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Research Product 87-33

Combat Leaders' Guide:
Platoon Leaders, Platoon Sergeants,
and Squad Leaders

ARI Field Unit at Fort Benning, Georgia
Training Research Laboratory

November 1987



U. S. Army Research Institute for the Behavioral and Social Sciences

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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) Since the modern combat leader is faced with making many complex decisions under conditions of great stress and fatigue, it is vital that he be provided with standardized job aids to assist him in accomplishing his combat mission. Until the present report, no effective, standardized job aids have been available to the combat leader. The Combat Leaders' Guide (CLG) project was initiated to produce a modular job performance aid system for combat leaders' use during periods of (Continued)		

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19. Key Words (Continued)

Recon	Medical	Supplies
Combat in cities	Air defense	Logistics
Target acquisition	Vehicle recovery	Fire support
Mines	Weapons	Conversion tables
Demo	Commo	Air assault operations
NBC	Law of war	
Land navigation	POW	

20. Abstract (Continued)

high stress in continuous combat. The CLG is designed to (1) be fully usable under combat conditions; (2) have a standardized format; (3) be a modular, highly flexible system; (4) provide fast information retrieval; (5) be easily personalized to individual need, job assignment, mission requirements, equipment availability, and area of operations by adding or removing modules; (6) be easily supplemented by higher command; (7) be fully usable under adverse weather and low light conditions; and (8) utilize as many government standard components as possible.

The CLG was designed to be produced in modular format on waterproof and tear-resistant paper. It is fastened with post screws to allow easy addition or deletion of materiel. The present research product represents camera-ready copies of the front and back side of each page.

The prototype CLG and an accompanying feedback form were distributed to active Army noncommissioned officers and officers in units and schools, and for desktop review to a number of former service members. Over 40% of respondents returned their feedback forms, with responses overwhelmingly in favor of the CLG's overall effectiveness and utility. Based upon the feedback received, changes were made to the prototype CLG.

The changes and the techniques used in the development of both the prototype CLG and the present research product are documented in the research report accompanying the prototype CLG, Field Evaluation of a Job Aid System for Combat Leaders: Rifle Platoon and Squad, and in the authoring guide, Authoring Guide: A Job Aid to Design and Produce a Combat Leaders' Guide, which is a job aid for the developers of similar job performance aids.

The Combat Leaders' Guide: Platoon Leaders, Platoon Sergeants, and Squad Leaders represents a fully usable job aid for the modern combat leader. It is easily adaptable to any career military field or branch or service and is equally usable by the Active Army, Army Reserve, and the Army National Guard.

U. S. ARMY RESEARCH INSTITUTE FOR THE BEHAVIORAL AND SOCIAL SCIENCES

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Deputy Chief of Staff for Personnel

EDGAR M. JOHNSON
Technical Director

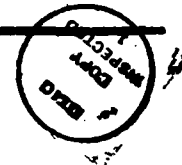
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Research Product 87-33

**Combat Leaders' Guide:
Platoon Leaders, Platoon Sergeants,
and Squad Leaders**

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Education and Training

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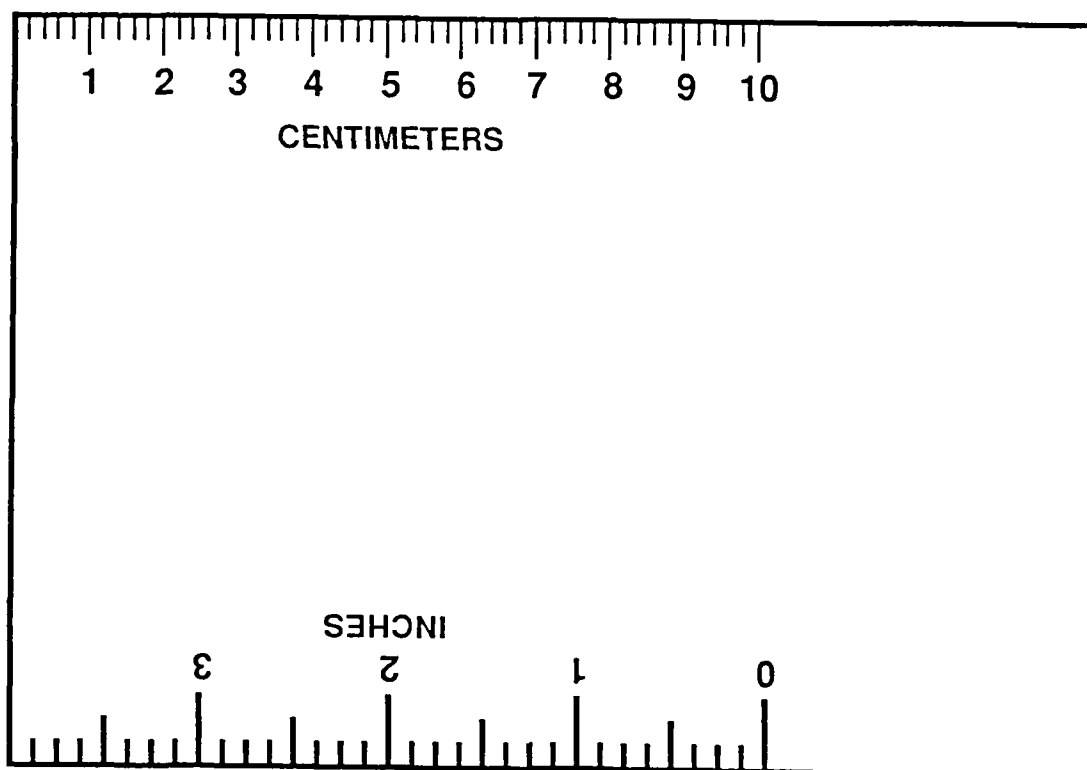
FOREWORD

Since the modern combat leader is faced with making many complex decisions under conditions of great stress and fatigue, it is important that he be provided with standardized job aids to assist him in accomplishing his combat mission. The purpose of this project was to improve on the existing prototype of the Combat Leaders' Guide: Rifle Platoon and Squad. The Combat Leaders' Guide: Platoon Leaders, Platoon Sergeants, and Squad Leaders was designed to be produced in modular format, on waterproof and tear-resistant paper. The present product contains 25 modules fastened together with post screws to allow easy addition or deletion of material. Each module and page is camera-ready.

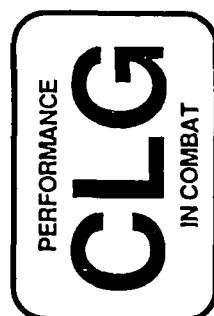
This project was produced by Litton Computer Services under contract to the Army Research Institute's Fort Benning Field Unit. The research tasks that support this mission are 1.2.5, Infantry and Special Operations Combat Effectiveness Research, and 3.4.2, Advanced Methods and Systems of Combat Vehicle Training; the work was sponsored by Training and Doctrine Command (TRADOC) Training and Technology Agency, Fort Monroe, Virginia. Overwhelmingly favorable comments on the earlier version of this product were received from personnel in Force Command units, the U.S. Army Infantry School, and other elements of TRADOC.



EDGAR M. JOHNSON
Technical Director



COMBAT LEADERS' GUIDE



PLATOON LEADERS,
PLATOON SERGEANTS,
AND SQUAD LEADERS

TRADOC TRAINING
TECHNOLOGY AGENCY
AND
ARMY RESEARCH INSTITUTE
FORT BENNING FIELD UNIT

COMBAT LEADERS' GUIDE TABLE OF CONTENTS		
#	MODULE	PAGE
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2	Plan	2.0.1
3	Move	3.0.1
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5	Defend	5.0.1
6	Delay	6.0.1
7	Withdraw	7.0.1
8	Patrol/recon	8.0.1
9	Combat in cities	9.0.1
10	Target acquisition	10.0.1
11	Mines/demo	11.0.1
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13	Land navigation	13.0.1
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0.2.1

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COMBAT LEADERS' GUIDE TABLE OF CONTENTS		
#	MODULE	PAGE
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21	Supplies/Logistics	21.0.1
22	Fire support	22.0.1
23	Conversion tables	23.0.1
24	Air assault operations	24.0.1
25	Abbreviations	25.0.1

0

0.2.2

0

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BASIC COMBAT RULES TABLE OF CONTENTS		
ITEM	PAGE	
The Principles of War	1.1.1	
The Profession of Arms	1.2.1	
Leading in combat	1.3.1	
Tactics for all echelons	1.4.1	
Basic rules of combat	1.5.1	

1	1.0.2	1
BASIC COMBAT RULES TABLE OF CONTENTS		
ITEM	PAGE	

0

0.1.1

0

INTRODUCTION

• The Combat Leaders' Guide (CLG) is a set of job aids designed to help you train for and perform your COMBAT MISSION.

- Job aids are "memory joggers" that you use while doing a task. Use them when you are tired and under stress to accurately complete complex tasks.

USING THE CLG:

- Use the job aids every time you do the tasks in training or in combat.
- Write with a #2B soft lead pencil.
- Standardize the CLGs in your unit to improve your command, control, and communication.

PAGE NUMBERS IN THE CLG:

- The 1st number (Ex: 0) is the module.
- The 2nd number (Ex: 0.1) is the job aid.
- The 3rd number (Ex: 0.1.1) is the page in that job aid.

0

0.1.2

0

INTRODUCTION

MAINTAINING THE CLG:

- Add or remove pages or modules by unscrewing the post screws.
- Protect the CLG from the weather.
- Dry the pages if they get wet.
- Reinforce the page holes if they become worn or torn.

CUSTOMIZING THE CLG:

- Add or remove pages or modules based on your unit's mission.
- Save the pages that you remove for later use.
- Organize the modules or job aids by content area or in the order you do them.
- Insert the plastic sleeves or tabs to quickly find key job aids or modules.
- Place other job aids that you make or that your unit issues in the plastic sleeves for quick reference and use.

THE PRINCIPLES OF WAR	
ITEM	PRINCIPLE
1	Objective
2	Offensive
3	Mass
4	Economy of force
5	Maneuver
6	Unity of command
7	Security
8	Surprise
9	Simplicity
Notes:	

1 1.1.1 1

THE PROFESSION OF ARMS	
THE PROFESSIONAL ARMY ETHIC	
ITEM	ETHIC
1	Loyalty to the institution
2	Loyalty to the unit
3	Personal responsibility
4	Selfless service
PROFESSIONAL SOLDIERLY QUALITIES	
ITEM	QUALITY
1	Commitment
2	Competence
3	Candor
4	Courage

1 1.2.1 1

1			1.3.1			1
LEADING IN COMBAT						
ITEM	ACTION					✓
1	Set the example					
2	Lead from as far forward as you can					
3	Lead from a position where your men can see you					
4	Lead from where you can control all elements physically or by radio					
5	Move to critical locations to influence the action					
6	Make sound, but quick decisions					
7	Forcefully execute decisions					

1			1.4.1			1
TACTICS FOR ALL ECHELONS						
ITEM	TACTIC					✓
1	Find the enemy-avoid being surprised					
2	Coordinate all firepower and electronics					
3	Maneuver to gain the initiative					
4	Protect the force					
5	Plan to sustain operations					
6	Keep lower, higher, and adjacent informed					
7	Report-report-report					
Notes:						

BASIC RULES OF COMBAT		
ITEM	RULE	✓
1	Secure	
1A	Use cover and concealment	
1B	Establish local security	
1C	Conduct the recon	
1D	Protect the unit	
2	Move	
2A	Establish moving element	
2B	Get in best position to shoot	
2C	Gain and maintain initiative	
2D	Move fast	
2E	Strike hard	
2F	Finish quick	
3	Shoot	

11.5.11

1

1.5.2

1

BASIC RULES OF COMBAT		✓
ITEM	RULE	
3A	Establish base of fire	
3B	Maintain mutual support	
3C	Kill enemy	
3D	Suppress enemy	
4	Communicate	
4A	Keep everybody informed	
4B	Tell soldiers what you expect	
5	Sustain	
5A	Keep fight going	
5B	Take care of soldiers	
Notes:		

PLAN		2
TABLE OF CONTENTS		2.0.1
ITEM	PAGE	
Troop leading procedures	2.1.1	
Warning order	2.2.1	
Factors of METT-T	2.3.1	
Military aspects of terrain	2.4.1	
Estimate of situation	2.5.1	
Analysis and comparison of courses of action	2.6.1	
Operation order	2.7.1	
Fragmentary order	2.8.1	
Time schedule	2.9.1	
Light data	2.10.1	

PLAN		2
TABLE OF CONTENTS		2.0.2
ITEM	PAGE	

2

1. Mission

2. Task organization

3. Time of operation

4. Special instructions

STEP

ACTION

1	Receive mission

2 Issue warning order

3 Make tentative plan

4 Start needed movement

5 | Recon

6 Complete plan

7 Issue orders

8 Supervise and refine

Notes:

2

2

2.3.1

2

FACTORS OF METT-T

ITEM	FACTOR	
1	Mission	
1A	Specified tasks	
1B	Implied tasks	
1C	Essential tasks	
1D	Restated mission	
1E	Constraints	
2	Enemy	
2A	Type	
2B	Location	
2C	Organization	
2D	Identification	
2E	Strength	
2F	Morale	

2

FACTORS OF METT-T		
ITEM	FACTOR	✓
2G	Capabilities	
2H	Likely courses of action	
2I	Intentions	
3	Terrain and weather	
3A	Observation	
3B	Fields of fire	
3C	Key terrain	
3D	Obstacles	
3F	Cover	
3G	Concealment	
3H	Avenues of approach	
3I	Trafficability	
3J	Visibility	

2

2.3.2

2

2

2.3.3

2

FACTORS OF METT-T		
ITEM	FACTOR	✓
3K	Weather forecast	
3L	Effect on soldiers	
3M	Effect on equipment	
4	Troops available	
4A	Number and type	
4B	Task organization	
4C	State of training	
4D	State of discipline	
4E	Strength-personnel	
4F	Strength-material	
4G	Morale	
4H	Past performance	
4I	Location and disposition	

2

2.3.4

2

FACTORS OF METT-T	
ITEM	FACTOR
4J	State of maint and supply
4K	Cbt service support available
4L	Effect of leadership
5	Time
5A	Planning and preparation
5B	Delay
5C	Line of departure
5D	Movement
5E	Start, critical, release points
5F	Hold or seize key terrain
5G	Enemy reaction
Notes:	

2

2.4.1

2

MILITARY ASPECTS OF TERRAIN	
Key word: OCOKA	
Note: Analyze EACH item from BOTH your own AND the enemy's point of view.	
ITEM	ASPECT
1	Observation and fire
2	Concealment and cover
3	Obstacles
4	Key terrain
5	Avenues of approach
Notes:	

2		2.5.1	2
ESTIMATE OF SITUATION			
1. Mission			
a. What must be done and when? _____			

b. State essential tasks and purpose.			

2. Situation and courses of action			
a. What is the situation?			
(1) What is the effect of terrain and weather? _____			

2	2.5.2	2
ESTIMATE OF SITUATION		
(2) What enemy forces are against us and where? _____		

(3) What friendly forces are available? _____		

(4) What conclusions can you draw about relative combat power? _____		

2

2.5.3

2

ESTIMATE OF SITUATION
b. What are the enemy's capabilities?
c. What are feasible courses of action to accomplish the mission?
3. Analysis of courses of action a. Select enemy capability(ies) for war gaming.

2

2.5.4

2

ESTIMATE OF SITUATION
b. War game courses of action against enemy capability(ies). (1) What are the critical events and times?
(2) What actions are required?
(3) What are major advantages and disadvantages of each course of action?

2		2
	2.5.5	
ESTIMATE OF SITUATION		
4. Comparison of courses of action-what is the best course of action? _____ _____ _____ _____ _____ _____ _____ _____		
5. Decision a. Refine the best course of action into a clear decision-include who, what, when, where, how, and why? _____ _____ _____ _____ _____ _____ _____ _____		

2		2
	2.5.6	
ESTIMATE OF SITUATION		
b. Announce the decision and concept of the operation. _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____		

2

2.6.3

2

ANALYSIS AND COMPARISON OF COURSES OF ACTION				
DOES		ITEM	DOESN'T	
CA1	CA2 CA3		CA1	CA2 CA3
		Considers obstacles		
		Controls key terrain		
		Helps speed of execution		
		Does not require adjustment of unit positions		
		Uses all headquarters		
		Requires normal combat support		

2

2.6.4

2

ANALYSIS AND COMPARISON OF COURSES OF ACTION				
DOES		ITEM	DOESN'T	
CA1	CA2 CA3		CA1	CA2 CA3

2		2.7.1		2	
OPERATION ORDER					
Task organization: _____					

1. Situation					
a. Enemy forces: _____					

b. Friendly forces: _____					

c. Attachments and detachments: _____					

2		2.7.2		2	
OPERATION ORDER					
2. Mission _____					

3. Execution					
a. Commander's intent: _____					

b. Concept of the operation					
(1) Maneuver: _____					

2		2.7.3		2	
OPERATION ORDER					
(2) Fires: _____					

c. Subordinate unit subparagraphs: _____					

d. Coordinating instructions: _____					

2		2.7.4		2	
OPERATION ORDER					
4. Service support: _____					

5. Command and signal					
a. Command: _____					

b. Signal: _____					

2		2.8.1	2
FRAGMENTARY ORDER			
Reference _____			

Task organization _____			

1. Situation _____			

2. Mission _____			

2	2.8.2	2
FRAGMENTARY ORDER		
3. Execution _____		

4. Service support _____		

5. Command _____		

6. Signal _____		

MOVE		
TABLE OF CONTENTS		
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Actions at unscheduled halts	3.6.1	
Actions for disabled vehicle halts	3.7.1	
Actions at assembly area	3.8.1	
Terrain driving	3.9.1	
Traveling	3.10.1	
Traveling overwatch	3.11.1	
Bounding overwatch	3.12.1	
Tasks of overwatch force	3.13.1	
Actions on an overwatch position	3.14.1	
Movement considerations	3.15.1	

3

3.0.1

3

3	3.0.2	3						
<table><tr><th colspan="2">MOVE TABLE OF CONTENTS</th></tr><tr><th>ITEM</th><th>PAGE</th></tr><tr><td></td><td></td></tr></table>			MOVE TABLE OF CONTENTS		ITEM	PAGE		
MOVE TABLE OF CONTENTS								
ITEM	PAGE							

ACTIONS BEFORE MARCH	
STEP	ACTION
1	Give warning order
2	Select quartering party NCO and send to team CP
3	Recon route from AA to SP
4	Record time from AA to SP
5	Adjust departing time from AA to arrive at SP on time
6	Have crews perform pre-combat checks
7	Have vehicle commanders report their status
8	Give march order to vehicle commanders

33.1.13

3

3.2.1

3

DUTIES OF QUARTERING PARTY		
STEP	ACTION	✓
1	Inspect intended assembly area for enemy NBC/mines	
2	Secure platoon area until platoon arrives	
3	Establish and maintain communications	
4	Clear or mark obstacles	
5	Select general location of each vehicle's hull-down concealed position and hide position	
6	Mark each vehicle's place	
7	Select covered/concealed route back to RP	

3

3.2.2

3

DUTIES OF QUARTERING PARTY	
STEP	ACTION
8	Meet platoon at RP
9	Guide platoon into area
10	Brief platoon leader
Notes:	

3

3.3.1

3

MARCH ORDERS
1. Destination (map) _____
2. Route of march (map) _____
3. Location of SP, critical points, RP (map) _____
4. SP time _____
5. March interval (meters) _____
6. March speed (mph/kph) _____
7. Catch up speed (mph/kph) _____
8. Time and location of scheduled halts _____
9. Time unit leaves present position _____
10. Order of march _____

3

3.6.1

3

ACTIONS AT UNSCHEDULED HALTS	
ITEM	ACTION
1	Establish security off road
2	Establish security on road
3	Maintain security—dismount personnel, if necessary
4	Report status
5	Take other appropriate actions(s)
6	Resume march when possible
Notes:	

3

3.7.1

3

ACTIONS FOR DISABLED VEHICLE HALTS	
ITEM	ACTION
1	Do not allow vehicle to obstruct traffic
2	Move disabled vehicle off road
3	Have disabled vehicle report status immediately
4	Have crew establish security
5	Have crew post guides to direct traffic
6	If crew repairs vehicle, have it rejoin rear of column
7	If crew cannot repair vehicle, have maintenance element pick it up

3			3.8.1			3
ACTIONS AT ASSEMBLY AREA						
ITEM	ACTION					
1	Follow guides into area					
2	Clear RP fast—do not stop					
3	Occupy preselected positions					
4	Place out security					
5	Maintain security					
6	Check positions					
7	Adjust positions as needed					
8	Camouflage positions					
9	Start maintenance					
10	Start resupply					

3			3.8.2			3
ACTIONS AT ASSEMBLY AREA						
ITEM	ACTION					
11	Start rearming					
12	Establish wire commo net					
13	Coordinate with other units					
14	Prepare reaction plan					
15	Rehearse reaction plan					
Notes:						

TERRAIN DRIVING		3	3.9.1	3
ITEM	ACTION			
1	Use terrain driving when contact with enemy is possible or expected			
2	Use all available cover and concealment			
3	Avoid skylining			
4	Do not move directly forward from a hull-down firing position			
5	Cross open areas quickly			
6	Always look for nearest cover for protection if fired upon			
Notes:				

TRAVELING		3	3.10.1	3
ITEM	ACTION			
1	Use traveling technique when speed is important and contact with enemy is unlikely			
2	Platoon moves on column axis, staggered laterally with intervals of 50-100 meters between vehicles, terrain permitting			
3	Platoon leader rides in lead vehicle to control movement			
4	Platoon sergeant rides in third vehicle to observe platoon leader, trailing squads, and last vehicle			
Notes:				

3		3.11.1		3
TRAVELING OVERWATCH		ITEM	ACTION	
1	Use traveling overwatch when enemy contact is possible			
2	Distance between lead vehicle and platoon leader is 100–400 meters			
3	Distance between other vehicles is 50–100 meters, but may vary with terrain			
4	Movement is continuous with maximum use of cover and concealment			
5	Movement keyed on lead squad to maintain proper distance and intervals			
Notes:				

3		3.12.1		3
BOUNDING OVERWATCH		ITEM	ACTION	
1	Use bounding overwatch when you expect enemy contact			
2	Cover movement of bounding squad from covered and concealed overwatch position			
3	If bounding squad makes contact, overwatch supports by fire and maneuvers			
4	Bounding squad moves to secure new positions while covered by overwatch			
5	Is new position open? If YES, go to STEP 6. If NO, go to STEP 7.			

BOUNDING OVERWATCH	
ITEM	ACTION
6	Bounding squad stays mounted with each man given a sector to observe
7	Bounding squad dismounts to man weapons and to provide security
8	When bounding squad secures new position, overwatch can move forward
9	Repeat steps 2-8 for each bound until completed
Notes:	

3

3.12.2

3

TASKS OF OVERWATCH FORCE	
ITEM	ACTION
1	Support bounding force with direct fire using prescribed weapons--ready posture
2	Maneuver in support of bounding force
3	Have capability of calling for indirect fire
4	Cover flanks, rear, and front of bounding force
5	Have concealed and protected positions
Notes:	

3

3.13.1

3

3

3.14.1

3

ACTIONS ON AN OVERWATCH POSITION		✓
ITEM	ACTION	
1	Visually check security of position	
2	Occupy hull-down, concealed firing position	
3	Platoon/squad leaders assign areas for observation/fire	
4	Search for targets	
5	Be alert for enemy activity	
6	Don't concentrate on moves of bounding element	
7	React immediately to any threat	

3

3.15.1

3

MOVEMENT CONSIDERATIONS BEFORE BOUNDING TO YOUR NEXT POSITION, YOU MUST CONSIDER:		✓
ITEM	QUESTION	
1	Where is my next psn?	
1A	Where will I take up my psn on the next bound?	
1B	Where is my alternate psn?	
1C	If my psn is unsuitable when I arrive, where will I go next?	
2	What is my best route?	
2A	What is my exact route from here to my next psn?	
2B	How will I use low ground?	

3		3.15.2		3
MOVEMENT CONSIDERATIONS				
ITEM	QUESTION			
2C	How will I take advantage of hedges, trees, and shrubs?			
2D	What is my alternate route from here to my next position?			
3	Where is the enemy?			
3A	If I were the enemy, where would I hide to observe, fire, and escape?			
3B	What likely enemy position(s) should I give special attention to during my move?			
3C	What is the enemy's most likely withdrawal route?			

3		3.15.3		3
MOVEMENT CONSIDERATIONS				
ITEM	QUESTION			
4	What do I do if fired upon?			
4A	What cover is on my route?			
4B	Am I fully prepared to return fire immediately?			
4C	Is my crew fully briefed on actions expected of them?			
4D	Who is covering my move and how can they help me?			
4E	Will smoke help—who delivers?			
Notes:				

4		4.0.1	4
ATTACK			
TABLE OF CONTENTS			
ITEM		PAGE	
Preparation for attack		4.1.1	
Consolidation		4.2.1	
Reorganization		4.3.1	

4		4.0.2	4
ATTACK			
TABLE OF CONTENTS			
ITEM		PAGE	

4

4.1.1

PREPARATION FOR ATTACK	
TASK	ACTION
1	Issue order
2	Move to assembly area
3	Check weapons
4	Check key equipment
5	Resupply
6	Refuel
7	Rearm
8	Conduct vehicle PMCS
9	Check attachments
10	Check NBC situation

4

4

4.1.2

PREPARATION FOR ATTACK	
TASK	ACTION
11	Confirm MOPP status
12	Inspect troops
13	Inspect vehicles
14	Feed troops
15	Rest troops
16	Recon routes to LD
17	Time routes to LD
18	Move to LD

Notes:

4

CONSOLIDATION		
STEP	ACTION	✓
1	Eliminate all remaining enemy resistance to our objective	
2	Report status to next higher	
3	Prepare to continue attack	
4	Prepare for en counterattack	
5	Coordinate with flank elem(s)	
6	Set up perimeter defense	
7	Position BFV/tanks/ITV to cover armor AA(s)	
8	Prepare range cards	
9	Begin planning to continue attack (map recon, orders)	

4

4.2.1

4

4

4.3.1

4

REORGANIZATION		
STEP	ACTION	✓
1	Report	
1A	Personnel losses	
1B	Ammo expended	
1C	Fuel status	
1D	Condition of vehicles	
1E	Equipment status	
1F	Enemy casualties	
1G	POW	
1H	Enemy vehicles	
1I	Enemy weapons	
2	Redistribute	
2A	Ammo	
2B	Personnel	

4

4.3.2

4

REORGANIZATION	
STEP	ACTION
2C	Vehicles
2D	Equipment
3	Evacuate
3A	Casualties
3B	POW
3C	Damaged equipment
4	Restore
4A	Communications
4B	Chain of command
5	Perform maintenance checks
5A	Vehicles
5B	Weapons
5C	Equipment

4

4.3.3

4

REORGANIZATION	
STEP	ACTION
6	Perform emergency repairs
6A	Vehicles
6B	Weapons
6C	Equipment

Notes:

DEFEND		5
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Defense planning notes	5.2.1	
Coordination with adjacent unit(s)	5.3.1	
Establish observation post	5.4.1	
Prepare squad defensive position	5.5.1	
Supervise building a fighting position	5.6.1	
Range card preparation	5.7.1	
Sector sketch preparation	5.8.1	
Occupation of a battle position (BP)	5.9.1	
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		5

DEFEND		5
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Vehicle camouflage	5.14.1	
Physical security	5.15.1	
		5.0.2
		5

5		5.1.1	5
DEFENSIVE PRIORITY OF WORK			
STEP	TASK		✓
1	Establish local security		
2	Position security force		
3	Position primary weapons		
4	Position vehicles		
5	Site final protective fires		
6	Site other priority targets		
7	Take NBC protective steps		
8	Clear fields of fire		
9	Prepare range cards		
10	Compute ranges		
11	Emplace obstacles		
12	Prepare fighting positions		
13	Set up wire commo net		

5		5.1.2	5
DEFENSIVE PRIORITY OF WORK			
STEP	TASK		✓
14	Select supply-evac routes		
15	Prepare supply-evac routes		
16	Prepare alternate positions		
17	Prepare suppl positions		
18	Prepare counterattack plans		
19	Rehearse counterattack plans		
20	Prepare dummy positions		
Notes:			

DEFENSE PLANNING NOTES

12. Position and mission of units in the rear

[illegible]

DEFENSE PLANNING NOTES

9. Special signals to use

10. On-order mission for platoon/squad

11. Position and mission of units on flanks

[illegible]

COORDINATION WITH ADJACENT UNIT(S)		5
1. Location of primary psn	_____	5.3.1
2. Location of alternate psn	_____	
3. Location of supplementary psn	_____	
4. 25mm sector of fire	_____	
5. TOW sector of fire	_____	
6. Dragon sector of fire	_____	
7. Coax sector of fire	_____	
8. Machine gun sector of fire	_____	
		5

COORDINATION WITH ADJACENT UNIT(S)		5
9. Location of dead space between units	_____	5.3.2

10. How to cover dead space	_____	

11. Location of OP	_____	

12. Location/types of obstacles	_____	

13. How to cover obstacles	_____	

ESTABLISH OBSERVATION POST		
ITEM	ACTION	✓
1	Establish OP along probable avenues of approach	
2	Select OP to provide	
2A	Maximum observation	
2B	Cover and concealment	
2C	Concealed routes to and from OP	
3	Best location is on or near military crest of hill	
4	OPs should be within range of small-arms and other supporting fire	

55.4.15

5

5.4.2

5

ESTABLISH OBSERVATION POST			
ITEM	ACTION		✓
5	Carefully camouflage and position wire and radio antennas		
6	Movement must not reveal location to enemy		
7	Operate OP in reliefs of 2 men each unless movement will reveal location		
8	Switch relief duties every 30 minutes		
9	Limited visibility may preclude movement of day OP to another position		
Notes:			

5		5.5.1		5
PREPARE SQUAD DEFENSIVE POSITION				
ITEM	ACTION			
1	Set priority for work			
2	Assign work to all soldiers			
3	Maintain security			
3A	OP			
3B	Patrols			
3C	STANO devices			
4	Work as fast as you can			
5	Use cover & concealment			
6	Construct fighting positions			
7	Inspect and correct faults			

5		5.6.1		5
SUPERVISE BUILDING A FIGHTING POSITION				
ITEM	ACTION			
1	Assign psn, loc, & sector of fire			
2	Check sector of fire stakes			
3	Check observation and fields of fire from firing position			
4	Check depth of hole			
5	Check grenade sumps			
6	Check overhead cover			
7	Check camouflage at position			
8	Check camouflage from 50 m forward of position			
9	Order soldier to correct faults			

5

5.7.1

5

RANGE CARD PREPARATION	
Note: Make 1 card & 1 copy for each primary, alternate, supplementary, and any static position if contact expected	
STEP	ACTION
1	Draw symbol for weapon/ position in lower center
2	Place azimuth (degrees) and distance (meters) from a terrain feature to position (or 8-digit grid)
3	Draw sector(s) of fire left and right limit arrows
4	Label left and right sectors
5	Place range(s) to far limits of sector(s)

5

5

5.7.2

5

RANGE CARD PREPARATION	
STEP	ACTION
6	Place TRP where ordered and engagement areas where targets may appear
7	Number each TRP and EA
8	Place deflection and range from weapon/position to each TRP and EA
9	Draw maximum engagement line(s) across sector(s) of fire for each weapon and different type of ammo
10	Show dead space area(s)
11	Write "dead space" on each

LG

5

5

5.8.2

5

SECTOR SKETCH PREPARATION	
ITEM	ACTION
7	Draw machine gun/cannon final protective lines or principal direction of fire
8	Draw OP
9	Draw leader positions
10	Draw TRP and EA in sector
11	Draw mines/obstacles
12	Draw indirect fire target locations
13	Draw indirect fire final protective fire locations
14	Draw and label dead space

✓

5

5.8.3

5

SECTOR SKETCH PREPARATION	
ITEM	TASK
15	Draw patrol routes
16	Draw location of your CP/OP
17	Draw locations, sector(s) of fire/EA of other weapons attached or operating in your sector
18	Place your unit ID, DTG prepared, and magnetic north arrow on sketch
Notes:	

✓

OCCUPATION OF A BATTLE POSITION (BP)		✓
STEP	ACTION	
1	Move to turret-down psn on BP	
2	Keep rest of plt in hide psn(s)	
3	Recon psn	
4	Designate gen loc of primary position(s) for plt	
5	Move plt to primary position(s)	
6	Designate primary sectors of fire/EATR	
7	Designate gen loc of supl positions	
8	Designate supl sectors of fire/EATR	

5

5.9.1

5

5

5.9.2

5

OCCUPATION OF A BATTLE POSITION (BP)		✓
STEP	ACTION	
9	Coord with flank/adjacent units	
9A	Observation/fields of fire	
9B	Routes of withdrawal	
9C	OP	
9D	Patrols	
9E	Flank position(s)	
9F	Wire communications	
10	Report situation to co/tm Cdr	
11	Check plt improving psn(s)	
12	Plan routes to next BP	

FIGHTING FROM A BATTLE POSITION (BP)	
STEP	ACTION
1	Determine targets to engage
2	Determine methods of target engagement
3	Send contact and spot report
4	Issue platoon fire commands
5	Call for indirect fire, as needed
6	Send spot reports
7	Move to subsequent BP
8	Keep co/tm Cdr informed of situation and location
9	Organize to fight from BPs

5

5.10.1

FIRE DISTRIBUTION AND CONTROL	
ITEM	PRINCIPLE
1	Avoid target overkill
2	Use each wpn in its best role
3	Concentrate on long-range tgt
4	Engage only targets that offer a high probability of hit
5	Take best shots possible
6	Expose only wpns/vehicles that must fire
7	Destroy most dangerous tgt(s) first
8	Maintain combat loads as long as possible—plan resupply

5

5.11.1

5

DEFENDING DURING LIMITED VISIBILITY			5
ITEM	ACTION	✓	
1	Employ long range STANO equip (GSR, sensors, NOD)		
2	Coordinate any movement outside battle psn boundaries with higher and adjacent units		
3	Redeploy some units & wpns to concentrate along limited visibility avenues of approach		
4	Employ scouts, OP, patrols, ambushes, and armor killer teams forward on secondary AA and between positions		
5	Employ nuisance obstacles and early warning devices along likely night approaches		

DEFENDING DURING LIMITED VISIBILITY			5
ITEM	ACTION	✓	
6	Plan required movement of weapons, units, and massing of fires on enemy approaches		
7	Rehearse movement of weapons, units, and massing of fires on enemy approaches		
8	Reposition weapons to take advantage of differences between enemy and friendly STANO devices		
9	Plan illumination on or behind engagement areas to silhouette enemy		

DEFENDING DURING LIMITED VISIBILITY			5
ITEM	ACTION		5
10	Move TRPs and/or EAs closer to defensive positions or move weapons closer to them—use METT-T	✓	5
11	Commence adjustments to defensive organization before dark		5
12	Complete return to daylight positions before dawn		5
13	Move closer to avenue(s) of approach you guard during bad weather		5
14	Be aware that sensors and radar may still penetrate bad weather		5

CAMOUFLAGE			5
STEP	ACTION		5
1	Prepare individual equipment	✓	5
1A	Helmet—break form		5
1B	Face and hands—disrupt		5
1C	Weapons—disrupt		5
1D	Shine—darken/conceal		5
1E	LBE—darken		5
2	Consider position carefully		5
3	Consider enemy viewpoint		5
4	Use natural concealment		5
5	Blend with background		5
6	Expose nothing that shines		5
7	Avoid unneeded movement		5
8	Keep camouflage discipline		5

5		5.13.2	5
CAMOUFLAGE			
STEP	ACTION		✓
9	Observe from prone position		
10	Don't skyline when moving		
11	Inspect the following areas		
11A	Individuals		
11B	Fighting positions		
11C	Vehicles		
11D	Routes-in and out		
11E	Noise/light discipline plan		
11F	Camouflage nets		
11G	Stand-to plan		
11H	Enemy's viewpoint/OPs		
Notes:			

5		5.14.1	5
VEHICLE CAMOUFLAGE			
STEP	ACTION		✓
1	Break up the silhouette		
2	Use camouflage nets to hide vehicles in positions		
3	Reduce glare of mirrors, headlights, vision blocks, windshields, and optics		
4	Reduce vehicle signatures		
5	Reduce noise		
5A	Do NOT slam hatches or doors		
5B	Only start and move vehicles as part of plan or operation		
5C	Start all vehicles at same time		

PHYSICAL SECURITY	
ITEM	ACTION
1	Conduct patrols
2	Conduct stand-to (general)
2A	All troops awake, dressed, and ready for combat
2B	Top off vehicle(s)
2C	Basic load of ammo/missiles
2D	Clean, service, assemble, and ready wpns for action
2E	Radios on and briefly tested
2F	Fully load vehicle(s)
2G	Ready vehicle(s) for short-notice moves

5

5.15.1

5

5

5.15.2

5

PHYSICAL SECURITY		
ITEM	ACTION	✓
3	Conduct stand-to (evening)	
3A	Place vision block covers in position	
3B	Place driver's night vision viewer into operation	
3C	Test all panel control lights	
3D	Prepare night vision goggles for operation	
3E	Turn off all internal lights	
3F	Upload all wpns and ammo	
3G	Test turret drive/stabilization	
3H	Test thermal sights	

PHYSICAL SECURITY		
ITEM	ACTION	✓
3I	Charge vehicle(s) battery	
3J	Load main gun with vehicle running	
3K	When dark, dismount to inspect each vehicle to insure no light is visible	
4	Silent mounted watch	
4A	Assign pers areas to use vehicle sights for surveillance	
4B	Raise launcher/ramp before turning engine off	
4C	Use manual power to traverse/elevate/depress turret and weapons	

55.15.35

5

5.15.4

5

PHYSICAL SECURITY		
ITEM	ACTION	✓
4D	Use radio listening silence	
4E	Set up rotating schedule for troops using thermal sight(s)	
4F	Lay main gun on primary enemy avenue of approach or engagement area	
5	Dismount local security	
5A	Assign sectors to elements	
5B	Have elements observe sectors	
5C	Adjust positions closer to vehicle(s) at night	

6		6.0.1	6
DELAY TABLE OF CONTENTS			
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Fundamentals of delay		6.1.1	
Fundamentals of a screening mission		6.2.1	
Planning a screening mission		6.3.1	

6	6.0.2	6
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6		6.1.1		6
FUNDAMENTALS OF DELAY				
ITEM	ACTION			✓
1	Centralized control and decentralized action			
1A	Maintain enemy contact			
1B	Coordinate flank security			
2	Make maximum use of terrain			
2A	Observation/fields of fire			
2B	Cover and concealment			
2C	Obstacles			
2D	Key terrain			
2E	Avenues of approach			
3	Force en to deploy/maneuver			

6		6.1.2		6
FUNDAMENTALS OF DELAY				
ITEM	ACTION			✓
3A	Slow enemy's progress			
3B	Trade space for time			
4	Use obstacles			
4A	Natural and reinforcing			
4B	Cover by observation/fire			
5	Maintain enemy contact			
5A	Keep enemy in sight			
5B	Observe and adjust fires			
5C	Keep free to maneuver			
6	Avoid decisive engagement			

FUNDAMENTALS OF DELAY		
ITEM	ACTION	✓
6A	Make en deploy, develop sit, & maneuver to attack psn(s)	
6B	Displace to next position before decisive engagement	
7	Forms of delay missions	
7A	Delay in sector	
7B	Delay forward of a line or position for a specified time	
8	Assign definite sectors	
8A	To each committed unit	
8B	For each avenue of approach	
9	Each unit sets up own security	

66.1.36

6

6.2.1

6

FUNDAMENTALS OF A SCREENING MISSION		
ITEM	ACTION	✓
1	Assign when Cdr has few troops available and wants to keep area under surveillance	
2	Cdr expects early warning/counter enemy recon	
3	Provide warning en approach	
4	Gain/maintain enemy contact	
5	Report enemy activity	
6	Destroy/repel enemy recon	
7	Impede and harass enemy with indirect fires	
8	Guide reaction forces	

6			6.3.1			6
PLANNING A SCREENING MISSION						
ITEM	ACTION		✓			
1	Cdr specifies					
1A	Unit to perform mission					
1B	General trace of initial screen within range of main body's artillery					
1C	Time screen must be in place					
1D	Passage points and routes through stationary units					
1E	Units that will be screened					
1F	Phase line for rear boundary of screening unit between main body and screening unit					

6

6.3.2

6

PLANNING A SCREENING MISSION		
ITEM	ACTION	✓
1G	Responsibility for area between screening/screened unit(s)	
1H	Width of assigned area	
2	Screened unit(s) may have to	
2A	Establish OP near position(s)	
2B	Patrol near position(s)	
3	Screening unit must carefully plan and coordinate	
3A	Rearward move	
3B	Passage of lines	

6		6.3.3		6
PLANNING A SCREENING MISSION				
ITEM	ACTION			✓
4	Screening unit Cdr specifies			
4A	PL setting up initial screen			
4B	Sectors to subordinate units with overlapping fields of fire and observation			
4C	OP forward of initial screen line in range of supporting fires if PL is not CFL/FSCL			
4D	Mission as unit moves to screen line			
4E	Time needed for operation			
4F	Specific location(s) of OP			

6		6.3.4		6
PLANNING A SCREENING MISSION				
ITEM	ACTION			✓
4G	Indirect fire planning			
4H	Routes and/or sectors for rearward displacement			
4I	Logistics plan			
Notes:				

WITHDRAW		7
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Relief in place	7.6.1	

WITHDRAW		7
TABLE OF CONTENTS		7.0.2
ITEM	PAGE	

7	7.1.1	7
DISENGAGEMENT PLANNING		
1. Scheme of maneuver _____		

2. Time of disengagement _____		

3. Priority of disengagement _____		

4. Location of new positions _____		

7	7.1.2	7
DISENGAGEMENT PLANNING		
5. Size and composition of advance parties _____		

6. Size and composition of overwatch forces _____		

7. Location of overwatch forces _____		

8. Combat service support _____		

7		7.2.1		7
DISENGAGEMENT ACTIONS				
ITEM	ACTION			✓
1	Deceive the enemy			
1A	Smoke			
1B	Patrols			
1C	Fires			
1D	Radio transmissions			
2	Use overwatch elements to keep enemy pressure off disengaging forces			
3	Maintain OPSEC			
4	Maintain COMSEC			
5	Recon routes			

7		7.2.2		7
DISENGAGEMENT ACTIONS				
ITEM	ACTION			✓
6	Prepare routes			
7	Recon new positions			
8	Prepare new positions			
9	Plan to move wounded			
10	Plan for movement of recoverable combat equip			
11	Move combat service support early			
12	Move during limited visibility			
13	Use obstacles to slow or stop enemy			

WITHDRAWAL UNDER ENEMY PRESSURE		
ITEM	ACTION	
1	Withdrawal principles	✓
1A	Co Cdr controls sequence of plt withdrawals	
1B	Plt ldr controls sequence of squad withdrawals	
1C	Fire/move to rear-basic tactic	
1D	Empl all aval fires to stop en	
1E	Use smoke to confuse en and conceal movement	
1F	One unit forms base of fire to cover movement of other unit(s) away from enemy- then they change roles	

7

7.4.1

WITHDRAWAL UNDER ENEMY PRESSURE		
ITEM	ACTION	
2	Methods of disengaging	✓
2A	Simultaneous	
2B	By teams	
2C	By thinning the lines	
2D	Based on enemy situation, terrain, and base of fire	
3	Base of fire	
3A	AT weapons best against enemy mounted attack- move them back first	

7

7.4.2

7

WITHDRAWAL UNDER ENEMY PRESSURE		
ITEM	ACTION	
3B	Infantry best in close terrain/ limited visibility/against dismounted enemy—move AT wpns/tanks back first	✓
4	Plan for AND specify	
4A	Scheme for maneuver	
4B	Time of withdrawal	
4C	Location of new positions	
4D	Size/make-up of advance party	
4E	Size/make-up of overwatch forces	

7

7.4.3

WITHDRAWAL UNDER ENEMY PRESSURE		
ITEM	ACTION	
4F	Battle/overwatch positions	✓
4G	Routes	
4H	Checkpoints	
4I	Remount point(s)	
4J	Evacuation of wounded	
4K	Evacuation of equipment	
4L	Priorities	
4M	Obstacles	
4N	Items to destroy	

7

7.4.4

7

WITHDRAWAL NOT UNDER ENEMY PRESSURE			7
ITEM	ACTION		7.5.1
1	Withdrawal principles		
1A	Speed/secrecy/deception		
1B	At night/under periods of reduced visibility		
1C	As part of larger force to perform another mission		
2	Does plt act as co scty force? If YES, go to STEP 3. If NO, go to STEP 4.		
3	Cover entire co area		
3A	Plan to reposition sqds/wpns to cover company withdrawal		

WITHDRAWAL NOT UNDER ENEMY PRESSURE			7
ITEM	ACTION		7.5.2
3B	Place 1 sqd in each plt psn to cover most dangerous AA		
3C	Place key wpns in each plt psn to cover most dangerous AA		
3D	Co XO or plt ldr will be scty force Cdr		
4	Force made up of 1 sqd, 1 mg tm, and 2 dragons		
4A	SL left in psn is plt scty force ldr		
4B	Reposition sqd to cover plt withdrawal and plt area		

WITHDRAWAL NOT UNDER ENEMY PRESSURE		7
ITEM	ACTION	7.5.3
4C	Co scty force Cdr controls plt scty force during withdrawal	7
5	Security force	
5A	Conceals withdrawal	
5B	Deceives enemy—keeps up normal co operating patterns	
5C	Provides covering fire if enemy attacks during withdrawal	
5D	Withdraws when company is at next psn or as ordered	
5E	Gets withdrawal order by land line or radio codeword	7

WITHDRAWAL NOT UNDER ENEMY PRESSURE		7
ITEM	ACTION	7.5.4
5F	Uses same basic plan as co to withdraw	7
5G	Reassembles to move to rear	
5H	If under attack, conducts fire and maneuver to rear until they break contact	
6	Quartering party	
6A	Send to next position before withdrawal starts	
6B	Has PSG and 1 guide for each squad as plt reps	
6C	Recons and selects psn/ sectors/routes/OP for plt	7

WITHDRAWAL NOT UNDER ENEMY PRESSURE		7
ITEM	ACTION	7
6D	Meets and guides plt into psn	
6E	PSG meets/briefs plt ldr on position/situation	
7	Company OPORD contains	
7A	Time withdrawal will start	
7B	Location of plt assy area(s)	
7C	Location of co assy area	
7D	Plt mission(s) upon arrival	
7E	Route from plt to co assy area	
7F	Size/org/Cdr of scty force	

WITHDRAWAL NOT UNDER ENEMY PRESSURE		7
ITEM	ACTION	7
7G	Next co mission	
7H	Next plt mission	
8	Plt ldr plans	
8A	When his withdrawal starts	
8B	Location of sqd assy areas	
8C	Location of plt assy areas	
8D	What sqds do at assy area(s)	
8E	Routes from sqd assy areas to plt assy area	
8F	Size/org/Cdr of scty force	

WITHDRAWAL NOT UNDER ENEMY PRESSURE		✓
ITEM	ACTION	
8G	Next plt mission	
8H	Next sqd mission(s)	
Notes:		

7

7.5.7

RELIEF IN PLACE		✓
ITEM	ACTION	
1	Incoming leader recons area	
2	Incoming and outgoing leaders coordinate	
3	Exchange liaison personnel	
4	Coordinate positions of weapons and vehicles	
5	Exchange range cards and fire plans	
6	Exchange relief or organic fire support elements	
7	Coordinate loc(s) of obstacles	
8	Transfer responsibility for minefields	

7

7.6.1

7

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8.1.1

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PATROL PLANNING STEPS	
STEP	ACTION
1	Study mission
2	Reverse planning
3	Study terrain and situation
4	Organize patrol
5	Select men/wpns/equip
6	Issue warning order
7	Coordinate
8	Make recon
9	Complete detailed plans
10	Issue order
11	Supervise/inspect/rehearse
12	Execute mission
Notes:	

8

8.2.1

8

PATROL WARNING ORDER	
1. Statement of situation	
2. Mission of the patrol	
3. General instructions	
a. General and specific situation	
b. Common uniform/equipment	

PATROL WARNING ORDER	
c. Wpns/ammo/equip	
d. Chain of command	
e. Time schedule	
f. Time/place/uniform and equip for order	

PATROL WARNING ORDER	
g. Times and place for inspections/rehearsals	
4. Specific instructions	
a. To subordinate leaders	
b. To special purpose teams or key jobs	

PATROL ORDER	
1. Situation	
a. Enemy forces	
(1) Identification	
(2) Location	
(3) Activity	
(4) Weather	
(5) Terrain	
b. Friendly forces	
(1) Mission of next higher unit	

8

8.3.1

8

PATROL ORDER	
(2) Location/planned actions of units on right and left	
(3) Msn and routes of other patrols	
(4) Fire support available	
c. Attachments and detachments	
2. Mission	

8

8.3.2

8

PATROL ORDER	
e. Transportation	
5. Command and signal	
a. Command	
(1) Chain of command	
(2) Loc of patrol ldr during move/at objective	
b. Signal	
(1) Arm-and-hand/other signals/ codes/call signs/freqs to use within patrol	
(2) Reports/codes/call signs/freqs to use with higher HQ	
Challenge and password	

PATROL REPORT		8
A. Patrol size and composition		8.4.1
B. Task		8
C. Time of departure		8.4.1
D. Time of return		
E. Routes out and back		
F. Terrain description		8

PATROL REPORT		8
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K. Results of enemy encounters		8
L. Condition of patrol		8.4.2
M. Conclude/recommend		8

SELECTION OF A PATROL BASE		8
STEP	ACTION	✓
1	Pick site of patrol base from map or aerial recon during planning	
2	Base is tentative	
3	Plan for alternate base site	
3A	Use if initial site is unsuitable	
3B	Recon alternate site and keep under observation until you occupy or no longer need it	
4	Select base so patrol can accomplish msn and consider	
4A	Terrain of little tactical value to enemy	
8.5.1		8

SELECTION OF A PATROL BASE		8
STEP	ACTION	✓
4B	Difficult terrain which makes foot movement hard	
4C	Area of thick vegetation	
4D	Area near source of water	
5	Plan for	
5A	OPs	
5B	Commo with OPs	
5C	Defense of base	
5D	Withdrawal from base (route(s), rally point(s), and rendezvous point(s), and an alternate base)	
8.5.2		8

SELECTION OF A PATROL BASE	
STEP	ACTION
5E	Security system to ensure all needed troops are awake
5F	Enforcement of camouflage, noise, and light discipline
5G	Needed activities with minimum movement/noise
6	Avoid the following
6A	Known/suspected en psns and built-up areas
6B	Ridges and hilltops, except if needed to keep commo
6C	Roads/trails/wet areas/slopes
6D	Small valleys

8

8.5.3

8

8

8.6.1

8

OCCUPATION OF PATROL BASE	
STEP	ACTION
1	Approach
1A	Halt patrol 200-400 meters from tentative patrol base site
1B	Post security
1C	Element leaders, RATELO, and security team join patrol leader and move forward to recon patrol site
2	Recon
2A	Patrol leader designates entry point as 6 o'clock
2B	Patrol leader moves to and designates center of base as patrol CP

OCCUPATION OF PATROL BASE		
STEP	ACTION	
2C	Element leaders recon their assigned sectors and then return to CP	
2D	Patrol leader sends 2 men back to bring remainder of patrol forward	
3	Occupation	
3A	Patrol enters base in single file	
3B	Camouflage signs of patrol's entry into area	
4	Leader checks perimeter by meeting each element leader at left flank of each sector	

88.6.28

8

8.6.3

8

OCCUPATION OF PATROL BASE			✓
STEP	ACTION		
4A	Both move clockwise to end of sector		
4B	Check each sector until entire perimeter checked		
5	All element leaders send out R&S team to recon forward of element's sector		
5A	Team moves out from left flank and moves clockwise to right limit of sector		
5B	Team re-enters at right flank		
6	Each R&S team reports		
6A	Signs of enemy activity		

OCCUPATION OF PATROL BASE	
STEP	ACTION
6B	Suitable OP locations
6C	Possible rally points
6D	Withdrawal routes
7	Patrol leader designates
7A	Withdrawal routes
7B	Rally point outside base
8	Each element
8A	Puts out OP
8B	Establishes commo with patrol OP
Notes:	

8

8.6.4

8

8		8.7.1		8
OPERATION OF PATROL BASE				
STEP	ACTION			✓
1	Security			
1A	Only one point of entry/exit			
1B	Camouflage and guard entry/exit point			
1C	Allow only required moving inside and outside base			
1D	Keep fires small/smokeless and build in pit			
1E	Only permit noisy work when other noise will cover it			
2	Stand-to			
2A	Hold both morning/evening			

8		8.7.2		8
OPERATION OF PATROL BASE				
STEP	ACTION			
2B	Vary times to prevent pattern			
2C	Must last long enough to accomplish purpose			
3	Plan defensive measures			
3A	Defend base when you cannot evacuate			
3B	Do not build complete fighting positions			
3C	Stress camouflage and concealment			
4	Make fire plan			
4A	Put early warning devices on avenues of approach			

8		8.7.3		8
OPERATION OF PATROL BASE				
STEP	ACTION			
4B	Put mines/tripflares in places that fire cannot cover			
5	Make withdrawal plan to rally at rally point/rendezvous point/alternate patrol base			
6	Commo			
6A	Establish with higher HQ/OPs/within patrol			
6B	Control radio to not alert en			
6C	Use wire within base			
6D	Use tug/pull wires to signal			
7	Maintain weapons/equipment			

OPERATION OF PATROL BASE		✓
STEP	ACTION	
8	Sanitation/personal hygiene	
8A	Catholes outside perimeter in day, inside at night	
8B	Wash, shave, and brush teeth on regular basis	
8C	Conceal trash or carry with patrol	
9	Establish eating/sleeping shifts and maintain security	
10	Water	
10A	Guard water details	
10B	No more than 2 trips per 24-hour period	

8

8.7.4

8

OPERATION OF PATROL BASE		✓
STEP	ACTION	
11	Continue to plan and prepare for mission	
12	When departing, remove and conceal all signs of patrol	
Notes:		

8

8.7.5

8

PRINCIPLES OF A RAID		
ITEM	PRINCIPLE	✓
1	Conduct raid with combat patrol	
2	Mission is to attack a position or installation	
2A	Destroy position or installation	
2B	Destroy or capture troops and equipment	
2C	Liberate personnel	
3	Attack	
3A	When enemy least expects an attack	
3B	When visibility is poor	

8

8.8.1

8

8

8.8.2

8

PRINCIPLES OF A RAID		
ITEM	PRINCIPLE	✓
3C	From unexpected direction, such as approaching from the rear or through impassable terrain	
4	Concentrate fire at critical points to suppress enemy	
5	Achieve violence by	
5A	Gaining surprise	
5B	Using massed fire	
5C	Attacking aggressively	
Notes:		

CONDUCT A RAID		
STEP	ACTION	✓
1	Patrol moves to ORP for recon patrol	
1A	Secure ORP	
1B	Conduct recon with leaders	
1C	Confirm plans	
1D	Coordinate movements of elements so all reach their positions at same time	
2	Security element	
2A	Move to positions to secure ORP	
2B	Give warning of enemy approach	

8

8.9.1

8

CONDUCT A RAID		
STEP	ACTION	✓
2C	Block avenues of approach into objective area	
2D	Prevent enemy escape from objective area	
2E	Inform patrol leader of all enemy action	
2F	Shoot only if detected or on patrol leader's order	
2G	During assault, prevent enemy from entering into, or escaping from, objective area	
2H	At end of assault, cover withdrawal of assault and support elements to ORP	

8

8.9.2

8

8			8.9.3			8
CONDUCT A RAID						
STEP	ACTION					✓
3	Support element					
3A	Move into psn prior to assault element moving into psn					
3B	Cover withdrawal of assault element from immediate area of objective					
3C	Withdraw on oral order/signal					
4	Assault element					
4A	Deploy close to objective to permit immediate assault if enemy detects you					
4B	Assault, seize, and secure objective when supporting fire lifts or shifts					

8			8.9.4			8
CONDUCT A RAID						
STEP	ACTION					✓
4C	Protect demolition/search teams while they work					
4D	Withdraw to ORP on oral order/signal					
5	Reorganize patrol at ORP					
5A	Move about 1000 m or 1 terrain feature away from ORP					
5B	Disseminate information					
5C	Redistribute ammunition					
5D	Treat casualties					
5E	Give status reports					

PRINCIPLES OF AN AMBUSH		8
ITEM	PRINCIPLE	8
1	Ambushes	
1A	Place effective fires on site from all positions	
1B	Well-trained teams	
1C	Simple, effective plan	
1D	Soldiers aware of their duties	
1E	Recon area beforehand	
1F	Do not let enemy find out what you plan to do	
1G	Security in all phases of operation, ESPECIALLY WHEN RETURNING to friendly lines or base camp	

PRINCIPLES OF AN AMBUSH		8
ITEM	PRINCIPLE	8
1H	Placement of men and siting of weapons	
1I	First priority to concealment and fields of fire	
1J	Simple and clear signal to open/shift/cease firing	
2	Area ambush	
2A	Cover all approaches and lay out in width or depth	
2B	Self-contained teams	
2C	One team springs ambush	
3	Linear ambush	

8		8.10.3		8
PRINCIPLES OF AN AMBUSH				
ITEM	PRINCIPLE			✓
3A	One avenue of approach			
3B	Place elements along road/trail to give width and all-round defense			
3C	Use all concealment			
4	Linear ambush organization			
4A	Security element/teams on flank			
4B	Assault element with support and search teams			
4C	Mines/footspikes on far side of kill zone			
5	Vehicular ambush			

8		8.10.4		8
PRINCIPLES OF AN AMBUSH				
ITEM	PRINCIPLE			✓
5A	Stop lead and trail vehicles in kill zone			
5B	Kill armor first			
5C	Organize like linear ambush			
6	Night ambush			
6A	Similar to day ambush			
6B	Use claymores, grenades, and automatic weapons			
6C	Control of soldiers is vital			
6D	Issue clear orders/signals			
6E	Fix sectors of fire with stakes			

PRINCIPLES OF AN AMBUSH		
ITEM	PRINCIPLE	
6F	Move into positions after EENT	
6G	Plan for illumination	
Notes:		

8
8.10.5
8

8
8.11.1
8

ORGANIZE AN AMBUSH		
STEP	ACTION	
1	Types of ambush	
1A	Point ambush (single kill zone)	
1B	Area ambush (multiple related point ambushes)	
2	Surprise	
2A	Allows patrol to seize control of the situation	
2B	Stops target from effectively reacting	
2C	Comes from good planning/preparation/execution	
2D	Coordinate all fires	

ORGANIZE AN AMBUSH		8
STEP	ACTION	8
3A	Position all weapons, mines, and demolitions	
3B	Isolate kill zone to prevent escape/reinforcement	
3C	Deliver large volume of highly concentrated fire into kill zone	
3D	Inflict maximum damage so you can quickly assault and destroy target	
4	Control movement to/ occupation of/withdrawal from ambush site	
5	Control measures provide	

ORGANIZE AN AMBUSH		8
STEP	ACTION	8
5A	Early warning of tgt approach	
5B	Holding fire until target moves into kill zone	
5C	Opening fire at proper time	
5D	Initiation of proper action if enemy detects ambush	
5E	Lifting/shifting of supporting fire	
5F	Timely and orderly withdrawal of patrol to ORP	
5G	Signal to open fire	
6	Change signals to prevent pattern	

ORGANIZE AN AMBUSH		8
STEP	ACTION	✓
6A	Using arm and hand/radio/ field phone	
6B	For security team to signal target's approach	
6C	To start ambush (casualty- producing)	
6D	To shift fire when you assault target (voice/whistles/flares)	
6E	To withdraw (voice/whistles/ flares)	
7	Fire discipline	
7A	Withhold fire until signal	
7B	Deliver immediately	
8.11.4		8

ORGANIZE AN AMBUSH		8
STEP	ACTION	✓
7C	Well timed and well aimed	
7D	Precise lifting and shifting	
8	Withdrawal to ORP	
8A	Recon withdrawal routes	
8B	On signal, patrol withdraws to ORP, reorganizes, and starts return march	
8C	Halt 1000 m from objective and disseminate information	
8D	Bound if ambush fails	
8E	Conceal withdrawal and use mines along withdrawal routes to stop pursuit	
8.11.5		8

CONDUCT AN AMBUSH		
STEP	ACTION	✓
1	Ambush formation based on	
1A	METT-T	
1B	Ease of control	
1C	Target you are attacking	
1D	Overall combat situation	
2	Patrol halts at ORP	
2A	Establish security	
2B	Confirm patrol's location	
2C	Conduct recon of objective area to confirm plan	
2D	Leaders return to ORP	

88.12.18

8

8.12.2

8

CONDUCT AN AMBUSH			✓
STEP	ACTION		
3	Security element		
3A	Moves to psns to secure ORP		
3B	Moves to flank ambush site		
4	Support/assault elements leave ORP when security team is in position		
4A	Occupy ambush positions		
4B	Is there a suitable position for support element to watch assault element's move? If YES, go to STEP 4D. If NO, go to STEP 4C.		
4C	Both elements leave ORP at same time		

8		8.12.3		8
CONDUCT AN AMBUSH				
STEP	ACTION			✓
4D	Support elem overwatches assault element's move to ambush site			
5	Patrol waits for target when all elements are in position			
6	Security team alerts patrol when target approaches			
7	Security team leader reports			
7A	Direction of movement			
7B	Target size			
7C	Special weapons/equipment			
8	Patrol leader alerts other elements			

8		8.12.4		8
CONDUCT AN AMBUSH				
STEP	ACTION			✓
9	Patrol leader gives signal to start ambush when majority of target is in kill zone			
10	Is assault element required to assault kill zone? If YES, go to STEP 11. If NO, go to STEP 12.			
11	Give signal to lift or shift fire			
12	Signal withdrawal to ORP upon mission completion			
12A	Account for equip/pers			
12B	Move to suitable location and disseminate information			
12C	Patrol returns to friendly lines			

PLAN A RECON MISSION		8
STEP	ACTION	8
1	Make estimate of the situation	8.13.1
1A	Current intelligence	
1B	Capabilities of unit	
1C	Tailor unit to support mission	
2	Plan	
2A	Intelligence	
2B	Deceptive measures	
2C	Use of smallest unit possible to accomplish mission	
2D	Remain undetected	
2E	Use of STANO devices	

PLAN A RECON MISSION		8
STEP	ACTION	8.13.2
2F	Rehearse plan	
2G	Minimize audio and electronic equipment	
2H	Inspect recon force and equip	
3	Subordinate missions	
3A	Command and control	
3B	Recon of objective	
3C	Security of force	
Notes:		

8		8.14.1		8
LEADING A RECON PATROL				
ITEM	PRINCIPLE			✓
1	Can you clearly define and locate your recon objective? If YES, go to STEP 2. If NO, go to STEP 3.			
2	Security elements perform their function from 1 location with mission including			
2A	Recon element			
2B	Security element			
3	Move into objective area by bounds with R&S teams			
4	For small recon patrol, patrol HQ forms part of recon element or part of R&S teams			

8		8.14.2		8
LEADING A RECON PATROL				
ITEM	PRINCIPLE			✓
5	Determine number and strength of recon/scty/R&S teams according to mission			
6	Techniques of recon patrol			
6A	Observe/collect/record information about enemy			
6B	Well-rehearsed plan			
6C	Use battlefield noises to cover movement			
6D	Use binoculars			
6E	Establish control measures, alternate withdrawal routes, coordinated fire support			

LEADING A RECON PATROL		
ITEM	PRINCIPLE	✓
6F	Move by bounds	
7	Recon using R&S teams	
7A	Use if you don't have separate scty & recon teams	
7B	Allows patrol to perform recon msn and provide scty	
8	Employing R&S teams	
8A	Any size recon patrol	
8B	Use for leaders' recon	
9	Organizing R&S teams	
9A	Use 1 team w/remainder at ORP acting as reaction force	

88.14.38

8

8.14.4

8

LEADING A RECON PATROL		
ITEM	PRINCIPLE	✓
9B	Multiple teams with each to recon portion of ORP	
9C	2 teams link up at point on far side of objective	
9D	1 team with security team acting as reaction force	
10	Security	
10A	Use 1 or 2 soldiers to bound	
10B	Rest of team provides scty	
10C	Vary formation according to terrain	
10D	Each member responsible for his specific sector	

CONDUCT AREA RECON MISSION		
STEP	ACTION	
1	Use surveillance/vantage pts around obj to observe it and surrounding area	
2	Patrol leader halts in ORP	
2A	Establish security	
2B	Confirm patrol's location	
3	Patrol and elem ldr recon obj	
3A	Confirm plan	
3B	Return to ORP	
4	Will terrain allow patrol to secure objective area? If YES, go to STEP 5. If NO, go to STEP 7.	

8

8.15.2

8

CONDUCT AREA RECON MISSION		
STEP	ACTION	
5	Security element departs ORP	
5A	Position scy teams at ORP	
5B	Position scy teams on likely enemy AA(s) into objective	
6	Recon element departs ORP	
6A	Move to several surveillance/vantage pts to recon obj	
6B	Recon area	
6C	Element returns to ORP	
6D	Disseminate info	
6E	Patrol returns to friendly lines	

CONDUCT AREA RECON MISSION		
STEP	ACTION	
7	Patrol leader leaves security team in ORP	
7A	Use R&S teams to recon objective	
7B	Move to different surveillance/vantage points to recon objective	
7C	Recon objective	
7D	R&S teams return to ORP	
7E	Disseminate information	
7F	Patrol returns to friendly lines	
Notes:		

8

8.15.3

8

8

8.16.1

8

CONDUCT A ROUTE RECON MISSION		
STEP	ACTION	✓
1	Use to obtain information on	
1A	Enemy	
1B	Obstacles	
1C	Route conditions	
1D	Critical terrain features along specific route	
2	Types of route recon	
2A	Hasty route recon	
2B	Deliberate route recon	
3	Route recon of suspect areas	

CONDUCT A ROUTE RECON MISSION			8
8.16.2			8
STEP	ACTION		
3A	Use detailed observation before recon		✓
3B	Check approach routes for mines, boobytraps, and ambush signs		
3C	Send dismounted personnel first with mounted personnel overwatching		
4	Recon by fire		
4A	Fire on likely/suspected enpsns to remove camouflage		
4B	Cause enemy to disclose presence by movement or return fire		

CONDUCT A ROUTE RECON MISSION			8
8.16.3			8
STEP	ACTION		
4C	Observe enemy positions to locate enemy		✓
4D	Use when time is critical and loss of surprise not essential		
4E	Does enemy return fire? If YES, go to STEP 4F. If NO, go to STEP 4G.		
4F	Develop situation		
4G	Continue recon		
5	Recon at night		
5A	Recon is slower and less effective		

8			8.16.4			8		
CONDUCT A ROUTE RECON MISSION								
STEP	ACTION					✓		
5B	Limited to STANO devices, patrolling, and obs of routes							
6	Route recon planning details							
6A	Enemy/friendly troops and AO information							
6B	Plans of higher commands							
6C	When, where, and how to report information							
6D	Departure time							
6E	Appropriate control measures							
6F	Action to take when you complete mission							

8			8.16.5			8		
CONDUCT A ROUTE RECON MISSION								
STEP	ACTION					✓		
6G	Special equip requirements							
7	Terrain considerations							
7A	Existing routes and their physical characteristics							
7B	Slope gradients and radius curves							
7C	Bridges							
7D	Vehicle fording, ferrying, and swimming sites							
7E	Obstructions to traffic flow							
7F	Artificial obstacles and man-made features							

CONDUCT A ROUTE RECON MISSION	
STEP	ACTION
7G	Rockfalls and slide areas
7H	Drainage

Notes:

8
8.16.6
8

CONDUCT A ZONE RECON MISSION	
STEP	ACTION
1	Fan method
1A	Select series of ORPs in zone
1B	Go to first ORP
1C	Establish security
1D	Confirm location
1E	Select recon routes out from and back to ORP
1F	Routes must overlap and form fan-shape around ORP
1G	Send out recon elements along routes

8
8.17.1
8

CONDUCT A ZONE RECON MISSION		
STEP	ACTION	✓
1H	Keep 1 element in ORP	
1I	Send elements out on adjacent routes	
1J	Disseminate information after you recon fan area	
1K	Move to next ORP	
1L	Repeat STEPS 1C-1K at each successive ORP	
2	Converging routes method	
2A	Select ORP	

8

8.17.2

8

CONDUCT A ZONE RECON MISSION		
STEP	ACTION	✓
2B	Select recon routes through zone/rendezvous point for patrol to link up after recon	
2C	Establish security	
2D	Confirm patrol's location	
2E	Assign recon route to each element	
2F	Determine location for rendezvous point	
2G	Designate linkup time at rendezvous point	
2H	Send recon elements on their assigned routes	

8

8.17.3

8

CONDUCT A ZONE RECON MISSION			8
STEP	ACTION	✓	
2I	Move with center element		
2J	Recon routes with fan method		
2K	Link up entire patrol at rendezvous point at the designated point		
2L	Secure rendezvous point in same way as ORP		
2M	Disseminate information at rendezvous point		
2N	Repeat STEPS 2A-2M for next rendezvous point		
2O	Return to friendly lines		
			8.17.4
			8

CONDUCT A ZONE RECON MISSION			8.17.5	8
STEP	ACTION	✓		
3	Successive sector method			
3A	Select ORP/recon routes/ rendezvous points			
3B	Repeat STEPS 2C-2M until you recon entire zone			
3C	Return to friendly zones			
Notes:				

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1	Develop careful, simple plan	
2	Attack in depth	
3	Move in short bounds	
4	Dominate killing areas (streets and crossroads)	
5	Clear each house thoroughly	
6	Consolidate each house taken	
7	Keep ammo/grenades aval	
8	Keep equipment light	
9	Plan for casualty/POW evac	

BUILT-UP AREA FIGHTING PRINCIPLES		9
ITEM	PRINCIPLE	9
10	Plan to replace casualties	
11	Street clearing	
11A	Move with 1 element on each side of street	
11B	Avoid main streets	
11C	Use side streets/alleys	
11D	All personnel must know killing areas	
11E	Have a reserve available	
12	House clearing	
12A	Enter from roof, if possible	

BUILT-UP AREA FIGHTING PRINCIPLES		9
ITEM	PRINCIPLE	✓
12B	Stay away from doors and windows	
12C	Breach walls with demo, tank HEP, 25mm HE, claymores	
12D	Guard wall breach(s)	
12E	If entering ground floor, never rush to top to clear down	
12F	Guard and leave cellars last	
13	Basement clearing	
13A	Fire through door	
13B	Toss in grenade(s)	
9.1.3		9

BUILT-UP AREA FIGHTING PRINCIPLES		9
ITEM	PRINCIPLE	✓
13C	Enter firing	
13D	Search carefully	
13E	Guard underground routes	
14	Mark cleared buildings	
Notes:		

ORGANIZE ATTACK ON BUILDING	
STEP	ACTION
1	Organize unit into assault force and support force
2	Designate special wpns/teams
3	Senior ldr commands aslt force, next senior support force
4	Assign duties to assault force
4A	Enter building at the highest level possible
4B	Secure breach/entry point
4C	Clear building room by room
4D	Mark each room when clear
4E	Mark building when clear

9

9.2.1

ORGANIZE ATTACK ON BUILDING	
STEP	ACTION
5	Assign duties to support force
5A	Occupy overwatch position
5B	Isolate bldg with direct/indirect fires/smoke
5C	Adjust indirect fires
5D	Suppress building and nearby buildings
5E	Cover assault force's move and building entry with fire
5F	Resupply ammo/replace pers
5G	Evacuate wounded/POW
6	Issue attack order

9

9.2.2

ATTACK AND CLEAR A BUILDING		9
STEP	ACTION	9
1	Support force isolates bldg from overwatch psn	
2	Support force suppresses enemy in bldg and nearby bldg(s) to cover aslt force's move	
3	Aslt force enters bldg at highest level possible to gain foothold	
4	Aslt force clears bldg room-by-room	
5	Aslt force marks each room when cleared	
6	Aslt force mark's each bldg when cleared	

9.3.1

ORGANIZE BUILDING DEFENSE		9
STEP	ACTION	9
1	Select building(s) to defend by considering	
1A	Protection	
1B	Dispersion	
1C	Concealment	
1D	Fields of fire	
1E	Observation	
1F	Covered routes	
1G	Fire hazard	
1H	Time available	
1I	Building strength	

9.4.1

ORGANIZE BUILDING DEFENSE	
STEP	ACTION
2	Position teams/vehicles
3	Select primary positions for key dismounted weapons
3A	Select alternate positions
3B	Select supplementary psns
4	Prepare positions for key dismounted weapons
4A	Place mg low for grazing fire
4B	Place antitank weapons high for long range coverage
4C	Consider moving to alternate positions during darkness for deception

9

9.4.2

ORGANIZE BUILDING DEFENSE	
STEP	ACTION
5	Prepare rooms in building(s)
5A	Establish command post
5B	Establish OPs
5C	Set up wire comms lines
5D	Stockpile ammo, grenades, water, and food
5E	Cover floors with sand/dirt (not in antitank positions)
5F	Reinforce fighting positions
5G	Camouflage firing positions
6	Prepare outside of building(s)

9

9.4.3

STEP	ACTION	
6A	Emplace mines to cover deadspace/approaches	
6B	Emplace obstacles to cover deadspace/approaches	
6C	Place claymores on roofs, in alleys, and in any other passages you want to deny	
6D	Cover all mines/obstacles by observation and fire	
7	Plan for/register indirect fires	
8	Inspect preparations	
9	Correct deficiencies	

9.4.4

9.

9.4.5

NOTES

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	Observation distances with naked eye	10.4.1
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	Warsaw Pact airborne vehicles	10.9.1
	Warsaw Pact motorized rifle fighting vehicles	10.10.1
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10

10.1.1

10

SPOT REPORT	
LINE	ITEM
1	Size
2	Activity
3	Location
4	Unit
5	Time observed
6	Equipment
7	Source of information
Notes:	

10

10.2.1

10

TARGET SIGNATURES	
ITEM	SIGNATURE
1	Soldiers
1A	Foxholes
1B	Trash
1C	Damaged vegetation
1D	Fires
1E	Noise
2	Tracked vehicles
2A	Tracks on ground
2B	Fuel spills/diesel smoke
2C	Track/engine noise

TARGET SIGNATURES		
ITEM	SIGNATURE	
2D	Loud, sharp sound—then white smoke	
3	Antitank	
3A	ATGM launch "swish"	
3B	Long, thin wires	
3C	Vapor trails—slow ATGM	
3D	Sharp crack—AT gun	
3E	Dismounted gunner up to 80 m away from launcher	
3F	Bright, white flash at night	
4	Artillery	

101010.2.2

10	10.2.3	10
TARGET SIGNATURES		
ITEM	SIGNATURE	✓
4A	Loud, dull sound	
4B	Grayish-white smoke	
4C	Bright, orange flash and black smoke-airburst	
4D	Rushing noise just before round impacts	
5	Aircraft	
5A	Aircraft noise	
5B	Glare on aircraft canopies and rotor blades	
5C	Vapor trails from fired missiles or aircraft	

TARGET SIGNATURES		
ITEM	SIGNATURE	✓
5D	Dust or moving foliage from hovering helicopters	
6	Mines and obstacles	
6A	Road repairs/holes filled	
6B	Signs placed on posts, trees, or stakes	
6C	Wilted plants or brush and strange material on road	
6D	Tripwires near AT mines	
6E	Areas where locals do not go	
6F	Loose/disturbed dirt in pattern	
6G	In/near tactical barbed wire	

10 10.2.4 10

SOUND RANGES AT NIGHT		
SOURCE OF SOUND	RANGE IN KM	
Cannon shot	Up to 15	
Single shot from rifle	2-3	
Automatic weapons fire	3-4	
Armored vehicle movement:		
• on a dirt road	1-2	
• on a highway	3-4	
Motor vehicle movement:		
• on a dirt road	Up to .5	
• on a highway	Up to 1	
Movement of foot troops:		
• on a dirt road	Up to .3	
• on a highway	Up to .6	

10 10.3.1 10

10		10.3.2	10
SOUND RANGES AT NIGHT			
SOURCE OF SOUND	RANGE IN KM		
Small arms loading	Up to .5		
Metal on metal	Up to .3		
A few men talking	Up to .3		
Steps of a single man	Up to .04		
Ax blow, sound of a saw	Up to .5		
Blows of shovels, pickaxes	Up to 1		
Screams	Up to 1.5		
Oars on water	Up to 2		
Notes:			

10		10.4.1	10
OBSERVATION DISTANCES WITH NAKED EYE			
SOURCE OF SOUND	RANGE IN KM		
Vehicle/tank headlights	4-8		
Muzzle flashes-single gun	4-5		
Muzzle flashes-small arms	1.5-2		
Bonfire	6-8		
Flashlight	1.5-2		
Lighted match	1.5		
Lighted cigarette	0.5-0.8		
Note: For observation from the air, the above distances increase 2-3 times!			

10

10.5.1

10

FIND UNKNOWN RANGE	
STEP	ACTION
1	R = Range W = Width ρ = Mils H = Height
2	List W or H of target in meters
3	List ρ
4	To compute R, divide Step 2 by Step 3 $\div$ =
5	To compute meters, multiply Step 4 by 1000 $\times$ =
6	List R from Step 5

10

10.6.1

10

FIND UNKNOWN WIDTH	
STEP	ACTION
1	R = Range W = Width ρ = Mils
2	List R (example 1000 m=1 or 1500 m=1.5)
3	List ρ
4	To compute W, multiply Step 2 by Step 3 $\times$ =
5	List W from Step 4

Note: For shift from a known point, round up to next higher 10 (example 54=60).

10

10.8.1

10

WARSAW PACT

ADA AND AT VEHICLES

10

10.7.1

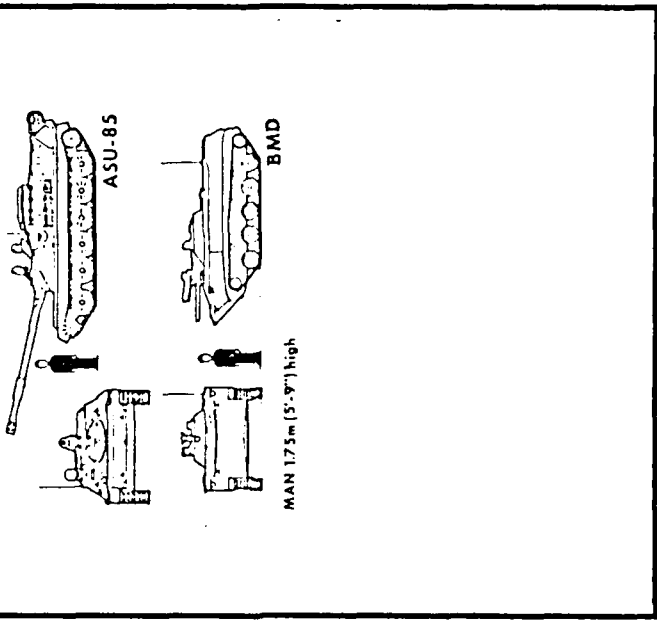
10

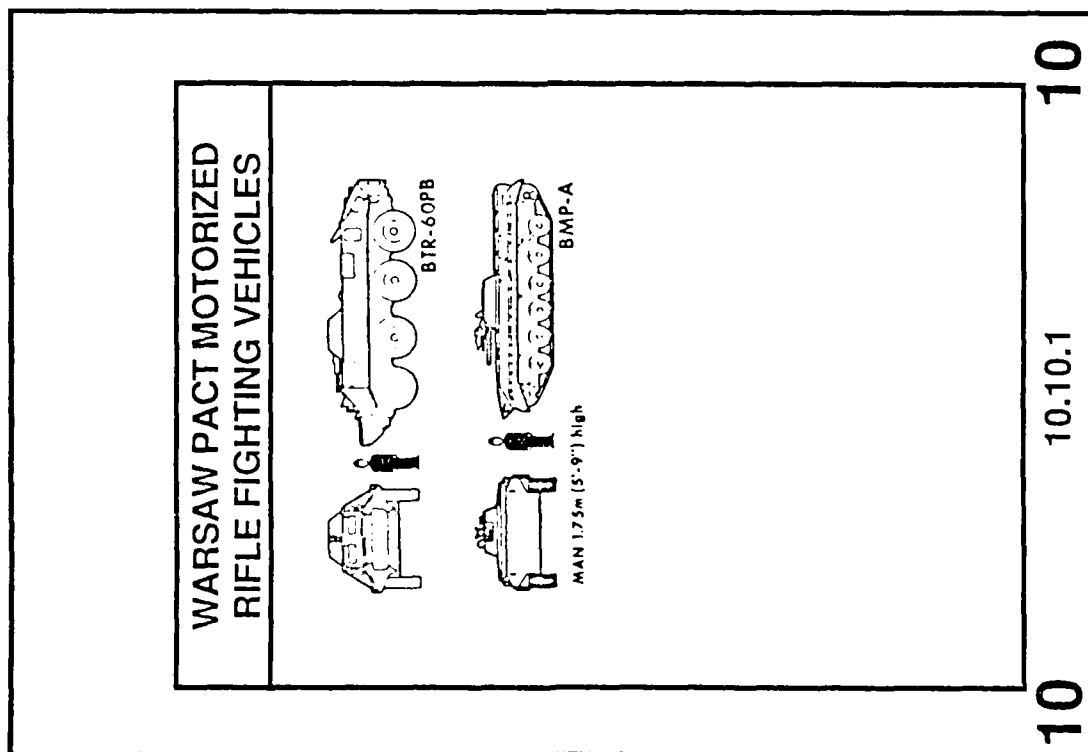
FIND UNKNOWN MIL ANGLE

STEP	ACTION
1	R = Range W = Width μ = Mils H = Height Known Point μ? W or H of target You R?
2	List R (example 1000 m=1 or 1500 m=1.5)
3	List W or H in meters
4	To compute μ , divide Step 3 by Step 2 + =
5	List μ from Step 4

Note: Round off the number in Step 5 to one decimal point only.

WARSAW PACT ADA AND AT VEHICLES	

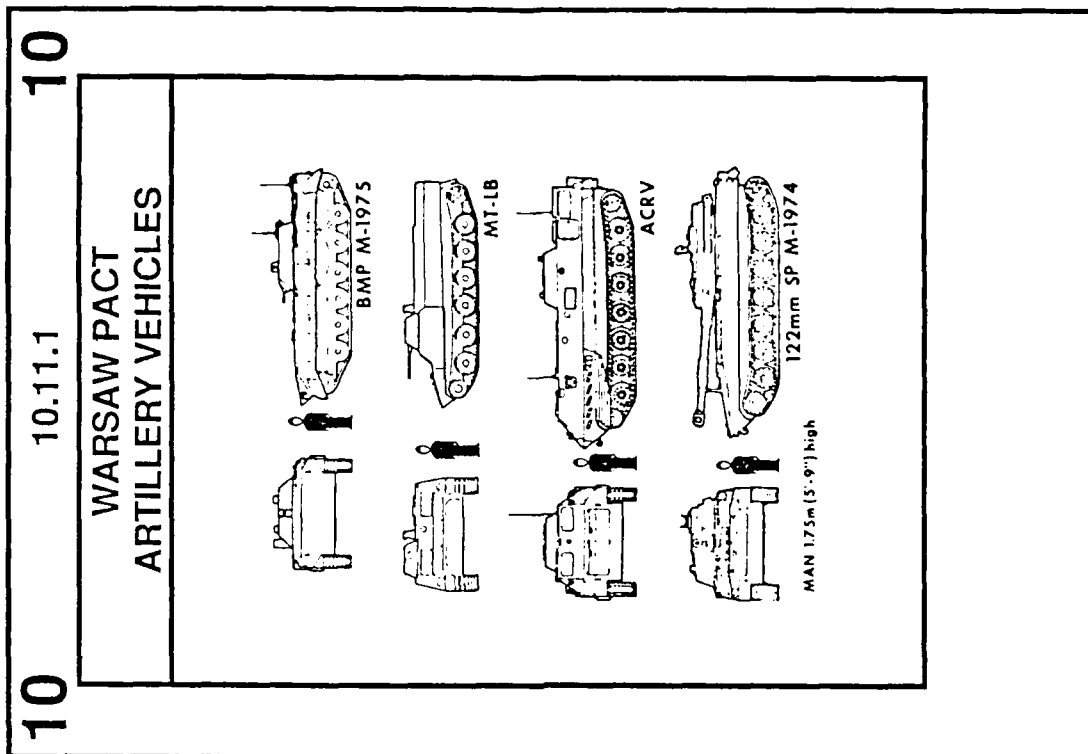
10.9.1	WARSAW PACT AIRBORNE VEHICLES  MAN 1.73m (5'8") high



10

10.10.1

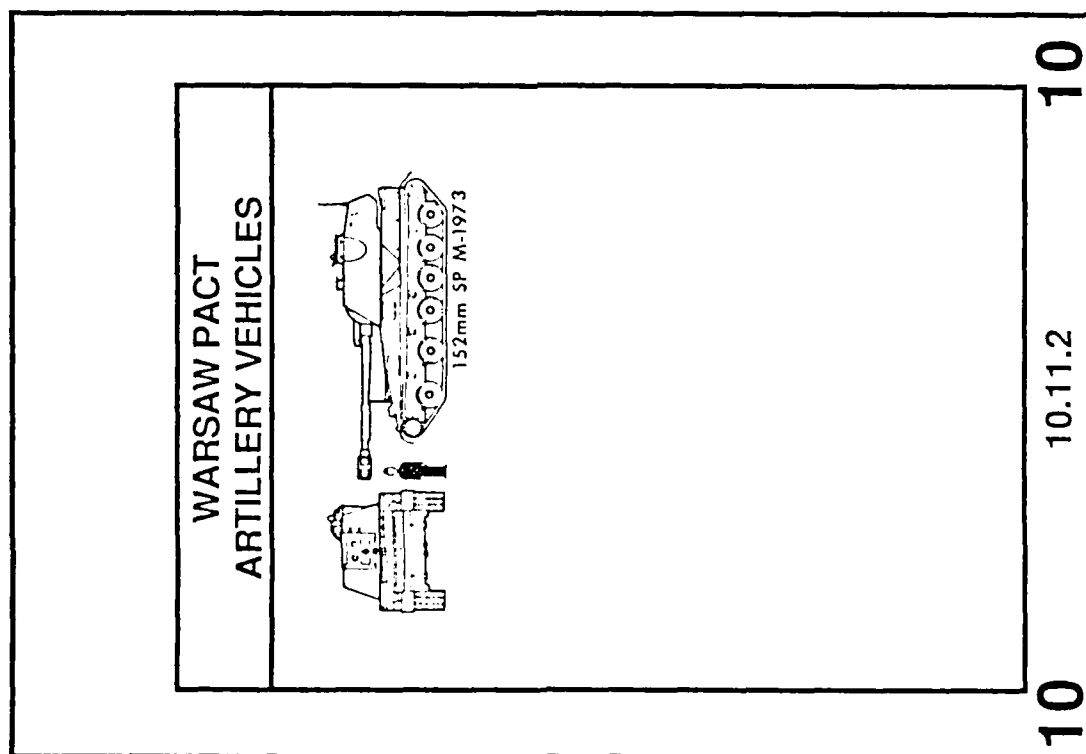
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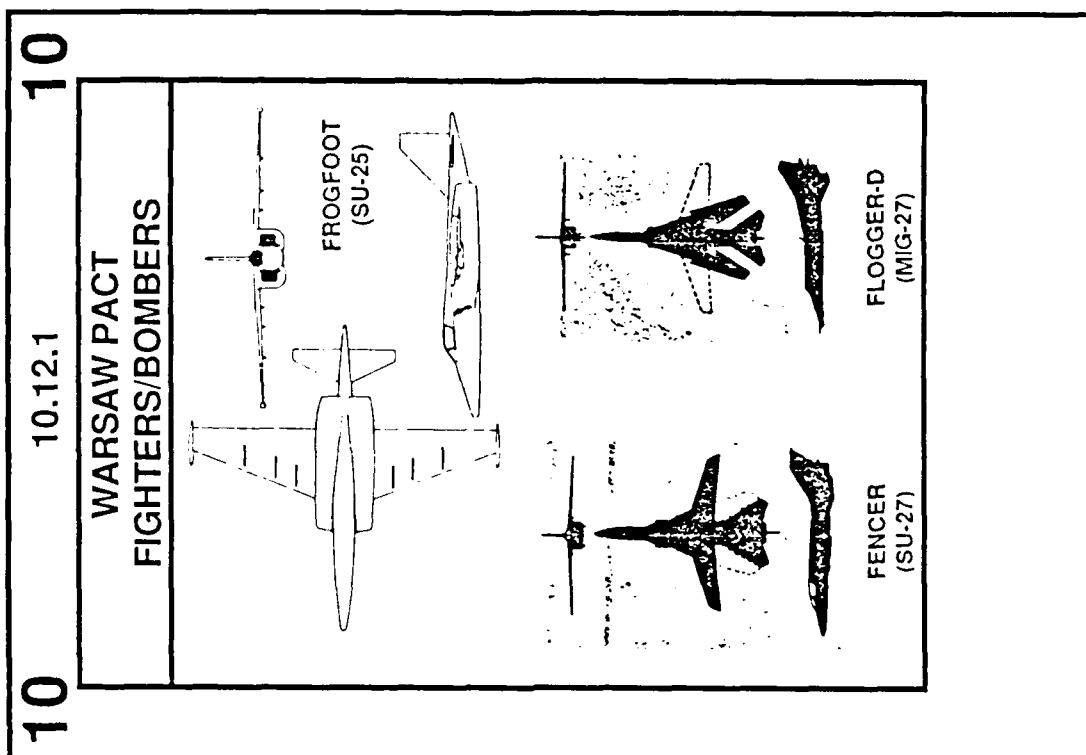
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10.11.1

10



10 10.11.2 10



10 10.12.1 10

WARSAW PACT HELICOPTERS



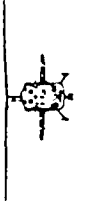
HARE



HOUND



HOPLITE



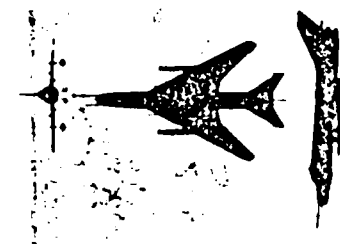
HIHO



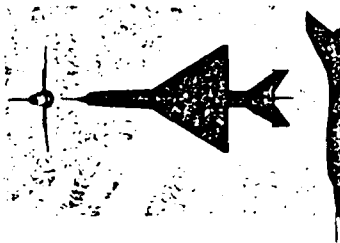
818



WARSAW PACT FIGHTERS/BOMBERS



FITTER-C
(SU-17, 20, & 22)



**FISHBED
(MiG-21)**

10

WARSAW PACT HELICOPTERS



HOOK



10

10

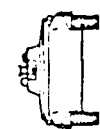
10.13.2

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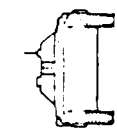
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10.14.1

WARSAW PACT RECON VEHICLES



BMP-A



BMP M-1976



BRDM



BRDM rkh

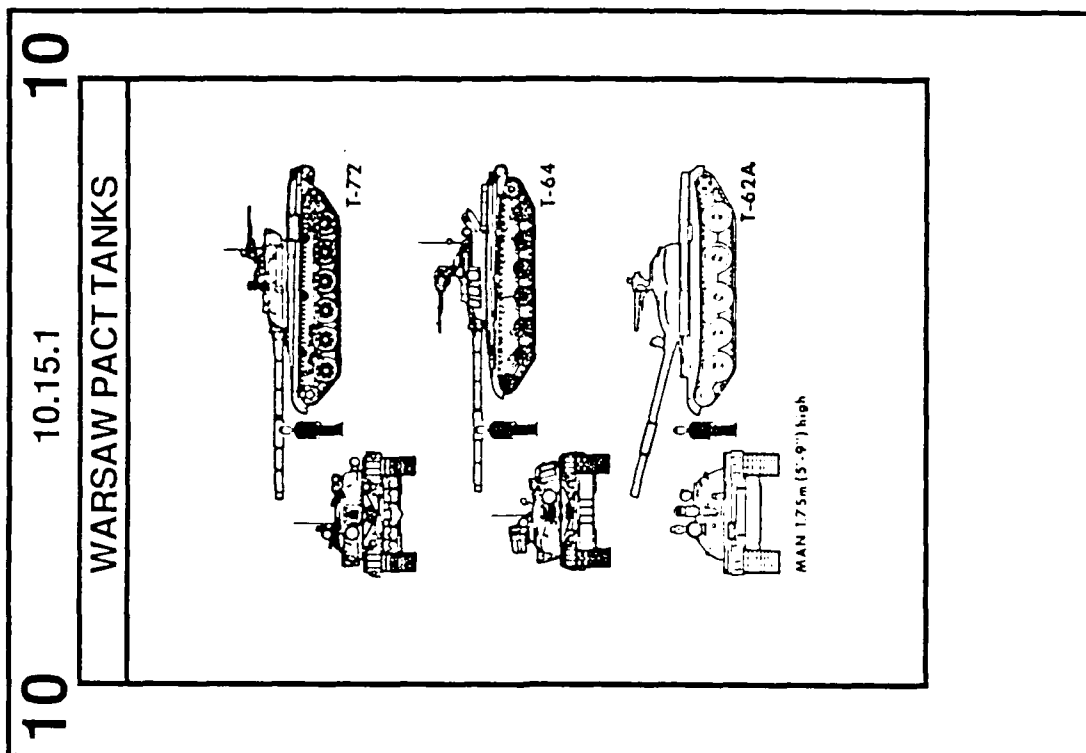
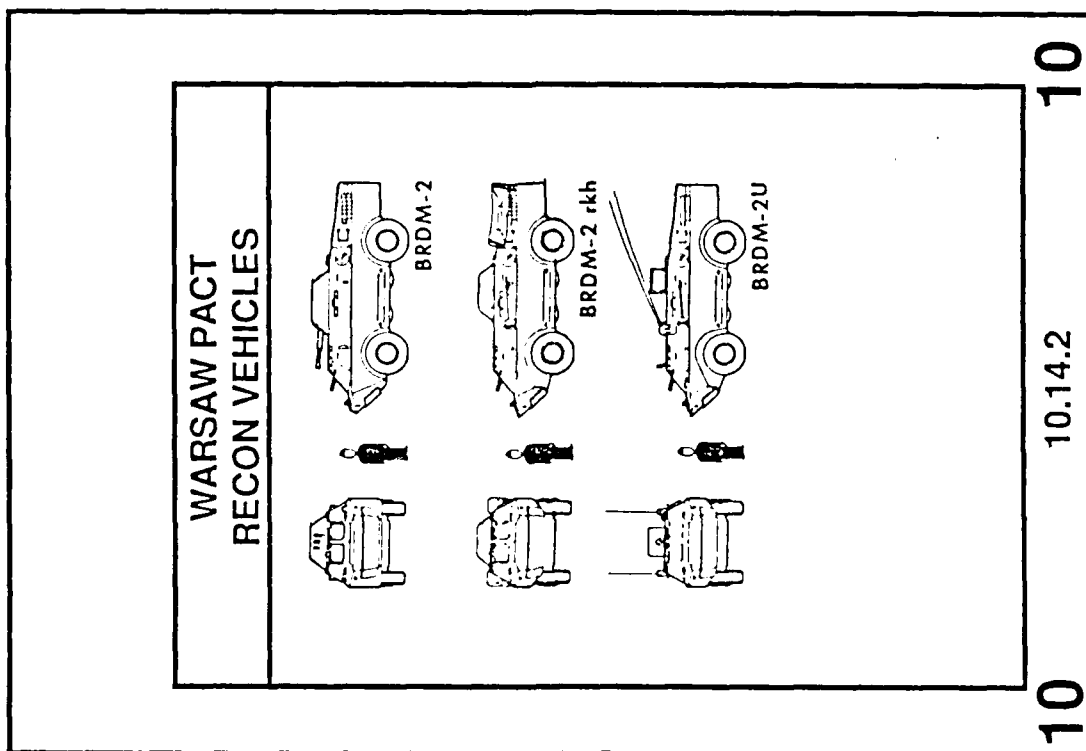
MAN 175m (5' 9") high

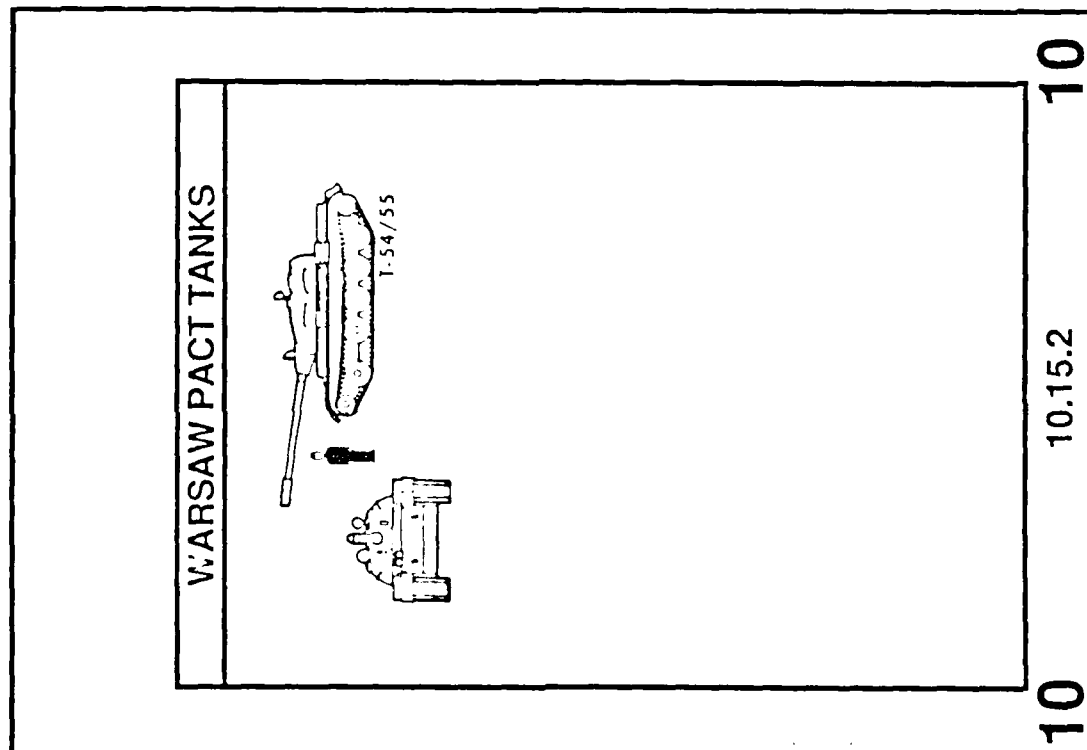
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10

10.14.1

10





10

10.16.1

10

MAINTENANCE ON AN/PVS-5 GOGGLES		
STEP	ACTION	
1	Inspect goggles and carrier by removing goggles from carrier to ensure all parts are present	✓
2	Inform your Cdr if any of the following parts are missing	
2A	Binocular assembly	
2B	Headstrap	
2C	Lens tissue	
2D	Socket head key	
2E	Instruction sheet	
2F	Demisting shield assembly	

MAINTENANCE ON AN/PVS-5 GOGGLES			10
STEP	ACTION		10.16.2
2G	Carrying case	✓	
2H	Eyepiece lens cap		
2I	Objective lens cap		
3	Inspect eyepiece and objective lenses		
3A	Insure eyepiece, objective lens cover, and demisting shields are present		
3B	Inspect lens for dirt and damage		
3C	Clean and dry lens using water and lens paper, if needed		

MAINTENANCE ON AN/PVS-5 GOGGLES			10
STEP	ACTION		10.16.3
3D	Report lens damage to organizational maintenance	✓	
4	Inspect exterior surfaces		
4A	Inspect face mask assembly and aluminum housing for damage		
4B	Wipe exterior with damp, clean cloth to remove dirt and grease		
4C	Report damage to maint		
5	Check clamp knobs so binocular assembly moves freely		

MAINTENANCE ON AN/PVS-5 GOGGLES			10
STEP	ACTION		10.16.4
6	Check lever clamps so monoculars move freely		10
7	Check diopter adjustment so diopter rings move freely		
8	Rotate focus knobs so they rotate freely		
9	Check rotary switch		
10	Clean carrying case and remove all accessories		
10A	Turn case over and shake dirt out		
10B	Clean exterior and interior with dry, clean, lint-free cloth		

MAINTENANCE ON AN AN/PAS-7			10
STEP	ACTION		10.17.1
1	Check parts of viewer for cleanliness and damage		10
1A	Check exterior surface		
1B	Check infrared window and eyepiece lens		
1C	Check rubber eyeshield and operation of security shutter		
1D	Check connector for bent or damaged pins		
1E	Check neck and hand sling fabric		
2	Check rechargeable battery and battery charger for cleanliness and damage		

10		10.17.2	10
MAINTENANCE ON AN AN/PAS-7			✓
STEP	ACTION		
2A	Check exterior surfaces		
2B	Check cable for cracks and breaks		
3	Check interconnecting cable for cleanliness and damage		
4	Check connectors and cable for damaged pins		
5	Check carrying bag for cleanliness and damage		
5A	Open bag and shake out dirt		
5B	Remove lint from interior and exterior of bag		
5C	Check fabric for damage		

10		10.17.3	10
MAINTENANCE ON AN AN/PAS-7			✓
STEP	ACTION		
5D	Check zipper for proper operation		
6	Check transit case for cleanliness and damage		
6A	Remove cover, empty case, and clean case		
6B	Check interior and exterior of case for cleanliness and damage		
6C	Check hold down latches for proper operation and for damage		
Notes:			

CLEANING METHODS FOR AN AN/PAS-7			10	10.18.1	10
STEP	ACTION				
1	Lens and window surfaces				
1A	Pull off rubber eyeshield				
1B	Remove dust and dirt from lens with clean camel's hair brush				
1C	Use lens tissue dampened with lens cleaner for stubborn dirt				
1D	Clean lens by starting at center and working out toward edge in circular motion				
1E	Dry lens with dry tissue using circular motion				

CLEANING METHODS FOR AN AN/PAS-7			10	10.18.2	10
STEP	ACTION				
2	Exterior surfaces				
2A	Brush external surface with camel's hair brush				
2B	Wipe surface with clean, lint-free cloth				
2C	Use cloth dampened with mild detergent and water for stubborn dirt				
2D	Dry thoroughly with clean, lint-free cloth				
3	Rubber eyeshield				
3A	Wipe with clean, lint-free cloth				

CLEANING METHODS FOR AN AN/PAS-7		
STEP	ACTION	
3B	Use cloth dampened with water for stubborn dirt	
3C	Air dry, or dry with a clean, lint-free cloth	
4	Connectors and cables	
4A	Remove dirt with a camel's hair brush	
4B	Use lint-free cloth dampened with water for stubborn dirt	
4C	Air dry or dry with a clean, lint-free cloth	
Notes:		

10 10.18.3 10

PLANNING PEWS INSTALLATION		
STEP	ACTION	
1	Size of area	
1A	Consider size of area to determine how many detectors you need	
1B	Detector's maximum range is 10 m	
1C	Maximum distance from receiver is 1500 m	
1D	Use PEWS to cover areas which other devices cannot cover	
1E	When covering a large area, you can place detectors using parallel hot-loop method	

10 10.19.1 10

PLANNING PEWS INSTALLATION		
STEP	ACTION	
2	Type of terrain	
2A	Trees and heavy vegetation will decrease operating range in "RF" mode	
2B	Hills or buildings will block signal in "RF" mode	
2C	Use wire mode for detectors when you cannot accomplish line-of-sight emplacement	
2D	You must place detectors in bottom of ditch or gully	
2E	Do not place detectors near streams or rivers	
3	Type of soil in area	

10

10.19.3

10

PLANNING PEWS INSTALLATION		
STEP	ACTION	
3A	For 10 m radius detection, place detectors in hard-packed soil, grassy or weedy areas, or wet soil	
3B	Avoid sand, loose soil, or rock formations because they will greatly reduce detection range	
Notes:		

PREPARING PEWS FOR OPERATION		
STEP	ACTION	✓
1	Prepare receiver ("RF" mode)	
1A	Install batteries	
1B	Switch "DSPL-TONE-OFF" switch to "OFF"	
1C	Release battery cover	
1D	Snap 2 batteries into position	
1E	Replace cover	
2	Install headset	
3	Install antenna	
3A	Install antenna adapter into "ANT" socket on front panel	

10 10.20.1 10

PREPARING PEWS FOR OPERATION		
STEP	ACTION	✓
3B	Connect antenna to socket	
4	Prepare detector ("RF" mode)	
4A	Install batteries	
4B	Switch "RF-OFF-W" switch to "OFF"	
4C	Loosen screws to release battery cover	
4D	Snap battery into clip	
4E	Check area code and ID number	
4F	Secure battery cover	

10 10.20.2 10

PREPARING PEWS FOR OPERATION		
STEP	ACTION	
5	Install antenna by screwing detector onto threaded post on top of detector	✓
6	Install ground stakes by screwing ground stakes into bottom of detector	
7	Prepare receiver (wire mode)	
7A	Repeat steps 1A-1D	
7B	Install wire link	
7C	Secure battery cover to wire link	
8	Receivers and detectors are now ready for operation	

10 10.20.3 10

INSTALLATION OF PEWS		
STEP	ACTION	
1	Install detectors	✓
1A	Dig shallow hole about 1 1/2-inches deep and slightly larger than detector	
1B	Push detector into hole so you firmly implant holding stakes into ground	
1C	Emplace detector in hole with arrow on top of detector parallel to road or trail	
1D	Pack soil firmly against sides of detector case	
1E	Do not cover top of detector with soil	

10 10.21.1 10

10		10.21.2	10
INSTALLATION OF PEWS			
STEP	ACTION		✓
1F	If you are using wire mode for detectors, strip 1/2-inch of insulation from end of wire		
1G	Insert each wire into terminal posts on detector		
1H	Run wire to receiver location		
1I	Camouflage detector & wire		
1J	Turn detector on and set "RF-OFF-W" switch to "RF" for radio mode or to "W" for wire mode		
2	Record detector lengths		
2A	Draw rough sketch		

10		10.21.3	10
INSTALLATION OF PEWS			
STEP	ACTION		✓
2B	Include easily identifiable natural and man-made features		
2C	Label features in STEP 2B that can be used to identify area of emplacement of detectors		
2D	Identify start point of emplacement of detectors		
3	Include following items on sketch		
3A	Direction of likely enemy approach		
3B	Direction indicator (north arrow)		

INSTALLATION OF PEWS		
STEP	ACTION	
3C	Unit designation (no higher than company)	
3D	Area code of detectors	
3E	Date detectors are installed	
3F	Whether detectors are in "RF" or wire mode	
3G	Pace count per 100 m of soldier recording pace count	
4	Record detectors on sketch	
4A	Record detectors as they are being laid	
4B	Lay detectors in sequence	

10

10.21.5

10

INSTALLATION OF PEWS		
STEP	ACTION	
4C	Determine direction from start point to first detector	✓
4D	Count paces to emplacement site	
4E	Record direction, pace count, and location of detector on sketch	
Notes:		

PERFORM PRE-MISSION CHECKS ON PEWS		
STEP	ACTION	
1	Perform receiver checks ("RF" mode)	✓
1A	Set "DSPL-TONE-OFF" switch to "TONE" position	
1B	Listen for tone in headset	
1C	Set "DSPL-TONE-OFF" switch to "DSPL" position	
1D	Observe display window	
1E	"L" will appear followed by ".8.8" and then will clear	
1F	Does "L" appear in display? If YES, go to STEP 1G. If NO, go to STEP 1H.	

10 10.22.1 10

PERFORM PRE-MISSION CHECKS ON PEWS		
STEP	ACTION	
1G	Replace batteries	✓
1H	Batteries are low and should be replaced	
2	After display has cleared, press "TEST-RESET" button and look for ".8.8" display	
3	Perform detector checks ("RF" mode)	
3A	Set receiver to "DSPL"	
3B	Set receiver "AREA" switch to area number of detector you are testing	

10 10.22.2 10

PERFORM PRE-MISSION CHECKS ON PEWS		
STEP	ACTION	
4	Check all detectors for "RF" mode of operation	
4A	Place detector power switch to "RF"	
4B	Press detector "TEST" button and hold button down for 4 seconds	
4C	Observe display window of receiver for response	
4D	Receiver display must indicate detector's ID number in first 2 frames of display window and a "C" or "P" in last frame	

10

10.22.3

10

PERFORM PRE-MISSION CHECKS ON PEWS		
STEP	ACTION	
5	Perform receiver/detector checks (wire mode)	
5A	Connect wire link to an operational receiver	
5B	Connect working detector to wire link using short length of field wire	
5C	Set "TEST" switch to each position on wire link	
5D	At each position, observe test indicator light on wire link which must light up at each position	

10

10.22.4

10

PERFORM PRE-MISSION CHECKS ON PEWS		
STEP	ACTION	
5E	Is test indicator light blinking? If YES, go to STEP 5G. If NO, go to STEP 5F.	
5F	Indicates that field wire is not broken or shorted	
5G	Indicates that wire is broken or shorted	
6	Set test switch on wire link to "REC" position	
7	Set detector mode switch to "W"	
7A	Press and release test button for 4 seconds on detector and observe display window	

10

10.22.5

10

PERFORM PRE-MISSION CHECKS ON PEWS		
STEP	ACTION	
7B	Receiver must indicate ID number of detector and "C" or "P"	
8	Perform receiver memory check	
8A	Connect 2 working detectors to receiver by "RF" mode, wire link mode, or both	
8B	Set "DSPL-TONE-OFF" switch to "DSPL"	
8C	Press and release test button on both detectors	
8D	Observe display window	

10

10.22.6

10

PERFORM PRE-MISSION CHECKS ON PEWS		
STEP	ACTION	
8E	Detector numbers from the 2 detectors should appear alternately in the display window	
9	Press "TEST-RESET" button on receiver while observing display	
10	Display on detector should blank out	
Notes:		

Notes:

10.22.8

10

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INSTALL HASTY PROTECTIVE MINEFIELD	
STEP	ACTION
1	Report intention to lay field
2	Get authorization to lay field
3	Recon to find best mine sites
3A	On enemy avenues of approach
3B	Under unit observation/fire
4	Report initiation of field
5	Place mines on avenues of approach
5A	Do NOT arm mines yet
5B	Use ONLY metallic mines

11

11.1.1

INSTALL HASTY PROTECTIVE MINEFIELD	
STEP	ACTION
5C	Do NOT boobytrap mines
6	Record field on DA 1355-1-R
7	Arm mines—from enemy side to friendly side
8	Report completion of field
9	Warn adjacent units
10	Always integrate mines with other defense plans
11	Retain DA 1355-1-R as long as unit and field stay in place

11

11.1.2

11

11

11.1.3

11

INSTALL HASTY PROTECTIVE MINEFIELD		
STEP	ACTION	
12	If transferred to another unit, gaining unit Cdr signs and dates DA 1355-1-R	✓
13	If field abandoned, forward DA 1355-1-R to co Cdr	
Notes:		

11

11.2.1

11

REMOVE HASTY PROTECTIVE MINEFIELD		
STEP	ACTION	
1	Do you have DA 1355-1-R for the field? If YES, go to STEP 2. If NO, treat as ENEMY field-use breaching techniques	✓
2	Try to have same man who emplaced mine remove mine	
3	Move to reference point	
4	Move to stake B-1	
5	Is stake B-1 in position? If YES, go to STEP 6. If NO, go to STEP 9.	
6	Move from stake B-1 to first mine row B	

REMOVE HASTY PROTECTIVE MINEFIELD		
STEP	ACTION	
7	Remove each mine in row B in order using the azimuth and distance on DA 1355-1-R	✓
8	Go to step 12	
9	Move from ref point to B-2	
10	Shoot BACK azimuth from stake B-2 to last mine in row B	
11	Remove each mine in row B-- use BACK azimuths	
12	Move to stake A-1 (or A-2)	
13	Remove mines in row A the same way as in row B and destroy the DA 1355-1-R	

11

11.2.2

LOCATING MINE SITES BY TERRAIN ANALYSIS		
STEP	ACTION	
1	Use map to determine mine locations by considering	✓
1A	AA(s) to enemy positions	
1B	Intersections and turnouts	
1C	Wooded areas	
1D	Bridges and fords	
1E	Hilltops	
1F	Depressions and ditches	
2	While viewing terrain from ground for possible mines and tripwires, consider STEPS 1A-1F plus the following	

11

11.3.1

LOCATING MINE SITES BY TERRAIN ANALYSIS	
STEP	ACTION
2A	Helicopter landing sites
2B	Signs of road repairs
2C	Mud smears, grass, sticks, loose dirt, dung, or other material on roads
2D	On shoulders of road at likely ambush sites
2E	Tripwires near known or suspected antitank mines
2F	Signs placed in trees, posts, or stakes
2G	Holes filled with asphalt or other material

11

11.3.2

LOCATING MINE SITES BY TERRAIN ANALYSIS	
STEP	ACTION
2H	Tunnels
2I	Unusual or out-of-place material
2J	Wilted plants or brush
2K	Flags, equipment, or supplies
2L	Areas where local civilians are not found
3	Locate possible mined and tripwired areas from the air by considering features in STEPS 1A-1F and features in STEPS 2A-2L
4	Report suspected locs to Cdr

11

11.3.3

11

BREACHING AND CLEARING MINEFIELDS		
STEP	ACTION	✓
1	Suppress enemy covering obstacles	
2	Obscure area with smoke	
3	Secure near side	
4	Reduce obstacle—blow or probe lane through	
5	Secure the far side	
6	Blow marked mines in place (time permitting)	
7	Mark cleared lane	
8	Move unit through obstacle	

11

11.4.1

INSTALLING M16A2 ANTIPERSONNEL MINE		
STEP	ACTION	✓
1	Inspect mine	
1A	Look for cracks, dents, swells, or any other damage	
1B	Unscrew shipping plug from fuze well with M25 wrench	
1C	Inspect fuze well for debris	
1D	Turn mine upside down and tap gently to remove debris	
1E	Inspect M605 fuze for damage	
1F	Safety pins must move freely	
1G	Rubber gasket around fuze	

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11.5.1

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INSTALLING M16A2 ANTIPERSONNEL MINE			11	11.5.2	11
STEP	ACTION				
1H	Tighten bushing adapter on fuze well	✓			
2	Screw fuze into fuze well and tighten with M25 wrench				
3	Dig hole to proper depth for tripwire/pressure installation				
4	Emplace mine				
4A	Place mine in hole				
4B	Cover and pack dirt around mine to proper fuze level NOTE: Go to STEP 6 for pressure installation				
5	Tripwire installation				

INSTALLING M16A2 ANTIPERSONNEL MINE			11	11.5.3	11
STEP	ACTION				
5A	Attach tripwires to 2 anchor stakes to form a wide "V", THEN to release pin	✓			
5B	Allow enough slack in wires for fuze top to rotate				
6	Arming mine fuze				
6A	Remove locking safety pin first (stop if you hear a click)				
6B	Remove interlocking safety pin (squeeze legs together)				
6C	Put camo on mine with care				
6D	Remove positive safety pin last to arm mine				

DISARMING M16A2 ANTIPERSONNEL MINE		11	11.6.1	11
STEP	ACTION			
1	Replace positive safety pin			
2	Replace interlocking safety pin			
3	Replace locking safety pin			
4	Cut slack tripwires at release pull ring			
5	Remove mine from hole			
6	Clean off top of mine			
7	Remove fuze assembly			
8	Replace shipping plug			
Notes:				

INSTALLING M18A1 ANTIPERSONNEL MINE		11	11.7.1	11
STEP	ACTION			
1	Inventory mine and accessories			
2	Inspect mine for cracks, dents, swells, or any other damage			
3	Test electrical circuit			
3A	Mate firing device, test set, and firing wire connector			
3B	Depress handle			
3C	Light must show in window			
3D	Return bail to safety position			
4	Aiming the mine			

INSTALLING M18A1 ANTIPERSONNEL MINE		
STEP	ACTION	✓
4A	With slit-type peep sight, aim mine at man's head standing 45 m from mine	
4B	With knife edge-type sight, aim mine at man's feet standing 50 m from mine	
5	Priming mine	
5A	Remove shipping plug-priming adapter from mine	
5B	Insert blasting cap into priming adapter	
5C	Screw into either cap well	

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11.7.2

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INSTALLING M18A1 ANTIPERSONNEL MINE		
STEP	ACTION	✓
6	Connect firing wire plug directly to firing device with safety on	
7	Firing position is minimum of 16 m from rear of mine to your fighting position-100 m for others under cover	
8	Recheck aim of mine	
9	Camouflage mine	
10	Move to covered position	
11	Retest firing circuit	
12	Firing the mine	

11

11.7.3

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INSTALLING M18A1 ANTIPERSONNEL MINE		
STEP	ACTION	
12A	Mate firing device and firing wire connector	✓
12B	Drop safety bail	
12C	Take cover	
12D	Depress handle	
Note: Anytime you move forward to check mine, TAKE FIRING DEVICE WITH YOU!		

11 11.7.4 11

DISARMING M18A1 ANTIPERSONNEL MINE		
STEP	ACTION	
1	Disconnect firing wire from firing device—replace covers	✓
2	Put firing device in pocket	
3	Remove priming adapter and blasting cap from cap well	
4	Remove blasting cap from priming adapter	
5	Reverse priming adapter and screw into cap well	
6	Remove mine and reroll blasting cap and wire	
7	Clean and repack mine and accessories in bandolier	

11 11.8.1 11

11			11.9.1			11		
INSTALLING M18A1 MINE WITH TRIPWIRES								
STEP	ACTION							
1	Arming M18A1 (claymore) with tripwires							
1A	Emplace and aim mine to cover target area							
1B	Emplace 2 tripwire stakes 20 m in front of mine and space them 10-20 m apart							
1C	Emplace 1 stake 1 m to the side of mine							
2	Installing fire device							
2A	Remove protective cap							
2B	Attach blasting cap to base with crimpers							

11			11.9.2			11		
INSTALLING M18A1 MINE WITH TRIPWIRES								
STEP	ACTION							
2C	Tape detonating cord to blasting cap on firing device							
2D	Attach firing device securely to one of the forward stakes							
2E	Attach tripwire to opposite forward stake							
3	Attach tripwire to firing device							
3A	If using M1 firing device, attach tripwire to pull ring							
3B	If using M3 firing device, insert wire into hole in winch							

11		11.9.3		11
INSTALLING M18A1 MINE WITH TRIPWIRES		STEP	ACTION	
3C	To take up slack—turn knurled knob until you pull locking safety pin into safety pin hole			✓
4	Secure detonating cord to stake near mine			
5	Insert loose end of detonating cord through priming adapter into blasting cap and crimp			
6	Insert cap into well and secure cap in well by screwing priming adapter into well			
7	Recheck mine for proper aim			
8	Remove safety pin from firing device & positive safety pin			

11		11.10.1		11
DISARMING M18A1 MINE WITH TRIPWIRES		STEP	ACTION	
1	Inspect mine, tripwire, firing device, and detonating cord			✓
2	To disarm mine			
2A	Cut detonating cord with M2 crimpers 6 inches from mine			
2B	Unscrew & remove shipping plug priming adapter			
2C	Remove blasting cap and detonating cord			
2D	Reverse shipping plug priming adapter and screw it back into detonator well			
2E	Put mine into carrying case			

DISARMING M18A1 MINE WITH TRIPWIRES		
STEP	ACTION	
2F	Cut detonating cord with M2 crimpers 6 inches from blasting caps on firing device	✓
3	To disarm M1 firing device use "DISARMING M1 PULL FIRING DEVICE" job aid	
4	Will you disarm M3 firing device? If YES, go to STEP 5. If NO, go to STEP 6.	
5	To disarm M3 firing device use "DISARMING M3 PULL-RELEASE FIRING DEVICE" job aid	

11

11.10.2

DISARMING M18A1 MINE WITH TRIPWIRES		
STEP	ACTION	
6	To blow M3 firing device in place	✓
6A	Cut cord and remove detonating cord	
6B	Lay out 10 m of commo string, wire, or twine to tripwire	
6C	Attach to tripwire	
6D	Move back to other end of string or wire and pull	
7	To dispose of crimped blasting caps, either attach them to other demo or give them to your Cdr	

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11.10.3

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INSTALLING M21 ANTITANK MINE		
STEP	ACTION	
1	Inspect mine for cracks, swells, dents, and any other damage	
2	Inspect M607 fuze	
3	Ensure cotter pin of fuze pull ring assy is securely in place	
4	Dig hole 6-inches deep, and 10-12 inches in diameter	
5	Remove closing plug assy from bottom of mine using M26 wrench	
6	Remove any debris by turning mine upside down	

11.11.1

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STEP	ACTION	✓
7	Insert M120 booster (washer side toward the fuze)	
8	Replace closing plug & tighten with M26 arming wrench	
9	Remove shipping plug from top of mine	
10	Check black powder bag in fuze cavity to ensure bag is not split open	
11	Remove closure assembly from fuze	
11A	Match fuze thread to fuze cavity in mine	

11.11.1

INSTALLING M21 ANTITANK MINE		
STEP	ACTION	
11B	Screw in fuze hand tight	✓
12	Emplace mine and cover with earth, leaving fuze uncovered	
13	Screw extension rod into threaded fuze well	
14	Arming mine fuze	
14A	Squeeze cotter pins together	
14B	Use one hand on pull ring assy and hold fuze firmly with other hand	
14C	Remove cotter pin & carefully remove band and stop from neck of fuze	

11

11.11.3

DISARMING M21 ANTITANK MINE		
STEP	ACTION	
1	Carefully attach band, stop, and pull ring onto fuze	✓
2	Insert cotter pin and spread back ends	
3	Remove extension rod from fuze	
4	Remove fuze from mine and install closure assy on fuze	
5	Install shipping plug into fuze well	
6	Remove closing plug from bottom of mine, then remove booster, and then reinstall closing plug	

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11.12.1

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INSTALLING M49A1 TRIPFLARE		
STEP	ACTION	✓
1	Chose location for flare and tripwire where you think enemy will try to infiltrate	
2	Position flare so it illuminates enemy and keeps friendly positions in the dark	
3	Use pullpin method to install flare with tripwire	
4	Mount bracket with 2 nails	
5	Bracket must be vertical and 15-18 inches above ground	
6	Mount flare by aligning lever with trigger pivot	

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11.13.2

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INSTALLING M49A1 TRIPFLARE		
STEP	ACTION	✓
7	Carefully slide flare down into bracket until bottom lever is 1/16-inch above bracket	
8	Flare base must be 1/2-inch below upper carriage bolt	
9	Bottom end of lever must be 3/8-inch below bracket prongs and centered between bracket prongs	
10	Clamp flare in bracket by tightening upper wingnut	
Notes:		

ARMING M49A1 TRIPFLARE		✓
STEP	ACTION	
1	Arming with pullpin method	
1A	Fasten 1 end of tripwire to post, stake, or other rigid object 15 m from flare	
1B	When facing flare trigger, tripwire must be to right or left of flare	
1C	Press lever down with one hand (do NOT release lever when pressing or flare will function)	
1D	Remove safety clip assembly	
1E	While holding lever down, insert pullpin thru 2 safety clip holes of cover loading assy	

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11.14.1

ARMING M49A1 TRIPFLARE		✓
STEP	ACTION	
1F	Before releasing lever, ensure that pullpin will hold in safety clip holes	
1G	Carefully release lever	
1H	Ensure lever retains pullpin in safety clip holes	
1I	Pull loose end of tripwire tight	
1J	Fasten it to loop in pullpin	
1K	Check that tripwire is tight and tightened at both ends	
2	Flare is prepared for firing	

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11.14.2

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DISARMING M49A1 TRIPFLARE			✓
STEP	ACTION		
1	Misfiring of M49A1		
1A	Do not approach flare for 5 minutes		
1B	Remove flare carefully and forward to authorized personnel for disposal		
1C	If cover loading assembly is loose, do not reassemble or tighten, repeat STEP 1B		
2	Disarming M49A1		
2A	Carefully depress lever against flare body		
2B	If you used pullpin as arming method, remove pullpin		

11 11.15.1 11

DISARMING M49A1 TRIPFLARE			✓
STEP	ACTION		
2C	Secure lever by inserting 1 end of safety clip through safety clip hole of cover loading assembly		
2D	Use only safety clip holes in cover loading assembly		
2E	Snap other end of safety clip into other safety clip hole		
3	Detach wire from pullpin		
4	Return flare to its original packaging		
5	Inspect flare before you return it to storage		

11 11.15.2 11

INSTALLING M1 PULL FIRING DEVICE		✓
STEP	ACTION	
1	Remove protective cap	
2	Using crimpers, attach nonelectric blasting cap to standard base	
3	Attach firing device assembly to demolition charge	
4	Anchor one end of tripwire to stake and fasten other end to pullring	
5	Remove locking safety pin first and positive pin last	
Notes:		

11 11.16.1 11

DISARMING M1 PULL FIRING DEVICE		✓
STEP	ACTION	
1	Insert nail, length of wire, or original safety pin into positive safety pin hole	
2	Insert similar pin into locking safety pin hole	
3	Cut tripwire	
4	Separate firing device and explosive	
5	Unscrew standard base	
Notes:		

11 11.17.1 11

INSTALLING M1A1 PRESSURE FIRING DEVICE	
STEP	ACTION
1	Remove protective cap from base
2	Crimp on nonelectric blasting cap
3	Assemble 3-pronged pressure head and extension rod, if needed
4	Screw in top of pressure cap
5	Attach firing device assembly to demolition charge
6	Remove safety clip first
7	Remove positive safety pin last

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11.18.1

DISARMING M1A1 PRESSURE FIRING DEVICE	
STEP	ACTION
1	Insert original pin, nail, or length of wire into positive safety pin hole
2	Replace safety clip, if available
3	Unscrew base assembly from firing device
Notes:	

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11.19.1

INSTALLING M3 PULL- RELEASE FIRING DEVICE	
STEP	ACTION
1	Remove protective cap
2	Attach nonelectric blasting cap to standard base w/ crimpers
3	Attach firing device to anchored charge
4	Attach one end of pullwire to an anchor, and place other end in hole in winch
5	Using knurled knob, draw up tripwire until locking safety pin is pulled into wide portion of safety pin hole
6	Remove locking safety pin first & positive pin last

11 11.20.1 11

DISARMING M3 PULL- RELEASE FIRING DEVICE	
STEP	ACTION
1	M3 is dangerous to disarm, it should be blown in place
2	If device must be disarmed, follow STEPS 3-5
3	Insert original pin, nail, or length of wire in positive safety pin hole
4	Insert original locking pin or nail in locking pin hole
5	Disassemble tripwire, firing device, and explosive
Notes:	

11 11.21.1 11

INSTALLING M5 FIRING DEVICE		
STEP	ACTION	✓
1	Insert length of 10-gage wire into interceptor hole	
2	Bend 10-gage wire slightly to prevent it from dropping out	
3	Remove small cotter pin from safety pin	
4	Holding release plate down, replace locking safety pin with length of 16- or 18-gage wire, bent slightly to prevent it from dropping out	
5	Remove protective cap from base	
6	Attach nonelectric blasting cap to base with crimpers	

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11.22.2

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INSTALLING M5 FIRING DEVICE		
STEP	ACTION	
7	Secure firing device to explosive device	
8	Emplace charge and firing assembly	
9	Place at least 5 pounds of weight on the firing device release plate	
10	Remove wire from safety pin hole	
11	Remove wire from interceptor hole	
Notes:		

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11.23.1

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DISARMING M5 FIRING DEVICE	
STEP	ACTION
1	Insert length of heavy gage wire into interceptor hole
2	Bend wire to prevent it from dropping out
3	Proceed carefully, as slightest disturbance of restraining weight may detonate mine
4	Disassemble firing device and mine
Notes:	

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11.24.1

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NONELECTRIC FIRING SYSTEM	
STEP	ACTION
1	Determine length of time fuse you need
1A	Cut a 6-inch length from end of fuse and discard
1B	Cut off a 3-foot length to check burning rate
1C	Light fuse end and list time (seconds) it takes to burn
1D	Compute burning rate per foot by dividing 1C by 1B ÷ =
2	Determine amount of explosive you need

NONELECTRIC FIRING SYSTEM	
STEP	ACTION
3	Cut fuse to proper length
4	Pass end of fuse through priming adapter
5	Attaching blasting cap to fuse
5A	Inspect open end of cap
5B	Remove debris from cap by shaking gently or by tapping hand with cap against other hand
5C	Hold fuse vertically with square cut end up
5D	Slip cap down over fuse so cap and fuse are in contact or they may misfire

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11.24.2

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11.24.3

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NONELECTRIC FIRING SYSTEM		
STEP	ACTION	✓
5E	Turn cap out and away from body and crimp cap at point 1/8 to 1/4-inch from open end	
6	Attach M60 fuse igniter	
6A	Unscrew fuse holder cap	
6B	Press shipping plug into igniter	
6C	Rotate and remove plug	
6D	Insert fuse in hole	
6E	Tighten cap	
7	Pull pin to detonate charge	

NONELECTRIC PRIMING OF DEMO BLOCK		
STEP	ACTION	
1	Prime demo block with a threaded cap well and priming adapter	✓
1A	Inspect cap well for debris	
1B	Insert cap with fuse attached into cap well	
1C	Screw adapter into cap well	
2	Prime demo block with a threaded cap well and no priming adapter	
2A	Inspect cap well for debris	

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11.25.1

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11.25.2

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NONELECTRIC PRIMING OF DEMO BLOCK		
STEP	ACTION	
2B	Wrap and tie string tightly around block, leave 6 inches on each end	✓
2C	Insert blasting cap with fuse attached into cap well	
2D	Tie loose string around fuse to prevent cap separating from block	
3	Prime demo block without threaded cap well and without priming adapter	
3A	Make hole with M2 crimpers	
3B	Repeat STEPS 2A-2D	

CLEAR NONELECTRIC MISFIRES	
STEP	ACTION
1	If possible, misfire should be cleared by soldier(s) who place the charge
2	Wait 30 minutes after misfire before moving to charge
3	Detonate 1-pound charge at side of untamped misfired charge without moving or disturbing it
4	Dig to within 1 foot of a tamped misfired charge
5	Detonate 2-pound charge on top of a tamped misfired charge

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11.26.1

ELECTRIC FIRING SYSTEM	
STEP	ACTION
1	Test firing wire with M51 test set or galvanometer
1A	Check test set
1B	Separate firing wire conductors at both ends
1C	Touch posts with both wires from one end
1D	Twist wires together at open end and retest wires
2	Lay out firing wire from charges to FIRING position
3	Test electric blasting cap with M51 blasting cap test set or galvanometer

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11.27.1

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ELECTRIC FIRING SYSTEM		
STEP	ACTION	
3A	Remove shunt from lead wires of electric blasting cap	✓
3B	Touch cap lead wires to posts	
4	After testing cap, twist free wire ends together	
5	Move to firing point and test entire circuit with M51 test set or galvanometer	
6	Test blasting machine by depressing handle	
7	On order, connect lead wires to 2 blasting machine posts	
8	Detonate charge—depress handle of blasting machine	

11 11.27.2 11

ELECTRIC PRIMING OF DEMO BLOCK		
STEP	ACTION	
1	Priming demo block with threaded cap well and priming adapter	✓
1A	Inspect cap well for debris	
1B	Untwist free ends of cap lead wire and fasten to firing wire with Western Union Pigtail Splice	
1C	Test blasting cap and firing wire with galvanometer or M51 tester	
1D	Pass cap lead wires through slot of adapter	
1E	Pull cap into place in adapter	

11 11.28.1 11

11			11.28.2			11		
ELECTRIC PRIMING OF DEMO BLOCK								
STEP	ACTION							
1F	Insert cap into cap well of block and screw adapter into place							
2	Priming demo block with threaded cap well with no priming adapter							
2A	Inspect cap well for debris							
2B	Repeat STEPS 1B-1D							
2C	Insert electric cap into cap well							
2D	Tie lead wires around block with two half hitches, allow slack in wires between cap and tie							

11			11.28.3			11		
ELECTRIC PRIMING OF DEMO BLOCK								
STEP	ACTION							
3	Priming demo block without threaded cap well							
3A	Make hole in end of demo block with M2 cap crimper							
3B	Untwist free ends of cap lead wire							
3C	Fasten them to firing wire with Western Union Pigtail Splice							
3D	Test blasting cap and firing wire with galvanometer or M51 test set							
3E	Repeat STEPS 2C-2D							

11		11.29.1		11
CLEAR ELECTRIC MISFIRES				
STEP	ACTION			
1	Is system below ground? If YES, go to STEP 2. If NO, go to STEP 3.			
2	Wait 30 minutes before checking to see if firing system is dual primed			
3	If system is above ground and not dual primed, check ASAP			
4	Check firing wire connections to blasting machine			
5	Make 2-3 more attempts to fire system			
6	Disconnect firing wire from blasting machine and shunt (twist together) wires			

11		11.29.2		11
CLEAR ELECTRIC MISFIRES				
STEP	ACTION			
7	Check entire system for breaks and short circuits			
8	If fault is below ground, remove tamp material (soil) carefully from borehole to within 1 foot of misfired charge			
9	Disconnect blasting cap wire from circuit			
10	Dig to within 1 foot of misfired charge			
11	Place 2-pound primed charge next to misfired charge			
12	Connect new charge to firing system and initiate detonation			

DETONATING CORD FIRING SYSTEMS		
STEP	ACTION	
1	Priming demolition blocks	✓
1A	Place loop of detonating cord on explosive with 4 wraps around block and loop	
1B	Pull running end through eye of loop and tighten	
2	Priming plastic explosives with detonating cord	
2A	Form either overhand knot, Uli knot, or triple roll knot	
2B	Insert knot into plastic explosives or molded piece of explosive	

11 11.30.1 11

DETONATING CORD FIRING SYSTEMS		
STEP	ACTION	
2C	Ensure that 1/2-inch of explosive is on all sides of knot and a minimum of 1 inch of explosive on end of knot	✓
3	Priming dynamite	
3A	Attach nonelectric blasting cap to end of detonating cord	
3B	Follow any of the methods for nonelectric priming	
4	Priming dynamite by lacing detonating cord through it	
4A	Punch four equally spaced holes through dynamite cartridge	

11 11.30.2 11

DETONATING CORD FIRING SYSTEMS		
STEP	ACTION	
4B	Lace detonating cord through dynamite	✓
5	Priming 40-pound cratering charge	
5A	Pass end of detonating cord through long tunnel on side of can	
5B	Tie an overhand knot on the portion passed through, at least 6 inches from end	
6	Priming shaped charges	
6A	Attach nonelectric blasting cap to end of detonating cord	

11 11.30.3 11

DETONATING CORD FIRING SYSTEMS		
STEP	ACTION	
6B	Follow standard nonelectric or electric priming methods	✓
7	Attaching nonelectric or electric firing system to detonating cord	
7A	Construct nonelectric or electric firing system	
7B	Splice assembly to detonating cord with string, M1 clip, or adhesive tape	
8	Construct ring main	
8A	Use when making detonating cord firing systems with more than one block of explosive	

11 11.30.4 11

DETONATING CORD FIRING SYSTEMS		
STEP	ACTION	
8B	Form a ring main	✓
8C	Close ring main by tying girth hitch with an extra turn tail to inside, or use a detonating cord clip	
8D	Run branch lines from explosives to ring main using girth hitch with one extra turn	
8E	Leave minimum of 6 inches on running end	
8F	Branch line must run 90 degrees from direction from which blast is coming	

11 11.30.5 11

DETONATING CORD FIRING SYSTEMS		
STEP	ACTION	
8G	Attach electric or nonelectric firing system to ring main at running end of detonating cord	✓
8H	Leave a 6-inch length of ring main free beyond the splice	
9	In actual combat systems, use detonating cord firing system	
9A	Tape a 3-foot section of detonating cord to blasting cap	
9B	Splice other end to ring main with square knot or M1 detonating cord and detonate charge	

11 11.30.6 11

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NBC-1 REPORT	
LINE	ITEM (* = CHEM)
B	Position of observer (UTM coord)
C	Direction of attack from observer (Degrees) (Mils)
D	Date/time of detonation/*area attacked (DTG)
F	Location of attack/*area attacked (Actual) (Estimated) (UTM coord)
H	Type of burst/*agent (Air) (Surface) (Unknown)

12 12.1.1 12

NBC-4 REPORT	
LINE	ITEM
Q	Location of reading (UTM coord) 1. _____ 2. _____ 3. _____ 4. _____
R	Dose-rate (rad/hr) 1. _____ 2. _____ 3. _____ 4. _____
S	Date/time of reading (DTG) 1. _____ 2. _____ 3. _____ 4. _____

12 12.2.1 12

12		12.3.1	12
SUPERVISE RADIATION MONITORING			
STEP	ACTION		✓
1	List grid coordinates of central point in area		
2	Tell IM-174 operator to take readings from central point every hour		
3	Check that operator uses IM-174 correctly		
4	Tell operator to report radiation readings to you immediately		
5	Report radiation readings using NBC-4 report		
6	Take readings continuously when you		

12		12.3.2	12
SUPERVISE RADIATION MONITORING			
STEP	ACTION		✓
6A	Read 1 or more rad/hr		
6B	Receive fallout warning		
6C	Are moving to a different loc		
6D	Receive orders		
7	Check every hour when		
7A	Reading drops below 1 rad/hr		
7B	Receive orders		
Readings/DTG			

12		12.4.1		12
USING A DOSIMETER				
STEP	ACTION			✓
1	Take dosimeter out of your pocket			
2	Hold viewing end of dosimeter up to your eye			
3	Point it toward a light or the sky, but not directly at the sun			
4	Point where vertical hairline crosses scale is total amount of radiation you received			
5	List total amount of radiation you received			
6	Report the number of rads or millirads in STEP 5 to your Cdr			

12		12.5.1		12
COLLECT/REPORT TOTAL RADIATION DOSE				
STEP	ACTION			✓
1	Do all dosimeters you will use read 0? If YES, go to STEP 3. If NO, go to STEP 2.			
2	Turn it in for recharging			
3	Select soldiers to wear dosimeters who perform duties within unit's area			
4	Insure that soldiers report readings to you accurately			
5	Collect readings from soldiers at the same time, at least once daily			

12

12.5.2

12

COLLECT/REPORT TOTAL RADIATION DOSE	
STEP	ACTION
6	Add together readings by all soldiers wearing dosimeters
7	List number of readings you receive
8	Divide STEP 6 by STEP 7 ÷ =
9	Round off STEP 8 to the nearest 10
10	Report reading in STEP 9 to your Cdr
Notes:	

12

12.6.1

12

PREPARATION FOR NBC ATTACK	
STEP	ACTION
1	Cover equipment and supplies with plastic sheets
2	Cover exposed weapons and ammo
3	Keep instruments in containers when not in use
4	Park all vehicles so air conditioners are away from prevailing winds
5	Cover unsheltered commo equipment
6	Put overhead cover on field latrines
7	Only open food when eating it

PREPARATION FOR NBC ATTACK		
STEP	ACTION	
8	Store unpackaged food in iceboxes	
9	Keep water in sealed containers	
10	Dig in supplies and equip	
11	Secure loose items	
12	Turn off all electronic equip and keep inside bunkers or armored vehicles to protect against electromagnetic pulse (EMP)	
Notes:		

12 12.6.2 12

EMP PROTECTIVE MEASURES		
STEP	ACTION	
1	Disconnect antenna(s)	
2	Use highest freq possible	
3	Disconnect everything from spare equipment	
4	Keep cable and wire lengths short	
5	Use remote sets only when needed	
6	Bury cables and wires at least 18 inches	
7	Do not leave connected cable or wire on a reel	

12 12.7.1 12

EMP PROTECTIVE MEASURES		
STEP	ACTION	
8	Use a common ground for all equipment	
9	Properly insulate antenna guy lines	
10	Never use commercial sources of power	
11	Shield all C-E equipment with iron, steel, or any metal	
12	Close all hatches, doors, vents, access panels, and ducts	
Notes:		

12 12.7.2 12

MARK RADIOLOGICALLY CONTAMINATED AREA		
STEP	ACTION	
1	Locate/identify contaminated area	
2	Select marker labeled "ATOM"	
3	Print information so word "ATOM" faces towards you in an upright position	
4	Print dose rate in centigrays per hour (rads per hour)	
5	Print date and time (state if local or zulu time) of detonation	
6	If you do not know the date and time of detonation, print "UNKNOWN"	

12 12.8.1 12

MARK RADIOLOGICALLY CONTAMINATED AREA		
STEP	ACTION	✓
7	Position markers so that information faces away from contaminated area	
8	Place markers at locations where dose rate measures 1 centigray per hour (rad per hour) or more	
9	Attach markers to objects so others can easily see them from all routes through the contaminated area	
10	Place each marker so that others can see it from the previous marker	

12

12.8.2

MARK BIO/CHEM CONTAMINATED AREA		
STEP	ACTION	✓
1	Locate/identify contaminated area	
2	Is contamination biological? If YES, go to STEP 3. If NO, go to STEP 4.	
3	Select marker labeled "BIO" for biological contamination	
4	Select marker labeled "GAS" for chemical contamination	
5	Print information on marker so word on marker faces towards you in upright position	
6	Print type of agent detected, if unknown, print "UNKNOWN"	

12

12.9.1

12

12			12.9.2			12		
MARK BIO/CHEM CONTAMINATED AREA								
STEP	ACTION						✓	
7	Print date of detection below type of agent							
8	Print time (state if local or zulu time) of detection below date							
9	Position markers so information faces away from contaminated area							
10	Attach markers to objects so others can easily see them from all routes through contaminated area							
11	Place each marker so that it can be seen from the previous marker							

12			12.10.1			12		
UNMASKING WITH CHEMICAL AGENT DETECTOR KIT								
STEP	ACTION						✓	
1	Is chemical agent detected? If YES, do not unmask. If NO, go to STEP 2.							
2	Have 2-3 soldiers unmask in the shade for 5 minutes, then remask for 10 minutes							
3	Check soldiers for chemical symptoms							
4	If no symptoms, tell other soldiers to unmask							
5	Be alert for chemical symptoms							
Notes:								

UNMASKING WITHOUT CHEMICAL AGENT DETECTOR KIT		12
STEP	ACTION	12.11.1
1	Have 2-3 soldiers hold their breath and break the seal of their masks for 15 seconds with eyes open	
2	Have soldiers reseal, clear, and check masks in the shade for 10 minutes	
3	Check soldiers for chemical symptoms	
4	If no symptoms, have soldiers break seal of mask and take 2-3 breaths	
5	Repeat STEPS 2-3	

UNMASKING WITHOUT CHEMICAL AGENT DETECTOR KIT		12
STEP	ACTION	12.11.2
6	If no symptoms, have soldiers unmask for 5 minutes and remask for 10 minutes in the shade	
7	Check soldiers for chemical symptoms	
8	If no symptoms, tell all soldiers to unmask	
9	Be alert for chemical symptoms	
Notes:		

OPERATING AN IM-174/PD RADIACMETER		
STEP	ACTION	
1	Open snaps and snap top of carrying case on fastener	
2	Turn "SET" control clockwise and let radiacmeter warm up for 2-20 minutes	
3	Hold function switch to "ZERO"	
4	Adjust "SET" control until meter shows "0"	
5	Release switch so pointer falls back to "0"	
6	Set function switch to "ELEC CAL"	

12 12.12.1 12

OPERATING AN IM-174/PD RADIACMETER		
STEP	ACTION	
7	Does pointer show "500"? If YES, go to STEP 10. If NO, go to STEP 8.	
8	Take off cap from "CALIB" control on front panel	
9	Turn control bottom until pointer shows "500" and replace cap on button	
10	Hold function switch to "LINEARITY"	
11	Is pointer within red mark? If YES, go to STEP 12. If NO, change batteries and go to STEP 1.	

12 12.12.2 12

OPERATING AN IM-174/PD RADIACMETER		
STEP	ACTION	
12	Set function switch to "READ"	✓
13	Take readings while turning in a circle	
14	Read meter face up at waist level	
15	List highest reading you obtain	
16	List grid coordinates of reading location	
17	Turn "SET" control to "OFF"	
18	Resnap carrying case	
19	Report your reading	

12 12.12.3 12

INSTALLING BATTERIES IN AN IM-174/PD RADIACMETER		
STEP	ACTION	
1	Loosen thumbscrew and remove battery box from radiacmeter	✓
2	Press down on lock plate, turn it to left and lift off	
3	Lift out retaining plate	
4	Put in batteries matching positive (+) and negative (-) marks	
5	Replace retaining plate and make sure locating pin on battery box goes in locating hole on retaining plate	
6	Replace lock plate	

12 12.13.1 12

INSTALLING BATTERIES IN AN IM-174/PD RADIACMETER	
STEP	ACTION
7	Press down on lock plate turning right until it locks
8	Wrap cable around battery box
9	Hand tighten thumbscrew
10	Put radiacmeter back into carrying case
Notes:	

12 12.13.2 12

OPERATING AN IM-174A/PD RADIACMETER	
STEP	ACTION
1	Open snaps and push back top of carrying case
2	Snap top of carrying case on fastener at rear
3	Let radiacmeter warm up for 2 minutes (20 if you can)
4	Turn zero control clockwise for warm up
5	Hold function switch to "ZERO"
5A	Adjust zero control until meter shows "0"
5B	Release switch while watching pointer

12 12.14.1 12

OPERATING AN IM-174/APD RADIACMETER		
STEP	ACTION	✓
5C	Pointer must swing between "5" and "10", then to "0"	
6	Press and hold function switch to "CHECK"	
7	Does pointer fall within "CHECK" band on scale? If YES, go to STEP 9. If NO, go to STEP 8.	
8	Replace batteries and repeat STEPS 3-5	
9	Release function switch, pointer must fall to "0"	

12

12.14.2

12

OPERATING AN IM-174A/PD RADIACMETER		
STEP	ACTION	✓
10	Take readings while turning in a circle	
11	Read meter face up at waist level	
12	List highest reading you obtain	
13	List grid coordinates of reading location	
14	Turn zero control to "OFF"	
15	Resnap carrying case	
16	Report your reading	

12

12.14.3

12

12		12.15.1	12
INSTALLING BATTERIES IN AN IM-174A/PD RADIACMETER			
STEP	ACTION		✓
1	Unscrew battery cover on bottom of radiacmeter		
2	Lift clips and slide batteries into place		
3	Match up positive (+) and negative (-) marks		
4	Put battery cover back onto radiacmeter, do not pinch wires		
5	Tighten battery cover		
6	Put radiacmeter into carrying case		

12		12.16.1	12
USING A PP-1578/PD DOSIMETER CHARGER			
STEP	ACTION		✓
1	Check SOP to determine how often you recharge dosimeter		
2	Remove dust cover on your dosimeter		
3	Place dosimeter in charger		
4	Use flashlight to illuminate dosimeter scale		
5	Turn handle on charger until indicator is set to zero		
6	Record date of recharging		
7	Record time of recharging		

13		13.0.1	13
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13

13.1.1

13

ORIENT MAP BY MAP-TERRAIN ASSOCIATION		✓
STEP	ACTION	
1	Place map horizontally	
2	Look at map and ground	
3	Find two features common to both map and ground	
4	Rotate the map until map features and ground features are in same position	
5	You have oriented your map when north and south correspond to north and south on ground	
Notes:		

13

13.2.1

13

ORIENT MAP USING A COMPASS		✓
STEP	ACTION	
1	Place map horizontally and place compass parallel to a north-south line pointing toward top of map	
2	Point compass north arrow toward magnetic north arrow	
3	List G-M angle	
4	Is G-M angle easterly? If YES, go to STEP 5. If NO, go to STEP 6.	
5	Compass reading should equal 360 minus STEP 4. 360 - =	
6	Compass reading must equal G-M angle (STEP 4)	

13

13.3.1

13

ORIENT MAP USING A PROTRACTOR	
STEP	ACTION
1	Draw a magnetic north line on map from any north-south and east-west grid line intersection
2	Align compass straightedge along line you drew in STEP 1
3	Rotate map and compass together until north arrow falls below fixed black index line on compass
4	You have now oriented your map to the ground
Notes:	

13

13.4.1

13

LOCATING POINTS BY INTERSECTION	
STEP	ACTION
1	Determine G-M angle
2	Locate and mark your psn on map
3	Measure magnetic azimuth to an unknown point
4	Convert magnetic azimuth to grid azimuth
5	Is G-M angle easterly? If YES, go to STEP 6. If NO, go to STEP 7.
6	Add G-M angle (STEP 1) to magnetic azimuth for easterly angle + =

LOCATING POINTS BY INTERSECTION	
STEP	ACTION
7	Subtract G-M angle (STEP 1) from magnetic azimuth for westerly angle _____ + _____ =
8	Place protractor on map with 0-degree indicator pointing north and index point in center
9	Put tickmark on number of degrees to plot and draw line from your psn on grid azimuth to unknown point
10	Repeat STEPS 3-10 for 2nd position keeping unknown point in sight
11	Where lines cross is location of unknown point

13

13.4.2

13

LOCATING UNKNOWN POINT BY RESECTION	
STEP	ACTION
1	Determine G-M angle
2	Locate 2 known positions on ground and mark on map
3	Measure magnetic azimuth to one of known locations
4	Convert magnetic azimuth to grid azimuth
5	Is G-M angle easterly? If YES, go to STEP 6. If NO, go to STEP 7.
6	Add G-M angle (STEP 1) to magnetic azimuth for easterly angle _____ + _____ =

13

13.5.1

13

13		13.5.2	13
LOCATING UNKNOWN POINT BY RESECTION			
STEP	ACTION		
7	Subtract G-M angle (STEP 1) from magnetic azimuth for westerly angle _____ + _____ =		
8	Place protractor on map with 0-degree indicator pointing north and index point in center		
9	Put tickmark on number of degrees to plot		
10	Remove protractor and draw line from back azimuth position in direction of unknown position		
11	Repeat STEPS 3-11 for 2nd and 3rd positions that you know		

13		13.6.1	13
LOCATING POINT BY STRAIGHTEDGE METHOD			
STEP	ACTION		
1	Locate your position on map		
2	Lay straightedge on map with one end at your position as pivot point		
3	Rotate straightedge until you sight unknown point along straightedge		
4	Draw a line along straightedge		
5	Repeat STEPS 1-4 for 2 other positions keeping unknown point in sight		
6	Where lines cross is location of unknown point		
7	Read coordinates of point where lines cross		

13

13.7.1

13

FIND TARGET BY GRID COORDINATES	
STEP	ACTION
1	Orient map
2	Identify target with terrain feature on ground
3	Locate terrain feature on map
4	Plot target on map in relation to terrain feature on ground
5	Compute grid coordinates of target point on map
6	List grid coordinates
Notes:	

13

13.8.1

13

COMPUTING CURRENT G-M ANGLE (DEGREES)	
STEP	ACTION
1	List current year
2	Year map was made
3	Subtract STEP 2 from STEP 1 _____ - _____ =
4	List annual magnetic change in degrees
5	Multiply STEP 4 by STEP 3 _____ X _____ =
6	List G-M angle for year map was made
7	Is annual change easterly? If YES, go to STEP 8. If NO, go to STEP 9.

13

13.8.2

13

COMPUTING CURRENT G-M ANGLE (DEGREES)	
STEP	ACTION
8	Subtract STEP 5 from STEP 6 to compute easterly G-M angle _____ - _____ = _____
9	Add STEP 5 to STEP 6 to compute westerly G-M angle _____ + _____ = _____
10	Place G-M angle for each map sheet you use below: Edition Series Sheet G-M Angle _____

13

13.9.1

13

COMPUTING CURRENT G-M ANGLE (MILS)	
STEP	ACTION
1	List current year _____
2	Year map was made _____
3	Subtract STEP 2 from STEP 1 _____ - _____ = _____
4	List annual magnetic change in mils _____
5	Multiply STEP 4 by STEP 3 _____ X _____ = _____
6	List G-M angle for year map was made _____
7	Is annual change easterly? If YES, go to STEP 8. If NO, go to STEP 9.

13

13.9.2

13

COMPUTING CURRENT G-M ANGLE (MILS)	
STEP	ACTION
8	Subtract STEP 5 from STEP 6 to compute easterly G-M angle _____ - _____ =
9	Add STEP 5 to STEP 6 to compute westerly G-M angle _____ + _____ =
10	Place G-M angle for each map sheet you use below: Edition Series Sheet G-M Angle _____

13

13.10.1

13

COMPUTING BACK AZIMUTH (DEGREES)	
STEP	ACTION
1	List azimuth
2	Is azimuth less than 180 degrees? If YES, go to STEP 3. If NO, go to STEP 4.
3	Add 180 degrees to azimuth in STEP 1. _____ + 180 =
4	Subtract 180 degrees from azimuth computed in STEP 1. _____ - 180 =
5	List back azimuth
Notes:	

13

13.11.1

13

COMPUTING BACK AZIMUTH (MILS)	
STEP	ACTION
1	List azimuth
2	Is azimuth less than 3200 mils? If YES, go to STEP 3. If NO, go to STEP 4.
3	Add 3200 mils to azimuth computed in STEP 1. _____ + 3200 =
4	Subtract 3200 mils from azimuth computed in STEP 1. _____ - 3200 =
5	List back azimuth
Notes:	

13

13.12.1

13

COMPUTING AZIMUTH WITH A PROTRACTOR	
STEP	ACTION
1	Draw straight line between the 2 points
2	Center protractor on azimuth line where it crosses any grid line
3	Make sure line extends past outer edge of protractor
4	Draw line longer if you need to
5	Recenter protractor on azimuth line where it crosses grid line
6	Align protractor index line with grid line

13

13.12.2

13

COMPUTING AZIMUTH WITH A PROTRACTOR	
STEP	ACTION
7	Is grid line a north-south line?
7A	If YES, align north-south protractor index line with north-south grid line.
7B	If NO, align east-west protractor index line with east-west grid line.
8	Read azimuth where lines crosses degree/mil scale
9	List degrees/mils from the scale
Notes:	

13

13.13.1

13

CONVERTING GRID TO MAGNETIC AZIMUTH	
STEP	ACTION
1	List grid azimuth reading
2	Aim compass at target
3	List compass reading
4	List G-M angle
5	Is G-M angle easterly? If YES, go to STEP 6. If NO, go to STEP 7.
6	Subtract STEP 4 from STEP 1 to compute easterly azimuth. - =
7	Add STEP 4 to STEP 1 to compute westerly azimuth + =

13

13.14.1

13

CONVERTING MAGNETIC TO GRID AZIMUTH	
STEP	ACTION
1	Aim compass at target
2	List compass reading
3	List G-M angle
4	Is G-M angle easterly? If YES, go to STEP 5. If NO, go to STEP 6.
5	Add STEP 3 to STEP 2 to compute easterly azimuth. + =
6	Subtract STEP 3 from STEP 2 to compute westerly azimuth + =

13

13.15.1

13

DISTANCE FACTOR IN DEAD RECKONING	
STEP	ACTION
1	Determine map distance to travel
2	To compute 20% of STEP 1, multiply STEP 1 by .2 X .2 =
3	Add STEP 1 to STEP 2 to convert map distance to ground distance + =
4	Use odometer to gauge proper distance
Notes:	

13		13.16.1	13
NAVIGATING BETWEEN TWO POINTS ON THE GROUND			
STEP	ACTION		
1	Find start/finish points on map		✓
2	Determine grid azimuth between start and finish points and any intermediate points		
3	Convert grid azimuth to magnetic azimuth		
4	Determine distance between start and finish		
5	Make thorough map recon of area between start and finish		
6	Select check points on route		
7	Move from start through each point until finished		

13		13.17.1	13
LAND NAVIGATION DOS AND DON'Ts			
DO	DON'T		
Plot course with map and plan detours	Make up the route on the ground as you go		
Check compass every 30 paces in close terrain	Rely on your sense of direction		
Check map at every identifiable feature	Rely on your sense of direction		
Locate each leg before going on to the next	Estimate position and proceed on an assumption		
Count paces and estimate distance	Rely on instinct to judge distance travelled		

LAND NAVIGATION DOS AND DON'Ts	
DO	DON'T
If the ground does not conform to the map--STOP. Go back over the course in your mind and find out where the error occurred. Recon to find a landmark.	Blame the map or compass and carry on.
Remember: 1. The compass is right. 2. The map is right. 3. You are wrong!	

13

13.18.1

13

NAVIGATING WITH STEERING MARKS		
STEP	ACTION	✓
1	Dismount and move away from vehicle	
2	Set azimuth on compass	
3	Pick steering mark in distance on azimuth	
4	Remount and proceed to steering mark in straight line	
5	Repeat STEPS 1-4 if you reach steering mark or your direction changes	
6	Continue until end is reached	
Notes:		

NAVIGATING WITHOUT STEERING MARKS			13
STEP	ACTION	✓	13.19.1
1	Dismount and move away from vehicle		
2	Determine azimuth for direction of travel		
3	Add or subtract 180 degrees to determine forward azimuth for travel _____ =		
4	Line up vehicle on azimuth		
5	Drive vehicle along azimuth		
6	Azimuth will vary slightly from azimuth computed in STEP 3		

MOUNTED NAVIGATION BY TERRAIN ASSOCIATION			13.20.1
STEP	ACTION	✓	13
1	Determine start point and destination, and draw line between them		
2	Analyze terrain for ease of movement, recognizable terrain features, and tactical considerations		
3	Follow features in terrain		
4	Break route into smaller segments		
5	Determine distance between each segment & total distance using odometer		
6	Plan for any problems on route		

DIRECTION FINDING WITHOUT A COMPASS		
SHADOW-TIP METHOD		
STEP	ACTION	✓
1	Place stick straight up in ground pointed toward sun	
2	Mark 1st shadow point (west)	
3	Wait 10-15 minutes	
4	Mark 2nd shadow point (east)	
5	Draw east-west line through 2 points	
6	Draw 2nd (north-south) line at 90 degrees to 1st line	
7	Find the direction you want using both lines	

1313

13.21.1

13

13.21.2

13

DIRECTION FINDING WITHOUT A COMPASS		
STEP	ACTION	✓
8	Find direction you want using north-south & east-west lines	
WATCH METHOD (NORTHERN)		
STEP	ACTION	✓
1	Point hour hand at sun	
2	South is halfway between hour and and 12 o'clock	
WATCH METHOD (SOUTHERN)		
STEP	ACTION	✓
1	Point 12 o'clock at sun	
2	North is halfway between hour hand and 12 o'clock	

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EVALUATE A CASUALTY		
STEP	ACTION	✓
1	Check responsiveness	
1A	Ask if victim is all right	
1B	Shake or tap on shoulder	
1C	Watch for response	
1D	Is victim conscious? If YES, go to STEP 1E. If NO, go to STEP 1G.	
1E	If conscious, ask where victim hurts or feels different than usual	
1F	Watch for response	
1G	If victim is unconscious, go to STEP 2	

141414.1.1

14

14.1.2

14

EVALUATE CASUALTY		
STEP	ACTION	✓
2	Check breathing and pulse	
2A	Is victim breathing? If YES, go to STEP 2B. If NO, go to STEP 2D.	
2B	Look for rise/fall of chest	
2C	Look and listen for breathing	
2D	If not breathing, begin treating	
3	Check bleeding	
3A	Look for spurting blood or blood-soaked clothes	
3B	Look for entry or exit wounds	
3C	If bleeding, begin treating	

14		14.1.3		14	
EVALUATE A CASUALTY					
STEP	ACTION				✓
4	Check for shock				
5	Check for fractures				
5A	Back or neck—do not move if suspect neck or back injury				
5B	Arm and leg/closed or open				
5C	If you suspect fracture, begin treating				
6	Check for burns				
6A	Look for reddened skin, blackened skin, or singed clothing				
6B	If burns found, begin treating				

14		14.1.4		14	
EVALUATE CASUALTY					
STEP	ACTION				✓
7	Check for concussion				
8	Watch for symptoms which require medical aid				
9	SEEK MEDICAL AID ASAP				
Notes:					

14		14.2.1	14
SYMPTOMS OF SHOCK			
ITEM	SYMPTOM		✓
1	Sweaty, cool skin		
2	Paleness of skin		
3	Restlessness/nervousness		
4	Thirst		
5	Loss of blood		
6	Confusion		
7	Fast breathing rate		
8	Blotchy, bluish skin, especially around the mouth		
9	Nausea and/or vomiting		

14		14.3.1	14
PREVENTING SHOCK			
STEP	ACTION		✓
1	Position victim by moving to covered area		
2	Lay victim on back unless sitting allows easier breathing		
3	Elevate feet higher than heart		
4	Loosen tight clothing at neck, waist, and ankles unless in chemical environment		
5	Keep victim from chilling or overheating		
6	Watch victim for life-threatening conditions		
7	Seek medical aid		

14	14.0.1	14
MEDICAL		
TABLE OF CONTENTS		
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Evaluate a casualty	14.1.1	
Symptoms of shock	14.2.1	
Preventing shock	14.3.1	
Symptoms of heat cramps or exhaustion	14.4.1	
First aid for heat cramps or exhaustion	14.5.1	
Symptoms of heat stroke	14.6.1	
First aid for heat stroke	14.7.1	
Symptoms of frostbite	14.8.1	
First aid for frostbite	14.9.1	
Symptoms of cold injuries	14.10.1	
First aid for cold injuries	14.11.1	
Request for army air MEDEVAC	14.12.1	
Set up a helicopter landing site	14.13.1	

14	14.0.2	14
MEDICAL		
TABLE OF CONTENTS		
ITEM	PAGE	

14		14.1.1	14
EVALUATE A CASUALTY			
STEP	ACTION		✓
1	Check responsiveness		
1A	Ask if victim is all right		
1B	Shake or tap on shoulder		
1C	Watch for response		
1D	Is victim conscious? If YES, go to STEP 1E. If NO, go to STEP 1G.		
1E	If conscious, ask where victim hurts or feels different than usual		
1F	Watch for response		
1G	If victim is unconscious, go to STEP 2		

14		14.1.2	14
EVALUATE CASUALTY			
STEP	ACTION		✓
2	Check breathing and pulse		
2A	Is victim breathing? If YES, go to STEP 2B. If NO, go to STEP 2D.		
2B	Look for rise/fall of chest		
2C	Look and listen for breathing		
2D	If not breathing, begin treating		
3	Check bleeding		
3A	Look for spurting blood or blood-soaked clothes		
3B	Look for entry or exit wounds		
3C	If bleeding, begin treating		

14		14.1.3		14
EVALUATE A CASUALTY				
STEP	ACTION			✓
4	Check for shock			
5	Check for fractures			
5A	Back or neck—do not move if suspect neck or back injury			
5B	Arm and leg/closed or open			
5C	If you suspect fracture, begin treating			
6	Check for burns			
6A	Look for reddened skin, blackened skin, or singed clothing			
6B	If burns found, begin treating			

14		14.1.4		14
EVALUATE CASUALTY				
STEP	ACTION			✓
7	Check for concussion			
8	Watch for symptoms which require medical aid			
9	SEEK MEDICAL AID ASAP			
Notes:				

SYMPTOMS OF SHOCK			✓
ITEM	SYMPTOM		
1	Sweaty, cool skin		
2	Paleness of skin		
3	Restlessness/nervousness		
4	Thirst		
5	Loss of blood		
6	Confusion		
7	Fast breathing rate		
8	Blotchy, bluish skin, especially around the mouth		
9	Nausea and/or vomiting		

14

14.2.1

14

PREVENTING SHOCK			✓
STEP	ACTION		
1	Position victim by moving to covered area		
2	Lay victim on back unless sitting allows easier breathing		
3	Elevate feet higher than heart		
4	Loosen tight clothing at neck, waist, and ankles unless in chemical environment		
5	Keep victim from chilling or overheating		
6	Watch victim for life-threatening conditions		
7	Seek medical aid		

14

14.3.1

14

14		14.4.1	14
SYMPTOMS OF HEAT CRAMPS OR EXHAUSTION			
ITEM	SYMPTOM		✓
1	Heat cramps		
1A	Muscle cramps in abdomen, legs, or arms		
1B	Much sweating and thirst		
2	Heat exhaustion		
2A	Headache and dizziness		
2B	Much sweating		
2C	Cramps and weak		
2D	Loss of appetite and nausea		
2E	Skin is pale, moist, and clammy		

14		14.5.1	14
FIRST AID FOR HEAT CRAMPS OR EXHAUSTION			
STEP	ACTION		✓
1	Move victim to a shaded area		
2	Loosen victim's clothing		
3	Is victim conscious? If YES, go to STEP 4. If NO, go to STEP 5.		
4	If conscious, give 3-5 canteens of cool salt water in next 12 hours		
5	If unconscious, seek medical aid ASAP		
6	If no aid available, when casualty is conscious, go to STEP 4		

14
14.6.1
14

SYMPTOMS OF HEAT STROKE		
Note: This is a MEDICAL EMERGENCY!		
ITEM	SYMPTOM	
1	Skin is hot and dry	✓
2	Sweating stopped	
3	Victim may collapse or pass out quickly after a headache	
4	Dizziness	
5	Fast pulse	
6	Nausea	
7	Vomiting	
8	Mental confusion	
Notes:		

14
14.7.1
14

FIRST AID FOR HEAT STROKE		
STEP	ACTION	
1	Can victim be immersed in water? If YES, go to STEP 2. If NO, go to STEP 3.	✓
2	Immerse victim in cold water, add ice if possible	
3	If cannot immerse, move to shaded area, remove clothing, sprinkle victim with water and fan	
4	MEDEVAC victim, cool all the way	
5	When conscious, give victim cool water	

14	14.8.1	14
SYMPTOMS OF FROSTBITE		
ITEM	SYMPTOM	✓
1	Numbness in affected area	
2	Itchy skin in affected area	
3	Redness of skin or pale, waxy skin in light-skinned soldiers	
4	Grayish coloring of skin in dark-skinned soldiers	
5	Swollen or tender areas	
6	Blisters	
7	Areas of skin which are firmer than surrounding areas	
Notes:		

14	14.9.1	14
FIRST AID FOR FROSTBITE		
STEP	ACTION	✓
1	Move victim to sheltered area	
2	Warm affected areas using body heat	
2A	Cover and keep victim warm	
2B	Place affected hands in clothing	
2C	Place feet under clothing against another soldier	
3	Cover and keep victim warm	
4	Seek medical aid ASAP	
5	Do not cause further injury by rubbing/soaking injured area	

SYMPTOMS OF COLD INJURIES		✓
ITEM	SYMPTOM	
1	Unreasonable behavior	
2	Lethargy—lack of response to orders	
3	Stumbling or falling	
4	Irrational outbursts of energy	
5	Slurred speech	
6	Uncontrollable shivering	
7	Dimness of vision	
Notes:		

14 14.10.1 14

FIRST AID FOR COLD INJURIES		✓
STEP	ACTION	
1	Move victim to a shelter or protected area	
2	Cover victim with blankets or a sleeping bag plus a wind-proof plastic bag, if possible	
3	If conscious, give victim hot drinks and sugar by mouth	
4	Do not try to warm victim by rubbing limbs or skin, giving alcohol, or using hot water bottles	
5	Do not encourage victim to walk even after he has apparently recovered	
6	MEDEVAC victim ASAP	

14 14.11.1 14

14		14.12.1		14
REQUEST ARMY AIR MEDEVAC				
LINE	ITEM			
1	UTM coord of pick-up site			
2	Pick-up site radio frequency, call sign, and suffix			
3	Number of patients by priority [(#)-1=urgent, 2=priority, 3=routine]			
4	Special equip required [(#)-5=none, 6=hoist, 7=stokes litter, 8=forest/jungle penetrate]			
5	Number of patients by type [(#)-9=litter, 0=ambulatory (sitting)]			

14		14.12.2		14
REQUEST ARMY AIR MEDEVAC				
LINE	ITEM			
6	Security of pick-up site [(#)-1=no en in area, 2=possible en in area, 3=en in area, 4=en in area (armed escort required)]			
7	Method of marking pick-up site [(#)-5=panels, 6=flare signal, 7=smeke signal, 8=signalman, 9=strips of fabric/parachute, 0=branches/wood/stone put together, 1=signal lamp/flash-light, 2=vehicle lights, 3=open flame]			
8	Patient nationality and status [(#)-4=US mil, 5=US civ, 6=non-US mil, 7=non-US civ, 8=POW]			

REQUEST ARMY AIR MEDEVAC		
LINE	ITEM	
9	CBR contamination [(#)-9=chem, 0=bio, 1=radiation]	
Notes:		

14 14.12.3 **14**

SET UP A HELICOPTER LANDING SITE		
STEP	ACTION	
1	Select landing site	✓
2	Size of landing site	
2A	Requires level landing area at least 30 m in diameter	
2B	Use 10 to 1 ratio to lay out landing site when obs are in approach/departure routes	
3	Ground slope of landing site	
3A	Must be no more than 15 degrees	
3B	Is slope under 7 degrees? If YES, go to STEP 3C. If NO, go to STEP 3D.	

14 14.13.1 **14**

SET UP A HELICOPTER LANDING SITE			14
STEP	ACTION		14.13.2
3C	Land helicopter upslope	✓	
3D	Land helicopter sideslope		
4	Surface conditions		
4A	Is ground firm enough? If YES, go to STEP 4B. If NO, go to STEP 4C.		
4B	Will keep helicopter from bogging down during loading and unloading		
4C	Tell pilot to hover over site during loading/unloading		
4D	Avoid dusty, sandy, or snow-covered areas		

SET UP A HELICOPTER LANDING SITE			14
STEP	ACTION		14.13.3
4E	Remove loose debris from landing site	✓	
5	Obstacles		
5A	Remove tall trees, telephone lines, powerlines or poles, and similar obstructions on approach/departure ends		
5B	Clearly mark obstructions that you cannot remove		
6	Establish security around entire landing site		
7	Mark landing site and touchdown point		

SET UP A HELICOPTER LANDING SITE		
STEP	ACTION	
7A	Base markings on mission, capabilities, and situation	
7B	Mark landing site with smoke and a signalman	
7C	At night, mark landing site and touchdown point with inverted "Y" composed of four lights	
7D	Use strobe lights, flashlights, or vehicle lights to mark landing site	
7E	Explain marking system to pilot when you make contact	

14

14.13.4

14

14.13.5

14

NOTES

15	15.0.1	15
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Planning for CONOPS	15.1.1	
Symptoms of sleep loss	15.2.1	
Symptoms of stress	15.3.1	
Symptoms of stress in unit	15.4.1	
Dealing with stress	15.5.1	

15	15.0.2	15
CONTINUOUS OPEATIONS TABLE OF CONTENTS		
ITEM	PAGE	

15		15.1.1	15
PLANNING FOR CONOPS			
ITEM	ACTION		✓
1	Do not go longer than 24 hours without sleep		
2	Recognize symptoms of stress/sleep loss		
3	Share duties among leaders so all leaders can get sleep		
4	Set up/enforce an eating and sleeping schedule		
5	Include order issue and movement times in warning orders so subordinates can schedule sleep		
6	Do not let soldiers sleep in vehicles		

15		15.1.2	15
PLANNING FOR CONOPS			
ITEM	ACTION		✓
7	If mounted, have soldiers dismount and pitch a lean-to for sleeping		
8	When soldiers are tired, give simple orders in a firm manner		
9	Make subordinates repeat back all orders		
Notes:			

SYMPTOMS OF SLEEP LOSS		
ITEM	SYMPTOM	✓
1	Being negative	
2	Forgetfulness	
3	Hallucinations	
4	Ignoring orders	
5	Mood changes	
6	Not alert	
7	Not understanding what is said	
8	Slow response time	
9	Very irritable	
10	Very short attention span	

15

15.2.1

15

SYMPTOMS OF STRESS		
ITEM	SYMPTOM	✓
1	Changes in eating behavior	
2	Feeling angry at everyone	
3	Feeling anxious, depressed, irritable, or annoyed	
4	Feeling tense or frustrated with no outlet	
5	Feeling tired even after rest	
6	Low self-confidence and feeling lonely	
7	Not caring about anyone or anything	
8	Physical problems	

15

15.3.1

15

15

15.3.2

15

SYMPTOMS OF STRESS	
ITEM	SYMPTOM
8A	Diarrhea
8B	Headaches
8C	Nausea
8D	Pounding heart
9	Recurrent bad dreams/ nightmares
10	Unable to concentrate/ forgetfulness
Notes:	

✓

15

15.4.1

15

SYMPTOMS OF STRESS IN UNIT	
ITEM	SYMPTOM
1	Frequent conflicts within unit
2	High AWOL and sick call rates
3	Increase in soldiers' complaints
4	Insubordination
5	Poor productivity and lack of pride in work
6	Sensitivity and resenting criticism
7	Soldiers exhibit lack of pride in unit
8	Soldiers ignore orders, SOPs, and policies

✓

$$\frac{15}{15.5.1} = 15$$

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16	16.0.1	16																		
<table> <tr> <th colspan="3">AIR DEFENSE TABLE OF CONTENTS</th> </tr> <tr> <th>ITEM</th> <th colspan="2">PAGE</th> </tr> <tr> <td>Engaging aircraft</td> <td colspan="2">16.1.1</td> </tr> <tr> <td>Air defense warning</td> <td colspan="2">16.2.1</td> </tr> <tr> <td>Weapons control status</td> <td colspan="2">16.3.1</td> </tr> <tr> <td>Passive air defense</td> <td colspan="2">16.4.1</td> </tr> </table>			AIR DEFENSE TABLE OF CONTENTS			ITEM	PAGE		Engaging aircraft	16.1.1		Air defense warning	16.2.1		Weapons control status	16.3.1		Passive air defense	16.4.1	
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16	16.0.2	16									
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AIR DEFENSE TABLE OF CONTENTS											
ITEM	PAGE										

16		16.1.1	16
ENGAGING AIRCRAFT			
Note: Specific rules for engaging aircraft are in your unit SOP or issued in your commander's order. In the absence of such guidance, follow the steps below:			
STEP	ACTION		✓
1	Immediately engage all attacking aircraft		
2	Immediately engage all helicopters positively identified as hostile		
3	Engage when friendly ADA units are engaging enemy aircraft in your area		
4	Engage hostile jet aircraft not attacking your position only after ordered to fire		

16		16.2.1	16
AIR DEFENSE WARNING			
WARNING	MEANING		✓
RED	Attack by hostile aircraft or missiles is IMMINENT or IN PROGRESS		
YELLOW	Attack by hostile aircraft or missiles is PROBABLE		
WHITE	Attack by hostile aircraft or missiles is IMPROBABLE		
Notes:			

16		16.3.1	16
WEAPONS CONTROL STATUS			
STATUS	ACTION		
Weapons FREE	You may fire at any aircraft NOT positively identified as friendly		
Weapons TIGHT	You can fire only at aircraft POSITIVELY identified as HOSTILE according to the announced hostile criteria		
Weapons HOLD	DO NOT FIRE except in self-defense		
Notes:			

16		16.4.1	16
PASSIVE AIR DEFENSE			
ITEM	ACTION		
1	When stopped, occupy positions with cover and concealment		
2	Place camouflaged covering on all exposed glass		
3	Camouflage all vehicles in the open		
4	Do not skyline vehicles		
5	Do not outline vehicles against area of a different color		
6	Use covered and concealed routes		
7	If unit attacked, turn vehicles 90 degrees to attack direction		

16		16.4.2		16
PASSIVE AIR DEFENSE				
ITEM	ACTION			✓
8	Maintain COMSEC while moving			
9	Disperse vehicles			
10	Wipe out vehicle track marks around stationary positions			
11	Post air guards on vehicles and in dismounted positions			
12	Rotate air guards frequently			
13	Specify air warning signals in unit SOP			
14	Specify both visual and audible air warning signals			
15	Enforce total blackout at night			

16		16.4.3		16
PASSIVE AIR DEFENSE				
ITEM	ACTION			✓
16	Enforce noise discipline			
17	Enforce area police			
18	Camouflage spoil from all dismounted positions			
Notes:				

VEHICLE RECOVERY TABLE OF CONTENTS		
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17.0.1

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VEHICLE RECOVERY TABLE OF CONTENTS		
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17.0.2

17

17			17.1.1	17
VEHICLE RECOVERY PROCEDURE				
DANGER—Move ALL unprotected troops AT LEAST 2 cable-lengths away BEFORE applying resistance				
STEP	PROCEDURE			
1	RECON THE AREA—check the terrain for an approach to the load, method of rigging, and natural anchorages			
2	ESTIMATE SITUATION— Decide load resistance and and capacity of the effort avail			
3	CALCULATE RATIO—Compute an estimate of mechanical advantage for the rigging			
4	OBTAIN RESISTANCE— Compute tackle resistance and the total resistance			

17			17.1.2	17
VEHICLE RECOVERY PROCEDURE				
STEP	PROCEDURE			
5	VERIFY SOLUTION—Compute line forces to compare with the winch & dead line capacities			
6	ERECT RIGGING—Orient crew —instruct them to assemble rigging—move them to a safe location			
7	RECHECK RIGGING—Make sure that the rigging is set up for proper and safe operation			
8	YOU ARE NOW READY— Signal the operator to apply power to the winch and recover the load			

VEHICLE RECOVERY FUNDAMENTALS	
ITEM	FUNDAMENTAL
1	ESTIMATING LOAD RESISTANCES: • Overturned=1/2 vehicle weight • Nosed (grade)=vehicle weight • Mired wheel-deep=vehicle weight • Mired fender-deep=DOUBLE vehicle deep • Mired turret-deep=TRIPLE vehicle weight
2	LOAD RESISTANCE REDUCTION FACTORS (note: does not apply to wheeled, or nosed/overturned tracked vehicles): • 10%--Recovery in the OPPOSITE direction from which the mired vehicle was traveling

17 17.2.1 17

VEHICLE RECOVERY FUNDAMENTALS	
ITEM	FUNDAMENTAL
2 cont.	• 40%--Apply power to the tracks of the mired vehicle • 50%--COMBINATION of recovery in opposite direction + applying power to the tracks of the mired vehicle
3	LOAD RESISTANCE: Obtain this by subtracting the reduction factors from the estimated load resistance
4	MECHANICAL ADVANTAGE: • Estimate--DIVIDE the load resistance by the available effort (the capacity of the winch) • Tackle--EQUAL to the number of winch lines supporting the load (lines which can become shorter)

17 17.2.2 17

VEHICLE RECOVERY FUNDAMENTALS	
ITEM	FUNDAMENTAL
5	TACKLE RESISTANCE: 10% of the load resistance TIMES the number of sheaves (grooved wheel(s) in block(s) of the rigging
6	TOTAL RESISTANCE: The load resistance PLUS tackle resistance
7	TACKLE TERMINOLOGY: • Fall line—This is the winch line which runs from the source of effort to the first block in the tackle (there is ONLY ONE fall line in a simple tackle system) • Return lines—These are the winch lines between the blocks or the winch line from the sheave of a block to the point where the end of the line is attached

17

17.2.3

VEHICLE RECOVERY FUNDAMENTALS	
ITEM	FUNDAMENTAL
7 cont.	• Dead lines—These are the lines used to attach blocks or other equipment to the load or to an anchor
8	LINE FORCES: • Fall line—Total resistance DIVIDED by mechanical advantage • Dead line—Fall line force TIMES the number of lines that the dead line supports
9	ATTACHMENT OF RIGGING: • Always attach tow cables to TOW HOOKS, not the lifting eyes or towing pintles • All light tracked vehicles carry one 10-ft tow cable; all main battle tanks carry two 10-ft tow cables

17

17.2.4

17

VEHICLE RECOVERY FUNDAMENTALS	
ITEM	FUNDAMENTAL
9 cont.	• CROSS tow cables to prevent them from tangling and keep the vehicles aligned • Always position a hook with the open part (throat) UPWARD • Never handle cables or wire ropes without heavy leather-palmed gloves • Always place safety keys in hooks/shackles/equipment requiring them • Do NOT apply loads SUDDENLY • Vehicle operators must keep hatches closed and use periscopes • Allow NO SMOKING or OPEN FLAMES if fuel or oil has spilled
Notes:	

17 17.2.5 17

UNIT VEHICLE RECOVERY METHODS AND EQUIPMENT				
UNIT	PSNL	METHODS	EQUIP	
Plt	Crew/ operator	Towing Winching Expedients	Similar vehicles- trucks- w/winches- materials on hand	
Co	Repair- men	Winching Lifting Towing	Recovery vehicles	
Bn	Repair- men	Winching Lifting Towing	Wrecker trucks- recovery vehicles	

17 17.3.1 17

UNIT VEHICLE RECOVERY METHODS AND EQUIPMENT			
UNIT	PSNL	METHODS	EQUIP
DS and GS	Repair-men	Winching Lifting Towing Transport	Wrecker trucks--recovery vehicles--transport vehicles
Notes:			

17 17.3.2 17

VEHICLE RECOVERY CAPABILITIES			
VEHICLE TYPE	MAXIMUM CAPACITY (TONS)		
	WINCH	LIFT	TOW
M62/M543 Wrecker Truck	22.5	10	15
M553 GOER Wrecker	22.5	12	23
M578 Recovery Vehicle	30	15	30
M88 Recovery Vehicle	45	25	56
Tracked Vehicles	Averaged tracked vehicle can pull/tow the equal of its weight on dry, level, hard-stand in reverse gear		

17 17.4.1 17

WINCH VARIABLE CAPACITIES				
WINCH TYPE	CABLE LAYER	CABLE ON DRUM (FT)	CAPACITY (TONS)	
5 Ton	1	0 - 39	5.000	
	2	40 - 85	4.225	
	3	86 - 138	3.670	
	4	139 - 199	3.230	
	5	200 - 266	2.890	
10 Ton	1	0 - 41	10.000	
	2	42 - 91	8.450	
	3	92 - 148	7.250	
	4	149 - 213	6.400	
	5	214 - 287	5.700	
22.5 Ton	1	0 - 42	22.500	
	2	43 - 93	18.850	
	3	94 - 153	16.250	
	4	154 - 220	14.250	
	5	221 - 296	12.650	
	6	297 - 380	11.400	

17 17.5.1 17

WINCH VARIABLE CAPACITIES				
WINCH TYPE	CABLE LAYER	CABLE ON DRUM (FT)	CAPACITY (TONS)	
30 Ton (low gear)	1	0 - 55	30.000	
	2	56 - 128	26.000	
	3	129 - 208	23.000	
	4	209 - 300	20.000	
45 Ton (low gear)	1	0 - 41	45.000	
	2	42 - 91	38.000	
	3	92 - 149	32.000	
	4	150 - 200	28.000	
Notes:				

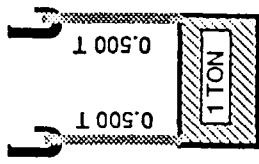
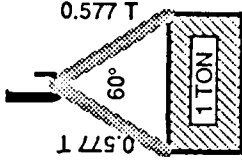
17 17.5.2 17

FIBER/WIRE ROPE AND CHAIN CAPACITIES			
DIAMETER (INCHES)	FIBER ROPE (SISAL) $T=4D^2$ (TONS)	WIRE ROPE (IPS) & CHAIN $T=4D^2$ (TONS)	
3/8	0.5625	5.625	
7/16	0.765625	7.65625	
1/2	1.00	10.00	
5/8	1.5625	15.625	
3/4	2.25	22.50	
7/8	3.0625	30.625	
1	4.00	40.00	
1-1/8	5.0625	50.625	
1-1/4	6.25	62.50	
1-1/2	9.00	90.00	
Notes:			

17

17.6.1

17

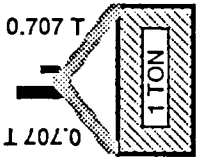
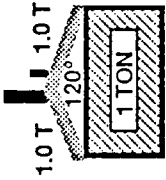
SLING LEG FORCES		
Force per sling leg (2-leg slings) per ton of total resistance		
INCLUDED ANGLE (DEGREES)	SLING LEG FORCE (TONS)	EXAMPLES
0	0.500	
10	0.502	
20	0.508	
30	0.518	
40	0.532	
50	0.552	
60	0.577	
70	0.610	
80	0.653	

17

17.7.1

17

RIGGING EXAMPLE	
THE PROBLEM M88 Recovery vehicle 25-ton M2 mired to fender depth, not mechanically disabled Fall line Return line Dead line Anchor line Original direction of travel	
STEP	PROCEDURE
1	Estimated load resistance = 50 tons (25-ton M2 times 2 for a fender-depth mire)
2	Load resistance = 25 tons (50-tons estimated load resistance minus 50%: 10% for recovery in opposite direction of original travel, and 40% for applying power to the tracks)

SLING LEG FORCES		
Force per sling leg (2-leg slings) per ton of total resistance		
INCLUDED ANGLE (DEGREES)	SLING LEG FORCE (TONS)	EXAMPLES
90	0.707	
100	0.778	
110	0.872	
120	1.000	
130	1.183	
140	1.462	
150	1.932	
160	2.880	
170	5.734	
Notes:		

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LAY M60 MACHINE GUN BY AIMING OR ELEVATION		
STEP	ACTION	
1	Set rear sight slide at estimated range to target	
2	Align sights on targets	
3	With gun laid on target, mark a spot on ground under the gas cylinder extension	
4	Drive stake into spot marked on ground	
5	Relay sights on target with gas cylinder on top of stake holding gun in proper bipod firing position	
6	Extend bipod to provide solid mount for gun	

18

18.1.1

LAY SAW BY AIMING OR ELEVATION		
STEP	ACTION	
1	Set rear sight slide at estimated range to target	
2	Align sights on targets	
3	With gun laid on target, mark a spot on ground under the handguard assembly	
4	Drive stake into spot marked on ground	
5	Lay sights again on target when handguard assembly is laid on top of stake with gun held for bipod firing properly	
6	Extended bipod to provide a solid mount for the gun	

18

18.2.1

18

LAY M60 OR SAW WITH A LOG OR BOARD		
STEP	ACTION	
1	Aim weapon toward desired sector of graze	✓
2	Place log or board beneath stock of weapon so that stock can slide across it	
3	Dig shallow trenches or grooves for bipod feet to allow rotation of feet as you move stock	
4	Adjust bipod legs to elevation providing best sector of graze	
5	Mark sectors of graze by notching or placing stops on horizontal log or board	

18

18.3.1

18

LAY M60 OR SAW WITH A LOG OR BOARD		
STEP	ACTION	
6	Use bipod firing position and grip	✓
7	Fire confirming burst to ensure that you have correctly laid weapon on target	
Notes:		

18

18.3.2

18

18

18.4.1

18

LAY M60 OR SAW WITH NOTCHED-STAKE	
STEP	ACTION
1	Aim weapon toward tgt area
2	Place stock of gun in rests of notched stakes or tree crotches
3	Make final adjustment to hit tgt
4	Dig shallow trenches/grooves for bipod feet to allow rotation of feet as you move stock
5	Hold, sight, and fire weapon using bipod firing position and grip
6	Fire confirming burst to ensure that you have correctly laid weapon on target

18

18.4.2

18

NOTES

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radio set		
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19	19.1.1	19
MESSENGER BRIEFING		
1. Name and location of headquarters or person to get message _____		
2. Route to follow _____		
3. Danger points to avoid _____		
4. Speed required _____		
5. Does message require answer _____		
6. Where to report if message cannot be delivered _____		

19	19.1.2	19
MESSENGER BRIEFING		
7. Special instructions _____		
8. Message content (only if required) _____		
9. Report destination to nearest leader when passing each OP/line _____		
10. Challenge _____		
12. Password _____		

RADIO TROUBLESHOOTING	
STEP	ACTION
1	Check frequency setting
2	Check battery: charge-new
3	Check antenna: upright-clear
4	Check ALL connections from battery through to antenna: clean-dry-tighten
5	Check ALL power and position switches
6	Replace CVC or handset
7	Check position for terrain mask: reposition if needed
8	Check antenna top section: repair if broken—replace if lost

19 19.2.1 19

PREPARING TA-312/PT TELEPHONE SET	
STEP	ACTION
1	Prepare telephone set for operation
1A	For local battery (LB), go to STEP 2
1B	For common battery signalling (CBS), go to STEP 3
1C	For common battery (CB), go to STEP 4
2	Use flat-tip screwdriver or dime to set selector switch to "LB"
2A	Install batteries

19 19.3.1 19

19		19.3.2	19
PREPARING TA-312/PT TELEPHONE SET			
STEP	ACTION		✓
2B	Remove handset from cradle & open carrying case		
2C	Rotate battery compartment cover latch clockwise until you release cover		
2D	Open cover of battery compartment		
2E	Insert 2 BA-30 batteries in compartment matching positive (+) and negative (-) marks		
2F	Close and lock cover		
2G	Refasten carrying case		

19		19.3.3	19
PREPARING TA-312/PT TELEPHONE SET			
STEP	ACTION		✓
3	Set selector switch to "CBS" using flat-tip screwdriver or dime		
3A	Install batteries		
3B	Repeat STEPS 2A-2F		
4	Set selector switch to "CB" using flat-tip screwdriver or dime		
4A	Do not install batteries		
4B	Switchboard provides power		
Notes:			

OPERATING TA-312/PT TELEPHONE SET		
STEP	ACTION	
1	Prepare telephone set for use on horizontal surface	✓
1A	Remove carrying case and keep strap out	
1B	Fold top of carrying case down around sides of telephone	
2	Position telephone set for use on support	
2A	Unhook carrying strap from ring on buzzer end of case	
2B	Adjust carrying strap so it fits around support	

19

19.4.1

OPERATING TA-312/PT TELEPHONE SET		
STEP	ACTION	
2C	Place telephone against support at convenient height	✓
2D	Wrap carrying strap around support and secure free end to upper ring on case	
2E	Cut length of wire, pass it thru lower loops of carrying case, and tie in place	
3	Connect telephone to line	
3A	Strip 1 inch of insulation from ends of wire you connect	
3B	Scape clean and fold back about 1/2-inch skinned portion of each wire	

19

19.4.2

19

OPERATING TA-312/PT TELEPHONE SET		
STEP	ACTION	
3C	Tie wire to upper ring on case	✓
3D	Push down one binding post	
3E	Insert bare end of wire into binding post slot	
3F	Release post to clamp wire	
3G	Repeat STEPS 3E-3F for other post	
4	Do you want buzzer to sound? If YES, go to STEPS 6-8. If NO, go to STEP 5.	
5	Fully rotate buzzer volume control counterclockwise to "LOW" position	

19

19.4.3

OPERATING TA-312/PT TELEPHONE SET		
STEP	ACTION	
6	Buzzer sound on "LB" op	✓
6A	Turn handcrank while handset is in cradle	
6B	Remove handset and listen for called party	
6C	Push press-to-talk switch to talk; release to listen	
7	For buzzer sound on "CBS" op	
7A	Remove handset and listen for called party	
7B	Push press-to-talk switch to talk; release to listen	

19

19.4.4

19

OPERATING TA-312/PT TELEPHONE SET		
STEP	ACTION	
8	Buzzer sound on "CB" op	✓
8A	Remove handset and listen for operator	
8B	Do not operate press-to-talk switch	
9	Ask distant party to call back	
10	Adjust buzzer volume control to desired volume	
11	Connection of external handset-headset for hands-free op	
11A	Connect handset-headset or handset microphone to connector on panel of phone	

19 19.4.5 19

OPERATING TA-312/PT TELEPHONE SET		
STEP	ACTION	
11B	Put handset in cradle when you have handset-headset connected	✓
11C	Turn "EXT-INT" switch to "EXT" position	
12	Install/remove deicing screen	
12A	Place screen in position	
12B	Line up dot on shield with notch on transmitter	
12C	Press shield firmly over cap	
12D	Remove deicing screen by prying screen up	

19 19.4.6 19

INSTALLING HOT LOOP WITH TA-312/PT		
STEP	ACTION	
1	Install field wire loop	
1A	Lay out field wire from your Cdr's position to each squad/section and back	
1B	Keep wire behind indiv psns	
1C	Tie wire to fixed object near each position	
2	Connect each telephone (TA-312/PT) to the hot loop	
3	Connect hot loop to your Cdr's telephone	
3A	Strip 1/2 inch of insulation off 2 wires at each end of loop	

19			19.5.3	19
INSTALLING HOT LOOP WITH TA-312/PT				
STEP	ACTION			
4D	Repeat STEPS 4A-4C on other conductor			✓
4E	Get 1 telephone (TA-312/PT) and slide exposed 1/2-inch section of 1 conductor into the slot of 1 binding post			
4F	Slide exposed 1/2-inch section of other conductor into the slot of 1 binding post			
4G	Repeat STEPS 4A-4F to connect each telephone to hot loop			
5	Make commo check on all telephones connected to hot loop			

19			19.6.1	19
INSTALLING HOT LOOP WITH TELEPHONES				
STEP	ACTION			
1	Install hot loop			✓
1A	Lay out field wire from HQ/FDC to each station in loop			
1B	Keep wire behind positions, bury it if necessary			
1C	Secure wire at each position, and leave enough slack in wire to make connections			
2	Connect each TA-1/PT to hot loop			
2A	Connect telephone at first psn (HQ/FDC) and telephone at last psn			

19			19		
19.6.2			19		
INSTALLING HOT LOOP WITH TELEPHONES					
STEP	ACTION				
2B	Conduct commo check between positions				
2C	To connect other stations in center of loop, cut one of the conductors of the wire				
2D	Remove 1/2 inch of insulation from each cut strand of wire				
2E	Attach 1 end of cut strand to each binding post to connect phones in center of loop				
3	Make commo check on all positions from HQ/FDC phone				
4	If any psns do not answer, check all connections				

19			19		
19.7.1					
PREPARING SB-993/GT SWITCHBOARD					
STEP	ACTION				
1	Position switchboard for operation				
1A	Open cover of switchboard				
1B	Place switchboard and operator's telephone set on dry surface				
2	Connect operator's telephone set				
2A	Cut length of field wire long enough to cover the entire switchboard				
2B	Strip 1 1/4 inch of insulation from each conductor on end of field wire				

PREPARING SB-993/GT SWITCHBOARD		
STEP	ACTION	
2C	Double over and flatten the stripped sections of wire	✓
2D	Insert one stripped section into each line terminal of "TEL" adapter and tighten plugs to secure field wire	
2E	Strip 1/2 inch of insulation from each conductor at other end and connect to line binding posts of operator's telephone set	
3	Perform adapter tests	
3A	Stand each adapter in jacks provided in holder	

19 19.7.2 19

PREPARING SB-993/GT SWITCHBOARD		
STEP	ACTION	
3B	Press ringing generator of operator's telephone set several times	✓
3C	Light in "TEL" adapter should flicker on while you operate generator	
3D	Test 6 adapters by inserting plugs of "TEL" adapter in jacks of other adapters and ringing	
3E	If adapter fails to light, discard it	
4	Connect incoming wires	

19 19.7.3 19

PREPARING SB-993/GT SWITCHBOARD			19
STEP	ACTION		19.7.4
4A	Examine each adapter and identify side with painted designation strip	✓	
4B	Tie each line to fixed object and leave enough slack to form drip loop and permit free movement of adapter		
4C	Connect wire lines to adapters using procedures for "TEL" in STEPS 2A-2E so painted side faces you		
4D	Mark each line adapter designation strip with pencil to identify party connected to adapter and place operator's adapter in holder "TEL" jacks		

OPERATING SB-993/GT SWITCHBOARD			19
STEP	ACTION		19.8.1
1	Establishing line-to-line call	✓	
1A	Ring signal lights neon lamp in adapter to signal an incoming call		
1B	When lamp flashes, insert plugs of "TEL" adapter into jack of flashing adapter		
1C	Use operator's telephone to determine number called		
1D	Remove "TEL" adapter from calling party's adapter		
1E	Plug "TEL" adapter into jack of requested party's line adapter		

OPERATING SB-993/GT SWITCHBOARD			19
STEP	ACTION		19.8.2
1F	Operate ringing generator on operator's phone set to signal requested party	✓	
1G	When requested party answers, plug their adapter into jack of calling party		
1H	Report connection is ready		
1I	When conversation begins, remove "TEL" adapter and return to "TEL" position of holder		
1J	When conversation ends, parties should ring-off, causing both adapters to flash		

OPERATING SB-993/GT SWITCHBOARD			19
STEP	ACTION		19.8.3
1K	Plug "TEL" adapter into connection and challenge to determine if it is a ring-off or re-call before disconnection	✓	
2	Establishing conference calls		
2A	When calling party requests conference call, instruct party to stand by while you establish call		
2B	Signal each requested party and direct them to stand-by for call		
2C	As you contact party, plug adapter into conference connection		

OPERATING SB-993/GT SWITCHBOARD		
STEP	ACTION	
2D	After making all connections, notify calling party that call is ready	
2E	When you hear conversation, restore "TEL" adapter to "TEL" position	
2F	On re-call or ring-off, challenge the connection before disconnecting all the adapters	
Notes:		

19

19.8.4

19

19.9.1 INSTALLING COMMO LINES		
STEP	ACTION	
1	Test field wire on reel	
1A	Attach telephone sets to payout and standing ends of wire on reel	
1B	Ring and speak through wire from one phone to other	
1C	If clear commo check, install wire	
2	Installing field wire	
2A	Tie field wire to fixed object where line begins and ends	
2B	Allow some slack in wire to attach to telephone and switchboard	

19

19.9.1

19		19.9.2		19
INSTALLING COMMO LINES				
STEP	ACTION			
2C	Lay field wire loosely with plenty of slack			
2D	Tie field wire at ground level to trees or posts at several places along the line			
3	Attach wire tags to line at			
3A	Both sides of road, railway, and trail crossings			
3B	Telephones, switchboards, and test stations			
3C	Both sides of buried or aerial crossings			
3D	Intervals where several lines are laid along same route			

19		19.9.3		19
INSTALLING COMMO LINES				
STEP	ACTION			
4	Test wire line			
4A	After every buried crossing			
4B	After every aerial crossing			
4C	Before and after you splice a new reel onto the line			
4D	Before connecting line to telephone or switchboard			
Notes:				

CROSSING OBJECTS WITH COMMO LINES		
STEP	ACTION	✓
1	Culvert crossing	
1A	Tie wire to fixed object and attach wire tag on each side of the road	
1B	Pass wire thru top of culvert	
1C	Add protective tape around wire at each end of culvert	
2	Aerial crossing	
2A	Wire must clear main traffic arteries and paved roads by at least 7 m at lowest point	
2B	Use buildings, trees, or poles to raise wire	

19 19.10.1 19

CROSSING OBJECTS WITH COMMO LINES		
STEP	ACTION	✓
3	If you cannot use objects in STEP 2B, use lance poles	
3A	Lash poles together to provide 7 m clearance for wire line	
3B	Tie wire line to top of poles with clove hitch	
3C	Tie guy wires near top of pole	
3D	Raise poles	
3E	Stake guy wires at 45 degree angle to line	
3F	Tie and tag wire line to a stake at each end of crossing	

19 19.10.2 19

CROSSING OBJECTS WITH COMMO LINES		
STEP	ACTION	
4	Buried crossings	✓
4A	Dig 6- to 12-inch deep trench across road, extending 2 feet beyond each side of road	
4B	Lay wire loosely in trench	
4C	Tie and tag wire to stake at each end of trench	
4D	Backfill the trench	
5	Railroad crossing	
5A	Pull enough slack from wire reel to reach across tracks	

19

19.10.3

CROSSING OBJECTS WITH COMMO LINES		
STEP	ACTION	
5B	Cut wire at wire reel and pull end of wire under tracks, along side of crossties	✓
5C	Drive stakes beyond each shoulder of the track and tie line to stakes	
5D	Pull line tight	
5E	Bury wire line from rails to stakes	
5F	Splice free end of line to wire reel	
5G	Continue to lay the line	

19

19.10.4

19

RECOVERING FIELD WIRE LINES	
STEP	ACTION
1	Retrieve field wire line
1A	Disconnect wire from terminal telephone or switchboard
1B	Splice wire line to wire on reel used for pickup
1C	Operate reeling unit to roll wire onto reel
1D	Remove and save wire tags
1E	Release wire ties and dismantle road crossings
1F	If you cannot dig out a buried crossing, cut out the crossing and splice wire

19 19.11.1 19

RECOVERING FIELD WIRE LINES	
STEP	ACTION
2	Splice field wire
2A	Cut conductors to stagger their lengths about 6 inches
2B	Remove insulation from each of the four conductors
2C	Tie square knot between the long conductor of one pair and the short conductor of the other pair
2D	Restore twist to line by wrapping the 2 remaining conductors around the 2 conductors already tied
2E	Tie a 2nd square knot

19 19.11.2 19

RECOVERING FIELD WIRE LINES		
STEP	ACTION	
2F	Remove sections of insulation from tips of conductors, untwist and flex strands	
2G	Separate steel strands from copper strands	
2H	Cut steel strands flush to the ends of insulation	
2I	Cross left-hand end of copper strands over crest of square knot	
2J	Wrap several tight turns over bare part of right-hand conductor	
2K	Cut extra wire from ends of copper strands	

1919

19.11.3

19

19.11.4

19

RECOVERING FIELD WIRE LINES		
STEP	ACTION	
2L	Repeat STEPS 2I-2K for the right-hand end of copper strands	
3	Tape the splice	
3A	Start taping at center of splice and wrap tape to cover 1-1/2 inches of insulation at one end	
3B	Work tape back over center knot to cover 1-1/2 inches on opposite side	
3C	Work tape back again to center of splice	
Notes:		

MOUNTING AN/VRC-46 RADIO SET		19
STEP	ACTION	19.12.1
1	Mount receiver-transmitter (R-T)	
1A	Make sure mount is clean and grounding straps connect securely between top strap and mount base	
1B	Remove rubber receptacle cover and make sure that chain is clear of guide pins and receptacle	
1C	Make sure vent port is free of obstructions	
1D	Lift and position R-T mount and carefully slide it back to seat plug in mount receptacle	

MOUNTING AN/VRC-46 RADIO SET		19
STEP	ACTION	19.12.2
1E	Raise and tighten clamping screws to lock R-T on mount	
1F	Use safety wire/scty chain to secure mounting clamps	
2	Assemble & connect antenna	
2A	Screw top antenna fully into bottom section	
2B	Screw assembled antenna sections onto top of spring mount of matching unit	
2C	Connect antenna cable (CX-4722/VRC) between "ANT CONT" connector of R-T and control cable connector of matching unit	

MOUNTING AN/VRC-46 RADIO SET		
STEP	ACTION	
2D	Connect antenna (RF) cable (CG-1773A/U) between "ANT" connector of R-T and small "BNC" connector of matching unit	
2E	Route cables between R-T and matching unit so mov of equip and psnl does not endanger them	
3	Tie down antenna	
3A	Clip V-shaped clamp to middle of upper antenna section	
3B	Make sure clamp does not cut into fiberglass on antenna section	

19

19.12.4

19

MOUNTING AN/VRC-46 RADIO SET			
STEP	ACTION		
3C	Lift and position AM-2060(*)/ GRC on mount and carefully slide it back to seat the plug in the mount receptacle		
4	Update DA form 2404		
Notes:			

MOUNTING AN/VRC-64 OR AN/GRC-160 RADIO		
STEP	ACTION	✓
1	Mount amplifier-power supply (AM-2060(*)/GRC)	
1A	Make sure mount is clean and grounding straps connect securely between top tray and mounting plate	
1B	Screw assembled antenna sections onto top of spring mount of matching unit	
1C	Connect antenna control cable (CX-4722/VRC) between amplifier-power supply (AM-2060(*)/GRC) of antenna control connector and control cable connector of matching unit	

19 19.13.1 19

MOUNTING AN/VRC-64 OR AN/GRC-160 RADIO		
STEP	ACTION	✓
1D	Connect antenna (RF) cable (CG-1773A/U) between "ANT" connector of R-T and small "BNC" connector or matching unit	
1E	Route cable between R-T and matching unit so movement of equip and pers do not endanger them	
2	Mount R-T on AM-2060(*)/ GRC	
2A	Slide R-T until bottom of battery box contacts bumper plate at rear of amplifier- power supply (AM-2060(8)/ GRC)	

19 19.13.2 19

MOUNTING AN/VRC-64 OR AN/GRC-160 RADIO		
STEP	ACTION	✓
2B	Raise clamps and tighten clamping screws to lock R-T on amplifier-power supply	
2C	Remove protective cap from "POWER" connector on R-T panel	
2D	Connect cable assembly (CX-4655/GRC) between AM-2060(*)/GRC "SET "POWER" connector and R-T power connector	
3	Assemble and connect antenna	
3A	Screw top antenna section fully into bottom section	

19

19.13.3

MOUNTING AN/VRC-64 OR AN/GRC-160 RADIO		
STEP	ACTION	✓
3B	Be sure clamp does not cut into fiberglass on antenna sections	
3C	Pull antenna approximately 60 degrees above ground level and tie to vehicle	
4	Tie down antenna	
4A	Clip V-shaped clamp to middle of upper antenna section	
4B	Remove rubber receptacle cover	
4C	Be sure chain is clear of guide pins and receptacle	

19

19.13.4

19

MOUNTING AN/VRC-64 OR AN/GRC-160 RADIO		
STEP	ACTION	
4D	Lift and position AM-2060(*)/ GRC on mount and carefully slide it back to seat the plug in the mount receptacle	
4E	Raise clamps and tighten clamping screws to lock amplifier-power supply on mount	
4F	Use safety wire or security chain to secure mounting clips	
Notes:		

19

19.13.5

19

19.14.1		
19		
INSTALLING AN/PRC-77 OR AN/PRC-25 RADIO		
STEP	ACTION	
1	Installing batteries	
1A	Release the 2 clamps and remove battery box	
1B	Inspect radio connector, if it is damaged, have it repaired	
1C	Check function of pressure relief valve by blowing and sucking through the valve for venting of battery box	
1D	Position battery receptacle over radio connector taking care not to damage battery receptacle	

19

19			19.14.2	19
INSTALLING AN/PRC-77 OR AN/PRC-25 RADIO				
STEP	ACTION			
1E	Replace battery box and tighten 2 clamps			
2	Assemble for manpack operation			
2A	Mount R-T on harness			
2B	Place harness on level surface with metal braces facing up			
2C	Place R-T on harness with front panel toward top and battery box resting in metal braces			
2D	Strap R-T to harness with retaining straps			

19			19.14.3	19
INSTALLING AN/PRC-77 OR AN/PRC-25 RADIO				
STEP	ACTION			
3	Install correct antenna and handset			
3A	Do you need maximum range? If YES, go to STEP 3C. If NO, go to STEP 3B.			
3B	Use short antenna (AT-892/PRC-25) when you do not need maximum range or when operating in densely foliated area			
3C	Use long antenna (AT-217A/PRC) for maximum range			
3D	Connect handset to one of audio connectors			

INSTALLING AN/PRC-77 OR AN/PRC-25 RADIO		
STEP	ACTION	
4	Mount assembled radio set on your back	✓
4A	Place harness on your back with R-T mounted	
4B	Adjust shoulder straps for a comfortable fit and good balance	
4C	Hook belt straps to combat belt	
4D	Hook ammo pouch straps to shoulder strap rings	
Notes:		

19 19.14.4 19

OPERATING SECURITY EQUIPMENT TSEC/KY-8		
STEP	ACTION	
1	Mount and interconnect security equipment	✓
1A	Slide TSEC/KY-8 onto mount and make sure to firmly seat tracks in mount grooves	
1B	Pull locking levers outward to lock TSEC/KY-8 in mount	
1C	Be sure "POWER" switches for R-T and TSEC/KY-8 are in "OFF" position	
1D	Connect and tightly screw secure equipment power cable to "POWER INPUT" receptacle on TSEC/KY-8	

19 19.15.1 19

OPERATING SECURITY EQUIPMENT TSEC/KY-8		
STEP	ACTION	
1E	Remove cap from "X-MODE" connector receptacle on R-T	✓
1F	Connect interconnecting cable (CS-12920/U) small connector to "X-MODE" receptacle on R-T	
1G	Connect other end of inter- connecting cable to "RADIO" receptacle on TSEC/KY-8	
1H	Coil and tape/tie extra cable so it is out of the way	
2	Key TSEC/KY-8	
2A	Make sure power switch is in "OFF" position	

19

19.15.2

OPERATING SECURITY EQUIPMENT TSEC/KY-8		
STEP	ACTION	
2B	Release 2 twist-lock fasteners on access door & swing open	✓
3	Prepare KYK-12/TSEC (sandwich)	
3A	Open KYK-12/TSEC like a book	
3B	Set various slides according to extract key list	
3C	Double check settings	
3D	Click each slider into psn	
3E	Close KYK-12/TSEC and swing handle around to hinge end	

19

19.15.3

19

OPERATING SECURITY EQUIPMENT TSEC/KY-8		
STEP	ACTION	
4	Insert current-keyed KYK-12/ TSEC into access opening	✓
4A	Be sure handle and hinge end face outward and data plate is facing up	
4B	Carefully slide sandwich into place	
4C	Press evenly on both sides to fully seat sandwich	
4D	Close access door and secure with 2 twist-lock fasteners	
5	Place system into operation	

19

9.15.4

OPERATING SECURITY EQUIPMENT TSEC/KY-8		
STEP	ACTION	
5A	Turn R-T power switch to "LOW"	✓
5B	Set TSEC/KY-8 "LOCAL- REMOTE" switch to "LOCAL"	
5C	Set "PLAIN-CIPHER" switch to "PLAIN"	
5D	Set "POWER" switch to "ON"	
5E	"POWER" indicator lamp and "RED" indicator lamps must light	
5F	Set "PLAIN-CIPHER" switch to "CIPHER"	

19

9.15.5

19

OPERATING SECURITY EQUIPMENT TSEC/KY-8		
STEP	ACTION	
5G	Red "PLAIN" indicator must go off and "GREEN" cipher indicator light must go on	✓
6	Perform 11-position alarm test	
6A	Rotate "ALARM TEST" switch clockwise to each position, then to "OFF"	
6B	You will see "RED" light blink on and hear "BEEPS" in each position	
7	Operate secure system	
7A	Press push-to-talk switch on radio audio accessory	

19 19.15.6 19

OPERATING SECURITY EQUIPMENT TSEC/KY-8		
STEP	ACTION	
7B	You should hear single "BEEP"	✓
7C	If no "BEEP", repeat STEPS 2-5	
7D	Begin secure transmission and reception	
Notes:		

19 19.15.7 19

PREPARING TSEC/KY-38 WITH RADIO SET			19
STEP	ACTION		19.16.1
1	Prepare radio for secure operation	✓	
1A	Disconnect cable assembly (CX-4655/GRC) between AM-2060(*)/GRC "SET POWER" connector and R-T "POWER" connector		
1B	Connect cable from left side of distribution box (J-2731/GRC) to "SET POWER" connector of AM-2060(*)/GRC		
1C	Connect cable from right side of distribution box (J-2731/GRC) to "POWER" connector of RT-841/PRC-77		

PREPARING TSEC/KY-38 WITH RADIO SET			19
STEP	ACTION		19.16.2
1D	Connect small end of inter-connecting cable assembly (CX-10475/U) to connector (J1) on left rear of distribution box (J-2731/GRC)	✓	
2	Mount and interconnect security equipment		
2A	Balance TSEC/KY-38 on front of mount and remove power connector cover on bottom of Z-ACD/TSEC		
2B	Ensure that Z-ACD/TSEC circuit breaker is at "OFF", and "ON-OFF" switch on front of MT-3823(*)/GRC is at "OFF"		

PREPARING TSEC/KY-38 WITH RADIO SET		
STEP	ACTION	
2C	Pass connector of cable assembly (CX-10476/U) through hole in rear plate of MT-3823(*)/GRC	✓
2D	Connect cable to connector on Z-ACD/TSEC	
2E	Set Z-ACD/TSEC circuit breaker to "ON" and slide TSEC/KY-38 into mount	
2F	Pass power connector cover through hole in rear plate	
2G	Raise and tighten 2 clamps on MT-3823(*)/GRC to secure TSEC/KY-38	

19

19.16.3

19

PREPARING TSEC/KY-38 WITH RADIO SET		
STEP	ACTION	
2H	Connect large end of inter-connecting cable assembly (CX-10475/U) to "RADIO CONNECTOR" on TSEC/KY-38	✓
2I	Mount amplifier, audio frequency (AM-4979/GR), in speaker mounting bracket	
2J	Connect power cable (CX-11761/U) to "POWER" connector of AM-4979A/GR	
2K	Connect AM-4979A/GR cable to "AUDIO" connector of TSEC/KY-38	

19

19.16.4

19

PREPARING TSEC/KY-38 WITH RADIO SET		
STEP	ACTION	
2L	Connect radio handset to "AUDIO" connector of the AM-4979A/GR	✓
3	Prepare KYK-28/TSEC	
3A	Open KYK-28/TSEC by releasing lock on right side with data plate facing up	
3B	Push locking levers on sides to rear (unlock) psn	
3C	Set various slides according to extract key list	
3D	Recheck settings	

19

19.16.5

19

PREPARING TSEC/KY-38 WITH RADIO SET		
STEP	ACTION	
3E	Pull locking levers on sides forward to lock position	✓
3F	Close and secure lock	
3G	Check gate mechanism by forcing gate back to expose keying pins	
4	Key TSEC/KY-38	
4A	"OFF-PLAIN-CIPHER" should be at "OFF" position	
4B	Open access cover and align guide pins of KYK-28/TSEC with guide pin holes of TSEC/KY-38	

19

19.16.6

19

PREPARING TSEC/KY-38 WITH RADIO SET			19
STEP	ACTION	✓	19.16.7
4C	Press firmly and smoothly on KYK-28/TSEC until it bottoms out on TSEC/KY-38		
4D	Remove KYK-28/TSEC and secure access door of TSEC/KY-38		
Notes:			

OPERATING TSEC/KY-38 WITH RADIO SET			19
STEP	ACTION	✓	19.17.1
1	Place system into operation		
2	Set radio switches & controls		
2A	Set AM-2060(*)/GRC "POWER" switch to "ON" and "SPKR" switch to "OFF"		
2B	Set distribution box (J-2731/GRC) circuit breaker to "ON"		
2C	Turn R-T function switch to "ON" or "SQUELCH", as authorized in unit SOP		
2D	Refer to CEOL extract and set operating frequency of net		

OPERATING TSEC/KY-38 WITH RADIO SET		
STEP	ACTION	
2E	Set R-T "VOLUME" control fully clockwise	✓
3	Set secure equip switches and controls	
3A	Set MT-3823(*)/GRC "ON-OFF" switch to "ON"	
3B	Set AM-4979A/GR power switch to "ON"	
3C	Set KY-38 power switch to "CIPHER" and "VOLUME" control to approximately mid-range	
3D	Set "DELAY" switch to "IN"	

19

19.17.2

OPERATING TSEC/KY-38 WITH RADIO SET		
STEP	ACTION	
4	Operate secure system	✓
4A	Press press-to-talk switch on handset	
4B	Do you hear multitone signal followed by final beep tone, then no tone? If YES, go to STEP 6. If NO, go to STEP 5.	
5	System failure exists	
5A	Zeroize KY-38 using "ZEROIZE" lever	
5B	Re-key using KYK-28	
6	Adjust system volume controls	

19

19.17.3

19

OPERATING TSEC/KY-38 WITH RADIO SET		
STEP	ACTION	
6A	For "CIPHER" operation, adjust "VOLUME" control on KY-38	
6B	For "PLAIN" operation, adjust "VOLUME" control on R-T	
7	Set delay switch to "OUT"	
8	Press push-to-talk switch on handset	
9	Being secure transmission and reception	
10	Zeroize KYK-28	
10A	Unlock and open KYK-28	

19

19.17.4

OPERATING TSEC/KY-38 WITH RADIO SET		
STEP	ACTION	
10B	Push 2 locking levers to rear	
10C	Move all slides to the "ZEROIZE" position	
10D	Pull locking levers forward	
10E	Close and lock KYK-28	
Notes:		

19

19.17.5

19

20	20.0.1	20
LAW OF WAR/POW TABLE OF CONTENTS		
ITEM	PAGE	
Principles of the Law of War	20.1.1	
Handling prisoners of war	20.2.1	
Handling captured documents/ equipment	20.3.1	

20	20.0.2	20
LAW OF WAR/POW TABLE OF CONTENTS		
ITEM	PAGE	

20		20.1.1	20
PRINCIPLES OF THE LAW OF WAR			
ITEM	PRINCIPLE		✓
1	Weapons and ammo		
1A	All US/NATO issued weapons and ammo are lawful		
1B	Do not alter weapons/ammo		
2	Tactics		
2A	Do NOT fake surrender, use enemy marked vehicles/ uniforms, or boobytrap dead or wounded personnel		
2B	Only use medical symbols for medical activities		
3	Attack ONLY combat targets		

20		20.1.2	20
PRINCIPLES OF THE LAW OF WAR			
ITEM	PRINCIPLE		✓
3A	Only use firepower your mission requires		
3B	Avoid needless destruction		
4	These are NOT combat tgts		
4A	Civilians/soldiers who give up, you capture, or are sick and wounded		
4B	Medical personnel, vehicles, and facilities		
4C	Undefended civilian bldgs		
4D	Historical monuments		
4E	Hospitals		

PRINCIPLES OF THE LAW OF WAR		
ITEM	PRINCIPLE	✓
5	Protected property marking	
5A	Red Cross/Crescent/Lion/ Star of David on white back	
5B	Blue and white shield in Europe	
6	Treat captives, civilians, and property on battlefied according to Law of War	
7	Allow enemy soldiers to give up	
8	Treat all captives as POWs	
8A	Protect from violence, sexual abuse, and intimidation	

20

20.1.4

20

PRINCIPLES OF THE LAW OF WAR		
ITEM	PRINCIPLE	✓
8B	Provide food, water, shelter, and medical treatment	
8C	Safeguard from dangers of combat	
8D	Evacuate ASAP	
8E	Do NOT use to clear or plant mines/boobytraps, as shield/ screen, or as hostages	
9	Treat all civilians humanely	
9A	Do NOT use physical force/ mental confusion	
9B	Protect women from forced prostitution/rape/sexual assault	

20		20.1.5	20
PRINCIPLES OF THE LAW OF WAR			
ITEM	PRINCIPLE		✓
9C	Prohibit reprisals/hostage taking/collective punishment		
10	Property on battlefield		
10A	Tag and turn in all enemy military property to chain of command for evacuation		
10B	Do NOT seize, steal, or loot civilian, POW needed military equipment, or personal property		
11	Identify violations of law of war or illegal orders		
12	Report all violations by friendly or enemy troops		

20		20.1.6	20
PRINCIPLES OF THE LAW OF WAR			
ITEM	PRINCIPLE		✓
13	Violations of Law of War are criminal acts under UCMJ		
14	If you believe Law of War is being violated, do your best to stop it		
14A	State you disagree with act		
14B	Use moral judgments		
14C	Clarify unclear orders		
14D	Threaten to report the act		
14E	Ask senior soldier to stop act		
14F	Refuse to obey an order to commit a criminal act		

20		20.1.7	20
PRINCIPLES OF THE LAW OF WAR			
ITEM	PRINCIPLE		✓
15	If act is done or order not withdrawn		
15A	Report act/order through chain of command immediately		
15B	If chain of command does not respond, report it to IG, PM, Chaplain, or JAG		
16	Report all war crimes no matter WHO COMMITS THEM		
Notes:			

20		20.2.1	20
HANDLING PRISONERS OF WAR			
ITEM	ACTION		✓
1	Search		
1A	Remove all wpns/documents		
1B	Return personal items		
1C	Leave helmet/NBC gear		
2	Segregate		
2A	Break chain of command		
2B	Separate by rank/sex		
2C	Separate military/civilians		
3	Silence—do not allow talking		
4	Speed—POW from battle area		
5	Safeguard		
5A	Prevent escape		
5B	Prevent harm		

20

20.3.1

20

HANDLING CAPTURED DOCUMENTS/EQUIPMENT		
ITEM	ACTION	
1	Documents	
1A	Official-maps, orders, awards, records, passes, and leaves	
1B	Personal-letters, diaries, pay records	
2	Equipment-all nonsurvival items	
3	TAG OR MARK ALL ITEMS	
3A	Date and time of capture	
3B	Place of capture	
3C	Capturing unit	

20

20.3.2

20

HANDLING CAPTURED DOCUMENTS/EQUIPMENT		
ITEM	ACTION	
3D	Circumstances of capture	
Notes:		

21	21.0.1	21
SUPPLIES/LOGISTICS TABLE OF CONTENTS		
ITEM	PAGE	
Supplies and logistical services	21.1.1	
Pre-combat checks	21.2.1	
Combat effectiveness graphics	21.3.1	
Selected information graphics	21.4.1	
Classes of supply and map symbols	21.5.1	
Collecting points and other symbols	21.6.1	

21	21.0.2	21
SUPPLIES/LOGISTICS TABLE OF CONTENTS		
ITEM	PAGE	

21			21.1.1	21
SUPPLIES AND LOGISTICAL SERVICES				
ITEM	PRINCIPLE			
1	Plt logistics includes supply/transportation/maintenance			✓
2	Chain of command must be concerned with supply status and equipment for fighting			
3	Plt logistics requires			
3A	Short-term plans to accomplish present mission			
3B	Long-term plans to insure continuous operation of plt			
4	Co XO directs co log services			
5	Squad leader coord/supv squad logistics			

21			21.1.2	21
SUPPLIES AND LOGISTICAL SERVICES				
ITEM	PRINCIPLE			
6	PSG coord/supv plt log by			✓
6A	Getting requests for supplies/equip from SLs and plt ldrs			
6B	Reviewing and consolidating requests			
6C	Giving consolidated list to co XO or supply sergeant			
7	PSG must			
7A	Maintain status of supplies and equipment in plt			
7B	Monitor status of requests given to XO and supply sergeant			

SUPPLIES AND LOGISTICAL SERVICES		
ITEM	PRINCIPLE	✓
7C	Routinely report status of plt supplies and equip to plt ldr	
8	SL is responsible for maintenance of squad equip	
9	PSG coordinates/supervises plt maintenance with XO	
10	When equip needs repair	
10A	Turn commo equip into commo chief	
10B	Turn wpns into co armorer	
10C	Turn any other equip into co supply sergeant	

21

21.1.3

21

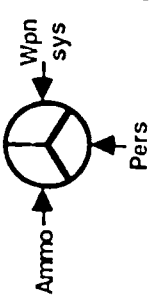
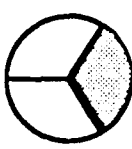
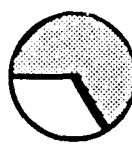
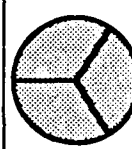
PRE-COMBAT CHECKS		
ITEM	ACTION	✓
1	Complete prepare-to-fire checks (ATGM, cannon, mg, SAW, etc)	
2	Complete before operations PMCS and resolve problems	
3	Load vehicles/rucksacks per loading plans	
4	Clean and function check individual and crew-served weapons	
5	"Top-off" vehicles with class III	
6	Properly stow basic load of classes I and V	

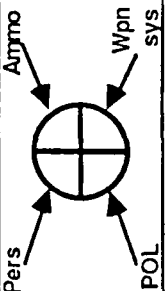
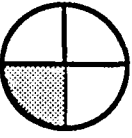
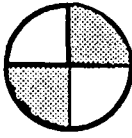
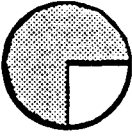
21

21.2.1

21

PRE-COMBAT CHECKS		21
ITEM	ACTION	21.2.2
7C	Fill canteens; water and oil cans (if applicable)	
8	Index battlesights	
9	Set radios on frequency	
10	Check radios' operation (only when authorized)	
11	Set speech security equipment	
12	Check speech security equipment operation (only when authorized)	
13	Check unit for proper uniform	
14	Brief unit on mission	

COMBAT EFFECTIVENESS GRAPHICS		21
CDR'S RATING TO PERFORM MISSION	EFFECTIVENESS GRAPHIC	21.3.1
"NO PROBLEM"		
"SOME DIFFICULTY" (In pers)		
"MAJOR PROBLEMS" (In pers and wpn sys)		
"CANNOT" (In pers, ammo, and wpn sys)		

SELECTED INFORMATION GRAPHICS		21	21.4.1	21
CDR'S RATING TO PERFORM MISSION	SELECTED INFORMATION GRAPHIC			
"NO PROBLEM"				
"SOME DIFFICULTY" (In pers)				
"MAJOR PROBLEMS" (In pers and wpn sys)				
"CANNOT" (In pers, ammo, and wpn sys)				

CLASSES OF SUPPLY AND MAP SYMBOLS		21	21.5.1	21
CLASS	DESCRIPTION	SYMBOL		
I	Substance			
II	Clothing, individual equip, tentage, org tool sets			
III	POL			
IV	Construction			
V	Ammunition			
VI	Personal demand			

CLASSES OF SUPPLY AND MAP SYMBOLS		
CLASS	DESCRIPTION	SYMBOL
VII	Major end items	
VIII	Medical materiel	
IX	Repair parts	
X	Materiel to support nonmilitary programs	
	All classes of supply	
	Multiple classes of supply, but not all	

21

21.5.2

21

21

21.6.1

21

COLLECTING POINTS AND OTHER SYMBOLS	
DESCRIPTION	SYMBOL
Cannibalization	
Civilian	
Decontamination station (place personnel (PERS) or equipment (EQUIP) or both below symbol)	
Maintenance	
Prisoners of War	
Salvage	

21

21.6.1

21

COLLECTING POINTS AND OTHER SYMBOLS		21
DESCRIPTION	SYMBOL	21.6.2
Stragglers		
Graves registration service		
Hospital or aid station		
Material management center		
Parking		
Topographic (map)		

COLLECTING POINTS AND OTHER SYMBOLS		21
DESCRIPTION	SYMBOL	21.6.3
Traffic control		
Water		
Notes:		

22	22.0.1	22
FIRE SUPPORT		
TABLE OF CONTENTS		
ITEM	PAGE	
Target list	22.1.1	
Principles of fire support planning	22.2.1	
Principles of fire support coordination	22.3.1	
Artillery/mortar communications	22.4.1	
Artillery/mortar support planning	22.5.1	
Artillery/mortar call for fire	22.6.1	
Artillery weapon capabilities	22.7.1	
Mortar weapon capabilities	22.8.1	
Artillery/mortar smoke request	22.9.1	
Artillery/mortar smoke height of burst corrections	22.10.1	
Artillery/mortar illumination request	22.11.1	
Artillery/mortar illumination factors	22.12.1	

22	22.0.2	22
FIRE SUPPORT		
TABLE OF CONTENTS		
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Artillery counterfire information form (ACIF)	22.13.1	
Close air support request communications	22.14.1	
Close air support control communications	22.15.1	
Close air support planning	22.16.1	
Immediate close air support request	22.17.1	
Close air support brief given to the aircraft	22.18.1	
Beacon bombing information for USN/USMC A-6	22.19.1	
Beacon bombing information for USAF F-111	22.20.1	
Beacon bombing information for USAF F-16	22.21.1	
Beacon bombing information for USAF/USN/USMC F-4	22.22.1	

22	22.0.3	22
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Joint air attack team (JAAT) communications	22.24.1	
Attack helicopter weapons capabilities	22.25.1	
Naval gunfire communications	22.26.1	
Naval gunfire support planning	22.27.1	
Naval gunfire call for fire	22.28.1	
Naval gunfire message to observer	22.29.1	
Naval gunfire weapons capabilities	22.30.1	
Naval gunfire illumination factors	22.31.1	
Light data	22.32.1	

22	22.0.4	22
FIRE SUPPORT TABLE OF CONTENTS		
ITEM	PAGE	

22		22.2.1		22
PRINCIPLES OF FIRE SUPPORT PLANNING				
ITEM	PRINCIPLE			
1	Plan early and continuously			✓
2	Use all targeting resources available			
3	Consider use of all available fire support			
4	Select the most effective fire support means			
5	Avoid unneeded duplication			
6	Provide flexibility			
7	Provide safe fires			
Notes:				

22		22.3.1		22
PRINCIPLES OF FIRE SUPPORT COORDINATION				
ITEM	PRINCIPLE			
1	Insure continuous targeting			✓
2	Consider the use of all available fire support means			
3	Use the lowest echelon capable			
4	Use the most effective type of support			
5	Furnish the type of support requested, when practical			
6	Avoid unneeded duplication			
7	Coordinate airspace			
8	Safeguard friendly elements			

ARTILLERY/MORTAR COMMUNICATIONS	22.4.1	22
Agencies:		
Observer to artillery/mortars		
Nomenclature:		
Conduct of fire net (USMC) Fire direction net/Fire control net (Army)		
Frequencies:		
30.00—75.95 MHz VHF-FM		
Compatible equipment:		
USMC—PRC-77, VRC-12 Army—PRC-77, VRC-12 USAF—PRC-77, VRC-46		

ARTILLERY/MORTAR SUPPORT PLANNING	22.5.1	22
Supporting unit _____		
If they are unavailable or direct commo is unavailable, unit through which you will request support _____		
Call sign _____		
Frequency _____		
Period effective from _____ to _____		
Notes _____		

ARTILLERY/MORTAR CALL FOR FIRE	
1. (Observer ID) " _____	This is " _____
2. (Warning order) " _____ (adjust fire/fire for effect, etc)" _____	
3. (Location of target) (Select best way)	
A. By grid coordinate:	
"Grid _____	" _____
"Direction _____	" _____ (observer to target) (mils/degrees)" _____
B. By polar plot:	
"Direction _____ (mils/degrees)"	" _____
"Distance _____ (meters)"	" _____
"Up/down _____ (meters)"	" _____

22

22.6.1

22

22	22.6.2	22
ARTILLERY/MORTAR CALL FOR FIRE		
C. By shift from known point:		
"Shift (TRP#) _____	" _____	" _____
"Direction _____ (mils/degrees)"	(Lateral shift) _____	(meters)" _____
"Left/right _____ (meters)"	(Range shift) _____	(meters)" _____
"Add/drop _____ (meters)"	(Vertical shift) _____	(meters)" _____
"Up/down _____ (meters)"		
4. (Target description) " _____		

5. (Method of engagement)		
A. (Type of adjustment) " _____ (adjust fire/fire for effect, etc)" _____		

22

22.6.3

22

ARTILLERY/MORTAR CALL FOR FIRE	
B. (Trajectory) "	_____ (high/low angle)"
C. (Ammo) "	_____ (HE, WP, ICM, etc)"
D. (Distribution of fire) "	_____ "
6. (Method of fire and control) "	_____ (at my cmd, when ready, TOT)"
MESSAGE TO OBSERVER	
Units to fire	_____
Changes to call for fire	_____
Number of rounds	_____

22

22.7.1

22

ARTILLERY WEAPON CAPABILITIES						
WPN	105	155	155	203	MLRS	
Model	M102	M109 A3	M198	M110 A2	M270	
Max rng	12400 m	18100 m	22400 m	22900 m	30000 m	
Ammo	HE, WP ICM, HC HEP-T APERS CHEM RAP ILLUM	HE, WP ICM, HC CPHD DPICM CHEM RAP ILLUM NUC	HE, WP ICM, HC CPHD DPICM CHEM RAP ILLUM NUC	HE HES ICM DPICM CHEM RAP NUC	DPICM	
RAP rng	15100 m	23500 m	30000 m	30000 m	30000 m	
Sust rate	3 rpm	1 rpm	2 rpm	0.5 rpm	13 rpm	
Fuze	PD, BD VT, MT MTSQ CP	PD, TD VT, MT MTSQ CP	PD, TD VT, MT MTSQ CP	PD, TD VT, MT MTSQ CP	TI	

MORTAR WEAPON CAPABILITIES					
WPN	60	81	81	81	107
Model	M224	M29	M29	M252	M30
			E1		
Max mg (m) and ammo	3490 HE 1472 WP 931 ILLUM	4789 HE 4737 WP 3150 ILLUM	4789 HE 4737 WP 3150 ILLUM	4789 HE 4737 WP 3150 ILLUM	6840 HE 5650 WP CHEM 5490 ILLUM
Min mg (m)	70 HE	72 HE	72 HE	72 HE	770 HE
Max rate	30 rpm	27 rpm	30 rpm	30 rpm	18 rpm
Sust rate	8 rpm	4 rpm	8 rpm	15 rpm	3 rpm
Fuze	Multi-option	PD VT	PD VT	PD VT	PT VT

22

22.8.1

22

22

22.9.1

ARTILLERY/MORTAR SMOKE REQUEST

1. "_____ This is _____
Alpha Foxtrot"

2. "Grid _____"

3. (Target description) " _____"

4. "Smoke/WP in effect"

Notes: For smoke of extended duration (WP more than 2 minutes or HC more than 5 minutes), send:

Target length " _____"

Wind speed " _____"

Smoke duration desired " _____"

22

ARTILLERY/MORTAR SMOKE HEIGHT OF BURST CORRECTIONS	
1. If round bursts on the ground, send: "Up 100"	
2. If the smoke cannisters bounce on the ground, send: "Up 50"	
3. If the smoke cannisters are too spread out, send: "Down 50"	
Notes:	

22

22.10.1

22

ARTILLERY/MORTAR ILLUMINATION REQUEST	
1. " _____ This is " _____	
2. "Grid _____ " _____	
3. (Target description) " _____	
(illumination/coordinated illumination)"	
4. "Direction _____ right/left _____ add/drop _____ up/down _____ "	
5. "Lateral/range spread"	Notes: Send command "Illumination Mark" when the target receives the maximum light. Send range and deviation corrections in 200 m increments.

22

22.11.1

22

22		22.11.2	22
ARTILLERY/MORTAR ILLUMINATION REQUEST			
Notes (continued):			
Send height of burst (up/down) corrections in 50 m increments.			
Once you verify the target, send the command "Coordinated Illumination" and then send a call for fire for HE.			
Notes:			

22

22.12.1

22

ARTILLERY/MORTAR ILLUMINATION FACTORS					
WPN	60	81	107	105	155
Model	M224	M252	M30	M102	M109 A3
HOB (m)	244	600	400	750	600
Burn time (sec)	25	60	90	60-A2 70-A3	120
Rate of fall	10 m/sec	6 m/sec	5 m/sec	10 m/sec	5 m/sec
RPM for cont illum	4 M83 A3	2 M301 A3	1 M335 A2	2 M314 A3	1 M485 A2
Notes:					

22 22.13.1 22	
ARTILLERY COUNTERFIRE INFORMATION FORM (ACIF)	
Section 1. SHELREP, MORTREP, BOMBREP	
A. From (Call sign) " _____" This is " _____"	
B. Position of observer (UTM grid) " _____" " _____" (encode)	
C. Azimuth of flash, sound, or groove " _____" (mils/degrees)"	
D. Time from " _____" (DTG)	
E. Time to " _____" (DTG)	
F. Area shelled " _____" (encode)	
G. Number/nature of guns " _____" " _____"	

22 22.13.2 22	
ARTILLERY COUNTERFIRE INFORMATION FORM (ACIF)	
H. Nature of fire " _____"	
I. Number/type/caliber of shells " _____" " _____"	
J. Flash to bang time " _____" (sec)"	
K. Damage " _____" (encode)	
Section II. Location of hostile weapons	
L. From and time " _____"	
M. UTM coordinates " _____"	
N. Source and accuracy " _____"	
O. Time active " _____"	

ARTILLERY COUNTERFIRE INFORMATION FORM (ACIF)	
P. Number and type "	_____
Q. Remarks "	_____ _____ _____ _____ _____
Section III. Counterfire action	
R. Time of counterfire "	_____
S. Fired by "	_____
T. Number of rounds, fuze, projectile "	_____
U. Remarks (effects) "	_____ _____ _____ _____

22 22.13.3 22

CLOSE AIR SUPPORT REQUEST COMMUNICATIONS	
Agencies: TACP to ASOC (USAF) DASC/TACC/SACC (USMC/USN)	
Nomenclature: Air Request Net (USAF) Tactical Air Request Net (USMC/USN)	
Frequencies: 2—30 MHz HF Primary 30.00—75.95 MHz VHF-FM Secondary	
Compatible equipment: USMC—PRC-104, GRC-193, MRC-138, PRC-77 Army—GRC-106, PRC-77, PRC-104, GRC-193 USAF—PRC-104, VRC-46, PRC-77	

22 22.14.1 22

22 22.15.1 22	
CLOSE AIR SUPPORT CONTROL COMMUNICATIONS	
Agencies:	
FAC to fighter/attack aircraft	
Nomenclature:	
Tactical Air Direction Net	
Frequencies:	225—400 MHz UHF Primary 30.00—75.95 MHz VHF-FM Secondary
Compatible equipment:	USMC—PRC-75, PRC-77 Army—VRC-12, PRC-77, VRC-24 USAF—PRC-66, MRC-107/108, PRC-77, GRC-206, PRC-113, VRC-46

22 22.16.1 22	
CLOSE AIR SUPPORT PLANNING	
Supporting TACP	
If they are unavailable or direct commo is unavailable, unit through which you will request support	
Call sign	
Frequency	
Period effective from	to
Notes	

IMMEDIATE CLOSE AIR SUPPORT REQUEST	
1. "_____ This is _____ with an immediate CAS request." (Wait for acknowledgement.)	
2. "Immediate"	
3. (Target is) "_____ (type/quantity)"	
4. (Target location) "_____ (UTM coordinates)", (elevation) "_____ (feet)"	
5. (Time on target) "_____ (ASAP or time)"	
6. Not transmitted.	

22

22.17.1

IMMEDIATE CLOSE AIR SUPPORT REQUEST	
7. (Final control)	
"Call sign _____"	
"Frequency _____"	
"Contact point or IP _____"	
8. Remarks: (examples)	
"Friendly location _____"	
"Weather _____"	
"Threats _____"	
Notes:	

22

22.17.2

22

22 22.18.1 22	
CLOSE AIR SUPPORT BRIEF GIVEN TO THE AIRCRAFT	
" _____ (aircraft call sign) This is _____ (your call sign) CAS briefing follows:"	
(1. Initial point (IP)) " _____ "	
(2. Heading (IP to target) " _____ " (MAGnetic) (Offset:) "Left _____ /Right _____ "	
(3. Distance (IP to target) " _____ " (Nautical miles)	
(4. Target elevation) " _____ " (Feet above or below mean sea level)	
(5. Target description) " _____ " _____	
(6. Target location) " _____ " (LATitude/LONGitude/UTM/offsets/visual)	

22 22.18.2 22	
CLOSE AIR SUPPORT BRIEF GIVEN TO THE AIRCRAFT	
(7. Type mark) " _____ (WP, beacon, laser)" (code) " _____ (beacon, laser)"	
(8. Location of friendlies) " _____ "	
(9.) "Egress _____ "	
Note: See next pages for additional line numbers that apply to beacon bombing for specific aircraft types.	
(Remarks) " _____ "	
(Time on tgt) "TOT _____ " or (time to tgt (TTT) "Standby _____ (min) plus _____ (sec) hack"	
Note: Omit data not required. Omit line numbers. Units of measure are standard.	

22 22.19.1 22	
BEACON BOMBING INFORMATION FOR USN/USMC A-6	
(10. Beacon to tgt) "Bearing (MAGnetic)" or "Beacon grid	_____ "
(11. Beacon to tgt) "Range (meters)" or "Tgt grid	_____ "
(12.) "Beacon elevation (Feet-mean sea level)	_____ "
Notes:	

22 22.20.1 22	
BEACON BOMBING INFORMATION FOR USAF F-111	
(10. Beacon to tgt) "Bearing (True)	_____ "
(11. Beacon to tgt) "Range (Feet)	_____ "
(12.) "Beacon grid (LATitude/LONGitude)	_____ "
(13.) "Target grid (LATitude/LONGitude)	_____ "
(14.) "Beacon delay	_____ " (Feet)
Notes: • F-111 A/E requires lines 10 and 11 • F-111 D requires lines 10 and 11 or lines 12 and 13 • F-111 F requires line 14 and either lines 10 and 11 or lines 12 and 13	

BEACON BOMBING INFORMATION FOR USAF F-16	
(10. Beacon to tgt) "Bearing (True)	"
(11. Beacon to tgt) "Range (Feet)	"
(12.) "Beacon elevation (Feet-mean sea level)	"
(13.) "Target elevation (Feet-mean sea level)	"
(14. Beacon) "Time delay (Microseconds)	"
Notes:	

22

22.21.1

22

BEACON BOMBING INFORMATION FOR USAF/USN/USMC F-4	
(10. Beacon to tgt) "Bearing (True)	"
(11. Beacon to tgt) "Range (Nautical miles)	"
(12.) "Beacon grid (LATitude/LONGitude)	"
(13.) "Target grid (LATitude/LONGitude)	"
(14. Offsets) "North-South (True feet)	"
(15. Offsets) "East-West (True feet)	"
(16.) "Beacon elevation (Feet-mean sea level)	"

22

22.22.1

22

**BEACON BOMBING INFORMATION
FOR USAF/USN/USMC F-4**

(17.) "Target elevation _____"
(Feet-mean sea level)

Notes:

- F-4 AN/ARN-101 requires lines 16 and 17 AND lines 10 and 11, or lines 12 and 13, or lines 14 and 15
- All other F-4s require lines 14, 15, 16, and 17

Notes:

22

22.22.2

22

22

22.23.1

22

**AIRCRAFT DELIVERED
ORDNANCE**

ITEM	DESCRIPTION	MIN SAFE DIST (m)	
		10% P _I	0.1% P _I
MK-82 LD	500# Bomb	250	425
MK-82 HD	500# Bomb (retarded)	100	375
MK-82 LGB	500# Bomb (GBU-12)	*	*
MK-83 HD	1000# Bomb (retarded)	275	500
MK-83 LD	1000# Bomb	275	500
MK-83 LGB	1000# Bomb (GBU-16)	275	500
MK-84 LD	2000# Bomb	225	500
MK-84 LGB	2000# Bomb (GBU-10/22)	*	*

AIRCRAFT DELIVERED ORDNANCE				
ITEM	DESCRIPTION	MIN SAFE DIST (m)		
		10% P _I	0.1% P _I	
MK 20 **	Rockeye (anti-armor CBU)	*	*	*
MK 77	500# Napalm	0	150	
CBU-55/77 **	Fuel-Air- Explosive (FAE)	*	*	*
CBU-XX **	Cluster Bomb Units (all types)	*	*	*
2.75" FFAR	Rocket with various warheads	100	175	
5" FFAR	Zuni with various warheads	*	*	*
SUU-11	7.62mm Mini-Gun	*	*	*
M-4, 12, 61, SUU-23	20mm Gatling Gun	*	*	*

22

22.23.2

AIRCRAFT DELIVERED ORDNANCE				
ITEM	DESCRIPTION	MIN SAFE DIST (m)		
		10% P _I	0.1% P _I	
GAU-12	25mm Gun	*	*	*
GPU-5A, GAU-8	30mm Gatling Gun	*	*	*
AGM-65A/ B/C/D/E/F	Maverick (TV, IIR, laser guided)	*	*	*
MK-21/29	Walleye I (1000# bomb, TV guide)	275	500	
MK-23/30	Walleye II (2400# bomb, TV guide)	*	*	*
AGM-123A	Skipper (100# Bomb, laser guided, rocket boosted)	275	500	
Notes:				

22

22.23.3

22	22.23.4	22
AIRCRAFT DELIVERED ORDNANCE		
Notes:		
* Minimum safe distances are to be determined.		
** Not recommended for use near troops in contact.		
Minimum safe distances are based on the weapon's fragmentation pattern.		
Within the context of this table, the 5-minute assault criterion has been applied to a prone soldier, wearing winter clothing and a helmet.		
The probability of incapacitation (P _i) means a soldier is unable to perform the bodily function required in an assault within a 5-minute period after the attack.		
Notes:		

22	22.24.1	22
JOINT AIR ATTACK TEAM (JAAT) COMMUNICATIONS		
Nomenclature:		
FM 1—Ground to air FM 2—Air-to-air UHF—Air-to-air		
Frequencies:		
30.00—75.95 MHz VHF-FM 121.00—143.95 MHz VHF-AM 225—400 MHz UHF		
Compatible equipment:		
USMC—PRC-77, VRC-12, PRC-75 Army—PRC-77, VRC-12, VRC-24 USAF—PRC-77, VRC-46, PRC-66 PRC-113, MRC-107/108		

ATTACK HELICOPTER WEAPONS CAPABILITIES			
WEAPON	MAX EFF RANGE (m)	MAX LOAD	
2.75" FFAR—10# Warhead	9300	76	
2.75" FFAR—17# Warhead	5500	62	
7.62mm Mini-Gun	1100	4000	
20mm Gatling Gun	1500	750	
30mm Chain Gun	3000	1200	
40mm Grenade Launcher	1600	265	
TOW	3750	8	
Hellfire	5000	16	
Notes:			

22	22.26.1	22
NAVAL GUNFIRE COMMUNICATIONS		
Agency: Observer to ship		
Nomenclature: Naval gunfire (NGF) ground spot net		
Frequency: 2—30 MHz HF		
Compatible equipment: USMC—PRC-104, GRC-193, MRC-138 Army—GRC-106, GRC-193 USAF—PRC-104, MRC-107/108, GRC-206		

Supporting ship _____

If they are unavailable or direct commo
is unavailable, unit through which you
will request support _____

Call sign _____

Frequency _____

Period effective from _____ to _____

Notes _____

* Mandatory elements

*1. (Spotter ID) " _____ This is
" _____

*2. "Fire mission target number (if known)"
" _____

Notes:

- Target number provided by Army FSO or USMC FSOC.
- Wait for readback.

*3. (Target location) (Select best way)

A. By UTM grid coordinates:

"Grid" _____

"Altitude" _____ (meters)"

"Direction" _____ (mils/degrees)"

NAVAL GUNFIRE CALL FOR FIRE	
B. By polar plot:	
"Direction _____ (mils/degrees)"	
"Distance _____ (meters)"	
"Vertical shift (up/down) _____ (meters)"	
C. By Shift From Known Point:	
"From reference point _____"	
"Direction _____ (mils/degrees)"	
"Lateral shift (left/right) _____ (meters)"	
"Range shift (add/drop) _____ (meters)"	
"Vertical shift (Up/Down) _____ (meters)"	
*4. (Target description) " _____"	

22

22.28.2

22

NAVAL GUNFIRE CALL FOR FIRE	
5. (Method of engagement) (Use as needed):	
" Danger close "	
" Reduced charge "	
" Ammunition _____ "	
" Fuze _____ "	
" Armament _____ "	
" Number of guns _____ "	
" Number of salvos _____ "	
" Special instructions _____ "	
*6. (Method of control) (Use as needed):	
" Fire for effect "	
" Spotter adjust "	
" Ship adjust "	
" At my command "	
" Cannot observe "	

22

22.28.3

22

22

22.29.1

22

NAVAL GUNFIRE MESSAGE
TO OBSERVER

Gun target line _____
(mils grid)

Ready time _____ (sec)

Notes:

22

22.30.1

22

NAVAL GUNFIRE WEAPONS CAPABILITIES				
WEAPON	5"/38	5"/54	16"/50	
Max range (m) full charge	15500	21500	38100	
Max range (m) reduced charge	7900	12000	24000	
Ammo	AP, HE, ILLUM, WP	AP, HE, ILLUM, WP	AP, HE, ICM	
Max rate of fire (rpm)	20	30	5	
Sustained rate of fire (rpm)	15	20	2	
Fuzes	PD, MT	PD, MT, CVT	PD, CVT	
Danger close distances (m)	750	750	1000 (2000 ICM)	

22

22.31.1

22

NAVAL GUNFIRE ILLUMINATION FACTORS			
WEAPON	5"/38	5"/54	16"/50
Height of burst (m)	500	500	N/A
Burn time (sec)	45	45	N/A
Rate of fall (m/sec)	10	10	N/A
Notes:			

22

22.32.1

22

LIGHT DATA		
ITEM	FIRST DAY	LAST DAY
BMNT		
BMCT		
Sun Rise		
Sun Set		
EECT		
EENT		
Moon Rise		
% Illum		
Moon Set		
Notes:		

23	23.0.1	23
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23				23			
				23.1.1			
US TO METRIC CONVERSION FACTORS (LENGTH)							
MULTIPLY	TIMES	TO GET					
Inches	25.40	Millimeters					
Feet	304.80	Millimeters					
Yards	914.40	Millimeters					
Inches	2.54	Centimeters					
Feet	30.48	Centimeters					
Yards	91.44	Centimeters					
Inches	0.025	Meters					
Feet	0.305	Meters					
Yards	0.914	Meters					
Miles	1609.34	Meters					

23

23.1.2

23

US TO METRIC CONVERSION FACTORS (LENGTH)		
MULTIPLY	TIMES	TO GET
Feet	0.00030	Kilometers
Yards	0.00091	Kilometers
Miles	1.609	Kilometers
MPG	0.425	Km per liter
MPH	1.609	Km per hour
Notes:		

23

METRIC TO US CONVERSION FACTORS (LENGTH)		
MULTIPLY	TIMES	TO GET
Millimeters	0.03937	Inches
Millimeters	0.00328	Feet
Millimeters	0.00109	Yards
Centimeters	0.3937	Inches
Centimeters	0.0328	Feet
Centimeters	0.0109	Yards
Meters	39.37	Inches
Meters	3.281	Feet
Meters	1.094	Yards
Meters	0.00062	Miles

23.2.1

23

23

23.2.2

23

METRIC TO US CONVERSION FACTORS (LENGTH)		
MULTIPLY	TIMES	TO GET
Kilometers	3280.84	Feet
Kilometers	1093.61	Yards
Kilometers	0.621	Miles
Km per liter	2.354	MPG
Km per hour	0.621	MPH
Notes:		

23			23.3.1	23
US TO METRIC CONVERSION FACTORS (AREA)				
MULTIPLY	TIMES	TO GET		
Sq. inches	645.16	Sq. millimeters		
Sq. inches	6.452	Sq. centimeters		
Sq. inches	0.00065	Sq. meters		
Sq. feet	0.093	Sq. meters		
Sq. yards	0.836	Sq. meters		
Sq. miles	2.59	Sq. kilometers		
Notes:				

23			23.4.1	23
METRIC TO US CONVERSION FACTORS (AREA)				
MULTIPLY	TIMES	TO GET		
Sq. millimeters	0.00155	Sq. inches		
Sq. centimeters	0.155	Sq. inches		
Sq. meters	1550.00	Sq. inches		
Sq. meters	10.764	Sq. feet		
Sq. meters	1.196	Sq. yards		
Sq. kilometers	0.386	Sq. miles		
Notes:				

US TO METRIC CONVERSION FACTORS (VOLUME)		
MULTIPLY	TIMES	TO GET
Cubic inches	16.39	Cubic centimeters
Cubic feet	0.028	Cubic meters
Cubic yards	0.765	Cubic meters
Cubic inches	0.016	Liters
Cubic feet	28.32	Liters
Notes:		

23

23.5.1

23

METRIC TO US CONVERSION FACTORS (VOLUME)		
MULTIPLY	TIMES	TO GET
Cubic centimeters	0.061	Cubic inches
Cubic meters	35.31	Cubic feet
Cubic meters	1.308	Cubic yards
Liters	61.02	Cubic inches
Liters	0.035	Cubic feet
Notes:		

23

23.6.1

23

23

US TO METRIC CONVERSION FACTORS (CAPACITY)		
MULTIPLY	TIMES	TO GET
Fluid drams	3.697	Milliliters
Fluid ounces	29.57	Milliliters
Fluid ounces	0.030	Liters
Pounds	0.454	Kilograms
Pints	0.473	Liters
Quarts	0.946	Liters
Gallons	3.785	Liters
Notes:		

23

23.7.1

23

23

23.8.1

23

METRIC TO US CONVERSION FACTORS (CAPACITY)		
MULTIPLY	TIMES	TO GET
Milliliters	0.271	Fluid drams
Milliliters	0.034	Fluid ounces
Liters	33.81	Fluid ounces
Kilograms	2.205	Pounds
Liters	2.113	Pints
Liters	1.057	Quarts
Liters	0.264	Gallons
Notes:		

23 23.9.1 23		
METERS AND FEET CONVERSION		
METERS	FEET-METER	FEET
0.305	1	3.281
0.610	2	6.562
0.914	3	9.842
1.219	4	13.123
1.524	5	16.404
1.829	6	19.685
2.134	7	22.966
2.438	8	26.247
2.743	9	29.528
3.048	10	32.809
6.096	20	65.617
9.144	30	98.426
12.192	40	131.234
15.240	50	164.043

23 23.9.2 23		
METERS AND FEET CONVERSION		
METERS	FEET-METER	FEET
18.990	60	196.852
21.340	70	229.660
24.380	80	262.459
27.430	90	295.278
30.480	100	328.087
60.960	200	656.1
91.440	300	984.3
121.920	400	1312.3
152.400	500	1640.4
304.800	1000	3280.9
609.600	2000	6561.7
914.400	3000	9842.6
1219.200	4000	13123.5
1524.000	5000	16404.3

KILOMETER TO MILE CONVERSIONS		
STANDARD MILES	KILOMETERS	NAUTICAL MILES
0.62	1	0.54
1.24	2	1.08
1.86	3	1.62
2.49	4	2.16
3.11	5	2.70
3.73	6	3.24
4.35	7	3.78
4.97	8	4.32
5.59	9	4.86
6.21	10	5.40
12.43	20	10.79
18.64	30	16.19

23

23.10.1

KILOMETER TO MILE CONVERSIONS		
STANDARD MILES	KILOMETERS	NAUTICAL MILES
24.86	40	21.58
31.07	50	26.98
37.28	60	32.38
43.50	70	37.77
49.71	80	43.17
55.93	90	48.56
62.14	100	53.96
124.28	200	107.92
186.42	300	161.88
248.56	400	215.84
310.70	500	269.80
372.84	600	323.76

23

23.10.2

23

KILOMETER TO MILE CONVERSIONS		
STANDARD MILES	KILOMETERS	NAUTICAL MILES
434.98	700	377.72
497.12	800	431.68
559.26	900	485.64
621.40	1000	539.6
Notes:		

23

23.10.3

23

STATUTE MILE CONVERSIONS			
KILOMETERS	STATUTE MILES	NAUTICAL MILES	
1.61	1	0.84	
3.22	2	1.74	
4.83	3	2.61	
6.44	4	3.47	
8.05	5	4.34	
9.66	6	5.21	
11.27	7	6.08	
12.88	8	6.95	
14.49	9	7.82	
16.09	10	8.68	
32.19	20	17.37	
48.28	30	26.05	

23

23.11.1

23

STATUTE MILE CONVERSIONS			
KILOMETERS	STATUTE MILES	NAUTICAL MILES	
64.38	40	34.74	
80.47	50	43.42	
6	60	52.10	
96.56	70	60.79	
112.65	80	69.47	
128.75	90	78.16	
144.85	100	86.84	
160.94	200	173.70	
321.88	300	260.50	
482.82	400	347.40	
640.76	500	432.20	
804.70	600	521.00	

23

23.11.2

23

STATUTE MILE CONVERSIONS			
KILOMETERS	STATUTE MILES	NAUTICAL MILES	
1126.60	700	607.9	
1287.50	800	694.7	
1448.50	900	781.6	
1609.40	1000	868.4	
Notes:			

23

23.11.3

23

NAUTICAL MILE CONVERSIONS			23
KILOMETERS	NAUTICAL MILES	STATUTE MILES	23.12.1
1.85	1	1.15	
3.71	2	2.30	
5.56	3	3.46	
7.46	4	4.61	
9.27	5	5.76	
11.12	6	6.91	
12.97	7	8.06	
14.83	8	9.21	
16.68	9	10.36	
18.53	10	11.52	
37.06	20	23.02	
55.60	30	34.55	

NAUTICAL MILE CONVERSIONS			23
KILOMETERS	STATUTE MILES	NAUTICAL MILES	23.12.2
74.13	40	46.06	
92.66	50	57.58	
111.19	60	69.10	
129.72	70	80.61	
148.26	80	92.13	
166.79	90	103.64	
185.32	100	115.20	
370.64	200	230.30	
555.96	300	345.50	
741.28	400	460.50	
926.60	500	575.80	
1111.92	600	691.00	

NAUTICAL MILE CONVERSIONS			
KILOMETERS	NAUTICAL MILES	STATUTE MILES	
1297.24	700	806.10	
1482.56	800	921.30	
1667.38	900	1036.40	
1853.20	1000	1151.60	
Notes:			

23

23.12.3

YARD TO METER CONVERSIONS	
YARDS	METERS
100	91
200	183
300	274
400	366
500	457
600	549
700	640
800	732
900	823
1000	914
1100	1006
1200	1097
1300	1189
1400	1280

23

23.13.1

23

YARD TO METER CONVERSIONS	
YARDS	METERS
1500	1372
1600	1463
1700	1554
1800	1646
1900	1737
2000	1828
3000	2742
4000	3656
5000	4570
6000	5484
7000	6398
8000	7312
9000	8226

23

23.13.2

23

METER TO YARD CONVERSIONS	
METERS	YARDS
100	109
200	219
300	328
400	437
500	547
600	656
700	766
800	875
900	984
1000	1094
1100	1203
1200	1312
1300	1422
1400	1531

23

23.14.1

23

METER TO YARD CONVERSIONS	
METERS	YARDS
1500	1640
1600	1750
1700	1860
1800	1969
1900	2078
2000	2188
3000	3282
4000	4376
5000	5470
6000	6564
7000	7658
8000	8752
9000	9846

23

23.14.2

23

NAUTICAL MILE TO METER CONVERSIONS	
NAUTICAL MILES	METERS
0.1	185
0.2	370
1/4	463
0.3	556
0.4	741
1/2	926
0.6	1111
0.7	1296
3/4	1389
0.8	1482
0.9	1667
1	1852
1 1/4	2315

23

23.15.1

23

NAUTICAL MILE TO METER CONVERSIONS	
NAUTICAL MILES	METERS
1 1/2	2778
1 3/4	3241
2	3704
2 1/4	4167
2 1/2	4630
2 3/4	5093
3	5556
3 1/4	6019
3 1/2	6482
3 3/4	6945
4	7408
5	9260

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23.15.2

[illegible]

23

23.15.3

23

24	24.0.1	24
AIR ASSAULT OPERATIONS TABLE OF CONTENTS		
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Ground tactical plan considerations	24.4.1	
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Landing plan fire support considerations	24.7.1	
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AIRCRAFT TROOP COMMANDER BRIEFING	24	24.1.1	24
1. Loading procedures _____			

2. Bump plan (for individuals/loads) _____			

3. Use of safety belts _____			

4. Preflight safety inspection of troops _____			

AIRCRAFT TROOP COMMANDER BRIEFING	24	24.1.2	24
5. In-flight procedures _____			

6. Downed aircraft procedures _____			

7. Offloading procedures _____			

8. Movement from the LZ _____			

9. _____			
10. _____			
11. _____			
12. _____			

24		24.2.1	24
AIR ASSAULT SAFETY BRIEFING CHECKLIST			
ITEM	ACTION		✓
1	Wear ID tags and earplugs at all times when near or in acft		
2	Wear helmets with fastened chin straps at all times		
3	Approach UH-60 acft from the front of acft, forward of rear cargo doors		
4	DO NOT go near tail of acft		
5	Approach/depart acft in a crouch for extra clearance of main rotor blade		
6	Move to/from acft on DOWN slope side to avoid main rotor		

24		24.2.2	24
AIR ASSAULT SAFETY BRIEFING CHECKLIST			
ITEM	ACTION		✓
7	Roll sleeves down whenever working with acft		
8	Weapons in acft		
8A	Bayonets off		
8B	Chambers empty		
8C	Safeties on		
8D	Bolts closed		
8E	Magazines in		
8F	Muzzles DOWN		
8G	Pistol grips forward		

24

24.2.3

24

AIR ASSAULT SAFETY BRIEFING CHECKLIST		
ITEM	ACTION	
9	Radios near acft	☒
9A	Bend short antennas all the way down	
9B	Tie long antennas down	
10	Fasten seat belts upon getting in acft	
11	Leave seat belts buckled until crew chief signals you to exit acft	
12	In event of forced landing	
12A	Sit upright	
12B	Place head against seat	

24

24.2.4

24

AIR ASSAULT SAFETY BRIEFING CHECKLIST		
ITEM	ACTION	
12C	Place hand flat on thigh	☒
12D	Stay in acft until MAIN ROTOR COMPLETELY STOPS, unless there is a fire	
13	Give written manifest of every passenger on acft to a person who is not flying on that acft and/or mission. Include	
13A	Unit	
13B	Rank	
13C	Full name	
13D	Social security number	

24

24.3.1

24

AIR ASSAULT OPERATION REVERSE PLANNING SEQUENCE	
ITEM	ACTION
1	Ground tactical plan
2	Landing plan
3	Air movement plan
4	Loading plan
5	Staging plan

Notes:

- Make careful analysis of METT-T.
- Develop ground tactical plan first.
- Ground tactical plan forms basis from which other plans are derived.
- Do not develop plans independently.

24

24.4.1

24

GROUND TACTICAL PLAN CONSIDERATIONS	
ITEM	CONSIDERATION
1	Missions of all force elements and methods of employment
2	Zones of attack, sectors, or areas of operations with graphic control measures
3	Task organization to include command relationships
4	Location and size of reserves
5	Fire support to include graphic control measures
6	Combat service support to include resupply, evacuation, and plans to sustain the force

24			24.5.1	24
LANDING PLAN CONSIDERATIONS				
ITEM	CONSIDERATION			
1	Supports ground tactical plan			✓
2	Availability, location, and size of potential LZs are overriding factors			
3	Force is most vulnerable during landing			
4	Elements must land with tactical integrity			
5	Inform all troops if briefed landing direction changes to reduce disorientation			
6	Force must land prepared to fight in any direction			

24			24.5.2	24
LANDING PLAN CONSIDERATIONS				
ITEM	CONSIDERATION			
7	Plan must offer flexibility for options in developing scheme of maneuver			✓
8	Plan supporting fires in and around each LZ			
9	Plan to bring artillery/mortars into LZ(s) early to provide fire support for next lifts and on objective			
10	Plan must provide for resupply and medical evacuation by air			
11				
12				

24		24.6.1	24
LANDING ZONE SELECTION CRITERIA			
ITEM	CRITERIA		✓
1	Location (based on METT-T)		
2	Capacity (size)		
3	Alternates (one per primary LZ)		
4	Enemy disposition		
5	Enemy capabilities		
6	Cover		
7	Concealment		
8	Obstacles		
9	Identification from the air		
10	Approach routes		

24		24.6.2	24
LANDING ZONE SELECTION CRITERIA			
ITEM	CRITERIA		✓
11	Departure routes		
12	Weather		
13	Surface conditions		
14	Ground slope		
15			
16			
17			
18			
19			
20			

24		24.7.1	24
LANDING PLAN FIRE SUPPORT CONSIDERATIONS			
ITEM	CONSIDERATION		✓
1	Plan for short, intense, high volume preparatory fires		
2	Plan for fires to end just before first assault element's landing		
3	Deception		
4	Loss of surprise		
5	Fire support availability		
6	Significant targets		
7	Obstacles to landing/maneuver		
8	Scheduling fires		
9	Positive control measures		

24		24.8.1	24
AIR ASSAULT PZ/LZ PLANNING CONSIDERATIONS			
ITEM	CONSIDERATION		✓
1	PZs		
1A	Require minimum movement by ground troops		
1B	Provide access to vehicles moving support assets		
1C	Be masked from enemy observation		
1D	Be outside the range of enemy artillery (if possible)		
2	LZs		
2A	Locate on, close by, or some distance away from the objective (base on METT-T)		

AIR ASSAULT PZ/LZ			24
PLANNING CONSIDERATIONS			24.8.2
ITEM	CONSIDERATION		
2B	Size determines how much combat power can be landed at one time		
2C	Enemy ADA and its capability to react to nearby landing		
2D	Deny enemy observation and acquisition of ground/air units		
2E	Land on enemy side of obstacles when attacking		
2F	Avoid exposing aircraft to enemy fire on approach or departure		
2G	Reduced visibility may limit or preclude use		

24.9.1			24
MINIMUM LANDING POINT SIZES (CIRCLE DIAMETER IN METERS)			
HELICOPTER TYPE	SIZE		
OH-58	25		
UH-1	35		
AH-1	35		
UH-60	50		
AH-64	50		
CH-47	80		
Note: Use an obstacle clearance ratio of 10 to 1 on the approach and departure ends of the PZ/LZ. (Example: A landing point requires 100 feet of horizontal clearance if a helicopter must approach or depart directly over a 10-foot tall tree.)			

24		24.10.1	24
AIR ASSAULT EXTRACTION LOADING PLAN REQUIREMENTS			
ITEM	REQUIREMENT		
1	PZ locations		✓
1A	Primary		
1B	Alternate		
2	PZ security		
3	PZ control party		
3A	Organization		
3B	Location		
4	Fire support		
5	Sequence of extraction		
5A	Main body		

24		24.10.2	24
AIR ASSAULT EXTRACTION LOADING PLAN REQUIREMENTS			
ITEM	REQUIREMENT		✓
5B	PZ control party		
5C	Security force		
6	Movement to the PZ		
6A	Route		
6B	Order of movement		
7	Loading priorities		
8			
9			
10			
Note: PZ time is the critical factor			

24		24.11.1	24
PICKUP ZONE CONTROL OFFICER (PZCO) DUTIES			
ITEM	DUTY		
1	Form control group		✓
2	Establish communications		
2A	Unit movement/loading net		
2B	Combat aviation net		
3	Plan fire support		
4	Initiate fire support		
5	Plan security		
6	Initiate security		
7	Clear PZ of obstacles		
8	Mark PZ		

24		24.12.1	24
PLT LDR DUTIES IN PLT AIR ASSAULT OPERATIONS			
ITEM	DUTY		✓
1	Overall responsibility for the air assault operation		
2	Act as PZCO (if ordered)		
3	Plan the operation		
4	Brief subordinate leaders		
5	Issue OPORD		
6	Conduct rehearsals		
7	Ride in Air Msn Cdr's (AMC) aircraft to ensure better comd, control, and commo		
Notes:			

24		24.13.1	24
PSG DUTIES IN PLT AIR ASSAULT OPERATIONS			
ITEM	DUTY		
1	Set up PZ		
1A	Supervise marking		
1B	Supervise clearing obstacles		
2	Act as PZCNCOIC (if ordered)		
3	Brief all chalk leaders		
4	Supervise all activity on PZ		
4A	PZ security		
4B	Movement of troops and equipment		
4C	Placement of chalks and slingloads		

24		24.13.2	24
PSG DUTIES IN PLT AIR ASSAULT OPERATIONS			
ITEM	DUTY		
5	Devise bump plan		
6	Disseminate bump plan		
7	Ensure PZ is cleared		
8	Ride in last aircraft for control purposes		
Notes:			

24

24.14.1

24

CHALK LDR DUTIES IN PLT AIR ASSAULT OPERATIONS	
ITEM	DUTY
1	Brief squad/attachments on their tasks inside aircraft
2	Brief squad/attachments on their positions inside aircraft
3	Ensure lights/panels for his aircraft are properly employed
4	Assign squad areas of security
5	Ensure that each soldier goes to his proper area
6	Supervise loading of squad/attachments into aircraft
7	Ensure squad/attachments buckle lap belts

✓

24

24.14.2

24

CHALK LDR DUTIES IN PLT AIR ASSAULT OPERATIONS	
ITEM	DUTY
8	Upon landing, ensure squad/attachments
8A	Exit aircraft quickly
8B	Rush to a safe distance (10 to 15 meters) from aircraft
8C	Assume the prone position
8D	Prepare to return enemy fire

Notes:

24		24.15.1	24
PZ CONTROL PARTY IN PLT AIR ASSAULT OPERATIONS			
ITEM	DUTY		✓
1	PZCO is a rifle platoon leader		
2	PZCNCOIC is a PSG		
3	RATELO (with 3 radios)		
3A	1 radio monitors combat aviation net		
3B	1 radio is on platoon command net		
3C	1 radio is on company command net		
4	Chalk-linkup guides (1 per chalk/squad) from the same chalk/squad that they are assigned to		

24		24.15.2	24
PZ CONTROL PARTY IN PLT AIR ASSAULT OPERATIONS			
ITEM	DUTY		✓
4A	Assist chalk in linkup in unit assembly area		
4B	Assist chalk in movement to chalk assembly area		
5	Lead aircraft signalman		
5A	Visually signals lead aircraft		
5B	From chalk on lead aircraft		
6	Slingload teams (3 personnel)		
6A	Signalman		
6B	Static-probe man		
6C	Hookup man		

24		24.16.1	24
AIR ASSAULT FORCE COMMANDERS' CHECKLIST			
ITEM	ACTION		
1	Action upon receipt of orders		✓
1A	Analyze mission(s)		
1B	Determine specified and implied task(s)		
1C	Determine objective(s)		
1D	Develop time schedule		
1E	Obtain aircraft ACL from AMC and/or ALO		
1F	Issue warning order		
2	Ground tactical plan		
2A	Choose assault objectives		

24		24.16.2	24
AIR ASSAULT FORCE COMMANDERS' CHECKLIST			
ITEM	ACTION		
2B	Designate usable LZ(s)		✓
2C	Establish D-day and H-hour (time of assault)		
2D	Identify special tasks required to accomplish mission		
2E	Organic troops		
2F	Army aviation resources		
2G	USAF support (AMC/ALO)		
2H	FARP		
2I	Engineers		
2J	Signal (include aerial relay)		

24		24.16.3	24
AIR ASSAULT FORCE COMMANDERS' CHECKLIST			
ITEM	ACTION		
2K	Medical		✓
2L	CAS		
2M	Field artillery within range		
2N	Mortar and naval gunfire		
2O	Preparation fires for LZs (to include lifting/shifting signals)		
2P	Flight corridors		
2Q	Air defense suppression		
2R	Control measures needed		
2S	Subsequent operations that may be conducted		

24		24.16.4	24
AIR ASSAULT FORCE COMMANDERS' CHECKLIST			
ITEM	ACTION		✓
3	Intelligence info/requirements		
3A	Enemy locations (including ADA positions)		
3B	CO's aerial recon of objective area (if possible)		
3C	Aerial recon (SLAR/photos)		
3D	Sensor reports		
3E	Terrain study		
3F	Weather forecast		
3G	Latest INTSUM		
3H	POW handling procedures		

24		24.16.5	24
AIR ASSAULT FORCE COMMANDERS' CHECKLIST			
ITEM	ACTION		✓
3I	Civilian control procedures		
4	Landing		
4A	Selection of primary/alternate LZs (capacity)		
4B	LZ identification procedures for landing sites (smoke/panels/flares/lights)		
4C	Use of pathfinders		
4D	Landing formation(s)		
4E	Approach and departure directions		
4F	Use of TACAIR		

24		24.16.6	24
AIR ASSAULT FORCE COMMANDERS' CHECKLIST			
ITEM	ACTION		✓
4G	Use of indirect fire weapons		
4H	Use of atk helicopters/units		
4I	Use of EW		
4J	Shifting of fires		
4K	Lifting of fires		
4L	Suppression of enemy ADA		
5	Flight routes (primary/alternate/return)		
5A	RP/direction and distance to LZs		
5B	SP/air control points/CCP/RPs		

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24.16.7

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AIR ASSAULT FORCE COMMANDERS' CHECKLIST	
ITEM	ACTION
5C	Phase lines (if used)
5D	Estimate time enroute
5E	Maneuver areas for attack helicopters
5F	Laagers (location, mission, security)
5G	Friendly ADA considerations
5H	Enemy ADA intelligence
6	Air movement table
6A	Units to be lifted
6B	Aviation units that will support

24

24.16.8

24

AIR ASSAULT FORCE COMMANDERS' CHECKLIST	
ITEM	ACTION
6C	Number and type of lift aircraft allocated to each unit
6D	Lift-off times
6E	Routes
6F	Unit LZs
6G	H-hour (landing time of initial serial)
7	Alternate commo plan
7A	FM
7B	UHF
7C	VHF

AIR ASSAULT FORCE COMMANDERS' CHECKLIST		
ITEM	ACTION	☒
7D	Visual/audio signals	☐
7E	Aerial radio relay	☐
8	Loading	☐
8A	PZ assignment by unit (primary/alternate)	☐
8B	Bump and/or straggler contingency plan	☐
8C	Holding areas	☐
8D	Routes from assembly areas to holding area to PZ(s)	☐
8E	Atk helicopter use (security and overwatch from PZ to LZ)	☐

242424.16.9

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24.16.10

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AIR ASSAULT FORCE COMMANDERS' CHECKLIST		
ITEM	ACTION	
9	Support plans for operation	✓
9A	Alternate plans/procedures due to weather (H-hour increment to delay operation)	
9B	Downed helicopter plans	
9C	Rally points	
9D	Escape and evasion plans	
9E	Laager sites	
9F	Rules of engagement	
9G	Deception plans to use	
9H	Spare aircraft available	

AIR ASSAULT FORCE COMMANDERS' CHECKLIST		
ITEM	ACTION	
9I	Recon (air-ground) to conduct	✓
9J	Straggler control procedures	
9K	Reporting (enroute, lift-off, touchdown, intel, contact)	
9L	Aircraft control after assault	
9M	Health service support and evacuation procedures	
10	Actions that must be completed	
10A	Warning orders	
10B	LNO(s) (receive/dispatch)	
10C	Attachments/detachments	

24 24.16.11 24

AIR ASSAULT FORCE COMMANDERS' CHECKLIST		
ITEM	ACTION	
10D	Issue commander's concept (time/place)	✓
10E	Briefings (time/place)	
10F	Preparation of OPORD	
10G	Issue OPORD (time/place)	
11	Logistics requirements	
11A	Class V resupply	
11B	Feeding plan	
11C	Water	
11D	MEDEVAC (frequency, call sign, location, procedures)	

24 24.16.12 24

24

24.16.13

24

AIR ASSAULT FORCE COMMANDERS' CHECKLIST	
ITEM	ACTION
11E	Refueling (location of FARP and ammo available)
12	Debriefing
12A	Ground units lessons learned
12B	Aviation units lessons learned
12C	Actions taken for correction

Notes:

24

24.17.1

24

NIGHT MARKING OF
PZs AND LZs

Notes:

- If more than 1 acft will land in the same PZ or LZ, add 1 more light for each acft.
- For OH-, UH-, and AH- acft, mark each additional acft landing point with 1 light at the exact point each acft is to land.
- For CH- acft, mark each additional point with 2 lights placed 10 m apart and aligned in the acft direction of flight.

ABBREVIATIONS	
A	
AA	Assembly Area or Avenue of Approach
ACL	Allowable Cargo Load
acft	aircraft
ADA	Air Defense Artillery
ALO	Air Liaison Officer
AMC	Air Mission Controller
ammo	ammunition
AO	Area of Operations
AP	Antipersonnel
ASAP	As soon as possible
aslt	assault
ASOC	Air Support Communication Center
assn	association
assy	assembly
AT	Antitank
ATGM	Antitank Guided Missile
atk	attack
aval	available
AWOL	Absent without leave
B	
BD	Base Detonating

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25.1.1

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ABBREVIATIONS	
B	
BFV	Bradley Fighting Vehicle (M2/M3)
Bio	Biological
bldg	building
BMCT	Beginning of Morning Civil Twilight
BMNT	Beginning of Morning Nautical Twilight
BOMBREP	Bomb Report
BP	Battle Position
C	
CA	Course of Action
camo	camouflage
CAS	Close Air Support
cbt	combat
CBU	Cluster Bomb Unit
CCP	communications checkpoint
Cdr	Commander
C-E	Communications-Electronics
CFL	Coordinated Fire Line
civ	civilian
Chem	Chemical
CO	Commanding Officer
Co	Company
coax	coaxial machinegun

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25.1.2

25

25		25.1.3	25
ABBREVIATIONS			
C			
comd	command		
Commo	Communication(s)		
COMSEC	Communications Security		
CONOPS	Continuous Operations		
cont	continue		
coord	coordinate(s)		
CP	Command Post; Concrete Piercing		
CPHD	Concrete Piercing Mustard Gas		
CVC	Combat Vehicle Crewman		
D			
DA	Department of the Army		
DASC	Direct Air Support Center		
demo	demolition(s)		
DPICM	Dual Purpose Improved Conventional Munitions		
DS	Direct Support		
DTG	Date-Time Group		
E			
EA	Engagement Area		
EECT	End of Evening Civil Twilight		
EENT	End of Evening Nautical Twilight		
eff	effective		

25		25.1.4	25
ABBREVIATIONS			
E			
elem	element		
emerg	emergency		
EMP	Electromagnetic Pulse		
en	enemy		
EW	Electronic Warfare		
F			
FAC	Forward Air Controller		
FAE	Fuel Air Explosive		
FARP	Forward Rearming and Refueling Point		
FCL	Fire Coordination Line		
FDC	Fire Direction Center		
FFAR	Folding Fin Aerial Rocket		
FM	Frequency Modulation		
FSCC	Fuel Support Coordination Center		
FSCL	Fire Support Coordination Line		
freq	frequency		
G			
GBU	Guided Bomb Unit		
Gen	General		
G-M	Grid-Magnetic		
GS	General Support		

25		25.1.5	25
ABBREVIATIONS			
G			
GSR	Ground Surveillance Radar		
H			
HC	Smoke		
HD	High Drag		
HE	High Explosive		
HEP	High Explosive Plastic		
HEP-T	High Explosive Plastic-Tracer		
HES	High Explosive Spotting		
HF	High Frequency		
HOB	Height of Burst		
hr	hour		
HQ	Headquarters		
I			
ICM	Improved Conventional Munitions		
ID	Identification		
IG	Inspector General		
IIR	Intelligence Information Report		
illum	illuminating		
indiv	individual		
info	information		
intel	intelligence		
INTSUM	intelligence summary		

25		25.1.6	25
ABBREVIATIONS			
I			
IP	Initial Point		
ITV	Improved TOW Vehicle		
J			
JAAT	Joint Air Attack Team		
JAG	Judge Advocate General		
K			
km	kilometer(s)		
kph	kilometers per hour		
L			
LAW	Light Antitank Weapon		
LAT	Latitude		
LBE	Load Bearing Equipment		
LD	Line of Departure; Low Drag		
ldr	leader		
LGB	Laser Guided Bomb		
loc	location		
log	logistics		
LONG	Longitude		
LP	Listening Post		
LZ	Landing Zone		

ABBREVIATIONS	
M	
m	meter(s)
MAG	Magnetic
maint	maintain; maintenance
MEDEVAC	Medical Evacuation
METT-T	Mission, Enemy, Terrain, Troops, and Time Available
mg	machinegun
mhz	megahertz
mk	mark
mm	millimeter
MOD	Model
MOPP	Mission Oriented Protection Posture
MORTREP	Mortar Report
mov	movement
mpg	miles per gallon
mph	miles per hour
msn	mission
MT	Mechanic Time
MTSQ	Mechanic Time Super Quick
N	
NATO	North Atlantic Treaty Organization
NBC	Nuclear, Biological, Chemical

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25.1.7

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ABBREVIATIONS	
N	
NCO	Noncommissioned Officer
NCOIC	Noncommissioned Officer In Charge
NFL	No Fire Line
NGF	Naval Gunfire
NOD(s)	Night Observation Device(s)
nuc	nuclear
O	
obj	objective
obs	obstacle
obsn	observation
op	operation
OP	Observation Post
OPORD	Operation Order
OPSEC	Operations Security
org	organization
ORP	Objective Rally Point
P	
PD	Point Detonating
pers	personnel
PEWS	Platoon Early Warning System
PL	Phase Line
plt	platoon

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25.1.8

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ABBREVIATIONS	
P	
PM	Provost Marshall
PMCS	Preventive Maintenance Checks and Services
POL	Petroleum, Oils, and Lubricants
PRC	Personnel Reporting Code
PSG	Platoon Sergeant
psn	position(s)
pls	points
POW	Prisoner(s) of War
PZ	Pickup Zone
PZCO	Pickup Zone Control Officer
PZNCOIC	Pickup Zone Noncommissioned Officer in Charge
R	
rad/hr	rads per hour
radn	radiation
RAP	Rocket Assisted Projectile
RATELO	Radio-Telephone Operator
recon	reconnaissance
ref	reference
reps	representatives
RF	Radio Frequency
RP	Release Point; Rally Point

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25.1.9

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ABBREVIATIONS	
R	
rpm	rounds per minute
R&S	Reconnaissance and Security
R-T	Receiver-Transmitter
S	
SACC	Supporting Arms Coordination Center
SAW	Squad Automatic Weapon
scty	security
sec	second
Sgt	Sergeant
SHELREP	Shell Report
sit	situation
SL	Squad Leader
SLAR	Side-Looking Airborne Radar
SOP	Standard Operating Procedure
spt	support
SP	Start Point
sqd	squad
STANO	Surveillance, Target Acquisition, and Night Observation
supl	supplementary; supplemental
supv	supervise
sust	sustain

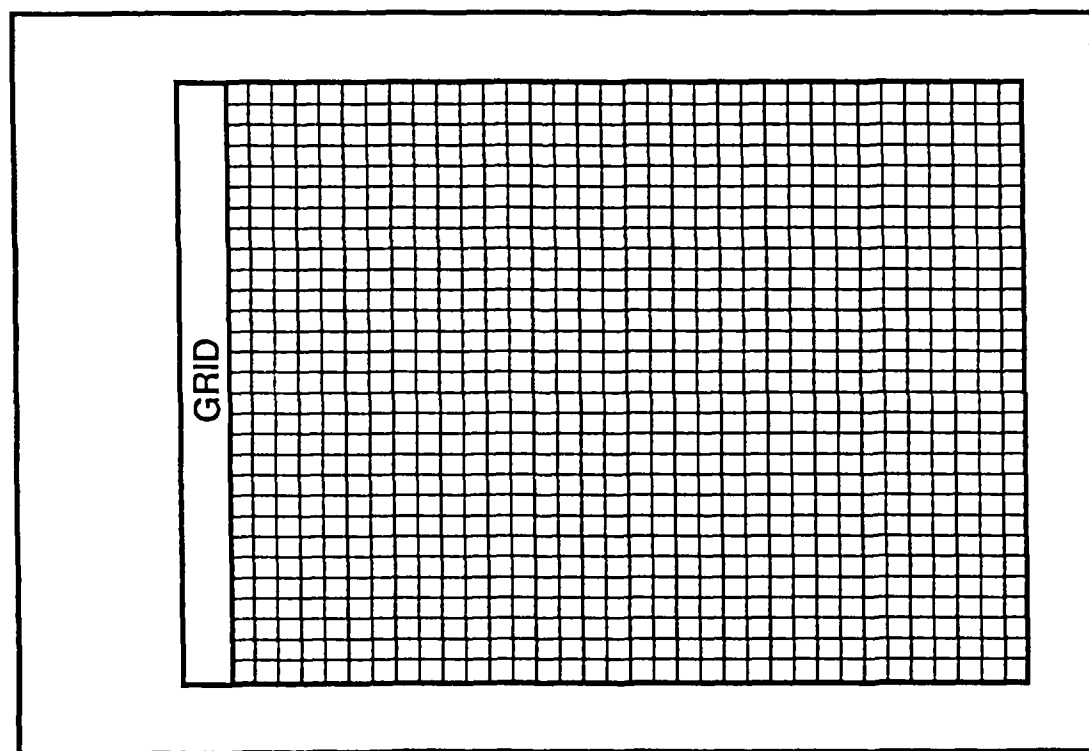
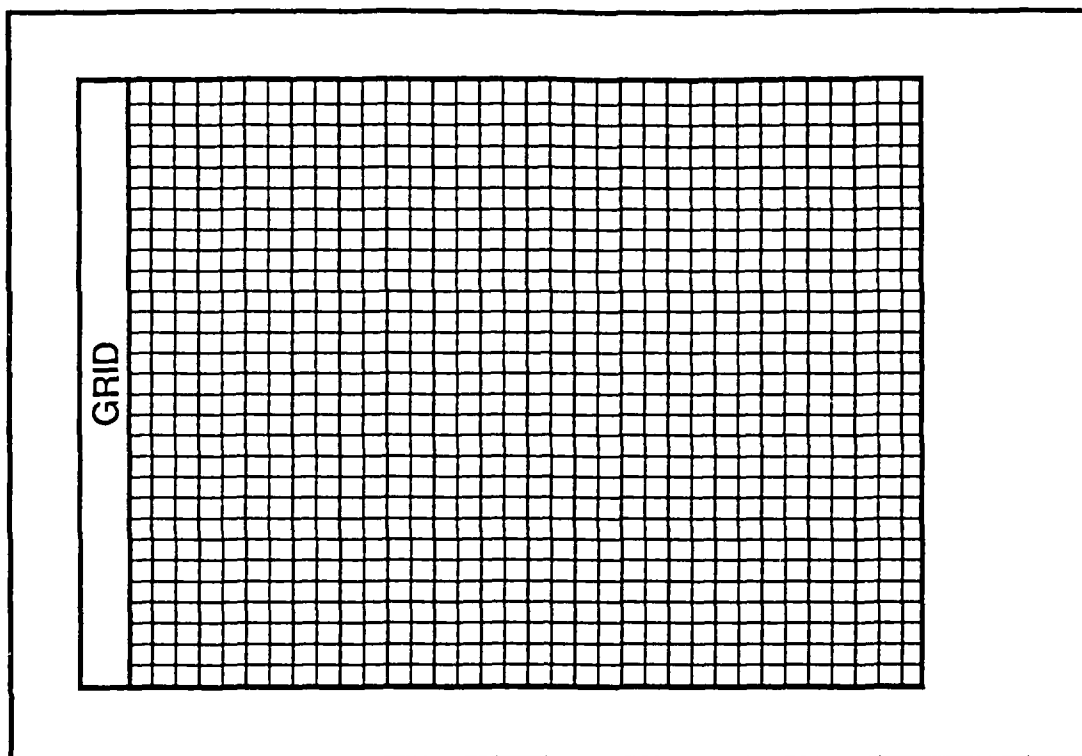
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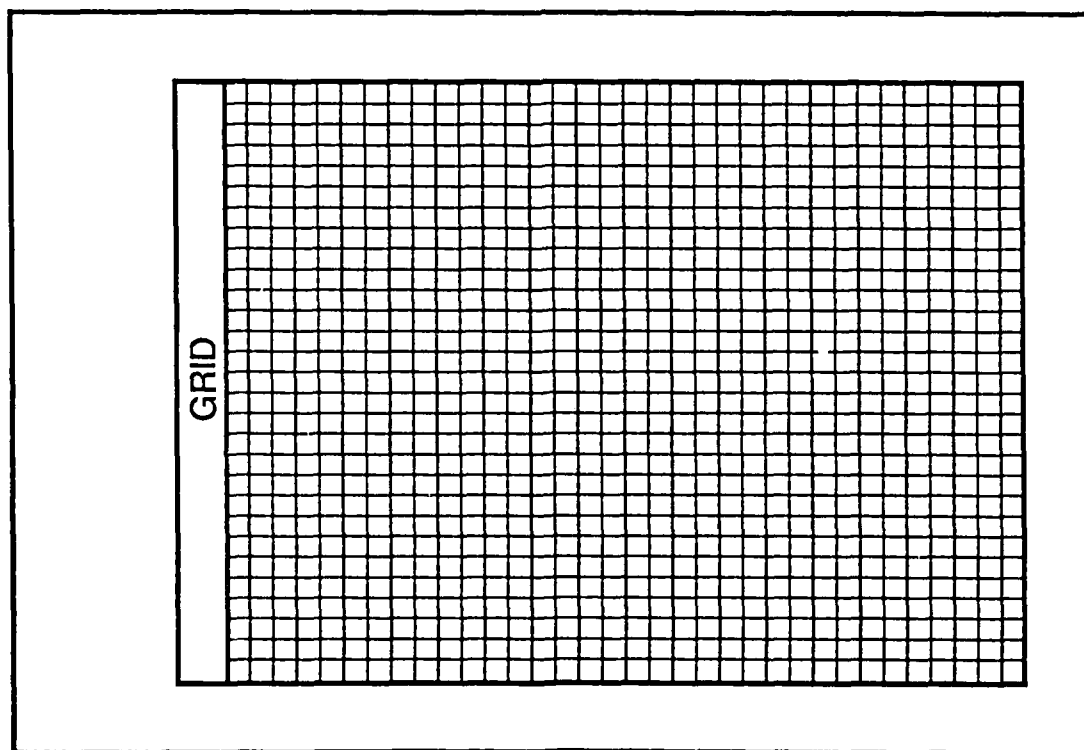
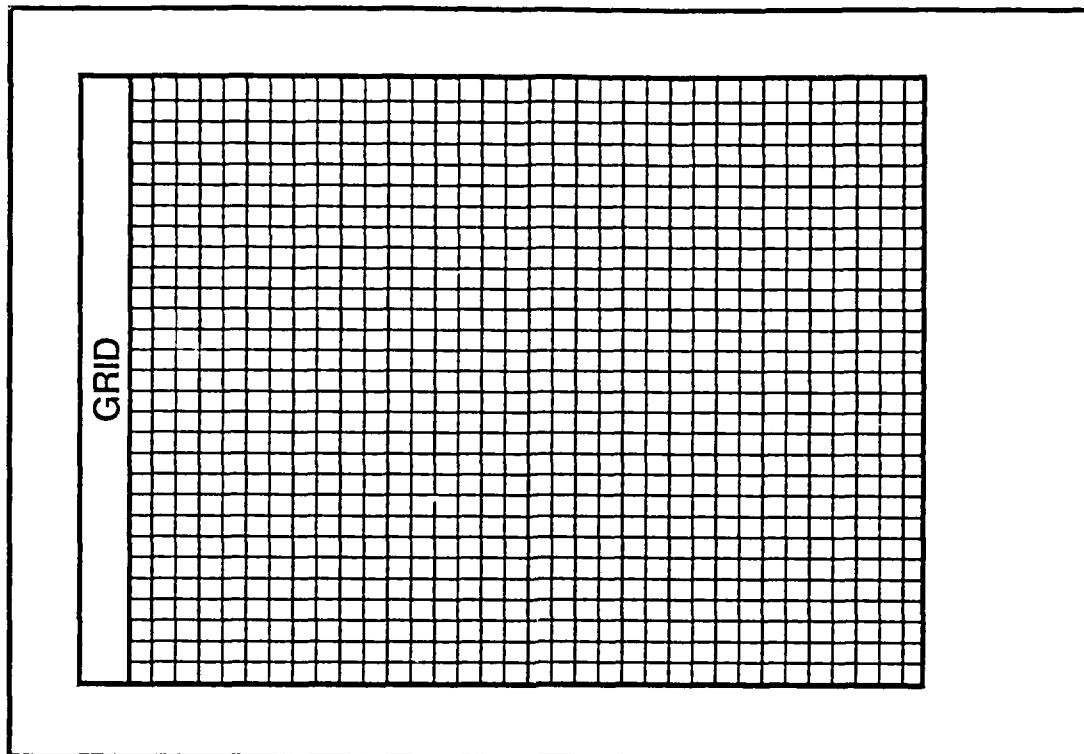
25.1.10

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25		25.1.11	25
ABBREVIATIONS			
S			
SUU	Suspended Underwing Unit		
svc	service		
sys	system		
T			
TACC	Tactical Air Control Center		
TACAIR	tactical air		
TACP	Tactical Air Control Party		
TD	Time Delay		
tgt	target		
TI	Timed		
tm	team		
TOT	Time on Target		
TTT	Time to Target		
TV	Television		
TOW	Tube-launched, Optically-tracked, Wire-guided		
TRP	Target Reference Point		
U			
UCMJ	Uniform Code of Military Justice		
UH	Utility Helicopter		
UHF	Ultra High Frequency		
US	United States		

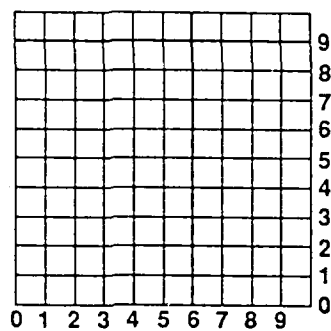
25		25.1.12	25
ABBREVIATIONS			
U			
USAF	United States Air Force		
USMC	United States Marine Corps		
US Mil	United States Military		
USN	United States Navy		
UTM	Universal Transverse Mercator (grid)		
V-W-X			
VHF	Very High Frequency		
VT	Variable Time		
w/	with		
w/o	without		
WP	White Phosphorous		
wpn(s)	weapon(s)		
XO	Executive Officer		



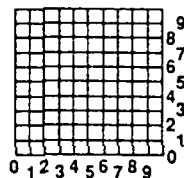


COMBAT LEADERS' GUIDE

1/25,000 or 1/250,000



1/50,000



READ RIGHT → THEN UP ↑