired, this is easily done from the 200- or 300-meter line at a rifle range to disk the target shot group once it is fired. When firing, set the range on the rear sight and mount the weapon on the tripod or use a good field firing position with the bipod.

If the dispersion of the shot group is too large to calculate the mean center of impact, load, and fire one ball round at a time. Note that wearing a flak jacket or gas mask by the gunner may change the mean point of impact. If firing confirmation zero on a range laid out in yards, do not be overly concerned if the point of impact is slightly above the point of aim, as the beaten zone of a normal burst will cover most targets. If many very distant targets are to be attacked, using ranges estimated in meters taken from a map or range finder, add yards to meters elevation change to the front sight in, or clockwise, one-half turn. This is especially true if shot groups are just slightly low on a target at 200 or 300 yards. If this is the case always add the one-half turn yards to meters elevation change. At 200

meters, one-half turn of the front sight blade, in either
direction, moves the point of impact up or down approximately 4
1/4 inches (108mm). At 200 meters, one-half turn (four clicks)
of the windage screws will move the point of impact left or
right approximately 3 1/8 inches (80mm).

19. **M240B Operator Checklist**. The follow checklist is to assist
with the understanding the M240B weapons system. These are not
timed events.

      (a) Perform operator maintenance for an M240B medium
machinegun and associated components:

Operator Steps
1. Ensure the weapon is in condition 4.
a. Apply weapon safety rules as required.
b. Pull the cocking handle completely to rear to lock bolt back.
c. Maintain positive control of the cocking handle.
d. Place safety to safe position.
e. Open cover assembly.
f. Clear feed tray.
g. Raise feed tray.
h. Look into chamber to make sure it is empty.
i. Announce "Clear" after ensuring the chamber is empty.
j. Continue to maintain positive control of the cocking handle.
k. Place safety to fire.
l. Fully depress the trigger and ease the cocking handle forward to close and lock the bolt.
2. Disassemble the M240B medium machinegun in a logical order.
3. Clean the M240B medium machinegun.
4. Inspect the M240B medium machinegun.
a. Identify missing parts as required.
b. Identify burred parts as required.
c. Identify broken parts as required.
d. Identify worn parts as required.
5. Lube the M240B medium machinegun.
6. Assemble the M240B medium machinegun.
7. Perform a function check on the M240B medium machinegun.
a. Ensure weapon safety is on fire.
b. Pull cocking handle completely to rear to lock the bolt back.
c. Maintain positive control of the cocking handle.

d.   Place weapon to safe position.
e.   Depress trigger, nothing should happen.
f.   While maintaining positive control, place safety to fire.
g.   Fully depress the trigger and ease the cocking handle forward to close and lock the bolt.
h.   Ensure safety cannot be moved to the safe position.
8.   Clean the tripod.
9.   Inspect the tripod.
a.   Identify missing parts as required.
b.   Identify burred parts as required.
c.   Identify broken parts as required.
d.   Identify worn parts as required.
10.   Lubricate the tripod.
11.   Clean the M240B SL-3 components.
12.   Inspect the M240B SL-3 components.
a.   Identify missing components as required.
b.   Identify burred components as required.
c.   Identify broken components as required.
d.   Identify worn components as required.
13.   Lubricate the M240B SL-3 components.
14.   Clean the M35 MMG vehicle mount components.
15.   Inspect the vehicle mount components.
a.   Identify missing components as required.
b.   Identify burred components as required.
c.   Identify broken components as required.
d.   Identify worn components as required.
16.   Lubricate the vehicle mount components.

(b) Disassemble and assemble the M240B machinegun.

Operator Steps
1.   Clear the machinegun.
2.   Disassembly.
a.   Remove the buttstock and buffer assembly.
b.   Remove the bolt and operating rod assembly.
(1) Disassemble the bolt and operating rod assembly.
c.   Remove the trigger housing assembly.
d.   Remove the barrel assembly.
(1) Disassemble the barrel assembly.
e.   Remove the cover assembly.
f.   Remove the feed tray.
3.   Assemble the M240B.

a.   Replace the feed tray.
b.   Replace the cover assembly.
c.   Assemble the barrel assembly.
(1) Replace the barrel assembly.
d.   Replace the trigger housing assembly.
e.   Assemble the bolt and operating rod assembly.
(1) Replace the bolt and operating rod assembly.
f.   Replace the buttstock and buffer assembly.
4.   Perform a function check.

(c) Operate the M240B medium machinegun.

Operator Steps
1.   Ensure the weapon is in Condition 4.
2.   Load the weapon using the cover raised.
a.   State the weapons conditions.
b.   Clear the weapon, ensure it is Condition 4.
c.   Place first round against cartridge stop (links facing up).
d.   Close cover (Condition 3).
e.   Pull cocking handle to the rear and place weapon on safe.
f.   Return the cocking handle forward (Condition 1).
3.   Unload and clear the weapon.
a.   Grasp cocking handle and pull bolt to the rear.
b.   Maintain positive control of cocking handle.
c.   Ensure the weapon is on safe.
d.   Open cover raise the feed tray.
e.   Inspect chamber both visually and physically.
f.   Place gun on fire.
g.   Squeeze the trigger and allow the bolt to return to its forward position (on an empty chamber).
h.   Close the cover assembly (Condition 4).
4.   Load the weapon with the cover closed.
a.   Place link belt into the feed tray with the open side of the links down.
b.   Ensure the first round of the belt is engaged by the belt feed pawl (2 clicks) and held in place to make a Condition 3.
c.   Pull the bolt to the rear position.

d.   Place the safety to "S".
e.   Return the cocking handle to the forward position (condition 1).
5.   Change barrels.
6.   Unload the weapon.
7.   Clear the weapon and ensure it is Condition 4.

       (d) Perform immediate action on an M240B medium machinegun to return the weapon into action.

Operator Steps
1.   Announce "MISFIRE".
2.   Wait 5 seconds for a possible hang fire.
3.   Within the next 5 seconds pull the cocking handle to the rear and watch for feeding and ejecting.
4.   If the weapon feeds/ejects attempt to fire.
5.   If the weapon fails to fire again, repeat steps 1-4 (If the weapon continues to fail, move to step 6).
6.   If the weapon does not feed or eject determine if the weapon is "HOT" or "COLD" (If "HOT", place weapon on safe and wait 15 minutes) then perform remedial action.

       (e) Perform remedial action on an M240B medium machinegun to return the weapon into action.

Operator Steps
1.   Make a Condition 4 weapon.
2.   Disassemble and inspect the weapon and ammunition.
3.   Assemble the weapon and perform a function check.
4.   Return the weapon into action or report discrepancies for subsequent repair.

       (f) Perform actions to stop a runaway gun to regain positive control of the weapon.

Operator Steps
1.   Verbally define a runaway gun.
2.   Verbally explain and demonstrate procedure for a runaway gun.
a.   Explain primary procedure for runaway gun.
(1) If safety permits keep weapon in safe direction an allow remainder of rounds to fire out.
(2) If there are more than 50 rounds of ammunition twist and break the belt of ammunition.
b.   Explain procedure and demonstrate secondary procedure.

(1) If safety does not permit twist and break the belt of ammunition.
c.   Explain procedure if primary and secondary measures are unsuccessful.
(1) Grab cocking handle, pull all the way back and hold, place safety to "S" safe remove ammunition belt.

(g) Perform actions to remove a ruptured/stuck cartridge to return the weapon into action.

Operator Steps
1. Verbally explain how to remove ruptured cartridge.
2. Demonstrate how to remove ruptured cartridge using ruptured cartridge extractor.
a.   Make the weapon condition 4 and remove barrel.
b.   Push threaded end of extractor post through ruptured case.
c.   Pull on handle to remove case.
3. Verbally explain how to remove stuck cartridge.
4. Demonstrate how to remove stuck cartridge.
a.   Primary method.
(1) Wait 15 minutes until the barrel is cool.
(2) Remove barrel.
(3) Remove cartridge case from chamber of barrel or extract with a multi-tool as necessary.
b.   Alternate method.
(1) Remove swab holder section, from cleaning rod and insert cleaning rod through muzzle end of barrel, gently tap out cartridge.

(h) Mount a M240B medium machinegun on a tripod to place the weapon into action.

Operator Steps
1. Inspect the M240B medium machinegun and associated components for serviceability.
2. Emplace the tripod in the desired location.
3. Attach the M240B medium machinegun receiver to the tripod.
a.   Attach pintle to M240B medium machinegun.
b.   Attach and lock pintle to pintle bushing.
4. Attach appropriate associated components.
a.   Mechanically zero the T&E.
b.   Attach T&E to M240B medium machinegun.

c. Attach T&E to MK125 tripod.	
d. Center and secure the traversing slide locking lever on traversing bar.	
5. Announce "GUN UP" when on target and prepared to fire.	

REFERENCE - TITLE	PUBLICATION ID	CHAPTER/PAGE
Machineguns and Machinegun Gunnery	MCTP 3-01C	Entire Manual
Operators Manual for the Machinegun 7.62MM M240	TM 10091C/10092C-OR	Entire TM
Ground Mount	TM 10796-OR	Entire TM
Mount, Vehicle, Medium Machine Gun, M35 (MMGVM)	TM 11792A-OI	Entire TM

Employ Observation Devices

MCT0102

03/11/2020

a. **LEARNING OUTCOME(S)**.

    (1) Marines will be able to employ multiple observation devices, within their capabilities, under conditions of unlimited and limited visibility such as daylight darkness, smoke, fog, dust, and haze to observe/scan the environment identifying objects while remaining mobile. (3)

b. **ENABLING LEARNING OBJECTIVES**.

    (1) Given a list of choices, identify nomenclature of a limited visibility device in accordance with TM 10271A-OR/1C.

STUDENT INFORMATION

OVERVIEW: In this lesson students will learn about observation devices used in the infantry. The Devices covered will include the AN/PVS-14.

CLASS PREPARATION: Read this outline prior to the start of this class. Ensure you have all materials provided for this class.

OUTLINE.

1. AN/PVS-14.

    a. Description. The AN/PVS-14 is a self-contained night vision device that enables improved night vision using ambient light from the sky (moon, sky glow, etc.). The PVS-14 contains a GEN III image intensifier tube that is similar in performance to the PVS-7 yet smaller, lighter and more versatile. The PVS-14 can be hand-held, carried in the utility uniform, head-mounted, helmet-mounted, or mounted to a weapon that enables walking, weapons firing, short-range surveillance, map reading, vehicle driving, and administering first-aid in both moonlight and starlight. Each unit allows for vertical adjustment (by using head strap), fore and aft adjustment, objective lens focus and eyepiece focus. The monocular is also equipped with an IR source, a low battery indicator and a gain control.

AN/PVS-14.

b.   Nomenclature.

(1) Sacrificial Window. This is a replaceable shield that protects the lens during operation in adverse conditions

(2) Eyecup. This assists in maintaining proper eye relief.

(3) Demist Shield. This is reduces the likelihood of diopter lens fogging.

(4) Eyeguard. This is utilized to establish eye relief when mounted on a weapon.

(5) Power Switch. On/off/IR/reset switch.

(6) Gain Control. Allows user to adjust gain for amount of available light. The more light the less gain that is required and vice versa.

(7) Battery Cap. The battery cap encloses the battery compartment. The battery cartridge holds one AA cell battery.

(8) Objective Lens. Focuses objective lens. Adjusts for sharpest image of viewed object from 9.8" (25 cm) to infinity.

(9) Eyepiece Lens. Adjust eyepiece lens for use without the need for glasses. Adjust for sharpest image of intensifier screen from +2 to -6 diopters.

c. Characteristics.

(1) Capabilities.

(a) Enables user to adjust fit.

(b) IR emitting source.

(c) Low battery indicator.

(d) High light cut off feature: 100 sec.

(e) Magnification- 1.0X.

(f) Field of view (FOV)- 40 degrees.

(2) Limitations.

(a) Besides battery power, requires ambient (natural) light for improved night vision.

(b) Ambient light reduced by clouds, under trees, shadows, etc.

(c) Less effective looking into shadows, smoke, fog, rain, etc.

(d) Clarity dependent on amount of light, condition of objective and diopter lenses, and age of image intensifier.
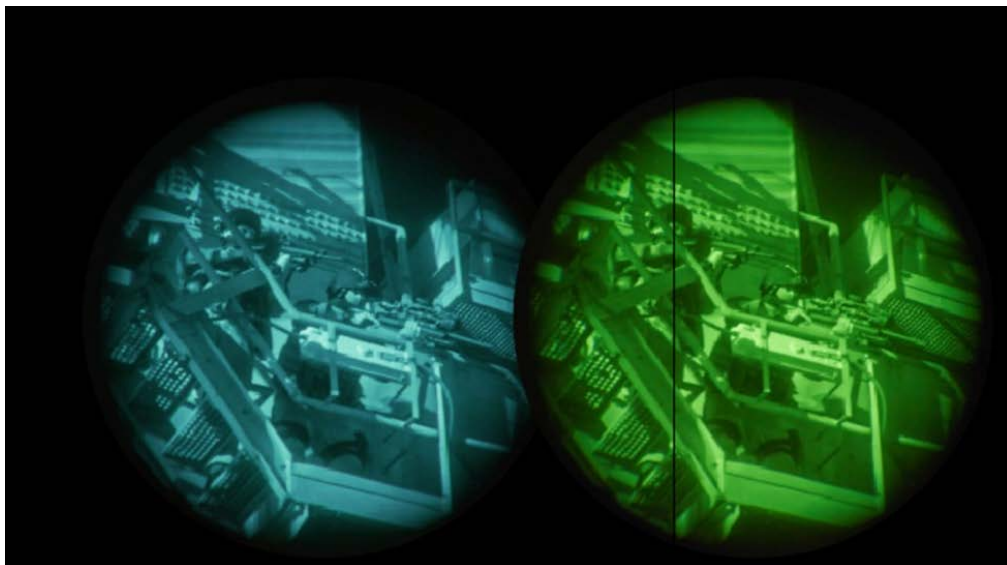
Night Vision Device. White Phosphor on left, Green phosphor on right.

(3) <u>Controls</u>.

(a) Highlight Cutoff Window. Sensor at front of MNVD that detects light, when there is too much it automatically turns off the image intensifier tube in 70 seconds + or – 30 seconds.

(b) IR Lens. Contains LED that is used for illumination and signaling.

(c) Latch. Allows MNVD to be connected/disconnected from head or helmet mount.

(d) Battery Polarity Indicator. Indicates how batteries need to be installed in MNVD.

(4) Adjustments. Allows user to customize fit of MNVD for his head and eyesight.

(a) Diopter Adjustment. Allows the user to adjust the eyepiece in order to obtain a clear picture for his personal eyesight.

(b) Objective Focus. Allows the user to adjust the MNVD for a specific range, (ex. Up close for map reading, far for patrolling).

(c) Eye Relief. Allows the user to adjust the distance the goggles sit off of the eye. The user must have a full field of view, without scope shadow, while simultaneously eliminating stray light from escaping around the eyecups.

(d) The AN/PVS-14 can be adjusted for pitch, eye relief and eye side using the controls.

(4) <u>Adjustment</u>. In order to adjust the NVGs, follow these instructions:

1. Once properly mounted, turn on the NVGs. Use an object that 15 meters away for the adjustments.

2. Use the gain knob to adjust the picture to the appropriate setting (depends on the light in the area/room).

3. Use the objective adjustment to focus your eyesight. May not be clear but find the best looking sight picture

4. Use the objective adjustment to fine tune, and adjust your sight picture. After this step your sight picture should be clear.

5. After step 4, only use the objective adjustment to focus the NVGs. Turning this lens will focus to near and far objects.

MANAGE SIGNATURE

MCT0111

01/20/2021

LEARNING OBJECTIVES FOR THIS LESSON

a. **LEARNING OUTCOME**.

(1) Marines will be capable of utilizing materials and techniques to hide, blend, disguise, or disrupt the appearance of military targets across visual, infrared, auditory, and electromagnetic spectra, for the purpose of preventing or delaying adversary detection and identification of friendly troops, equipment, activities, or intentions. (13)

b. **ENABLING LEARNING OBJECTIVES**.

(1) Given a list of definitions, identify adversary electronic warfare capabilities in accordance with JP 3-85. (13A)

STUDENT INFORMATION

OVERVIEW: In this lesson, Marines will learn the basics of signature management.

CLASS PREPARATION: Read this outline prior to the start of this class. Ensure you have all materials provided for this class.

OUTLINE. The purpose of this lesson is to reduce the physical signature (visual, IR thermal, and radar) of the infantry Marine in order to avoid being observed and targeted by the adversary.

"To be detected is to be targeted is to be killed"

Marine Corps Operating Concept, 2016

1. **Introduction of Signature Management**. The individual Marine is ultimately responsible for reducing his signature. In this lesson we will learn about ways to help hide your visual, thermal, and radar signal from the enemy. There is 8 considerations that every Marine must adhere to when it comes to signature management.

a. Disperse into multiple small elements, Displace often

b. Find a concealed site, conform to the terrain.

c. Operate at night.

d. Camouflage everything, blend with your surrounds.

e. Minimize movement, minimize radio calls.

f. Post air guards.

g. Plan to operate under UAS

h. Inspect your signature from the enemy's point of view.

2. **Individual Signature Management**. Managing your signal, both camouflage and concealment, disrupts the enemy's intelligence, surveillance, and reconnaissance efforts. Marines must disperse into multiple small elements, displace often, find concealed sites, conform to terrain, operate at night, camouflage everything, blend with their surroundings, minimize movement, minimize radio calls, post air guards, plan to operate under UAS, and inspect their signature from the adversary's point of view.

a. Camouflage Discipline. This includes light discipline, heat discipline, noise discipline, trash discipline, and movement discipline. In this portion of the lesson we will go over; camouflage standards, camouflage processes, and how to camouflage your self and gear.

(1) Camouflage Standards And Processes. All Marines in the field must reduce the physical signature they leave. Whether it's too avoid the enemy's visual reconnaissance, or not being pickup up radar it everyone's responsibility to camouflage from the adversary.

(a) Camouflage Processes. All SOPs and TTPs conform to eight basic rules.

1. DISPERSE into multiple small elements. This is the most important step. Be indistinguishable —unable to be identified as different— in order to avoid being targeted. Assume you are being watched. Disperse individuals, vehicles, and positions irregularly. Displace often.

2.   FIND a concealed site. Conform to terrain. Find low dead ground and micro-terrain, behind hills, tucked against the shadows of buildings, or under trees. Avoid open terrain as it will allow sound and light to travel further. In the city, move inside a building.

3.   OPERATE at night. Camouflage discipline includes light discipline. Train in night operations, with NVGs, lasers, and camouflage ghillie blankets. Operate in rain, fog, wind, and dust when Unmanned Aerial Systems (UAS) cannot fly. Operate at dawn or dusk when shadows are long, sun glare is high, and thermal crossover masks your heat signature. Know the daily light levels. At night, sound and light travel further.

4.   CAMOUFLAGE everything: people, positions, and equipment. Blend with your surroundings. Camouflage discipline includes light discipline, heat discipline, noise discipline, trash discipline, and movement discipline. minimize lights. Mask engines, heaters, and generators. silence all equipment. leave no trash behind, especially dunnage.

5.   MINIMIZE movement. control movement in TAAS and bps. control convoys. Minimize radio calls for EMCOM.

6.   Post air guards.

7.   PLAN to operate under UAS. Think overhead. hills block visual, thermal, and radar observation, but the biggest threat is overhead UAS. plan concealed routes and positions. Plan operations at critical times. Minimize logistics requirements. Plan resupply events.

8.   INSPECT your **signature** from the enemy's point of view. USE binoculars, NVGs, thermal scopes, and UAS. Counter adversary HUMINT, OSINT, and ELINT efforts. This information cues ISR platforms. Reduce the signature of your unit so that the adversary does NOT prioritize his ISR assets against you.

   b.   Camouflage Equipment. Marine in the field must always camouflage their helmet, camouflage personal equipment, mask the shine on your optics and equipment, and silence your gear.

      (1) Helmet. To reduce the signature of your helmet, you need to set up your helmet with a net draped over it. Secure it using zip ties, boot bands, burlap strips. Adding camouflage net

or foliage is also needed. Follow these steps to ensure this is done properly:

       (a) Drape and prepare your helmet. Use the following pictures as examples:
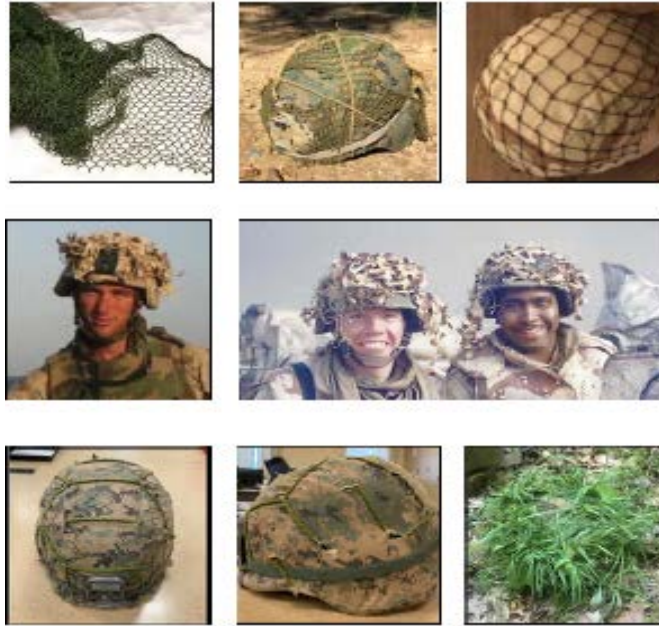
       (b) Add natural foliage to blend in with your environment. Keep the vegetation short, long leafs and branches move too much.

       (c) The overall shape of the helmet is the most recognizable characteristic, and must be changed. Besides using the above techniques keep these notes in mind; use the net to obscure the shape and the boot bands to hold vegetation. Avoid interfering with the function of the NVG mount, the plate should be covered during the day time due to the shine and it being recognizable at range. Vegetation must match the foliage at ground level, it doesn't help if your helmet looks green if all there is on the ground is dead branches. A finished helmet should blend in with your surroundings, see examples below.

         (d) Also note that the boonie cover is camouflaged in the same manner as the helmet (use the molle bands)

         (2) <u>Rifle</u>. The best way to camouflage a rifle is to paint it, however this requires command authorization. To paint your weapon refer to the weapons paint SOP of your unit. The technical instruction on how to do this is located in the Weapons Painting SOP, CamPen, CA: 1st Marines, 1 Feb 2020. The picture below show that a painted weapon blends in better than a non-painted one.

(a) <u>Notes</u>. On top of painting your weapons you can take other measures as well. Wrap bootbands and burlap strips to your stock and handguards (do this without interrupting the optics, chamber, charging handle, magazine well, and ejection port.) The goal is to break up the linear shape of your weapon. The radar signature of the metal <u>cannot</u> be masked.

(3) <u>Equipment</u>. The process the physical signature of your equipment is based on these fundamentals. They are equipment dependent.

(a) <u>Main Pack and Assault Pack</u>.

<u>1</u>. Wrap a bungee cord around the pack.

<u>2</u>. Weave bungee cord through the MOLLE webbing on the top of the pack.

<u>3</u>. Tie pieces of "Gutless" 500 cord into the other webbing you want to camouflage.

<u>4</u>. Add foliage in the field to blend with your environment. Tuck foliage under the bungees and tie it with the 500 cord or carry a ghillie blanket.

<u>5</u>. Notes. 550 cord tie ins should be grouped in twos. One clump of vegetation should be tied into two 550 cord anchors to prevent excessive flapping. Burlap straps can be used instead of natural foliage. Identify and mask the shine if any. <u>Do not stage packs in linear neat rows</u>. Patterns are easy to see from the air.

(b) <u>Flak, Chest Rig, Boot Tops, and Sub Belts</u>.

     <u>1</u>. Wrap shoulder straps of flak or chest-rig with boot bands or shock cord.

     <u>2</u>. Don an extra set of boot bands outside of trousers, over the boot top.

     <u>3</u>. Weave boot bands, bungees, or shock cord through belt pouches and flak pouches.

     <u>4</u>. Tuck bundled vegetation into the elastic platforms.

     <u>5</u>. Don a ghillie blanket after preparing with cut local vegetation.

     <u>6</u>. <u>Notes</u>. Replenish vegetation that wilts or discolors. Remember to use the <u>right size</u> of vegetation for each platform. With the helmet considerations added in, this covers four most distinguishable areas of the human silhouette; shoulders waist, head and ankles. <u>Always tailor this to the level of tactical situation</u>. Lastly, do not camouflage frequently used pouches such as ammunition and batteries.

(c) Vegetation Cutting Considerations. In order to do this you will need field knife or axe (use of gloves is recommended to avoid injury). Follow this process when it comes to cutting foliage:

    1. Determine the most common local vegetation.

    2. Cut the vegetation with a field knife. Wear gloves.

    3. Clump the vegetation into bundles.

    4. Add the bundles of vegetation to your prepared equipment (see helmet and equipment sections).

    5. Notes. The most prevalent local foliage may be deadfall. Always cut foliage. Do not pull it up by the roots. roots and soil break up the pattern of the vegetation. Replace foliage as it wilts and falls out. camouflage is continuous. Replace foliage if your environment no longer matches the initial foliage. Always cuts more than you think you need, it will save you from going back to re-forage for more. Remember, if the bundle is too big, it will sway too much, giving away your position.

helmet camouflage   shoulder/waist/ankle camouflage   Main pack and assault pack camouflage

6. <u>Sizing</u>. Using the above images it is recommend to keep these sizes; Helmet/bonnie cover should use fist to fist in a half sizes, packs should use long clumps of vegetation to cover the pack. For the blanket, you should use fist sized clumps around the head and shoulders, longer clumps down the back, higher back clumps should point down. Lower back clumps should face up. For the plate carrier, chest-rig shoulder straps, use long bundles to mask the shape of the shoulders and obscure the chest.

3. **<u>POSTITION CONCEALMENT</u>.**

a. <u>Bivouac</u>.

(1) Disperse into multiple small elements. this is the most important step. Be indistinguishable —unable to be identified as different- IOT avoid being targeted. multiple small bivouacs are better than one large one. Displace often. Disperse positions irregularly, not covered and aligned. Avoid rows of tents, packs, pallets, or equipment. Patterns are easily seen from the air. See example below:

(2) Find a concealed site, off the main roads and away from junctions. CONFORM to terrain. FIND low dead ground and micro-terrain, under trees, behind hills, tucked into the shadows of buildings. In the city, bivouac *inside* a building.

(3) Occupy at night. Camouflage discipline includes light discipline.

(4) Camouflage every position and all equipment needs overhead concealment. Blend with your surroundings.
Stage packs under trees and in the shadows, not covered and aligned. Cover crew-served weapons, ammunition, and equipment with tarpaulins. Cover supplies with tarpaulins. Camouflage antennas and comm equipment. Camouflage sleeping positions. Use the tarpaulin even during daylight. Use natural vegetation to enhance the concealment a tarpaulin will provide. See examples below:
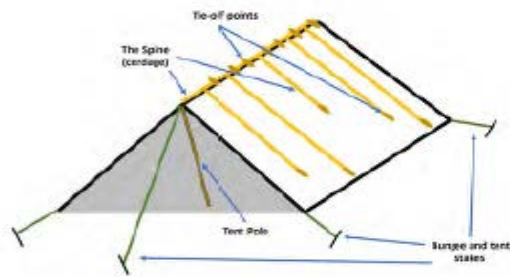
TIE a length of 550 cord along the Spine of the A-frame. ATTACH irregular lengths of 550 cord to the Spine.
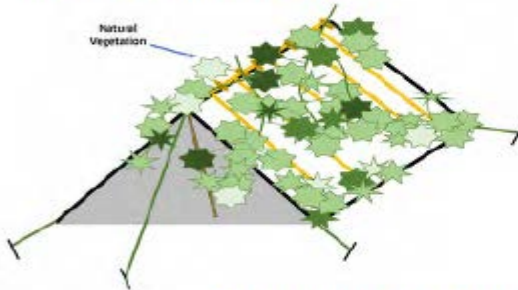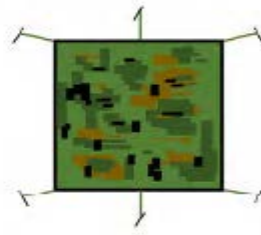
TIE natural vegetation at the tie-off points to cover the tarpaulin.

(5) Minimize movement.

(6) Post air guards. Air guards should be trained to identify UAS, fixed-, and rotary-wing aircraft in both day and night conditions using binoculars and optics. Listen for UAS.

(7) Plan to operate under Unmanned Aerial Systems (UAS). Think about your overhead. Hills can block ground visual, IR thermal, and radar observation, but the biggest threat is overhead UAS. Plan resupply events.

(8) Inspect your signature from the enemy's point of view. Use binoculars, NVGs, thermal scopes, and UAS during clearance patrols.

b. Patrol Base Concealment.

(1) Find a concealed site. Find defilade to prevent ground observation. Find a tree-line to provide concealment from air observation. See images below:
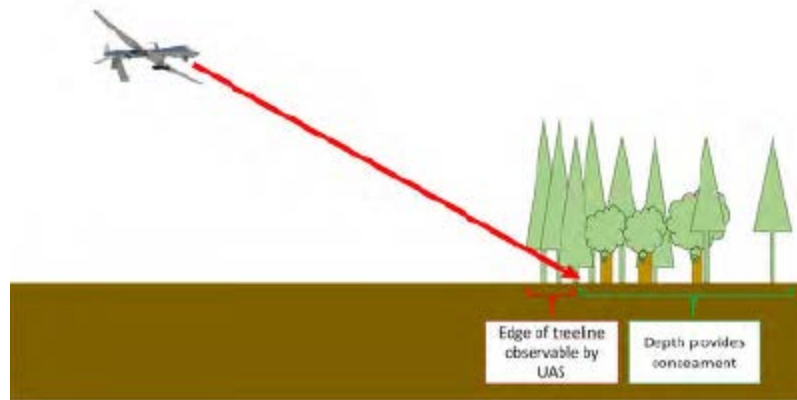
GAIN depth in the treeline to maximize overhead concealment.

CONCEAL your position in a wooded area to avoid UAS observation.
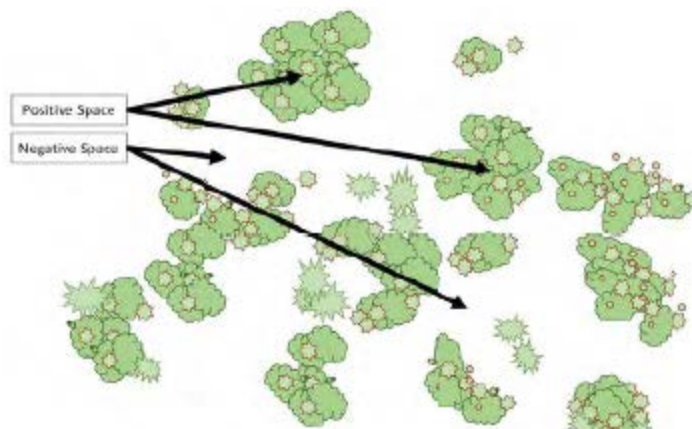
USE the base of trees to maximize overhead concealment.

       (2) Occupy at night, if possible. Do not move the entire unit into position at once. USE the "bent-L" occupation method IOT reduce confusion and minimize visible and noise signature.

(3) Post air guards. Air guards should be trained to identify UAS, fixed-, and rotary-wing aircraft in both day and night conditions using binoculars and optics. Listen for UAS.

(4) Position buddy pairs irregularly with varying distances between them. Select positions that correspond to assigned sectors of fire. See images below.
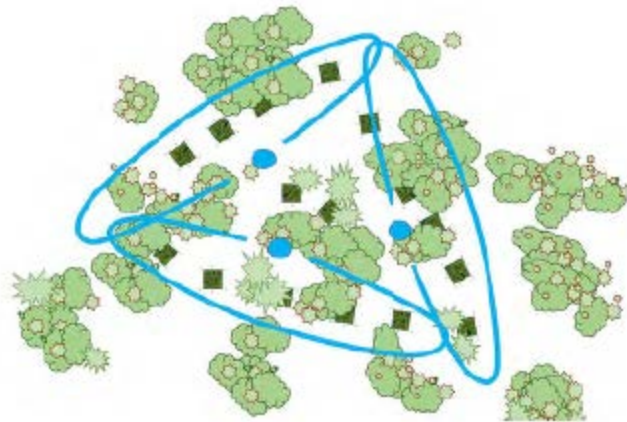
Triangular patrol base with poor overhead concealment.
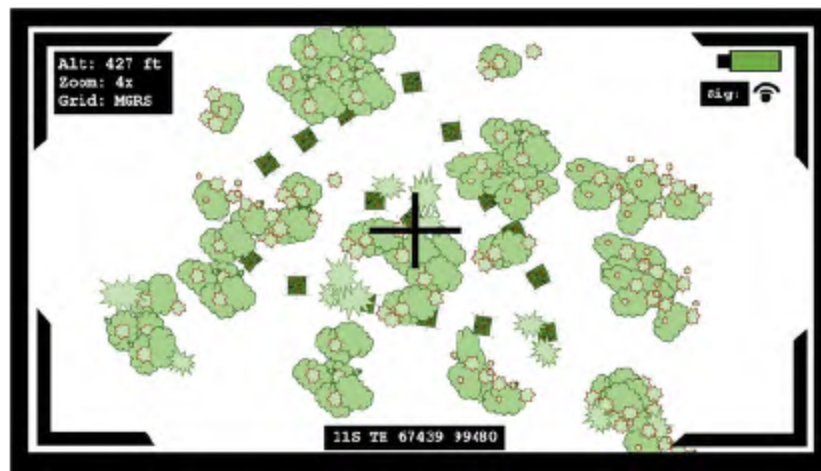
Example UAS video feed of a triangular patrol base with poor overhead concealment.
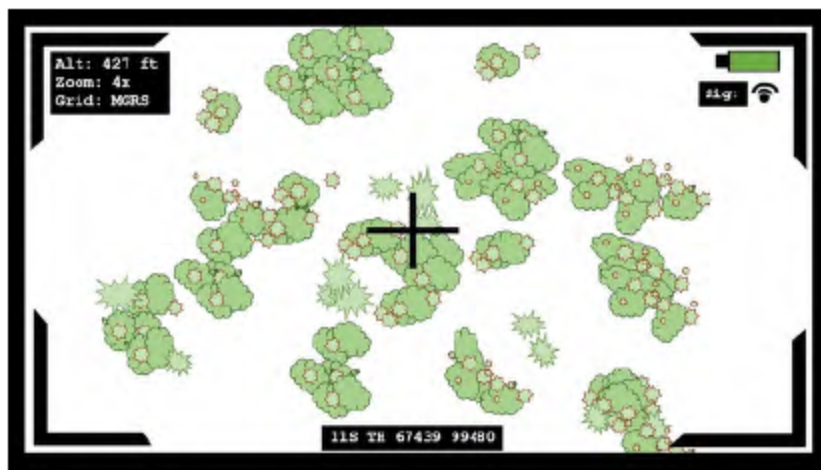
(5) Camouflage your position. Blend with your surroundings. Natural concealment is best. The tarpaulin reduces infrared acquisition, but it is easily identified by its square and shiny appearance, distinctive sag, and difficulty in adding foliage. Camouflage the tarpaulin with a camouflage ghillie blanket or camouflage netting.

(6) Inspect your signature from the enemy's point of view. Use binoculars, NVGs, thermal scopes, and UAS. Conduct clearance patrols to observe your position.

(7) Enforce camouflage discipline. After the patrol base has been camouflaged, priorities of work should focus on the mission and maintenance of camouflage.

c. Fighting Position. This task can be done in 60 minutes with two Marines and the appropriate gear.

(1) Disperse into multiple small elements. This is the most important step. Be indistinguishable IOT avoid being targeted. Assume you are being watched. Establish irregularly-spaced positions, NOT linear positions.

(2) Find a concealed site. The mission -the sector of fire- dictates the position. Conform to the terrain. Avoid silhouettes. Position in open desert may have few options.

(3) Occupy at night. Camouflage discipline includes light discipline.

(4) Camouflage your position. Blend with your surroundings. Every position needs overhead concealment. cover your position with a camouflage ghillie blanket, camouflage net,

woven mat, or a marpat tarp. Add foliage to blend with your surroundings. See examples below:

1: Ghillie Blanket   2: Camouflage Net   3: Woven Mat   4: MARPAT Tarp

(5) Minimize Movement.

(6) Post air guards. LP/Ops should be assigned as air guards to listen for UAS.

(7) Crew serve considerations. Machine gun and anti-armor positions must be protected by a squad. These weapons are the units most destructive and suppressing force therefore they must be protected. These crew positions must be protected from enemy observation and from enemy fires, additionally they <u>must</u> have overhead concealment. Use a flat-top frame of deadfall branches lashed to corner tripods, use a thermal blanket if available.
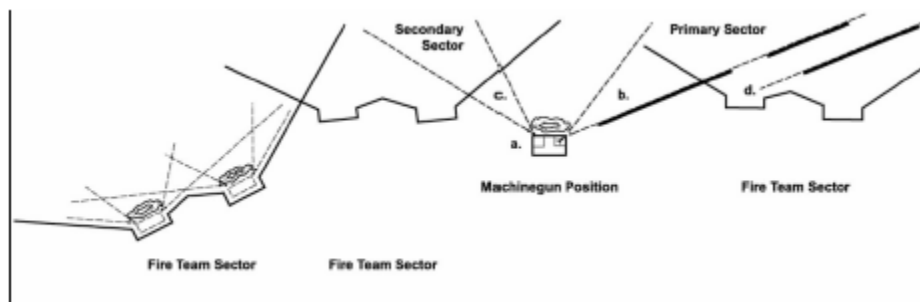
d. <u>CP</u>.

(1) Disperse into multiple small elements. This is the most important step. Be indistinguishable —unable to be identified as different—IOT avoid being targeted. Assume you are being watched. Displace often. Avoid rows of vehicles, packs,

pallets, or equipment. Patterns are easily seen from the air. Disperse antenna farms. Disperse logistics pallets. Disperse generators. Mask noise with a dirt berm or put the generator indoors in the basement. Hide security positions, especially barbed wire. Disperse vehicles with three vehicle lengths between each vehicle.

(2) Find a concealed site. Select a site unimportant to the adversary, off the main roads. Avoid road junctions. CONFORM to terrain. Find low dead ground and micro-terrain, behind hills, tucked against the shadows of buildings, or under trees. In the city, move inside a building. Dirt blocks visual, light, thermal, EM, and radar sensors. Woods and towns are good. Dense urban clutter masks EM signals. CPs in open desert terrain have few options.

(3) Occupy at night. Camouflage discipline includes light discipline.

(4) Camouflage all tents, vehicles, logistics pallets, and bivouac area.
(5) Minimize movement. Minimize radio calls for EMCON. Establish routes in and out reduce track signature, control traffic.

(6) Post air guards. Air guards should be trained to identify UAS, fixed-, and rotary-wing aircraft in both day and night conditions using binoculars and optics. Listen for UAS.

(7) Plan to operate under UAS. Think overhead. Hills block visual, thermal, and radar observation, but the biggest threat is overhead UAS. Plan concealed routes and positions. Plan resupply events.

(8) Inspect your signature from the enemy's point of view. Use binoculars, NVGs, thermal scopes, and UAS. Counter adversary HUMINT, OSINT, and ELINT efforts. This information cues ISR platforms. Reduce the signature of your CP so that the adversary does NOT prioritize his ISR assets against you.

e. Spoil Discipline. Spoil is anything that can be used to identify what or where you were. It can be MRE trash, dunnage, or anything else that you may leave behind that give away your positions. Special care must be taken not to leave spoil behind as it can compromise your units position and/or mission.

f. Redeye UAS Drill. The purpose of this drill is to alert the unit if adversary UAS is sighted. This drill can be done if the unit is stationary or moving. The standard for this is simple; the unit will freeze and within 5 minutes the unit leader will decide what to do.

    (1) The trigger for this is when adversary UAS is sighted, ANY Marine can call the drill using the brevity code and the location (I.E. "Redeye UAS at one o'clock" or "Redeye, UAS to the west, over the river."

    (2) Once the brevity has been given, all units will freeze in place. Marine will go prone if they are on foot or in the open, they will minimize your shadow. Marines will cover themselves with a camouflage ghillie blanket, poncho, or tarp. To reduce the physical signature (visual, IR thermal, and radar) of the unit IOT avoid being observed and targeted by the adversary. Do NOT run. Do NOT increase the signature of the unit.

    (3) Respond to the unit leader's orders. Marine need to freeze in place right immediately; the UAS may not have seen us. The unit leader at this point can make three decisions at this point. First, the unit leader can continue the mission; if they have seen us and we will operate under adversary observation. The unit leader refuses to let his unit be suppressed or

disrupted by an adversary UAS. Second, he can use counter UAS weapon systems if available. Third, the Hawkeye brevity can be given and the drill will be conducted at this point.

4. **FULL SPECTRUM PRINCIPLES.**

The Electromagnetic Spectrum

Radio Spectrum | Visible Spectrum

Microwaves

ELF | VLF | LF | MF | HF | VHF | UHF | SHF | EHF | IR | UV | X-Rays | Gamma Rays
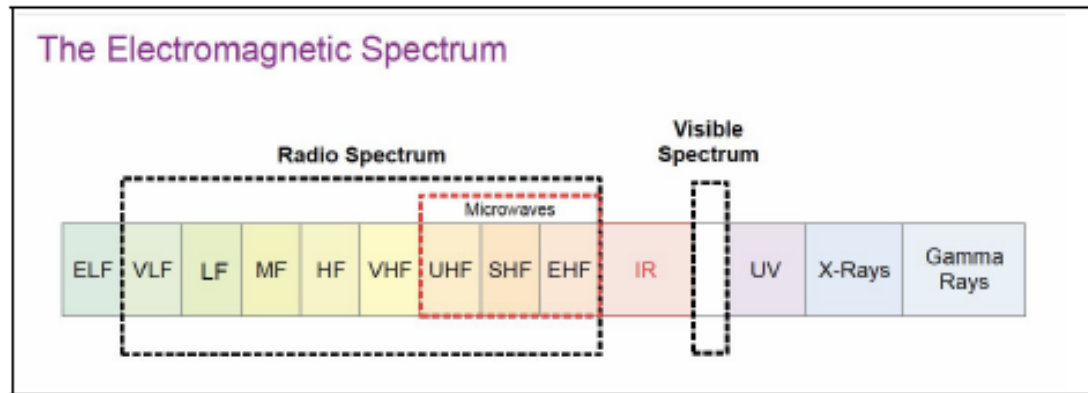
a. <u>EMCON Considerations</u>. The purpose of this next part of the lesson is to learn how to reduce the technical signature of the infantry Marine. Marines in today's battlefield need to be aware of their electrometric emissions in order to avoid being located and targeted by the adversary. Your radio can kill you. Our communications equipment squawks continuously and our adversaries can hear it. This is our challenge: Electromagnetic warfare (EW) is changing ground combat and we now need to change how we fight. The threat has changed. Our adversaries can now find us with sophisticated electromagnetic reconnaissance—EW satellites, aircraft, UAS, and ground collections capabilities— and then target us with long-range precision fires. Operations have changed. Our new concepts envision Marines seizing advanced bases under the arc of enemy missile fires. And even during traditional operations, Marines will face the threat of advanced EW collections cueing UAS and triggering long-range missile, rocket and artillery fire.

Las Vegas, Nevada, from outer space.
Source: International Space Station, 2010.

Marine CP in Iraq.
Source: National Archives, 2003.

b.   <u>EMCON Options</u>. To remain a viable force on the battlefield, units must understand the principles of camouflage and concealment. To design and effectively integrate camouflage and concealment activities, personnel must constantly consider an enemy's point of view. (What will it see? What characteristics will its sensors detect?) Placing a low priority on camouflage and concealment activities because of time constraints, minimal resources, or inconvenience could result in mission failure and the unnecessary loss of life.

     (1) <u>Infrared (Thermal) Sensor Concealment</u>. Natural materials and terrain shield heat sources from infrared sensors and break up the shape of cold and warm military targets viewed on infrared sensors. Do not raise vehicle hoods to break windshield glare because this exposes a hot spot for infrared detection. Even if the infrared system can locate a target, the identity of the target can still be disguised. Avoid building unnecessary fires. Use vehicle heaters only when necessary. ULCANSs, infrared-defeating obscurants, chemical-resistant paints, and certain uniforms are designed to help break up infrared signatures, but they do not defeat infrared sensors. During the winter, additional measures must be taken to reduce thermal signature.

     (2) <u>Ultra-Violet Sensor Concealment</u>. Enemy use of UV sensors poses a significant threat in snow-covered areas. Winter paint patterns, the arctic-style LCSS, and terrain masking are critical means for defending against these sensors. Any kind of smoke defeats UV sensors. Field-expedient countermeasures, such as constructing snow walls, also provide a means of defeating UV sensors.

     (3) <u>Radar Concealment</u>. GMTI radar is a threat to ground forces near a battle area. Radar-reflecting metal on uniforms has been reduced, and helmets and body armor are now radar-transparent. Plastic canteens are standard issue, and buttons and other nonmetal fasteners have replaced metal snaps on most field uniforms to minimize their vulnerability to detection by GMTI radar. But Marines must carry metal objects (ammunition, magazines, weapons) to accomplish their mission, and most radar can detect these items. Therefore, movement discipline is especially important. Moving by covered routes (terrain masking) prevents radar detection. Slow, deliberate movements across areas exposed to radar coverage helps avoid detection by GMTI radar.

c. <u>EM Emitters and Control Measures</u>.

(1) <u>List of Authorized Emitters</u>. Using all available Intel from your S-2, you will be able to assess what emitters you will be able to use, or not use. Your unit leader is responsible for creating an EMCOM plan. The following is an example plan, this can be added into any 5 paragraph order.

Example List of Authorized Emitters for one specific mission

List of Authorized Emitters: Convoy Operations			EMCON			
	Equipment	Freq/Power	1	2	3	4
1	Radio: VHF FH Voice	All / 10W	ON 1	ON 1	Off 2	Off 2
2	Radio: PRC-150 HF ALE CHAT	All	ON + Voice	ON + Voice	ON	Off
3	Radio: PRC-117G UHF MUOS CHAT	All	ON 3	ON 3	ON 3	Off 3
4	Radio: UHF (PRC-113, PRC-117)	All	ON	ON	OFF 4	OFF 4
5	Radio: SATCOM	-	ON	ON	Off 2	Off 2
6	Computers (non-communications)	NA	ON	ON	Off	Off
7	PED	-	ON	Off GPS Auth	Off GPS Auth	Off GPS Auth
8	UAS	-	ON	ON	Off	Off
9	Vehicle: JBC-P / BFT / TC	-	ON 5	ON 5	Off 2	Off 2
10	Vehicle: C-IED / CREW UHF	-	As needed	As needed	As needed	Off
11	Vehicle: Intercom	-	ON	ON	Off 6	Off

Notes: 1. Minimize calls in the assembly area. RP departure is particularly noisy and vulnerable. Restrict power to 10W.
2. NO voice at EMCON 3. Emergency calls are authorized only for safety, enemy contact, or CASEVAC.
3. All POSREPs are MUOS CHAT, except at EMCON 4. SEND only mission-essential reports.
4. NO voice at EMCON 3. Vulnerable UHF for emergency air coordination only: CAS, MEDEVAC.
5. JBC-P/BFT position reporting is Off. TC authorized to send text.
6. NO voice at EMCON 3. Convoy CDR can authorize intercom for specific elements, like security, for specific times.

(2) <u>EP EMCOM Responsibilities</u>. Each Marine must UNDERSTAND adversary electromagnetic support (ES) collection capabilities: electromagnetic reconnaissance, DF, and SIGINT. Marines must also understand friendly electromagnetic emission signatures: radios, computers, PED, UAS, vehicles, generators, and radars. Additionally Marines must train on the SOPs for EMCOM during any field exercise (well trained units need less comm) and BPT conduct combat operations under adversary EW threats.

(3) <u>Reducing EM Emissions</u>. Use these rules to reduce EM Emissions.

(a) <u>Talk Less</u>. TALK less. TRANSMIT only mission-critical information. TALK short. TALK correct.

(b) <u>Schedule Less</u>. MINIMIZE required reports. SCHEDULE comm windows.

(c) <u>Move</u>. MINIMIZE required reports. SCHEDULE comm windows.

(d) <u>Chat</u>. CHAT. Do NOT **call**. CHAT reports, requests, and brevity codes.

(e) <u>Signal</u>. SIGNAL movement, tactical action, and convoys with one-arm hand and arm signals.

(f) <u>Wire</u>. COMMUNICATE between stationary positions with comm wire and field phones.

(g) <u>Mask Antennas</u>. PLACE CP, vehicle, and manpack antennas behind barriers, buildings, woods, or hills.

(h) <u>Reduce Power</u>. SHUT it OFF when not in use. SET radio to low power.

(i) <u>Plan Simple Flexible Ops</u>. PLAN operations that require less radio calls. PLAN less nets.

(4) <u>Considerations</u>. Marines and leaders need to TRAIN on proper radio procedures and ENFORCE disciplined EP EMCON practices. See TALK Less, SCHEDULE Less, MOVE, CHAT, SIGNAL, WIRE, MASK Antennas, REDUCE Power, PRIORITIZE LPD Nets, and PLAN Simple Flexible Ops. The most important goal is to reduce radio calls. The technical signature of Marine infantry units is mostly radio emissions. The main effort is to **PLAN simple flexible operations** that require less radio calls. Well-trained units need less comm. Marines need to understand that covered nets do NOT protect them from being located and targeted. Secure nets like SINCGARS VHF FH can be located. The *volume* of traffic—especially before stepping off on an operation—is an indicator to the enemy. The *origin* of the traffic is a target. Marine command posts, a priority target for the enemy, emit large electromagnetic signals. Locate CPs in buildings or woods, and disperse tents, vehicles, antennas, and generators as far away as possible. Cover everything with camouflage netting. CPs are vulnerable to adversary DF collections and must enforce strict EP EMCON procedures.

(5) <u>Reduce Computer EM Emissions</u>. Follow these rules to reduce your computer EM Emissions.

(a) <u>Shut It Off</u>. Computers emit small amounts of EM for short distances, and must be shut off when not in use. Unplug all unnecessary peripheral.

(b) <u>Disable Wifi/Bluetooth</u>. The only recommended connections should be shielded wire. Your S-6 can only be contact to induce other processes if needed (I.E. disable unnecessary ports, limit the amount of computers, and monitor usage.)

(6) <u>Reduce PED EM Emissions</u>.

(a) <u>PROHIBIT all portable electronic devices (PED)</u>. EM emission risk is small compared to information leakage. The adversary can exploit vulnerabilities in applications, data storage, geo-located photographs, and internet traffic. Even when wireless is disabled, some devices save location and pattern of life information for later automatic upload, without the user's knowledge. Many PED have more than one transmission technology and are vulnerable even when not connected to the internet.

(b) <u>COLLECT All PED</u>. When deployed, CONTROL all PED use to specific locations and times. SET clear PED policy. NO connections to the Marine Corps network. NO wireless device-to-device information sharing. NO photographs of documents or computer screens. NO access to classified spaces or medical spaces. NO data storage of FOUO or PII. **Mobile phones** run applications, even games, that store GPS location information. Cellular phone connectivity and internet connectivity create global signatures and vulnerabilities. DISABLE geo-location on cameras. SHUT OFF wireless (WiFI, bluetooth) search emissions. **Smart watches** can store GPS location data and emit wireless signals. SHUT OFF wireless (WiFI, bluetooth) emissions. DISABLE watch apps on phones, tablets, or computers.
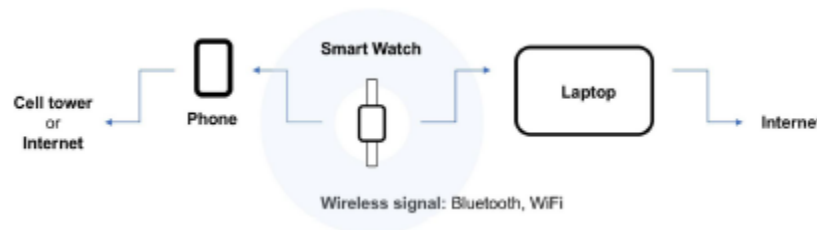
(c) <u>Fitness Trackers</u>. Most trackers CANNOT be SHUT OFF. Batteries CANNOT be removed. Wireless transmissions CANNOT be stopped. GPS and data storage CANNOT be disabled. DISABLE the associated fitness tracker apps on phones, tablets, or computers.

(d) Computer Tablets And E-Readers. Different brands (iPad, Samsung Galaxy, Amazon Fire, NOOK, Kindle, Lenovo) have different capabilities. Some emit wireless signals. Some have cellular telephone connectivity. Some have camera, data storage, and internet capability.

(e) Inventory scanners store and upload location data and emit wireless signals.

(f) GPS devices or commercial GPS wrist watches—are usually receive-only. However, some commercial devices track and store location data for later wireless upload. This feature must be disabled. GPS receivers can be jammed or spoofed with incorrect grids. Commercial GPS wrist watches are more vulnerable to spoofing. The DAGR, especially when loaded with crypto, is less vulnerable to jam or spoof.

g.   Other PED. Two-way-radios, digital cameras, camcorders, pagers, personal digital assistants (PDAs), thumb drives and other storage devices, computer peripherals, and fax machines all pose some risk to deployed units.

(7) Understanding Adversary Capabilities.

(a) ES collections. Your S-2 will be your primary source of information to identifying and understanding ES collection capabilities and negating your signal from them.

1.   Marines and unit leaders can search for items on SIPR in the intelligence sections (see S-2). The internet can be a source of information on this as well, but be sure to have your S-2 check the source before you use this information.

2.   Request a Threat Vulnerability Assessment (TVA) on the enemy in the AO. Once this is conducted, it will tell what the enemy can do and tell you friendly EM vulnerabilities as well. Counter Intelligence will conduct this report.

(b) Satellite ES Collections. Ask your S-2 what Electromagnetic Emissions can adversary satellites collect in our AO, or search for info on SIPR. Marines must understand satellite terms and what kind of satellites are adversaries have. Additional Satellite TTPs and Satellite proliferation (commercial and government) terms. For more space concepts or satellite question see www.dia.mil/military-power-publications

and read Space Threat Assessment 2020. Example of types of orbit in relation to space:

        (c) <u>Aircraft ES Collections</u>. Ask your S-2 for electromagnetic emissions that adversary aircraft can collect in our AO. SIPR is once again a commonly used tool for this. Read TTPs and sensor capabilities on the craft. Pilot training also plays a pretty big picture.

        (d) <u>UAS ES Collections</u>. Ask your S-2 for electromagnetic emissions that adversary UAS can collect in our AO. SIPR is once again a commonly used tool for this. Note that the UAS is in category based on size and operation altitude. See <u>MCRP 3-20.5 Unmanned Aircraft System Operations</u> and <u>MCRP 3-42.1A UAS Multi-Service TTPs</u> for more details.

        (e) <u>UAS Ground Collections</u>. Ask your S-2 for electromagnetic emissions that adversary ground units can collect in our AO. SIPR is once again a commonly used tool for this. Note that the UAS is in category based on size and operation altitude. Recent historical events (I.E. the Russian-Georgian Conflict, and the Warfare in Ukraine and Syria) have shaped how are adversaries are trying to attrite the U.S. Battlefield supremacy.

        (f) <u>U.S. EW Doctrine</u>. U.S electromagnetic warfare doctrine is split up into three divisions; <u>Electromagnetic Attack, Protection, and Support</u>.
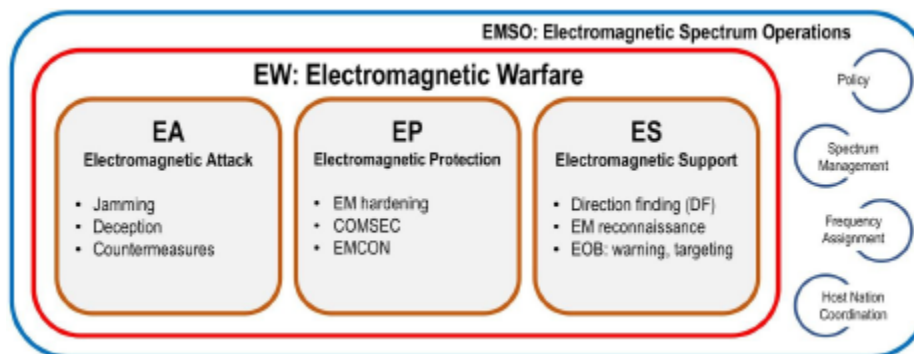
        <u>1</u>. EW is part of the larger electromagnetic spectrum operations (EMSO)—management of the electromagnetic environment. EMSO is called 'JEMSO' in joint doctrine.

        <u>2</u>. <u>Electromagnetic Attack</u>. Division of electromagnetic warfare involving the use of electromagnetic energy, directed energy, or antiradiation weapons to attack

personnel, facilities, or equipment with the intent of degrading, neutralizing, or destroying enemy combat capability and is considered a form of fires.' (*DOD Dictionary* , 1 Jun 2020). EA includes jamming, deception of adversary ISR, countermeasures such as CREW, intrusion of false information into adversary nets, and probing.

(g) <u>Electromagnetic Protection</u>. Division of electromagnetic warfare involving actions taken to protect personnel, facilities, and equipment from any effects of friendly or enemy use of the electromagnetic spectrum that degrade, neutralize, or destroy friendly combat capability. (*DOD Dictionary* , 1 Jun 2020) EP includes electromagnetic hardening or shielding of equipment, COMSEC crypto and TRANSEC frequency hopping technology, and emission control (EMCON) actions such as reducing power and using directional antennas to limit signatures. Friendly EP minimizes the enemy's ability to conduct ES and EA against us. Wartime reserve modes are EP. Defensive EA—countermeasures to foil adversary guided weapons or electronically triggered weapons (CREW) is NOT EP.

(h) <u>Electromagnetic Support</u>. Division of electromagnetic warfare involving actions tasked by, or under direct control of, an operational commander to search for, intercept, identify, and locate or localize sources of intentional and unintentional radiated electromagnetic energy for the purpose of immediate threat recognition, targeting, planning and conduct of future operations. (*DOD Dictionary* , 1 Jun 2020) ES collects data through direction finding (DF) and electromagnetic reconnaissance to update electromagnetic order of battle (EOB) files. This information is used for threat warning and targeting purposes. ES is short-term collections that support local commanders. SIGINT is a national-level collections effort. ELINT—collecting on non-communications devices such as radars and vehicles—is a subset of SIGINT.

Notional Component Electromagnetic Spectrum Operations Organization
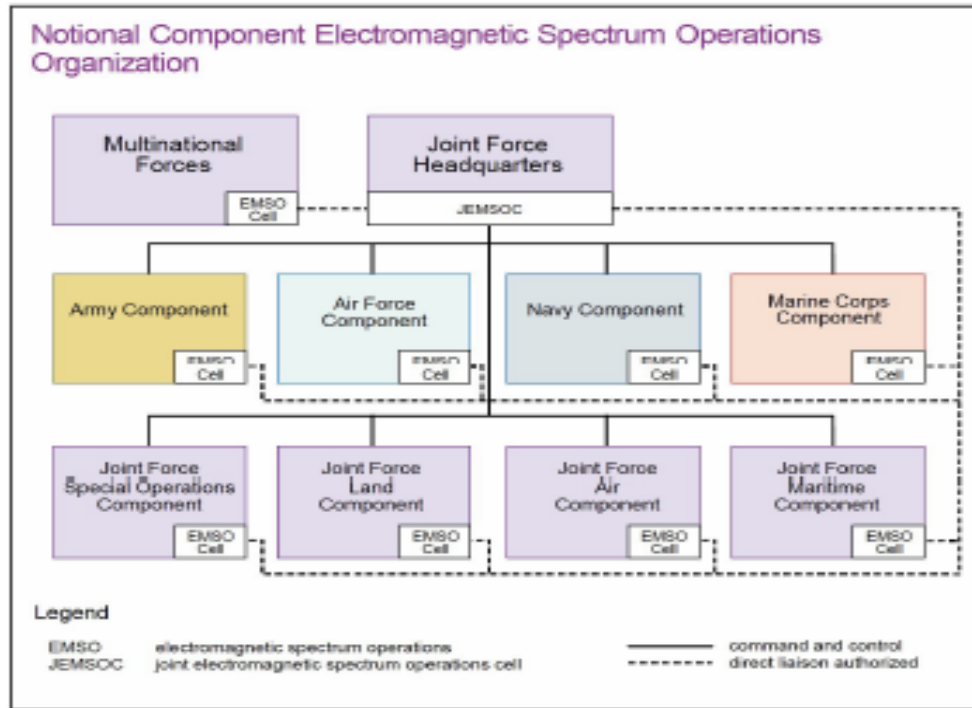
REFERENCES:

NUMBER	TITLE	PAGE
JP 3-85	Joint Electronic Warfare Capabilities	Entire Manual
MCTP 3-01A	Scouting and Patrolling	Entire Manual
MCRP 3-32.2	MTTP Military Deception Operations	Entire Manual
MCTP 3-34C	Survivability Operations	Entire Manual

NOTES:

PERFORM INDIVIDUAL ACTIONS IN A PATROL

MCT0105

01/21/2021

LEARNING OBJECTIVES FOR THIS LESSON

1. **LEARNING OUTCOME**.

    a. Marines will possess the knowledge and understanding of different types of patrols and will be able to apply basic decision making, individual movement, and immediate actions as a member of a team while conducting surveillance, observation, concealment, verbal and non-verbal communication in dynamic situations. (6)

2. **ENABLING LEARNING OBJECTIVES**.

    a. Given a list of choices, identify the types of patrols in accordance with MCTP 3-01A. (6A)

    b. Given a list of choices, identify the characteristics of danger area in accordance with MCTP 3-01A. (6C)

STUDENT INFORMATION

OVERVIEW: In this lesson, Marines will learn about the patrol types, organization, missions of patrols, how to properly prepare for a patrol, proper execution of a patrol (by type), Immediate actions,

CLASS PREPARATION: Read this outline prior to the start of this class. Ensure you have all materials provided for this class. **OUTLINE.**

1. **THE DEFINITION OF A PATROL**.

A patrol is a detachment of Marines sent out from a larger unit to perform an assigned mission of gathering information, carrying out a harassing, a destructive combat mission, or a security mission.

a. **The Purpose Of Patrolling**. A commander must have current information about the enemy and the terrain if he is to employ his unit effectively. Patrols are an important means of gaining this information. They may also be used to destroy enemy installations, capture enemy personnel, perform security missions, or to prevent the enemy from gaining information. Modern warfare places a high premium on effective patrolling because units have larger areas of operation and can be threatened from all directions. As the distance between units increases, aggressive patrolling becomes necessary for security, to prevent infiltration by enemy units, and to establish contact with friendly adjacent units.

2. **TYPES OF PATROLS.**

a. **Patrols Classified By Mission**. Patrol missions can range from security patrols in the close vicinity of the main body to reconnaissance deep into enemy territory. The planned action determines the type of patrol. The two categories of patrols are: Combat patrols and Reconnaissance patrols.

(1) Regardless of the type of patrol being sent out, a clear task and purpose must be issued to the patrol leader. Any time a patrol leaves the main body of the unit there is a possibility that it may become engaged in close combat.

b. **Combat Patrols**. A combat patrol is a tactical unit sent out from the main body to engage in independent fighting. It may be to provide security or to harass, destroy, or capture enemy troops, equipment, or installations. Combat patrols, which are normally larger and more heavily armed than reconnaissance patrols, usually depart with the intent of making contact with the enemy, followed by a return to friendly positions. Regardless of the mission, the patrol reports any information concerning the enemy and terrain that it acquires while executing the assigned mission by conducting an after action (i.e., patrol) debrief with an intelligence representative from the CLIC or the battalion S-2. There are three types of combat patrols that the squad may be tasked with: **ambush**, **contact**, and **security**.

(1) Ambush. Is a surprise attack from a concealed position upon a moving or temporarily halted target. An ambush patrol does not need to seize or hold terrain. It may close with and destroy the enemy (i.e., near ambush) or attack by fire (i.e., far ambush). Ambushes must be executed with ferocity and violence of action, seeking decisive effects in the opening

moments of the engagement. The size of the enemy, the orientation of the ambush site, the battlespace geometry, security, and the size of the ambush element generally dictate what means of employment the squad leader chooses. Leaders execute ambushes to reduce the enemy's overall combat effectiveness for the specific purpose of destroying its units. Destruction is the primary purpose of an ambush because the loss of personnel killed or captured and the loss of equipment and supplies destroyed or captured reduces the enemy's overall combat effectiveness. Frequent ambushes force the enemy to divert soldiers from other missions to guard convoys, troop movements, and logistics resupply efforts. Based on the amount of time available, ambushes may occur hastily or deliberately, as described here:

(a) A hasty ambush is conducted based on an unforeseen opportunity. It is used when a patrol sees the enemy before the enemy sees them, and the patrol has time to act, usually as an immediate action drill.

(b) A deliberate ambush is conducted against a specific target at a location chosen based on intelligence. With a deliberate ambush, leaders plan and prepare based on detailed information that allows them to anticipate enemy actions and enemy locations. The ambush site is the terrain on which a point ambush is established. An ambush site contains a support by fire position for the support element and an assault position for the assault element. The ambush site should not be in an obvious location. It should provide:

<u>1</u>. Good fields of fire into the kill zone.

<u>2</u>. Good cover and concealment.

<u>3</u>. Protective obstacles (e.g., a river, a canal) between the ambush site and kill zone, if possible.

<u>4</u>. A covered and concealed withdrawal route.

<u>5</u>. A defense against a possible enemy flank attack.

(c) <u>Ambush Considerations</u>. During METT-T analysis, the squad leader identifies four different locations related to ambushes: the kill zone, the ambush site, security positions, and rally points. Squad leaders should consider the following when selecting these four positions (See deliberate considerations above).

(d) <u>Kill Zone Considerations</u>. The kill zone is the part of the ambush site where concentrated fire is delivered to trap, isolate, or destroy enemy forces. The concentration of fire may vary depending upon whether it is a near or far ambush. The kill zone should have the following characteristics:

<u>1</u>. A location that enemy forces are likely to enter.

<u>2</u>. Provide natural tactical obstacles between the kill zone and the assault position, when possible.

<u>3</u>. Large enough to observe and engage enemy forces.

<u>4</u>. A near ambush is a point ambush where the assault element is within reasonable assaulting distance of the kill zone (i.e., less than 50 meters). Close terrain, such as an urban area, jungle, or heavy woods, may require this positioning.

<u>5</u>. A far ambush is a point ambush where the assault element is beyond reasonable assaulting distance of the kill zone (i.e., beyond 50 meters). This location may be appropriate in open terrain offering good fields of fire, or when attack is by fire for a harassing ambush.

(2) <u>Contact</u>. A contact patrol is a patrol sent out from one unit to make contact with another unit, either friendly or threat forces. Though modern technology has reduced (but not eliminated) the need for contact patrols to be conducted between US forces, there still may be a need when a US force must contact a non-US coalition partner which lacks compatible communications or position reporting equipment. Contact patrols may go to the other unit's position, or the units can meet at a designated contact point. The squad leader provides the unit with information about the location, situation, and intentions of their own unit, and obtains and reports the same information about the contacted unit back to HHQ. The contact patrol also observes and reports pertinent information about the area between the two units. Though this is one possible mission of a contact patrol, the standard mission of a contact patrol is to maintain contact to the front, flanks, or rear of the unit by:

(a) Establishing contact with an enemy force when the definite location of the force is unknown.

(b) Maintaining contact with enemy forces through direct and/or indirect fires, or observation.

(c) Avoiding decisive engagement with the enemy.

(3) Security. Security patrols are conducted during offense, defense, and stability activities across the full range of military operations. Just as the nature of security requirements can be different in each of the operational areas, so can the manner in which security patrols are employed.

(a) Patrols are assigned missions that may or may not require them to engage the enemy. They are used in proximity to defensive positions, on the flanks of advancing units or in rear areas. Purposes of security patrols are to detect infiltration by the enemy, destroy infiltrators, and protect against surprise and ambush.

(b) In any situation where there is a threat of attack, such as a rear area threatened by guerrillas or a facility that is under threat of a terrorist attack, all Marines, not just the infantry, must know how to conduct a security patrol.

(c) In just the offensive operations, infantry units provide security patrols to screen their flanks, areas, and routes. Whereas, in defensive operations, security patrols are used to prevent the enemy from infiltrating an area, detect and destroy infiltrators, and prevent surprise attacks. In rear areas, particularly when there is guerrilla or terrorist threat, the requirement to conduct security patrols increases for all Marine air-ground task force (MAGTF) units ashore, particularly aviation and combat service support units.

b. **Reconnaissance Patrols**. Reconnaissance patrols gather information about the enemy, terrain, or resources for the purpose of confirming or disproving the accuracy of information. The squad is ideally suited for reconnaissance patrol missions because of its relatively small size, cohesion, and experience working together. Reconnaissance patrols are conducted to gather information on:

(1) The locations of possible threat forces, installations, and equipment.

(2) The identification of enemy units and equipment.

(3) The strength and disposition of enemy forces.

(4) The movement of enemy personnel and equipment.

(5) New or special types of weapons.

(6) Unusual activities of threat forces.

(7) Patterns of life.

(8) Population atmospherics.

(9) Types of Reconnaissance Patrols. The goal of reconnaissance patrols is to rely on stealth rather than combat strength, to gather the necessary information, and to fight only when necessary to complete the mission or to defend themselves. A reconnaissance patrol normally travels light, with only the required personnel, arms, ammunition, and equipment necessary to complete the mission. This increases stealth and cross-country mobility in close terrain. Regardless of how the patrol is armed and equipped, reconnaissance patrols must be able to rapidly transition to combat. The three types of reconnaissance patrols include:

(a) Area. An area reconnaissance is a directed effort to obtain detailed information concerning the terrain or enemy activity within a prescribed area such as a town, ridge line, woods, or other features critical to operations. Critical Actions include; actions form the ORP, execution of the observation plan, and link-up of the reconnaissance elements.

(b) Route. Route reconnaissance is oriented on a road, a narrow axis such as an infiltration lane, or on a general direction of attack. Squads conducting route reconnaissance missions should view the route from both the friendly and enemy perspectives. Infantry squads require augmentation with technical experts (e.g., combat engineers) for a complete detailed route reconnaissance. However, squads should be capable of conducting a quick route reconnaissance or area reconnaissance of selected areas of a route. The squad could also be tasked to survey a route along a planned infiltration lane. After being briefed on the proposed infiltration, the squad leader conducts a thorough map reconnaissance and develops the surveillance plan. The platoon reports conditions likely to affect friendly movement. These conditions include: The presence of the enemy, Terrain Information, The location and condition of

obstacles (manmade and natural), Fords, Bypasses, chokepoints, route and bridge conditions.

        (c) <u>Zone</u>. A zone reconnaissance is a directed effort to obtain detailed information concerning all routes, obstacles (to include chemical or radiological contamination), terrain, and enemy forces within a zone defined by boundaries. A zone reconnaissance normally is assigned when the enemy situation is vague or when information concerning cross-country trafficability is desired.

3. **<u>PATROL ORGANIZATION</u>**.

The key to successful small unit combat organization is unit cohesion. The nature of infantry patrolling does not normally permit long periods of preparation and rehearsal to build a unit specifically for each mission. Accordingly, the infantry unit leader must combine unit integrity considerations with the proven concepts of patrol organization. Organization of a patrol is a two-step process. First, there is the general organization of the entire patrol and second the task organization of various patrol elements. The patrol leader establishes a patrol headquarters and elements to accomplish the mission. The major subdivisions of reconnaissance and combat patrols are elements. The existing infantry structure (squads and fire teams) is reinforced as required.

    a. **<u>General Organization</u>**. A combat patrol is organized into four units. Any attachments a patrol may have (i.e., demolition team, scout snipers, and machine gun squad) will be added to the element that supports its function. For example, the demolition personnel should go with the unit conducting the attack, and scout snipers and machine gunners should stay with the support element. The size of each element is based on the situation and the squad leader's analysis of METT-T. Unit leaders should seek to maintain fire team cohesion when establishing elements (e.g., assault and support). The squad leader ensures that every individual, team, and element is organized and assigned a specific task, but that ALL are capable of and prepared to perform other tasks. This may not be possible for certain specialist tasks requiring a trained technician (e.g., demolition, scout/sniper, explosive ordnance disposal). While these considerations are general they can be applied to both types of patrols. See the Examples below.
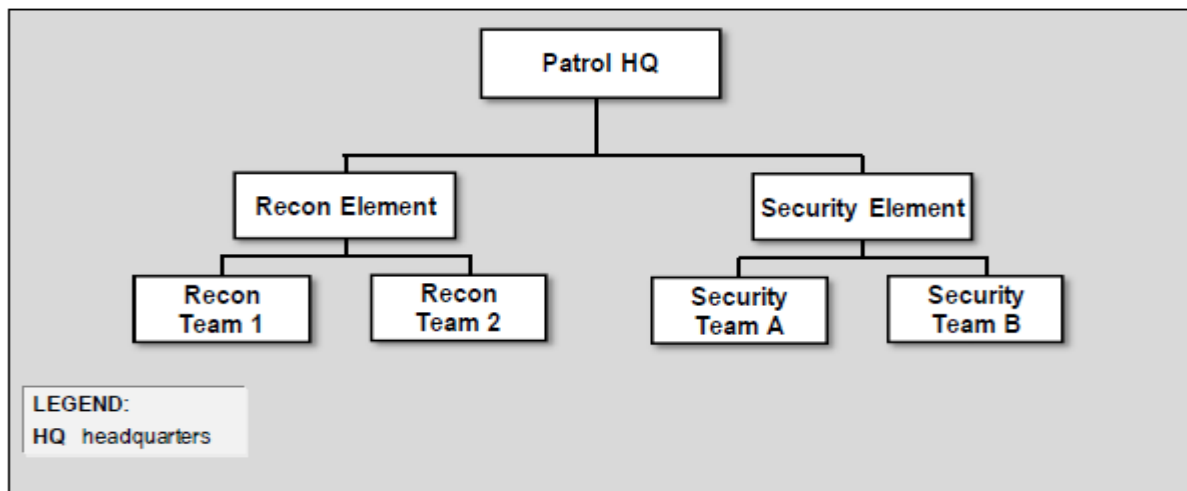
Reconnaissance Example
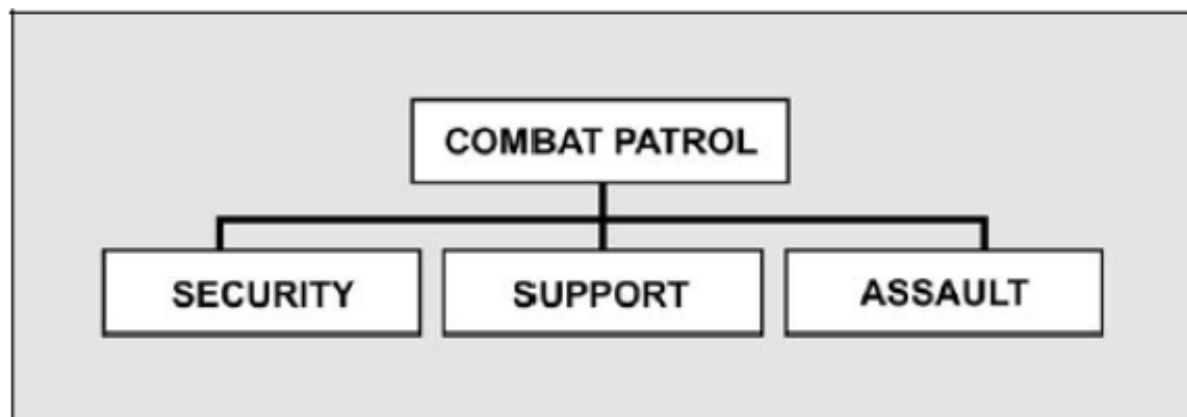
Combat Example

     (1) <u>Headquarters</u>.

       (a) The headquarters is composed of the patrol leader, assistant patrol leader, and personnel who provide support for the entire patrol, such as a forward observer, corpsman, UAS operator, and radio operator.

       (b) The headquarters element controls speed and direction of movement, may provide flank security during the patrol, responsible for communication with higher, and ultimately responsible for any and all aspects required to control and support the patrol.

       (2) <u>Security Element</u>. The security element fills a very critical task. While all elements of the patrol are responsible for their own local security, what distinguishes the security

element is that it protects the entire patrol. Their positions must be such that they can—depending upon the engagement criteria, and provide early warning of approaching enemy forces. To facilitate the success of the assault element, the security element must fix or block all enemy response forces away from the objective area. The security element is a force that performs four roles:

        (a) It isolates the objective area from enemy forces attempting to enter it.

        (b) It prevents enemy forces from escaping the objective area.

        (c) It protects the assault and support elements.

        (d) It secures the patrol's withdrawal route.

    (3) <u>Assault Element</u>. The assault element executes the squad's decisive effort (i.e., task and purpose). Its task is to conduct the necessary actions on the objective. This element must be capable of destroying or seizing the target of the combat patrol. Tasks typically associated with the assault element include:

        (a) Conducting an assault across the objective to destroy enemy equipment, capture or kill enemy personnel, or clear key terrain and enemy positions.

        (b) Deploying close enough to the objective to conduct an immediate assault if detected.

        (c) Being prepared to support itself if the support element cannot suppress the enemy.

        (d) Providing support to an attached breach element to reduce obstacles, if required.

        (e) Conducting a controlled withdrawal from the objective.

        (f) Marines within the assault element can expect to be augmented with or tasked to fill the following special teams; search, detainee, demolition, aid and litter teams.

    (4) <u>Support Element</u>. The purpose of the support element is to suppress the enemy on the objective using direct and

indirect fires. The support element is a shaping effort that sets conditions for the mission's decisive effort (i.e., the assault element). The support force may be divided into two or more elements if required, based on METT-T. The support element must be organized to contend with any secondary enemy threat that could interfere with the assault elements. The support elements suppress, fix, or destroy enemy elements on the objective. The support element's primary duty is to suppress enemy forces; preventing the enemy from repositioning against the assault elements. The support force:

       (a) Gains fire superiority with crew-served weapons and indirect fires.

       (b) Controls the rate and distribution of fires.

       (c) Shifts or ceases fire on signal.

       (d) Supports the withdrawal of the assault element.

  b. **Special Organization**.

     (1) Patrol's units are further subdivided into teams. Each of which performs essential, designated tasks. Such as demolition team, EPW/detainee search team, aid/litter team etc.

     (2) Each team must be given clear instructions as to what type of support must be provided, at what location, and during what phase of the patrol.

  c. **Task Organization**. The patrol leader must organize the patrol in such a manner as to make sure that each individual, team, and unit is assigned a specific task or tasks. In addition, it is imperative that all the patrol members know how to perform the task assigned to all members of the patrol. This may not be possible in cases where trained technicians are required to perform certain task; however the requirement for that technical task to be performed will almost certainly be the exception rather than the rule. The patrol leader must plan for maximum flexibility to take care of an emergency and ensure that the patrol's mission is not put in jeopardy with the loss of a couple of key members, a team, or an entire element.

d. **Individual Tasks**.

(1) Tasks for subordinate leaders to direct and supervise the initial preparation which may include following time schedule in accordance with warning order, drawing ammunition, rations, and special equipment; conducting immediate action drills or other necessary individual or unit training; meeting and briefing attachment personnel; reconnoitering the area for passage of lines; and coordinating with the necessary unit leaders.

(2) Assistant Patrol Leader (APL). Assist the Patrol Leader in patrol prep, navigation, and rehearsals and take charge in the absence of the patrol leader. The APL is responsible for accountability throughout the patrol; getting head counts during halts, after crossing danger areas, and upon consolidation get the ammo, casualty, and equipment report.

(3) Radio Operator (RO). Maintain communications with higher at all times. Report all incoming transmissions to me. Maintain radio silence. Report the patrol's progress using Brevity Codes.

(4) Navigator. Know the patrol's location at all times. Maintain the direction of movement in accordance with the patrol route. Report the arrival at all checkpoints to the PL.

(5) Paceman. Know the distance for each leg of the patrol. Be able to notify the navigator and PL the distance covered at all times.

(6) Flanks. When terrain and vegetation permit, move out to provide security to the right and left of the patrol formation.

4. **REHEARSALS/INSPECTIONS**.

a. **Rehearsals**. Ensure the operational proficiency of the patrol. Plans are checked and any necessary changes are made. The patrol leader verifies the suitability of the equipment. It is through rehearsals that patrol members become thoroughly familiar with the actions they are to take during the patrol.

(1) If the patrol is to operate at night, conduct both day and night rehearsals. They should be conducted on terrain similar to that on which the patrol will operate. All actions should be rehearsed. If time is limited, only the most critical

phases should be rehearsed. Action at the objective area is the most critical phase and should always be rehearsed.

(2) The patrol should talk through each phase, describing the actions and have each man perform his duties. The patrol then walks through all phases of the patrol, using only signals and commands that will be used during the actual patrol. Rehearsals continue until the patrol is thoroughly familiar with the plan. The rehearsal is also used to test the sound-ness of the patrol order and patrol organization. You will also test fire weapons at range/designated area by following the squad leaders instructions.

(3) After the rehearsals, the patrol leader makes final adjustments to his plan based on what he learned during the rehearsal. When this is complete, the patrol leader issues final instructions to subordinate leaders noting any changes he has made in the patrol plan. While the team leaders are making adjustments with the teams, the patrol leader reports to the commander stating that his patrol is ready to conduct the mission.

b. **Inspections.** The patrol leader conducts inspections to determine the patrol's state of physical and mental readiness. The patrol leader conducts an initial inspection before rehearsals to ensure completeness and correctness of uniform and equipment. This is so that rehearsals are conducted as realistically as possible with all required gear and equipment. Prior to the patrol stepping off the patrol leader should conduct a final inspection. This is to ensure all equipment is still in working order, that any discrepancies on the initial inspection have been corrected, and that the unit is ready to embark on the mission.

(1) For the patrol leader's inspection, you are responsible for:

(a) Having prescribed uniform, weapons, ammunition, ordnance, and equipment as indicated in the warning order. Ensure that all items are available, serviceable and silenced.

(b) Know the SOP for the units CASEVAC plan.

(c) Know SOP for lost Marine plan.

(d) Having completely camouflaged face, neck, hands, and gear. Ensure that you are correctly camouflaged using either the splotching or striping technique.

(e) Having identification tags and Geneva Convention card (Military Identification Card).

(f) Not taking any unnecessary equipment and personal items. Especially items that can give information to the enemy (i.e) personal letter or official documents). Only mission essential gear and equipment should go on the patrol.

(2) During the inspection, the patrol leader will question each member of the patrol to ensure he knows:

(a) The mission, routes, and fire support plan.

(b) His assignment and during what part of the patrol he performs it.

(c) What the other members of the patrol are to do at certain times during the patrol.

(d) Challenges and passwords, near and far recognition signals, call signs, frequencies, code words, reporting times, and other pertinent details.

5. **TARGET INDICATORS.**

a. **Camouflage And Concealment**. Ensure your entire body and all gear is camouflaged. Try to blend in with your surroundings and remain in the shade as much as possible. Moving shadows attract attention. Remain motionless when observing. Anything in motion attracts the eye. Also avoid the skyline and distort or change distinct outlines because objects can be seen and easily identified from great distances by their outlines. Anything that goes on patrol with you should come back with you. Do not drop trash, gear, or anything that could identify you or your unit and alert the enemy that you have been operating in the area. See signature management for more details.

b. **Light Discipline**. Expose nothing that reflects light. Cover or remove anything that is reflective such as snaps or buckles on your gear or rank insignia. At night, do not use flashlights or open flames. No one is allowed to smoke while on patrol.

c. **Noise Discipline**. Ensure all gear is properly secured.
Remove or tape down rifle slings and other gear to reduce
unwanted noises. Top off canteens before you step off so they
don't make sloshing noises. Do not speak unless absolutely
necessary; use hand and arm signals. Your hearing is amplified
with your mouth open and removing your helmet will reduce sound
distortion. Sounds are transmitted a greater distance in dry
weather and at night than in wet weather or in the daytime. At
night, sounds become very important. Stop frequently to listen
for the enemy and to ensure you are not making identifiable
noises.

| Striping | Splotching | Combination |

d. **SLLS**. While on patrol at irregular intervals conduct
SLLS. SLLS is an effective tool to acclimatize senses to the
environment.

    (1) STOP, at a point of concealment.

    (2) LOOK, for signals of human or animal activity
(smoke, tracks, roads, aircrafts, vehicles, troops, wire, etc.).
Watch for trip wires or booby traps, and avoid leaving evidence
for travel. Peripheral vision is more effective for recognizing
movement at night and twilight.

    (3) LISTEN, for vehicles, troops, aircrafts, weapons,
animals, etc.

    (4) SMELL, for vehicles, troops, fire, animals, etc.

6. **CONTROL MEASURES**.

Control measures are used as means of controlling the movement
of a patrol and aid the patrol leader in keeping the patrol

organized. The different control measures are checkpoints and
rally points.

    a. **Checkpoints**.

      (1) A checkpoint is a predetermined point on the surface
of the Earth used as a means of controlling movement, a
registration target for fire adjustment or reference for
location. Checkpoints are a means of control between the parent
unit and the patrol. These locations are decided upon and
coordinated before the patrol leaves, so that both the patrol
members and the parent unit will know where the patrol is when
the patrol reports in. The parent unit can follow the progress
of the patrol without the need of transmitting coordinates that
the enemy could monitor.

      (2) Individual Actions At Check Points. Actions at
checkpoints will vary depending on how the patrol leader or unit
uses checkpoints.

        (a) Usually, the patrol will pass through or near a
checkpoint and the patrol leader will radio that information in
to the higher unit. This way, the unit can monitor the progress
of the patrol.

        (b) At times, the patrol leader may call for a halt
at a checkpoint in order to change directions, study the map,
pass information to element leaders, etc.

    b. **Rally Points.** A rally point is an easily identifiable
point on the ground where units can reassemble and reorganize if
they become dispersed. It should provide cover and concealment,
be defensible for at least a short time, and be easily
recognized and known to all patrol members. All rally points
are considered and identified as tentative rally points until
they are occupied, found to be suitable, and designated as rally
points by the patrol leader. Rally points should be located
every three to five hundred meters and on the near and far side
of danger areas. Rally points should be considered and
tentatively mapped out when planning a patrol. However,
confirmation or rejection of rally points can only occur once
the patrol leader has seen the actual ground. In the worst-case
scenario you may have to give a direction and a distance on the
far side of a danger area. If the patrol gets dispersed due to
enemy contact or another reason, the patrol needs to know what
to do at rally points. There are three types of rally points:

(1) <u>Initial Rally Point</u>. The initial rally point is within friendly lines where the patrol can rally if it becomes separated before departing the friendly area or before reaching the first en route rally point. It may be the assembly area where the patrol waits while the patrol leader contacts the last friendly position through which the patrol will pass. The location of the initial rally point must be coordinated with the forward unit commander.

(2) <u>Checkpoint</u>. A checkpoint is a predetermined point on the surface of the Earth used as a means of controlling movement, a registration target for fire adjustment or reference for location (JP 1-02). Checkpoints are a means of control between the parent unit and the patrol. These locations are decided upon and coordinated before the patrol leaves, so that both the patrol members and parent unit will know the patrol's location when it reports in. The parent unit can follow the progress of the patrol without transmitting coordinates over the radio that the enemy could monitor.

(3) <u>En Route Rally Point</u>. These are rallying points between the initial rallying point and the objective rallying point; and from the objective rallying point back to the point where the patrol reenters friendly lines. They are determined as the patrol passes through a likely area that is suitable for a rally point.

(4) <u>Objective Rally Point (ORP)</u>. The objective rally point is located nearest the objective where the patrol makes final preparations prior to approaching the objective and is sometimes called the Final Preparation Position (FPP). It also serves as a location where the patrol reassembles after completing actions on the objective. The objective rally point must be suitable to accommodate those activities accomplished prior to actions on the objective. This position must provide the patrol concealment from enemy observation and, if possible, cover from enemy fires. It may be located short of, to a flank or beyond the objective. It should be out of sight, sound, and small-arms range of the objective area. The patrol leader's reconnaissance of the objective is made from this position; it is the release point from which patrol elements and teams move to the objective to accomplish the mission.

7. **<u>SECURITY</u>**.

a. The patrol is dispersed consistent with control, visibility, cover, and concealment. Scouts are employed to the

front, flanks, and rear of the patrol to provide security. For
the patrol members traveling in the main body of the patrol,
areas of responsibility are assigned to the front, flanks, and
rear. Scouts are the eyes and ears of the patrol leader. They
move when and where directed by the patrol leader and maintain
contact with the patrol leader at all times, except when
momentarily obscured by vegetation or other terrain features.

    b. **Front**. Small patrols (squad size) may employ from one
scout up to a fire team as the point, depending on the enemy
situation, terrain, and route being followed by the patrol.
Normally, squad-size patrols will use two scouts as the point.
The point is responsible for investigating the route of advance
immediately to the front of the patrol. The point moves as far
ahead of the patrol as visibility and terrain permit. When
visibility is good, the point may precede the main body by as
much as 100 meters. The point travels right and left ahead of
the patrol, searching the area over which the patrol will pass.
The point maintains direction by knowledge of the general route
to be followed and visual contact with the patrol leader. The
patrol leader or the navigator ensures that the point is
proceeding correctly. The point, which stays far enough ahead
of the patrol to provide security, is not a trailbreaker for the
patrol. If the point loses contact with the patrol, the point
waits for the main body to catch up or moves rearward if contact
is not quickly regained. One of the navigators may be
positioned with the point. One or more member's works as the
point while the other is the navigator.

    c. **Flank**. For patrols of squad size or less, using one or
two members on either flank may provide security. If two scouts
are assigned to a flank, one is positioned to observe the patrol
leader and the other works farther out from the patrol. The
scout who must observe the patrol leader remains within a
maximum distance of 100 meters. The scout farther out remains
in sight of the inside scout but normally does not move more
than 20 or 25 meters away and remains prepared to relieve flank
security regularly. Moving through dense woods or jungle may
render the use of flank security impractical because of reduced
visibility. In such cases, it moves with the patrol itself, but
maintains observation to its assigned flanks.

    d. **Rear**. A small patrol normally has only one rifleman
assigned as rear security. An interval between the member
assigned as rear security and the last Marine of the patrol is
maintained at the limit of visibility, up to 50 meters. This

member maintains rear security for the patrol by constantly observing to the rear.

   e. **Halts**. The patrol occasionally halts to observe and listen for enemy activity; this is called a security halt. Upon signal, when reaching a danger area and periodically throughout the conduct of the patrol, every member freezes in place, remains quiet, observes, and listens. It may be necessary to call a security halt just after departing friendly areas and just before entering friendly areas. The patrol may halt briefly to send a message, eat, rest, check direction, or make a reconnaissance. The area selected should provide adequate concealment and cover, as well as favor the defense. All-round security is established and the patrol leader ensures all members move out when the patrol resumes movement. There are two types of security halts:

      (1) Short Security Halt. A short security halt is used to listen for the enemy. Once the hand and arm signal for halt is given. The patrol halts, faces outboard and takes a knee behind some type of cover or concealment. This formation resembles the shape a cigar.

      (2) Long Security Halt (Hides). A long security halt is used when, you have to send a message, eat, rest, check direction, and make a reconnaissance or anything that is going to cause the patrol to be stationary for a long period. On order from the patrol leader the patrol will form a 360-degree perimeter, get down and take cover. Sectors of fire will be assigned, listening posts/ observation posts (LP/ OP) will be put into position and automatic weapons will be positioned on likely avenues of approach. The terrain, quantity and quality of cover and concealment, and size of the patrol govern the size of the area physically occupied by a patrol during a long security halt. If the situation permits, a long security halt can also be used as the final preparation position and/ or objective rally point. Long security halts includes both passive and active security measures.

         (a) Passive Security Measures Are:

            1. Avoid built-up areas.

            2. Select an area remote from all human habitation.

            3. Avoid known or suspected enemy positions.

            <u>4</u>. Avoid ridgelines, topographic crests, valleys, lakes, and streams.

            <u>5</u>. Avoid roads and trails.

            <u>6</u>. Avoid open woods and clearings.

            <u>7</u>. Select areas offering dense vegetation, preferably bushes and trees that spread out close to the ground.

         (b) <u>Active Security Measures</u>:

            <u>1</u>. Establish security covering all likely avenues of approach into the site.
            <u>2</u>. Establish communications (i.e., wire, radio, signal, runner, etc.) with posted security to provide early warning of enemy approach.

            <u>3</u>. Select an alternate area for occupation if the original hide is compromised or found unsuitable.

            <u>4</u>. Plan for withdrawal in the event of discovery.

            <u>5</u>. Establish an alert plan with a certain percent of the personnel awake at all times.

         (c) <u>Security Halts During Limited Visibility</u>. The distance between members of the patrol during limited visibility is kept to where the patrol leader can maintain control.

         (d) <u>Resuming Movement</u>. When given the command to move out, the patrol moves out one Marine at a time immediately forming back into a tactical column. The assistant patrol leader gets a head count and informs the patrol leader immediately when done.

8. **<u>DEBRIEFING INFORMATION</u>**.

Upon return of the patrol, the commander receives the patrol report at a debriefing attended by the patrol leader and all members of the patrol. While there are suggested patrol report formats, necessary information is given with the commander's needs and patrol's mission in mind. The debriefing should be conducted as soon as possible following the patrol's return,

while the information is still fresh in the minds of the members of the patrol.

9. **IMMEDIATE ACTIONS ON A PATROL**.

   a. **Enemy Contact**. The squad may make contact with the enemy at any time. Contact may be made through observation, a meeting engagement, or an ambush. Contact may be visual, where the squad sights the enemy but remains undetected. In this case, the squad leader can decide whether to initiate or avoid physical contact, based on the squad's mission and capability to effectively engage the enemy force. The following actions may be performed, depending on the type of patrol and enemy contact.
      (1) Reconnaissance Patrol. The reconnaissance patrol's mission should prohibit physical contact unless necessary to accomplish the mission. The squad's actions upon contact are Usually defensive in nature. If contact is inevitable, it must be broken as quickly as possible, and the squad should continue the mission if it is able.

      (2) Combat Patrol. Since the combat patrol's purpose is to seek or exploit opportunities for contact, actions upon contact are usually offensive in nature. When enemy contact is made, the squad's actions must be swift and violent in an effort to inflict maximum damage on the enemy force, followed by immediately relocating to another area or returning to friendly lines. Patrols can expect to make physical contact with the enemy in one of two ways: A meeting engagement in which a combat action that occurs when a moving force, incompletely deployed for battle, engages an enemy at an unexpected time and place. It is an accidental meeting where neither the patrol nor the enemy expect contact and are not specifically prepared to deal with it or an ambush (See ambushes above).

   b. **IA Drills**. During patrols, contact—whether visual or physical—is often unexpected, at very close range, and of short duration. Effective enemy fire often allows leaders little or no time to fully evaluate the situation and issue orders. In these situations, immediate action drills provide a means of swiftly initiating positive offensive or defensive action, as appropriate. Immediate action drills are designed to provide swift and positive small unit reaction to enemy contact. They are simple courses of action that are standardized throughout the unit, which Marines repeatedly rehearse until they are second nature. It is not feasible to attempt to develop an immediate action drill to cover every possible situation, but

they are extremely useful for the most common or dangerous situations.

       (1) <u>Immediate Halt</u>. When the patrol detects the enemy but is not detected itself, the situation requires the patrol to immediately halt in place. The first member visually detecting the enemy gives the hand-and-arm signal for FREEZE. Every member halts in place and remains absolutely motionless and quiet until further signals or orders are given.

       (2) <u>Air Observation</u>. These actions are designed to reduce the danger of detection by aircraft and limit casualties from air attack. Air Observation. When the patrol is operating in an area that provides cover and/or concealment (i.e., woodland environment) and a member of the patrol hears or observes unidentified aircraft or a small UAS that may detect the patrol, the hand-and-arm signal to FREEZE is given and all Marines should do the following:

       (a) Halt in place initially until the patrol leader identifies the aircraft and gives further signals or orders.

       (b) Immediately seek any cover available within the immediate vicinity when operating in an open area with little to no cover/concealment (e.g., desert environment).

       (c) Maximize the use of micro-terrain or available concealment in an effort to blend in with their surroundings to avoid detection.

       (d) Marines must not look up, as sunlight can reflect off their faces, even when camouflaged.

IA drill to Air Observation.

(3) Air Attacks. When an attack aircraft or armed UAS detects the squad and makes a low-level attack, the immediate action drill for air attacks is used. The first member sighting an attacking aircraft shouts, "AIRCRAFT," followed by the direction of the incoming attack: FRONT, LEFT, REAR or RIGHT. Marines must move quickly to cover and stop unnecessary movement. Between strafing runs by the aircraft, patrol members seek better cover and a means to egress or eliminate the threat. Attacking aircraft are fired upon only on the patrol leader's command.

(4) Meeting Engagements. The immediate actions described in the following subparagraphs are common reactions to a meeting engagement with enemy forces.

(a) Hasty Ambush. A hasty ambush is the immediate action executed to avoid contact and/or execute a rapid, unplanned ambush on an unsuspecting enemy force. It is often a subsequent action after the command "FREEZE" is passed. When the signal for the hasty ambush is given, the entire patrol moves quickly to the right or left of the line of movement, as indicated by the squad leader, and takes up the best available concealed firing positions. The squad leader conducts the same actions as for a point ambush.

Critical Tasks

- Patrol detects an enemy unit; squad leader is notified
- Patrol halts and remains motionless
- Squad leader gives signal for Hasty Ambush
- Squad leader directs elements to covered and concealed positions
- Security Elements move to flanks of patrol
- Squad leader establishes control measures
- Squad leader initiates and controls ambush
- Patrol withdraws, consolidates, reports and continues mission

LEGEND:
ASLT assault
LOA limit of advance
SEC security
SUP support

Hasty Ambush Example.

(b) <u>Immediate Assault</u>. This immediate action drill is used either defensively to make and quickly break undesired but unavoidable contact (including near ambush), or offensively to decisively engage the enemy (including far ambush). When used in a meeting engagement, the members nearest to the enemy open fire and shout, "CONTACT," followed by the direction of the incoming attack: FRONT, LEFT, REAR, or RIGHT, followed instantly by a rehearsed reaction. When used offensively, the enemy is decisively engaged; escapees are pursued and destroyed until orders to break contact are given by the patrol leader. If the patrol engages the enemy any longer than necessary to break contact, it may put the mission in jeopardy. When used defensively, the assault ends if the enemy withdraws and contact is broken quickly. If the enemy stands fast, the assault is carried through the enemy positions and movement is continued until contact is broken. **<u>Extreme discipline and caution must be exercised so as not to be baited into an organized enemy ambush</u>**.

(c) <u>Reaction To Near Ambush</u>. The immediate assault during a near ambush should be a decentralized action. However, it is very important that the squad leader not lose control of the squad after the immediate assault. The squad leader must immediately retake control to assess the situation and decide the next move. The Marines in the squad must pay attention for guidance from their squad leader as the immediate assault culminates or turns into a more deliberate effort. In a near ambush (i.e., within 50 meters or hand grenade range), Marines within the killing zone immediately return fire, take up covered positions, and throw fragmentation or smoke grenades. Immediately upon grenade detonation, Marines assault through the ambush using fire and movement. Marines not in the killing zone identify enemy positions, initiate immediate suppressive fires and take up covered positions, shifting fires as Marines in the kill zone assault through the ambush.
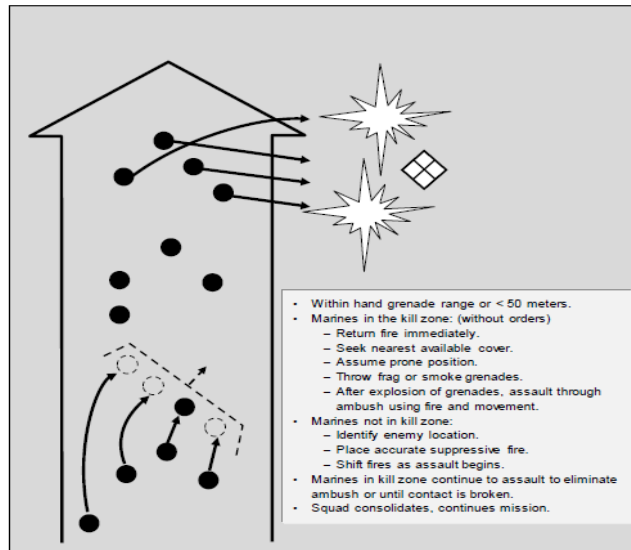
Reaction to Near Ambush.

(d) <u>Reaction To Far Ambush</u>. In a far ambush (i.e., beyond 50 meters or beyond hand grenade range), Marines immediately return fire while taking up covered positions and suppress the enemy. They concentrate on destroying enemy crew-served weapons first while obscuring the enemy position with smoke and keeping up suppressive fire. Marines not receiving fire move by covered and concealed routes to a vulnerable enemy flank and assault using fire and movement techniques. Marines in the kill zone continue suppressive fire and shift fire as the assaulting element fights through the enemy position.
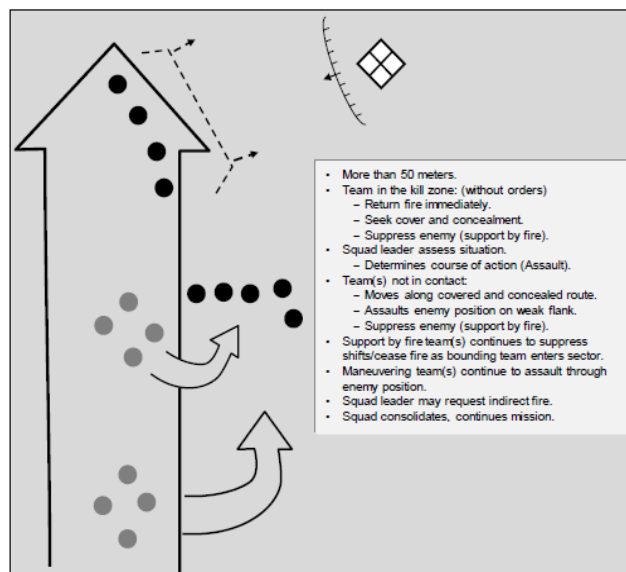
Reaction to Far Ambush.

(e) Break Contact. The squad may find itself being engaged by enemy forces by either direct or indirect fire. In either instance, the squad must conduct an immediate action drill to break contact. The two methods to break contact are the clock system and fire and maneuver. The clock system is usually used when the squad is being engaged by enemy indirect fires and the source or direction of fire cannot be identified. The method is executed as follows:

1. Clock Method.

    a. The squad leader shouts or gives the hand-and-arm signal indicating a direction and a distance.

    b. Marines move in the given direction for 200 meters.

    c. Patrol members keep the same relative positions as they move.

    d. Subordinate leaders must ensure that the members of their elements and teams move as directed.

    e. Movement continues until contact is broken.

"10 o'clock 200 meters"

- Any squad member detecting incoming (whistle or explosion) gives alert: "INCOMING!"
- All squad members seek cover in the prone.
- After indirect fire impacts, Squad Leader gives direction and distance to move (10 o'clock... 200 meters!).
- Squad runs out of the impact area in the direction and distance indicated.
- Squad consolidates, continues mission.
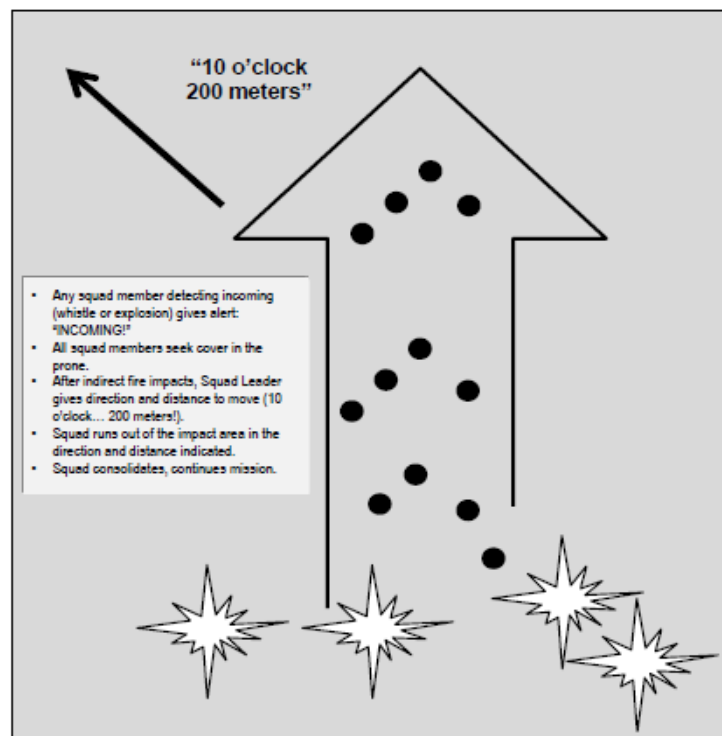
Break Contact (Clock System) Example
Note that twelve o'clock is the direction of the patrol.

2. Fire and Maneuver Method.

a. The fire and maneuver method of breaking contact is usually conducted when the patrol is being engaged by enemy direct fire weapons, as in a far ambush, and the squad leader determines breaking contact is required vise assaulting the enemy's position. The squad takes these steps:

b. The squad leader directs one fire team in contact to support the disengagement of the remainder of the patrol.

c. The squad leader orders a distance and direction, or the last rally point, for the movement of the patrol not suppressing

d. The base of fire continues to suppress the enemy.

e. The moving element uses smoke grenades or supporting fires to obscure its movement

f. The moving element takes up designated positions and engages the enemy.

g. The squad leader directs the base of fire element to move to their location

h. The squad continues to bound away from the enemy, continuing to suppress until contact is broken.

BREAK CONTACT

SMOKE

- Squad leader orders: "Break Contact."
- Squad leader designates support by fire element an maneuver element.
- Squad leader issues distance and direction for a terrain feature for the maneuver element.
- Support by fire suppresses enemy position.
- Maneuver uses smoke to mask movement.
    - Takes up overwatch position.
    - Begins to suppress enemy.
- Squad leader directs support by fire element to break contact.
- Support by fire element uses smoke to screen movement
    - Takes up overwatch position.
- Squad continues to bound away until contact is broken.
- Squad leader consolidates; continues mission.

Break Contact (Fire and Maneuver).

(f) Danger Areas. A danger area is any place where the patrol is vulnerable to enemy observation, fire, or both. While patrols normally plan to avoid danger areas, sometimes they cannot. When it must cross a danger area, it does so as quickly and as carefully as possible. The squad leader plans for crossing each known danger area and includes these plans in the patrol order. The below table shows a list of danger areas and actions to be conducted when encountering them.

Table 5-2. Danger Areas and Actions at Danger Areas.	
Danger Area	Action at Danger Area
Open Areas	Conceal the squad on the near side and observe the area. Post security to give early warning. Send an element across to clear the far side. When cleared, cross the remainder of the squad at the shortest exposed distance and as quickly as possible.
Roads and Trails	Cross roads or trails at or near a bend, a narrow spot, or on low ground.
Villages	Bypass villages on the downwind side and well away from them. Avoid animals, especially dogs, which might reveal the presence of the platoon.
Enemy Positions	Pass on the downwind side (the enemy might have scout dogs). Be alert for trip wires and warning devices. Indirect fires may be used to divert the enemy's attention.
Explosive Hazards	Explosive hazards can consist of IEDs, mines, and other threats. An individual patrol should avoid deliberate minefields if possible, but a guard for a larger unit may have to address them. Combat engineer attachments are highly valuable if prior planning indicates a high probability of danger areas with explosive hazards.
Streams	Select a narrow spot in the stream that offers concealment on both banks. Observe the far side carefully. Emplace near side and far side security for early warning. Clear the far side and then cross rapidly but quietly.
Wire Obstacles	Avoid wire obstacles whenever possible (the enemy usually covers obstacles with observation and fire).

Danger Areas and Action at Danger Areas.

1. The squad leader decides how the unit will cross based on the following; Time available, Size of the unit, Size of the Danger Area, Fields of fire into the area, and The amount of security that can be post.

2. The squad may cross the danger area using one of the following techniques; All at once, in buddy teams, or one at a time.

REFERENCES:

NUMBER	TITLE	PAGE
Scouting and Patrolling	MCTP 3-01A	Entire Manual
Marine Rifle Squad	MCRP 3-10A.4	Entire Manual

TACTICAL COMBAT CASUALTY CARE (TCCC)

MCT0103

01/18/2021

LEARNING OBJECTIVES FOR THIS LESSON

a. **LEARNING OUTCOME(S).**

(1) Marines will be capable of performing triage, assessing, treating and evacuating a casualty, to include self-aid and buddy-aid, in order to initiate field care measures to save life, limb, or eyesight. (4)

b. **ENABLING LEARNING OBJECTIVES.**

(1) Given a list of choices, identify the factors that influence combat casualty care in accordance with Pre-Hospital Trauma Life Support. (4A)

STUDENT INFORMATION

OVERVIEW: In this lesson, Marines will learn about TCCC and the techniques and procedures associated with TCCC. The outcome for this lesson is for the Marine to be capable of providing TCCC in self-aid and buddy-aid scenarios.

CLASS PREPARATION: Read this outline prior to the start of this class. Ensure you have all materials provided for this class.

OUTLINE.

1. **INTRODUCTION:** The purpose of TCCC is to provide life-saving care to the injured combatant, limit the risk of taking further casualties, and enable the unit to achieve mission success. This class relates to all classes Marines will receive during the Infantry Marine Course. There are three phases to TCCC: Care Under Fire (CUF), Tactical Field Care (TFC), and Tactical Evacuation Care (TEC).

2. **CARE UNDER FIRE**

a. Patient Safety.

(1) The most effective medicine on the battlefield is fire superiority. Suppressing hostile enemy fighters will always be priority one during TCCC.

(2) When a Marine becomes a casualty, you will instruct the casualty to try to take cover and apply self-aid. If the casualty is able, they should apply a tourniquet to them self. It may make more sense depending on the tactical situation to have the casualty play dead. This may be the case if a Marine is hit crossing a danger area and enemy fire is still incoming.

(3) Use cover and concealment to your advantage during the initial stage of treating a casualty. Keep yourself and the casualty behind cover or at least concealed at all times.

(4) Provide care only when it is safe to do so. You can only safely provide care when the enemy has been suppressed or eliminated, after the enemy has withdrawn, or once you and the casualty are both protected from hostile fire.

(5) If there is still a threat of imminent danger, do not provide care to the casualty, keep suppressing the enemy. You can become a casualty yourself if fire is still incoming.

b. Determine If Casualty Is Alive Or Dead. It is pointless to render aid to a casualty that is already dead. When the tactical situation permits, look for signs of life such as a pulse, breathing, and movement. If the casualty is not alive, do not continue with care.

c. Immediate Care. The casualty should self-apply a tourniquet immediately if possible. When the enemy is suppressed you will reach the casualty and immediately treat all life threatening bleeding by applying a TQ or pressure dressing. Then you will transport the casualty to a safe position using a two person drag.

d. Moving The Casualty. The fastest way to move a casualty is by dragging with two rescuers. This can be done in a variety of environments. The rescuers can be standing or crawling. Use any available gear to hold onto casualty.

e. Casualty Collection Point. Most aid will be performed at the Casualty Collection Point (CCP) or where there is adequate cover and concealment. Upon reaching this point you will reassess the tourniquet or pressure dressing to ensure it

has not come loose or damaged, inform higher of the situation, then begin First Responder Aid.

3. **First Responder Aid**.

    a. When you, as the first responder, have the casualty at the CCP, you are in charge of rendering aid before the Corpsman/CLS Marine arrives or if they are working on another casualty. You will be responsible for the following: Massive Hemorrhaging, Airways, Respirations, Circulation, Head Trauma/Hypothermia, and Pain Management. Your job is to quickly treat injuries and get casualty to next echelon of care.

    b. Hemorrhage. Hemorrhage is defined as blood escaping from arteries, veins or capillaries. The heart pushes blood through the arteries and into the capillaries. Once that exchange has taken place, the blood is then pushed into the veins back into the heart. The heart sends that blood to the lungs where it picks up more oxygen and then continues that cycle.

    c. Three Types Of Bleeding.

        (1) Arterial. If an artery near the surface is cut, BRIGHT RED BLOOD will gush out in spurts that are synchronized with the heartbeat.

        (2) Venous. Blood from the veins is DARK RED. Venous bleeding is characterized by a steady, even flow.

        (3) Capillary. Capillary blood is usually BRICK RED in color. If capillaries bleed, the blood oozes out slowly.
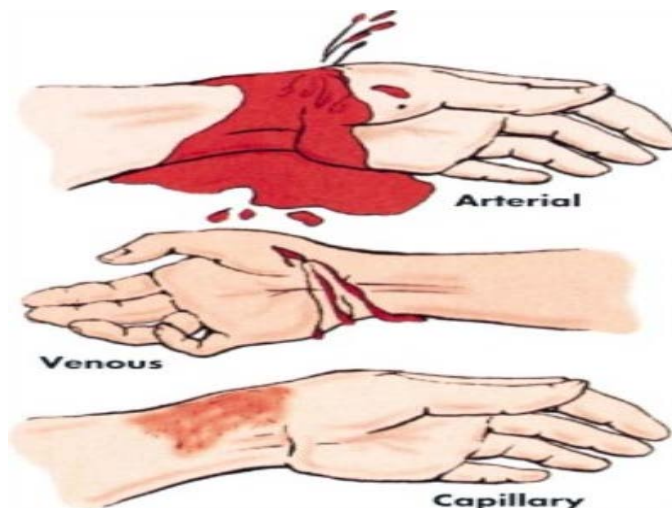
c. Hemorrhages Continued. Hemorrhaging can further be broken down into categories, they are as follows:

   (1) Life Threatening. Any arterial bleed is life threatening. These types of bleeds can cause a human to bleed to death in 2 to 4 minutes. Some venous bleeds are considered life threatening based off of how much blood is being lost and how quickly.

   (2) Non-Life Threatening. Slow venous bleeds and capillary bleeds.

   (3) Extremity. Bleeding from the arms, hands, legs or Feet.

   (4) Non-Extremity. Bleeding from head, neck, chest, back, abdomen, or pelvis.

   d. Hemorrhage Controls. Different methods are used depending on the nature of bleeding. The most common first responder methods used to control hemorrhages are tourniquets (TQs), pressure dressings, hemostatic agents and bandages.
   (1) Direct Pressure.

   (a) If bleeding is not life threatening, apply direct pressure by exposing the wound. Place sterile gauze or dressing over the injury site and apply fingertips, palm or entire surface of one hand and apply direct pressure.

   (b) Pack large, gaping wounds with sterile gauze and apply direct pressure. Once the bleeding has been controlled, it is important to check a distal pulse to make sure that the dressing has not been applied too tightly. If a pulse is not felt, adjust the dressing to re-establish circulation.

   (c) Always apply pressure to the blood vessel above the wound while applying a tourniquet.

   (2) Tourniquets.

   (a) Used to control life threatening extremity hemorrhage.

   (b) If the Tourniquet is not available, make and utilize an improvised tourniquet. Choose a material about 2" wide.

(c) Material such as rope, wire and string should not be used because they can cut into flesh.

(d) A good improvised tourniquet that is readily available to every Marine is your MCMAP Belt.

(e) Twist the windless until the hemorrhage is controlled.

(f) Document placement of a tourniquet by placing a "**T**" and the time and date on the casualty's forehead.

(g) Do not cover a tourniquet under any condition. Leave it exposed for open viewing.

(h) Pressure must be applied at all times while applying a TQ.

(i) Use 'pocket method' for placement. Above shoulder pockets, above cargo pockets.

(j) Another reference for placement, if cargo pockets are unsuitable or unavailable, is to place the tourniquet two inches above the wound.

(k) CAT TQ. The Combat Application Tourniquet (CAT) is one of the most common forms of tourniquets used by the Marine Corps.

(k) SOF-T TQ. The Special Operations Forces Tourniquet (SOF-T) (sometimes referred to as the Special Operations Forces Tactical Tourniquet [SOFT-T]) is another common form of tourniquet used in the Marine Corps.

(l) Both the CAT and the SOF-T work the same way with minimal training required to use the other type.

(3) Tourniquet Application.

(a) Apply pressure to arteries while placing TQ. Sweep casualties genitals up and out of the way.

(b) Apply TQ above shoulder and cargo pockets.

(c) T-Time and Date.

(4) <u>Tourniquet Mistakes</u>.

(a) Not using one when you should.

(b) Using one when you shouldn't.

(c) Putting it on too close to wound.

(d) Not tight enough.

(e) "Better to use and not need than to need and not use."

(f) While using the CAT, ensure the tourniquet is not bent, warped, or twisted around the patient's extremity. Put the strap back through the D-ring before cinching down on the windlass.

!WRONG!   **!WRONG!**   **!CORRECT!**

    e. <u>AVPU</u>. Assessing alertness and airway starts with the AVPU acronym. Alertness, Verbal stimulus, Painful Stimulus, Unresponsivness.

        (1) <u>Assess Alertness</u>. The easiest way to establish consciousness is to speak to the casualty.

        (2) <u>Verbal Stimulus</u>. Establish whether the casualty is conscious by gently shaking him and asking, "Are you OK?"

        (3) <u>Painful Stimulus</u>. If unresponsive to verbal stimulus, use the knuckles on your hand and rub the casualty's sternum with firm pressure.

        (4) <u>Unresponsive</u>. If still unresponsive to stimulus, move on to assessing the airway. Secure weapon and remove flak to access chest.

    f. <u>Assess The Airway</u>. If the casualty is unresponsive or not breathing observe for rise and fall of the chest. The tongue is the single most common cause of an airway obstruction. In most cases, simply using the head-tilt/chin-lift technique can clear the airway. This action pulls the tongue away from the air passage in the throat. Perform finger sweep. If foreign material or vomit is visible in the mouth, it should be removed.

        (1) <u>Head-Tilt/Chin-Lift</u>. Place one hand on the casualty's forehead and apply firm, backward pressure with the palm to tilt the head back. Place the fingertips of the other hand under the bony part of the lower jaw and lift, bringing the chin forward. The thumb should not be used to lift the chin.

      (2) <u>Jaw-Thrust</u>. The jaw-thrust may be accomplished by the rescuer grasping the angles of the casualty's lower jaw and lifting with both hands, one on each side, displacing the jaw forward and up. The rescuer's elbows should rest on the surface on which the casualty is lying. If the lips close, the lower lip can be retracted with the thumb. If mouth-to-mouth breathing is necessary, close the nostrils by placing your cheek tightly against them. The head should be carefully supported without tilting it backwards or turning it from side to side. If this is unsuccessful, the head should be tilted back very slightly. The jaw-thrust is the safest first approach to opening the airway of a casualty who has a suspected neck injury because in most cases it can be accomplished without extending the neck.

    (3) <u>Check For Breathing.</u>

        (a) **<u>LOOK</u>** for the chest to rise and fall.

        (b) **<u>LISTEN</u>** for air escaping during exhalation by placing your ear near the casualty's mouth.

        (c) **<u>FEEL</u>** for the flow of air on your cheek.

(4) Rescue Breathing.

(a) After opening the airway, use your finger to sweep away any obstruction. If the casualty is not breathing, begin rescue breathing.

(b) Mouth To Mouth, Mouth To Nose. Placing your mouth over the casualty's mouth and holding the nose closed, breathe twice with 1 to 1.5 second breaths while looking for rise and fall of chest. Now feel pulse for 10 seconds with 2 fingers then try again. If casualty's mouth is injured, put your mouth to the casualties nose and hold the mouth shut. If pulse is found, continue breaths 12-20 per minute until casualty is transferred to next echelon of care. If no pulse is present, CPR will be performed by CLS Marine or Corpsman.

g. Tiger Claw Sweep.

(1) Assessing the respiratory system includes all injuries to the abdomen that affect the casualty's lungs and breathing. When a casualty has chest injuries that cover the abdomen in blood and debris, the best way to find wounds is the tiger claw sweep. This method is done by placing your non dominant hand palm over the top of your dominant hand and interlocking your fingers. This is done in order to conduct a blood sweep.

(2) This Blood sweep is done across the casualty's chest, sides, and back in an overlap while applying pressure to find any further wounds on a casualty. If any further wounds are found on any of these four portions on the torso they should be treated as a sucking chest wound.

   h.   Sucking Chest Wound.

      (1) A sucking chest wound is a collection of air or gas in the pleural space (a thin, fluid filled space that surrounds the lung) that causes the lung to collapse. Most often, this a result of penetrating trauma such as a stab or gunshot wound.

      (2) Many small wounds will seal themselves. These wounds are of particular concern because of their potential to cause a tension pneumothorax.

      (3) Some large wounds will be completely open, allowing air to enter and escape the pleural cavity.

      (4) These wounds allow air to enter when the intrathoracic pressure is negative and block the air's release

when the intrathoracic pressure is positive; hence the term "sucking chest wound".

Air (rushes in)

Wound site

Collapsed right lung

Pleural cavity

Left lung

Heart
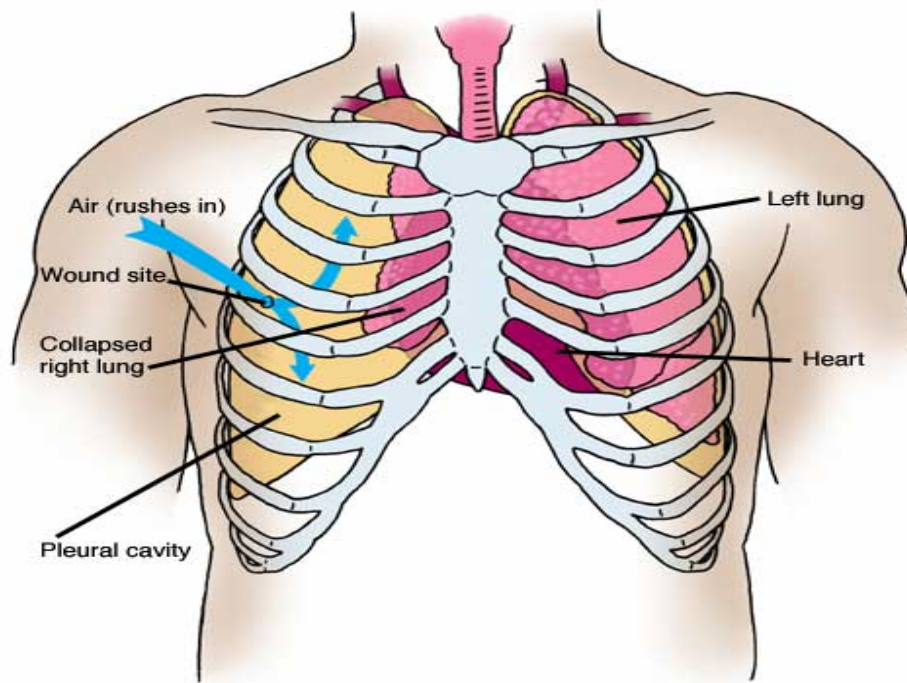
    (1) Signs/Symptoms.

        (a) Chest wall trauma (Bleeding/wound).

        (b) Difficulty in breathing with a moist and loud sucking sound.

        (c) A feeling of someone sitting on your chest.

    (2) Treatment. Cover the wound with an occlusive dressing. Tape the dressing on three (3) sides to temporarily seal the wound. Assess for associated penetrating chest trauma (i.e. exit wounds), and treat as indicated. Monitor for signs and symptoms of Tension Pneumothorax.

        (a) Symptoms of tension pneumothorax include chest tightness or pain, coughing, blue skin, rapid/difficult breathing, and rapid pulse.

REFERENCES:

NUMBER	TITLE	PAGE
1708	TCCC for all combatants	Entire Manual
0323039863	Pre-Hospital Trauma Life Support, Military Version, Current Edition	Entire Manual

COMBAT ORDERS

MCT0108

01/14/2021

1. **LEARNING OUTCOME(S)**.

   a. Marines will be able to receive, analyze and act based on a warning order, fragmentary order, and/or five-paragraph order and commander's intent ensuring preparation to accomplish the mission. (9)

2. **LEARNING OBJECTIVES**.

   a. N/A.

STUDENT INFORMATION

OUTLINE.

1. **PURPOSE OF COMBAT ORDERS**.

   a. Combat Orders are a form of detailed planning done at every level of the Marine Corps. It translates the commander's decision into oral, written, or graphic communication sufficient to guide implementation and promote initiative by subordinates. This plan or order, once completed, becomes the principal means by which the commander expresses their decision, intent, and guidance.
   b. There are three main types of Combat Orders; Warning Order, Operation Order, Fragmentary Order.

2. **WARNING ORDER**.

   a. The warning order is a preliminary notice of an order or action that is to follow. It gives a snapshot of the commanders initial analysis and puts it into a format that is can be used by his/her subordinates to prepare for an upcoming operation. The warning order may include, but is not limited to:

      (1) Situation, both Friendly and Enemy

      (2) Mission

(3) Allocated addition forces and resources (TO/E)

(4) Initial Guidance (Commanders Intent)

(5) Initial Tasking (Start Subordinate Unit Mission Planning)

b. <u>METT-T</u> is a military tool used to conduct an analysis of a problem, and helps develop the operation order. The acronym METT-T stands for:

(1) Mission

(2) Enemy

(3) Terrain and Weather

(4) Troops

(5) Time (support available/time available)

Other considerations for the analysis may include, but are not limited to:

(1) Adversary versus friendly capabilities assessment

(2) Civilian and cultural considerations

(3) Possible employment options

While there is no right or wrong way to conduct METT-T, Marines should always consider two fundamental questions while conducting the analysis.

(1) What needs to be accomplished to complete the mission?

(2) How should it be done?

3. **OPERATION ORDER.**

a. The order contains only critical or new information and not routine matters normally found in SOPS. The initial task organization, mission statement, commander's intent, CONOPS, and specified and implied task are required inputs to orders development. When writing the order it's good to follow one simple rule; a good order is judged on its **usefulness** not its

size. The operations order is broken up into <u>six</u> parts, with an unofficial sixth part added to the front. Acronym OSMEAC:

    (1) Orientation

    (2) Situation

    (3) Mission

    (4) Execution

    (5) Administration and Logistics

    (6) Command and Signal

    b. <u>Orientation</u>. This part of the sets the stage for the rest of the order. This is usually done around a terrain model or a graphic of the operation area. It is important to make sure all units involved are present before the orders is briefed. Orientation has, but is not limited to, the following:

    (1) A general overview of the environment.

    (2) Current Location.

    (3) Direction of North.

    (4) Key Terrain Features.

    (5) Tactical Control Measure(s).
    (6) Vegetation and Weather.

    (7) Background Information on local Populace.

    c. <u>Situation</u>. Provides current information or intelligence updates on friendly and enemy activity. Situation has, but is not limited to, the following:

    (1) Enemy.

        (a) SALUTE – Size, Activity, Location, Unit, Time, Equipment.

        (b) DRAW-D – Defend, Reinforce, Attack, Withdraw, Delay.

(c) EMPCOA/EMLCOA – Enemy's most probable/Likely course of action. Use the METT-T analysis to help build this.

(2) Friendly.

(a) HAS – Higher, Adjacent, Supporting

(b) Attachments and Detachments.

d. <u>Mission</u>. This is the most important part of this format. Everything done during this operation has to accomplish this written statement.

(1) Task. The action to be taken.

(2) Purpose. The desired result of the action.

e. <u>Execution</u>. This has commander's desired outcome and all maneuver plans on how the operation will be carried out.

(1) Commander's Intent.

(a) Method.

(b) Purpose.

(c) End state.

(2) Concept of Operations.

(a) Scheme of Maneuver. This can be in paragraph form, or in broken down sections. (Phases, Stages, Parts)

(b) Fire Support Plan.

(3) Subordinate Tasks. This will become <u>your</u> mission statement.

(4) Coordinating Instructions.

f. <u>Administration and Logistics</u>. What is required to conduct the mission? The 5 B's (listed below) acronym is used to remember mission requirements. Logistics refers to what will be required and how to resupply.

(1) Beans. Chow and Water plan, and how to resupply them.

(2) Bullets. All Ammunition for weapon systems required to complete the Mission.

(3) Batteries. Almost everything used takes batteries.

(4) Bandages. Location of CCPs, Medical Assets, and what to bring for general treatment of the casualties.

(5) Bad Guys. What to do with EPWs.

g. <u>Command and Signal</u>.

(1) Signal.

(a) Radio frequencies and call signs for all units. (SMARTPACK)

(b) All applicable signals. Only include hand and arm signals if it is non-standard, or altered for that mission.

(c) Signal Plan.

(d) Challenge and Password.

(2) Command.

(a) Location of Higher. This can be done per Phase/Part/Stage. Ensure that it is clearly stated and leaves no ambiguity.

(b) Location of Key Leaders. This can be done per Phase/Part/Stage. Ensure that it is clearly stated and leaves no ambiguity.

(c) Succession of Command. This is not just an officer or enlisted issue. It is recommended this be done by Billet. It is also recommended this be done by phases/stages/parts. One Marine might be in a better position to commander depending on the operation

4. **<u>FRAGMENTARY ORDER</u>**. This order is an abbreviated form of an operation order. It is issued as needed after an operation order to change or modify that order or to execute a branch or sequel to that order. This is also called a FRAGO. There is no right or wrong way to write this order however it is recommend only to include mission essential task.

5. **TACTICAL TASK**. Tactical task are standardized items in the
Marine Corps. The list of task answers the "*what*" portion of the
Mission statement. They are characterized or grouped as either
enemy-oriented, terrain-oriented, friendly-oriented, or
population-oriented tasks. These tactical tasks have nuanced and
distinct meanings. While this lesson will only go over commonly
used task, the rest of the task can be found in the MCDP 1-0
(see chart below 4-1)

Enemy-Oriented Tactical Tasks	Terrain-Oriented Tactical Tasks	Friendly-Oriented Tactical Tasks
ambush	*breach**	*cover*
attack by fire	clear	*disengage*
block	control*	*displace*
*breach**	cordon*	*exfiltrate*
bypass	occupy*	follow and assume
canalize	*reconnoiter**	follow and support
contain*|	*retain*	*guard*
corrupt	*secure**	protect
deceive	seize	*screen*
defeat		
degrade		
deny		
destroy		
disrupt	Population-Oriented Tactical Tasks	
exploit	*advise*	enable civil authorities
feint	*assess the population*	exclude
fix	assist	*influence**
influence*	build/restore infrastructure	occupy*
interdict	contain*	reconnoiter*
isolate	control*	secure*
neutralize	*coordinate with civil authorities*	*train*
penetrate	cordon*	transition to civil control
*reconnoiter**		
support by fire		
suppress		
Key		
* Tactical tasks with multiple classifications and applications.		

<center>4-1</center>

a. <u>Enemy-Oriented Tactical Tasks</u>. The following tactical
tasks focus friendly efforts on generating effects against enemy
forces.

(1)**Ambush**. A surprise attack by fire from concealed
positions on a moving or temporarily halted enemy. An ambush is
fundamentally a type of attack, enemy-oriented, and is planned
and executed accordingly.

(2) **Attack by fire**. Fires (direct and indirect) in the physical domains and/or through the information environment to engage the enemy from a distance to destroy, fix, neutralize, or suppress. Within the physical domains, an attack by fire closely resembles the task of support by fire. The chief difference is that one unit conducts the support by fire task to support another unit so it can maneuver against the enemy.

(3) **Breach.** To break through or secure a passage through an obstacle. See also terrain-oriented tactical tasks.

(4) **Deny.** To hinder or prevent the enemy from using terrain, space, personnel, supplies, facilities, and/or specific capabilities.

(5) **Support by Fire.** Movement to a position where the maneuver force can engage the enemy by direct fire in support of another maneuvering force. *Support by fire* closely resembles the task of *attack by fire*. The difference is a unit conducting attack by fire only uses direct and indirect fires. A unit conducting support by fire uses direct and indirect fires to support the maneuver of another friendly force.

(6) **Suppress.** The transient or temporary degradation of an opposing force or the performance of a weapons system below the level needed to fulfill its mission objectives.

b. Terrain-oriented Tactical Tasks. The following tactical tasks focus friendly efforts on achieving some sort of condition as it relates to terrain.

(1) **Breach.** To break through or secure a passage through an obstacle. See also enemy-oriented tactical tasks.

(2) **Reconnoiter**. To secure data, by visual observation or other methods, about the meteorological, hydrographic, or geographic characteristics of a particular area. See also enemy- and population-oriented tactical tasks.

(3) **Retain.** To occupy and hold a terrain feature to ensure it is free of enemy occupation or use.

(4) **Secure.** To gain possession of a position, terrain feature, piece of infrastructure, or civil asset, with or without force, and prevent its destruction or loss by enemy action. The attacking force may or may not have to physically occupy the area. See also population-oriented tactical tasks.

c. <u>Friendly Force-Oriented Tactical Tasks</u>. The following tactical tasks focus friendly efforts on supporting the actions of other friendly forces.

(1) **<u>Cover</u>.** To conduct offensive and defensive actions independent of the main body to protect the covered force and develop the situation. It is the tactical task associated with the security operation *cover*.

(2) **<u>Disengage</u>.** To break contact with the enemy and move to a point where the enemy cannot observe nor engage friendly forces by direct fire.

(3) **<u>Displace</u>.** To leave one position to take another while remaining in contact with the enemy. *Displace* differs from the tactical task *disengage* in that units disengage to break contact with the enemy, while units displace to continue the mission or execute alternate missions.

(4) **<u>Exfiltrate</u>.** To remove personnel or units from areas under enemy control by stealth.

(5) **<u>Guard</u>.** To protect the main force by fighting to gain time while also observing and reporting information.

d. <u>Population-Oriented Tactical Tasks</u>. The following tactical tasks focus friendly efforts on achieving some sort of condition as it relates to the population within the area of operations.

(1) **<u>Advise</u>.** To improve the individual and unit capabilities and capacities of host nation security forces through the development of personal and professional relationships between United States and host nation forces.

(2) **<u>Assess the Population</u>.** To evaluate the nature, situation, and attitudes of a designated population or elements of a population inhabiting the area of operations.

(3) **<u>Coordinate with Civil Authorities</u>.** To interact with, maintain communication, and harmonize friendly military activities with those of other inter-organizational agencies and coalition partners to achieve unity of effort.

(4) **<u>Influence</u>.** To persuade the local population, including potential and known adversaries, within the

operational area to support, cooperate with, or at least accept the friendly force presence, and to dissuade the local population from interfering with operations. See also enemy-oriented tactical tasks.

(5) **Train.** To teach designated skills or behaviors to improve the individual and unit capabilities and capacities of host nation security forces.

REFERENCES:

MCIP 3-10A.4i, Marines Rifle Squad	**Appendix G**
MCWP 5-10 Marine Corps Planning Process	**Entire Pub**

COMBAT ORDERS EXAMPLE FORMATS:

WARNING ORDER
SITUATION: ENEMY: (SALUTE/DRAW.D)
S-
A.
L.
U.
T.
E-
FRIENDLY: (HAS)
H-
A.
S-
ATTACHMENTS:
DETACHMENTS:
MISSION: (W.W.W.W.W.)
WHO:
WHAT:
WHEN:
WHERE:

WHY:								
UNIT	Gen. Org.	Duties	Arms, Ammo. & Equipment	Gear Common To All	TIME SCHEDULE			
					WHEN	WHAT	WHERE	WHO

Specific Instructions:

Operation Order Format

REFERENCES: List any maps or documents needed to understand the order or that were used in the preparation of the order.

TIME ZONE USED THROUGHTOUT THE ORDER:

TASK ORGANIZATION:

1. SITUATION
    a. Enemy Forces
        1) Situation (size, activity, location, unit, time, and equipment)
        2) Capabilities (defend, reinforce, attack, withdrawal, delay)
        3) Most likely and most dangerous courses of action
    b. Friendly Forces
        1) Mission of your parent unit
        2) Mission of unit providing your support
        3) Mission and/or route of adjacent unit that may affect your mission
    c. Attachments and detachments

2. MISSION
    a. Who
    b. What
    c. Where (coordinates)
    d. Why

3. EXECUTION
    a. Concept of operation: The overall plan (scheme of maneuver) for the unit and plan for fire support.
    b. Commander's intent: How commander views the upcoming mission
    c. Sub-unit missions: for sections, teams, and individuals
    d. Coordinating instructions:
        1) Time schedule
        2) Formations and order of movement
        3) Route (primary and alternate)
        4) Movement within friendly front lines
        5) Rally points and actions at rally points
        6) Actions on enemy contact, at danger areas, and at the objective
        7) CBRN safety instruction and MOPP level and PIR requirements
        8) Fire support (if not previously discussed)
        9) Rehearsals and inspections
        10) Debriefing (including essential elements of information, and other intelligence requirements, time, and place).

Operation Order Format (Cont.)

4. ADMINISTRATION and LOGISTICS
    a. Rations / Chow plan
    b. Uniform, arms and ammunition
    c. First aid / medical plan
    d. Detainee / captured material handing plan

5. COMMAND and SIGNAL
    a. Command
        1) Squad leader's location
        2) Chain of command
    b. Signal
        1) Frequencies and call signs
        2) Pyrotechnics and signals
        3) Challenges and passwords
        4) Brevity and code words

Notes:
    1. Details under subparagraphs should be tailored to provide all relevant and essential information.
    2. Items covered by SOP need not be covered in the operation order, but should be referenced.

(Classification)

(Change from oral orders, if any)

Copy _ of _ copies
Issuing Headquarters
Place of issue (may be in code)
Date-time Group of signature
Message Reference Number

FRAGO

References:

1. SITUATION

    a. Enemy forces.

    b. Friendly forces.

    c. Attachments and detachments.

2. MISSION

3. EXECUTION
Intent:

    a.Concept of operations.

    b.Tasks to maneuver units.

    c.Tasks to CS units.

    d.Coordinating instructions.

4. ADMINISTRATION AND LOGISTICS

5. COMMAND AND SIGNAL

(Classification)

ACKNOWLEDGE:

OFFICIAL:

NAME (Commander's last name)
RANK (Commander's rank)

ANNEXES:
DISTRIBUTION:

(Classification)