1-23 IN MORTARS

TACSOP

ASOF APR 2016

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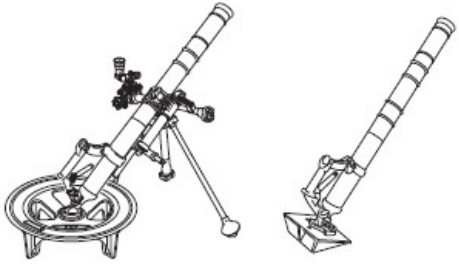
CHAPTER 1

MORTARS SYSTEMS AND BASIC USE

M224A1 Mortar System (60mm)



4.1 MORTAR CHARACTERISTICS.

Below are listed the characteristics of the M224A1 Mortar System:

M224A1 60MM MORTAR

COMPONENT	CONVENTIONAL (lbs.)	HANDHELD (lbs.)
Complete System	35.1	16.6
Cannon, M225A1	13.0	
Bipod, M170A1	12.85	Max charge for hand held mode is charge 1
Sight Unit, M67	2.9	
Baseplate, M7	9.2	
Baseplate, M8	3.7	

	RANGE (m)	
Minimum	70	75
Maximum	3,490	1,340
HE (M888)	70 to 3,490	75 to 1,340
HE (M720)	70 to 3,490	75 to 1,340
HE (M721)	70 to 3,200	75 to 1,340
HE (M49A1)	44 to 1,930	50 to1,300
WP (M302A1)	33 to 1,630	45 to 1,200 (charge 3)
ILLUM (M83A3)	725 to 951	725 to 750 (charge 3)
TP (M766 SRTR)	56 to 538	72 to 750 (charge 2)

RATE OF FIRE	
	MAXIMUM
M720/ M888	30 rounds for 4 minutes
M49A4	30 rounds for 1 minute; 18 rounds for next 4 minutes
	SUSTAINED
M720/ M888	20 rounds per minute
M49A4	8 rounds per minute

4.2 AMMUNITION CHARACTERISTICS.

Below are listed the characteristics of the ammunition able to be fired from the M224 60mm Mortar System:

TYPE OF ROUND	NATO COLOR CODE			US COLOR CODE		
	ROUND	MARKINGS	BAND	ROUND	MARKINGS	BAND
HE M720,0M888, m4944)	OLIVE DRAB	YELLO DRAB	N/A	OLIVE	YELLOW	YELLOW
White Phosphorus M302A1, M302A2	LIGHT GREEN	RED	YELLOW	GREY	YELLOW	YELLOW
ILLUMINATION M83A3 M721	WHITE	BLACK	NA	NA	NA	NA
TRAINING PRACTICE M69TP M50A3 M766 (SRTR)	BLUE	WHITE	NA BROWN NA	BLUE	WHITE	NA NA BROWN

4.3 PRE-MOUNT CHECKS

Prior to mounting the 60mm Mortar System, checks are conducted on the tube and system to ensure that it is serviceable and able to conduct missions. Each Squad member should be able to perform all the following pre-mount checks:

a. The Gunner performs pre-mount checks on the cannon, ensuring:
   (1) Cannon is clean both inside and outside;
   (2) Firing pin is visible;
   (3) Selector switch is in good working condition;
   (4) Range scale indicator serviceable.

b. The Assistant Gunner performs pre-mount checks on the bipod, ensuring:
   (1) The spread chain is doubled, not wrapped around the legs, and hooked untangled to the left leg;
   (2) The cross leveling wing nut is neither too loose nor too tight;
   (3) The traverse bearing is centered;
   (4) All moving parts are well lubricated and are in working condition;
   (5) The dove tail slot is serviceable.

c. The Ammo Bearer performs pre-mount checks on the baseplate, ensuring:
   (1) The rotatable socket moves freely and has a light coat of oil;
   (2) Checks the spades for cracks and dents.

4.4 SAFETY CHECKS

Prior to firing, the following safety checks are conducted by the Gunner:
•U-shaped rotatable socket is facing the direction of fire;
•Selector switch is on drop fire;
•Collar locking assembly is on the correct saddle, properly seated and hand tight;
•No masking of the tube and it has complete overhead clearance;
•Cross-leveling wing nut is hand tight;
•Leg spreader (M170) cable is taut with no kinks or wraps around bipod legs.

***NOTE: If unsure of mask and overhead clearance, de-elevate to 0800 and elevate to 1511, while looking at the angle of tube, to ensure proper clearance.

MALFUNCTIONS

a. **Misfire.** A misfire is a complete failure to fire. It may be caused by a faulty firing mechanism or a faulty firing element in the propelling charge. Mechanical malfunctions may be caused by a faulty firing pin, rounds lodging in the tube because of burrs, dirt, or foreign matter in the cannon;
b. **Hang fire.** A hang fire is a delay in the functioning of a propelling charge explosive train at the time of firing. In most cases the delay, though unpredictable, ranges from a split second to several minutes. Thus a hang fire can't be distinguished from a misfire;
c. Cook-off. A cook off is a functioning of any or all of the explosive components of a round chambered in a very hot cannon, initiated by the heat of the weapon.

***NOTE: There will be times when the trigger will stick in hand held mode. Trouble shoot by using CLP at the ball bearing at this point:

V

4.6 REMOVAL OF MISFIRES.

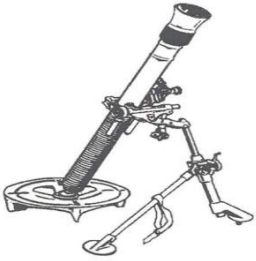
When a misfire occurs any or the first to notice announces **MISFIRE!** All persons except the Gunner move away from the Gun. **The Gunner then tries to trigger fire the weapon twice, if the charge of the round is no larger than 1.** If the weapon does not fire, he then kicks the base of the barrel in an attempt to dislodge the round. If the round still does not fire he then **puts the selector switch on safe,** checks the barrel for heat with his finger tips. If the tube is too hot, the Gunner waits with the rest of the crew and re-checks after **one minute.** If the barrel still is not cool, attempt to cool it off by running water on the outside of the barrel. After the barrel has cooled, the crew returns to remove the misfire. The Gunner depresses the elevation to its minimum. The assistant Gunner lays in the prone and holds both bipod legs in place and the Gunner unlocks the cannon and rotates 90 degrees in either direction. The Ammo Bearer then places his hands, palms facing up, near the muzzle's edge; as the Gunner passes horizontal, he ensures to never lower below that point until the round has been removed. As the round slides out the Ammo Bearer catches the round and then hands it off to the Squad Leader for inspection. The Gunner and assistant Gunner swab the bore, put the selector switch on fire, and set the Gun back up for firing.

Conventional Vs. Handheld?

TIP: As a consideration the bipod may be attached to the tube and used in conjunction with hand held mode. This is best used for extended patrols or when extra support is needed due to environmental considerations like soft or wet ground or when stationary for more than 10 min. As a rule of thumb when attached to weapons squads as support, if the 240's set up tripods the 60's should set up bipods. These considerations should be made by the Section Sergeant and as always METT-C Dependent.

***NOTE** While using the M8 Baseplate in conjunction with the Bipod, the 60mm Mortar would be operated in drop fire mode and the range indicator would be used in the same fashion as in hand held mode.

M252 Mortar System (81mm)



MORTAR CHARACTERISTICS.

Below are listed the characteristics of the M252 Mortar System:

WEIGHT (lbs.)	
Complete System	121
System (w/o BII)	93.5
Cannon, M253	35
Bipod, M177	27
Baseplate, M3A1	29
Sight Unit, M67A1	2.5

RANGE (m)	
Minimum	83
Maximum	5,608

AMMUNITION (lbs)				
	HE	**WP**	**IL**	**TR**
Ready to Fire	9.4	10.6	9.1	9.4
In Single Container	12	13.8	12.4	12.5
In 3-Round Pack	57	63	60	60

ELEVATION (mils)	
Elevation (Approximate)	800 to 1515
For Each Turn of Elevation Knob	10

TRAVERSE (mils)	
Right or Left from Center	100
For Each Turn of Traverse Knob	7

RATE OF FIRE	
Maximum	30 rounds per minute for 2 minutes
Sustained	15 rounds per minute indefinitely

AMMUNITION CHARACTERISTICS.

Below are listed the characteristics of the ammunition able to be fired from the M252 81mm Mortar System:

	CARTRIDGE				
	M821	M889	M819	M853	M880
TYPE	HE	HE	RP	ILLUM	TP
STANDARD	A	A	A	A	A
MIN RANGE	83 M	83	300	300	47
MAX RANGE	5608 M	5608	4875	5100	458
BURSTING AREA	40-DIAMETER	40		1,200 M	
BURN TIME				60 SEC	
FUZE	M734 MULTIOPTION	M935 IMPACT & DELAY	M772 MTSQ	M772 M768	M775
COLOR CODE	OLIVE DRAP W/ YELLOW MARKING	OLIVE DRAB W/ YELLOW MARKING	LIGHT GREEN BROWN BAND W/BLACK MARKING	WHITE WITH BLACK MARKING	BLUE W/ WHITE MARKING

PRE-MOUNT CHECKS

Prior to mounting the 81mm Mortar System, checks are conducted on the tube and system to ensure that it is serviceable and able to conduct missions. Each Squad member should be able to perform all the following pre-mount checks:

a. The Gunner checks the baseplate and ensures that:
   (1) The barrel is clean and free from grease and oil, both inside and out;
   (2) The breech plug and Blast Attenuator Device are screwed tightly to the barrel;
   (3) The firing pin is secured correctly and present.

b. The Assistant Gunner checks the bipod and ensures that:
   (1) The barrel clamps are clean and dry;
   (2) The barrel carrier is centered;
   (3) The securing strap is correctly located, securing the barrel clamps and buffers to the plain leg;
   (4) The leg-locking hand wheel is hand tight;
   (5) Four inches of elevation shaft are exposed and the shaft is not bent;
   (6) Ensures that the Mortar mounting buffers are working properly and free of debris.

c. The Ammunition Bearer checks the barrel and ensures that:
   (1) The rotating socket is free to move in a complete circle;
   (2) The ribs and braces have no brakes, cracks, or dents;
   (3) The circle clip is correctly located, securing the rotating socket to the baseplate.

The Squad Leader supervises the Squad drill and is responsible for supervising the layout of the equipment. The equipment is placed out the same as for the Gunner's examination.

SAFETY CHECKS

Prior to firing, the following safety checks are conducted by the Gunner:

- •U-shaped rotatable socket is facing direction of fire.
- •Firing pin recess is facing skyward.
- •Collar locking assembly properly seated and locked.
- •No masking of the tube and it has complete overhead clearance
- •Plain leg is fully extended, teeth intermeshed and locking knob hand tight.

The Assistant Gunner cleans the bore and swabs it dry. The first Ammunition Bearer ensures that each cartridge is clean, the safety pin is present, and the ignition cartridge is in good condition.

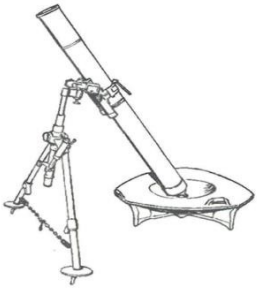
MALFUNCTIONS

The malfunctions that can happen during the firing of the 81mm Mortar System are the same as the 60mm Mortar System (see 60mm malfunction SOP).

REMOVAL OF MISFIRES.

When a misfire occurs any or the first to notice announces **MISFIRE!** All persons except the Gunner move away from the Gun. The Gunner kicks the barrel in an attempt to dislodge the round. If the round still does not fire, he then checks the barrel for heat. If the tube is too hot, the Gunner waits with the rest of the crew and re-checks after **one minute.** If the barrel still is not cool, attempt to cool it off by running water on the outside of the barrel. After the barrel has cooled, the crew returns to remove the misfired round. The Gunner depresses the elevation to its minimum, ensures that the socket on the baseplate is free of dirt and debris, and removes the firing pin utilizing the firing pin wrench. The assistant Gunner lays in the prone and holds both bipod legs in place and the Gunner unlocks the cannon and rotates it 90 degrees. The Ammo Bearer then places his hands, palm's facing up near the edge (not over) the Blast Attenuator Device, as the Gunner raises the barrel out of the baseplate. After the Gunner passes horizontal, he ensures to never lower below that point until the round has been removed. As the round slides out, the Ammo Bearer catches the round and then hands it off to the Squad Leader for inspection. The Gunner and assistant Gunner swab the bore, replace the firing pin, and set the Gun back up for firing.

M120 Mortar System (120mm)



MORTAR CHARACTERISTICS: M120 120MM MORTAR

WEIGHT (lbs.)	
Complete System	725.5
System (Dismounted)	318.5
Cannon, M298	110
Bipod, M190 (Ground-Mounted)	70
Bipod, M191 (Carrier-Mounted)	78
Baseplate, M9	136
Sight Unit, M67	2.5
Trailer, XM1100	399
RANGE (m)	
Minimum	200
Maximum	7,200
ELEVATION (mils)	
Elevation (Approximate)	800 to 1510
For Each Turn of Elevation Knob	5
TRAVERSE (mils)	
Right or Left from Center	136
Using Extension	316
For Each Turn of Traverse Knob	5
RATE OF FIRE	
Maximum	16 rounds for 1 minute
Sustained	4 rounds per minute indefinitely

NOTE: Prior to boresighting, ensure to tighten machine bushing.

SAFETY CHECKS

Prior to firing, the following safety checks are conducted by the entire Squad:
Baseplate is facing direction of fire;

- •Breach cap is properly seated in the baseplate; with the firing pin facing skyward;
- •Collar-locking assembly properly seated and hand tight to two clicks and the traversing extension assembly is perpendicular to the ground and hand tight;
- •The buffer housing assembly is locked and hand tight to two clicks;
- •No masking of the tube and it has complete overhead clearance;
- •Spreader chain is taut with no kinks or wraps around the bipod legs.

MALFUNCTIONS

The malfunctions that can happen during the firing of the 120mm Mortar System are the same as the 60mm & 81mm Mortar System

REMOVAL OF MISFIRES.

When a misfire occurs, any or the first to notice announces **MISFIRE!** All persons except the Gunner move at least 100 meters away from the Gun. The Gunner kicks the barrel in an attempt to dislodge the round. If the round still does not fire, he then checks the barrel for heat. If the tube is too hot, the Gunner waits with the rest of the crew and re-checks after **one minute.** If the barrel still does not cool, attempt to cool it off by running water on the outside of the barrel. After the barrel has cooled, the crew returns to remove the misfire. The Gunner depresses the elevation to its minimum and removes the firing pin utilizing the firing pin wrench. The AB gets the artillery staff and extractor tool. The Gunner and assistant Gunner inspect the springs on each of the 4 claws on the extractor tool. The AB inserts the extractor tool and artillery staff into the tube until contact between the extractor and round is felt. The AB turns the artillery staff 90 degrees or until he feels the extractor has grabbed the round. The AG assists the AB in removing the round using the hand under hand method. Once the round is a quarter of the way out of the tube, the AG grabs the round while the AB controls the artillery staff. The Gunner moves forward and depresses all four claws on the extractor as the Gunner re-inserts the firing pin and re-lays the Gun on the poles.

MCV/RMS&L

- Supports infantry uni1s w.h screening obscurants, suppressive forces and on-call supporting fires; 120 mm and 81mm mortar carrier variants provide complimentary capabilities with responsive, accurate and lethal indirect fire support to the dismounted infantry assault

Armament
120mm RMS / M240B MG
Smoke

Mobility
Top Speed- 63mph
50m Dash-9sec.
Wheel Clearance-21 in
Vertical Climb-24 n
Gap Crossing-78in
Range- 330 miles (CBT Ops) @40 MPH
Winch Self Recovery

Lethality
RSTA, BTLN, and CO: Mounted 120mm
BTLN: Adds dismounted 81mm mortar
CO: Adds dismounted 60mm mortar

SU1Vivabil-Hi
gh Hard Steel Struclt.re
Protection: 14.Smm
SpallLiner
RPG w/AddonAnoor ISi..ATJ

C2
SINCGARS, FBC82EPtRS
GPS, VIS /VICMFCS

Deployability
C-130- 1 EA
C-17 – 3 EA

4ea.

Ammunttion Stowage
RSTA 120xl
BTLN: 12(1181-41136
CO: 12!11xl-48171

Key Characteristics

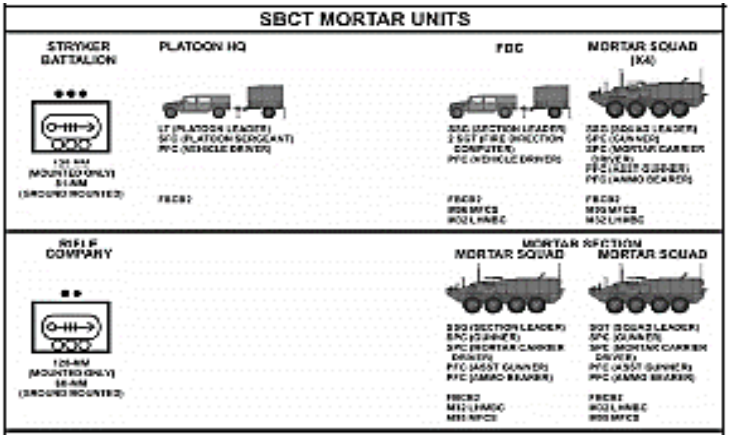
Configuration: Combat (inches)		Shipping Inches)
Height:	125	106
Width:	153	113 (boxes removed)
Length:	288	288

Crew: 5

120mm Recoil Mortar System: Mounted with soft recoiless
Mounts Mortar Fire Control System computer: Receives Digital fire missions and provides gun as FDC capability
Fires all US 120 mm Mortar rounds:
Initial rate- 15 Rounds per minute
Sustained Fire Rate- 4 Rounds per minute (up to 60 md)

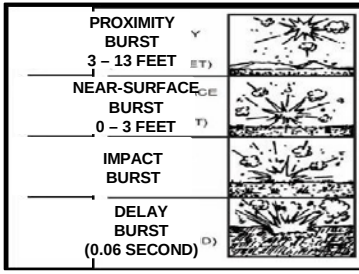
Min range- 200 meters
Max range- 6800 meters

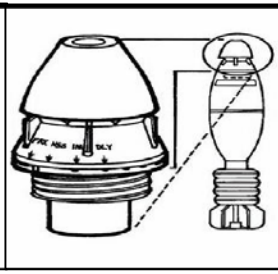
The SBCT Mortar Platoon and Section Capabilities



An SBCT Infantry Battalion Mortar Platoon has four recoil mortar system-light 120-mm mortars carried and fired from the Stryker mortar carrier vehicle. The FDC section uses a wheeled vehicle, as does the mortar section leader. Each SBCT rifle company also has a section of heavy mortars. For dismounted operations, SBCT mortar units use the arms room concept with battalion mortars platoon carrying additional medium mortars and the company mortars section carrying additional light mortars. Both mortar squad and FDC personnel operate from Stryker mortar carrier vehicles, which offer protection from medium caliber fire and shell fragments. Stryker has additional armor kits such as slat armor for rocket-propelled grenade (RPG) protection and Stryker reactive armor tiles for RPG/ATGM protection.

120mm/MCV Ammunition Characteristics





CARTRIDGE/TYPE	MAXIMUM RANGE (METERS)	FUZE	CHARACTERISTICS AND LIMITATIONS
M934/M934A1 HE cartridges 	7,200	M734 multioption (M934) fuze M734A1 multioption (M934A1) fuze	These cartridges' maximum range is achieved at charge 4. They weigh 30.17 pounds.

CARTRIDGE/TYPE	MAXIMUM RANGE (METERS)	FUZE	CHARACTERISTICS AND LIMITATIONS
M983 IR ILLUM cartridge 	6,675	M776 MTSQ fuze	This cartridge is identical to the M930, except for the illuminating candle composition. It weighs 30.6 pounds. The candle provides IR illumination for 50 to 60 seconds and is used to support troops with night vision devices.

CARTRIDGE/TYPE	MAXIMUM RANGE (METERS)	FUZE	CHARACTERISTICS AND LIMITATIONS
M929/XM929 smoke WP cartridges 	7,200	M734A1 multioption (M929) fuze M745 PD (XM929) fuze	These cartridges weigh 30 pounds. The current M929 utilizes the M734A1 multioption fuze and should be set to PROX for smoke curtains/screens. The XM929, a redesign of the original M929, utilizes the M745 PD fuze.
NOTE: All rounds have a minimum range of 200 meters at charge 0 (charge may vary in firing table and whiz wheel).			

CARTRIDGE/TYPE	MAXIMUM RANGE (METERS)	FUZE	CHARACTERISTICS AND LIMITATIONS
M931 FRTC 	7,200	M781 PD fuze	This cartridge matches the M934 HE cartridge in size, shape, and weight, and has similar ballistic characteristics. It weighs 30.82 pounds. The M781 PD practice fuze produces a flash, a bang, and a smoke signature that provides audio-visual feedback to the mortar crew and FO.
NOTE: All rounds have a minimum range of 200 meters at charge 0 (charge may vary in firing table and whiz wheel).			

RMS6L Misfire Procedures (Pg 1)

1. When a misfire occurs, the first crew member that notices shouts, "MISFIRE!"
2. The vehicle commander alerts the FDC of misfire using either voice or digital radio communications

***Note*:** To avoid injury during peacetime live-fire exercises, all crew members, except the gunner and squad leader, will exit the vehicle through the squad leader or ammunition bearer's hatch. They will then move to a position 100 meters in the opposite direction of fire. In combat, all crew members remain inside the vehicle.

3. Gunner confirms safety mechanism is set to FIRE position (—F‖ position is showing) and announces, WEAPON IS ON FIRE.

Note: If the gunner confirms system is on SAFE, the gunner announces, WEAPON IS ON SAFE, and leaves the weapon on SAFE. If the squad leader confirms the system is on SAFE, he announces, WEAPON IS ON SAFE, and he and the gunner exit the vehicle in the opposite direction of fire. They then move to the same location as the rest of the crew, then proceed to step 8.

RMS6L Misfire Procedures (Pg 2)

4. The squad leader confirms the action of the gunner by physically observing that the ―F‖ is showing and announces, WEAPON IS ON FIRE.

5. The gunner secures the rubber mallet and strikes the upper portion of the cannon up to three times with the rubber mallet. If the cartridge fires, the squad leader will call the crew back to the vehicle and the mission will resume. If the cartridge does not fire after striking the cannon with the rubber mallet, the squad leader and gunner will exit the vehicle from the opposite direction of fire and wait for one minute.

6. After one minute, the gunner, assistant gunner, and squad leader return to the vehicle

7. The gunner checks the barrel for heat using bare hands. Starting at the muzzle, the bare hand is moved close to the barrel, sensing for heat, if heat is not sensed with the hands, the gunner touches the barrel lightly with his fingertips every few inches down to the breech cap. If the barrel is too hot, the crew uses some means (water, snow, or elapsed time) to cool the barrel before attempting to remove the misfire.

8. When the barrel is cool enough to handle, the gunner places the safety mechanism on SAFE (―S‖ showing) and announces, THE SAFETY MECHANISM IS IN THE SAFE POSITION.

9. The assistant gunner physically confirms that the safety mechanism is on SAFE (―S‖ showing) and announces, THE SAFETY MECHANISM IS IN THE SAFE POSITION.

10. The squad leader confirms the actions of the gunner and assistant gunner and physically verifies that the safety mechanism is in the SAFE position.

RMS6L Misfire Procedures (Pg 3)

11. Ensuring the cannon is pointed toward the target area, the gunner traverses the mortar using the traversing hand wheel until the cannon is at the 3200 mils position and travel lock is engaged. (The cannon is pointed over the center of the ramp).

12. The assistant gunner lowers the ramp as directed by the squad leader if not already lowered using the troop ramp control box.

13. If the M67 sight is installed, the gunner locks data on the sight and removes the sight and places it back in the sight box.

14. The assistant gunner removes and stows the blast attenuator device (BAD). The squad leader confirms the actions of the assistant gunner.

15. The gunner and assistant gunner stow their seats in the raised position.

16. The gunner slowly lowers the cannon to its lowest elevation using the elevation hand wheel.

17. The gunner and assistant gunner slowly lower the cannon to the travel position by pushing up on the brass bushing and lowering the folding mechanism.

18. The assistant gunner inspects extractor catches on the cartridge extractor to ensure they are the latest configuration. There should be a 1/8 inch hole in the face of each catch. The hole indicates that the catch is the latest configuration. The assistant gunner inspects the cartridge extractor and makes sure that the cartridge extractor catches are free of burrs, wear, or rust/corrosion that would impair function. The assistant gunner tests each cartridge extractor catch to ensure free operation, and that each catch will snap positively into its original position.

RMS6L Misfire Procedures (Pg 4)

19. The squad leader confirms the actions of the assistant gunner. If the cartridge extractor fails to meet inspection standards, the squad leader will attempt to retrieve another mission capable cartridge extractor from another squad. If unable to retrieve another mission capable cartridge extractor from another squad, he will proceed to removal of a stuck cartridge in step 32.

20. The assistant gunner attaches the cartridge extractor to the extended artillery cleaning staff assembly ensuring the extractor is securely attached and the cleaning staff assembly sections are fully extended and locked.

21. While keeping head and body away from the front of the cannon, the assistant gunner rotates the artillery cleaning staff assembly to obtain positive control of the extractor head. The assistant gunner must place the extractor in his left palm facing upward. He inserts the cartridge extractor into the cannon and lowers the cartridge extractor slowly (hand to hand) deeper into the cannon until contact is made with the round.

22. The assistant gunner rotates the extractor in either direction until the spring-loaded extractor catches connect into the round. Rotation continues until resistance is felt.

23. ***Note:*** If the round is grasped by the extractor, continue with step 22. If the round is not grasped by the extractor, proceed to removal of a stack cartridge in step 32.

24. With the gunner's hands held at the ready at the muzzle, the assistant gunner withdraws the cartridge extractor assembly in a steady motion until the extractor appears at the end of the muzzle.

RMS6L Misfire Procedures (Pg 5)

25. The assistant gunner continues to withdraw the round. The gunner grasps the body of the round as it comes out of the barrel. The cartridge extractor and round are moved by the assistant gunner and gunner down the ramp as they proceed to the left or right side of the vehicle.

26. Once the gunner and assistant gunner have cleared the ramp, the ammunition bearer comes forward and stands beside the gunner.

27. With the assistant gunner holding the artillery cleaning staff assembly and the gunner holding the round, the ammunition bearer presses on all four extractor catches at the same time, releasing the round from the cartridge extractor.

28. The gunner inspects the cartridge for cause of misfire. If the primer has been struck by the firing pin, he disposes of the cartridge in accordance with applicable safety regulations and unit SOP

Note: If no contact or insufficient contact was made with the firing pin, check the safety mechanism function on the cannon. Clean the cannon before attempting to fire the round a second time. If the cartridge does not fire after checking the safety mechanism and swabbing the cannon, repeat the misfire procedure and dispose of the cartridge in accordance with applicable safety regulations and unit SOP.

29. The assistant gunner swabs the barrel and replaces the blast attenuator device. The gunner places the safety mechanism to the FIRE position (—F‖ is showing).

30. The squad leader confirms the actions of the gunner and assistant gunner and verifies that the safety mechanism is in the FIRE position.

31. The gunner places the mortar into action (replacing the M67 sight unit if applicable), and the mission is continued.

RMS6L Misfire Procedures (Pg 6)

IN THE EVENT OF A STUCK CARTRIDGE:

32. Squad leader verifies safety mechanism is set to SAFE position (with ―S‖ showing).

33. The gunner loosens the wiper compression clamp and removes the two wiper segments.

34. The ammunition bearer pulls out and turns the cannon retaining ring plunger.

35. The ammunition bearer unscrews and removes the cannon retaining ring using a large spanner wrench and hammer while the gunner secures the cannon to keep it from sliding. The assistant gunner maintains positive control of the artillery cleaning staff.

36. The gunner slowly pushes the cannon forward approximately 3 inches until the breech key clears the cradle assembly keyway.

37. The ammunition bearer unscrews and removes the breech cap using a hammer and removal tool while the gunner holds the upper portion of the cannon.

38. The assistant gunner attempts to push the cartridge out through the base of the cannon (fin first and in one steady motion) while the ammunition bearer places his hands ready to catch the round.

39. The ammunition bearer grasps the round by the fin and body of the round as it comes out of the barrel.

40. Once the ammunition bearer has positive control of the round, the assistant gunner allows the cleaning staff to rest in the bore and moves to the rear of the cannon.

41. The assistant gunner presses on all four of the extractor catches at the same time releasing the round from the cartridge extractor.

RMS6L Misfire Procedures (Pg 7)

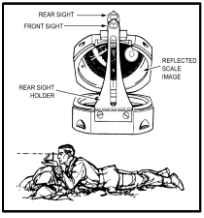
42. The ammunition bearer hands the round to the assistant gunner who passes the round to the gunner. The gunner carries the round down the ramp and proceeds to the left or right side of the vehicle. At this point the crew follows steps 28-31.

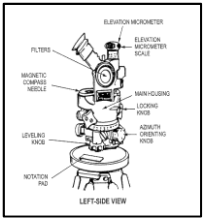
43. The ammunition bearer replaces the breech cap and cannon retaining ring and engages the cannon retaining ring plunger.

44. The assistant gunner and gunner replace the wiper segments and tighten the wiper compression clamp.

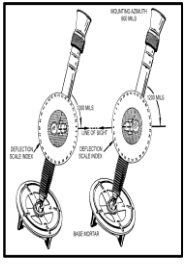
45. The crew places the gun into action and continues the mission.

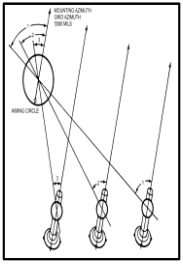
***Note*:** If the round cannot be pushed out of the cannon, the gunner, assistant gunner, and ammunition bearer—keeping the cannon in a horizontal position—slide the cannon toward the rear of the vehicle and out of the cradle assembly, then walk the barrel down the ramp. The cannon with stuck round is placed a safe distance from the carrier and the unit contacts EOD. The squad leader reports his actions to the chain of command.





Section 1B:
Laying in the Guns





Boresight a Mortar

The purpose of bore sighting is to ensure the sight is aligned to the true lay of the tube.

Bore sighting will be done at the COP / AA prior to firing (stationary MFP) or patrolling.

1. The primary method will be a distant aiming point.
2. The secondary method will be the sight box method.

Prep Mortar

1. select an aiming point to use for bore sighting deflection. This aiming point should be as far as possible from the mortar, but it must be at least 200 m from the mortar.
2. Set the sight at a deflection of 3200 mils and an elevation of 0800 mils, and lay the mortar on the distant aiming point. Ensure that the mortar is within 2 turns of center traverse, and that both bubbles on the sight are level.
3. Place the M45 bore sight on the top of the barrel, flush with the rim at the muzzle end of the barrel. Center the cross-level bubble by rotating the bore sight and then tighten the clamp screw. Fine adjustment can be made by tapping on either side of the bore sight. The mortar is now prepared for bore sighting

Boresight for Elevation:

1. Elevate or depress the mortar, until the bore sight elevation bubble is level.
2. Rotate the sight's elevation micrometer knob until the elevation bubble on the sight is leveled.
3. Check the coarse elevation scale. If the coarse elevation index is not at 8, loosen the two screws that hold the coarse elevation scale. Slip the scale until the 0800-mil mark meets the reference mark on the housing. If it is plus or minus 20 mils from the 8 (0800) on the elevation scale, the sight should be turned in.
4. Ensure the reading on the micrometer elevation scale reads 0 mils on the fine elevation scale index mark. If not, tighten the elevation locking knob. Loosen the two screws on the elevation knob, and slip the micrometer elevation scale until 0 mils is at the index mark. Then tighten the two screws.
5. All bubbles on the sight and bore sight should be level, and the elevation scales on the sight should read 0800 mils. If not, repeat the process. The mortar is now bore sighted for elevation

Boresight for Deflection (Distant-Aiming-Point Method)

1. Look through the boresight elbow telescope. Ensure the vertical cross line is still laid on the aiming point. Ensure the mortar does not traverse more than four turns of center traverse.
2. If needed, re-lay the cross-level vials on the boresight by tapping the vials on either side of the sight. Use the cross-leveling hand wheel until both vials are level, and the boresight vertical cross line is on the aiming point.
3. Look through the elbow telescope of sight. Use the deflection micrometer knob of the sight to move the vertical cross line of the sight to the same point on the aiming point on which the boresight is laid. The sight picture on the boresight and the M53 sight must be the same.
4. After all bubbles are level (deflection and elevation) and the sight pictures are the same, check the deflection scale. The scale should read 3200 mils.
5. Check the 3200 on the coarse (fixed) deflection (red) scale. If the 3200 is not aligned at the index mark and is + or - 20 mils, the M53 sight should be turned in

Boresight for Deflection (Sight-Case Method)

1. Align the long axis (handle) of the M53 sight case perpendicular (handle up) to the barrel 25m from the MTR position
2. Align the vertical cross line of the boresight on the right side of the sight case.
3. Using the deflection micrometer knob, align the vertical cross line of the M53 sight on the left side of the sight case.
4. Look through the boresight elbow telescope. Ensure the vertical cross line is still laid on the right side of the sight case. If not, relay on the sight case using the traversing hand wheel or shift the sight case so the right side is aligned with the vertical line of the boresight. If traversing is needed, ensure the mortar does not move more than four turns of center traverse.
5. If needed, re-level the cross-level vials on the boresight by tapping either side of the sight. These steps may need repeating several times to accomplish this.
6. Look through the M53 sight elbow telescope. By using the deflection micrometer knob of the sight, move the vertical cross line of the sight to the left edge of the sight case. The vertical line of the boresight should be on the right side of the sight case.
7. After all bubbles are level and the sight pictures are correct, check the deflection scale. The scale should read 3200 mils.
8. Check the 3200 on the coarse (fixed) deflection (red) scale. If the 3200 is not aligned at the indexed mark and is plus or minus 20 mils, the M53 sight should be turned in.
9. If all procedures are correct, the sight is now bore sighted. Remove the boresight. The mortar is ready to fire.

DIGITAL BORESIGHT

2-25. For the Mortar Fire Control System (MFCS) software to properly compute the boresight values, the mortar trunnions must be leveled. In a tactical environment, this is most easily accomplished using a gunner's quadrant. To make the process easier to perform, the vehicle should be parked on a slight incline, roughly 20 to 50 mils, with the front of the MCV higher than the rear. The incline may be measured with the gunner's quadrant placed on top of the mortar's traversing mechanism gearbox, or traversing gear ring, and aligned with the fore and aft axis of the carrier. The ―line of fire‖ indicated on the gunner's quadrant (Figure 2-19) should point toward the front of the vehicle.

Figure 2-19. Gunner's quadrant sight.

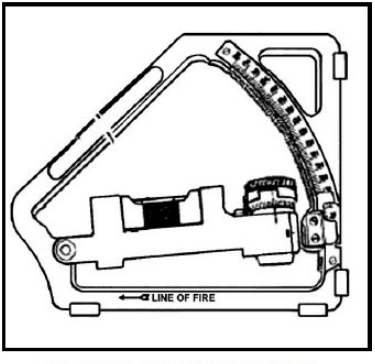


Figure 2-19. Gunner's quadrant sight.

Note: When using the gunner's quadrant, be sure the mating surfaces are free of any burrs, projections, or paint that would prevent the quadrant from seating properly. The gunner's quadrant must be held against the three registration pins on the seating pads to achieve an accurate reading.

MANUAL BORESIGHT SET-UP

•Ensure the MFCS is fully initialized and the navigation subsystem is fully aligned.
•Record the current Easting, Northing, and Altitude position data. This information may be required at the end of the boresight procedure.
•Elevate the weapon to roughly 0800 mils as indicated by the gunner's quadrant placed on the mortar's elevation seats. (As the turntable is not level, the elevation will change as the weapon is traversed.)
•Set the gunner's quadrant to zero mils +/- any correction value determined during the end for end test. The correction value should be recorded on the outside of the quadrant case.
•Place the gunner's quadrant on the mortar's 0800 mil cross-level seats and traverse the weapon to center the bubble. When moving the cannon, always make the last turn of the traversing hand wheel in the direction of the most resistance.
***Note*:** For this and subsequent steps, keep crew movement and vehicle motion to a minimum.
•When the bubble is centered, remove and re-seat the gunner's quadrant on the cross-level seats and verify the bubble is still centered. If not, repeat the prior step. If the bubble cannot be centered, relocate the vehicle to a more suitable position and repeat the prior step.
•On the Commander's Interface, select the pointing device (PD) control button and then select the boresight tab.

BORESIGHT AT 0800 MILS

1. Set the gunner's quadrant to 0800.0 mils, +/- any correction value it may have.
2. Set the gunner's quadrant to 1300.0 mils +/- any correction value it may have.
3. Place the gunner's quadrant on the mortar's elevation seats (coarse scale closest to the elevation seats). Elevate the cannon to center the bubble. When elevating the cannon, always make sure the last turn of the hand wheel moves the cannon up.
4. When the bubble is centered, remove and reseat the gunner's quadrant on the seats at least two times and verify the bubble is centered both times.
5. Set the gunner's quadrant to zero mils.
6. Place the gunner's quadrant on the mortar's 1300 mil cross-level seats and verify the bubble is still centered. If the bubble is not centered, traverse the weapon in the same direction needed to center the bubble.
7. When the bubble is centered, remove and reseat the gunner's quadrant on the cross-level seats and verify the bubble is still centered. If not, repeat steps 1 through 7. Do not proceed to the next step until an accurate and consistent zero mil cross-level measurement is achieved.
8. Compare the azimuth currently displayed in the upper right hand corner of the CI to the previously recorded azimuth. The difference between the two should not exceed three mils.
9. On the CI, select the ON DAP AT 1300 MILS button on the PD boresight tab.

10. Read and record the azimuth, elevation, and roll values displayed in the New Boresight Corrections window at the bottom of the PD boresight tab.

11. Select the Save Corrections button on the PD boresight tab. PD OUT should be displayed in the upper right hand corner of the CI.

12. Set the PD Power Switch on the PDA to OFF. Ensure the PLGR or DAGR is operational and after ten seconds switch the PD Power to ON.

***Note*:** If the PLGR or DAGR is not tracking the required number of satellites, the PD will not begin aligning and a manual position update will be required, or you may wait to obtain the correct number of satellites so the PD will align. Allow no movement on the vehicle during alignment.

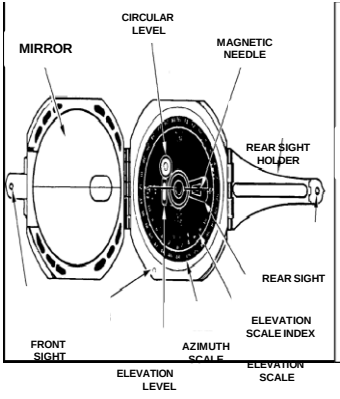
13. Select the PD Status tab and verify that the PD has restarted (by watching the countdown at the top right of the screen). If it has not restarted, select Position Update and enter the current Easting, Northing, and Altitude position data recorded during boresight set-up and press Send Update.

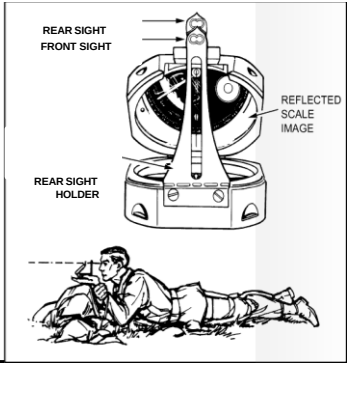
14. When the alignment countdown ends, select the bore sight tab.

15. Verify that the azimuth, elevation, and roll values displayed in the current boresight correction window at the top of the PD boresight tab match the recorded values. If not, the values were not retained in the PD and the process must be repeated.

16. Digital boresight is now complete.

M2 COMPASS



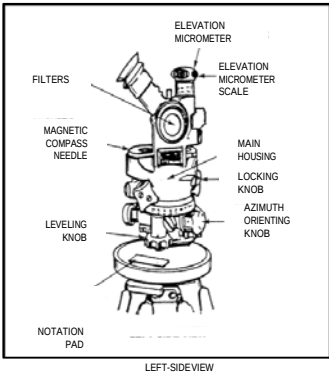


The M2 compass will be the primary means of laying in a section of 2 guns. The squad leader will lay in the base gun than utilize sight to sight to ensure the guns are prepared for a parallel sheaf.

The M2 compass must be decimated utilizing the GM angel found in the map legend to ensure accurate first rounds can be achieved. You will find the mil correction knob on the upper left hand side of the compass.

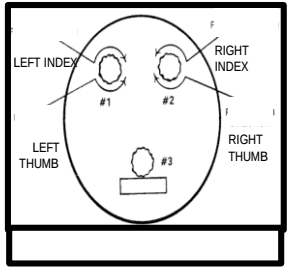
M2 compass can be used for finding elevation during direct lay by recording your desired elevation on the elevation scale index, and placing right hand side compass on top of the tube. You will raise or drop the elevation of the tube until elevation level bubble is centered.

M2 AIMING CIRCLE



The M2 aiming circle will utilized when laying a section or larger or a more accurate lay is needed for any size element.

When establishing the Mortar Firing Position the aiming circle should orient itself to the front left of the gun line to reduce possibilities for sight blockage.



Basic cross leveling of aiming circle

Aiming circle procedures

Set up and level Aiming circle.

Subtract the mounting azimuth from the declination constant of the aiming circle.
(mounting azimuth = direction of fire.)
(Declination constant = 6400 mils – or + GM angle found on the marginal data on your map.)

Declination constant Remainder 6380 mils
Announced mounting azimuth - 5550 mils
830 mils

Record remainder on the azimuth and micrometer scales of the aiming

circle. In this case, the remainder is 830 mils.
Non record to north.
Record back to the gun line and begin laying in element until all guns are within 1 mil mortar lay.

PROCEDURES FOR DECLINATING THE AIMING CIRCLE AT A DECLINATION STATION

Where a declination station is available, the procedure for declinating the aiming circle is as follows:

(1) Set up and fine level the aiming circle directly over the declination station marker using the plumb bob.

(2) Place the grid azimuth of the first azimuth marker on the scales using the recording motion. Place the vertical cross line of the telescope on the azimuth marker using the nonrecording (orienting) motion. The aiming circle is now oriented on grid north.

(3) With the recording motion, rotate the instrument to zero. Release the magnetic needle and look through the magnifier. Center the north-seeking needle using the recording motion, and then relock the magnetic needle.

(4) Notice the new azimuth on the scale, which is the declination constant—record it.

(5) Recheck the aiming circle level and repeat steps 2 through 4 using the remaining azimuth markers until three readings have been taken. If there is only one marker, repeat the entire procedure twice using the same marker.

(6) Find the average declination constant using these three readings.

(7) Record the average declination constant in pencil on the notation (strip) pad of the aiming circle as its declination constant. All readings should be within 2 mils of each other; if not, repeat steps 2 through 4. Ensure the aiming circle is directly over the station marker to obtain the 2-mil tolerance. If the desired 2-mil accuracy is not gained after two tries, the aiming circle is defective and should be turned in for repair.

DECLINATION CONSTANT (EXAMPLES)

EXAMPLE 1

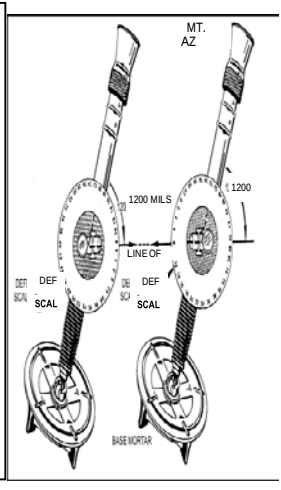
1st point reading = 6399 mils
2nd point reading = 6398 mils
3rd point reading = 6398 mils
Total = 19195 mils
19195 ¸ 3 = 6398.3 (rounded off to the nearest whole number) = 6398 mils (average declination constant)

EXAMPLE 2

1st point reading = 0030 mils
2nd point reading = 0031 mils
3rd point reading = 0029 mils
Total = 0090 mils
0090 ¸ 3 = 0030 mils (average declination constant)

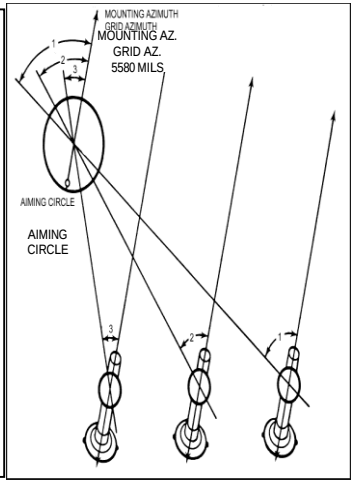
Reciprocal Lay With M2 Aiming Circle

1. Leaders will establish a DOF and disseminate to PLT, SQD LDR will pre lay his gun to assist with speed of establishment.
2. After aiming circle is set up he will state "aiming point this instrument", all gun sights will bisect the aiming circle and sound of with "aiming point identified".
3. Aiming circle will read data in sequence to each gun, when gun receives corrections they will record it on there sights and shift guns back on to the aiming circle, always remaining



Sight to Sight

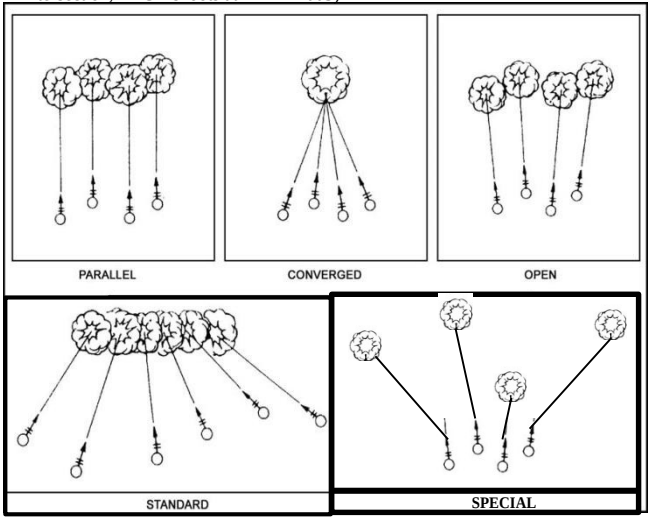
1. Leader lays base gun on DOF with M2 compass.
2. Gunner refers his sight to bisect the second guns sight unit and reads back azimuth.
3. If sight reads more than 3200 mils subtract 3200
4. If sight reads less than 3200 mils add 3200
5. Second gun will record back azimuth on his sight and shift his gun back on to the base guns sight, never leaving 2 turns center traverse. He will continue to do this until guns are



TYPES OF SHEAVES

The term "sheaf" denotes the lateral distribution of the bursts of two or more weapons fired together. The width of the sheaf is the lateral distance between the centers of the flank bursts. The front covered by any sheaf is the width of the sheaf, plus the effective width of one burst.

1) A **parallel shea**f is one in which the trajectories of all weapons are parallel (See below Figure).
2) **Converged sheaf** is one in which the trajectories of all weapons converged to the same target (see figure below).
3) **Open sheaf** is one in which the trajectories of all weapons are spread out (opened) to allow for a greater area to be covered.
4) **Standard sheaf** is one in which the trajectories are slightly converged so as to allow greatest impact on target.
5) **Special sheaf** is one is which multiple targets are shot by section simultaneously (i.e. #1 GN shoots at TRP AB019, #2 GN shoots at Hilltop 548, #3 GN shoots at intersection, #4 GN shoots at TRP AB005)

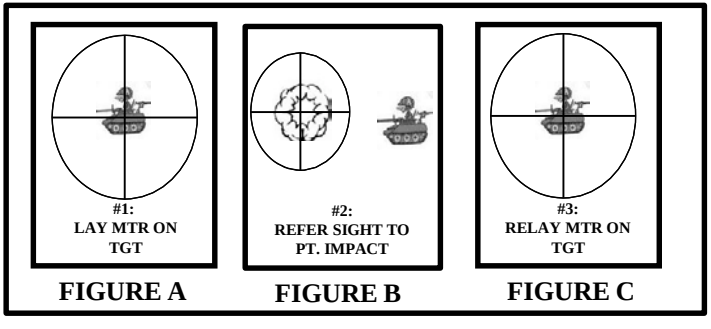


DIRECT LAY OF MORTARS

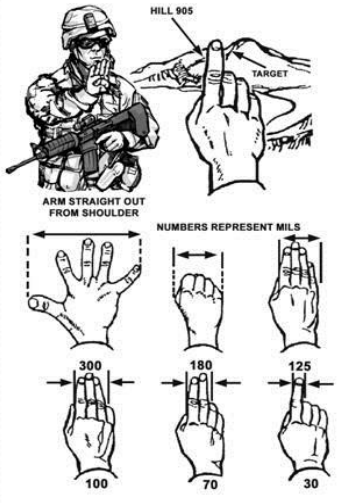
1. Refer the mortar sight TO 3200.
2. Center the traverse bearing.
3. Place elevation data on the mortar sight.
4. Level the mortar (approximate level).
5. Shift the mortar (if necessary). (The mortar will require shifting unless the target is within two turns of traverse after the above steps have been completed. If the target is within two turns of traverse, the mortar may be traversed onto the target to obtain the lay described in step 6. If the mortar is traversed to the target, step 5 will be bypassed.)
6. (**SEE FIGURE A)** Lay the mortar on the target
7. Inform the squad leader that the mortar is "Up." Fire round
8. Observe the burst of the round
9. Level and cross-level the mortar.
10. (**SEE FIGURE B)** Refer the sight to the point of impact. (If the round is determined to be over or short, the squad leader will issue a command to elevate or depress the barrel, for example, "Up one turn.)
11. Elevate/depress the barrel.
12. (**SEE FIGURE C)** Relay the mortar on the target.
13. Fire the mortar (as described in step 7 above).

NOTE: Repeat steps 8 through 13 until the target is hit, at which time the squad leader may end the mission or "fire-for-effect" if deemed appropriate.

DIRECT LAY DIAGRAM

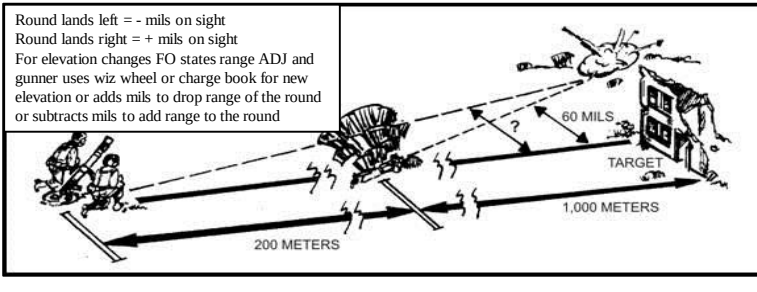


DIRECT ALIGNMENT OF MORTARS



Direct alignment of mortars is used when the gun system is obscured by defilade and unable to use it in the direct lay mode. squad leader will emplace himself aligned between with the gun system and target. Gunner will index 3200 on sight and place a pole out in the direction of fire. SL will make first range estimation and shoot round. SL will use hand method for corrections in place of an FDC. Gunner will record mil change on sight, refer back to his pole and shoot the next round.

Round lands left = - mils on sight
Round lands right = + mils on sight
For elevation changes FO states range ADJ and gunner uses wiz wheel or charge book for new elevation or adds mils to drop range of the round or subtracts mils to add range to the round



MORTAR TACTICS IN OPEN TERRAIN

MORTAR FIRES ARE INHERENTLY INACCURATE. MORTARS ARE AN AREA WEAPON. MORTARS ARE BEST USED FOR SUPPRESSION, NOT DESTROYING POINT TARGETS.

DO NOT FIRE MORTARS AT INVULNERABLE TARGETS:
• BUILDINGS. BLASTING THROUGH CEILINGS WITH MORTAR FIRE IS A WASTE OF ROUNDS.
• BUNKERS AND ENTRENCHMENTS.
• TANKS AND ARMOR. MORTAR FIRE CAN ONLY BUTTON THEM UP AND SLOW THEM DOWN.

❑**MORTAR SMOKE BLINDS THE ENEMY AND REDUCES THE ACCURACY OF HIS FIRE.**
DON'T WASTE AMMUNITION. ROUNDS ARE LIMITED. SAVE ROUNDS FOR LUCRATIVE TARGETS. MORTAR ROUNDS ARE HEAVY TO CARRY AND CONSUMED RAPIDLY. DON'T WASTE ROUNDS ON:
• UNOBSERVED TARGETS
• BAD TARGETS
• DISTANT TARGETS THAT DO NOT SUPPORT YOUR MISSION. SELECT TARGETS CAREFULLY.

❑**MORTAR SMOKE**
MORTAR SMOKE PROVIDES MORE OBSCURATION AT GREATER RANGE THAN GRENADE SMOKE. FIRE MORTAR SMOKE:
• TO BLIND THE ENEMY DURING AN ATTACK.
• IN FRONT OF A DISTANT ENEMY THAT IS FIRING ON YOU.
• IN FRONT OF YOUR POSITION WHEN PINNED BY THE ENEMY TO PERMIT WITHDRAWAL.
• TO DECEIVE THE ENEMY BY MISDIRECTING HIS ATTENTION.

❑**ENEMY MORTARS**

PAY ATTENTION TO THE ENEMY'S MORTARS.

• IF YOU ARE UNDER MORTAR FIRE, YOU ARE UNDER OBSERVATION. MOVE.

• IF HE IS SAVING ROUNDS, HE PROBABLY DOESN'T HAVE MANY TO WASTE.

• IF HE IS USING SMOKE, HE'S HIDING SOMETHING. FIRE INTO HIS SMOKE.

❑WHEN YOU ARE PINNED DOWN IN THE OPEN BY ENEMY FIRE, EXPECT TO BE MORTARED. USE BOUNDING OVER WATCH TO AVOID BEING FIXED. FIND AND ATTACK HIS MORTARS. STUDY THE TERRAIN FOR POTENTIAL POSITIONS. LISTEN FOR MORTAR FIRE TO DETERMINE HIS LOCATION.

❑**GOOD TARGETS**

FIRE MORTARS AT VULNERABLE TARGETS IN THE OPEN:

• INFANTRY IN THE OPEN

• INFANTRY UNDER TREES

• INFANTRY BEHIND ONE-SIDED DEFILADE LIKE WALLS OR HILLS

• STATIONARY SOFT VEHICLES

• STATIONARY CREW-SERVED WEAPONS, ESPECIALLY HEAVY WEAPONS THAT CANNOT BE MOVED QUICKLY

MORTAR SUPPRESSION IS NOT DESTRUCTION. SUPPRESSION NEEDS TO BE COMBINED WITH OTHER WEAPONS. LIMITED ROUNDS LIMIT THE DURATION OF MORTAR SUPPRESSION. ENEMY INFANTRY IN THE OPEN SHOULD BE ATTACKED WITH A COMBINED ARMS MORTAR AND DIRECT FIRE ATTACK.

MORTAR TECHNIQUES: MORTAR UNITS

MORTAR CREWS ARE VALUABLE SUPPORT UNITS. DO NOT USE MORTAR CREWS TO ASSAULT OR ENGAGE IN DIRECT FIRE COMBAT.

❑LIGHT, MEDIUM OR HEAVY?
LIGHT MORTARS MOVE FASTER AND ARE MORE RESPONSIVE THAN MEDIUM OR HEAVY MORTARS. MEDIUM AND HEAVY MORTARS MOVE SLOWLY, AND THEIR AMMUNITION IS HEAVY, BUT THEY ARE MORE DESTRUCTIVE. HEAVY MORTARS USUALLY NEED VEHICLES TO MOVE ON THE BATTLEFIELD.

❑ON THE MOVE
WHILE ON THE MOVE, MORTARS ARE AN INFANTRY COMMANDER'S MOST RESPONSIVE AND IMMEDIATE FIRE SUPPORT AVAILABLE. A MORTAR UNIT'S ABILITY TO SET UP AND FIRE QUICKLY IS CRITICAL.

❑MOUT
MORTARS ARE VALUABLE IN MOUT BECAUSE OF THEIR HIGH RATE OF FIRE, HIGH ANGLE OF FIRE, AND SHORT MINIMUM RANGE. POSITIONS IN EXISTING STRUCTURES AND NARROW ALLEYS PROVIDE MAXIMUM PROTECTION FOR MINIMUM EFFORT. AVOID ROOFTOP POSITIONS FOR MORTARS. OBSERVERS SHOULD USE TALL BUILDINGS TO CONTROL FIRES.

❑SECURITY
MORTAR CREWS PROVIDE THEIR OWN SECURITY. THEY SHOULD STAY CLOSE TO THE UNITS THAT THEY ARE SUPPORTING TO MINIMIZE SECURITY NEEDS.
COMMUNICATIONS. LIGHT MORTARS SHOULD STAY WITHIN SIGNAL RANGE OF THE UNITS THAT THEY ARE SUPPORTING, EVEN WHEN CONNECTED BY RADIO. MORTARS ARE DIFFICULT TO ADJUST WHEN VISIBILITY IS POOR. MEDIUM AND HEAVY MORTARS OPERATE ALMOST EXCLUSIVELY BY RADIO.

❑**SHIFTING POSITIONS**
ONCE THEY ARE SET UP, AVOID MOVING GUNS UNNECESSARILY. MOVING MORTAR AMMUNITION IS MUCH MORE DIFFICULT TASK THAN MOVING THE TUBES.

❑**PLANNED TARGETS**
IN STATIONARY POSITIONS, PLAN AND REGISTER TARGETS. TARGET DEAD SPACE, CHOKE POINTS, AND FINAL PROTECTIVE FIRES.

❑**MORTAR POSITIONS**
THE BEST MORTAR POSITION IS A COMPROMISE BETWEEN DEFILADE, SECURITY AND COMMUNICATIONS.

❑**DEFILADE**
DEFILADE MORTAR POSITION SUPPORTS BOTH THE PRIMARY AND THE ALTERNATE PLATOON DEFENSIVE POSITIONS WITHOUT MOVING TUBES OR AMMUNITION.

- PROVIDES PROTECTION FROM ENEMY DIRECT FIRE WEAPONS
- MINIMIZES THE REQUIREMENT FOR SECURITY
- HELPS THE UNIT AVOID DETECTION BY THE ENEMY
- AVOIDS TREES AND OVERHEAD COVER

CHAPTER 2
FDC OPERATIONS

SUPERIMPOSITION OF REFERRED DEFLECTION

The referred deflection is superimposed (written) on the azimuth disk under the mounting azimuth using the LARS rule. The disk is normally numbered 400 mils left and right of the referred deflection, which is usually enough to cover the area of operation. However, if needed, the deflection scale can be superimposed all the way around the azimuth disk.

Where you place your referred deflection is based on your direction of fire rounded to the nearest 50

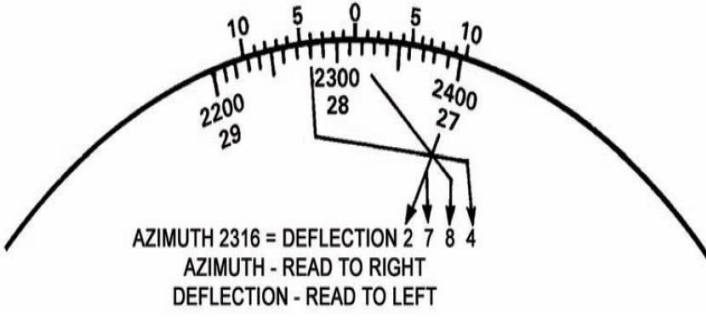
For example:

DOF 3224 = MAZ 3200

DOF 1625 = MAZ 1650

DOF 3150 = MAZ 3150

LARS= left add right subtract (deflection)
RALS= Right add left subtract (azimuth)



USING A CHARGE BOOK TO FIND ELEVATION

ALWAYS USE THE LOWEST CHARGE POSSIBLE TO REACH RANGE
EXAMPLE: At a range of 1500 meters lowest charge = charge 2

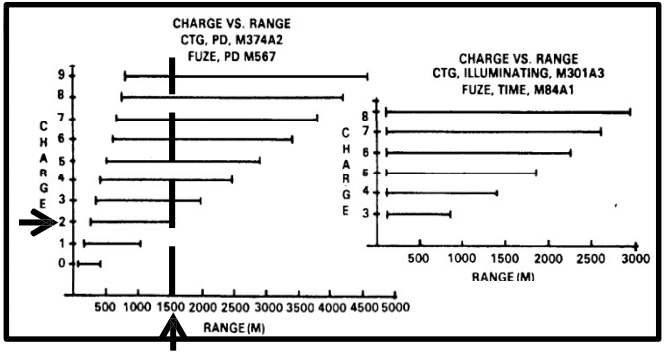
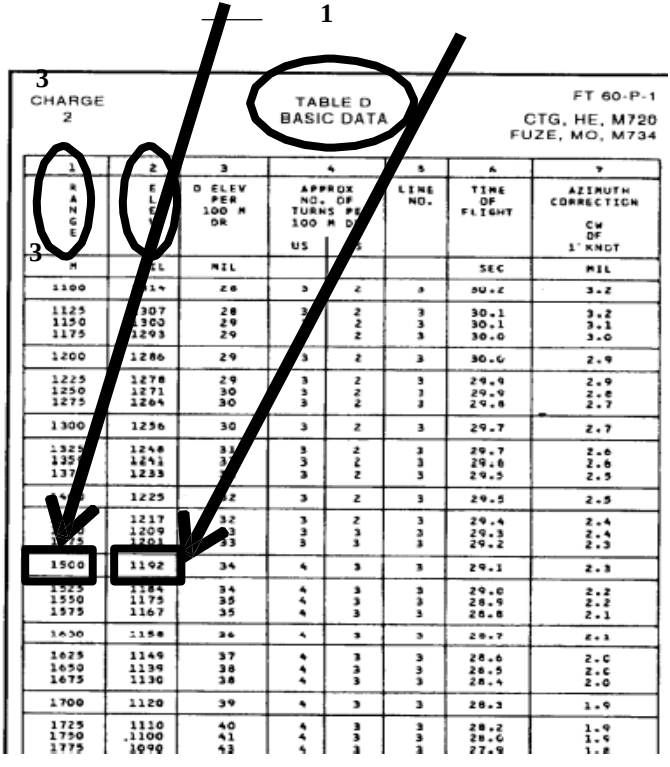


TABLE D TO FIND ELEVATION

1. **GO TO <u>TABLE D</u> UNDER PREDETERMINED CHARGE**
2. **GO TO FINAL CHART RANGE, (COLUM 1)**
3. **FIND CORRESPONDING ELEVATION (COLUM 2)**

EXAMPLE: Range = **1500m**

Firing data for GN is charge 2 @ elevation of **<u>1192</u>**



1 RANGE	2 ELEVATION	3 D ELEV PER 100 M DR	4 APPROX NO. OF TURNS PER 100 M DR US		5 LINE NO.	6 TIME OF FLIGHT	7 AZIMUTH CORRECTION CW OF 1° KNOT
M	MIL	MIL				SEC	MIL
1100	1314	28	3	2	3	30.2	3.2
1125	1307	28	3	2	3	30.1	3.2
1150	1300	29	3	2	3	30.1	3.1
1175	1293	29	3	2	3	30.0	3.0
1200	1286	29	3	2	3	30.0	2.9
1225	1278	29	3	2	3	29.9	2.9
1250	1271	30	3	2	3	29.9	2.8
1275	1264	30	3	2	3	29.8	2.7
1300	1256	30	3	2	3	29.7	2.7
1325	1248	31	3	2	3	29.7	2.6
1350	1241	31	3	2	3	29.6	2.6
1375	1233	32	3	2	3	29.5	2.5
[illegible]	1225	32	3	2	3	29.5	2.5
[illegible]	1217	32	3	2	3	29.4	2.4
[illegible]	1209	33	3	3	3	29.3	2.4
[illegible]	1201	33	3	3	3	29.2	2.3
1500	1192	34	4	3	3	29.1	2.3
1525	1184	34	4	3	3	29.0	2.2
1550	1175	35	4	3	3	28.9	2.2
1575	1167	35	4	3	3	28.8	2.1
1600	1158	36	4	3	3	28.7	2.1
1625	1149	37	4	3	3	28.6	2.0
1650	1139	38	4	3	3	28.5	2.0
1675	1130	38	4	3	3	28.4	2.0
1700	1120	39	4	3	3	28.3	1.9
1725	1110	40	4	3	3	28.2	1.9
1750	1100	41	4	3	3	28.0	1.9
1775	1090	42	4	3	3	27.9	1.8

TABLE E TO FIND MAX ORD

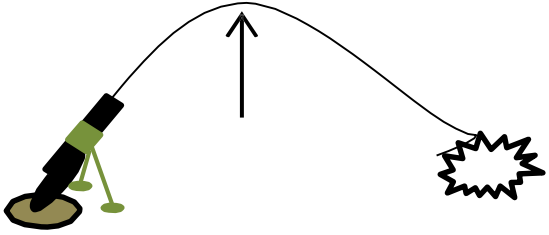
1. Reference info by going to your range
2. Range = 1200m.
   MAX ORD=highest point of the round
1. Max ORD is 1187

FT 120-E-1 TABLE E CHARGE 1

CTG, HE, M934
FUZE, MD, M734 SUPPLEMENTARY DATA

1	2	3	4	5	6	7	
RANGE	ELEV	PROBABLE ERRORS		ANGLE OF FALL	COT ANGLE OF FALL	TML VEL	MAX ORD
		R	D				
M	MIL	M	M	MIL		M/S	
1200	1335	15	9	1360	0.2	150	1187
1225	1330	15	9	1354	0.2	150	1184

MAX ORD



Pivot point

For pivot point you are using the middle circle of the board as your mortar point

All you need for pivot point is a range and Direction of fire (DOF)

Pivot Point (Polar)

1. Plot FO Position and Mortar position on map
2. FO calls distance and direction to target
3. Determine distance & direction from the gun to the target on map
4. Index gun target direction on the plotting board
5. Superimpose referred def. on the nearest 50 mils and place dist. on the board

Pivot Point (Grid)

1. Plot FO Position and Mortar position on map
2. FO calls grid mission
3. Plot target on map
4. Determine distance & direction from the gun to the target
5. Index gun target direction on the plotting board
6. Place referred deflection on the nearest 50 mils and place distance on the board

Subsequent corrections (Pivot Pt. Grid and Polar)

1. Index observer target direction and place left/right add/drop
2. Place burst point over the centerline and read direction and determine distance

Below Pivot Point

Below Pivot Point is used when targets are more than 2900 meters or more away from gun line (MFP).

Set Up Pivot Point

1. For below pivot point you will drop your mortar point from pivot point gun dependent

   60mm: 1000m

   81mm: 2000m

   120mm: 3000m

2. And all will push 500m to the left. Once you have dropped and pushed left, you will plot your MFP and any other Known Points (RPs, TGTs, FOs, TRPs, etc).
3. Index DOF and superimpose referred deflection to nearest 50 mils
4. Plotting Board set up is complete

Below Pivot Point Fire Mission

1. Plot Target and find deflection
2. Use range arm to plot the distance from the gun line to the target

Subsequent Corrections

1. Index observer target direction and place plot left/right add/drop on the plotting board
2. Line the gun and target up and determine distance and direction

MODIFIED OBSERVED CHART (MOC)

Set up of MOC

1. **Place the azimuth wheel on 0**
2. The second step is to get the 8 digit grid to the MFP and **find your direction of fire (DOF**)
3. **Determine your grid intersection (GI).** Use the general location of the MFP to determine the grid intersection, the GI will be 1-3 grid squares south and west of the actual MFP. The GI will be the pivot point on the plotting board.
4. **Superimpose grid**s and any other KP (RP, TGTs, etc) onto the plotting board. Remember each small box is 50m, and the large box is 500m. Determine the mounting azimuth (the nearest 50mils to the direction of fire) and superimpose the referred deflection over it.
5. See next page for example of what a modified observed chart looks like.

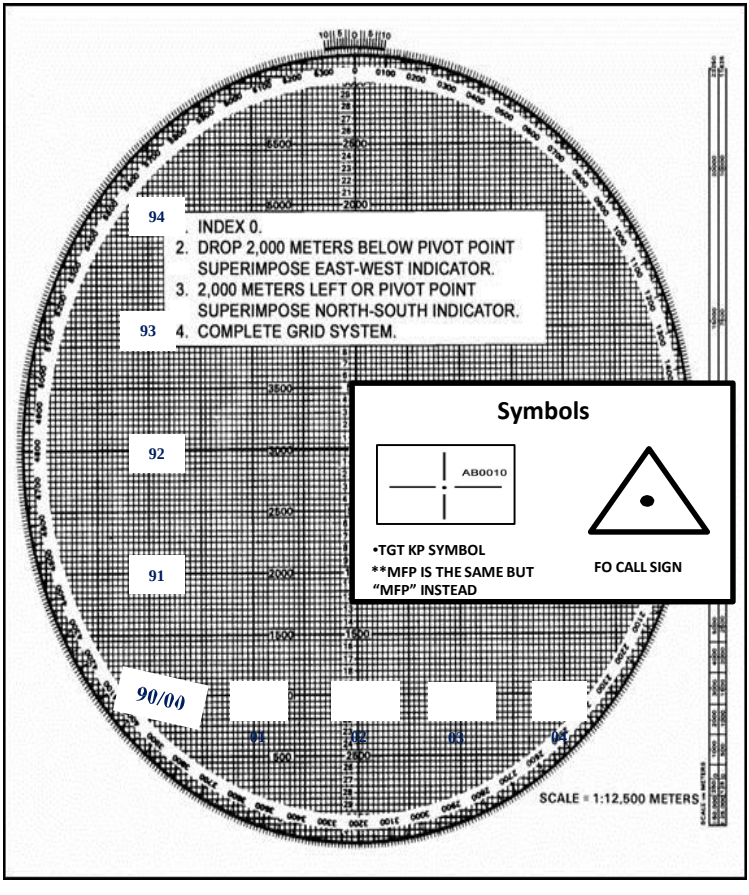
Missions on Modified Observed

1. **Polar**: Plot the FO's position, index the direction to the target and use the range arm to determine the distance.

2. **Grid:** plot the target the same way as the FO and guns were plotted.

3. **Subsequent corrections: `**
    1. Index the Observer target direction (OT). If the OT direction is not known then line the observer and target up on the board and read the azimuth.
    2. Make the corrections then index the gun target direction to determine new azimuth and distance.

MODIFIED OBSERVED CHART EXAMPLE



Now you can use this as a regular map and can plot 8 digit grids

GRID MISSION

1. THE OBSERVER/FO WILL SEND GRID OF TGT.
2. PLOT GRID ON:
    1. PIVOT PT OR BELOW PT: PLOT ON MAP: FIND DISTANCE AND DIRECTION
    2. MODIFIED OBSERVED: PLOT ON BOARD.
3. USING YOUR DOF, SUPERIMPOSE THE REFERRED DEFLECTION
4. ROTATE AZIMUTH DISC FROM YOUR MFP AND ALIGN WITH TGT
5. READ OFF YOUR NEW DISTANCE, AND DEFLECTION
6. REFER TO YOUR CHARGE BOOK USING YOUR NEW DISTANCE TO GET YOUR CHARGE AND ELEVATION

SHIFT MISSION

1. GO TO OBSERVER TARGET (OT) DIRECTION (EXAMPLE 6200 MILS)
2. ALIGN YOUR OBSERVERS POINT WITH THE KNOWN POINT YOU ARE SHIFTING FROM
3. PROCESS ALL DATA FROM YOUR OT (I.E. RIGHT 100 ADD 100)
4. ONCE CORRECTIONS HAVE BEEN MADE ROTATE AZIMUTH DISC TO YOUR MFP AND ALIGN WITH NEW CORRECTED TARGET
5. READ OFF YOUR NEW DISTANCE, AND DEFLECTION
6. REFER TO YOUR CHARGE BOOK USING YOUR NEW DISTANCE TO GET YOUR CHARGE AND ELEVATION

POLAR MISSION

1. THE OBSERVER/FO WILL SEND YOU DISTANCE AND DIRECTION FROM HIS CURRENT POINT.
2. YOU WILL NEED TO PLACE THE OT DIRECTION AND MAKE ALL PLOTS FROM HIS CURRENT LOCATION.
3. ONCE POINTS HAVE BEEN PLOTTED ROTATE AZIMUTH DISC TO YOUR MORTAR POINT AND ALIGN WITH NEW TARGET
4. READ OFF YOUR NEW DISTANCE, AND DEFLECTION
5. REFER TO YOUR CHARGE BOOK USING YOUR NEW DISTANCE TO GET YOUR CHARGE AND ELEVATION

MARKING CENTER SECTOR

HOW TO MARK CENTER AZIMUTH

RIGHT LIMIT(R/L):_____-_____LEFT LIMIT (L/L)
=_____SUM
IF RIGHT LIMIT IS SMALLER ADD 6400 TO R/L

DIVIDE SUM BY 2 =_____+_____ORIGINAL L/L

=_____**MCS AZIMUTH**

HOW TO MARK CENTER RANGE

MAX RANGE:_____-_____MIN RANGE =_____SUM

DIVIDE SUM BY 2:_____+_____ORIGINAL MIN RANGE

=_____**MCS RANGE**

NOW PLOT FROM MTR POINT

VERTICAL INTERVAL

- IF THE TGT'S ALT. IS ABOVE THE MFP THEN IT'S A **+VI**
- IF THE TGT'S ALT. IS BELOW THE MFP THEN IT'S A **–VI**

- IF THE VI IS **LESS THAN 50** METERS THEN THE CORRECTION DOES NOT APPLY

ANGLE T

SUBTRACT SMALLER FROM LARGER BETWEEN OT DIRECTION AND AZIMUTH OF FIRE.

EXAMPLE 1:

OT DIR = 3200 AZIMUTH OF FIRE = 2700

ANGLE T = 3200 – 2700 **= 500**

EXAMPLE 2:

OT DIR = 1900 AZIMUTH OF FIRE = 2900

ANGLE T = 2900 – 1900 **= 1000**

DEFLECTION CORRECTION

IF INITIAL CHART DEFLECTION IS LARGER

INITIAL CHART DEFLECTION_____-_____FINAL CHART DEFLECTION

= _____RIGHT

IF INITIAL CHART DEFLECTION IS SMALLER

FINAL CHART DEFLECTION_____-_____INITIAL CHART DEFLECTION

=_____LEFT

RANGE CORRECTION

IF INITIAL CHART RANGE IS LARGER:

INITIAL CHART RANGE_____-_____FINAL CHART RANGE
= **(-)** _____

IF INITIAL CHART RANGE IS SMALLER:

FINAL CHART RANGE_____-_____INITIAL CHART RANGE
= **(+)** _____

RANGE CORRECTION FACTOR (RCF)

INITIAL CHART RANGE:_____(ROUND TO NEAREST 100)
EXPRESS IN 1000THS:_____DIVIDED INTO RANGE CORRECTION
=_____(RCF)

ROUND ANSWER TO NEAREST WHOLE METER, AND USE SIGN (+/-) OF THE RANGE CORRECTION (DIFFERENCE OF INITIAL CHART RANGE AND FINAL CHART RANGE, IF INITIAL CHART RANGE IS LARGER, - SIGN, IF SMALLER THAN + SIGN

TOTAL RANGE CORRECTION

INITIAL CHART RNG ROUNDED TO NEAREST 100: _
EXPRESS IN 100THS:_____X_____RCF +_____ALT CORRECTION

=_____TOTAL RNG CORRECTION

RANGE CORRECTION (REGISTRATION)

FINAL COMMAND RANGE:_____-_____ALT CORRECTION
(REVERSE SIGN OF ALT CORRECTION AND SUBTRACT)

=_____**FINAL ADJUSTED COMMAND RANGE**

***COMPARE THE ADJUSTED COMMAND RANGE AND SUBTRACT THE SMALLER FROM THE LARGER

IF INITIAL CHART RANGE IS LARGER:

INITIAL CHART RNG:_____-_____FINAL ADJ COMMAND RNG

= (-)_____RANGE CORRECTION

IF INITIAL CHART RANGE IS SMALLER:

FINAL ADJ COMMAND RNG:_____-_____INIT CHART RNG

= (-)_____RANGE CORRECTION

TRAVERSE MISSION

NUMBER OF ROUNDS =_____
60mm = 4 RDS PER 100M X TOTAL WIDTH
81mm = 3 RDS PER 100 M X TOTAL WIDTH
120mm = 2 RDS PER 100 M X TOTAL WIDTH

NUMBER OF MILS TO TRAVERSE:_____
(USE DEFLECTION CONVERSION TABLE)

****CHART RANGE AND HOW MUCH TO COVER: AREA TO COVER PER GUN
**** IF RANGE IS GREATER THAN 4000, DIVIDE RANGE BY 2 AND ROUND TO THE NEAREST HUNDRED THEN DIVIDE ANSWER BY 2

NUMBER OF MILS:_____DIVIDE BY 10:_____= **NUMBER OF TURNS**

NUMBER OF TURNS:_____/ _____(DIVIDE BY # ROUNDS)

=_____NUMBER OF TURNS BETWEEN ROUNDS

TOTAL NUMBER OF ROUNDS: _____
(ADD 1 ROUND TO FINAL ROUND COUNT)

DEFLECTION CONVERSION TABLE

RANGE IN METERS	DEFLECTION IN METERS														
	1	10	20	30	40	60	75	100	125	150	175	200	300	400	500
500	30	20	41	61	81	102	152	201	260	297	34	388	556	687	800
600	1.7	17	34	51	68	85	127	168	209	260	289	328	472	599	708
700	15	16	29	44	58	73	109	145	180	215	250	284	412	529	632
800	13	13	25	33	51	64	95	127	158	189	219	250	365	472	569
900	11	11	22	34	45	57	85	113	141	168	195	223	328	426	517
1000	10	10	20	31	41	61	76	102	127	162	176	201	297	388	473
1100	93	9	18	28	37	46	69	92	115	138	161	183	271	366	436
1200	.es	8	17	26	34	42	64	85	106	127	148	168	249	328	402
1300	79	8	16	23	31	39	69	78	98	117	136	166	231	304	374
1400	73	7	15	22	29	36	66	73	91	109	127	145	215	283	349
1500	68	7	14	20	27	34	61	68	85	102	118	135	201	265	328
1600	63	6	13	19	25	32	48	64	80	95	111	127	189	250	309
1700	60	6	12	18	24	30	45	60	75	90	104	119	178	235	291
1800	67	6	11	17	23	28	42	57	71	86	99	113	168	223	276
1900	54	5	11	16	21	27	40	64	67	80	94	107	160	211	262
2000	51	5	10	15	20	25	38	61	64	76	89	102	152	201	250
2100	49	5	10	15	19	24	36	48	61	73	85	97	146	192	238
2200	46	6	9	14	19	23	35	46	58	69	81	92	138	183	228
2300	44	4	9	13	18	22	33	44	55	66	77	88	132	176	218
2400	43	4	8	13	17	21	32	42	63	63	74	86	127	168	209
2600	41	4	8	12	16	20	31	41	51	61	71	81	122	162	201
2600	39	4	8	12	16	20	29	39	49	59	68	78	117	166	194
2700	38	4	8	11	16	19	28	38	47	67	66	75	113	160	187
2800	37	4	7	11	15	18	27	36	46	55	64	73	109	145	180
2900	36	4	7	11	14	18	26	35	44	63	61	70	105	140	174
3000	34	3	7	10	14	17	26	34	42	61	59	68	102	135	168
3100	33	3	7	10	13	16	26	33	41	49	67	66	98	131	163
3200	32	3	6	10	13	16	24	32	40	48	56	64	95	127	168
3300	31	3	6	9	12	16	23	31	39	46	54	62	92	123	163
3400	30	3	6	9	12	15	22	30	37	45	62	60	90	119	149
3500	30	3	6	9	12	15	22	29	36	44	51	58	87	116	145
3600	29	3	6	8	11	14	21	28	36	42	49	57	86	113	141
3700	28	3	6	8	11	14	21	28	34	41	48	55	82	110	137
3800	27	3	5	8	11	13	20	27	33	40	47	54	80	107	133
3900	27	3	5	8	10	13	20	26	33	39	46	52	78	104	130
4000	26	3	5	8	10	13	19	26	32	38	45	51	76	102	127

**** IF RANGE IS GREATER THAN 4000, DIVIDE RANGE BY 2 AND ROUND TO THE NEAREST HUNDRED THEN DIVIDE ANSWER BY 2

SEARCH MISSION

NUMBER OF ROUNDS =_____

60mm = 4 RDS PER 100M X TOTAL LENGTH
81mm = 3 RDS PER 100 M X TOTAL LENGTH
120mm = 2 RDS PER 100 M X TOTAL LENGTH

NUMBER OF TURNS:_____

(BASED ON CHART RANGE IN CHARGE BOOK)
ILLUM: IN TABLE E, COLUMN 6
HE: TABLE 4, COLUMN 4

MULTIPLY TURNS BY AREA TO COVER: _____

TOTAL TURNS:_____/_____(# ROUNDS)

=_____TURNS IN-BETWEEN PER ROUND

******(ADD 1 ROUND TO FINAL ROUND COUNT)**

QUICK SMOKE

WIND SPEED: _____
AREA: _____
CONDITION: _____
HUMIDITY: _____
DURATION: _____

1. ADJUSTMENT PHASE

   (ALWAYS FIRE ONE WP ROUND TO CONFIRM ADJUSTMENT)

2. ESTABLISHMENT PHASE

AREA DIVIDED BY 100:_____X_____(ROUNDS IN SMK CARD FOR 1 MINUTE)
= _____

MAX AREA TO BE COVERED WITH SMOKE

120MM: UNDER FAVORABLE CONDITIONS, A 120mm MORTAR PLATOON CAN SCREEN AN AREA ABOUT **800 METERS** WIDE

81mm: UNDER FAVORABLE CONDITIONS, A MORTAR PLATOON CAN SCREEN AN AREA ABOUT **500 METERS** WIDE.

******60mm MORTAR SECTIONS ARE NOT NORMALLY USED** TO PRODUCE LARGE SCALE SMOKE SCREENS. THEY CAN BE USED TO AUGMENT THE SCREENING SMOKE OR A LARGER CALIBER MORTAR UNIT, AND THEY CAN PRODUCE USEFUL **POINT OBSCURATION DURING URBAN OPERATIONS**

120 MM SMOKE CARD

		WIND SPEED (KNOTS)						
HUMIDITY	TEMPERATURE	NUMBER OF ROUNDS						
		2	4	9	13	18	22	26
30	LAPSE	12	6	6	6			
	NEUTRAL	12	6	4	4	6	8	12
	INVERSION	6	6	3				
60	LAPSE	12	4	4	6			
	NEUTRAL	12	4	3	4	6	6	8
	INVERSION	6	6	3				
90	LAPSE	8	4	3	4			
	NEUTRAL	8	3	3	3	4	6	6
	INVERSION	6	4	3				

81 MM SMOKE CARD

		WIND SPEED (KNOTS)						
HUMIDITY	TEMP.	2	4	9	13	18	22	26
		NUMBER OF ROUNDS						
30	LAPSE	6	6	12	12			
	NEUTRAL	2	4	8	8	16	24	24
	INVERSION	2	3	8		16		
60	LAPSE	6	6	8	8			
	NEUTRAL	2	3	6	8	16	16	24
	INVERSION		2	6		12		
90	LAPSE	2	3	8	8	12		
	NEUTRAL	2	2	6	8	8	12	16
	INVERSION	1	2	4				

ILLUMINATION

1. Entering the Firing Tables is at even 50 meters. Always round up to the nearest 50 meters.
2. Everything is in relationship to the HOB (Height of Burst).
3. UP's and DOWN's (The FO will always send up's and down's to the nearest 50 meters)
   a. Columns 2 & 3 is basic data for 600 meter height of burst.
   b. Columns 4 & 5 is the data to change the height of burst 50 meters
      1. If you are working above the HOB your corrections will always be a -.
      2. If you are below the HOB your corrections will always be a +.

4. Range and deviation changes are plotted as with all other missions.
   a. The FO will always send these corrections in 200 meter changes.

5. All previous corrections (up, down, range, deviation) must be applied to the new data.

ILLUMINATION MARK

1. Control of firing the illumination and HE are done by the FDC.

2. The FDC will time the flight of the illumination round and compare that to the time of flight for the HE and fire the HE at that time difference. (Ill mark is when the FO has the best light for the target, the HE is fired at the difference so that it will impact at the best light). EXP: Ill T/F=63 seconds, HE T/F=23 seconds. Smaller from the larger, 63-23=40 seconds. Fire Ill and 40 seconds, later you would fire the HE.

3. T/F for HE must be determined each round to insure that it will impact at the best light. Enter the Firing tables at chart range to get T/F for HE.

BY SHELL AT MY COMMAND

1. The FO will control the firing of each round HE and Illumination.

FPF

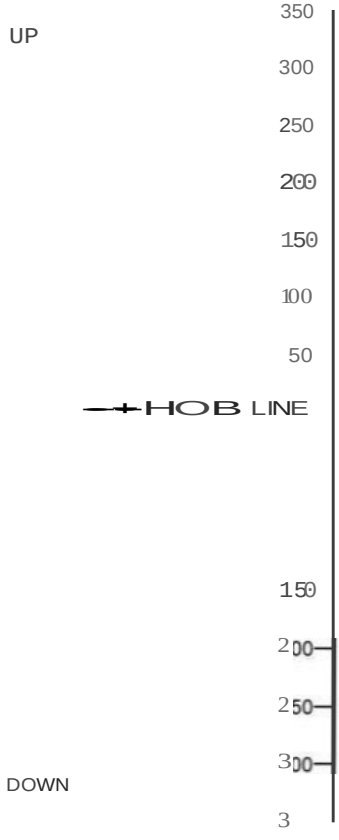
1. **TYPES ADJUSTMENT:**

   a. Firing all guns and adjusting each to it's final location.

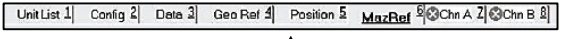
   b. Attitude (both guns and target) FDC determines the dange close gun and adjust that one only and then the attitude is applied and a confirming round for each gun fired.

   c. Attitude for guns and target FDC applies the data but does not fire.

HOB LINE DIAGRAM FOR ILLUM MISSIONS



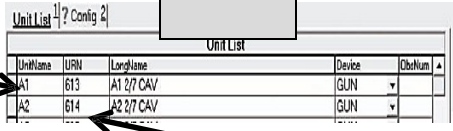
MFCS INITIALIZATION



Navigation through set up is accomplished by clicking on each tab listed

Unit name is the mortar
Enter as many as you have guns
(#2 gun = A2)

Unit list tab

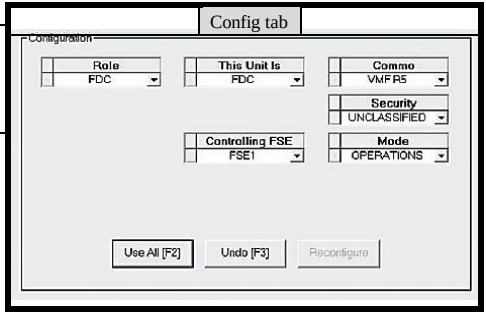


URN= unit reference number

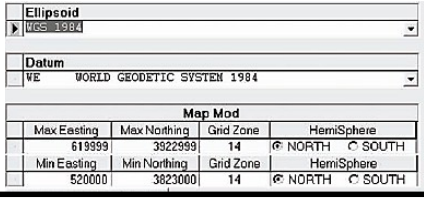
Log In Procedures
Username: 11c
Password: mortarman

NOTE: To save changes on screen always press F2 before proceeding to next screen.

Config tab



1. Ellipsoids always WGS 1984
2. Min easting and northing found bottom left corner of map
3. Max E & N fill in automatically



Unit position tab

1. Fill your own unit position using DAGR
2. If ground mounted source is manual
3. Always put FO position in so you can fire polar missions

UnitName		Easting	Northing	Alt	Zone	Datum	HemiSphere
FDC		549950	3834950	+0374	14	WE	North / South

Position Data Source: MANUAL

Clear

Other Units' Position

UnitName		Easting	Northing	Alt	Zone	Datum	HemiSphere
A1		549910	3835125	+0374	14	WE	North / South
A2		549910	3835050	+0374	14	WE	North / South
A3		549910	3834975	+0374	14	WE	North / South
A4		549910	3834900	+0374	14	WE	North / South
FOS1		547200	3834700	+0374	14	WE	North / South
FSE1		547200	3834700	+0374	14	WE	North / South

Maz ref tab

1. Mount Az= Your DOF
2. Generally 2800 unless you need to place poles behind at 0700.

Guns' Mount References

UnitName	Mnt Az	Use Ref		
A1	6000	REF 2800	REF 0700	REF 3200
A2	6000	REF 2800	REF 0700	REF 3200
A3	6000	REF 2800	REF 0700	REF 3200
A4	6000	REF 2800	REF 0700	REF 3200

When firing in degraded mode channel setup is not necessary

Not needed in degraded mode

1. TCIM & CHAN statuses tell whether the computers are communicating with one another
2. Device type SINGARS always
3. Modulation NRZ
4. Data rate generally 4800
5. Comsec whatever radios are running
6. EDC mode As seen
7. NET method as seen
8. Net usage data only
9. Stations and rank automatically filled in

Channel A/B

Chn A Net Parameters

1.	TCIM Status	FAILED
2.	Chn A Status	INACTIVE
	SINCGARS Status	NOT IN USE
3	Protocol	C220
	DeviceType	SINCGARS
4.	Modulation	NRZ
5.	DataRate	N4800
	ComsecMode	CT
	FhMode	FH
6.	EdcMode	NONE
7.	NadMethod	DAPNAD
8.	NetUsage	DATA ONLY
	NumberOfStations	7
	Rank	3

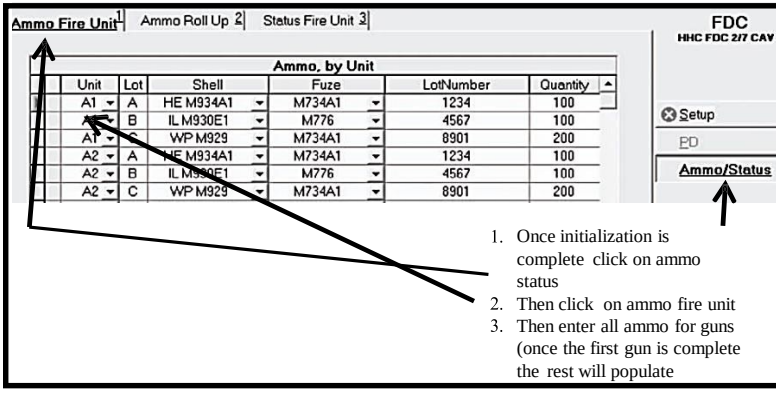
Chn A This Unit

UnitName	En	IP Address	Adr
FDC	☑	130.139.112.031	31

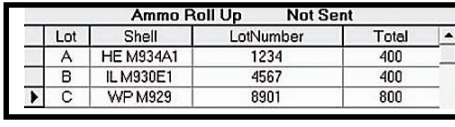
Chn A Subscribers

UnitName	En	IP Address	Adr
A1	☑	130.139.112.041	41
A2	☑	130.139.112.042	42
A3	☑	130.139.112.043	43
A4	☑	130.139.112.044	44
FOS1	☑	130.139.112.040	40
FSE1	☑	130.139.112.050	50

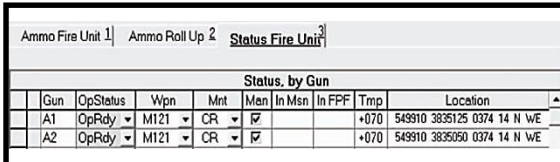
Configuration: 8-SINCGARS_4800N_CT_FH



1. Once initialization is complete click on ammo status
2. Then click on ammo fire unit
3. Then enter all ammo for guns (once the first gun is complete the rest will populate



Ammo roll up is automatically filled out As fire missions go on it will reflect



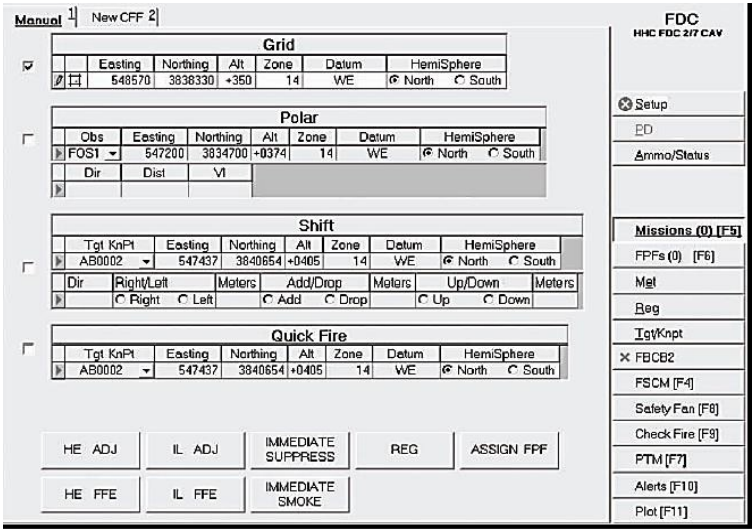
Status fire unit screen

1. Op status needs to be manually op ready (in a track it will automatically update)
2. MNT click on ground mounted
3. TEMP and LOC will be already entered

Bottom of status fire unit screen

1. Tells how many guns there

are



GRID MISSION

1. FDC enters easting northing and altitude based on call for fire
2. Then click on HE ADJ

POLAR MISSION

1. FO has to be pre programmed in the MFCS
2. The only thing required then is a distance and direction
   (VI is the difference in elevation from FO to TGT and not required)

SHIFT

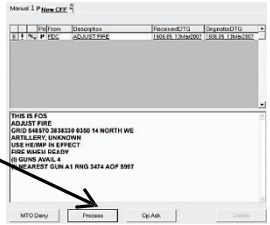
1. Requires previously saved known points or TGT

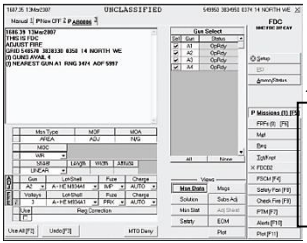
QUICK FIRE

1. Also requires saved known points or targets

This message follows the manual call for fire

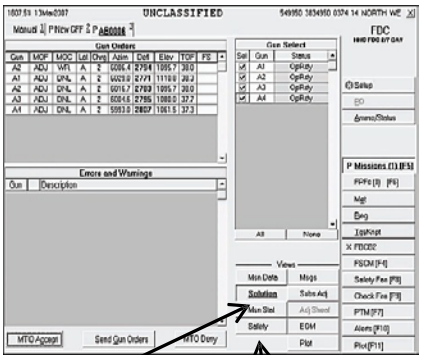
1. Check grid data
2. Then push process





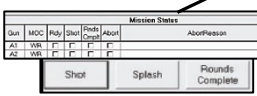
Things to check on MSN Data screen

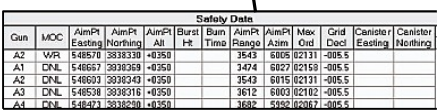
1. Fuze type
2. # volleys in FFE
3. Press F2



Solution screen

1. Notice all guns have different data
2. When firing with more than 1 gun always use A2 data for all guns
3. Once complete press send gun orders (degraded mode you will tell the guns their data but this keeps the round count)



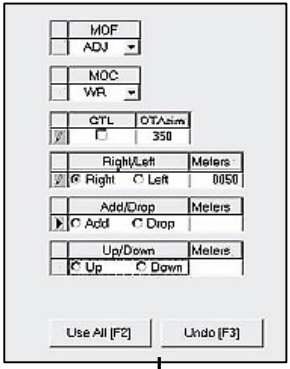


This screen pops up automatically after send gun orders

1. Push shot then gives count down to splash
2. Necessary to push shot to keep round count accurate

Safety data button

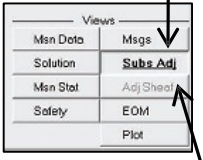
1. Shows where the round will land
2. Shows how high the round will go
3. Range and azimuth

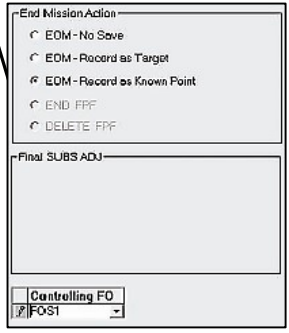


SUBSEQUENT ADJ

1. MOF can be ADJ or FFE
2. MOC WR
3. Always put OT AZ in
4. Then put the observers correction in

From here repeat previous steps to either fire an adjustment or ffe



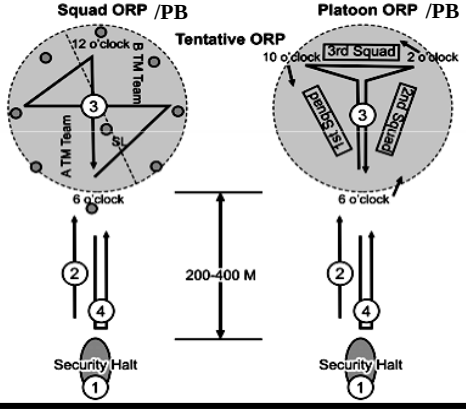


EOM

1. You can record as TGT, KP or not save
2. If TGT or KP press F2 and screen will prompt TGT number or FP number

CHAPTER 3
DEFENSIVE OPERATIONS

ORP AND PATROL BASE OPERATIONS



SQD/PLT SECURITY PLAN FOR PB ACTIVITIES

BLACK_____
GOLD_____
ALT. PB_____
RUNNING PASSWORD_____
NUMBER
COMBINATION_____

Priorities of Work (Platoon and Squad). Once the SL/PL is briefed by the R&S teams and determines the area is suitable for a patrol base, the leader establishes or modifies defensive work priorities in order to establish the defense for the patrol base. Priorities of work are not a laundry list of tasks to be completed; to be effective, priorities of work must consist of a **CLEAR TASK & PURPOSE, ACHIEVABLE TIME HACK, AND SPOT CHECKED**. For each priority of work, a clear standard must be issued to guide the element in the successful accomplishment of each task. It must also be designated whether the work will be controlled in a centralized or decentralized manner. **Priorities of work are determined IAW METT-TC. Priorities of Work may include, but are not limited to the following tasks:**

(#1) Security (Continuous).

• Prepare to use all passive and active measures to cover all of the perimeter all of the time, regardless of the
percentage of weapons used to cover that all of the terrain.
• Readjust after R&S teams return, or based on current priority of work (such as weapons maintenance).
• Employ all elements, weapons, and personnel to meet conditions of the terrain, enemy, or situation.
• Assign sectors of fire to all personnel and weapons. Develop squad sector sketches and platoon fire plan.
• Confirm location of fighting positions for cover, concealment, and observation and fields of fire. SLs supervise
placement of aiming stakes and claymores.
• Only use one point of entry and exit, and count personnel in and out. Everyone is challenged IAW the
unit SOP.
• Hasty fighting positions are prepared at least 18 inches deep (at the front), and sloping gently from front to rear,
with a grenade sump if possible.

(#2) Withdrawal Plan. *The SL/PL designates the signal for withdrawal, order of withdrawal, and the platoon rendezvous* point and/or alternate patrol base.

(#3) Communication (Continuous). *Commo must be maintained with higher headquarters, OP's, and within the unit.* May be rotated between the patrol's RTOs to allow accomplishment of continuous radio monitoring, radio maintenance, act as runners for PL, or conduct other priorities of work.

(#4) *Weapons and Equipment Maintenance.* *The PL ensures that machine guns, weapon systems, commo*
equipment, and night vision devices (as well as other equipment) are maintained. These items are not disassembled at the same time for maintenance (no more than 33 percent at a time), and weapons are not disassembled at night. If one machine gun is down, then security for all remaining systems is raised.

(#5) *Mess Plan*. *At a minimum, security and weapons maintenance are performed prior to mess. Normally no more*
than half the platoon eats at one time. Rangers typically eat 1 to 3 meters behind their fighting positions.
• Rest/sleep plan management. The patrol conducts rest as necessary to prepare for future operations.
• Alert Plan and Stand-to. The PL states the alert posture and the stand-to time. He develops the plan to ensure
all positions are checked periodically, OP's are relieved periodically, and at least one leader is always alert.
The patrol typically conducts stand-to at a time specified by unit SOP (such as 30 minutes before and after
BMNT or EENT).
• Resupply. Distribute or cross-load ammunition, meals, equipment, etc.
• Sanitation and personal hygiene. The PSG and medic ensure a slit trench is prepared and marked. All Soldiers
will brush teeth, wash face, shave, wash hands, armpits, groin, feet, and darken (brush shine) boots daily. The
patrol will not leave trash behind.

(AS NEEDED) *Water Resupply.* *The PSG organizes watering parties as necessary. The watering party carries canteens in an* empty rucksack or duffel bag, and must have commo and a contingency plan prior to departure.
(AS NEEDED) *Mission Preparation and Planning.* *The PL uses the patrol base to plan, issue orders, rehearse, inspect, and prepare* for future missions.

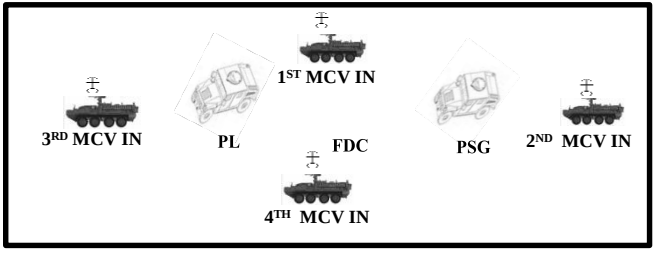
MOUNTED ASSEMBLY AREA PROCEDURES

1: WHEN OCCUPYING A DELIBERATE ASSEMBLY AREA:

- **A. THE LEAD GUN TRUCK WILL MOVE TOWARD THE 12 O'CLOCK POSITION**
- **B. THE 2ND GUN TRUCK WILL MOVE TO THE 3 O'CLOCK**
- **C. THE 3RD GUN TRUCK WILL MOVE TO THE 9 O'CLOCK**
- **D. THE 4TH GUN TRUCK WILL MOVE TO THE 6 O'CLOCK**
- **E. FDC AND THE REST OF HQ WILL TAKE THE CENTER**

ALL GUNS WILL HASTY LAY ON THE SAME DOF, GIVEN FROM FDC

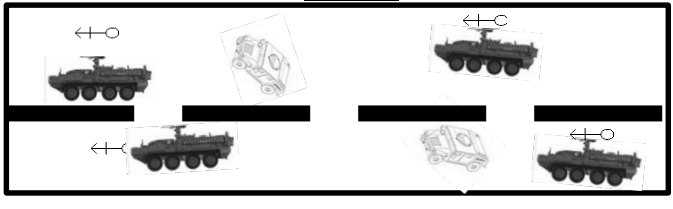
DELIBERATE AA



2: WHEN OCCUPYING HASTY ASSEMBLY AREA:

- **A. LEAD TRUCK PULLS OFF TO ONE SIDE OF RODE,**
- **B. ALL VEHICLES ALTERNATE SIDES OF ROAD**
- **C. EACH VEH COVERS ASSIGNED SECTOR OF SECURITY**
- **D. ALL GUNS WILL HASTY LAY ON THE SAME DOF, GIVEN FROM FDC**

HASTY AA

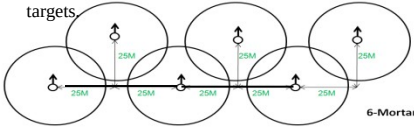


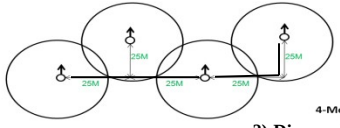
MORTAR FIRING POINT FORMATIONS (MOUNTED / DISMOUNTED)

There are three common formations when in a MFP:

1) Lazy W.

The Lazy W formation lays the Mortars on a modified line and provides flank security for the MFP. It is used when the terrain affords little cover and concealment, and it adds depth to the sheaf, which is useful when engaging area targets.

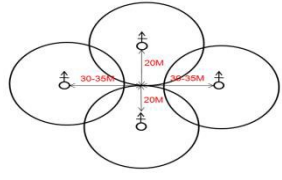




35M BETWEEN 60mm
50M BETWEEN 81mm
60M BETWEEN 120mm

2) Diamond.

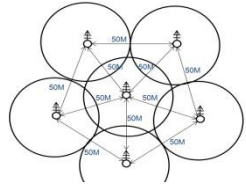
The Diamond formation allows a four-gun Section to fire in all directions with equal ease. It is used when 6400-mil coverage is required. It creates a tight, defensible position against ground attack and is excellent for use in restricted terrain. It is particularly useful in built-up areas.



35M BETWEEN 60mm
50M BETWEEN 81mm
60M BETWEEN 120mm

3) Six-Mortar Star Formation

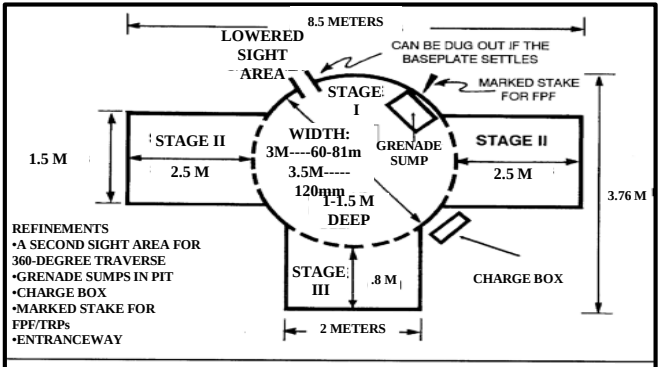
The 6-Mortar Star formation is used to accomplish the same firing ability of the diamond, but with more mortar systems. It serves as the most compact and defensible formation and is used primarily while in strongpoint or perimeter defense.



50M FROM CENTER GUN

DUG-IN POSITIONS

All infantry and mortar squads dig in during defensive operations and continue to improve their positions as long as they occupy them. If mortar platoons or sections defend from a strongpoint, they dig extensive fortifications to withstand a dismounted assault supported by heavy fire.



MORTAR POSITION (3 STAGES OF CONSTRUCTION)

STAGE I.

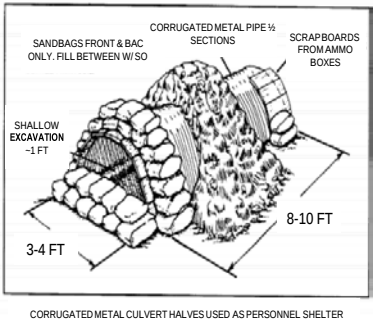
After the position's general location is selected, the exact baseplate position is marked and construction begins. The mortar pit for 81-mm/60-mm mortars should be 3 meters wide and a maximum of 1.5 meters deep. All walls or parapets above ground must be at least 1 meter thick for protection against small-arms fire and shell fragments. Sandbags, logs, 55-gallon drums, dirt-filled ammunition boxes, timber, or other materials can be used in constructing walls or parapets. The gunner must be able to see the aiming posts or the distant aiming point through all deflection and elevation settings. Construction for a heavy mortar pit is the same, except the pit diameter is 3.5 meters in length.

STAGE II.

Construct the personnel shelters perpendicular to the principal direction of fire with firing ports positioned as determined by assigned small-arms sectors of fire. Build shelters at 1.5 m deep & 1.5 m wide, and 2.5 m long on opposite sides of the pit with a minimum of 0.5 meters of overhead cover. There should be a blast barrier of at least two sandbags in thickness separating the personnel shelters from the mortar pit. The firing ports can be made using wooden ammunition boxes with the bottoms knocked out. Personnel should use sandbags to adjust the opening to the smallest usable size. Corrugated metal culvert halves covered with earth make excellent personnel shelters (Figure 7-8). Whatever design is selected, it should support the weight of the overhead cover on sandbags. Use timber or some other structurally sound material.

STAGE III

A bunker should be 2 m wide, 1 ammo box (length) deep, and 2 ammo boxes (stacked on their sides) high (three for a 120mm MFP). The bunker is divided into four sections separated by the ammunition boxes stacked on their sides (Figure 7-9). Ammunition boxes form the floor on which the ammunition is stacked. U-shaped pickets or other suitable support material are placed across the stacked boxes, providing a base on which to place dirt-filled ammunition boxes to enclose the top of the bunker. All boxes are filled with dirt to increase stability and add protection. A canvas tarpaulin or plastic sheet available from the ammunition packing material should be placed on the top of the ammunition boxes, then covered with dirt and sandbags to form at least an 18-inch layer over the bunker. The tarpaulin should also drape over the opening to the bunker to protect the ammunition from dirt and moisture.



CORRUGATED METAL CULVERT HALVES USED AS PERSONNEL SHELTER

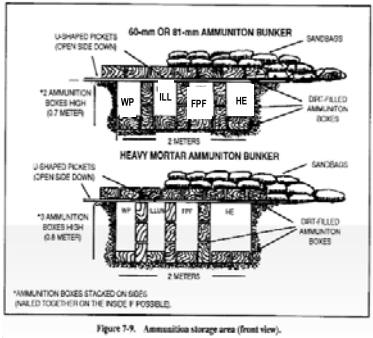


Figure 7-9. Ammunition storage area (front view).

Once the mortar position is completed to STAGE III, personnel can add refinements.

(1) Add another sight area to allow 360-degree traverse.

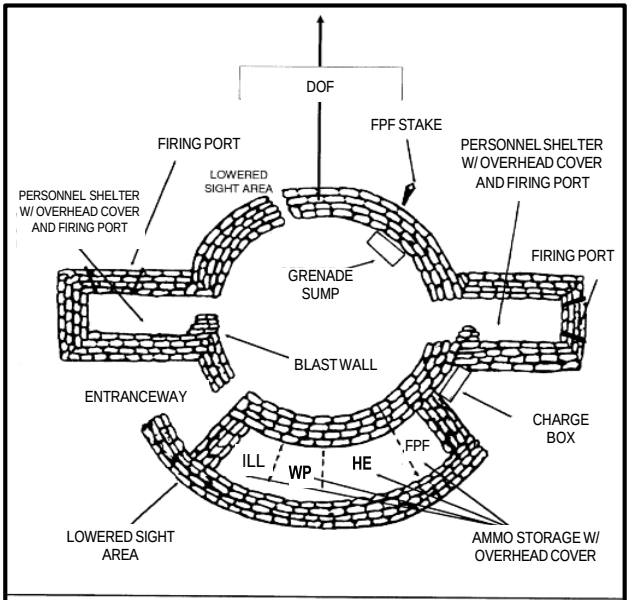
(2) Dig grenade sumps (at least one) in the circular pit. They are dug against the wall of the pit, using the trench-style pit as shown in FM 7-8.

(3) Add an entry with a 90-degree blast baffle. This can enter either the circular pit or one of the personnel shelters. Eventually, it should connect with a crawl trench toward the FDC.

(4) Dig a hole, outside the circular pit, near the ammunition bunker for placing excess charges until disposal. Personnel should place an empty ammunition box in this hole; the cover will protect the excess charges from flash fires. Sandbags should be placed on the box lid when not placing charges into it (Figure 7-10).

(5) Place aiming stakes around the rim of the circular pit corresponding to priority targets / TRPs.
(7) Sandbag the base of the aiming posts without disturbing them. This protects them from being blown over by enemy fire.

e. A STAGE III dismounted mortar position will take from 30 to 40 man-hours if it is dug by hand,.
Each mortar position will require approximately the following amount of fortification material (the exact amount depends on the depth of the excavation):
6,000 sandbags.
50 wooden ammunition boxes, or an equivalent amount of timber.
150 U-shaped pickets (72 inches long).
f. As time permits, personnel should add sandbag layers to increase protection.



COMPLETED DISMOUNTED MORTAR POSITION WITH REFINEMENTS

CHAPTER 4
OFFENSIVE OPERATIONS

DISMOUNTED OPERATIONS

MOUNTED OPERATIONS

FORMATIONS AND ORDERS OF MOVEMENT

I. Movement Formation: Fire Team Wedge; MG Team attached.

II. Three Movement Techniques utilized:

A. Traveling technique used behind FFL when contact is not likely.

B. Traveling Overwatch forward of the FFL when enemy contact is possible.

C. Bounding Overwatch used forward of the FFL when enemy contact is expected.

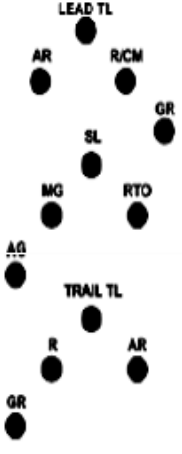
III. Distances are based on but not dictated by visibility, terrain, and vegetation.

IV. Actions at Night: Modified Wedge

V. Actions at the Halt: Short and Long Halt (GV/LV)

VI. Leader Location: Fixed/Unfixed

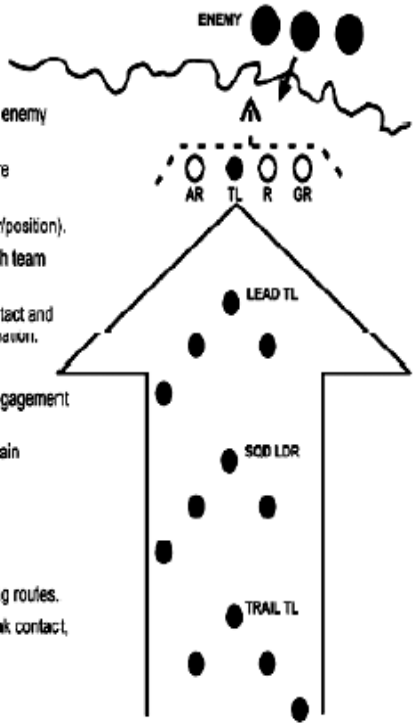
FIRE TEAM WEDGE



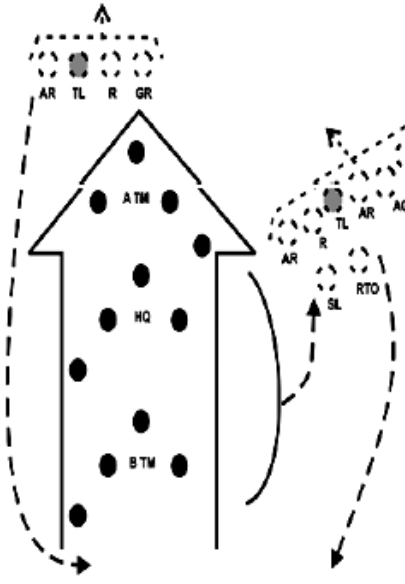
MODIFIED WEDGE

REACT TO CONTACT

- Seek nearest cover.
- Return fire (known or suspected enemy position).
- TM LDRs control fire by using fire commands.
- Report enemy situation (number/position).
- Maintain contact (visual/oral) with team members.
- SQD LDR moves to team in contact and makes an assessment of the situation.
- Factors of his assessment:
  - Can squad move out to engagement area.
  - Can squad gain and maintain suppressive fire.
  - Location of enemy.
  - Size of enemy
  - Vulnerable flanks.
  - Covered/concealed flanking routes.
- SQD LDR determines COA (break contact, squad attack, etc.)
- Report situation to PL

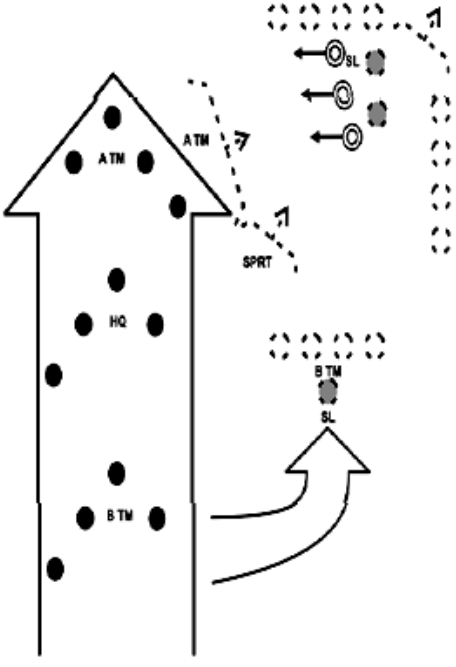


BREAK CONTACT

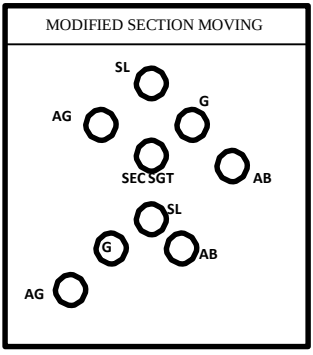


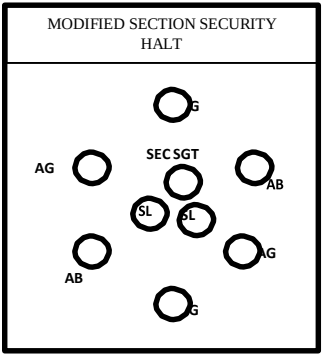
- Squad Leader orders: "Break Contact".
- Squad Leader designates SPT element and maneuver element.
- SL issues distance and direction or a terrain feature for the maneuver element.
- SBF suppresses enemy position.
- Maneuver uses smoke to mask movement.
  - Takes up overwatch position.
  - Begins to suppress enemy
- Squad Leader directs SBF to break contact.
- SBF uses smoke to screen movement.
  - Takes up overwatch position.
- Squad continues to bound away until contact is broken.
- Consolidate / reorganize.

SQUAD ATTACK



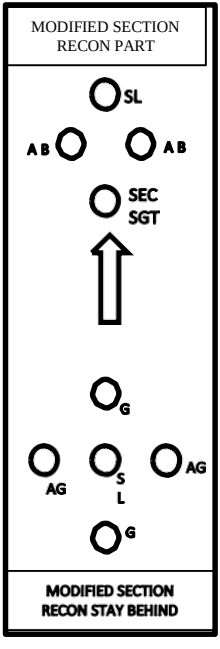
- React to contact.
- TM in the kill zone: (without orders)
  - Return fire.
  - Seek cover and concealment.
  - Suppress enemy calls out 3 D's becomes overwatch.
- SL assess situation.
  - Determines COA (flank/attack).
- TM not in contact: (with SL)
  - Moves along covered and concealed route.
  - Assaults enemy on weak flank.
- Overwatch TM continues to suppress shifts/cease fire as bounding team enters sector.
- Bounding team continues to assault through enemy.
- SL may request indirect fire.
- Consolidate and reorganize.

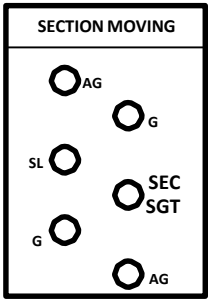


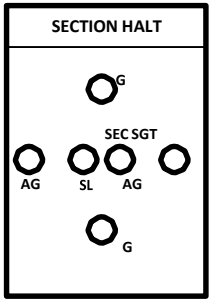


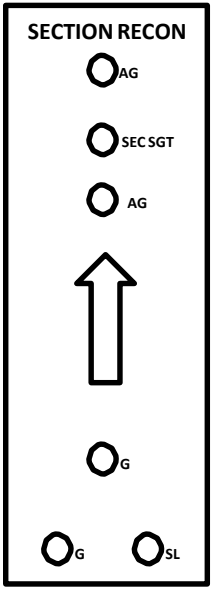
DELIBRATE OCCUPATION OF A MFP (MODIFIED SECTION)

-SEC SGT BRINGS SEC TO HALT
-5 POINT CONTINGENCY ISSUED TO STAY BEHIND SL AND TO THE RECON PARTY
-RECON LEAVES, GUNS UP IN DIR OF FIRE
-SEC SGT CALLS FOR HALT IN TENNITIVE FIRING POINT AND CONDUCT SLLS AND AREA RECON
-SIGHT IS CLEAR AND SAFE PLACES AB'S IN TENNITVE GUN LOCATION S TO PULL SECURITY
-SEC SGT RADIO'S STAY BEHIND TO PREPARE TO MOVE
-SEC SGT AND SL RETURN TO STAY BEHIND AND GUIDE THEM TO POSITION OR ISSUE GRID TO LOCTAION WITH DISTANCE AND DIRECTION AND STAY BEHIND SL MOVES TO FIREING POINT
-SECTION LAYS IN B SL CHECKS LAY OF GUNS, SEC SGT AND A SL SET UP FDC AND COMMO
- SEC SGT LETS SUPPORTED UNIT KNOW HE CAN PROCESS MISSIONS









DELIBERATE OCCUPATION OF A MFP (SEC.)

-- TYPICALLY AN ELEMENT OF THIS SIZE SHOULD NOT PATROL WITH OUT ADDITIONAL TROOPS FOR SECURITY AND WEIGHT DISPERSION

-- SEC SGT BRINGS SEC TO HALT

-- 5 POINT CONTINGENCY ISSUED TO STAY BEHIND SL AND TO THE RECON PARTY

-- RECON LEAVES, 1 GUN TUBE WILL BE UP IN DIR OF FIRE

-- SEC SGT CALLS FOR HALT IN TENNITIVE FIRING POINT AND CONDUCT SLLS AND AREA RECON

-- SIGHT IS CLEAR AND SAFE , SEC SGT PLACES AB'S IN TENNITVE GUN LOCATIONS TO PULL SECURITY

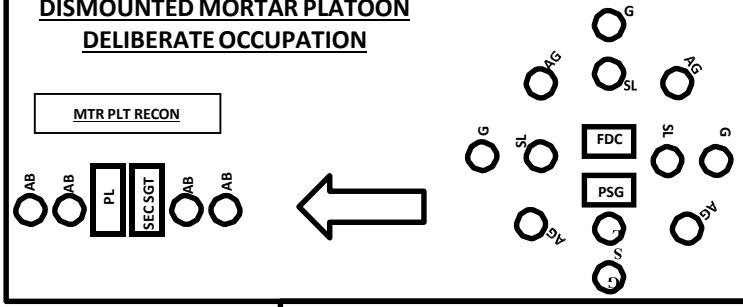
-- SEC SGT RADIO'S STAY BEHIND TO PREPARE TO MOVE

-- SEC SGT RETURNS TO STAY BEHIND AND GUIDE THEM TO POSITION OR ISSUE GRID TO LOCTAION WITH DISTANCE AND DIRECTION AND STAY BEHIND SL MOVES TO FIREING POINT

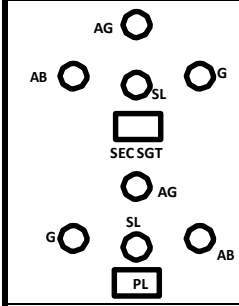
-- SECTION LAYS IN, SL CHECKS LAY OF GUNS, SEC SGT AND A SL SET UP FDC AND COMMO

-- SEC SGT LETS SUPPORTED UNIT KNOW HE CAN PROCESS MISSIONS

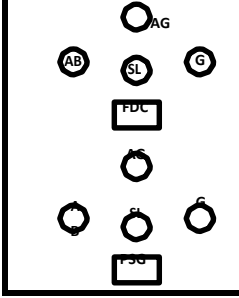
DISMOUNTED MORTAR PLATOON
DELIBERATE OCCUPATION



MTR PLT DISMOUNTED MVT



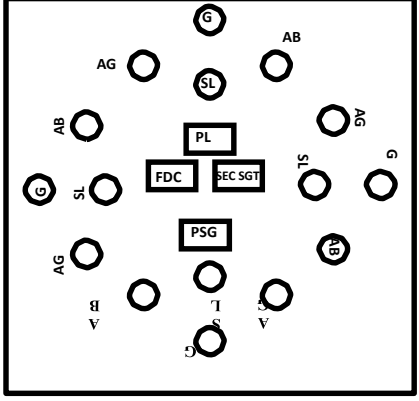
SECTIONS CAN SERVE INDIPENDENTLY OR MUTUALLY SUPPORT EACH OTHER OR UNITS



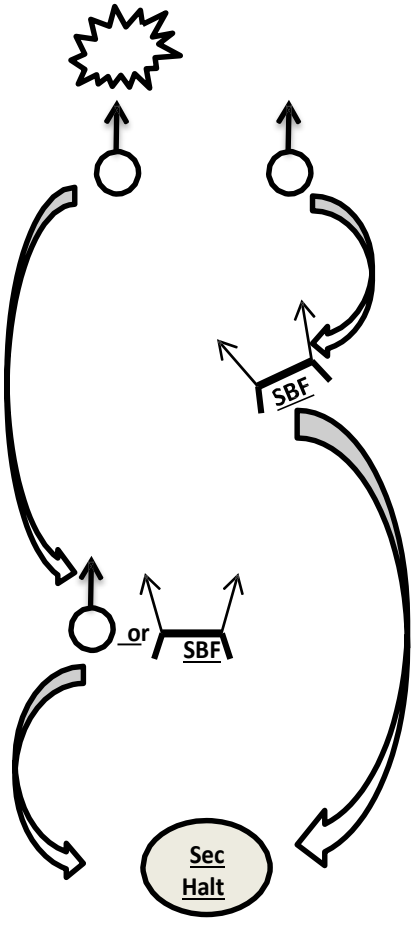
STEPS:

-PL/PSG CALL PLT HALT GUNS SET UP IN DIRECTION OF FIRE
-PL ISSUES 5 POINT TO RECON AND STAY BEHIND
-PL INTIATES HALT CONDUCTS SLLS AND RECON OF FP
- SEC SGT SET UP AIMING CIRCLE ISSUES PRE DEFLECTIONS TO AB
-AB PLACE AIMMING POLE IN MTR POSITIONS AND PULL SEC
-PL RADIOS STAY BEHIND TO PREPARE TO MOVE
-PL MOVES OR ISSUES DISTANCE, DIRECTION, AND GRID TO STAY BEHIND AND REST OF THE PLT MOVES INTO POSITION
-GUNS USE PRE DEFLECTIONS AND LAY IN ON AIMING CIRCLE
-PLT LAYS IN POLES, EST. SECURITY, AND MFP IS ESTABLISHED

MTR PLT HALT



SECTION WITHDRAWAL UNDER PRESSURE



Contact is made

Section gains fire superiority

Gun not in contact, or directed by Sec SGT, breaks contact and sets up a support by fire suppressing the enemy

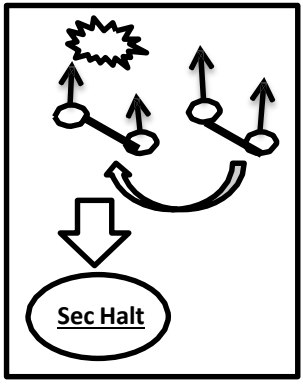
Gun in contact displaces under covering fires from SBF. They establish a direct lay, SBF, or both on the enemy, allowing other gun to displace.

Section will continue this until they are out of effective fire or enemy has been destroyed, move to a security halt, reconsolidate, reorganize, and continue the mission

Mortars are a high value target for the enemy, breaking contact is priority for the mortar platoon, and sections . You should only stay and fight when you are unable to withdraw

PLATOON WITHDRAWAL UNDER PRESSURE

Phase 1

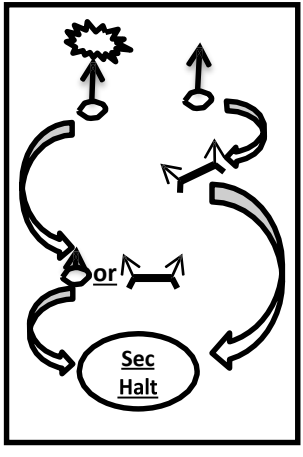


(Phase 1)
During pressure, acting as a platoon, guns will react as sections

Section in contact will gain and maintain fire superiority. Simultaneously, section not in contact will secure weapon systems and if motorized, vehicles, and break contact to reconsolidation point dictated by leadership, and est. security halt

(Phase 2)
At this point leadership will decide who will break contact and who sets up a support by fire suppressing the enemy

Phase 2



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MORTARS AT COMPANY LEVEL

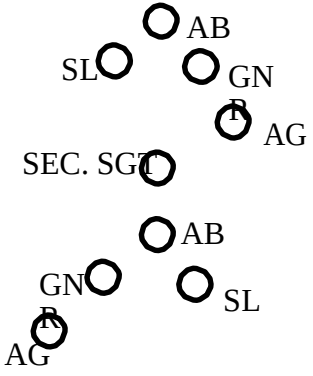
60mm ON PATROL

While timely accurate fires are a must, typically daily use for patrolling in Afghanistan is direct lay for these systems. The use of a Fire Direction Control (FDC) is not needed in this situation. When engaging with direct lay, mortar Squad Leader will work up an IDF mission and utilize his COP 120mm and/or 81mm for greater effects and lethality on the enemy

COP / FOB HOT GUNS

Use of the systems will be primarily defensive in nature, providing counter fire on Target Reference Points (TRPs) as well as denial and interdiction missions. Sections will also utilize these guns by massing fires on burst point grids (BPGs) sent to hot guns by maneuvering Mortars units on the ground.

OPTION 1: 2x 60mm ON PATROL AS A SECTION



FOOM FOR 2x 60mm ON PATROL

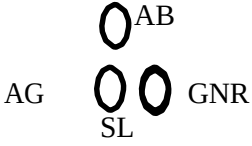
ADVANTAGES

- MTR SEC CAN SERVE AS A MANEUVER SQD IF ROE LIMITS USE OF MTRS IN AO
- CAPABILITY FOR CHIEF & CHECK ALLOWS FOR MORE ACCURATE AND HIGHER RATE OF FIRE
- 2 GUNS CAN MUTUALLY SUPPORT ONE ANOTHER AS WELL AS MANEUVER UNIT.
- ABILITY TO SHOOT MULTIPLE MISSIONS SIMULTANEOUSLY

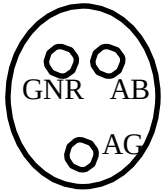
DISADVANTAGES

- IF SECTIONS ARE SERVING AT PLT SIZED COPS, WITHOUT EXTRA SECTIONS FROM HHC MORTARS, COMPANY SECTION CANNOT MAN COP GUNS WHEN ON PATROL

OPTION 2: 1x 60mm ON PATROL 1x BASE DEFENSE GUN



FOO FOR 1x 60mm SQD ON PATROL



FOO FOR 1x 120mm/81mm ON COP
****SQD IS FULL GN TM & FDC (WITH CHIEF AND CHECK)**

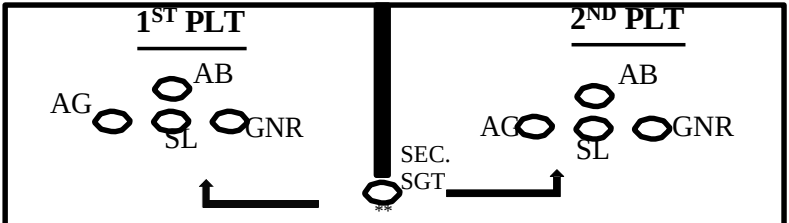
ADVANTAGES

•ROTATION ALLOWS CONTINUOUS MANNING OF COP BASE DEFENSE GUN AND MUTUAL SUPPORT FOR MTR SQD ON PATROL (LARGE PAYLOAD OF ROUNDS)
•CHIEF & CHECK ON FOB WITH BIGGER GUNS ALLOWS MORE ACCURATE AND TIMELY FIRES
•ALLOWS ROTATION OF GN TMs AND LDRs

DISADVANTAGES

•LESS FIRE POWER ON GROUND FOR INITIAL CONTACT

OPTION 3: 1x 60mm ON SEPARATE PATROLS



SEC. SGT CAN FLEX TO EITHER PATROL DEPENDING ON SL EXPERIENCE AND ENEMY THREAT

ADVANTAGES

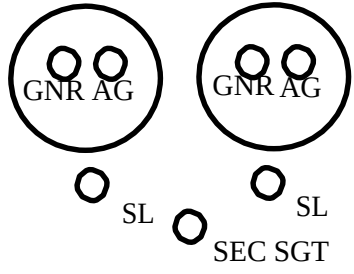
•MTR SUPPORT ON 2 PATROLS SIMULTANEOUSLY
•SEC. SGT CAN MOVE WITH EITHER PATROL DEPENDING ON SL EXPERIENCE AND/OR ENEMY THREAT

DISADVANTAGES

•NO BASE GUN TO PROVIDE LARGER SUPPORT IF 2x PATROLS OUT WITH 60mm TEAMS AT SAME TIME

OPTION 4: 1x 60mm ON PATROL 2x BASE DEFENSE GUN

FOO FOR 1x 60mm GN TM FOR DIRECT LAY ONLY ON PATROL



FOO FOR 2x 120mm/81mm ON COP

ADVANTAGES

•MORE FIRE POWER ON FOB

•FDC HAS CHIEF, CHECK, AND SECTION SGT

DISADVANTAGES

•LESS FIRE POWER ON GROUND
•NO FDC
•NO POSSIBILITY FOR GRID & POLAR MISSION, TEAM CAN SOLELY SHOOT DIRECT LAY OR HAND HOLD MODE
•NO MORTAR LEADERSHIP ON GROUND

MFP OCCUPATIONS (MOUNTED & DISMOUNTED)

1.Deliberate Occupation.

A *deliberate occupation is one that has been planned* and has the advance party precede the platoon to conduct extensive preparation of the new position. A deliberate occupation may take place during daylight hours following a daylight operation, at night after a daylight preparation, or at night following a nighttime preparation. Only the minimum number of vehicles and personnel should go forward. Too much activity during preparation risks compromise. When the tactical situation allows, a good procedure for deliberate occupations of a new position is to do the preparation before darkness and to move the sections by night. Deliberate nighttime occupation following a nighttime preparation is often necessary, but it can be time-consuming.

LEADER'S RECON CONSIST OF:

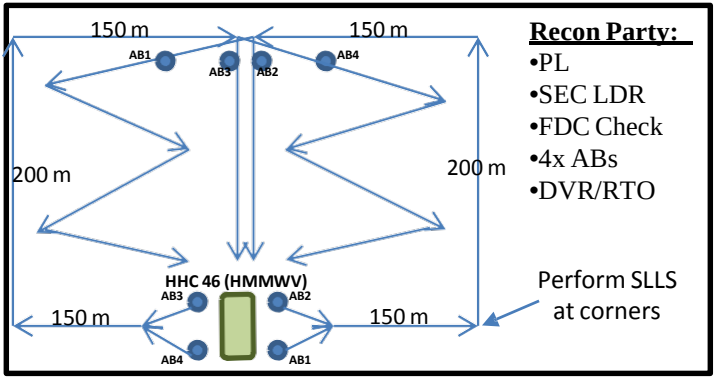
- •PL
- •RTO
- •SEC. LDR
- •AMMO BEARER OR REP. FROM EACH GUN
- •ANY OTHER PERSONAL NEEDED

EQUIPMENT TO BE BROUGHT:

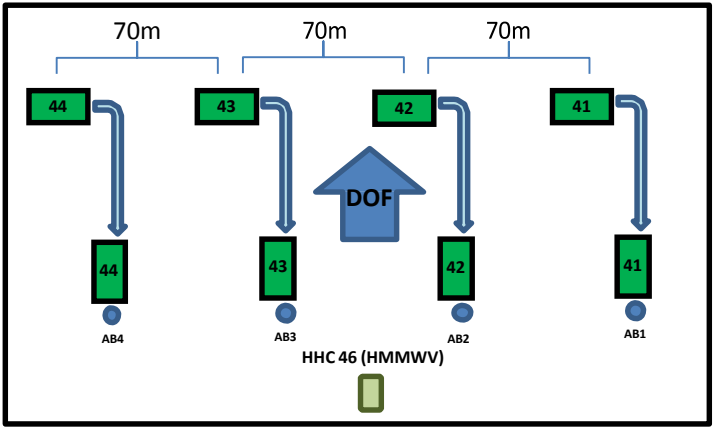
- ▪PL
  - •GPS
  - •MAP
  - •PROTRACTOR
  - •COMPASS
- ▪RTO
  - •RADIO
  - •SOI
- ▪SEC. LDR
  - •AIMING CIRCLE
  - •PLOTTING BOARD OR LHMBC
- ▪AMMO BARER
  - •AIMING POSTS WITH LIGHTS (FOR LIMITED VISIBILITY)
  - •BASE PLATE (OPTIONAL)
  - •AX/SHOVEL

Deliberate Occupation of MFP (PLT, Mounted)

Recon of MFP



PLT Occupation of MFP

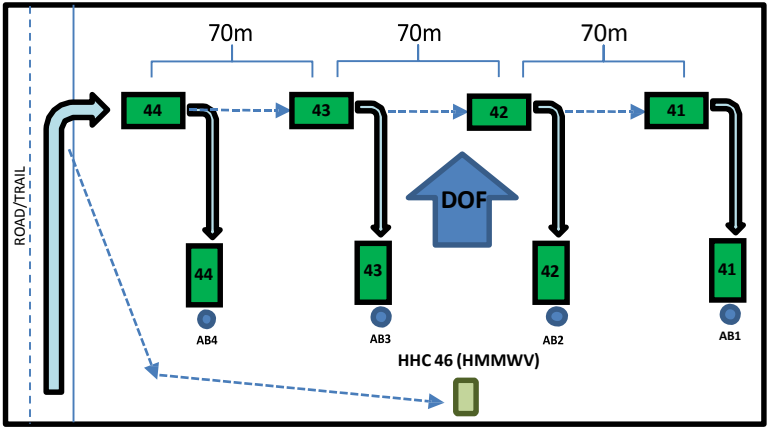


2. Hasty Occupation.

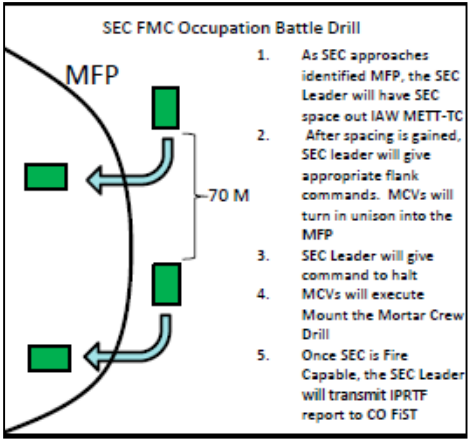
A hasty occupation of a MFP is established in the same as a deliberate occupation, minus the Leaders' recon. It is considered as a "taking the MFP by force", Vehicles / Dismounts will stop at the proposed MFP, emplace Guns; Gunners will utilize their M2 compass to lay in the Guns on the DOF while the PL/PSG emplace the M2A2 aiming circle. The PSG/SL will emplace security as necessary, and the FDC element will setup their equipment. Once Guns are established, they will reciprocal lay with the M2A2, and re-lay their poles. MFP is established once the Guns are on the DOF with 1800 poles out, FDC is established and has communication with the FOs.

Hasty Occupation of MFP (Mounted)

Mounted BN MTR Platoon



Mounted Company MTR Section



3. Emergency Occupation / Hipshoot.

This occurs when the Platoon is in a movement formation and en-route to MFP. The RTO receives a call for fire and announces "Fire Mission;" he continues to process the call for fire. The SL or Section Leader directs the ABs to a clear spot for firing. The Gunner puts the Gun into action in a general direction of fire. The FDC announces a direction, charge, and elevation to the Gun line. The Gunner sets up on the direction and fires a round (ONLY for base gun). Upon adjustment completion, FFE is given to all guns.

CHAPTER 5
COMMUNICATIONS

ASIP Radio Procedures

• **TASK:** Set a Single Channel Frequency
•**PURPOSE:** To establish Non-Secure FM Radio Communications-to set a MEDEVAC Frequency, for instance.
•Set SINCGARS Mode switch to "SC".
•Set SINCGARS COMSEC switch to "PT".
•Set SINCGARS Function switch to "LD".
•Place Channel Selector to "CUE", "MAN", or Channels 1-6.
•Press "FREQ" on the SINCGARS keypad.
•Press "CLR" on the SINCGARS keypad.
•Enter the 5 Digit Frequency using the keypad.
•Press "STO" on the SINCGARS keypad.
•Set SINCGARS Function switch to "ON".
•Conduct a radio check with an element on the new net.

•**TASK: Fill an ASIP radio with Frequency Hopping data from an SKL.**
•**Purpose: To enable Secure FM Radio Communications.**
•Set SINCGARS Mode switch to "FH"
•Set SINCGARS COMSEC switch to "CT"
•Set SINCGARS Function switch to "LD"
•In the ANCD, select "APPL" -> "RADIO"
•In the ANCD, select "SEND" -> "RADIO" -> "ICOM"
•Connect ANCD to the Audio / Fill connector on SINCGARS.
•Arrow down on the ANCD.
•Select NO when ANCD asks "Do you want to include time?:
•Press ENTER on ANCD.
•Press LOAD (the number 0) on the SINCGARS.
•You will hear a series of beeps.
•Radio will display "DONE" when transfer is complete. ANCD will display "Transfer successful."

ASIP PLANNING RANGES	
POWER SETTING	**RANGE**
LOW (LO)	200 M-400 M
MEDIUM (M)	400 M-5 KM
HIGH (H)	5 KM-10 KM
POWER AMP (PA)	10 KM-40 KM

•**Task: Load Time into an ASIP radio.**
•**Purpose: To ensure the ASIP radio is properly synched to permit Frequency Hopping Communications.**
•Set SINCGARS Function switch to "LD"
•Press "TIME" on the SINCGARS keypad. The Julian Date will appear.
•Press "CLR" on the SINCGARS keypad. The Julian Date will clear.
•Enter the last two digits of the Julian Date and press "STO"
•Press "TIME" again- Hours and Minutes will display.
•Press "CLR" on the SINCGARS keypad to clear the time.
•From a PLGR enter the current SULU time (hour and next minute).
•You must enter the next minute because the SINCGARS will not allow modifications of seconds.
•When the PLGR time matches the time you have entered on the SINCGARS press "STO".
•Set SINCGARS Function switch to "ON"
•Conduct a radio check with an element on your net.

•**Task: Change the NET ID on an ASIP radio.**
•**Purpose: To enable secure FM Communications with a different element.**
•Place SINCGARS Channel Selector to Channel 1,2,3,4, or 5.
•Set SINCGARS Mode switch to "FH"
•Set SINCGARS COMSEC switch to "CT"
•Set SINCGARS Function switch to "LD"
•On the SINCGARS keypad press "FREQ"
•On the SINCGARS keypad press "CLR"
•The last three digits of the Net ID will clear (F___)
•Enter the new Net ID.
•Press "STO" on the SINCGARS keypad.
•Set SINCGARS Function switch to "ON"
•Conduct a radio check with an element on the new net.

SKL (SIMPLE KEY LOADER)

1. Hold power button on SKL to initialize.
2. Wait for Logon screen to appear.
3. Enter User ID and Password.
4. Select Launch (located at top of screen); Select **Launch UAS** and click **OK** at Startup Information screen.
5. Expand all key selection trees on the Key Tab screen using the +
6. Select and highlight appropriate COMSEC key.
7. Select **LOAD** icon.
8. At Key Load Settings screen; Select Protocol: **DS-102,** Activate Mode: **KYK-13.** Select **OK** again at the **Ready to Send** Key screen.
9. Press **INITIATE** button; will appear at Status screen.
10. Connect fill cable to appropriate radio port and initiate fill on the radio.

Filling Keys in DAGR

1. Turn on ANCD
2. Select RADIO
3. Select COMSEC
4. Select the GPS KEY
5. Press ENTER
6. Connect ANCD to DAGR
7. Turn on DAGR
8. Ensure setting is set to DS102
9. Press MENU twice
10. Select COMMUNICATIONS
11. Select CRYPTO FILL
12. Will fill automatically

JCR

JCR EMPLOYMENT. The following list outlines how the BCT will utilize JCR in support of TOC operations.

1. Enemy spot reports. It is critical to pass spot reports via BFT as this creates an enemy icon that is transmitted network wide. If the element in contact cannot make a digital report, send a FM SALT report to the appropriate CP and the CP will create the digital report.
2. Planned Call for Fire (CFF) missions for designated observers; follow up via FM.
3. Digital NBC 1 report. This creates a contaminated area icon across the network. An FM report on the unit net should follow.
4. Send Obstacle Reports, BRIDGEREPS, and other geo-reference reports digitally.
5. Provide unit locations digitally utilizing GPS.
6. FM radio remains the primary means of communications after crossing the Line Departure (LD) because it is more responsive, multiple stations can monitor, and the parties convey emotion during the transmission – a critical aspect in assessing and understanding the battlefield situation. FM radio is recommended as the primary means of communication for:
    a. Initial contact/SPOT reports.
    b. Coordinating operations when in contact or moving.
    c. CFF on targets of opportunity; particularly moving targets.
    d. Subsequent adjustment of fires on planned and unplanned targets.
    e. Urgent MEDEVAC requests.
    f. Enemy air warning.

JCR OPERATOR RESPONSIBILITIES

JCR operator will ensure the following tasks have been conducted prior to execution.

1. Perform required PMCS – Checking cables, and hardware so that the unit has time to react if something needs to be changed.
2. Ensure correct SA and filter settings.
3. Establish/verify message address groups by making sure the right people get the right message.
4. Establish/verify default message address groups.
5. Verify Message folders have been established.
6. Ensure proper maps (CADRG/IMAGERY/DTED) are loaded and displayed.
7. Verify equipment will send and receive SA and C2 messages to the TOC and other JCR's on that mission.
8. Verify Mission Date Load has been received and loaded (Overlays/TIRS).

WARNING: IF ANY CABLES ARE DISCONNECTED NOTIFY 31U PERSONNEL IMMEDIATELY. DO NOT ATTEMPT TO RECONNECT CABLES

❑ **CPU:** CHECK FOR CRACKS OR DENTS. ENSURE CABLE CONNECTIONS AND RAM BALL MOUNT ARE SECURE

❑**CABLES:** CHECK FOR MISSING/DAMAGED CABLES, BROKEN PINS OR CONNECTORS AND CRACKED CABLES

❑**DISPLAY UNIT (DU):** CHECK FOR DENTS, PUNCTURES ON THE DU TOUCH SCREEN. ENSURE DU IS SECURED IN DESIRED POSITION.

❑**KEYBOARD:** CHECK FOR STICKING OR MISSING KEYS AND ENSURE THE MEMBRANE SEAL IS NOT TORN. VERIFY THAT THE KEYBOARD IS CONNECTED TO THE DU.

❑**PLGR:** REMOVE THE INTERNAL BATTERY (BA5800) AND ENSURE THAT CABLES ARE PROPERLY SECURED.

❑**ANTENNAS:** ENSURE ALL ANTENNAS ARE PRESENT AND PROPERLY SECURED. FOR HELP ON FBCB2 APPLICATIONS, REFER TO THE EMBEDDED TUTORIAL AND/OR THE SOFTWARE USERS MANUAL (SUM) ON THE TASK BAR UNDER HELP. THE SUM CAN ALSO BE FOUND UNDER "F8-HELP" IN THE OPS SCREEN

❑**TROUBLE REPORT PROCEDURES:**

1. NOTIFY FIRST LINE SUPERVISOR
2. FIRST LINE SUPERVISOR NOTIFIES 31U PERSONNEL AND REQUESTS ASSISTANCE

CHAPTER 6
MEDICAL

TRIAGE FLOW CHART

Point of Injury (POI)

- Is the casualty in direct line of fire/danger?
- What was the cause of injury?
- Is the casualty litter or ambulatory (can he walk)

Triage

- Are you ok?
- Can you move to cover? Can you come to me?
- Can you Perform Self-aid?
- Can you return fire?

CAN'T MOVE/UNRESPONSIVE

Care under Fire (1st step of TC3)

- Gain Fire Superiority
- Visual blood sweep
- Apply tourniquet to ANY extremity hemorrhage
- Drag/carry casualty to a safer location for further care/treatment/

Rapid Trauma Assessment

- Reassess any interventions (tourniquets)
- Full body blood sweep
  - Treat injuries as needed
- Assess casualty's breathing
  - Check for bilateral rise and fall of chest
  - Chest movement unequal = grounds for NCD
    - Find the clavicle, go one rib down and insert NCD to the hub parallel to the casualty's chest just above that rib
- Secure patient's airway with NPA if unconscious

Tactical Casualty Evacuation

- Get casualty onto litter/sked/spine board (secure with litter straps across chest, just above belt line, feet)
- If using a blanket for shock treatment, ensure blanket is secured **UNDER** litter straps
- Call up 9 line MEDEVAC w/ MIST report
- Move casualty to the LZ/extraction point

ABILITY TO MOVE TO YOU

Tactical Field Care (2nd step of TC3)

- Reassess any interventions (tourniquets)
- Determine level of consciousness using AVPU scale
- Perform full blood sweep (head to toe, back to front)
  - Treat injuries as needed
- Monitor skin (color, temperature, condition)
- **ALWAYS** treat for **SHOCK** (loosen tight clothing, elevate feet, keep warm, reassure the casualty, keep talking to him)

Management of the casualty

- Reassess any interventions/treatments
- Check pulse, skin, capillary refill (blanched skin)
- Reassure casualty
- Keep warm (apply blanket if not already covered)
- Continue to monitor casualty for any changes in vital signs
- Ensure accountability for casualty weapon/equipment
- Chain of command notified of situation at hand
- Ensure 360 security is being maintained

CAUSALITY FLOW CHART

Head

- When inspecting the head, use your hands to feel the skull for any fractures, soft spots, abrasions, cuts, or burns. Inspect the hard boney structure around the eye (orbits). Check behind the ears for discoloration (battle signs). Note any fluid seeping from ears, nose or eyes. Note black eyes, sign of orbital fracture. Assess his mental acuity by asking who are you, what are you doing here, what day is it and where are you

Throat/Neck

- Upon inspection look for Jugular vein distention (JVD), it looks like extremely pronounced veins, late sign of Tension Pneumothorax. Look to see if Trachea is centered, off-center indicates collapsed lung opposite deviation direction. Make sure there are no airway obstructions (tounge, teeth, fluid, foreign matter). Check back of neck for spinal step off (feels like stairs)

Chest

- Look for equal rise and fall of chest when breathing. Unilateral/irregular rise, deep breathing/shallow breathing Is usually signs of Tension pneumothorax. Treat Tension pneumo with a Needle-Chest decompression (14g catheter, placed below the 2nd rib but just above the 3rd rib). When the needle has advanced far enough, the biggest sign of success is the casualties look of relief because he can now breathe. Look for small bumps on chest (indicates severe blunt trauma). Flail chest (paradoxical movement of chest when breathing, indicates 2 or more ribs are fractured). Entrance and/or exit wounds (caused by gun shots, shrapnel from a blast, any other penetrating objects can usually lead to a sucking chest wound. 9 times out of 10 a sucking chest wound will develop into hemopneumothorax

Abdomen

- While inspecting the abdomen, look for tenderness to palpation, unusual rigidity (hardness of abdominal wall), casualty guarding against touching of abdomen, and pulsating masses (very obvious if observed). When palpating (feeling) abdomen, palpate all 4 quadrants (Upper/lower, left/right). If vomiting, is there blood present? If urination, is there blood in urine? Is pain coming and going? Severe right upper quadrant pain over 24 hours can be an indication of appendicitis.

Extremities (Arms & Legs)

- Any major bleeding should be controlled with a tourniquet immediately. If you are unsure, tourniquet. It is always easier and more effective to apply a tourniquet rather than manage blood loss any other way. Tourniquets can be worn up to eight hours safely. Tourniquets can always be downgraded to pressure dressings; your goal is to stop the bleeding immediately. Touch the bottoms of feet and palms of hand, and have casualty wiggle toes and fingers to demonstrate motor sensory functions. Check for capillary refill on tips of fingers and toes. Look for any instability in bones (fractures). Splint and secure any fractures discovered. Check distal pulses (arm=wrist, leg=top of foot). Observe strength and range of motion.

BOLO

- Spurting/gushing blood with heartbeat, indication of Arterial bleed (must be controlled **IMMEDIATELY**)
- Uneven pupils (indicates possible brain trauma or head injury, contact medical personal immediately, do **NOT** administer IV fluids, sit the casualty up)
- Severe abdominal pain (indicates internal injury/internal bleeding, casualty needs to be evacuated to next level of care, usually can only be treated by surgeons. Lay casualty down with knees bent towards chest to decrease pressure on intestines)
- Always ensure armpits/inguinal areas are checked for bleeding/injuries (easily over looked area)
- Tourniquet placement should always be as high as possible
- Casualty mental status (disarm mentally unstable casualty)
- **EXPOSE EXPOSE EXPOSE THE BODY!** (TAKE CLOTHS, EQUIPMENT OFF, ETC)

CPR FORMULA

CPR should never be performed in a combat environment, however if need be:

- Begin compressions immediately. If casualty is still not breathing on his own:

- 30:2 meaning 30 compressions w/ 2 rescue breaths
- Site is at least 2" above tip of sternum
- **DO NOT COMPRESS TIP OF STERNUM (Solar-Plexus)!!!**

SHOCK

Shock is the depressed state of vital organs due to the cardiovascular (heart) system not providing enough blood. Although shock is not a cold-weather injury, it is a symptom or a result of other injuries. Any illness or injury can produce shock, which increases the instance and severity of a cold-weather injury. Shock should be assumed in all injuries and treated accordingly. Even minor injuries can produce shock due to cold, pain, fear, and loss of blood.

Symptom Initial symptoms of shock include apprehension, shortness of breath, sweating, cold skin, rapid and faint pulse, and excessive thirst. If the victim is not given adequate first aid immediately, his condition may digress into incoherence, slower heart beat, unconsciousness, and possibly death.

Treatment To treat shock, restore breathing and heart rate through artificial respiration or cardiopulmonary resuscitation. Treat the injury and control hemorrhaging. Make the victim as comfortable as possible and try to relieve the pain. Keep the victim warm but do not overheat him. Elevate the back and head, or feet. If the victim is conscious and has no abdominal injuries, administer water. The victim should receive proper medical attention as soon as possible.

HEAT INJURIES

Heat injuries, although associated with hot weather, can occur in cold-weather environments. Most heat injuries can be avoided by planning, periodic inspections of personnel clothing (ventilation) and equipment, a balance of water and food intake, and rest.

HEAT CRAMPS

Heat cramps are caused by an accumulation of lactic acid in the muscles and a loss of salt through perspiration.

(1)***Contributing Factor.*** Strenuous exertion causes the body to heat up and to produce heavy perspiration.

(2)***Symptoms.*** Symptoms of heat cramps include pain and cramping in the arms, legs, back, and stomach. The victim sweats profusely and cannot quench his thirst.

(3)***Treatment.*** Have the victim rest in a cool, shady area, breath deeply, and stretch the cramped muscle as soon as possible to obtain relief. Loosen the victim's clothing and have him drink cool water. Monitor his condition and seek medical attention if pain and cramps continue.

HEAT EXHAUSTION

Heat exhaustion may occur when a soldier exerts himself in any environment and he overheats. The blood vessels in the skin become so dilated that the blood flow to the brain and other organs is reduced.

(1)***Contributing Factors.*** Factors that contribute to heat exhaustion are strenuous activity in hot areas, unacclimatized troops, inappropriate diet, and not enough water or rest.

(2)***Symptoms.*** Symptoms of heat exhaustion may be similar to fainting but may also include weakness; dizziness; confusion; headache; cold, clammy skin; and nausea. The victim may also have a rapid but weak pulse.

(3)***Treatment.*** Move the victim to a cool, shady area and loosen his clothes and boots. Have the victim drink water and, if possible, immerse him in water to aid in cooling. Elevate the victim's legs to help restore proper circulation. Monitor his condition and seek medical attention if the symptoms persist.

HEAT STROKE

Heat stroke is a life-threatening situation caused by overexposure to the sun. The body is so depleted of liquids that its internal cooling mechanisms fail to function.

1)Contributing Factors. Factors that contribute to heat stroke are prolonged exposure to direct sunlight, overexertion, dehydration, and depletion of electrolytes.

2) ***Symptoms.*** Symptoms of heat stroke include hot, dry skin; dizziness; confusion and incoherency; headache; nausea; seizures; breathing difficulty; a slow pulse; and loss of consciousness.

3) ***Treatment.*** Cool the victim at once, and restore breathing and circulation. If the victim is conscious, administer water. If possible, submerge the victim in water to reduce his temperature, treat for shock, and prepare for immediate evacuation.

COLD-WEATHER INJURY PREVENTION

To prevent cold weather injuries we must use the acronym cold to ensure you and your soldiers are properly protected from and become a cold weather injury

.

C—Clothing should be clean since prolonged wear reduces its air-trapping abilities and clogs air spaces with dirt and body oils.

O—Overheating. Avoid overheating. Appropriate measures should be taken when a change in weather or activity alters the amount of clothing needed to prevent overheating and, therefore, accumulation of perspiration.

L—Loose and in layers (to trap air and to conserve body heat). The uniform should be worn completely and correctly to avoid injury to exposed body surfaces. The cold-weather uniform is complete when worn with gloves and inserts.

D—Dry. Keep dry. Wet clothing loses insulation value

BODY HEAT MAY BE LOST THROUGH:

1)***Radiation.*** The direct heat loss from the body to its surrounding atmosphere is called radiation heat loss. The head can radiate up to 80 percent of the total body heat output. On cold days, personnel must keep all extremities covered to retain heat. This accounts for the largest amount of heat lost from the body.

2)***Conduction.*** Conduction is the direct transfer of heat from one object in contact with another (being rained on or sitting in snow).

3)***Convection.*** Convection is the loss of heat due to moving air or water in contact with the skin. Wind chill is convection cooling. Clothing that ventilates, insulates, and protects must control the layer of warm air next to the skin.

4)***Evaporation.*** The evaporation of perspiration causes heat loss. Wet clothing can cause heat loss by conduction and evaporation. Dressing in layers allows soldiers to remove or add clothing as needed

This flowchart will assist you in making assessments on wind chill to prevent injury

WIND CHILL FACTOR CHART

COOLING POWER OF WIND EXPRESSED AS AN EQUIVALENT CHILL TEMPERATURE (UNDER CALM CONDITIONS)

ESTIMATED WIND SPEED (IN MPH)	ACTUAL THERMOMETER READING (F)											
	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
	EQUIVALENT TEMPERATURES (F)											
Calm	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
5	48	37	27	16	6	-5	-15	-26	-36	-47	-57	-68
10	40	28	16	4	-9	-24	-33	-46	-58	-70	-83	-95
15	36	22	9	-5	-18	-32	-45	-58	-72	-85	-99	-112
20	32	18	4	-10	-25	-39	-53	-67	-82	-96	-110	-124
25	30	16	0	-15	-29	-44	-59	-74	-88	-104	-118	-133
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109	-125	-140
35	27	11	-4	-21	-35	-51	-67	-82	-98	-113	-129	-145
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116	-132	-148

Winds greater than 40 MPH have little additional effect.	**LITTLE DANGER** (For properly clothed person) Maximum danger of false sense of security.	**INCREASING DANGER** Danger from freezing of exposed flesh.	**GREAT DANGER**
	Trench foot and immersion foot may occur at any point on this chart.		

Dehydration

Dehydration is the loss of body fluids to the point that normal body functions are prevented or slowed. This is usually caused by overexertion and improper water intake. A soldier needs about three to six quarts of water each day to prevent dehydration. The adequacy of liquid intake can best be judged by the urine color and volume. Dark amber colored urine instead of light yellow or the absence of a need to urinate upon awakening from a night's sleep are indicators of dehydration.

Symptoms

Darkening urine, decreased amounts of urine being produced, dry mouth, tiredness, mental sluggishness, lack of appetite, headache, fainting, rapid heartbeat, dizziness, higher temperature, nausea, and unconsciousness.

Treatment

Prevent dehydration by consuming three to six quarts of fluids each day (forced drinking in the absence of thirst is mandatory) and avoid caffeine and alcohol, which may chemically contribute to dehydration. Keep the victim warm and treat for shock. In advanced cases, administer fluids by mouth if the victim is conscious. Do not let him eat snow; eating snow uses body heat. Allow the victim to rest. If he fails to improve within one hour or is unconscious, evacuate him to a medical facility immediately.

CHILBLAIN	
What is it?	Excessive exposure to cold temperature that is marked by inflammatory swelling of hands and feet accompanied by severe itching and burning sensations and sometimes ulceration; usually affects individuals with a history of cold limbs in summer as well as in winter.
Symptom	Swollen red tissue (in light-skinned individuals) or darkening of the skin (in darker-skinned individuals). This injury DOES NOT involve freezing of tissue.
Treatment	Warm affected area with direct body heat; do not massage or rub affected area, do not wet the area or rub it with snow or ice; do not expose affected area to open fire, stove, or any other intense direct heat source.
Prevention	Proper use of cold weather clothing and equipment; proper hydration and nutrition

IMMERSION FOOT	
What is it?	Prolonged exposure to cold, wet conditions. Inactivity, damp socks, and boots speed onset and severity
Symptoms	Cold, numb feet; may progress to hot with shooting pains; swelling, redness, and bleeding in severe cases
Treatment	Re-warm and dry feet by exposing to warm air; do not allow victim to walk on injury; do not rub, moisten, or expose area to extreme heat; evacuate
Prevention	Keep feet warm, clean, and dry with frequent sock changes; wet socks should be dried out ASAP to allow them to be reused; wipe VB boots out once per day (minimum); dry boots overnight by stuffing with paper towels

HYPOTHERMIA

Causes	•Dehydration •Poor nutrition •Diarrhea •Decreased physical activity •Cooling after sweating	•High winds •Immersion in water •Wrong clothing (type, amount, etc.) •Unpredicted change in weather
What is it?	Excessive heat loss from exposure to a low ambient temperature, wetness, high humidity, and wind; causing lowering of body's core temperature; serious medical condition requiring medical attention. Early recognition of this condition is the key to preventing advanced serious medical conditions.	
Symptoms	•Shivering •Slurred speech •Stumbling •Apathy •Nausea	•Delirium •Acetone breath (fruity) •Stops shivering (advanced) •Unconsciousness •Weak vital signs (body shutting down)
Treatment	**Mild** Reduce the cold and add heat (change to dry clothing, get into warming shelter, enter sleeping bag, etc.); have the individual exercise; provide food and warm liquids. **Severe** Evacuate ASAP to definitive care. Treat victim very gently. Provide warm, sweet drinks. Breathe warm air into the victim. Use Hibler Pack-apply padded heat sources	
Prevention	Proper use of cold weather clothing and equipment; anticipate the need for warming shelters, change of clothing, etc; adequate hydration and nutrition	

DO NOT:
•Attempt field re-warming unless medical help is more than 6 hours away
•Allow physical activity
•Attempt CPR compressions
•Assume a cold victim is dead even if he appears to be

FROSTBITE	
What is it?	Freezing of body tissue. The ambient temp MUST be below 32 F for frostbite to occur **Superficial:** Only the outer layer of skin is affected. **Deep:** More tissue is involved; can be down to and include the bone.
Symptoms	**Superficial:** Waxy white or gray skin (pink or red in dark skinned individuals) with pliable underlying layers. **Deep:** Tissue is white or bluish , firm to the touch, will not move over underlying layers.
Treatment	**Superficial:** Field treatment is to warm affected area with direct body heat or use water at temp of approximately 98 degrees F-104 degrees F; once thawed, do not allow tissue to refreeze. Evac to higher care. **Deep:** Field treatment is the same as for superficial AS LONG AS YOU ARE SURE THAT THE INJURY WILL NOT REFREEZE. NEVER moisten or rub with snow/ice; do not expose to intense heat sources.
Prevention	Proper use of cold weather clothing and equipment; use contact gloves to handle equipment; use approved gloves to handle POL products (petroleum, oil, lubricants, etc.) keep face and ears covered and dry; avoid tight, restrictive clothing; adequate hydration and nutrition; avoid alcohol and tobacco products.

ACUTE MOUNTAIN SICKNESS (AMS)		
What is it?	A collection of non-specific symptoms that can resemble the flu, carbon monoxide poisoning, or a hangover. Typically occurs at altitudes above 8000 feet. Occurs from low oxygen concentration.	
Symptoms	•Dizziness •Shortness of breath •Headache	•Insomnia •Upset stomach •Depression
Treatment	Slow or halt ascent; rest; acetaminophen (Tylenol) or other over-the-counter (OTC) medications may help; eat and ensure individual is hydrated; Diamox may help; descend if symptoms do not subside.	
Prevention	Maintain a slow ascent rate. Work high and sleep low; altitude increases of more than 1000 feet per day are not recommended; some prescription medications can aid acclimatization; adequate hydration and nutrition.	

High-Altitude Pulmonary Edema (HAPE)	
What is it?	Lungs fill with fluid (blood serum) that leaks from capillaries. Also known as dry-land drowning- as the lungs fill with fluid, the individual begins to lose the ability to get oxygen into the bloodstream. Manage altitude illness.
Symptoms	In the early stages, shortness of breath during exertion and an infrequent cough; as it develops, shortness of breath at rest, gurgling respiration (rales), and a frequent cough that produces pink or white frothy sputum; fever; looks similar to pneumonia.
Treatment	Rapid descent of 2000-4000 feet immediately; oxygen, medications, or Gamow bag may temporarily help, but rapid descent is the only definitive treatment; Diamox helpful in early stages.
Prevention	Maintain a slow ascent rate. Work high and sleep low; altitude increases of more than 1000 feet per day are not recommended; some prescription medications can aid acclimatization; adequate hydration and nutrition.

High-Altitude Cerebral Edema (HACE)		
What is it?	Increased intracranial pressure (swelling of the brain) caused by fluid leaking from capillaries.	
Symptoms	•Headache •Nausea •Dizziness •Loss of appetite	•Fatigue •Insomnia •Severe headache and vomiting (in severe cases)
Treatment	Rapid descent of 2000-4000 feet immediately; oxygen, medications, or Gamow bag may temporarily help, but rapid descent is the only definitive treatment; dexamethasone (Decadron) may help with symptoms, but is only temporary.	
Prevention	Maintain a slow ascent rate. Work high and sleep low; altitude increases of more than 1000 feet per day are not recommended; some prescription medications can aid acclimatization; adequate hydration and nutrition.	

LINE #	MEDEVAC REQUEST ALL MEDEVACS BEGIN WITH: "I HAVE A MEDEVAC REQUEST"	
1	**LOC. PICKUP SITE**	GRID IDENTIFY + 8-DIGIT GRID
2	**RADIO FREQ / CALL SIGN**	CALL SIGN, FREQ, PREFIX
3	**PATIENTS BY PRECEDENCE**	***ALL IN RELATION TO TIME OF LOSS OF LIFE, LIMB OR EYESIGHT **URGENT:** 2-HR EVAC (2-HR UNTIL CAS DOW) **URGENT SURGICAL:** 2-HR TO FORWARD MEDICAL CARE **PRIORITY:** 4-HR UNTIL BECOMES URGENT **ROUTINE:** 24-HR **CONVENIENCE:** WHENEVER CONVENIENT
4	**SPECIAL EQUIP**	**HOIST:** 250FT, 600LBS MAX CAPACITY, 2-SPEEDS (LOW= 600LBS 125FT/MIN HIGH = 300LBS 250FT) **STOCKS LITTER:** 400LBS SINGLE CAS **SKEDCO:** 400LBS SINGLE CAS **JUNGLE PENETRATOR:** 600LBS, 3 PERSONNEL **ADDITIONAL:** TAG LINE FOR SKEDCO & STOCKS LITTER **VENTILLATOR**: FOR ANY BREATHING ISSUE
5	**# PATIENTS BY TYPE** **(LITTER/ AMBULATORY)**	**** ALL IN RELATION CONFIG OF MEDEVAC VEHICLE **LITTER:** CAS CONFINED TO ACTUAL LITTER **AMBULATORY:** WALKING WOUNDED
******ONLY LINE 1-5 ARE NEEDED TO INITIATE MEDEVAC******		
6	**SECURITY OF SITE**	**A:** NO ENEMY **B:** POSSIBLE ENEMY **C:** KNOW ENEMY **D:** KNOWN ENEMY, ESCORT NEEDED
7	**METHOD OF MARKING**	**A:** PANELS **B:** PYRO **C:** SMOKE **D:** NONE **E:** OTHER
8	**NATIONALITY & STATUS**	**A:** US MILITARY **B:** US CIVILIAN **C:** NON US MILITARY **D:** NON US CIVILIAN **E:** EPW
9	**TERRAIN DESCRIPTION**	DESCRIPTION, SLOP SLANT, ETC
10	**M-I-S-T REPORT**	**MIST REPORT IS PER CAUSALITY**

CASUALTY COLLECTION POINT (CCP) PROCEDURES

The CCP will be located at the back of FDC. One CLS qualified person per squad will report to FDC with a CLS bag and a litter to see if he is needed, and assist in treating the wounded. The squad leader will only send his CLS person as long as he remains mission capable, if this isn't possible he will call FDC to notify them of the situation.

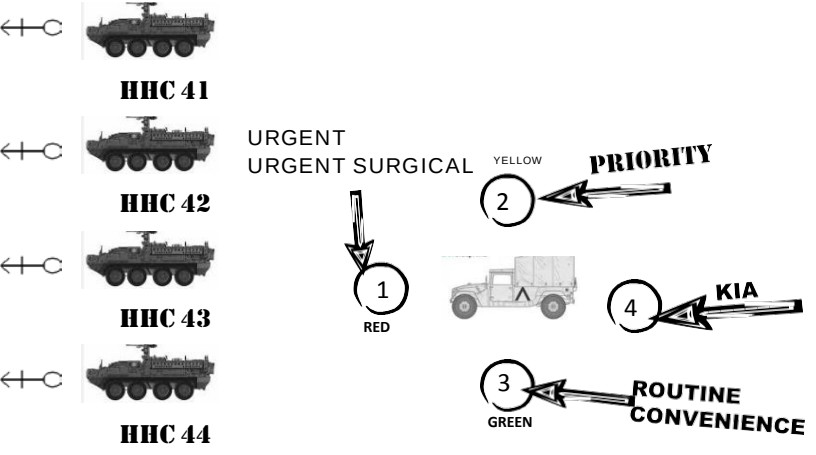
ALL CASUALTIES WILL BE SORTED AND EVACUATED IN THIS ORDER:

1. **URGENT, URGENT SURGICAL** - WILL EITHER BE LOADED INTO THE LT'S VEHICLE IMMEDIATELY OR REMAIN AT THE BACK OF FDC.
   NIGHT MARKING: RED CHEM LIGHTS

2. **PRIORITY –** WILL BE MOVED TO THE LEFT SIDE OF FDC
   NIGHT MARKING: YELLOW CHEM LIGHTS

3. **ROUTINE AND CONVENIENCE** – WILL MOVE TO THE RIGHT SIDE OF FDC
   NIGHT MARKING: GREEN CHEM LIGHTS

4. **KIA** – WILL BE PLACED AT THE FRONT OF FDC COVERED
   NIGHT Marking: IR CHEM LIGHT



PACKAGE OF A SKEDCO

PACKAGE OF CAUSALITY

TO USE THE SKED, REMOVE THE RETAINER STRAP AND UNROLL THE SKED. REVERSE ROLL IT TO MAKE IT LAY FLAT PLACE THE PATIENT ONTO THE SKED. HE SHOULD BE POSITIONED SO THAT THE 2ND CROSS STRAP FROM THE HEAD END (TOWARD THE LABEL) IS ACROSS HIS UPPER CHEST. FASTEN ALL OTHER CROSS STRAPS. THE CROSS STRAP AT THE FOOT END CAN BE PASSED THROUGH THE 2 OUTSIDE GROMMETS AT THE FOOT END OF THE SKED. THE RETAINER STRAPS CAN ALSO BE USED FOR THIS.

1. HEAD STRAPS ARE ON INSIDE OF CARABINEER
2. HEAD STRAP/FOOT STRAP GOES UNDER SKEDCO ON OUTSIDE

****HOIST**
TAG LINE IS SECURE AT FEET END IOT PREVENT OSCULATION

1. FEET ARE SECURE INSIDE OF WEBBING, RETAINER STRAPS FASTENED AND SECURED WITH OVERHAND SAFETIES.
2. 30 FT ROPE SECURED AT END WITH SQUARE KNOT AND OVERHAND SAFETIES

30 FT STATIC ROPE

1. CAUSALITY: 30 FT ROPE MUST NOT BE CRISSCROSSED ACROSS CAUSALITY
2. EQUIPMENT: 30 FT ROPE IS CROSSED ACROSS EQUIPMENT TO SECURE LOAD

PACKAGE OF EQUIPMENT

FOR USE AS AN EQUIPMENT CARRIER SIMPLY PLACE THE EQUIPMENT ON THE SKED AND FASTEN ALL STRAPS. THERE ARE 4 EXTRA RETAINER STRAPS INCLUDED WITH THE SKED. THEY CAN BE USED TO EXTEND THE LENGTH OF THE CROSS STRAPS WHEN CARRYING BULKY EQUIPMENT.

CHAPTER 7

MACHINE GUN USE AND WEAPONS

MACHINE GUNNER INFO

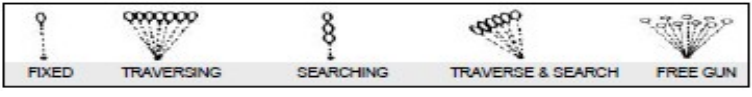
•**Point Targets**: require the use of a single aiming point. Examples of point targets are enemy Soldiers, bunkers, weapons emplacements, and lightly armored vehicles. Fixed fire is delivered at point targets.

•**Area Targets:** Area targets may have considerable width and depth and may require extensive traversing and searching fire. These include targets in which the exact location of the enemy is unknown. The following are varieties of area targets likely to be engaged.

-**Linear Targets:** Linear targets have sufficient width to require successive aiming points (traversing fire). The veaten zone effectively covers the depth of the target area. Traversing fire is delivered at linear targets.

-**Deep Targets.** Deep targets require successive aiming points (searching fire). Searching fire is delivered at deep targets.

-**Linear Targets with Depth**. Linear targets with depth have sufficient width requiring successive aiming points in which the beaten zone does not cover the depth of the target area. A combine charge in direction and elevation (traversing and searching) is necessary to effectively cover the target with fire traversing and searching fire are delivered at linear targets with depth



RATES OF FIRE AND BARREL CHANGE

Sustained Fire: for the M249 is 85 rounds per minute in bursts of 3 to 5 rounds. The M60 and M240B are 100 rounds per minute in bursts of 6 to 9 rounds. The gunner pauses 4 to 5 seconds between bursts. The barrel should be changed after firing at sustained rate for 10 minutes. This is the normal rate of fire for the gunner.

• **Rapid Fire: for the M249, M60, and M240B gunner is 200 rounds per** minute in bursts of (6 to 8 M249) 10 to 12 rounds. The gunner pauses 2 to 3 seconds between bursts. The barrel should be changed after firing at a rapid rate for 2 minutes. This procedure provides for an exceptionally high volume of fire, but for only a short period.

• **Cyclic Fire: uses the most ammunition that can be used in 1 minute. The** cyclic rate of fire with the machine gun is achieved when the trigger is held to the rear and ammunition is fed into the weapon uninterrupted for one minute. Normal cyclic rate of fire for the M249 is 850 rounds, M60 is 550 rounds, and for the M240B is 650 to 950 rounds. Always change the barrel after firing at cyclic rate for 1 minute. This procedure provides the highest volume of fire that the machine gun can fire, but this adversely affects the machine gun, and should only be fired in combat during emergencies.

METHODS OF APPLICATIONS OF FIRE

•**Grazing Fire:** Occurs when the center of the cone of fire does not rise more than 1 meter above the ground. When firing on level or uniformly sloping terrain, the gunner can obtain a maximum of 600 meters of grazing fire.

•**Plunging Fire:** Occurs when the danger space is confined to the beaten zone. Plunging fire also occurs when firing at long ranges, from high ground to low ground, into abruptly rising ground, or across uneven terrain, resulting in a loss of grazing fire at any point along the trajectory.

•**Frontal Fire:** Long axis of the beaten zone at right angle to front of target

•**Flanking Fire:** Flanking fire is fining at the side of a target

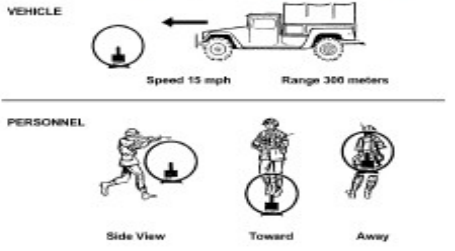
•**Oblique Fire:** long axis of the beaten zone at angle (<90) to front of the target

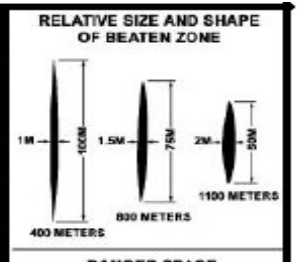
•**Enfilade Fire:** Long axis of the beaten zone coincides or nearly coincides with the long axis of the target: Most desirable type of fire… maximizes the effects

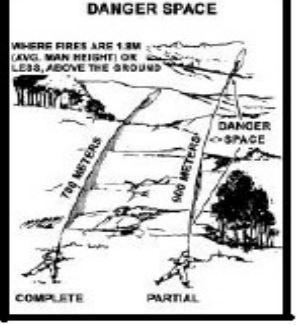
•**Final Protective Fire/Line:** An FPL is a predetermined line along which grazing fire is placed to stop an enemy assault. If an FPL is assigned, the machine gun is sighted along it except when other targets are being engaged. Fire must be delivered during all conditions of visibility.

ENGAGING MOVING TARGETS: LEADS

SPEED	RANGE OF TARGET (Vehicle)		
15 mph	300 meters	500 meters	900 meters
	1/2 X Target length	1 X Target length	2 X Target lengths







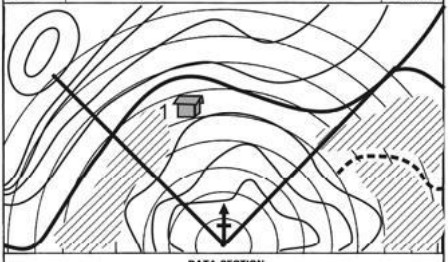
STANDARD RANGE CARD

For use of this form see FM 3-21.71; the proponent agency is TRADOC.

SQD WPNS
PLT 1
CO B

May be used for all types of direct fire weapons.

MAGNETIC NORTH



DATA SECTION

POSITION IDENTIFICATION: GUN #1 | DATE: 2 FEB 06

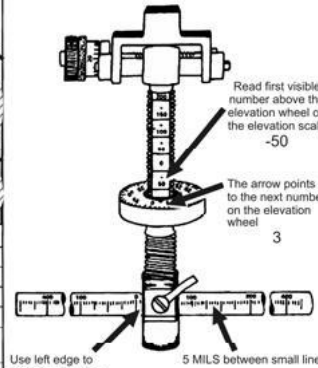
WEAPON: M240B | EACH CIRCLE EQUALS METERS: 100

NO.	DIRECTION/ DEFLECTION	ELEVATION	RANGE	AMMO	DESCRIPTION
1	L5	-50/3	550m		Building (PDF)

REMARKS: Swamp Road Water

PDF - Principal Direction of Fire

- First target is always the PDF



* The left or right direction is given for the direction the barrel points.

T&E Reading
L5 -50/3

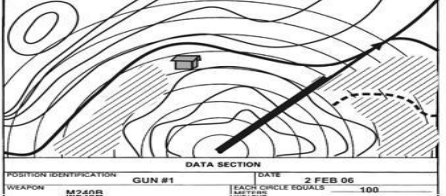
STANDARD RANGE CARD

For use of this form see FM 3-21.71; the proponent agency is TRADOC.

SQD WPNS
PLT 1
CO B

May be used for all types of direct fire weapons.

MAGNETIC NORTH



DATA SECTION

POSITION IDENTIFICATION: GUN #1 | DATE: 2 FEB 06

WEAPON: M240B | EACH CIRCLE EQUALS METERS: 100

NO.	DIRECTION/ DEFLECTION	ELEVATION	RANGE	AMMO	DESCRIPTION
1	R450	-50/10	600m		FPL

REMARKS: Swamp Road Water

FPL - Final Protective Line

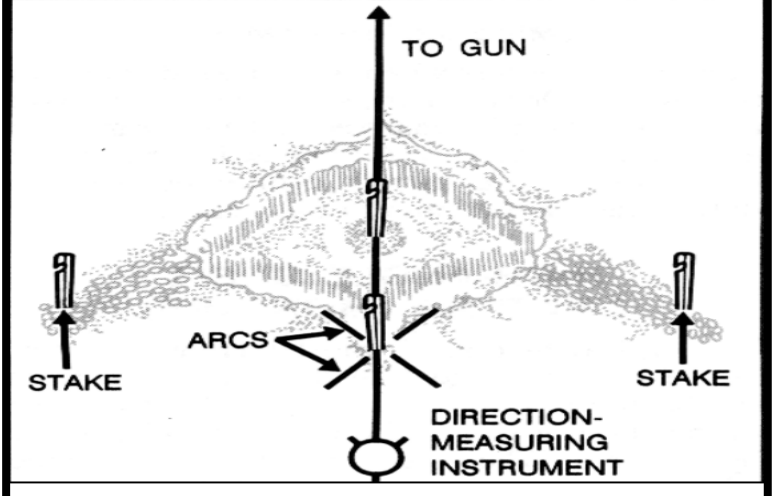
- FPL is always target #1
- FPL will always be metal-to-metal
- Represented by thick line
  - Break in thick line for dead space out to 600 meters
  - The gap is equal to the width of the dead space

WEAPONS SYSTEMS INFORMATION

M4 CARBINE **Weight: 6.49 LBS** **Effective Range: 500 M** **AREA RANGE: 600 M** **MAX Range:3,600 M** **Description: A 5.56 mm, magazine fed, gas-operated, air-cooled, semiautomatic or three-round burst, hand-held, shoulder-fired weapon.**	**M9 PISTOL** **Weight: 2.1 LBS** **Effective Range: 50 METERS** **MAX Range: 1,800** **Description:** **The M9 pistol is a 9-mm, semiautomatic, magazine fed, recoil-operation, double-action**
M240B **Weight: 27.6** **POINT Range ON TRIPOD:800 M** **POINT RANGE ON BIPOD: 600 M** **AREA RANGE ON TRIPOD: 1,100M** **AREA RANGE ON BIPOD: 800 M** **MAX Range: 3,725** **Description: The M240B is a belt-fed, air-cooled, gas-operated, fully automatic machine gun that fires from the open bolt position.**	**M2 .50 CAL** **Weight: 84 LBS** **Effective Range: 1,830 METERS** **MAX Range: 6,764 METERS** **Description:** **The Browning machine gun caliber .50 M2 is a belt-fed, recoil-operated, air-cooled, crew-served machine gun. The gun is capable of single shot, as well as automatic fire, and operates on the short recoil principle**
M249 **Weight: 16.1** **POINT Range ON TRIPOD:800 M** **POINT RANGE ON BIPOD: 6000 M** **AREA RANGE ON TRIPOD: 1000M** **AREA RANGE ON BIPOD: 800 M** **MAX Range: 3600 M** **Description: The M249 machine gun is a gas-operated, air-cooled, belt or magazine-fed, automatic weapon that fires from the open-bolt position.**	**M203** **Weight: 2.1 LBS** **Effective Range : 150 METERS** **MAX Range: ABOUT 400 M** **MIN RANGE: 14 – 38 METERS** **CASUALTY RADIUS- 5 METERS** **Description: The M203 grenade launcher is a lightweight, single-shot, breech-loaded, pump action(sliding barrel), shoulder-fired weapon that is attached to an M16 rifle series, or the M4 carbine series with the M203A1, and M4 carbine series with the rail system.**

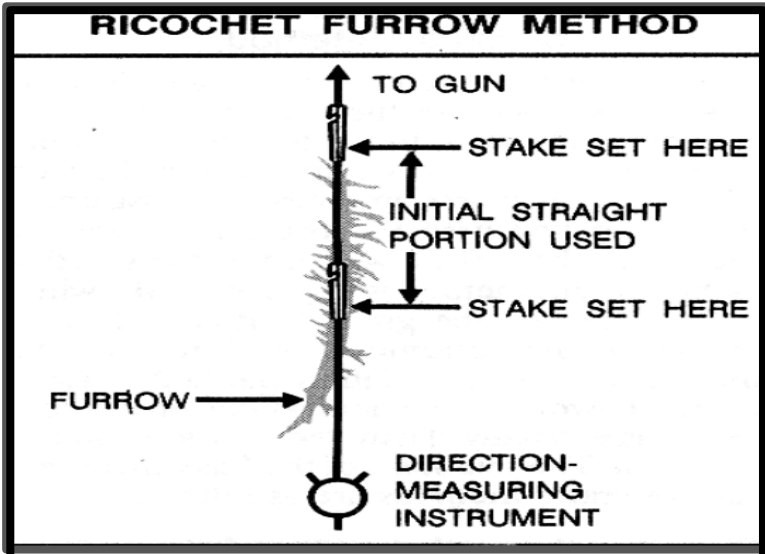
CHAPTER 8
CRATER ANALYSIS

SIDE SPRAY METHOD



CRATER ANALYSIS OF ARTILLERY

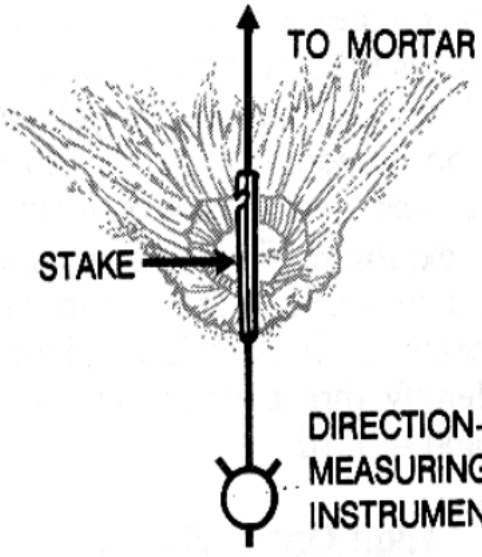
WHEN ARTILLERY ROUNDS IMPACT, DUE TO THEIR LOW ANGLE OF FIRE, THEY BLAST FORWARD AND AWAY FROM THERE POO. PLACE A STAKE AT THE POINT OF IMPACT AND AT THE FAR LEFT AND RIGHT OF THE CRATER MARKINGS. ESTIMATE THE CENTER BETWEEN THE LEFT AND RIGHT STAKES AND MARK MIDDLE. USE A COMPASS TO SHOOT A BACK AZIMUTH FROM THE CENTER STAKE TO THE POINT OF IMPACT STAKE AND GET A BACK AZIMUTH TO YOUR POO.



CRATER ANALYSIS OF A RICOCHET ARTILLERY ROUND

BECAUSE ARTILLERY ROUNDS ARE SHOT AT A LOW ANGLE, THEY SOME TIMES DO NOT HIT THE GROUND AND EXPLODE, WHILE THE ROUND IS UNEXPLODED ORDINANCE AND SHOULD BE HANDLED ACCORDINGLY , YOU CAN STILL USE ITS IMPRINT TO FIND THE POO. BECAUSE ARTILLERY TUBES ARE RIFLED THEY PUT A SPIN ON THE ROUND, TYPICALLY THE ROUND WILL LEAVE A J SHAPED IMPRINT ON THE GROUND . YOU WILL PLACE THE FIRST STAKE AT THE INITIAL POINT OF IMPACT AND PLACE A SECOND STAKE JUST BEFORE THE CRATER HOOKS OFF. YOU WILL THEN USE A COMPASS TO SHOOT AN AZIMUTH FROM THE SECOND STAKE TO THE FIRST STAKE AND YOU WILL FIND YOU BACK AZIMUTH TO YOUR POO

MAIN AXIS METHOD



CRATER ANALYSIS FOR MORTARS

WHEN MORTAR ROUNDS IMPACT THEY BLAST BACK TOWARDS THERE POINT OF ORIGIN (POO). YOU WILL PLACE A STAKE AT THE POINT OF IMPACT, AND ESTIMATE CENTER OF THE BLOW BACK OF THE ROUND. YOU WILL THAN USE A COMPASS TO GET A BACK AZIMUTH TO THE POO. TYPICALLY YOU WILL FIND TAIL FINS TO THE ROUNDS INDICATING ROUND SIZE AND MAX RANGE.

FINAL STEPS

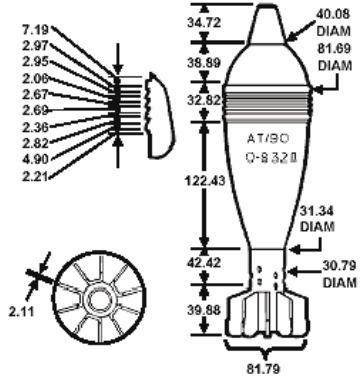
1. NOW THAT YOU HAVE YOU AZIMUTH TO YOUR POINT OF ORIGIN YOU CAN UTILIZE REMAINING SHRAPNEL TO ESTIMATE THE MAX RANGE FOR THE TYPE OF ROUND BEING USED. TAIL FINS FOR MORTAR ROUNDS ARE EASY TO RECOGNIZE, BUT ARTILLERY ROUNDS CAN BE HARDER TO IDENTIFY. THE FOLLOWING PAGES GIVE THE MAX RANGES AND CHARACTERISTICS OF THE TYPES OF ROUNDS WE WILL MOST LIKELY ENCOUNTER.

2. NOW THAT YOU HAVE AN AZIMUTH THE POO . AND THE ROUNDS MAX RANGE YOU WILL SUPERIMPOSE THIS DATA ON A MAP, YOU NOW CAN INDENTIFY AREAS OF POSSIBLE POINTS OF ORIGIN THAT THE ENEMY IS USING TO SHOOT INDIRECT FIRES.

3. ANY USABLE FRAGMENTS OBTAINED FROM CRATER ANALYSIS SHOULD BE TAGGED AND SENT TO THE BATTALION S2. AS A MINIMUM, THE TAG SHOULD INCLUDE THE FOLLOWING INFORMATION:

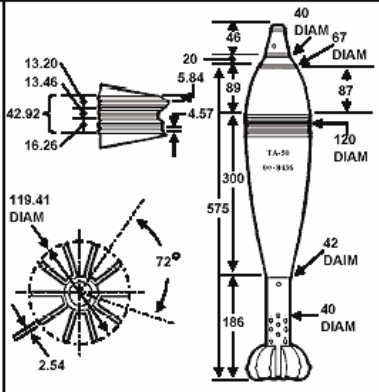
D - DATE-TIME-GROUP OF SHELLING
L - LOCATION OF THE CRATER.
A - AZIMUTH TO THE HOSTILE WEAPON.
P - PROJECTILE TYPE

82 MM PROJECTILE



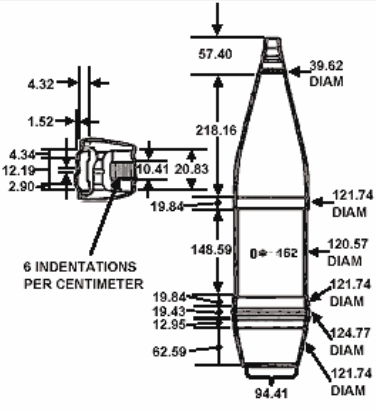
MAX RANGE 5000 METER

120 MM PROJECTILE

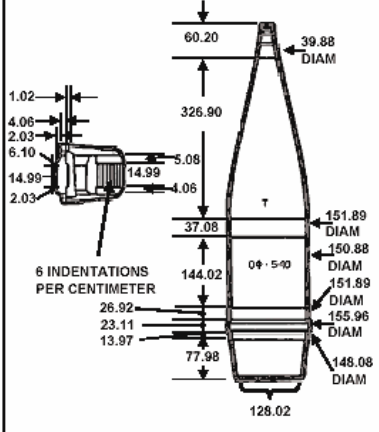


MAX RANGE 7100 METER

122 MM PROJECTILE

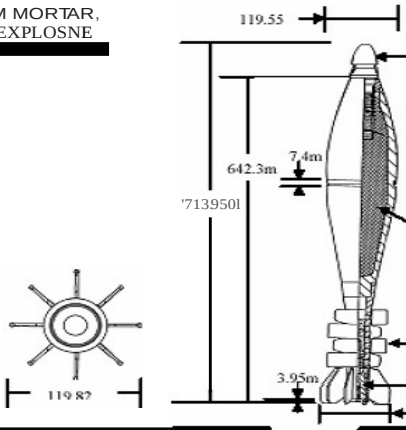


152 MM PROJECTILE

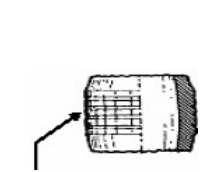


NOTE: All dimensions in millimeters. To convert to inches, multiply millimeters by 0.03937.
LEGEND: DIAM = diameter

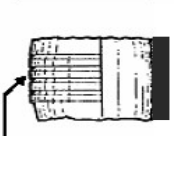
120 MM MORTAR, HIGH EXPLOSNE



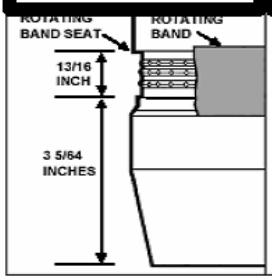
60 MM MORTAR.HJGH EXPLOSIVE



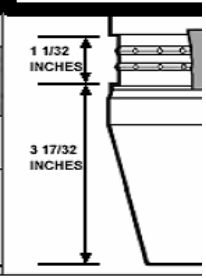
81 MM MORTAR, HIGH EXPLOSIVE



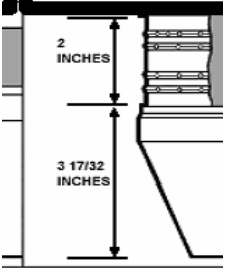
105 MM HOWITZER HIGH EXPLOSIVE



155 MM HOWITZER HIGH EXPLOSIVE



203 MM HOWITZER HIGH EXPLOSIVE



CHAPTER 9

INSPECTIONS

PCC / PCC Checklist

Below are the required items for conducting missions (both training & combat):

WORN OR CARRIED:

- ❑Eyepro
- ❑Watch
- ❑Pen/pencil & paper
- ❑Primary Weapon w/ sling
- ❑Laser (LDRs & crew serves)
- ❑Nomex gloves
- ❑IR Flag
- ❑Dog Tags (worn around neck or in rear right pant pocket)
- ❑ID Card (left breast pocket)
- ❑Compass / Map / Protractor
- ❑Headlamp or other small flashlight carried on FLC
- ❑Whiz Wheel (FOR LDRs' & mission dependent)

COMBAT KIT:

- ❑IBA / IOVT / PLATE CARRIER
- ❑Knee & Elbow (inserts approved) Pads
- ❑Extra Batteries (for NVGs, Laser, Weapon sights, MBITR, etc)
- ❑FLC or personal kit
- ❑IFAC
- ❑7 x Magazines
- ❑MICH;
- ❑NVG & Mount; PACKED INTO CANTEEN CUP W/ COVER
- ❑EARPLUGS W/ CASE
- ❑Seat belt cutter
- ❑IR Strobe
- ❑CAMELBAK / WATER SOURCE

•**RUCKSACK / ASSAULT PACK (IAW MISSION CRITICAL EQUIPMENT & SOP)**

Leader PCI / PCC Checklist

In addition to the items on the previous page, the following items should also be brought by Leaders (both training & combat):

WORN OR CARRIED:

- ❑Leader Markings x 2
- ❑Graphics / GRGs
- ❑Garmin / GPS DEVICE
- ❑Shift Fire Markers
- ❑Target List Worksheet
- ❑Convoy Brief Checklist
- ❑10-Line MEDEVAC
- ❑MBITR
- ❑Compass

FDC WILL BRING THE FOLLOWING ITEMS IN ADDITION:

- ❑Plotting Boards x 2
- ❑Charge Books (For systems being fired)
- ❑Aiming Circles x 1
- ❑Alcohol Pens x2
- ❑Permanent marks (fine tip) 2 x packs

RTOS WILL BRING THE FOLLOWING ITEMS IN ADDITION:

- ❑ASIP w/ COMSEC
- ❑ANCD / SKL
- ❑Extra Batteries
- ❑SOI
- ❑Target List Worksheet
- ❑SALUTE Report Checklist
- ❑10-Line MEDEVAC
- ❑FDC Computer Records x 30

Recovery Plan

The PLT recovery plan will be broken in to 4 phases . Initial cleaning, detailed cleaning, SQD LDR inspections, and PSG/PL inspections The recovery plan will be conducted after all field training exercises or extended range stays for more than 48 hrs. Recovery will not take longer than 5 days but should be completed as fast as possible.

Phase 1 *initial cleaning*

-Account for personal/SQD/PLT equipment
-Top off and clean out vehicles
-Initial cleaning of weapons and all sensitive items
-Identify all non mission capable equipment

Phase 2 *detailed cleaning*

-2404 completed on all sensitive items
-all personnel/SQD/PLT equipment detailed and thoroughly cleaned
-vehicles complete 5988e and re dispatched
-Order and turn in all non mission capable equipment
-Weapons thoroughly cleaned

Phase 3 *SQD LDR inspections*

-Weapons clean
-ta-50 clean and serviceable
-Initiate report of survey
-Inspect vehicles and all BII

Phase 4 *PSG inspections*

-Vehicles and all BII
-Weapons and sensitive items and MTR tubes
-TA-50 IAW layout SOP

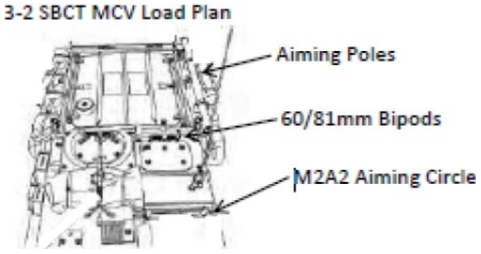
TA-50 LAYOUT

1. Assault pack with cat-eyes and name.
2. Duffel bags stacked with proper stenciling per unit SOP.
3. Sleeping bag stuff sack.
4. Towels folded with rolled wash-cloth next to it.
5. Barracks bags folded and stacked.
6. Poncho liner folded and stacked.
7. E-tool painted, folded and laying atop the e-tool carrier.
8. Wet weather bags folded and stacked.
9. Gloves, stacked on top of each other as if praying, Velcro or straps closed as if worn Elbow pads stacked.
10. Socks rolled.
11. Boone cap
12. Patrol Cap
13. Neck gator folded.
14. Sewing kit and 2 locks.
15. Knee pads stacked.
16. Boots, desert.
17. Boots, desert tan.
18. Eye pro, tinted and clear lenses.
19. T-shirt, desert tan, folded and stacked.
20. Silk undershirts and drawers folded and stacked.
21. Flashlight
22. Weapons cleaning kit.
23. Wet weather boots.
24. Camel back
25. IBA complete as worn, with FLC, IFAK, Magazines,
    Seatbelt Cutter, Camel Back, Plates, name tap and rank.
26. Kevlar, assembled, with NVG base plate attached and
    painted facing forward.

TA-50 LAYOUT

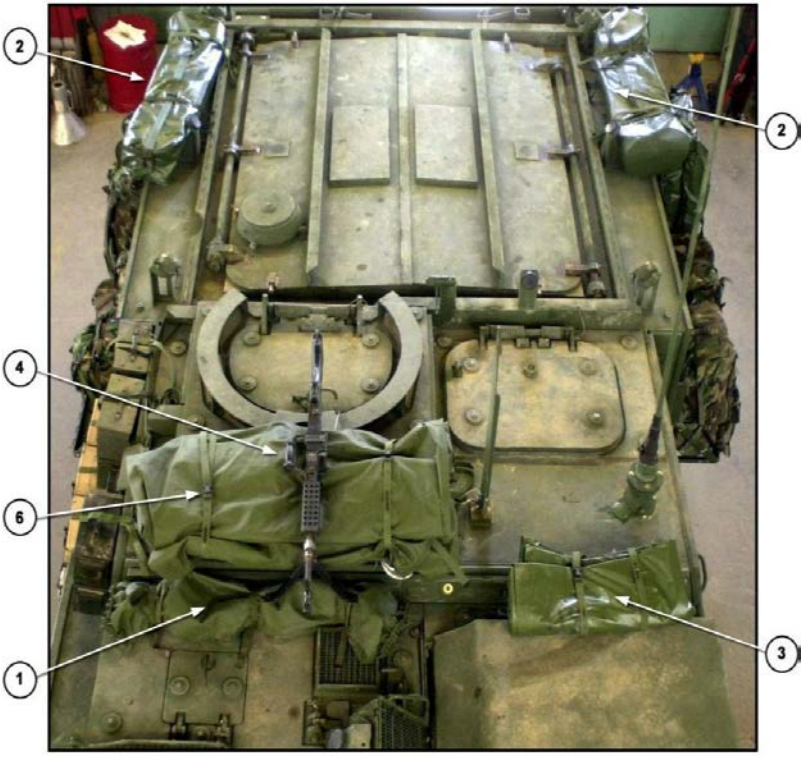
27. Sleeping bag assembled complete and canoed.
28. Gortex top with rank and name rolled.
29. Gortex bottom rolled.
30. Fleece top rolled.
31. Fleece bottom rolled.
32. Wet weather top with rank rolled.
33. Wet weather bottom rolled.
34. Army Combat Shirt rolled.
35. ACU top rolled.
36. ACU bottom rolled.
37. ACU top rolled.
38. ACU bottom rolled.
39. ACU top rolled.
40. ACU bottom rolled.
41. ACU top rolled.
42. ACU bottom rolled.

MCV LOAD PLAN



1. Shackle, 30-Ton
2. Machine Gun, 7.62mm, M240B
3. Tow Bar (not shown)

1. Can, Fuel 5 gal.
2. Can, Water 5 gal.
3. Litter, Folding
4. Shackle, 3G-Ton



1. Bipod, 60mm or 81mm
2. Camouflage Support System (2 each)
3. Cover, Dust and Sand
4. Machine Gun, 7.62mm, M2408
5. Mount Tripod, M112A1 (under tarp)
6. Tarpaulin, Nylon 12 ft. x 17 ft

1. Pioneer Tool Rack Containing: Ax Single Bit, Mattock, Handle Mattock, Shovel Hand
2. Chain Box Containing: Tool Bag, Hook Tow Cable 2X, Snatch Block, and Jack Assembly (12 Ton)
3. Alice Pack, MOLLE (2 Each)
4. Camouflage Screen System (2 Each)

5. Pioneer Tool Rack Containing: Ax Single Bit, Mattock, Handle Mattock, Shovel Hand
6. Chain Box Containing: Tool Bag, Hook Tow Cable 2X, Snatch Block, and Jack Assembly (12 Ton)
7. Alice Pack, MOLLE (2 Each)
8. Camouflage Screen System (2 Each)

OPERATOR MAINTENANCE TOW DISABLED STRYKER WITH STRYKER VEHICLE MCV

TOW VEHICLE WITH TOW BAR

CAUTION

Do not tow the Stryker vehicle under a suspended load. Suspended TOWING will increase stress to the suspension system hydropneumatic struts and will cause the vehicle hull to sit close to or on the wheel assemblies. Failure to comply may result in damage and premature wear to tires, hull and suspension system.

CAUTION

Do not tow the DISABLED vehicle without hydraulic fluid. Notify Field Maintenance for recovery assistance if required. Failure to comply may result in damage to the backup steering pump.

NOTE

If vehicle is DISABLED due to air pressure or brake system problems, notify Field Maintenance for recovery.

1. If DISABLED vehicle's engine is running, perform engine shutdown
2. If DISABLED vehicle's engine has had a premature, uncontrolled shutdown, perform the following procedures:

a. Apply parking brake

b. If the vehicle has a CAT 3126 engine or a CAT C7 engine, set transmission gear range selector to Neutral (N).

c. Shut down all electrical and communications switches. Set AUX MASTER and AUTO MASTER switches to off position.

3. Chock wheels on DISABLED vehicle.

WARNING

The front service hatch can fall on hands, electrical lines and brake lines when TOWING the vehicle. Secure front service hatch open with stowage strap. Failure to strap the hatch open can result in personnel injury and damage to brake lines.

4. Open front service hatch on DISABLED vehicle and secure with stowage strap.

WARNING

The removed/installed component weighs between 100-149 lbs (46-67 kg). Handle with care and use the assistance of additional personnel and a suitable lifting device. Failure to do so may result in injury to personnel and damage to equipment.

5. Remove first and second tow bars from stowage on DISABLED vehicle and set tow bars on the ground in front of DISABLED vehicle.
6. Attach the two tow bars to the DISABLED vehicle

NOTE

Pins should be installed from the outside of the shackle

7. Connect the pintle hook on the TOWING vehicle then position TOWING vehicle in front of DISABLED vehicle.

WARNING

Do not place hands near the pintle while aligning the pintle hook with the tow bar, as the vehicle could move suddenly and the pintle may crush hands and/or fingers. Failure to comply may result in injury to personnel.

WARNING

Use extreme care when hooking the tow bar to the TOWING vehicle. Personnel must stand clear of the trailer and the vehicle while positioning the trailer for attachment, and must stand outside of the tow bar when hooking the tow bar to the TOWING vehicle. Ground guides must be used when backing TOWING vehicle to DISABLED vehicle. Failure to do so may result in injury or death to personnel.

8. Under direction of ground guides, maneuver vehicle so that both tow bar eyelets (9) are centered over pintle hook. Close pintle hook lock and install snap pin in pintle hook. Ensure that tow bar is fully seated on pintle hook.

9. Engage parking brake and transfer case gear lock on TOWING vehicle.
10. Perform engine shutdown on TOWING vehicle.

NOTE

• Pneumatic connections on Stryker vehicles are quick disconnect type. They are located under front hatch and above the left rear fuel tank. Protective covers on fittings are color coded RED for supply air connection and BLUE for service air connection.

• Pneumatic connections on TOWING kit air lines are color-coded RED for supply air connection and BLUE for service air connection. The same color coding is used on vehicle quick disconnect fittings to ensure proper connection.

11. Connect quick-disconnect of long BLUE tow bar air line to TOWING vehicle's BLUE air service quick-disconnect then connect quick-disconnect of long RED tow bar air line to TOWING vehicle's RED air service quick-disconnect
12. Connect intervehicular electrical cable (15) to TOWING vehicle's trailer receptacle and secure retainer lock of cover to intervehicular electrical cable.
13. Route intervehicular electrical cable and long air lines over towbar and loosely secure with strap.
14. Connect intervehicular electrical cable to electrical connector on DISABLED vehicle.
15. Connect BLUE quick-disconnect of long BLUE tow bar air line to DISABLED vehicle's BLUE air service quick-disconnect.
16. Connect RED quick-disconnect of long RED tow bar air line to DISABLED vehicle's RED air service quick-disconnect.

OPERATOR MAINTENANCE TOW DISABLED STRYKER WITH STRYKER VEHICLE MCV

CAUTION

Air transport and emergency air switches in the air transport box must be set to off position (covers closed) and the brake control valve must be open when TOWING a DISABLED vehicle, to ensure that the DISABLED vehicle's brakes are operational. Failure to do so may result in damage to equipment when TOWING the DISABLED vehicle.

17. Open DISABLED vehicle's brake control valve in driver's compartment.
18. Perform engine start-up on TOWING vehicle.
19. Set AUTO MASTER and AUX MASTER switches on DISABLED vehicle to ON position.
20. Set three position ignition switch on DISABLED vehicle to SECOND position.
21. Push in and hold trailer air supply valve knob in driver's compartment on TOWING vehicle until knob remains fully engaged. Ensure that air pressure builds in DISABLED vehicle.
22. Release parking brake on DISABLED vehicle then verify operation of lights on DISABLED vehicle and straighten the wheels of DISABLED vehicle.
23. Perform engine shutdown on TOWING vehicle.
24. Set three position ignition switch, AUTO MASTER, and AUX MASTER on DISABLED vehicle to OFF positions.

NOTE

During turning maneuvers, the steering axles of the towed vehicle occasionally have a tendency to turn in the opposite direction of TOWING vehicle.

25. Loosely secure steering wheel of DISABLED vehicle to shock tower inside driver's station with strap.
26. Ensure that transfer case gear lock on DISABLED vehicle is disengaged.
27. Remove planetary carrier shift cylinder cover from the transfer case cover.
28. Using transfer case assembly wrench, manually disengage transfer case on DISABLED vehicle by turning shift cylinder spindle NINE turns CLOCKWISE or until resistance is met.
29. Verify that transfer case has been properly disconnected by performing following steps:
a. Remove #4 engine access panel
b. Using your hand, rotate drive shaft to verify that it spins freely without binding.
c. If binding is noted and shaft does not spin freely, repeat previous steps to disengage transfer case. If resistance continues to be present, notify vehicle commander.

30. Ensure that transfer case fluid on DISABLED vehicle is at proper level.
31. Remove and stow wheel chocks

WARNING
Force from the closing hatch may cause hands to be trapped between the hatch and the hatch opening. Keep hands clear when opening or closing the hatch. Failure to do so may result in injury to personnel.
32. Secure all hatches and ensure front service hatch is secured open with stowage strap on DISABLED vehicle.

CAUTION

Driveline damage may occur when TOWING in the reverse direction. Tow DISABLED vehicle from the front. Reverse TOWING should only be used for emergency recovery, to a maximum distance of 1 mi (1.6 km). Failure to comply may result in damage to equipment.

CAUTION

When TOWING for distances greater than 10 mi (16 km), periodically stop to check the towed vehicle for any indications of driveline malfunction or overheating. If any malfunctions are detected, notify Field Maintenance. Failure to do so may result in damage to equipment.

NOTE

• Acceleration, braking and turning radius are severely limited during TOWING operation.

• Maximum speed for TOWING is 20 mph (32 km/h) on smooth terrain/roads and 10 mph (16 km/h) on rough terrain.

33. Perform engine start-up then release parking brake on TOWING vehicle.

NOTE

The vehicle may contain either a CAT 3126 engine or a CAT C7 engine.

34. To determine if the vehicle has a CAT 3126 engine or a CAT C7 engine, refer to power pack model differences.

a. If the TOWING vehicle has a CAT 3126 engine, select appropriate transmission gear range for TOWING.

b. If the TOWING vehicle has a CAT C7 engine, select appropriate transmission gear range for TOWING.

35. Tow DISABLED vehicle a short distance to ensure that brakes on DISABLED vehicle operate properly. If any problem is noted, notify Field Maintenance.

END OF TASK

CHAPTER 10

REFERENCE CARDS

DATA SHEET

For use of this form, see FM 3-22.91. The proponent agency is TRADOC.

SETUP		WEAPON DATA		FO DATA		
				FO	ALT	GRID
TIME OUT:	UNIT:	WPN:	WPN:			
TGT PREFIX:		DIR:	DIR:			
TGT NO:	___ mm CAR: ☐ YES	DIS:	DIS:			
ALARM: ☐ ON ☐ OFF	☐ NO	WPN:	WPN:			
MIN E:	GP:	DIR:	DIR:			
MIN N:		DIS:	DIS:			
GD: ☐ E ☐ W	E:	WPN:	WPN:			
LAT: ☐ + ☐ -	N:	DIR:	DIR:			
LISTEN: ☐ ON ☐ OFF	ALT:	DIS:	DIS:			
BIT RATE:	AZ:	WPN:	WPN:			
KEY TONE:	DEF:	DIR:	DIR:			
BLK: ☐ SNG ☐ DBL	CLE:	DIS:	DIS:			
OWNER ID:						

AMMUNITION DATA

TEMPERATURE _____ TYPE: ☐ HE ☐ WP ☐ ILL ☐ CS ☐ TNG

LOT NUMBER									
WEIGHT									
ON HAND									
RECEIVED									
TOTAL									
ROUNDS EXPENDED									
ROUNDS REMAINING									

TARGET DATA

TARGET ID			CHART DATA			FIRING CORRECTIONS				FIRING DATA					INTELLIGENCE				ROUNDS	
TGT NO.	GRID	ALT	DEFL	RG / DAS		DEFL CORR	RANGE CORR	ALT VI	ALT CORR	DEFL	RG / DAS	FUZE TIME SETTING	ELEV	TIME FIRED	TARGET DESCRIPTION	METHOD OF ENGAGEMENT	SURVEILLANCE		EFF	REM

COMPUTER'S RECORD

For use of this form, see FM 3-22.61; the proponent agency is TRADOC

ORGANIZATION	DATE	TIME	OBSERVER ID	TARGET NUMBER

☐ ADJUST FIRE ☐ FIRE FOR EFFECT
☐ IMMEDIATE SUPPRESSION

GRID _____
DT DIRECTION _____
ALTITUDE _____

SHIFT FROM _____
DT DIRECTION _____ ALTITUDE _____

☐ LEFT / ☐ RIGHT _____
☐ ADD / ☐ DROP _____
☐ UP / ☐ DOWN _____

POLAR
DT DIRECTION _____ ALTITUDE _____
DISTANCE _____

☐ UP / ☐ DOWN _____
VERTICAL ANGLE ☐ + / ☐ - _____

TARGET DESCRIPTION
METHOD OF CONTROL
METHOD OF ENGAGEMENT
MESSAGE TO OBSERVER

FDC ORDER	INITIAL CHART DATA	INITIAL FIRE COMMAND	ROUNDS EXPENDED
MORTAR TO FIR _____	DEFLECTION _____	MORTAR TO FOLLOW _____	
MORTAR TO ADJ _____	DEFLECTION CORRECTION	SHELL AND FUZE _____	
METHOD OF ADJ _____	☐ L ☐ R	_____	
BASIS FOR CORRECTION _____	RANGE _____	MORTAR TO FIRE _____	
SHEAF CORRECTION _____	VIALT CORRECTION	METHOD OF FIRE _____	
SHELL AND FUZE _____	☐ + ☐ -	_____	
_____	RANGE CORRECTION	DEFLECTION/AZIMUTH _____	
METHOD OF FIR _____	☐ + ☐ -	CHARGE _____	
RANGE LATERAL SPREAD _____	CHARGE/RANGE _____	TIME SETTING _____	
TIME OF OPENING FIRE _____	AZIMUTH _____	ELEVATION _____	
	ANGLE T _____	_____	

OBSERVER CORRECTION			CHART DATA		SUBSEQUENT COMMANDS						
DFV	RANGE	TIME (HEIGHT)	DEFL	CHARGE (RANGE)	MORTAR FIRE	METHOD FIRE	DEFL AZIMUTH	RANGE / CHARGE	TIME (SETTING)	ELEV	

Squad Leader Cheat Sheet

1

Deflection: _____
Charge: _____

Elevation: _____

Fuse: _____

Code Name: _____

2

Deflection: _____
Charge: _____

Elevation: _____

Fuse: _____

Code Name: _____

3

Deflection: _____
Charge: _____

Elevation: _____

Fuse: _____

Code Name: _____

4

Deflection: _____
Charge: _____
Elevation: _____
Fuse: _____

Code Name: _____

5

Deflection: _____
Charge: _____
Elevation: _____
Fuse: _____

Code Name: _____

6

Deflection: _____
Charge: _____
Elevation: _____
Fuse: _____

Code Name: _____

7

Deflection: _____
Charge: _____
Elevation: _____
Fuse: _____

Code Name: _____

8

Deflection: _____
Charge: _____
Elevation: _____
Fuse: _____

Code Name: _____

9

Deflection: _____
Charge: _____
Elevation: _____
Fuse: _____

Code Name: _____

ROUND COUNT SHEET

SL NAME: _____	GUN#: _____	ROUNDS
GUNNER: _____	GUN S/N: _____	HE: _____
AG: _____	DATE: _____	WP: _____
AB: _____	DAY/NIGHT	IR: _____

COMMAND	DEFL	CHARGE	ELEVATION	RNDS FIRED	RNDS REMAINING	MISC

CALL FOR FIRE

1. Observer ID / Call Sign _____

2. Warning Order:
   a) Type of Mission
      - ☐ Adjust Fire
      - ☐ Fire for Effect
      - ☐ Suppress
      - ☐ Immediate Suppression
   b) Size of Element to Fire.
      (**Omission indicates request for one battery)
   c) Method of Target Location:
      - ☐ Grid
      - ☐ Polar
      - ☐ Shift from a Known Point

3. Target Location:
   a) Grid - 6-digit grid _____
   b) Polar - _____
      Distance and direction to target from observer's pos.
   c) Shift from a Known Point - Dir. to target
      - ☐ Lateral Shift (Left/Right) in Meters _____
      - ☐ Range Shift (Add/Drop) in Meters _____
      - ☐ Vertical Shift (Up/Down) in Meters _____

4. Target Description: (Number / Vehicle Type / Personnel)

5. Method of Engagement:

6. Method of Fire Control:
   - ☐ Fire When Ready
   - ☐ At My Command
   - ☐ Cannot Observe
   - ☐ Time on Target
   - ☐ Check Fire

SAFETY DIAGRAM _____

MAX CHARGE:_____

CHG M I N

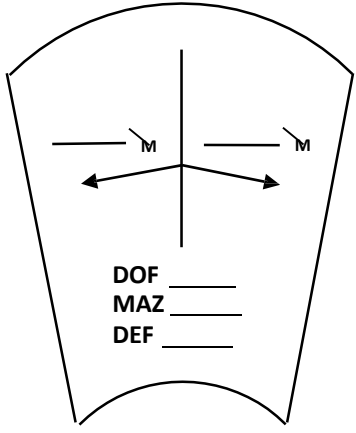
ELEV _____

____ _____

____ _____

81MM MORTAR & 107MM MORTAR
(CIRCLE MORTAR FIRED)

MAX RANGE: _____



LEFT LIMIT
AZ _____
DEF _____

RIGHT LIMIT
AZ_____
DEF _____

DOF _____
MAZ _____
DEF _____

MIN RANGE _____

MIN CHARGE _____

CHG	MAX ELEV		TIME FUZE
_____	_____		_____
	_____	_____	_____
_____	_____		_____

FIRING POSITION COORDINATES _____
MOUNTING AZIMUTH _____

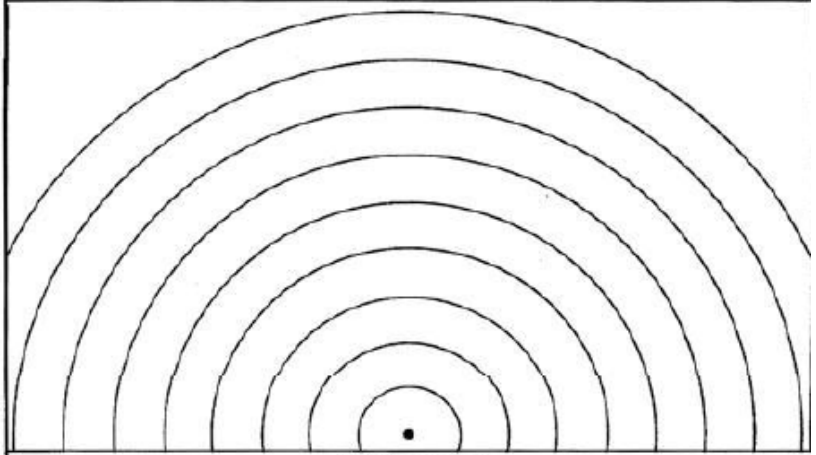
STANDARD RANGE CARD

For use of this form see FM 3-21.71; the proponent agency is TRADOC.

SQD _____
PLT _____
CO _____

May be used for all types of direct fire weapons.

MAGNETIC NORTH



DATA SECTION

POSITION IDENTIFICATION | DATE

WEAPON | EACH CIRCLE EQUALS _____ METERS

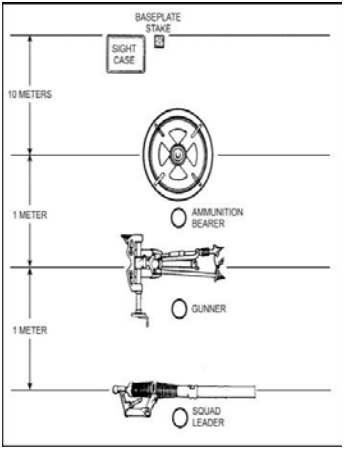
NO.	DIRECTION/ DEFLECTION	ELEVATION	RANGE	AMMO	DESCRIPTION

REMARKS:

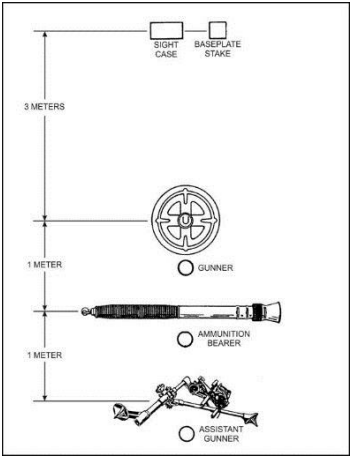
Gunner's Examinations

The gunner's examination tests the proficiency of the gunner in five areas: mounting the mortar, making small deflection change, referring the sight and realigning aiming posts, making large deflection and elevation changes, and reciprocally laying the mortar. It is also a test of the three qualified assistants the candidate is allowed to choose. The candidate's success in the examination depends mainly on his ability to work harmoniously with these assistants. The examining board must consider this factor and ensure uniformity during the test. Units should administer the gunner's examination at least semiannually to certify crew proficiency.

For Gunners Examination Procedures, see FM 3-22.90 (Mortars), Chapter 9 ("Gunner's Examination")



60mm Gunners Exam Equipment Setup



81mm Gunners Exam Equipment Setup

GUNNER'S EXAMINATION SCORECARD - MORTARS For use of this form, see FM 3-22.90; the proponent agency is TRADOC.	1. MORTARS (CHECK ONE) ☐ Ground Mounted ☐ Carrier Mounted ☐ Support Squad

DATA REQUIRED BY THE PRIVACY ACT OF 1974

Authority 10 USC 3012 (g), Executive Order 9397.

Principal Purpose Evaluates individual's training on mortars.

Routine Uses Evaluate individual proficiency; SSN is used for positive identification purposes only.

Disclosure Disclosure of this information is voluntary. However, individuals not providing information cannot be rated/scored on a mass basis.

2. ORGANIZATION		3. DATE
4. NAME (Last, First, MI)	5. GRADE	6. SSN

7. CHECK ONE

☐ M224 ☐ M29A1 ☐ M252 ☐ M30 ☐ XM120

ITEMS	TRIAL a	TIME b	TRIAL SCORE c	CREDIT SCORE d	INITIALS e
8. Ground-Mounting the mortar carrier and support. Placing the mortar in firing position from traveling position.	1st Trial				
	2d Trial				
9. All - Small deflection change.	1st Trial				
	2d Trial				
10. Ground and Carrier - Referring the sight and realigning aiming posts. Support: direct laying.	1st Trial				
	2d Trial				
11. All - Large deflection and elevation change.	1st Trial				
	2d Trial				
12. Ground and Carrier - Reciprocal laying. Support - Laying by compass.	1st Trial				
	2d Trial				
13. TOTAL CREDIT SCORE					

EXPERT GUNNER	90 to 100
FIRST-CLASS GUNNER	80 to 89
SECOND-CLASS GUNNER	70 to 79
UNQUALIFIED	69 or LESS

14. VERIFIED BY

a. PRINTED/TYPED NAME	d. UNIT
b. SIGNATURE	
c. GRADE	e. DATE

DA FORM 5964-R, SEP 90

☆ U.S. GOVERNMENT PRINTING OFFICE: 1990 527-027/21109

GUNNER'S EXAM

RMS6-L 120-mm MORTAR CARRIER

POC: TCM STRYKER. FT BENNING GA

NAME *(Last, first, middle initial)* GRADE

DATE | UNIT | QUALIFICATION

STEPS:	TIME	SCORE
PLACE MORTAR INTO ACTION:		
Q §eli< Ql Les§ 20 19 17 16 14		
DEFLECTION & ELEVATION CHANGE (MANUAL):		
I 'QC L.:i 20 18 17 16 15 14		
DEFLECTION & ELEVATION CHANGE (DIGITAL):		
2Q §ec or Less 20 18 17 16 15 14		

TOTAL SCORE

Qualification Scores

EXPERT GUNNER	108-120
1ST CLASS GUNNER	95-107
2NO CLASS GUNNER	84-94
UNQUALIFIED	O3

QUALIFICATION:

VERIFIED BY: DATE:

Duties and Responsibilities

(See FM 7-90 pages 2-3)

The duties and responsibilities outlined below are not all encompassing or in order of priority. This is a guide that adds efficiency to all mortar operations.

PLATOON LEADER

Primary combat leader

Principal advisor to the Battalion Commander and FSO on the tactical employment of mortars.

Recommends task organization, employment techniques and positioning of mortars to best support the scheme of maneuver.

Assists in developing the fire support plan with FSO, determine the best type and amount of ammunition to fire based on METT-TC.

Develops the platoon plan based on the battalion OPORD, and reviews it with the FSO and S3.

Assist the S-3 in determining the RSR. If a CSR has been set, the platoon must not exceed it without authorization. The mission may need to be tailored so that it can best meet the CSR.

Informs the commander, S-3, and FSO on all ammunition ranges and limitations.

Designates reconnaissance and advance parties.

Selects and conducts a reconnaissance of all new firing positions and controls movements of all platoon elements.

Keeps abreast of the current enemy and friendly situation through battle tracking.

Assigns missions and gives instructions to all subordinate leaders; supervises the execution of orders; ensures that priority targets are covered at all times.

Coordinates and directs the fires and displacements of the platoon.

Ensures security measures are being enforced in order to increase the platoon's survivability against air, ground, and indirect attacks.

Ensures all aiming circles are declinated.

Lays mortars for firing and confirms direction of fire established by the FDC.
Submits location and ammunition status reports to the FSO, S-3, commander, and S-2.
Anticipates needs of the platoon for timely resupply.
Is responsible for the welfare of the platoon.
Is responsible for the training and cross training of the platoon, technically and tactically.
Performs map spot and hasty survey operations.
Coordinates for artillery survey.
Coordinates for registration, observed, or radar.
Establishes communication with company FIST teams and company mortars.
Enforces safety at all times.
Keeps abreast of all enemy counter battery fire capabilities.
Supervises the execution of orders.

PLATOON SERGEANT

a. Assumes the duties of the platoon leader in his absence.
Ensures the Platoon leader's orders are being executed.
Responsible for the security plan of the perimeter.
Ensures that FOs/OPs have communication with FDC and they record incoming messages on DA form 1594.
Supervises field camouflage, hygiene, and sanitation.
Supervises the test firing of all weapons and the bore sighting of all mortar systems.
Ensures the platoon is trained in their primary duty positions and cross-trained on others.
Ensures that a basic load on all platoon equipment is on hand.
Monitors ammunition expenditure and ensures ammunition records are maintained.
Submits timely ammunition requests.
Submits and coordinates for all resupply.
Ensures other NCOs within the platoon actively supervise maintenance.
Knows status of class I, III, IV, and V.
Coordinates recovery of disabled vehicle.
Ensures FDC maintains situational maps.

Supervises preparation of platoon ground defense.
Ensures all equipment is maintained.
Maintains platoon's sensitive items list.
Coordinates and executes casualty evacuation and submits replacement requests to the S-1 for personnel and equipment.
Ensures all safety and borescope and pullover inspections are being performed and recorded.
Responsible for ensuring dispersions and security during movement.
Updates 2408-4 and maintains gun logbooks.

SECTION LEADER

Assumes all duties of the Platoon Sergeant in his absence.
Informs the PL and PSG of all changes in the status of ammunition and the current tactical situation.
Advises when displacements should be made based on range of mortars and the location of supported units.
Attends the recon with the PL and advises him on the best position based on METT-TC.
Lays in mortar when directed.
Controls FDC personnel; ensures that safe procedures are used in computing firing data and validates the computer safety check before issuing the FDC order.
Ensures the current MET is being applied to all firing data.
Establishes and maintains all situation maps, marks all restrictive fire control measures (RFCMs) on the map and ensures they are entered into the computer.
Updates the FSO and TOC on all mortar locations and intelligence.
Supervises all fire missions.
Examines target location with respect to friendly unit locations, RFCMs, and reference points. Based on target description, ammunition available and command guidance, he determines if the mission should be fired, as well as the number and type of rounds.
Issues FDC order.
Checks the accuracy of the computers and FDC records.
Ensures fires are correctly plotted.
Maintains ammunition records.
Reports ammunition status.

Recommends when pre-registration should be done.
Determines and applies MET for firing data.
Assumes control of the section during split section operations.
Supervises the laying of commo wire in the mortar position.
Supervises the FDC rest plan to facilitate 24-hour operations.
Ensures all incoming messages are recorded on DA 1594.
Ensures FDC personnel are briefed in the ground defensive plan.
Ensures that his vehicles are properly camouflaged.
Supervises the maintenance of his vehicle and equipment.
Trains FDC personnel and the gun Squad Leaders on proper FDC procedures.
Establishes radio watch plan.
Ensures enough computer and ammo records are on hand.

CHIEF COMPUTER

Assumes Section Leader's duties in his absence.
Accurately computes all data for all fire missions and ensures they are fired IAW FDC order.
Ensures FDC understands mission.
Ensures all orders of FDC, PSG, and PL are being carried out.

CHECK COMPUTER

a. Independently checks all data computed by Chief Computer and informs him of the results.
Attends the OPORD with the PL.
Attends recon with PL and assists in site setup.

GUN SQUAD LEADER

a. Controls squad movement.
Places squad into firing position.
Ensures mortar is properly laid.
Checks masks and overhead clearance.
Ensures the mortar position is camouflaged.
Ensures that proper deflection, elevation, and charge are correct and recorded.

Ensures ammunition is properly prepared and reports any discrepancies to FDC.
Briefs his squad on the PL's orders.
Informs the squad of any changes.
Maintains M16 plotting board and map to conduct emergency fire missions without an FDC when required.
Plots fires and determines firing data when operating separately from the section.
Supervises the preparation and manning of squad fighting positions.
Implements the squad rest and security plans.
Ensures communication is maintained with FDC.
Responsible for the safety and welfare of the squad members.
Supervises the maintenance of squad vehicles, weapons, and equipment.
Supervises the test firing of squad weapons and mortar boresighting.
Ensures ammunition and equipment are properly stored.
Trains squad members in individual and crew-related skills and cross-train to maintain technical proficiency.
Keeps squad briefed on tactical situation.
Ensures squad has enough cleaning and maintenance equipment.
Maintains squad sensitive item list.

GUNNER

a. Assumes control of the squad when the squad leader is unavailable.
Manipulates the sight and mortar during fire missions.
In charge of maintenance, serviceability, and accountability of all the mortar equipment.
Boresights the mortar system.
Lays mortars on priority target between missions.
Place correct data on sight; ensures correct sight picture is obtained and mortar is safe to fire before firing.
Assists with the maintenance of vehicle.

ASSISTANT GUNNER

Assumes duty of the Gunner in his absence.
Assists the gunner in manipulating the sights and mortar during fire missions.

Hangs and fires all rounds.
Inspects all rounds for correct charge, fuse setting, and pulled safety clip.
Assists with the maintenance of the mortar equipment and vehicle.

AMMUNITION BEARER
Assumes Assistant Gunner's duties in his absence.
Clears squad's firing position while on leader's reconnaissance.
Guides the squad into firing positions during occupation.
In charge of squad's ammunition; keeps count of the rounds, maintains the ammo point, and sets all fuses, charges, and time settings.
Responsible for referring and realigning aiming posts.
Responsible for clearing obstructions causing sight blockage.
Assists in maintenance of the mortar equipment and vehicle.

RTO
Responsible for the maintenance, cleanliness, and accountability of communication equipment.
Ensures computer records are recorded and maintained correctly.
Ensures all radios are filled with current COMSEC.
Maintains the SKL.
Conducts the COMSEC during PCIs.
Draws extra batteries, manpacks, and accessory bags for radios.
Keeps platoon up to date on challenge and password changes.

DRIVER
Ensures that the vehicle is loaded properly according to the SOP.
Responsible for dispatching, daily PMCS, and closing of the dispatch.
Responsible for maintenance, cleanliness, and accountability of the vehicle and BII.
Immediately reports all vehicle deficiencies to squad leader.
e. PSG's driver controls simultaneous shutdowns and start-up of all vehicles using a short count.

SECTION I — MORTAR AMMUNITION

TARGETS AND METHODS OF ENGAGEMENT FOR 81MM

TARGET	ROUND TYPE	# ROUNDS FFE PER GUN
FPF	HE, WP	Specified
Squad in the open	HE (PD/ PROX)	2
Platoon in the open	HE (PD/ PROX)	4
Platoon dug in (w overhead cover)	HE (Delay)	5
Platoon dug in (w/o overhead cover)	HE (PROX)	4
Command Post	HE (Delay)	5
Fortification	HE (Delay)	5
Machine gun nest	HE (PROX)	2
Mortar section	HE (PROX), WP	3, 1
Armored vehicles (1-2)	HE (PD), WP	10, 2
Armored vehicles (3+)	HE (PD), WP	15, 4

NOTE: Double FFE totals per gun for M374A3 Ammunition.

TARGETS AND METHODS OF ENGAGEMENT FOR 120MM

TARGET	ROUND TYPE	# ROUNDS FFE PER GUN
FPF	HE, WP	Specified
Squad in the open	HE (PD/ PROX)	1
Platoon in the open	HE (PD/ PROX)	2
Platoon dug in (w overhead cover)	HE (Delay)	3
Platoon dug in (w/o overhead cover)	HE (PROX)	2
Command Post	HE (Delay)	3
Fortification	HE (Delay)	3
Machine gun nest	HE (PROX)	1
Mortar section	HE (PROX), WP	2, 1
Armored vehicles (1-2)	HE (PD), WP	8, 2
Armored vehicles (3+)	HE (PD), WP	12, 4