

**BRIEFING AND REPORTING
FORMATS**

9 LINE MEDEVAC

LINE	ITEM	EXPLANATION
1	Location of pick-up site.	grid coordinates
2	Radio frequency, call sign w/suffix.	The call sign/frequency of the radio at the pick-up site
3	Number of patients by precedence	<ul style="list-style-type: none"> a. Urgent (Non-Surgical, i.e., Heat, Disease, etc) evacuate w/in 2 hours b. Urgent-Surgical (All Trauma) - immediate surgical care to stabilize c. Priority - evacuate within 4 hours d. Routine - evacuate within 24 hours e. Convenience - evacuate when possible
4	Special equipment required.	<ul style="list-style-type: none"> A - None B - Hoist C - Extraction Equipment D - Ventilator
5	Number of patients by type.	<ul style="list-style-type: none"> L - Utter A - Ambulatory (sitting)
6	Security of pick-up	<ul style="list-style-type: none"> N - No enemy troops in area P - Possibly enemy troops in area (approach with caution) E - Confirmed Enemy troops in area (approach with caution). X - Currently Engaged Enemy troops in area (armed escort required). <p>* <i>In peacetime</i> - number and types of wounds, Injuries, and Illnesses</p>
7	Method of marking pick-up site.	<ul style="list-style-type: none"> A - Panels B - Pyrotechnic signal C - Smoke Signal D - None E - Other
8	Patient's nationality and status.	<p>The number of patients in each category need not be transmitted.</p> <ul style="list-style-type: none"> A - US/Coalition military B - US/Coalition Force civilian C - Non-US/Coalition military D - Non-US/Coalition civilian E - EPW F - High Value Target (armed escort required)
9	NBC Contamination	<p>Include this line only when applicable.</p> <ul style="list-style-type: none"> N - Nuclear B - Biological C - Chemical <p>* <i>In peacetime</i> - terrain description of pick-up site</p>

"9-LINE" CAS BRIEFING

ITALICS REPRESENTS ROTARY WING CAS

1: INITIAL POINT/BATTLE POSITION (IP/BP): _____
CODE, NAME, OR LAT/LONG

2: HEADING: _____ "(DEG MAGNETIC) "OFFSET _____"
IP/BP TO TGT LEFT OR RIGHT

3: DISTANCE: _____ "IN NAUTICAL MILES (KM X .54) OR METERS(RW)
IP/BP TO TGT

4: TARGET ELEVATION: _____ "IN FT MSL (METERS X 3.3)

5: TARGET DESCRIPTION: _____
WHAT IT IS, RELATIVE POSITION, MOVEMENT

6. TARGET LOCATION: _____
GRIDS, LAT/LONG, VISUAL

7. TYPE MARK: _____ " CODE" _____
WP, BEACON, LASER,ILLUM,IR ACTUAL CODE

LASER-TO-TGT LINE: _____ "(DEGREES MAG)

8. LOCATION OF FRIENDLIES: _____
DISTANCE (100s OF METERS) & CARDINAL DIRECTION FROM TGT (NO GRID)

9. EGRESS: EGRESS _____ TO _____
CARDINAL DIRECTION DESTINATION/IP (OPTIONAL)

REMARKS:

**ATTACK CLEARANCE, THREATS, RESTRICTIONS, HAZARDS, ABORT CODE
SEAD, DANGER CLOSE**

"HOW COPY" (PAUSE FOR REPLY)

TIME ON TARGET: TOT _____

TIME TO TARGET: STANDBY _____ PLUS _____ HACK

CLOSE COMBAT ATTACK CHECKLIST

1. Enemy situation -- specific target identification.
2. Friendly situation -- location and method of marking friendly positions.
3. Ground maneuver mission and scheme of maneuver.
4. Attack aircraft scheme of maneuver.
5. Planned engagement area and BP/SBF position.
6. Method of target marking.
7. Fire coordination and fire restrictions.
8. Map graphics update.
9. Request for immediate aviation close fight support -- used for targets or for ground-to-air target handoff.

INFANTRY GROUND COMMANDER

1. (Aircraft Call Sign) This is ROCK 1-6.
2. My location is _____. Visual recognition signal is _____.
3. Target description.
4. Target location.

From my location, target is ____ degrees, ____ meters.

Grid of target:

Reference a known point (major terrain feature).

5. Marking target with _____ (depends on conditions).
6. Ready to mark target at your command, over.

A/C TM LDR

1. ROCK 1-6, This is (A/C Call Sign).
2. Observer location is _____. Visual recognition is _____.
3. Verify target is _____ located at _____.
4. MANEUVERING TO ENGAGE.
5. ROCK 1-6, This is A/C, give friendly recognition signal.
** AH-64 confirms friendly recognition signal **
7. ROCK 1-6, This is A/C, target located grid _____.
8. Mark target with _____.
9. Target will be engaged with _____.
10. BDA follows _____ (pilot gives BDA to ground unit).

Format 1. Adjust Fire Mission (Grid Method)
<p>Observer: " _____ this is _____, Adjust Fire, Over" (FDC Call Sign) (Observer Call Sign)</p> <p>"Grid _____, Over" (Minimum 6-digits)</p> <p>Target Description: " _____" (Target Description, Size, Activity)</p> <p>Method of Engagement (optional): (Danger Close, Mark, High Angle, Ammo / Fuze Type)</p> <p>Method of Fire and Control (optional): (At My Command, Time on Target, Request Splash, Request TOF, Request Ordinate Altitude Information)</p> <p>"Over"</p> <p>FDC may challenge after they read back the above. The observer should be prepared to authenticate.</p>
Message to Observer (* = Mandatory Call)
<p>Units to Fire* (Firing Unit, Adjusting Unit)</p> <p>Changes to Call for Fire (If any)</p> <p>Number of Rounds* (Per Tube)</p> <p>Target Number*</p> <p>Time of Flight (Seconds)</p> <p>Ordinate Altitude</p> <p>Information</p>
Given After Message to Observer
<p>"Direction _____, Over" (Mils or Degrees*)</p> <p>[*Mils is the default – specify if using degrees.]</p> <p>When requesting mortar fires, direction is given as OTL when talking to the FDC. Direction is given as GTL when sending directly to the mortar crew. (See FM 3-22.90, Mortars.)</p>
Adjustments
<p>"Left/Right _____" (Meters, Distance from Impact to OTL)</p> <p>"Add/Drop _____, Over" (Meters, Distance from Impact to Target)</p> <p>"Up/Down _____" (Only for Airburst Rounds – typically USMC only) (Meters, Distance from Height of Burst (HOB) to Desired HOB)</p>
Mission Completion
<p>"End of Mission _____, Over." (BDA and Target Activity) or "Refinements, Record as Target, End of Mission, and Surveillance (RREMS)"</p> <p>RREMS transmission is optional.</p>

Format 2. Adjust Fire Mission (Polar Plot)	
Observer:	"_____ this is _____, Adjust Fire Polar, Over" (FDC Call Sign) (Observer Call Sign)
"Direction _____"	in mils / degrees method (observer to target line – nearest 10 mils / 1 degree) <i>(Note: Must specify degrees to FDC only if direction is given in degrees.)</i>
"Distance _____"	in meters (to nearest 100m) <i>(Note: Difference in target altitude is with respect to observer, not given if less than a 35m elevation difference between the observer and target. For polar missions, the FDC must know the observer's location.)</i>
Target Description:	"_____" (Target Description, Size, Activity)
Method of Engagement (optional):	(Danger Close, Mark, High Angle, Ammo / Fuze Type)
Method of Fire and Control (optional):	(At My Command, Time on Target, Request Splash, Request TOF, Request Ordinate Altitude Information)
"Over"	FDC may challenge after they read back the above. The observer should be prepared to authenticate.
Message to Observer (* = Mandatory Call)	
Units to Fire*	(Firing Unit, Adjusting Unit)
Changes to Call for Fire (If any)	
Number of Rounds*	(Per Tube)
Target Number	
Time of Flight (Seconds)	
Ordinate Altitude	
Information	
Adjustments	
"Left/Right _____"	(Meters, Distance from Impact to OTL)
"Add/Drop _____, Over"	(Meters, Distance from Impact to Target)
"Fire for Effect, Over"	(Sent with the final correction, when effects on target are observed.)
Mission Completion	
"End of Mission _____, Over."	(BDA and Target Activity) or "Refinements, Record as Target, End of Mission, and Surveillance (RREMS)" RREMS transmission is optional.

Format 3. Adjust Fire Mission (Shift from a Known Point)

Observer:	this is	Adjust Fire,
(FDC Call Sign)		(Observer Call Sign)
Shift	Over"	
(Identify known point, for example, target AA7733)		
"Direction	" In mils / degrees grid (OTL – nearest 10 mils / 1 degree)	
(Note: Must specify degrees to FDC only if direction is given in degrees.)		
"Left/Right	" in meters (Lateral shift to nearest 10m)	
"Add/Drop	" in meters (Range shift to nearest 100m)	
"Up/Down	" in meters (Vertical shift to nearest 5m)	
(Note: Difference in target altitude is with respect to observer, not given if less than a 35m elevation difference between the observer and target. For shift from a known point mission, the location of the known point must be known to both the observer and the FDC.)		
Target Description: "		
(Target Description, Size, Activity)		
Method of Engagement (optional):		
(Danger Close, Mark, High Angle, Ammo / Fuze Type)		
Method of Fire and Control (optional): At My Command, Time on Target, Request Splash		
Request TOF, Request Ordinate Altitude Information)		
"Over"		
FDC may challenge after they read back the above. The observer should be prepared to authenticate.		
EXAMPLE – MIL RELATIONSHIP		
The observer knows the distance from his location to a known point (church) is 2,500 meters. With binoculars, the observer measures an angular deviation of 62 mils from the church to the target. The observer calculates the lateral shift as follows:		
W = R x mils (Width of lateral shift = Range (km) x mils)		
W = 2500/1000 x 62 = 155 meters = approximately 160 meters		
(Lateral shift expressed to nearest 10 meters.)		
"Left 160" (Note: one degree = 17.45 mils)		
Message to Observer (" = Mandatory Call)		
Units to Fire* (Firing Unit, Adjusting Unit)		
Changes to Call for Fire (If any)		
Number of Rounds* (Per Tube)		
Target Number*		
Time of Flight (Seconds)		
Ordinate Altitude		
Information		
Adjustments		
"Left/Right _____" (Meters, Distance from Impact to OTL)		
"Add/Drop _____, Over" (Meters, Distance from Impact to Target)		
"Fire for Effect, Over"		
(Sent with the final correction, when effects on target are observed)		
Mission Completion		
"End of Mission _____ Over." (BDA and Target Activity) or "Refinements, Record as Target, End of Mission, and Surveillance (RREMS)"		
RREMS transmission is optional.		

Format 4. Fire for Effect Mission (Grid Method)	
Observer:	"_____ this is _____, Fire for Effect, Over" (FDC Call Sign) (Observer Call Sign)
"Grid _____, Over" (Minimum 6-digits)	
Target Description:	"_____" (Target Description, Size, Activity)
Method of Engagement (optional): (Danger Close, Mark, High Angle, Ammo/Fuze type)	
Method of Fire and Control (optional): (At My Command, Time on target, Request Splash, Request TOF, Request Ordinate Altitude Information)	
"Over"	
FDC may challenge after they read back the above. The observer should be prepared to authenticate.	
Message to Observer (*=Mandatory Call)	
Units to Fire* (Firing Unit, Adjusting Unit)	
Changes to Call for Fire (If any)	
Number of Rounds* (Per tube)	
Target Number*	
Time of Flight (Seconds)	
Ordinate Altitude Information	
Adjustment	
Prior to 1 st Adjustment: "Direction _____, Over" (Mils or Degrees – Mils is the default, specify if using degrees.)	
"Left/Right _____" (Meters, Distance from Impact to OTL)	
"Add/Drop _____" (Meters, Distance from Impact to Target)	
"Up/Down _____" (Only for Airburst Rounds – typically USMC only) (Meters, Distance from Height of Burst (HOB) to Desired HOB)	
"Repeat, Over"	
Mission Completion	
"End of Mission _____, Over." (BDA and Target Activity) or "Refinements, Record as Target, End of Mission, and Surveillance (RREMS)" RREMS transmission is optional.	

**Format 5. Suppression / Immediate Suppression / Smoke Mission
(Grid Method)**

Observer: " _____ this is _____"
(FDC Call Sign) (Observer Call Sign)

"Suppress / Immediate Suppression / Smoke _____, Over"
(Target # / 6-digit Grid)

Note: USMC may include a "Duration" call after target location. USA will only fire one volley. Call "Repeat" if additional volley is required.

Format 6. Marking Mission (Grid Method)

Observer: " _____, this is _____, Fire for Effect, Over"
(FDC Call Sign) (Observer Call Sign)

"Grid _____, Over"
(Minimum 6-digits)

"Marking round, white phosphorous, at my command, request time of flight,
Over."

Method of Engagement (optional):

(Danger Close, Mark, High Angle, Ammo / Fuze type)

Method of Fire and Control (optional):

(At My Command, Time on Target, Request Splash, Request TOF, Request
Ordinate Altitude Information)

FDC may challenge after they read back the above.

The observer should be prepared to authenticate.

Message to Observer (*=Mandatory Call)

Units to Fire* (Firing Unit, Adjusting Unit)

Changes to Call for Fire (If any)

Number of Rounds* (Per tube)

Target Number*

Time of Flight (Seconds)

Ordinate Altitude Information

Mission Completion

"End of Mission _____, Over." (BDA and Target Activity) or "Refinements,
Record as Target, End of Mission, and Surveillance (RREMS)"
RREMS transmission is optional.

Note: CAS TOT for marking, WP delivered 30-45 sec prior and illumination on deck delivered 45 sec prior to CAS TOT.

Format 9. Artillery / Mortar Illumination Request – Call for Fire

Warning: Use of illumination requires care and adequate coordination to avoid adverse impact on the operations of adjacent and supporting units using night-vision devices.

Observer: " _____, this is _____"
(FDC Call Sign) (Observer Call Sign)

Warning Order: " _____, Over"

Target Location: " _____, Over"
(Grid, Polar, Shift)

Target Description: " _____, Over"
(Target Description, Size, Activity)

Method of Engagement: "Illumination"

Method of Fire and Control: " _____, Over"
(By Shell, At My Command, Request Ordinate Information)

"Direction _____, Over"
(Adjustment of Illumination)

Note: Observer will give direction if grid mission.

Adjustments Include:

"Right / left _____" (In 200 meter increments)

"Add / drop _____" (In 200 meter increments)

"Up / down _____" (In 50 meter increments)

Adjust illumination over adjusting point/target. When maximum illumination is obtained, the overseer transmits: "Illumination mark."

When target is verified, observer transmits "coordinated illumination" and attacks with desired munitions using the call for fire format.

Note: Coordinated illumination directs the FDC to calculate and direct the firing of the illumination and the attack munitions at a time that should result in the attack munitions impacting when the target is at maximum illumination. Observers desiring to control the firing of both the illumination and the attack munitions transmit: "By shell, at my command"

To receive 2- or 4-gun illumination during an illumination mission, transmit the following under Method of Fire and Control:

For 2-gun illumination: "range spread" or "lateral spread"

For 4-gun illumination: "range and lateral spread"

Format 10. Naval Surface Fire Support Call for Fire	
(Grid / Polar Plot / Shift from a Known Point)	
(CFF given in two transmissions)	
First Transmission	
" _____, this is _____, Fire Mission, (Ship Call Sign) (Observer Call Sign)	
Target # _____, Over" (Assigned by Observer)	
Second Transmission	
Target Location – Grid	
"Grid _____, Altitude _____, (Minimum 6-digits) (Meters MSL)	
Direction _____, Over" (mils/grid)	
Target Location – Polar Plot	
"Direction _____" in mils/deg (to nearest 10 mils/deg) "Distance _____" in meters (to nearest 100 m) "Up/Down _____" in meters (to nearest 5 m) (vertical shift)	
Target Location – Shift from a Known Point	
"Shift _____" (target number/reference point)	
"Direction _____" in mils/deg (to nearest 10 mils/degrees) (from observer to target)	
"Right/Left _____" in meters (to nearest 10 m) (lateral shift)	
"Add/Drop _____" in meters (to nearest 100 m) (range shift)	
"Up/Down _____" in meters (to nearest 5 m) (vertical shift)	
Target Description: (Type, Size, Degree of Protection) Method of Engagement: (Danger Close, Trajectory, Ammo/Fuze type, # Guns, # Salvo, Special Instructions) Method of Control: (Spotter Adjust, Ship Adjust, Fire for Effect, Cannot Observe, At My Command)	
Prefiring Report (Spotter Reads Back)	
Gun-Target Line (From Gun to Target) Line of Fire (If firing ILLUM)	
First Salvo at _____ (Danger close missions only) Summit(MAX ORD in feet for Air Spotter, Meters for Ground Spotter) Changes to Call for Fire	
Ready/Time of Flight (Time of flight in seconds) "FIRE OVER" (Command from Spotter after Prefiring Report is read back)	

Format 16. AC-130 Call for Fire

1. Warning Order:
"_____ this is _____, Fire Mission, Over"
(AC-130 Call Sign) (Observer Call Sign)
2. Friendly Location / Mark:
"My position _____, marked by _____"
(TRP, Grid, etc.) (Strobe, Beacon, etc.)
3. Target Location: "_____"
(Magnetic bearing and range in meters, TRP, grid, etc.)
4. Target Description / Mark: "_____ marked by _____"
(Target Description) (LTM, Tracer, etc.)
5. Remarks: "_____ Over"
(Threats, Danger Close, Restrictions, At My Command, etc.)
As Required
 1. Clearance: Transmission of the fire mission is clearance to fire (unless danger close). For AC-130, danger close is 165m for the 105mm, 75m for the 40mm, 100m for the 30mm, and 65m for the 25mm. For closer fire, the observer must accept responsibility for increased risk. State "Cleared Danger Close" (with commander's initials) on Line 5. This clearance may be preplanned.
 2. At My Command – For positive control of a gunship, state "At My Command" on Line 5. The gunship will call "Ready to Fire" when ready.

Adjusting AC-130 Gunship Fire

1. If significant miss distance or wrong target, adjust round impact by giving cardinal direction (north, south, east, west) and range (meters) from impact to desired target. "Northeast 200, Over."
2. Marking / confirming targets can also be accomplished using covert illumination (Burn) or with the laser marker (Sparkle).
3. To move Burn or Sparkle, say "Move Burn / Sparkle 300m west" or "Roll Burn / Sparkle 100m east."
4. Once Burn / Sparkle is over target, say "Freeze Burn / Sparkle." (If you say "Stop Burn / Sparkle" the gunship will turn it off.)

Notes:

1. Do not ask the gunship to identify colors.
2. Do not reference clock positions.
3. Do not pass run-in headings / no-fire headings (give no-fire areas and friendly troop positions only).
4. Do not correct left / right or short / long.
5. If applicable, pass multiple target locations in precedence ASAP in order to allow AC-130 to engage as rapidly as possible to preclude enemy scatter effect.



AIR MOVEMENT COORDINATION BRIEF



1. ENEMY SITUATION:

- ENEMY AIR CAPABILITY:
- ENEMY ADA CAPABILITY:
- IN WEATHER:
 - % ILLUM
 - NVG WINDOW
 - CEILING & VISIBILITY

2. FRIENDLY SITUATION:

- UNIT SUPPORTING OPERATION:
- AXIS OF MOVEMENT/CORRIDOR/ROUTES:
- FRIENDLY ADA STATUS:

3. MISSION:

4. EXECUTION:

A. CONCEPT OF THE OPERATION:

(OVERVIEW OF WHAT REQUESTING UNIT WANTS TO ACCOMPLISH WITH THE AIR ASSAULT/ AIR MOVEMENT)

B. TASKS TO COMBAT UNITS:

INFANTRY

ATTACK AVIATION

C. TASKS TO COMBAT SUPPORT UNITS:

ARTILLERY LONG RANGE : NONE

AVIATION (LIFT): NONE

D. COORDINATING INSTRUCTIONS

PZ OPERATIONS

1. DIRECTION OF LANDING:

2. TIME OF LANDING/ FLIGHT DIRECTION:

3. LOCATION OF PZ/ ALTERNATE PZ:

4. LOADING PROCEDURES:

5. MARKING OF PZ (PANEL, SMOKE, SM , LIGHTS):

6. FLIGHT ROUTE PLANNED (SP, ACP, RP):

7. FORMATIONS: (PZ, ENROUTE, LZ):

8. CODEWORDS:

PZ SECURE (PRIOR TO LANDING) -

PZ CLEAR (LEAD BIRD AND LAST BIRD) -

ALTERNATE PZ (AT PZ, ENROUTE, LZ) -

NAMES OF PZ/ ALT PZ –

9. TAC AIR/ ARTILLERY:

10. NUMBER OF PAX PER BIRD & FOR ENTIRE LIFT:

11. EQUIPMENT CARRIED BY INDIVIDUALS:

12. MARKING OF KEY LEADERS:

13. ABORT CRITERIA (PZ, ENROUTE, LZ) :

LZ OPERATIONS:

1. DIRECTIONS OF LANDING:

2. FALSE INSERTION PLANS:

3. TIME OF LANDING (LZ TIME):

4. LOCATION OF LZ AND ALTERNATE LZ:

5. MARKING OF LZ (PANEL, SMOKE, SM, LIGHTS):

6. FORMATION OF LANDING:

7. CODE WORDS, LZ NAME, ALTERNATE LZ NAME:

8. TAC AIR/ ARTILLERY PREPARATION, SEAD, FIRE SUPPORT COORDINATION:

9. SECURE LZ OR NOT?:

5. SERVICE SUPPORT:

A. NUMBER OF A/C PER LIFT AND NUMBER OF LIFTS:

B. REFUEL/ REARM DURING MISSION OR NOT:

C. SPECIAL EQUIPMENT/A/C CONFIGURATION FOR WEAPONS CARRIED BY UNIT PERSONNEL:

D. BUMP PLAN:

6. COMMAND AND SIGNAL

A. FREQ, CALL SIGNS CODEWORDS:

B. LOCATION OF AIR MISSIONS COMMANDER, GROUND TACTICAL COMMANDER & AIR ASSAULT TASK FORCE COMMANDER:

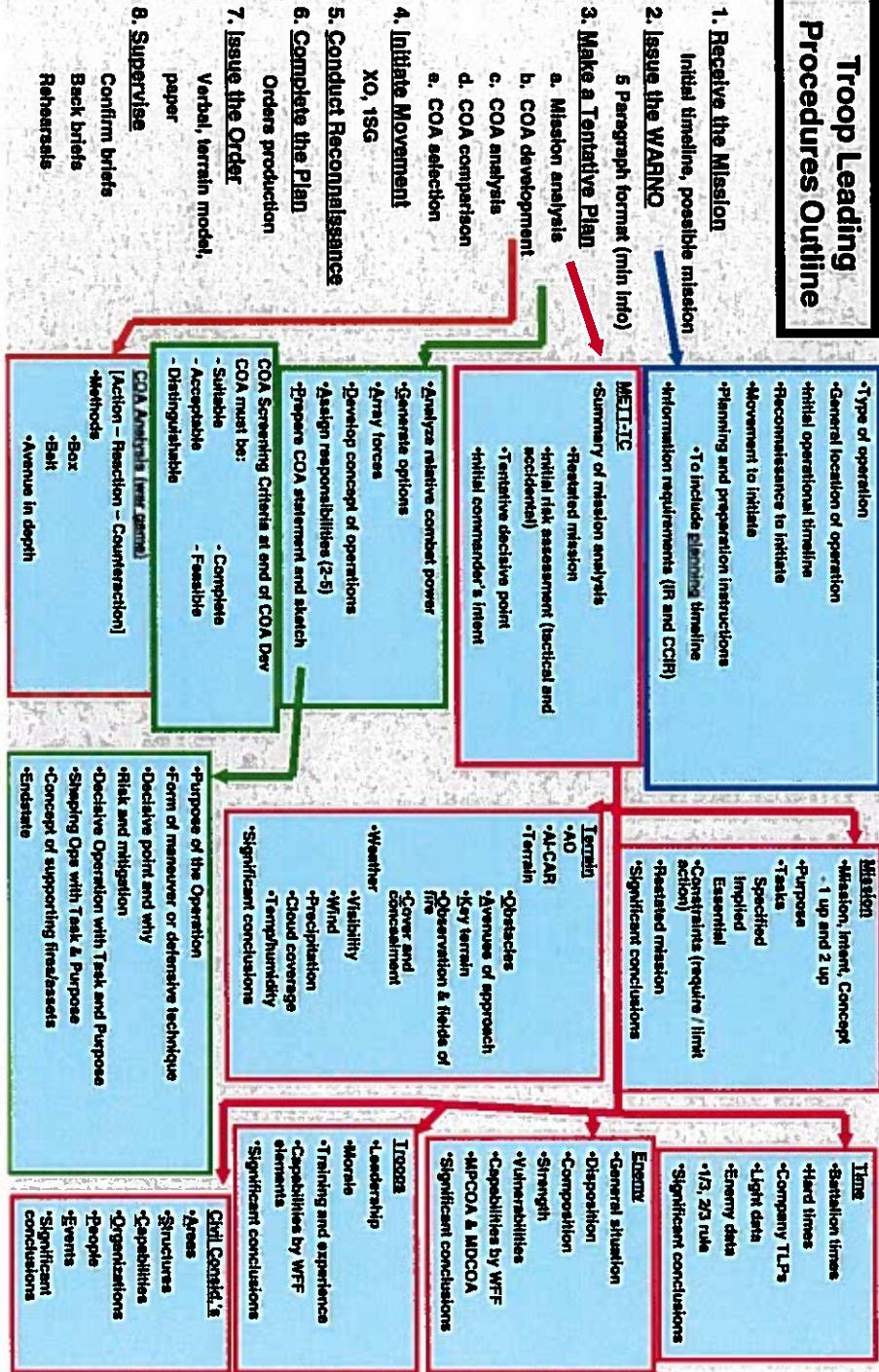
AIR MISSIONS CDR -

GROUND TACTICAL CDR -

AIR ASSAULT TF CDR -

TLP's & ORDERS PRODUCTION

Troop Leading Procedures Outline



Tactical Mission Tasks		
Tactical Task	Military Symbol	Definition
ATTACK BY FIRE		A tactical mission task in which a commander uses direct fire, supported by indirect fire, to engage an enemy without closing with him to destroy, suppress, or decisive fight. See also frontal assault; support by fire. (FM 3-00, p. B-3; FM 1-02, p. 1-18) (Graphic: FM 1-02, p. 7-32)
BLOCK (ENEMY FORCE)		A tactical mission task that denies the enemy access to an area or prevents his advance in a direction or along an avenue of approach. (FM 3-00, p. B-12; FM 1-02, p. 1-23) (Graphic: FM 1-02, p. 7-45, p. A-2)
BREACH		(Army): A tactical mission task in which the unit employs all available means to breakthrough or secure a passage through an enemy defense, obstacles, infrastructure, or fortifications. (FM 3-00) (Marine Corps): The employment of any means available to break through or secure a passage through an obstacle. (FM 1-02, p. 1-34) (Graphic: FM 1-02, p. A-3)
BYPASS		A tactical mission task in which the commander directs his unit to maneuver around an obstacle, avoiding contact with an enemy force. (FM 1-02, p. 1-18; FM 3-02) (Graphic: FM 1-02, p. A-2)
CANALIZE		(DOD): To restrict operations to a narrow zone by use of existing or reinforcing obstacles or by fire or bombing. (Army): A tactical mission task in which the commander restricts enemy movement to a narrow zone by exploiting terrain coupled with the use of obstacles, trees, or friendly maneuver. See also obstacle. (FM 1-02, p. 1-27; FM 3-00) (Graphic: FM 1-02, p. A-2)
CLEAR		(Army): 1. A tactical mission task that requires the commander to remove all enemy forces and eliminate organized resistance in an assigned area. (FM 3-00) 2. To eliminate fortifications on a tactical route in order to allow a higher-priority transmission to occur. (FM 11-322). This area elimination or neutralization of an obstacle that is usually performed by follow-on engineers and is not done under fire. (FM 3-02) See also reduce. (FM 1-02, p. 1-32) (Graphic: FM 1-02, p. A-2)
CONTAIN		(JP 1-02) A tactical mission task that requires the commander to stop, hold, or surround enemy forces or to cause them to center their activity on a given front and prevent them from withdrawing any part of their forces for use elsewhere. (FM 3-00, p. Glossary-8) (Graphic: FM 1-02, p. A-2)
CONTROL	No Symbol Available	A tactical mission task that requires the commander to maintain physical influence over a specified area to prevent its use by an enemy. (FM 3-00, FM 1-02, p. 1-44)
COUNTERATTACK		(JP 1-02) Attack by all or part of a defending force against an enemy attacking force for such specific purposes as regaining lost ground, or for clearing away delaying enemy forces before committing main effort by striking to the enemy's disadvantage of his position in attacking. In general, a counterattack is offensive. It is undertaken to reverse the situation and is directed at fixed objectives. (FM 1-02, p. 1-45) (Army) – A form of attack by part or all of a defending force against an enemy attacking force, with the general objective of denying the enemy his goal in attacking. (FM 3-00, p. Glossary-8; FM 3-02) (Graphic: FM 1-02, p. A-2)
COVER		(JP 1-02) – (DOD, NATO) 1. The action by land, air, or sea forces to protect by屏蔽, defend, or shield of either or both. [Joint definitions S-8 para applicable] (Army) 1. Protection from the effects of fire. (FM 3-02) 2. A form of security operation whose primary task is to protect the main body by fighting in gain time while still observing and reporting information and preventing enemy ground observation of, and direct fire against, the main body. Unlike a covering or guard force, the covering force is a self-contained force capable of operating independently of the main body. See also covering force. (FM 1-02, p. 1-46; FM 3-00) (Graphic: FM 1-02, p. A-2)
DEFEAT	No Symbol Available	A tactical mission task that causes when an enemy force has temporarily or permanently lost the physical power or the will to fight. The defeated force's commander is unwilling or unable to pursue his adopted course of action, thereby yielding to the friendly commander's will, and can no longer interfere to a significant degree with the actions of friendly forces. Defeat can result from the use of force or the threat of its use. See also decisive point. (FM 1-02, p. 1-44; FM 3-00)
DELAY		A form of retrograde in which a force under pressure trades space for time by slowing the enemy's momentum and inflicting maximum damage on the enemy without, in principle, becoming decisively engaged. (FM 3-00) (See page A-3 for symbol.)
DESTROY		1. A tactical mission task that physically renders an enemy force combat-inoperative until it is reconstructed. 2. To damage a combat system so badly that it cannot perform any function or be restored to a usable condition without being entirely rebuilt. (FM 1-02, p. 1-22; FM 3-00) (Graphic: FM 1-02, p. A-2)
DISRUPT (ENEMY FORCE)		1. A tactical mission task in which a commander integrates direct and indirect fires, tanks, and obstacles to upset an enemy's formation or tempo, disrupt his morale, disorient his forces to commit prematurely or assault in piecemeal fashion. (FM 3-00) 2. In information operations, jamming and intercepting the flow of information between selected command and control nodes. (FM 1-02, p. 1-46) (Graphic: FM 1-02, p. A-2)
FIX (ENEMY FORCE)		A tactical mission task where a commander prevents the enemy from moving any part of his force from a specific location for a specific period of time. (FM 3-00) (FM 1-02, p. 1-41) (Graphic: FM 1-02, p. A-2)
FOLLOW AND ASSUME		A tactical mission task in which a second committed force follows a force conducting an offensive operation and is prepared to continue the mission if the lead force is fixed, stalled, or unable to continue. See also attack; offensive operations. (FM 3-00; FM 1-02, p. 1-42) (Graphic: FM 1-02, p. A-2)
FOLLOW AND SUPPORT		A tactical mission task in which a committed force follows and supports a lead force conducting an offensive operation. See also direct pressure force; oncoming force; exploitation; pursuit. (FM 1-02, p. 1-42; FM 3-00) (Graphic: FM 1-02, p. A-2)
GUARD		(DOD, NATO) 1. A form of security operation [Note: the NATO definition replaces "security operator" with "security element"] whose primary task is to protect the main force by fighting to gain time while still observing and reporting information [Note: the NATO definition ends here] and preventing enemy ground observation of and direct fire against the main body by reconnoitering, attacking, defending, and delaying. Units conducting a guard mission cannot operate independently because they rely upon fire and combat support assets of the main body. See also cover, flank guard, screen. (FM 3-00; FM 1-02, p. 1-46) (Graphic: FM 1-02, p. A-2)

INTERDICT		A tactical mission task where the commander prevents, disrupts, or delays the enemy's use of an area or route. (FM 3-0; FM 1-02, p. 1-102) (Graphic: FM 1-02, p. A-4)
ISOLATE		A tactical mission task that requires a unit to isolates physically and psychologically—an enemy from his source of support, deny an enemy information, movement, or prevent an enemy unit from having contact with other enemy forces. See also encirclement. (FM 3-0; FM 1-02, p. 1-102) (Graphic: FM 1-02, p. A-4)
NEUTRALIZE		(DDO) 1. As applies to military operations, to render ineffective or unusable. 2. To render enemy personnel or material incapable of interfering with a particular operation. See FM 3-0, 2. To render safe mines, booby, mines, and booby traps. See FM 5-20. 4. To make harmless anything contaminated with a chemical agent. See FM 3-0. (See page A-4 for symbol) (Graphic: FM 1-02, p. A-4)
OCCUPY		A tactical mission task that involves a force moving into an area so that it can control the entire area. Both the force's movement to and occupation of the area occur simultaneously. (FM 3-0; FM 1-02, p. 1-125) (Graphic: FM 1-02, p. A-4)
PASSAGE OF LINES (FORWARD)		(Army) A tactical enabling operation in which one unit moves through another unit's positions with the intent of moving into enemy contact. (FM 3-0; FM 1-02, p. 1-142) (Graphic: FM 1-02, p. A-4)
PASSAGE OF LINES (REARWARD)		(Army) A tactical enabling operation in which one unit moves through another unit's positions with the intent of moving out of enemy contact. (FM 3-0; FM 1-02, p. 1-142) (Graphic: FM 1-02, p. A-4)
PENETRATE		(DDO, NATO) In land operations, a form of offensive which seeks to break through the enemy's defense and disrupt the defensive system. (Army) A form of maneuver in which an attacking force seeks to capture enemy defenses on a narrow front to disrupt the defensive system. (FM 3-0; FM 1-02, p. 1-142) (Graphic: FM 1-02, p. A-4)
REDUCE	No Symbol Available	A tactical mission task that involves the destruction of an entrenched or bypassed enemy force. (FM 3-0; FM 1-02, p. 1-159)
RELIEF IN PLACE		(DDO, NATO) An operation in which, by direction of higher authority, all or part of a unit is replaced in an area by the incoming unit. The responsibilities of the replaced element for the mission and the assigned zone of operations are transferred to the incoming unit. The incoming unit continues the operation as ordered. Also called RIF. (FM 3-0; FM 1-02, p. 1-162) (Graphic: FM 1-02, p. A-4)
RETAIN		(DDO) 1. When used in the context of deliberate planning, the directed command without the referenced operation plan, operation plan in concept toward, and any associated operation planning system or Joint Operation Planning and Execution System-supported data processing files in an inactive library status. The plan and its associated will not be maintained unless directed by follow-on guidance. 2. A tactical task to occupied hold a terrain feature to ensure that it is free of enemy occupation or use. Army: Retained mission task in which the commander ensures that a terrain feature is uncompromised by a friendly force removes threat of enemy occupation or use. (FM 3-0; FM 1-02, p. 1-162) (Graphic: FM 1-02, p. A-4)
RETIREMENT		(DDO, NATO) An operation in which a force cuts off contact moves away from the enemy. [Note: the Army classifies retirement as "a form of retreat"] (FM 3-0; FM 1-02, p. 1-162) (Graphic: FM 1-02, p. A-4)
SCREEN		(DDO, NATO) 4. A security element whose primary task is to observe, identify, and report threats, and which only fights in self-protection. See FM 2-0. 5. (DDO only) A task to maintain surveillance, provide early warning to the main body; or impede, disrupt, and harass enemy reconnaissance within its capability without becoming decisively engaged. (Army) A form of security operation that primarily provides early warning to the Headquarters. (FM 3-0) (See also encirclement; flank guard; guerre; security operations. (FM 1-02, p. 1-167) (Graphic: FM 1-02, p. A-4)
SECURE		(DDO, NATO) In an operational context, to gain possession of a position or installation with or without force, and to make such disposition as will prevent, as far as possible its destruction or loss by enemy action. See FM 3-0. (Army) 1. A tactical mission task that involves preventing a unit, facility, or geographical location from being disrupted or destroyed as result of enemy action. (FM 3-0) 2. One of the five breaching fundamentals. These actions which enhances the enemy's ability to interfere with the reduction and passage internet power through a line. Secure may be accomplished by maneuver or by fire. (FM 3-34.2) (See also assault; breach; denial measure; reduce; suppress. (FM 1-02, p. 1-167) (Graphic: FM 1-02, p. A-4)
SEIZE		(DDO) To employ combat forces to occupy physically and control a designated area. (Army) A tactical mission task that involves taking possession of a designated area using combatting force. (FM 3-0) (Marine Corps) To clear a designated area and obtain control of it. See also control. (FM 1-02, p. 1-169) (Graphic: FM 1-02, p. A-4)
SUPPORT BY FIRE		A tactical mission task in which a maneuver force moves to a position where it can engage the enemy by direct fire in support of another maneuvering force that is located by fire overshoot. (FM 3-0; FM 1-02, p. 1-179) (Graphic: FM 1-02, p. 7-32)

SURPRISE		1. A tactical mission task that results in the temporary degradation of the performance of a force or weapon system below the level needed to accomplish the mission. (FM 3-02, FM 1-02, p. 1-170). 2. One of the five breaching fundamentals. The focus of all fires on enemy personnel, weapons, equipment to prevent infiltrative lines on friendly forces. The purpose of surprise is to protect forces reducing and maneuvering through the obstacle and to soften the initial foothold. (FM 3-02.2) (Graphic: FM 1-02, p. A-4)
TURN (ENEMY FORCE)		A tactical mission task that involves forcing an enemy force from one avenue of approach or movement corridor to another. (FM 3-02, FM 1-02, p. 1-182) (Graphic: FM 1-02, p. 7-49 and p. A-4)
WITHDRAW		Limited for both types of withdraw: LIP 1-02 – A planned operation in which a force in contact disengages from an enemy force. [The Army considers it a form of retrograde.] (Army) – A type of retrograde where a force in contact moves to disengage from the enemy and move in a direction away from the enemy. (FM 3-02, p. G-27; FM 1-02, p. 1-181) (Graphic: FM 1-02, p. A-4)
WITHDRAW UNDER PRESSURE		A type of retrograde where a force in contact moves to disengage from the enemy and move in a direction away from the enemy while under pressure from the enemy. (FM 3-02, p. 11-181) (Graphic: FM 1-02, p. A-4)
AMBUSH		(Army) A form of attack by fire or other destructive means from concealed positions on a moving or temporarily halted enemy. (Marine Corps) A surprise attack by fire from concealed positions on a moving or temporarily halted enemy. (FM 1-02; FM 3-02) (Graphic: FM 1-02, p. 7-32)
BLOCK (OBSTACLE EFFECT)		An obstacle effect that integrates fire planning and obstacle effort to stop an attacker along a specific avenue of approach or to prevent him from passing through an engagement area. (FM 3-02, p. E-12; FM 1-02, p. 1-02) (Graphic: FM 1-02, p. 7-49, p. A-4)
DISRUPT (OBSTACLE EFFECT)		An engineer obstacle effect that focuses fire planning and obstacle effort to cause the enemy to break up his formation and tempo, interrupt his timetable, commit breaching assets prematurely, and attack in a piecemeal effort. (FM 3-02) (FM 1-02, p. 1-02) (Graphic: FM 1-02, p. A-3)
FIX (OBSTACLE EFFECT)		An engineer obstacle effect that focuses fire planning and obstacle effort to slow an attacker's movement within specified area, normally an engagement area. (FM 3-02) (FM 1-02, p. 1-01) (Graphic: FM 1-02, p. A-3)
TURN (OBSTACLE EFFECT)		A tactical obstacle effect that integrates fire planning and obstacle effort to drive an enemy formation from one avenue of approach to an adjacent avenue of approach or into an engagement area. (FM 3-02) (Graphic: FM 1-02, p. 7-49 and p. A-4)

WARNO _____ TO OPORD _____

Initial Task Org:

Effective:

<input type="checkbox"/>				
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1. SITUATION: General Enemy Overview:**AO:**North
South
East
West

Who the CO/TM is fighting:

AI:North
South
East
West**BCT Mission:****BCT Cdr Intent:****BN/TF Mission:****BN/TF Cdr Intent:****2. MISSION: Upcoming Task and Purpose or Type of Operation/General location:****3. EXECUTION:**Movement Instructions/Movement to initiate:**Recon Tasks/ Recon to initiate**

Our Current Location: _____

Recon Team:

Our Next Location: _____

Objective Location: _____

Information requirements (IR and CCIR)

WARNO TO OPORD

Page 2 of 2:

Coordinating Instructions:**Planning/prep
Instructions****Priorities of Work / Rehearsal:****Time Line**

BN

CO/PLT

ENEMY

4. SERVICE SUPPORT:

CTCP Grid: _____

UMCP Grid: _____

LRP Grid: _____

AXP Grid: _____

CCP Grid: _____

MCP Grid: _____

CLASS I:

CLASS III:

CLASS IV:

CLASS V:

5. Command and Signal:

TASK ORGANIZATION

AREA OF OPERATIONS:

N:

S:

E:

W:

AREA OF INTEREST:

ADA

CAS

RESERVES

FIRE SUPPORT

SUSTAINMENT

LIGHT AND WEATHER DATA

Date BMTN EENT Moonrise Moonset % Illum

TEMPERATURE

WIND

PRECIPITATION

HUMIDITY

CLOUD COVER

ILLUMINATION

EFFECTS:

TERRAIN

OBSTACLES:

Existing:

Reinforcing:

AVENUES OF APPROACH

Dismounted

Size	Speed	Formations	Techniques
------	-------	------------	------------

Mounted

Size	Speed	Formations	Techniques
------	-------	------------	------------

KEY TERRAIN

OBSERVATION AND FIELDS OF FIRE

COVER AND CONCEALMENT

ASCOPE

AREAS

STRUCTURES

CAPABILITIES

ORGANIZATIONS

PEOPLE

EVENTS

1. SITUATION
-GENERAL-

A. ENEMY FORCES

COMPOSITION:

The enemy 1 level up that we face is expected to be at ____ % strength.

They are composed of: (PLT's, SQD's)

Systems at the 1 level up in support of the element that we face are:

On our objective, we can expect to see:

DISPOSITION:

Purpose 2 Levels up:

They will accomplish this by:

They are arrayed with _____ (Brief individual task and purposes from enemy side)

The purpose of the one level up:

They will accomplish this by:

Decisive to this enemy operation is:

This is decisive because:

They are arrayed with _____ (Brief individual task and purposes from enemy side)

We face the _____

CAPABILITIES:

- Intelligence:
- Movement and Maneuver:

RESERVES

- Fire Support:
- Protection:

ADA

M/CM/S

- Sustainment:
- Command and Control:

MOST PROBABLY COURSE OF ACTION

The purpose of the enemy operation is:

Decisive to their operation is:

This is decisive because:

They will accomplish this by conducting a _____ defense

One _____ (decisive operation) will

IOT

One _____ (shaping operation) will

IOT

One _____ (shaping operation) will

IOT

One _____ (shaping operation) will

IOT

The purpose of enemy fires is to

The purpose of enemy ADA is to

The purpose of _____ is to

The purpose of _____ is to

B. FRIENDLY FORCES

BDE MISSION:

BDE INTENT:

- • • •

BDE CONCEPT:

BN MISSION:

BN INTENT:

-
-
-
-
-
-

ENDSTATE:

BN CONCEPT:

2. MISSION

3. EXECUTION

CDR'S INTENT

-
-
-
-
-
-
- **ENDSTATE**

A. CONCEPT OF THE OPERATION:

The purpose of this operation is to:

Decisive to this operation is:

This is decisive because:

We will accomplish this by conducting a _____ (offensive technique)

FOM:

We accept tactical risk by:

Will mitigate this by:

_____ PLT (decisive operation) will

IOT

_____ PLT (shaping operation) will

IOT

_____ PLT (shaping operation) will

IOT

_____ PLT (shaping operation) will

IOT

The purpose of MTRs is to

The purpose of SNIPERS is to

The purpose of ENGINEERS is to

The purpose of _____ is to

The purpose of _____ is to

FIRE PLAN DEVELOPMENT										
<u>Essential Fire Support Tasks</u>					<u>Enemy Fire Support Assets</u>					
					FA					
					MTR					
					FASCAM					
					CHEM					
<u>Available F.S. Assets</u>			<u>Call Signs and Frequencies</u>			<u>Target List</u>				
			CO FSO			TOT #	Grid	Remarks		
			CO CMD							
			MTR							
			CAS							
			NGF							
<u>Available Munitions</u>										
HE	HE(V)	HE(TD)	DPCM	LLUM	VIP	SMOKE	CPHD	RAP	M826	
<u>Execution Matrix</u>										
<u>Target #</u>	<u>Purpose</u>	<u>Location</u>	<u>Trigger</u>	<u>OBS</u>	<u>COMMS</u>	<u>Resources</u>				
<u>IDFCM</u>										
<u>Specific Guidance</u>										

RISK ESTIMATED DISTANCES

Table 29. Mortar Risk-estimate Distances							
Item / System	Description	0.1% PI (meters/feet)			10% PI (meters/feet)		
		1/3 Rng	2/3 Rng	Max Rng	1/3 Rng	2/3 Rng	Max Rng
M224	60mm mortar	100m/ 328'	150m/ 492'	175m/ 574'	60m/ 197'	65m/ 213'	65m/ 213'
M252	81 mm mortar	165m/ 541'	185m/ 607'	230m/ 755'	75m/ 246'	80m/ 262'	80m/ 262'
M120/ M121	120 mm mortar	150m/ 492'	300m/ 984'	400m/ 1312'	100m/ 328'	100m/ 328'	100m/ 328'

Table 30. Cannon Risk-estimate Distances							
Item / System	Description	0.1% PI (meters/feet)			10% PI (meters/feet)		
		1/3 Rng	2/3 Rng	Max Rng	1/3 Rng	2/3 Rng	Max Rng
M102/ M119	105mm Howitzer HE	175m/ 574'	200m/ 655'	275m/ 902'	85m/ 279'	85m/ 279'	90m/ 295'
M109/ M198/ M777	155mm Howitzer HE	200m/ 656'	280m/ 919'	450m/ 1476'	100m/ 328'	100m/ 328'	125m/ 410'
M109/ M198/ M777	155mm Howitzer DPICM	280m/ 919'	300m/ 984'	475m/ 1558'	150m/ 492'	180m/ 591'	200m/ 656'

Table 31. Naval Gunfire Risk-estimate Distances							
Item/ System	Description	0.1% PI (meters/feet)			10% PI (meters/feet)		
		1/3 Rng	2/3 Rng	Max Rng	1/3 Rng	2/3 Rng	Max Rng
Mk-45	5" / 54 gun	450m/ 1476'	450m/ 1476'	600m/ 1969'	210m/ 689'	225m/ 738'	250m/ 820'

Table 32. Tomahawk Land Attack Missile Risk-estimate Distances							
Item/ System	Description	0.1% PI (meters/feet)			10% PI (meters/feet)		
		1/3 Rng	2/3 Rng	Max Rng	1/3 Rng	2/3 Rng	Max Rng
TLAM	1000-lb unitary warhead	200m / 656'			80m / 263'		

Note: TLAM risk-estimate distances are not range dependent.

Table 33. Fixed-wing Risk-estimate Distances

Weapon	Description	0.1% PI (m/ft)	10% PI (m/ft)
Mk-84 LD ¹ airburst	2000-lb bomb	380 m / 1247'	140m / 459'
Mk-84 HD contact	2000-lb bomb/ retarded	270 m / 886'	165m / 541'
Mk-84 HD ¹ airburst	2000-lb bomb/ retarded	355 m / 1165'	180m / 591'
CBU-87 ² , CBU-89 ²	CEM or GATOR	265 m / 869'	180m / 591'
CBU-103/104 (WCMD)	CEM or GATOR	155 m / 509'	90m / 295'
CBU-99 ² /100 ² , Mk-20 ²	Rockeye	230 m / 755'	140m / 459'
GBU-12	500-lb LGB	170 m / 558'	50m / 164'
GBU-51 contact	500-lb LCDB LGB	100 m / 328'	35m / 115'
GBU-16	1000-lb LGB	195 m / 640'	75m / 246'
GBU-10/24	2000-lb LGB	250 m / 820'	70m / 230'
GBU-38 contact	500-lb JDAM	185 m / 607'	55m / 180'
GBU-38 airburst	500-lb JDAM	230 m / 755'	80m / 263'
GBU-38(v)4 contact	500-lb LCDB JDAM	100 m / 328'	35m / 115'
GBU-32 contact	1000-lb JDAM	210 m / 689'	75m / 246'
GBU-32 airburst	1000-lb JDAM	275 m / 902'	100m / 328'
GBU-31 contact	2000-lb JDAM	265 m / 869'	80m / 263'
GBU-31 airburst	2000-lb JDAM	305 m / 1001'	105m / 345'
GBU-39 contact	250-lb SDB	135 m / 443'	35m / 115'
GBU-39 airburst (7')	250-lb SDB	160 m / 525'	40m / 131'
GBU-39 airburst (14')	250-lb SDB	180 m / 591'	55m / 181'
AGM-130	2000-lb TV guided	220m / 722'	70m / 230'
AGM-154	JSOW	170m / 558'	100m / 328'
AGM-158A	JASSM	210m / 689'	55m / 181'
AGM-65	Maverick (All)	95m / 312'	35m / 115'
M151, M229, M261 ³	2.75" Rockets med alt	365m / 1198'	190m / 623'
	2.75" Rockets low alt	225m / 738'	115m / 377'
Zuni – Contact ³	5" Rockets low alt	290m / 951'	125m / 410'
M61A1	20 mm gatling	60m / 197'	35m / 115'
GAU-12	25 mm gatling	55m / 181'	30m / 98'
GPU-5A, M230A1	30 mm gatling / chain	40m / 131'	25m / 82'
GAU-8 (A-10)	30 mm gatling	65m / 213'	40m / 131'

Table 33. Fixed-wing Risk-estimate Distances

Weapon	Description	0.1% PI (m/ft)	10% PI (m/ft)
Mk 82 LD contact	500 lb bomb	215 m / 801'	105m / 345'
Mk-82 LD ¹ airburst	500-lb bomb	300 m / 984'	135m / 443'
Mk-82 HD contact	500-lb bomb/ retarded	230 m / 755'	130m / 427'
Mk-82 HD ¹ airburst	500-lb bomb	280 m / 919'	155m / 509'
Mk-83 LD contact	1000-lb bomb	305 m / 1001'	120m / 394'
Mk-83 LD ¹ airburst	1000-lb bomb	340 m / 1116'	145m / 476'
Mk-83 HD contact	1000 lb bomb/ retarded	265 m / 869'	160m / 525'
Mk 83 HD ¹ airburst	1000-lb bomb/ retarded	315 m / 1034'	175m / 574'
Mk-84 LD ¹ contact	2000-lb bomb	315 m / 1034'	110m / 361'

Table 33. Fixed-wing Risk-estimate Distances

Weapon	Description	0.1% PI (m/ft)	10% PI (m/ft)
AC-130	25 mm	65m / 213'	35m / 115'
	30 mm Mk 44	100m / 328'	45m / 148'
	40 mm	75m / 246'	25m / 82'
	105 mm cannon	165m / 511'	65m / 213'
AGM-114 K	Hellfire	110m / 361'	40m / 131'
AGM-114 K2A	Hellfire	110m / 361'	50m / 164'
AGM-114 M	Hellfire	125m / 410'	40m / 131'
AGM-114 N	Hellfire	120m / 394'	40m / 131'
PW II / CPW2 ⁴	UK PI Values	235m / 771'	—
PW III / EPW3 ⁴	UK PI Values	305m / 1001'	—
AGM-85 ⁴	UK PI Values	130m / 427'	—
UK 540-lb bomb ⁴	UK PI Values	200m / 656'	—
UK 1000-lb bomb ⁴	UK PI Value	240m / 787'	—
CRV-7 – Single Rocket ⁴	UK PI Value	105m / 345'	—
CRV-7 – Opt Prod ⁴	UK PI Value	125m / 410'	—

See classified ALSA website for munitions profiles and assumptions.

¹ Airburst fuzing (DSU-33)⁴ Not recommended for use with troops in contact³ Fixed-wing only. See Table 34 for rotary-wing numbers.¹ UK – United Kingdom values shown for reference. No UK 10% PI available.

AGM – air to ground missile HD – high drag / air inflatable retarder (AIR)

alt – altitude LD – low drag

CBU – cluster bomb unit PW – Paveway

FPW – enhanced Paveway WCMD – wind corrected munitions dispenser

CBU – guided bomb unit

Table 34. Rotary-wing Risk-estimate Distances¹

Airframe / Weapon	Firing Range	0.1% PI (meters/feet)		10% PI (meters/feet)					
0.50 cal ¹	300m	20m	/ 66'	15m	/ 49'				
	500m	35m	/ 115'	25m	/ 82'				
Cobra / 20 mm (M56)	300m	75m	/ 246'	30m	/ 98'				
	800m	85m	/ 279'	50m	/ 164'				
Apache / 30 mm (M789)	500m	70m	/ 230'	25m	/ 82'				
	1000m	75m	/ 246'	30m	/ 98'				
2.75" Rockets									
M-151	300m	140m	/ 459'	60m	/ 197'				
	800m	160m	/ 525'	80m	/ 263'				
	1000m	180m	/ 591'	90m	/ 295'				
	2000m ²	300m	/ 984'	155m	/ 509'				
	3000m ²	405m	/ 1329'	210m	/ 689'				
M-229	300m	145m	/ 476'	70m	/ 230'				
	800m	165m	/ 542'	90m	/ 296'				
	1000m	185m	/ 607'	100m	/ 328'				
	2000m ²	305m	/ 1001'	165m	/ 542'				
	3000m ²	410m	/ 1346'	220m	/ 722'				
Hellfire Variants³									
AGM-114 K2A	All Ranges	110m	/ 361'	50m	/ 164'				
AGM-114 M		125m	/ 410'	40m	/ 131'				
AGM-114 N		120m	/ 394'	40m	/ 131'				
BGM-71 TOW Anti-Tank	All Ranges	N/A		N/A					
Rocket / gun assumptions: Running / diving fire with 5-20 degree dive angle fired parallel to FLOT; 10 or 20 round gun burst or 2 round rocket burst; forward flight.									
¹ Non-exploding round (ball-type ammunition)									
² 2000m and 3000m 2.75" rocket values for use by US Army aviation only.									
³ AGM-114 A/B/C/D/L/K variants will have risk-estimate distances smaller than the variants listed above.									
AGM – air-to-ground missile									
cal – caliber									
TOW – tube-launched, optically tracked, wire guided									

WEAPONS CAPABILITIES

Anti-Tank						
Weapon	Caliber	Type	Max Eff RG Meter	Min RG Meter	Room Size	Remarks
M220A2 TOW	-----	HEAT	3750	65	15'x15' 7' high 20 ft2 vent	Back blast 75 m
Javelin	-----	HEAT	2000	65 Direct 75 Top	15'x12' 7' high 20 ft2 vent	Back blast 25 m
M17 Dragon	-----	HEAT	1000 stat 100 move	65	15'x15' 7' high 20 ft2 vent	Back blast 50 m
M72A2 LAW	66 mm	HEAT	200 stat 125 move	30	12'x15' 8' high 20 ft2 vent	Back blast 50 m
M136 AT4	84 mm	HEAT	300	30	17'x24' 8' high 20 ft2 vent	Back blast 60 m
M3 MAWS	84 mm	HEAT 751 HEAT 551 HE 441 HEDP 502 SMOKE 469 ILLUM 545	500 700 1100 1000 area 500 stat 300 move 1300 2100	- 5 - 15 20 - 70 15 - 40 ** ** - -	15'x12' 7' high 20 ft2 vent	20 ft2 vent equals a 3x7' door

Organic Weapon Systems						
Weapon	Caliber	Type	Max Eff RG Meter	Min RG Meter	Eff Area Meter	Remarks
M9	9 mm	Ball	50	N/A	N/A	
M11	9 mm	Ball	50	N/A	N/A	
M16A2	5.56 mm	Ball	600 area 550 point	N/A	N/A	
M4	5.56 mm	Ball	600 area 500 point	N/A	N/A	
M203	40 mm	HE	160 area 350 point	31	5 m	

Machine Gun						
Weapon	Caliber	Type	Max Eff RG Meter	Min RG Meter	Eff Area Meter	Remarks
M2	.50 in	AP	1830 area 1100 veh 700 point	N/A	N/A	800 m Grazing
M60E3	7.62 mm	Ball	1100 area 600 point 200 move	N/A	N/A	600 m Grazing
M240B	7.62 mm	Ball	1100 area 600 point 1800 sup	N/A	N/A	600 m Grazing
M249	5.56 mm	Ball	600 area 600 point 1000 sup	N/A	N/A	600 m Grazing
MK19	40 mm	HEDP HE	2212 area 1500 pt	18 - 28	15 m	

Table 2. Field Artillery Cannons

Artillery	Ammunition		Range (Meters)			Rates of Fire / Notes
	Projectile	Fuze	Danger Close	Max	DPICM	
105mm M119A1	HE, HC, WP, ILLUM, APICM, DPICM	PD, VT, MT, ET, MTSO, Delay	600 m ¹	11,500	14,100	19,500
155 mm M198	HE, HC, WP, ILLUM, CPHD, APICM, DPICM, M825 Smoke, SCAT-MINE	PD, VT, MT, ET, MTSO, Delay	600 m ¹	18,300 or 22,000 with M795 HE, M825 Smoke	18,000 or 28,200 with M864	Sustained rate of fire: 3 rnds/min. Max rate of fire: 10 rnds/min
155 mm M109A5A6	HE, HC, WP, ILLUM, CPHD, APICM, DPICM, M825 Smoke, SCAT-MINE	PD, VT, MT, ET, MTSO, Delay	600 m ¹	18,200 or 21,700 with M795 HE, M825 Smoke; 24,500 with XM982 Block 1-1a ²	17,900 or 28,100 with M864	Sustained rate of fire: 1 rnd/min. Max rate of fire: 4 rnds/min
155 mm M777- series	HE, HC, WP, ILLUM, CPHD, APICM, DPICM, M825 Smoke, SCAT-MINE	PD, VT, MT, ET, MTSO, Delay	600 m ¹	22,200 w/ M201A1 Chg 8S or 22,500 w/ M232, Zone 5, 24,500 w/ XM982 Block 1- 1a Smoke; 24,500 w/ XM982 Block 1-1a	N/A	Sustained rate of fire: 2 rnds/min. IAW Thermal Warning Device. Max rate of fire: 4 rnds/2 min

¹See appendix F, Surface-to-Surface Risk-Estimate Distances for detailed discussion of "danger close".

²Excalibur not authorized for M109A5.

APICM – antipersonnel improved conventional munition, CPHD – copperhead, DPICM – dual purpose improved conventional munition, ET – electronic time, HC – hexachloroethane, HE – high explosive, ILLUM – illumination, MT – mechanical time, MTSO – mechanical time superquick, PD – point detonating, RAP – rocket assisted projectile, SCAT-MINE – scatterable mines, VT – variable time, WP – white phosphorous.

Table 3. Mortars

Wpn	Ammunition		Danger Close	Range (m)		Rates of Fire
	Model	Type		Min	Max	
60 mm M224	M720	HE	600 m	70	3,489 ¹	30 rnds/min for 4 min ² then 20 rnds/min sustained. Diameter of Illumination: M721 – 500 m, M83A3 – 300 m
	M888	HE		70	3,489	
	M722	WP		70	3,489	
	M721	ILLUM		200	3,489	
	M302A1	WP		35	1,830	
	M83A3	ILLUM		725	950	
81 mm M29A1	M49A4	HE	600 m	45	1,830	25 rnds/min for 2 min then 8 rnds/min sustained. Diameter of Illumination: 360 m
	M374A2	HE		70	4,600	
	M374A3	HE		73	4,800	
	M375A2	WP		70	4,595	
81mm M252	M301A3	ILLUM	600 m	100	3,150	18 rnds/min for 2 min then 8 rnds/min sustained. Diameter of Illumination: 650 m
	M821	HE		80	5,800	
	M889	HE		83	5,800	
	M374A3	HE		73	4,800	
	M819	RP		300	4,875	
	M375A2	WP		73	4,595	
120 mm M120	M853A1	ILLUM	600 m	300	5,060	16 rnds/min for 1 min then 4 rnds/min sustained. Diameter of Illumination: 1,500 m
	M301A3	ILLUM		100	3,950	
	M57	HE		200	7,200	
	M68	WP		200	7,200	
	M91	ILLUM	600 m	200	7,100	
	M933	HE/PD		200	7,200	
	M934	HE/MOF		170	7,200	
	M929	WP		170	7,200	
	M930	ILLUM		170	7,200	

HE – high explosive

ILLUM – illumination

MOF – multi-option fuze

PD- point detonating

RP – red phosphorus

WP – white phosphorus

wpn - weapon

¹Bipod-mounted, charge 4 (maximum handheld is 1,300 meters).

²Charge 2 and over. 30 rounds per minute can be sustained with charge 0 or 1.

Table 4. Artillery / Mortar / Rocket Illumination Factors

Weapon	Type	Height of Burst (meters)	Burn Time (seconds)	Rate of Fall (m/sec)
60 mm	M83A1 M83A2/3	160	25 32	6
100 mm (2.75")	M-257 (Over)	550	120	4.5
70 mm (2.75")	M-278 (Cover)	800	180	4.5
81 mm	M301A3	600	60	6
105 mm	M314A2 M314A3	750	60-66	12
120 mm	M930	500	50	5
150 mm	M118 M485-series	750 600	60 120	10 5

Table 6. Cannon / Mortar Targets and Suggested Ammunition

Targets	Cannons	Mortars
Personnel or light vehicles in open	ICM, DPICM, HE/VT, HE/TI, Excalibur/VT/PI	HE/MOF, HF/VT, HE/TI, HE/PD
Personnel or light vehicles in light overhead cover	ICM, DPICM, HC/TI, HC/PD, HC/D, Excalibur/PD/D	HC/MOF, HC/TI, HE/PD, HE/D
Personnel or light vehicles in trees	HE/TI, HE/D	HE/MOF, HF/VT, HE/PD, HE/D
Covered positions or heavy vehicles in the open	DPICM, HE/PD, HE/D, Excalibur/PD/D	HE/MOF, HC/PD, HE/D
Large bunker complexes	HE/CP, HE/D, HE/PD	HE/MOF, HE/PD, HE/D
Small bunkers	Copperhead, HF/CP, HF/PD, HF/D, Excalibur/D	HE/MOF, HE/PD, HE/D
Armored vehicles	DPICM, Copperhead, HC/PD, HC/D	HC/MOF, HE/PD, HE/D
Urban Structures	Excalibur/VT	
CP - concrete piercing D - delay DPICM - Dual Purpose, Improved Conventional Munitions HE - high explosive ICM - Improved Conventional Munitions MOF - multi-option fuze PD - point detonating TI - time VT - variable time		
Note: MOF has the following actions – Impact (IPM), Delay (DLY), Near Surface Burst (NSB), and Proximity (PRX).		

Table 7. Artillery Precision-guided Munitions				
Munitions	Variant	Payload	Range	
Guided 155mm Projectile	XM982 Block 1a-1	Similar to HE M107	7.5-24 km	
Target Types: Precisely located targets – Personnel, lightly armored targets (stationary), and structures where collateral damage must be restricted.				
<i>Note: Excalibur is fired only by the M777 and M109A6 cannon weapons.</i>				

Table 8. Multiple Launch Rocket System / High Mobility Artillery Rocket System				
Munition	Variant	Payload	Range	Targets
Rockets (MLRS)	M26	644 M77 DPICM	10-32 km	Personnel, Light Armor, Soft Vehicles (Stationary), Buildings (GMLRS Only)
	M26A2 ER-MLRS	518 PI M77	13-45 km	
Guided Rockets (GMLRS)	M30	404 PI M77 DPICM	15-60 km	
	M31	51.5 lbs Unitary HE	15-60 km	
ATACMS	Block 1 M39 (JEE)	950 M74 APAM bomblets	25-165 km	Personnel, Light Armor, Soft Vehicles (Stationary)
	Block 1A M39A1 (JEN)	300 M74 APAM bomblets	70-300 km	
	Quick Reaction Unitary (QRU)	Single Burst, HE/PD Fuze	70-270 km	Block 1 – 1A targets when duds / collateral damage are precluded.
	ATACMS Unitary	Single unitary warhead with multi-function fuze – Proximity, PD, or Delay	70-300 km	Fixed Infrastructure sites (building, etc.)
APAM – Anti-Personnel, Antiaarmor ATACMS – Army Tactical Missile System DPICM – Dual Purpose, Improved Conventional Munitions ER-MLRS – Extended Range Multiple Launch Rocket System GMLRS – Guided Multiple Launch Rocket System HE – High Explosive JEE, JEN – Computer Munitions Identification Codes MLRS – Multiple Launch Rocket System PD – Point Detonating PI – Product Improved <i>Note: Default rates of fire are 5 seconds between rockets and 15 seconds between missiles.</i>				

INDIRECT FIRE CONSIDERATIONS

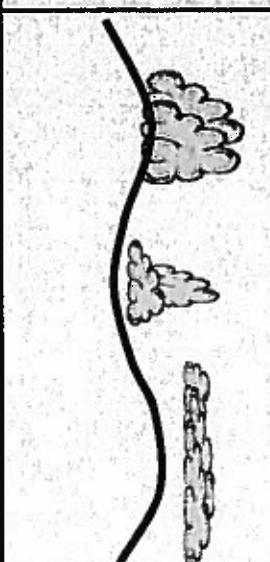
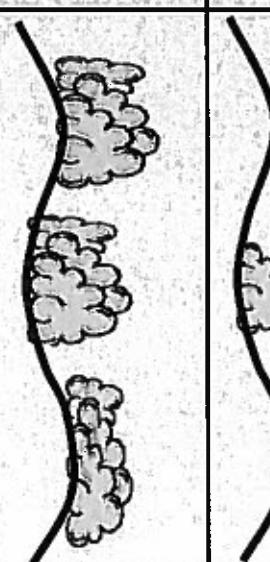
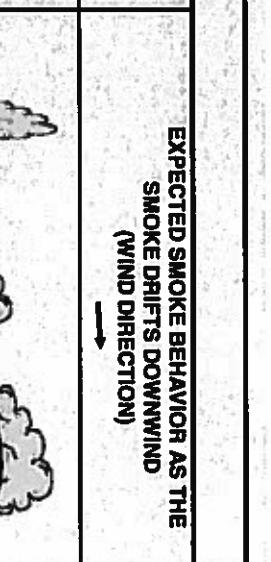
SMOKE CONSIDERATIONS

EQUIVALENT WIND SCALE FOR ESTIMATING WIND SPEED	
KNOTS	OBSERVATION
1	Smoke, vapor from breath, or dust raised by vehicles or personnel rises vertically. No leaf movement.
1-3	Direction of wind slightly shown by smoke, vapor from breath, or dust raised by vehicles or personnel. Slight, intermittent movement of leaves.
4-6	Wind slightly felt on face. Leaves rustle.
7-10	Leaves and small twigs in constant motion.
11-16	Wind raises dust from ground. Loose paper and small branches move.
17-21	Small trees with leaves sway. Coastal wavelets form on inland waters.
22-27	Large branches on trees in motion. Whistle heard in telephone or fence wires.
28-33	Whole trees in motion. Inconvenience felt walking against the wind.

Note: One knot equals 1.15 miles per hour (mph).

Delivery System	Type Round	Time to Build Effective Smoke (minutes)	Average Burning Time (minutes)	Average Obscurational Length (meters) Per Round	
				Wind direction	
				Cross	Head / Tail
155 mm	WP	½	1 to 1 ½	150	50
	HC	1 - 1 ½	4	350	75
	M825	½	5 to 10	350	100 to 200
105 mm	WP	½	1 to 1 ½	75	50
	HC	1 to 1 ½	3	250	50
120 mm	WP	½	2 ½	100	60
107 mm	WP	½	1	200	40
81 mm	WP	½	1	100	40
	RP	½	2 ½	100	40
60 mm	WP	½	1	75	40

Note: All rounds are fired as standard missions with parallel sheets under favorable conditions.

GENERAL ATMOSPHERIC CONDITIONS AND EFFECTS ON SMOKE		
SMOKE CONDITION (TEMPERATURE GRADIENT)	TIME OF DAY WEATHER CONDITIONS	EXPECTED SMOKE BEHAVIOR AS THE SMOKE DRIFTS DOWNWIND (WIND DIRECTION)
Ideal (Inversion)	<p>1. Night – until one hour after sunrise.</p> <p>2. Wind speed less than 5 knots.</p> <p>3. Sky cover less than 30 percent.</p> <p>All three conditions must be met.</p>	
Favorable	<p>This condition occurs most often 1 to 2 hours before and after sunrise and when the wind speed is 5 knots or more and/or the sky cover is 30 percent or more.</p>	
Marginal (lapse)	<p>1. Day – beginning 2 hours after sunrise.</p> <p>2. Wind speed is less than 5 knots.</p> <p>3. Sky cover is less than 30 percent.</p>	

TRIGGERS IN THE OFFENSE

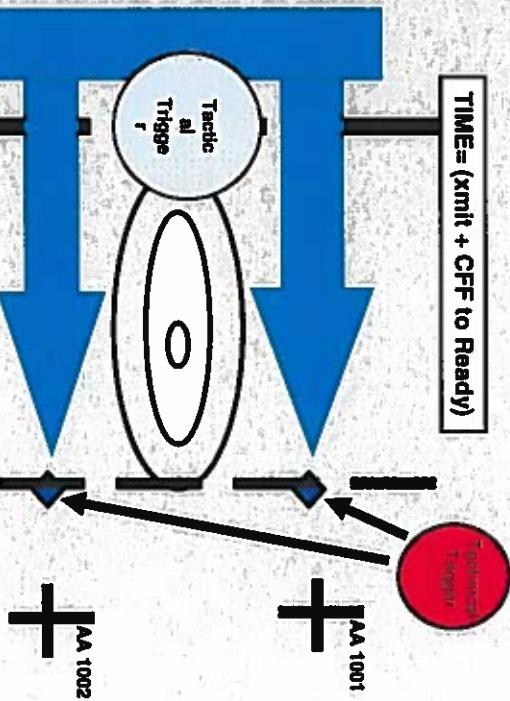
- Maneuver event driven
- Terrain oriented
- Conditions must be set
- Must be synchronized with the BOS's

Steps for building effective triggers for the offense

Step 1: CDR to FSO: "I want suppression on the objective as we come out of the passes and the smoke screen built just prior to the Support Force crossing PL Clarke. Then they can use the smoke and suppression to get into position."

Not: "When the support force is moving into position."

Step 2: FSO determines it will take 3:00 for suppression fires to impact and 10:35 for the obscuration smoke to be fired and build and then asks the CDR/S3:
"Where will the Support Force be 3 minutes from exiting the passes and 11 minutes and from PL Clarke?"



Step 3: CDR/S3 to FSO:
"The support force will move 1 km every 3 minutes, so 3 minutes from exiting the passes they'll be at PL Harman and 11 minutes out from PL Clarke, they'll be at the 37 Easting." FSO to CDR/S3:

Step 4: "The trigger for A30B, suppression is PL Harman and for AB300 will be when the Support Force crosses the 37 Easting."

TRIGGERS IN THE DEFENSE

Determining Triggers in the Defense

Step 1: First The FSO Determines The Technical Trigger For AB3000.

Time of Flight	50 seconds
Transmission Time	10 seconds
Total Time	60 seconds

- *Enemy driven
 - *Clearly defined Pt. on the ground
 - *Physical or Lazerd spot
 - *Tactical & technical
- TACTICAL TRIGGER:** triggers cue the observer/executor of the target, to lay the guns on the target. (AMC).

TECHNICAL TRIGGER: triggers involve the actual firing of the target, taking into account the enemy rate of march, and time of flight.

S2 to FSO: Where will the lead of the Assault Force be 1 minute prior to

the obstacle?

S2 to FSO: They will be moving at 20 kph until contact and will then slow to 6 kph. So they will be at PL Screwdriver.

FSO: PL Screwdriver is the Technical Trigger for AB3000.

MARKING A TRIGGER IN THE DEFENSE		
TYPE	PRO	CON
VS-17 panel	easy to establish	day only
Reverse polarity tape	visible at night	5KM
Diesel/charcoal	clearly visible at night	6-hrs, weather dependent
Laser spot	quick, virtually undetectable	FIST cannot move
Plywood	large, visible	cover & concealment

Step 2: Then the FSO Determines The Tactical Trigger for AB3000
First step is determining how long it will take the DS battalion to be ready to fire the first volley of the Bn 6 DPICM.

The FSO uses the MTP 6-115-MTP DPICM FFE Mission Time Standard:
 Observer Calls Mission :55
 Ds Bn FDC :35
 Platoon FDC :15
 Gun Time :45
 1st Volley Ready to Fire 2:30

Just to be safe, the FSO adds 30 seconds in for any error and determines the tactical trigger for AB3000 will be 3:00 prior to the technical trigger.

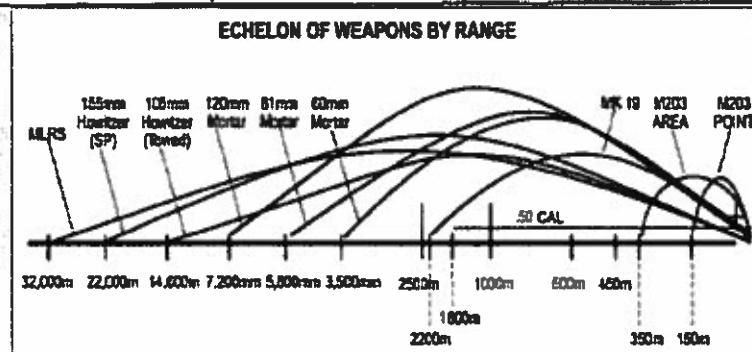
FSO to S2: Where will the enemy be 3:00 from PL Screwdriver?

S2 to FSO: They will be moving at 20 kph. So they will be at the 433 easting.

FSO: The Tactical Trigger for AB3000 will be the 43 Easting.

Table E-3. GUIDE FOR ARTILLERY OR MORTAR ATTACK OF TYPICAL TARGETS (Continued)

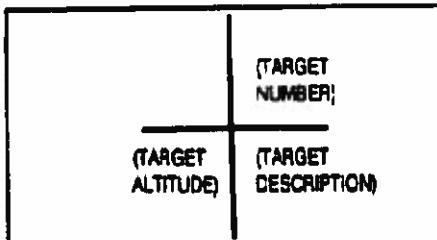
SHELL AND WEAPON	FUZE	SUITABLE FOR
V/P 81-mm 107-mm 103-mm, 155-mm Terror	Quick Superquick Delay	Incendiary Manning Screening Decoys Vehicles
V/P	Time	Maintain sector
Smoke 120-mm, 155-mm		Screening Decoys
Hurricane 81-mm 107-mm, 103-mm, 155-mm	Time Base setting	Harassment Manning
CAP (Cavemente) 155-mm		Point targets Command posts Armored targets
Rocket-assisted projectile (RAP) 120-mm, 155-mm 203-mm	Quick Superquick Delay	Same as HE (used when increased target is necessary)
A28/I 155-mm	Time Base setting	Deny mobility to personnel
RAAMS 52-mm	Time Base setting	Deny mobility to vehicles
Beehive 82-mm	Time	Personnel—check fire, battery defense
DPMCVI 155-mm 203-mm	Time Base setting	Personnel in open Light armored vehicles in open
APICM 105-mm 155-mm	Time Base setting	Personnel in open
HE 81-mm, 107-mm, 103-mm, 155-mm, 203-mm	Quick	Adjusting Personnel in open Light armored vehicles
HE	Delay, 0.03 second	Targets in trees Unarmored vehicles
HE	Concrete pending 0.25-second delay	Bunkers Earth and log emplacements Hard targets
HE	VT radio-activated M614 20-meter HOB M725/727-meter HOB to HOB adjustment required	Personnel in open, in trenches, or in firing positions Light armored vehicles
HE	Time OR adjust/recompute	Same as VT



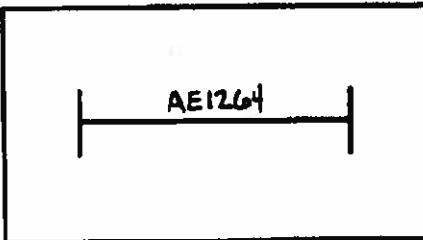
METHOD	DAY/ NIGHT	ASSETS	FRIENDLY MARKS	TARGET MARKS	REMARKS
SMOKE	D/N	ALL	GOOD	GOOD	Easily identifiable, may compromise friendly position, obscure target, or warn of fire support employment. Placement may be difficult due to structures.
SMOKE (IR)	D/N	ALL/ NVD AT NIGHT	GOOD	GOOD	Easily identifiable, may compromise friendly position, obscure target, or warn of fire support employment. Placement may be difficult due to structures. Night marking is greatly enhanced by the use of IR reflective smoke
ILLUM, GROUND BURST	D/N	ALL	N/A	GOOD	Easily identified, may wash out NVDs.
SIGNAL MIRROR	D	ALL	GOOD	N/A	Avoids compromise of friendly location. Dependent on weather and available light and may be lost in reflections from other reflective surfaces (windshields, windows, water)
SPOT LIGHT	N	ALL	GOOD	MARGINAL	Highly visible to all. Compromises friendly position and warns of fire support employment. Effectiveness is dependent upon degree of urban lighting.
IR SPOT LIGHT	N	ALL NVD	GOOD	MARGINAL	Visible to all with NVGs. Less likely to compromise than overt light. Effectiveness dependent upon degree of urban lighting.
IR LASER POINTER (below .4 watts)	N	ALL NVG	GOOD	MARGINAL	Effectiveness dependent upon degree of urban lighting.
IR LASER POINTER (above .4 watts)	N	ALL NVD	GOOD	GOOD	Less affected by ambient light and weather conditions. Highly effective under all but the most highly lit or worst weather conditions. IZLID-2 is the current example.
VISUAL LASER	N	ALL	GOOD	MARGINAL	Highly visible to all. Risk of compromise is high. Effectiveness dependant upon degree of urban lighting.
LASER DESIGNATOR	D/N	PGM OR LST EQUIPPED	N/A	GOOD	Highly effective with PGM. Very restrictive laser acquisition cone and requires line of sight to target. May require pre-coordination of laser codes

METHOD	DAY/ NIGHT	ASSETS	FRIENDLY MARKS	TARGET MARKS	REMARKS
TRACERS	D/N	ALL	N/A	MARGINAL	May compromise position. May be difficult to distinguish mark from other gunfire. During daytime use, may be more effective to kick up dust surrounding target.
ELECTRONIC BEACON	D/N	SEE REMARKS	EXCELLENT	GOOD	Ideal friendly marking device for AC-130 and some USAF fixed wing (not compatible with Navy or Marine aircraft). Least impeded by urban terrain. Can be used as a TRP for target identification. Coordination with aircrews essential to ensure equipment and training compatibility.
STROBE (OVERT)	N	ALL	MARGINAL	N/A	Visible by all. Effectiveness dependent upon degree of urban lighting.
STROBE (IR)	N	ALL NVD	GOOD	N/A	Visible to all NVDs. Effectiveness dependent upon degree of urban lighting. Coded strobes aid in acquisition.
FLARE (OVERT)	D/N	ALL	GOOD	N/A	Visible by all. Easily identified by aircrew.
FLARE (IR)	N	ALL NVD	GOOD	N/A	Visible to all NVDs. Easily identified by aircrew.
GLINT/IR PANEL	N	ALL NVD	GOOD	N/A	Not readily detectable by enemy. Very effective except in highly lit areas.
COMBAT IDENTIFICATION PANEL	D/N	ALL FLIR	GOOD	N/A	Provides temperature contrast on vehicles or building. May be obscured by urban terrain.
VS-17 PANEL	D	ALL	MARGINAL	N/A	Only visible during daylight. Easily obscured by structures.
CHEMICAL HEAT SOURCES	D/N	ALL FLIR	POOR	N/A	Easily masked by urban structures and lost in thermal clutter. Difficult to acquire, can be effective when used to contrast cold background or when aircraft knows general location.
SPINNING CHEM-LIGHT (OVERT)	N	ALL	MARGINAL	N/A	Provides unique signature. May be obscured by structures. Provides a distinct signature easily recognized. Effectiveness dependent upon degree of urban lighting.
SPINNING CHEM-LIGHT (IR)	N	ALL NVD	MARGINAL	N/A	Provides unique signature. May be obscured by structures. Effectiveness dependent upon degree of urban lighting.

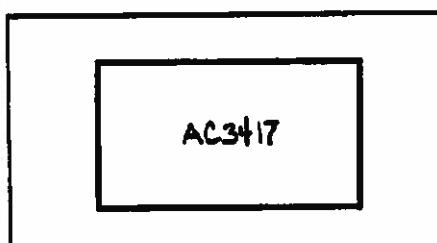
POINT TARGET SYMBOL



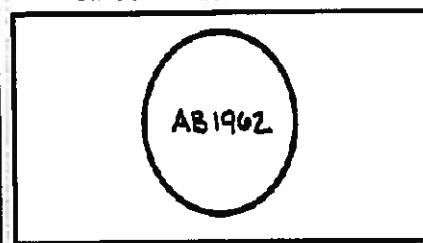
LINEAR TARGET SYMBOL



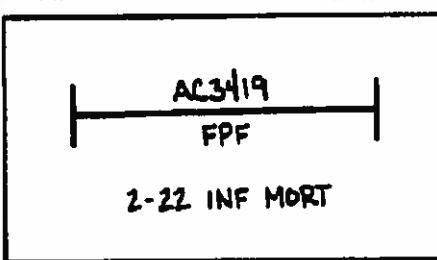
RECTANGULAR TARGET SYMBOL



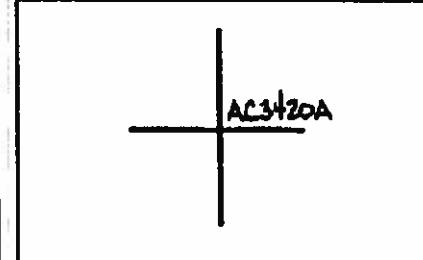
CIRCULAR TARGET SYMBOL



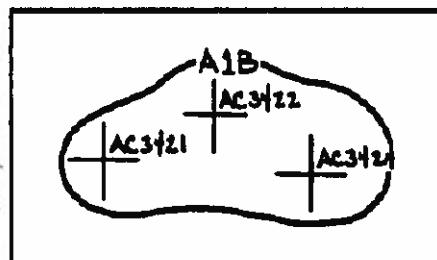
FINAL PROTECTIVE FIRE SYMBOL



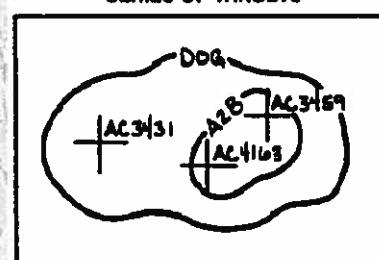
TARGET REFERENCE POINT SYMBOL



GROUP OF TARGETS



SERIES OF TARGETS



CRATER ANALYSIS

CRATER ANALYSIS (Low Angle)

Types of craters

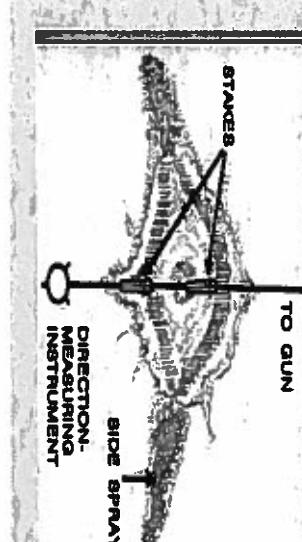
- LOW ANGLE FUZE QUICK CRATERS (ARTILLERY)
- FUZE FURROW AND CENTER OF CRATER METHOD
- SIDE SPRAY METHOD
- LOW ANGLE FUZE DELAY CRATERS (ARTILLERY)
- RICOCHET FURROW METHOD
- HIGH ANGLE SHELL CRATERS (MORTARS)
- MAIN AXIS METHOD
- SPLINTER GROOVE METHOD
- FUZE TUNNEL METHOD

Equipment needed

- M2 AIMING CIRCLE (M2 COMPASS), STAKES, AND COMMUNICATIONS WIRE TO OBTAIN DIRECTION
- A CURVATURE TEMPLATE
- DIA PROJECTILE FRAGMENTATION GUIDE FOR MEASURING FRAGMENT DIMENSIONS (DST-1160-G-028-85, WITH CHANGE 1, DATED 27 JAN 89)
- BLANK DA FORM 2186-R (ARTILLERY COUNTERFIRE INFORMATION)

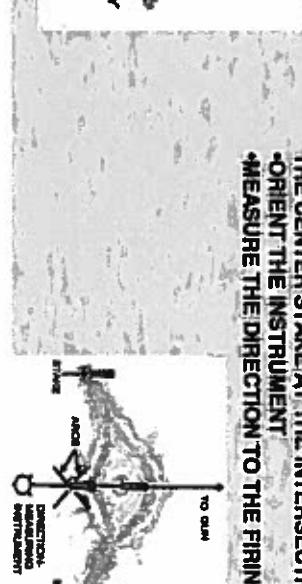
Fuze Furrow and Center of Crater Method

- PLACE A STAKE IN CENTER OF CRATER
- PLACE A SECOND STAKE IN THE FUZE FURROW
- SET UP A DIRECTION MEASURING INSTRUMENT IN LINE WITH THE STAKES AND AWAY FROM FRAGMENTS
- ORIENT THE INSTRUMENT
- MEASURE THE DIRECTION TO THE HOSTILE WEAPON



Side Spray Method

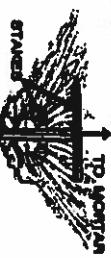
- PLACE A STAKE IN THE CENTER OF CRATER
- PLACE TWO STAKES, ONE AT THE END OF EACH END OF EACH LINE OF SPRAY, EQUIDISTANT FROM THE CENTER STAKE
- HOLD A LENGTH OF COMMUNICATIONS WIRE (OR ANOTHER APPROPRIATE FIELD EXPEDIENT MEANS) TO EACH SIDE SPRAY STAKE; AND STRIKE AN ARC FORWARD OF THE FUZE FURROW
- PLACE A STAKE WHERE THESE ARCS INTERSECT
- SET UP A DIRECTION MEASURING INSTRUMENT IN LINE WITH THE CENTER STAKE AT THE INTERSECTION OF THE ARCS
- ORIENT THE INSTRUMENT
- MEASURE THE DIRECTION TO THE FIRING WEAPON



CRATER ANALYSIS (High Angle)

SPLINTER GROOVE METHOD

- LAY A STAKE ALONG ENDS OF THE SPLINTER GROOVES THAT EXTEND FROM THE CRATER
- LAY A SECOND STAKE, PERPENDICULAR TO THE FIRST STAKE THROUGH THE AXIS OF THE FUZE TUNNEL
- SET-UP A DIRECTION MEASURING INSTRUMENT IN LINE WITH THE SECOND STAKE AND AWAY FROM FRAGMENTS
- ORIENT THE INSTRUMENT
- MEASURE THE DIRECTION TO THE WEAPON



MAIN AXIS METHOD

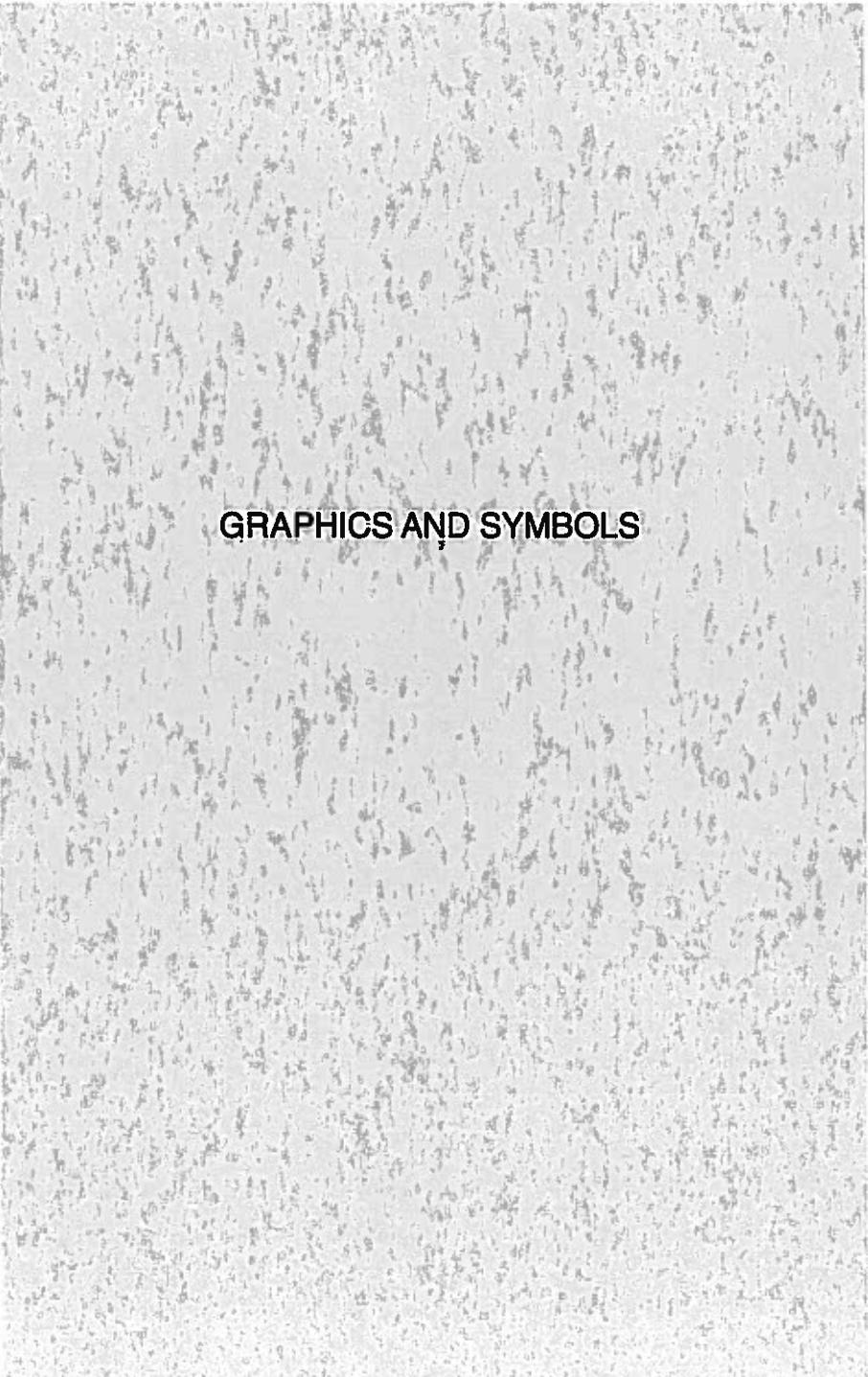
- LAY A STAKE ALONG THE MAIN AXIS OF THE CRATER, DIVIDING THE CRATER IN SYMMETRICAL HALVES. THE STAKE POINTS IN THE DIRECTION OF THE MORTAR
- SET-UP A DIRECTION MEASURING INSTRUMENT IN LINE WITH THE STAKE AND AWAY FROM FRAGMENTS
- ORIENT THE INSTRUMENT
- MEASURE THE DIRECTION TO THE WEAPON



FUZE TUNNEL METHOD

- PLACE A STAKE IN THE FUZE TUNNEL
- SET-UP A DIRECTION MEASURING INSTRUMENT IN LINE WITH THE STAKE AND AWAY FROM FRAGMENTS
- ORIENT THE INSTRUMENT
- MEASURE THE DIRECTION TO THE WEAPON





GRAPHICS AND SYMBOLS

Air Defense

AD Gun Towed	
AD Gun Tracked / Armored	
Wheeled / Armored	
AD Gun / Missile	
Tracked / Armored	

Armor

Assault	
Amphibian	
Wheeled	
Tank Equipped	
Antiarmor	

Combat Arms

Lift Helos	
Light (UH-1 or 60)	
Medium (UH-47 / CH-46)	
Heavy (CH-53)	
Engineer	
Aviation	
AT Motorized	
AT Mesh	
Basic Aviation	
Engineer	
CBT	
CBT	
Combat Engineers	
Mechanized CBT	
Artillery	
Basic towed	
Construction	
CON	
Railway Construction	
Pipeline Construction	
Tracked (COLT)	
Dismounted (FIST)	
Counter Battery Radar	
Forward Observer	
SP Rocket Artillery	
SIP Artillery	

Combat Arms (Cont'd)

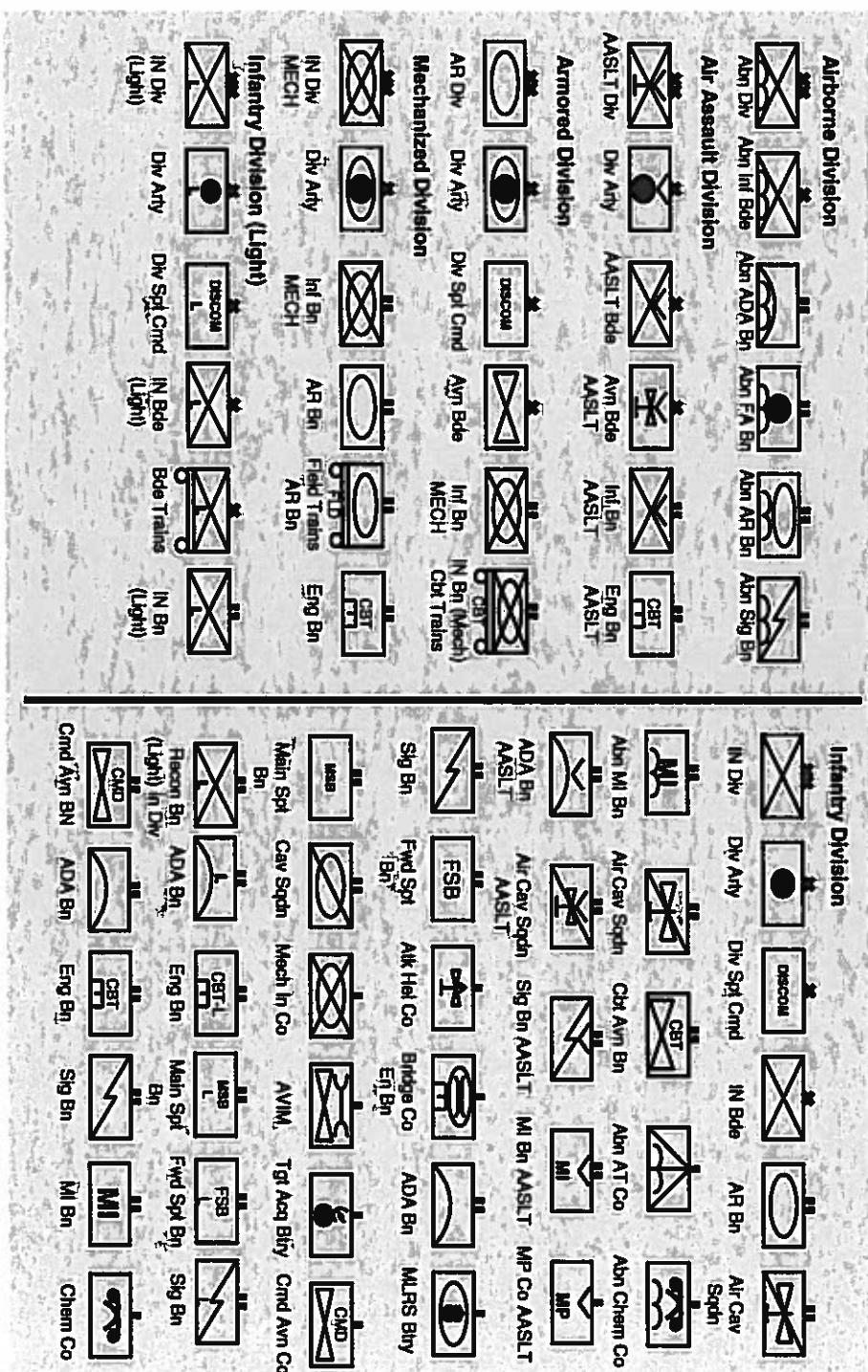
Artillery		HIMARS
Sound Ranging		
Surface to Surface Missile		
Survey Team		
ANGICO		
Infantry		
Basic		
Mortar		
Mortar (armored)		
EFSS (ITV Mounted 120mm Mortar)		
Air Assault Infantry with out aircraft		
Air Assault Infantry with aircraft		
Amphibious Infantry		
USMC Landing Team		
Artic		
Reconnaissance		
Light		Reconnaissance
Mech Infantry		
Mech Infantry In tracked Fighting Vehicle		
Dismounted Mech Infantry		
Mech Inf Fighting Vehicle USMC LAV		
Motorized Infantry		
Mountain		
Naval Infantry		
Observation Post		
Combat Outpost		
Reconnaissance		
Reconnaissance Cavalry or Scouts		
Airborne Reconnaissance Cavalry or Scouts		
Signals / Communications		
Radio Relay Station		
Retransmission Station		
Radio/Wireless Station		
Radio Recon OP		
Signal Support Operations		
Telephone Switching Center		
Teltype Center		
Tactical Satellite Communications		

Chemical Corps	Military Intelligence	Law Enforcement
 Basic Chemical	 MI Military Intelligence	 MP Military Police
 Decontamination	 Aerial Exploitation (UAV)	 Signals / Communications
 Smoke	 GSM Ground Station Module	 Communications
 APC equipped Smoke	 J-STARS	 Area Signal
 Motorized Smoke	 MET Meteorological	 Command Operations
 Smoke & Decontamination	 OPS Operations	 Construction / Installers
 APC equipped Smoke & Decontamination	 Military Intelligence	 FES Forced Entry System
 Motorized Smoke & Decontamination	USMC SCAMP	CCP Communications Configured Package
 Sensor OP/LP	Sensor Control and Management	Airborne CCP
Biological Recon	TEB	Large Extension Node
Chem/Nuc Recon (FOX)	EW Electronic Warfare (Basic)	Node Center
Chem/Nuc Recon (M21)	EW Equipped USMC LAV	RAU Remote Access Unit
NBC Observation Post (Dismounted)	DF	SEN Small Extension Node
Landing Support	EW Intercept	
Landing Support	EW Jamming	
Shore Party		

Combat Support (Continued)

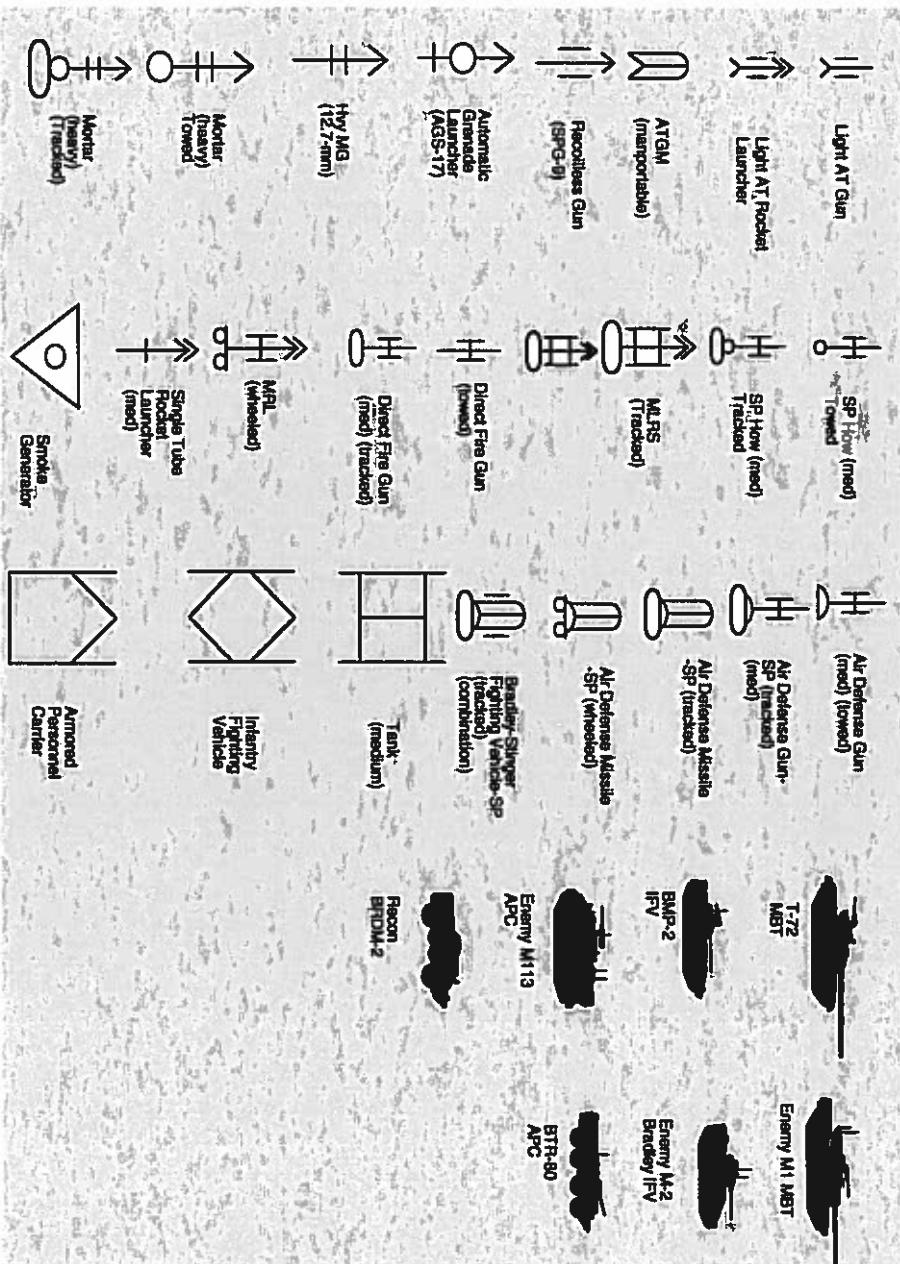
Combat Service Support

D	Denial	Basic Supply	Supply and Transport
V	Veterinary	Class I Subsistence	Motor Transport
MWR	Morale, Welfare & Recreation (MWR)	Class II Clothing, Indv Equipment, Tentage Etc	Railhead
MF	Mortuary Affairs	Class III POL Supply Barrier Material	Seaport (SPOD or SPOE)
PS	Personnel Services	Class IV Construction & Barrier Material	Airfield/Airport (APOD or APOE)
Mail or Counter	Class V AMMO	Water Distribution	
PA	Public Affairs	Class VI Personal Items	
BPAD	Broadcast Public Affairs Department	Class VII Major assemblies	
PRESS	Corps Media Center	SF	Special Forces
JIB	Joint Information Bureau (EAC)	SEAL	SEALS
RHU	Reception Holding Unit	Class X Civic Affairs/Non Military	CA Civil Affairs
SALV	Salvage	SF Fixed Wing	SF Rotary Wing
SVC	Service	SPT Psychological Ops (PSYOP)	Marine Force Recon
		W SF	Horse, Camel, pack animal-Mounted Special Forces



Air Def. Gun		Recoilless Rifle	
AT Gun		Multi-barrel Rocket Launcher	
AT Missile SP (Tracked)		SAM	
AT Rocket Launcher		SSM	
Air Def. Gun SP		ASM	
Direct Fire or Cannon		Non-LOS AT Missile	
Howitzer		Armor Protected Wheeled	
Laser		Mk 19 on HMMWV	
Rifle or Automatic		Bradley-Stinger Fighting Vehicle	
Mortar		LAV with 25mm	
Grenade Launchers		Scud on a TEL	
Flame Thrower		Medium Tank with Mine Rollers	
Smoke Generator		Medium Tank with Mine Plow	

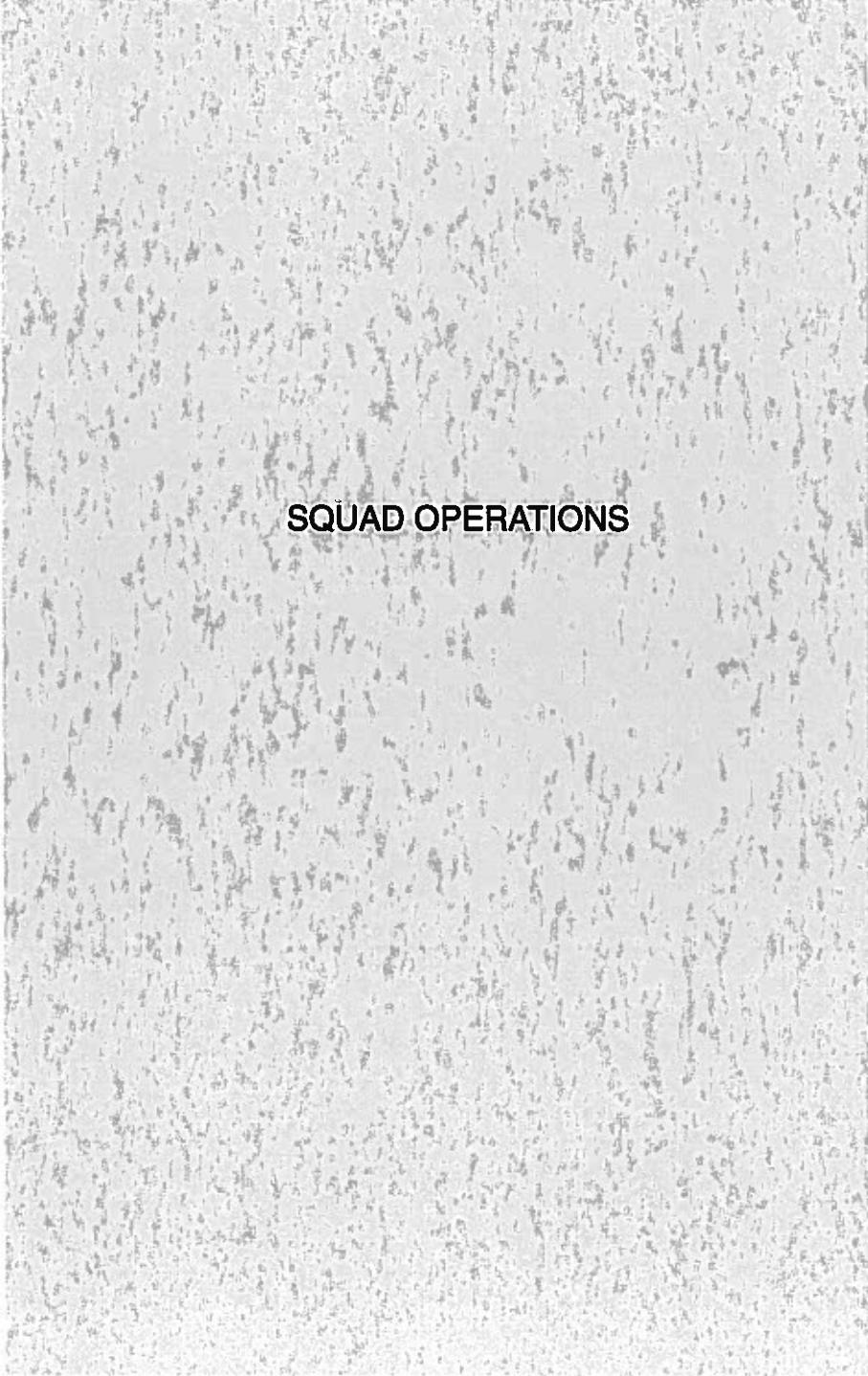
75mm M20
SPG-9
82 mm
105mm



Minefields (Continued)	
Mined Area	
Obstacle Effect:	
Block	
Fix	
Tum	
Disrupt	
Obstacle-Free Area	
Obstacle-Restricted Area	
Roadblocks, Craters, and Blown Bridges Planned (Usually used to close a lane through an antitank ditch or other obstacle.)	
Explosives, State of Readiness-1 (Safe)	

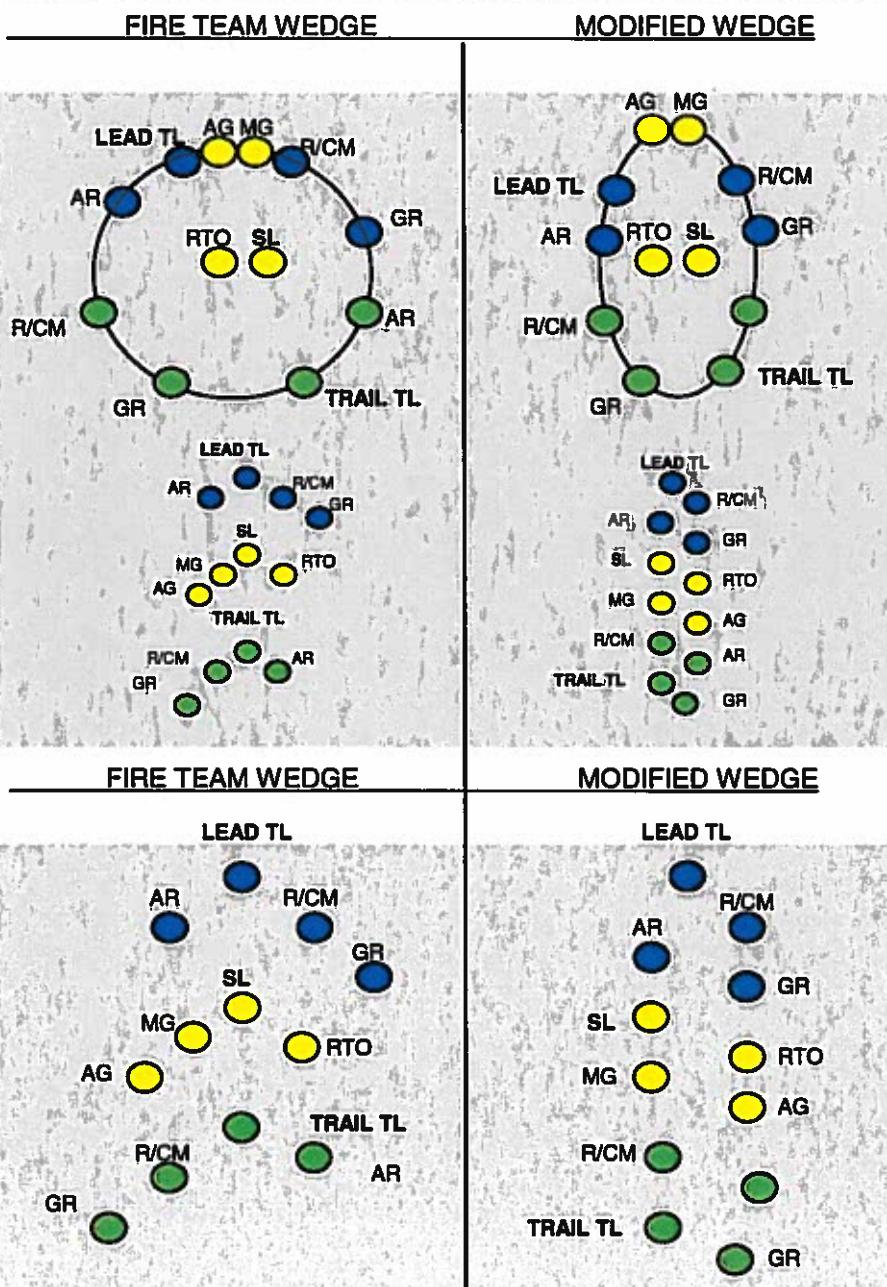
**JULIAN DATE CALENDAR
(PERPETUAL)**

DAY	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	DAY
1	001	092	060	091	121	152	182	219	244	274	305	335	1
2	002	093	061	092	122	153	183	214	245	275	306	336	2
3	003	094	062	093	123	154	184	215	246	276	307	337	3
4	004	095	063	094	124	155	185	216	247	277	308	338	4
5	005	096	064	095	125	156	186	217	248	278	309	339	5
6	006	097	065	096	126	157	187	218	249	279	310	340	6
7	007	098	066	097	127	158	188	219	250	280	311	341	7
8	008	099	067	098	128	159	189	220	251	281	312	342	8
9	009	040	068	099	129	160	190	221	252	282	313	343	9
10	010	041	069	100	130	161	191	222	253	283	314	344	10
11	011	042	070	101	131	162	192	223	254	284	315	345	11
12	012	043	071	102	132	163	193	224	255	285	316	346	12
13	013	044	072	103	133	164	194	225	256	286	317	347	13
14	014	045	073	104	134	165	195	226	257	287	318	348	14
15	015	046	074	105	135	166	196	227	258	288	319	349	15
16	016	047	075	106	136	167	197	228	259	289	320	350	16
17	017	048	076	107	137	168	198	229	260	290	321	351	17
18	018	049	077	108	138	169	199	230	261	291	322	352	18
19	019	050	078	109	139	170	200	231	262	292	323	353	19
20	020	051	079	110	140	171	201	232	263	293	324	354	20
21	021	052	080	111	141	172	202	233	264	294	325	355	21
22	022	053	081	112	142	173	203	234	265	295	326	356	22
23	023	054	082	113	143	174	204	235	266	296	327	357	23
24	024	055	083	114	144	175	205	236	267	297	328	358	24
25	025	056	084	115	145	176	206	237	268	298	329	359	25
26	026	057	085	116	146	177	207	238	269	299	330	360	26
27	027	058	086	117	147	178	208	239	270	300	331	361	27
28	028	059	087	118	148	179	209	240	271	301	332	362	28
29	029		088	119	149	180	210	241	272	302	333	363	29
30	030		089	120	150	181	211	242	273	303	334	364	30
31	031		090		151		212	243		304		365	31

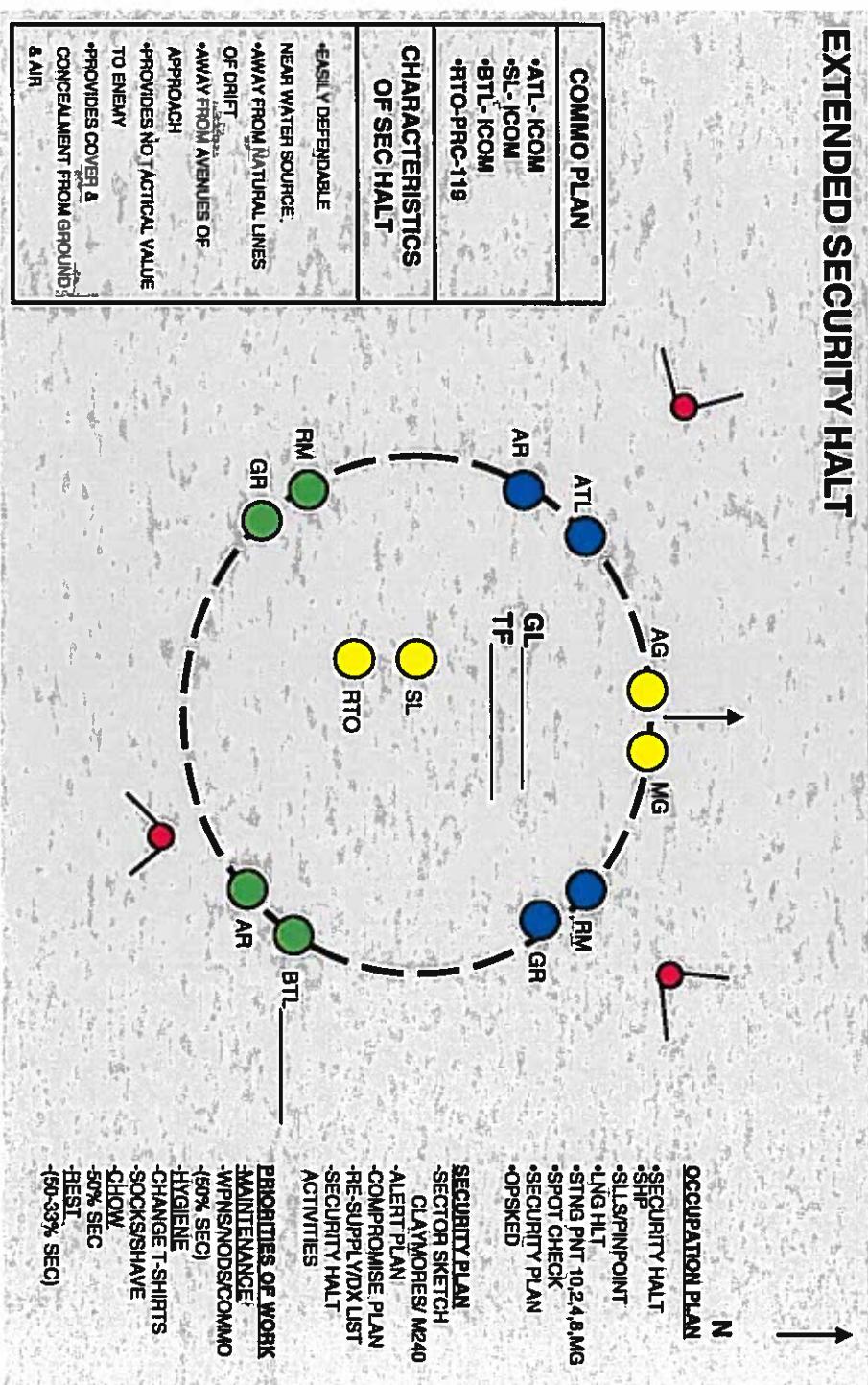


SQUAD OPERATIONS

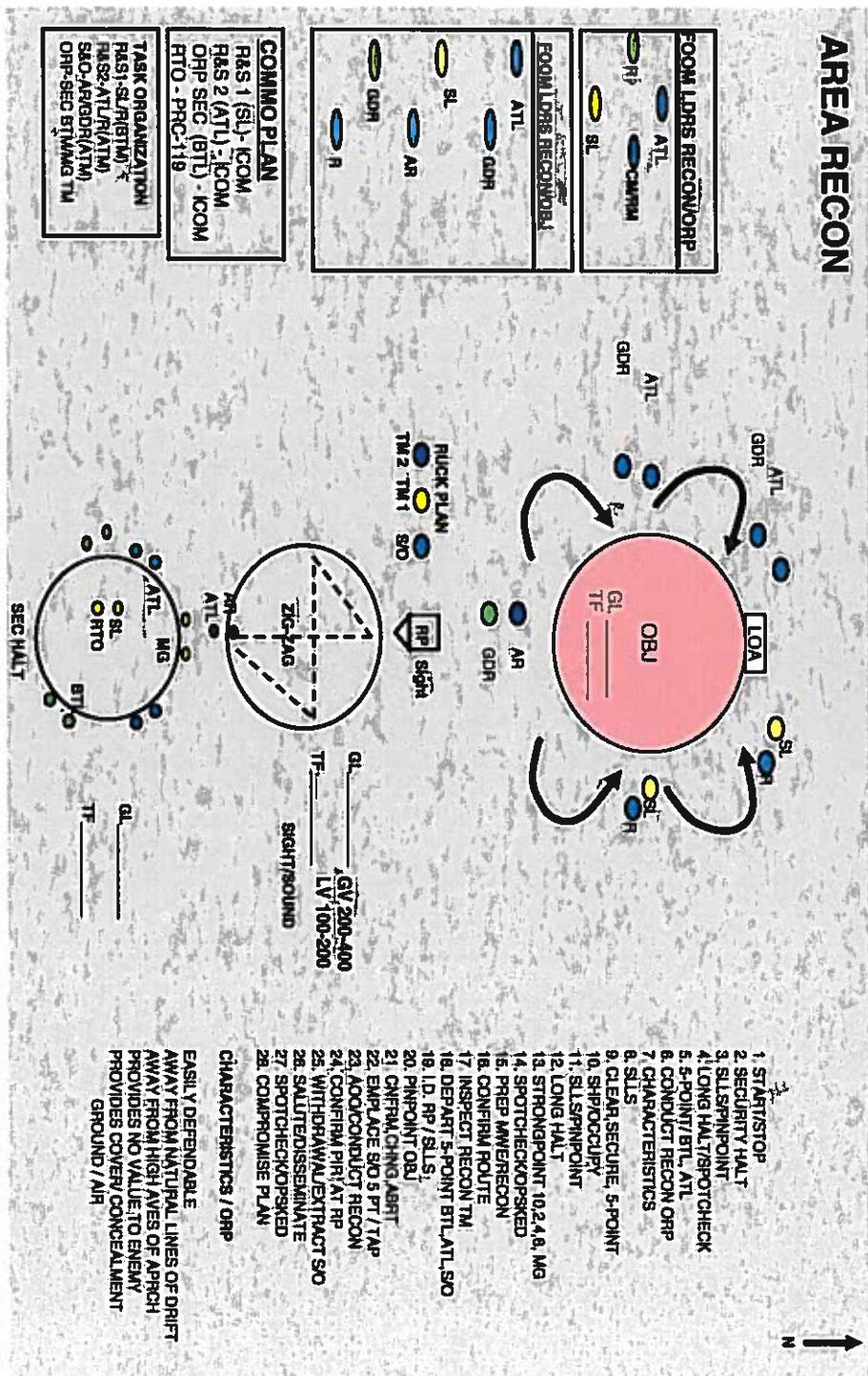
FORMATIONS AND ORDER OF MOVEMENT



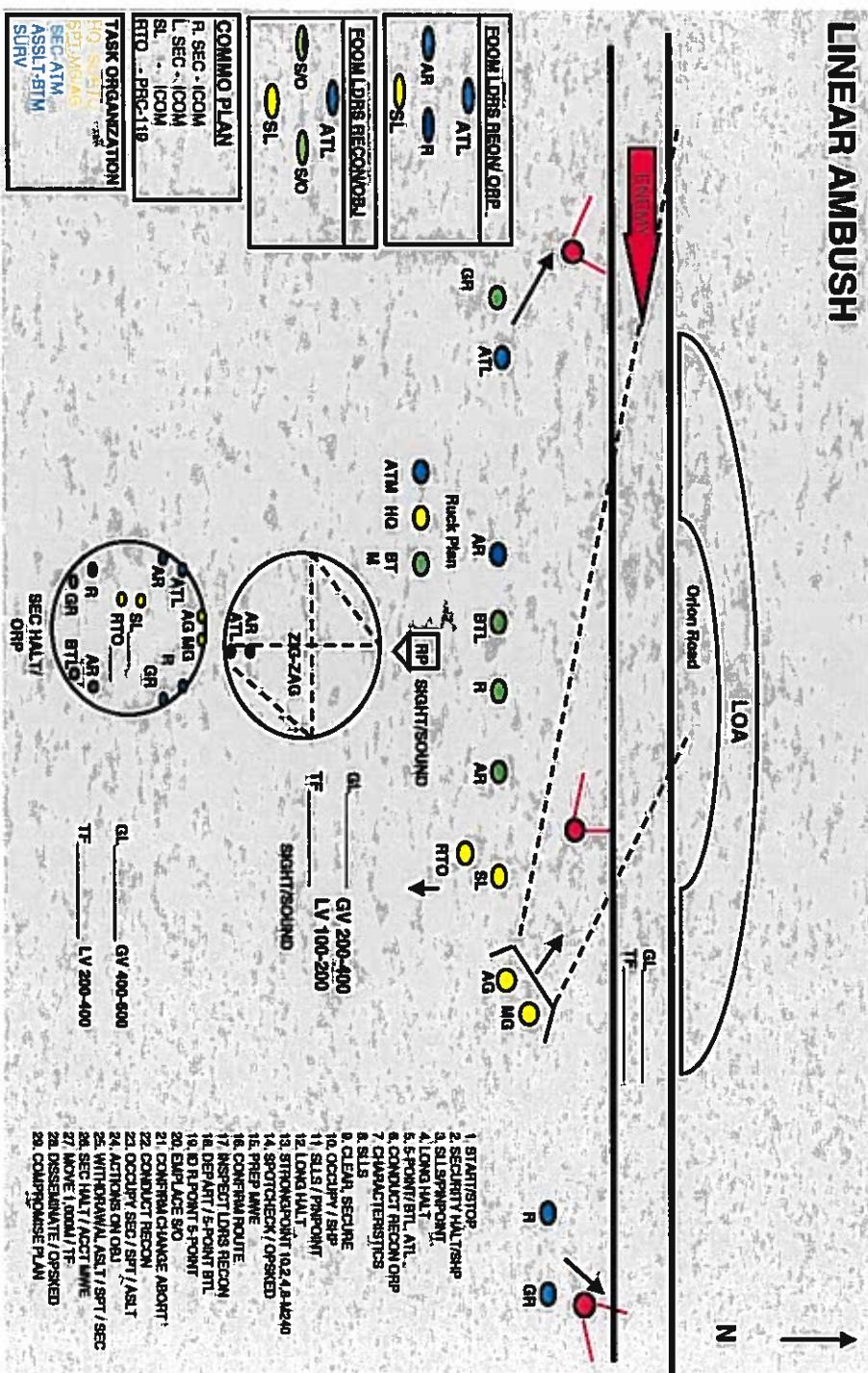
EXTENDED SECURITY HALT



AREA RECON



LINEAR AMBUSH



SQUAD PATROL BASE



GL
TF
DIR
DIST

ALT
GL
TF

GL
TF
DIR
DIS

FOOMDERS RECONNE

ATL
FM
SL

CLEAR & SECURE

ZIG ZAG
ATL

COMMOP PLAN

ATL-ICOM

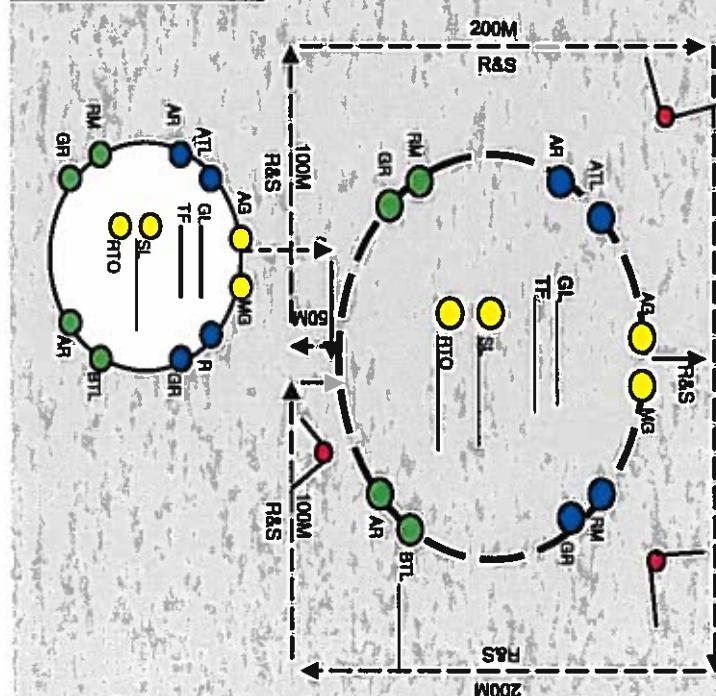
ATL-RCOM

ATO-PROG-10

CHARACTERISTICS OF OPB

- EASILY DEFENDABLE
- AWAY FROM NATURAL LINES OF DRIFT
- AWAY FROM VENUES OF APPROACH
- PROVIDES NO TACTICAL VALUE TO ENEMY
- PROVIDES COVER & CONCEALMENT FROM GROUND & AIR
- NEAR WATER SOURCE

200M R&S



SECURITY PLAN

- SECTOR SKETCH
- ALERT PLAN
- WITHDRAWAL PLAN (BLACK & GOLD)
- EVACUATION PLAN
- ALT PB
- PATROL BASE ACTIVITIES

PRIORITIES OF WORK

- WPNNS/NDS/RCOMMO (50% SEC)
- CHARGE T-
- SHIRT/SOCKS IS HAVE CAMMO
- SIT/TRENCH (10% SEC)
- CHOW
- 50% SEC
- REST
- (15-35% SEC)
- TLPs
- FIELD PLANNING
- TACTICAL RESUPPLY

SQUAD PATROL BASE (CLANDESTINE/PASSIVE)

GOLD

ALT PB

GL

TF

DIR

DIST



BLACK

ALT PB

GL

TF

DIR

DIST

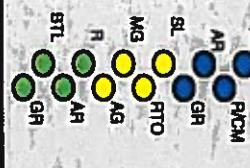
GL

TF

DIR

DIST

FOOM (MODIFIABLE WEDGE)



OCCUPATION PLAN

- CHARACTERISTICS
- SECURITY HALT
- SLS

LONG HALT/ STRONG POINT

10, 2, 4, 8

•SPOT CHECK

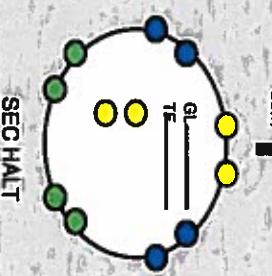
•PREP M.W. & E

•SPOT CHECK

•CONFIRM ROUTE & DISTANCE

•SHR/ MOVE

•OCCUPY/ SLS



35m

to

50m

CHARACTERISTICS

- EASILY DEFENDABLE
- AWAY FROM NATURAL LINES OF DRIFT
- AWAY FROM AVENUES OF APPROACH
- PROVIDES NO TACTICAL VALUE TO ENEMY
- PROVIDES COVER & CONCEALMENT GROUND & AIR
- NEAR A WATER SOURCE

SEC HALT

- PRIORITY: ALT, PB (B & G), EVAC, ALERT
- REST PLAN (25%)
- STAND TOO
- CONFIRM ROUTE
- MOVE TO PB
- PB PRIORITIES

DEPARTURE OF FFU

DET RUCKING / CONTACT
POINT (IF NEEDED)
GL _____
TF _____

GL
TF

PASS BY
PASS THROUGH
OCCUPY

IRP

SECURITY
HALT

SL/RTO/GUIDE



FFU COORDINATION

GL
TF

LT

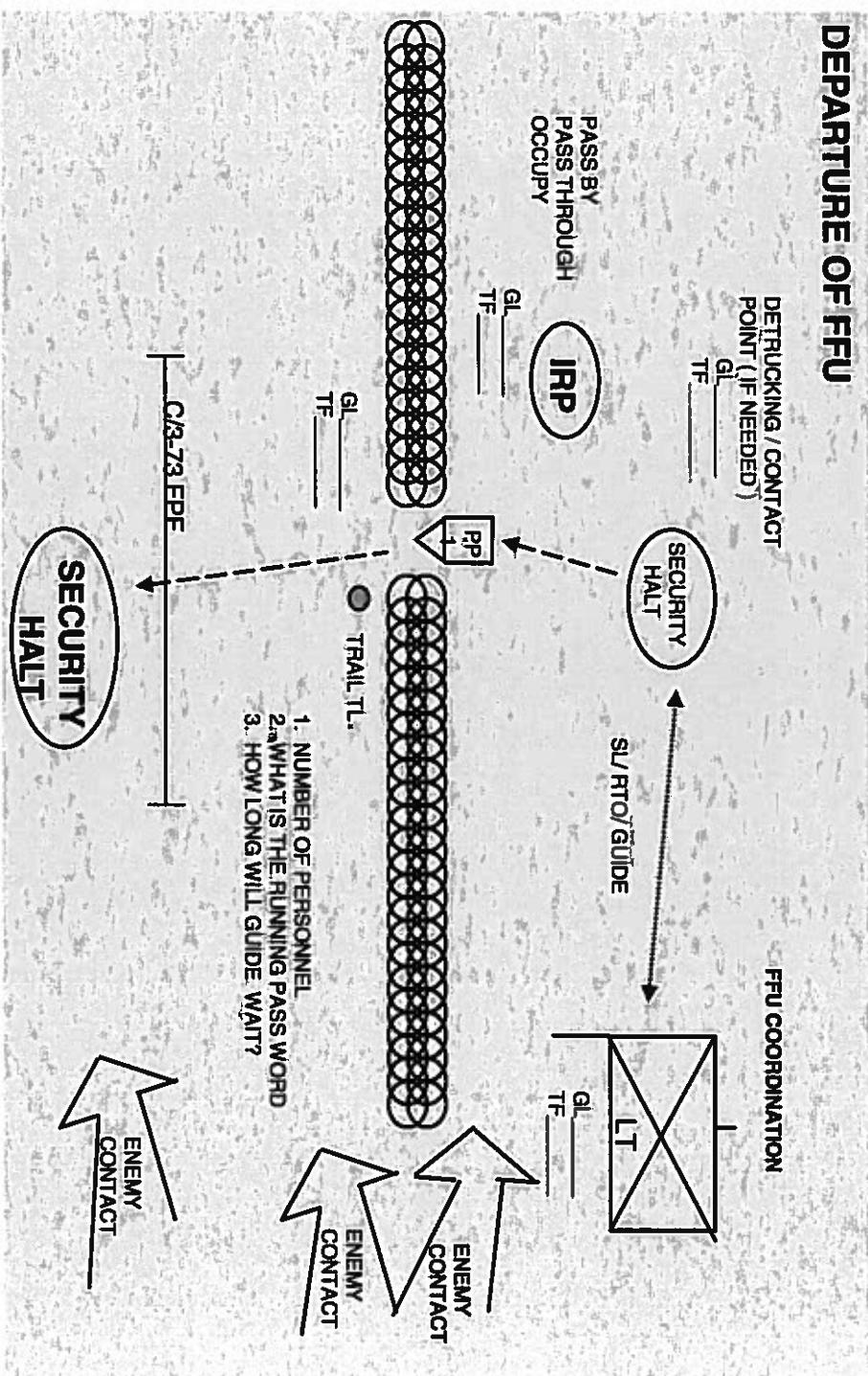
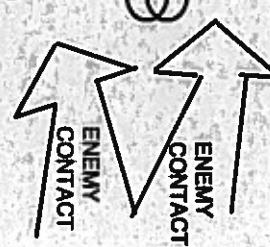
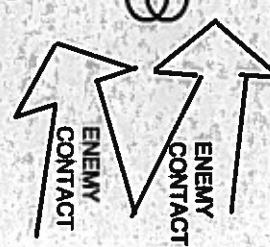
PP

PP

TRAIL TL.

1. NUMBER OF PERSONNEL
2. WHAT IS THE RUNNING PASS WORD
3. HOW LONG WILL GUIDE WAIT?

SECURITY
HALT



RE-ENTRY OF FFU

2 MAY 00

ENTRUCKING / CONTACT POINT (IF NEEDED)

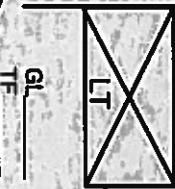
GL

TF

COURTESY VISIT

SURTO/GUIDE

SECURITY HALT



ENEMY CONTACT

GL

TF



SECURITY TRAILER

SECURITY

PROBING RULES

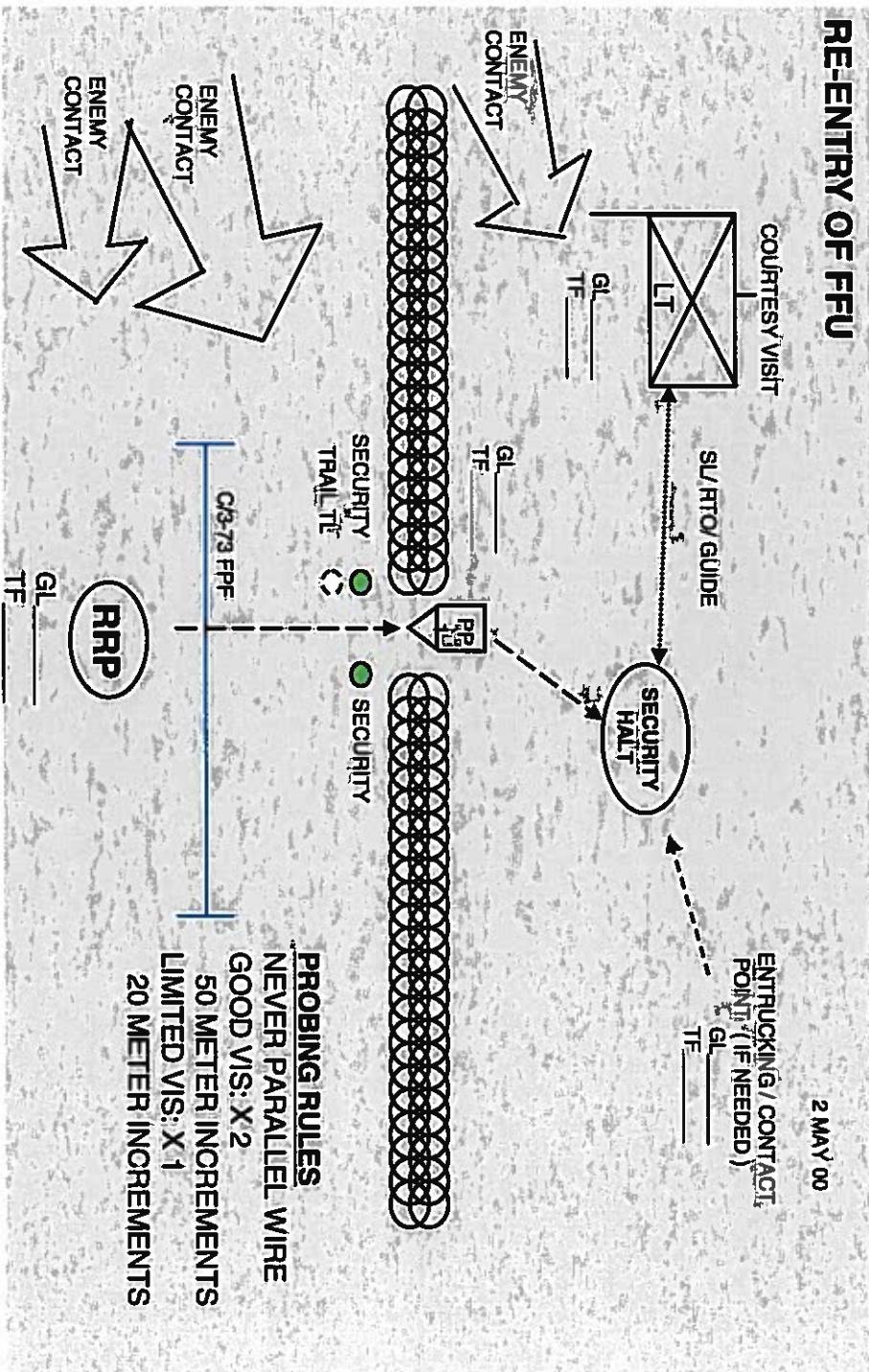
NEVER PARALLEL WIRE

GOOD VIS: X2

50 METER INCREMENTS

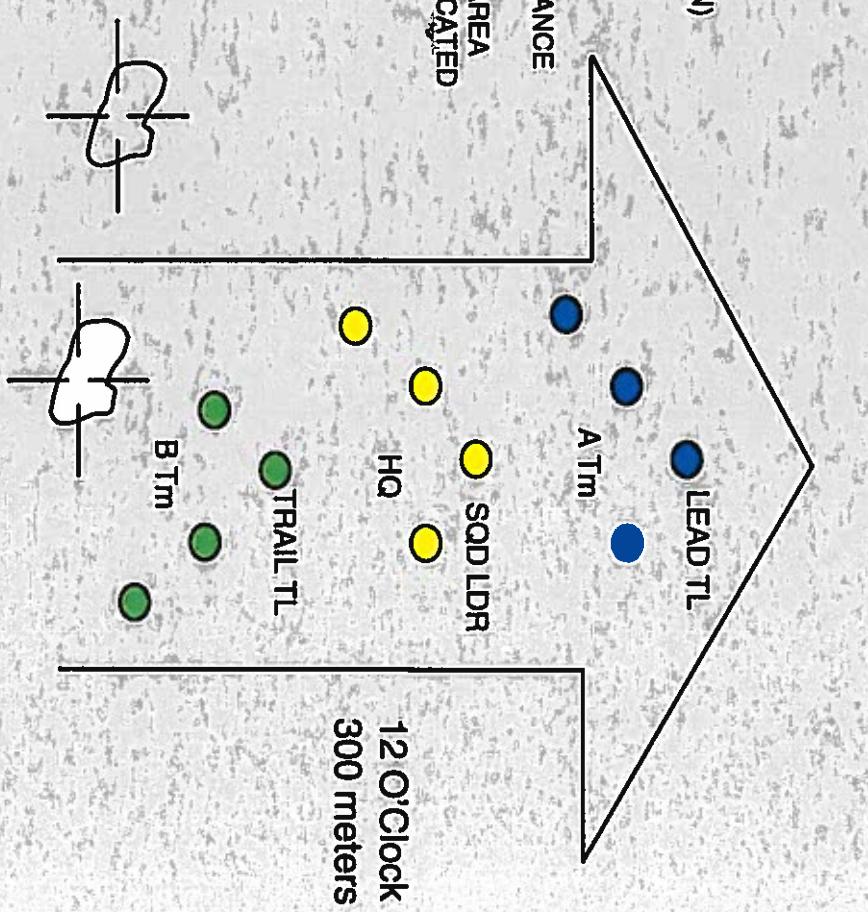
LIMITED VIS: X1

20 METER INCREMENTS



REACT TO INDIRECT FIRE

- ANY SQUAD MEMBER DETECTING INCOMING (WHISTLE OR EXPLOSION) GIVES ALERT: "INCOMING!"
- ALL SQUAD MEMBERS SEEK COVER IN THE PRONE WITHIN 2 SECONDS.
- AFTER INDIRECT FIRE IMPACTS, SL GIVES THE DIRECTION AND DISTANCE TO MOVE WITHIN 2 SECONDS
- SQUAD RUNS OUT OF THE IMPACT AREA IN THE DIRECTION & DISTANCE INDICATED
- MOVE MINIMUM 300M
- CONSOLIDATE AND REORGANIZE.



REACT TO CONTACT

BATTLE DRILL 1

- SEEK NEAREST COVER
- RETURN FIRE (known or suspected enemy locations)

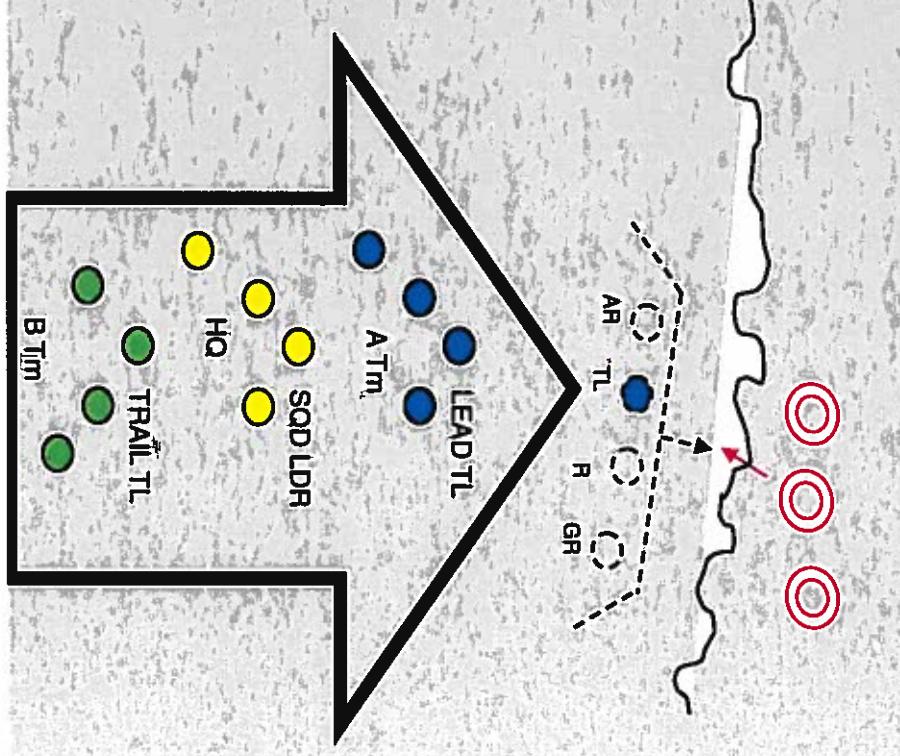
- TM LDRS CONTROL Fires by using Fire Commands:
- REPORT ENEMY SITUATION (3D's Distance, Direction, Description)

- MAINTAIN CONTACT (VISUAL/ORAL) WITH Team Members (SFC)

- SQD LDR Moves to Team in Contact and makes an Assessment of the Situation

FACTORS OF HIS ASSESSMENT:

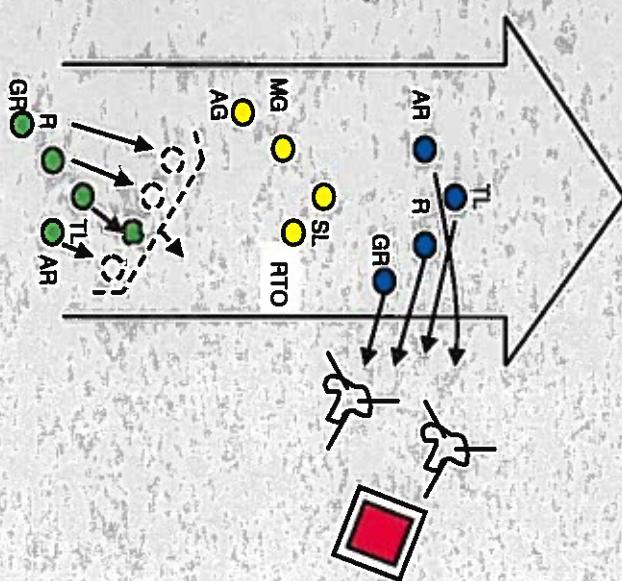
- Can Squad move out of engagement area
- Can Squad gain and maintain suppressive fire
- Location of enemy
- Size of enemy force
- Vulnerable Flanks of Enemy/Friendly Positions
- Covered/Concealed Flanking Routes
- SQD LDR Determines COA (Break, Contact, Squad Attack, ETC.)
- REPORT SITUATION TO PL



REACT TO A NEAR AMBUSH

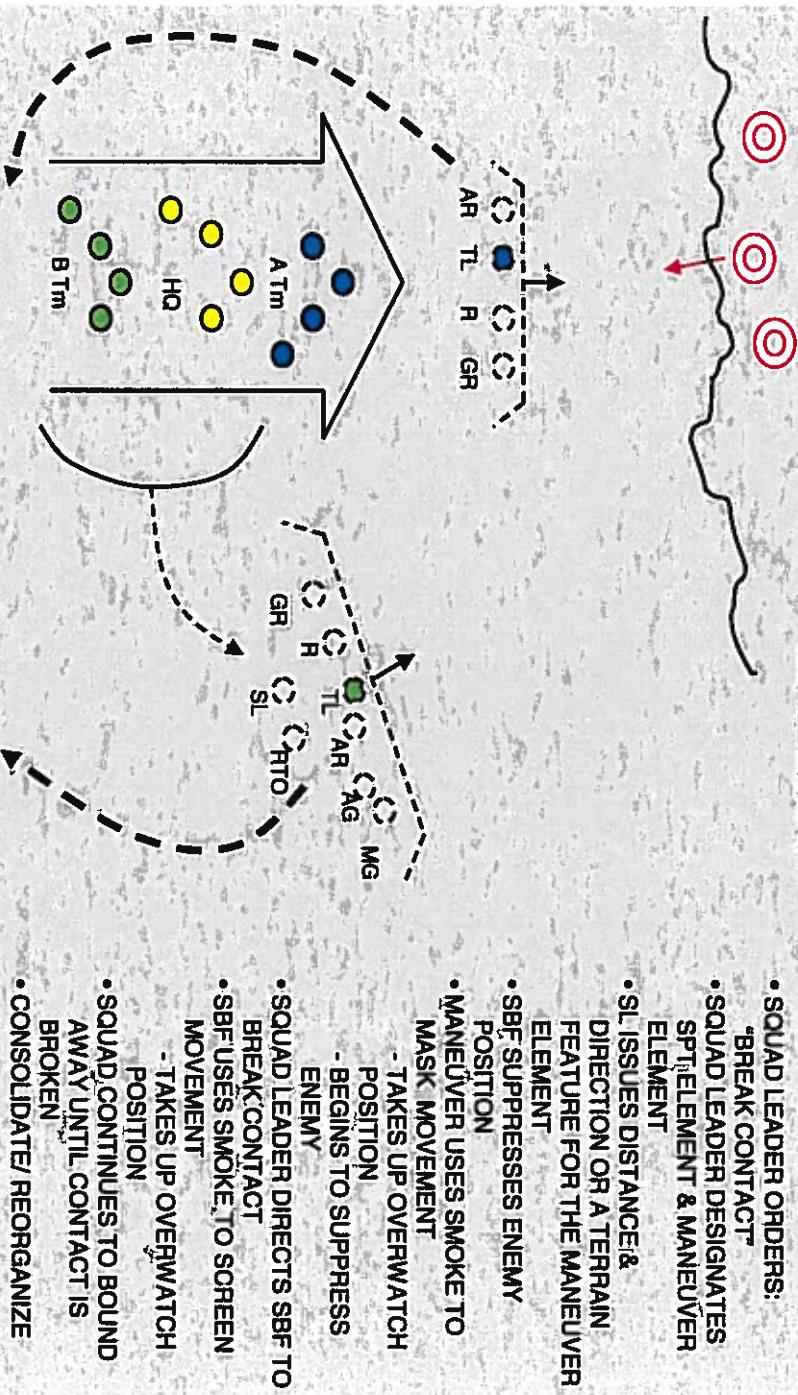
BATTLE DRILL 4

- WITHIN HAND GRENADE RANGE - 35 METERS
• SOLDIERS IN THE KILL ZONE: (WITHOUT ORDERS)
RETURN FIRE IMMEDIATELY
SEEK NEAREST AVAILABLE COVER
ASSUME PRONE POSITION
THROW CONCUSSION, FRAG, OR SMOKE GRENADES
AFTER EXPLOSION OF GRENADES, ASSAULT
THROUGH AMBUSH USING FIRE AND MOVEMENT
- SOLDIERS NOT IN KILL ZONE:
IDENTIFY ENEMY LOCATION
PLACE ACCURATE SUPPRESSIVE FIRE
SHIFT FIRES AS ASSAULT BEGINS
- SOLDIERS IN KILL ZONE CONTINUE TO ASSAULT TO
ASSAULT TO ELIMINATE AMBUSH OR UNTIL CONTACT
IS BROKEN
- CONSOLIDATE AND REORGANIZE



BREAK CONTACT

BATTLE DRILL 3



LINK-UP

OCCUPATION OF THE LURP

1ST SQD - 10 TO 2, M-60 AT 10
2ND SQD - 6 TO 2, M-60 AT 2
3RD SQD - 6 TO 10, M-60 AT 6

1ST SQUAD
TO ARRIVE
AT LINK-UP
SITE

SECT TM O ORTO
SL O O SECT TM

LURP

GL
TF

10
2

6

ENEMY
CONTACT

2ND SQUAD
SEC HALT
MOVING SQUAD

3RD SQUAD
MOVING SQUAD

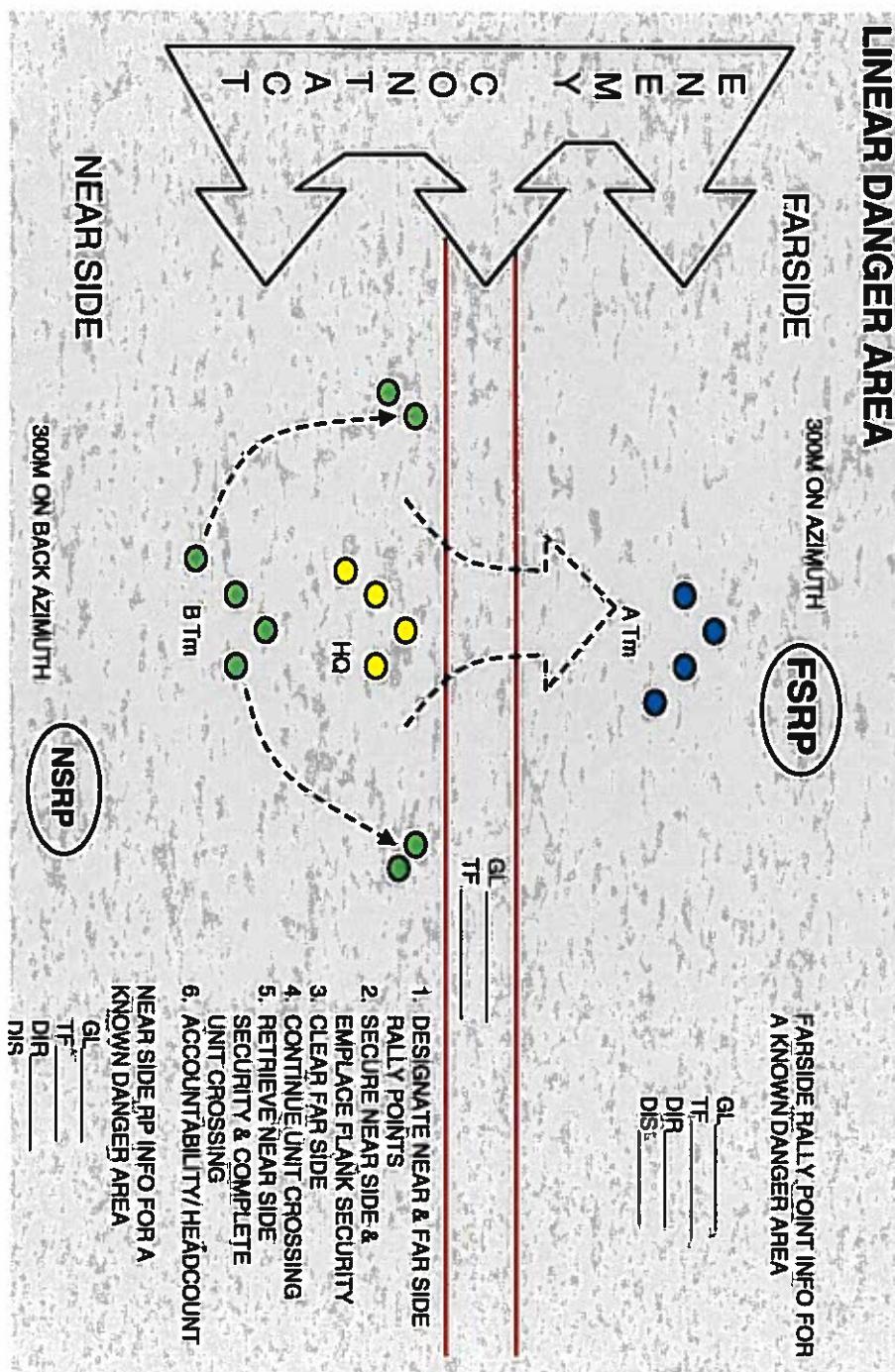
LUS

GL
TF

LUS SELECTION
EASILY RECOGNIZABLE:
OFF PROMINENT TERRAIN

FAR RECOGNITION SIGNAL: _____
NEAR RECOGNITION SIGNAL: _____

LINEAR DANGER AREA

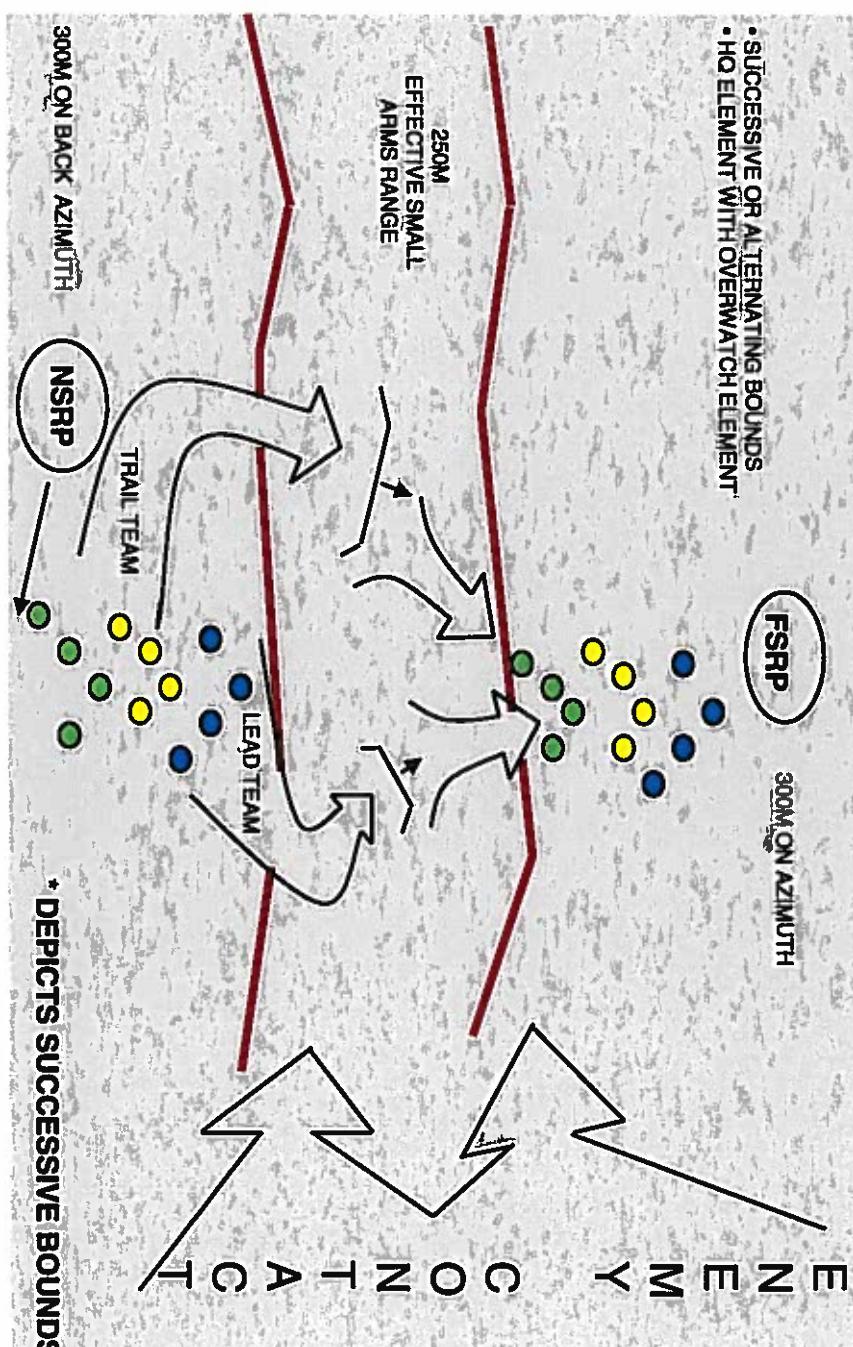


LARGE OPEN DANGER AREA

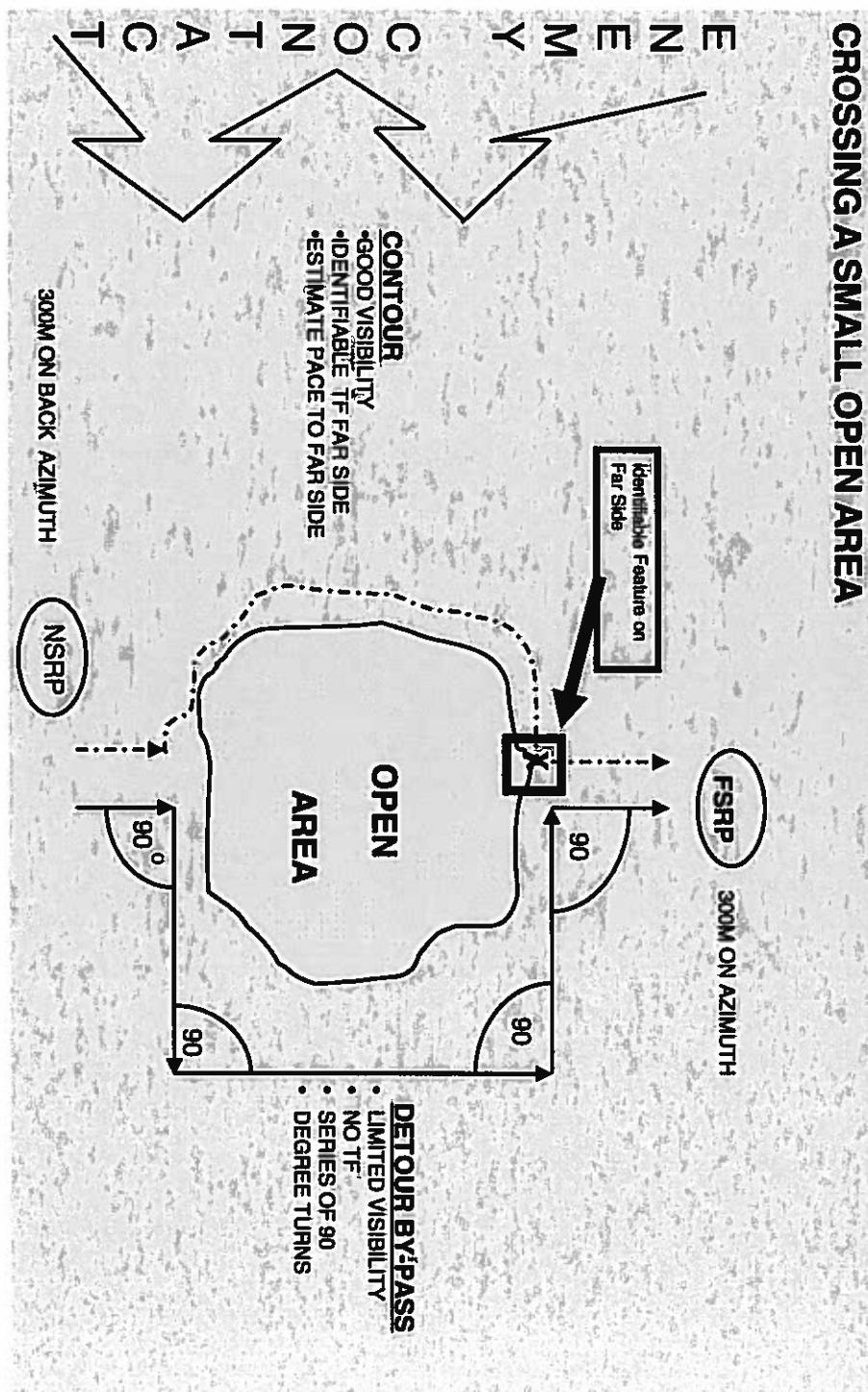
- SUCCESSIVE OR ALTERNATING BOUNDS
- HQ ELEMENT WITH OVERWATCH ELEMENT

FSRP

300M ON AZIMUTH

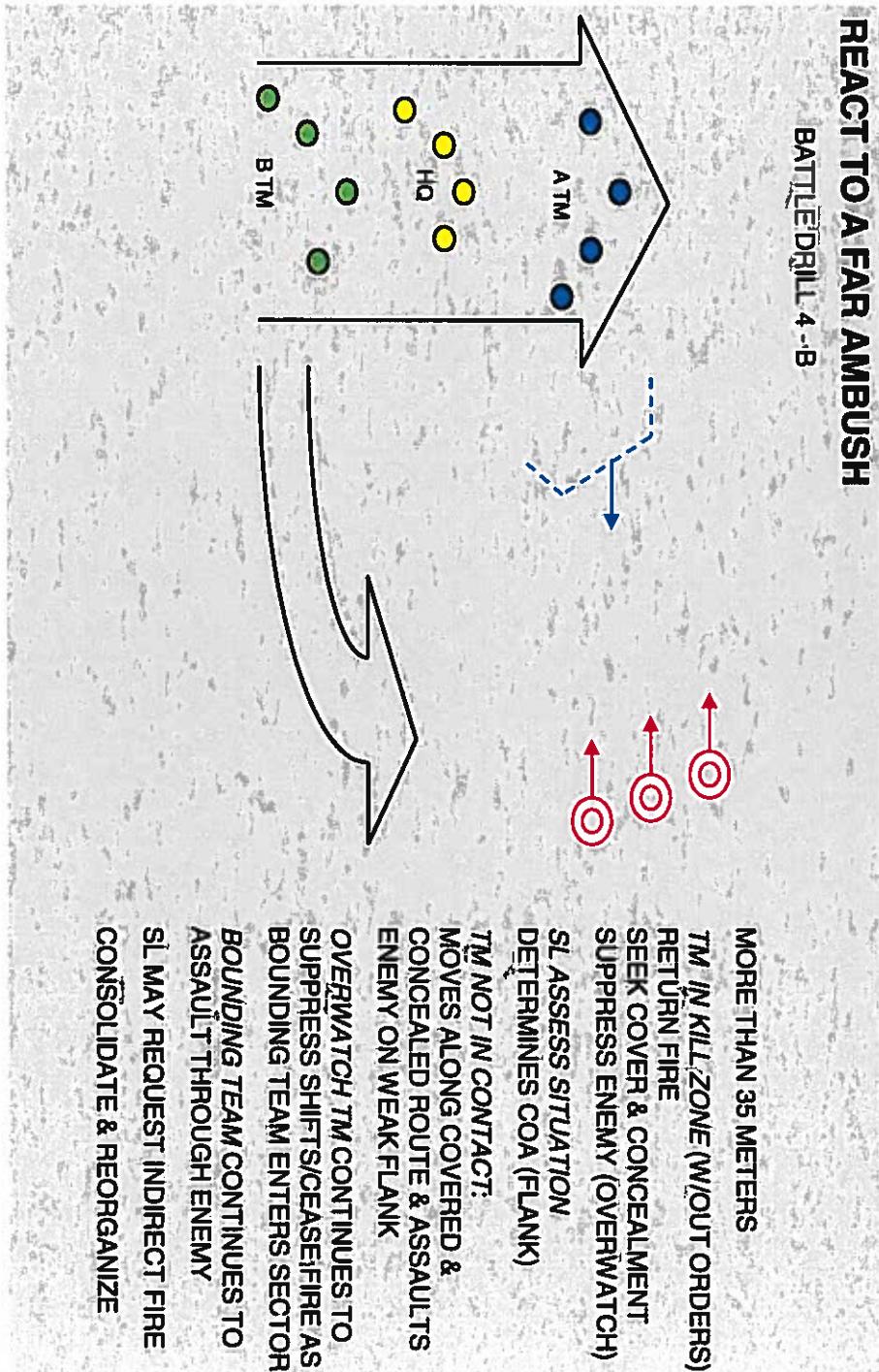


CROSSING A SMALL OPEN AREA



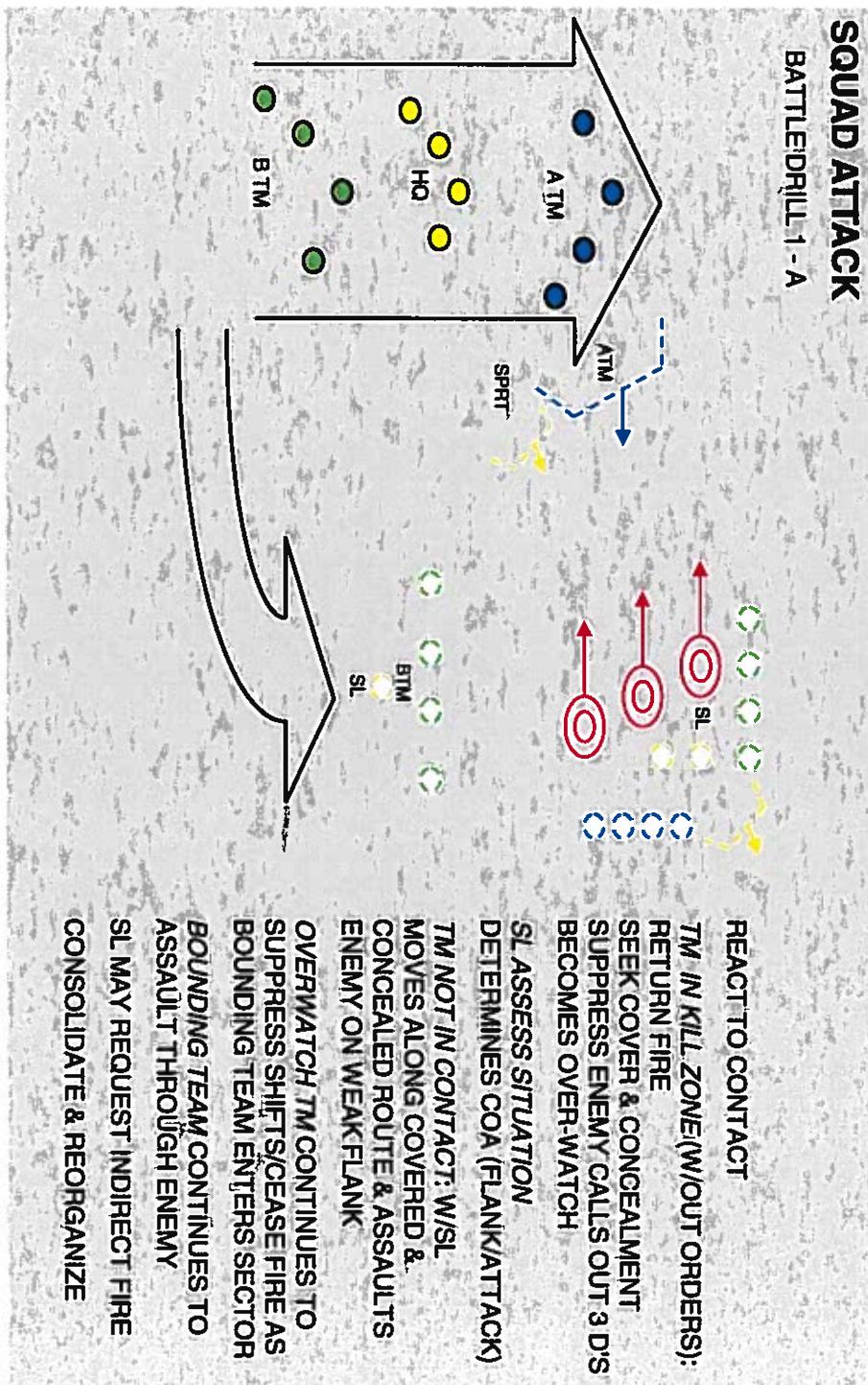
REACT TO A FAR AMBUSH

BATTLE DRILL 4 -B



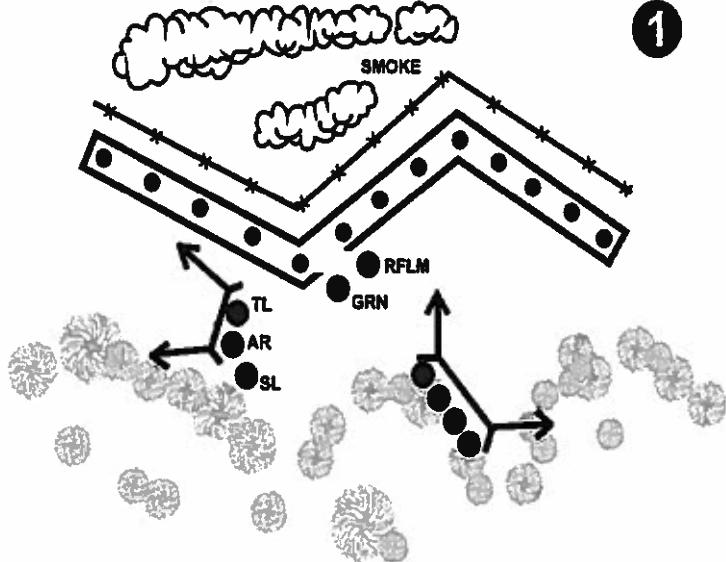
SQUAD ATTACK

BATTLE DRILL 1 - A

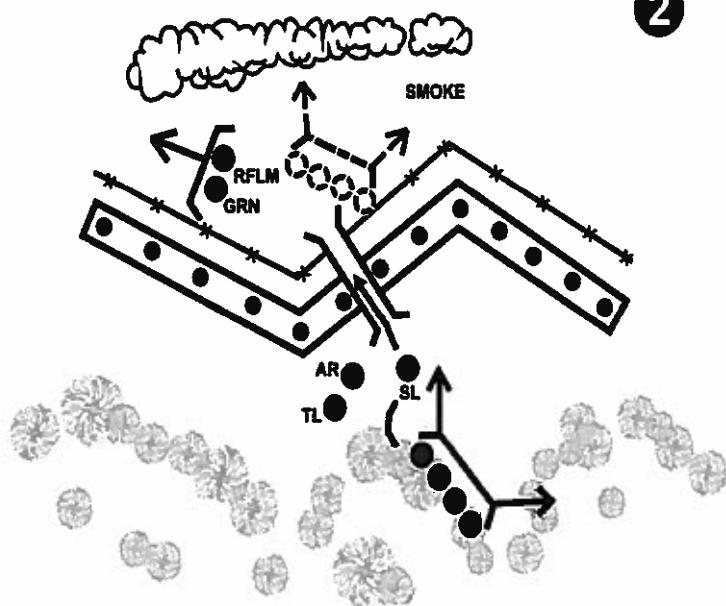


Conduct Initial Breach of Mined Wire Obstacle

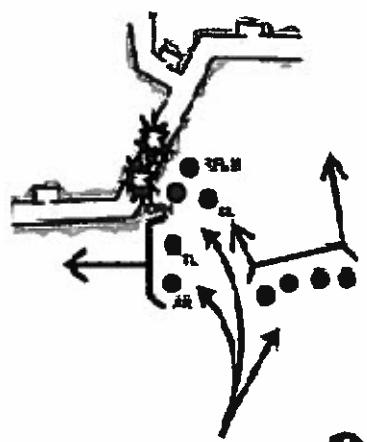
1



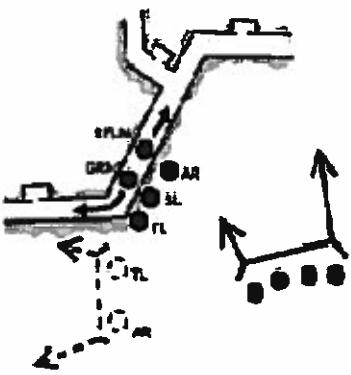
2



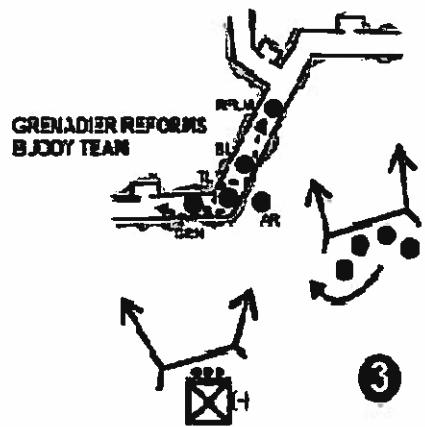
Enter a Trench



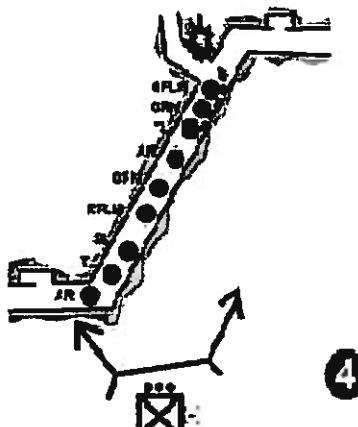
①



②



③



④

**GRENADIER REFORMS
BODY TEAM**

PLT OPERATIONS

MOVEMENT TO CONTACT

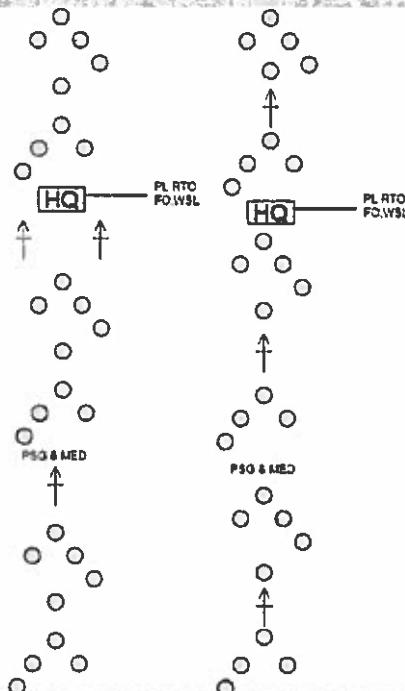
MEETING ENGAGEMENT

Movement Formations:

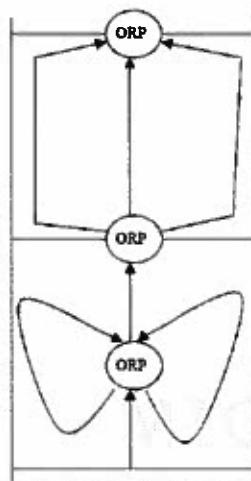
- Platoon Column: Good for speed and control, but minimal firepower to the front.
- Platoon Line: Poor speed and control, but maximum platoon firepower to the front.
- Platoon Wedge or Vee: Speed and control are better than in a line, but not as good as a column. Platoon Vee is especially effective when combined with bounding overwatch.
- Platoon File: Not a good technique if contact is expected.

Movement Techniques:

- Traveling: Faster and easier to control, but does not always facilitate making contact with the smallest element possible. Good if enemy contact not likely.
- Traveling Overwatch: Fast, but harder to control. Allows lead squad to make contact without committing the main body.
- Bounding Overwatch: Slow, but affords the best security. Best technique when contact is expected.

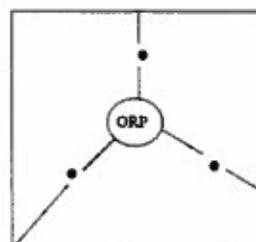


SEARCH AND ATTACK



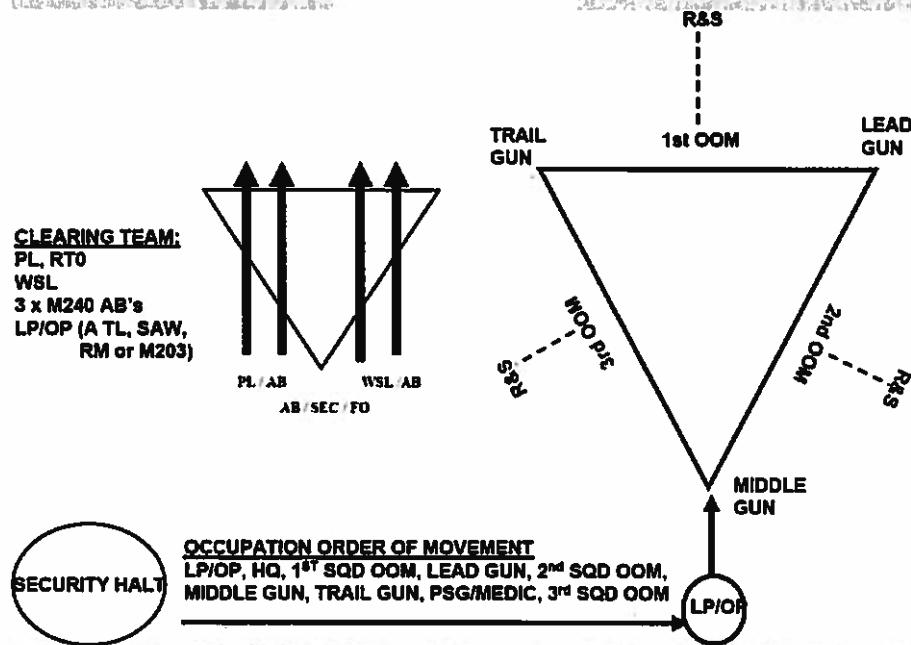
BOX TECHNIQUE:
•Easiest to plan
•Most control
•Fastest technique
•Easiest to execute
•Narrow frontage
•Must hump rucks

FAN TECHNIQUE:
•More difficult to plan v box
•Less control v box
•Slower than box technique
•More difficult to execute v box
•Wider frontage (+)
•Can leave rucks at ORP (+)



ASSIGN AO TECHNIQUE:
•Most difficult to plan
•Least control
•Slowest technique
•Most difficult to execute
•Almost unlimited size of AO
•Can be very detailed
•Can leave rucks

PLATOON PATROL BASE



Daylight Patrol Base:

- 8) STAND-TO:
 - a) Re-establish perimeter.
 - b) Continue with POWS that were not completed at night.
 - c) Preuse fire and place.
 - d) Dissemination
 - e) Reconnaissance/inspections

DEPARTURE:

- LP/CP
- Daymotos / Guns
- Short half
- Depart