

## TABLE OF CONTENTS

<u>CHAPTER</u>	<u>TITLE</u>	<u>PAGE</u>
<b>ONE</b>	<b>TACTICS</b>	<b>1-1</b>
1.1	Principles of Patrolling	1-1
1.2	Troop Leading Procedures	1-1
1.3	Assumption of Command	1-3
1.4	Duties of the PL	1-4
1.5	Duties of the APL	1-4
1.6	Duties of the Squad Leaders	1-6
1.7	Duties of the Individual	1-9
1.8	Reports and Charts	1-10
1.9	Coordination Checklists	1-11
1.10	Orders	1-20
1.11	Patrol Organization and Movement	1-51
1.12	Security During Movement	1-62
1.13	Immediate Action Drills	1-67
1.14	Departure/Reentry of Friendly Forward Units	1-69
1.15	Patrol Bases	1-72
1.16	Reconnaissance Operations	1-75
1.17	Combat Operations	1-80
1.18	Link-up Operations	1-84
<b>TWO</b>	<b>DEMOLITIONS</b>	<b>2-1</b>
2.1	Characteristics of Explosives	2-1
2.2	Dual Detonation Systems	2-2
2.3	Timber Cutting	2-3
2.4	Steel Cutting	2-8
2.5	Breaching Charges	2-15
2.6	M122 Demolition Firing Device	2-19
2-7	Demo Knots	2-23
2.9	Field Expedient Demolitions and Booby Traps	2-24
<b>THREE</b>	<b>WEAPONS</b>	<b>3-1</b>
3.1	Company Level Weapons	3-1
3.2	Range Card	3-2
3.3	Fire Support	3-3
3.4	Close Air Support	3-6
3.5	Call For Fire/Request Fire	3-8
3.6	Threat	3-16
3.7	Foreign Weapons	3-19
3.8	Threat Mines	3-29
<b>FOUR</b>	<b>URBAN BREACHING</b>	<b>4-1</b>
4.1	C-Shaped Charge	4-1
4.2	Det-Cord Linear	4-3

4.3	Donut Charge	4-6
4.4	Oval Charge Working	4-9
4.5	Rigid Linear Working	4-12
4.6	Rubber Strip Charge	4-15
4.7	Water Impulse	4-17
4.8	Breacher Logbook	4-20
<b>FIVE</b>	<b>COMMUNICATIONS</b>	<b>5-1</b>
5.1	Antennas	5-1
5.2	Tactical Communications Equipment	5-14
5.3	Morse Code	5-16
5.4	Battery Life Chart	5-17
5.5	SINGARS Tasks	5-18
<b>SIX</b>	<b>MINE / COUNTERMINE</b>	<b>6-1</b>
6.1	Mine Characteristics	6-1
6.2	Firing Devices	6-5
6.3	Minefield Types	6-6
6.4	Minefield Employment Authority	6-7
6.5	Reporting, Recording, and Marking Minefields	6-8
6.6	Breaching Methods	6-18
<b>SEVEN</b>	<b>MEDICAL</b>	<b>7-1</b>
7.1	Vital Body Functions	7-1
7.2	Shock	7-1
7.3	Head Injury	7-2
7.4	Sucking Chest Wound	7-4
7.5	Stomach Wounds	7-5
7.6	Control Hemorrhage	7-5
7.7	Orthopedic Injuries	7-7
7.8	Burns	7-8
7.9	Environmental Injuries	7-9
7.10	Bites and Stings	7-12
7.11	Improvised Litters	7-14
7.12	Aeromedevac	7-17
7.13	Intravenous Techniques	7-19
7.14	Casualty Evacuation	7-20
<b>EIGHT</b>	<b>BREACHING</b>	<b>8-1</b>
8.1	Breaching Fundamentals	8-1
8.2	Breaching Organization	8-2
8.3	Types of Breaching Operations	8-4
8.4	Intelligence	8-6
8.5	Responsibilities/Checklists for Leaders/Elements	8-7
8.6	Lane Reporting	8-9

<b>NINE</b>	<b>AIR OPERATIONS</b>	<b>9-1</b>
9.1	LZ/PZ Operations	9-1
9.2	DZ Operations	9-29
9.3	Slingload Operations	9-42
9.4	Helicopter Rappeling	9-55
9.5	Helicopter Jumping	9-58
9.6	Aircraft Information	9-65
9.7	Poncho Expedient Parachute	9-69
<b>TEN</b>	<b>MOUNTAIN OPERATIONS</b>	<b>10-1</b>
10.1	Introduction to Knot Tying	10-1
10.2	Equipment	10-25
10.3	Balance Climbing	10-30
10.4	Belays	10-31
10.5	Party Climbing	10-34
10.6	Rappels	10-35
10.7	Secure a Casualty in a Sked Stretcher	10-41
10.8	Rope Installations	10-45
10.9	Rope Bridges	10-51
<b>ELEVEN</b>	<b>WATER OPERATIONS</b>	<b>11-1</b>
11.1	Casting	11-1
11.2	Recovery	11-1
11.3	Surface Swimming	11-2
11.4	Small Boats	11-3
11.5	Field Expedient Flotations Devices	11-7
11.6	Waterproofing Equipment and Munitions	11-12
11.7	Small Boat Operations	11-17
<b>TWELVE</b>	<b>SERE</b>	<b>12-1</b>
12.1	Survival	12-1
12.2	Evasion	12-36
12.3	Resistance	12-39
12.4	Escape	12-40
12.5	Code of Conduct	12-41
12.6	Codes	12-42
<b>THIRTEEN</b>	<b>MISCELLANEOUS</b>	<b>13-1</b>
13.1	Navigation	13-1
13.2	NBC	13-6
13.3	Hand to Hand Combat	13-11
13.4	Recon/Surveillance/Target Acquisition Devices	13-13
13.5	Conversion Factors	13-15
13.6	Weight of Common Items	13-16
13.7	Tricks of the Trade	13-17

<b>FOURTEEN</b>	<b>BATTLE DRILLS</b>	<b>14-1</b>
14.1	Conduct a Point/Area Recon	14-1
14.2	Conduct a Zone Recon	14-3
14.3	Conduct a Route Recon for Obstacles	14-5
14.4	Conduct a Route Clearing Operation	14-7
14.5	Bridge Recon	14-9
14.6	Employ a Hasty Protective Minefield	14-11
14.7	Breach Enemy Minefield	14-13
14.8	Breach Enemy Minefield with Explosives	14-16
14.9	Breach Enemy Minefield with Bangalore Torpedo	14-19
14.10	Breach Wire Obstacle with Wire Cutters	14-22
14.11	Breach Wire Obstacle with Bangalore Torpedo	14-25
14.12	Install a Triple Standard Concertina Fence	14-28
14.13	Prepare a Target for Demolition Using an Obstacle Folder	14-18
14.14	Secure and Airfield / Landing Strip	14-32
14.15	Establish an LZ / PZ of Opportunity	14-34
14.16	Construct an LZ / PZ / DZ with Demolitions	14-38
14.17	Construct an LZ / PZ / DZ using Engineer Tools	14-41
14.18	Conduct Aerial Re supply	14-43
14.19	Conduct an Airborne / Airmobile Operation	14-47
14.20	Crater a Road / Airfield with Explosives	14-48
14.21	Establish a Patrol Base	14-52
14.22	Establish a Hasty Defensive Perimeter	14-54
14.23	Establish a Point Ambush	14-55
14.24	Conduct an Anti-Armor / Anti-Vehicular Ambush	14-57
14.25	Conduct a Hasty Ambush	14-60
14.26	Conduct a Raid	14-61
14.27	Conduct Stream / Gap Crossing	14-64
14.28	Conduct a Cliff Assault	14-67
14.29	Knock Out Bunkers	14-69
14.30	Enter Building / Clear Room	14-72
14.31	Support By Direct Fire	14-77

**ANNEX A                      REFERENCES**

**ANNEX B                      GLOSSARY**

# **CHAPTER ONE**

## **TACTICS**

### **1. PRINCIPLES OF PATROLLING:**

- a. Planning
- b. Recon
- c. Security
- d. Control
- e. Common Sense

### **2. TROOP LEADING PROCEDURES:**

- a. Receive the Mission. (Mission Analysis)
- b. Issue Warning Order.
- c. Make Tentative Plan (Estimate of the Situation)
  - (1) Mission Analysis:
    - (a) Extract mission and commander's intent two levels up.
    - (b) Extract mission and intent of immediate commander.
    - (c) Extract all assigned/implied tasks.
    - (d) Determine mission-essential tasks.
    - (e) Determine constraints and limitations.
    - (f) Construct restated mission.
    - (g) Construct tentative time schedule.
  - (2) Develop courses of action (METT-T):
    - (a) Mission.
    - (b) Enemy.
    - (c) Terrain (OCOKA).
      - Observation and fields of fire.
      - Cover and concealment.
      - Obstacles.

- Key terrain.
- Avenues of Approach.
- (d) Troops.
- (e) Time available.
- (3) Analyze courses of action.
- (4) Compare courses of action.
- (5) Decision
- d. Start movement
- e. Conduct reconnaissance
- f. Complete the Plan.
- g. Issue OPORD/FRAGO
- h. Supervise:
  - (1) Inspect
  - (2) Rehearse

**Notes**

### 3. ASSUMPTION OF COMMAND:

Assumption of Command Coordination:

(PL asks Sapper Instructor)

- a. Is this area secure?
- b. What type of planning?
- c. Can I use my whole patrol?
- d. Is there anything else I need to know?

**Any patrol member may have to take command of the patrol in an emergency. If so, he must take the following steps in any order, depending on the situation.**

- a. Establish security.
- b. Reestablish a chain of command.
- c. Confirm location.
- d. Get leader's equipment.
- e. Meet with subordinate leaders.
- f. Issue FRAGO based on METT-T.
- g. Allow for dissemination of information.
- h. Continue the mission.

**Notes**

**4. DUTIES OF THE PL:**

a. Planning/ Prep:

- (1) Post time schedule.
- (2) Issue adequate Warning Order.
- (3) Issue adequate OORDER.
- (4) Conduct rehearsals.
- (5) Conduct inspection.
- (6) Adequately use subordinates.

b. During movement/Actions on:

- (1) Select and use initial RP.
- (2) Exit FFU satisfactorily.
- (3) Select & use suitable routes.
- (4) Select Rps & inform Patrol.
- (5) Select & utilize suitable formation
- (6) Control formation & personnel.
- (7) Cross danger areas properly.
- (8) Remain oriented at all times.
- (9) Control navigation.
- (10) Locate, Clear, and Secure ORP logically in relation to OBJ.
- (11) Conduct Leaders' recon.
- (12) Issue contingency plan.
- (13) Disseminate information.
- (14) Avoid detection.

**5. DUTIES OF THE APL:**

a. Assist PL in Plan/Prep:

- (1) Conduct initial inspection of equipment.
- (2) Ensure radios are operational.
- (3) Coordinate drawing of supply/equipment.

- (4) Conduct/Assist conduct of test fire.
- (5) Assist PL during rehearsal.
- (6) Assist PL during inspection.
- (7) Count personnel out through FFU.
- (8) Enforce light, noise, and camo discipline.
- (9) Enforce dispersion.

b. During Movement, at Halts:

- (1) Ensure weapons are pointed out.
- (2) Supervise/Enforce rear security.
- (3) Come forward at halts.
- (4) Send up head count automatically.

c. Actions in the ORP:

- (1) Assist in the occupation of the ORP.
- (2) Supervise the establishment and maintenance of an alert plan in the ORP.
- (3) Supervise the final preparation of weapons and equipment in the ORP per guidance from PL.
- (4) Assist the PL in control.
- (5) Supervise the reorganization and redistribution of ammo and equipment and ensure accountability and status of personnel, to include WIAs, MIAs and KIAs, is maintained.
- (6) Perform additional tasks assigned by the PL.
- (7) Take command in PL's absence.

c. Actions in a patrol base:

- (1) Assist in the occupation of the patrol base.
- (2) Assist in supervising the establishment and adjustment of the perimeter.
- (3) Maintain security in the patrol base:
  - (a) Maintain noise and light discipline.
  - (b) Supervise camouflage and perimeter preparation.

- (c) Periodically inspect the perimeter and ensure sectors of fire are assigned.
  - (d) Ensure that designated personnel remain alert, and that equipment is maintained in a state of readiness.
  - (4) Requisition supplies, water, ammo, and supervise their redistribution.
  - (5) Supervise priorities of work and ensure their accomplishment:
    - (a) Maintenance plan.
    - (b) Hygiene plan.
    - (c) Messing plan.
    - (d) Water plan.
    - (e) Rest plan.
- NOTE: All Priorities of work will be issued with Task, Condition, and Standard.
- (7) Check LP/OP.
  - (8) Supervise/Inspect police of PB.
  - (9) Check/ Supervise Alert plan.
  - (10) Perform additional tasks assigned by the PL and assist him in every way possible.

**6. DUTIES OF THE SQUAD LEADERS:**

- a. Throughout the Mission:
  - (1) Set the example by adhering to established standards and procedures.
  - (2) Obtain status reports from the Team Leaders & submit them to PL/APL.
  - (3) Make recommendations by delegating tasks to TM Leaders & establishing a priority of tasks in accordance with orders from the PL.
  - (4) Make recommendations to PL or APL when problems are observed.
  - (5) Use initiative in absence of orders.
- b. During Movement and at Halts:
  - (1) Ensure heavy equipment and duties are rotated amongst soldiers.
  - (2) Ensure PL/APL are notified when rest, halts and water resupply are needed.

- (3) Maintain proper movement techniques.
- (4) Monitor route, pace and azimuth.
- (5) Check personnel at halts.

c. Actions in the ORP:

- (1) Assist in the occupation of the ORP.
- (2) Assist the PL/APL with the establishment and maintenance of an alert plan in the ORP.
- (3) Assist the PL/APL with the final preparation of weapons and equipment in the ORP per guidance from PL.
- (4) Assist the PL/APL in control.
- (5) Assist the PL/APL with the reorganization and redistribution of ammo and equipment and ensure accountability and status of personnel, to include WIAs, MIAs and KIAs, is maintained.

d. Actions on the OBJ:

- (1) Ensure all special "E" required for actions on present.
- (2) Assist in supervising the establishment and adjustment of the perimeter.
- (3) Maintain security in the patrol base:
  - (a) maintain noise and light discipline
  - (b) Supervise camouflage and perimeter preparation
  - (c) Periodically inspect the perimeter and ensure sectors of fire are assigned.
  - (d) Ensure the designated personnel remain alert, and that equipment is maintained in a state of readiness.
- (4) Assist the APL with the requisition of supplies, water, ammo, and supervise their redistribution.
- (5) Supervise priorities of work, and ensure their accomplishment.

NOTE: All priorities of work will be issued with Task, Condition and Standard.

- (6) Adhere to time schedule.
- (7) Report finished priorities to the PL/APL.

- (8) Ensure the personnel know the alert and evacuation plan, location of key leaders, LP/OPs and the alternate PB.

**Notes**

**7. DUTIES OF THE INDIVIDUAL:**

- (1) Cooperate 100% w/Chain of Command.
- (2) Ensure personal weapon, equipment, etc. are always ready.
- (3) Maintain individual Camouflage.
- (4) Maintain dispersion during Mvt & halts.
- (5) Point weapon out from formation.
- (6) Pass up head count.
- (7) Secure equipment and accountability.
- (8) Know all signals, frequencies, call signs, challenge and password.
- (9) Be alert, follow orders aggressively.
- (10) Do not sleep unless authorized.
- (11) Ensure personal area is policed.
- (12) Use buddy system at all times.

**Notes**



## **9. COORDINATION CHECKLISTS:**

### **a. Friendly Forward Unit(FFU): (PL must do)**

- (1) Identify yourself and your patrol with the forward unit commander.
- (2) State the size and mission of your patrol.
- (3) Give time and place of departure and return (location of departure/reentry points).
- (4) Location of IRP (if applicable, RRP).
- (5) Give the general area of operations of your patrol.
- (6) Get information on:
  - (a) Terrain and vegetation forward of the sector.
  - (b) Known or suspected enemy positions.
  - (c) Recent enemy activity.
  - (d) Friendly positions.
- (7) Determine the forward unit's fire and barrier plan.
- (8) Determine what support the forward unit can provide:
  - (a) Guides/location of guides.
  - (b) Communication plan between the patrol and the forward unit to call for support.
  - (c) Navigational aids or signals.
  - (d) Litter teams.
  - (e) Fire support.
  - (f) Reaction squads.
- (9) Exchange call signs and frequencies.
- (10) Coordinate pyrotechnic plans, emergency signals, and codes.
- (11) Confirm challenge and password. (Normal, forward of front lines, and running passwords.)
- (12) Ensure information will be passed on if the forward unit is relieved.
- (13) Request additional information not already covered.

b. Adjacent unit:

- (1) Identify yourself and your patrol with the adjacent unit commander.
- (2) State the size and the mission of your patrol.
- (3) Give time and place of departure and return (Location of departure/reentry point).
- (4) Routes
- (5) Fire support planned and any fire coordination lines or no fire lines.
- (6) Exchange call signs and frequencies.
- (7) Confirm challenge and password.
- (8) Coordinate pyrotechnic plan, emergency signals, and codes.
- (9) Request additional information not already covered.

c. Aerial resupply:

- (1) Identify yourself and your patrol.
- (2) Enemy and Friendly Situation:
  - (a) Known or suspected enemy locations.
  - (b) Friendly unit locations and axis of friendly movements.
- (3) Weather
- (4) Mission
- (5) Number and type aircraft requested and available. (Include ACL and number of lifts required.)
- (6) Location and time of bundle loading.
- (7) Types and number of bundles.
- (8) Availability of aircraft for rehearsals.
- (9) Flight route:
  - (a) General
  - (b) Checkpoints
  - (c) Communication's checkpoint (CCP):
    - Primary and Alternate CCP
    - Location of CCP
    - Marking of CCP
    - Report time

(d) Heading from CCP

(10) Drop zone:

(a) Location:

- Primary
- Alternate

(b) Marking:

- Long range
- Short range

(11) Time of drop

(12) Length of DZ in seconds

(13) Procedure for closing the DZ.

(14) Formation, altitude, and air speed:

(a) En route.

(b) At drop zone.

(15) Communications:

(a) Call signs.

(b) Frequencies (Primary and Alternate).

(c) Codes.

(16) Emergency procedures and signals.

(17) Request additional information not already covered.

d. Aerial Movement:

(PL must do if conducting an airborne operation)

(1) Identify yourself and your patrol.

(2) Enemy and friendly situation:

(a) Known or suspected enemy locations.

(b) Friendly unit locations and axis of friendly movements.

(3) Weather.

(4) Mission.

(5) Number and type of aircraft requested and available. (Include ACL and number of lifts required.)

(6) Location and time of pick-up.

- (7) Loading plan.
- (8) Availability of aircraft for rehearsal
- (9) Flight route:
  - (a) General.
  - (b) Checkpoints.
- (10) Formations:
  - (a) At pick-up site.
  - (b) Enroute.
  - (c) At landing site (Including heading).
- (11) LZ/DZ:
  - (a) Location:
    - Primary
    - Alternate
  - (b) Marking:
    - Long range
    - Short range
- (12) Communications:
  - (a) Call signs.
  - (b) Frequencies (Primary and Alternate).
  - (c) Codes.
- (13) Emergency procedures and signals.
- (14) Request additional information not already covered.

e. Rehearsal/Test Fire Site:

- (1) Identify yourself and your patrol.
- (2) Request terrain similar to objective site.
- (3) How secure is the area?
- (4) Is OPFOR available for rehearsal?

- (5) Can blanks, simulators, pyrotechnics, live ammo, explosives be used in the area?
- (6) Are fortifications available in the area? If not, can they be built?
- (7) Time area is available.
- (8) Is transportation available to the area?
- (9) Is coordination needed among other patrols in the area?
- (10) Request additional information not already covered.

f. Fire Support:

- (1) Identify yourself and your patrol.
- (2) Mission and objective.
- (3) Routes to and from the objective (include alternate routes).
- (4) Time of departure and expected time of return.
- (5) Target list (include target location and target description, as a minimum).
- (6) Determine fire support means available (artillery, mortar, aerial fire support, to include Army, Air Force, and Navy).
- (7) Determine ammunition available.
- (8) Request range fans of guns providing support.
- (9) Determine availability of:
  - (a) Forward observers.
  - (b) Aerial observers.
  - (c) Dedicated firing elements.
- (10) Coordinate control measures for fire support:
  - (a) Checkpoints.
  - (b) Phase lines.

- (c) Boundaries.
- (d) Coordinated fire line.
- (e) Restrictive fire measures.
- (f) Suppressive fire targets.
- (11) Communications (include primary and alternate means, emergency signals, codes and call signs, and frequencies).
- (12) Request additional information not already covered.

g. S-2/Intelligence Update:

- (1) Identification of the patrol.
- (2) Weather and light data.
- (3) Terrain update:
  - (a) Aerial photos
  - (b) Trails and obstacles not on map.
- (4) Known or suspected enemy locations.
- (5) Weapons.
- (6) Strength.
- (7) Probable courses of action.
- (8) Recent enemy activity
- (9) Reaction time of reactionary forces.
- (10) Civilian activity in area.
- (11) Priority Intelligence Requirements (PIR), Information Requirements (IR) and Other Information Requirements (OIR).
- (12) Request additional information not already covered.

h. S-3/Operation's Update:

- (1) Identification of the patrol.
- (2) Changes in the friendly situation.
- (3) Route selection, LZ/PZ selection.
- (4) Link-up procedure.
- (5) Transportation (other than air).
- (6) Resupply (in conjunction with S-4).
- (7) Signal plan.
- (8) Departure and reentry of forward units.
- (9) Special equipment requirements.
- (10) Adjacent units operating in the area of operations.
- (11) Rehearsal areas.
- (12) Method of insertion/extraction.
- (13) Request additional information not already covered.

i. S-4 / LOGISTICS COORDINATION:

- (1) Identify yourself and your patrol.
- (2) Prepare two copies of a complete S-4 request, separated by class:
  - (a) Class I (Chow and water)
  - (b) Class IV (Barrier material)
  - (c) Class V (Ammunition and explosives)
  - (d) Class VI (Personal demand items)
  - (e) Class VIII (Medical supplies)

- (3) At the supply point, have a detail with empty rucksacks and RTO with radio, ready to move tactically.
- (4) Maintain accountability of supplies actually received.
- (5) Have a resupply plan.

j. Vehicular Movement:

- (1) Identify yourself and your patrol.
- (2) Supporting unit identification.
- (3) Number and type of vehicles.
- (4) Entrucking point.
- (5) Departure/loading time.
- (6) Preparation of vehicles for movement:
  - (a) Driver responsibilities.
  - (b) Patrol responsibilities.
  - (c) Special supplies/equipment required.
- (7) Availability of vehicles for preparation, rehearsal, inspection. Include time and location.
- (8) Routes:
  - (a) Primary.
  - (b) Alternate.
  - (c) Checkpoints.
- (9) Detruck points:
  - (a) Primary
  - (b) Alternate
- (10) March interval/speed.

(11) Communications:

(a) Frequencies.

(b) Call signs.

(c) Codes.

(12) Emergency procedures and signals.

(13) Request additional information not already covered.

**Notes**

**10. ORDERS:**

WARNING ORDER

CONDUCT ROLL CALL.

HAVE PATROL HOLD ALL QUESTIONS UNTIL FINISHED ISSUING WARNING ORDER.

FOLLOW WARNING ORDER FORMAT.

HAVE SAPPER HANDBOOK OUT, A MAP, AND TAKE NOTES.

APL MONITOR THE PATROL

LOOK AT/ORIENT MAP.

1. SITUATION: A brief statement of the enemy and friendly situation. (Who, What, Where) (**Show friendly and enemy on map.**)

**EXAMPLE: ENEMY**- Pinrim Guerrillas are currently conducting hit and run operations in the vicinity of WM6568 using 2 to 3 man patrols.

FRIENDLY: 1st Bn 501st PIR have currently conducted airborne operations in the vicinity of Forney Airfield and secured the area for future combat operations.

2. MISSION:

Tells the patrol what they are to accomplish, tailored to fit patrol. (Who, What, When, Where, Why) Read twice. **Show on map.**

**EXAMPLE:** Sapper 1 will conduct a Ford recon in the vicinity of WM67657455 NLT 2330 15 Dec 1997 to facilitate a mechanized convoy pushing to the west.

3. GENERAL INSTRUCTIONS/ORGANIZATION:

NAME	CHAIN OF CMD	PLANNING GUIDANCE TO SUBORDS, KEY LDRS, SQDS/TEAMS	SPC EQT	AMMO	UNIFORM AND EQT COMMON TO ALL

**NAME**- List of all members of the patrol

**Chain of Command**- Succession of leadership by position then time in grade and time in service.

**EXAMPLE: HQ**

Stanley - PL 1  
 Washington - RTO  
 Falaniko - APL 2

**1st SQD:**

Griffith - SL 3  
 Watnes - ATL 6  
 Mann - G  
 MacMillian - R  
 Porter - BTL 9

**Planning Guidance**- Provides subordinate leaders information on areas that they are responsible for and therefore must prepare personnel and/ or equipment. Consideration should be given to the following areas when planning. **You will always plan for a combat patrol!**

- . Command and Control
- . Duties during actions on OBJ
- . Order of movement
- . Location of key leaders
- . Special teams Pri/Alt
- . Duties enroute

**EXAMPLE- 2nd SQD** You are second in the order of movement, responsible for flank security during movement and at halts. During actions on the objective you will be responsible for calculating stream velocity. You will provide the following teams: ALT compass, ALT pace, ALT 2-man A/L, PRI 2-man EPW search, ALT 2-man demo team, and SL you will be the stream velocity team leader.

**Special Equipment**- Specific by name list of all essential equipment (by squad) that will be needed to accomplish the mission. Keep in mind that you will always plan for a combat patrol.

**EXAMPLE- 3rd SQD**- 1-PRC/119 complete with waterproofing materials, 2-spare batteries, 1-claymore, 2-Prusik handcuffs, 2- gags, 2- sandbags, 2- HC smoke, 1- Red smoke, 1- Green star cluster, 1- white parachute flare, 3- 1:50,000 FLW maps.

### **Notes**

**Ammunition**- NOTE: Ammo Basic Loads: M-16 - AR 420 Rounds, 5.56mm

R 210 Rounds, 5.56mm

M-60 - 1100 Rounds, 7.62mm (Linked)

M203 - 24 Rounds (4 Ill, 4 Shot, 16 HE)

M249 - 600 Rounds, 5.56mm (Linked)

**Uniform and equipment common to all**- specifically states what each member of the patrol will wear and carry besides special equipment.

**EXAMPLE- WORN**- Combat or jungle books, OD green or black socks, ETC...

**LCE**- Web belt with suspenders, 2- 1 Qt. canteens w/ cover. ETC...

**Time Schedule**- Utilizing the reverse planning process a list of important times that the patrol must meet. Must include the following: **When, What, Who, and Uniform.**

TIME SCHEDULE				
WHEN	WHAT	WHERE	WHO	UNIFORM
0600	Warning Order	Base Camp	ALL	DTY,LCE,WPN
0800	Initial Insp	Base Camp	ALL	All Equip
1200	Test Fire	Base Camp	ALL	DTY,LCE,WPN

**SPECIFIC INSTRUCTIONS**: Will include task, condition, standards, and time hacks for tasks that need to be completed for the OPORD.

**EXAMPLE**: 3rd SQD Give me a by name list of special teams NLT 10 min after the Warning Order. A key leader will make the actions on the OBJ terrain model. Your RTO and Sapper \_\_\_\_\_ will be responsible for Fire Support Coordination. You will also provide the APL with a 2- man detail for the S-4 coordination. SL, you will write the small boat annex and have it completed NLT 30 min prior to the OPORD.

(Time, Place, Uniform, and Equipment for OPORD)

(The time is now \_\_\_\_\_. What are your questions?)

**Notes**

## OPERATION ORDER

An Operation Order (OPORD) is a directive issued by a leader to his subordinates in order to effect the coordinated execution of a specific operation. A five-paragraph format (shown below) is used to organize the briefing, to ensure completeness, and to help subordinate leaders understand and follow the order. Use a terrain model or sketch along with a map to explain the order. When possible, such as in the defense, give the order while observing the objective.

### OPORDER FORMAT

CONDUCT ROLL CALL

HOLD ALL QUESTIONS UNTIL OPORDER IS ISSUED

FOLLOW OPERATION ORDER FORMAT

TAKE NOTES

LOOK AT AND ORIENT MAP

TASK ORGANIZATION:

States how the unit is organized to conduct the operation.

1. SITUATION:

a. Enemy Forces:

(1) Weather and light data. General forecast. (Discuss the positive and negative effects on the enemy and friendly forces.)

HIGH \_\_\_\_\_ MOONRISE \_\_\_\_\_ SUNRISE \_\_\_\_\_

LOW \_\_\_\_\_ MOONSET \_\_\_\_\_ SUNSET \_\_\_\_\_

WIND SPEED \_\_\_\_\_ MOONPHASE \_\_\_\_\_ BMNT \_\_\_\_\_

WIND DIR \_\_\_\_\_ % ILLUMINATION \_\_\_\_\_ EENT \_\_\_\_\_

FORECAST: \_\_\_\_\_

(2) Terrain:

- O (Note the pos and neg effects on enemy and friendly)
- C (Note the pos and neg effects on enemy and friendly)
- O (Note the pos and neg effects on enemy and friendly)
- K (Note the pos and neg effects on enemy and friendly)
- A (Note the pos and neg effects on enemy and friendly)

The enemy situation in higher headquarters' OPORDER (paragraph 1.a.) is the basis for this, but the leader refines this to provide the detail required by his subordinates. The results of his enemy analysis are considered to determine the information included. This should include the enemy's composition, disposition, strength, recent activities, and capabilities. Also included is the enemy's most probable course of action.

- (3) Identification of enemy forces (composition).
- (4) Location, known, and suspected (disposition). **(Show on map).**
- (5) Activity (What is the enemy doing?)
- (6) Strength (% men --% weapons)
  - Morale (is it High or Low)
  - Capabilities (NBC, Night vision, aerial, Include reactionary force and time, etc...)
  - Equipment(AK-47s, M-60, AKM, RPG, etc...)
- (7) Probable course of action.

### **Notes**

b. Friendly Forces:

This information is in paragraphs 1b, 2, and 3 in higher headquarters' OPORD.

- (1) Mission of next higher unit to include the intent of the leader (two levels up).
- (2) Location and planned actions of units on the left, right, front, and rear. State how such actions influence your unit, particularly adjacent unit patrols. **(Show on map)**.
- (3) Units providing fire support:
  - (a) List the fire support means available to your unit: mortar, artillery, CAS, etc.
  - (b) Means to request support (freq and call sign).
  - (c) Location of units, if known (Show on map).

c. Attachments and Detachments:

When not shown under "Task Organization," list here, or in an annex, units attached or detached from the platoon, together with the effective times.

**Name:** SGT Smith and CPL Joe

**Effective time:** 200730OCT1997- 220800OCT1997

**Purpose:** Provide medical support

**Notes**

## 2. MISSION: (WHO, WHAT, WHEN, WHERE, & WHY)

The unit's mission is a clear, concise statement of the task(s) to be accomplished by the unit and the purpose for doing it. The mission statement is derived from the mission analysis during the Estimate of the Situation. The mission is always **stated twice**, in full, and must stand alone without reference to any documents except a map (**Show on map**).

## 3. EXECUTION:

### a. Intent.

Intent is the stated vision that defines the purpose of an operation and the end state with respect to the relationship among the force, the enemy, and the terrain. Intent provided clarity to the overall operation and informs subordinates what operational aspects are the most important; it also affords subordinates the ability to accomplish the mission in the absence of additional guidance, orders, or communications. Note: At battalion level and below, this subparagraph may be required and should only be used if there is a need to expand on the purpose of the operation in more detail than paragraph 2 permits. Must include the following: WHY, HOW, and END STATE.

### b. Concept of the Operation:

This paragraph describes, in general terms, how the unit will accomplish its mission from start to finish. It should identify the most important task, designate and focus on the decisive point.

### CONCEPT MUST INCLUDE THE FOLLOWING:

1. GENERAL DIRECTION	PRI/ALT
2. MAIN EFFORT	PRI/ALT
3. DECISIVE POINT	PRI/ALT
4. MODE OF TRAVEL	PRI/ALT
5. OVERALL TIME	PRI/ALT
6. OVERALL DISTANCE	PRI/ALT

Refer to the operation overlay, map sketch, or terrain model. When using more than one mode of transportation (i.e. Boat, vehicle, or air) and the route exceeds the boundaries of the terrain model, use a map in conjunction with the terrain model.

- (1) Maneuver - The maneuver paragraph addresses, in detail, the mechanics of the operation. Specifically address all subordinate units and attachments by **NAME**, giving each its mission in the form of a **task and purpose**.

POINT: P/A  
L/SEC: P/A\_TL:\_  
L/ASSLT:\_TL:\_  
GUN 1:\_AG:\_  
SURV:\_  
DEMO: P/A

PACE: P/A  
R/SEC: P/A\_TL:\_  
R/ASSLT:\_TL:\_  
GUN 2:\_AG:\_  
EPW: P/A

COMPASS: P/A  
ORP SEC:\_  
SPTT TL:\_  
GUN 3:\_AG:\_  
A/L: P/A

**EXAMPLE:** Sapper Cook and Sapper Wilson you are the PRI Aid and Litter responsible for transporting all friendly dead and wounded to the CCP.

Sapper Smith and Sapper Jones you are ALT Aid and Litter if the need arises you may be called upon to assist or act as the PRI team.

The main effort must be designated and all other subordinates missions must relate to the main effort. Actions on the objective will comprise the majority of this paragraph.

**ACTIONS ON THE OBJECTIVE MUST INCLUDE:**

- 1. ENGAGEMENT/DISENGAGEMENT**
- 2. COMPROMISE PLAN (surv, leaders recon, sec, etc)**
- 3. WITHDRAW PLAN**

(1. assisted 1. unassisted 2. under pressure 2. not under pressure)

- 4. DISSEMINATION POINT**
- 5. WHERE UNIT WILL ASSEMBLE**

Use a sketch, terrain model, or overlay as you address the scheme of maneuver. Note: It is imperative that the concept define the relationship of each subordinate unit, and that the concept is clearly understood.

- (2) Fires: This paragraph describes how the leader intends for the fires to support his maneuver (much like a "scheme" of fire support).

STATE THE FOLLOWING:

1. PURPOSE TO BE ACHIEVED
2. PRIORITY OF FIRES
3. RESTRICTIVE CONTROL MEASURES
4. PRIORITY TARGETS

A target list and overlay should be referenced here, if applicable. Include TRP#, 8-DIGIT GRID COORDINATES, TERRAIN FEATURE, AND AMMUNITION AVAILABLE.

Specific targets should be discussed and pointed out on the terrain model.

## c. Tasks to Maneuver Units:

In this paragraph 3.a.(1) for all combat units (Infantry, Armor, Attack Aviation) attached or OPCON to your unit. Each of these subunits will have a separate paragraph and the reserve will be addressed last. Tasks or information common to two or more subunits will be addressed in coordinating instructions.

**MUST GIVE TASK, CONDITIONS, AND STANDARDS!!!**

Company commanders task platoons, and platoon leaders task their subordinate squads. Those squads may be tasked to provide any of the following special teams:

POINT:	PACE:	COMPASS: P/A
L/SEC:_TL:_	R/SEC:_T/L:_	ORP SEC:_
L/ASLT:_TL:_	R/ASLT:_TL:_	SPPT TL:_
GUN 1:_AG:_	GUN 2:_AG:_	GUN 3:_AG:_
SURV:_	EPW: P/A	A/L: P/A
DEMO: P/A		

**EXAMPLE:** PRI Aid and litter, once the objective site is cleared you will be called off the LOA and report directly to me. You will then begin to search the objective from the center working your way out, policing up all friendly wounded first, and transporting them back to the CCP using poleless litters or fireman's carry. Once at the CCP you will take all instructions from the APL or the patrol's medic.

**EXAMPLE:** ALT Aid and litter if the patrol suffers mass casualties on the objective you will be called off the LOA to assist the PRI team. If this happens, PRI team will search from center to the left, ALT team will search center to the right of the objective area. You will transport casualties to the CCP and take all instructions from the APL or the patrol's medic.

**Notes**

d. Tasks to Combat Support Units:

This paragraph is identical to paragraph 3.b. except that support units such as mortars, artillery, engineers, and ADA that are attached or OPCON to your unit are addressed here.

e. Coordinating Instructions:

This paragraph lists the details of coordination and control applicable to two or more subunits. These also may have been assigned by higher or required by the COA developed by the leader. If they do not apply to all subunits, clearly state those units that must comply. Items that might be addressed include:

- (1) Order of movement, formation, and movement technique.
- (2) Actions at halts (short/long)
- (3) Routes (Primary/Alternate) Orient and use terrain model. Show primary and alternate azimuths and distances in increments of five. Show withdrawal routes. Indicate checkpoints, planned rally points, LZ/PZ/DZ, FFU, danger areas (Identify with eight digit grid coordinates.)
- (4) Departure and Re-entry of friendly lines.
- (5) Rally points and actions at rally points (Plan must include IRP, ORP, PB, and RRP and all other planned rally points to include grid location and terrain reference).
- (6) Actions at danger areas (General plan for unknown linear, small open areas, and large open areas; specific plan for all known danger areas the unit will encounter along the route. Include, also, a plan for mines and booby traps).

Note: Use terrain model or sketch and state azimuths, directions, and grid coordinates, where applicable, for items 1-7.

- (7) Actions on enemy contact (chance contact, far ambush, sniper fire, indirect fire, aerial attack). Note the detailed description for actions other than Battle Drills or Unit SOP.
- (8) Reorganization and consolidation instructions (other than SOP items).
- (9) Fire distribution measures: point fire versus area fire.

- (10) Fire control measures: Range cards, TRPs, visual sound signals.
- (11) MOPP Levels
- (12) Troop safety and operational exposure guidance.
- (13) Time schedule (rehearsals, backbriefs, inspections, movement).
- (14) Priority Intelligence Requirements.
- (15) Debriefing requirements
- (16) Reports
- (17) Rules of Engagement

**Notes**

#### 4. SERVICE SUPPORT:

This paragraph provides the critical logistical information required to sustain the unit during the operation. Also included are combat service support instructions and arrangements that support the operation.

##### a. General.

- (1) SOPs in effect for sustainment operations.
- (2) Current and proposed trains, resupply, and cache points.
- (3) Casualty and damaged equipment collection points.
- (4) Special instructions to medical personnel.

##### b. Material and Services.

###### (1) Supply

- (a) Class I: Ration plan
- (b) Class V: Ammunition
- (c) Class VII: Major End Items (weapons)
- (d) Class VIII: Medical
- (e) Class IX: Repair parts
- (f) Distribution methods

###### (2) Transportation

###### (3) Services (Laundry, showers)

###### (4) Maintenance (Weapons and Equipment)

c. Medical Evacuation. Method of evacuating dead and wounded, friendly and enemy. Include priorities.

d. Personnel. Method of handling EPWs and designation of the EPW collection point.

e. Miscellaneous.

- (1) Special Equipment
- (2) Captured Equipment

5. COMMAND AND SIGNAL:

This paragraph states where command and control facilities and key leader will be located during the operation.

a. Command

- (1) Location of the higher unit commander and CP.
- (2) Location of key personnel (PL, PSG) and CP. during each phase of the operation.
- (3) Succession of command.
- (4) Adjustments to the unit SOP (Instructions to the PSG).

b. Signal:

- (1) SOI and index in effect.
- (2) Methods of communication in priority.
- (3) Pyrotechnics and signals, to include arm and hand signals.
- (4) Code words
- (5) Challenge and password (behind friendly lines).
- (6) Number combination (forward of friendly lines).
- (7) Running password
- (8) Recognition signals (near/far and day/night).
- (9) Special instructions to RTOs.

6. ISSUE ANNEXES
7. GIVE TIME HACK
8. ASK FOR QUESTIONS

### FRAGMENTARY ORDER (FRAGO)

General: A fragmentary order provides brief, specific, and timely instructions without loss of clarity. Elements normally found in complete order may be omitted when these elements have not changed, are not essential to the mission, might delay or complicate transmission, or are unavailable or incomplete at the time of issue. Fragmentary orders are normally used to issue supplemental instructions or changes to a current operations order while the operation is in progress.

### FRAGO FORMAT

#### TASK ORGANIZATION:

1. SITUATION:
  - a. Enemy forces.
  - b. Friendly forces.
  - c. Attachments and detachments.
2. MISSION.
3. EXECUTION:
  - a. Intent.
  - b. Concept of the operation.
    - (1) Maneuver.
    - (2) Fire.
  - c. Tasks to maneuver units.
  - d. Tasks to combat support units.
  - e. Coordinating instructions.

4. SERVICE SUPPORT.
5. COMMAND AND SIGNAL.
6. TIME HACK.
7. ASK FOR QUESTIONS.
8. ANNEXES:  
(If any paragraph is the same as in the OPORD, so state).

AERIAL MOVEMENT ANNEX:

1. SITUATION: (who, what, where)
  - a. Enemy
  - b. Friendly (Include unit supporting operation)
2. MISSION (who, what, when, where, why, read twice)
3. EXECUTION:
  - a. Concept of Operation
  - b. Sub-Units Missions
  - c. Coordinating Instructions:
    - (1) Time aircraft available and location of pick-up site.
    - (2) Organization for movement.
    - (3) Station time and plan for those who are unable to land.
    - (4) Landing site:
      - (a) Location:
        - Primary
        - Alternate
      - (b) Marking:
        - Long range
        - Short range

(5) Flight route to landing site:

(a) General.

(b) Checkpoints.

(c) Pre-landing warning.

(6) Formations:

(a) At pick-up site.

(b) En route.

(c) At landing site.

(7) Actions on enemy contact:

(a) En route.

(b) At landing site.

(8) Rehearsal.

(9) Assembly area (Grid, terrain reference, marking, assembly techniques).

#### 4. SERVICE SUPPORT

#### 5. COMMAND AND SIGNAL:

a. Signal:

(1) Air/Ground call signs and frequencies.

(2) Air/Ground emergency code.

b. Command:

(1) Location of PL in air and at landing site.

(2) Location of APL in air and at landing site.

AERIAL RESUPPLY ANNEX

1. SITUATION: (Who, What, Where)
  - a. Enemy
  - b. Friendly (Include unit supporting operation)
2. MISSION (Who, What, When, Where, Why, Read twice)
3. EXECUTION:
  - a. Concept of Operation.
  - b. Sub-Unit Missions:
    - (1) Command.
    - (2) Security.
    - (3) Marking.
    - (4) Recovery/Transport.
  - c. Mission of teams.
  - d. Missions of individuals.
  - e. Coordinating Instructions:
    - (1) Communications checkpoint (CCP):
      - (a) Location.
      - (b) Marking of CCP.
      - (c) Report time.
    - (2) Heading from CCP.
    - (3) Drop Zone:
      - (a) Location:
        - Primary.

- Alternate.

(b) Marking:

- Long range.
- Short range.

(c) Altitude indicate.

(4) Drop formation.

(5) Date/time of resupply (and alternates).

(6) Actions on enemy contact during resupply.

(7) Rehearsals.

(8) Actions at DZ.

(9) Dissemination area -- grid and terrain reference.

4. SERVICE SUPPORT

5. COMMAND & SIGNAL: (Number and type of resupply bundles)

a. Signal:

(1) Air to ground call signs and frequencies.

(2) Air drop communications procedures.

(3) Long-range visual signals.

(4) Short-range visual signals.

(5) Air to ground emergency code.

(6) Code word at DZ.

b. Command:

(1) Location of PL.

(2) Location of APL.

- (3) Location of patrol members not involved in resupply.

**Notes**

## PATROL BASE ANNEX

1. SITUATION: (who, what, where)
  - a. Enemy
  - b. Friendly
2. MISSION (Who, What, When, Where, Why, Read Twice)
3. EXECUTION:
  - a. Concept of operation
  - b. Sub-Unit missions:
    - (1) Elements
    - (2) Teams
    - (3) Individuals
  - c. Coordinating instructions:
    - (1) Occupation plan
    - (2) Operation plan:
      - (a) Security plan
      - (b) Alert plan
      - (c) Alternate patrol base plan
      - (d) Evacuation plan
    - (e) Fire plan
4. SERVICE SUPPORT:
  - a. Water plan
  - b. Maintenance plan
  - c. Hygiene plan

d. Messing plan

e. Rest plan

5. COMMAND AND SIGNAL:

a. Signal:

(1) Call signs and frequencies.

(2) Code words

(3) Emergency signals

b. Command:

(1) Location of PL.

(2) Location of APL.

(3) Location of patrol headquarters.

SMALL BOAT ANNEX

1. SITUATION: (who, what, where)

a. Enemy Forces:

(1) Weather:

(a) Tide

(b) Surf

(c) Wind

(2) Terrain

(3) Identification, location, activity, and strength.

b. Friendly Forces:

(Unit furnishing support, if applicable)

- c. Attachments and Detachments:
- 2. MISSION: (Who, What, When, Where, Why, Read Twice)
- 3. EXECUTION:
  - a. Concept of Operation.
  - b. Organization for Movement.
  - c. Missions of Elements, Teams, and Individuals:
    - (1) Security teams
    - (2) Tie-Down teams:
      - (a) Load equipment.
      - (b) Secure equipment.
    - (3) Designation of coxswain/boat commanders.
    - (4) Selection of navigator(s) and observer(s).
  - d. Coordinating Instructions:
    - (1) Formations and order of movement.
    - (2) Route and alternate route of return.
    - (3) Method of navigation.
    - (4) Actions on enemy contact.
    - (5) Rally points
    - (6) Embarkation plan
    - (7) Debarkation plan
    - (8) Rehearsals
- 4. SERVICE SUPPORT:

- a. Rations
  - b. Arms and Ammunition
  - c. Uniform and Equipment:
    - (1) Method of distribution of paddles and life jackets.
    - (2) Disposition of boat, paddles, and life jackets upon debarkation.
  - d. Method of handling wounded and prisoners.
5. COMMAND AND SIGNAL:
- a. Signal:
    - (1) Signals to be used between/in boats.
    - (2) Code words
  - b. Command:
    - (1) Location of patrol leader.
    - (2) Location of assistant patrol leader.

**Notes**

## STREAM CROSSING ANNEX

### 1. SITUATION: (who, what, where)

#### a. Enemy Forces:

(1) Weather

(2) Terrain:

(a) River width

(b) River depth

(c) Current

(d) Vegetation

(e) Obstacles

(3) Enemy location, identification, activity.

#### b. Friendly Forces

### 2. MISSION: (Who, What, When, Where, Why, Read Twice)

### 3. EXECUTION:

#### a. Concept of Operation

#### b. Sub-unit Missions:

(1) Elements.

(2) Teams.

(3) Individuals.

#### c. Coordinating Instructions:

(1) Crossing procedure.

(2) Security.

(3) Order of crossing.

(4) Actions on enemy contact.

(5) Alternate plan.

(6) Rally points.

(7) Rehearsal plan.

4. SERVICE SUPPORT

5. COMMAND SIGNAL:

a. Signal

b. Command:

(1) Location of PL

(2) Location of APL

(3) Location of HQ

TRUCK ANNEX

1. SITUATION: (Who, What, Where)

a. Enemy

b. Friendly

2. MISSION (Who, What, When, Where, Why, Read Twice)

3. EXECUTION:

a. Concept of Operation

b. Sub-Unit Missions

c. Coordinating Instructions:

(1) Time of departure and return.

(2) Loading and order of movement.

- (3) Route.
  - (4) Actions on enemy contact (vehicular ambush).
  - (5) Actions at the de-trucking point.
  - (6) Rehearsals
4. SERVICE SUPPORT:  
Equipment needed for convoy (sandbags, etc.)
  5. COMMAND AND SIGNAL:
    - (a) Signal
    - (b) Command:
      - (1) Chain of command.
      - (2) Location of PL and APL.

#### LINK-UP ANNEX

1. SITUATION: (Who, What, Where)
  - a. Enemy
  - b. Friendly
2. MISSION (Who, What, When, Where, Why, Read Twice)
3. EXECUTION:
  - a. Concept of Operation
  - b. Sub-Unit Missions:
    - (1) Teams (Ops) (R&S Teams)
    - (2) Individuals (Security personnel)
  - c. Coordinating Instructions:

- (1) Time of link-up
- (2) Location of linkup site
- (3) Rally points
- (4) Actions upon enemy contact.
- (5) Actions at the link-up site.
- (6) Rehearsals

4. SERVICE SUPPORT

5. COMMAND AND SIGNAL:

a. Signal:

- (1) Frequencies and call signs.
- (2) Long range recognition signal/identification.
- (3) Short range recognition signal/identification.
- (4) Posting authentication. (Verbal)

b. Command:

- (1) Location of PL and APL.
- (2) Location of patrol headquarters.

**Notes**

## CLIFF ANNEX (ASCENT AND DESCENT)

1. SITUATION: (Who, What, Where)
  - a. Enemy forces.
    - (1) Weather.
    - (2) Terrain (Include cliff height).
    - (3) Enemy location, identification, activity.
  - b. Friendly forces.
2. MISSION: (Who, What, When, Where, Why) (Read twice).
3. EXECUTION:
  - a. Concept of the operation.
  - b. Sub-Unit Missions:
    - (1) Elements.
    - (2) Teams.
    - (3) Individuals.
  - c. Coordinating Instructions:
    - (1) Descent or Ascent procedure.
    - (2) Security.
    - (3) Order of ascent or descent.
    - (4) Actions on enemy contact.
    - (5) Alternate plan.
    - (6) Rally points.
    - (7) Rehearsal plan.
4. SERVICE SUPPORT:
5. COMMAND AND SIGNAL:

- a. Signal.
- b. Command. Location of PL, APL, HQ.

**Notes**

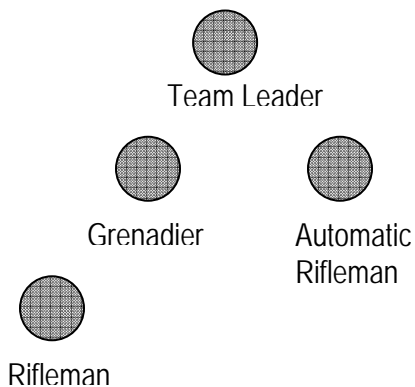
## 11. PATROL ORGANIZATION AND MOVEMENT

a. Formations: (varies with METT-T)

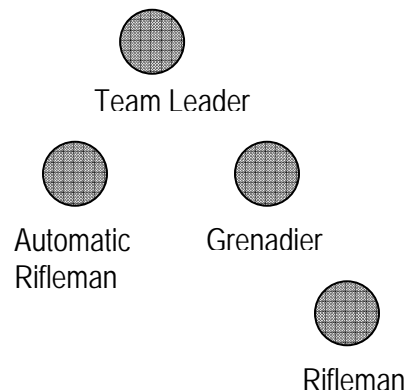
(1) Wedge:

- (a) The wedge is the basic formation for the fire team.
- (b) Interval between soldiers is normally 10 meters.
- (c) When rough terrain, poor visibility, or other factors make control of the wedge difficult, fire teams modify the wedge.
- (d) The normal interval is reduced so that all team members can see their team leaders, and all team leaders can see their squad leaders.
- (e) Easy to control.
- (f) Provides good flexibility.
- (g) Allows immediate fires in all directions.
- (h) Provides good all around security.

Fire Team Wedge  
(Heavy Left)

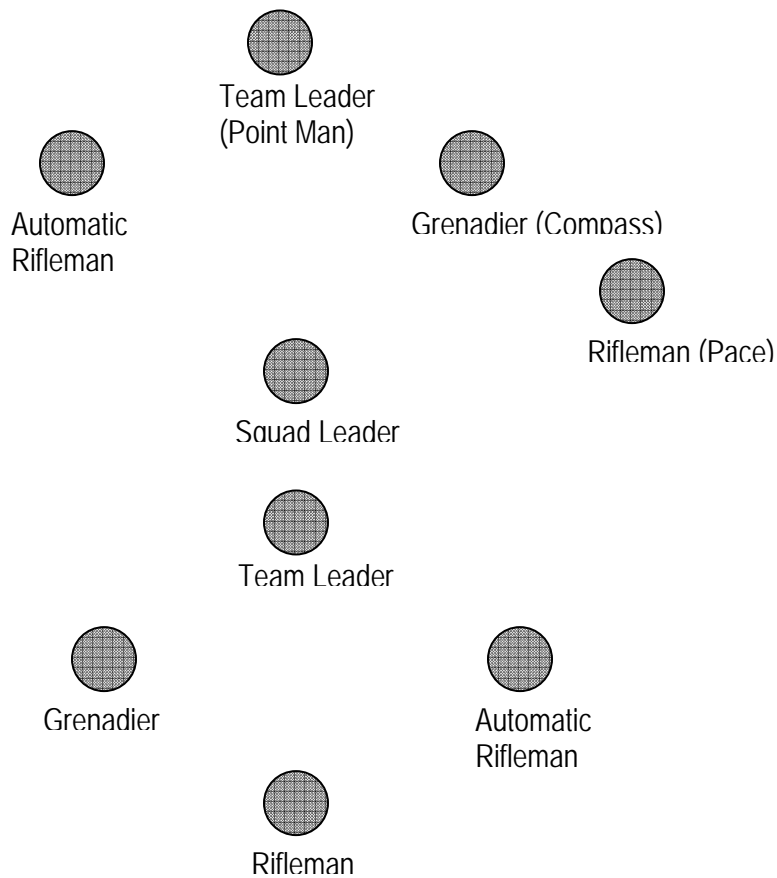


Fire Team Wedge  
(Heavy Left)



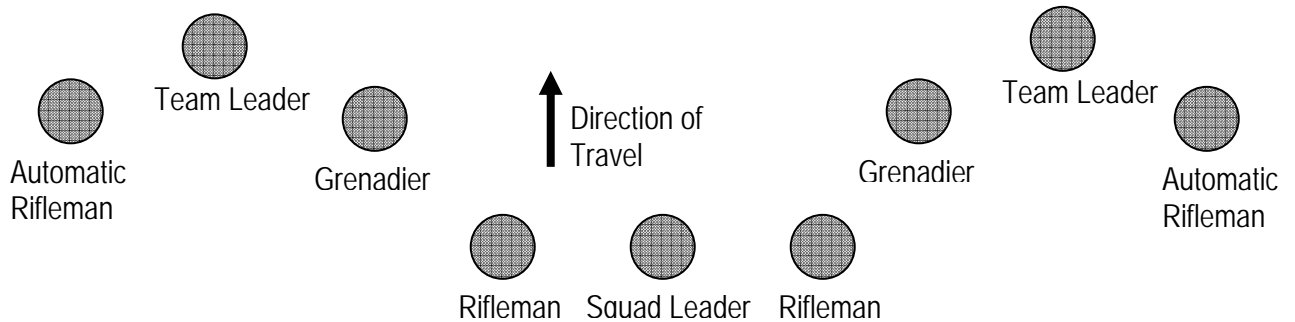
(2) Squad Column:

- (a) The column is the element's most common formation.
- (b) It provides good dispersion laterally and in depth without sacrificing control.
- (c) Facilitates maneuver.
- (d) The lead fire team is the base fire team.
- (e) The rifleman in the trail team provides rear security when traveling as the rear element of a platoon or when traveling independently.



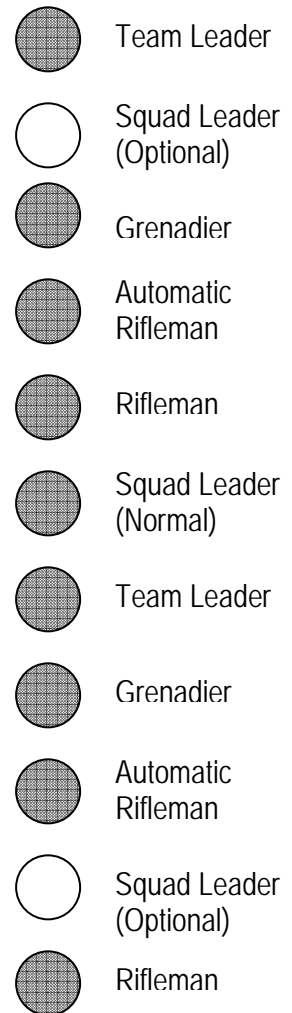
(3) Squad Line:

- (a) Provides maximum firepower to the front.
- (b) The right fire team is the base fire team.



(4) File:

- (a) When terrain precludes the use of the wedge, the patrol uses the file formation.
- (b) If the patrol leader desires to increase his control over the formation, exert greater morale presence by leading from the front, and be immediately available to make key decisions, he will move forward to the first or second position.
- (c) Easiest to control.
- (d) Is less flexible than wedge, and is the most difficult formation from which to maneuver.
- (e) Allows immediate fires to flanks, but masks most fires to front and rear.
- (f) Provides the least amount of security.



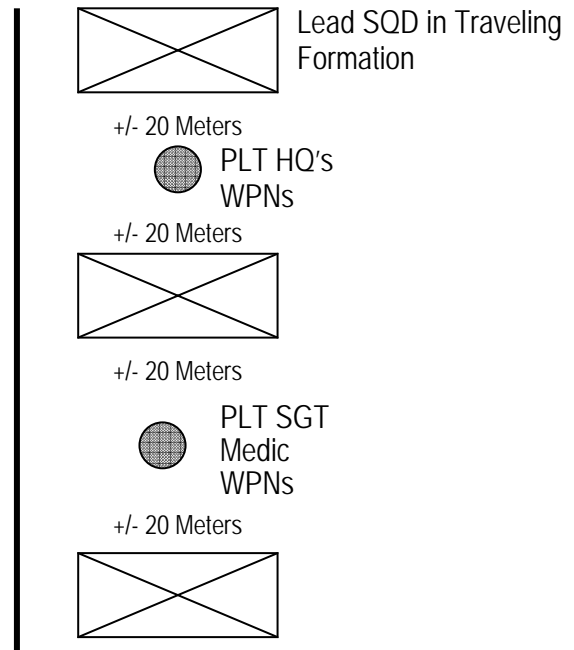
b. Techniques: (vary with METT-T)

NOTE: METT-T will determine where crew served weapons travel in the formation. They normally travel with the PL so he can quickly establish a base of fire.

(1) Traveling:

- (a) Enemy contact not likely.
- (b) More control than traveling overwatch but less than bounding overwatch.
- (c) Minimum dispersion between individuals.
- (d) Facilitates speed of movement.
- (e) Provides least amount of security.
- (f) Distance between individuals is normally 10 meters.
- (h) When traveling as a platoon, the patrol leader normally travels behind the lead squad for control purposes.

**Notes**



(2) Traveling overwatch:

- (a) Enemy contact possible.
- (b) Provides the least amount of control.
- (c) Increased dispersion.
- (d) Speed of movement decreases due to control.
- (e) Security increases due to speed and dispersion.
- (f) Distance between individuals varies with METT-T.
- (g) Distance between teams of the lead squad is 50 meters.
- (h) Distance between the lead squad and the HQ element is 50 to 100 meters.

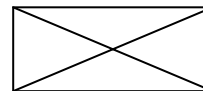
**Notes**



50 - 100 Meters



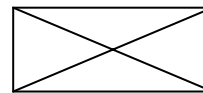
50 - 100 Meters



+/- 20 Meters



+/- 20 Meters



(3) Bounding Overwatch:

- (a) Enemy contact expected
- (b) Maximum control.
- (c) Maximum dispersion.
- (d) Minimum speed.
- (e) Maximum security.

Execution:

a. One squad bounding. One squad bounds forward to a chosen position, then it becomes the overwatching element unless contact is made en route. The bounding squad may use what technique it deems necessary to move to the next covered and concealed position, for example, traveling or bounding overwatch, or individual movement techniques.

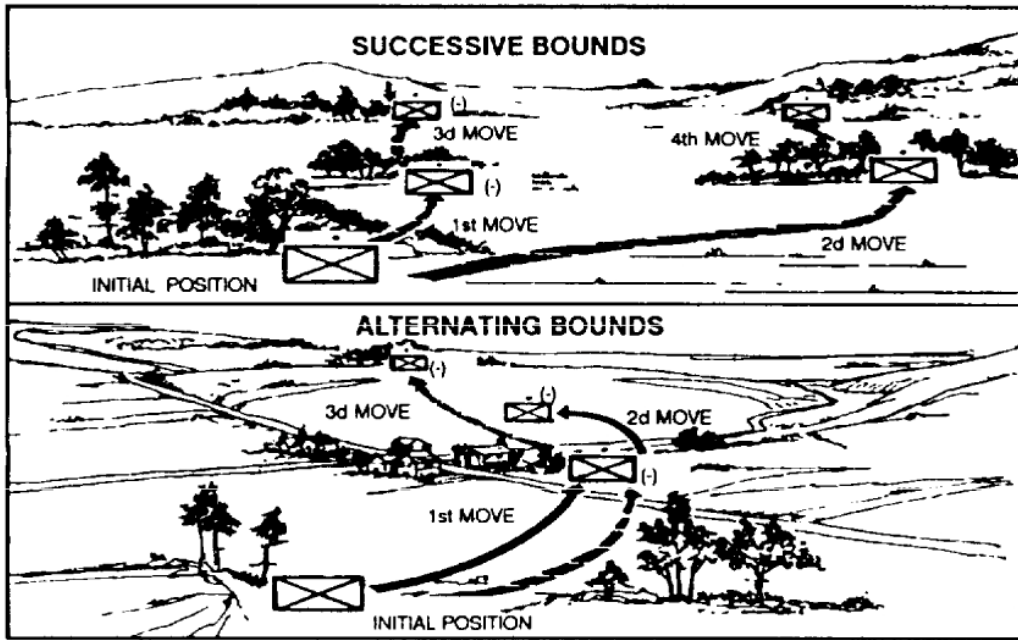
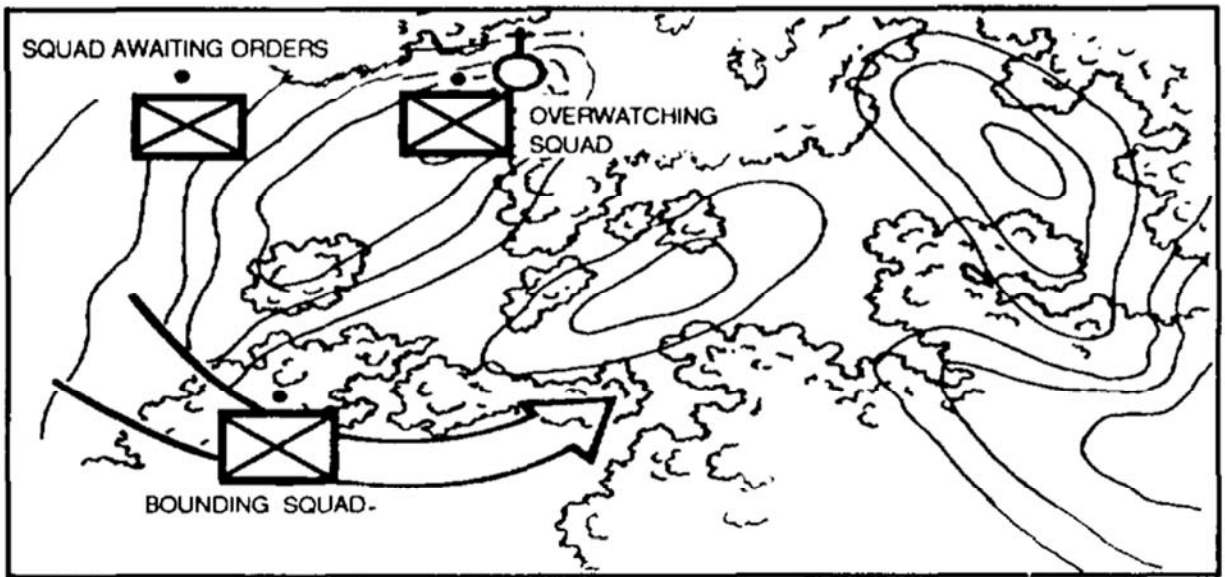
b. One squad overwatching. One squad overwatches the bounding squad from covered and concealed positions from which it can see and suppress likely enemy positions. The platoon leader and platoon's crew served weapons remain with the overwatching squad.

c. One squad awaiting orders. One squad is uncommitted and ready for employment as directed by the platoon leader. The platoon sergeant and the squad leader of the awaiting squad position themselves close to the PL.

Considerations:

- a. Where the enemy is likely to be.
- b. The routes to the next overwatch position.
- c. The ability of the overwatching element's weapons to cover the bound.
- d. The fields of fire at the next overwatch position.

Elements can bound successively or alternately. Successive bounds are easier to control; alternate bounds can be faster. (See next page)



- b. Control. The primary means of controlling the movement of formations will be the follow me and do as I do method coupled with hand-and-arm signals.

(1) Signals:

(a) Visual:

Hand-and-Arm (used whenever possible):

These are only suggestions, use according to unit SOP.

- PL- Point to patrol cap insignia.
- APL- Tug on collar insignia.
- SQUAD Leaders - Slap 1,2, or 3 fingers on left shoulder patch for the 1st, 2d, or 3d squad leader respectively. Slap 4 fingers for all squad leaders.
- Security listening halt - Remove headgear.
- Map check - Slap cargo pocket.
- RTO - Hand to ear with thumb and little finger extended.
- Move out - Face direction of movement, swing arm overhead from rear to front.
- Stop - Raise hand palm open.
- Freeze - Raise hand fist clenched.
- Good - Thumbs up.
- Bad - Thumbs down.
- Headcount - Tap head.
- Pacecount - Tap boot.
- Danger Area - Move hand across neck in a slicing motion.
- Rally Point - Circle arm over head and point to location.
- Increase Speed - Clenched fist moved up and down.

- Decrease Speed - Open hand palm pushing down.
- Wedge - Arms extended down and to the sides at approximately 45° angles.
- Enemy - Stand in firing position ready to kill the enemy.
- Security - Point fingers at eyes.
- Surveillance - Place hand down over eyes.
- Spread Out - Same as wedge but move arms outward.
- Close It Up - Same as wedge but move arms inward.
- File - Arm extended to the front and rotate in a counter clockwise direction.

Pyrotechnics - Use only when needed, remember they can also be seen by the enemy.

Luminous tape/compass - Luminous tape on the patrol cap and luminous marks on the compass can be used at night over short distances. Rucksacks should also be marked with tape for squad identification. (1 strip for first squad, 2 strips for second squad, etc.)

Infrared devices - STANO sending and receiving.

(b) Audio:

Voice - Keep to a whisper.

Radio - Maintain good radio discipline. Always assume the enemy has the capability to locate and intercept the patrol with direction finding equipment.

Whistle - A secondary means to signal withdraw, shift fire, etc. May be difficult to hear over gunfire.

Field Phones - Useful in patrol base or ambush site. Consider weight when planning.

(c) Physical:

Tugline - Useful in Patrol Base or ambush site. Difficult to install.

Time - A good secondary means of control.

(2) Headcount - Used when traveling in a file.

(a) Sent up by APL automatically every 200m.

(b) PL returns with headcount good or bad.

(c) After all halts, APL counts Sappers out and sends up headcount good or bad.

(3) Five Point Contingency Plan: (GOTWA)

G - Going where for what.

O - Others going with me.

T - Time I'm due back.

W - What to do if I don't come back.

A - Actions on enemy contact you and me.

(4) Break in Contact - caused by loss of control.

(a) Avoid a break in control by keeping patrol alert and maintaining a good headcount.

(b) If a break in contact occurs, halt the patrol and listen for the lost element. Attempt to contact by radio. Send out R&S teams and attempt link-up operations.

d. Route Selection - Make a detailed recon.

(1) Consider OCOKA.

(2) Must have at least one dog leg.

(3) Keep azimuths and distances in increments of five.

(4) Avoid silhouetting yourself on ridge lines and hilltops, use the military crest.

(5) Cross linear danger areas at bends and during darkness when possible.

(6) Use terrain features as checkpoints and boundaries for ease of navigation.

- (7) Never follow the same route twice, have primary and alternate routes.
- (8) Plot TRPs along route.
- (9) Avoid natural lines of drift, contact with the enemy, local inhabitants and built up areas.
- (10) In daylight maximize concealment, darkness, and maximize stealth.

**Notes**

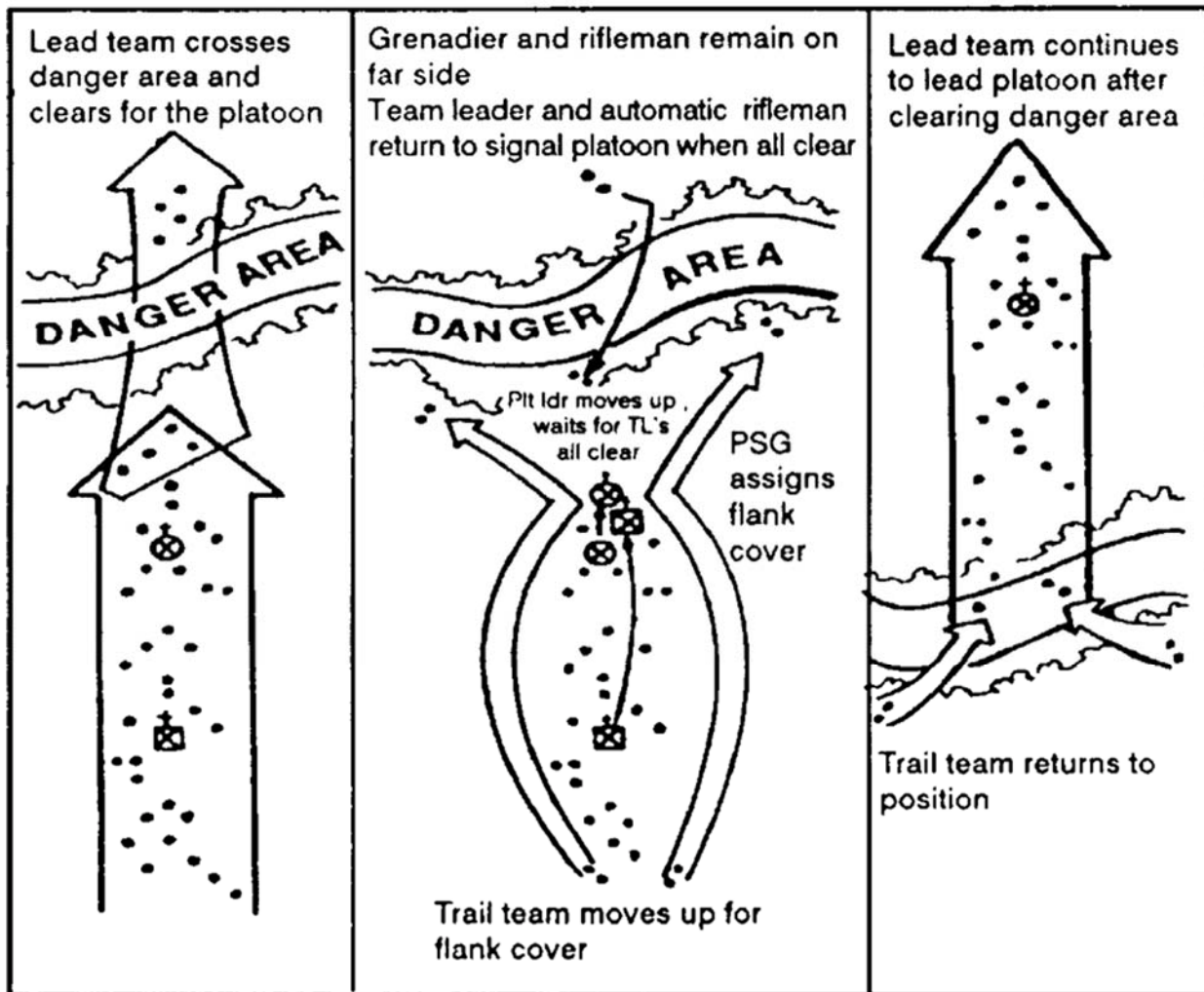
**12. SECURITY DURING MOVEMENT**

- a. Actions at halts: (Except at Stop, Look, Listen, and Smell (SLLS))
  - (1) Short halts (Map Check, Danger Areas)
    - (a) Soldiers spread out and assume kneeling positions behind cover.
    - (b) They watch the same sectors that were assigned to them during movement.
    - (c) Soldiers remain alert and keep movement to a minimum.
    - (d) When moving out, ensure everyone does not stand up at the same time - alternate.
  - (2) Long halts (Patrol Base, ORP)
    - (a) The platoon establishes a perimeter defense.
    - (b) The PL ensures the platoon halts on defensible terrain.
    - (c) Leaders issue sectors of fire to their soldiers and they establish hasty fighting positions.
    - (d) Leaders establish operations, and orient machine guns and anti-armor weapons along likely enemy avenues of approach.
  - (3) Security/Listening Halt.(SLLS) Freeze in place. All members will adjust to the sights, sounds and smell of the battlefield. If the halt is in an exposed area, each man will take a knee. It is also used to see if the patrol is being followed or if enemy is in the area. APL does not normally move forward.
- b. Actions at rally points. If the patrol comes into enemy contact and must occupy a rally point, the following will take place:
  - (1) Send SALUTE Report to higher.
  - (2) Change route.
  - (3) Establish security.
  - (4) Senior man takes charge.

- (5) Get a good headcount.
- (6) Get an ACE REPORT.
- (7) Wait the specified amount of time as put out in the OORDER or contingency plan.
- (8) Issue FRAGO if necessary.
- (9) Move out and continue the mission.

c. Actions at danger areas:

- (1) Linear
  - (a) Patrol halts at suspected danger areas.
  - (b) PL goes forward to recon/confirm.
  - (c) PL designates near/far side rally points.
  - (d) PL issues contingency plans to security/clearing teams and APL places security L/R side.
  - (e) Flank security is posted on the near side.
  - (f) Clearing team crosses to recon and secure the far side.
  - (g) Clearing team signals the PL that the far side is secure/unsecure.
  - (h) Unsecure - Clearing team comes back and patrol crosses at another point.
  - (i) Secure - Patrol crosses danger area and APL controls patrol's movement across danger area.
  - (j) Flank security crosses, covering tracks and rejoins patrol.



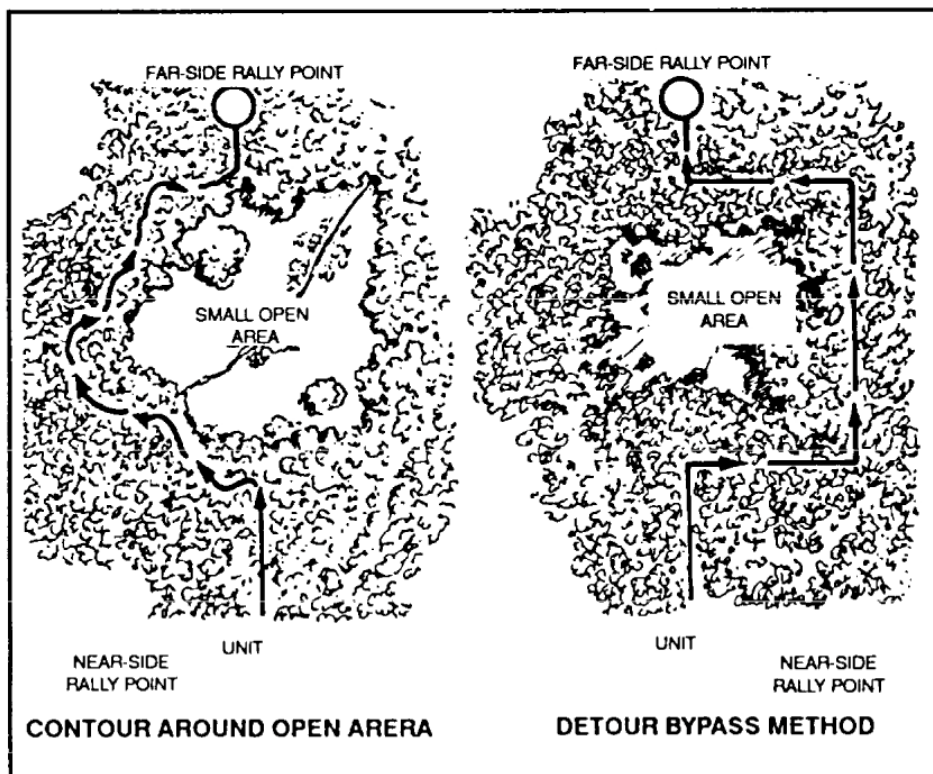
## (2) Small Open:

## (a) Contour bypass method.

- Patrol halts at danger area.
- PL moves forward to recon/confirm.
- The PL has the compassman pick out a prominent terrain feature on the far side with the movement azimuth and he has the paceman estimate the distance.
- The patrol executes the contour bypass method by skirting around the edge of the danger area in the wood line to the prominent terrain feature on the far side.
- Once at the far side the patrol moves out on azimuth.

(b) Detour bypass method:

- Patrol halts at danger area.
- PL moves forward to recon/confirm.
- PL directs a 90 degree change in azimuth either left or right. The alternate compass and paceman will take over navigation.
- The patrol moves far enough to pass the danger area. The PL then designates the original compass and paceman to take over navigation back on azimuth.
- When the patrol moves far enough to pass the danger area again, the PL directs the alternate compass and paceman to make a 90 degree change back toward the original route of march. The alternate paceman moves the patrol a distance equal to the one he traveled on the first leg.
- The original compass and paceman head the patrol back on azimuth and the patrol moves out.



d. Large open:

Use the counter or detour method unless time or mission does not allow.  
Otherwise use traveling overwatch or bounding overwatch.

**Notes**

### **13. IMMEDIATE ACTION DRILLS**

#### a. Far Ambush:

- (1) Drop and take cover. Lay down suppressive fire.
- (2) Attack - PL orders Sappers not in the kill zone to conduct fire and maneuver and to continue to assault until the ambush is eliminated or contact is broken.
- (3) Withdraw - PL orders smoke grenades thrown (number and direction) and orders peel off with a direction and a distance. Conduct actions at rally points.

#### b. Near Ambush:

- (1) Drop and take cover, lay down suppressive fire. Throw grenades (smoke/frag).
- (2) Patrol members in the kill zone will immediately assume the prone position and return fire.
- (3) The remainder of the patrol not in the kill zone will lay down suppressive fire into the ambush position.
- (4) Continue the assault until the ambush is eliminated or contact is broken.

#### c. Sniper Fire:

- (1) Drop and take cover, lay down suppressive fire.
- (2) Withdraw - PL orders smoke grenades thrown (number and direction) and orders peel off with a direction and a distance. Conduct actions at Rally Points.
- (3) Call artillery.

#### d. Chance Contact:

- (1) Patrol sees the enemy, enemy doesn't see the patrol:
  - (a) Freeze in place, let the enemy pass.
  - (b) Set up a hasty ambush by getting the patrol on line and initiating the ambush when the enemy is in the kill zone.

- (2) Patrol and enemy see each other - The man nearest the enemy open fire and shout contact front, right, etc. The patrol assaults until the enemy is eliminated or contact is broken.
- (3) Enemy is stationary - patrol sees the enemy, but the enemy does not see the patrol. The patrol leader directs the patrol around the enemy by the most covered and concealed route.

e. Indirect Fire:

- (1) Patrol members yell "INCOMING!"
- (2) Drop and take cover.
- (3) PL shouts a direction and a distance (i.e., 12 o'clock for at least 200 m).
- (4) The patrol moves out and conducts actions at Rally Points.

f. Aerial Attack:

Upon noticing any aircraft during a patrol, everyone immediately freeze in place. If an enemy aircraft is making a final run on the patrol, the patrol will get down, take cover and attempt to get perpendicular to the line of flight. Engage targets flying head on by aiming slightly above the aircraft nose.

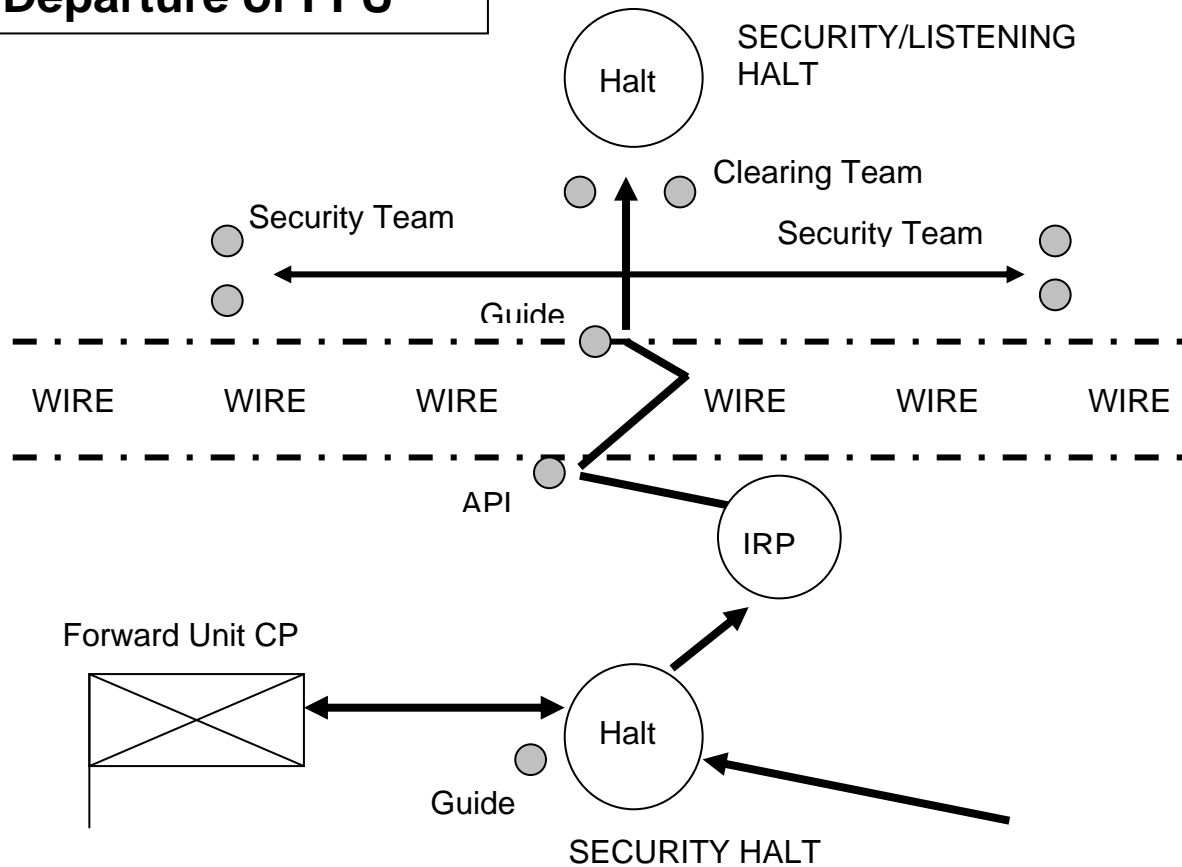
- (1) Fixed wing - Lead fast moving aircraft by 200m. (Two football field lengths)
- (2) Rotary - Lead helicopters by 50m. (One-half football field length)

## **14. DEPARTURE/REENTRY OF FRIENDLY FORWARD UNITS**

### a. Departure of FFU:

- (1) The patrol arrives at the forward unit and is met by a guide. The guide leads the patrol to the assembly area. No one should move anywhere without a guide in the forward unit area.
- (2) The PL gives the APL a contingency plan and, with his RTO and the guide, he moves to make final coordination with the forward unit commander.
- (3) PL returns and briefs the patrol on any changes.
- (4) PL designates IRP, (last covered and concealed position before exiting the wire).
- (5) The PL gives contingency plans to the APL, the clearing team and the security teams.
- (6) The PL, clearing team, and the security teams led by the guide move to the departure point. At the departure point, the PL places close in security and sends the clearing team out.
- (7) When the clearing team signals all clear, the PL and his RTO (led by the guide) move back to pickup the rest of the patrol.
- (8) APL counts the patrol out on the far or near side (depends on depth of wire) of the wire. APL tells guide the number in the patrol, confirms the running password and tells him how long the guide will wait at the departure point. APL picks up security then sends up the headcount.
- (9) The PL takes the patrol out of sight, sound, and small arms range of the FFU in a covered and concealed position to conduct a security/listening halt. Conduct SLLS
- (10) Patrol moves out and APL sends up the headcount.

## Departure of FFU



### b. Reentry of FFU:

- (1) PL conducts security halt, issues contingency plans to the APL and the clearing team and moves out with his RTO and the clearing team to clear the tentative RRP.
- (2) Once the tentative RRP is cleared the PL and his RTO move back, pick up the patrol, and occupies the RRP.
- (3) Contact the Friendly Forward Unit from the RRP.
- (4) PL issues a contingency plan to the APL and security teams and moves out with his RTO, the security teams, and the recon team to probe for the gap:
  - (a) Day - only try twice to find gap.

(b) Night - only try once to find gap.

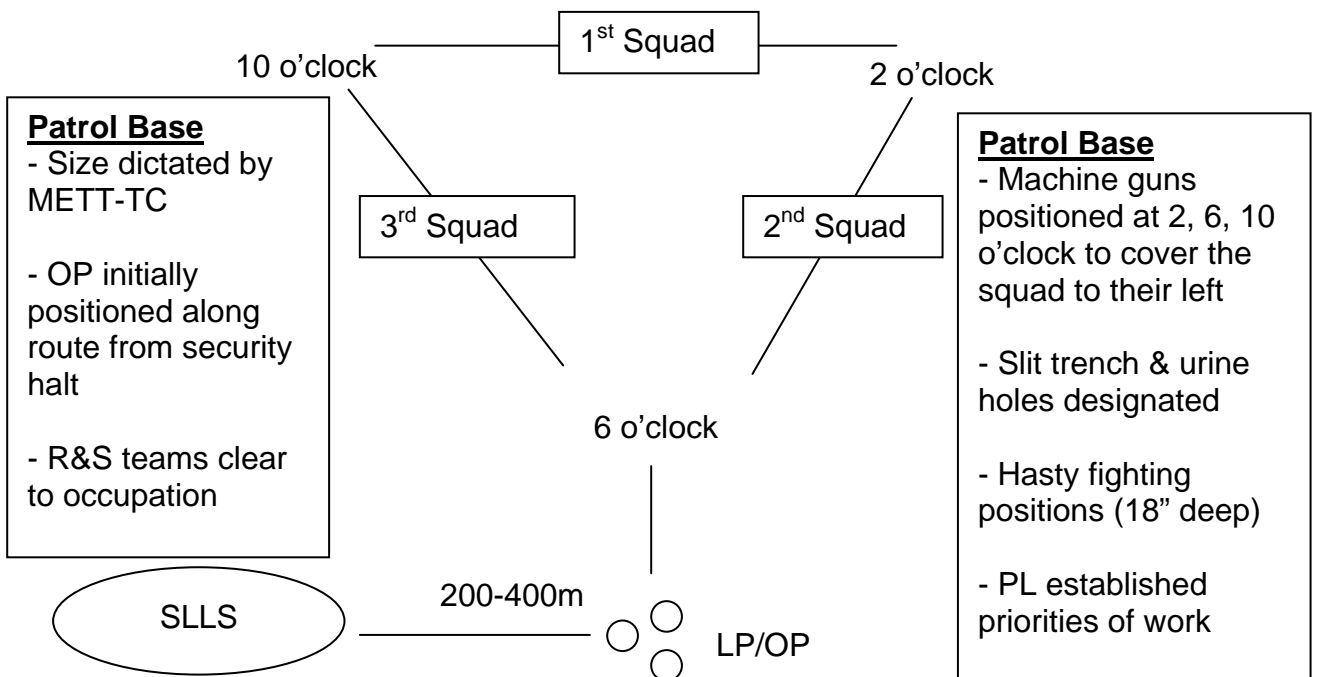
- (5) Once the gap has been found and the guide contacted, the PL will place close in security at the gap. He may choose to leave any PIR with the security teams.
- (6) PL returns with the recon team and his RTO to pick up the rest of the patrol.
- (7) The APL counts the patrol through the wire and the guide leads the patrol to a secured position. Patrol members should not talk with the guide.
- (8) The PL issues a contingency plan to the APL and leaves with his RTO and the guide to outbrief the forward unit commander on any information of immediate value to the forward unit.
- (9) The PL returns to the patrol with his RTO and the guide and departs for the parent unit for debriefing:

**Notes**

## 15. PATROL BASES

General: A Patrol Base is a position setup when a squad or platoon conducting a patrol halt for an extended period of. Patrol bases should not be occupied for more than 24 hours(except in an emergency). The unit never uses the same base twice.

- a. PL conducts security halt 200-400 meters short of tentative patrol base, conducts SLLS, issues contingency plans to the APL and the clearance team and moves out with his RTO, and clearance team to clear the tentative patrol base. The patrol base is 90 degrees off of the direction of movement.



- b. Once at the tentative Patrol Base site the PL will stop at the 6 o'clock position and conduct SLLS. The PL will issue a 5-point contingency plan and specific instructions to the clearance team on how they will recon, clear, and secure the tentative patrol base. Once cleared, the PL will reconfirm the site with the Tm Ldr. The PL and the Tm Ldr will then place the remaining members of the clearance team forming the basis of the perimeter in a triangle (or Wagon Wheel) shape.
- c. The PL leaves a 5-point contingency plan with the clearance team and gives the APL a courtesy call prior to leaving the tentative site. The PL and his RTO move back to pick up the rest of the patrol. Enroute the PL selects LP/OP position. Prior to moving out, the PL issues a contingency plan to the tentative LP/OP team.

- d. Enroute to the PB at the 90-degree dogleg, the PL drops off the tentative P/OP and continues to lead the patrol into the PB. Rear security covers tracks.
- e. The patrol occupies the PB maintaining squad integrity. Only the PL, APL, and the PL's RTO are in the middle of the perimeter. Once the patrol has their initial position the PL conducts SLLS.
- f. The PL/APL check security and emplace crew served weapons.
- g. The PL sends out three each R&S teams after issuing them a 5-point contingency plan. The entire patrol is notified prior to their departure and are at 100% security.
- h. Once R&S teams return and debrief the PL, the PL's RTO calls up the SPARE up to higher that they have now occupied the patrol base.
- i. PL establishes an alert plan.
- j. PL establishes an evacuation plan.
- k. Squads/APL make fire plans. (PL's RTO consolidate them.)
- l. Conduct priorities of work:
  - (1) Security.
  - (2) Maintenance.
  - (3) Clean/service equipment.
  - (4) Thorough ACE REP.
  - (5) Hygiene.
  - (6) Chow/Water.
  - (7) Sleep.
  - (8) Stand-To.
  - (9) Planning.

NOTE: All priorities of work will be issued with Task, Condition, and Standard. The PL is not restricted to this example, Priorities of work are dictated by METT-T and should reflect the previous day's mission.

1-74

**Notes**

## **16. RECONNAISSANCE OPERATIONS**

### **a. Conduct an Area Recon:**

An area reconnaissance is conducted to obtain information about a specified location and the area around it. The area may be given as a grid coordinate or an objective on an overlay. In an area recon, the platoon uses surveillance or vantage points around the objective from which to observe it and the surrounding area. The patrol leader must decide type of technique to use to gather all information without being compromised.

- (1) Patrol occupies a security halt short of the tentative ORP and the PL initiates SLLS.
- (2) The PL issues a 5-point (GOTWA) and special instructions to the APL. PL checks clearing team for equipment and communications prior to departing the security halt.
- (3) PL clears, secures and occupies the TORP with his clearing team. PL issues 5-point (GOTWA) to clearing team leader.
- (4) PL and RTO move back and picks up the patrol at the security halt. RTO gives a courtesy call to the PL prior to departure.
- (5) PL and APL get patrol in order of movement.
- (6) The patrol occupies a TORP and conducts SLLS. Patrol occupies TORP either using cigar shape or triangular perimeter.
- (7) PL issues a 5-point (GOTWA) and special instructions to the APL. PL checks the Surveillance team for equipment and communications and departs to pin point the objective.
- (8) PL establishes a release point out of sight and sound of the objective.
- (9) The PL moves forward and confirms the objective. PL emplaces surveillance team, selects a hard target and leaves a 5-point (GOTWA) and special instructions.
- (10) PL and RTO move back and pick up the patrol at the TORP. RTO gives a courtesy call back to the APL.
- (11) The PL issues a 5-point (GOTWA) and special instructions to the APL. PL checks the R&S teams for equipment and communications prior to departing for the objective.

- (12) The PL and R&S team leader define and confirm enemy location, limit of advance, and possible vantage points on the objective.
- (13) R&S teams move to the release point and confirm the status with the surveillance team. R&S teams then move out to recon the objective.
- (14) Both R&S team recorders and surveillance will gather PIR using the SALUTE report format. Each team will draw sketches and take photographs.
- (15) R&S teams complete recon and move back to the release point to compare notes (conduct additional recon if necessary).
- (16) PL gathers R&S teams to include surveillance and moves back to the ORP.
- (17) In the ORP, a detailed sketch of the objective and all other information gathered will be disseminated throughout the patrol.
- (18) If the recon was compromised the patrol moves one terrain feature or 1000m away (safe distance away) to disseminate information and call higher.
- (19) The PL gets an ACE report and the patrol moves out.

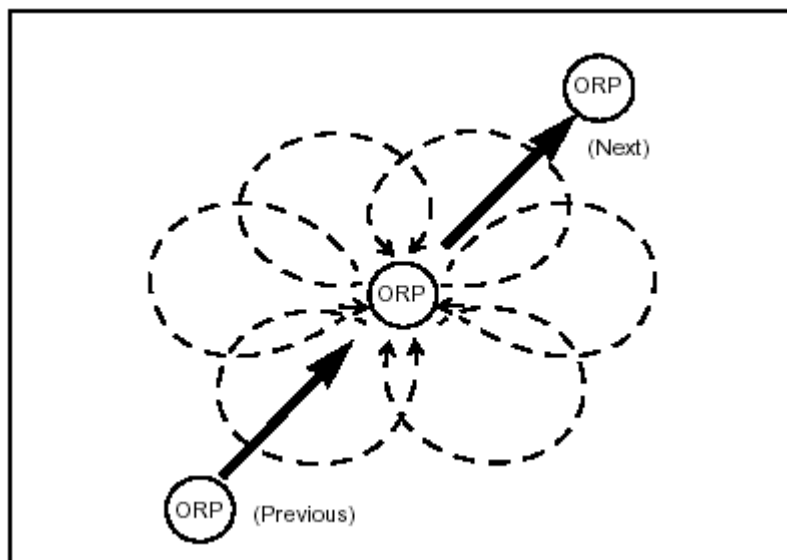
b. Conduct a Zone Recon:

This reconnaissance is conducted to obtain information on enemy, terrain, and routes within a specific zone. The Patrol Leader must decide which technique to use that best suits the patrol, area, and terrain. The types of zone recon are the fan, box, converging routes, and successive sector.

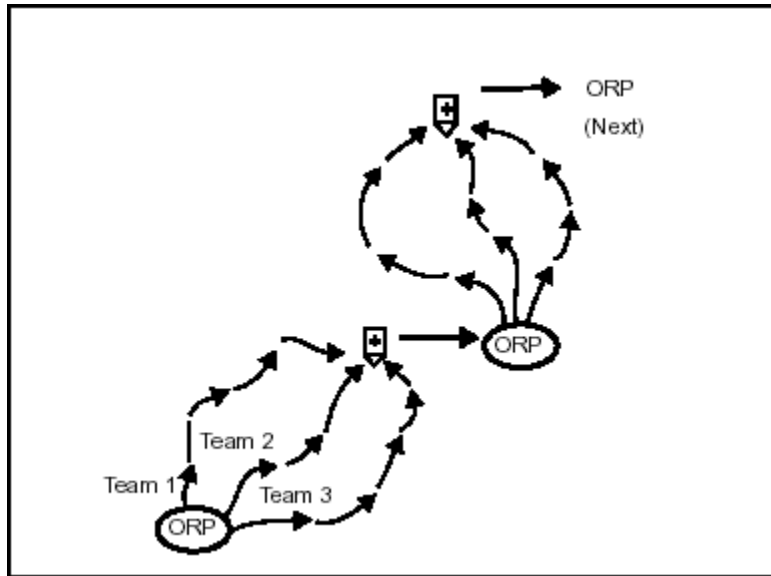
- (1) The patrol occupies a security halt short of tentative ORP and PL initiates SLLS
- (2) The PL issues a 5-point (GOTWA) and special instructions to the APL. PL checks clearing team for equipment and communications prior to departing the security halt.
- (3) PL clears, secures, and occupies the TORP with his clearing team. PL issues 5-point (GOTWA) to clearing Tm Ldr.
- (4) PL and RTO move back and picks up the patrol at the security halt. RTO gives a courtesy call to the APL prior to departure.

- (5) PL and APL get patrol in order of movement.
- (6) The patrol occupies a TORP and conducts SLLS. Patrol occupies TORP either using cigar shape or triangle perimeter.
- (7) PL selects the best method to conduct zone reconnaissance.
- (8) The PL issues 5-point (GOTWA) and special instructions to the ORP security, R&S teams, and APL. PL checks equipment and communications of the R&S teams and departs to conduct zone recon.
- (9) Upon completion of their recon, R&S teams return to the ORP. In the ORP a detailed sketch of the zone and all other information gathered will be disseminated throughout the patrol.
- (10) If the recon was compromised, the patrol moves one terrain feature or 1000m away (safe distance away) to disseminate the information and call higher.
- (11) The PL gets an ACE report and the patrol moves out.

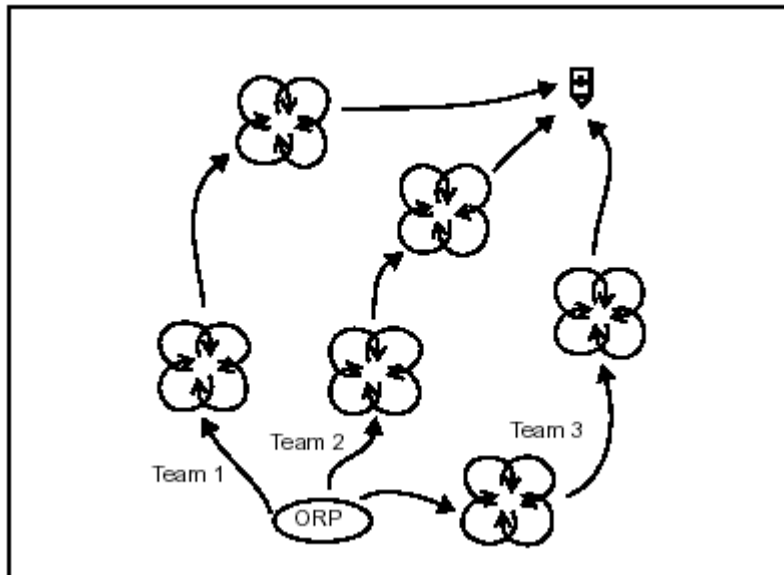
#### FAN METHOD



BOX METHOD



CONVERGING ROUTES



c. Conduct a Route Recon:

- (1) The patrol occupies a security halt short of tentative ORP and PL initiates SLLS

- (2) The PL issues a 5-point (GOTWA) and special instructions to the APL. PL checks clearing team for equipment and communications prior to departing the security halt.
- (3) PL clears, secures, and occupies the TORP with his clearing team. PL issues 5-point (GOTWA) to clearing Tm Ldr.
- (4) PL and RTO move back and picks up the patrol at the security halt. RTO gives a courtesy call to the APL prior to departure.
- (5) PL and APL get patrol in order of movement.
- (6) The patrol occupies a TORP and conducts SLLS. Patrol occupies TORP either using cigar shape or triangle perimeter.
- (7) The PL issues contingency plans to the R&S teams and sends them out.
- (8) The R&S teams conduct the route recon.
- (9) Upon completion of the recons, the R&S teams return to the ORP. Notes are consolidated and five master sketches of the route are made. All information is disseminated throughout the patrol.
- (10) If the recon was compromised the patrol moves one terrain feature or 1000m away to disseminate the information.

### **Notes**

## 17. COMBAT OPERATIONS

### a. Ambush:

An ambush is a surprise attack from a concealed position on a moving or temporarily halted target. Hasty and deliberate ambushes are two categories of ambushes. Types of ambushes are point and area. A point ambush is a planned attack on an enemy force in a single kill zone. An area ambush is a planned attack in two or more related point ambushes. Types of formations are linear and L-shape.

- (1) The patrol occupies a security halt short of tentative ORP and PL initiates SLLS
- (2) The PL issues a 5-point (GOTWA) and special instructions to the APL. PL checks clearing team for equipment and communications prior to departing the security halt.
- (3) PL clears, secures, and occupies the TORP with his clearing team. PL issues 5-point (GOTWA) to clearing TM Ldr.
- (4) PL and RTO move back and picks up the patrol at the security halt. RTO gives a courtesy call to the APL prior to departure.
- (5) PL and APL get patrol in order of movement.
- (6) The patrol occupies a TORP and conducts SLLS. Patrol occupies TORP either using cigar shape or triangle perimeter.
- (7) PL issues 5-point (GOTWA) and special instructions to the APL. PL checks surveillance teams for equipment and communications then departs to pin point the objective.
- (8) The PL establishes the release point out of sight and sound of the objective.
- (9) PL moves forward and confirms the objective. PL replaces the surveillance team, and leaves a 5-point with special instructions.
- (10) PL and RTO move back to patrol at the TORP. RTO, gives a courtesy call back to the APL.
- (11) PL issues 5-point (GOTWA) and special instructions to the APL. PL checks leaders recon for equipment and communications prior to departing for the objective.

- (12) PL conducts a leaders recon of the objective with his RTO, the support/assault and security team leaders.
- (13) The leader's recon defines and confirms the locations for the assault, support, and left/right side security positions. Upon completion they return back to the ORP. RTO gives a courtesy call back to the APL.
- (14) PL issues a 5-point (GOTWA) and special instructions to the ORP security. PL spot checks all teams and sends out the left/right side security.
- (15) Security will call PL once they are in position. PL moves patrol to the release point and checks in with surveillance.
- (16) From the release point PL will instruct support and left/right assault lines to move into position.
- (17) When the enemy is in the kill zone, the PL will initiate the ambush with the most casualty producing weapon(s). PL then gives shift/lift signals.
- (18) The assault element will assault across the kill zone and destroy the remainder of the enemy.
- (19) Once across, the assault element forms a reconsolidation line on the limit of advance.
- (20) The PL will gather ACE reports from the key leaders and send out special teams such as EPW-search, demo teams, and aid and litter teams. Immediately after EPW-search teams have cleared the objective, the APL will move to establish the check point, EPW and casualty collection point.
- (21) Once the demo team sets charges, the PL will initiate a withdraw plan. The assault force passes through the choke point and moves to the ORP. The support and security element takes the most direct route to the ORP.
- (22) The patrol will move 1000m or a terrain feature away (safe distance away) to disseminate information, after 100% accountability of all men, weapons, and equipment.

b. Raid:

A raid is a combat operation to attack a position or installation followed by a planned patrol. It is conducted to destroy a position or installation, to destroy or capture

enemy soldiers or equipment, or to free friendly prisoners. The surprise, fire power, and violence are the key characteristics for a successful raid.

- (1) Patrol occupies security halt short of tenatatiev ORP and PL initiates SLLS.
- (2) PL issues 5-point (GOTWA) and special instructions to the APL. PL checks clearing team for equipment and communications prior to departing the security halt.
- (3) PL recons, clears, and secures TORP with his clearing team. PL issues 5-point (GOTWA) to clearing team leader.
- (4) PL and RTO move back to pick up patrol at the security halt. RTO gives a courtesy call back to the APL.
- (5) PL and APL gets patrol in the order of movement.
- (6) Patrol moves forward and occupies the TORP and conducts SLLS. Patrol occupies using either cigar shape or triangle perimeter.
- (7) PL issues 5-point (GOTWA) and special instructions to the APL. PL checks surveillance team for equipment and communications and departs to pin point the objective.
- (8) The PL establishes the release point out of sight and sound of the objective.
- (9) PL moves forward and confirms the objective. PL emplaces the surveillance team, and leaves a 5-point with special instructions.
- (10) PL and RTO move back to patrol at the TORP. RTO, gives a courtesy call back to the APL.
- (11) PL issues 5-point (GOTWA) and special instructions to the APL. PL checks leaders recon for equipment and communications prior to departing for the objective.
- (12) PL conducts a leaders recon of the objective with his RTO, the support/assault and security team leaders.
- (13) The leader's recon defines and confirms the locations for the assault, support, and left/right side security positions. Upon completion they return back to the ORP. RTO gives a courtesy call back to the APL.

- (14) PL issues a 5-point (GOTWA) and special instructions to the ORP security. PL spot checks all teams and sends out the left/right side security.
- (15) Security will call PL once they are in position. PL moves patrol to the release point and checks in with surveillance.
- (16) From the release point PL will instruct support and left/right assault lines to move into position.
- (17) When the enemy is in the kill zone, the PL will initiate the ambush with the most casualty producing weapon(s). PL then gives shift/lift signals.
- (18) The assault element will assault across the kill zone and destroy the remainder of the enemy.
- (19) Once across, the assault element forms a reconsolidation line on the limit of advance.
- (20) The PL will gather ACE reports from the key leaders and send out special teams such as EPW-search, demo teams, and aid and litter teams. Immediately after EPW-search teams have cleared the objective, the APL will move to establish the checkpoint, EPW and casualty collection point.
- (21) Once the demo team sets charges, the PL will initiate a withdraw plan. The assault force passes through the choke point and moves to the ORP. The support and security element takes the most direct route to the ORP.
- (22) The patrol will move 1000m or a terrain feature away (safe distance away) to disseminate information, after 100% accountability of all men, weapons, and equipment.

**18. LINK-UP OPERATIONS**

## a. Conventional: (Stationary unit and moving unit)

- (1) The stationary unit occupies a TORP.
- (2) The stationary unit's PL issues the APL a contingency plan and moves out on a leader's recon of the link-up site with his RTO, navigation team, and the link-up team.
- (3) Once the stationary unit's PL confirms and clears the link up site, he issues the link up team a contingency plan and returns to the ORP.
- (4) In the ORP, the stationary PL contacts the moving PL and informs him that the link up site is occupied. (Spare)
- (5) The moving unit approaches the link up site, stops short and informs the stationary unit that link-up is imminent. (Spare)
- (6) The moving unit's PL issues a contingency plan to his link-up team and sends them out to the link-up site.
- (7) The moving link up team notes the far recognition signal, moves in and the two link up teams exchange the near recognition signal. Link-up is complete.
- (8) The moving link up team calls the moving unit forward and the stationary link up team guides the moving unit to the stationary units ORP.
- (9) The patrol reorganizes and moves out.

## b. Partisan:

- (1) The patrol occupies a TORP.
- (2) The PL issues the APL a contingency plan and conducts a leader's recon of the objective with his RTO, navigation team, security team leader, and sniper team leader. The PL confirms the far recognition signal of the partisan, the location of the security elements, the location of the sniper team, defines a release point and returns to the ORP.
- (3) The PL issues the APL a contingency plan and departs to conduct the partisan link-up with his body guard, the sniper team and the security elements. At the release point the PL issues the security teams and the sniper team contingency plans and they move out to their positions.

- (4) As the PL and bodyguard approach the partisan, the PL notices the near recognition signal. The PL and partisan meet and exchange the verbal signal. Link-up is complete.
- (5) Information or equipment, etc. is exchanged.
- (6) As the PL returns to the ORP, the security teams and the sniper team meet at the release point and return to the ORP.
- (7) The patrol reorganizes and moves out.

**Notes**

## CHAPTER TWO

### DEMOLITIONS

#### 1. CHARACTERISTICS OF EXPLOSIVES:

Explosives are separated into two categories: High and Low.

- (1) Low explosives are characterized by having a detonating velocity up to 1,300 feet per second, producing a pushing or shoving effect.
- (2) High explosives are characterized by having a detonating velocity between 3,280 – 27,888 feet per second, producing a shattering or brisance effect.

##### A. Block Demolition Charges

Explosive	Unit lbs.	Size (inches)	RE Factor
TNT	1.00	1.75 x 1.75 x 7	1.00
M112 block	1.25	1 x 2 x 10	1.34
M118 block	2.00	1 x 3 x 12	1.14
M118 sheet	.50	.25 x 3 x 12	1.14
M186 roll	25.00	.25 x 3 x 50ft.	1.14
Ammonium Nitrate	43.00	7 x 24	.42
M1 Dynamite	.50	1.25 x 8	.92

##### B. MDI Components

- (1) High Strength Blasting Caps
  - (a) M11– The M11 cap comes with a 30 foot length of shock tube factory attached to a standard size of aluminum blasting cap tube. The M11 is essentially instantaneous in its action. The M11 has a plastic connector on the free end of its shock tube called the “J” hook that is used to connect detonation cord if required.
  - (b) M14- The M14 consists of military strength and size nomenclature blasting cap, factory crimped to a factory calibrated 5 minute length of M700 time blasting fuse. It is a standardized delay initiator for shock tube blasting cap-priming systems.
  - (c) M15- The M15 has pyrotechnic devices installed to provide a small time delay between its initiation and firing of its detonator(s). The M15 has two detonators. One

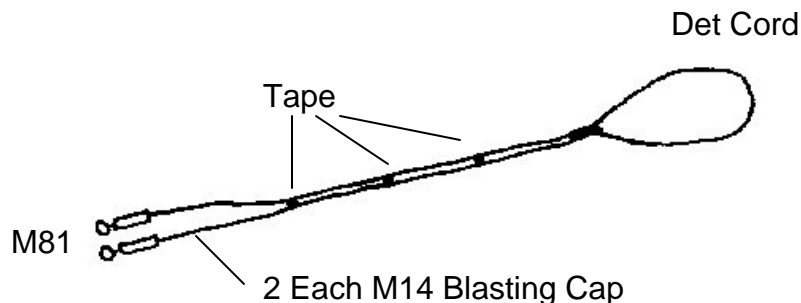
detonator is low strength with a 25-millisecond delay and the other is high strength with a 200-millisecond delay. The low strength end of the M15 and two low strength shock tube blasting caps (M12 and M13) are meant to be used in relaying the initiating pulse to a high strength cap. **Do not use the M15 with dynamite.**

- (d) Low strength blasting caps- The M12 and M13 are relay type blasting caps with factory-attached lengths of shock tube (500 feet for the M12 and 1,000 feet for the M13). The detonators of these caps are purposely too large to fit in military explosives. **These caps will not reliably set off explosives such as detonating cord.** They can only detonate shock tube. The low strength caps come with a plastic clamp attached to the detonator for easy attachment of shock tube.
- (e) Blasting cap holder (M9)- The M9 cap holder allows connection of up to 5 shock tubes to the high strength M11 or M14 blasting caps. The M9 can also be used to connect the M11 or M14 caps to detonating cord. The M9 cannot be used to attach detonating cord or shock tube together and must be taped shut for ensured connection.
- (f) Time blasting fuse (M81)- The M81 is used to initiate shock tube ends of the blasting caps and the time fuse end of the M14 blasting cap.

## **2. DUAL DETONATION SYSTEMS:**

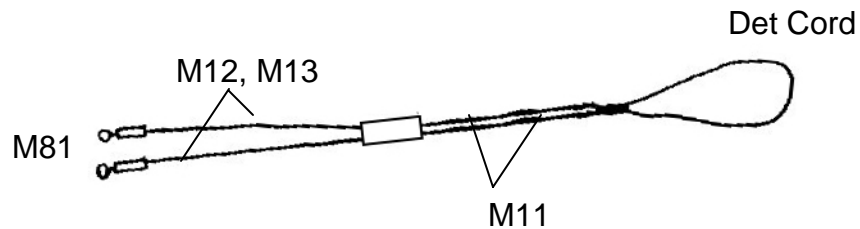
### a. Time Delay:

- (1) 2 M81 igniters
- (2) 2 M14 blasting caps
- (3) 18-24 inches detonating cord



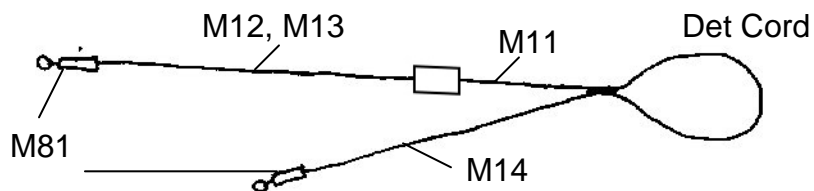
b. Command:

- (1) 2 M81 igniters
- (2) 2 M12/M13/M14 blasting caps
- (3) 2 M11 blasting caps
- (3) 18-24 inches detonating cord



d. Combination:

- (1) 2 M81 igniters
- (2) 1 M14 blasting cap
- (3) 1 M12/M13 blasting cap
- (4) 1 M11 blasting cap
- (5) 18-24 inches detonating cord



### 3. TIMBER CUTTING:

a. Conventional Formula:

- (1) Read the problem/gather information:

(a) Type of explosive

Example  
TNT

(b) RE Factor	1
(c) Package Weight	1
(d) Number of Trees	3
(e) Formula	

$$P=(D^2/40) \text{ (External/Ring)}$$

$$P=(D^2/50) \text{ (Abatis)}$$

$$P=(D^2/250) \text{ (Internal)}$$

(g) Tree diameter (D): 20 inches

$$D=(\text{circumference}/3.1416)$$

(2) Solve Formula:

Example

$$P=(D^2/40)=(20^2/40)$$

$$P=(400/40)= 10 \text{ lbs TNT}$$

(3) Divide by RE Factor:

$$10 \text{ lbs TNT}/1 = 10 \text{ lbs TNT}$$

(4) Divide by package weight and round up:

$$10 \text{ lbs TNT}/1 \text{ lb} = 1 \text{ PKG TNT}$$

(6) Number of Targets is 3

(7) Multiply by number of trees:

$$10 \text{ PKG TNT} \times 3 \text{ Charges} = 30 \text{ PKG TNT}$$

b. Ring Charge Formula: For use with M112, M118, or M186. Max diameter of tree can only be 30 inches.

(1) Read the problem/gather information:

	<u>Example</u>
(a) Type	M112
(b) RE Factor	1.34
(c) Package Weight	1.25
(d) Number of Trees	6

(e) Formula:

$$P=(D^2/40)$$

(f) Tree Diameter	28 inches
-------------------	-----------

$$D=(\text{circumference}/3.1415)$$

(g) Charge Thickness:

0.5 inch for D < 15 inches  
1 inch for D > 15 inches

(2) Solve Formula:

$$P=(D^2/40)=(28^2/40)=(784^2/40)=19.6 \text{ lbs TNT}$$

(3) Divide by RE Factor:

$$19.60 \text{ lbs TNT}/1.25 \text{ lb PKG}=14.62 \text{ lb C-4}$$

(4) Divide by package weight and round-up:

$$14.62 \text{ lb C-4}/ 1.25 \text{ lb PKG} = 11.69 \text{ PKG C-4}$$

(5) Number of targets is 6

(6) Multiply by the number of trees:

$$12 \text{ PKG C-4} \times 6 \text{ Trees} = 72 \text{ PKG C-4}$$

(7) The Ring Charge is utilized when the direction of the fall of the tree is not important, there is no shortage of explosives and there is no need to clear the stump of the tree low to the ground. This charge will place the remaining portion of the stump below the 8-inch Vehicle and Rotary Wing Aircraft obstacle clearance.

This charge is mainly used to clear the way for roads, airfields, drop zones, and helicopter landing zones.

(a) Securing the Charge: Remove the bark from the tree. Then, if adhesive face of explosive will not adhere to tree, wrap tree with tape. Use additional tape on outside of explosive if necessary.

(b) Charge Thickness:

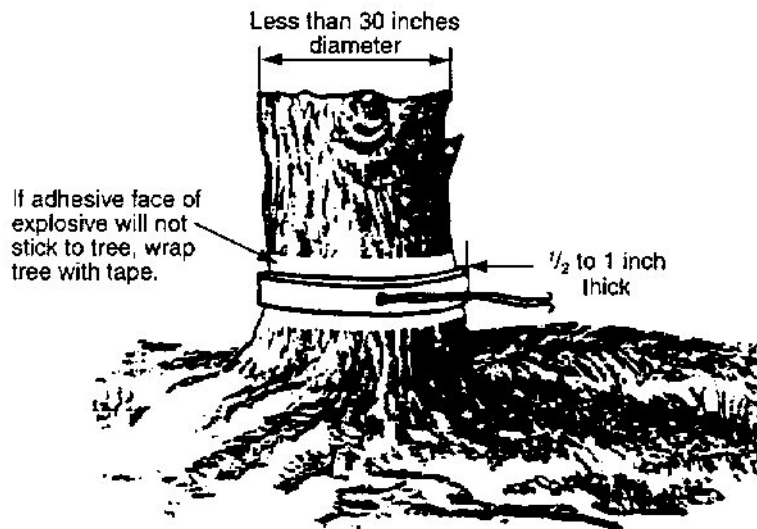
0.5-inch thick for 10-inch diameter trees

1-inch thick for 10-30 inch diameter trees

Note: Only trees 30 inches or less can be cut with this charge. Trees larger than 30 inches should be cut using an external charge.

(c) Place charge as close to ground as possible

(d) Detonate with demo knot or blasting cap at center of charge with C-4 cover surrounding the detonator by at least 1 inch of explosive.



c. Land Clearing Charges:

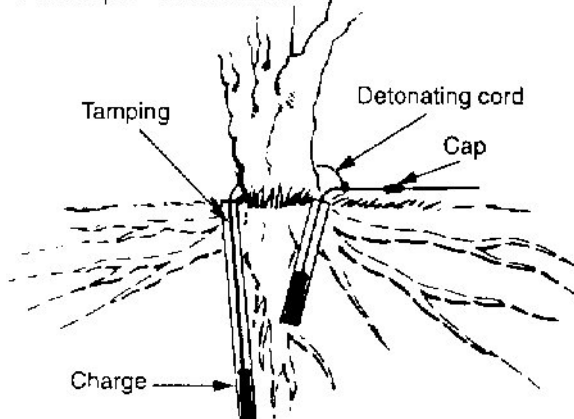
(1) Stump Removal: Stumps are of two general types- Tap rooted and laterally rooted. Military dynamite is the explosive best suited for stump removal. Measure the diameter of a stump at a point 12 to 18 inches above the ground. Use 1 pound per foot of diameter for

dead stumps and 2 pounds per foot for live stumps. If both the tree and stump are to be removed, increase the amount of explosive by 50 percent.

- (2) Tap Rooted Stumps: The preferred method for tap rooted stumps is to bore a hole in the taproot below the ground level. The best method is to place charges on both sides of the taproot to obtain a shearing effect. Tamp the charges for best results.
- (3) Laterally-Rooted Stumps: In blasting laterally rooted stumps, drill sloping charge placements as close as possible under the center of the stump and at a depth equal to the radius of the stump base. If the root formation cannot be determined, assume that it is lateral type and proceed accordingly.

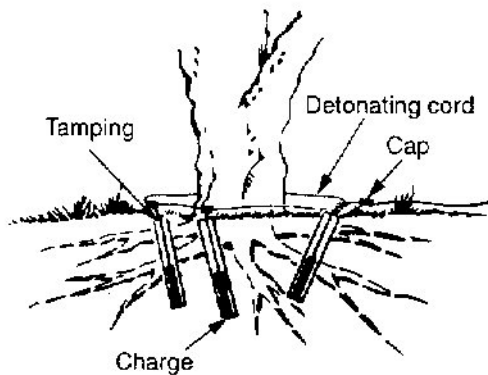
**Placement of charge  
for taprooted stumps**

Hole depth = tree diameter



**Placement of charge for  
lateral-rooted stumps**

Hole depth = tree radius



**4. STEEL CUTTING:**

a. Conventional Formula:

(1) Read the problem/gather information:

Example

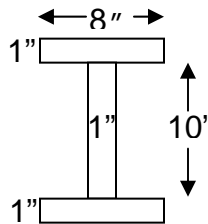
- (a) Type of explosive M112/C-4
- (b) How many targets 4
- (c) Which formula:

$$P = \frac{3}{8} A = 0.375 A$$

(d) Measurements/area calculation:

ATF	8 x 1	8 sq inches
ABF	8 x 1	8 sq inches
AW	10 x 1	10 sq inches
TA = A =		26 sq inches

- (e) Package weight of explosive 1.25 lbs
- (f) RE factor 1.34
- (g) Draw a picture



(2) Solve for TNT:

$$P = \frac{3}{8} A$$

$$P = \frac{3}{8} (26 \text{ sq inches})$$

$$P = 9.75 \text{ lbs TNT}$$

(3) Divide by RE factor:

Pounds C-4=(P/RE Factor)=(9.75 lbs TNT/1.34)=7.27 lbs

(4) Divide by explosive's package size and round up:

$$(7.27 \text{ lbs C-4} / 1.25 \text{ lbs/PKG})= 5.81 \text{ PKG C-4}$$

(5) Number of target is 4.

(6) Multiply by number of charges:

$$6 \text{ PKGs} \times 4 \text{ Charges} = 24 \text{ PKGs C-4}$$

b. Advance formula (Ribbon Charge)- Only works with M112, M118, M186, and for steel up to 3 inches thick.

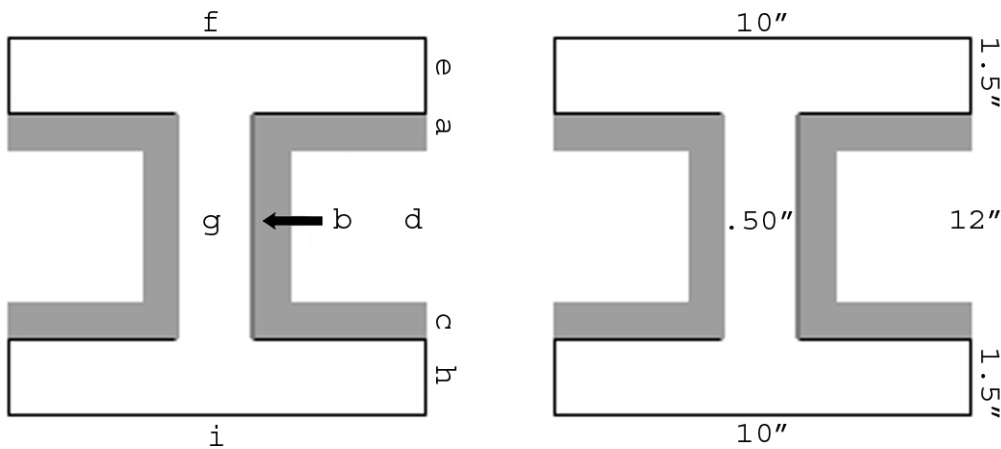
(1) Read the problem/gather information:

- |                       |                              |
|-----------------------|------------------------------|
| (a) Type of explosive | <u>Example</u><br>M118 Sheet |
| (b) Number of targets | 4                            |
| (c) Measurements      |                              |

TF	Width = 10	Thickness = 1.5
BF	10	1.5
W	12	0.75

(d) Package size: L x W x H      .75 x 3 x 12

(e) Draw a Picture:



(f) Find the total charge volume (TCV):

	CT	x	CW	x	CL	=	CV
TF	.5 x e = a		CT x 3		f-g		
BF	.5 x h = c		CT x 3		i-g		
W	.5 x g = b		CT x 3		g-a-c		
					TCV		

CT = ½ thickness of target, but not less than ½”

CW = 3 times charge thickness

Cl = Length of cut desired

**Example**

	CT	x	CW	x	CL	=	CV
TF	.75		2.25		9.25		15.54
BF	.75		2.25		9.25		15.54
W	.5		1.5		10.5		7.87
					TCV		39.95

(h) Block Size

$$L \times W \times H = \text{Block Size}$$

**Example**

$$.25\text{in} \times 3\text{in} \times 12\text{in} = 9 \text{ cu. in.}$$

(2) N/A

(3) N/A

(4) Total package volume divided by block size and round up:

**Example**

$$\frac{38.95 \text{ cu. in.}}{9 \text{ cu in}} = 4.32 \text{ Sheets M118}$$

Round up to 5 sheets of M118

(5) Number of targets is 4.

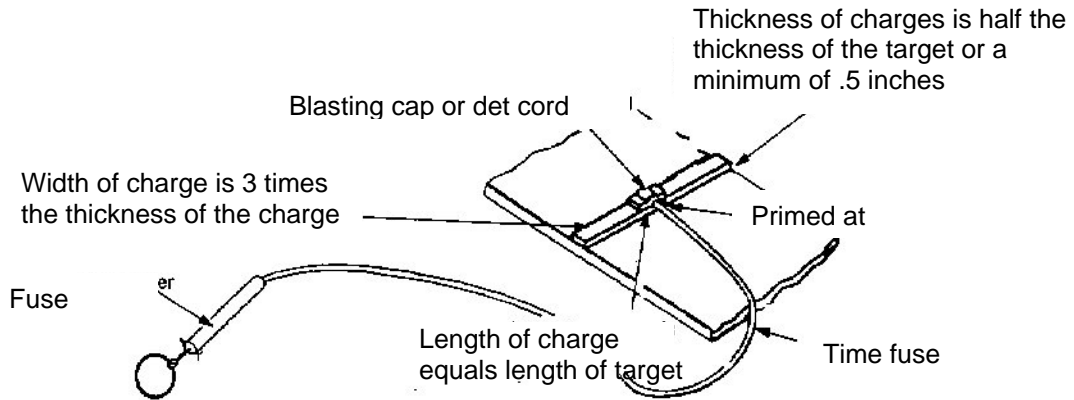
(6) Multiply amount of explosive by number of targets:

**Example**

5 sheets of M118 x 4 Charges = 20 Sheets of M118

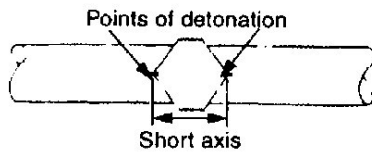
c. Ribbon Charge: (CT x CW x CL = CV)

(CV/EV = Number of Packages)



d. Diamond Charge: (CV/EV)

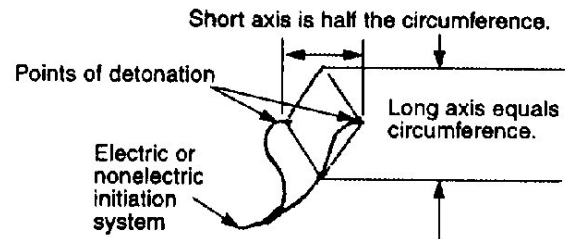
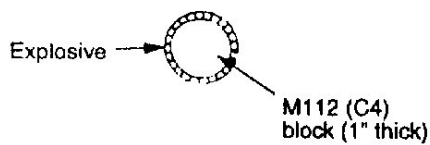
**Top view**



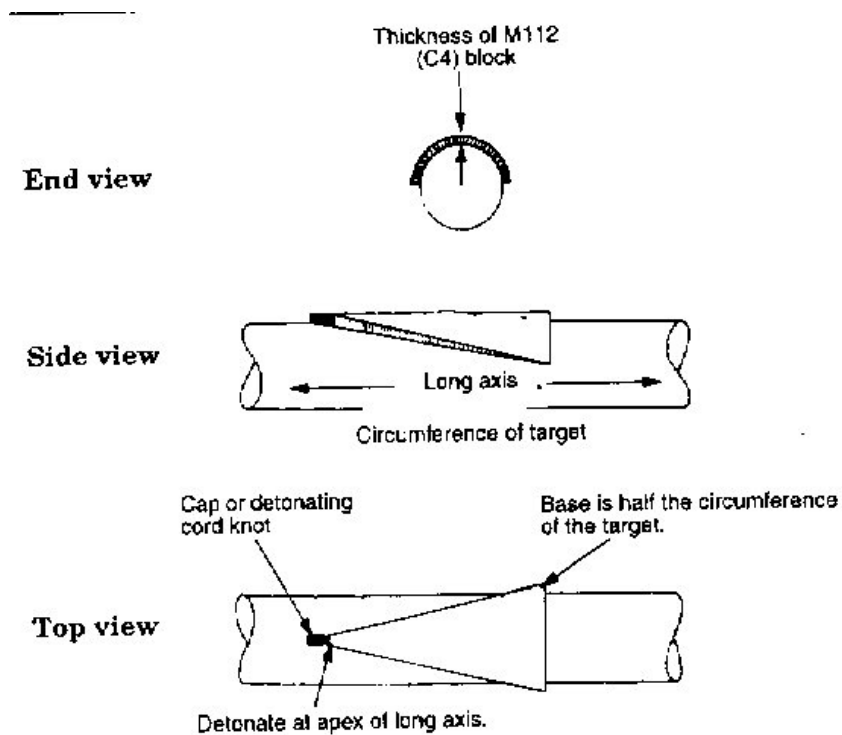
**Side view**



**End view**



## e. Saddle Charge: (CV/EV)



## f. Steel Chain Cutting Charge:

$$P = D$$

P = Pounds of TNT Required

D = Diameter in inches of steel chain to be cut

D = 1 inch

P = 1 pound of TNT, if block will bridge link. If not, use two blocks (one inch each side).

## g. Rail Cutting Formula:

Rails are preferably cut at crossings, switches or curves. Cut at alternate rail splices for a distance of 500 feet.

Less than 5 inches high – use ½ pound of explosives

Five inches or higher – use 1 pound of explosives

Crossing and switches - use 1 pound of explosives

Tracks- The destruction of railroads with explosives should be done at vulnerable points. These are curves, switches, frogs and crossovers, which may be destroyed with a small amount of explosive. This is called the spot method.

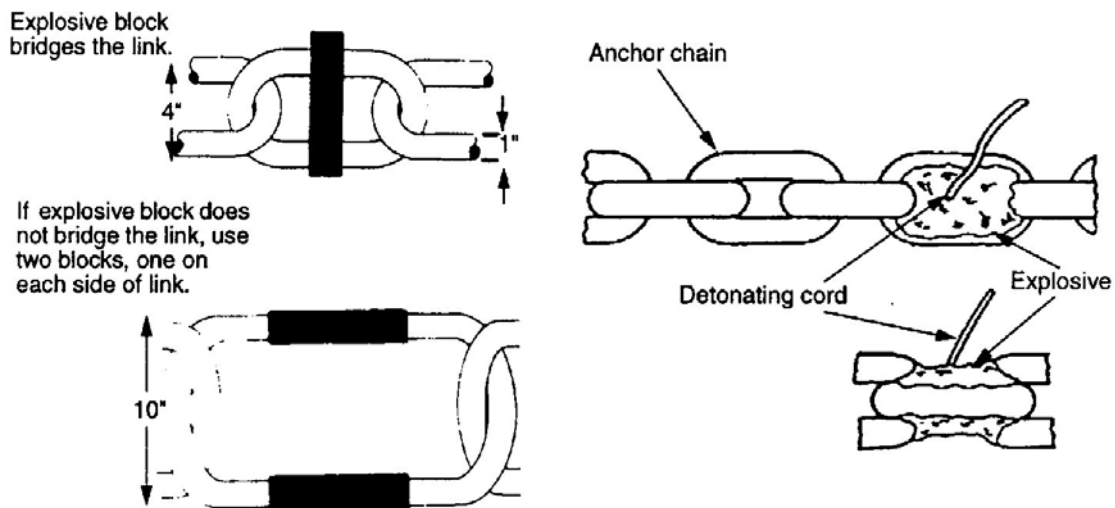
#### h. Charge Placement:

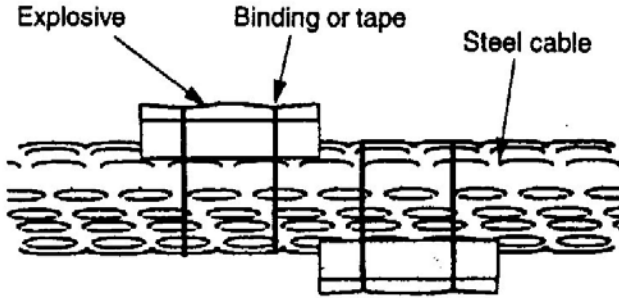
Steel Sections- The size and type of a steel section will determine the placement of the explosive charge. Cut extended sections by placing the explosives on one side of the section completely along the proposed line of rupture. In some steel trusses with individual members fabricated from two or more primary sections (such as angle irons or bars separated by spacer washers or gusset plates), place the charge with its opposing portions offset the same distance as the thickness of the section being cut to produce a shearing action.

Heavier I-Beams, wide-flange beams and columns can also require auxiliary charges placed on the outside of the flanges. Ensure that opposing charges are never directly opposite each other because this tends to neutralize the explosive effect.

Note: When cutting steel greater than 3 inches thick, use:

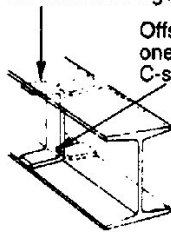
$$P = 3/8 \times A$$





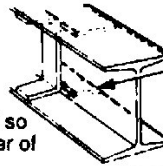
**Beams less than 2 inches thick**

C-shaped charge cuts web and half of top and bottom flanges.



Offset-flange charge is placed so one edge is opposite the center of C-shaped charge.

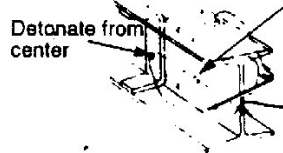
**Beams 2 to 3 inches thick or**



Offset flange placed so one edge is opposite an edge of the C-shaped charge.

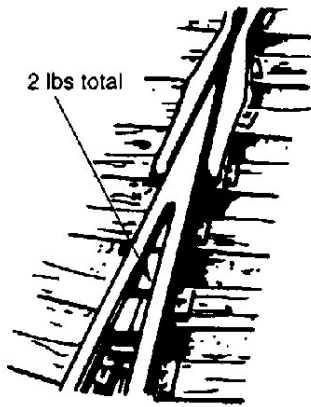
**Priming**

Detonate from outer edge if using caps, or from center if using detonating-cord knots.

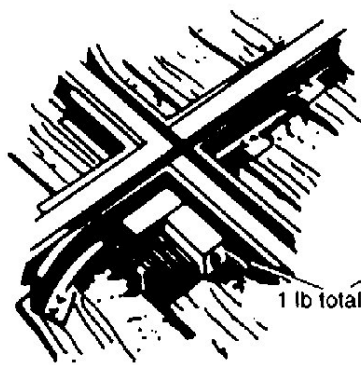


Detonate from center

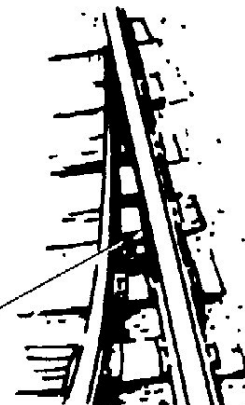
Detonating-cord branch lines must be of equal length.



Frog



Crossover



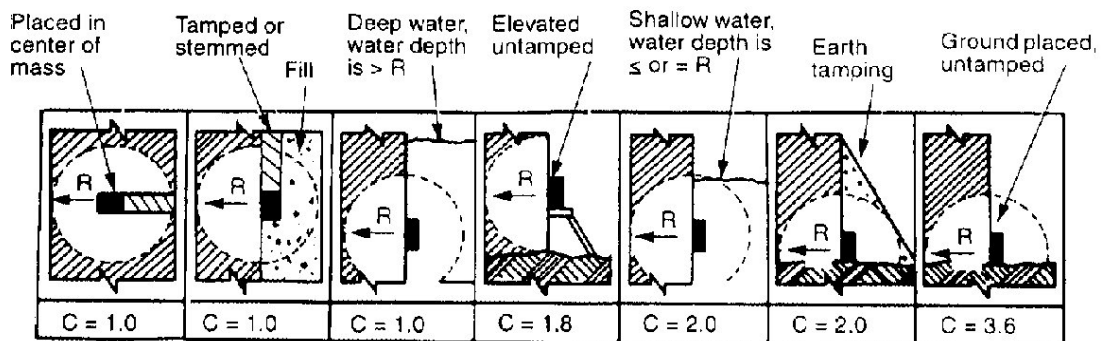
Switch

## 5. BREACHING CHARGE

### a. Breaching Charge Chart

Material	R	K
Earth	All Values	0.07
Poor masonry, shale, hardpan, good timber and earth construction	Less than 1.5 m (5 ft)	0.32
	1.5 m (5 ft) or more	0.29
Good masonry, concrete, block, rock	0.3 m (1 ft) or less	0.88
	Greater than 0.3 m (1 ft) and Less than 0.9 m (3 ft)	0.48
	Greater than 0.9 m (3 ft) and less than 1.5 m (5 ft)	0.40
	Greater than 1.5 m (5 ft) and less than 2.1 m (7 ft)	0.32
	2.1 m (7 ft) or greater	0.27
Dense concrete, first-class masonry	0.3 m (1 ft) or less	1.14
	Greater than 0.3 m (1 ft) and Less than 0.9 m (3 ft)	0.62
	Greater than 0.9 m (3 ft) and less than 1.5 m (5 ft)	0.52
	Greater than 1.5 m (5 ft) and less than 2.1 m (7 ft)	0.41
	2.1 m (7 ft) or greater	0.35
Reinforced concrete (concrete only; will not cut reinforced steel)	0.3 m (1 ft) or less	1.76
	Greater than 0.3 m (1 ft) and Less than 0.9 m (3 ft)	0.96
	Greater than 0.9 m (3 ft) and less than 1.5 m (5 ft)	0.80
	Greater than 1.5 m (5 ft) and less than 2.1 m (7 ft)	0.63
	2.1 m (7 ft) or greater	0.54

Values of C, the tamping factor, for breaching charges:



(1) Read the problem/gather information:

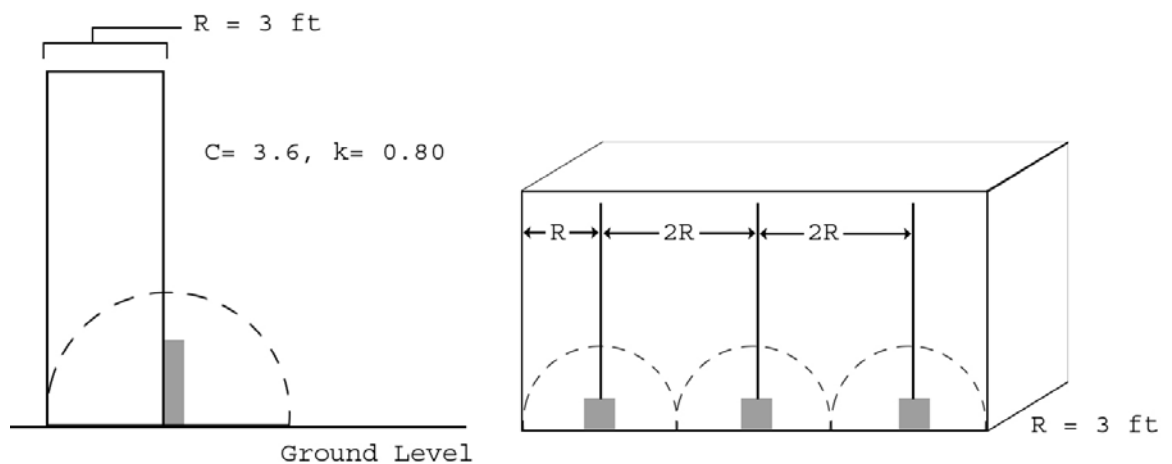
**Example**

Type of Explosive	TNT
RE Factor	1
Package Weight	1 lb
Type of Material	Reinforced Concrete
Breaching Radius (ft) (R)	3 ft
K Value (from chart)	0.80
Type Tamping	Untamped, Ground Placed
C Value (from chart)	3.6
Width of Target	70 ft

(a) Formula:

$$P = R^3 K C$$

(b) Draw a picture:



(2) Solve formula:

$$P = R^3 K C$$

$$P = (3 \text{ ft})^3 (0.80) (3.6) = 77.76 \text{ lbs TNT}$$

(3) Divide by RE factor:

$$\frac{77.76 \text{ lbs TNT}}{1} = 77.76 \text{ lbs TNT}$$

(4) Divide by package weight and round up:

$$\frac{77.76 \text{ lbs TNT}}{1 \text{ lb TNT/PKG}} = 77.76 \text{ lbs TNT}$$

77.76 PKGs rounds up to 78 PKGs TNT

(5) Determine the number charges and round up:

$$N = \frac{W}{2R} = \frac{70}{2(3)} = 11.60 \text{ Charges}$$

11.60 Charges rounds up to 12 charges

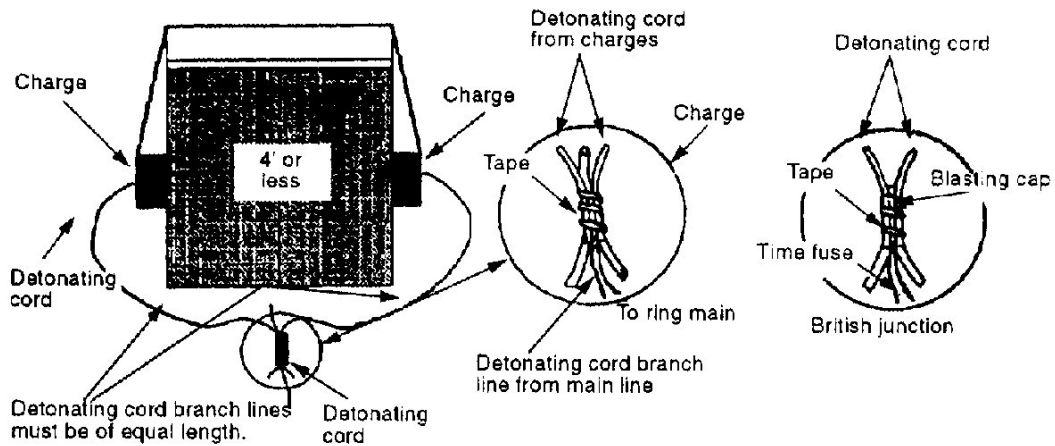
(6) Multiply amount of explosives by number of charges:

$$78 \text{ PKGs} \times 12 \text{ Charges} = 936 \text{ PKGs TNT}$$

b. Counter Force Charge Placement: Use 1½ pounds of explosive per foot of thickness. Round up to the next higher ½ foot before multiplying. Maximum target thickness is 4 feet.

Breaching Charge Thickness\*

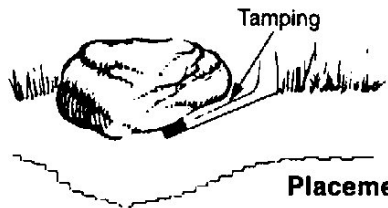
Charge Weight (lbs)	Charge Thickness (inches)
Less than 5	1
5 to less than 40	2
40 to less than 300	3
300 or more	4
* Approximate Values	



c. Boulder Blasting Charges:

- (1) Block Holing Method: Drill a hole in the top of the boulder deep and wide enough to hold the amount of explosive required. Prime the charge, place into the borehole and stem.
- (2) Snakeholing Method: Dig a hole large enough to hold the charge under the boulder. Pack the explosive charge under and against the boulder.
- (3) Mudcapping Method: Place the charge on top or against the side of the boulder wherever a crack or seam exists that will aid in breakage. Cover the charge with 10 to 12 inches of mud or clay.

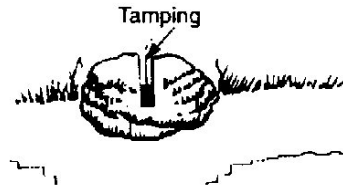
**Placement of snake-hole charge**



**Placement of mud-capped charge**



**Placement of block-hole charge**



Boulder Diameter (m)	Charge Size (lbs)		
	Block-Hole Method	Snake-Hole Method	Mud-Cap Method
3	0.250	0.75	2.0
4	0.375	2.00	3.5
4	0.500	3.00	6.0

**Notes**

## 6. M122, DEMOLITION FIRING DEVICE

### a. M122, General Data Chart

M122, General Data	
Transmitter:	
Size (antenna collapsed)	
Length:	11.0 in (28 cm)
Width:	2.63 in (6.37 cm)
Height:	6.25 in (15.87 cm)
Weight:	
Without battery pack:	2.25 lbs (1.25 kg)
With battery pack:	4.25 lbs (2.13 kg)
Operating temperature	-25° F to +125° F (-32° C to +52° C)
Effective range:	
Nominal:	0.6 MI (1km) or less
Estimated:	
Dense foliage:	0.6 MI (1km) or less
Dense jungle:	0.5 MI (0.8km) or less
Land (line of sight):	2.0 MI (3.3km) or less
Water:	3.0 MI (5.0km) or less
Frozen tundra:	0.5 MI (0.8km) or less
From aircraft:	6.0 MI (10.0km) or less
Receiver:	
Size:	
Length:	4 in (10 cm)
Width:	4 in (10 cm)
Height:	4 in (10 cm)
Weight:	
Without battery pack:	1.1 lbs (0.5 kg)
With battery pack:	1.4 lbs (0.6 kg)
Nominal capacity:	Five M6 Electric Blasting Caps in series
Operating temperature:	-25° F to +125° F (-32° C to +52° C)
Number of caps able to be initiated:	See table

Transmitter Battery Pack, M112	
Type Battery:	Alkaline
Voltage:	18 volts
NSN:	6135-01-110-3516
Size:	
Length:	5.1 in (12.9 cm)

Width:	3.3 in (8.4 cm)
Height:	2.3 in (5.8 cm)
Weight:	2.0 lbs (0.9 cm)
Receiver Battery Pack, M112	
Type Battery:	Alkaline
Voltage:	1.5 volts
BA Type	BA 3030/U
NSN:	6135-00-930-0030
Operating Temperature:	General and Low temperatures
TM:	TM 9-1375-213-12-3&P
Life Expectancy at given temps:	-25° F - 20 Days +70° F – 50 Days +125° F – 30 Days

Firing Lead Length (ft)	Number of M6 Caps	
	No. 18 AWG	WD-1 Wire
50 (or less)	15	10
100	14	9
200	13	8
500	12	2
1000	8	1

b. Firing Procedures:

- (1) Before firing, allow 8 minutes to pass after the arming switch is set to ARM.
- (2) Set the receiver's code in the transmitter. Set letter using area code switch. Set numbers using the six button switches.
- (3) Unscrew the transmitter antenna cap and extend the antenna to its full 47-inch length.
- (4) Hold the transmitter in a vertical attitude. Lift FIRE button cover and push the FIRE button. Hold the FIRE button down for at least five seconds.
- (5) When using one transmitter to activate two or more receivers in succession, allow approximately 3-4 seconds delay between firing.

- (6) Avoid contact with antenna when pressing fire button. A slight burn can result from touching the antenna when a signal is being transmitted, in addition to the transmission range being reduced.
- (7) Operator will obtain greater transmitting range when operating transmitter by:
  - (a) Holding the transmitter against chest.
  - (b) In a kneeling position, placing the transmitter on the knee
  - (c) Placing the transmitter on ground or on top of large metal surface, such as the top of a vehicle, etc.
- (8) To recover the receiver:
  - (a) Return to the receiver site only after it has been determined that the charge has been fired.
  - (b) Hold the receiver body steady and lift the arming switch and move it to the SAFE position.
  - (c) Disconnect the firing leads and antenna from the receiver.
- (9) Misfire procedures:
  - (a) Check to ensure at least 8 minutes have passed since the receiver's arming switch was moved to the ARM position.
  - (b) Check the transmitter's code setting. Use a flat tip screwdriver to rotate the code switch back and forth through all positions five times. Reset the area code.
  - (c) If 8 minutes have passed since arming the receiver. Lift the FIRE button cover, and press the FIRE button.
  - (d) If the charge fails to fire, set the code to all zeros (any area code) lift the FIRE button cover, press and hold FIRE button for 5 seconds and observe lamp. If the FIRE SIGNAL lamp fails to light, secure another transmitter, if possible, and attempt to fire the charge with it.
  - (e) If the FIRE SIGNAL lamp lights, reset the transmitter with the proper code for the receiver being used, move closer to receiver if such movement can be safely undertaken from both a tactical and situation as well as to maintain a safe distance from the

explosives. In addition to moving closer to receiver, relocate transmitter, if possible, so that its signal will reach the receiver from a different direction.

(f) From the new position, lift the FIRE button cover and push FIRE button once again.

(g) If above procedure again fails to initiate the explosives, secure another transmitter. Set the proper code, and attempt to fire the charge in the normal manner.

- Reset transmitter to zero at transmitter site.
- Wait ½ hour before approaching a misfired charge. When operator approaches a receiver after a misfire, it is advisable that he take the transmitter with him in order to prevent the receiver from being inadvertently activated by someone else. The transmitter's antenna should be collapsed.
- During the waiting time, attempt to use another receiver if available.
- After waiting ½ hour, approach the receiver, separate and cut the lead wires from the blasting cap binding posts one at a time without disturbing the receiver caps, or connections.
- Strip an inch of insulation from the cut lead wires and shunt wires. Remove the remaining wire from binding posts.
- Remove the blasting caps from the firing circuit by cutting the det chord.
- Place the caps a safe distance away from the charges and personnel. Check cap circuit using M51 test set or galvanometer. Check wires for visual damage in the process.
- Using a new receiver, repeat the hook-up sequence.
- If a new receiver is not available, check the current receiver as follows.
- Retrieve and hold the receiver steady, lift and move arming switch to the SAFE position.

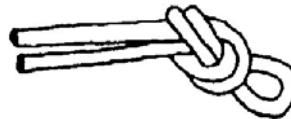
- Ensure that the receiver's battery cap is tightened to the index mark located on the receiver's battery compartment.
- Ensure that the receiver's antenna is properly connected and is NOT grounded.
- Ensure the firing circuit has been properly connected.
- If the problem is one of the above, correct as required and repeat arming and firing procedure.
- If the problem is not one of those listed above, use a standard blasting machine to complete the operation.

## 7. DEMO KNOTS

- a. Uli Knot- Used to prime plastic explosives. (8 Wraps minimum)



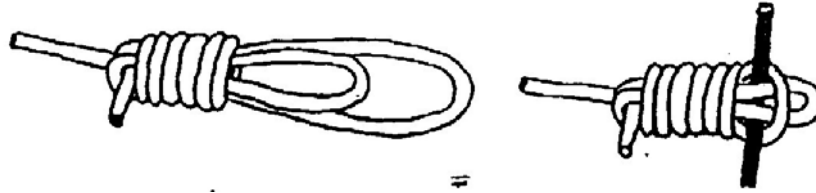
- b. Overhand Knot- Used to prime plastic explosives.



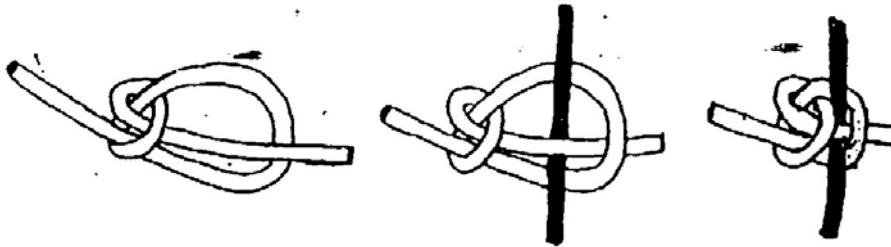
- c. Triple Roll Knot- Used to prime plastic explosives.



- d. Gregory Knot- Used to tie into a line main (4-6 wraps)



e. Scanman Knot- Used to tie into a line main.



## 8. FIELD EXPEDIENT DEMOS

Expedient demolition techniques are not presented as a replacement for the standard demolition methods, but are for use by experienced blasters in special missions. Availability of trained soldiers, time, and material will usually determine the use of conventional demolitions versus expedient demolitions.

EXPEDIENT DEMOLITIONS CHART		
Expedient Charge	Conventional Charge	Reference
Exp. Bangalore	M1A1, Bangalore Torpedo	SF Demo
Exp. Shape Charge	M-2, 15 lbs Shape Charge	FM 5-250
Exp. Claymore	M18A1, Claymore Mine	SF Demo
Exp. Satchel Charge	M183, Satchel Charge	FM 5-250
Exp. Cratering Charge	40 lbs Cratering Charge	FM 5-250
Grape Shot Charge	M18A1, Claymore Mine	FM 5-250
Platter Charge	None	FM 5-250
Fougasse	None	FM 3-11
Dust Initiator	None	FM 5-250
Soap Dish	None	SF Demo
Barbed Wire APM	None	SF Demo

a. Improvised Shape Charge: (Monroe Effect)

(1) Material Required:

(a) Cone- The cavity angle is between 30 degrees and 60 degrees; 45 degrees is optimum. Example cavity shapes:

– Bowl

- Funnel (Cover Hole)
- Champagne Glass
- Champagne, wine, or cognac bottle (With false bottom)

(b) Explosives:

- Plastic explosive (M112, M118, M186)
- Dynamite
- Molten TNT

(c) Container to hold explosives:

- Cardboard cylinder

(d) Primer

- M-6 or M-7 blasting cap is optimum
- Uli knot/Triple Roll Knot

(e) Miscellaneous

- Demo Kit
- Sticks (Stand Off)
- Dual Det System
- Blunt packing stick

(2) Preparation:

(a) Prepare the container.

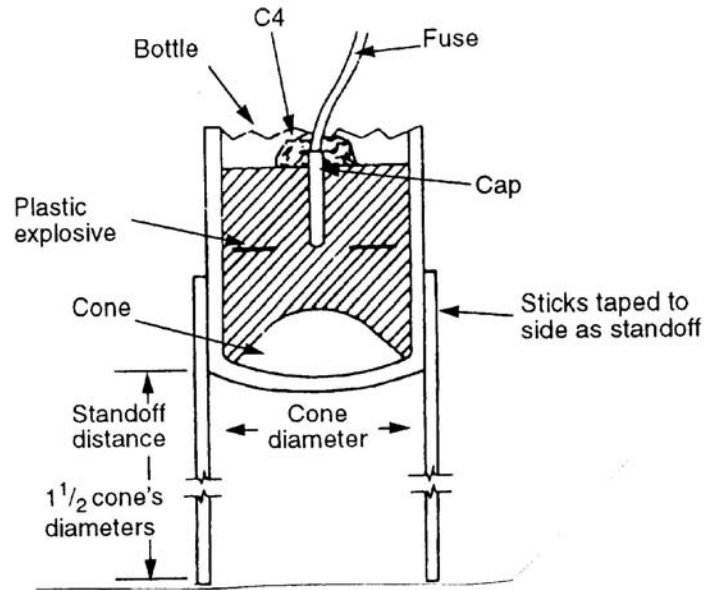
(b) Pack the explosives onto the container. The height of explosives in the container should equal twice the height of the cone (measured from the base of the cone to the top of the explosive).

(c) Prepare the stand-off. Stand-off height is equal to 1.5 times the diameter of the cone. Tape the measured stand-off material of the charge.

(d) Prepare a dual det firing system as required.

(e) Prime the charge by placing blasting cap or Uli knot in the top dead center of the charge. Cover the cap or knot with a small quantity of explosive.

(3) Illustration- Improvised Shape Charge



b. Platter Charge: (Miznay-Shardin Effect)

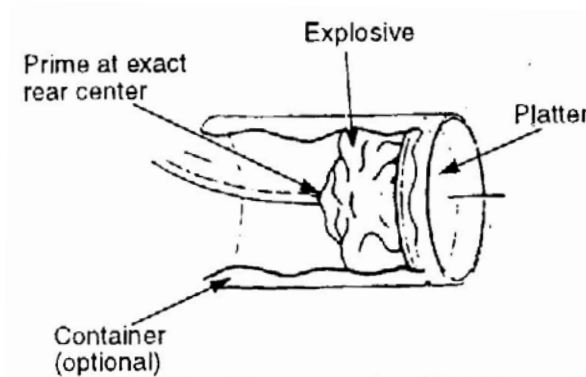
(1) Materials Required:

- (a) Platter- Round, convex, 2-6 pounds, 6-8 inch diameter, steel platter is optimum. Square or flat platters are acceptable.  $\frac{1}{2}$ " to  $1\frac{1}{2}$ " thickness.
- (b) Container- To hold explosives (optional)
- (c) Buffer material:
  - Cardboard
  - Tire tube
  - Cloth
  - Felt
- (d) Explosives- The weight of the explosives should equal the weight of the platter. C-4 plastic explosives are best.
- (e) Primer:
  - M-6, M-7 Blasting Cap, optimum
  - Uli knot/Triple Roll Knot
- (f) Miscellaneous
  - Demo Kit
  - Dual det system
  - Aiming device (guttled M60 fuse igniter)
  - Hanging device (wire, coat hanger, tape, string, etc.)

(2) Preparation:

- (a) Place buffer material behind platter. Buffer material should be the same thickness as the steel.
- (b) Pack explosives uniformly on the buffer material. Hold in place with tape or optional container. Do not place anything over front of platter (i.e.- tape).
- (c) Prepare handling device as required.
- (d) Attach arming device
- (e) Prepare dual det firing system
- (f) Prime charge by placing blasting cap or Uli knot in the exact center of the charge. Cover cap or knot with a small quantity of explosives.

(3) Illustration- Improvised Platter Charge:



c. Improvised Bangalore Torpedo:

(1) Materials Required:

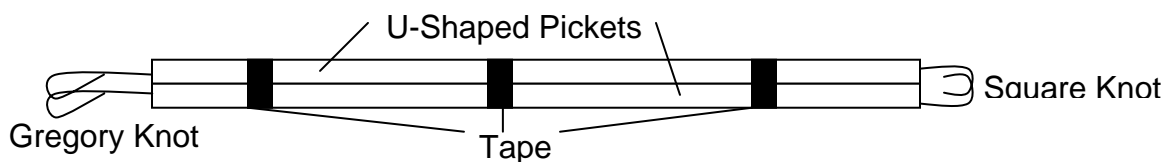
- (a) Container- U-Shaped Pickets
- (b) Explosive- Plastic Explosive (1.5 lbs per foot of Bangalore)
- (c) Primer- Det Cord
- (d) Miscellaneous:
  - Demo Kit

- Dual det system
- Packing stick (solid, non-sparking)
- Dummy nose cone (branch stick)

(2) Preparation:

- (a) Pack C-4 into U-shaped picket by cutting the explosive first, then using the packing stick.
- (b) Prior to completely filling the picket, run a length of det cord down the center of each picket leaving an extra 1-2 feet of det chord on both ends of the picket.
- (c) Cover the det cord with the remaining plastic explosive.
- (d) Place two completed pickets together and wrap tightly with tape, cloth or string.
- (e) When attaching two or more expedient Bangalore torpedoes, tie the extra det cord together with a square knot.
- (f) On the lead torpedo section, tie the extra det cord ends together in a square knot and secure the dummy nose cone if used.
- (g) On the tail section, tie gregory knots with the free running end of det cord. These will be used to tie into the line main.

(3) Illustration- Expedient Bangalore Torpedo



d. Grape Shot, AP Mine

(1) Materials Required:

- (a) Container: Thicker walls will produce more accurate aim.
  - #10 can
  - Ammo can
  - Artillery casing
  - Powder tube

(b) Buffer material (2-3 inches):

- Earth/Mud
- Leaves
- Felt
- Cloth
- Cardboard

(c) Explosive- Plastic Explosive (1 Part explosive to 1 part shrapnel)

(d) Projectiles:

- Nuts/Bolts
- Screws/Nails
- Pebbles
- Small pieces of barbed wire
- Ammo cartridges

(e) Primer:

- Blasting Cap
- Det Cord Demo Knot (optimum)

(f) Miscellaneous:

- Demo kit
- Dual det system
- Packing Stick (broom handle)
- Sighting device (guttled M-60 fuse igniter)

(2) Preparation:

(a) Pack explosives firmly into container

(b) Add layer of buffer material

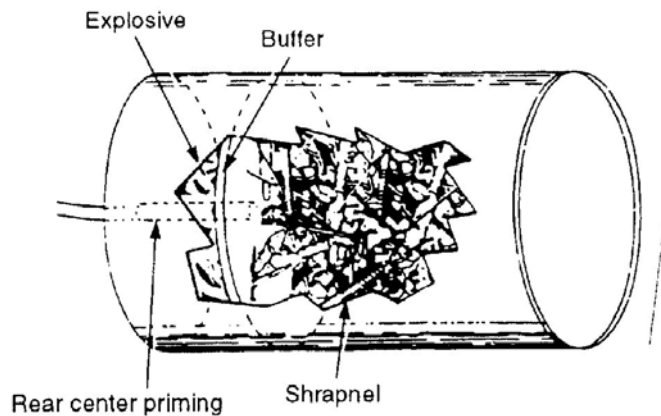
(c) Fill container with projectiles

(d) Attach sighting device (if used)

(e) Prime explosives with either the blasting cap or a Uli knot in the exact rear of the charge. Cover the cap or knot with a small quantity of explosives.

(f) Cover with tape, if desired.

## (3) Illustration- Improved Grape Shot Charge



## e. Improved Cratering Charge:

## (1) Material Required:

## (a) Mixing container:

- 55 gallon drum
- Plastic garbage bags
- Sand Bags

## (b) Primer:

- TNT (primed with det cord)
- Dynamite (laced with det cord)
- The ratio is one pound of primer to 25 pounds of ammonium nitrate

## (c) Charge:

- Ammonium nitrate fertilizer (containing at least 33 1/3 percent nitrogen) and diesel fuel, motor oil, or gasoline. The ratio is 25 pound fertilizer to one quart fuel. Use dry fertilizer only.

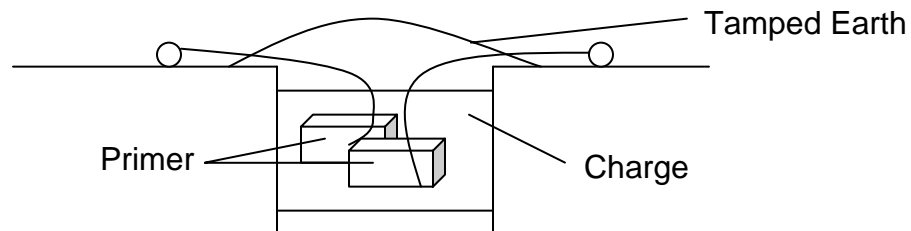
## (d) Miscellaneous:

- Demo kit
- Dual det system
- Stirring Stick
- Digging tools
- Shape Charge (optional)

## (2) Preparation:

- (a) Pour fuel on fertilizer in mixing container. Stir mixture until consistent.
- (b) Allow the mixture to soak for one hour.
- (c) Construct a borehole with either a shape charge or pioneer hand tools.
- (d) Pour one-third of the charge into the bag.
- (e) Place the ½ lb. primer into the charge
- (f) Pour another one-third of the charge into the charge
- (g) Place the second ½ lb. primer into the charge
- (h) Pour the rest of the charge into the bag.
- (i) Tape the bag closed and place in borehole
- (j) Tamp with earth
- (k) Fire
- (l) Bag does not have to be used, charge can be mixed in borehole, but must be fired as soon as possible to avoid moisture from reducing the effectiveness of the charge.

(3) Illustration- Improvised Cratering Charge:



f. Improvised Satchel Charge (Ammonium Nitrate Satchel Charge):

(1) Materials Required:

- (a) Mixing Container: (for the wax)
  - Ammo Can

- Cooking Pot

(b) Charge Container:

- Briefcase
- Cardboard box
- Sand bag
- Ammo can
- Rucksack
- Plastic bag

(c) Primer:

- TNT (primed with det cord)
- Dynamite
- Use one pound of explosive for every 25 pounds of ammonium nitrate.

(d) Charge:

- Ammonium nitrate fertilizer (containing at least 33.33 percent nitrogen) and wax (paraffin). The ratio is 4 pounds fertilizer to 1 pound wax.

(e) Miscellaneous:

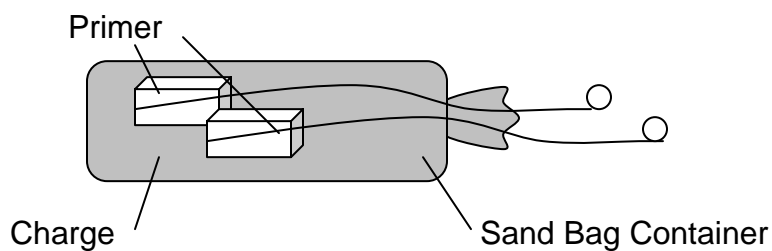
- Demo kit
- Dual det system
- Stirring Stick
- Heat source to melt wax
- Shrapnel/projectiles (optional):
  - Nuts/bolts
  - Screws/nails
  - Pebbles
  - Bits of barbed wire
  - Ammo cartridges

(2) Preparation:

- Melt the wax in a container over a heat source.
- Add the melted wax to the fertilizer while still hot. Mix well. Add shrapnel if desired.
- Pour one-third of the mixture into the charge container.
- Add the first primer before the mixture hardens.

- (e) Add one-third of the remaining mixture into the charge containers.
- (f) Add the second primer to the charge
- (g) Pour the remainder of the mixture into the container
- (h) This charge can be molded into any shape desired while mixture is still warm.
- (i) When mixture hardens, breaching charge is ready.

(3) Illustration- Improvised Satchel Charge:



g. Dust Initiator:

(1) Materials required:

- (a) Charge container:
  - Sand bag
  - MRE bag
  - Plastic bag
- (b) Explosive Charge:
  - Powdered TNT
- (c) Incendiary mix:
  - Thermite (two parts aluminum powder or magnesium powder to three parts ferric oxide).
- (d) Cover/surround:
  - (up to 40 lbs. per 1000 cubic feet)
  - (3 lbs. cover for enclosed space, 5 lbs. for partially enclosed space)
  - Coal dust
  - Cocoa
  - Coffee
  - Confectioners sugar

- Tapioca
- Wheat flour
- Cornstarch
- Hard Rubber Dust
- Aluminum powder
- Magnesium Powder
- Powdered soap
- Gasoline (3 gallon maximum)

(e) Primer:

- Blasting Cap
- Uli Knot

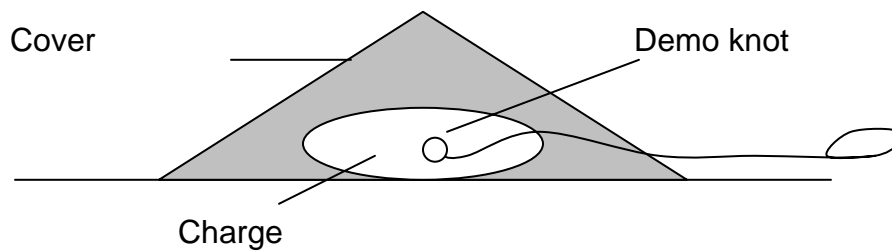
(f) Miscellaneous:

- Demo kit
- Dual det system
- Pounding/mixing stick

(2) Preparation

- (a) Powder the explosive (open blocks of TNT and crush the blocks in a canvas bag)
- (b) Prepare the dust initiator charge by mixing one part powdered TNT to one part ferric oxide. A one pound charge will effectively detonate up to 40 pounds of cover. Pour mixture into charge container.
- (c) Prime the dust initiator.
- (d) Place Thermite charge.
- (e) Place cover material on the dust initiator.
- (f) Close doors, windows, vents, etc. making the building as air tight as possible.
- (g) Ignite charges.

(3) Illustration- Dust Initiator



h. Fougasse

(1) Materials Needed:

(a) Container:

- 55 gallon drum (optimum)
- Trash can
- 5 gallon can
- Artillery casing
- Powder tube
- Open trench

(b) Fuel:

- Gasoline (optimum)
- JP-4
- Diesel

(c) Thickener/Setting time

- M-1 Thickener (Use 1 QT to 5 GAL fuel) 72 hr
- M-4 Thickener (Use 3 OZ to 1 GAL) (Optimum) 1hr
- Soap Flakes (Use 1 LB soap to 5 GAL fuel) 72 hr
- Styrofoam 72 hr

(d) Soap dish:

- ½ LB Thermite, ½ LB C-4

(e) Primer

- Det cord or Uli knot

(f) Miscellaneous

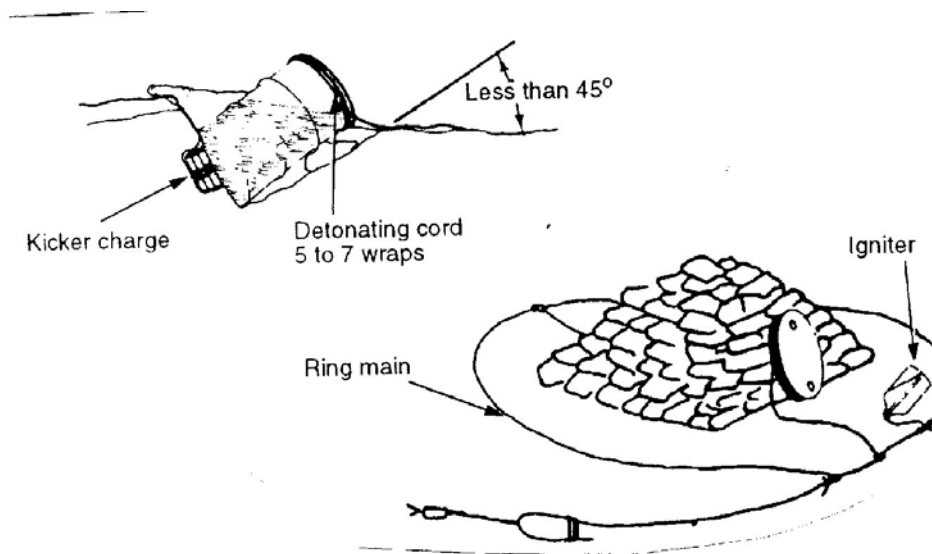
- Sand bags
- Earth
- Pioneer box (digging tools)
- Det cord

- Demo kit
- Dual det system

(2) Preparation:

- (a) Dig a hole so container sits at a 45 degree angle upwards and toward the enemy
- (b) Place fuel in the container, add thickener. Allow to sit for desired thickener setting time.
- (c) Place constructed soap dish charge, primed with det cord at the base of the drum.
- (d) Place full container in the hole.
- (e) Run all priming systems into one ring or line main
- (f) Cover the drum with earth and sand bags leaving the top open.
- (g) Prime the ring/line main with a dual det system.

(3) Illustration- Fougasse:



i. Soap Dish (One charge per 500 gallons)

(1) Materials Required

- (a) Container:

- Soap dish
- Cardboard box
- Cigar box

(b) Thermite: ½ LB  
- 2 parts aluminum powder to 3 parts ferric oxide

(c) Explosive: ½ LB  
- C-4

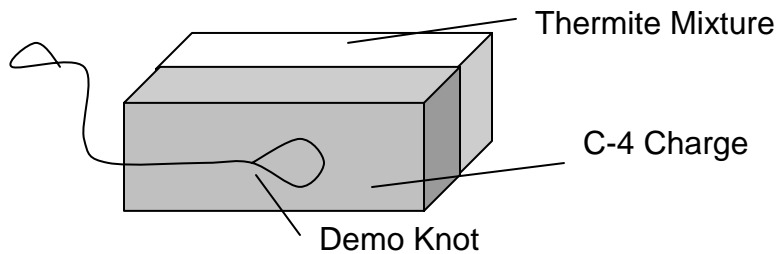
(d) Primer:  
- Uli knot

(e) Miscellaneous:  
- Demo kit  
- Det cord  
- Dual det system

## (2) Preparation

- Place C-4 and Thermite into container.
- Place C-4 with Uli knot
- Tape the container shut.
- Place the charge at fuel level, with Thermite closest to the fuel.
- Prime dual det system.

## (3) Illustration- Soap Dish Charge:



## j. HE Artillery Shell AT Mine:

### (1) Materials Required:

- HE artillery shell

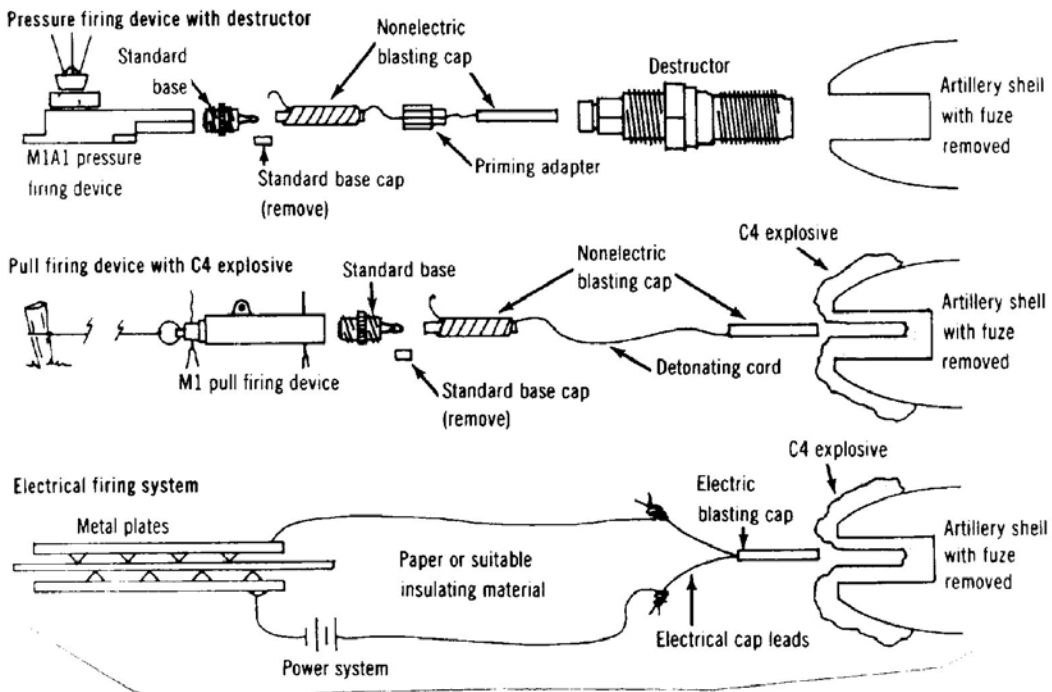
- (b) C-4 or other plastic explosive
- (c) Blasting cap
- (d) Miscellaneous:
  - Demo kit
  - Det cord
  - Dual det system or firing device

(2) Preparation:

- (a) Remove the fuse from the artillery shell
- (b) Pack C-4 firmly into the fuse well.
- (c) Prime with a blasting cap by inserting into the C-4.
- (d) Install either a dual det system or connect to a firing device for a booby trap.

(3) Illustration- HE Shell AT Mine

**High Explosive Artillery Shell Antitank Mine**



k. Improvised Claymore AP Mine

(1) Materials required:

(a) Explosive: Plastic explosive (C-4) (1 part explosive to 4 parts shrapnel)

(b) Shrapnel:

- Nails/screws
- Pebbles
- Nuts/bolts
- Ammo casings
- Small pieces of barbed wire

(c) Convex Base:

- Sheet metal
- Wood
- Plastic

(d) Retainer:

- Screen
- Plastic bag
- Paper

(e) Legs:

- Sticks/wood
- Metal poles

(f) Primer:

- Blasting kit
- Det cord or Uli knot

(g) Miscellaneous:

- Demo kit
- Dual det system or firing device
- Det cord

(2) Preparation:

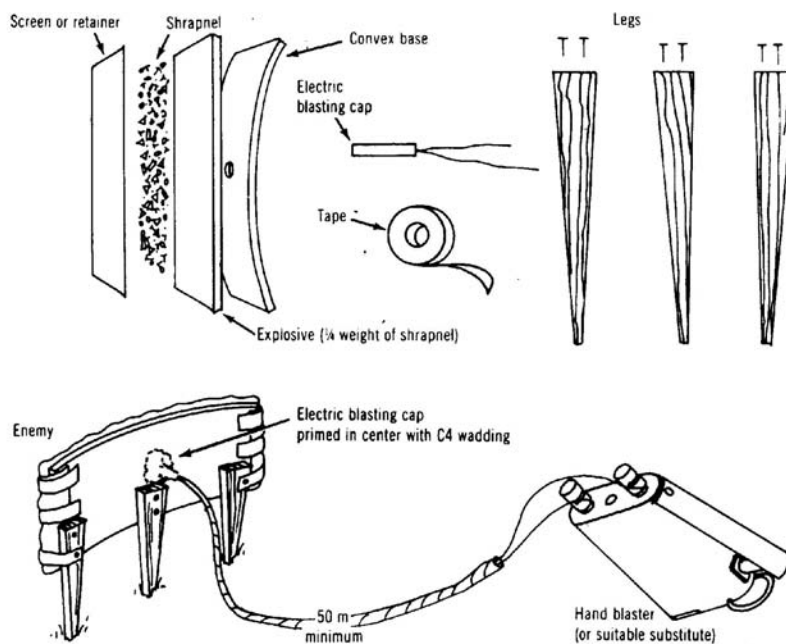
(a) Attach legs to convex base.

(b) Bore a hole in the middle, center of the convex base large enough for the blasting cap or det cord to fit through.

- (c) Mold explosive to convex base. One part explosive to 4 parts shrapnel.
- (d) Add shrapnel to explosive and hold in place with retaining material.
- (e) Tape the mine together.
- (f) Prime the mine with a blasting cap or Uli knot. Cover the cap/knot with a bit of plastic explosive.
- (g) Install and prime the dual det system or the firing device for a booby trap.

(3) Illustration- Improvised Claymore AP Mine:

**Improvised Claymore Mine**



**I. Barbed Wire AP Fragmentation Mine:**

(1) Materials required:

- (a) One roll standard barbed wire (NSN: 5660-00-251-4482)
- (b) One block plastic explosive
- (c) Primer:

- Blasting cap
- Det cord or Uli knot

(d) Miscellaneous:

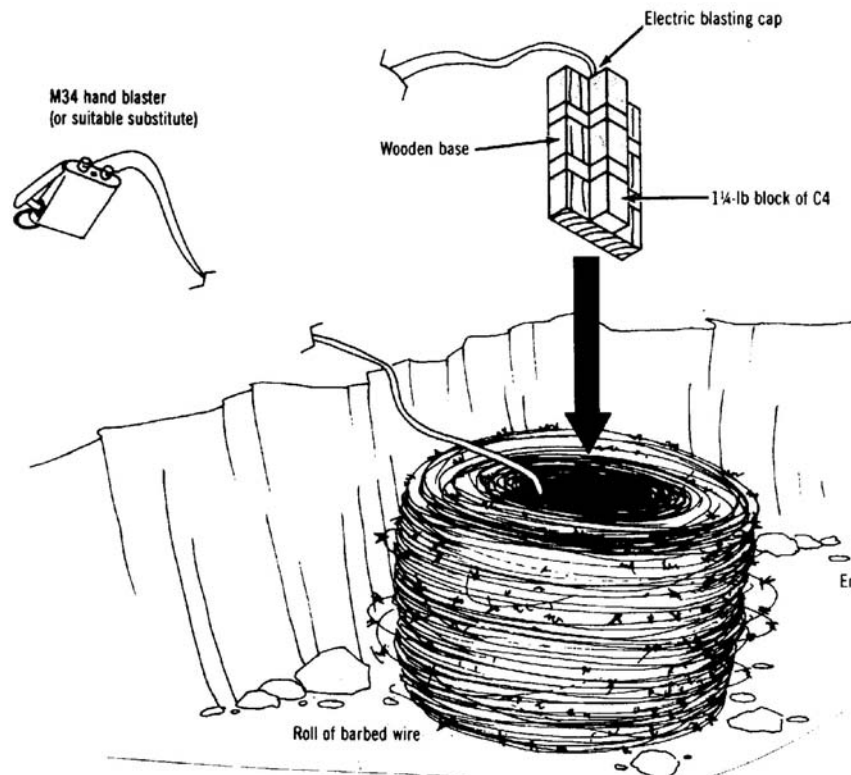
- Demo kit
- Dual det system or firing device
- Det cord
- Wooden base

(2) Preparation:

- Attach the block of C-4 to the wooden base with tape.
- Prime the explosive with either a blasting cap or Uli knot.
- Insert the explosive into the roll of barbed wire.
- Prime the dual det system or install the firing device for a booby trap.

(3) Illustration- Barbed Wire AP Fragmentation Mine:

**Barbed Wire Antipersonnel Mine**



m. Fragmentation Grenade AP Mine:

(1) Materials required:

(a) Grenade:

- M67, M26, M33

(b) Tape

(c) Paper clip

(d) Trip wire:

- Clear monofilament fish line (13 LB test)
- Wire
- String

(2) Preparation:

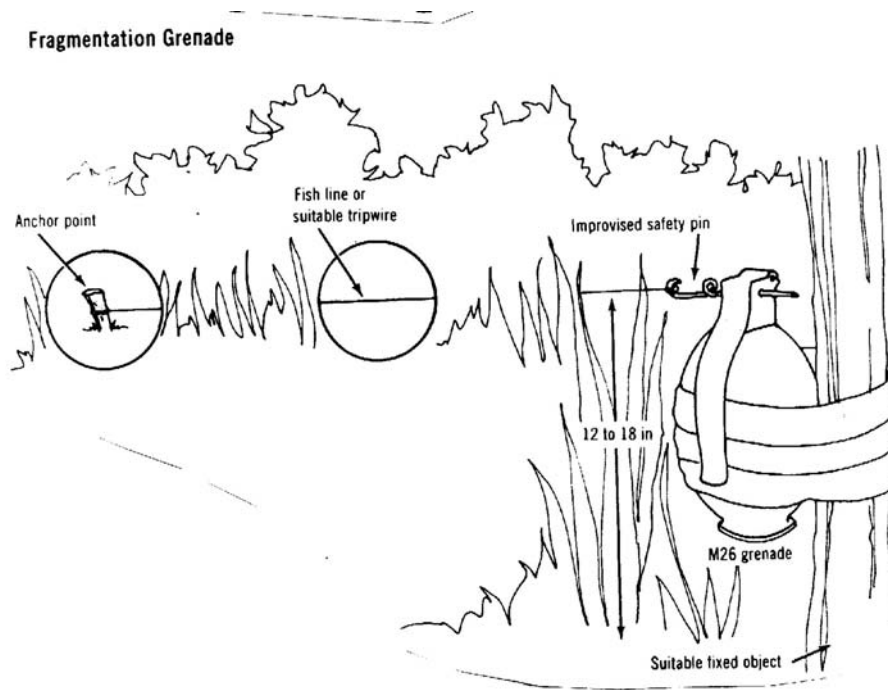
(a) Tape grenade to a tree or other fixed object.

(b) Temporarily secure spoon to grenade

(c) Using a paper clip, construct a pull-pin with a loop in one end. Remove safety pin and insert the pull-pin.

(d) Run the trip wire from the anchor point across an avenue of approach to the improvised safety pin.

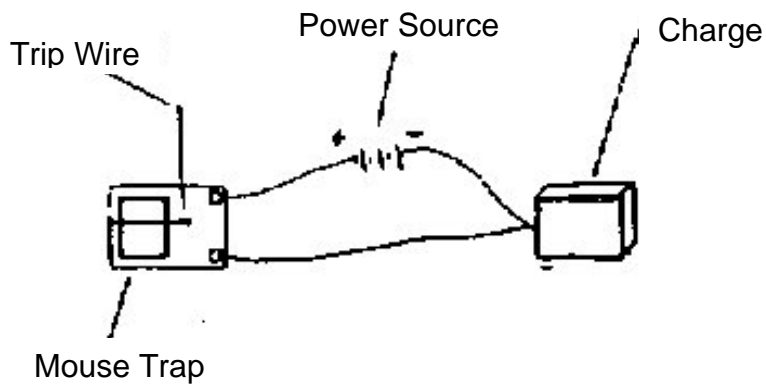
(3) Illustration- Fragmentation Grenade AP Mine:



n. Firing Devices:

(1) Mouse Trap: (Trip release)

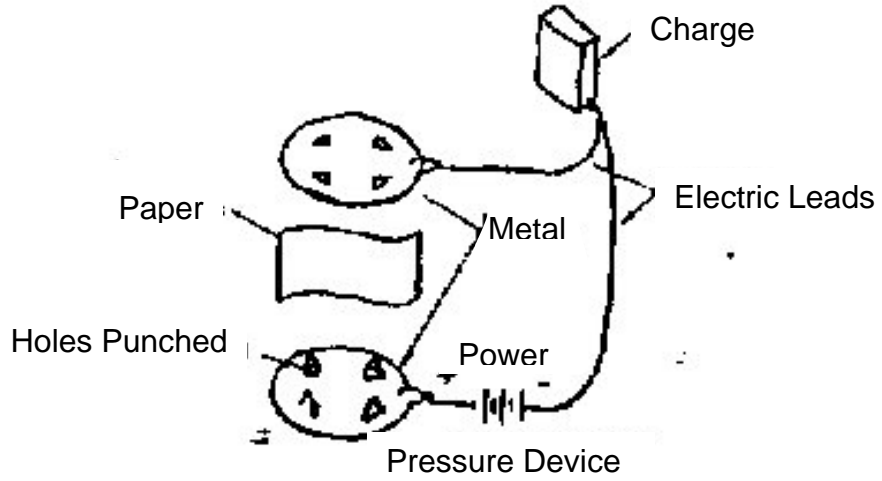
Illustration:



Note: The thumbtacks should be of all metal construction and non-painted.

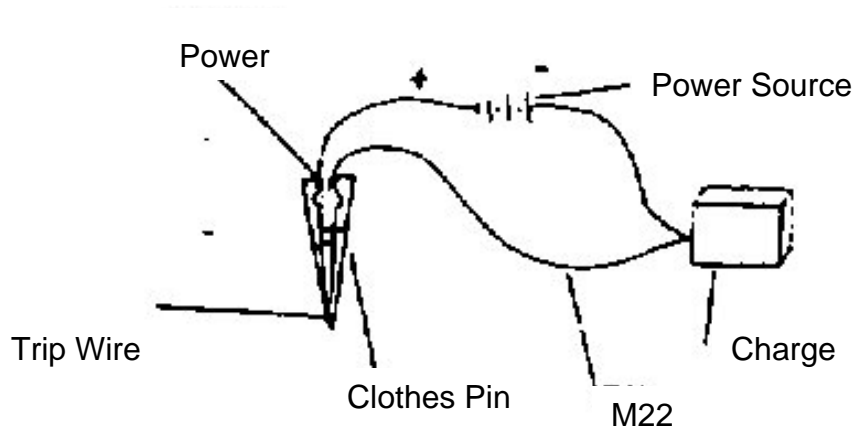
(2) Metal Plates: (Pressure device)

Illustration:



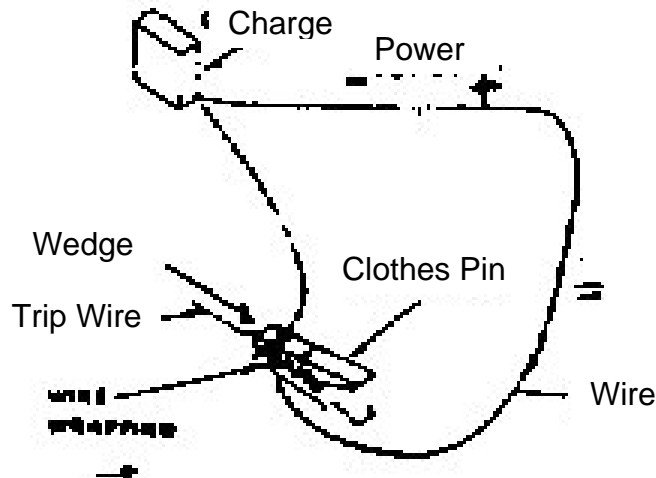
(3) Clothes Pin: (Tension release)

Illustration:



(4) Clothes Pin: (Pull release)

Illustration:



(5) Pull-loop Switch

Illustration:

o. Disarming Booby Traps:

Neutralizing: Neutralization is simply making a booby trap safe to handle. It involves two basic steps. First is in disarming or replacing the safety pins in the firing assembly. The second is diffusing or separating the firing assembly from the main charge and/or detonator from the firing assembly. If neutralization is not possible, the device must be destroyed in place.

p. Clearing Non-explosive Traps:

- (1) Be alert for other mines and booby traps in the area and ensure that individual traps are not further booby trapped.
- (2) Extreme caution must be exercised in clearing or neutralizing trip wire activated traps such as mace (log or bail) and the whip. After personnel have been cleared from the area, those devices can be activated by grappling hook from the side or rear of the point of impact.

(3) All booby traps which have been sprung should be destroyed or disposed of to prevent further use by the enemy.

q. Booby Traps: Safety must be the first priority when dealing with booby traps.

Note: Only as a last resort attempt to disarm the booby trap yourself.

(1) Rules of Conduct:

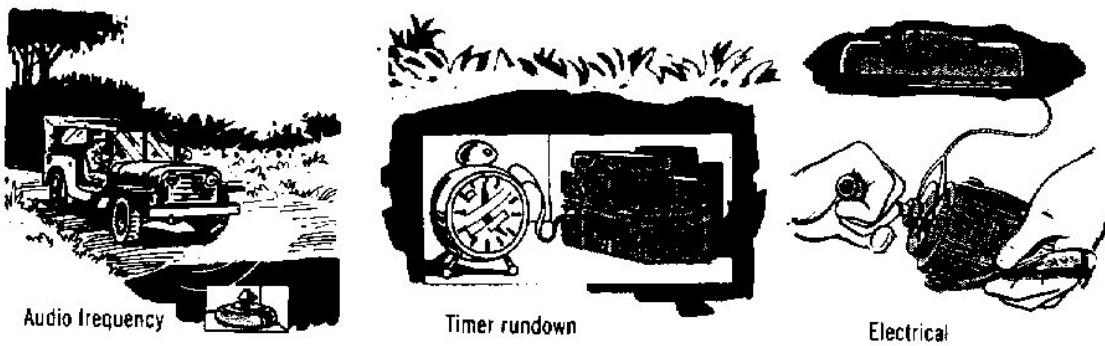
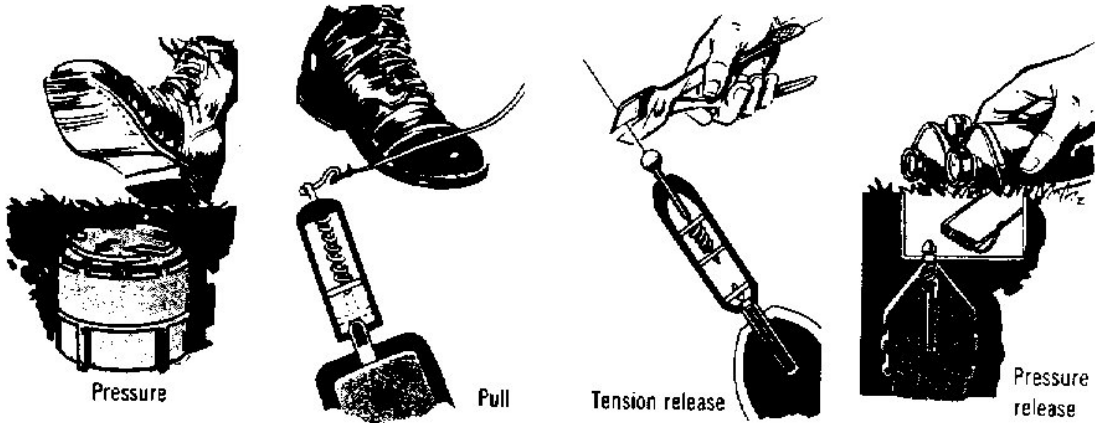
- (a) Keep in constant practice by inspecting and studying all known booby trap methods and mechanics.
- (b) Develop patience. A careless act may destroy you and others as well.
- (c) Remember that knowledge inspires confidence.
- (d) Let only one man deal with a booby trap. Keep all others out of danger.
- (e) If in doubt, get help from an expert.
- (f) Never group together when there is danger.
- (g) Be suspicious of every unusual object.
- (h) Regardless of nationality, consider every enemy a ruthless, cunning, ingenious killer.
- (i) Take protective measures.

(2) Detection and Search Techniques:

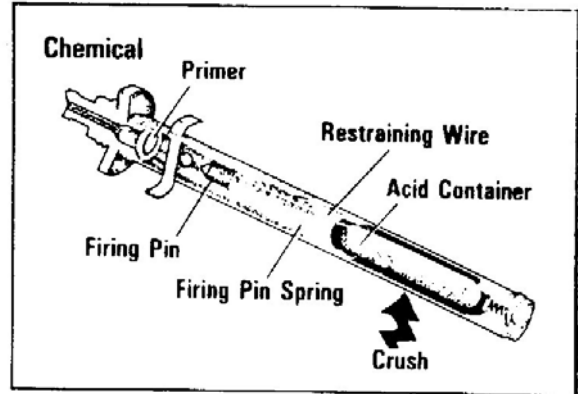
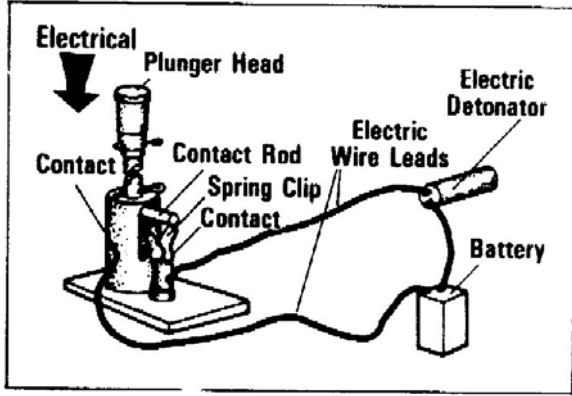
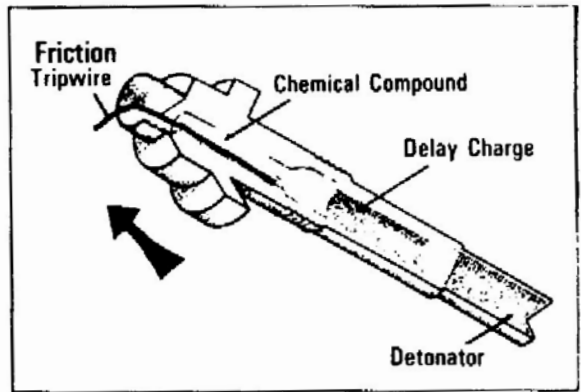
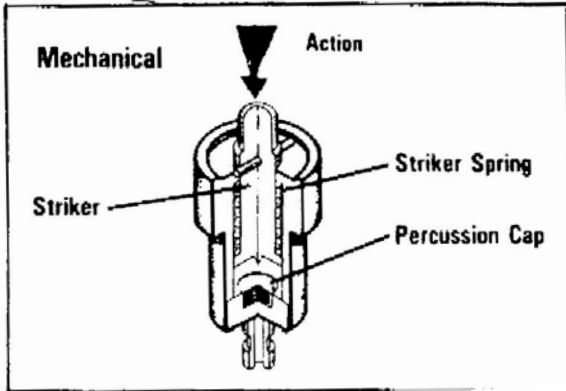
Detection of booby traps requires constant alertness and careful observation. The efficiency of detection effort depends on your knowledge and methods of booby trap detection.

(3) Construction Techniques:

(a) Initiating actions:



(b) Firing Devices:




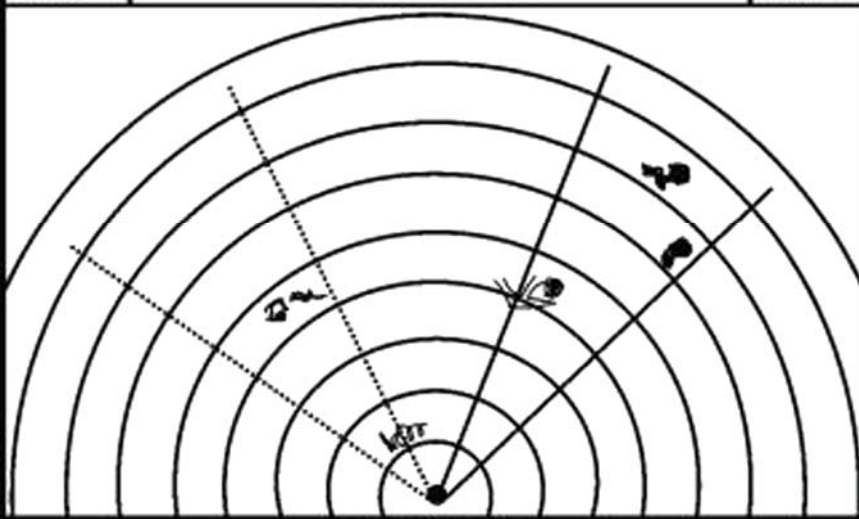
## CHAPTER 3

### WEAPONS

#### 1. COMPANY LEVEL WEAPONS:

Type	Maximum Effective Range	Unloaded Weight	Basic Load	Remarks
M1911A1, .45 cal, Automatic Pistol	50m	2.4	21 rds	7 rd magazine FM 23-35
M9, 9mm, Automatic Pistol	50m	2.1	45 rds	15 rd magazine TM9-1005-317-10 FM 23-35
M16A2, 5.56mm Assault Rifle	800m (Area Target) 550m (Point Target)	8.8	210 rds	FM 23-9 30 rd magazine
M203/79, 40mm, Grenade Launcher	350m (Area Target) 200m (Point Target)	11 (203) 6 (M79)	36 rds, HE	FM 23-31
M249, 5.56mm, SAW	800m	15.16	600 rds	FM 23-14 200 rd box weighs 6.92 lbs.
M67, 7.62mm, Machine gun	800m (Area Target) (Bipod mount)	23	600-900 rds	FM 23-67 Basic load designated by Cdr
M67, 90mm, Recoiless Rifle	300m	37.5	9 rds	FM 23-11
M72A1, 66mm, LAW, Heat Rocket	200m	5.2 (Loaded)	N/A	FM 23-33
M67/68/34, Hand Grenade	25m	1 1.5 (M34)	4	15m Burst radius (M34) 25m Burst radius
M18A1, AP mine, Claymore	50m	6.8	N/A	100m Casualty fan
M136, 84mm, Launcher and Cartridge, AT4, Heat	300m	14.8 (Loaded)	N/A	FM 23-25 10m Min Arming Range

2. RANGE CARD:

STANDARD RANGE CARD					
For use of this form see FM 7-72. The proponent agency is TRADOC					
SOD <u>20</u>	May be used for all types of direct fire weapons				 MAGNETIC NORTH
PLT <u>20</u>					
CO _____					
DATA SECTION					
POSITION IDENTIFICATION <u>FL93668141</u>			DATE <u>11NOV</u>		
WEAPON <u>M60</u>		EACH CIRCLE EQUALS <u>100</u> METERS			
NO.	DIRECTION/DEFLECTION	ELEVATION	RANGE	AMMO	DESCRIPTION
1	L035	0/ 24	400		PDF
2	R375	-50/ 15	625		BARN
3	R175	-50/ 40	725		HEDGEROW
REMARKS: <input type="checkbox"/> TW30/R1T <input type="checkbox"/> TW3/L3 <input type="checkbox"/> TW7/R3					

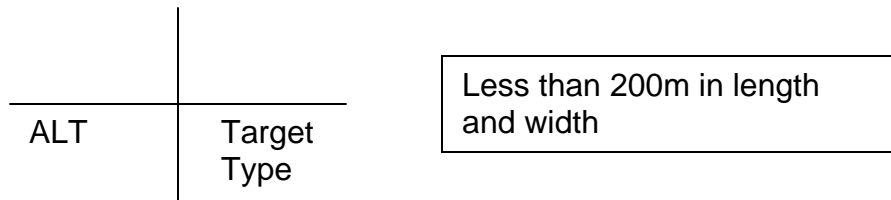
### 3. FIRE SUPPORT:

#### a. Capabilities:

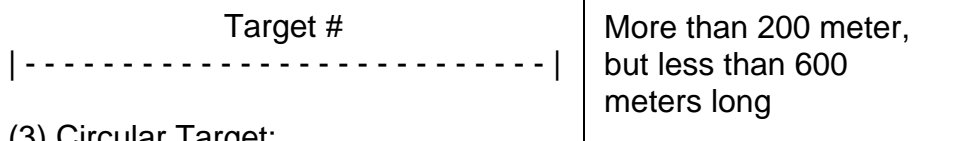
<b>Field Artillery</b>				
Weapon	Max Range (m)	Min Range (m)	Max Rate rds per min	Sustained Rate rds per min
105mm Howitzer, M101A1, Towed	11,000 14,500 (RAP)	0	10 fir 3 min.	3
105mm Howitzer M102, Towed	11,000 14,500 (RAP)	0	10 fir 3 min.	3
104mm Howitzer, M119 Towed	14,000	0	6 for 2 min	3 rds for 30 min, then 1 rnd per min
155m Howitzer M198 Towed	18,100 30,000 (RAP)	0	4 for 3 min 2 for 30 min	1 rnd per min Temperature dependent
155mm Howitzer M109A6 SP	22,200 30000 (RAP)	0	4 for 3 min	1 for 60 min 0.5
203mm Howitzer M110A2, SP	22,900 30,000 (RAP)	0	1.5 for 3 min	0.5
<b>Mortars</b>				
Weapon	Max Range (m)	Min Range (m)	Max Rate rds per min	Sustained Rate rds per min
60mm	3500 (HE)	70 (HE)	30 for 4 min	20
81mm	4790 (HE)	70 (HE)	25 for 2 min	8
120mm	7,200 (HE)	180 (HE)	15 for 1 min	5
<b>Naval Guns</b>				
Weapon	Full Charge	Reduced Charge	Max Rate rds per min	Sustained Rate Rnds per min
5 in / 38	15,904	8,114	20	15
5in / 54	23,133	12,215	35	20
16 in / 50	36,188	22,951	2	1

b. Target Symbols:

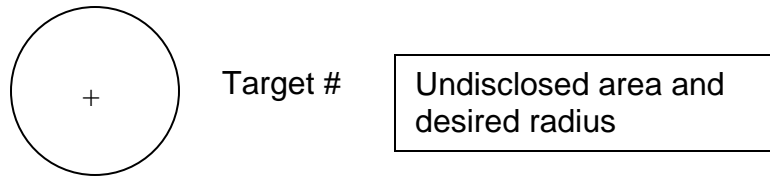
(1) Point Target:



(2) Liner Target:



(3) Circular Target:



c. Target List:

<u>Target Number</u>	<u>Description</u>	<u>Location</u>	<u>Remarks</u>
Assigned by Artillery Unit	Terrain Feature	Grid	Priority, Type Ammo

d. Target Overlay: A complete fire support overlay must include:

- (1) Unit and official capacity of person making overlay
- (2) Date the overlay was prepared
- (3) Map sheet number
- (4) Effective period of overlay (DTG)
- (5) Priority target
- (6) ORP location
- (7) Callsigns and frequencies (PRI/ALT)
- (8) Routes (PRI/ALT)

- (9) Phase line/Checkpoints used by the patrol
- (10) Spares
- (11) Index marks to position overlay on map
- (12) Objective
- (13) Target symbols
- (14) Description, location, remarks column, complete

e. Sterile Overlay must include:

- (1) Index marks to position overlay on map
- (2) Target symbols

**4. CLOSE AIR SUPPORT (CAS):**

- a. Information requirements when coordination or requesting close air support:

INITIAL CONTACT: “ (FAC CALL SIGN) _____, (MISSION #) _____ (AUTHENTICATION) _____ ”			
FAC BRIEF: *** AUTHENTICATION RESPONSE ***			
IP		INS STR PT	CP/IP/TGT
TGT LOCATION			
TGT DESCRIPTION			
FRIENDLY FORCES			
*** READ BACK - IP AND TARGET LOCATION ***			
ATTACK CLEARANCE			
*** ACKNOWLEDGE CLEARANCE ***			
NAV DETAILS (ELEV)			
TARGET ID (MARK)			
THREATS			
HAZARDS			
QNH, WIND			
OTHER ITEMS			
*** ACKNOWLEDGE ***			
DEPARTING IP: “ (MISSION #) _____, IP, _____ (ABORT CODE)			

- (1) Target Location- Distance and direction from smoke (6 digit grid)
- (2) Target description
- (3) Friendly forces (Example- 250 meters NW of smoke)
- (4) Target ID (Example- Target 600 meters SE of smoke)
- (5) NAV Details (Elevation)
- (6) Threats- ADA, small arms, etc.

(7) Hazards- Friendly aircraft in area

(8) Wind direction

b. Close Air Support Resources:

AIRCRAFT	SERVICE	CHARACTERISTICS
F-4 *	AF/N/MC/R/NG	A multi-mission aircraft optimized for air-to-air combat; also has a good air-to-ground capability; supersonic, typical load 6,000 lbs, max load 15,000 lbs.
A-4 *	N/MC	Sub-sonic, typical 4,000 lbs, maximum load 9,000 lbs.
A-7 *	AF Res/NG/N	Very accurate delivery; sub sonic; typical load 8,000 lbs, max load 15,000 lbs
A-10 *	AF	Specialized CAS aircraft, sub-sonic; typical load 6,000 lbs, max load 16,000 lbs, 30mm gun
O/A-37 *	AF Res	Sub-sonic, CAS version of primary trainer, typical load 2,000 lbs, max load 5,000 lbs, interdiction role in low thrust environment
F-16 *	AF	A multi-role aircraft, complements the F-4 and F-15 in an air-to-air role. Most accurate ground delivery system in the inventory, supersonic, typical load 6,000 lbs, max load 10,600 lbs
F-18 *	N/MC	A multi-role fighter scheduled to replace the F-4. A wide variety of air-to-surface weapons. Typical load 7,000 lbs, max load 17,000 lbs, 20mm gun mounted in the nose, air-to-air missiles.
AC-130	AF/R	A specialized CAS/RACO aircraft propeller driven. Two modes: A model is equipped with two 40mm guns, two 20mm guns and two 7.62mm miniguns. The H model is similar, except no 7.62 miniguns and one of the 40mm guns is replaced with a 105mm Howitzer. Both models have advanced sensors and target acquisition system including forward looking infrared radar (FLIR) and low light TV. Weapons employment accuracy is outstanding. This aircraft is vulnerable to enemy air defense systems and must operate in a low threat environment.

\* Denotes aircraft with FM capability.

## 5. CALL FOR / REQUEST FIRE:

### a. Field Artillery Terminology:

#### (1) Direction:

- Observer-to-target
- Given in mils (1 degree = 17.8 mils) to the nearest 10 mils
- Grid direction
- Magnetic direction
- Cardinal direction

#### (2) Distance:

- Observer-to-target
- Given in meters to the nearest 100 meters

#### (3) Known Points:

- FDC must know location
- Preplanned target
- Previously fired target
- Terrain

#### (4) Lateral Shift:

- Given in meters to nearest 10 meters
- Used to adjust or shift from known points
- Send to FDC if shift is 30 meters or greater

#### (5) Range Shift:

- Given in meters to the nearest 100 meters
- Used to adjust or shift from known points
- Send to FDC if shift is 30 meters or greater

### b. Elements and Sequences of Call for Fire (STANAG 2962)

#### (1) Observers Identification- Call signs

#### (2) Warning Order:

##### (a) Type of mission:

- Adjust fire
- Fire for effect

- Suppress
- Immediate suppression

(b) Size of element to fire for effect- When the observer does not specify what size element to fire, the battalion FDC will decide

(c) Method of target location:

- Polar plot
- Shift from a known point (give point TRP)
- Grid

(3) Location of Target:

(a) Grid coordinate- 6 digit. 8 digit if greater accuracy is required

(b) Shift from known point:

- Send OT direction:
- Mils (nearest 10)
- Degrees
- Cardinal direction
- Send lateral shift (Right/Left) (nearest 10m)
- Send range shift (Add/Drop) (nearest 100m)
- Send vertical shift (Up/Down) Use only if it exceeds 35 meters (Nearest 5 meters)

(c) Polar Plot:

- Send direction (Nearest 10 mils)
- Send distance (Nearest 100 meters)
- Send vertical shift (Nearest 5 meters)

(4) Description of Target:

(a) Type

(b) Activity

(c) Number

(d) Degree of protection

(e) Size and shape (Length/Width or radius)

(5) Method of Engagement:

(a) Type of Adjustment- When the observer does not request a specific type of fire control adjustment, area fire will be used.

- Area fire- moving target
- Precision fire- point target

(b) Danger Close- When friendly troops are within:

- 600 meters for mortars
- 600 meters for artillery
- 750 meters for naval guns 5 inches or smaller
- 1000 meters for naval guns over 5 inches
- 2000 meters for 16 inch naval guns (ICM or controlled variable time)

(c) Mark- Used to orient observer or to indicate targets

(d) Trajectory:

- Low angle (standard)
- High angle (Mortars or if required)

(e) Ammunition- HE quick will be used unless specified by the observer.

- Projectile (HE, ILLUM, ICM, SMOKE, etc.)
- Fuse (Quick, Time, etc)
- Volume of Fire (Observer may request the number of rounds to be fired)

(f) Distribution:

- 100 meter sheaf (Standard)
- Converged sheaf (Used for small hard targets)
- Specified sheaf (Any length, width, and attitude)
- Open sheaf (Separate bursts)
- Parallel sheaf (Linear target)

(6) Method of Fire and Control:

(a) Method of Fire- Specific guns and a specific interval between rounds. Normally to adjust fire, it is one gun with a 5-second interval between rounds.

(b) Method of Control:

- "At my command" - "Fire" Remains in effect until observer announces "Cancel at my command"
- "Cannot observe" Observer can't see the target
- "Time on target" Observer tells FDC when he wants the rounds to impact
- Continuous illumination- Calculated by the FDC otherwise observer indicates interval between rounds in seconds
- Coordinated illumination- Observer may order the interval between ILLUM and HE shells
- "Cease loading" to indicate the suspension of loading rounds
- "Check fire" Load and fire as fast as possible
- "Repeat" Fire another round(s) with or without adjustments

c. Authentication- Challenge and reply

d. Message to Observer

- (1) Battery (ies) to fire for effect
- (2) Adjusting battery
- (3) Changes to the initial call for fire
- (4) Number of rounds (per tube) to be fired for effect
- (5) Target numbers
- (6) Additional information
  - (a) Time of flight- Moving target mission
  - (b) Probable error in range- 38 meters or greater (normal mission)

(c) Angle T- 500 mils or greater

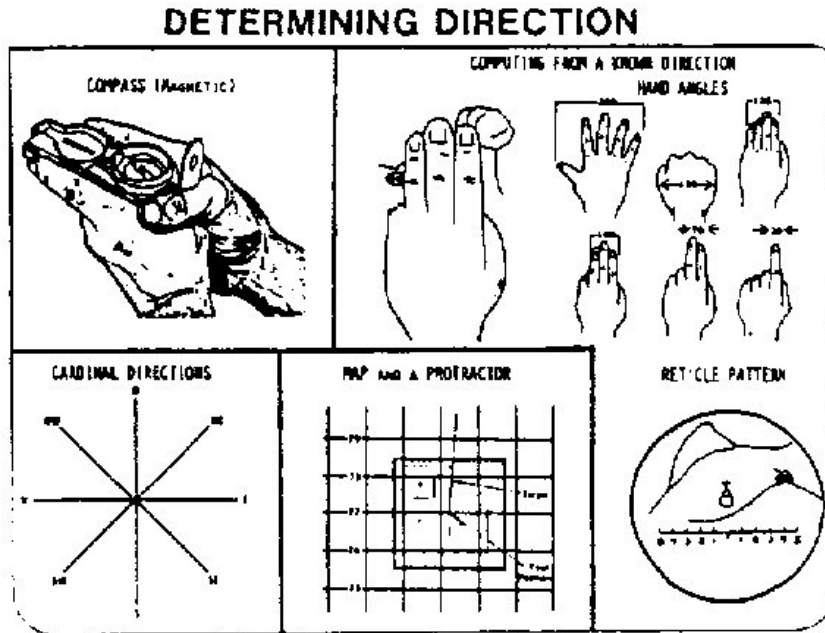
e. Correction of Errors- When FDC has made an error when reading back the fire support data, the observer announces "CORRECTION" and transmits the correct data in its entirety.

f. Adjustment:

(1) Lateral Shift (Right/Left)

(a) Determine horizontal angle in mils by:

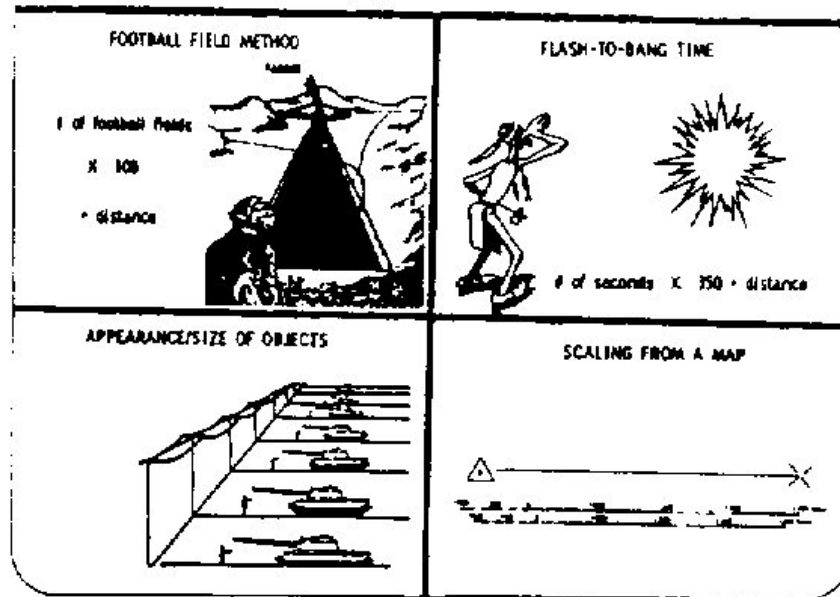
- Binocular reticule pattern
- Finger method (Arm must be fully extended)
- One finger (30 mils)
- Two finger (70 mils)
- Three fingers (100 mils)
- Four fingers (125 mils)
- Fist (180 mils)
- Spread Hand (300 mils)



(b) Determine OT distance:

- Known
- Given
- Estimated

### DETERMINING DISTANCE



(c) Determine OT factor:

- Estimate, in meters, the distance from you, the observer, to the target to the nearest thousand meters
- Drop the zeros
- If the distance is half-way between whole numbers, then round to the nearest even number.
- The OT factor converts mils to meters

Example

OT Distance = 2500

OT Factor = 2

- If OT distance is less than 1000 meters, round to nearest 100 meters and divide by 1000.

(d) Compute lateral shift (meters)- Multiply horizontal angle (mils) by OT factor. A lateral shift less than 30 m is ignored by the FDC.

(2) Range Shift: (Add/Drop)

Successive bracketing:

- If OT distance is 999m or less, start with a 100m bracket.
- If OT distance is between 1000-1999m, start using a 200m bracket
- If OT distance is 2000m or greater, start using a 400m bracket.
- Successively halve the bracket until the round is hitting within 50m, then fire for effect

h. Examples of Call for Fire Transmissions:

GRID MISSION

**OBSERVER**

F24, this is J42, ADJUST FIRE, OVER.  
GRID WM180513, DIRECTION 0530,  
OVER

Infantry platoon in the open, OVER

SHOT, OUT.

SPLASH, OUT.

End of mission, 15 casualties, platoon  
dispersed, OVER.

**FIRING UNIT**

J42, this is F24, ADJUST FIRE, OUT.  
GRID WM180513, DIRECTION 0530,  
OUT.

Infantry platoon in the open, OUT  
SHOT, OVER.

SPLASH, OVER.

End of mission, 15 casualties, platoon  
dispersed, OUT.

POLAR MISSION

**OBSERVER**

F24, this is J42, ADJUST FIRE,  
POLAR, OVER.  
DIRECTION 2420, DISTANCE 4400,  
OVER

Enemy observation post, OVER.

I AUTHENTICATE MIKE, OUT

SHOT, OUT.

SPLASH, OUT.

Observation post destroyed, 3  
casualties, OVER.

**FIRING UNIT**

J42, this is F24, ADJUST FIRE,  
POLAR, OUT.  
DIRECTION 2420, DISTANCE 4400,  
OVER

Enemy observation post,  
AUTHENTICATE Tango Mike, OVER.

SHOT, OVER.

SPLASH, OVER.

Observation post destroyed, 3  
casualties, OUT.

SHIFT FROM KNOWN POINT

**OBSERVER**

F24, this is J42, ADJUST FIRE, SHIFT  
AB1001, OVER.

DIRECTION 2420, RIGHT 400, ADD  
400, OVER

5 T72 Tanks in the open, OVER

I AUTHENTICATE Tango, over.

SHOT, OUT.

SPLASH, OUT.

End of mission, 2 tanks destroyed, 3 in  
woodline, OVER.

**FIRING UNIT**

J42, this is F24, ADJUST FIRE, SHIFT  
FIRE AB1001, OUT.

DIRECTION 2420, RIGHT 400, ADD  
400, OUT

5 T72 Tanks in the open,  
AUTHENTICATE Juliet November,  
OVER

SHOT, OVER.

SPLASH, OVER.

End of mission, 2 tanks destroyed, 3 in  
woodline, OUT.

## 6. THREAT:

a. Doctrine- Threat doctrine states that victory is gained by attacking and destroying an opponent's force rather than by seizing and holding terrain. Threat units defend against a stronger force only to gain time to concentrate their forces before resuming the offense.

(1) Offense- Threat infantry units and threat motorized rifle units use the offense as the preferred form of combat. The doctrine of both threat units states that decisive results can only be achieved through offensive operations.

(2) Defense- Threat forces use two types of defense-hasty and deliberate. They use a hasty defense when their advantage is stopped or delayed. This may turn into a deliberate defense if the delay is long. The main differences between the two are in the positioning of troops, the depth of the defensive position, and the preparation time.

b. Organization- There are two types of threat units that US troops may face in combat: infantry units, such as those found in Asia; and motorized rifle units, such as those found in Europe.

(1) Infantry Units (Asia):

(a) In Asia and other areas outside of Europe, infantry units are the main threat. These units are well prepared for combat. They undergo tough, physical training. They stress foot marches, marksmanship, and close combat techniques. They are supported by tanks, assault guns, and field artillery.

(b) Flexibility is built into Threat infantry doctrine. If an attack is halted in one sector, commanders are expected to probe, reconnoiter, and infiltrate until they find some other way to attack the objective. Great stress is placed on mobility and/or the ability to outmaneuver road bound units with non-motorized troops.

(c) Threat infantry tactics are suited to the rugged terrain in which he likes to fight. Units infiltrate over rugged terrain to get behind the defender's lines, or inside his perimeter, to disrupt his mobility and firepower, and block attempts to withdraw or reinforce.

(d) A typical infantry squad has nine men, including a squad leader and a deputy squad leader. A squad has assault rifles,

one antitank (AT) grenade launcher, and one light machine-gun.

- (e) There are three rifle squads in a rifle platoon. The platoon headquarters (HQ) has a platoon leader, an assistant platoon leader, and one sniper.
- (f) An infantry battalion has three rifle companies, a heavy machine-gun (HVMG) company, a mortar (MORT) company, a recoilless (RCL) gun platoon, and headquarters.
- (g) A heavy machine-gun company has three heavy machine-gun platoons and a headquarters. Each platoon has three heavy machine-guns.
- (h) A mortar company has three mortar platoons and a headquarters. Each platoon has three mortars.
- (i) A recoilless gun platoon has four medium AT recoilless guns.

(2) Motorized Rifle Units (Europe):

- (a) Motorized rifle units are common in Europe and may be found in other parts of the world. These units fight as combined arms teams-motorized rifle, armor, artillery, tactical air, air defense, engineers, chemical, and other support units.
- (b) They use surprise to seize the initiative and gain fire superiority. They fight in both good and bad visibility. Their doctrine calls for continuous operations-day and night.
- (c) MR units deploy in two echelons. The first echelon is the main force. The second echelon normally contains one-third of the unit's strength and will assume the first echelon's missions when needed. A small reserve may also be formed by the battalion to meet contingencies.
- (d) MR units plan for the use of nuclear, biological, and chemical weapons.
- (e) An MR squad has eight men, including a squad leader. It rides in either a BTR-60 (ARMORED PERSONNEL CARRIER) or a BMP (INFANTRY COMBAT VEHICLE). The BTR-60 has a two-man crew, including the squad leader who is the vehicle commander. Both the BTR-60 and the BMP

squads have assault rifles, two light machine-guns, and one AT grenade launcher.

- (f) A BMP has a 73-mm AT gun, 7.62-mm coax machine-gun, and a Sagger (antitank guided missile).
- (g) A BTR-60 has a 14.5-mm machine-gun and a 7.62-mm machine-gun. There are three firing ports on each side of the vehicle. The same techniques are used to kill the BTR-60 as with the BMP. One weakness of the BTR-60 is that soldiers can get out of it only from the top.
- (h) An MR company has a headquarters and three MR platoons.
- (i) An MR battalion may be equipped with either BTR-60's or BMP's. The BTR-60 equipped battalion has three MR companies, a mortar battery, an AT platoon, a signal platoon, and a headquarters. The BMP equipped MR battalion has the same organization, except it does not have an AT platoon.
- (j) An AT platoon has two recoilless AT guns and two man-packed Saggars or Spigots.

**Notes:**

## 6. FOREIGN WEAPONS:

### a. Soviet KPV

- (1) Caliber: 14.5 x 114 mm
- (2) Feed: 100 rnd ndl
- (3) Muzzle: Vel.: 3280 fps
- (4) Length: 78 in.
- (5) Rate of Fire:
  - (a) Cyclic: 6000 rpm
  - (b) Practical: 150 rpm
- (6) Locking System: Rotary Bolt
- (7) Operating System: Recoil
- (8) Effective Range:
  - (a) Ground: 2000m
  - (b) A/c: 1400m
- (9) Weight: 108 lbs



Soviet KPV



Soviet KPV Charging Handle Close-up

b. Soviet DSHK

- (1) Caliber: 12.7 x 108 mm
- (2) Feed: 50 rnd ndl
- (3) Muzzle: Vel.: 2822 fps
- (4) Length: 63 in.
- (5) Rate of Fire:
  - (a) Cyclic: 575 rpm
  - (b) Practical: 80 rpm
- (6) Locking System: Locking Bolt
- (7) Operating System: Gas
- (8) Effective Range:
  - (a) Ground: 2000m
  - (b) A/c: 1500m
- (9) Weight: 40.5 lbs

c. Soviet SGMB

- (1) Caliber: 76.2 x 54 mm
- (2) Feed: 50 rnd ndl belt
- (3) Muzzle: Vel.: 2625 fps
- (4) Length: 43 in.
- (5) Locking System: Rotary Bolt
- (6) Operating System: Gas
- (7) Effective Range: Ground: 1000m
- (8) Weight: 30 lbs

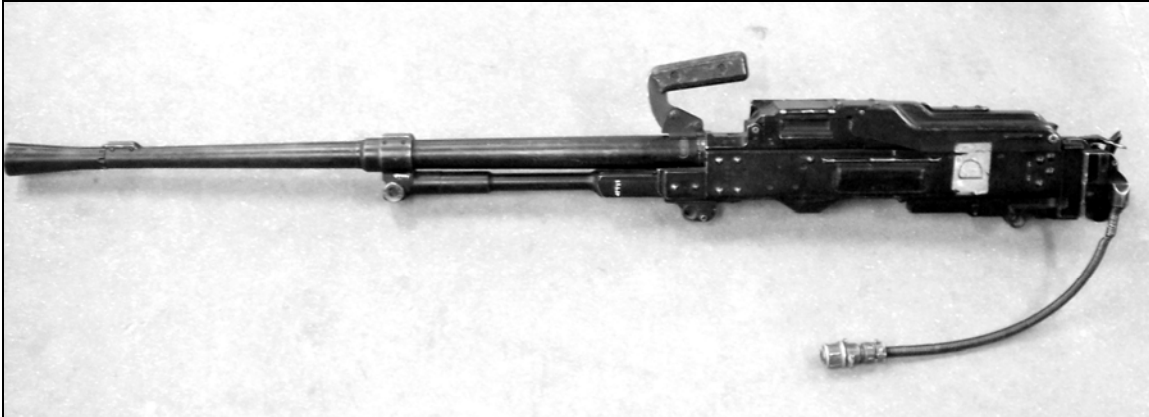


Soviet SGMB

d. PK-T

- (1) Caliber: 14.5 x 54 mm
- (2) Feed: 100/200/500 rnd ndl
- (3) Muzzle: Vel.: 2707 fps
- (4) Length: 45.7 in.
- (5) Rate of Fire:
  - (a) Cyclic: 690-720 rpm
  - (b) Practical: 250 rpm
- (6) Locking System: Locking Lugs
- (7) Operating System: Gas
- (8) Effective Range:

- (a) Ground: 400m
- (b) A/c: 500m
- (9) Weight: 15.5 lbs



Soviet PK-T

e. Soviet RPD

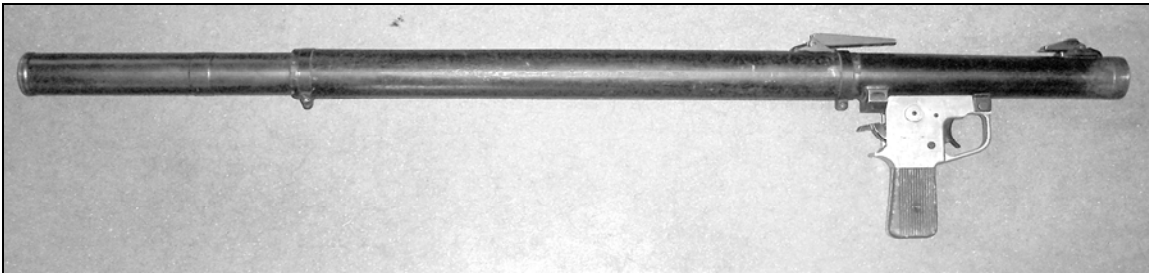
- (1) Caliber: 7.62 x 39 mm
- (2) Feed: 250 rnd ndl
- (3) Muzzle: Vel.: 2400 fps
- (4) Rate of Fire:
  - (a) Cyclic: 650-750 rpm
  - (b) Practical: 150 rpm
- (5) Locking System: Lucking Lugs
- (6) Operating System: Gas
- (7) Effective Range:
  - (a) Ground: 400m
  - (b) A/c: 500m
- (8) Weight: 15.5 lbs



Soviet RPD

f. Soviet RPG-2

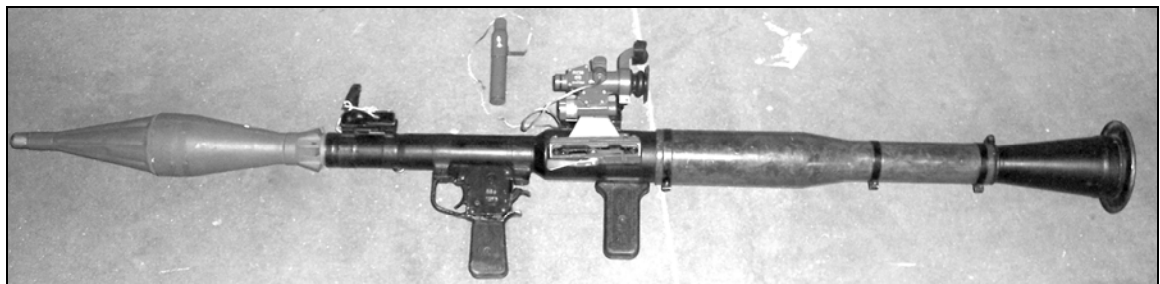
- (1) Caliber: 40 x 82 mm
- (2) Feed: Manual
- (3) Muzzle: Vel.: 275 fps
- (4) Rate of Fire: 4-6 rpm
- (5) Locking System: Friction
- (6) Operating System: Manual
- (7) Effective Range: 150m
- (8) Weight: 6 lbs



Soviet RPG-2

g. Soviet RPG-7/B

- (1) Caliber: 40 x 40 mm/85 x 40 mm/70 x 40 mm
- (2) Feed: Manual
- (3) Length: 39 in.
- (4) Rate of Fire: 4-6 rpm
- (5) Locking System: Friction
- (6) Operating System: Manual
- (7) Effective Range:
  - (a) Stationary: 500m
  - (b) Moving: 300m

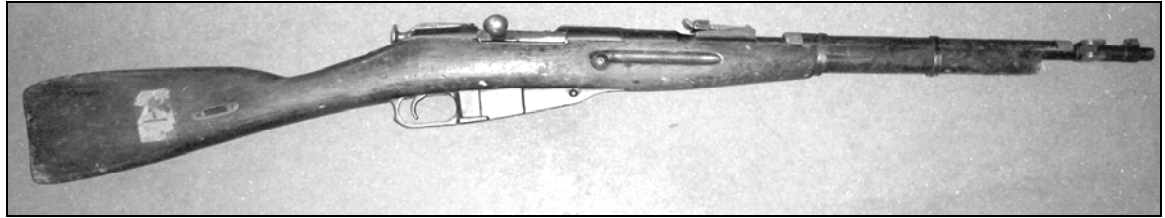


Soviet RPG-7/B

h. Soviet M1944 Carbine

- (1) Caliber: 7.62 x 54 mm
- (2) Feed: 5 rnd mag
- (3) Muzzle: Vel.: 2625 fps

- (4) Length: 40 in.
- (5) Locking System: Rotary Bolt
- (6) Operating System: Manual
- (7) Effective Range: 800m
- (8) Weight: 8.8 lbs



Soviet M1944 Carbine

i. Soviet PPSH-41

- (1) Caliber: 7.62 x 25 mm
- (2) Feed: 35 rnd mag/71 rnd drum
- (3) Muzzle: Vel.: 1600 fps
- (4) Length: 33 in.
- (5) Rate of Fire:
  - (a) Auto: 700-900 rpm
  - (b) Semi: 105 rpm
- (6) Locking System: Blow Back
- (7) Effective Range: 200m
- (8) Weight: 7.7 lbs



Soviet PPSH-41

j. Czech VZ-58P

- (1) Caliber: 76.2 x 39 mm
- (2) Feed: 30 rnd det mag
- (3) Muzzle: Vel.: 2300 fps
- (4) Length: 33 in.
- (5) Rate of Fire: 700-800 rpm
- (6) Locking System: Locking Lugs
- (7) Operating System: Gas
- (8) Effective Range: 400m

(9) Weight: 8.75 lbs



Soviet VZ-58P

k. West German G-3 A3

- (1) Caliber: 7.62 x 51 mm
- (2) Feed: 20 rnd det mag
- (3) Muzzle: Vel.: 2624 fps
- (4) Length: 42.2 in.
- (5) Rate of Fire: 500-600 rpm
- (6) Locking System: Locking Cam
- (7) Operating System: Delayed Blow Back
- (8) Effective Range: 300-400m
- (9) Weight: 9.9 lbs



West German G-3 A3

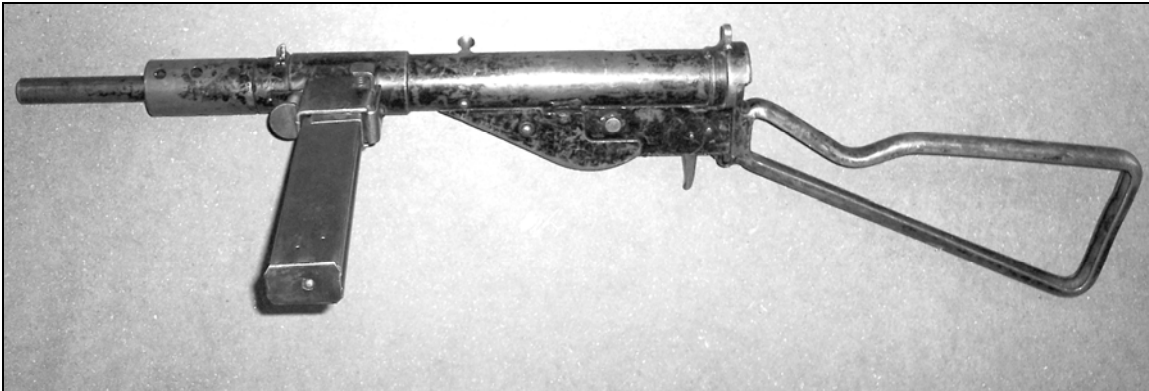
l. East German MPKIMS-74

- (1) Caliber: 5.45 x 39 mm
- (2) Feed: 30/40 rnd det mag
- (3) Length: 34.2 in.
- (4) Rate of Fire:
  - (a) Cyclic: 650 rpm
  - (b) Practical: 110 rpm
- (5) Locking System: Rotary Bolt
- (6) Operating System: Gas
- (7) Effective Range: 450m

(8) Weight: 6.3 lbs

m. STEN/MK-2

- (1) Caliber: 9 x .19 mm
- (2) Feed: 32 rnd det mag
- (3) Muzzle: Vel.: 1000 fps
- (4) Length: 31 in.
- (5) Rate of Fire:
  - (a) Cyclic: 575 rpm
  - (b) Practical: 128 rpm
- (6) Locking System: Blow Back
- (7) Effective Range: 200m



STEN/MK-2

n. H&K P7

- (1) Caliber: 9 x 19 mm
- (2) Feed: 8 rnd mag
- (3) Locking System: Blow Back
- (4) Effective Range: 50m



K&K P7

o. Walther P-38

- (1) Caliber: 9 x 19 mm
- (2) Feed: 8 rnd mag
- (3) Locking System: Pivot Arm
- (4) Operating System: Recoil
- (5) Effective Range: 50m



Walther P-38

p. AK Family

(1) AK-47 (Automatic Kalashnikov)

- (a) Caliber: 7.62 x 39 mm
- (b) Feed: 30 rnd det mag
- (c) Muzzle Vel.: 2500 fps
- (d) Length: 34.2 in.
- (e) Rate of Fire:
  - 1. Cyclic: 600 rpm
  - 2. Practical: 40 rpm
- (f) Locking System: Rotary Bolt
- (g) Operating System: Gas
- (h) Effective Range: 300-400m
- (i) Weight: 9.5 lbs.

(2) Soviet AKM/AKMS-47 (M: Modernized; S: Special)

- (a) Caliber: 7.62 x 39 mm
- (b) Feed: 30 rnd det mag
- (c) Muzzle Vel.: 2545 fps
- (d) Length: 34.5 in.
- (e) Rate of Fire:
  - 1. Cyclic: 600 rpm
  - 2. Practical: 40 rpm
- (f) Locking System: Rotary Bolt
- (g) Operating System: Gas
- (h) Effective Range: 300-400m
- (i) Weight: 6.93 lbs. with mag



Soviet AKM-47



Soviet AKMS 47

(3) Soviet AK-74

- (a) Caliber: 5.45 x 39 mm
- (b) Feed: 30/40 rnd det mag
- (c) Muzzle Vel.: 2545 fps
- (d) Length: 34.5 in.
- (e) Rate of Fire:
  - 1. Cyclic: 600 rpm
  - 2. Practical: 40 rpm
- (f) Locking System: Rotary Bolt

- (g) Operating System: Gas
- (h) Effective Range: 400m
- (i) Weight: 9.5 lbs. with mag

**Notes:**

## 8. THREAT MINES:

### a. Antipersonnel

- (1) MRUD, Yugoslav Fragmentation Mine- Electric or Non-electric initiation, can be daisychained



- (2) OZM-3, Soviet Bounding Fragmentation Antipersonnel Mine- Trip wire (tension), or electrically command initiated



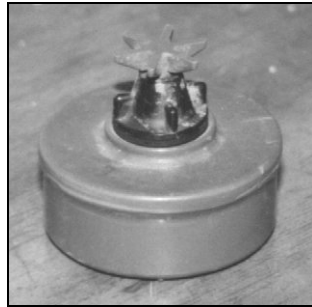
- (3) PFM-1/1S, Soviet Scatterable Blast Antipersonnel Mine-Pressure activation, "1S" version is programmable to self-destruct after 24 hours in 12 hour increments



- (4) PMA-1A, Yugoslav Blast Antipersonnel Mine-Pressure initiated, completely nonmetallic and undetectable with magnetic mine detectors. Plastic box



(5) PMA-2, Yugoslav Blast Antipersonnel Mine- Pressure initiated, limited amount metal content. Star shaped pressure head



(6) PMA-3, Yugoslav Blast Antipersonnel Mine- Pressure initiated, extremely limited metal content. CAUTION: Pressure plate very sensitive, care should be taken when using manual probe.



(7) PMD-6, Soviet Blast Antipersonnel Mine- Pressure initiated, Accumulative fuse. Wooden box fabricated at unit.



- (8) PMN, Soviet Blast Antipersonnel Mine- Delay-armed, pressure initiated. Mine can give appearance of changing color due to electro-static field drawing dust.



- (9) PMN-2, Soviet Blast Antipersonnel Mine- Delay-armed, blast-resistance, pressure initiated. Like the PMN, this mine can give the appearance of changing color due to the electro-static field drawing dust.



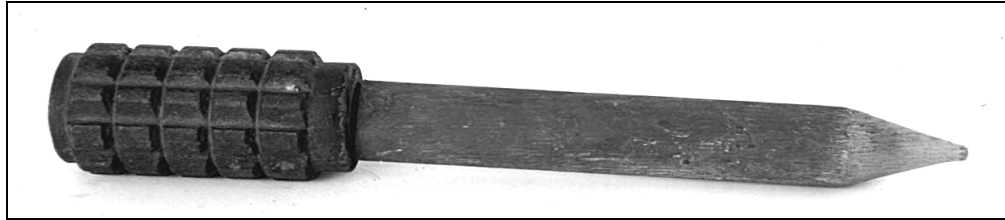
(10) PMR-2A, Yugoslav Fragmentation Antipersonnel Mine- Trip wire (tension), trip wire/signal with PMR-2AS version. No arming delay.



(11) PMR-3, Yugoslav Fragmentation Antipersonnel Mine- Pressure or trip wire (radial pull). Mine can be placed right side up, or upside down on stake.



- (12) POMZ-2/2M, Soviet Fragmentation Antipersonnel Mine- Trip wire (tension) initiated, POMZ-2(5.1 Lb.), POMZ-2M(3.9 Lb.).



- (13) PROM-1/2, Yugoslav Bounding Fragmentation Antipersonnel Mine- Pressure, trip wire (radial pull). PROM-2 may be mechanical, electric, or both. Plastic bodied unlike PROM-1. PROM-2 can be activated by static discharge from the human body. Trip line sensors very sensitive.



- (14) SB-33, Italian Scatterable Blast Antipersonnel Mine- Blast resistance, pressure initiated, difficult to detect with metallic mine detector. SB-33/AR has electronic antiremoval feature.



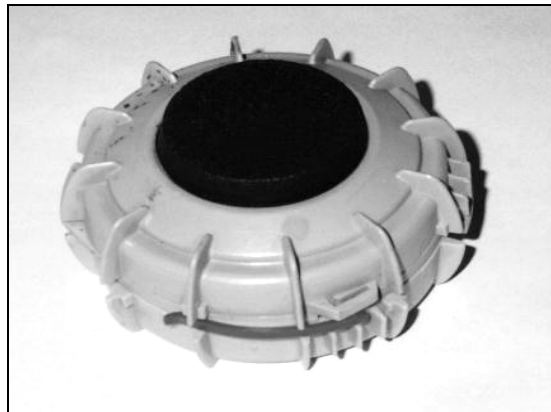
- (15) VALMARA 69, Italian Bounding Fragmentation Antipersonnel Mine- Trip wire(tension), pressure initiated.



- (16) VS-MK2/2-E, Italian Scatterable Blast Antipersonnel Mine-  
Blast-resistance, pressure initiated, difficult to detect. The VS-  
MK2-E has an electronic package with antiremoval features  
Non-metallic.

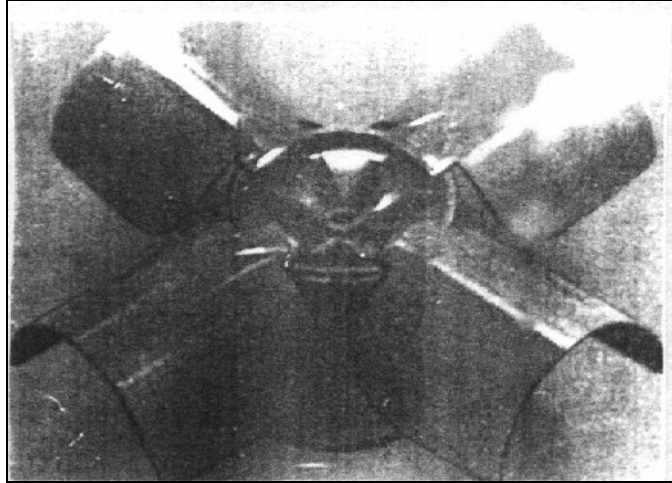


- (17) (17) VS-50, Italian Scatterable Blast Antipersonnel Mine-  
Blast-resistant, pressure initiated. VS-50-A version has  
electronic package with antiremoval features. Non-metallic,  
difficult to pick up with hand held magnetic mine detector.

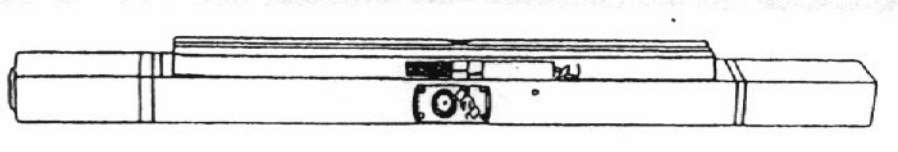


b. Antitank:

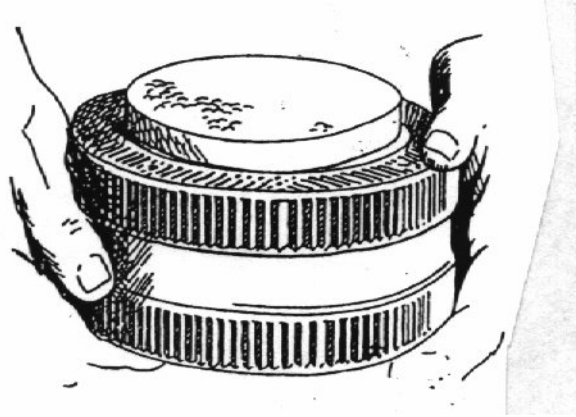
- (1) AABABEL, Yugoslav Scatterable Shaped-Charge Antitank Mine- Delay-armed, magnetic influence fuze. Operation of hand held mine detector might initiate mine.



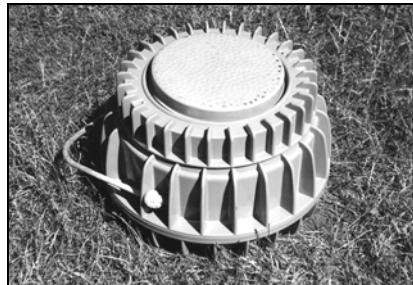
- (2) Barmine, United Kingdom Blast Antitank Mine- Both single and double impulse, pressure initiated. Mine can incorporate magnetic sensing and anti disturbance fuze.



- (3) TC 2.4, Italian Scatterable Blast Antitank Mine- Blast-resistant, pressure activated. Difficult to detect with mine detector. May have anti-lift devise in bottom detonator well.



- (4) TC-6/TCE-6, Italian Blast Antitank Mine- Blast- resistant, pressure initiated. Has secondary fuze well for booby-trap purposes. "E" version incorporates electronic package for remote activation/de-activation. Possibly has anti-lift/anti disturbance/self-destruct features.



- (5) TM-62M, Soviet Blast Antitank Mine- Fuze variants have delay-armed, blast-resistant, pressure initiated, magnetic influence, and seismic influence capabilities. Possible anti disturbance and anti lift features.



- (6) TMA-1/1A, Yugoslav Blast Antitank Mine- Pressure initiated, completely nonmetallic. Anti handling possible in secondary fuze well.



- (7) TMA-2/2A, Yugoslav Blast Antitank Mine- Pressure initiated, completely nonmetallic. Possible anti disturbance device.



- (8) TMA-3, Yugoslav Blast Antitank Mine- Pressure initiated, completely nonmetallic. Anti handling device possible. TMA-4 is a smaller version of TMA-3.



- (9) TMA-5/5A, Yugoslav Blast Antitank Mine- Pressure initiated, completely nonmetallic. Fuze stored in compartment built into body of the mine. Mine has brackets to stock pile.



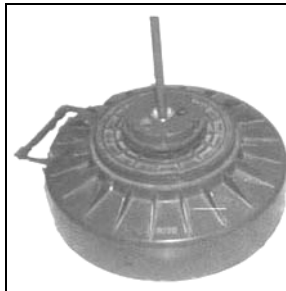
- (10) TMM-1, Yugoslav Blast Antitank Mine. Pressure initiated. Anti handling devices possible in 2 secondary fuze wells.



- (11) TMN-46, Soviet Blast Antitank Mine- Pressure or truncated (bent) tilt-rod initiated. Secondary fuze well on bottom of mine.



- (12) TMRP-6, Yugoslav Platter Charge Antitank Mine- Pressure, tilt-rod, electrical command, or trip-wire hooked to end of tilt-rod initiation. Possible antihandling in secondary fuze well on bottom of mine.



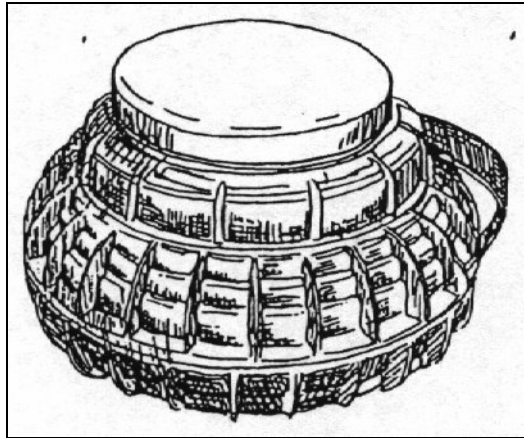
- (13) VS 1.6/AR/AN, Italian Scatterable Blast Antitank Mine- Blast-resistant, pressure initiated. "AR" version antir3emoval. "AN" version self-neutralization. Detection with mine detector difficult.



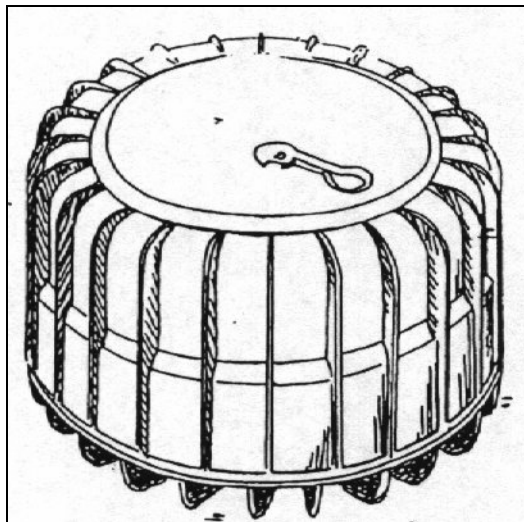
- (14) VS 2.2, Italian Blast Antitank Mine- Blast-resistant, pressure initiated. Detection with mine detector difficult. Bottom detonator well for booby traps. If a VSN/AR-AN fuze is used, removal of fuze will cause detonation.



- (15) VS-HCT, Italian Shaped-Charge Antitank Mine- Delay-armed, magnetic influence initiated. Hand held mine detector may detonate mine. There are "10" self-neutralization settings ranging from 1-128 days.



- (16) VS-HCT2, Italian Shaped-Charge Antitank Mine. Delay-armed, magnetic influence initiated. Hand held mine detectors may detonate mine. Anti-lift (tilt), and self neutralization can be programmed for 1-90 day settings.



## CHAPTER FOUR

### URBAN BREACHING

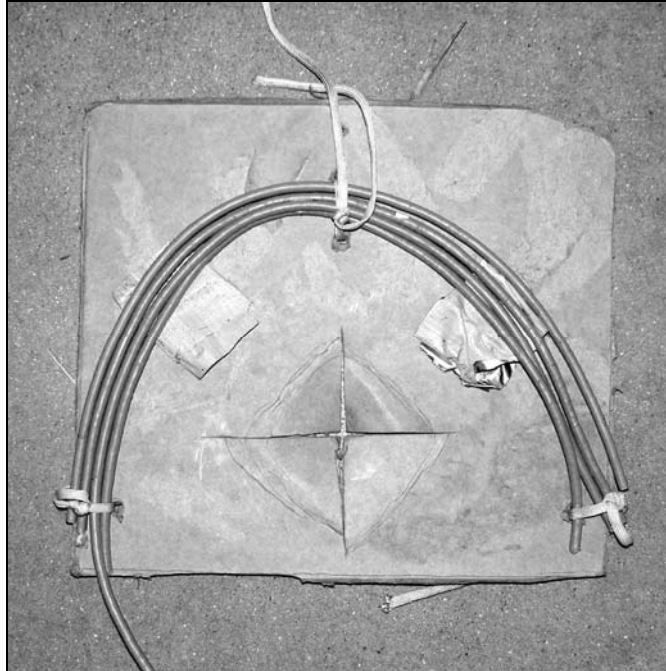
#### 1. C-SHAPED CHARGE

**Materials Required:**

- 3-18" pieces of det cord
- 1-24" piece of det cord
- 1-12" piece of det cord
- 8"x12" piece of cardboard
- 3-12" pieces type three nylon
- 2-2"x3" pieces 100 mph tape
- 2- M-11 blasting caps
- 1- M-81 fuse
- 1- chem light

- (1) Cut three eighteen inch pieces of 50 grain per foot det-cord and a twenty four-inch piece of 50 grain per foot Det-cord. Cut a piece of cardboard eight inches wide and twelve inches tall. Cut an X shape in the cardboard. The X shaped cut should be centered from top to bottom, but offset to one side.
- (2) Cut a hole in the side, just large enough to route type three nylon cord through. The hole must be opposite the X shape cut.
- (3) Cut one hole in the top of the card board and one hole in the bottom of the cardboard both holes should be just large enough to route type three nylon cord through. These holes must be on the same side as the X shaped cut.
- (4) Cut three pieces of type three nylon cord twelve inches long, and place one piece through each of the holes.
- (5) Cut two pieces of 100mph tape two inches wide and three inches long, double the tape over so that it forms a two-sided adhesive. Place one piece of tape between the top piece of type three nylon cord and the sidepiece of type three nylon cord. Place the other piece of 100mph tape between the bottom piece of type three nylon cord and the side piece of type three nylon cord.
- (6) Route the four pieces of 50 grain per foot det-cord from the top edge on the same side as the X shape cut, to the middle of the side opposite the X shape cut, to the bottom edge on the same side as the X shape cut. This will create the C shape.

- (7) **NOTE:** ensure that the twenty four inch piece of 50 grain per foot det cord is routed side by side and touching between two of the eighteen inch pieces of 50 grain per foot det-cord.
- (8) Use all three of the pieces of type three nylon cord to secure the 50 grain per foot det-cord to card board, by tying them around the cardboard and all four pieces of det-cord, using an unsafetied square knot.
- (9) Cut one piece of 50 grain per foot det-cord twelve inches long. With the twelve-inch piece of det-cord form a bight.
- (10) Place the two M-11 blasting caps side by side, then place the running ends of the det-cord bight along side so that a diamond shape is formed. Ensure that there is a three-inch pigtail on each side of the bight. Then tape both ends of the det cord in place with both M-11 blasting caps.
- (11) Attach one M-81 fuse igniter to each of the M-11 Blasting cap transmission lines.
- (12) Cut a one-inch section of chem-lite. At one end of the chem-lite section cut a V shaped notch slightly narrower than the 50 grain per foot det-cord is wide. Cut a second notch directly across from the first on the same end of the chem-lite section.
- (13) Slide the chem-lite portion onto the det cord bight of the initiation system so that the two V shaped notches are facing the closed end of the bight.
- (14) Place the pigtail of the charge through the bight of the initiation system then slide the chem-lite portion up, this will pinch the pigtail of the charge against the bight of the initiation system.
- (15) Next place the X shaped cut of the charge over the doorknob so that the cardboard is facing away from the target and the det-cord is against the target.
- (16) Ensure that the open side of the C shape formed by the 50 grain per foot det-cord is between the doorknob and the door jam.
- (17) Move to safe distance and ignite charge.



C-Shaped Charge

## **2. DET CHORD LINEAR CHARGE**

### **Materials Required:**

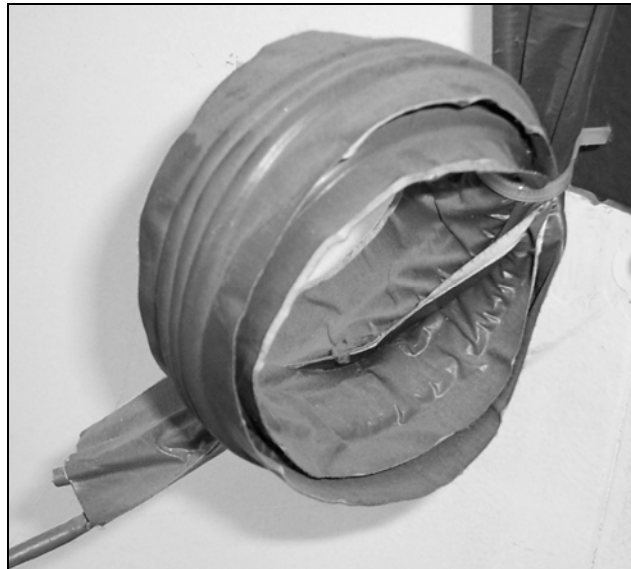
- 2- 80" pieces of det cord
- 1- 92" piece of det cord
- 1- 12" piece of det cord
- 8- 1"x4" pieces of 100 mph tape
- 1- 80" piece of 100 mph tape
- Double sided tape
- 2- M-11 blasting caps
- 1- M-81 fuse igniter
- 1- Chem-light

- (1) Cut one ninety two-inch piece of 50 grain per foot det-cord and two eighty-inch pieces of 50 grain per foot Det-cord.
- (2) Cut a piece of 100mph tape eighty inches long and lay it down flat with the adhesive side facing up.
- (3) Route the three pieces of 50 grain per foot det-cord from the top edge of the rubber to the bottom edge of the rubber.
- (4) Place the ninety-two inch piece of 50 grain per foot det cord is routed side by side and touching between the two eighty inch

pieces of 50 grain per foot det-cord, and that all three pieces of det-cord are flush with the top edge.

- (5) Fold the 100mph tape remaining on the sides of the det-cord over onto the det-cord, and once again ensure that the three pieces of 50 grain per foot det-cord are parallel, side by side, and touching the entire length of the charge.
- (6) Run a piece of double-sided tape from top of the charge strip to the bottom.
- (7) Peel one inch of the backing material, on the double-sided tape, up at each end of the charge.
- (8) At the middle of the charge cut the backing material so that a one-inch section can be peeled back in each direction.
- (9) Cut eight pieces of 100mph tape one inch wide and four inches long. Place one piece at each end of the charge around the exposed adhesive. Use two pieces in the middle of the charge to cover the exposed adhesive. Place a piece of tape around the one each piece of backing material that is peeled up at each end of.
- (10) **NOTE:** if available the backing material of the double sided tape should be sprayed with spray adhesive at this point.
- (11) Run an eighty-inch long by one inch wide piece of 100mph tape the entire length of the charge.
- (12) Cut one piece of 50 grain per foot det-cord twelve inches long. With the twelve-inch piece of det-cord form a bight.
- (13) Place the two M-11 blasting caps side by side, then place the running ends of the det-cord bight along side so that a diamond shape is formed. Ensure that there is a three-inch pigtail on each side of the bight. Then tape both ends of the det cord in place with both M-11 blasting caps.
- (14) Attach one M-81 fuse igniter to each of the M-11 Blasting cap transmission lines.
- (15) Cut a one-inch section of chem-lite. At one end of the chem-lite section cut a V shaped notch slightly narrower than the 50 grain per foot det-cord is wide. Cut a second notch directly across from the first on the same end of the chem-lite section.

- (16) Slide the chem-lite portion onto the det cord bight of the initiation system so that the two V shaped notches are facing the closed end of the bight.
- (17) Place the pigtail of the charge through the bight of the initiation system then slide the chem-lite portion up, this will pinch the pigtail of the charge against the bight of the initiation system.
- (18) Pull the backing material away from the double-sided tape, and place the charge lengthwise six inches from the hinges of the target.
- (19) Move to safe distance and ignite charge.



Det Cord Linear Charge (Rolled)

### 3. DONUT CHARGE

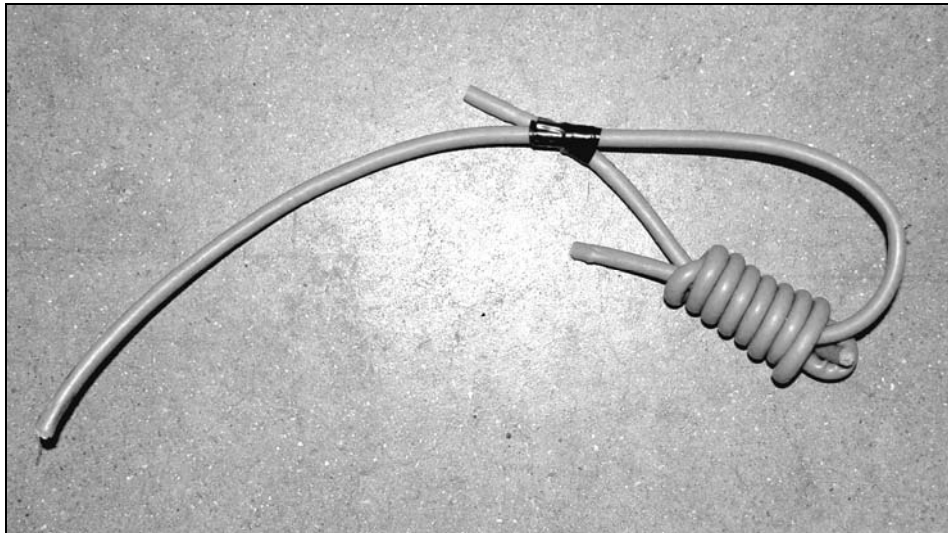
**Materials Required:**

- 1- 18" piece of det cord
- 1- 24" piece of det cord
- 1- 12" piece of det cord
- 1"x2" piece of 100 mph tape
- 1"x3" piece of 100 mph tape
- 2- M-11 blasting caps
- 1- M-81 fuse igniter
- 1- Chem-light

- (1) Cut an eighteen inch and a twenty four inch piece of 50 grain per foot Det-cord
- (2) Take the twenty four inch piece of 50 grain per foot Det-cord and tie a Uli knot around the eighteen inch piece of 50 grain per foot Det-cord.
- (3) At one end of the eighteen inch piece of 50 grain per foot Det-cord place a one inch wide two inch long piece of 100mph tape.
- (4) Place the tape around the piece of Det-cord so that the adhesive side is facing away from the Det-cord.
- (5) Next form a bight with the eighteen-inch piece of 50 grain per foot Det-cord. Secure the two ends parallel to each other by using a one inch wide three inch long piece of 100mph tape.
- (6) Run the 100mph tape around the exposed adhesive from the first piece of tape. Once the exposed adhesive from the first piece of tape has been covered completely, continue to run the 100mph tape around both of the ends.
- (7) **NOTE:** Ensure that when taping over the first piece of tape with the second that the adhesive of the second piece of tape doesn't come into contact with the Det-cord that the first piece of tape is going around.
- (8) Cut one piece of 50 grain per foot det-cord twelve inches long. With the twelve-inch piece of det-cord form a bight.
- (9) Place the two M-11 blasting caps side by side, then place the running ends of the det-cord bight along side so that a diamond shape is formed. Ensure that there is a three-inch

pigtail on each side of the bight. Then tape both ends of the det cord in place with both M-11 blasting caps.

- (10) Attach one M-81 fuse igniter to each of the M-11 Blasting cap transmission lines.
- (11) Cut a one-inch section of chem-lite. At one end of the chem-lite section cut a V shaped notch slightly narrower than the 50 grain per foot det-cord is wide. Cut a second notch directly across from the first on the same end of the chem-lite section.
- (12) Slide the chem-lite portion onto the det cord bight of the initiation system so that the two V shaped notches are facing the closed end of the bight.
- (13) Place the pigtail of the charge through the bight of the initiation system then slide the chem-lite portion up, this will pinch the pigtail of the charge against the bight of the initiation system.
- (14) Place the charge over doorknob so that the Uli knot is between the doorknob and door jam. Pull the sliding portion of the eighteen-inch section of 50 grain per foot det-cord, to tighten hold the charge in place.
- (15) Move to safe distance and ignite charge.



Donut Charge

4-8

**Notes**

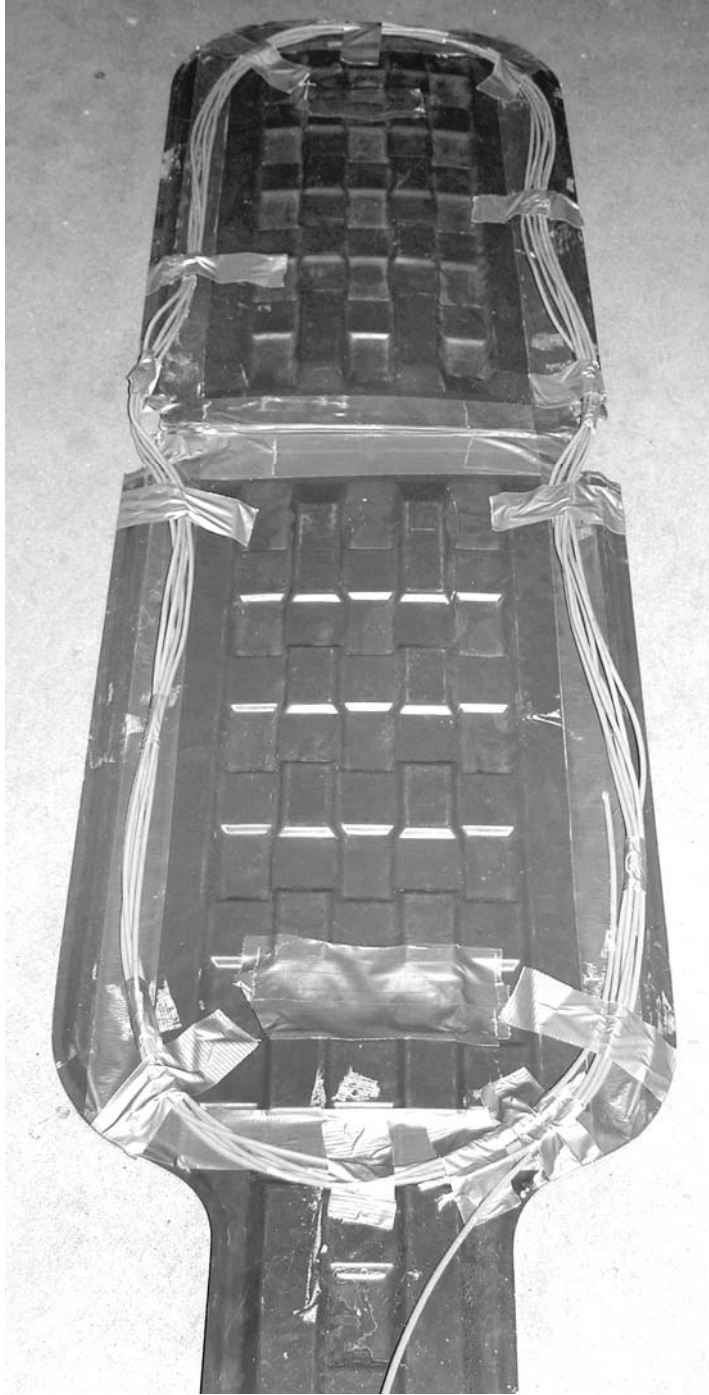
#### 4. OVAL CHARGE

**Materials Required:**

- 3- 12' piece of det cord
- 1- 12" piece of det cord
- 2- E type silhouettes
- Type three nylon cord
- 1- 10" piece of type three nylon cord
- 2- M-11 blasting caps
- 100 mph tape
- 1- M-81 fuse igniter
- 1- Chem-liht

- (1) Cut three twelve foot pieces of 50 grain per foot det-cord.
- (2) Cut the head off one E type silhouette.
- (3) Cut a C shape into the same E type silhouette approximately eight to ten inches below the removed head.
- (4) Cut three holes in the bottom of the E type silhouette large enough to pass a piece of type three-nylon cord through. Cut two holes in each side and three in the top of the E type silhouette large enough to pass a piece of type three-nylon cord through.
- (5) In the second E type silhouette cut three holes in the bottom of the E type silhouette large enough to pass a piece of type three-nylon cord through. Cut two holes in each side and the top of the E type silhouette large enough to pass a piece of type three-nylon cord through.
- (6) Place the two E type silhouettes bottom to bottom. Route type three nylon cord through the previously cut holes and tie them together with square knots.
- (7) Place a ten-inch piece of type three-nylon cord through each of the remaining previously prepared holes.
- (8) Hold the ends of the twelve-foot sections of 50 grain per foot det-cord. Have one sapper pull a piece of det-cord twelve to eighteen inches out of the rest. Milk out the slack created. The other sapper pulls a different piece of 50 grain per foot det-cord approximately twelve to eighteen inches out of the rest in the opposite direction.

- (9) Starting at the bottom of the two E-type silhouettes, (the end that still has the head attached,) route the pieces of det-cord around the outside edge of the silhouettes. As the det-cord passes the holes cut for type three nylon cord, use a piece of type three nylon cord to secure the det-cord to the E-type silhouette, (use a square not.) continue the process all the way around the joined E-type silhouettes. When the det-cord gets back to the bottom, take one of the 12 to 18 inch pig tails and continue to route it overlapping the previous wraps. The other pig tail leave hanging past the remaining head portion of the E-type silhouette.
- (10) Place the charge against the target so that the head is on the ground, the det-cord is against the wall and the charge is held in place by a prop stick in the C-shaped cut at the top of the charge.
- (11) Cut one piece of 50 grain per foot det-cord twelve inches long. With the twelve-inch piece of det-cord form a bight.
- (12) Place the two M-11 blasting caps side by side, then place the running ends of the det-cord bight along side so that a diamond shape is formed. Ensure that there is a three-inch pigtail on each side of the bight. Then tape both ends of the det cord in place with both M-11 blasting caps.
- (13) Attach one M-81 fuse igniter to each of the M-11 Blasting cap transmission lines.
- (14) Cut a one-inch section of chem-lite. At one end of the chem-lite section cut a V shaped notch slightly narrower than the 50 grain per foot det-cord is wide. Cut a second notch directly across from the first on the same end of the chem-lite section.
- (15) Slide the chem-lite portion onto the det cord bight of the initiation system so that the two V shaped notches are facing the closed end of the bight.
- (16) Place the pigtail of the charge through the bight of the initiation system then slide the chem-lite portion up, this will pinch the pigtail of the charge against the bight of the initiation system.
- (17) Move to safe distance and ignite charge.



Oval Charge

## 5. RIGID LINEAR CHARGE

### Materials Required:

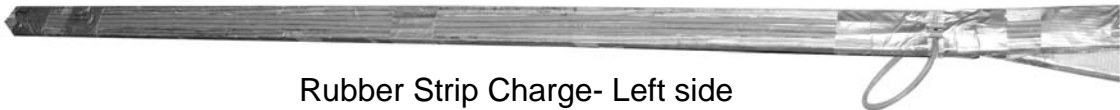
- 2- 84" pieces of det cord
- 1- 96" piece of det cord
- 1- 12" piece of det cord
- 2- 42"x1"x2" pieces of wood
- 1-48"x1"x2" piece of wood
- Double sided tape
- 100 mph tape
- 8- 1"x4" pieces of 100 mph tape
- 1- 80"x1" piece of 100mph tape
- Spray adhesive (optional)
- 2- M-11 blasting caps
- 1- M-81 fuse igniter
- 1- Chem-light

- (1) Cut two eighty four inch pieces of 50 grain per foot det-cord and a ninety six inch piece of 50 grain per foot Det-cord. Cut three pieces of wood to the following dimensions; 2ea 42" pieces of 1" x 2" wood route 1 side of each piece 3/16" of an inch deep and 3/4" wide the entire length of these two boards. In one end of each board cut a notch 1/4" inch wide and 1/4" deep. Cut 1 48" pieces of 1" x 2" wood.
- (2) Take all three pieces of det-cord, ensuring that the 96" piece is in the center.
- (3) Place the two 42" pieces of wood end to end routed side up so that the notched ends are touching.
- (4) Place the three pieces of det-cord flush with one end of the two 42" pieces of wood. The det-cord must run side by side and touching in the routed portion of the wood.
- (5) Use 100mph tape around the charge every six to twelve inches to hold the det-cord in place.
- (6) Where the two 42" pieces of wood come together, pull a six inch bight of det cord through the notches from the center piece of det cord, (the 96" piece of det-cord.) Then continue to lay the det-cord in the second 42" piece of wood in the same manner.

- (7) Run a piece of double-sided tape from top of the charge to the bottom.
- (8) Peel one inch of the backing material, on the double-sided tape, up at each end of the charge.
- (9) At the middle of the charge cut the backing material so that a one-inch section can be peeled back in each direction.
- (10) Cut eight pieces of 100mph tape one inch wide and four inches long. Place one piece at each end of the charge around the exposed adhesive. Use two pieces in the middle of the charge to cover the exposed adhesive. Place a piece of tape around the one each piece of backing material that is peeled up at each end of.
- (11) **NOTE:** if available the backing material of the double sided tape should be sprayed with spray adhesive at this point.
- (12) Run an eighty-inch long by one inch wide piece of 100mph tape the entire length of the charge.
- (13) Turn the charge so that the det-cord is facing down, lay the 48" inch piece of wood on the charge 2" to 4" from the junction of the two 42" pieces of wood.
- (14) Run a piece of 100mph tape length wise across the 48" piece of wood and the 42" piece of wood it is laying on.
- (15) Run a piece of 100mph tape completely around the lengthwise tape and the 42" piece of wood.
- (16) Hold the 48" piece of wood so that it is at 90% to the 42" piece of wood and run a piece of 100mph tape length wise between n the two pieces of wood.
- (17) To secure the lengthwise pieces of tape, use rape tape around the joined 48" piece of wood and the 42" piece of wood.
- (18) Cut one piece of 50 grain per foot det-cord twelve inches long. With the twelve-inch piece of det-cord form a bight.
- (19) Place the two M-11 blasting caps side by side, then place the running ends of the det-cord bight along side so that a diamond shape is formed. Ensure that there is a three-inch

pigtail on each side of the bight. Then tape both ends of the det cord in place with both M-11 blasting caps.

- (20) Attach one M-81 fuse igniter to each of the M-11 Blasting cap transmission lines.
- (21) Cut a one-inch section of chem-lite. At one end of the chem-lite section cut a V shaped notch slightly narrower than the 50 grain per foot det-cord is wide. Cut a second notch directly across from the first on the same end of the chem-lite section.
- (22) Slide the chem-lite portion onto the det cord bight of the initiation system so that the two V shaped notches are facing the closed end of the bight.
- (23) Place the pigtail of the charge through the bight of the initiation system then slide the chem-lite portion up, this will pinch the pigtail of the charge against the bight of the initiation system.
- (24) Pull the backing material away from the double-sided tape, and place the charge lengthwise between the doorknob and door jam. The rubber should be against the door and the det-cord should be away from the door.
- (25) Move to safe distance and ignite charge.



Rubber Strip Charge- Left side



Rubber Strip Charge- Right side

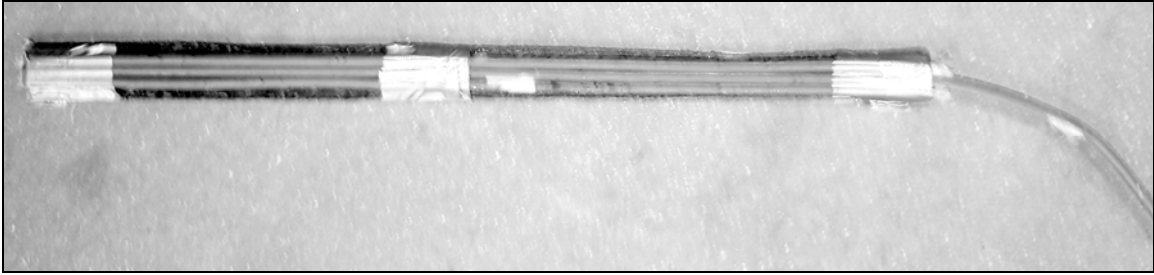
## 6. RUBBER STRIP CHARGE

### Materials Required:

- 2- 18" pieces of det cord
- 1- 24" piece of det cord
- 1- 12" piece of det cord
- 1- 18"x1" piece of rubber
- 4- 4"x1" pieces of 100 mph tape
- 3- 1"x3" pieces of 100 mph tape
- 1- 18"x1" piece of 100 mph tape
- 1- 18" piece of double-sided tape
- Spray adhesive (optional)
- 2- M-11 blasting caps
- 1- M-81 fuse igniter
- 1- Chem-light

- (1) Cut two eighteen inch pieces of 50 grain per foot det-cord and a twenty four inch piece of 50 grain per foot Det-cord. Cut a piece of rubber eighteen inches long and one inches wide.
- (2) Cut three pieces of 100mph tape one inch wide and three inches long.
- (3) Route the three pieces of 50 grain per foot det-cord from the top edge of the rubber to the bottom edge of the rubber.
- (4) **NOTE:** ensure that the twenty four inch piece of 50 grain per foot det cord is routed side by side and touching between two of the eighteen inch pieces of 50 grain per foot det-cord, and that all three pieces of det-cord are flush with the top edge.
- (5) Use the three pieces of 100mph tape to secure the det-cord at to the rubber. Place one piece around the top, one piece around the bottom and one piece around the middle. Once again ensure that the three pieces of 50 grain per foot det-cord are parallel, side by side, and touching the entire length of the rubber.
- (6) Turn the charge over so that the rubber is facing up and the det-cord down. Run an eighteen inch piece of double sided tape from top of the rubber strip to the bottom.
- (7) Peel one inch of the backing material, on the double sided tape, up at each end of the rubber.

- (8) Cut four pieces of 100mph tape one inch wide and four inches long. Place one piece at each end of the rubber around the exposed adhesive. Place a piece of tape around the one each piece of backing material that is peeled up at each end of rubber.
- (9) **NOTE:** if available the backing material of the double sided tape should be sprayed with spray adhesive at this point.
- (10) Run an eighteen inch long by one inch wide piece of 100mph tape the entire length of the rubber.
- (11) Cut one piece of 50 grain per foot det-cord twelve inches long. With the twelve-inch piece of det-cord form a bight.
- (12) Place the two M-11 blasting caps side by side, then place the running ends of the det-cord bight along side so that a diamond shape is formed. Ensure that there is a three-inch pigtail on each side of the bight. Then tape both ends of the det cord in place with both M-11 blasting caps.
- (13) Attach one M-81 fuse igniter to each of the M-11 Blasting cap transmission lines.
- (14) Cut a one-inch section of chem-lite. At one end of the chem-lite section cut a V shaped notch slightly narrower than the 50 grain per foot det-cord is wide. Cut a second notch directly across from the first on the same end of the chem-lite section.
- (15) Slide the chem-lite portion onto the det cord bight of the initiation system so that the two V shaped notches are facing the closed end of the bight.
- (16) Place the pigtail of the charge through the bight of the initiation system then slide the chem-lite portion up, this will pinch the pigtail of the charge against the bight of the initiation system.
- (17) Pull the backing material away from the double-sided tape, and place the charge lengthwise between the doorknob and door jam. The rubber should be against the door and the det-cord should be away from the door.
- (18) Move to safe distance and ignite charge.



Rubber Strip Charge

## **7. WATER IMPULSE CHARGE**

### **Materials Required:**

- 1- 8' piece of det cord
- 1- 4' piece of det cord
- 1-12" piece of det cord
- 100 mph tape
- 2- 1000 ml IV bags
- 1- 4' piece of type three nylon cord
- 12"x6" piece of cardboard
- 2- M-11 blasting caps
- 1- M-81 fuse igniter
- 1- Chem-light

- (1) Cut one eight-foot piece of 50 grain per foot det-cord and one four-foot piece of 50 grain per foot Det-cord.
- (2) S-roll the eight-foot piece of 50 grain per foot det-cord so that it is approximately six inches in length.
- (3) Place the four-foot section of det-cord on top of the S-rolled eight-foot section length wise, so that a two-foot tail is protruding from one end. Tape in place securely with 100mph tape as tight as possible.
- (4) Place the det-cord between two 1000 ml IV bags length wise, then tape around the middle as tight as possible.
- (5) Cut a piece of type three nylon cord four foot long.
- (6) Place one end of the type three nylon cord along the side of the charge.

- (7) Using 100mph tape, tape over the type three nylon cord at the middle of the charge so that a two-inch pigtail of type three nylon cord is hanging free below the tape.
- (8) Repeat process on the opposite side of the charge.
- (9) Fold the two-inch pigtails up and tape around the charge again, securing the bight in the type three nylon cord.
- (10) Cut a piece of cardboard six inches wide by twelve inches long
- (11) Place the cardboard on the outside of the charge and tape in place, by taping around the bottom, top, and center of the charge.
- (12) Cut one piece of 50 grain per foot det-cord twelve inches long. With the twelve-inch piece of det-cord form a bight.
- (13) Place the two M-11 blasting caps side by side, then place the running ends of the det-cord bight along side so that a diamond shape is formed. Ensure that there is a three-inch pigtail on each side of the bight. Then tape both ends of the det cord in place with both M-11 blasting caps.
- (14) Attach one M-81 fuse igniter to each of the M-11 Blasting cap transmission lines.
- (15) Cut a one-inch section of chem-lite. At one end of the chem-lite section cut a V shaped notch slightly narrower than the 50 grain per foot det-cord is wide. Cut a second notch directly across from the first on the same end of the chem-lite section.
- (16) Slide the chem-lite portion onto the det cord bight of the initiation system so that the two V shaped notches are facing the closed end of the bight.
- (17) Place the pigtail of the charge through the bight of the initiation system then slide the chem-lite portion up, this will pinch the pigtail of the charge against the bight of the initiation system.
- (18) Place the charge against the target backing material away from the target, and hold in place with a prop stick. The charge should be centered on the target if it is metal, or directly on the doorknob if is wood.

(19) Move to safe distance and ignite charge.



Water Impulse Charge

**BREACHER'S LOGBOOK****AMMUNITION LIST**

<b><u>DODIC</u></b>	<b><u>NOMENCLATURE</u></b>	<b><u>UI</u></b>
M032	CHG, DEMO BLK 1-LB TNT	EA
M456	CORD DETONATING, 50GR/FT	FT
ML13	FLSC, 75GR/FT 6FT LENGTH	EA
ML14	FLSC, 125GR/FT 6FT LENGTH	EA
ML15	FLSC, 225GR/FT 6FT LENGTH	EA
ML17	FLSC, 400GR/FT 6FT LENGTH	EA
ML19	FLSC, 600GR/FT 6FT LENGTH	EA
MO23	CHG, DEMO BLK M112	EA
ML47	CAP, BLASTING NONELEC, 30FT	EA
MN02	CAP, BLASTING NONELEC, 500FT	EA
MN03	CAP, BLASTING NONELEC, 1000FT	EA
MN06	CAP, BLASTING NONELEC / W DELAY	EA
M591	DYNAMITE M1 (.5LBS) STICKS	EA
MO24	CHG, DEMO BLK M118	EA

## CONVERSION FACTORS

### LENGTH

MILLIMETERS	0.04	INCHES
CENTIMETERS	0.39	INCHES
METERS	3.28	FEET
METERS	1.09	YARDS
KILOMETERS	0.62	MILES
INCHES	25.40	MILLIMETERS
INCHES	2.54	CENTIMETERS
FEET	30.48	METERS
MILES	1.61	KILOMETERS

### WEIGHT

GRAMS	0.035	OUNCES
GRAMS	15.4	GRAINS
KILOGRAMS	2.21	POUNDS
OUNCE	28.35	GRAMS
OUNCE	438	GRAINS
POUNDS	0.45	KILOGRAMS
POUNDS	454	GRAMS

GR/FT            =        GRAINS PER FOOT  
GM/SQ INCH       =        =        GRAMS PER SQUARE INCH  
GM                =        GRAMS  
GR                =        GRAINS  
LBS               =        POUNDS

4-22

**Notes**

**RE FACTORS**

<b><u>ITEM</u></b>	<b><u>EXPLOSIVE</u></b>	<b><u>RE FACTOR</u></b>
FLSC	CH-6	1.50
SHEET EXPLOSIVE (C-2)	PETN BASED	1.66
DETONATION CORD	PETN	1.66
BLASTING CAP	RDX	1.60
C-4 M112	RDX BASED	1.34
DYNAMITE	RDX	0.92
BOOSTER	PETN BASED	1.66
C-4 M118	PETN/RDX	1.14

**EXPLOSIVE MEASURES**

<b><u>ITEM</u></b>	<b><u>UNIT OF MEASURE</u></b>
FLSC	GR/FT
SHEET EXPLOSIVE	GM/SQ INCH
DET CORD	GR/FT
BOOSTER	GM
BLASTING CAP	GR
C-4	LBS

**NET EXPLOSIVE WEIGHT FORMULA**

<b><u>EXPLOSIVES</u></b>	<b><u>FORMULA</u></b>
C-4 (M112)	LBS x 1.34 =
C-4 (M118)	LBS x 1.14 =
DYNAMITE	LBS x 0.92 =
TNT	NEEDS NO CONVERSION
FLSC	FT x GR x 1.50 =
DET CORD	FT x GR x 1.66 =
BLASTING CAP	N x 13.5 x 1.66 =
SHEET EXPLOSIVE	(L x W) T x 15.4 x 1.66 =

**EXAMPLE OF N.E.W. AND STANDOFF****EXAMPLE 1**

7 FT 50 GR/FT DET CORD  
2EA M11 BLASTING CAPS

$$7' \times 50 \times 1.66 = 581 \text{ GRS TNT EQUIV.}$$

$$2 \times 13.5 \times 1.60 = \underline{43.2} \text{ GRS TNT EQUIV.}$$

$$624.2$$

$624.2/7000 = .08$  LBS OF TNT EQUIV      STANDOFF W AND W/O SHIELD  
4/8FT

**EXAMPLE 2**

8 FT 50 GR/FT DET CORD  
2EA C-4 M112  
2EA M11 BLASTING CAPS

$$8' \times 50 \times 1.66 = 664 \text{ GRS TNT EQUIV.}$$

$$2 \times 13.5 \times 1.60 = \underline{43.2} \text{ GRS TNT EQUIV.}$$

LBS

$$2 \times 1.25 \times 1.34 = 3.35$$

$$707.2$$

$707.2/7000 = .10$   
EQUIV.

$$.10 + 3.35 = 3.45 \text{ LBS OF TNT}$$

STANDOFF W AND W/O SHIELD 14/28 FT

**Notes**

**TABLE OF N.E.W. STANDOFF DISTANCE**

<b><u>NEW (TNT EQUIV)</u></b>	<b><u>W/O SHIELD (FT)</u></b>	<b><u>W/SHIELD (FT)</u></b>
0.01.....	4.....	2
0.02.....	5.....	3
0.03.....	6.....	3
0.04 THRU 0.05.....	7.....	4
0.06 THRU 0.08.....	8.....	4
0.09 THRU 0.12.....	9.....	5
0.13 THRU 0.17.....	10.....	5
0.18 THRU 0.22.....	11.....	6
0.23 THRU 0.29.....	12.....	6
0.30 THRU 0.37.....	13.....	7
0.38 THRU 0.47.....	14.....	7
0.48 THRU 0.57.....	15.....	8
0.58 THRU 0.70.....	16.....	8
0.71 THRU 0.84.....	17.....	9
0.85 THRU 1.00.....	18.....	9
1.01 THRU 1.17.....	19.....	10
1.18 THRU 1.37.....	20.....	10
1.38 THRU 1.58.....	21.....	11
1.59 THRU 1.82.....	22.....	11
1.83 THRU 2.08.....	23.....	12
2.09 THRU 2.37.....	24.....	12
2.38 THRU 2.67.....	25.....	13
2.68 THRU 3.01.....	26.....	13
3.02 THRU 3.37.....	27.....	14
3.38 THRU 3.76.....	28.....	14
3.77 THRU 4.18.....	29.....	15
4.19 THRU 4.62.....	30.....	15
4.63 THRU 5.00.....	31.....	16
5.00 THRU 5.99.....	32.....	16
6.00 THRU 6.99.....	33.....	17
7.00 THRU 8.00.....	36.....	18
8.01 THRU 10.00.....	38.....	19
10.01 THRU 11.00.....	40.....	20
15.....	45.....	23
20.....	49.....	25
30.....	56.....	28
35.....	59.....	30
40.....	61.....	31

**EXAMPLE TABLE ONLY**

**CHAPTER FIVE**  
**COMMUNICATION**

**1. ANTENNAS:**

a. Repair:

- (1) Connect the two broken ends. Ensure metal on metal contact. Wrap with stripped wire. Solder if possible. Splint the break.
- (2) If the broken end is lost, add a piece of wire the same length as missing piece. Ensure metal on metal contact. Solder if possible. Lash a pole the length of the antenna to the base.

b. Expedient Antennas:

(1) Suspended vertical wire:

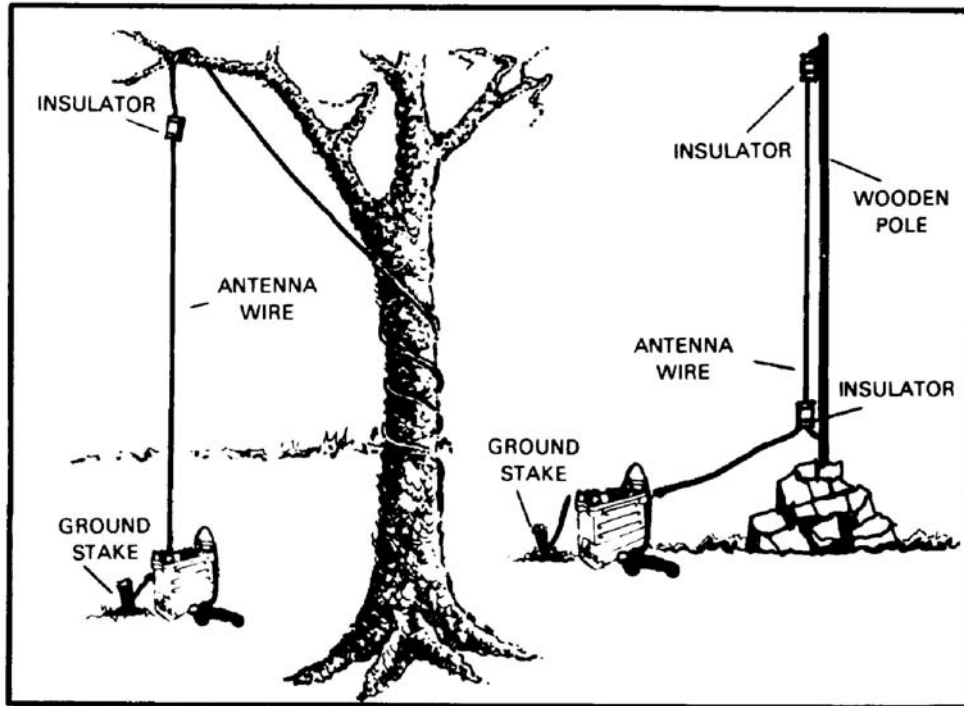
(a) Materials needed:

- Radio (AN/PRC-77, AN/PRC-119A with Adapter)
- Wire (WD-1)
- Insulator (MRE Spoon)
- Ground (Metal Tent Stake)
- Tie-Down (550 Shock Cord)

(b) Preparation:

- Figure length of wire using quarter wave formula. Double this measurement for half-wave length.
- Measure and cut antenna wire.
- Drill two holes in spoon.
- Attach the antenna wire to the antenna well of the radio or the adapter on the AN/PRC-119A.
- Attach other end of the antenna wire to the spoon.
- Attach 550 cord to the other end of the spoon.
- Run the wire up next to a tree and attach the cord to a branch.
- Set the radio into operation.

(c) Illustration:



(2) Jungle Antenna:

(a) Material needed:

- Radio (AN/PRC-77, AN/PRC-119A)
- Wire (WD-1)
- 2 Insulators (MRE Spoons)
- Tie-Down (550 Shock Cord)
- 3 Spreader Sticks (Tree Branches)

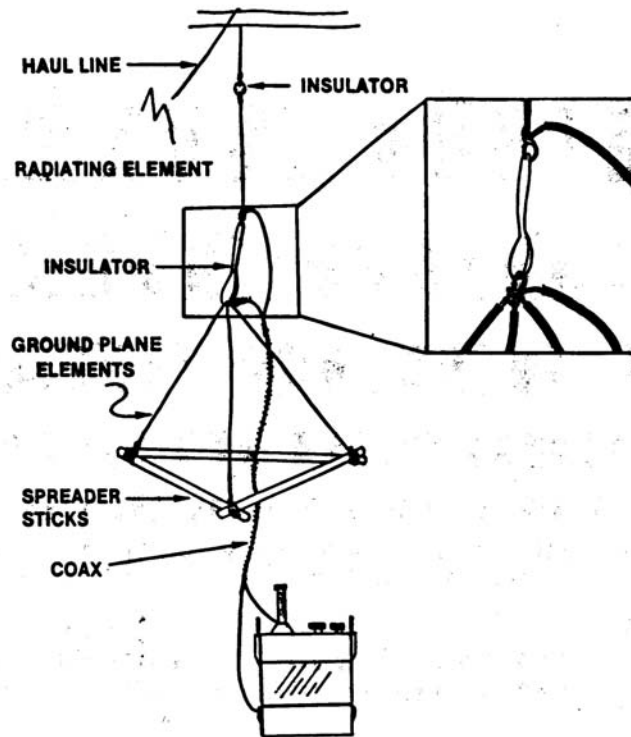
(b) Preparation:

- Figure length of wire using quarter wave formula.
- Measure and cut four equal lengths of antenna wire.
- Measure and cut three spread sticks (same length as antenna wire).
- Drill two holes in the spoons.
- Assemble the spread sticks into a triangle shape and tie together with 550 cord.

- Attach a length of measured wire to each of the corners of the triangle. Take one of the insulators and attach the other end of the three wires to it leaving some excess (1-2 inches). Splice the three excess strands together. This assembly is called the ground plane.
- Attach the last length of measured wire (vertical wire) to the other end of the insulator connected to the ground plane. Leave some excess 1-2 inches. Connect the opposite end to the other insulator.
- To the opposite end of the insulator attach a length of 550 cord. This is the haul line.
- Assemble the coax cable. Take two equal lengths of commo wire (no more than 45 feet) and twist them together with 8-10 twists per foot.
- Attach one wire of the coax cable to the battery box. Attach the other end to the excess splice of the ground plane assembly or adapter on the AN/PRC-119A.
- Attach the other wire of the coax cable to the antenna well of the radio. Attach the other end to the excess of the vertical wire assembly.
- Run the haul line up and over a tree branch and secure the antenna in place.
- Set the radio into operation.

(c) Illustration:

## “JUNGLE ANTENNA”



(3) Vertical Half-Rhombic Antenna:

(a) Materials needed:

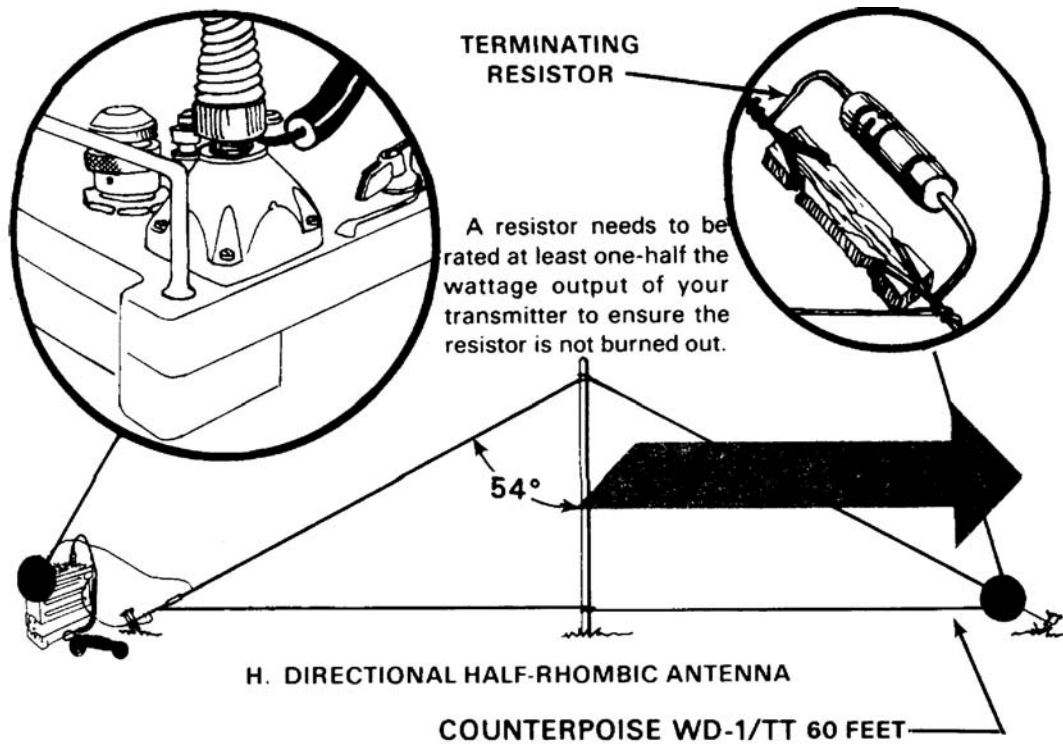
- Radio (AN/PRC-77, AN/PRC-119A)
- Wire (WD-1)
- 2 Insulators (MRE Spoons)
- 2 Stakes (Metal Tent Stakes)
- 1 Pole (Tree/Pole [30 Foot])
- 400-700 Ohm (Battery and Nails) Non-inductive Resistor

(b) Preparation:

- Cut a 100-foot length of commo wire. Allow for excess.
- Cut a pole approximately 10 meters or 30 feet long.

- Drill two holes in each spoon.
- Assemble resistor by pounding a nail into each end of a fresh BA-30.
- Find center of 100-foot length of wire and attach to one end of the 30-foot pole.
- Plant the pole into the ground.
- Attach a spoon to each end of the 100-foot wire, leaving some excess. The insulators should be ankle to knee high.
- Attach a tie-down to the opposite end of the insulator, leaving some excess. Attach the tie down to a ground stake.
- Draw the antenna taut and pound the ground stake into the ground.
- On the far end insulator, attach the excess wire from the antenna to one end of the resistor.
- Run a length of wire from ground stake to ground stake. This is called the counterpoise. Attach the excess wire from the counterpoise to the other end of the resistor.
- The angle formed by the antenna wire and the ground should be approximately 45-55 degrees.
- Connect a ground wire from the battery box of the radio or adapter to the ground wire excess of the near side insulator.
- Attach a 5-foot maximum length of wire to the antenna well of the radio or adapter and fasten this to the antenna wire near side insulator, opposite the resistor.
- Set the radio into operation.
- Remove the resistor to make the radio bi-directional.

(c) Illustration:



(4) Slant Wire Antenna:

(a) Materials required:

- Radio (AN/PRC-77, AN/PRC-119A)
- Wire (WD-1)
- Insulators, four (MRE Spoons)
- Stakes, Two (tent stakes)

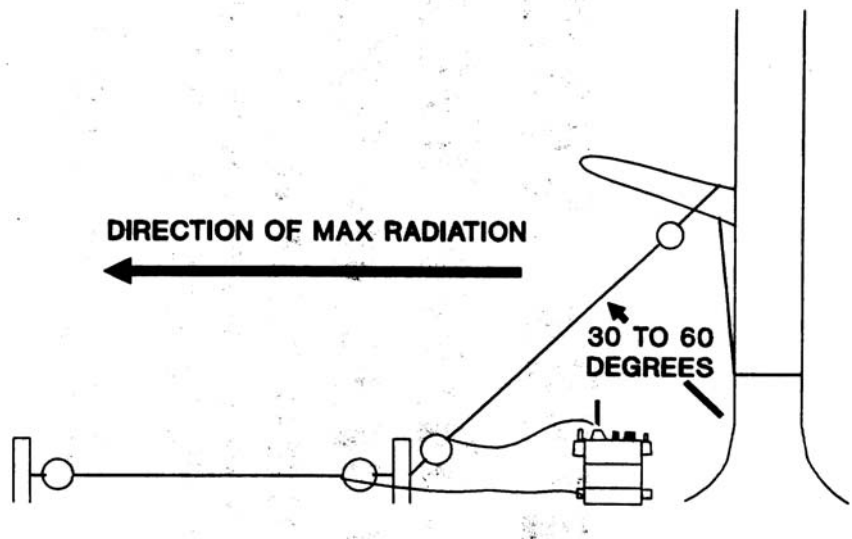
(b) Preparation:

- Calculate the length of wire using the quarter wave formula.
- Measure and cut two equal lengths of antenna wire.
- Drill holes in each spoon.
- Pound stakes into the ground.
- Attach insulators to each end of both wires.
- Attach the antenna wire to the stake on one end and a tree on the other end. Ensure the wire is at 30 - 60 angle.

- Attach the ground wire from one stake to the other. Ensure that the wire is taut and between ankle and knee high.
- Attach a ground wire to the battery box of the radio or the adapter.
- Attach a length of wire (5 feet) to the antenna well of the radio or the adapter and fasten this to the excess antenna wire of the near side insulator.
- Place the radio into operation.

(c) Illustration -- Slant Wire Antenna:

## SLANT-WIRE ANTENNA



## (5) Doublet Antenna:

## (a) Materials required:

- Radio (AN/PRC-77, AN/PRC-119)
- Wire (claymore)
- Insulator, one MRE spoon
- Coax wire
- Reels for claymore wire (2)

## (b) Preparation:

- Calculate the length of the wire using the quarter wave formula for 30.00.
- Measure and cut two equal length of antenna wire.
- Attach one end of the wire to a coax cable and the other end to a reel cable.
- Calculate the length for the frequency you will be using and roll out enough from the reel to equal that.
- Hang the end of the antenna straight out with the broadside toward the receiving station.
- Connect the coax to the radio and place the radio into operation.

## (c) illustration

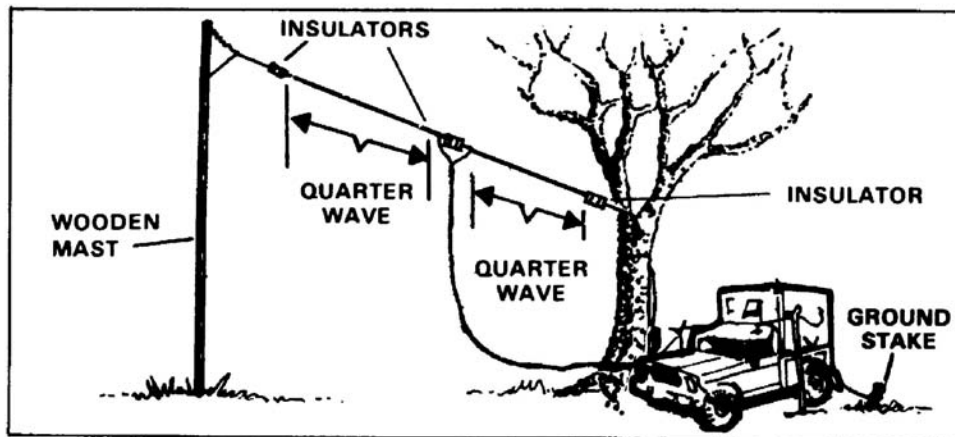


Figure 3-32. Half-wave doublet antenna.

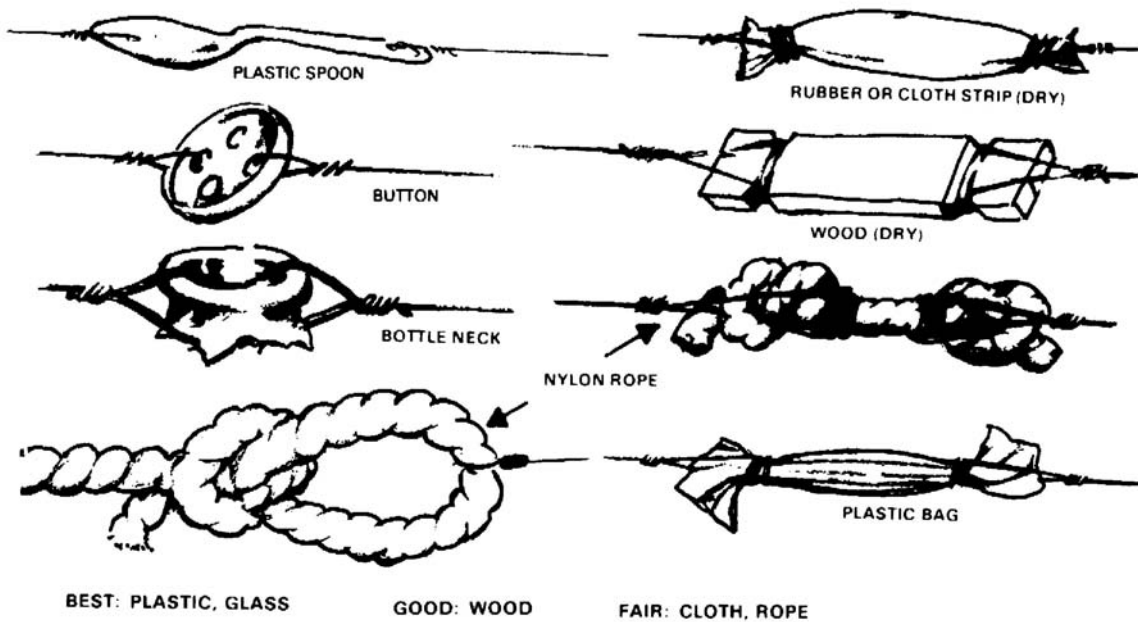
(6) Suitable Materials for Antenna Construction:

(a) Antenna Wires:

- Copper wire.
- Aluminum wire.
- Commo wire.
- Demo wire.
- Metal pipe/rod.

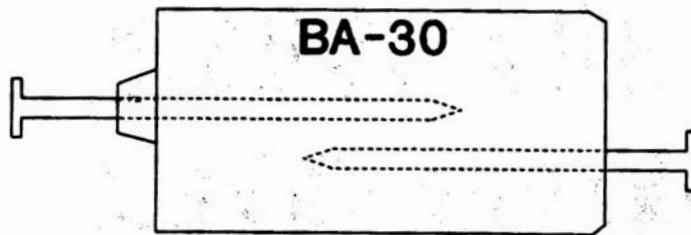
(b) Insulators:

Best	Good	Fair
Plastic Spoon (MREs)	Dry Wood	Cloth
Button (BDUs)	Dry Rubber	Rope, 550 Chord
Bottle Neck		
Plastic Bag		
Glass/Plastic		



- (c) Resistors: (Noninductive - 400 to 600 ohms)
- Use a resistor rated at least one-half the wattage output of transmitter (2-5 Watts).
  - Fresh BA-30 with nails driven into each end.
  - Salt water filled ear plug case (old barrel type).

## IMPROVISED RESISTER



## COAX



**WRAP THE GROUND WIRE AROUND THE ANTENNA WIRE  
8 TO 10 TIMES\FOOT**

- (5) Wave Length Conversion Formulas:  
(Used for determining antenna length)

(a) Quarter wave antenna:

$$\text{ANTENNA LENGTH (FT)} = \frac{234}{\text{FM Frequency}}$$

(b) Example -

$$\text{FM FREQUENCY} = 37.25$$

$$\text{ANTENNA LENGTH (FT)} = \frac{234}{37.25}$$

$$\text{ANTENNA LENGTH (FT)} = 6.2 \text{ FT}$$

$$2 \text{ FEET} \times 12 \text{ Inches/Foot} = 2.4 \text{ Inches}$$

Total Length = 6ft, 2in.

Add two inches for connections

**Overall length is 6ft, 4 in.**

Operating Frequency (MHz)	Element Length (Radiating Element and Ground Plane Element)
30	2.38m (7ft., 10in.)
32	2.23m (7ft., 4in)
34	2.1m (6ft., 11in.)
36	1.98m (6ft., 6in.)
38	1.87m (6ft., 2in.)
40	1.78m (5ft., 10in.)
43	1.66m (5ft., 5in.)
46	1.55m (5ft., 1in.)
49	1.46m (4ft., 9in.)
52	1.37m (4ft., 6in.)
55	1.3m (4ft., 3in.)
58	1.23m (4ft., 0in.)
61	1.17m (3ft., 10in.)
64	1.12m (3ft., 8in.)
68	1.05m (3ft., 5in.)

5-12

72	0.99m (3ft., 3in.)
76	0.94m (3ft., 1in.)

**Notes**

c. Sighting/Location (Consider Enemy Situation):

(1) Good sites for radio communications:

- (a) High hill.
- (b) Level ground.
- (c) Slight rise.
- (d) Line-of-Sight.
- (e) Moist ground.
- (f) Salt water.

(2) Poor sites for radio communications:

- (a) High tension lines/telephone wires.
- (b) Underpass/tunnel.
- (c) Valleys.
- (d) Overhead steel bridges.
- (e) Dense brush/foilage.
- (f) Dry ground.
- (g) Steel buildings.
- (h) Heavily traveled highways.
- (i) Near other radio stations.

**2. TACTICAL COMMUNICATIONS EQUIPMENT:**

## a. Radio Sets:

NOMENCLATURE	RANGE	WEIGHT	REMARKS
AN/PRC-25 Series	5-8 km	24.7 lb.	AN/VRC Vehicle AN/GRC-125 Vehicle or Man-pack
AN/PRC-77 Series	5-8 km	24.7 lb.	Replacing AN/PRC-25 Series AN/VRC-64 Vehicle AN/GRC-160 Vehicle or Man-pack
AN/PRC-119			SINGGARS
AN/PRC-88	CH-1 1600 m CH-2 500 m	AN/PRR-9 (10 oz) AN/PRT-4 (18 oz)	Consists of: AN/PRT-4 and the AN PRR-9 (Squad Radio)
AN/PRC-68 (SUT)	1-3 km	35 oz.	Small unit transceiver 1000 channels 10 presets
AN/VRC-46	41 km	90 lb. (approx.)	RT 524/VRC Vehicle Mounted
AN/VRC-47	41 km	90 lb. (approx.)	Same as AN/VRC-46, except has an additional receiver (R-442/VRC) & speaker (LS-454/U)
AN/VRC-64	12 km		Vehicle mounted AN/PRC-77 w/ amplifier (OA-3633/RC)
TSEC/KY-38	10% reduction		Speech security equipment
AN/PRC-70	121-4000 km		Extended frequency range multi-mode field radio. 'Burst' commo SF, Ranger, selected engineer units AM Frequencies
AN/PRC-74	40 km		AM

b. Wire Equipment:

NOMENCLATURE	RANGE	WEIGHT	REMARKS
TA-1/PT	10-16 km	3.5 lb.	Telephone
TA-312/PT	38 km	9.5 lb.	Field Phone
SB-22/PT		30 lb.	Switchboard 12 circuits
SB-993-GT		2.25 lb.	Switchboard 6 circuits
CE-11	400 m		Reel Equipment consists of: TA-1, RL-39, and DR-8
DR-8	800 m		WD-1 Wire
MX-306	800 m	25-26 lb.	WD-1 Wire
MX-6894	800 m	4 lb.	Lightweight combat assault wire
MX-6895	400 m	2 lb.	Lightweight combat assault wire

c. Antennas:

NOMENCLATURE	RANGE	WEIGHT	REMARKS
RC 292	Approx. twice the range of the radio	48 lb.	Frequency changes may require change in antenna length.
OE 254	Approx. twice the range of the radio		Do not have to change antenna length when changing frequency.

**Voice Transmission Maximum Planning Ranges**

Radio	RF Power	Ranges
Manpack/Vehicular	LO (Low)	200 – 400m
	Med (Medium)	400m – 5Km
	HI (High)	5Km – 10Km
Vehicular	PA (Pwr Amp)	10Km – 40Km

**3. MORSE CODE:**

A	.-	N	-. .
B	-... .	O	--- .
C	-... .	P	..-... .
D	-... .	Q	---..- .
E	. .	R	..- .
F	...-. .	S	... .
G	---. .	T	- .
H	.... .	U	...- .
I	.. .	V	...-. .
J	.-... .	W	.-.- .
K	-.- .	X	-...-. .
L	.-... .	Y	-.-- .
M	-- .	Z	---... .
0	----- .	5	..... .
1	.------ .	6	-..... .
2	..----- .	7	--..... .
3	...----- .	8	---..... .
4	....----- .	9	----..... .

#### 4. BATTERY LIFE CHART:

BATTERY	BATTERY LIFE	USE/REMARKS
BA-4386 (Magnesium)	60 Hours	AN/PRC-25 Series Radio Set AN/PRC-77 Series Radio Set
BA-1588	48 Hours	AN/PRC-68 Small Unit Transceiver
BA-1372	35 Hours	AN/PSS-11 Mine Detector
BA-1100	100 Hours	AN/PVS-2 Night Vision Sight
BA-1567	12 Hours	AN/PVS-4 Night Vision Sight AN/PVS-5 Night Vision Goggles
BA-3090/U	3 Days (Receiver) 16 Days (Detector)	AN/TRS-2
BA-5590	60 Hours	KY-57 Speech security equipment
BA-30	14 Days	TA-312/PT Telephone SB-22/PT - SB-993/GT Switchboards
BA-386 (Dry Cell)	20 Hours 30 Hours	AN/PRC-25 Series Radio Set AN/PRC-77 Series Radio Set
BA-399	35 Hours	AN/PRT-4 Squad Radio
BA-505U (Dry Cell)	14 Hours	AN/PRT-9 Squad Radio
BA-4505/U (Magnesium)	28 Hours	AN/PRT-9 Squad Radio

#### Notes

**5. SINGARS TASKS:**

a. Primary Task 1: Load Single Channel Freq in SINGARS RT

SUBTASKS	ACTION	RESULTS
a. Prepare to perform Task	1. Obtain proper freqs from ANCD*  2. Sel RT controls: COMSEC to PT MODE to SC FCTN to Z-FH, TST, and then to LD CHAN to MAN, CUE, to 1-6	(Load CUE Ireq only if directed)  RT display shown (GOOD) (or see unit maintainer)
2. Load SC Ireq	(1) <u>Press:</u> FREQ  CLR  XXXXX (Freq)  STO  (2) <u>Repeat:</u> Step b-1 for each needed  3. <u>Sel:</u> FCTN to SQ ON	Display shows [00000] or [30000] Display shows [_____] } Display shows SC freq entered Display blinks (data is stored) (As directed by NCS or unit SOP)  Loading of SC freq is complete

*\* In units using secure FH nets, operations normally load on a routine basis only a MAN SC frequency. CUE and CHAN 1-6 SC frequencies are loaded only as needed or directed.*

*\*\* Only NCS and All NCS routinely load a CUE frequency.*

**Notes**

b. Primary Task 2: Load COMSECFH Data/Sync Time Using ANCD\*

**Note: Set RT controls to CT, LD, FH, MAN, and DATA OFF (There is no requirement to clear a COMSEC alarm).**

<b>1. Select: SOI Radio sUpervisor</b>
<b>2. Send Receive Database: sEtap COMSEC Time</b>
<b>3. Send to: Radio Ancd Stu Pc</b>
<b>4. Select:** ICom Nonicom Abn Rcu Haveq</b>
<b>5. Connect to RT AUD/FILL Connector [v]**</b>
<b>6. Set FCTN switch to LD on RT</b>
<b>7. Do you want to include time? [v]****</b>
<b>8. Pres [LOAD] on RT</b>
<b>9. Transfer in Progress / Transfer Succesful</b>
<b>10. RT cannot accept time from ANCD</b>

\* The ICOM Fill Procedure loads the radio with COMSEC keys, FH date, and sync time for all six SINCGARS channels.

\*\* Select "RCU" to fill RCU, C-11561, with COMSEC keys. Procedure is the same as that shown for ICOM.

\*\*\* Throughout this manual when [v] appears you must press the down arrow to proceed.

\*\*\*\*Load time as part of COM Fill during net operations and Hot Start Late Net Entry only, not net updates.

### Notes

c. Primary Task 3: Perform Hot Start Net Opening

Subtask	Action	Result
a. Load RT with COMSEC/FH Data and Time*	(Set Primary Task 2 for ICOM Fill)	COMSEC/FH data and time are loaded into all 6 channels of the RT
b. Enter net	Call NCS in CT, Fill and request to enter net	Hot Start net opening is complete
Load Julian Date (JD) in RT	1. Turn ANCD ON (ANCD) 2. Enter: RADIO (ANCD) 3. Enter: TIME (ANCD) 4. Press: TIME (once) (RT) 5. Press: CLR (RT) 6. Enter: XX (JD) (RT) 7. Press: STO (RT)	Select: Sol Radio sUpervisor  Send Receive Database sEtap Comsec Time  Julian Date: XX [v]  Display shows "00"  Display shows " _"  Display shows "XX" (New JD) Display blinks and new JD is stored

d. Primary Task 4: Perform Passive Late Net Entry (LNE)

Subtask	Action	Result
Use Passive Method of Late Net Entry	(1) Press:  FREQ  SNYC  (2) Wait for radio traffic to be heard (Do not press PTT)  (3) Call NCS and re-enter net	Display shows [F XXX] Display shows [LF XXX]  Display shows [F XXX] ("L" is dropped)  Passive LNE is complete*

\* If traffic is not heard for 3 minutes after using Passive Late Net Entry method, use the Hot Start Procedure or CUE and ERF method.

Enter (Shown as [ENTR])	Causes activation of the entry you have
-------------------------	---

	selected
Hot Keys	Capital letters of selection eg-suX) Allows direct shift from QREF to full SOI file category
“J” Key (for JUMP)	In find, causes ANCD to continue search for next item
“K” Key (for KEEP)	Causes item being viewed to be stored in QREF file
MAIN MENU	Returns you to SOI/Radio/SUPERVISOR menu
PgUP/PgDN	Moves to top or bottom of list
ZERO (red button)	Used in combat emergency only; DO NOT use for deletions

e. Following are examples of the information which may be available in a full SOI information file\*:

(1) Group: (Group)

qRef <u>Group</u> Net suffix Pyro TmPd Set C/s Find Memo
T01 Set: 5210 DEM 003 003 5210 SPT

\* Once a time period has been selected, the same time period will be appear each subsequent time the ANCD is turned on. Thus, you need to change the time period only when advancing to the next day. To change the time period, enter TNMPD and make time period selection.

f. Primary Task 5: Obtain SOI Information from ANCD  
(Assume QREF has been loaded into Oerator’s ANCD)

(1) To look at any of the QREF items, perform the following steps:

Select: SOI Radio sUpervisor
<u>qReF</u> Group Net suffix Pyro TmPd C/s Find Memo

(2) QREF displays up to 40 items from Net, suffix, Pyro, or C/s available by scrolling. For each net stored as QREF items, the following information is available to the QREF user: net name, CUE, frequency, MAN frequency, time period, call sign, net ID and call word. To view items In Group, TmPd, Set, Find and Memo, as extensions of QREF entriesm

return to the main SOI menu and select the type of information needed. In viewing QREF or exclusion entries, be sure you have the correct time period selected.

(3) Rules to remember in obtaining SOI information from the ANCD:

ABORT	Causes ANCD to return to SOI menu
Arrow down (shown as [v])	You must press the down arrow to go to the next screen.
Arrow right/ arrow left	Allows viewing of additional information and return
Arrow up/ arrow down	Allows viewing of each item.
DELETE	To delete SOI set, enter SOI, the set, and press DELE key.

b. Net (Net)

qRef Group <u>Net</u> sufX Pyro TmPd Set C/s Memo
TO6 1-4 FA BN W7T C31975 M74800 0424
TO6 1-4 FA BN W7T Callword: Bulldog*

\* Obtained by pressing right arrow (Press left arrow to return)

c. Suffix: (sufX)

qRef Group Net <u>sufX</u> Pyro TmPd Set C/s Find Memo
Commander 02 COFS/XO 27

d. Pyro: (Pyro)

qRef Group Net sufX Pyro TmPd Set C/s Find Memo
GREEN SMOKE** [v]
Sale to land or drop Supplies here**

\*\* Meaning of signal is obtained by pressing right arrow (Press left arrow to return.)

e. Time Period: (Tmpd)

qRef Group Net sufX Pyro Tmpd <u>S</u> et C/s Find Memo
Enter Time Pd: → ##

f. SET (Set)\*

qRef Group Net sufX Pyro Tmpd <u>S</u> et C/s Find Memo
select: <u>C</u> hoose <u>S</u> end <u>R</u> eceive
Scroll [v], press <u>ENTR</u> to select set [v]
Set: (name/nr) Edn: (name/tp) [ENTR]

\* A Set may be detailed by entering Set and pressing the DELE key on the ANCD.

g. SIGN/CNTRSIGN: (C/s)

qRef Group Net sufX Pyro Tmpd Set <u>C</u> /s Find Memo
TO1 Sign: HARDWOOD Cntrsign: SNEAKER

h. FIND\* (Find)

qRef Group Net sufX Pyro Tmpd Set C/s <u>F</u> ind Memo
Find: Net nEtid Sfx Word C/sgn Grp gRp# Des Frq

\* FIND is used with full SOI file for quick location item desired. If first item viewed is not the desired one, press "J" to cause ANCD to continue search.

i. Memo:\*\* (Memo)

qRef Group Net sufX Pyro Tmpd Set C/s Find <u>Memo</u>
Memo: 1- 2- 3- 4-

\*\* Each of the 4 memos may be 6 lines of 22 spaces each.  
Memos will be included in transfer of SOI data (QREF or full SOI file).

## CHAPTER SIX

### MINE / COUNTERMINE

#### 1. MINE CHARACTERISTICS:

##### a. Conventional Mines:

Mine	Arming Fuzing	Type Warhead	Sensing Width	AHD S-D	Weight Mine (Expl) (Lb.)	Remarks
ANTI-TANK						
M15	Manual Pressure	Blast	Track	Yes No	30 (22)	2 Secondary fuse wells Standard firing device w/ M1 Activator
M19	Manual Pressure	Blast	Track	Yes No	28 (21)	Non-metallic 2 Secondary fuse wells Standard firing device w/ M2 Activator
M21	Manual Tilt-Rod Pressure	Shape Charge	Vehicle	Yes No	17 (11)	Bury when using tilt-rod
M24	Manual Tape Strip	3.5 in Rocket	10 m	Yes No	18 (18)	TM 9-1345-203-12&P Kit contains - firing device, discriminator, M28A1 Rocket
ANTI-PERSONNEL						
M14	Manual Pressure	Blast	Point	No No	3.3oz (1 oz)	Non-metallic Penetrates boot and foot
M16A2	Manual Pressure Tripwire	Bounding Frag	Point	Yes No	8 (1)	30 meter casualty radius
M18A1	Manual Command Tripwire	Direction Frag	Point	No No	6.8 (1.5)	100 meter casualty radius

## b. Scatterable Mines:

Mine	Arming Fuzing	Type Warhead	Sensing Width	AHD S-D	Weight Mine (Expl) (Lb.)	Remarks
ANTI-TANK						
M56	Helo Drop  Pressure	Blast	Track	Yes  Yes	5.9 (3.2)	Helicopter delivered anti-tank mine dispensing system 1 helo - 160 mines 300X20 meter minefield
RAAM M741 M718 M70 M73	G-force/ Spin  Magnetic	Platter Charge	Vehicle	Yes  Yes 2 opt	3.8 (1.3)	Remote anti-armor mine system 155mm Howitzer(17km range) 1 round(M483)/9 mines
GEMS S M75	Spin/ Electric impulse/ Battery Magnetic	Platter Charge	Vehicle	Some  Yes 2 opt	4.0 (1.3)	Ground Emplaced Mine Scattering System Trlr mtd dispenser(M128) Anti-disturbance switch
GATOR BLU91 XM89	Bore pin/ Electric impulse Magnetic	Platter Charge	Vehicle	No  Yes 3 opt	3.8 (1.3)	Air delivered scatterable mines USAF Bomblet(SUU66), 72 AT USN Bomblet(MK7), 45 AT
MOPM S XM78	Bore pin/ Electric impulse Magnetic	Platter Charge	Vehicle	Yes  Yes adj.	3.8 (1.3)	Modular Pack Mine System(SM133) 17 mines per dispenser Semicircle minefield w/ 35m radius
VOL- CANO AIR/ GRD XM89	Bore pin/ Electric impulse  Magnetic	Platter Charge	Vehicle	No  Yes 3 opt	3.8 (1.3)	Multiple delivery mine system XM87 canister, 5 AT mines 160 canisters per dispenser Replaces M56

ANTI-PERSONNEL						
ADAM M731 M692 M67 M72	Manual  Tripwire	Bounding Frag	6 m	N/A  No	0.9	Area Denial Artillery Munitions 155mm How, 17km range 1 rd M483, 36 mines 6-10m casualty radius
GEMS S M74	Spin/ Electric impulse/ Battery Tripwire	Blast Frag	12.2 m (40 ft)	Yes  Yes 2 opt	3.1 (1.2)	10-15m casualty radius
GATOR BLU92 XM90	Bore pin/ Electric impulse Tripwire	Blast Frag	6m	N/A  Yes 3 opt	3.2 (1.2)	USAF Bomblet(SUU66), 22 AP USN Bomblet(MK7), 15AP
MOPM S XM77	Bore pin/ Electric impulse  Tripwire	Blast Frag	12m	N/A  Yes 3 opt	3.2 (1.2)	4 AP mines per dispenser Mines dispensed using a RCU Self-destruct up to 30 days
VOL- CANO AIR/ GRD XM90	Bore pin/ Electric impulse  Tripwire	Blast Frag	6m	N/A  Yes 3 opt	3.2 (1.2)	1 AP mines per XM87 canister 160 canisters per dispenser 10-15m casualty radius

c. Special Purpose Mines:

Mine	Arming  Fuzing	Type Warhead	Sensing Width	AHD  S-D	Weight Mine (Expl) (Lb.)	Remarks
ANTI-TANK						
WASP M XM84	Manual Acoustic Radar	Platter Charge	50m	Yes Yes adj.	35 (12)	Wide Area Side Penetrator Mine Replaces M24
ANTI-PERSONNEL						
PDM XM86	Manual  Tripwire	Bounding	6m	Yes  Yes	1	Pursuit Deterrent Munitions Hand grenade type release firing mechanism Special Forces munitions
	Manual	Burster		Yes	22.75	Chemical agent mine, VX 2 secondary fuse wells

6-4

M23	Pressure Command	Cone	Point	No		Standard firing device w/ M1 activator Similar to M15 AT mine
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**Notes**

## 2. FIRING DEVICES:

TYPE	INITIATING ACTION	APPLICATIONS	REMARKS
M1 Pull Release	3-5 lb. tension	AP boobytraps AT mines (w/applicator)	Remove locking safety pin, then the positive safety pin.
M1A1 Pressure Release	20+ lb. pressure	Boobytraps AT mines (w/applicator)	Remove safety fork, then the positive safety pin.
M3 Pull/Tension Release	6-10 lb. tension. Tension release.	AP boobytraps AT mines (w/applicator)	Dual function
M5 Pressure Release	Release of 5+ lb. pressure	AT mines Boobytraps	'Mousetrap' Ensure firing device rests on a solid foundation. Improvise a positive safety with a piece of wire.
M142 Multi- purpose	25+ lb. pressure 7+ lb. tension 2+ lb. pressure/ tension release	AP mines Demolitions Boobytraps	When used as an AHD, replace coupling device with standard base. Replaces M1, M1A1, M3
M122	Radio transmission	Demolitions	SF, EOD units
TDTD	Adjustable time delay Anti-disturbance device	Demolitions	Time delay firing device. SF, combat engineer, Ranger units. Replaces M1 Delayed Firing Device
M71	Radio Transmission	MOPMS	Remote control unit used to controls up to 15 MOPMS.

**3. MINEFIELD TYPES:**

- a. Protective - To provide local, close-in protection:
  - (1) Hasty Protective - Used as part of a unit's defensive perimeter.
    - (a) Conventional - Laid on the top of the ground in random pattern with no AHDs. Employed outside hand grenade range but within small arms' range.
    - (b) Scatterable - MOPMS. Do not employ mines unless the enemy situation warrants.
  - (2) Deliberate Protective - Used to protect static installations. Standard pattern minefield.
- b. Tactical - Emplaced as part of an obstacle plan. Conventional or scatterable mines with AHDs may be used.
- c. Point - Used to disorganize enemy forces and hinder the use of key terrain.
- d. Interdiction - Placed on the enemy or in his rear areas to kill, disorganize, disrupt lines of communication, command and control facilities.
- e. Phony - Degrade enemy mobility. Use when the enemy has become sensitive to mine warfare. Supplement with a live minefield and/or use as gaps in live minefield and/or use as gaps in live minefields.

#### **4. MINEFIELD EMPLOYMENT AUTHORITY:**

##### a. Conventional Mines:

###### (1) Protective Minefields:

(a) Deliberate- Division or installation commander.

(b) Hasty- Brigade Commander. May delegate authority to battalion or company level on a mission basis.

(2) Tactical Minefields- Division commander. May delegate authority to brigade level.

(3) Point Minefields- Brigade commander. May delegate authority to battalion.

(4) Interdiction Minefields- Corps commander. May delegate to division level.

(5) Phony Minefields- Authority is granted according to the same type minefield.

##### b. Scatterable Minefields: Minefields containing scatterable mines -- Corps commander is the employing authority for all minefields containing scatterable mines within the corps area of operations.

(a) Long duration (24 hours or more)- Corps commander. May delegate employment authority to division level. Division may further delegate to brigade level.

(b) Short duration (less than 24 hours)- Same as long duration except authority may be further delegated to battalion or task force level.

**5. REPORTING, RECORDING, AND MARKING MINEFIELDS:**

a. Conventional:

(1) Reporting:

(a) Report of Intent to Lay- made as soon as the decision is made to lay a minefield. It includes the following data:

- Tactical purpose.
- Type of minefield.
- Estimated number of mines by type.
- Surface laid or buried.
- AHDs used.
- Location of minefield.
- Location and width of lanes and gaps.
- Estimated start and completion times.

(b) Report of Initiation- made when emplacement of the minefield begins and the area is no longer safe for friendly movement.

(c) Report of Completion- oral report to the authorizing commander that the minefield is complete and functional. Followed as rapidly as possible by a completed DA Form 1355 or DA Form 1355-1-R.

(d) Additional Reports:

- Progress Report- If requested, give an estimate of percent complete.

- Report of Transfer- A certificate signed by both commanders stating that the receiving commander was shown or informed of all mines within the zone of responsibility. The certificate is sent to the higher commanders who have authority over both the relieved and relieving commanders.

- Report of Change- Made immediately upon any change or alteration made to a previously reported minefield and is sent through command channels to the headquarters which maintains the written minefield records.

(2) Recording- All conventional minefields are recorded on DA Form 1355 (STANAG 2036) except for hasty protective minefields, which are recorded on DA Form 1355-1-R.

(3) Marking- Minefields are marked as necessary to protect friendly forces. In rear areas, minefields will be marked with one of the following:

(a) Two strand barbed wire fence with signs.

(b) Concertina fence with signs.

(c) HEMMS.

NOTE: In forward areas, mark only the friendly side(s). Mark lanes inconspicuously. Point and interdiction minefields are not marked.

### **Notes**

**MINEFIELD - RECORD**

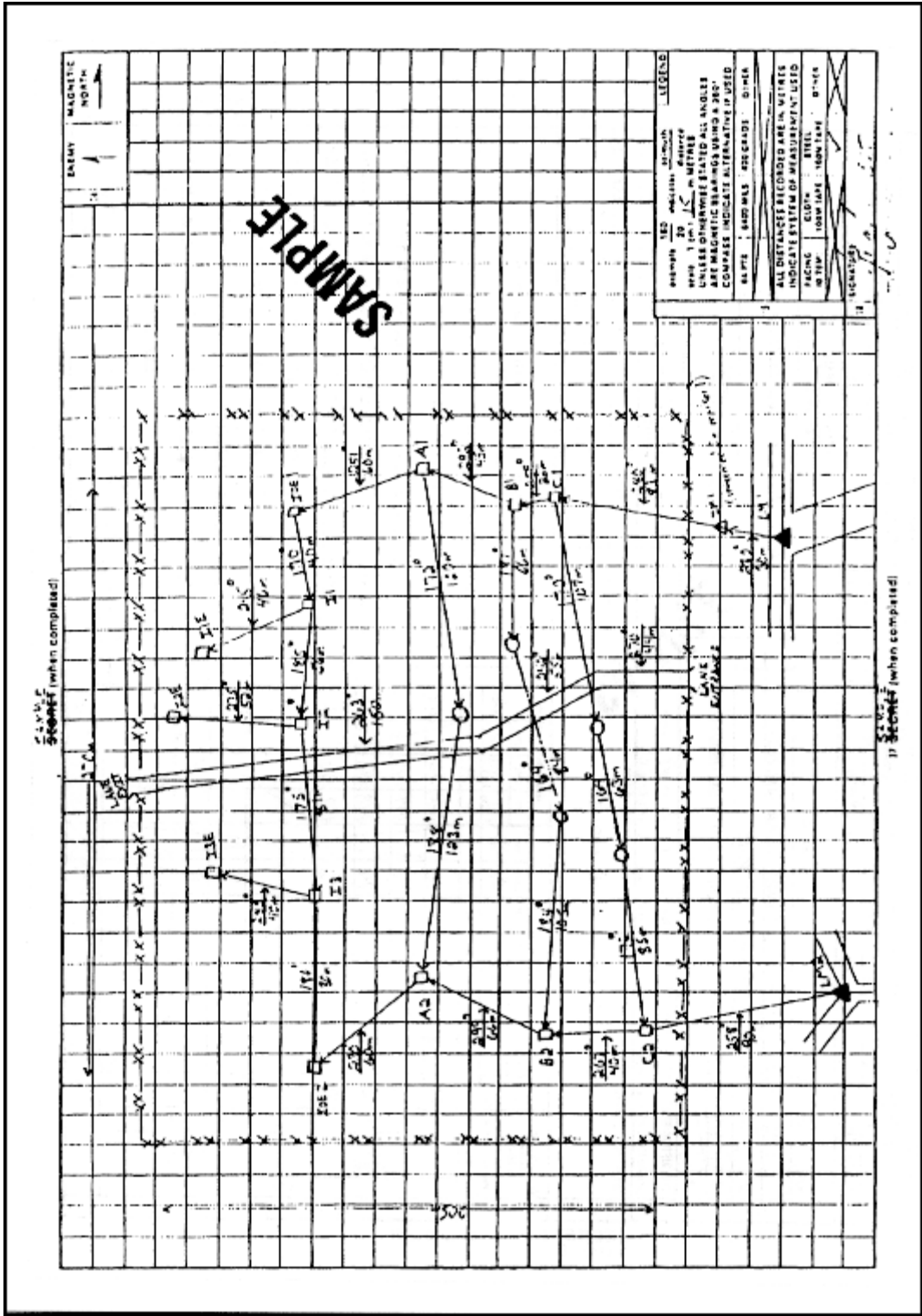
DA FORM 1355, MAR 87  
EDITION OF JUL 87 IS OBSOLETE

SECRET (when completed)

SECRET (when completed)

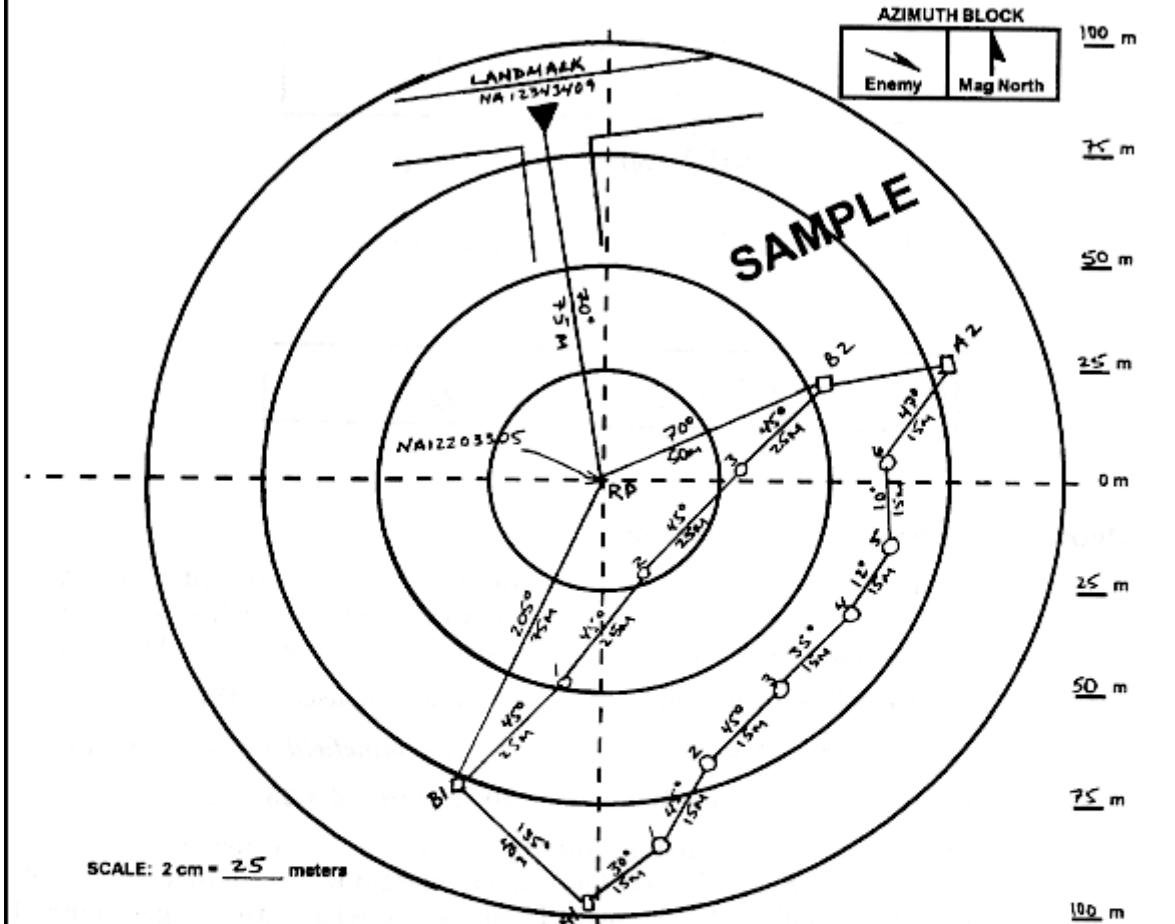
31 MAR 88

AUTHORITY: CG 2d INF DIV 1st Bn, 8 Co, 2d Eng, BN 217 AREA BSCR 762-01-1952	START DATE: 01/20/90 COMPLETION DATE: 01/20/90 REASON: for LINK 500-80-1304	MAP NUMBER: 762-01-1952	SHEET NO AND SCALE: H754 1:50,000	SHEET OR NAME: NJ 201C MUNYAL	SHEET NO. 1 of 4
INTERMEDIATE MARKERS					
NO	COORDINATES	DESCRIPTION	NO	DESCRIPTION	METHOD OF CROSSING
1	T 3017342	U-SHAPED PICKET FLUSH w/GROUND	1	U-SHAPED PICKETS 17' ABOVE GROUND	
2	T 2927329	U-SHAPED PICKET FLUSH w/GROUND	2		
3	T 2927329	U-SHAPED PICKET FLUSH w/GROUND	3		
4	T 2927329	U-SHAPED PICKET FLUSH w/GROUND	4		
8 DESCRIPTION OF BOUNDARY FENCE OR MARKING: SPANDED PICKETS FLUSH w/GROUND SPANDED GATTLIE FENCE 4 SIDES (MINIFIELD ENCLOSED) NO OF STRIPS/ROWS: 3 U-SHAPED PICKETS FLUSH WITH THE GROUND.					
LARRES					
NO	WIDTH	HOW MARKED	NO	DESCRIPTION	METHOD OF CROSSING
1	8 M	SEMI 5 SET	1		SEE NOTE R, BACK 12
NOTES					
1 MINE CLUSTERS AT 3 METRES/SPACE SPACING ALL DIMENSIONS IN MINEFIELD MEASURED IN METERS. (2) NUMBER OF THE LINK NUMBER (AND STRIPS NUMBER) FOR EACH CLUSTER: 15, 22, 24, 27, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.					
SIGNATURE OFFICER IN CHARGE: [Signature] DATE: 01 JAN 90					



**HASTY PROTECTIVE ROW MINEFIELD RECORD**

For use of this form, see FM 20-32; the proponent agency is TRADOC.



SCALE: 2 cm = 25 meters

**TABULAR BLOCK**

Row	Type	Action	Mine Number
A	M16A1	Tripwire	1, 2, 6
A	M21	Pressure	3, 4, 5
B	M16A1	Tripwire	1, 3
B	M19A1	Controlled	2
Remarks: Points A1, B1, A2, B2 are marked with orange tent pegs flush with ground.			

**IDENTIFICATION BLOCK**

Unit: 2nd Platoon, Dec, 116th ENAB BN  
 Reference Point(s): Tree stump side of road with white angle tape at NA 12343409  
 Remarks: Landmark is road junction at NA 12343409.  
 Map & Sheet No. TALBOT 5568  
 Name of OIC: 2LT ALLAN SSN 123-45-6789  
 Signature: *[Signature]* Time & Date: 2000 16 JUN 06  
 Mines Removed:   
 Mines Transferred:

DA Form 1365-1-R, Jul 86 (This form supersedes all previous forms)

INSTRUCTIONS

HASTY PROTECTIVE MINEFIELD RECORD

(FM 20-32 AND TC 20-31)

1. DESIGNATE AN EASILY IDENTIFIABLE REFERENCE POINT ON THE GROUND AS WELL AS STAKE, A STAKE OR THE LINE) OR SET THE POINT (ONE BLANK FORM OR THE OTHER) BY TYPING IN THE CLARIFIED POINT OF CIRCLES TO THE DESIGNATED REFERENCE POINT ON THE GROUND.

2. FIX THE REFERENCE POINT TO A LAND-MARK, SUCH AS A ROAD JUNCTION, 90° CORNER, ETC. THAT CAN BE FOUND IN A STANDARD MILITARY MAP.

3. COMPLETE THE AZIMUTH BLOCK.

4. COMPLETE THE FOLLOWING INFORMATION IN THE IDENTIFICATION BLOCK. UNIT, REF PT BLK, MAP, SHEET NO., DIC, NAME, SSAN.

5. STARTING FROM THE REFERENCE POINT, RECORD THE MAGNETIC BEARING IN DEGREES (°) AND DISTANCE IN PAGES (P) OF EACH LEG FROM THE PREVIOUS POSITION TOWARD THE ENEMY POSITION AND FROM RIGHT TO LEFT OR LEFT TO RIGHT ACROSS EACH ONE OF THE WIRE. HOWEVER, ALL WIRE MUST BE RECORDED IN THE SAME DIRECTION. MAGNETIC DEVIATION IS GIVEN. THE STARTING POINTS IN THE WIRE MUST BE MARKED AS 1, 2, ETC., AND THE ENDING POINTS MARKED A1, B2, ETC. AS SHOWN IN THE EXAMPLE. EACH WIRE IN EACH ROW WILL BE INDICATED SEPARATELY FROM THE STARTING POINT TO THE LAST WIRE IN THE ROW.

6. FILL IN THE LAMAR BLOCK. (SEE EXAMPLE)

7. FILL IN THE SCALE BEING USED UNLESS SPALL IS PROVIDED. "SCALE: 1CM = " AND THE IN THE PAGE (P) BLANKS IN THE RIGHT MARGIN.

8. MAKE ALL MINEFIELD REPORTS (REVISION, DESTRUCTION, COMPLETION, TRANSFER AND CHANGE) BY SOME SETTING MARKS.

9. NOTE WHAT HAS BEEN USED TO IDENTIFY A, B, C, E, OR OTHER PLASH WITH GROUND; SURE PACKET OR FENCE POST WRAPPED WITH ENGLISH TAPE, ETC.

SCALE: 1cm = 25 paces

TABULAR BLOCK

Row	Type	Activation	Mine number
A	MIAI	TRIPWIRE	1, 2, 6
	MIAI	CONTROLLED	3, 4, 5
B	MIAI	TRIPWIRE	1, 3
	MIAI	PRESSURE	2

Remarks: LAWMORALE IS ROAD JUNCTION AT WA123456789

IDENTIFICATION BLOCK

Unit: 2<sup>nd</sup> PLT, 2<sup>nd</sup> BDE, 1<sup>st</sup> CD BN  
 Ref Pt: TRAC STUMP SIDE OF ROAD

Remarks: Points A1 & A2, B1 & B2 ARE MARKED WITH 2x2" STAKES

Map & Sheet No: TALBOT 5566

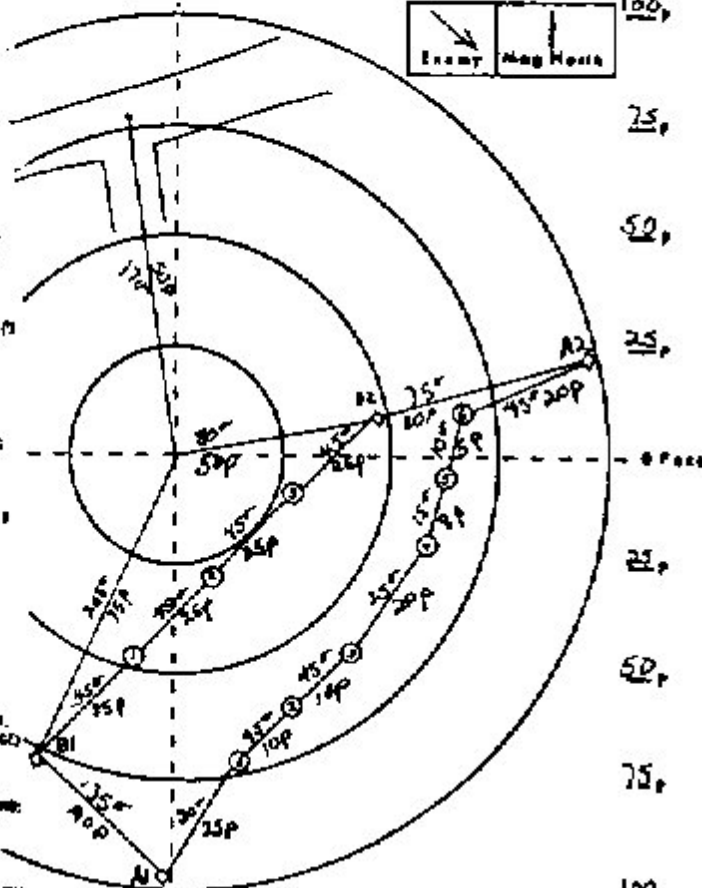
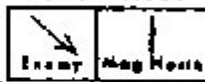
Name of DIC: LT. ALLAN

Signature: *[Signature]* *[Signature]*

Mines removed: \_\_\_\_\_

Mines transferred: \_\_\_\_\_

AZIMUTH BLOCK



b. Scatterable:

(1) Reporting/Recording:

(a) Front:

DATA (INSTRUCTIONS ON NEXT PAGE)

LINE #	INFORMATION REQUIRED
1	APPROVING AUTHORITY
2	TARGET/OBSTACLE #
3	TYPE EMPLACEMENT SYSTEM
4	TYPE MINES
5	SELF-DESTRUCT PERIOD
6	AIMING POINT/CORNER POINTS OF MINEFIELD
7	
8	
9	
10	
11	
12	
13	
14	
15	SIZE OF SAFETY ZONE FORM AIM POINT
16	UNIT EMPLACING MINES/REPORT#
17	PERSON COMPLETING REPORT
18	DTG OR REPORT

19 REMARKS

LINE # INSTRUCTIONS

- 1 APPROVING AUTHORITY. Enter approving authority (CDR 3AD)
- 2 TARGET/OBSTACLE NUMBER. If the minefield is part of an obstacle plan, enter the obstacle number (2XXX0157). This number represents II Corps, target number 157. If the minefield is not a part of an obstacle plan or does not have a number, then leave blank or enter N/A.
- 3 TYPE EMPLACEMENT SYSTEM. Enter the type system that emplaced the minefield, such as GEMSS, Artillery, Volcano, etc.
- 4 TYPE MINES. Enter AP for anti-personnel mines, AT for anti-tank mines. If both, enter AP/AT.
- 5 SELF-DESTRUCT PERIOD. Enter the time period in which the minefield will self-destruct.
- 6-14 AIMING POINT/CORNER POINTS OF THE MINEFIELD. If the system used to emplace the minefield uses a single aim point to deliver the mines, enter that aim point, (i.e. MB10102935). If the system has distinct corner points such as GEMSS, enter those corner points, (i.e., MB17954790, MB18604860, MB18504890, MB18054895, FM17804850).
- 15 SIZE OF THE SAFETY ZONE FORM AIM POINT. If an aim point is given in line 6, enter the size safety zone from that aim point. Example: Artillery emplaces a minefield from air point MB 10102935 and the safety zone is 1000M X 1000M, enter 500M so that personnel plotting or receiving the information can plot the coordinate and go 500 M in each direction from the aim point and plot the safety zone.
- 16 UNIT EMPLACING MINES/REPORT NUMBER. (i.e., BCO 23 ENGR BN). Reports should be numbered consecutively. This should be the fourth minefield that B Company has emplaced.
- 17 PERSON COMPLETING THE REPORT. (i.e., SFC Hollis).
- 18 DTG OF REPORT. (i.e. 160735Z0T82).
- 19 REMARKS. Any other items the reporting unit may feel are important.

- (2) Marking- Mark to the extent necessary to protect friendly troops as with the conventional minefields.
- (3) SCATMINWARN- Used to warn friendly units of a scatterable minefield.

<u>LINE</u>	<u>MESSAGE</u>
ALPHA	Emplacing System
BRAVO	AT YES/NO
CHARLIE	AP YES/NO
DELTA	Number of aim points/corner points.
ECHO	Grid coordinates of aim points/ corner points and size safety zone
FOXTROTDTG of self-destruct period	

- c. Enemy- Any detection of enemy minefields must be reported ASAP, using the following format (STANAG 2096):

<u>LINE</u>	<u>MESSAGE</u>
ALPHA	Map sheet designation
BRAVO	Date and time of collection of information.
CHARLIE	Type of minefield (AT, AP)(Self-Destructing)
DELTA	Coordinates of minefield extremities
ECHO	Depth of minefield
FOXTROTEEnemy weapons or surveillance	
GOLF	Estimated time to breach minefield
HOTEL	Estimated material and equipment needed to breach the minefield.
INDIA	Routes for by-passing minefield (if any).
JULIET	Coordinates of lane entry (if any).

KILO	Coordinates of lane exit (if any).
LIMA	Width of lanes, in meters (if any).
ZULU	Other:

**Notes**

**6. BREACHING METHODS:**

EXPLOSIVE							
NOMENCLATURE	TYPE	MINES CLEARED	WEIGHT (LB.)	LANE CLEARED		ASSEMBLY TIME	EMPLOYMENT TIME (MIN) (SPEED)
				WIDTH METERS (FEET)	LENGTH METERS (FEET)		
M58A3 (MICLIC) NOTE 1	Trailer mounted	AT/AP	3100	8 (26)	100 (328)	Crane and crew 35 min	4 (25 mph)
M173 (Projected charge demo kit) NOTE 1	Towed	AT/AP	3000	8 (26)	70 (230)	Crane and 2 men 30 min	10 (15 mph)
M175 (Diamond Lil)	Pushed by Tank	AT/AP	11,000	8 (26)	100 (328)	2 squads 1 hour	20 (8 mph)
M1A1 (Projected Charge Kit)	Portable	AP	63	6 (2)	50 (170)	2 men 10 min	10
M1A1 (Bangalore)	Portable	AP	130/ Kit	6 (2)	15 (50)	1 squad 5 min	5

MECHANICAL						
NOMENCLATURE	TYPE	MINES CLEARED	WIDTH OF LANE CLEARED m(FT)	WEIGHT (LB.)	PREPARATION TIME	EMPLOYMENT TIME (min) (SPEED)
Roller	Tank mounted	AT/AP	2 @ 1.1 (3.6)	20,000	Crane and crew 45 min	4 (5 mph)
Plow	Tank mounted NOTE 2	AT/AP	2 @ 1.8 (6)	12,000	Crane and crew 45 min	4 (3 mph)

MANUAL			
	LANE CLEARED WIDTH (meters)	MAN-HOURS REQUIRED PER 100 METERS	REMARKS
Location by probing	1 (footpath)	16-22	NOTE 3
Removal by rope or explosives	1 (foot path)	38-44	NOTE 3
Location by detector Assisted by probing	8 (one-way vehicle lane)	27-33	NOTE 3
Removal by rope or explosives	8 (one-way vehicle lane)	220-247	NOTE 3

NOTE 1. Breaching vehicles should place one track/wheel in the line charge crater to ensure straddling the "skip zone".

NOTE 2. Based on average conditions of visibility and moderate enemy activity and normal US countermeasures, such as screening of enemy observation and counterbattery fires against hostile artillery or other weapons covering the field.

NOTE 3. Plows issued to M1 units should be mounted prior to combat and remain permanently attached.

## **CHAPTER SEVEN**

### **MEDICAL**

#### **1. VITAL BODY FUNCTIONS:**

a. Respiration - Normal cycle is 12-20 times a minute.

b. Blood circulation:

Heartbeat/Pulse - 60-100 beats a minute is normal.

c. Body Temperature:

97.6° Fahrenheit -- Auxiliary

98.6° Fahrenheit -- Oral

99.6° Fahrenheit -- Rectal

#### **2. SHOCK: Inadequate organ and tissue perfusion with oxygenated blood.**

a. Symptoms:

(1) Sweaty but cool skin.

(2) Paleness of skin.

(3) Restlessness, nervousness.

(4) Thirstiness.

(5) Loss of blood (bleeding).

(6) Confusion (or loss of awareness).

(7) Faster-than-normal breathing rate.

(8) Blotchy or bluish skin (especially around the mouth and lips).

(9) Nausea and/or vomiting.

(10) Rapid pulse.

(11) Low blood pressure.

b. Treatment:

(1) Position the casualty under cover and on his back.

(2) Elevate his feet above the level of the heart.

(3) Loosen clothing. (Do not remove MOPP clothing in a chemical environment.)

(4) Maintain body temperature.

(5) Calm the casualty.

(6) Seek medical aid.

**3. HEAD INJURY:**

a. Symptoms:

(1) Bleeding.

(2) Deformity.

(3) Unconsciousness.

(4) Memory loss.

(5) Clear fluid or blood leaking from nose and ears.

(6) Staggering/dizziness.

(7) Change in pulse.

(8) Breathing problems.

(9) Nausea or vomiting.

(10) Convulsions.

(11) Slurred speech.

(12) Confusion.

- (13) Sleepiness.
- (14) Black eyes.
- (15) Eye problems.
- (16) Paralysis.
- (17) Headache.

b. Treatment:

- (1) Maintain open airway.
- (2) Place a dressing over wounded area.
- (3) Do not attempt to clean the wound.
- (4) Keep casualty warm.
- (5) Do not attempt to remove an impaled object from the head.
- (6) Do not give the casualty anything to eat or drink.
- (7) Do not administer morphine or similar drugs.
- (8) Do not attempt to push any brain matter back into the head.
- (9) Keep the airway clean.
- (10) Position the casualty on his side opposite the site of injury.

**4. SUCKING CHEST WOUND:**

- a. Evaluate the casualty. Be prepared to perform lifesaving measures.
- b. Locate the open chest wound(s). Check for an entry and/or exit wound.
- c. Expose the wound. Cut or remove clothing to expose the entire area of the wound. Do not remove clothing that is stuck to the wound. Do not remove MOPP gear in a chemical environment.
- d. Obtain the casualty's field dressing. Carefully tear open the plastic wrapper and remove the inner packet.
- e. Place the wrapper over the wound. Place it directly over the wound when the casualty exhales and hold it in place. Tape three sides in place.
- f. Apply the dressing to the wound. Place the dressing directly over the plastic. Wrap the tails around the body and tie a square knot on top of the wound while the casualty exhales.
- g. Position the casualty. On his injured side or a sitting position whichever makes breathing easier.

## **5. STOMACH WOUNDS:**

- a. Evaluate the casualty. Be prepared to perform lifesaving measures.
- b. Position the casualty on his back with knees up.
- c. Expose the wound. Remove clothing but do not attempt to remove clothing stuck to the wound. Do not remove MOPP gear in a chemical environment.
- d. Pick up any organs which may be protruding or on the ground with a clean dressing and place on top of the casualty's stomach.
- e. Apply the field dressing. Place the dressing directly over the wound. Wrap the tails around the body and tie a square knot to the side of the wound loosely enough to insert two fingers between the tie and dressing. Wrap two cravats over dressing.

## **6. CONTROL HEMORRHAGE:**

- a. Expose the wound - Cut or tear clothing and carefully expose the entire area of the wound. Do not remove clothing stuck to the wound. Do not touch the wound. Do not remove MOPP clothing in a chemical environment.
- b. Initial dressing - Use the casualty's field dressing. Do not contaminate the sterile side of the dressing. Place the dressing over the wound. Wrap the tails around the injured part and tie a square knot on the side of the wound, not on the top. The knot should be loose enough to insert two fingers between the knot and the dressing.
- c. Manual pressure - If bleeding continues after applying the initial dressing, conduct the following:
  - (1) Direct pressure - Place your hand on the dressing and exert firm pressure for 5 to 10 minutes.
  - (2) Elevate the wound - Elevate the wound 2 to 4 inches above the level of the heart to reduce the bleeding.
  - (3) Digital pressure - Use your fingers, thumb or hands to press at the site where a main artery supplying the wounded area lies near the skin surface. The 11 pressure points are illustrated here:
- d. Pressure dressing - If the bleeding persists after applying manual pressure, a pressure dressing must be applied as follows:

- (1) Place a wad of padding on top of the field dressing, directly over the wound.
  - (2) Place a cravat or improvised dressing over the wad and wrap the ends tightly around the injured limb.
  - (3) Tie a square knot directly over the wound tight enough so that only the tip of one finger can be inserted between the dressing and the knot.
- e. Tourniquet - Use only when a pressure dressing fails or when an arm or leg is cut off. Do not loosen or release a tourniquet after it has been applied and the bleeding has stopped. Apply the tourniquet as follows:
- (1) Improvise a tourniquet by obtaining a cravat and a sturdy stick or similar objects.
  - (2) Place the tourniquet around the limb, between the wound and the body trunk. Ensure that:
    - (a) It is placed 2-4 inches above the wound.
    - (b) It is not placed on a joint.
    - (c) When possible, place over clothing to reduce skin damage.
  - (3) Tie an overhand knot, place the stick on top of the knot, and complete with another knot forming a square knot.
  - (4) Twist the stick until the tourniquet is tight around the limb.
  - (5) Secure the stick to prevent it from loosening.
  - (6) If the limb is missing, apply a dressing to the stump.
  - (7) Mark the casualty's forehead with a "T".

## 7. ORTHOPEDIC INJURIES:

### a. Types:

- (1) Sprain. Connecting tissues of the joints have been torn.
- (2) Dislocations- Occurs when a joint is not in proper position.
- (3) Closed fracture- Broken bone that did not break the overlying skin.  
Sprains and dislocations are treated as closed fractures.
- (4) Open fracture- Broken bone that breaks the overlying skin.

### b. Treatment. If you are not sure whether a bone is fractured, treat the injury as a fracture. Splint the fracture to immobilize.

#### (1) Materials:

- (a) Splints- Boards, poles, sticks, tree limbs, rolled magazines, rolled newspapers, etc.
- (b) Padding- Jacket, blanket, poncho, shelter half, vegetation, etc.
- (c) Bandages- Belts, rifle slings, bandoleers, cravats, etc.

#### (2) Rules for splinting:

- (a) Gather materials. Insure that splints are long enough to immobilize the joint above and below the suspected fracture. If possible, obtain at least 4 bandages.
- (b) Remove any jewelry from the injured area.
- (c) Pad the splints where they touch any part of the body.
- (d) Check the circulation below the site of the injury. Casualties with impaired circulation should be evacuated as soon as possible to prevent possible loss of limbs.
- (e) Apply and tie the splint in place. Do not reposition injury. Splint in position found, stop bleeding and protect the wound if an open fracture, before applying the splint. Tie the splints to the casualty with two bandages above and two bandages below the fracture. Tie the bandages with a square knot away from the casualty loose enough to be able to slip two fingers under the bandage.

(f) Recheck the circulation to see if the bandages are too tight.

**8. BURNS:**

- a. Expose the burn. Cut and gently lift away any clothing covering the burned area. Do not remove any clothing that is stuck to the burns.
- b. Apply a field dressing. Use the casualty's dressing. Tie a square knot loosely enough to insert two fingers between the tie and dressing.
- c. Do not place a dressing over the face or genital area.
- d. Do not break any blisters.
- e. Do not apply grease or ointments.
- f. Flush chemical burns with water then apply a field dressing.
- g. Flush WP burns with water and cover with mud or a wet material.
- h. Treat for shock and seek medical aid.

**9. ENVIRONMENTAL INJURIES:**

INJURY	SIGNS/SYMPTOMS	FIRST AID
<b>COLD INJURIES</b>		
CHILBLAIN	Red, swollen, hot, tender, itching skin. Continued exposure may lead to infected (ulcerated bleeding) skin lesions.	<ol style="list-style-type: none"> <li>1. Area usually responds to locally applied rewarming (body heat).</li> <li>2. <b>Do Not</b> rub or massage area.</li> <li>3. Seek medical treatment.</li> </ol>
IMMERSION FOOT/TRENCH FOOT	Affected parts are cold, numb, and painless. As parts rewarm they may be hot, with burning and shooting pains. Advanced stage: skin pale with bluish cast: pulse decreases blistering, swelling, heat hemorrhages, and gangrene may follow.	<ol style="list-style-type: none"> <li>1. Gradual rewarming by exposure to warm air.</li> <li>2. DO NOT massage or moisten skin.</li> <li>3. Protect affected parts from trauma.</li> <li>4. Dry feet thoroughly: avoid walking.</li> <li>5. Seek medical treatment.</li> </ol>
FROST BITE NOTE 1	<p>SUPERFICIAL: Redness, blisters in 24-36 hours and sloughing of the skin.</p> <p>DEEP: Preceded by superficial frostbite; skin is painless, pale-yellowish, waxy, "wooden" or solid to touch, blisters form in 12-36 hours</p>	<p>SUPERFICIAL:</p> <ol style="list-style-type: none"> <li>1. Keep casualty warm; gently rewarm affected parts.</li> <li>2. Decrease constricting clothing, increase exercise and insulation.</li> </ol> <p>DEEP:</p> <ol style="list-style-type: none"> <li>1. Protect the part from additional injury.</li> <li>2. Seek medical treatment as fast as possible.</li> </ol>
SNOW BLINDNESS	Eyes may feel scratchy, watering, redness, headache, increased pain with exposure to light can occur.	<ol style="list-style-type: none"> <li>1. Cover the eyes with a dark cloth.</li> <li>2. Seek medical treatment.</li> </ol>
DEHYDRATION	Similar to heat exhaustion.	<ol style="list-style-type: none"> <li>1. Keep warm, loosen clothes.</li> <li>2. Replace lost fluids, rest, and additional medical treatment.</li> </ol>
HYPOTHERMIA	Casualty is cold, uncontrolled shivering, until shivering stops, inner body core temperature is low, consciousness may be altered, uncoordinated movements may occur, shock and coma occur as body temperature drops.	<p>MILD HYPOTHERMIA:</p> <ol style="list-style-type: none"> <li>1. Rewarm body evenly and without delay. (Heat source must be provided.)</li> <li>2. Keep dry, protect from elements.</li> <li>3. Warm liquids may be given to conscious casualty only.</li> <li>4. Be prepared to start CPR.</li> <li>5. Seek medical treatment immediately.</li> </ol>

		<p><b>SEVERE HYPOTHERMIA:</b></p> <ol style="list-style-type: none"> <li>1. Quickly stabilize body temperature.</li> <li>2. Attempt to prevent further heat loss.</li> <li>3. Handle the casualty gently.</li> <li>4. Evacuate to nearest medical treatment facility as soon as possible.</li> </ol>
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HEAT INJURIES		NOTE 2, 3
HEAT CRAMPS	Casualty experiences muscle cramps in arms, legs and/or stomach, may also have wet skin and extreme thirst.	<ol style="list-style-type: none"> <li>1. Move the casualty to a shaded area and loosen clothing.</li> <li>2. Provide large quantity of cool water, slowly.</li> <li>3. Monitor casualty and provide water as needed.</li> <li>4. Seek medical attention if cramps persist.</li> </ol>
HEAT EXHAUSTION	Casualty experiences loss of appetite, headache, excessive sweating, weakness or faintness, dizziness, nausea, muscle cramps. The skin is moist, pale and clammy.	<ol style="list-style-type: none"> <li>1. Move the casualty to a cool, shaded area and loosen clothing.</li> <li>2. Pour water on casualty and fan to increase cooling effect of evaporation.</li> <li>3. Provide at least one quart of water to replace lost fluids.</li> <li>4. Elevate legs.</li> <li>5. Seek medical aid if symptoms continue.</li> </ol>
HEATSTROKE (SUNSTROKE)  NOTE 4	Casualty stops sweating (hot, dry skin), may experience headache, dizziness, nausea, vomiting, rapid pulse and respiration, seizures, mental confusion. Casualty may suddenly collapse and lose consciousness. <u>THIS IS A MEDICAL EMERGENCY!</u>	<ol style="list-style-type: none"> <li>1. Move casualty to a cool, shaded area, loosen clothing, remove outer clothing if the situation permits.</li> <li>2. Immerse in cool water. If cool bath is not available, massage arms and legs with cool water. Fan casualty to increase the cooling effect of evaporation.</li> <li>3. If conscious, slowly consume one quart of water.</li> <li>4. <u>SEEK MEDICAL AID AND EVACUATE AS SOON AS POSSIBLE.</u> Perform any lifesaving measures.</li> </ol>

NOTE 1: DO NOT attempt to thaw deep frostbite. There is less danger of walking on feet while frozen than after they have thawed.

NOTE 2: The first aid procedure for heat related injuries caused by wearing individual protective equipment is to move the casualty to a clear area and give him water to drink.

NOTE 3: When in a chemical environment, DO NOT loosen or remove casualty's protective garments.

NOTE 4: Can be fatal if not treated promptly and quickly.

**10. BITES AND STINGS:**

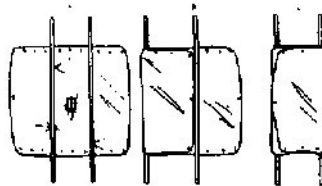
BITES AND STINGS	
TYPE	FIRST AID
Snakebite	<ol style="list-style-type: none"> <li>1. Get the casualty away from the snake.</li> <li>2. Remove all rings and bracelets from the affected extremity.</li> <li>3. Reassure the casualty and keep him quiet.</li> <li>4. Place ice or freeze pack, if available, over the area of the bite.</li> <li>5. Apply constricting band(s) 1-2 finger widths proximal to the bite. One finger should be able to be slipped between the band and skin. ARM or LEG Bite - Place one band above and one band below the bite site. HAND or FOOT Bite - Place one band above the wrist or ankle.</li> <li>6. Immobilize the affected limb in a position below the level of the heart.</li> <li>7. Kill the snake, if possible, (without damaging its head or endangering yourself) and send it with the casualty.</li> <li>8. Seek medical treatment immediately.</li> </ol>
Brown Recluse Black Widow Spider Bites	<ol style="list-style-type: none"> <li>1. Keep the casualty calm.</li> <li>2. Wash the area.</li> <li>3. Apply ice or a freeze pack, if available.</li> <li>4. Seek medical treatment.</li> </ol>
Tarantula Bite, Scorpion sting, Ant bites	<ol style="list-style-type: none"> <li>1. Wash the area.</li> <li>2. Apply ice or a freeze pack, if available.</li> <li>3. Apply baking soda, calamine lotion, or meat tenderizer to the bite site to relieve pain and itching.</li> <li>4. If site of bite(s) or sting(s) is on the face, neck (possible airway blockage), or genital area, or if reaction is severe, or if the sting is by the dangerous Southwestern scorpion, keep the casualty as quiet as possible and seek immediate medical aid.</li> </ol>
Bee stings	<ol style="list-style-type: none"> <li>1. If the stinger is present, remove by scraping with a knife or finger nail. DO NOT squeeze venom sack on stinger, more venom may be injected.</li> <li>2. Wash the area.</li> <li>3. Apply ice or freeze pack, if available.</li> <li>4. If allergic signs or symptoms appear, be prepared to perform CPR and seek medical assistance.</li> </ol>
Human and other animal bites	<ol style="list-style-type: none"> <li>1. Cleanse the wound thoroughly with soap or detergent solution.</li> <li>2. Flush bite well with water.</li> <li>3. Cover bite with a sterile dressing.</li> <li>4. Immobilize injured extremity.</li> <li>5. Transport casualty to a medical treatment facility.</li> <li>6. Kill the animal, if possible, without damaging its head or endangering yourself, and send it with the casualty.</li> </ol>

Sharks, Barracuda, and Alligators	<ol style="list-style-type: none"> <li>1. Control the bleeding.</li> <li>2. Prevent shock.</li> <li>3. Provide basic life support.</li> <li>4. Splint any orthopedic injuries.</li> <li>5. Provide immediate medical attention.</li> </ol>
Turtles, Moray Eels, Corals	<ol style="list-style-type: none"> <li>1. Clean the wound(s) thoroughly.</li> <li>2. Splint if necessary.</li> </ol>
Jellyfish, Portuguese Man- o-War, Anemones, etc.	<ol style="list-style-type: none"> <li>1. Gently remove clinging tentacles with a towel.</li> <li>2. Apply diluted ammonia, alcohol, meat tenderizer, or talcum powder.</li> <li>3. Seek medical attention.</li> </ol>
Spineyfish, Urchins, Stingrays, and Conch shells	<ol style="list-style-type: none"> <li>1. Soak the wound in warm water for 30-60 minutes.</li> <li>2. Seek further first aid as necessary.</li> </ol>

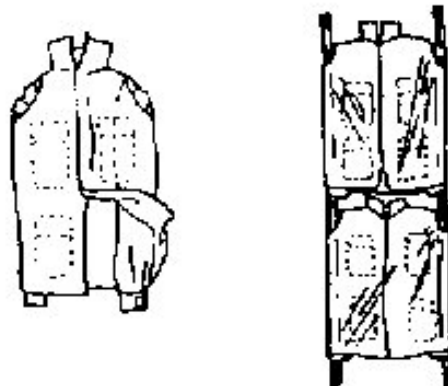
**Notes:**

**11. IMPROVISED LITTERS:**

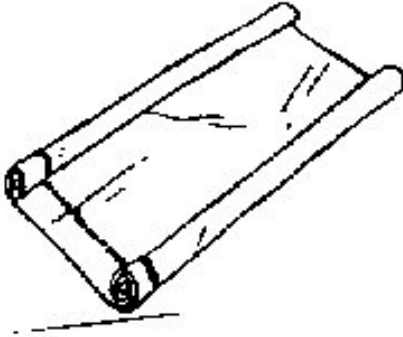
- a. Poncho Litter - Can also be constructed using a blanket, shelter half, etc.
  - (1) Open the blanket and lay one pole lengthwise across the center. Then fold the blanket over the pole.
  - (2) Place the second pole across the center of the folded blanket.
  - (3) Fold the free edges of the poncho over the second pole and the first pole.



- b. Jacket Litter. Button shirts or jackets and turn inside out, leaving the sleeves inside. Pass the poles through the sleeves. Can also use mattress covers, sacks, etc.



- c. Rolled Blanket. Shelter half, poncho, etc. Roll the blanket from both sides toward the center. Grip the rolls to carry.



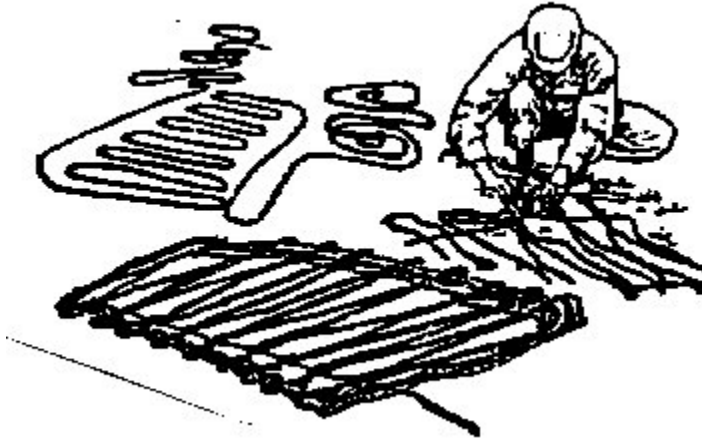
- d. Rope Litter – A rope litter is a field expedient litter prepared using one rope. It requires 20-30 minutes to prepare. Use a rope litter only when other materials are not available.

Note: Above the treeline, very little material exists to construct litters.

- (1) Make twenty to twenty-four bights, about 45-61 cm (18-24in. long). Start in the middle of the rope so two people can work on the litter simultaneously.
- (2) With the remainder of the rope, make a clove hitch over each bight. There is approximately a hand's width between the clove hitches.
- (3) Pass the remainder of the rope through the bights outside the clove hitches. Dress the clove hitches down toward the closed end of the bight to secure the litter and tie off the ends of the rope with two overhand knots.
- (4) Line the litter with padding such as clothing, sleeping bags, or empty boxes.
- (5) Four to six bearers are required for this method.

Note: Alter the above measurements to suit the total length of the rope available.

7-16



Notes:

**12. AEROMEDEVAC - Nine line call format:**

LINE	ITEM	EXPLANATION
1	Location of pick-up site.	Encrypt the grid coordinates of the pick-up site. When using the DRYAD Numeral Cipher, the same "SET" line will be used to encrypt both the grid zone letters and the coordinates. To preclude misunderstanding, a statement should be made that grid zone letters are included in the message. (Unless unit SOP specifies its use at all times.)
2	Radio frequency, call sign w/ suffix.	Encrypt the frequency of the radio at the pick-up site and not a relay frequency. The call sign (and suffix if used) of person to be contacted at the pick-up site may be transmitted in the clear.
3	Number of patients by precedence.	Report only applicable information and encrypt the appropriate amount(s) and brevity number(s). (#)-1-Urgent - Save life/limb/eyesight EVAC w/in 2 hours (#)-2-Priority - Evac w/in 4 hours. (#)-3-Routine - Evac w/in 24 hours. (#)-4-Tactical Immediate - ASAP. If two or more categories must be reported in the same request, insert the word "BREAK" between each category.
4	Special equipment required.	Encrypt the appropriate brevity number(s). 5 - None 6 - Hoist 7 - Stokes Litter 8 - Forest/Jungle Penetrator
5	Number of patients by type.	Report only applicable information and encrypt the appropriate amount(s) and brevity number(s). If requesting MEDEVAC for both types, insert the word "BREAK" between the litter entry and ambulatory entry. (#) - Litter (#) - Ambulatory (sitting)
6	Security of pick-up site.	1 - No enemy troops in area. 2 - Possibly enemy troops in area (approach with caution). 3 - Enemy troops in area (approach with caution). 4 - Enemy troops in area (armed escort required). - Peacetime.
7	Method of marking pick-up site.	Encrypt the appropriate brevity number(s): 5 - Panels. 6 - Pyrotechnic signal.

		<ul style="list-style-type: none"> <li>7 - Smoke signal.</li> <li>8 - Signal person.</li> <li>9 - Strips of fabric or parachute.</li> <li>0 - Tree branches, pieces of wood, or stones placed together.</li> <li>1 - Signal lamp or flashlight.</li> <li>2 - Vehicle lights.</li> <li>3 - Open flame.</li> </ul>
8	Patient's nationality and status.	<p>The number of patients in each category need not be transmitted. Encrypt only the appropriate brevity number(s):</p> <ul style="list-style-type: none"> <li>4 - US military.</li> <li>5 - US civilian.</li> <li>6 - Non-US military.</li> <li>7 - Non-US civilian.</li> <li>8 - EPW.</li> </ul>
9	NBC contamination	<p>Include this line only when applicable. Encrypt the appropriate brevity number(s).</p> <ul style="list-style-type: none"> <li>9 - Nuclear</li> <li>0 - Biological</li> <li>1 - Chemical</li> <li>- Peacetime</li> </ul>

### 13. INTRAVENOUS TECHNIQUE:

#### a. Initiating an I.V.:

- (1) Gather correct equipment.
- (2) Inspect equipment for defects.
- (3) Wash hands.
- (4) Assemble equipment.
- (5) Hang bag above heart level and squeeze drip chamber half full of solution.
- (6) Remove air from tubing.
- (7) Place tape on bag.
- (8) Apply constricting band above infusion site.
- (9) Instruct patient to clench fist.
- (10) Select and prepare infusion site.
- (11) Remove protective cover from catheter/needle unit without contaminating.
- (12) Place thumb on vein approximately 1 inch below injection site and with a firm downward pressure of the thumb, pull skin taut.
- (13) Hold syringe with angio-catheter in bevel up position and pierce the skin at 20-30 degree angle either directly above or slightly to the side of vein.
- (14) Decrease the angle until almost parallel to skin, direct it toward the vein wall.
- (15) Aspirate for blood or note blood in flash chamber.
- (16) Advance catheter slowly into vein, remove needle while keeping one finger pressed over the lumen end of the catheter.
- (17) Connect tubing to catheter hub.
- (18) Release constricting band and instruct patient to open fist.

(19) Adjust the flow rate and check for infiltration and secure catheter with tape.

(20) Secure dressing.

b. Terminating I.V.:

(1) Turn off solution.

(2) Remove dressing and tape.

(3) Place 2" X 2" gauze at infusion site and gently withdraw needle or catheter.

(4) Instruct patient to apply pressure for 2-3 minutes with gauze.

(5) Apply Band-Aid.

**14. CASUALTY EVALUATION:**

a. Triage- Necessary when there are multiple casualties.

(1) Sorting of casualties to establish priorities of treatment and evaluation.

b. Conduct Primary Survey (Is the scene secure)?

(1) Airway with c-spine Immobilization - check for open airway, If the airway is closed, you should open it with manual maneuvers, using one of the two methods.

(a) Head tilt/ chin lift

(b) Modified jaw thrust (Used when you have suspected C-spine injury)

(c) Airway Adjuncts - Use J tube to help maintain open airway.

1. Measure from the corner of the mouth to the tip of the ear.

2. Place J tube in the mouth then rotate 180 degrees.

3. Re assess the Airway

(2) Breathing- Assess: Look, Listen, Feel

- (a) Is the casualty breathing? If NO, perform rescue breathing.
  - (b) Is breathing adequate? Check: Rate, Depth, Regularity and Ease.
  - (c) Check Neck, Chest and Back for injuries.
  - (d) Treat life threatening injuries that pertain to breathing.
- (3) Circulation- look for bleeding
- (a) Check pulse - Carotid, Femoral or Radial
  - (b) Stop bleeding using Manual pressure, Pressure points, Dressing, Pressure Dressing, or Tourniquets.
  - (c) Reassess all treatment.
  - (d) Administer I. V. as needed.
- (4) Disability
- (a) Splint fractures.
  - (b) Treat non life threatening injuries.
- (5) Expose casualty.
- (a) Treat any other injuries found.
  - (b) Evac

7-22

**Notes:**

## **CHAPTER EIGHT**

### **BREACHING**

#### **1. BREACHING FUNDAMENTALS (SOSR):**

- a. Suppress- Suppression is the focus of all available fires on enemy personnel, weapons, or equipment to prevent effective fires on friendly forces. This suppression includes direct, indirect fires, and electronic countermeasures (ECM). The purpose of suppression is to protect forces reducing and maneuvering through the obstacle and to soften the initial foothold (assault force objective). Suppressive fires in sufficient volume will be requested by Commanders to serve to isolate the breach site. Fire control measures are used to ensure that all fires are massed, lifted, or shift-synchronized with other actions at the obstacle.
- b. Obscure- Obscuring the enemy hampers observation and target acquisition and conceals friendly activities and movement. Screening smoke employed in the breaching area or between the breaching area and the enemy conceals movement and obstacle-reduction activities. Obscuring must be carefully planned to provide maximum degradation of enemy observation and fires, but it must not significantly degrade friendly fires and control. Breaching during periods of limited visibility (darkness and inclement weather) is most often effective; however, Terrain masking that obscures the breaching site is usually the only form of obscureness that is not a double-edged sword.
- c. Secure- The force secures the breach site to prevent the enemy from interfering with the obstacle reduction and the passage of the assault force through the lanes created during reduction. Security must be effective against outposts and fighting positions near the obstacle and against overwatching units and counterattack forces. In general, enemy tactical obstacles are secured by fires, and protective obstacles are secured by force. Identifying the extent of the enemy defenses is critical before selecting the appropriate technique to secure the breach. If defenders control the breach site and cannot be adequately suppressed, the force must secure the breach site by occupation before it can reduce the obstacle.
- d. Reduce- Reduction is the creation of lanes through or over the obstacle to allow the attacking force to pass. The number and width of lanes will vary with the situation and type of breaching operation. The unit reducing the obstacle is responsible for marking and reporting the obstacle and conditions to higher headquarters. Follow-on units will further reduce or clear the obstacle when possible. Reduction cannot be accomplished until the other SOSR fundamentals are applied and become effective.

## **2. BREACHING ORGANIZATION:**

### a. Support Force:

#### (1) Support Force Mission:

- (a) Primary responsibility is to eliminate the enemy's ability to interfere with the breaching operation.
- (b) Isolate the battle field with fires and suppress enemy fires covering the obstacle.
- (c) Mass direct and indirect fires to fix the enemy in position and destroy any weapons that are able to bring fires on the breach force.
- (d) Control obscuring smoke to minimize the effects of enemy-observed direct and indirect fires.
- (e) Mass air defense assets with the support force.

#### (2) Support Force Composition:

- (a) A mechanized force is typically organized around tanks and improved tube-launched, optically tracked, wire-guided (TOW) vehicles (ITVs); Air defense assets may also be massed with the support force. Similarly, a light force's support may consist of organic indirect fire weapons, light or heavy machine guns, and man-packed or vehicle mounted anti-tank weapons.
- (b) The commander must allocate direct and indirect-fire systems to achieve a support force ratio of 3:1 against the enemy for a deliberate attack. A ratio of 2.5:1 is required for a hasty attack.

b. Breach Force:

(1) Breach Force mission:

- (a) Primarily creates lanes that enable the assault force to pass through the obstacle (mounted 1 per company, 2 per TF separated by 100 meters; dismounted 1 per assault PLT)
- (b) Marks and reports lanes.
- (c) Covers the assault force's passage through the lanes.
- (d) Provides guides as required (ie MPs).

(2) Breach force composition:

- (a) Infantry/engineers
- (b) Breaching assets (expect a 50% loss of assets)
- (c) Maneuver force (local security)
- (d) Vehicle mounted smoke systems
- (e) Smoke pots
- (f) Smoke grenades

c. Assault Force:

(1) Assault Force Mission:

- (a) Primarily destroys and dislodges enemy on the far side of the obstacle.
- (b) Secures the far side of obstacle.
- (c) Assumes control of direct fires.

(2) Assault Force composition:

- (a) Infantry/engineers
- (b) Achieves a 3:1 ratio on the assault objective.

d. Special teams.

### **3. TYPES OF BREACHING OPERATIONS:**

- a. In-Stride Breach- This breaching operation is used by maneuver brigades and task forces (TF) to quickly overcome unexpected or lightly defended obstacles; however, The actual breach is conducted at the subordinate level. The in-stride breach tactic enables a TF to seize and maintain the initiative through simple, decentralized, independent breaching operations conducted under the responsibility and control of company team commanders.

The in-stride breach is executed when:

- (1) An unclear situation (including enemy and friendly obstacle locations) makes it necessary for several lead subordinate units to be capable of independent breaching operations to accomplish the mission.
- (2) The enemy defense (obstacles and fires) is so weak that the forces necessary to support, breach, and assault can be task organized into a subordinate unit and do not require the maneuver of other subordinate units to adequately suppress, secure, or reduce the obstacle.

- b. Deliberate Breach- The deliberate breach is a scheme of maneuver specifically designed to cross an obstacle in order to continue the mission. A unit conducts a deliberate breach when the force allocation ratios for support, breach, and assault forces are beyond the capability of the task-organized subordinate unit. The deliberate breach is characterized by thorough reconnaissance, detailed planning, extensive preparation, and explicit rehearsal. The deliberate breach is centrally planned and executed.

The deliberate breach is executed when:

- (1) A unit fails an attempted in-stride breach of enemy tactical obstacles.
- (2) The force allocation ratios indicate that a confirmed enemy situation is beyond the capabilities of a subordinate unit.

- c. Assault Breach- The assault breach allows a force to penetrate an enemy's protective obstacles and destroy the defender in detail. It provides a force with the mobility it needs to gain a foothold into an enemy defense and exploit success by continuing the assault through the objective. When the enemy has a prepared defense complete with protective obstacles, conducting an assault breach becomes an implied task essential to mission accomplishment. The assault breach may be conducted to support either a mounted or dismounted assault.

The assault breach is executed when:

- (1) The enemy has had time to prepare protective obstacles around or within its positions.
  - (2) A company team or platoon has been assigned the mission to assault an enemy's defense as part of a larger unit's actions on the objective.
- d. Covert Breach- The covert breach is a special breaching operation used by dismounted forces during limited visibility. It is silently executed to achieve surprise and to minimize casualties. The covert breach relies on stealth, quiet manual lane reduction techniques, and dismounted maneuver. This breaching operation may support a mounted attack. In this case, the force conducting a covert breach creates and secures lanes designed for follow-on forces. Though the covert breach applies some characteristics of the other breaching operations, the planning and execution of SOSR is significantly different.

The covert breach is executed when:

- (1) Time is not critical.
- (2) Undetected movement is key to infiltrating through tactical obstacles and forward defenses.
- (3) Surprise is essential for breaching protective obstacles and assaulting enemy positions.
- (4) Surprise is essential for breaching tactical obstacles to support a follow-on mounted attack.
- (5) Limited visibility and terrain present the opportunity to silently reduce enemy obstacles.
- (6) Overwhelming combat power is not required to support the breach for an assault.

**4. INTELLIGENCE:**

a. OBSTINTEL - Obstacle intelligence is essential in determining the type of reduction technique that offers the best chance for success and minimizes risk to the breaching force. Below is an example of obstacle information (may vary based on PIR) that should be obtained during minefield reconnaissance.

- (1) Obstacle location
- (2) Obstacle orientation
- (3) Presence of wire (type, # belts)
- (4) Gaps (location and size)
- (5) Minefield composition (buried or surface, AT or AP mines, and anti-handling devices)
- (6) Type of mines
- (7) Location of enemy positions (direct-fire weapons, Ops, and fighting positions)

b. Ground Reconnaissance (Leaders' recon):

- (1) Search for best covered and concealed routes/ positions.
- (2) Locate the extent of all obstacles (depth/composition).
- (3) Establish surveillance.
- (4) Locate enemy Ops.
- (5) Locate support position (Note 1).
- (6) Locate assault position (Note 1).
- (7) Locate local security position.
- (8) Analyze enemy's posture to establish breach locations.
- (9) Determine where breaching will begin.
- (10) Complete the plan and allow time to disseminate.

## **5. RESPONSIBILITIES/CHECKLIST FOR LEADERS/ELEMENTS:**

### a. Breach Team Leader:

#### (1) Coordination:

- (a) Fire support
- (b) Command and control (markings, signals)
- (c) Breaching assets (personnel/ equipment)
- (d) Locates (or recommends) breach sites (PRI/ALT) and determines other lane requirements.
- (e) Confirms location and coordinates actions with the support element
- (f) Rehearsals

### b. Reduction Team:

- (1) Clear lane
- (2) Locate and mark mines/tripwires
- (3) Bypass mines and tripwires by 2 meters (1 meter path)
- (4) Mark lane (initial, intermediate, full lane)
- (5) Cut wire
- (6) Set explosive charges
- (7) Proof lane
- (8) Signals/reporting system (lane report)
- (9) Provide guides
- (10) Upgrade lane (METT-T dependent)
- (11) Moves stealthfully (covert breach)

### c. Security Team:

- (1) Provides security of breach site.
- (2) Secures flanks/main avenues of approach to breach site.
- (3) Provides early warning against enemy patrols (covert breach).
- (4) Must be effective against fighting positions/Ops in the vicinity of the breach site
- (5) Silently eliminate enemy Ops (covert breach)
- (6) Covers withdraw of reduction team if detected covert breach)
- (7) Transition to an assault breach.
- (8) Secures the friendly side of breach site.
- (9) Assists in extracting injured personnel from lane.

d. Assault Element:

- (1) Silently eliminate enemy Ops (covert breach).
- (2) Provides alternate breach teams.
- (3) Transition to an assault breach.
- (4) May assist in extracting injured personnel from lane.
- (5) Destroys/dislodges enemy on the far side of obstacle.
- (6) May help the support force suppress enemy fires while the breach force reduces the obstacle.
- (7) Secures the objective site.

e. Support Element:

- (1) Prevent enemy from interfering with the breaching operation.
- (2) Must know where breach will be made and where the reduction team is moving from
- (3) Places weapons to cover likely enemy positions and isolate the breach site.

- (4) Provides rapid and violent suppressive fires/smoke (direct or indirect).
- (5) Act as a deception team (covert breach).
- (6) On signal lifts fire or shifts to continue isolating the breach site
- (7) 360 degree security at support position.

**6. LANE REPORTING:**

a. Breached lanes will be recorded and reported using the following format:

<u>LINE</u>	<u>INFORMATION</u>
ALPHA	Map sheet designation
BRAVO	Date/Time of completion
CHARLIE	Type of minefield Anti-tank (AT) Anti-personnel (AP)
DELTA	Coordinates of minefield extremities
ECHO	Depth of minefield
FOXTROT	Enemy weapons or surveillance
GOLF	Estimated time to upgrade/widen breach (if required)
HOTEL	Estimated material/equipment to upgrade (if required)
INDIA	Routes for bypass (if any)

b. Reporting will be in accordance with unit SOP.

8-10

**Notes**

**CHAPTER NINE**  
**AIR OPERATIONS**

**1. LZ/PZ OPERATIONS:**

a. General:

- (1) HLP- Helicopter Landing Point. An area for landing a single aircraft.
- (2) HLS- Helicopter Landing Site. An area with one or more helicopter landing points (HLPs).
- (3) HLZ- Helicopter Landing Zone. An area with one or more landing sites (HLSs).

b. Consideration Factors: The factors that contribute to the process of HLZ site selection are grouped into two main categories.

(1) Tactical considerations:

- (a) The estimate of the situation using METT-T
- (b) Location of the objective from the tentative HLS
- (c) Size of the element to be moved

(2) Technical considerations: The considerations that pertain to the technical aspects of selection and operation of a day or night HLS. They are subdivided into seven selection factors.

- (a) Size of the helicopter landing point the size of the HLP will be decided by the aviation unit commander based on:
  - Size of the aircraft
  - Pilot unit proficiency
  - Atmospheric conditions
  - Day or night operations

Size	Cleared area Diameter	Type Aircraft
1	25 meters	OH-58D
2	35 meters	UH1H Iroquois AH-1G Cobra
3	50 meters	UH-60 Blackhawk AH-64A Apache
4	80 meters	CH-47D Chinook CH-53 Seastallion CH-54 Skycrane <u>Slingload</u> (same as landing aircraft)
5	100 meters	<u>Slingload</u> (different from landing aircraft) unlike/unknown aircraft

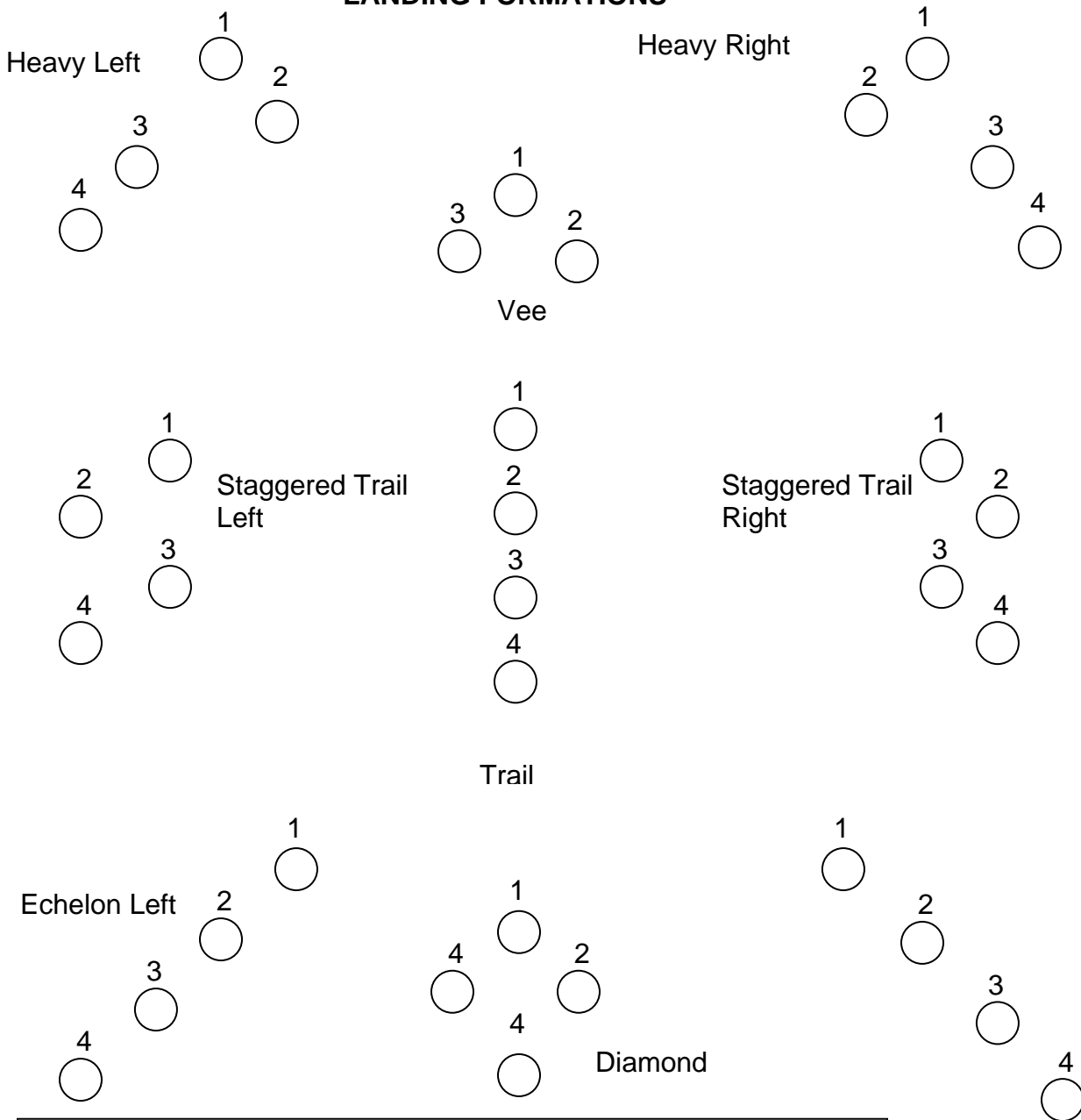
Note: The distance between HLP'S in a HLS is the same as the cleared area diameter of the landing aircraft.

(b) Landing formation and number of aircraft. Nine (9) standard aircraft formations.

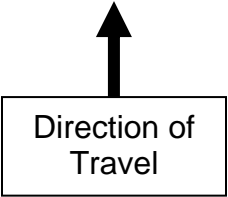
- Trail
- Staggered trail left
- Staggered trail right
- Echelon left
- Echelon right
- Heavy left
- Heavy right
- Diamond
- Vee

Note: Number of aircraft and formation is determined by, size of aircraft, surface conditions, obstacles, and vertical obstacle ratio on the approach and departure routes. A sling loaded aircraft is not part of the formation.

## LANDING FORMATIONS



Distance between aircraft in flight:  
 Day: 2-3 Rotor disks  
 Night: 3-5 Rotor disks  
 Distance between aircraft landing points:  
 Day: 35 meters  
 Night: 50 meters  
 In heavy left and right formations, the distance is doubled between aircrafts 1 to 3.



## FORMATION MATRIX

Form Type	TDP Size	1	#A/C 2	L/W 3	Meters 4	5
TRAIL R&L	1	25	25/25	50/25	75/25	100/25
	2	35	35/35	70/35	105/35	140/35
	3	50	50/50	100/50	150/35	200/50
	4	80	80/80	160/80	240/80	320/80
	5	100	100/100	200/100	300/100	400/100
ST R&L	1	25	18/43	35/43	53/43	71/43
	2	35	25/60	49/60	74/60	99/60
	3	50	35/85	71/85	106/85	141/85
	4	80	57/137	113/137	170/137	226/137
	5	100	71/171	141/171	212/171	283/171
E R&L	1	25	18/43	35/60	53/78	71/96
	2	35	25/60	49/84	74/109	99/134
	3	50	35/85	71/121	106/56	141/191
	4	80	57/137	113/93	170/250	226/306
	5	100	71/171	141/241	212/312	283/383
HYV R&L	1	25	18/43	35/78	53/96	71/113
	2	35	25/60	49/109	74/134	99/159
	3	50	35/85	71/156	106/191	141/227
	4	80	57/137	113/250	170/306	226/363
	5	100	71/171	141/312	212/383	283/454
DIAM	1	25	18/43	18/60	35/60	
	2	35	25/60	25/84	49/84	
	3	50	35/85	35/121	71/121	
	4	80	57/137	57/193	113/93	
	5	100	71/171	71/241	141/241	
VEE	1	25	18/43	18/60	35/78	35/96
	2	35	25/60	25/84	49/109	49/134
	3	50	35/85	35/121	74/156	71/191
	4	80	57/137	57/193	113/250	113/306
	5	100	71/171	71/241	141/312	141/383

1. All lengths & widths are given in meters.
2. The formation sizes **DO NOT** include the addition of a sling load point.
3. To use this table
  - a. Find the formation and the size TDP from the left side of the matrix.
  - b. Cross index this line with the number of A/C off the top of the matrix.
  - c. Read the formation size (Given in length & width)
  - d. All sizes assume that the #1 TDP is placed on the edge of the formation

(3) Surface Conditions at the site.

- Firm enough to support the weight of the aircraft.
- Free of loose sand (brown out conditions).
- Free of loose snow (white out conditions).
- Free of debris

(4) Obstacles at or near the site.

- HLP'S will never contain an obstacle.
- All obstacles will be removed, reduced, or marked. An obstacle is anything 18 inches or greater in height, depth, or width. All obstacles should be removed if possible. In daylight it is the aircraft's responsibility to avoid all obstacles. At night the pathfinders must mark all obstacles. Excessive slope is also an obstacle. The pathfinders must advise the pilots of any excessive ground slope.
- Utility and observation aircraft will not land when the slope exceeds 7 degrees.
- Cargo aircraft will be issued an advisory when the slope is 7 to 15 degrees.
- Avoid landing down slope, when possible land up slope or side slope. During night, forward and lateral slopes should not exceed 3 degrees.
- Use the following formula to determine the degree of slope (only good for up to 20 degree slope).

$$\frac{V \times 57.3}{H} = \text{Degree of slope (round up)}$$

**Example Problem**

HE = 700 VD = 150

LE = 550

HD = 3000

$$\frac{150 \times 57.3}{3000} = 3 \text{ degree of slope}$$

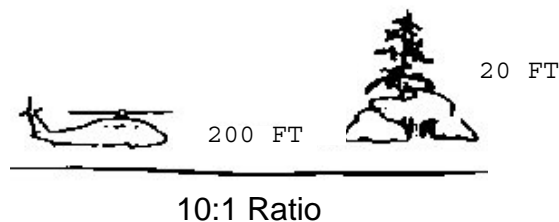
(e) Approach and departure routes

- Long axis
- Into the wind
- Lowest obstacle
- Vertical obstacle ratio on approach and departure routes

10:1 ratio rule (for planning purposes)

5:1 ratio rule can be used depending on if insertion or extraction.  
Try to have the aircraft approach and depart over the lowest obstacles.

## DIAGRAM



(5) Winds:

- (a) 0-5 Knots- Aircraft can land in any direction.
- (b) 6-9 Knots- Aircraft can land with a cross wind.
- (c) 10-30 Knots- Aircraft can land and take off into the wind.

- (d) Aircraft cannot land with tail winds in excess of 5 knots.
- (e) UH-1H- Cannot fly when the winds are in excess of 30 knots.
- (f) UH-60- Cannot fly when the winds are in excess of 45 knots.
- (g) Always try to land aircraft into the wind.

Note: A tail wind during take off will increase the obstacle clearance distance and could prevent a successful take off. Take off into any prevailing wind will improve the take off performance.

- (h) Atmospheric Conditions. Density altitude determines the actual lift capability of the aircraft. There are three atmospheric conditions which effect the performance of helicopters.
  - Altitude.
  - Temperature.
  - Humidity.

As any of these factors increase, the performance of the aircraft decreases.

- (i) Loads. When a helicopter is loaded to near maximum lift capacity, it requires longer distances to lift-off and land. The load types are:
  - Equipment/Personnel.
  - Internal/External.
  - Insertion/Extraction.

d. Marking:

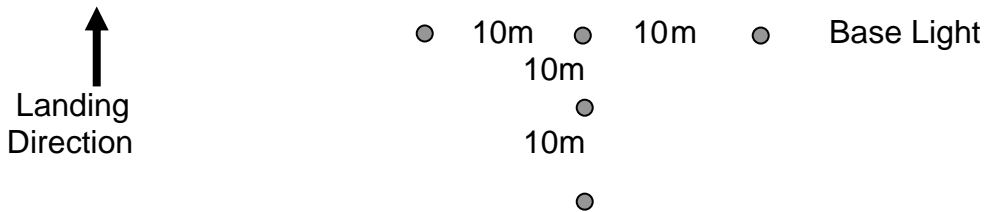
- (1) Day- A ground guide will mark the PZ or LZ for the lead aircraft by displaying a folded VS-17 panel chest high or by other identifiable means. Signalman is positioned 40 meters up and slightly to the right for landing aircraft and 20 meters up and slightly to the right for sling loaded aircraft.

(2) Night- The number one Touchdown Point (TDP) is marked with an inverted Y (preferred) or a NATO T.

(a) Inverted Y- Best used with approaches initiated from terrain flight altitudes (nap of the earth/low level flight). The desired touchdown point is midway between the front two lights with the fuselage of the aircraft aligned with the stem lights.



(b) NATO T- Best used with approaches initiated from air altitudes of 500 feet above ground level (AGL) or higher. The desired touchdown point is in the upper left portion of the T.

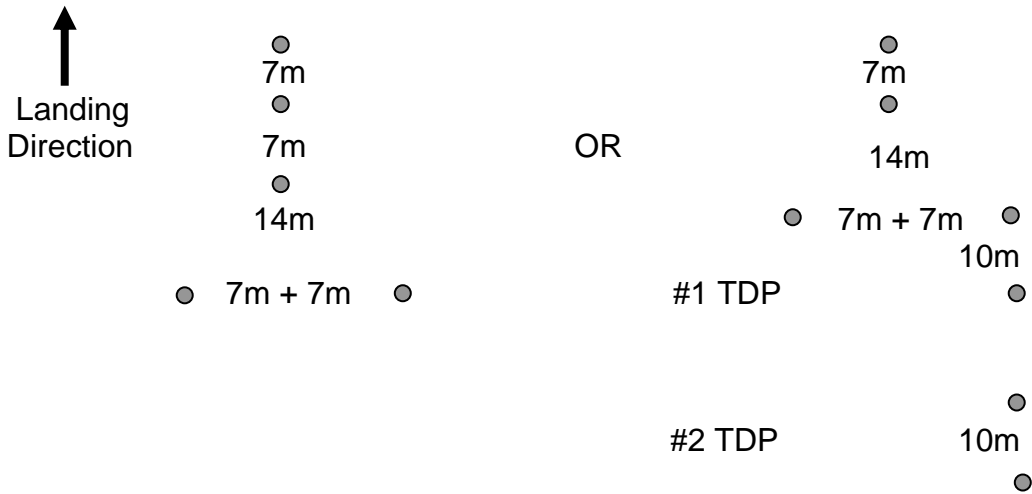


(c) Additional TDPs:

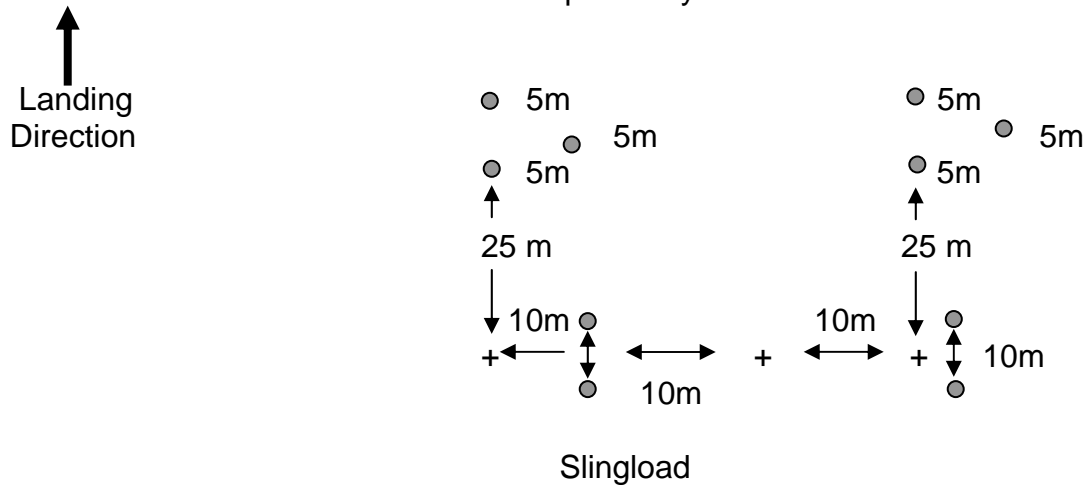
- Utility aircraft. Marked with 2 lights, 5 meters apart. Placed one helicopter diameter length from the number 1 TDP. The TDP is located 5 meters to the left center of the lights.



- Cargo aircraft. Marked with 2 lights, 10 meters apart. Placed one helicopter diameter length from the number 1 TDP. The TDP is located 10 meters to the left center of the lights. Slingloads are dropped 10 meters to the right of the lights.



- (d) Reference Lights. Used when a signal man is not available. Placed 25 meters up from the TDP on landing heading. Three lights are spaced 5 meters apart in an equilateral triangle.



- (e) Obstacles.

- Day- Use red VS-17 panel.
- Night- Use red lights.
- If the obstacle is on the aircraft approach route, both near and far sides of the obstacle will be marked.
- If the obstacle is on the aircraft departure route, the near side of the obstacle will be marked.
- If the obstacle protrudes into the PZ/LZ, but is not on the flight route of the aircraft, the near side of the obstacle is marked.
- Large obstacles on the approach route are marked by circling the obstacle with red lights.

- (f) Approach lights. Are set a minimum of 50 meters wide or the width of the formation and up 20 meters from the last obstacle.

(g) Departure lights. Placed same as approach lights. A minimum of 50 meters wide or the width of the formation. Also placed on top of the highest obstacle in the departure flight path.

(h) Marking devices:

- Aircraft landing lights. (Beanbag lights)
- Flashlights with cones. (Light batons)
- Chem lights.
- Fire.
- Marking light holes.

e. Signaling:

(1) Signaling devices:

- (a) Mirror.
- (b) Strobe Light- Use blue filter cover.
- (c) VS-17 Panel.
- (d) Smoke- Least desirable. Do not use red smoke.
- (e) SE-11- Light Gun. Ranges:

<u>With Filter</u>	<u>Without Filter</u>
Day - mu	2000m
Night - 4000m	8000m

(2) Hand and Arm Signals. When directing taxiing helicopters the position is slightly to the right, in full view of the pilot, and at a safe distance of no more than 40 meters or no closer than 20 meters during slingload operations. The signalman never stands in front of an armed helicopter. Use light batons at night.

- (a) Assume Guidance. Palms forward.

9-12



Assume Guidance

(b) Hover. Wait until aircraft is 5 feet off the ground.



Hover

(c) Move Downward. Palms down.



Move Aircraft Downward

(d) Move Upward. Palms up.



Move Aircraft Upward

(e) Move Forward. Only for short distances. Palms backward.



Move Aircraft Forward

(f) Move Backward. Palms upward.



Move Aircraft Backward

(g) Move Right/Left.



Move Aircraft Right



Move Aircraft Left

(h) Spot Turn Left/Right. Step off in the opposite direction of tail movement.



Spot Turn Left



Spot Turn Right

(i) Land.



Land

(j) Stop. Palms forward.



Stop

(k) Take Off. Circle overhead, throw arm in direction you want him to go.



Take Off

(l) Go Around. Do not land. Wave off.



Do Not Land (Arms Wave)

(m) Proceed Right/Left to Next Signalman.



Proceed Right



Proceed Left

(n) Cut Sling Load.



Cut Sling Load

(o) Load Not Released. Modified "time out".



Load Not Released

9-18

(p) Hook-Up Complete.



Hook-Up Complete

(q) Cut Your Engine. Multi-engine aircraft, point toward engine.



Cut Your Engine

### SAPPER BREAKDOWN FOR HLS OPERATIONS

#### 1. CONTROL CENTER

TL  
GTA  
TL RTO  
#1 TDP TM LDR  
SLP TM LDR

#### 2. MARKING PARTY

ATL  
INR  
SL SIG MAN  
STATIC PROBE MAN

#### 3. SECURITY ELEMENT

Establishment of HLS:

1. Emplace security

2. Conduct leaders recon

(a). Personnel on leader's recon

- (1) Team leader
- (2) RTO
- (3) GTA
- (4) # 1 TDP TM LDR
- (5) SLP TM LDR

(b). Team leader leaves 5 point contingency plan with ATL:

(c). Team leader determines land heading:

Prioritizes as follows:

- (1) Long axis of the site
- (2) Wind direction and speed
- (3) Slope or obstacles at the site

(d). Emplacement of the GTA:

- (1) Good 360 degree observation of site
- (2) Not emplaced in a cleared area
- (3) Opposite of the communication check point (CCP)

(e). #1 TDP TM LDR:

- (1) Measures the length of HLS
- (2) Determines the unusable at departure end of HLS
- (3) Locates the tentative #1 TDP

(f). Slingload point team leader:

- (1) Measures the width of HLS
- (2) Determines unusable on approach end of HLS

- (3) TL will now bring the marking party forward:
  - (a) Emplaces the INR using the same considerations as with the GTA
  - (b) Ensures INR can cover any of the GTA's dead space
  - (c) Ensures all operating radios are at least 25 meters apart
  - (d) ATL supervises designation and marking of TDP's in order from first to last:
  - (e) ATL ensures that the GTA and INR update their ATC block on their maps as each point is cleared
- (4) SLP TM LDR establishes the sling load point using the following criteria:
  - (a) SLP will be located no less than 100m from the nearest active TDP for unlike or unknown aircraft.
  - (b) SLP can be located 80m from nearest active TDP if all aircraft are alike
- (5) Diameter of the SLP is determined by 4 factors
  - (a) Size of aircraft
  - (b) Day or night operations
  - (c) Pilot unit proficiency
  - (d) Atmospheric conditions

Site is operational for daytime operation when:

- (1) All TDP's are cleared
- (2) All SLP's are cleared

10 minutes prior to mission time the following will be accomplished:

- (1) #1 TDP signal man in position
- (2) SLP signal man in position

- (3) Hook up man and static probe man are ready and in position
- (4) All personnel are in the proper uniform
- (5) All radios are on the primary frequency
- (6) GTA's and INR's ATC block are complete, accurate and alike. All signaling devices are out and ready.

## **GTA TRANSMISSION'S FOR HELICOPTER LANDING SITE OPERATIONS**

### **MISORIENTED AIRCRAFT**

- PILOT: \_\_\_\_\_, THIS IS \_\_\_\_\_, OVER.  
 GTA: \_\_\_\_\_, THIS IS \_\_\_\_\_, state number, type and intention, OVER.
- PILOT: \_\_\_\_\_, THIS IS \_\_\_\_\_, WITH A FLIGHT OF \_\_\_\_\_, INBOUND TO YOUR SITE FOR LANDING AND REQUESTING NAVIGATIONAL ASSISTANCE, OVER.
- GTA: \_\_\_\_\_, THIS IS \_\_\_\_\_, DO YOU HAVE FM HOMING CAPABILITIES? OVER.
- PILOT: \_\_\_\_\_, THIS IS \_\_\_\_\_, AFFIRMATIVE, OVER.  
 GTA: \_\_\_\_\_, THIS IS \_\_\_\_\_, SHORT COUNT FOLLOWS. 1-2-3-4-5-5-4-3-2-1, END OF SHORT COUNT, STATE INBOUND HEADING, OVER.
- PILOT: INBOUND HEADING, \_\_\_\_\_, OVER. (NOTE: IF SHORT COUNT IS NOT A LONG ENOUGH TRANSMISSION FOR THE PILOT TO HOME IN ON, A LONG COUNT MAY BE REQUIRED.)
- GTA: THE GTA READS ENTIRE ATC BLOCK EXCEPT HEADING AND DISTANCE FROM CCP. AND ENDS THE TRANSMISSION WITH: CONTINUE APPROACH FOR VISUAL IDENTIFICATION, OVER.

CCP - AIRCRAFT

1. PILOT: SAPPER #\_\_\_\_\_, THIS IS AC-316, OVER.  
GTA: AC-316, THIS IS SAPPER #\_\_\_\_\_, OVER.
2. PILOT: SAPPER #\_\_\_\_\_, 316 IS AT CCP INBOUND, OVER.  
GTA: 316, THIS IS SAPPER #\_\_\_\_\_, STATE NUMBER, TYPE, AND INTENTIONS, OVER.
3. PILOT: 316 IS A SINGLE UH-1H, CCP INBOUND FOR LANDING, OVER.  
GTA: ROGER (READ ATC BLOCK), CONTINUE APPROACH FOR VISUAL IDENTIFICATION, OVER.
4. PILOT: WILCO.  
GTA: 316, I AM AT YOUR 12 O'CLOCK, 500 METERS, SIGNAL OUT CAN YOU IDENTIFY?
5. PILOT: 316 IDENTIFIES ORANGE PANEL, OVER.  
GTA: 316, THIS IS SAPPER #\_\_\_\_\_, VISUAL CONTACT, FORM YOUR OWN APPROACH, REPORT FINAL, OVER.
6. PILOT: SAPPER #\_\_\_\_\_, 316 FINAL, OVER.  
GTA: 316, SAPPER #\_\_\_\_\_, WINDS 6 KNOTS AT 045 DEGREES, YOU ARE CLEAR TO APPROACH (LAND), OVER.
7. PILOT: SAPPER #\_\_\_\_\_, 316 REQUESTS DEPARTURE INSTRUCTIONS, OVER.  
GTA: 316, THIS IS SAPPER #\_\_\_\_\_, WINDS 6 KNOTS AT 045 DEGREES, CLEAR TO DEPART, STATE INTENTIONS, AND REPORT WHEN YOU ARE CLEAR OF MY CONTROL ZONE (ADVISORIES), OVER.

EXAMPLE ATC BLOCK FOR HLS OPERATIONS

HEADING \_\_\_\_\_, DISTANCE \_\_\_\_\_, (FROM CCP TO HLS)  
LANDHEADING \_\_\_\_\_,

PERTINENT INFORMATION:

SIGNAL ON CALL.  
DESCRIPTION OF LANDING SITE.  
CONDITIONS AT LANDING SITE.  
FIELD ELEVATION OF THE LANDING SITE. (NIGHT ONLY)

ADVISORY:

TURBULENCE AT OR NEAR THE SITE.  
OBSTACLES / HAZARDS.  
ARTILLERY / MORTAR FIRE.  
ENEMY SITUATION.  
WEATHER.

f. Air Loading and Safety

(1) Prepare troops and their equipment for air movement:

- (a) Helmets are worn with chin straps fastened.
- (b) Identification tags are worn and ID card is carried.
- (c) Sleeves are rolled down and fastened, top button of the jacket is secured.
- (d) All weapons are on safe, no rounds are chambered.
- (e) All loose equipment is tied down or otherwise secured.
- (f) No bayonets will be affixed to weapons.
- (g) Equipment bipods are collapsed or removed.
- (h) Antennas are removed or depressed.

(2) Methods used to approach Army aircraft:

- (a) Occupy and secure the PZ position and ready personnel and equipment for loading.
- (b) Move towards the aircraft only after it has landed.
- (c) Approach the aircraft at a crouch. Be aware of the location of items such as antennas. etc.
- (d) If the aircraft has landed on a side slope, approach it from the down slope side.
- (e) Approach the following types of aircraft as indicated:
  - 1. UH-1H helicopters: Approach from 45 degrees off the front of the aircraft.

2. UH-60 helicopters: Approach directly from the sides. Use this approach for OH-58, OH-6 and cargo helicopters (when using the forward troop doors).

3. For cargo helicopters when using the rear ramp:

- Approach from 45 degrees off the rear of the aircraft.

- For CH-53 and CH-54 helicopters, approach only from the right rear in order to avoid the tail rotor.

Note: Never approach utility or observation helicopters from the rear due to tail rotor hazard.

(3) Loading the aircraft and actions while in flight:

(a) Load in reverse order: first in, last out.

(b) Secure all loose items and check all cargo lashings.

(c) DOT NOT place equipment under troop seats. The seats are designed to collapse in the event of a crash, absorbing some of the energy of impact.

(d) All seatbelts will be fastened and remain fastened during flight.

(e) All troops will remain seated during the flight.

(f) No smoking is allowed aboard Army or Air Force aircraft.

(g) Individual weapons will not be fired from an aircraft at any time.

(h) Individual weapons will be oriented as indicated:

1. Muzzle up UH-1H aircraft.

2. Muzzle down aboard UH-60, OH-58, and CH-47 aircraft.

(4) Aircraft off-loading procedures:

(a) Do not off-load prior to being instructed to do so by the aircrew.

(b) Do not move toward the rear of observation or utility type helicopters due to the tail rotor hazard.

(c) For aircraft on a side-slope, exit on the down slope side.

(d) Move clear of the rotor span and assume a prone position, facing away from the aircraft, until the aircraft departs.

(e) The aircraft troop commander will ensure that all personnel are out of the aircraft prior to leaving.

(5) Crew served weapon breakdown and loading procedures:

(a) Ground mount TOW:

1. Team and equipment breakdown:

- Squad leader carries the tripod, the day sight, and the night sight.
- Gunner carries the traversing unit.
- Assistant gunner (AG) carries the launch tube, the MGS, extra coolant bottles and batteries.
- Ammo bearer carries two rounds of ammunition.

2. Loading aboard the UH-60 helicopter:

- The squad leader and the ammo bearer should load from opposite sides of the aircraft and to the front as they are carrying bulky equipment.
- The gunner and the AG should load from opposite sides of the aircraft and towards the rear.
- Ammo bearer loads first. He occupies the center rear seat and secures the missiles by his feet.
- The gunner loads next, outboard of the ammo bearer and secures the traversing unit at his feet.
- The AG loads next and occupies the outermost seat facing the rear of the aircraft. He secures his equipment in the seat next to him except for the launch tube, which he secures between his legs.
- The squad leader will load last and occupies one of the out board front seats. He secures the sights in the seat next to him and places the tripod between his legs.

- All equipment will be secured to the aircraft by cargo tie-downs or seats belts.

(b) The 81mm mortar:

1. Team and equipment breakdown:

- The squad leader will carry the sight and aiming stakes.
- The gunner carries the bipod.
- The assistant gunner carries the mortar tube.
- The ammo bearer carries the base plate.
- Each member of the crew will carry at least one round.

2. Loading aboard the UH-60 helicopter:

- The squad leader and the gunner load from opposite sides of the aircraft and towards the front.
- The assistant gunner and the ammo bearer load from opposite sides of the aircraft and towards the rear. Ammo bearer should be on the same side as the squad leader.
- All equipment will be secured in the aircraft and monitored during flight by the section members.

(c) Crew served weapon off-loading procedures:

1. Consideration should be given to which side of the aircraft the weapon will be set up on upon reaching the LZ. The squad leader should be located on this side.
2. Due to the amount of heavy equipment carried by each man, if it is necessary to off-load the aircraft quickly, the equipment need only be moved far enough away from the helicopter so as not to impede its departure. Sensitive items such as night sights, etc., need to be taken clear of the rotor span.

Note: Whether or not these methods are used at your unit, loading and off-loading procedures should be practiced until the crews are proficient.

## Notes

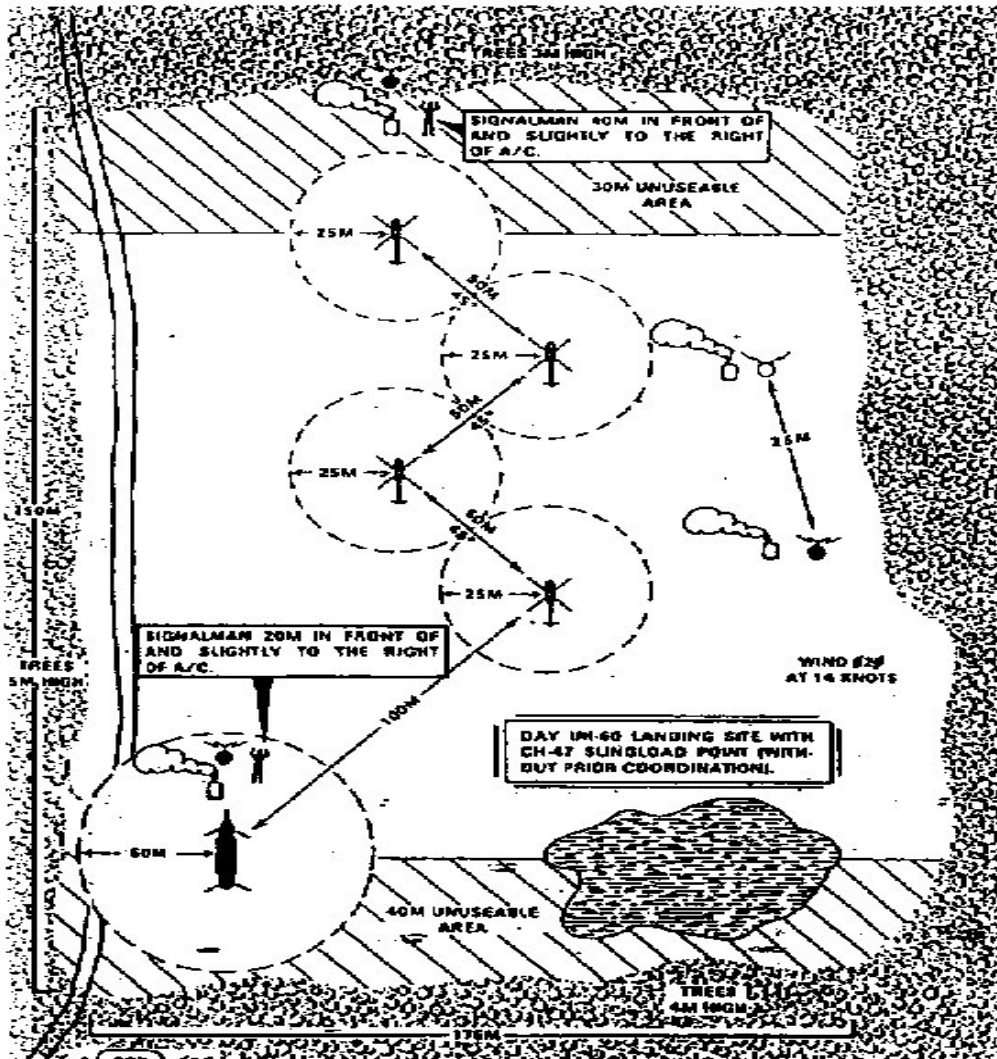


Diagram of HLS

## 2. DZ OPERATIONS:

A drop zone is any designated area where personnel and/or equipment may be delivered by parachute or, in case of certain items, by free drop. The DZ is located where it can best support the ground tactical plan.

a. Selection factors: The drop zone selection factors discussed in this section are used to analyze the suitability of a drop zone.

(1) Air drop, Airspeeds: The Aircraft airspeed will determine the amount of time the aircraft will fly over the drop zone.

### ARMY AIRCRAFT

UH-1H	50-70 KTS	(optimum 70 KTS)
UH 60	65-75 KTS	(optimum 70 KTS)
CH-47	80-110 KTS	(optimum 90 KTS)
CH-54	65-75 KTS	(optimum 70 KTS)

### AIR FORCE AIRCRAFT

	C-130	C-141	C17
Personnel	130 KTS	130 KTS	130 KTS
Equipment	140 KTS	150 KTS	150 KTS
CDS	140 KTS	150 KTS	150 KTS
Door bundle	130 KTS	130 KTS	130 KTS

(Door bundles, CDS and heavy equipment- best speed for all loads is 130 knots)

(2) DROP ALTITUDE: Drop altitude is measured from above ground level (AGL). This is from the highest field elevation on the drop zone to the drop aircraft.

### ARMY AIRCRAFT

Personnel	day or night	1500 feet.
Bundles	day	300 feet.
	night	500 feet.

## AIR FORCE AIRCRAFT

Personnel	
Combat (Wartime) operations	Determined jointly by Airborne and Airlift commanders
Tactical training	800 feet
Basic airborne trainees	1250 feet
Halo (minimum opening)	2500 feet
CDS bundles	300-600 feet
Door bundles	300 feet
Heavy equipment	650-1300 feet

Note: Drop altitude for CDS and heavy equipment is determined by type parachute, number of parachutes, and number of CDS bundles.

- (3) Type of load: The type of load to be delivered will determine the amount of time to extract the load from the aircraft.
  - (a) Personnel: Allow 1 second for each jumper to exit the aircraft. The one second interval begins after the first jumper exits the aircraft. (ex. 10 jumpers require 9 seconds)
  - (b) Equipment: Allow 3 seconds for each door bundle to exit the aircraft. The 3 second interval begins after the first bundle exits the aircraft. (ex. 3 bundles require 6 seconds)
- (4) Method of delivery
  - (a) Low velocity: Utilized for sensitive equipment and personnel drops. The canopy attached is used to slow the rate of decent to prevent damage to equipment or injure the jumper.
  - (b) High velocity: Is the delivery of certain items of supply. The chute is designed to stabilize the load and reduce the rate of descent to a magnitude which ensures acceptable landing shock.
  - (c) Free drop: Used for non-sensitive items only. No parachute is attached to the load.
- (5) Obstacles. (On or near the drop zone)
  - (a) Obstacles to personnel: Any feature, either natural or man-made that would pose a hazard to a jumper.
  - (b) Obstacles to equipment: Any feature, either natural or man-made that may hinder the recovery of the load.

- (6) Access: Avoid major obstacles to personnel and equipment between the drop zone and the objective. Ensure that adequate routes are available to conduct troop movement and to recover equipment.
- (7) Size of the drop zone: For the Army verbal initiated release system (VIRS), and ground marked release system,(GMRS). Use the  $D=R \times T$  formula.
- (8) Adequate approach and departure routes: Routes for the aircraft both into and away from the drop zone must be considered.
  - (a) Enemy situation and location.
  - (b) Terrain higher than the drop zone.
  - (c) No-fly areas.
  - (d) Obstacles to the aircraft.

b. Establishment of a drop zone.

(1) Team breakdown

- (a) Control center
- (b) Marking party
- (c) Recovery party
- (d) Security party

(2) Equipment needed

- (a) ASIPS/SINCGARS, complete 2 each
- (b) Anemometers 2ea
- (c) Map
- (d) Smoke
- (e) acquisition aids (signal mirror, strobe light)
- (f) VS-17 panels, RAM
- (g) Beanbag lights, M-2 light batons, Amber rotating beacon

(h) Compass

(i) MEW equipment

(3) When establishing a Army Verbal Initiated Release system, (VIRS) or Ground Marked Release system, (GMRS) the first step is to determine the release point.

(a) Determine drop heading. If the drop zone was surveyed and a MAC form 339 was published for the drop zone, use the magnetic course indicated. If not take into consideration, long axis, wind direction.

(b) Determine point of impact (PI).

(c) Determine wind direction and speed. This should be done using the PIBALL. The Mean Effective Wind (MEW) is more accurate. If PIBALL capabilities are not available then the surface wind direction and speed must be used. Once the wind direction and speed have been determined, calculate a  $D = K \times A \times V$  formula for drift in meters.

Once the wind direction and speed has been determined, calculate a  $D = K \times A \times V$  formula for drift in meters.

(d) Pace off the drift in meters into the wind. This should be the reciprocal heading of the PIBALL direction.

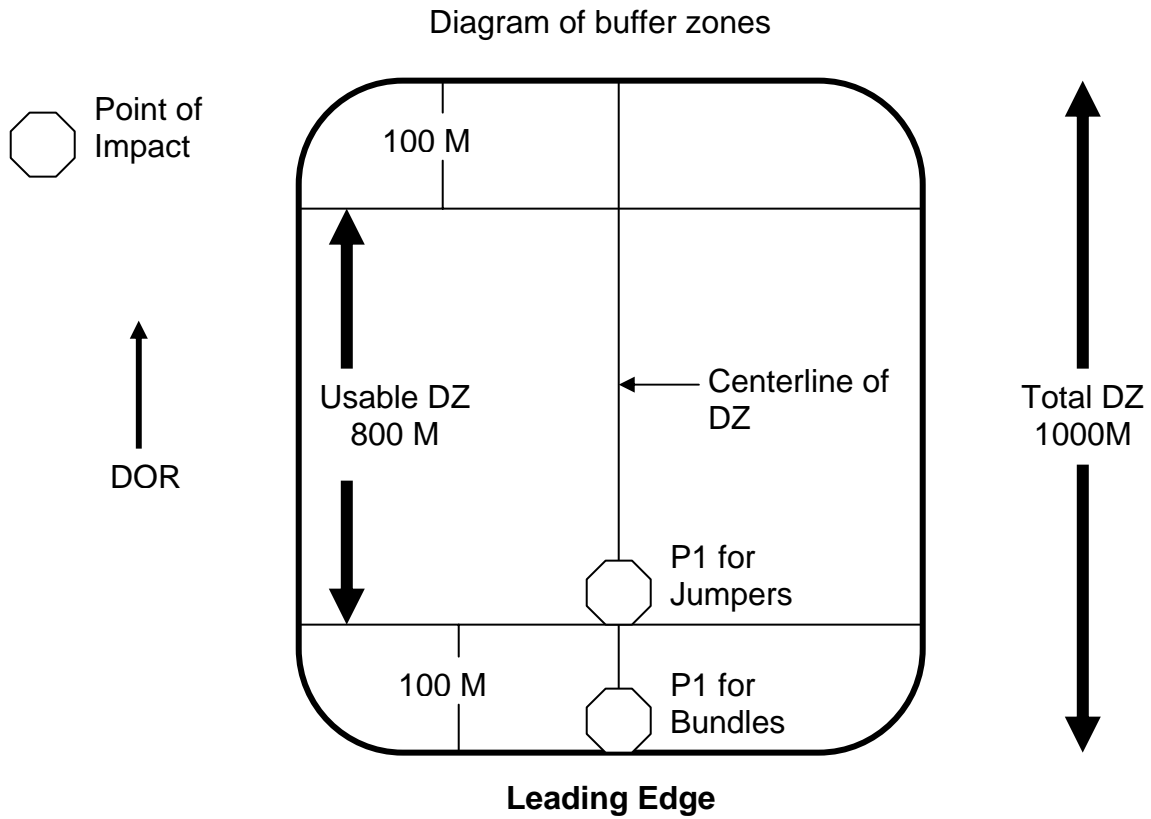
Note: If the direction and distance of the drift are paced into the woodline, adjust the PI as necessary. Forward or left and right only.

(e) Pace off the forward throw on the back azimuth of drop heading.

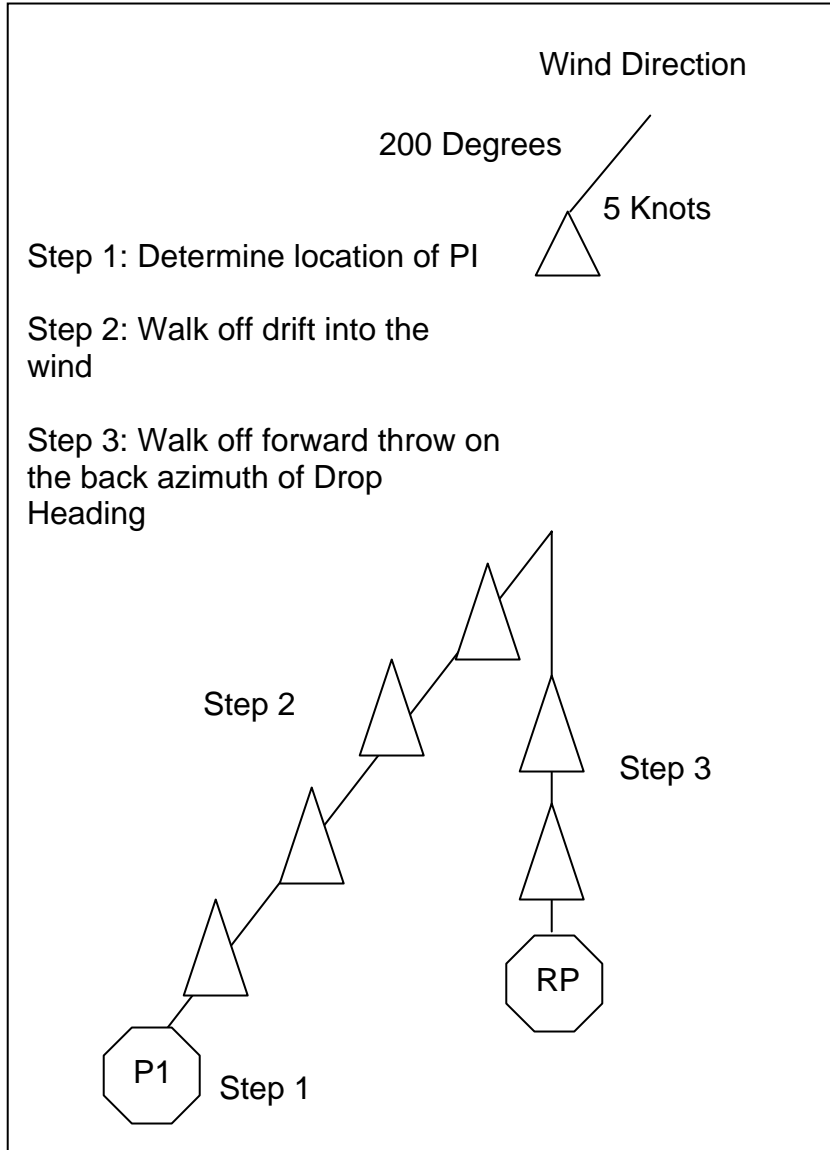
Note: Forward throw is the effect that inertia has on a falling object. When an object leaves an aircraft, it is traveling at a speed equal to the speed of the aircraft. The load or jumper continues to move in the direction of flight until the dynamics of the parachute takes effect.

A 100m buffer zone will be established on the leading edge and trailing edge of GMRS, Army, and Air Force VIRS drop zones for personnel operations. The point of impact (PI) will not be placed closer than 100m to the leading edge tree line. The planned location of the last jumper landing area will not be closer than 100m prior to the trailing edge tree

line. This will decrease the risk of a tree landing; buffer zones are not required for door bundle operations.



Determine the release point of GMRs, Army VIRS, and Air Force VIRS drop zones.



c. DZ CALCULATIONS:

(1) Determine required length of DZ. Use distance formula  $D = RT$ :

D- DZ length (distance) in meters.

R- Ground speed (rate) of the aircraft in meters per second.

- Ground speed is the aircraft's speed.

- To convert knots to meters per second, Multiply by 0.51.

T- Time required for aircraft to release its cargo in seconds.

- The time in seconds to drop personnel is equal to the number of jumpers from one door minus one.

- The time in seconds to drop bundles is equal to the number of bundles from one door minus one, multiplied by three.

- Round up.

Example: Aircraft speed is 130 knots.

32 jumpers. (From one door)

$$D = RT$$

$$R = 130 \text{ Aircraft Speed (Knots)}$$

$$130 \times 0.51 = 66.3$$

$$T = 32 \text{ Jumpers minus one} = 31 \text{ seconds}$$

$$D = 66.3 \times 31$$

$$D = 2055.3 \text{ Meters}$$

Round Up to 2056 Meters

(2) Determine the length of time the aircraft is over the DZ in seconds:

- Use time formula:  $T = D/R$

T- Time in seconds required for aircraft to release its cargo. Round down.

D- Actual length of DZ in meters. (Given)

R- Rate (Aircraft Speed).

Example: Aircraft speed 110 knots.

500 meter long DZ.

$$T = D/R$$

$$D = 500 \text{ meters}$$

$$R = 110 \text{ Aircraft Speed (Knots)}$$

$$110 \times 0.51 = 56.1 \text{ meters per second}$$

$$T = 500/56.1$$

$$T = 8.9$$

Round Down to 8 seconds.

(3) Determine the amount of Drift. Use formula

$$D = KAV.$$

D - Amount of drift of parachutes in meters from a given altitude.  
Round up.

K - Constant factor. Use:

- 3.0 for personnel.
- 1.5 for cargo.

A - Altitude in hundreds of feet.

V - Velocity of the surface wind in knots. To convert wind in miles per hour to knots, divide by 0.87.

Example: Personnel drop at 800 feet.  
10 MPH surface winds.

$$D = KAV$$

$$K = 3.0$$

$$A = 8$$

$$V = 9 \text{ knots}$$

$$D = (3.0) (8) (9.0)$$

$$D = 270 \text{ (Round up)}$$

(4) Forward Throw - Lateral distance (in meters) covered by a bundle from the time it exits the aircraft to the time the parachute is fully deployed.

Forward throw for personnel:

(a) From C-130/C-141 is 240 yards.

(b) Army aircraft is  $1/2$  airspeed expressed in meters.

Example: Army aircraft traveling at 90 knots.

$$\text{Forward Throw} = 90/2 = 45 \text{ meters.}$$

(5) Drop Zone Throw - Lateral distance (in meters) covered by a free dropped bundle from the time it exits the aircraft to the time it hits the

ground. DZ throw is one half the aircraft's speed plus 10 for every 100 feet of altitude.

Example: Aircraft traveling at 60 knots.

Aircraft altitude at 100 feet.

DZ Throw =  $60/2 + 10 = 40$  meters.

d. DZ Markings:

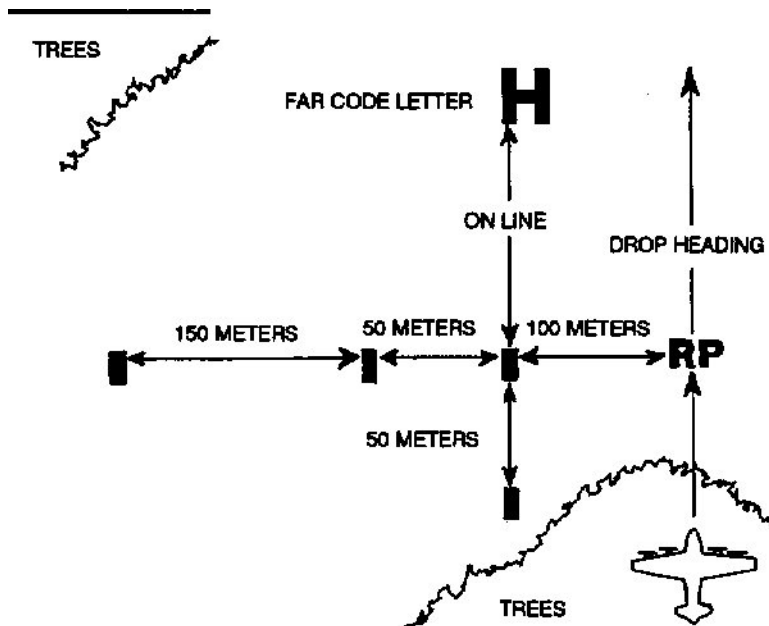
(1) USAF Aircraft - Utilize the ground marker release system (GMRS).

(a) For daylight operations, the DZ is marked with VS-17 panels.

(b) For night operations, replace panels with lights. The distances between the lights are the same as panels. The color of lights is coordinated with the air mission commander.

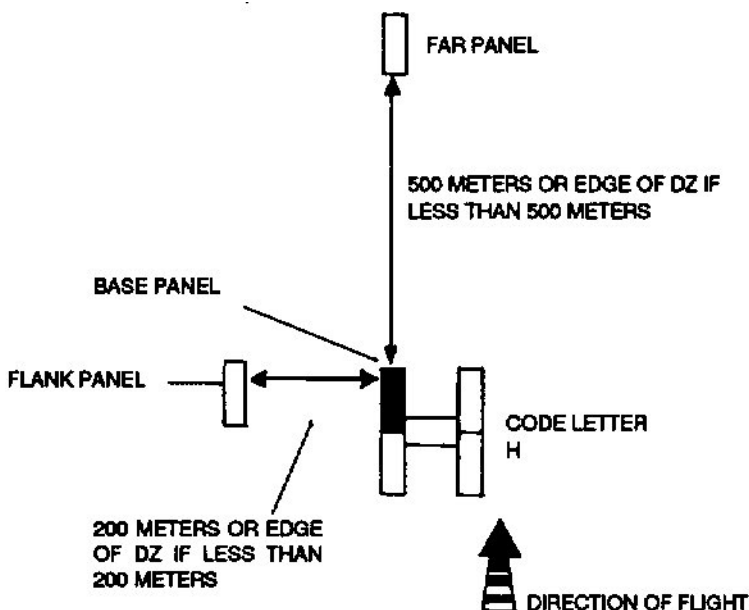
(c) Markings are placed so they are visible only from the direction of aircraft approach and are positioned at an angle to present the maximum surface toward the approaching aircraft.

(d) Far code letter required if the inverted "L" is within a 15:1 obstacle ratio on the approach end.



(2) US Army Aircraft:

- (a) For daylight operations, the DZ is marked with VS-17 panels (orange side up) forming a code letter with a far and flank panel.
- (b) For night operations, replace the panels with lights. White lights are preferred over blue or green lights which are difficult to detect from long range.



Far Panel is placed 500 meters from the code letter along drop heading or the end of the DZ whichever comes first.

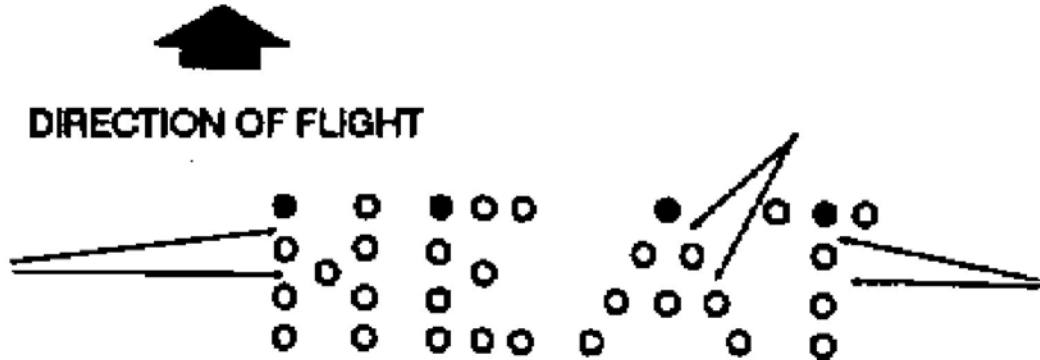
Flank Panel is placed 200 meters to the left of the code letter along drop heading or the end of the DZ whichever comes first.

(3) Code Letters:

- (a) Consist of the letters H, E, A, or T.
- (b) During daylight use VS-17 panels. Code letters are a minimum of two panels high and one panel wide. Code letter will be emplaced at the release point (RP). Shaded panels are the base panels.



(c) At night replace panels with lights. Code letters are a minimum of four lights high and three lights wide. Five meters between all lights. Shaded lights are the base lights.



e. Standard Drop Zone Transmissions: Verbal initiated release system

PILOT: \_\_\_\_\_, this is \_\_\_\_\_, over.

GTA: \_\_\_\_\_, this is -----, over.

PILOT: \_\_\_\_\_, this is \_\_\_\_\_, CCP inbound for a personnel parachute drop, over.

GTA: \_\_\_\_\_, this is \_\_\_\_\_, state number, type and intentions. over.

PILOT: \_\_\_\_\_, \_\_\_\_\_, IS A \_\_\_\_\_, over.

GTA: \_\_\_\_\_, this is \_\_\_\_\_, (GTA reads entire ATC block and ends the transmission with, continue approach for visual identification, over.)

PILOT: WILCO.

Upon sighting aircraft:

GTA: \_\_\_\_\_, this is \_\_\_\_\_, I am at your \_\_\_\_ o'clock \_\_\_\_\_ meters, signal out can you identify, over.

PILOT: \_\_\_\_\_, \_\_\_\_\_ identifies orange panel over.

GTA: \_\_\_\_\_, \_\_\_\_\_ has visual contact, turn to drop heading, over.

PILOT: \_\_\_\_\_, \_\_\_\_\_ turning drop heading, over.

GTA: \_\_\_\_\_, this is \_\_\_\_\_, steer left/right, over.

PILOT: \_\_\_\_\_, \_\_\_\_\_ roger.

GTA: \_\_\_\_\_, this is \_\_\_\_\_, on course, over.

PILOT: \_\_\_\_\_, \_\_\_\_\_ roger.

When aircraft is 8-10 seconds out from release point:

GTA: \_\_\_\_\_, this is \_\_\_\_\_, with \_\_\_\_\_, stand by, over.

PILOT: \_\_\_\_\_, this is \_\_\_\_\_, standing by, over.

When aircraft is directly over release point:

GTA: \_\_\_\_\_, this \_\_\_\_\_, with 6 jumpers, execute, execute, execute.  
(GTA must say "execute or no drop at" least 3 times or until first load exits).

At completion of operation:

GTA: \_\_\_\_\_, this is \_\_\_\_\_, I observe \_\_\_\_\_ away and clear, state intention and report when clear of my control zone, (issue any advisories), over. NOTE: GTA must place aircraft into closed traffic pattern with a reporting point, if more than one pass is required.

#### ATC BLOCK FOR DROP ZONE OPERATIONS

HEADING \_\_\_\_\_, DISTANCE \_\_\_\_\_,  
DROP HEADING \_\_\_\_\_  
DROP SPEED \_\_\_\_\_  
DROP ALTITUDE \_\_\_\_\_, FEET INDICATED.

PERTINENT INFORMATION:

SIGNAL ON CALL  
DESCRIPTION  
CONDITIONS

ADVISORY

**3. SLINGLOAD OPERATIONS:**

a. General. There are three phases to sling load operations.

- (1) Preparation and rigging.
- (2) Inspection of preparation and rigging.
- (3) Sling load operation.

b. Equipment:

(1) Aerial Delivery Slings (ADS):

(a) Type XXVI nylon is identified by a colored thread stitched lengthwise down the middle of the strap. Slings are issued in 3, 9, 11, 16, 20, 60 and 120 foot lengths.

(b) Rated tensile strengths for XXVI nylon ADS used as a pendant are.

- Two loop slings: 8,900 pounds.
- Three loop slings: 13,500 pounds.
- Four loop slings: 17,800 pounds.
- Six loop slings: 27,000 pounds.

(c) Rated tensile strength for type XXVI nylon ADS when used as part of a sling set.

- Two-loop slings: 5,600 pounds.
- Three-loop slings: 8,500 pounds.
- Four-loop slings: 11,200 pounds.
- Six-loop slings: 17,000 pounds.

(d) Inspection:

- All ADS will be inspected every 6 months.
- Inspect before and after each use.

- Serviceable slings will be stenciled in parachute ink with the date of the last inspection with 1" letters.
- Criteria for unserviceability:
  - Three or more consecutive loose or broken stitches.
  - Five or more broken or loose stitches overall.
  - Foreign matter (grease, oil) that cannot be removed.
  - Excessively worn or frayed areas.
  - Fusing indicated by unusual hardening or softening areas.
  - Cuts or broken strands.
  - Mildewed areas.
  - Cotton buffers missing.

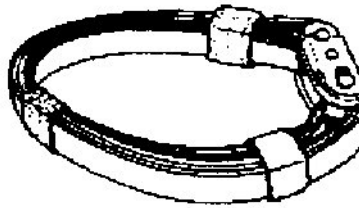
(e) Illustration:



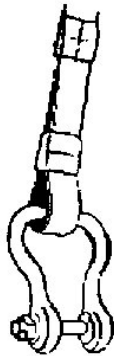
ADS Sling

(f) Three foot apex ring (donut).

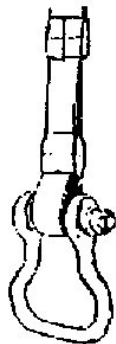
- The apex ring (donut) joins the slings to form the sling apex and attaches the slings to the helicopter cargo hook (UH-1H).
- The apex ring is made by joining the two ends of a 3-foot sling with a type IV connector link.



(g) Types of hitches: When connecting ADS to metal air items or directly to the load one of the following types of hitches will be used.



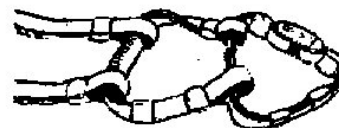
SLING TO CLEVIS



CHOKER HITCH



BASKET HITCH



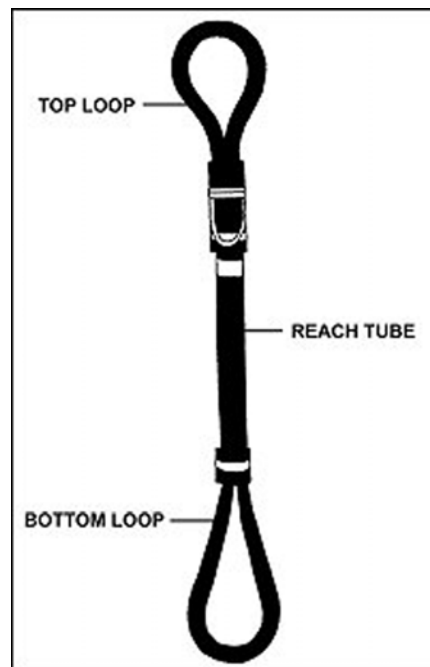
(2) 11,000/25,000 pound capacity reach pendants

(a) Data:

- Synthetic rope assembly with an attached, stiffened reach tube
- Reach tube enables the hook up man to place the pendant's top eye on the helicopter cargo hook while the helicopter hovers at a higher distance over the load
- Both are approximately 5 feet long
- Top loop is black and smaller in size and gets attached to the aircraft
- Bottom loop is green and larger in size and gets attached to the load
- Safe working load capacity stamped on the reach tubes

(b) Inspection. Before and after every use; Check for cuts and tears in the nylon-urethane plastic sheath on each loop. If the white strength member (third layer) shows, remove the pendant from service.

(c) Illustration:



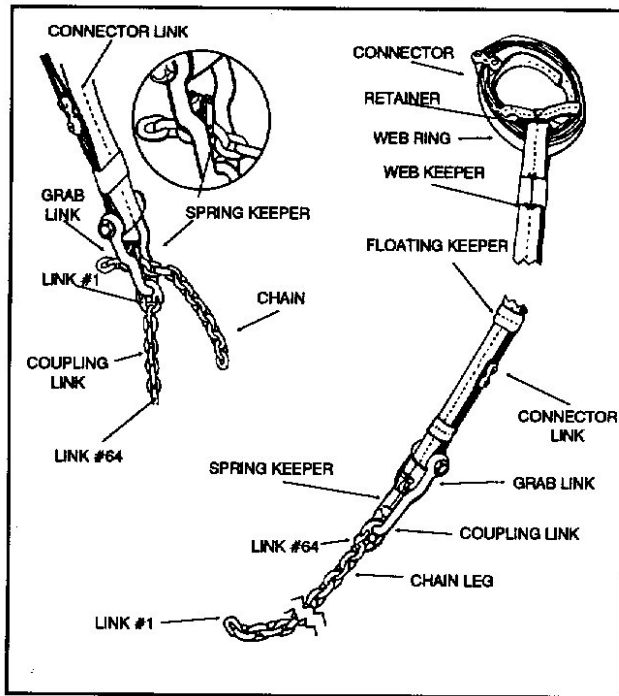
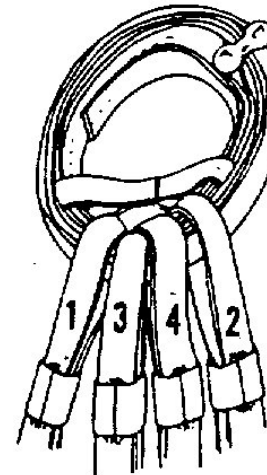


Figure 5-3. Parts of the multi-leg sling set.



SLING LEG NUMBERING SEQUENCE FOR THE MULTILEG SLING SET

(3) 10,000/25,000 pound capacity sling sets:

(a) Data:

1. Both sets look alike except for minor differences:

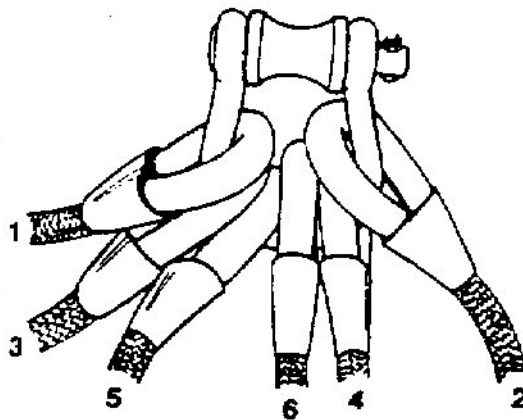
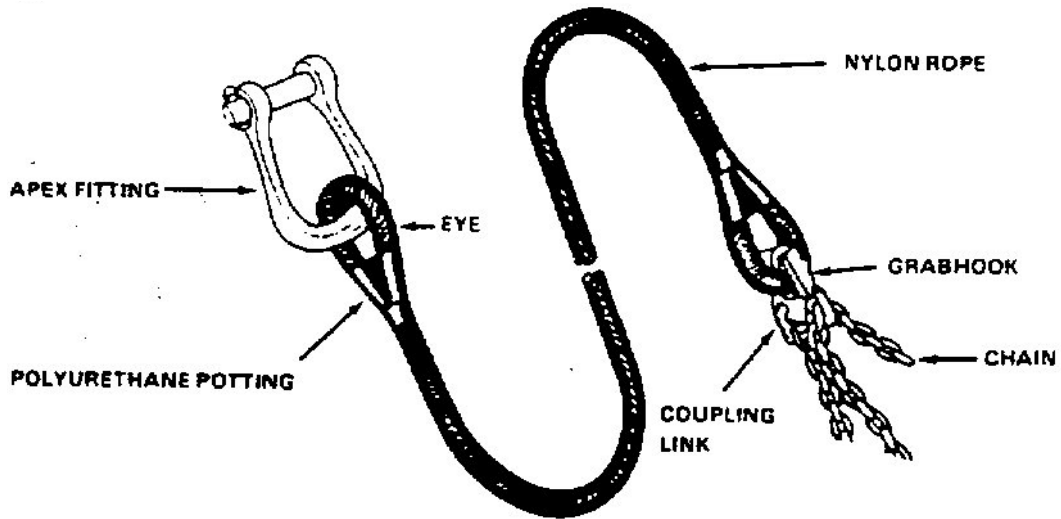
	10,000	25,000
<b>APEX FITTING</b>		
material	brushed aluminum	gold steel
pin size	1 1/8-inch dia	1 1/2-inch
weight	4 1/2-lb.	10-lb.
<b>SLING LEG</b>		
rope color	olive drab	black
length	12-feet	12-feet
rope dia.	7/8-inch dia.	1 1/4-inch
chain links	110-115	86-88
length	8-feet	8-feet
<b>TOTAL WEIGHT</b>	<b>52-lb.</b>	<b>114-lb.</b>

Note: Parts are not interchangeable.

(b) Inspection:

- Inspect all metalware for proper operation of moving parts, rust, corrosion, cracks, bends, distortions, burrs, sharp edges, grease, oil, acids.

(c) Illustrations:



**SLING LEG NUMBERING SEQUENCE**

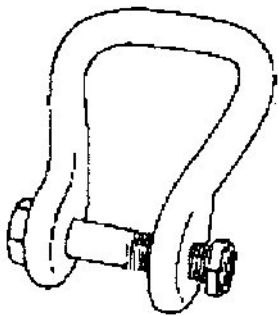
(4) Connector Assemblies:

(a) Data:	Sling	Pendant
- Large suspension clevis	7,875	12,500
- Medium suspension clevis	3,750	6,250
- Small suspension clevis	3,750	6,250
- Clevis platform - 4000 pounds.		
- Type IV connector - 12,500 pounds.		

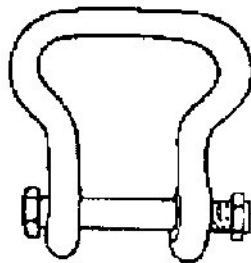
(b) Inspection:

- Inspect for proper operation of moving parts, rust, corrosion, cracks, burrs, distortions, burrs, sharp edges, grease, oil, acid, or other foreign matter.
- Check for presence of all nuts, bolts, washers, and spacers.

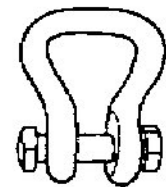
(b) Illustrations:



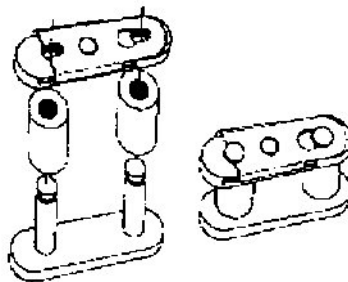
Large Clevis



Medium Clevis



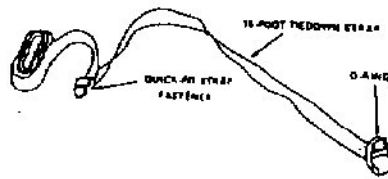
Small Clevis



(5) Cargo Tie-Down Equipment

Connector Link

(a) 15-foot tie-down strap: Tensile strength - 2000 pounds.



(b) CGU-1B: 5000 pound capacity.



(c) Load binder: Tensile strength - 500 pounds.



**Notes**

(6) Cargo Bags and Nets:

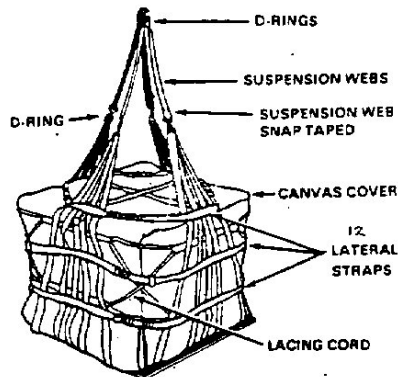
(a) A-22 Cargo Bag:

- Adjustable cotton duck cloth and webbing container consisting of a sling assembly, cover, and four suspension webs. The bag can transport 2,200 pounds of cargo. Bag can be rigged with or without the cover.

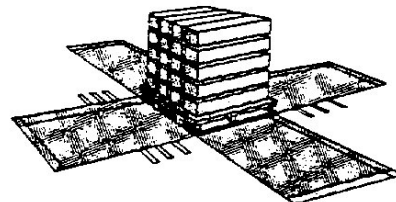
- Inspection:

- Ensure all parts are present. Inspect all D-rings for burrs, cracks, and distortions. Inspect lateral straps and suspension webs using the same inspection criteria for the ADS.

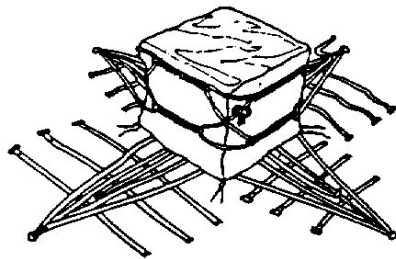
- Illustration:



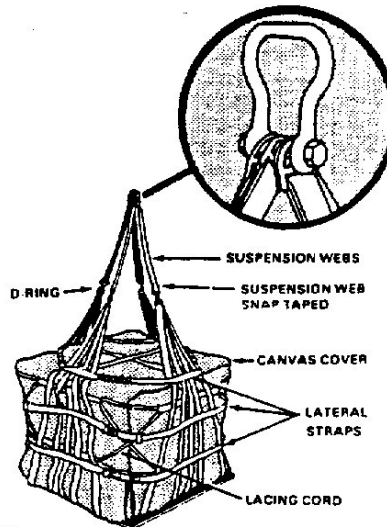
**A-22 CARGO BAG**



**CENTERED LOAD**



**SECURING THE COVER WITH LACING CORD**



**UPPER SLING AND MEDIUM CLEVIS**

(b) Cargo Nets:

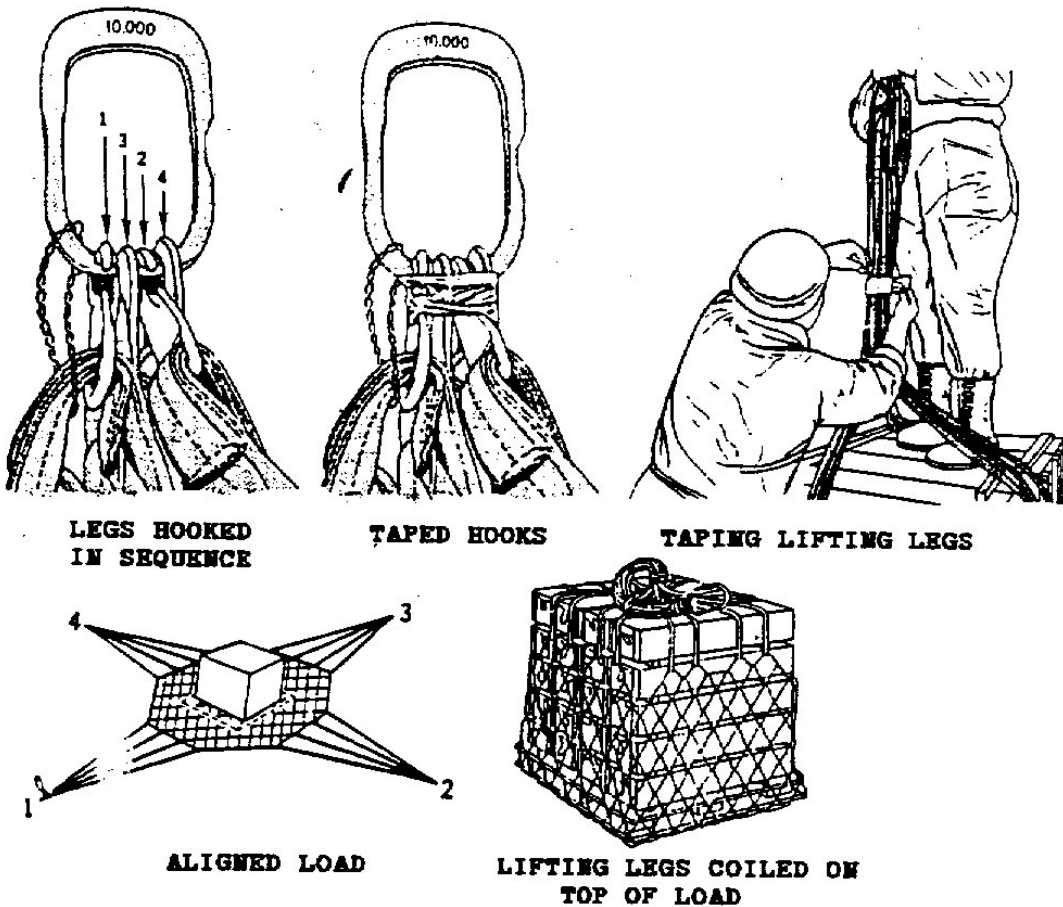
- Two types:

- 5,000 pound capacity net.

- 10,000 pound capacity net.

- Inspection: Inspect the metal apex each hook for cracks, burrs, and distortions. Check stitching for damage and unraveling. Check nylon straps for cuts and severe abrasions. Inspect border cord for cuts over 1/2" or severely abraded areas.

- Illustration:



(7) Additional equipment required:

- (a) Nylon cord, type III, tensile strength 550 pounds.
- (b) Tape, cloth backing, 2 inches, green.
- (c) Natural textile cotton webbing, 1/4", tensile strength 80 pounds.
- (d) Padding material.

c. Duties of Ground Crew:

(1) The hook-up team:

- (a) Signal man.
- (b) Static probe man.
- (c) Hook-up man.

(2) Protective equipment:

- (a) Ballistic helmet.
- (b) Goggles.
- (c) Earplugs.
- (d) Shockproof gloves.
- (e) Sleeves rolled down.
- (f) Top button on shirt buttoned.

(3) Hook-Up Procedures. The helicopter approaches the hook-up site and is guided into position over the load by the signal man. The static probe man discharges the static electricity from the aircraft cargo hook using the static probe. Then the hook-up man places the donut on the cargo hook of the craft.

(a) Duties of the signal man:

- Before the arrival of the helicopter, the signal man directs the spotting of the load for hook-up, inspects the load to ensure that the slings are not fouled, and ensures that the load is ready for hook-up.

- As the helicopter approaches the hook-up site, the signal man dons his protective equipment, takes up his position, and issues the "assume guidance" signal.
- He must be positioned so that the pilot can plan his approach on him.
- After the helicopter comes to a hover, the signal man uses the appropriate arm and hand signals to direct the aircraft over the load, allowing the hook-up men to complete the hook-up. The signals should be precise. The signal man should avoid indiscriminate arm waving.
- The signal man observes the cargo hook and slings at all times. When the hook-up is complete, he signals the pilot to remain in place until the hook-up men are clear of the load and from under the helicopter.
- When the hook-up men are clear, the signal man gives the "move upward" signal. The signal is given slowly so the helicopter rises slowly, taking slack out of the slings. He remains alert to ensure the slings are not fouled and the load is properly suspended. If fouling of the slings or improper suspension occurs, the signal man issues the "move downward" signal and corrective action is taken by the hook-up men. After the hook-up men have completed the corrective action, the procedure is then repeated.

(b) Duties of the Hook-Up Men:

- Normally, one man handles the static probe and controls the cargo hook. The second man places the donut on the cargo hook. The hook-up must be accomplished rapidly and accurately to minimize helicopter hovering time and reduce the exposure time of the hook-up team under the helicopter.
- As the helicopter approaches the hook-up site, the hook-up men don their protective equipment and position themselves at or on the load.
- As the helicopter hovers over the load, the hook-up men station themselves so that the hook-up can be accomplished quickly and easily and so that the signal man has a clear view of the operation.

- When the cargo hook is in reach, the static probe man grounds the hook by touching it with the static probe rod. He then assists the hook-up man by controlling the hook.
- The hook-up man places the donut on the cargo hook and ensures that it is seated and the hook is properly closed.
- After the hook-up is complete, both men walk away from the load and wait nearby in the event corrective action must be taken.

(4) Release Procedures. The helicopter approaches the release site and is guided into position by the signal man. The release team stands by but is not employed unless the slings cannot be released by the pilot. Normally, the ground crew consists of one signal man and two release men.

(a) Duties of the signal man. The duties of the signal man for the release are the same as for the hook-up.

(b) Duties of the release men. The cargo release team dons their protective equipment and stand nearby until needed. If the electronic hook release becomes inoperative or the pilot is unable to release the load from inside the aircraft, the release men move forward and manually release the load.

d. Weight Limitations of Aircraft:

(1) Maximum weight limitations are based on the structural strength of the cargo hook assembly.

(2) UH-1H/UH-1N	4,000 Pounds/5,000 Pounds
UH-60A/UH-60L	8,000 Pounds/9,000 Pounds
CH-47C	20,000 Pounds
CH-47D	26,000 Pounds
CH-54A	20,000 Pounds
CH-54B	25,000 Pounds

(3) ACL - (Allowable Cargo Load) is based on type of aircraft, age of aircraft, altitude above sea level, temperature, humidity, and aviation unit SOP.

**4. HELICOPTER RAPPELLING:**

a. UH-1H:

(1) Commands for a tactical rappel:

- (a) Get Ready.
- (b) Sit in the Door.
- (c) Drop Ropes.
- (d) Position.
- (e) Go.

(2) Exiting the aircraft:

- (a) A minimum of 2 second delay between exit groups will be maintained by the rappelmaster.
- (b) There are two exit groups:
  - The right front and the left rear rappeller.
  - The left front and the right rear rappeller.

(3) UH-1H Preparation:

- (a) Aircraft seats will be removed from the cargo compartment.
- (b) Both cargo compartment doors will be placed in the locked-open positions. If locks are not present or unserviceable, the cargo compartment doors will be removed.
- (c) Scuff pads (Protective padding) will be installed on the aircraft to protect the ropes from being cut or worn by the aircraft floor edges in the aircraft doorway.
- (d) Installation of the donut ring:
  - Equipment needed:
  - One- 120" steel cable, 1/2 inch diameter.
  - Three to four - 1/2 inch saddle clamps.
  - Seven - Static line snap fasteners or snaplinks.

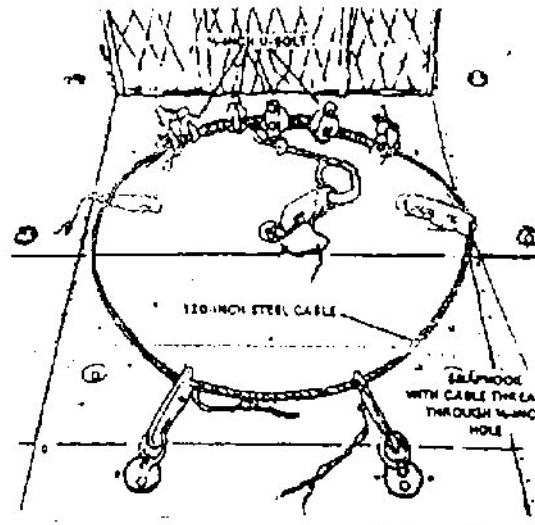
- One- Floating safety ring consisting of a steel O-ring with a 2,000 pound tensile strength or two snaplinks.
  - The two parachute static line snap hooks towards the front of the aircraft and the two towards the rear of the aircraft will be facing inward with the gates down.
  - The two center parachute static line snap hooks that are towards the sides of the aircraft will be facing inward with the gates down.
- U-bolts on the saddle clamps face to the rear of the aircraft.

(e) Installation of the floating safety ring.

- If the floating safety ring is a cold-rolled, 1/4 inch steel ring with attached parachute static line snap hooks, it will be attached to the center aircraft floor tie-down ring with a snap link with the gate facing inward and down.
- If the floating safety is the type with two snaplinks, the snaplinks will be attached as follows.
- One of the snaplinks will be attached to the center aircraft tie-down ring gate facing down, the other snaplink will be attached to the same aircraft ring with the gate facing up.
- The two snaplink gates will be taped closed with masking tape and taped together ensuring that the snaplink gates are on opposite sides of each other.

(f) The rappel ropes are installed with snaplinks facing down.

(g) Illustration:



b. UH-60:

(1) Commands for a tactical rappel:

- (a) Aircraft seats will be removed from the cargo compartment.
- (b) Both cargo compartment doors will be placed in the locked-open position. If the locks are not present or unserviceable, the cargo doors will be removed.
- (c) The "hellhole door" on the helicopter floor will be removed. The rappelmaster will use the "hellhole door" to observe the rappellers during their descent.
- (d) Scuff pads (protective padding) will be installed on the aircraft to protect the ropes from being cut or worn by the helicopter door or floor edges.
- (e) The rappel ropes are installed to the primary anchor point with two snaplinks with opposing gates and to the secondary anchor point with one snaplink with the gate opening away from the rope.

(f) Primary anchor points:

- The four (4) cabin ceiling tie-down rappelling fitting assemblies are the four primary anchor points for the rappel ropes (installed at aviation support unit level).
- At each primary anchor point the two snaplinks in the rappel rope primary anchor knot are snapped to the red colored tie-down rings with opposing gates.

(g) Secondary anchor points:

- The restraint cargo rings in the aircraft cabin ceiling are the preferred secondary anchor points for the rappel ropes.
- The snaplink of the secondary anchor knot of each set of rappel ropes is attached to the appropriate restraint cargo ring with opposing gates.

**5. HELICOPTER JUMPING:**

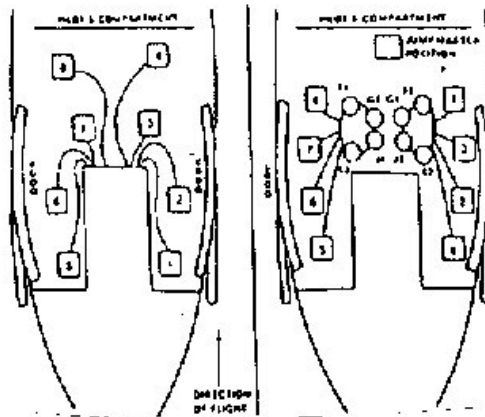
a. UH-1H:

(1) Commands:

- (a) Get Ready. (4 Minutes)
- (b) Check Static Lines.
- (c) Check Equipment.
- (d) Sound off for equipment check. (OKAY)
- (e) Sit in the Door.
- (f) Stand By. (8-10 seconds out)
- (g) Go.

(2) Exiting the aircraft:

- (a) Individual tap-out. Starting on the right door, each jumper is tapped out by the Jumpmaster in numerical order (1-4). The same procedure is repeated for the left door.
- (b) Seating arrangement.

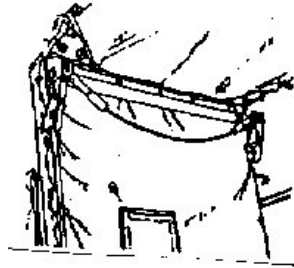


### (3) Preparation of helicopter:

- (a) Both cargo compartment doors are locked in the open position. If the doors cannot be locked they are removed.
- (b) All troop seats are removed except one seat on each side (located to the rear of the pilot and copilot seats) are installed so they are facing to the rear of the aircraft. If the parachutists are jumping combat equipment or eight parachutists are to jump, all the seats in the cargo compartment are removed.
- (c) The door and/or frame are inspected to ensure there are no sharp edges that would cut or fray static lines. If these are determined to be hazards to the static, corrective actions are taken before the helicopter is jumped.
- (d) Under field conditions, the door and/or frame can be padded and taped to preclude a mission abort. Otherwise the aircraft is returned to maintenance for correction of the deficiency.
- (e) Safety belts are attached to the tie-down rings located on each side of the compartment for floor-seated parachutists.
- (f) The door gunner/crew chief's foot operated radio switch may be unscrewed by hand prior to jump. The exposed radio switch wires are taped to prevent an electrical short. If the switch is not removed, it is padded and taped. The ground-handling wheel-mounting brackets on

both landing skids are padded with cellulose wadding and taped.

(4) Standard overhead anchor system.



(5) Expedient anchor system:

(a) Materials needed:

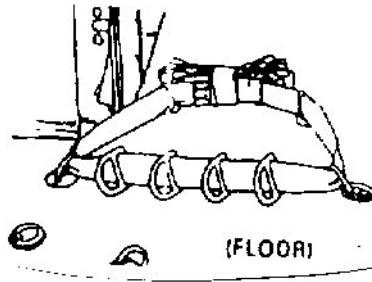
- Cotton A-7A strap.
- Four d-rings.
- Four connector straps
- Nylon A-7A straps may used with cotton buffers on the D-Rings and connector snaps

(b) Pass the strap through tie-down Numbers F-4, K-3, J-4, and G-2 (left door).

(c) D-rings are placed on the strap with the round part of the rings facing outboard.

(d) Tape excess between tie down rings number J4 and number G2.

(e) Do the same for the right door but pass the strap through tie-down Numbers G-1, F-2, K-2, and J-3.



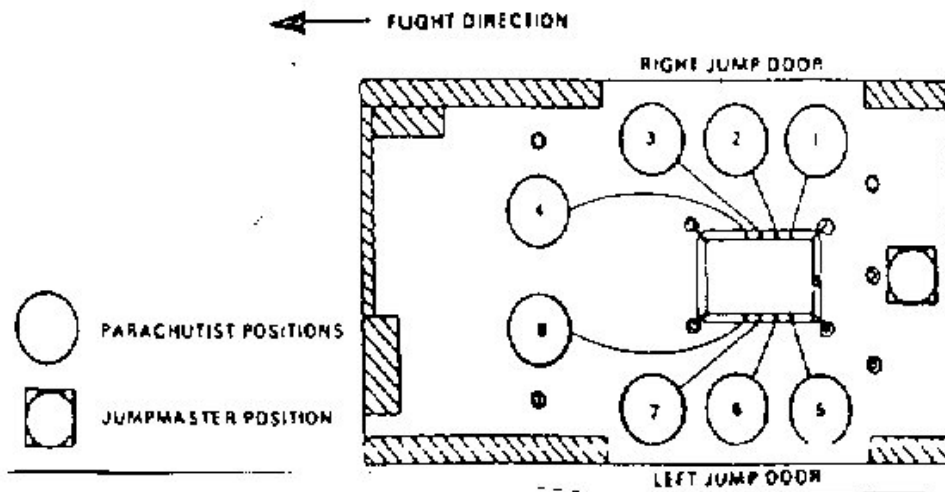
b. UH-60:

(1) Commands- Same as for UH-1H.

(2) Exiting the aircraft:

(a) Individual tap-out. Starting from the right door, each jumper is tapped out by the Jumpmaster in numerical order (1-4). The same is repeated for the left door (5-8).

(b) Seating arrangement:



(3) Preparation of the Helicopter:

(a) Lock both cargo doors in the open position.

(b) Remove seats in the cargo compartment (except as required by aircraft crew).

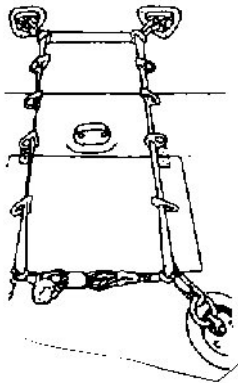
(c) Tape cargo floor, troop seat, and tie-down fitting wells in front of the cargo doors.

(d) Tape sharp edges of cargo floor and door frame that could cut or fray static lines or snag parachutist's equipment.

(e) Tape the cargo door's weather stripping below the door catch.

(4) Modified anchor line:

(a) Install a floor-mounted anchor line system (using a modified STABO extraction system anchoring strap assembly; NSN 1670-00-999-3544; TM 10-1670-251-12).



(b) Install four snap hooks and eight D-rings with cotton buffers on the anchor web loop, with the snap hooks and the D-rings facing out in the following order: one snap hook, four D-rings; two snap hooks, four D-rings; and one snap hook.

(c) Insert approximately 30 inches of the web loop running end into the quick-fit adapter to secure the loop.

(d) Center the anchor line system on the cargo floor with the quick-fit adapter to the rear then attach the snap hooks to tie-down fittings 3-B, 3-C, 4-B, and 4-C. Insert the safety wires and tape the snap hooks.

(e) Center the quick-fit adapter between tie-down fittings 4-B and 4-C and tighten the web loop by pulling on the loop running end. Secure the web loop running end with an overhand knot. Fold and tape excess webbing to the web loop.

(5) Safety belt installation:

(a) Install four floor-mounted safety belts.

(b) Attach a standard safety belt to the tie-down fittings 5-A and 5-C for the Jumpmaster.

(c) Attach an 86 inch long (extended) safety belt to forward tie-down fittings 1-A and 1-D.

(d) Attach a 112 inch long (extended) safety belt to tie-down fittings 1-A and 5-A, left door.

(e) Attach a 112 inch long (extended) safety belt to tie-down fittings 1-D and 5-C, right door.

- (f) Ensure that a serviceable safety harness is available for the Jumpmaster (and the crew chief, when required). The jumpmaster's safety line is attached to tie-down fitting 5-B. The crew chief's safety line is attached to tie-down fitting 1-A or 1-D, as required. If safety harnesses not available, a back-up type parachute may be used.

c. CH-47:

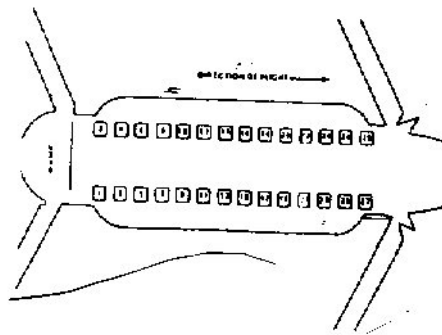
(1) Commands:

- (a) Get Ready.
- (b) Portside Personnel Stand-up.
- (c) Starboard Side Personnel Stand-up.
- (d) Hook-up.
- (e) Check Static Lines.
- (f) Check Equipment.
- (g) Sound-Off For Equipment Check.
- (h) Stand By.
- (i) Go.

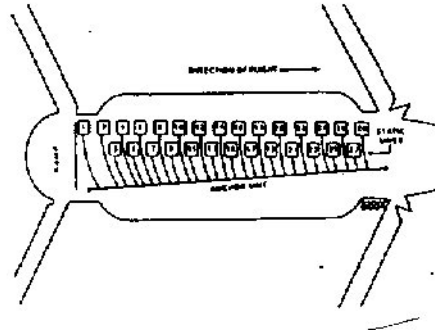
(2) Exiting the aircraft:

- (a) On the command GO, Number 1 jumper walks off the Portside rear corner of the ramp. The remaining parachutist follow at 1-second intervals regulated by the Jumpmaster.

(b) Seating arrangements:



(c) Static-line routing:



(3) Preparation of helicopter:

- (a) Safety belts are installed for all parachutists and let out all the way to ensure positive hook-up while seated.
- (b) The permanently installed anchor line cable is secured to the attachment points on the starboard side of the aircraft.
- (c) The ramp is declined for personnel parachute drops during flight.

### Notes

## **6. AIRCRAFT INFORMATION:**

### a. UH-1H Iroquois:

#### (1) Airspeed:

(a) Maximum: 120 knots.

(b) Tactical: 70 knots.

#### (2) Allowable Cargo Load:

(a) Combat equipped troops: 8 with seats,  
11 without seats.

(b) Maximum hook capacity: 4,000 pounds.

(c) Lift capacity: 2,300 pounds.

#### (3) Flight time: 2 hours, 20 minutes.

#### (4) Crew: 3 (Air Ambulance -4).

#### (5) Medical Rescue Information:

(a) Maximum litter capacity: 6.

(b) Internal hoist capacity: 600 LB.

(c) Hoist usable cable length: 250 FT.

(d) Normal air ambulance configuration: 3 litters, 4 ambulatory.

(e) Maximum configuration: 6 litters, or 9 ambulatory.

#### (6) Missions:

(a) Command and control.

(b) Resupply.

(c) Combat troop assault.

(d) Mobility.

(e) Air ambulance.

b. UH-60A Blackhawk:

(1) Airspeed:

(a) Maximum: 193 knots.

(b) Cruise: 147-153 knots.

(2) Allowable Cargo Load:

(a) Combat equipped troops:

- With seats: 11

- Without Seats: 21

(b) Maximum hook capacity: 8,000 LB.

(c) Lift capacity: 8,000 LB.

(3) Flight Time: 2 hours, 20 min.

(4) Crew: 3. (Air Ambulance -4).

(5) Medical rescue Information:

(a) Maximum litter capacity: 4.

(b) Hoist cable length: 250 FT.

(c) Rescue hoist capacity: 600 LB.

(d) Normal configuration: 4 litter, and 4 ambulatory.

(e) Maximum configuration: 6 litter, or 11 ambulatory.

(6) Missions:

(a) Combat troop assault.

(b) Command and Control.

(c) Resupply.

(d) Mobility.

(e) Air ambulance.

c. CH-47 Chinook:

(1) Airspeed:

(a) Maximum: 175 knots.

(b) Internal load: 80-120 knots.

(c) External load:

- Center hook suspension: 40-60 knots.

- Tandem load: 115-120 knots.

(2) Allowable Cargo Load:

(a) Combat equipped troops: 33.

(b) Hook capacity:

- C model: 20,000 LB.

- D model:

For and Aft hooks together: 25,000 LB.

For and Aft hooks each: 17,000 LB.

Center hook: 26,000 LB.

(3) Crew: 4.

(4) Medical Rescue Information:

(a) Standard configuration: 12 litter, and 16 ambulatory.

(b) Maximum configuration: 24 litter, or 31 ambulatory.

(5) Missions:

(a) Transport.

(b) Mobility.

(c) Resupply.

(d) Air ambulance.

**7. PONCHO EXPEDIENT PARACHUTE.** The poncho expedient parachute can be used to drop up to 65 pounds of non to mildly sensitive equipment and lessens the need for more expensive parachutes. The load requires a buffer to protect load.

- a. First, pull the hood drawstring loop to close the hood opening, then wrap the excess drawstring tightly around the base of the hood and tie it off so no air will escape. Leave at least a one inch loop in the poncho hood drawstring to secure 1/4" cotton breakaway.
- b. Lay the poncho flat and fold the four corners in so that they meet in the center.
- c. Cut nine suspension lines 8-10 feet in length, one will be the static line.
- d. Tie one suspension line to each of the eight grommets on the poncho with a bowline knot.
- e. Ensure the suspension lines are not tangled and are the same length.
- f. Tie all the free ends of the suspension lines to a snaplink with a bowline minus the safety.
- g. Fold the poncho as follows:
  - (1) Lay the half-folded poncho flat, length wise.
  - (2) On both long sides of the poncho, make "S" folds 6 to 8 inches wide to meet in the center (there should be the same number of folds on both sides).
  - (3) Fold the narrow-folded poncho into an "M" fold.
- h. Construct the deployment bag, use a sandbag. Punch a hole just below the seam, tie the fixed looped end of the static line to the sandbag, turn inside out, then tie the fixed loop of the static line to the drawstring (which is wrapped around the hole of the poncho) with one loop of 25 LB. test cord (or a light weight string that will break when the bundle is deployed from the aircraft) and tied with a square knot. If using 1/4" cotton webbing, cut it 2/3 of the way through to ensure it will break.
- i. Attach the load to the snaplink that is attached to the suspension lines.
- j. "S" Fold the suspension lines on top of the load.
- k. Then place the "M" folded poncho parachute on top of the folded suspension lines.

9-70

- I. Affix the poncho parachute to the top of the load with one wrap of 25 LB. test cord in the same manner as tying a, ensuring the cord goes through the loop in the static line. Tie with a square knot. This will deploy the suspension lines prior to breaking loose from the aircraft.

**Notes**

## **CHAPTER TEN**

### **MOUNTAIN OPERATIONS**

#### **1. INTRODUCTION TO KNOT TYING**

a. Introduction: When discussing knots with mountaineers, it quickly becomes apparent that everyone has favorites based on years of training and experience. In military mountaineering, there must be a degree of standardization. A soldier must be able to look at a rope installation and know if it was tied correctly. While some exotic knots show a great deal of skill on the part of the person tying it, using such knots does not offset the safety margin gained when everyone is familiar with a simpler, more uniform system.

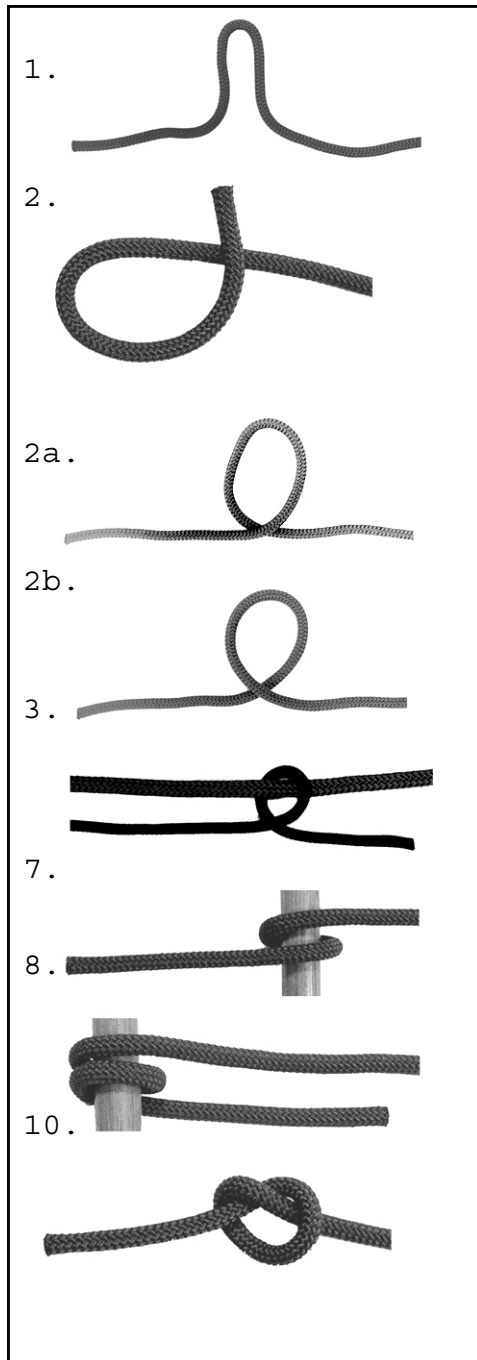
b. Body:

- (1) Knots: A soldier should keep in mind that a knot is only a temporary condition in a rope. Knots have a magical ability to untie themselves over a period of time. A permanent knot may be more desirable for some prepossess, but no such knot exists. Most knots are intended to be temporary. All knots must be repeatedly checked and often retied.
- (2) Adverse Conditions: Often there is a need to tie a knot in a rope or webbing under adverse conditions (in the dark, on a steep rock cliff, during a rain storm, while hanging on with one hand). The soldier must know which knot is best (or at least acceptable) for the purpose intended, and must know how to tie the knot well. Repeated practice is the most effective teacher.
- (3) Selection: In considering which knots to use, strength certainly cannot be discounted, but it should not be the sole basis of knot selection. Climbers are not found at the bottom of cliffs with broken knots. Ease of tying, the chance of working loose, ease of untying after loading, ease of being taught to others, and allowance for quick inspection to see if it is tied correctly are all pertinent factors.

(4) Relative strength of knots for single ensure rope::

No Knot:	100%	Clove Hitch:	60-65%
Figure of Eight:	75-80%	Overhand:	60-65%
Bowline:	70-75%	Two Half Hitches:	60-70%
Water Knot:	60-70%	Square Knot:	43-47%

(5) Terms used in rope work:



(1) Bight: A simple bend in the rope in which the rope does not cross itself.

(2) Loop: A simple bend in the rope in which the rope crosses itself (Fig 2).

(a) Overhand Loop: The running end is over the standing end.

(b) Underhand Loop: The running end is under the standing end.

(3) Half hitch: A loop which runs around an object in such a manner as to lock or secure itself (Fig 3).

(4) Running end: Loose/working end of the rope. (not pictured)

(5) Standing end: Stationary/non-working end of the rope. (not pictured)

(6) Lay: The twist used in construction of the rope. (not pictured)

(7) Turn: A wrap of the rope around an object, providing 360 degree contact (Fig 4).

(8) Round turn: A wrap of the rope around an object 1 1/2 times. A round turn must be used to distribute the load over a small diameter anchor (3" or less). It may be used over large diameter anchors to reduce the tension on the knot or provide added friction (Fig 5).

(9) Pigtail: The final end of the running part of the rope left after the knot has been satisfied. All pigtails will be a minimum of 4" long.

(10) Overhand knot

f. Classes of knots: remember the acronym (J.A.M.S.)

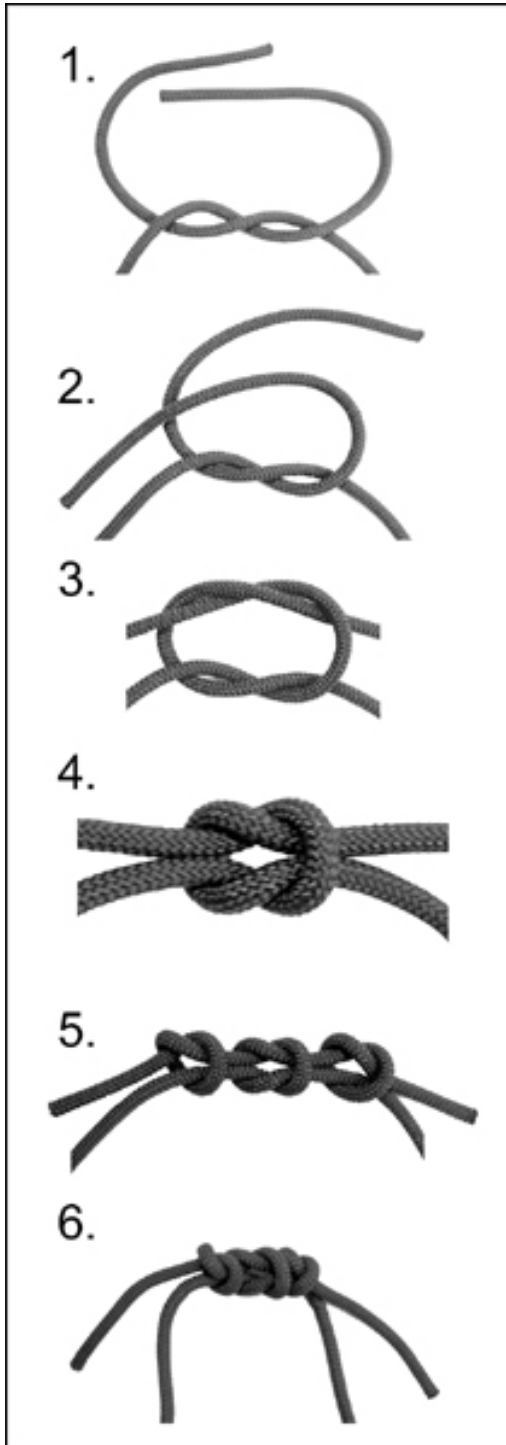
(1) Class 1 (Joining Knots): Square knot, Figure of Eight Bend Water Knot.

(2) Class 2 (Anchor Knots): Bowline, End of the rope Clove Hitch, Round Turn 2 Half Hitches.

(3) Class 3 (Middle of the Rope Knots): MOR Clove Hitch, Double Figure of Eight Knot, MOR Prusik, Bowline on a Bight, Wireman's Knot.

(4) Class 4 (Special Knots): Figure of Eight Retrace, Three Loop Bowline, End of the Rope Prusik, Muntar Hitch, Butterfly Coil w/Farmer's tie off, Rappel Seat.

g. Tying the knot: Listed below are techniques for tying the knots along with diagrams showing how the knots appears during tying.



**SQUARE KNOT: CLASS 1, Joining Knot.**

**PURPOSE:** To join the ends of two ropes of equal diameter together when they are under tension.

**TYING THE KNOT:**

STEP 1: Holding one running end in each hand, place the running end in your right hand over the one in your left hand.

STEP 2: Pull it under then back over the top of the rope in your left hand.

STEP 3: Place the running end in your left hand over the one in your right hand and repeat as in step 2.

STEP 4: Dress the knot down and safety it off with an overhand knot on each side of the knot.

**CHECKPOINTS:**

- Two interlocking bights.
- The running ends are on opposite ends of the knot and on the same side of the standing end.
- Minimum 4-inch pigtails after the overhand safeties

**FIGURE OF EIGHT BEND:** Class 1, Joining knot:

**PURPOSE:** To join the ends of two ropes of equal or similar diameter no more than 5-mm difference in diameter

**TYING THE KNOT:**

STEP 1: Grasp the top of a 2' bight.

STEP 2: With the other hand grasp the running end and make a 360 degree turn around the standing end.

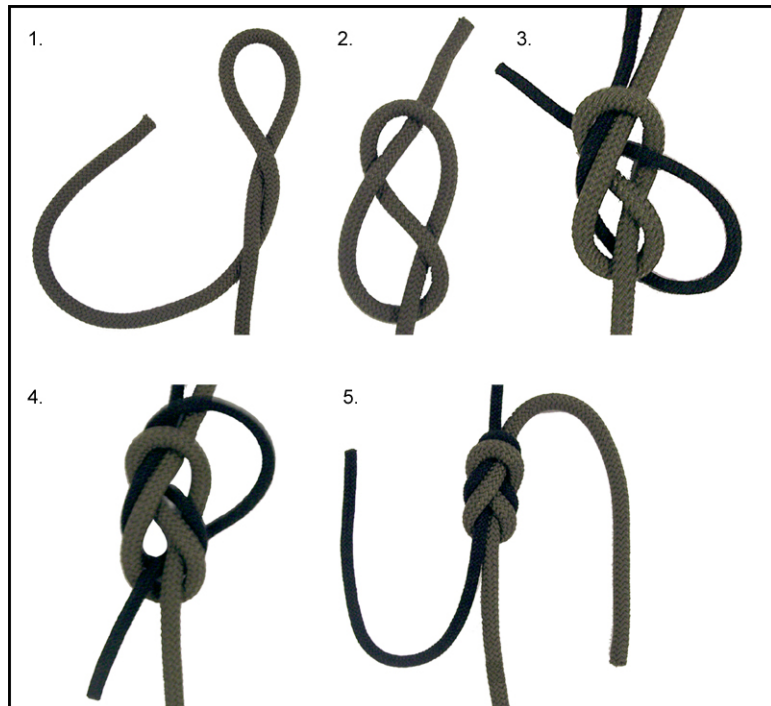
STEP 3: Place the running end through the loop you have just formed thus creating an in-line Figure of Eight.

STEP 4: Route the running end of the other rope back through the Figure of Eight starting from the original ropes running end. Trace the original knot to the standing end.

STEP 5: Dress the Knot down.

**CHECKPOINTS:**

- Two ropes running side by side in the shape of a figure eight
- The running ends are on opposite ends of the knot and on opposite sides of the standing ends
- Minimum 4-inch pigtails and no twists



**WATER KNOT:** Class 1, Joining Knot.

**PURPOSE:** Used to join the ends of tubular webbing.

**TYING THE KNOT:**

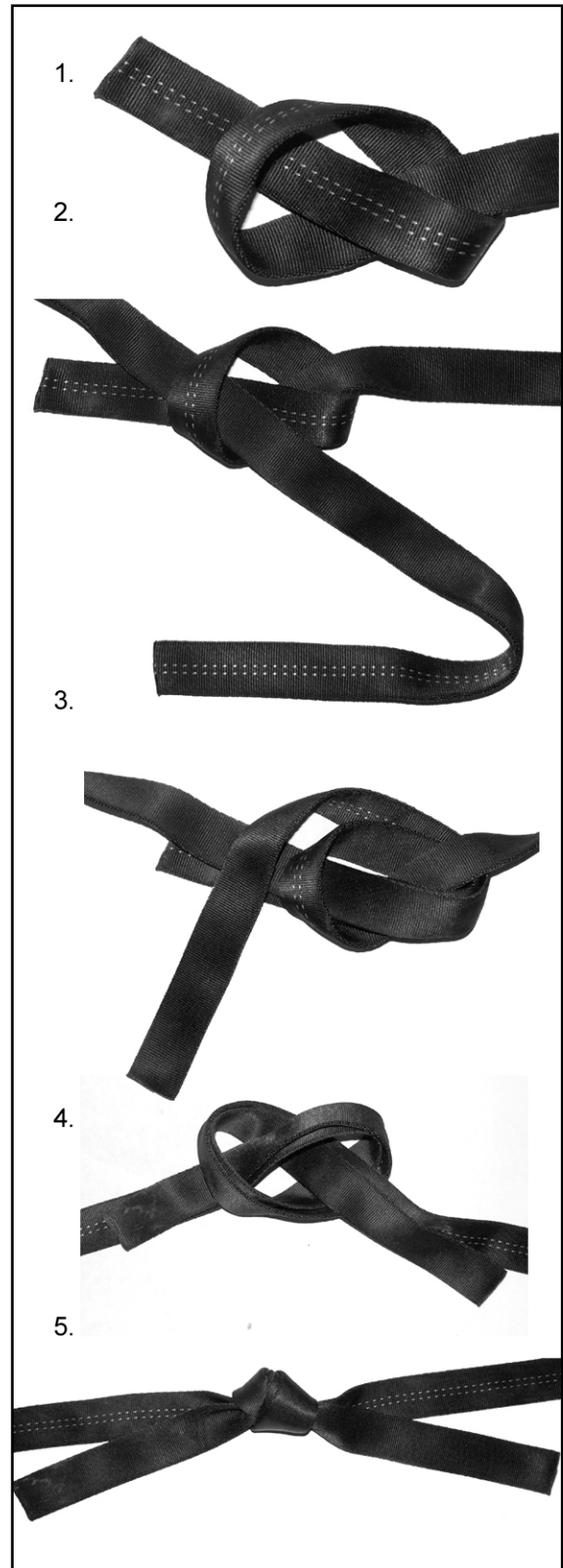
**STEP 1:** Tie an overhand knot in one end of the webbing with the webbing in the left hand.

**STEP 2:** Route the other end of the webbing back through the overhand knot from running end to standing end, following the course of the original overhand knot. Do not allow the webbing to become twisted within the knot.

**STEP 3:** Dress the knot.

**CHECKPOINTS:**

- Two pieces of webbing running side by side in the shape of an overhand
- The running ends are on opposite ends of the knot and on the same of the standing ends
- There are no twists in the webbing
- Minimum 4-inch pigtails



**BOWLINE:** Class 2, Anchor Knot.

**PURPOSE:** To tie the end of a rope around an anchor point when you have altering tension or to form a fixed loop in a Rope.

**TYING THE KNOT:**

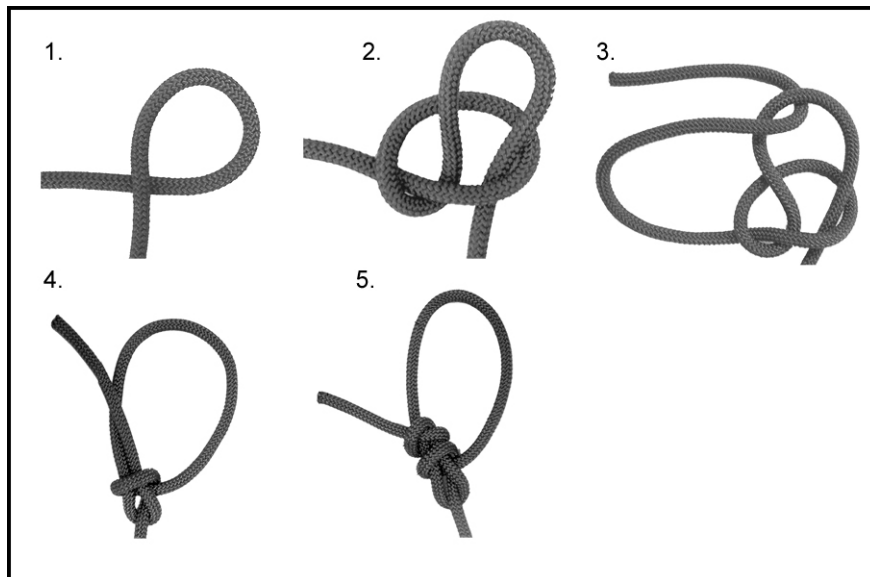
**STEP 1:** Bring the running end of the rope around the anchor point from right to left. If the anchor point is less than 3” make a round turn around the anchor, right to left, top to bottom.

**STEP 2:** With your right thumb facing towards you form a loop in the standing part of the rope by turning your wrist clockwise. Lay the loop to the right. Secure the loop with your left thumb and forefinger.

**STEP 3:** With your right hand, reach down through the loop and pull up a bight from the standing part of the rope. Insure that the standing part is towards you. Secure the bight with your right hand and release the grasp of the left.

**STEP 4:** Place the running end of the rope (on your left) through the bight from left to right and bring it back onto itself. Hold the running end loosely, dress the knot down by pulling on the standing end.

**STEP 5:** Safety the Bowline with an overhand knot.



**CHECKPOINTS:**

- A bight around the standing end of the rope held in place by a loop.
- The running end of the bight is on the inside of the fixed loop.
- Minimum 4-inch pigtails after the overhand safeties.

**CLOVE HITCH, End of the Rope:** Class 2, Anchor Knot.

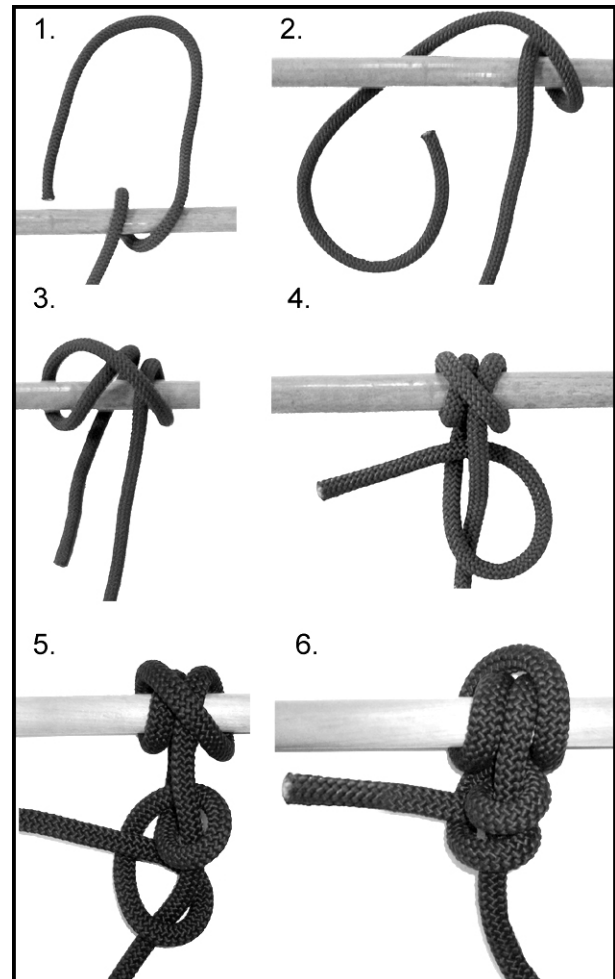
**PURPOSE:** To anchor the end of the rope under tension

**TYING THE KNOT:**

**STEP 1:** Make a turn around the anchor point, right to left. Bring the rope over the standing part and down continuing around the anchor forming a diagonal locking bar. Wrap the running end around the anchor point and pass it through the diagonal locking bar.

**STEP 2:** Dress the knot down.

**STEP 3:** Safety the knot with two Half Hitches.

**Checkpoints:**

- Two turns around the anchor with the diagonal locking bar in the opposite direction of pull.
- The running and standing ends exit the middle of the knot.
- Safety the running end to the standing end with two half hitches.
- Minimum 4-inch pigtail

**ROUND TURN, TWO HALF HITCHES:** Class 2,  
Anchor Knot.

**PURPOSE:** Used to tie the end of a rope to an anchor. This knot must have constant tension.

**TYING THE KNOT:**

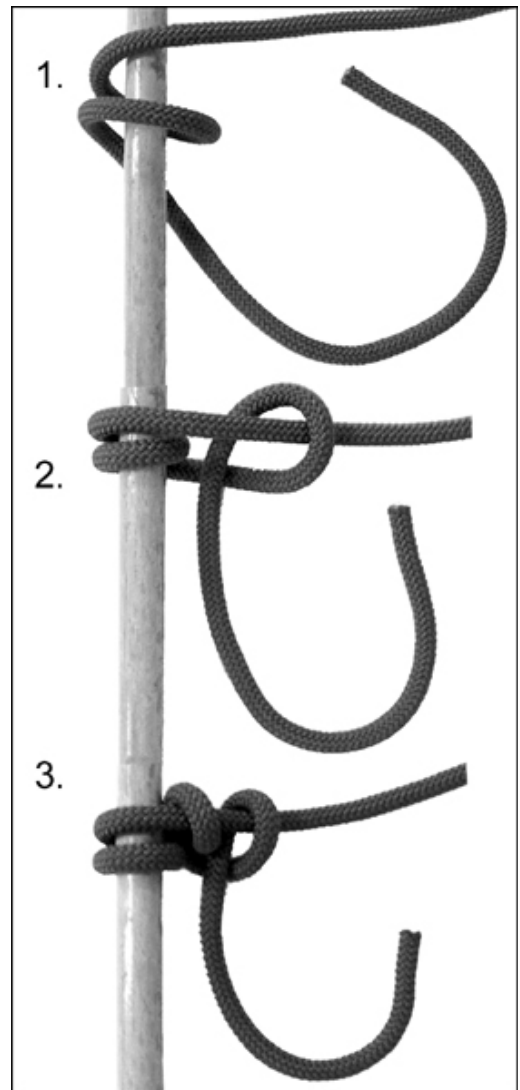
**STEP 1:** Route the rope around the anchor from right to left, top to bottom (must have two wraps in the rear of the anchor, and one in the front). Run the loop around the object to provide 360 degree contact, distributing the load over the anchor.

**STEP 2:** Bring the working end of the rope left to right and over the standing part, forming a half hitch (first half hitch).

**STEP 3:** Repeat step 2 (last half hitch must have a minimum of 4" pigtail).

**CHECKPOINTS:**

- A complete turn around the anchor point with no crosses.
- Two half hitches in place by a locking bar
- Minimum 4" pigtail



**MIDDLE OF THE ROPE CLOVE HITCH:** Class 3, Middle of the Rope.

**PURPOSE:** To form an anchor in the middle of the rope

**TYING THE KNOT:**

STEP 1: Hold the rope with both hands, palms down and approximately 12" apart.

STEP 2: With the right hand form a loop away from you and towards you left hand.

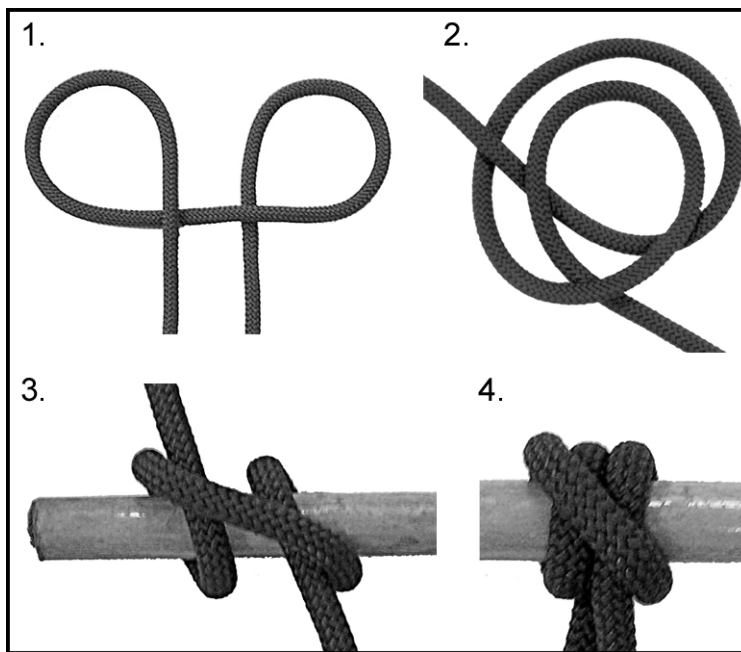
STEP 3: With the left hand form a loop towards you and towards you right hand.

STEP 4: Bring the loop in your left hand behind the loop in the right hand.

STEP 5: Place both loops over the anchor and pull both ends of the rope in opposite directions.

**CHECKPOINTS:**

- Two turns around the anchor with a diagonal locking bar
- The running and standing ends exit the center of the knot



**DOUBLE FIGURE EIGHT KNOT:** Class 3, Middle of the Rope.

**PURPOSE:** To form a fixed loop in a rope

**TYING THE KNOT:**

STEP 1: Form a 12" bight.

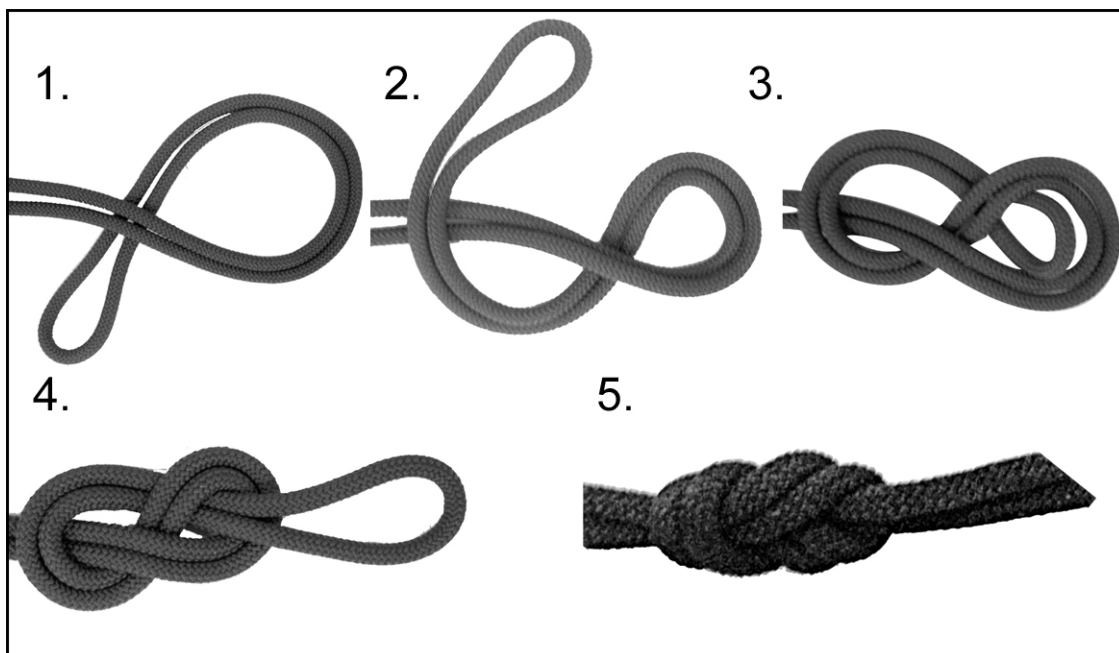
STEP 2: With the bight, make a 360 degree turn around the standing part of the rope, forming a double loop in your hand.

STEP 3: Place the bight through the loop.

STEP 4: Dress the knot down.

**CHECKPOINTS:**

- Two ropes running side by side in the shape of a figure eight
- The knot forms a fixed loop
- Minimum 4-inch pigtails and no twists



**MIDDLE OF THE ROPE PRUSIK:** Class 3, Middle of the Rope Knot.

**PURPOSE:** To attach a moveable rope to a fixed rope

**TYING THE KNOT:**

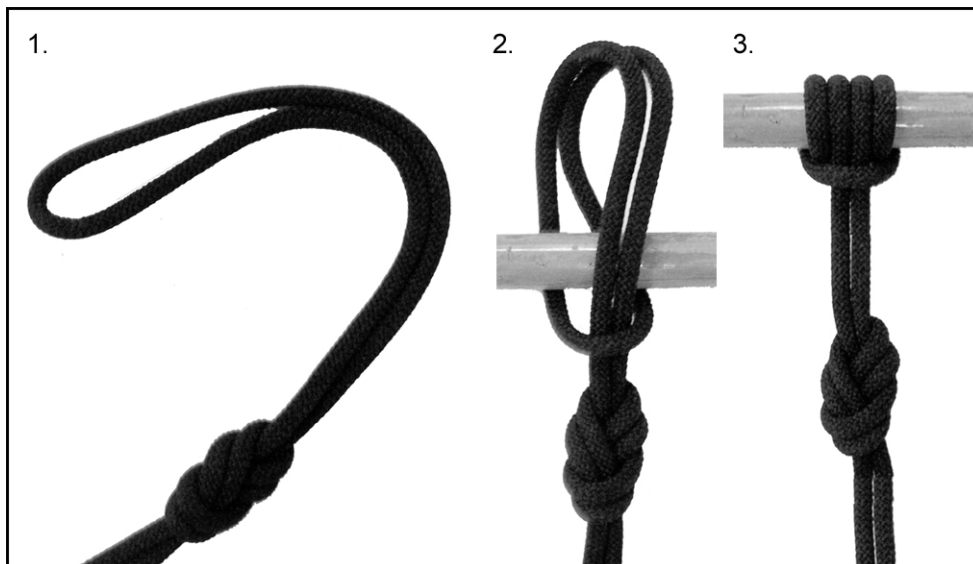
**STEP 1:** Tie a Double Figure of Eight in the rope, making a 10"-12" loop. Place the loop over the fixed rope so that the closed end of the loop is 4-6" below the fixed rope and the double figure of eight is close to you.

**STEP 2:** Reach down through the loop and pull both running ends through the loop and continue around the anchor with the figure of eight, passing it again through the original loop. You will now have two round turns on the fixed rope and a locking bar running perpendicular to them.

**STEP 3:** Dress the wraps and locking bar down to make sure they are tight and not twisted.

**CHECKPOINTS:**

- Two round turns with a perpendicular locking bar.
- With a double figure eight stabilizing the knot no more than 6" away from the prusik
- The ropes between the prusik and double figure eight have equal tension.



**FIGURE OF EIGHT RETRACE:** Class 4, Special Knot.

**PURPOSE:** To tie the climbing rope around a fixed object or harness.

**TYING THE KNOT:**

STEP 1: Grasp the top of a 2' bight.

STEP 2: With the other hand grasp the running end (short end) and make a 360 degree turn around the standing end.

STEP 3: Place the running end through the loop you have just formed.

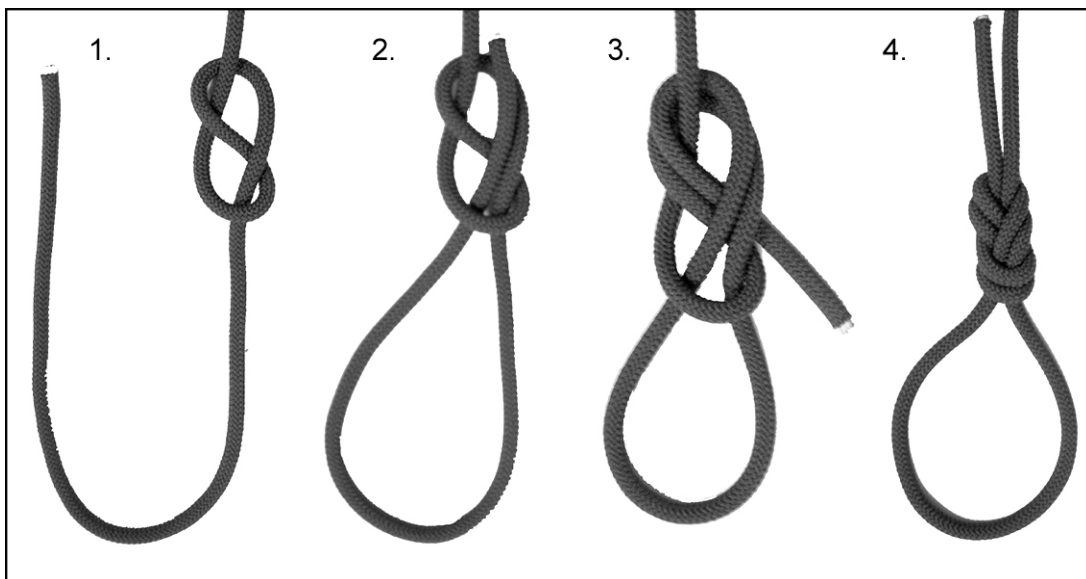
STEP 4: Place the running end around the anchor point or harness.

STEP 5: Route the running end back through the figure of eight tracing the original knot to the standing end.

STEP 6: Dress the knot.

**CHECKPOINTS:**

- Two ropes running side by side in the shape of a figure eight
- The knot will form a fixed loop around a fixed object or harness
- Minimum 4-inch pigtails and no twists



**THREE LOOP BOWLINE:** Class 4, Special Knot.

**PURPOSE:** To form three fixed loops in a rope. Normally used as an anchor knot

**TYING THE KNOT:**

**STEP 1:** Form a bight in the middle of the rope. Bring the bight around the anchor point from right to left. Make a round turn around the anchor point if the anchor point is less than 3" in diameter.

**STEP 2:** With your right thumb facing towards you, form a double loop in the standing part by turning your wrist clockwise. Lay the loops to the right.

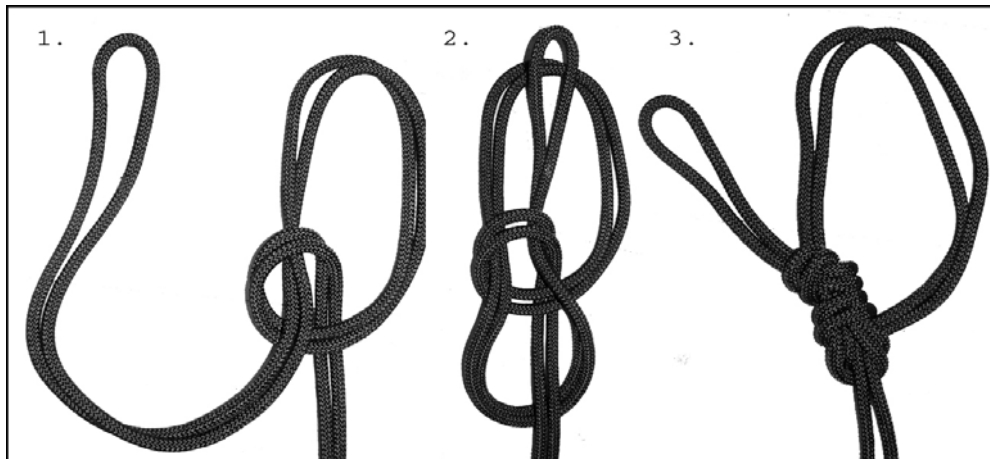
**STEP 3:** With your right hand, reach down through the loop and pull up a double bight from the standing part of the rope. Ensure that the standing parts are towards you.

**STEP 4:** Place the running end (bight) of the rope through the doubled bight from left to right and bring it back onto itself. Hold the running end loosely, dress the knot down by pulling on the standing part.

**STEP 5:** Safety the knot with a doubled overhand knot.

**CHECKPOINTS:**

- Two bights around the standing ends, held in place by two loops
- The running end of the bight is on the inside of the two fixed loops
- Minimum 4-inch pigtail after the double overhand knot



**END OF ROPE PRUSIK:** Class 4, Special Knot.

**PURPOSE:** To attach a moveable rope to a fixed rope, at the end of a rope

**TYING THE KNOT:**

STEP 1: With the running end make a round turn around the standing part of the fixed rope, working to your right.

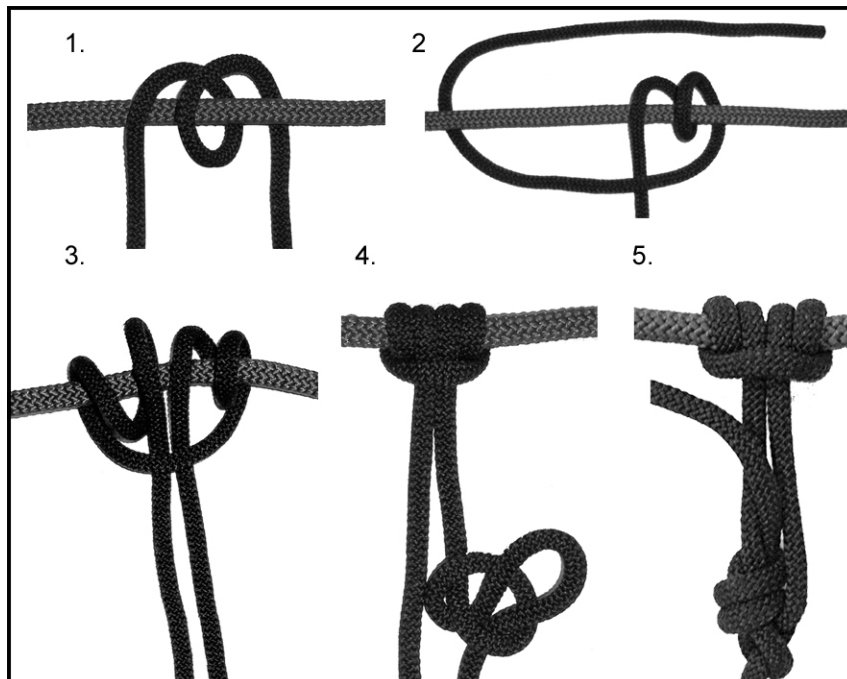
STEP 2: With the running end, come back over the standing part and under the fixed rope.

STEP 3: Come over the fixed rope and make a round turn working towards the right, bringing the running end through the locking bar.

STEP 4: Dress the knot down and stabilize the Prusik with a safetied bowline.

**CHECKPOINTS:**

- Two round turns with a perpendicular locking bar
- Stabilized with a saftied bowline no more than 6" from the prusik
- The ropes between the prusik and bowline have equal tension.
- Minimum 4-inch pigtail



**MUNTAR HITCH:** Class 4, Special Knot

**PURPOSE:** To form a mechanical belay

**TYING THE KNOT:**

STEP 1: Hold the rope in both hands, the right palm up and the left palm down.

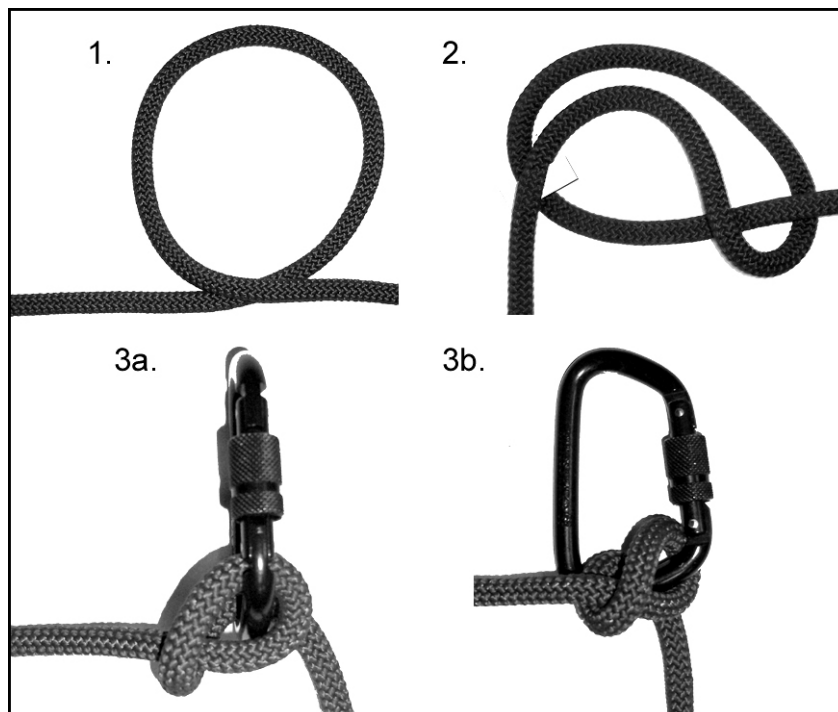
STEP 2: With the right hand form a loop away from you.

STEP 3: Without twisting the rope in the left hand bring it up directly behind the loop in your right hand.

STEP 4: Place the bight that you have formed around the rope into the carabiner. Lock the carabiner.

**CHECKPOINTS:**

- A bight passing through a locked carabiner
- The closed end of the bight is around the standing or running end.



**RAPPEL SEAT:** Class 4, Special Knot.

**PURPOSE:** Used to make a harness for climbing or repelling

**TYING THE KNOT:**

STEP 1: Find the middle of the rope, make a bight.

STEP 2: Determine which hand you will brake with and place the bight on the opposite side just above the hip.

STEP 3: Reach around your back and secure a single strand of rope. Bring the rope around to your front and make one wrap over the rope in your left hand. Make another wrap over the rope in your right hand and tighten. This creates a loop around your waist.

STEP 4: Pass the two ends between your legs, ensuring they do not cross.

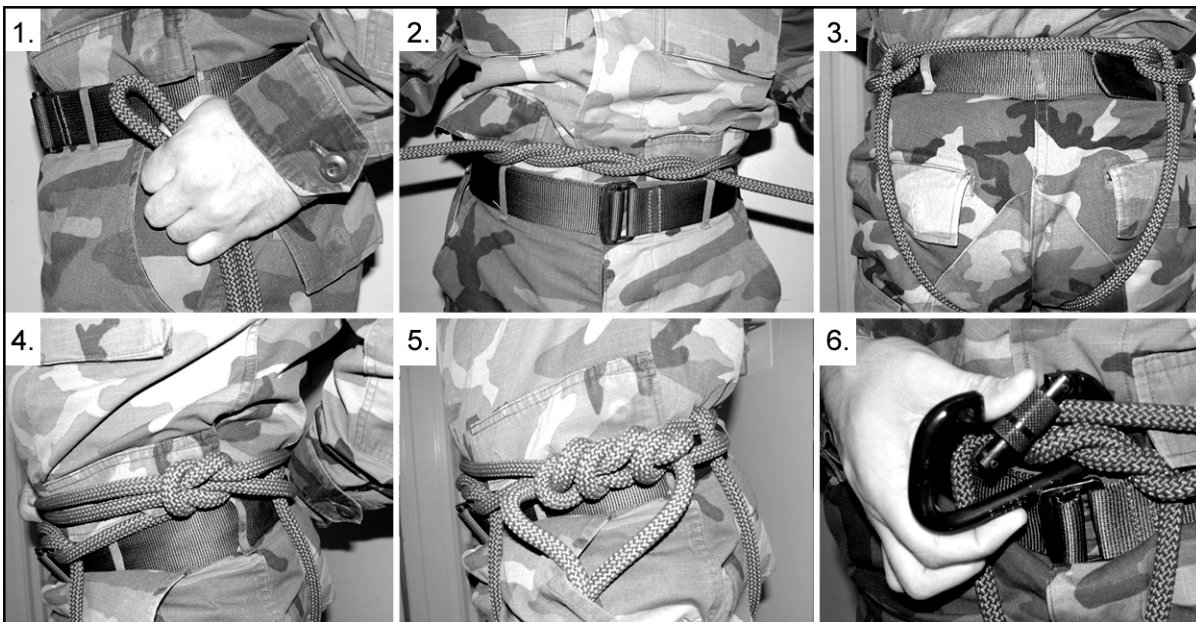
STEP 5: Pass the two ends over the top of the waist loop bisecting you pocket flaps (ensure running ends come out towards the center of your buttocks). Squat, secure the two running ends and tighten the seat.

STEP 6: From the center of your buttocks, bring each rope over the leg loops just created (creating a half hitch on both hips).

STEP 7: Bring the rope on your brake side across your front to your non-brake side hip and secure the two ends with a square knot, safety the knot with an overhand knot on each side. Tuck all excess into a pocket. Must have a minimum of 4" pigtail.

**CHECKPOINTS:**

- Two overhands around the body, above the hips
- Ropes not crossed between the legs
- A half hitch on each hip over the waist rope
- Square knot on guide hand side
- Minimum 4-inch pigtail after overhand safeties



## Rappel Seat

**BOWLINE ON A COIL:** Class 4, Special Knot

**PURPOSE:** Used to secure a climber to the end of a climbing rope

**TYING THE KNOT:**

STEP 1: With the running end, place 3' of rope over your right shoulder. The running end is to your back.

STEP 2: Starting at the bottom of your ribcage, wrap the standing part of the rope around your body and down in a clockwise direction four to eight times.

STEP 3: With the standing portion of the rope in your left hand, make a clockwise loop towards you. The standing portion is on the bottom.

STEP 4: Insuring that the loop does not come uncrossed, bring it up under the coils between the rope and your body.

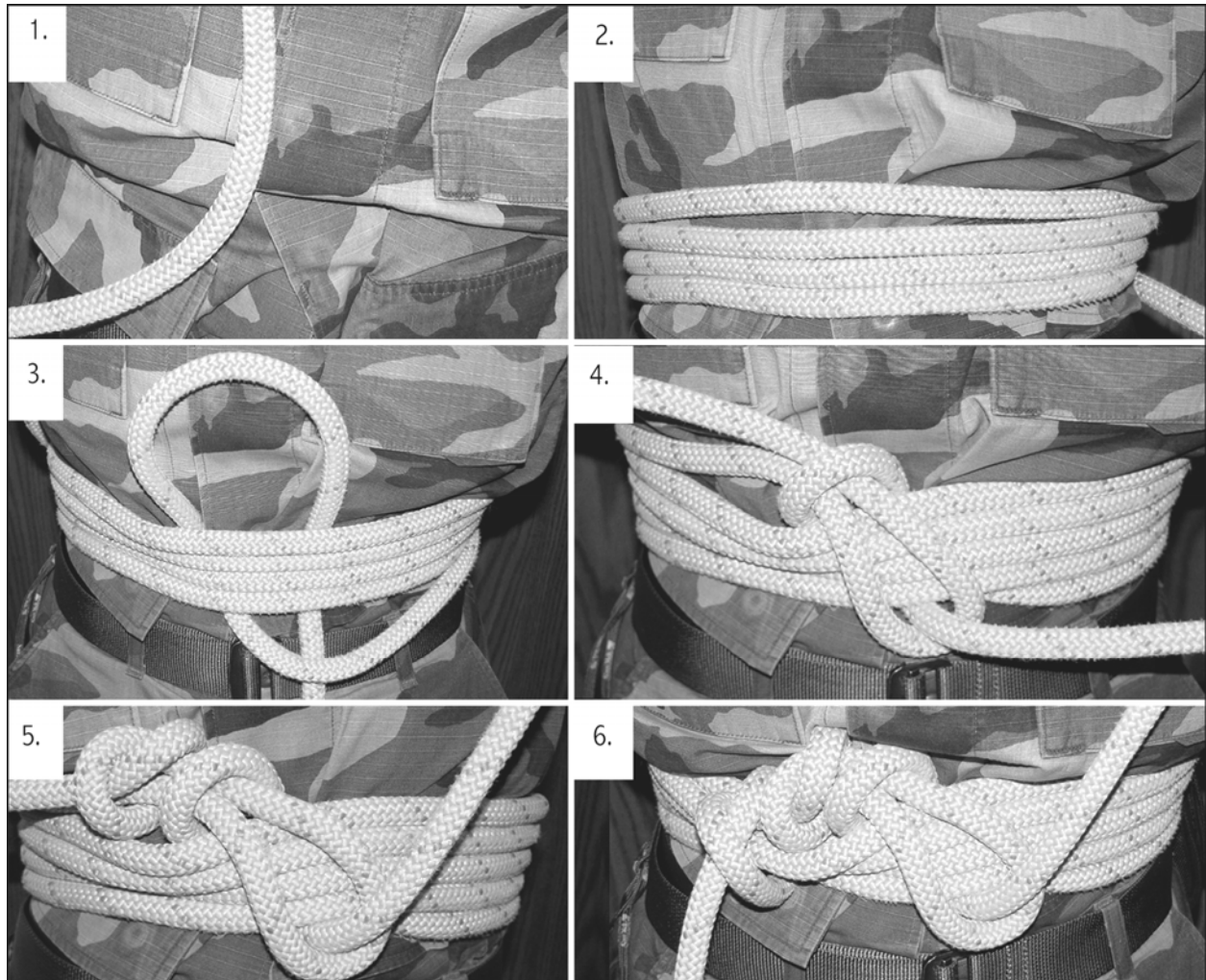
STEP 5: Using the standing part, bring a bight up through the loop. Grasp the running end of the rope in your right hand. Pass it through the bight from right to left and back on itself.

STEP 6: Holding the bight loosely, dress the knot down, by pulling on the standing end.

STEP 7: Safety the bowline with an overhand around the top single coil, then tie an overhand around all coils, leaving a minimum of 4" pigtail.

**CHECKPOINTS:**

- A minimum of four wraps around the body not crossed
- A bight held in place by a loop
- The loop must be underneath all wraps
- Centered on the middle-line of the body
- Minimum 4" pigtail after second overhand knot



**MIDDLE OF THE ROPE FIGURE EIGHT SLIP KNOT:** Class 3, Middle of Rope

**PURPOSE:** To form an adjustable bight in a rope.

**TYING THE KNOT:**

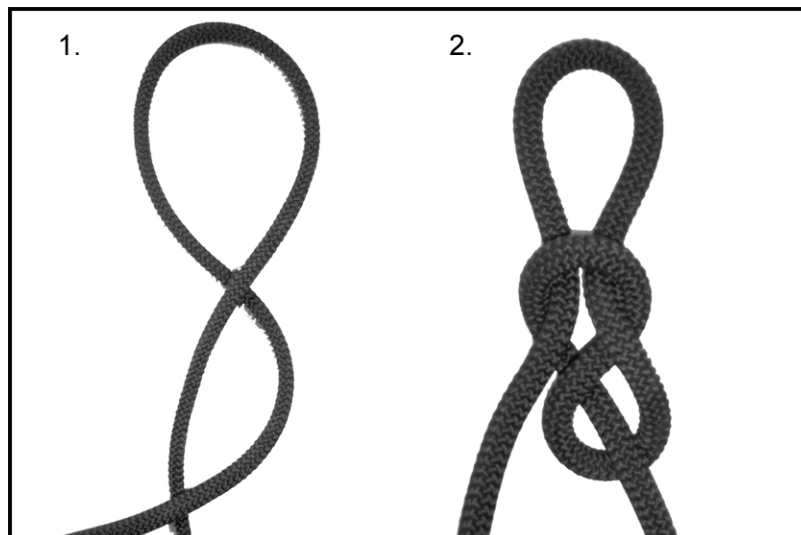
**STEP 1:** Take a bight in the rope holding the closed end; grasp the doubled rope below the bight with the opposite hand. Make two twists in the bight (360 degree) using the top hand.

**STEP 2:** Maintaining the two twists, reach through the loop and pull a bight through the loop in your hand.

**STEP 3:** Dress down the knot.

**CHECKPOINTS:**

- The knot is in the shape of a figure eight.
- An adjustable bight passes through one loop of the figure eight



## PERFORMANCE MEASURE -17

**TWO LOOP FIGURE EIGHT KNOT:** Class 4, Special Knot

**PURPOSE:** Used To form two adjustable fixed loops in a rope.

### TYING THE KNOT:

STEP 1: Form an 18" bight.

STEP 2: Bring the bight 360 degrees around the doubled standing end.

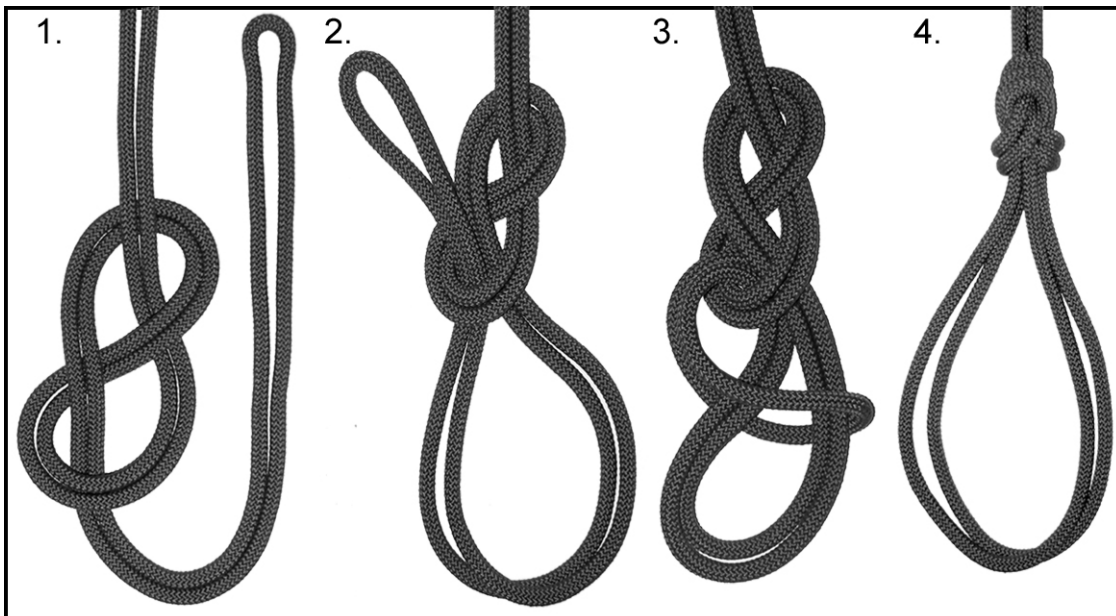
STEP 3: Holding the bight, form a doubled bight and place it through the loop you have just formed.

STEP 4: Hold the double bight, placing the original bight over the knot, forming a common locking bar on the bottom of the double figure eight knot.

STEP 5: Remove all unnecessary twists and crossovers. Dress the knot down.

### CHECKPOINTS:

- Two ropes running side by side in the shape of a figure eight
- The knot has two adjustable fixed loops
- The loops are adjustable by means of a common locking bar at the bottom of the knot
- Minimum 4-inch pigtails and no twists



**BUTTERFLY COIL WITH FARMER'S TIE OFF:** Class 4, Special Knot.

**PURPOSE:** To prepare a climbing rope for carrying on the body

**TYING THE KNOT:**

STEP 1: Backfeed the doubled rope until you have the approximate center bight.

STEP 2: Place the center bight over your head and drape it in front, over your shoulder so it hangs no lower than your waist.

STEP 3: With the rest of the doubled rope in front of you make doubled bights placing them over your head in the same manner as the first bight, ensuring as you alternate from side to side (right to left, left to right) while maintaining equal length bights.

STEP 4: Continue coiling until you have approximately two arms length of rope left. Carefully remove the coils from your neck/shoulders holding the center in one hand.

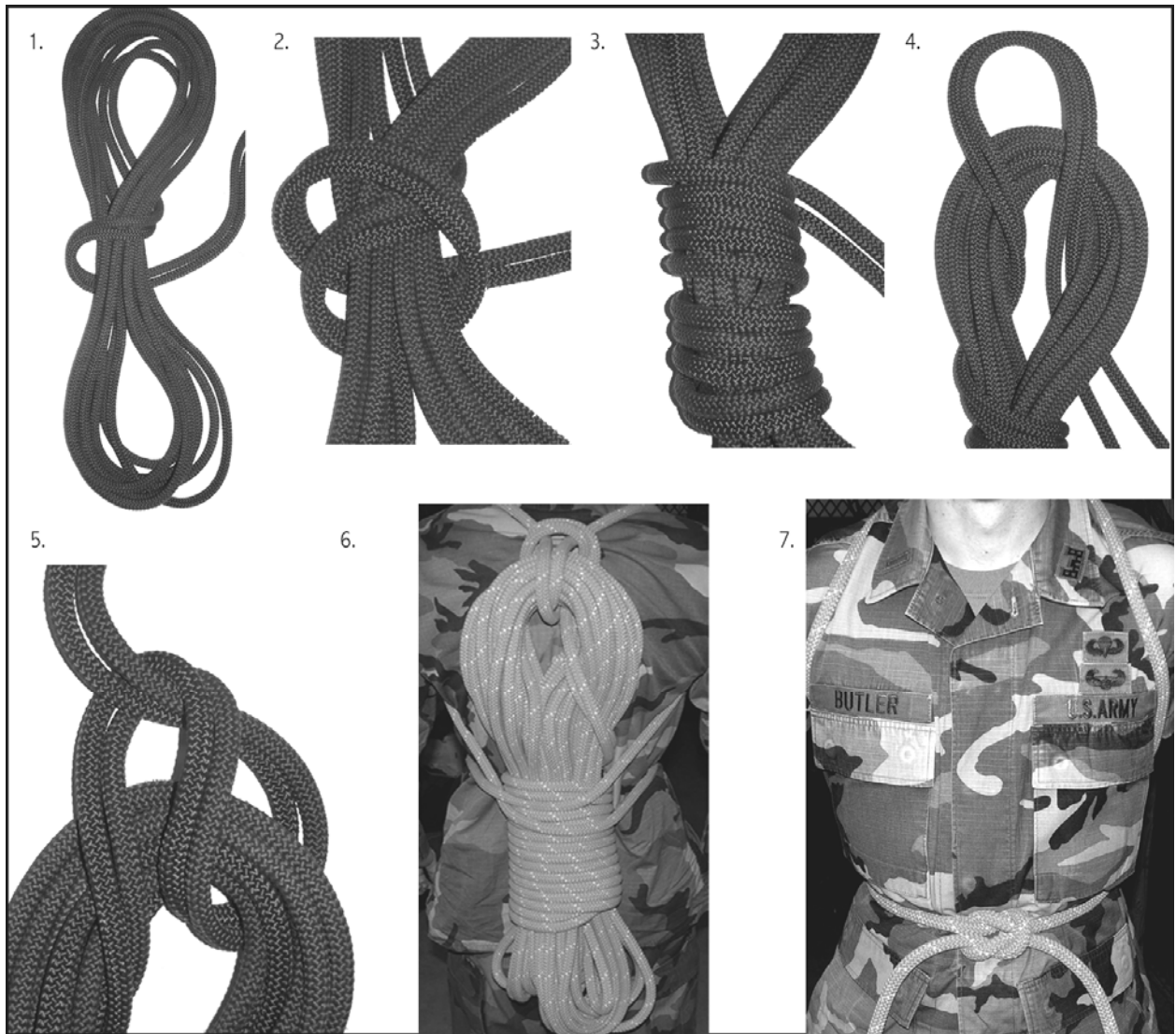
STEP 5: With the two ends, wrap the coils a minimum of three times ensuring the first wrap locks on itself.

STEP 6: Pass a doubled bight from the two loose ends up through the apex of the coils, pull the two loose ends through the doubled bight and dress it down.

STEP 7: Place the butterfly coil on your back. Separate the two loose ends. Bring one over your right shoulder and one over your left shoulder. Continue down under your arms and across your back. Ensure the rope crosses over the coils. Secure the two ends in front with a square knot without overhand safeties.

**CHECKPOINTS:**

- Coils uniform and even no greater than 6" difference
- A minimum of three turns around the coils with the first one locking on itself
- A double bight through the top of the coils, securing the standing ends and dressed down
- A minimum of one wrap around the body and coils tied off with an un-safetied square knot
- Minimum 4-inch pigtail



Butterfly Coil with Farmer's Tie Off

**WEB WRAP:**

**PURPOSE:** To attach a movable piece of webbing to a fixed rope.

**TYING THE KNOT:**

STEP 1: With an endless loop of webbing form a four inch bight. Ensure the knot is offset and opposite the bight.

STEP 2: Wrap the rest of the webbing around the rope a minimum of three times. Wrap more times if the rope is wet or icy.

STEP 3: Pass the rest of the webbing through the original bight and dress the knot down.

**CHECKPOINTS:**

- A bight locked over a minimum of three turns
- The knot is offset from the loop and completely out of the wraps

**AUTO BLOCK KNOT:**

**PURPOSE:** To attach a moveable rope or webbing to a fixed rope that is easy to release

**TYING THE KNOT:**

STEP 1: Join a utility rope to form an endless loop, about 24inches. You may use a standard length runner of tubular webbing. Offset the joining knot. Form a four inch bight on the opposite end from the joining knot. Wrap the long portion of the endless loop around the rope a minimum of three times on a double rope and four times on a single rope.

STEP 2: Snap both bights into a carabineer.

**CHECKPOINTS:**

- A minimum of four turns around the rope
- Both bights are in the carabineer
- The joining knot is offset and out of the turns

## 2. EQUIPMENT:

### a. Military:

#### (1) Rope:

##### (a) Characteristics:

- Nylon rope. 120 feet (36 ½ meters) in length, 7/16 inch in diameter (1.1 cm), 3,849 pound breaking strength when dry. The breaking strength is reduced by 18% when the rope is wet. Stretches 1/3 of length, 3 strand, multi-filament, twisted. Right hand lay. Lightweight (6 pounds).
- Sling rope. Same characteristics as nylon rope, 15 foot length (4.5 meters).
- Manila rope. Has a lower stretch factor than the nylon rope.

DIAMETER	TENSILE STRENGTH	SAFE LOAD
1/4 inch	550 pounds	150 pounds
1/2 inch	2,650 pounds	660 pounds
3/4 inch	5,400 pounds	1,350 pounds
1 inch	9,000 pounds	2,250 pounds

(b) Care of rope. Do not step on the rope or drag it on the ground. Do not let the rope come into contact with sharp corners. Keep rope as dry as possible. Do not leave the rope knotted or tightly stretched longer than necessary. Do not hang it on sharp edges. Rope is always coiled except when in actual use. Always coil in a clockwise direction and tie the coil with six to eight wraps.

(c) Rope management. Always inspect a rope before use. If one strand is cut or frayed more than halfway through, do not use. Mark the middle of the rope. The rope ends should be whipped, burned, and taped.

(2) Snaplink. Will hold a load of 2,000 pounds when the gate is closed. Inspect for burrs and excessive wear. Gate should open and close smoothly. Pins must be firmly seated and punched. Gate should have minimal lateral movement.

(3) Rock pitons:

(a) Types:

- Vertical. For flush vertical cracks.
- Horizontal. For flush horizontal cracks and for offset horizontal or vertical cracks.
- Angle. For wide horizontal or vertical cracks. Wide/open side must be placed down in horizontal cracks. Wide/open side must be placed against the rock in vertical cracks.
- Wafers. For shallow cracks, vertical, or horizontal.

(b) When driving the piton, always have it attached to the hammer thong or to the sling rope by a snap link.

(c) Pitons that have been used, removed, bent, and straightened should be discarded.

(d) To remove a piton, knock it back and forth with the hammer until loosened, then pull it out with a bight of rope.

(4) Piton hammer. Use the point for chipping rock or ice and cleaning out piton cracks. Never for pulling out pitons. Use the hammer end for driving pitons and testing rock.

(5) Ice piton. Cut a recess in the ice and remove all rotten ice. Drive the piton vertically all the way to the ring. Check frequently. Use time of the piton is limited.

(6) Crampons. Ensure proper fit. Front points should protrude past, but not fail to touch the toe of the boot. If they break at the hinge, wire the pieces together to rejoin.

(7) Ice ax. Extreme care must be exercised at all times in handling and using the ax.

b. Civilian. All equipment listed is supplied by BLUE WATER.

STOCK NUMBER	DESCRIPTION	REMARKS
<b>ROPES</b>		
509760	Assault line (Camo) 7/16 in, 600 ft	7000 LB tensile strength 1.6% working elongation 19 ft per LB weight 800 safe working load
590160xx	Dynamic line, 11 mm, 600 ft, standard rock guard	xx - color pattern 79 gr. per meter weight 2450 kg static breaking strength 5.2% 80K elongation 80 kg falling weight 890 kg ax impact force
590260xx	Dynamic, 11 mm, 600 ft, Dry Rockguard	Same as standard rockguard with increased water and wear resistance
<b>CORD</b>		
500500	Cord, 5 mm, 400 ft	Green/Orange, Orange/Green, 1275 LB tensile strength
500700	Cord, 7 mm, 200 ft	Purple/Yellow, Yellow/Purple, 2600 LB tensile strength
<b>DESCENDERS</b>		
601000	CM1 Rescue 8 Descender, large, with ears	8500 LB strength
601001	CM1 Regular 8 Descender	8000 LB strength
<b>ASCENDERS</b>		
602001	CM1 5004(pair), handled, 5/8 in rope	4600 LB strength
602106	Gibbs Ascender, spring loaded, aluminum shell, single	
<b>CARABINERS</b>		

605110	Stubai 85, 12 mm offset 'D', steel, locking, black	5500 LB strength 2500 kg strength	
<b>PULLEYS</b>			
610012	CM1, RP-102, Bronze Bushing, Black	6500 LB capacity	
610014	RS1, 2 in, heavy-duty rescue pulley, blue	10,000 LB capacity	
<b>STOCK NUMBER</b>	<b>CAM NUMBER</b>	<b>MEASUREMENT</b>	<b>REMARKS</b>
<b>CAMS</b>			
630001	1	12 - 19.5 mm	Canadian Alpine Manufacturing
630002	2	15.5 - 26.5 mm	
630003	3	22.5 - 33.5 mm	
630004	4	27 - 44 mm	
630005	5	33 - 55 mm	
630006	6	42 - 66 mm	
<b>WIRED NUT</b>			
632002	2	17 x 11 mm	Blue Water Classics
632003	3	19 x 13 mm	
632004	4	21 x 15.5 mm	
632005	5	23 x 18 mm	
632006	6	26 x 21 mm	
632007	7	29 x 24 mm	
632008	8	33 x 21 mm	
<b>MISCELLANEOUS</b>			
<b>STOCK NUMBER</b>	<b>DESCRIPTION</b>	<b>REMARKS</b>	
707304	RS1, Slot system chest harness, regular	Blue Water LTD 209 Louvorn Road Carrollton, GA 30117	
720300	Alpine/Rescue Harness, fully adjustable, assorted colors		
7901XX	Climbing special, tubular nylon webbing, 1 in x 100 yds	XX color code 4500 LB strength	
901010	Rope cutter, box type		
	Climbing helmet		

### 3. **BALANCE CLIMBING:**

#### a. Precautions/Techniques:

- (1) Test holds by applying weight gradually.
- (2) Change feet only when necessary using the hop-skip.
- (3) Know the limits of your ability.
- (4) Plan your entire route.
- (5) Avoid overstretching (spread eagle).
- (6) Avoid hugging the rock.
- (7) Avoid using knees, elbows, and buttocks.
- (8) Vocal signal "ROCK" when causing rock to fall.
- (9) Never climb alone.
- (10) Do not lunge.
- (11) Avoid wet rock, when possible.
- (12) Clean boot sole before climbing.
- (13) Do not use vegetation or pitons for foot and hand holds.
- (14) Never wear gloves, unless in extreme cold.
- (15) Keep weight over feet.
- (16) Feet and legs carry weight, hands are mainly for balance.
- (17) Keep as much boot sole as possible in contact with the rock.
- (18) Keep hand holds low, between waist and shoulder height.
- (19) Lean slightly away from rock.
- (20) Maintain three points of contact with the rock at all times.
- (21) Relaxation is necessary, rest when possible keeping arms low.

b. Type Holds:

- (1) Push holds. Use in combination with a pull hold.
- (2) Pull hold. Easiest to use, but are the most likely to break out.
- (3) Friction holds. Good intermediate hold, however, difficult to use for the inexperienced climber.
- (4) Jam holds. Ensure your hand or foot can easily be removed.
- (5) Combination holds:
  - (a) Pinch hold.
  - (b) Cross pressure hold. Pull outward or push inward with the hands.
  - (c) The lay back. Hands pulling and feet pushing along an offset crack.
  - (d) Inverted pull/push holds - (underholds).
  - (e) Chimney climbing.

**4. BELAYS:**

a. Procedures:

- (1) Place rope through guide hand, around body to break hand, ensuring rope slides freely.
- (2) If belay position is unsteady, anchor with sling rope or part of the climbing rope.
- (3) Do not allow rope to run over sharp edges of rock.
- (4) Never allow braking hand to go forward of guide hand when taking up rope.
- (5) Anticipate needs of the climber.
- (6) Do not allow excessive slack to accumulate and do not take up too much slack suddenly.
- (7) Brace for direction of fall.

b. Belay Positions:

- (1) Sitting. Preferred position. Keep legs as straight as possible. Guide hand must be on the side of the better braced leg. (Cannot use sitting belay for upward pull, unless you have a mechanical belay.)
- (2) Standing hip. Only used when a sitting belay is not possible:
  - (a) Upward pull.
  - (b) Downward pull.
- (3) Piton. Use a dynamic belay to prevent a fall from being stopped too suddenly.
- (4) Natural anchors. Where possible, use rock projections or trees for intermediate belay points.

c. Belay Commands:

<u>BELAYER</u>	<u>CLIMBER</u>
	(1) READY
(2) CONDUCT ON BELAY TEST	(3) TESTING
	1/3
	2/3
	3/3
(4) CLIMB	(5) UP ROPE/CLIMBING
	Slack.
	Tension.
	Falling.
	NUMBER 1 CLIMBING (etc.)
NUMBER 1 CLIMB	

d. Munter Hitch Belay. A snaplink is hooked into a suitable anchor point at the top of a cliff. A belay rope is tied into the snaplink with a munter hitch. One end of the belay rope is tied with an end of the rope bowline with a snaplink hooked into it. The Munter hitch is ideal for this type of belay because it is reversible.

10-32

**Notes**

## 5. PARTY CLIMBING:

### a. Two-Man Party:

#### (1) Tying in:

- (a) Leader, Number 1 man (best qualified), bowline on a coil.
- (b) Second man, Number 2 man (least qualified), bowline on a coil.

#### (2) Sequence:

- (a) Number 1 man climbs, Number 2 man belays.
- (b) Number 2 man climbs to Number 1 man, Number 1 man belays.
- (c) Repeat sequence.
- (d) When both climbers are of equal ability, Number 2 man may continue to climb, belayed by Number 1 man, alternating the lead.

### b. Three-Man Party:

#### (1) Tying in:

- (a) Leader, Number 1 man (best qualified), bowline on a coil.
- (b) Middle man, Number 2 man (good belayer), tied in with a butterfly or wireman's knot.
- (c) Third man, Number 3 man (least qualified), bowline on a coil.

#### (2) Sequence:

- (a) Number 1 man climbs, Number 2 man belays.
- (b) Number 2 man climbs, Number 1 man belays.
- (c) Number 1 man climbs, Number 2 man belays.
- (d) Number 3 man climbs, Number 2 man belays.
- (e) Number 2 man climbs, Number 1 man belays.
- (f) Repeat sequence.

**6. RAPPELS:**

## a. Equipment:

NSN	DESCRIPTION
4020-00-931-8793	Rope, climbing, nylon.
8465-00-360-0228	Link, snap, mountain, piton.
8415-00-268-7868	Glove, leather, work

Cut the nylon climbing rope into 15 foot lengths (4.5 meters) for sling ropes.

## b. Personnel. The following minimum personnel are required to conduct peacetime rappelling operations:

- (1) Qualified rappeller. Must be a graduate from the Ranger, Air Assault, or Sapper Leader Course or certified by Sapper cadre.
- (2) Belayman. Must be a belayman on each set of ropes.
- (3) Belay control. There must be 1 belay controller for every two sets of ropes.
- (4) Medic. There will be a medic at each rappel site who must have military transportation available for casualty evacuation.

## c. Types:

- (1) Body rappel. Turn up collar to prevent neck burns.
- (2) Hasty rappel. Use on moderate pitches. Easier and faster than other methods, especially when rope is wet.
- (3) Seat-shoulder rappel. More efficient for men with packs and during night operations.
- (4) Seat-hip rappel. This method has the least friction and is the fastest.
- (5) Australian rappel. Allows the rappeller to face downhill during descent.

## d. Precautions:

- (1) Shirts are tucked into the pants.
  - (2) Knives, keys, etc. are removed from the belt.
  - (3) Helmets are securely fastened.
  - (4) LCE and rucksacks are not fastened in the front.
  - (5) Weapons are slung with the muzzle down and away from the brake hand.
  - (6) Remove loose rocks and other obstacles from rappel lanes.
  - (7) Avoid running the rope over sharp edges.
- e. Anchors. Must always secure the rappel ropes to 2 load sharing anchors with a proper anchor knot.
- (1) Natural. Rocks or trees preferred. Rocks should be padded.
  - (2) Artificial:
    - (a) Single timber deadman. Safest type, however, construction requires considerable effort.
    - (b) Picket holdfast. Easier to construct than the deadman.
    - (c) Four piton anchor. Least desirable. Check frequently.
- f. Cliff evacuation:
- (1) Litter evacuation:
    - (a) Preparation of litter:
      - Lash two sturdy skid poles (10 feet long, 3 inches in diameter) with wire or cord to bottom of litter stirrups. Poles even with litter handles at bottom end.
      - Lash spreader bars along each hinge joint with wire or cord to prevent hinge joint from collapsing.
      - Tie belay rope to head end of litter by:
      - Passing one end of belay rope through one stirrup and form round turn around the stirrup. Two half-hitches are made around

the spreader bar, one on each side of the hinged joint. Make round turn around opposite stirrup. Tie off with bowline, or a figure of eight retrace halfway between end of canvas and litter handles.

(b) Lashing casualty to the litter:

- Tie the end of a sling rope around the upper thigh of each leg with a bowline.
- Ropes cross body to upper stirrups of litter.
- Round turns made through each stirrup; ropes brought across chest and tied together with square knot and 2 half-hitches with the ends tucked under casualty.
- Ends of two additional sling ropes tied to upper stirrups with round turn and 2 half-hitches.
- Ropes brought diagonally across body to lower stirrups (raise casualty's knees).
- Round turns made through each stirrup; the ropes are then brought from the stirrups and wrapped around the feet, bringing the ropes across the bottom of the feet first. Secure the ropes with a square knot and two overhands on the bottom of the feet. If a minimum 4" pigtail can not be maintained when securing the overhand knots then end of line safeties may be used. Ensure there are no knots or twists on the top of the feet.

(c) Evacuation procedure:

- Belayer sounds off with "on belay".
- Rappellers set up two rappel lanes, not more than six feet apart.
- One rappeller is right hand break, one is left hand break
- The two rappellers, using the seat-hip rappel, go over the edge and rappel down approximately 8 feet and call for litter.
- Litter eased over edge to rappellers.
- Litter is belayed down slowly; rappellers hold on the bottom litter handles with guide hands; stay below litter and guide it

down, calling for "slack" or "tension" from the belayer as appropriate.

- Lower all the way to ground and move immediately away from slope to avoid falling rocks.

(2) Rappel carrier evacuation (Buddy Rappel):

(a) Lashing the casualty:

- To secure the victim to the carrier's back with a rope, the carrier ties a standard rappel seat (brake of choice, depending on the injury) and rests his hands on his knees while the victim straddles his back.
- A 4.5 meter (15 foot sling rope) is used. A 45 cm (18 inch) tail of the sling is placed on the victim's left hip. (This method describes the procedure for a seat- hip rappel with a right-hand brake.)
- The long remaining end of the sling rope is routed under the victim's buttocks, and passed over the victim's and carrier's right hip. The rope is run diagonally from right to left, across the carrier's chest, over his left shoulder, and back under the victim's left armpit.
- The rope is then run horizontally, from left to right, across the victim's back. The rope is passed under the victim's right armpit and over the carrier's right shoulder.
- The rope is run diagonally, from right to left, across the carrier's chest and back across the carrier's and victim's left hip.
- The two rope ends should now meet. The two ends are tied together with a square knot and overhand knots.
- The knot is positioned on the victim's left hip. The carrier's shoulders may need to be padded to prevent cutting by the rope.

(b) Preparation:

- Belay rope is tied around casualty's chest with a bowline.
- Belayer sounds off with "on belay".

- Rappeller hooks up for seat-hip rappel, taking one additional turn around snaplink, or use a rescue "8" descender to control descent.

(c) Evacuation procedure:

- Rappeller's brake hand goes over casualty's leg with rope passing under casualty's leg.
- Rappeller backs over edge and executes a normal seat-hit rappel.





Front of carrier



Close up of square knot and two overhand knots



Back of carrier, front of casualty

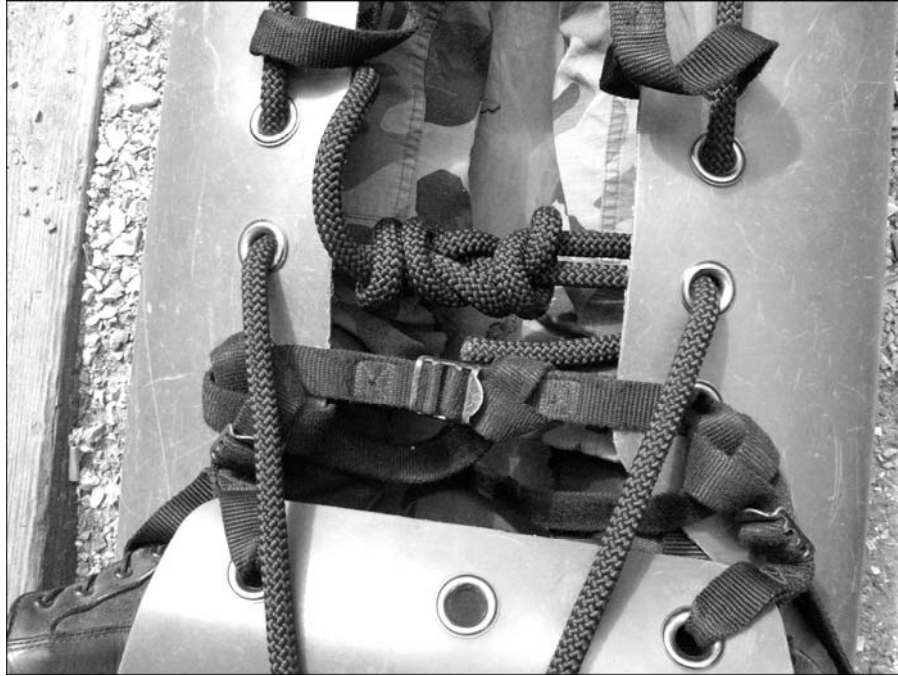
## **7. SECURE CASUALTY IN A SKED STRETCHER**

- a. Remove the Sked stretcher from the pack and place on the ground.
  - (1) Unfasten retainer straps, step on foot end of Sked, and unroll completely to opposite end. Bend the Sked in half and back roll, repeat with opposite end Skedcoof stretcher. Sked stretcher will now lay flat.
- b. Place the casualty on the litter.
  - (2) Place Sked stretcher next to casualty. Insecure head end of stretcher is adjacent to head of casualty. Place cross straps under Sked. Log roll casualty and slide Sked as far under patient as possible. Gently roll casualty down on to Sked stretcher. Slide casualty to center of Sked stretcher. Be sure to keep spinal column as straight as possible. Pull straps out from under Sked stretcher and fasten to buckle.
  - (3) Position foot end of Sked stretcher at head of casualty. Have one rescuer straddle Sked and support casualty's head, neck, and shoulders. Grasp foot straps of Sked stretcher and slide Sked under casualty. Center patient on Sked stretcher and fasten straps to buckles.
- c. Secure the casualty in the Sked.
  - (1) Lift the sides of Sked and fasten the four cross straps to the buckles directly opposite the straps with no twists.
  - (2) Safety each cross strap with a half hitch dressed directly under the buckle so that the free running end is running towards the casualty's feet with the excess tucked underneath the casualty's body.
- d. Secure the casualty's feet with the foot straps.
  - (1) Route the foot strap from inside outward around the foot ensuring that the strap creates a turn with the running end running under the standing end (top to bottom).
  - (2) Ensure that the strap passes under the arch of the foot with no twists.
  - (3) Rout the running end of the foot strap from inside outward through the end grommet located at the foot of the Sked side. Fasten to buckles with no twists.
  - (4) Safety with a half hitch with the free running end towards the inside of the Sked. Tuck the free running ends under the feet.

- e. Secure the 30-foot static rope to the Sked.
- (1) Find the middle of the rope and tie a doubled figure eight knot forming no larger than a fist size loop. Attach a locking carabiner (lowering line carabiner) to the looped end.
  - (2) Route each end of the rope outside inward through the two lower grommets located at the head end of the Sked. Pull the knot up against the Sked.
  - (3) Continue feeding the rope through the unused grommets on the side of the Sked starting from inside outward of the first grommet and routing them through the carrying handles.
  - (4) Route the ropes from outside inward through the second set of unused grommets.
  - (5) Route the ends from inside outward routing them through the third unused grommet. Route the rope through the carrying handles located at the foot end of the Sked.
  - (6) Route the rope from outside inward through the third to the last grommet of the Sked sides. Insure both ends of rope are even.
  - (7) Route the rope ends from inside outward through the grommets located underneath the top three grommets at the foot end of the Sked. Ensure that the rope runs on the outside of the casualty's leg and not through the foot straps.
  - (8) Tie the ends of the rope together using a square knot no overhand safeties centered over the end of the Sked bringing the ends of rope up over the end of the Sked.
  - (9) Route the ends of the rope through the second to the last grommet located at the ends of the Sked sides from outside inward, tying the ends together with a square knot centered over the legs. Safety each side of the square knot with an over hand safety tucking the excess tails under the legs of the casualty.
  - (10) Secure the free running end of the casualty's safety line to the lowering line carabiner using a doubled figure eight. Ensure that there is no tension between the bowline around the chest and the doubled figure eight when tensions placed on the lowering line.

10-42





## 8. ROPE INSTALLATIONS:

a. Tightening system. A butterfly knot or a wireman's knot is tied in the standing line far enough in front of the anchor to allow for tightening of the rope. A pulley effect for tightening the static line is obtained by inserting a snaplink into the butterfly or wireman's, passing the running end around the anchor and inserting it through the snaplink. The running end is then pulled, tightening the system. Once tight, the running end is tied off to the anchor with a round turn and two half-hitches.

b. A-frame.

(1) A-Frame Teams:

(a) Lashing Man- responsible for tying the two poles together

- Clove hitch - left pole 18" from top
- 18" tail on top of knot running end towards ground bottom
- Locking bar on outside
- 6–8 horizontal wraps– not crossed
- 4–6 vertical wraps
- Joining knot on outside– two wraps after joining knot
- Secure running end to 18" tail (square knot w/end of the line safeties)

(b) Apex man– responsible for securing middle of rope to poles

- Middle of the rope clove hitch on each pole
- Bottom to bight
- Top to anchor
- Diagonal locking bar on inside
- 12"-18" bight below apex
- Two snap links (opposite and opposed) on bight or one locking carabineer

(c) Anchor men – responsible for securing rope to anchors

- Leaning no more than 30 degrees (45 degrees with load)
- Transport tightening system- (figure 8 slip w/ locking half-hitch)
- No more than half a twist between poles and anchor
- Two snap links (opposite and opposed) on bight or one locking carabineer
- Secured with two doubled half-hitches with quick release

- Rope management

(d) Spreader man– responsible for tying rope at bottom of poles

- 6" from ground
- End of rope clove hitches on each leg
- No slack in between poles
- Diagonal locking bar to outside
- Rope running from pole to pole is on top of clove hitch

(e) Continuous loop man– responsible for joining two 120' ropes

- Figure 8 bends
- Two double figure of eights (12" – 18" from the Figure 8 bends)
- Fixed loop must arrive at apex no matter direction of pull

(f) Mule team– responsible for raising load

- Retie double figure 8, 2 double arms length from where rope meets ground
- Snaplink ruck to frame
- Figure 8 bends to clean side
- Pull

(2) Construct the A-Frame:

Select two, sturdy, three to four meter long poles. Two sling ropes are tied together and secured to the poles (approximately one meter from the top), with a clove hitch on one pole. Six to eight horizontal wraps are made downward to ensure the apex of the A-frame remains at the desired height. Four to six vertical wraps are then made and the ends are finally tied tightly with a square knot and finished with over-hand knots. Ensure the square knot is not tied in the crotch formed by the two poles. When the bottoms of the poles are spread apart, the resulting bipod forms the A-frame. To keep the bottom of the A-frame from spreading, the poles are braced by tying a sling rope between the legs of the A-frame, securing it on each leg with a clove hitch or round turn and two half-hitches.

c. Fixed Rope:

- (1) Simple fixed rope. A climbing rope either tied to an anchor or body belayed from the top. Used to aid in climbing a cliff. Only one man climbs at a time. In difficult places, knots can be tied into the rope.
  - (2) Fixed rope. Similar to the simple fixed rope but differs by employing many anchor points and is of a more permanent nature. The rope is anchored from either the top or the bottom and a climber either descends or ascends the cliff respectively. Next, intermediate anchor points are installed as necessary, using anchored sling ropes tied to the climbing rope with a prussic knot. Finally, the fixed rope is finished off with a transport tightening system at the bottom or top as required.
- d. Vertical Hauling Rope. Used to move men and equipment up vertical or near vertical pitches:
- (1) Equipment needed:
    - (a) A-frame.
    - (b) Snaplinks (2-6 as needed).
    - (c) Climbing rope (minimum of 4 each).
    - (d) Sling rope (2 each).
  - (2) Preparation:
    - (a) Find the middle of a climbing rope and double the rope.
    - (b) Place the bight (1 foot length) over the apex of the A-frame.
    - (c) Tie middle of the rope clove hitches on each spar of the A-frame with the running ends of the climbing rope.
    - (d) Finish with an anchor bowline on each rope.
    - (e) Tie two climbing ropes together with figure 8 bend forming one large loop.
    - (f) Hook two snaplinks with opposing gates into the bight.
    - (g) Hook the large loop into the snaplinks.
    - (h) Tie double figure 8 (preferred) or butterfly knots into the climbing ropes forming the large loop at opposing ends of the loop. (One knot

at the top, one at the bottom.) Both figure 8 should be on the same rope.

- (i) Hook snaplinks into the knot with a transport carrier.
- (j) Form a belay line by tying an end of the rope bowline into a climbing rope and hooking a snaplink into the loop. This hooks into the figure 8 knot of the haul line. Use a Munter hitch belay for ascending or descending loads.

(3) Miscellaneous:

- (a) A knotted hand line may be used as a simple fixed rope to assist troops being hauled up an incline.
  - (b) Two troops should be stationed at the top to assist in loading/unloading the haul line and maintaining the transport tightening system.
  - (c) The haul line is pulled from below to haul troops and equipment up the cliff.
  - (d) A-frame should lean more than 45 degrees out over the edge of the cliff.
- e. Suspension traverse. Used to move men and equipment across horizontal gaps to near vertical cliffs.

(1) Equipment needed:

- (a) Two, A-frames (if required).
- (b) Five, sling ropes.
- (c) Three-four, nylon climbing ropes.
- (d) One-three, snaplinks.

(2) Preparation:

- (a) Position the A-frames on either side of the gap or one at the top and one at the bottom of the cliff if there are no suitable anchors at the site.

- (b) Tie off one end of a climbing rope to an anchor with a round turn and a bowline. Run the rope over the top of the apex of each A-frame and finish it off with a transport tightening system at the other end.
- (c) Repeat step (b) with a second climbing rope. These two ropes are the static lines.
- (d) Secure each static line to the apex of the A-frame with a sling rope by finding the middle of the sling rope and tying a middle of the rope clove hitch to a top spar of the A-frame. With the running ends of the sling rope, tie into the static line with an end of the rope prussic. Do this with both static lines at both apexes.
- (e) Construct a transport carrier and connect it to the static lines with a snaplink.
- (f) For horizontal gaps, use two climbing ropes, one on each side of the gap, to pull the loads back and forth across the gap. The ropes are connected to the middle loop of the transport carrier with a bowline.
- (g) For near vertical descents, use a Munter hitch belay from the top. Use the spreader sling rope at the base of the A-frame for an anchor point.

(3) Miscellaneous:

- (a) For transporting personnel, the transport carrier is inserted through a Swiss seat and connected to the snaplink attached to the static lines.
  - (b) If the suspension traverse is used to lower men down a near vertical cliff, construct the transport tightening systems at the top of the cliff where the majority of the patrol will be.
  - (c) A 25mm manila rope may be used in place of the two climbing ropes for a static line.
  - (d) Position two men at either end of the installation to assist in loading/unloading, maintaining the ropes, and for belaying/pulling the loads.
- f. Knotted Hand Line. Coil a climbing rope with successive middle of the rope clove hitches. Once coiled, take the end of the rope and run it through the middle of the coil. As the coils unravel, overhand knots will appear. After using a

knotted hand line, it is very difficult to remove the knots and have a serviceable climbing rope.

NOTE: The A-frame is used to elevate the rope off of the ground. If the terrain at either or both end does not warrant the construction of an A-frame one is not needed.

**Notes:**

## 8. ROPE BRIDGES:

### a. One-Rope Bridge:

- (1) Uniform: BDU's w/sleeves rolled down, boots unbloused, bowline around the waist with a hand line and bowline tied on the end, not more than arms length, LCE buckled behind back.
- (2) Equipment: One 120' static rope w/two locking karabiners. Per person-one sling rope, two non-locking D-rings, individual equipment.
- (3) Organization: The bridge team will consist of a six-member team. They number as follows:

Number 1 Man: Rope Swimmer/puller, Far side security (Must be highly competent, strong swimmer & preferably a team leader)

Number 2 Man: Lead safety swimmer, Far side lifeguard (Must be highly competent & a strong swimmer)

Number 3 Man: Near side lifeguard (Must be highly competent & a strong swimmer) last to cross.

Number 4 Man: Bridge team commander (Must be highly competent & a strong leader) Overall responsible for everything the bridge team does or fails to do.

Number 5 & 6 Man: Rope tighteners (mule team).

- (4) Construction:
  - (a) PL conducts a recon of the obstacle and establishes local security up and down stream of the near side anchor.
  - (b) BTC determines near side and far side anchor points. If the far side anchor point cannot be determined by the BTC due to lack of visibility, the #1 man may determine the anchor upon reaching the far side.
  - (c) The bridge team will ground their rucksacks to the rear of the near side anchor point. The rope will be back stacked in the #1 mans rucksack prior to reaching the obstacle. After the #3 man grounds his rucksack he will assume the duties of the near side lifeguard. The #3 man has in his possession a knotted hand line and is standing in the water, down stream from the bridge. (The

#3 man will wear and Australian rappel seat if an extra sling rope is available. If the sling rope is not available then he must tie the seat using his available rope prior to crossing the obstacle)

- (d) The #1 and #2 men cross the obstacle with their weapon and LCE only. The #1 man will have an Australian rappel seat tied and tow the rope across. The rope bridge will have a double figure of eight tied on both ends of the rope with one end secured to the #1 man using a locking karabiner fixed into a nonlocking d-ring. The opposite end of the rope bridge will be secured to the #1 mans rucksack until the rope bridge is secured to the far side anchor. The #2 man crosses on the upstream side of the #1 man, protecting the #1 man from floating debris.
- (e) Upon exiting the far side the #2 man pulls security while the #1 man secures the rope to the far side anchor. A tensionless anchor is tied by using four complete round turns (minimum) tied from right to left top to bottom. The running end is secured using the double figure of eight with the locking karabiner snapped onto the standing end of the rope. The #1 man signals the BTC that the far side is complete. The #1 man then replaces the #2 man on security. The #2 man assumes the duties as the far side lifeguard by standing in the water on the downstream side of the bridge with a knotted hand line.
- (f) The BTC creates a transport tightening system by tying a figure of eight slip safetyed with a half hitch using a locking karabiner affixed to the loop. (Tied approximately 1/5 of the way across the obstacle or 1/3 of the way when using dynamic rope.) The rope is the routed around the near side anchor (from right to left) and back to the karabiner. Next the rope is routed through the karabiner and back towards the near side anchor. The BTC signals the # 1 man to complete the far side anchor.
- (g) Upon receiving the signal from the #1 man the BTC will signal the tightening team to tighten the bridge. No more than three people should be used to tighten the bridge. Once the bridge is tightened the rope is then routed back around the near side anchor and secured with two double half hitches. Any excess is coiled and wrapped onto the bridge.
- (h) The BTC places himself on the loading platform on the upstream side. He will inspect each soldier for proper uniform

and monitor the flow of personnel across the bridge. No more than three personnel on the bridge at any time. The #2 and # 3 men are alert for any soldiers who fall into the water.

- (i) Personnel crossing the bridge will route their individual safety line under the trail arm shoulder straps of their LBE and rucksack. The soldier's individual weapon will also be attached to the safety line using a non-locking D-ring affixed to the front sight post. The D-ring and weapon will then be attached to the bridge and pulled across with the trail hand over the front sight post. If an M60 or M249 is carried, a karabiner will be attached to the front sight post and the butt stock. It will be dragged across with the weapon oriented to the far side.
- (j) After the patrol has crossed the obstacle, the next to cross are the #5 and #6 men. They will have the #1 and #2 mans rucksacks trailing their weapon with their arm routed through the ruck shoulder strap. The rucksacks will be secured to the bridge (with the cargo pockets facing up-stream) using a non-locking D-ring affixed to the rucksack frame. Trailing the #5 and #6 men will be the BTC. The #3 man will assume the BTCs position on the rope bridge and load the BTC. The BTC will cross in the same manner as the 5 & 6 men with the #3 mans rucksack.
- (k) Once the BTC gets onto the far side he will signal the #3 man. The #3 man will then disassemble the bridge (in reverse sequence) on the near side. He will attach the fixed loop of the bridge to the Australian seat around his waist (same manner as the #1 man). The #4, #5, and #6 men will pull the #3 man across the obstacle with the # 3 man facing the near side anchor pulling rear security.
- (l) Time stops when the rope is back stacked in the #1 man rucksack, and the closing flap is closed.

b. Two-Rope Bridge:

(1) Equipment:

- (a) Two climbing ropes.
- (b) Two snaplinks.

(2) Construction:

- (a) Construct two 1-rope bridges, one above the other approximately 5 feet apart at both anchors.
- (b) Find center of sling rope and place in small of back at the waist and tie bowline around the waist with half-hitch. Then at each end, you place an end of rope bowline with half-hitch and also attach a snap link in each. This will act as a safety line as well as your spreader rope.

(3) Miscellaneous:

- (a) Cross the bridge, with one man between spreaders. Men facing in opposite directions.
- (b) Frequently check ropes and anchors for excessive friction and wear.

c. Three-Rope Bridges:

(1) Equipment:

- (a) Two hand lines. 3/4- to 1-inch diameter manila rope.
- (b) Tread rope. 1-inch in diameter rope.
- (c) 1 sling rope per 2 meters of span.
- (d) Three snaplinks.
- (e) 2 double A-frames (if needed).
- (f) Spreader bars (if needed).

(2) Construction:

- (a) Measure span to determine length of hand and tread ropes, allowing for sufficient rope at both anchors for lashings.
- (b) Lay out tread rope and tie middle of the rope clove hitches every 2 meters (2 paces) of span length with sling ropes.
- (c) Lay out the hand lines and tie sling ropes into them with round turns and two half hitches approximately waist high.
- (d) Tie a climbing rope to the bridge and pull it across the gap.

- (e) Anchor the tread rope on the far side with a round turn and a bowline.
- (f) Anchor the handlines with round turns and bowlines.
- (g) Finish the bridge by first constructing a transport tightening system on the tread rope and then the hand rails.
- (h) Adjust the sling ropes as needed.

(3) Miscellaneous:

- (a) Conduct frequent inspection of ropes and anchors.
- (b) Maximum span is 150 meters.
- (c) Cross 3 to 5 men at a time.
- (d) Reference: TM 5-270

**Notes:**

## **CHAPTER ELEVEN**

### **WATER OPERATIONS**

#### **1. CASTING:**

- a. Helicopter-Helocasting. Swimmers must not be free dropped at speeds in excess of 20 knots or from a height greater than 20 feet. Water must be at least 15-20 feet deep. Swimmers will push themselves up and out of helicopter making a quarter turn to the rear of the aircraft. Equipment will be waterproofed and fitted with a towline. Weapon will be held over the swimmer's head or attached to his equipment. Once in the water, swimmers will link up with their swim buddies and move to landing site, or small boat if used.
- b. Surface Craft. Most efficient means of transporting infiltrating personnel. Speeds for water delivery of swimmers should be no greater than 25 knots. Swimmers slip over the side of the vessel into the water within surface swimming range of the beach. Equipment will be waterproofed and fitted with a towline. Weapon will be attached to swimmer's equipment. Once in the water, swimmers will link up with their swim buddies and move to the landing sites.

#### **2. RECOVERY:**

- a. Helicopter. STABO or rope ladders may be used. STABO requires the use of special personnel harnesses.
- b. Surface Craft. Simplest method of recover is for swimmers to climb aboard. For high speed recovery operations, an inflatable boat, small (IBS), is secured to the side of a recovery vehicle. Swimmers line up parallel to the shore at 25 meter intervals in a straight line. A recovery man is positioned in the IBS. He kneels at the front of the boat with his feet braced on the forward tube seat, his body and head turned so he can see the swimmers, and holds a semi rigid sling to recover the swimmers. If a safety man is in the IBS, he kneels in the rear of the boat to assist the swimmers out of the water. When the swimmers are ready for pick-up, the guide raises his hand. All other swimmers also raise one hand. As the IBS closes on a swimmer, the swimmer kicks hard to raise himself out of the water and crooks the arm nearest the boat to form a target for the recovery man. When the swimmer feels the sling on his arm, he grasps his wrist with the other hand and rolls into the IBS. Once in the IBS, he lets go of the sling, scrambles into the recovery craft, and moves all the way forward, keeping a low silhouette. This procedure is repeated until all surface swimmers have been recovered.

#### **3. SURFACE SWIMMING:**

a. Equipment:

- (1) Face mask (with 18" dummy cord)/compass board/snorkel (compass man only).
- (2) Swim fins with 24" dummy cord.
- (3) Knife and scabbard.
- (4) Buddy line.
- (5) Watch and wrist compass.
- (6) Swim vest.
- (7) Wet suit.
- (8) Flare. (MK 13 or MK 99)

b. Techniques:

- (1) There are three different swim techniques when a swimmer is beyond 200 meters of the beach:
  - (a) The side stroke is used during normal surface swimming. This stroke allows the swimmer to remain oriented to the beach and to see obstacles.
  - (b) The swimmer may swim on his back using the flutter kick. This allows the swimmer to rest, but his buddy must remain alert for obstacles.
  - (c) If equipped with swim fins, the swimmer may face forward kicking his legs. He extends one arm forward in the direction he wants to go using his hand as a rudder.
- (2) Noise must be kept to a minimum. Avoid splashing. The head is the only part of the body out of the water.
- (3) When the swimmer is within 200 meters of the beach he should use the breast stroke to scan the beach as he approaches it.

- (4) Swimmers will remain in the water as long as possible to avoid detection by the enemy.
- (5) Before entering the surf zone, swimmers should remove masks, if worn, to prevent reflection of sunlight or moonlight.
- (6) Swimmers should not remove fins until a decision is made to cross the beach.

c. Navigation:

- (1) The compass man is outfitted with a face mask, a compass board, a snorkel, and swim fins. He will swim forward with his face down in the water (to avoid reflection off his face mask) observing the compass board and maintaining azimuth. His buddy will swim nearby to warn him of obstacles.
- (2) A swimmer may swim on his back using the flutter kick and navigate with a wrist compass. The compass is mounted on either the right or left wrist. The arm without the compass is extended forward in line with the swimmer's body. The arm with the compass is bent at a 90-degree angle and holds the leading arm just above the elbow. This enables the swimmer to see and read the compass at a glance. His buddy will swim nearby to warn him of obstacles.

#### **4. SMALL BOATS:**

a. 3-Person Pneumatic Recon Boat:

- (1) Description. The three-person pneumatic reconnaissance boat is designed to carry the crew and individual equipment on reconnaissance missions across or along streams or rivers having a current not exceeding four feet per second. The types of missions which can be accomplished include; measurement of stream width and depth, determining types of stream or river bottom, and inspecting bank conditions for suitability of bridge and ferry sites. The boat may also be used for general utility work in bridge construction and for river crossings for infiltration of Ranger, Sapper, or guerrilla type personnel into enemy territory. One-man operation of the boat is made possible by means of two oarlocks attached to the left hand and right hand sides of the floatation tube.
- (2) Data:

(a) Boat	NSN: 1940-00-287-6962
Length, overall (inflated)	9 feet (2.75 meters)
Width (inflated)	4 feet (1.22 meters)
Weight (complete with auxiliary items)	40 pounds (14.14 kg)
Inflation pressure (approximate)	2 psi (140 g/sqcm)
Capacity (approximate)	675 pounds (306kg)
Folded size (406 mm X 610 mm)	16 inches X 24 inches

## (b) Auxiliary equipment:

Paddles (3)	Three-section, aluminum NSN: 2040-00-715-5941
Hand pump Type II, Size 1 Carrying case	Conforming to MIL-P-12647 NSN: 4320-00-580-6673 Nylon, stitched construction NSN: 2090-00-844-6626

b. 7-Person CO<sub>2</sub> Inflatable Landing Boat:

(1) Description. The 7-person CO<sub>2</sub> inflatable landing boat is designed to carry the crew and individual equipment across streams or other bodies of water. The boat may be used for general work in bridge building, river crossing, measuring streams, inspecting bank conditions, clandestine operations and infiltration of Ranger, Sapper, or guerrilla type personnel into enemy territory. The boat is portable, all weather operational and inflatable, both by CO<sub>2</sub> cylinder and by air pumps.

## (2) Data:

## (a) Boat:

Inflated:

Length: 12 feet (3.6 m)

Width 6 feet (1.8 m)

Rolled dimensions 61 in X 16 1/2 in X 24 in  
(155 cm X 42 cm X 61 cm)

Capacity (7 crew 1575 pounds (714.4 kg)  
members and equip)

(b) CO<sub>2</sub> Cylinder:

Volume 205 cu in (3360 ccm)

CO<sub>2</sub> weight 4.9 pounds (2.2 kg)

c. 15-Person Inflatable Assault Boat:

(1) Description. The 15-person inflatable assault boat is able to carry an engineer crew (with equipment) of three when paddled or two when powered by an outboard motor or 15 soldiers with gear, across water obstacles. The types of missions which can be accomplished include landing of assault troops and inspecting river bottoms and banks for stability of bridge and ferry sites. When paddled, a fully loaded boat can maintain forward motion in 5 feet (1.5 meters) per second current. When powered by a 25 HP outboard motor, a fully loaded boat can maintain forward motion in 11 feet (3.3 meters) per second current.

(2) Data:

(a) Components:

- Boat:
- Neoprene-coated nylon fabric with 10 separate air compartments.
- Transom for mounting 25 HP outboard motor.
- Towing bridle.
- Life line.
- Pumps:
- Hand-held, hand operated (1).
- Foot-held, hand operated (2).
- Wooden paddles (11).
- Carrying case.
- Repair kit.

## (b) Weights and dimensions:

- Weight 250 pounds (113 kg)
- Length (approx.) 17 feet (5.2 m)
- Width 5 feet 8 inches (1.7m)
- Depth at bow 34 inches (86.36 cm)
- Capacity 3,375 pounds (1531 kg)  
(15 people with equipment)

(c) Inflation time: 10 to 20 minutes.

## d. Zodiac Marine Commando F470:

(1) Description. The Zodiac Marine Commando F470-10 man inflatable craft is designed for rugged and military uses, where speed of deployment and infiltration/exfiltration are essential. This boat is self-contained and when used with its CO<sub>2</sub> system, will deploy its hull and floorboard and self-inflate in 2.5 to 3 minutes. It therefore, can be dropped by parachute or during heliborne operations and be deployed in the water or on the ground without any floorboards, stringers, or braces.

## (2) Specifications:

Overall length	4.70 meters	15' 5"
Overall width	1.90 meters	6' 3"
Inside length	3.30 meters	10' 10"
Inside width	0.90 meters	3'
Tube diameter	0.50 meters	20"
Max # of passengers	10 men	
Max payload	1230 kilograms	2710 lbs.
Max HP with standard slatted floor	40 HP short shaft	
Max HP with optional aluminum floor*	65 HP short shaft	
Dimensions in bag	1.50 m x 0.75 m	59" x 29.5"
Weight with standard slatted floor	120 kilograms	295 lbs.

Weight with optional aluminum floor*	120 kilograms	265 lbs.
Number of air-tight chambers	5+2+1 = 8	
Weight of CO <sub>2</sub> charged bottle with manifold* U.S. D.O.T. approved	20.45 kilograms	45 lbs.

\* Optional equipment

- (3) Zodiac of North America  
P.O. Box 400  
Thompson Creek Road  
Stevensville, Maryland 21666  
Telephone Number 301-643-4141  
Telex 087.812

## 5. FIELD EXPEDIENT FLOATATION DEVICE:

a. Floatation Devices:

- (1) Trousers. Knot each trouser leg at the cuff and button the fly. With both hands grasp the waistband at the sides and swing the trousers in the air to trap air in each leg. Quickly press the sides of the waistband together and hold it underwater so that the air will not escape, to keep you afloat as you cross a body of water. These "water wings" may have to be reinflated several times when crossing a large body of water.
- (2) Empty containers. Lash together empty tins, gas cans, empty canteens, or boxes and use as "water wings". You should only use this type floatation in a slow moving river or stream.
- (3) Plastic bags. Fill two or more plastic bags with air and securely tie them together at the mouth.
- (4) Poncho. Roll green vegetation tightly inside your poncho so that you have a roll at least 8 inches in diameter. Tie the ends of the roll securely. You can wear it around your waist or across one shoulder and under the opposite arm.
- (5) Logs. Use a stranded drift log if one is available, or find a log near the water to use for floatation. Be sure to test the log before starting to cross, as some tree logs will sink even when the wood is dead.

- (6) Cattails. Gather stalks of cattails and tie them in a bundle 10 inches or more in diameter. The air cells in each stalk cause the stalks to float until it rots. Test the cattail bundle to be sure it will support your weight before attempting to cross a body of water.

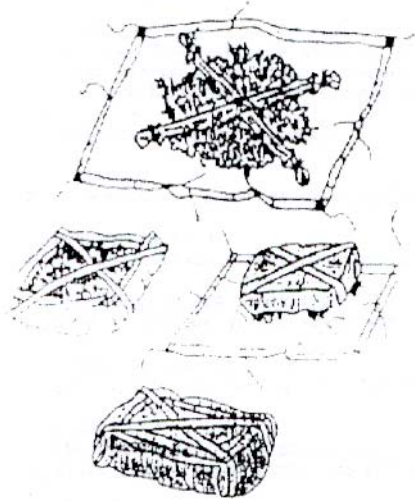
b. Rafts:

- (1) Poncho Raft. The Poncho Raft will support about 80 LB if properly constructed. To construct it use:
  - 2 ea. ponchos
  - 2 ea. 15' sling ropes
  - 2 ea. snaplinks
  - 2 ea. 10' pieces of 550 cord
  - 2 ea. ruck sacks
  - 2 ea. M-16A2s
  - a. Tightly Goose neck hood of poncho to the inside.
  - b. Place both ruck sacks frame side down and butt to butt on first poncho.
  - c. Snap closed poncho, roll tightly to ruck sacks, tightly goose neck the ends.
  - d. Tie off one goose neck with a non slip knot, work towards the center grommets, make half hitches, then tie off other end goose neck.
  - e. Turn rucks over and place on 2nd poncho.
  - f. Repeat step #3.
  - g. Goose neck and tie off one end of poncho with a non-slip knot. Tie overhand (or any MOR fixed loop) between the goose neck and the grommets. Tie half hitches in grommets. Tie fixed loop between grommets and far goose neck. Tie off far goose neck with non-slip knot.
  - h. Place one snap link in each fixed loop.
  - i. Attach weapons to the snap links (one facing forward, one facing rearward). Front sight post and caring handle are snapped into the snap links.

j. Attach 15' sling rope to the snap link (one to each) with small EOR bowline. Tie a large bowline on the opposite end of each rope, large enough to go over the shoulder with ease but not to loose to fall off.

- (2) Brush raft. The brush raft will support about 250 pounds if properly constructed. To construct it, use ponchos; fresh, green brush; two small saplings; and a rope or vines as follows:
- (a) Tightly tie off the neck of each poncho with the neck drawstring.
  - (b) Attach ropes or vines at the corner and side grommets of each poncho. Ensure the ropes or vines are long enough to cross to and tie with the rope or vine attached at the opposite corner or side.
  - (c) Spread one poncho on the ground with the tied-off hood up.
  - (d) Stack fresh, green brush (no thick branches) on the poncho until the brush stack is about 18 inches high.
  - (e) Pull the poncho neck drawstring up through the center of the brush stack.
  - (f) Make an X-frame of two small saplings and place it on top of the brush stack.
  - (g) Tie the X-frame securely in place with the poncho neck drawstring.
  - (h) Pile another 18 inches of brush on top of the X-frame.
  - (i) Compress the brush slightly.
  - (j) Pull the poncho sides up around the brush, and using the ropes or vines attached to the corner and side grommets, tie diagonally from corner to corner and from side to side.
  - (k) Spread the second poncho, tied-off hood up, next to the brush bundle.
  - (l) Roll the brush bundle onto the center of the second poncho so that the tied side is down.
  - (m) Tie the second poncho around the brush bundle in the same manner as you tied the first poncho around the brush.

- (n) Tie one end of the rope to an empty canteen and the other end to the raft. This will aid you in towing.



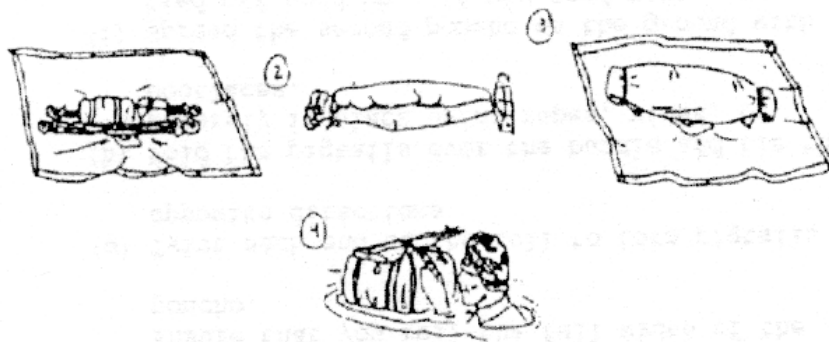
- (3) Australian Poncho Raft. If you do not have time to gather brush for a raft, you can make an Australian poncho raft. This raft, although more waterproof than the poncho brush raft, will only float about 80 pounds of equipment. To construct this raft, use two ponchos, two 4-foot poles or branches, and ropes, vines, bootlaces, or comparable materials as follows:

- (a) Tightly tie off the neck of each poncho with the neck drawstring.
- (b) Spread one poncho on the ground with tied-off hood up.
- (c) Place and center the two 4-foot poles about 18 inches apart on the poncho.
- (d) Place the rucksacks, packs, and/or other equipment between the poles. You should also place other items, such as your boots and outer garments, that you want to keep dry between the poles.

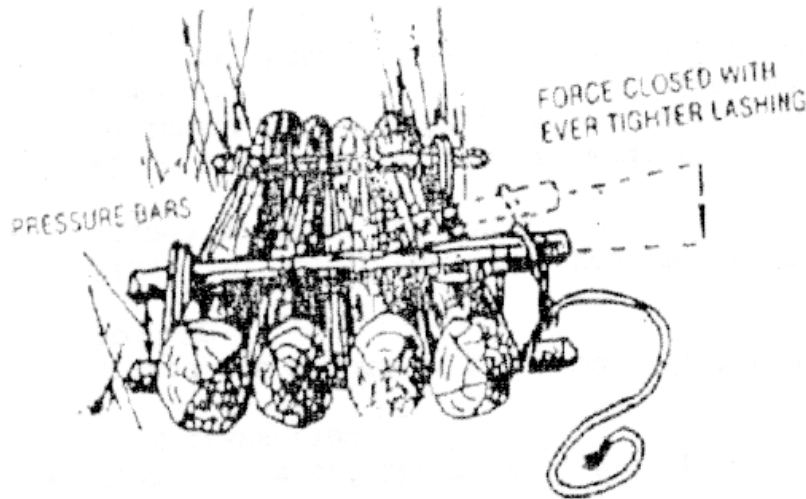
NOTE: At this point you will need your buddy's help to complete the raft. Proceed as follows:

- (e) Snap the poncho sides together.

- (f) Hold the snapped portion of the poncho in the air and roll it tightly down to the equipment. Ensure that you roll the full width of the poncho.
- (g) Twist each end of the roll to form pigtails in opposite directions.
- (h) Fold the pigtails over the bundle and tie them securely in place using ropes, vines, or bootlaces.
- (i) Spread the second poncho on the ground with the tied-off hood up. If you need more buoyancy, place some fresh, green brush on this poncho.
- (j) Place the equipment bundle, pigtail side down, on the center of the second poncho.
- (k) Wrap the second poncho around the equipment bundle following the same procedure you used for wrapping the equipment in the first poncho.
- (l) Tie ropes, vines, or other binding material around the raft about one foot from the end of each pigtail.
- (m) Place and secure weapons on top of the raft.
- (n) Tie one end of the rope to a canteen and the other end to the raft. This will help you in towing the raft.



- (4) Log Raft. You can make a raft using dry, dead, standing trees for logs. Spruce trees found in polar and subpolar regions make the best rafts. A simple method for making a raft is to use pressure bars lashed securely at each end to hold the logs together.



## 6. WATERPROOFING EQUIPMENT AND MUNITIONS:

### a. Weapons:

- (1) Lubricant. Small arms, M16's, machine-guns, and mortars can be waterproofed with a coat of standard lubricant for amphibious or underwater operations.
- (2) Plastic. If Breakfree(TM) lubricant is not available, weapons can be placed inside plastic material (roll plastic): Seal edges of plastic by using an iron (or some item that can be heated) to melt the plastic together. (Before completely sealing the plastic, remove as much air as possible by using a straw, snorkel, or foot pump.) This will normally provide adequate waterproofing for short distances or short periods of submersion.
- (3) Barrier cloth (waterproof cloth). When available, can be used in the same manner as described for plastic.
- (4) Inner tubes. LAW's and other weapons can be placed in sections of inner tubes with the ends folded and tied.

NOTE: All weapons must be cleaned as soon as possible after immersion in water.

b. Ammunition:

- (1) Small arms ammunition as packaged is waterproofed for submersion to a depth of 200 feet.
- (2) Hand grenades (except Thermite) may be carried in their own containers to a depth of 30 feet or may be waterproofed in the same manner as weapons.
- (3) Mortar rounds and powder increments can be safely carried in their shipping tubes to a depth of 30 feet. They may also be waterproofed with plastic material, barrier cloth, or sections of inner tubes in the same manner as weapons.

NOTE: Ammunition deteriorates rapidly after being submerged and must be cleaned, dried, and inspected as soon as possible after immersion.

c. Rucksacks and Equipment:

- (1) Rucksacks. For most waterborne operations the equipment carried, not the rucksack, will be waterproofed. The general procedure for waterproofing articles to be carried inside the rucksack is to place the articles inside standard waterproof bags. The mouths of the bags are twisted shut and fastened tightly with rubber bands. Each sealed bag is then placed inside a second plastic bag and sealed in the same way. For small items, a plastic bag with an airtight zipper works well.

(2) Packaging Equipment:

- (a) Pad sharp corners of equipment and tape sharp edges.
- (b) Package and distribute individual items so that they are in tactical "ready" condition.
- (c) Cross load critical items among several bundles so the loss of one bundle will not jeopardize the mission.
- (d) Cross load and have all weapons ready for immediate use.
- (e) Pack essential components together, such as radios and their batteries.
- (f) Keep packages small. The larger the package the greater the change in air volume and buoyancy at different depths. Before

sealing plastic bags, remove as much air as possible by using a straw, snorkel, or foot pump.

(g) Compress soft objects as much as possible. For example, sleeping bags should be rolled as tightly as possible.

(h) Cushion fragile objects, such as radios, by packing blankets, ponchos, or other soft items around them.

(3) Transporting equipment. Rifles or other weapons can be tied to the rucksack or slung across the swimmer's chest. Surface swimmers may tow rucksacks or other bundles on a line. The length of the towline is determined by conditions; the longer the line, the greater its chance of tangling in seaweed or other obstacles. Bundles should be dip tested to check waterproofing and buoyancy before the swim begins.

d. Demolitions. Demolitions that are to be transported and/or fired underwater must be waterproofed and properly prepared. Although the explosives are waterproof, components of the system may not.

(1) Waterproof Sealing Compound. The sealant is used to waterproof the connection between the time blasting fuse and a non electric blasting cap and to moisture proof primed dynamite. It will not make a waterproof seal and must not be submerged in water unless the charge is to be fired immediately.

(2) Non electric System. The nonelectric system is the system most commonly used. It allows the swimmer ample time to leave the objective area before detonation. It should be used only at night, since the time fuse when burning gives off bubbles and leaves traces of residue that float to the surface. This system is compact, quickly emplaced, and is a "fire and swim" item. When a non-electric system is used, the entire system may be waterproofed as follows:

(a) Determine the length of time fuse needed; cut and place one end into the fuse igniter.

(b) Place the fuse igniter, to include at least one inch of fuse, into a balloon or condom; tie, remove all air, and seal with authorized waterproofing compound.

(c) Place the other end of the fuse into the blasting cap and crimp the cap one-fourth of an inch from the fuse well; rotate the crimpers 90

degrees and make a second crimp one-eighth of an inch from the fuse well.

- (d) Use putty or clay to seal the blasting cap opening and dip six to eight times in a waterproof paint or varnish, letting it dry after each dip. Paraffin may also be used.
  - (e) To transport the primers, loop and tape fuse together to prevent tangling. Transport in waterproof bag.
  - (f) Place cap in demolition at objective. Pull fuse igniter pin through balloon or condom to ignite.
- (3) Electric Systems. The electronic system is preferred when the tactical situation allows. Waterproofing of the blasting cap is not needed; if a malfunction occurs, it is immediately evident.

**CAUTION:** Salt water is a semi-conductor of electricity. Ensure the system is shunted prior to placing cap in well. The electric system does not give off an audible or visual signal, but it is bulky, takes longer to emplace, is restricted by wire or the transmitting distance of radio-controlled firing devices, and must be fired from the surface.

- (4) Safe Blast Distance. Pressure of 50 pounds per square inch (psi) or greater may cause injury to organs and body cavities containing air. A pressure of over 300 psi may cause severe injury to a fully submerged diver, and 500 psi may cause death. The swimmer should use his fins to raise his upper body out of the water as much as possible. The depth of the swimmer at the time of the blast and the type bottom has a bearing on how much pressure the swimmer is exposed to.

$$P = \frac{13,000 \times (\text{Weight of Explosive} / 3)}{D}$$

P = Blast Pressure in PSI  
D = Distance From Blast  
13,000 = Constant for TNT

**Notes:**

## 7. SMALL BOAT OPERATIONS:

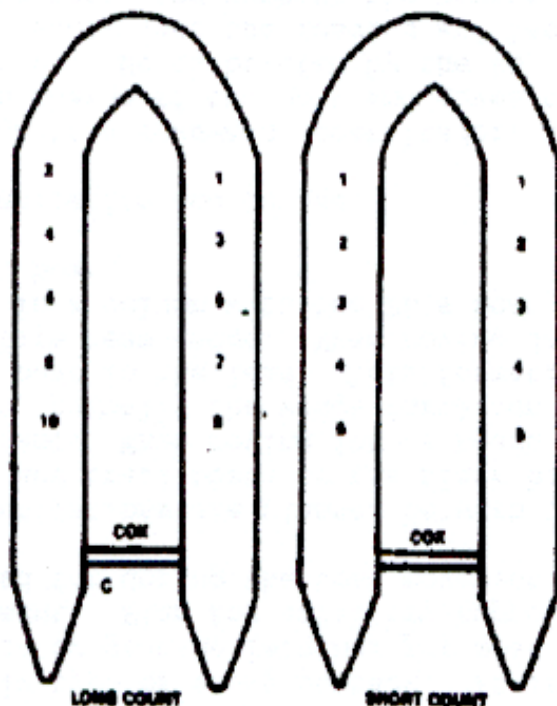
### a. General:

- (1) Small boats are vulnerable to air observation and attack. On a river they are vulnerable to enemy ambushes and Ops monitoring river traffic. These disadvantages may be offset somewhat by operating at night with good dispersion between boats. Enforce strict noise and light discipline. Conditions reducing visibility such as fog, rain, and snow should be used to make enemy observation more difficult. Where there is an air threat, camouflage nets should be on each boat. A boat that is stopped, pulled to the bank of a river, and covered with a camouflage net is very difficult to see from the air.
- (2) Crossload key men and equipment. Boat crews are briefed and rehearsed in their reaction to each likely type of enemy contact. At least one automatic weapon or grenade launcher per boat is manned during movement. Plan for artillery support that can be called for during the boat movement.
- (3) Communications are planned between the PL and the lead and trail boats or the flank boats during movement. When moving into a beach from a mother craft, normally the wedge formation is used with the PL's boat in the lead. This formation is similar to the fire team wedge. When moving down a river, boats move in a column with the PL's boat following the point boat.

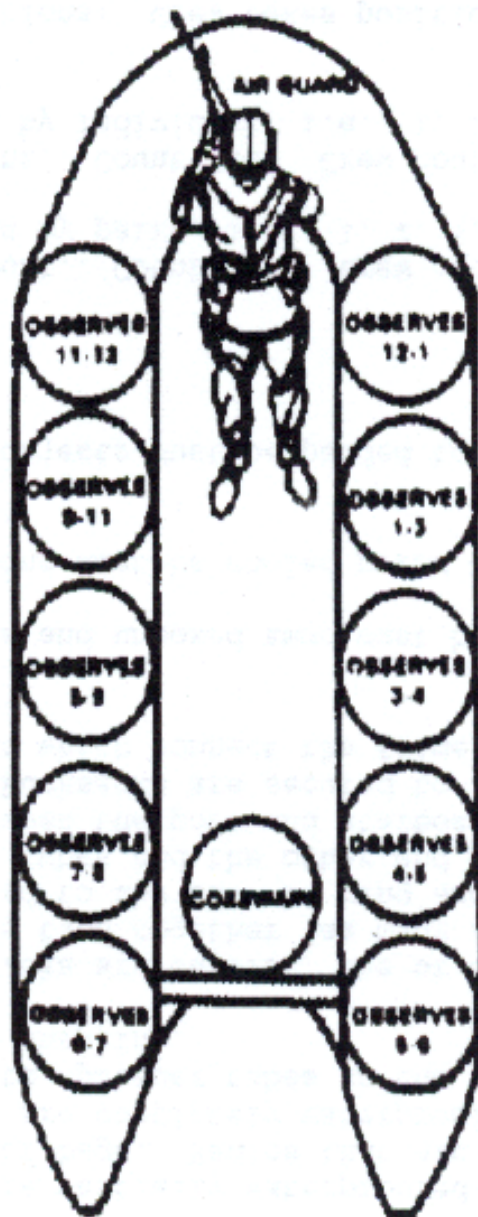
### b. Crew Organization and Duties:

- (1) Designate a coxswain (boat leader) for each boat. He is in charge of the boat and gives the commands to the crew. He is briefed by the PL, inspects the boat, supervises the loading and lashing of equipment in the boat, and numbers the members of his crew. The duties of each crew member depend on his position in the boat. The coxswain is not numbered. There are two ways to number the crew:
  - (a) The long-count method. The crew counts off on the command "long count, count off" from right to left from front to rear. The passengers are counted last from front to rear. This is also the sequence by which the boat crew embarks singly over the bow of the boat. It is used in deep water where there is a steep drop-off such as a dock or the ramp of a mother craft. The bow line is used to hold the boat steady while crew members embark or debark.

- (b) The short-count method. The crew counts off on the command "short count, count off" from front to rear by two's. The first two men are the "ones," the second two are the "twos", etc. This is also the sequence by which the crew members embark or debark in pairs over the sides of the boat. It is used in shallow water and on beaches with light surf.



- (2) Crew Organization and Duties. If river navigation is necessary, appoint a navigator. He has no other duties in the boat and must be completely free to concentrate on navigation. He is assisted by an observer, who may be a paddler, who observes the river to his front. Appoint an air guard for each boat. The first paddler on the left sets the stroke. The first paddler on the right is the observer. He handles and stows the bowline. All paddlers are responsible for loading and lashing equipment in their respective compartments and for observing a sector. One automatic weapon or grenade launcher per boat is manned, usually by the air guard. The coxswain is in charge, rides at the stern of the boat, but must be able to observe forward.



c. Loading and Lashing of Equipment:

- (1) All personnel will wear life preservers with quick release knot.
- (2) LBE will be worn unlocked at the waist.
- (3) Rifle is slung outside of life preserver opposite outboard side, muzzle down.
- (4) Parts of machine-guns are tied together with cord and (if not being manned) partially wrapped in a poncho and placed in the bow of the boat. A sling rope is tied to the machine-gun and a snaplink is used to fasten the sling rope to the "D" ring in the bow.
- (5) Radios are partially waterproofed by wrapping them in waterproof bags. Radios that are not needed during movement are completely waterproofed. Radios are secured to spreader tubes in the boat with a sling rope and snaplink.
- (6) If rucksacks are carried, one or more 12-foot sling ropes are tied together (as many as needed). One end is secured to the bow "D" ring and routed under the spreader tubes and the other end is secured to a rope tied between the port and starboard "D" rings in the stern. Rucksacks are secured to this rope by snaplinks which connect the frame of the rucksack to the rope.
- (7) Batteries and unboxed ammo must be semi-waterproofed.
- (8) Hot weapons must be cooled prior to being placed in the boat.
- (9) Pointed objects must be padded to prevent puncture of the boat.

d. Commands:

- (1) Short Count...Count Off: Crew counts off their positions by pairs; i.e., 1, 2, 3, coxswain.
- (2) Long Count...Count Off: Crew counts off their position by individual; i.e., 1, 2, 3, 4, 5, 6, coxswain.
- (3) Boat Stations: Crew takes positions along side of boat.
- (4) High Carry...Move (Used for long distance moves over land):

- (a) On the preparatory command of "high carry" the crew faces to the rear of the boat and squats down grasping carrying handles with the inboard hand.
  - (b) On the command "move", the crew swivels around, lifting the boat to their shoulders, so that the crew is standing and facing to the front with the boat on their inboard shoulders.
  - (c) Coxswain guides the crew during movement.
- (5) Low Carry...Move (Used for short distance moves over land):
- (a) On preparatory command of "low carry", the crew remains facing the front of the boat and grasps the carrying handles with the inboard hand.
  - (b) On the command "move", the crew stands up straight raising the boat approximately 6-8" off the ground.
  - (c) Coxswain guides the crew during movement.
- (6) Lower the Boat...Move: Crew lowers the boat gently to the ground using carrying handles.
- (7) Give Way Together: Crew paddles to front with Number 2 setting the stroke.
- (8) Hold: Entire crew keeps paddles motionless in the water thereby stopping the boat.
- (9) Hold Left/Right: Left crew holds, right crew continues with previous command. Do the opposite for the right.
- (10) Back Paddle: Entire crew paddles backwards, propelling the boat to the rear.
- (11) Back Paddle Left/Right: Left crew backpaddles causing the boat to turn left, right crew continues with previous command. Do the opposite for the right.
- (12) Rest Paddles: Crew members place paddles on their laps with blades outboard. This command may be given to pairs; i.e., Number 1's rest paddles.

e. Embarking and Debarking:

- (1) When launching, the crew maintains a firm grip of the boat until they are inside the boat; similarly, when beaching or debarking, they hold on to the boat until it is completely out of the water.
- (2) The number two man announces the depth of the water when entering; ankle deep, knee deep, thigh deep.
- (3) Stay as low as possible when entering and leaving boat to avoid capsizing.
- (4) The long count is a method of loading or unloading in which the boat crew embarks or debarks individually over the bow of the boat. It is used at river banks, on loading ramps and when deep water prohibits the use of other methods.
- (5) The short count is a method of loading in which the boat crew embarks or debarks in pairs over the sides of the boat while the boat is in the water. It is used in shallow water and on ocean beaches with light surf.
- (6) Beaching the boat is a method of debarking the entire crew at once into shallow water whereupon the boat is carried quickly out of the water.

f. Surf Operations:

(1) Launching:

- (a) Use short count method of loading.
- (b) Crew must keep their weight well forward until beyond the surf.
- (c) The bow of the boat must be kept perpendicular to the waves.

(2) Landing:

- (a) The stern of the boat must be kept perpendicular to the waves.
- (b) Crew must keep their weight well to the rear after entering the surf.
- (c) Paddlers do not look seaward.
- (d) Crew debarks using the shortcount or beaching method.

(e) Crew holds onto the boat until it is out of the water.

g. Navigation:

(1) Checkpoint and general route: This method is used when the drop site is marked by a well-defined checkpoint and the waterway is not confused by many beaches and tributaries. It is best used during daylight hours and for short distances.

(2) Navigator-Observer Method: This is the most accurate means of river navigation and can be used effectively in all light conditions.

(a) Equipment needed:

- Compass.
- Poncho.
- Pencil.
- Red filtered flashlight (for night use).

(b) Navigator is positioned in center of boat and does not paddle. During hours of darkness, he uses his flashlight under the poncho to check his map.

(c) The navigator keeps his map and compass oriented at all times.

(d) The navigator keeps the observer informed of the configuration of the river by announcing bends, sloughs, reaches, and stream junctions as shown on his map.

- (e) The observer compares this information with the bends, sloughs, reaches, and stream junctions he actually sees and when these are confirmed the navigator confirms the location of the boat on his map.
- (f) The navigator also keeps the observer informed of the general azimuths of reaches as shown on his map and the observer confirms these with actual compass readings of the river.
- (g) The navigator announces only one configuration at a time to the observer and does not announce another until it is confirmed and completed.
- (h) A strip map drawn on clear acetate backed with luminous tape may be used by the observer. The drawing may be to scale or a schematic. It should show all curves and the azimuth and distances of all reaches. It may also show terrain features, stream junctions, and sloughs.

#### h. Capsize Drills.

- (1) The command and procedures to capsize the boat are as follows:
  - (a) "Prepare to capsize." Paddles are positioned overhead, blades outward.
  - (b) "Pass paddles." All paddles are passed back and collected by the coxswain.
  - (c) "Number 2, Number 4, Number 6 men out." Followed by, "Number 7, Number 8, Number 9 men out." Those personnel slide into the water and move approximately three or four meters from the boat. The coxswain does the same.
  - (d) The Number 1, Number 3, Number 5 men move into position and the command, "Number 7 to lifeline," is given.
  - (e) "Capsize the boat." The boat is turned over, Number 1, Number 3, Number 5 men lean back and straighten their legs as they pull on the capsize line.
- (2) The commands and procedures to right the boat, intentionally capsized, follow:

- (a) Now Number 7, on top of the boat, assists Number 3 and Number 5 men onto the boat. The Number 1 man hands the capsize line to the Number 7 man.
  - (b) "Prepare to right." Number 3, Number 5, and Number 7 men move into position.
  - (c) "Number 1 man to lifeline."
  - (d) "Right the boat." The boat is turned over, Number 3, Number 5, and Number 7 men lean back and straighten their legs as they pull back on the capsize line.
  - (e) The Number 1 man, now in the boat, assists other crew members into the boat.
  - (f) The coxswain, last man out of the water, swims to the Number 7 man, who retrieves and passes paddles.
  - (g) The Number 7 man assists the coxswain into the boat.
- (3) The procedures for righting an unintentionally capsized boat are the same, except that nobody is on top of the boat. The Number 7 man automatically moves onto the boat to provide assistance.

## Notes

## CHAPTER TWELVE

### SERE

#### 1. SURVIVAL:

- a. S - Size up the situation, your surroundings, your physical condition, and your equipment.

U – Undue haste makes waste.

R - Remember where you are.

V - Vanquish fear and panic.

I - Improvise.

V - Value living.

A - Act like the natives.

L - Live by your wits, but for now, learn basic skills.

- b. Water- On the average adults require a minimum of 2-3 quarts of water daily. Drink as much water as possible to maintain body fluid levels.

(1) General water sources:

(a) Surface water- Streams, lakes, springs.

(b) Precipitation- Rain, snow, dew, sleet, and hail.

(c) Subsurface- Wells, cisterns, caves.

(2) Indicators of possible water sources:

(a) Abundance of vegetation.

(b) Drainage ditches and low lying areas.

(c) Large clumps of lush grass.

(d) The "V" of intersecting game trails often point toward water.

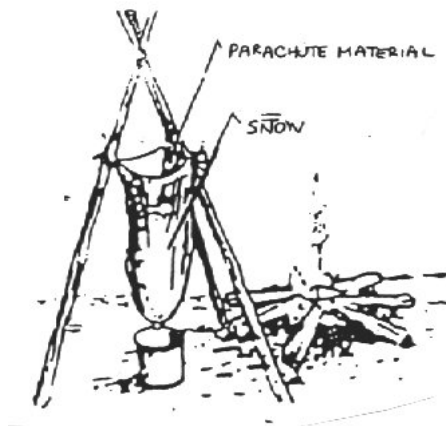
- (e) The presence of swarming insects indicates water is near.
- (f) Bird flight in the early morning or late afternoon might indicate the direction of water.
- (g) Evidence of insects and birds going into a hole in trees, tree crotches or rock crevices may indicate a water source.

(3) Frigid areas:

- (a) Melt snow and/or ice.
- (b) Do not eat snow and/or ice without melting it first.
- (c) Use old sea ice as opposed to new sea ice.

OLD SEA ICE	NEW SEA ICE
Bluish or Blackish	Milky or Gray
Shatters Easily	Doesn't Break Easily
Rounded Corners	Sharp Edges
Taste Relatively Salt Free	Taste Extremely Salty

- (d) Melt snow/ice with body heat by using waterproof container placed between layers of clothing. Do not place next to the skin.
- (e) Melt snow/ice with a snow machine.



(4) Open seas:

- (a) Drink sea water only after passing it through a desalinization kit.
- (b) Catch rain water in tarps or other water-holding containers. If tarp or container becomes salt encrusted, wash it in the sea.

(5) Tropical areas:

- (a) Green bamboo is an excellent source of fresh water. To get the water, bend over a stalk of green bamboo, tie it down, and cut off the top. The water will drip freely during the night. Or, cut out sections of bamboo to carry with you. Bore a hole at the bottom of a section to obtain the water. Old bamboo may be used in this manner but the water must be filtered and purified before use.
- (b) Banana or plantain trees are excellent sources of water. Cut off the tree leaving about a 6-12 inch stump. Scoop out the center of the stump so that a bowl like reservoir is formed. Water from the roots will immediately start to fill the hollow. The first three fillings of water will be bitter but succeeding fillings will be palatable. The stump will supply water for up to four days. Cover when not in use to keep out insects.
- (c) Some tropical vines can provide water. Cut a notch in the vine as high as you can reach, then cut the vine off close to the ground. Do not drink the liquid if it is sticky, milky or bitter tasting. Do not touch vine to lips.

(6) Coastal areas:

- (a) Dig a beach well behind the first set of dunes by digging a hole deep enough to allow water to seep in.
- (b) Dig a hole on the beach deep enough to allow water to seep in. Build a fire and heat rocks in it. Drop the heated rocks into the water and hold a cloth over the hole to absorb the steam. Wring the water out of the cloth.
- (c) Fill a metal container with sea water. Build a fire and boil the sea water. Hold a cloth over the container to absorb the steam. Wring the water out of the cloth.

(7) Desert areas:

12-4

(a) Dig holes deep enough to allow water to seep in, in the following locations:

- Valleys and low areas.
- At the foot of cliffs or rock outcroppings.
- At the first depression behind the first sand dune of dry desert lakes.
- Whenever damp surface sand is found.
- Whenever green vegetation is found.

(b) Cut off the top of a barrel cactus. Mash or squeeze the pulp. Do not eat the pulp but place it in your mouth and suck out the juice, and then spit the pulp out.

(c) Extreme temperature variations between night and day causes condensation on metal surfaces. Use a cloth to absorb the water and wring the water out of the cloth.

(8) Do not drink the following in a survival situation:

- (a) Alcoholic beverages.
- (b) Urine.
- (c) Blood.
- (d) Sea water.
- (e) Fish juices.

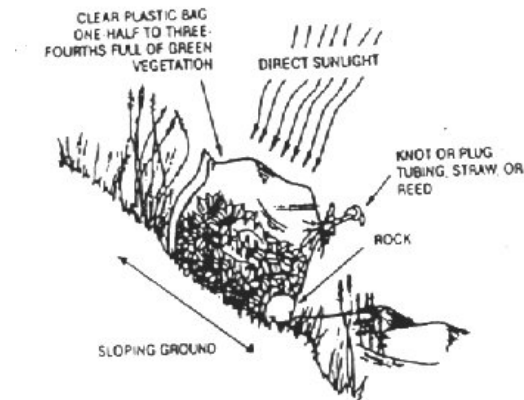
(9) Methods of collection:

(a) Wrap a cloth around a leaning tree during a rain storm. Leave the end hanging down above a container. The cloth absorbs the water and drips it into the container.

(b) Wrap a cloth around each ankle and walk through dew covered grass. Wring out the cloth.

(c) Above ground still- You must have a sunny slope on which to place the still. Proceed as follows:

- Fill the bag with air by turning the opening into the breeze or by "scooping" air into the bag.
- Fill the plastic bag half to three fourths full of green leafy vegetation. Be sure to remove all hard sticks or hard spines that might puncture the bag. CAUTION: Do not use poisonous vegetation. It will provide poisonous liquid.
- Place a small rock or similar item into the bag.
- Close the bag and tie the mouth securely as close to the end of the bag as possible to retain the maximum amount of air space. (If you have a piece of tubing, small straw, or hollow reed, insert one end in the mouth of the bag before you tie it securely. Then tie off or plug the tubing so that air will not escape. This will allow you to drain out condensed water without untying the bag.)
- Place the bag, mouth downhill, on a slope in full sunlight. The mouth of the bag should be slightly higher than the low point in the bag.
- Settle the bag in place so that the rock works itself into the low point of the bag.



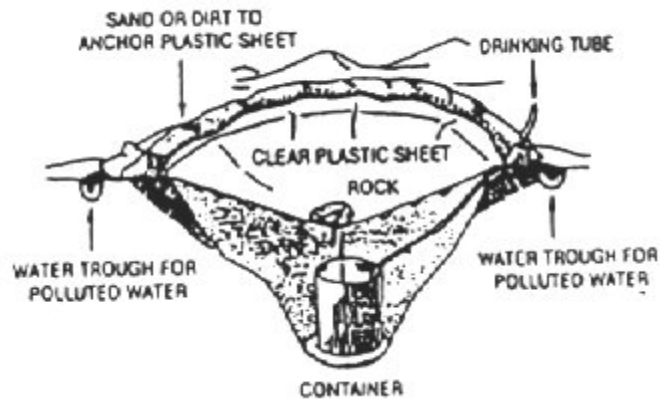
- To get condensed water from the still, loosen the tie around the bag's mouth and tip the bag so that the water collected around the rock will drain out. Then retie the mouth securely and reposition the still to allow further condensation.

12-6

(d) Below ground still - Select a site where you believe the soil will contain moisture, where the soil will be easy to dig, and where sunlight hits most of the day. Proceed as follows:

- Dig a bowl-shaped hole approximately 3 feet across and 2 feet deep.
- Dig a sump in the center of the hole. The depth of the perimeter of the sump will depend on the size of the container that you have to set it in. The bottom of the sump should allow the container to stand upright.
- Anchor the tubing to the bottom of the container by forming a loose overhand knot in the tubing.
- Place the container upright in the sump.
- Extend the unanchored end of the tubing up, over, and beyond the lip of the hole.
- Place the plastic sheeting over the hole, covering the edges with soil to hold it in place.
- Place a rock in the center of the plastic.
- Allow the plastic to lower into the hole until it is about 15 inches below ground level. The plastic now forms an inverted cone with the rock at its apex. Make sure that the apex of the cone is directly over your container. Also make sure the plastic cone does not touch the sides of the hole because the earth will absorb the condensed water.
- Put more soil on the edges of the plastic to hold it securely in place and to prevent loss of moisture.
- Plug the tube when not being used so that moisture will not evaporate.
- You may want to use plants in the hole as a moisture source. When digging the hole you should dig out additional soil from the sides of the hole to form a slope on which to place the plants. Then proceed as above.
- If polluted or salt water is your only moisture source, dig a small trough outside the hole about 10 inches away from the lip of

your still. Dig the trough about 10 inches deep and 3 inches wide. Pour the water in the trough. Be sure you do not spill any of the water around the rim of the hole where the plastic touches the soil.



### Notes

- (10) Filtration- Only makes the water more palatable. It does not purify it.
- (a) Place the water in a container and let it stand for 12 hours.
  - (b) Remove the odor from the water by adding charcoal from a fire. Let the water stand for 45 minutes before drinking it.
  - (c) To make a filtration system, place several layers of filtering material such as sand, crushed rock, charcoal, or cloth in bamboo, a hollow log, or an article of clothing.
  - (d) Dig a hole deep enough to allow water to seep in approximately 3 feet from the edge of a swamp or muddy body of water.
- (11) Purification- Rainwater collected in clean containers or in plants is generally safe for drinking. However, you must purify water from lakes, ponds, swamps, springs, or streams, especially those near human habitations or in the tropics. When at all possible, you must disinfect all water obtained from vegetation or from the ground by using iodine, chlorine, or by boiling.
- (12) Storage- Use a clean container which can be sealed or covered to prevent contamination:
- (a) Water bag.
  - (b) Prophylactic.
  - (c) Section of bamboo.
  - (d) LPO bladder.
- c. Food. After water, food is your most urgent need. In a survival situation, always be on the lookout for wild foods and live off the land whenever possible. Save rations for emergencies. You may live many days without food if you have water. With few exceptions, everything that grown from the soil, or that walks, crawls, or swims is a potential food source.
- (1) Plants - Being able to recognize both cultivated and wild edible plants is important in a survival situation. Study Appendix C of FM 21-76 and memorize a few plants in each of the habitats and climatic zones of the world.
- (a) Thoroughly wash all cultivated plants to remove pesticides with water suitable for drinking.

(b) General rules:

- Mushrooms and fungi should not be selected as a food possibility.
- Avoid plants with umbrella-shaped flower clusters.
- All beans and peas should be avoided.
- As a general rule, all bulbs should be avoided.
- White and yellow berries should be avoided as they are almost always poisonous.
- Approximately one-half of all red berries are poisonous.
- Blue and black berries are generally safe for consumption.
- Aggregated berries are (usually) safe for consumption (for example, thimbleberry, raspberry, blackberry, salmonberry).
- Single fruits on a stem are generally considered safe to eat.
- Plants with shiny leaves should be considered poisonous.
- A milky sap indicates a possible poisonous plant.
- Plants which are irritants to the skin should not be eaten (for example, poison ivy).
- Select a plant which grows in sufficient quantity in the local area.
- Apply the edibility test to only one plant at a time. If ill effects occur, it will be obvious which plant caused the problem.

(c) Edibility test:

- Touch the plant's sap or juice to the inner forearm or tip of the tongue (a small taste of a poisonous plant will not do serious harm).

- If no ill effects are encountered, such as a rash or bitter taste, numbing situation, etc., then proceed with the rest of the steps.
- Boil the plant or plant part in two changes of water. The toxic properties of many plants are water soluble or are destroyed by heat. Cooking and discarding two changes of water lessen the amount of poisonous material or remove it completely. These boiling periods should last at least 5 minutes each.
- Place approximately one teaspoon of the prepared plant food in the mouth and chew it but do not swallow it.
- If unpleasant effects occur (burning, bitter, or nauseating taste, etc.), remove the material from the mouth at once and discard the plant as a food source.
- If no unpleasant effects occur, swallow the plant material and wait 8 hours.
- If after 8 hours, no unpleasant effects have occurred (nausea, cramps, diarrhea, etc.), eat about two tablespoons full and wait 8 hours.
- If no unpleasant effects have occurred at the end of this 8 hour period, the plant may be considered edible.
- Keep in mind that any new or strange food should be eaten with restraint until the body's system has become accustomed to it.
- Plants selected by exceptions to the above system should be used as a food source only when positive identification can be made.
- The flowering portions of practically all plants are edible. Care must be exercised in removing only the flowering portions.

(2) Insects:

- (a) Avoid hairy insects as the hairs could cause irritation or infection.
- (b) Avoid poisonous insects such as centipedes, scorpions, and poisonous spiders.

- (c) Avoid insects which commonly carry diseases such as flies, ticks, and mosquitoes.
  - (d) Do not eat raw grasshoppers (may contain parasites) and do not eat the large legs as they will stick in your throat.
  - (e) Add insects to stews, fry, boil, roast, or eat them raw.
- (3) Reptiles and amphibians:
- (a) Hunt frogs at night when you can locate them by their croaking. Club or spear them. Skin a frog, cook and eat the entire body.
  - (b) Newts and salamanders are found under rotten logs or under rocks. Skin and remove the innards before cooking.
  - (c) All poisonous and nonpoisonous freshwater and land snakes are edible. Pin the snakes head down with a forked stick and cut off its head. Take extreme care at all times.
  - (d) All lizards are edible. The bite of two species are poisonous. The Gila Monster and the Beaded Lizard which are found only in the American southwest, Central America, and Mexico. Club lizards to kill them. Skin large lizards and remove the entrails, then boil, roast, broil, or fry the meat. Small lizards may be impaled through the mouth on a stick and roasted without removing the entrails. The meat is done when the skin bubbles and cracks.
  - (e) Crocodiles and alligators can be found around and in the lakes, rivers, and streams in tropical and warm temperate zones. The best way to kill them is by shooting. To skin them, heat them over a fire to loosen the plates. Broil or fry the meat.
  - (f) Marine fresh water and land turtles are edible. Catch them by their tail and club them. Remove the shell, cut off the head and remove the entrails, boil, or fry the meat. Save the shell for use as a bowl.
- (4) Fish and marine life - Wear shoes to protect the feet while wading in the water. Avoid reaching into dark holes. Avoid all aquatic life during a red tide.
- (a) Crustaceans include freshwater and saltwater crabs, crayfish, lobsters, shrimp, and prawns. All are edible, but always cook the freshwater crustaceans as they may have parasites. Catch by hand

or use a dip net. Many species are nocturnal and are most easily caught at night. Avoid all crustaceans above the high tide mark.

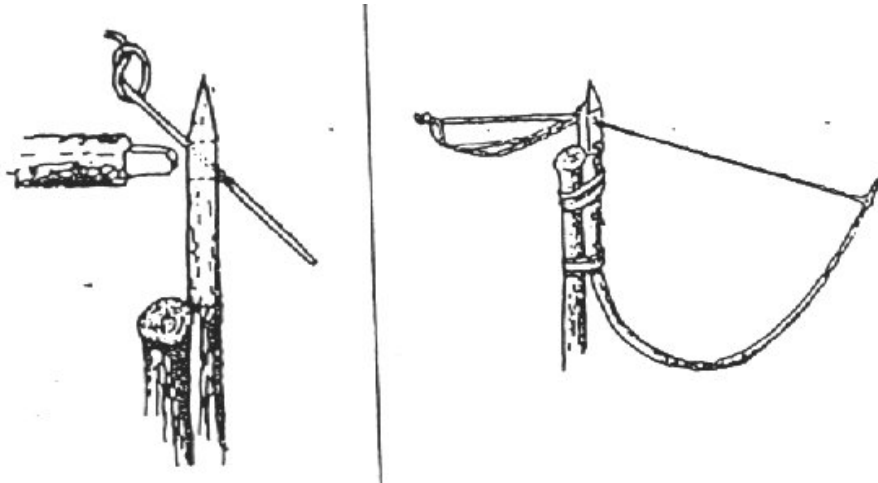
- (b) Mollusks include freshwater and saltwater shellfish such as snails, clams, mussels, bivalves, periwinkles, chitens, and sea urchins. Mollusks should be steamed, boiled or baked in the shell. Do not eat shellfish that are not covered by water at high tide. Mussels are poisonous in tropical zones during the summer. Avoid cone-shaped shells.
- (c) Eels are excellent eating. Catch them during the day in muddy water or spear them by torchlight at night. After catching an eel, strike a sharp blow to the head to stun it. Skin an eel before cooking.
- (d) Fish. Some characteristics of poisonous fish are smooth skin, rough skin, bristles, or spines rather than true scales; some puff up or inflate when disturbed. Poisonous fish are seldom found in the open sea, but live around rocky or coral reefs and muddy or sandy shores. No poisonous fish are known to live along the shores of the North Pacific and Arctic Oceans. Do not eat fish eggs or entrails. Don't eat fish with unpleasant odor, pale, slimy gills, sunken eyes, flabby skin or flesh which remains dented when pressed. Gut fish by cutting along the abdomen and scrape out the intestines. Cut out the large blood vessels that lie next to the backbone. Scale or skin the fish. Catch fish by:
  - Hook, line, and pole. Improvise hooks from pins, needles, wire, small nails, a piece of metal, a piece of wood, coconut shell bone, thorns, flint, sea shells, tortoise shell, etc. a fishing line from gutted suspension lines, plant or cloth fibers.
  - Setting lines. Tie several baited hooks on a line and fasten the line to a low hanging branch.
  - Stake out. Stick two reeds on the bottom of a stream or lake. Run a line between the two reeds and run fishing lines with hooks off of this line. This is a good device for clandestine fishing.
  - Jigging. Effective at night. Use a long pole with a short line with a hook and spoon attached. Dabble the hook and spoon just below the surface.
  - Snagging. You must be able to see the fish to snag it.

- Using your hands. Grab the fish firmly just behind the gills.
- Muddying the water. When the fish come to the surface club them or toss them out with your hands.
- Using a net. Make a dip net from your undershirt and a forked stick.
- Shooting. Aim slightly under the fish in water less than 3 feet deep.
- Explosive devices. Retrieve the fish at once as their air bladders are usually ruptured by the blast and they sink quickly.
- Spearing. Most effective at night with a torch. After spearing the fish, hold it firmly on the bottom until you can reach down and grab it.
- Poisoning. Some plants contain Rotenone which stuns or kills cold-blooded animals but does not affect people who eat them. Works best in 70 degree or above water temperature. Lime will also work. Get lime by burning and crushing coral and sea shells.
- Ice fishing. Cut the hole where the water is shallow.

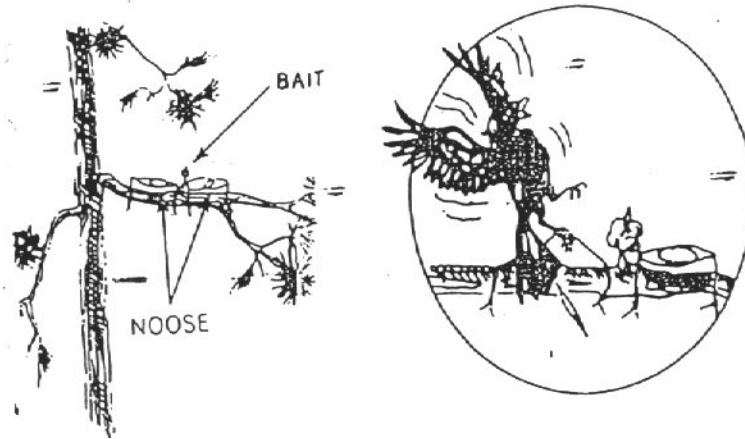
(5) Birds:

- (a) All are edible. Pluck or skin the bird after killing it. Cut off its head close to the body. Cut along the abdomen and gut the bird. Wash the insides with fresh clean water. Save the neck, liver, and heart for stew.
- (b) Boil scavenger birds for at least 20 minutes to kill parasites.
- (c) Clean and dry the intestines to use for cord.
- (d) Birds are easiest to catch in the nest where you can just grab them.
- (e) Bird eggs are edible when fresh.

- (f) Spread a survival or mist net between two trees along a flyway used regularly by birds to entangle them.
- (g) Grab large birds that roost in trees by their feet and club them. Some birds only fly short distances when disturbed at roost. If you fail to catch one on the first try, follow them and try again.
- (h) Use a bola or throwing stick to hit birds that move in flocks.
- (i) Catch shore birds by baiting a hook on an anchored line with a piece of fish.
- (j) Inland birds are easily caught using an Ojibwa bird snare.



- (k) Catch birds using perch snares.



(6) Mammals:

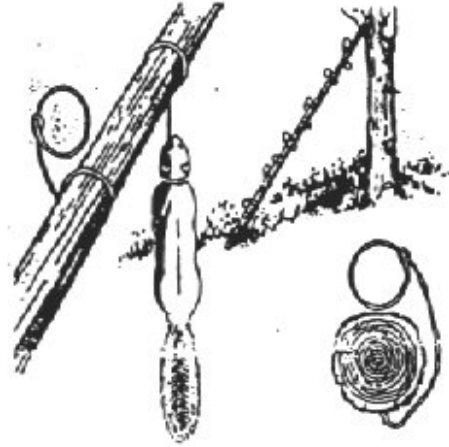
- (a) All are edible.
- (b) Locate fur bearers along game trails leading to watering, feeding, and bedding areas. Look for fresh droppings or tracks.
- (c) The vulnerable spots on many animals are the head, neck, or just back of the shoulder. Aim for one of these when shooting game.
- (d) Club, drop kick, hit with a rock, or catch by hand, smaller animals. Swing the animal against a tree, hitting its head, when caught by hand.
- (e) Scare predators away from a fresh kill and recover its prey.
- (f) Animals caught in traps and snares should be clubbed or speared, approach with caution.
- (g) After you kill an animal immediately bleed it by cutting its throat. Clean the animal near a stream if possible to wash and cool the carcass. Cooling the carcass removes parasites.
- (h) To skin and dress the animal:
  - Place carcass, belly up, on a slope if available.
  - Remove genitals or udder.
  - Remove musk glands.

- Split hide from tail to throat. Make the cut shallow so that you do not pierce the stomach.
  - Insert your knife under the skin, taking care not to cut into the body cavity. Peel the hide back several inches on each side to keep hair out of the meat.
  - Open the chest cavity by splitting the sternum.
  - Reach inside and cut the windpipe and gullet as close to the skull as possible.
  - With the forward end of the intestinal tract free, work your way to the rear, lifting out internal organs and intestines. Cut only where necessary to free them.
  - Carefully cut the bladder away from the carcass so that you do not puncture the bladder. Pinch the urethra tightly and cut it beyond the point you are pinching.
  - Remove the bladder.
  - From the outside of the carcass, cut a circle around the anus.
  - Pull the anus into the body cavity and out of the carcass.
  - Lift or roll the carcass to drain all the blood. Try to save as much as you can as it is a valuable source of food and salt. Boil the blood.
  - Remove the hide by making cuts along the inside of the legs to just above the hoof or paw. Then peel the skin back, using your knife in a slicing motion to cut the membrane between the skin and the meat. Continue this until the entire skin is removed.
- (i) The heart, liver, and kidneys are edible. Remove the gall bladder from the liver (if present). The eyes, brain, and tongue are edible. Remove the retina from the eyes and remove the outer skin from the tongue after cooking.
- (j) Use the tendons and ligaments of the body of large animals for lashings.

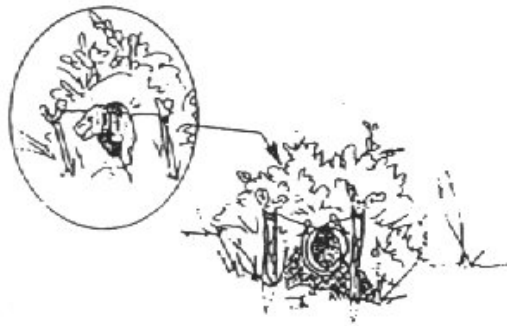
(k) The marrow in bones is a rich food source. Crack the bones and scrape out the marrow.

(l) Some traps and snares for trapping game include:

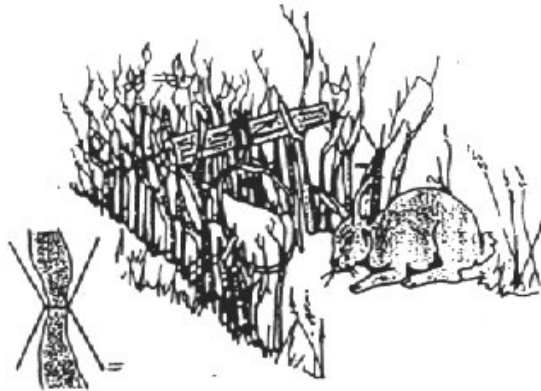
- Squirrel pole. Using simple loop snares.



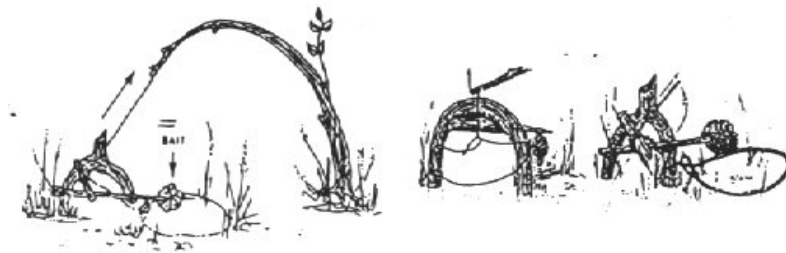
- Single or double wire snare. Using simple loop snares. Funnel the animal into the trap or place at the entrance of a hole or den.



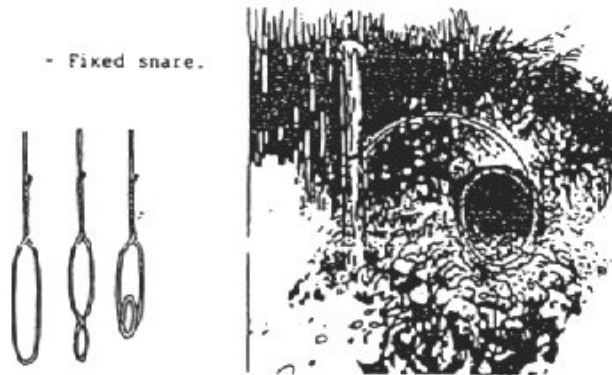
- Drag noose. Using a simple loop snare.



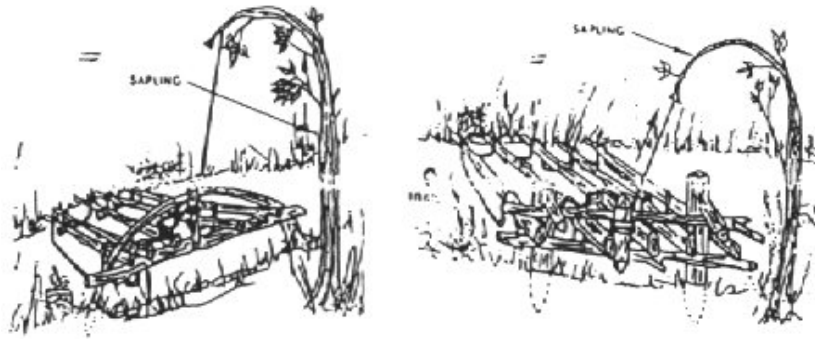
- Hanging snare.



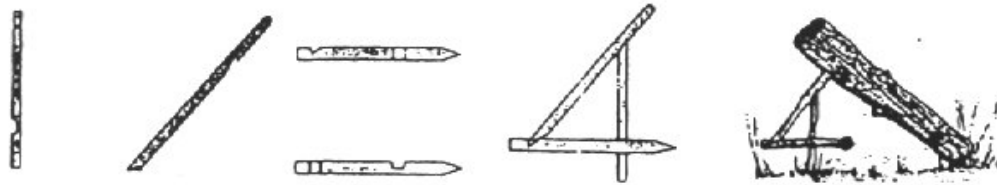
- Fixed snare.



- Treadle spring snare. Cover the treadle with leaves or grass.

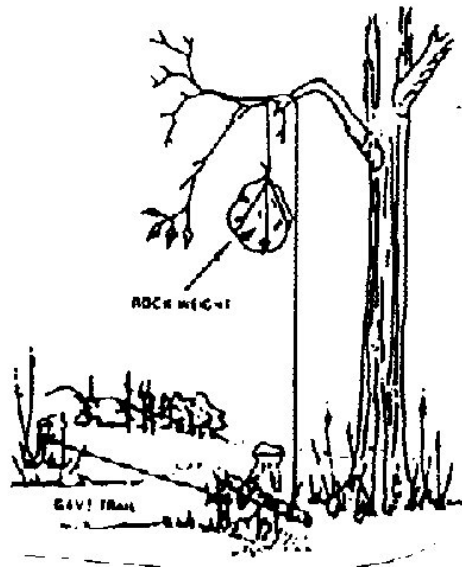


- Figure 4 trigger with deadfall.



- Trip-string deadfall trap.

- Trip-string deadfall trap.



(7) Food preservation:

- (a) Clean blood splattered on meat will glaze over and help preserve it for a short time.
- (b) Meat can hang for several days when temperatures are below 40°.
- (c) Keeping an animal alive is a method of preserving it.
- (d) Bury food in snow.
- (e) Wrap food in waterproof material and place in a cool stream.
- (f) One night of heavy smoking will keep meat edible for about one week. Two nights will keep it edible for 2-4 weeks. Smoke meat by:
  - Cutting it with the grain in 1/4 inch strips.
  - Dig a fire pit (3' deep X 1.5' wide) with an enclosed area (poncho-teepee, vented at the top).
  - Collect green wood chips from a deciduous tree. Do not use conifer tree.
  - Start a fire and let it burn down to coals. Stoke the fire with the wood chips.
  - Place the strips of meat on a grate 2 feet above the coals.
  - Properly smoked meat will look like a dark, brittle, curled stick.
- (g) Preserve meat by air drying. Hang it in the wind and hot sun out of the reach of animals. Cover it so flies cannot land on it. If possible, soak the meat in saltwater.

d. Fire:

(1) Materials:

TINDER*	KINDLING*	FUEL
<p>Birch bark</p> <p>Shredded inner bark from cedar, chestnut, red elm trees</p> <p>Fine wood shavings</p> <p>Dead grass, ferns, moss, fungi, straw</p> <p>Sawdust</p> <p>Very fine pitch-wood scrapings</p> <p>Dead evergreen, needles</p> <p>Punk (the completely rotten portion of dead logs or trees)</p> <p>Evergreen tree knots</p> <p>Bird down (fine feathers)</p> <p>Down seed heads (milk weed, dry cattails, bulrush, Canada thistle, goldenrod, dandelion)</p> <p>Fine dried vegetables fibers</p> <p>Spongy threads of dead puffball</p> <p>Dead palm leaves</p> <p>Skin-like membrane lining</p>	<p>Small twigs</p> <p>Small strips of wood</p> <p>Split wood</p> <p>Heavy Cardboard</p> <p>Pieces of wood removed from the inside of larger pieces</p> <p>Wood that has been soaked or doused with highly flammable materials such as gasoline, oil, or wax</p> <p>* Must be completely dry.</p>	<p>Dry standing wood and dry dead branches</p> <p>Dry inside (heart) of fallen tree trunks and large branches</p> <p>Green wood that is finely split</p> <p>Dry grasses twisted into bunches</p> <p>Peat dry enough to burn (this may be found at the top of undercut banks)</p> <p>Dried animal dung</p> <p>Animal fats</p> <p>Coal, oil shale, or oil sand lying on the surface</p>

bamboo		
Lint from pockets and seams		
Charred cloth		
Waxed paper		
Outer bamboo shavings		
Gunpowder		
Cotton		
Lint		

(2) Lighting the fire. If you lack matches, a cigarette lighter, or pyrotechnics; try the following:

- (a) Convex lens. Use the lens from binoculars, cameras, telescopic sights, or the magnifying glass from a compass. Angle the lens so the sun's rays are concentrated on the tinder.
- (b) Magnesium/metal match. Scrape some magnesium off the block into the tinder with a knife. Then scrape the knife down the metal match causing sparks. Keep scraping until the magnesium ignites.
- (c) Battery. Using a vehicle battery, attach wires to each terminal and touch together over the tinder pile. When using small batteries, hold a piece of steel wool between the terminals, when it glows, place it in the tinder pile.
- (d) Flint and steel. Use a knife blade and a piece of flint. Strike the flint with the knife causing sparks over the tinder pile.

(3) Building the fire:

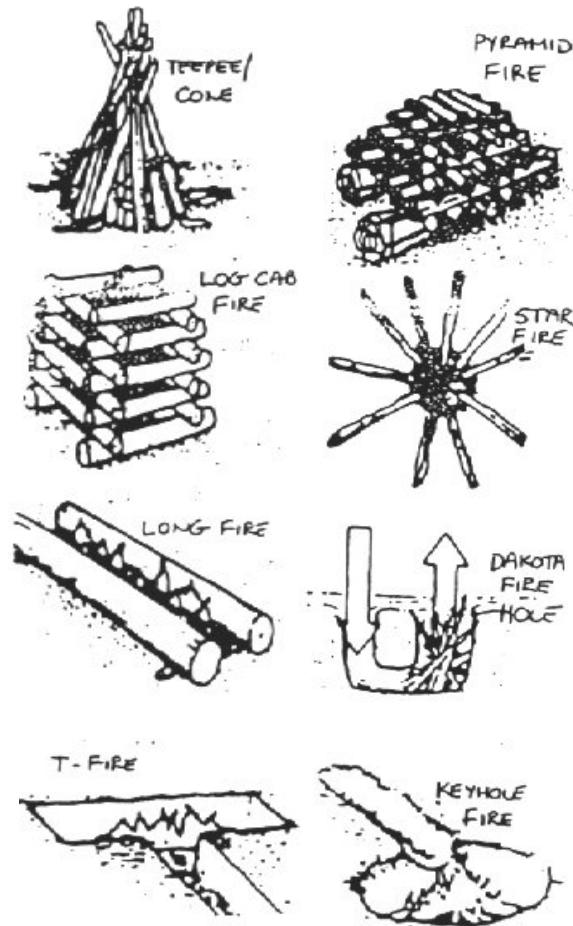
- (a) Teepee/cone fire. Used primarily for cooking. Works even with wet wood.
- (b) Pyramid fire. Burns from the top down. Requires no attention during the night.
- (c) Log cabin fire. Provides large amounts of light and heat.

(d) Starfire. Requires constant attention. Easily controlled.

(e) Long fire. Use in conjunction with a shelter and fire wall.

(f) T/Keyhole fire. Used for baking.

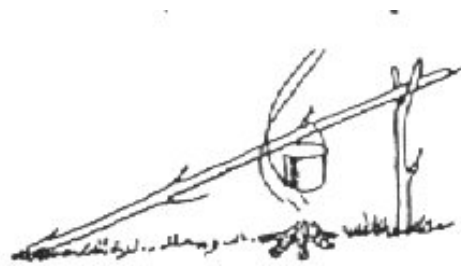
(g) Dakota fire hole. For use in clandestine situations.



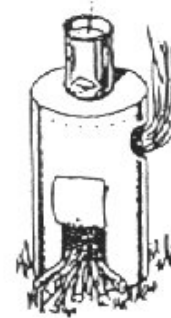
(4) Helpful techniques:

- (a) Do not use wet or porous rocks for a fireplace as they tend to explode when heated.
- (b) Build a fire near a tree to help disperse smoke.
- (c) If you are in a snow covered area, use green logs to make a dry base for the fire.
- (d) Always light a fire from the upwind side.
- (e) Use a fire wall to reflect and direct heat.

(5) Expedient stoves:



CRANE HOLDING POT



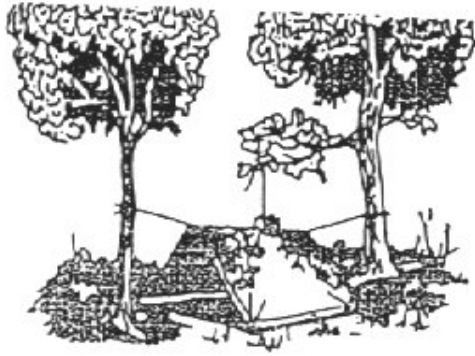
HOBO STOVE

e. Shelter:

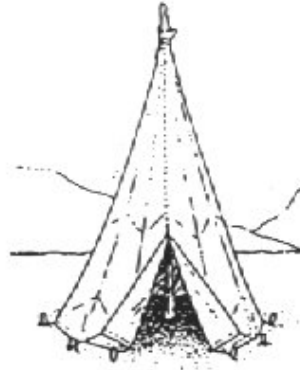
- (1) Poncho lean-to. Tie off the top of the poncho about waist high. Use drip sticks or drip lines to divert rainwater.



- (2) Poncho tent. Less space than the lean-to, provides a low silhouette.



(3) Parachute teepee. Use poles 10-15 feet long.



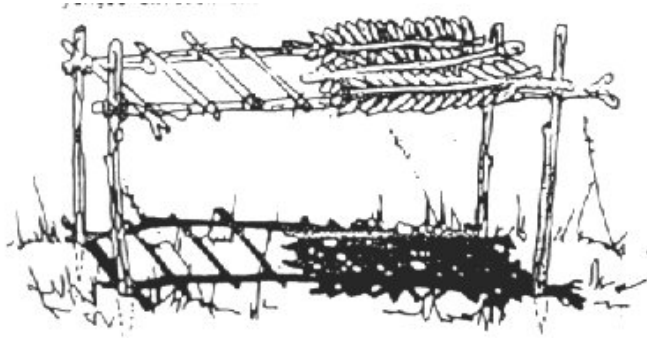
(4) One-man shelter. Use a parachute or tree boughs.



(5) Field expedient lean-to.



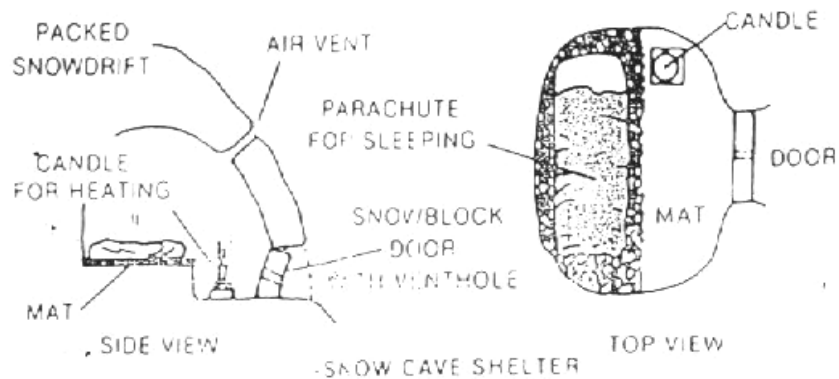
- (6) Swamp bed. Do not sleep on the ground in a swamp or jungle environment.



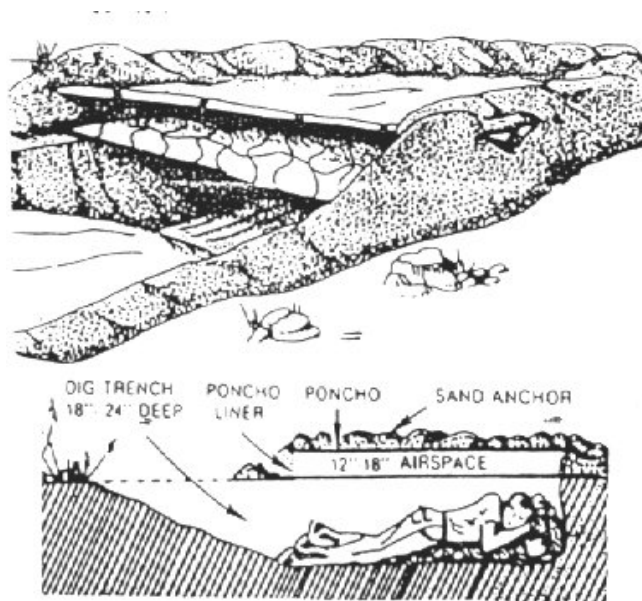
- (7) Tree pit snow shelter. Located under conifer trees.



- (8) Snow cave. If you use a fire and can't see your breath, your snow shelter is too warm.



(9) Desert/beach shelter. Reduces the temperature 30°-40°.



(10) Miscellaneous:

- (a) In foothills, avoid flash flood areas.
- (b) In mountainous terrain, avoid avalanche areas.
- (c) Near bodies of water, avoid a site that is below the high water mark.
- (d) When at rest, as much as 80% of your body heat can be lost to the ground. Use adequate insulating material for the floor of your shelter.

- (e) Do not overlook natural formations such as caves, rocky crevices, clumps of bushes, small depressions, large rocks on the leeward sides of hills, large trees with low hanging limbs, and fallen trees with thick branches.
- (f) Stay away from low ground such as ravines, narrow valleys, or creek beds. They are colder at night and harbor more insects.
- (g) Check for poisonous snakes, ticks, mites, scorpions, and stinging ants.
- (h) Check for loose rocks, dead limbs, coconuts, or other natural growth that might fall on your shelter.

f. Direction Finding:

(1) Shadow tip method:

- (a) First, find a straight stick about 3 feet (1 meter) long and a fairly level, brush-free spot so that the stick will cast a definite shadow.
- (b) Push the stick in the ground so it stands upright. It need not be perfectly vertical to the ground.
- (c) Mark the tip of the shadow cast by the stick.
- (d) Wait until the shadow moves 1½ to 2 inches (approximately 10-15 minutes).
- (e) Mark the tip of the second shadow.
- (f) Draw a line from the first mark through and about a foot beyond the second mark.
- (g) Stand with left foot on the first mark and your right foot on the other end of the line you drew.
- (h) If you are in the northern temperate zone, you will be facing in a northerly direction. If you are in the southern temperate zone, you will be facing in a southerly direction.

(2) Watch method:

- (a) Place a small stick in the ground so that it casts a definite shadow.

- (b) Place your watch on the ground so that the hour hand points toward and along the shadow of the stick.
- (c) Find the point on the watch midway between the hour hand and 12 o'clock and draw an imaginary line from that point through and beyond the center of the watch. This imaginary line is a north-south line.
- (d) In the southern temperate zone place your watch on the ground so that 12 o'clock points toward and along the shadow of the stick.
- (e) If you carry a digital watch, you follow the same steps as with a conventional watch except you draw on the ground the face of a conventional watch with the hands indicating the proper time (as shown on your digital watch) and the hour hand pointing to and along the shadow of the stick.
- (f) If your watch is set on daylight savings time, then use the midway point between the hour hand and 1 o'clock to draw your imaginary line.

(3) North star:

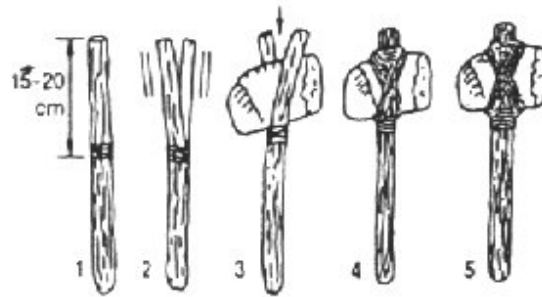
- (a) The North Star is the last star in the handle of the Little Dipper, but the complete Little Dipper is often difficult to see.
- (b) The easiest way to locate the North Star is by using the Big Dipper. A straight line drawn between the two stars (pointers) at the end of the Big Dipper's bowl will point to the North Star. The distance to the North Star is about five times the distance between the pointers.
- (c) Directly across from the Big Dipper is the constellation Cassiopeia. It is made up of five stars and resembles a lopsided "M" or "W" depending on its position in the sky. The North Star is straight out from the center star of Cassiopeia. It is almost equidistant between the Big Dipper and the Cassiopeia.

- (4) Southern Cross. South of the equator you can use the constellation Southern Cross to help you determine the general direction of south. The Southern Cross is a group of four bright stars in the shape of a cross that is tilted to one side. The two stars forming the long axis, or stem, of the cross are called pointers. To determine which direction is south:

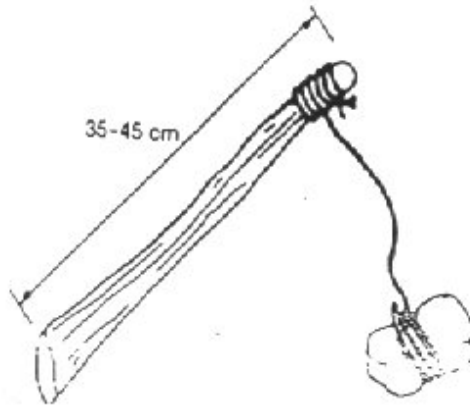
- (a) Imagine the long axis extends from its foot five times its length. The point where this imaginary line ends is in the general direction of south.
- (b) Look straight down from this imaginary point to the horizon and select a landmark.

g. Expedient Weapons and Tools:

- (1) Weighted sock. Make a sling club from a sock by putting sand or a rock in it. This weapon is only a one shot deal.
- (2) Simple club. Make it short enough to swing easily but long enough and strong enough for you to damage whatever you hit.
- (3) Weight club. The weight may be natural such as a knot on the wood or added like a stone. There are three techniques for lashing a stone to a handle: split handle, forked branch, and wrapped handle.



- (4) Sling club. A blow from this type of club has more force than a blow from other types of clubs.



- (5) Wooden knife:

- (a) Find a straight-grained piece of hardwood about 12 inches long and 1 inch in diameter.
- (b) Shave about 6 inches of this hardwood to form the knife blade, making the point of the blade off center so that it is not formed by the pith. (The pith makes a weak point.)
- (c) If you have a fire, slowly dry the blade portion over the fire until it is slightly charred. (The drier the wood, the harder the point.)
- (d) Sharpen the blade using a coarse stone.

- (6) Bone knife:

- (a) Find a suitable bone and lay it on a hard surface.
- (b) Hit the bone with a heavy object so that the bone shatters.
- (c) Select a pointed bone splinter that can be further shaped.
- (d) Sharpen the splinter by rubbing it on a rough textured rock.
- (e) Lash the sharpened bone splinter to a piece of hardwood (handle).

- (7) Stone knife. To make a stone knife, you will need a sharp-edged piece of stone, a chipping tool, and a flaking tool. (A chipping tool is a light

blunt-edged tool for breaking off small pieces of stone, and a flaking tool is a pointed tool used to break off thin, flattened pieces.) You can make a chipping tool from wood, bone, or metal and a flaking tool from bone, antler tine, and soft iron. Lash the blade to a handle.

(8) Metal knife:

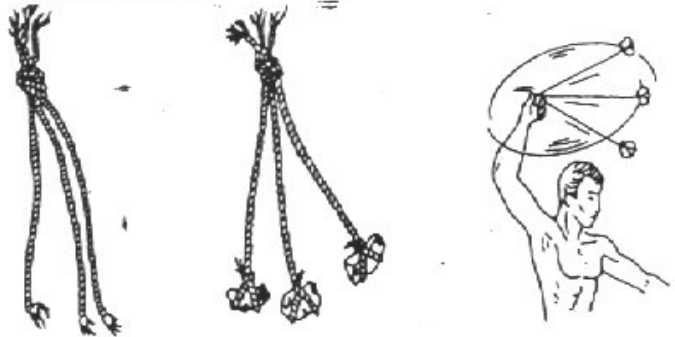
- (a) Find a piece of soft iron whose shape closely resembles the intended knife (if possible).
- (b) Place the metal on a flat, hard surface and hammer it to get the shape you desire.
- (c) Rub the metal on a rough-textured rock to get a cutting edge and point.
- (d) Lash the knife onto a hardwood handle.

(9) Spear:

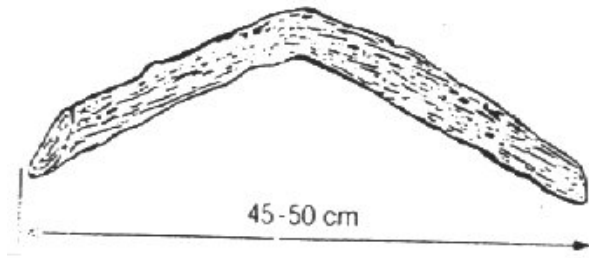
- (a) Select a shaft (a straight sapling) 4-5 feet long. The length should allow you to handle the spear easily and effectively.
- (b) Attach a knife blade to the shaft.

(10) Bola. Effective for capturing running game or low flying fowl in a flock.

1. Use overhand knot to join (3) 60-cm cords.
2. Tie 0.25 kg weight securely to ends of cords.
3. Hold by center knot and twist the bola over your head. Release toward target.



(11) Rabbit stick. Used to kill small game.



(12) Tendon lashing:

- (a) Remove the tendons from game animals and dry them completely.
- (b) Smash the dried tendons so that they separate into fibers.
- (c) Moisten the fibers and twist them into a continuous strand. If you need stronger lashing material, you can braid the strands.

(13) Rawhide lashing:

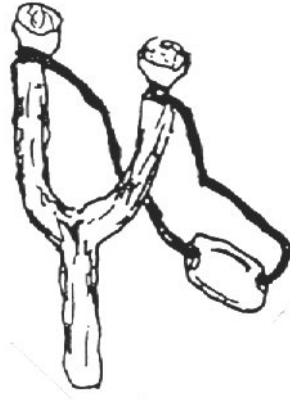
- (a) Skin an animal and remove all fat and meat from the skin.
- (b) Spread out the skin, making sure there are no folds that can trap moisture.
- (c) Cut the dry skin into strips.
- (d) Soak the strips (2 to 4 hours) until they are soft and pliable.

(14) Twist stick. Used for removing an animal from its den.

(15) Noose stick. Used for snaring animals.



(16) Sling shot:



#### h. Health and Hygiene:

- (1) Always ensure your shots/immunizations are up to date.
- (2) Plan for regular rest periods and learn to make yourself comfortable under less than ideal conditions.
- (3) Keep yourself clean with soap and water. If water is scarce take an air bath by removing your clothes and exposing your body to the sun and air. White ashes, sand, or loamy soil are soap substitutes.
- (4) Keep your hands clean to avoid spreading germs. Keep the fingers out of the mouth.
- (5) Keep your hair clean to avoid becoming infested with fleas or lice.
- (6) Keep your clothing clean to reduce the chance of skin infection and parasite infestation. If soap and water are not available, air clean your clothes by shaking them out and sunning them for two hours.
- (7) Keep your teeth clean. If a toothbrush is unavailable, use a chewing stick. Improvise toothpicks and dental floss.
- (8) Take care of your feet. To prevent serious foot trouble, break in your shoes prior to wearing them on any mission, wash and massage your feet daily, trim your toenails straight across, and check your feet for blisters. If you get a blister, do not open it. An intact blister is safe from infection. Apply a dressing around the blister, not on it. If the blister bursts, clean it and apply a bandage over it.
- (9) Check body regularly for lice, fleas, ticks, etc. Pick them off and kill them. Do not eat. Use a smoky fire to fumigate your clothing and equipment.

(10) All water obtained from natural sources should be purified.

(11) Keep flies and other vermin off your food and drink.

**Notes**

i. Survival Kit. The items listed below are suggested for all survival kits:

Food packet	Small compass
Tea packet	Knife
Snare wire	Water purification tablets
Waterproofed matches	Signaling device (Mirror)
Plastic spoon	Razor blade
Water bag (Condom)	Tweezers
Safety pins	Surgical tubing
Fish hooks	Container
Fishing line	Magnesium bar
550 Cord	Cyalume Lightstick

## 2. **EVASION:**

a. Basic principles. Evasion may require living in the open for extended periods of time and traveling on foot over difficult terrain, often during inclement weather. A knowledge of survival techniques is essential. Successful evasion depends primarily upon the ability to:

- (1) Prepare a detailed plan to include:
  - (a) Evading the enemy.
  - (b) Survival.
  - (c) Returning to friendly territory.
- (2) Observe the elementary rules of movement, camouflage, and concealment.
- (3) Take your time; hurrying while traveling increases weariness and decreases alertness. Patience, preparation, and determination are key words in evasion. Be confident, but careful.
- (4) Conserve food.

(5) Conserve as much strength as possible for critical periods.

(6) Rest and sleep as much as possible.

b. Short-Range Evasion:

(1) Short-range evasion generally is conducted relatively near friendly areas as a result of isolation of units or individuals who are separated or lost from their parent unit.

(2) When a unit becomes isolated, some courses of action to be considered are:

(a) Continue the mission.

(b) Defense of present position.

(c) Breakout to areas under friendly control.

(d) Evasion by exfiltration.

(e) Combination of any of the above.

c. Long-Range Evasion:

(1) Long-range evasion differs from short-range evasion in several aspects:

(a) Distance from friendly forces is greater, ranging from hundreds to even thousands of miles.

(b) The will to survive and the knowledge of survival techniques become more important.

(c) Conditions such as travel restrictions, security checks, and border crossing are more likely.

(d) Supply economy will have to be planned and practiced. Items such as boots, clothing, and supplies must be cared for to assure maximum usage.

(2) In long-range evasion, make a careful, deliberate analysis of every possible course of action before abandoning the relative security of one position for another. It is possible that the enemy may be aware of your existence and has probably initiated actions to capture you.

- (3) Knowledge that you may have to travel hundreds of miles over a period of many months may be discouraging. Therefore, a strong will to survive, together with an ability to withstand hardships and overcome obstacles, are mandatory.
- (4) The determination to survive must be maintained at times by sheer will power, and it should be recognized that many of the obstacles to be overcome are mental rather than physical.
- (5) Courses of action available to the long-range evader are:
  - (a) Evasion by exfiltration
  - (b) Evasion by deception
  - (c) Combination of the above

**Notes**

**3. RESISTANCE.** The first line of defense against interrogation and later indoctrination is military bearing, silence, and trust in yourself, your Army, your country, and your Religion. The following points will help in resisting enemy interrogation:

- a. Give only name, rank, service number, and date of birth.
- b. Be respectful during interrogation, but do not give the impression of willingness to cooperate through "politeness." Such an idea, once planted in the mind of the enemy, may prolong the interrogation.
- c. Act ignorant of having information which may be useful to the enemy.
- d. Beware of "stool pigeons" and prison camp medical personnel who may be used extensively to collect information.
- e. Knowledge of the enemy's language will increase chances of a successful escape. Neither disclose nor admit this ability during interrogation.
- f. Do not believe statements by the enemy that other prisoners have talked. This is a common interrogation procedure to catch you off guard and to encourage you to talk.
- g. Avoid looking the interrogator directly in the eye. This may reveal information without a direct answer. Pick out a spot between the interrogator's eyes or on his forehead and concentrate on it.
- h. While being interrogated, be courteous but firm in refusal to give information. Salute all officer interrogators senior to you.
- i. Never give information about other prisoners. If the name of a fellow prisoner is mentioned during interrogation, report the name and circumstances about the enemy's interest to your superior; this individual may be under surveillance and will, in turn, be interrogated about your conversation.
- j. Beware of the temptation to impress interrogators by boasting of exploits either true or invented.
- k. Do not be tricked into filling out innocent looking questionnaires or writing statements which require more than name, rank, service number, and date of birth.
- l. Do not attempt to deceive the enemy by volunteering false information. A skilled interrogator will be able to extract the information he needs once you start talking on the subject.

m. Set up and maintain a way of communicating with fellow prisoners.

**4. ESCAPE.** If captured, you must make every effort to develop and execute a plan of escape. Always remain alert to all escape opportunities, because each one may be the last. It is your duty to attempt to escape as soon after capture as possible. Chances of successful escape are greater at that time as the following factors work to your advantage:

- a. At the time of capture, you will be closer to friendly lines than at any other time while in custody; you will be oriented as to direction; and will know where friendly forces are located. If not injured, you are in better physical condition at this point than you will be while in custody.
- b. Because enemy personnel in the forward combat zone generally are not as well trained as regular prisoner guards, many opportunities for escape will exist. The danger of being shot by a guard immediately after capture, however, is greater in the forward combat zone because combat troops are keyed to battle pitch and may shoot at the slightest provocation.

In a prisoner of war camp, the prisoner covert organization has an important role in any escape attempt. The covert organization is discussed in more detail in FM 21-77. The techniques to be utilized in an escape depend largely on the particular conditions of captivity. It is unlikely that you can succeed by your own efforts alone. For the escape to succeed diversions usually must be planned; ladders may have to be provided, then whisked away and disposed of; and numerous escape items such as documents, money, compasses, and food may be required. Providing these is an important function of the EPW covert organization.

5. **CODE OF CONDUCT** For Members of the Armed Forces of the United States:

- a. I am an American, fighting in the forces which guard my country and our way of life. I am prepared to give my life in their defense.
- b. I will never surrender of my own free will. If in command, I will never surrender the members of my command while they still have the means to resist.
- c. If I am captured, I will continue to resist by all means available. I will make every effort to escape and aid others to escape. I will accept neither parole nor special favors from the enemy.
- d. If I become a prisoner of war I will keep faith with my fellow prisoners. I will give no information or take part in any action which might be harmful to my comrades. If I am senior, I will take command. If not, I will obey the lawful orders of those appointed over me and will back them up in every way.
- e. When questioned, should I become a prisoner of war, I am required to give name, rank, service number and date of birth. I will evade further questions to the utmost of my availability. I will make no oral or written statements disloyal to my country and its allies or harmful to their causes.
- f. I will never forget that I am an American, fighting for freedom, responsible for my actions and dedicated to the principles which made my country free. I will trust in my God and in the United States of America.

**6. CODES:**

## a. EPW Tap Code:

- (1) Tap down the A-F-L-Q-V Column to the row with the desired letter.
- (2) Tap Across the row to the desired letter.
- (3) Use the letter C in place of K

A	B	C/K	D	E
F	G	H	I	J
L	M	N	O	P
Q	R	S	T	U
V	W	X	Y	Z

- (4) An aid to easily remembering the tap code is to memorize the F-L-Q-V column. When receiving the letter "D" for example, you should hear A with the first set of taps, and hear across the "A" row, A - B - C - D, you have the letter "D".

EXAMPLE: 'D' = A pause A-B-C-D  
 'H' = A-F PAUSE F-G-H  
 'Q' = A-F-L-Q PAUSE Q

- (5) The tap code can be used orally, visually, or by mouth. Sweeping with a broom, chopping wood, whistling, playing musical instruments, etc.

"Remember A-F-L-Q-V"

- (6) When using the tap code, numbers are sent by a slow tapping until the number desired is reached.  
 (Example: 36 = ... ..)  
 (Longer pauses must be used)  
 (Zero is sent as the letter "O" ... ..)

b. Sign Language:

## PW HAND LANGUAGE

For Training Use Only

A	B	C	D	E
F	G	H	I	J
K	L	M	N	O
P	Q	R	S	T
U	V	W	X	Y
Z				

NUMBERS ARE SENT BY WAVING FINGERS AS FOLLOWS:



### Notes

## **CHAPTER THIRTEEN**

### **MISCELLANEOUS**

#### **1. NAVIGATION:**

##### a. Orient a Map:

##### (1) Compass:

- (a) Determine the direction of the declination and its value from the declination diagram.
- (b) Using any north-south grid line on the map as a base, draw a magnetic azimuth equal to the G-M angle given in the declination diagram with the protractor.
- (c) If the declination is easterly (right), the drawn line is equal to the value of the G-M angle. Align the straightedge, which is on the left side of the compass, alongside the drawn line on the map. Rotate the map and compass until the magnetic arrow of the compass is below the fixed black index line. The map is now oriented.
- (d) If the declination is westerly (left), the drawn line will equal 360 degrees minus the value of the G-M angle. Align the straightedge, which is on the left side of the compass, alongside the drawn line on the map. Rotate the map and compass until the magnetic arrow of the compass is below the fixed black index line. The map is now oriented.

(2) Terrain Association: A map can be oriented by terrain association when a compass is not available or when the user has to make many quick references as he moves across country. Using this method requires careful examination of the map and the ground, and the user must know his approximate location. Orient the map by:

- (a) Using the contour lines.
- (b) Matching the terrain features.
- (c) Matching man made features.

b. Measure Distance:

- (1) Graphic (Bar) Scales. When using the graphic scale, be sure to use the correct scale for unit of measurement desired.
- (2) Pace Count. When figuring your pace count, walk a pace course over similar terrain that you will be walking over during a patrol. Keep track of your pace count by putting a pebble in your pocket or tying a knot in a string for every 100 meters traveled.
- (3) Odometer. To quickly convert kilometers to miles, remember "six times clicks." To convert miles to kilometers, remember miles divided by six.
- (4) Estimation:
  - (a) Visualize the distance in 100 meters increments. A good training technique is to require soldiers to pace the range after he has estimated the distance.
  - (b) Flash to Bang Method. Count the number of seconds between the flash of a weapon to its sound. Multiply the number of seconds by 330 meters to get the approximate range.

c. Back Azimuth:

- (1) If your azimuth is less than 180, add 180 to get the back azimuth.
- (2) If your azimuth is greater than 180, subtract 180 to get the back azimuth.
- (3) An expedient method at night to get a back azimuth is to simply turn the compass around.

d. Convert Azimuth:

- (1) To convert from grid to magnetic on an east GM angle, subtract.
- (2) To convert from magnetic to grid on an east GM angle, add.
- (3) To convert from grid to magnetic on a west GM angle, add.
- (4) To convert from magnetic to grid on a west GM angle, subtract.

e. Contour Line:

- (1) Index line. Every fifth line is heavier and numbered.

- (2) Intermediate line. Four solid lines between the index lines.
- (3) Supplementary line. Broken line which shows sudden changes in elevation of at least one half the contour interval.
- (4) To determine the elevation of a hilltop, add one half the contour interval.
- (5) To estimate the elevation to the bottom of a depression, subtract one half the contour interval from the value of the lowest contour line before the depression.
- (6) If a point is less than one fourth the distance between contour lines the elevation will be the same as the last contour line.
- (7) To estimate the elevation of a point between one fourth and three fourths of the distance between contour lines, add one half the contour interval to the last contour line.
- (8) A point located more than three fourths of the distance between contour lines is considered to be at the same elevation as the next contour line.

f. Intersection- Used to find an unknown point from two known points.

- (1) Orient the map using a compass.
- (2) Locate and mark your position on the map.
- (3) Determine the magnetic azimuth to the unknown position using the compass.
- (4) Convert the magnetic azimuth to the grid azimuth.
- (5) Draw a line on the map from your position on this grid azimuth.
- (6) Move to a second known point and repeat steps 1 through 5.
- (7) The location of the unknown position is where the lines cross on the map. Determine grid coordinates to the desired accuracy.

g. Resection- Used to find your location from two or more known points.

- (1) Orient the map using a compass.
- (2) Identify two or three known distant locations on the ground and mark them on your map.

- (3) Measure the magnetic azimuth to the known position from your location using a compass.
- (4) Convert the magnetic azimuth to a grid azimuth.
- (5) Convert the grid azimuth to a back azimuth.
- (6) Repeat 3, 4, and 5 for a second position and a third position, if desired.
- (7) The intersecting lines is your location. Determine the grid coordinates to the desired accuracy.

h. Equipment:

(1) Maps:

- (a) Planimetric map- Does not show relief
- (b) Topographic map
- (c) Photomap
- (d) Joint Operations Graphics- These are a series of 1:250,000 scale military maps designed for joint ground and air operations
- (e) Photomosaic- Assembly of aerial photographs
- (f) Terrain model
- (g) Military city map- 1:5,000 to 1:25,000 scale topographic map of a city
- (h) Special maps- Designed or modified to give information not covered on a standard map

(2) Military Map Substitutes:

- (a) Foreign Maps- Must change the marginal information and grids to conform to our standards
- (b) Atlases
- (c) Geographic maps

(d) Road tourist maps

(e) City/utility maps

(f) Field sketches

(3) Compasses:

(a) Lensatic

(b) Artillery- M-2 Compass

(c) Wrist/pocket

(d) Protractor- Only grid azimuths are obtained on a map

## 2. NBC

a. U.S. Policy:

<u>TYPE</u>	<u>USE</u>	<u>1ST USE AUTHORITY</u>
Nuclear	We will use first if need be	Presidential
Biological	We will never use	N/A
Chemical	We will use only after enemy first uses	Presidential
Herbicides	We will use under special conditions	Presidential
Riot Control	We will use under special conditions.	Presidential

b. Soviet Policy:

<u>TYPE</u>	<u>USE</u>	<u>1ST USE AUTHORITY</u>
Nuclear	Will use first if need be	Highest level of government
Biological includes toxins	Will use first if need be	Highest level of government

Chemical

Will use first if  
need beHighest level of  
government

## c. NBC Reports:

LINE	NUCLEAR	CHEMICAL/BIOLOGICAL	REMARKS
NBC 1 Report - Observer's Initial Report			
B	Location of observer	Location of observer	Use coordinates (UTM or place)
C	Direction of attack from observer	Direction of attack from observer	Direction measured clockwise from grid north in degrees or mils (state which)
D	Date-Time of Detonation	Date-Time for start of attack	Use Zulu time
E	Illumination Time (sec)	Date-Time for end of attack	Use Zulu time
F	Location of area attacked	Location of area attacked	Use grid coordinates (or place). State whether location is actual or estimated.
G	Means of delivery	Kind of attack	State whether attack was by artillery, mortars, rockets, missiles, bombs, or spray.
H	Type of burst	Type of agent/ type of burst/ persistency: P(Persistent) NP(non-persistent)	Specify air, surface, unknown for nuclear. State whether ground, air burst, or spray for chemical.
J	Flash-to-Bang time	N/A	Use seconds.
L	Cloud width at H+5 min	N/A	State whether measured in degrees or mils.
M	Stabilized cloud top or bottom angle or cloud top or bottom height at H+1 min	Enemy action before and after attack. Effect on troops.	Nuclear - state whether angle is cloud top or bottom and whether measured in degrees or mils. State whether height is cloud top or bottom and whether measured in meters or feet.
NBC 3 Report - Warning of Predicted Contamination Report			
A	Strike serial number	Strike serial number	Assigned by NBC center

D	Date-Time of detonation	Date-time group for start of attack	Use Zulu time
F	Location of area attacked	Location of area attacked	Use grid coordinates or place. State whether location is actual or estimated.
H	Type of burst	Type of agent/ Type of burst/ persistency, P(persistent) NP(non-persistent)	Specify air, surface, or unknown for nuclear. State whether ground, airburst, or spray for chemical.
N	Estimated yield	N/A	Sent as KT (kilotons)
PA	Coordinates of external contours of radioactive cloud	Predicted hazard area (coordinates)	Chemical - if wind speed is 10 Km/hr or less, this item is 010 (the radius of the hazard area in Km)
PB	Effective down wind direction from which the wind is blowing.	Duration of hazard in attack and hazard areas	Nuclear - state whether direction is in degrees magnetic or mils. Chemical in days.
Y	Direction of left and right radial lines.	Downwind direction of hazard and wind speed	Nuclear - direction measured clockwise from GN to the left and then to the right radial lines (degrees or mils) four digits each. Chemical - Direction: four digits (degrees or mils). Wind speed: three digits Km/hr or knots).
Z	Effective wind speed.  Downwind distance of Zone I. Cloud radius.	N/A	Three digits - effective wind speed (Km/hr or knots). Three digits - downwind distance of Zone I (Km or nautical miles). If wind speed is less than eight Km/hr this line contains only the three digit radius of Zone I.
ZA	N/A	Significant weather phenomena.	Air stability (one digit). Temperature in centigrade (two digits). Humidity (one digit). Significant weather phenomena (one digit).
ZI	Effective downwind speed. Downwind distance of Zone I. Downwind distance cloud	N/A	Three digits effective wind speed (Km/hr). Four digits downwind distance of Zone I (hundreds of meters). Four digits downwind distance of Zone II (hundreds of meters). Three digits - cloud radius

	radius		(hundreds of meters).
NBC 4 Report - Monitoring and Survey Report			
H	Type of burst	Type of agent/ Type of burst/ persistency, P(persistent), NP(non-persistent)	Specify air, surface, or unknown for nuclear. State whether ground, airburst, or spray attack for chemical.
Q	Location of reading	Location of sampling and type of sample.	UTM or place. Chemical - state whether the test was vapor or liquid.
R	Dose rate or actual value of decay exponent	N/A	State in cGyph
S	Date-time of reading	Date-time contamination detected	State time initial identification test sample or reading was taken.

d. MOPP Levels:

MOPP Level	Overgarment	Overboots	Mask/Hood	Gloves
0	Readily Available	Readily Available	Carried	Readily Available
1	Worn*	Carried	Carried	Carried
2	Worn*	Worn	Carried	Carried
3	Worn*	Worn	Worn*	Carried
4	Worn Closed	Worn	Worn Closed	Worn

\* Overgarment and/or hood is worn open or closed depending on the temperature.

g. Decontamination Techniques:

- (1) Chemical- Agent Decontamination Of Soldiers And Individual Equipment.  
Use the M258A1 skin decontaminating kit to decontaminate your skin, individual weapons, and equipment. Instructions for the use of the kit are printed on its container. This kit is especially made for skin decontamination; however, you may use it to decontaminate some personal equipment such as your rifle, mask, and gloves.
- (2) Chemical - Agent Decontamination Of Unit Equipment.
  - (a) Decontaminate key weapons with DS2 decontaminating solution, soapy water, solvents, or slurry. After decontamination, disassemble weapons and wash, rinse, and oil them to prevent corrosion. Decontaminate ammunition with DS2 solution, wipe with gasoline-soaked rags, and then dry it. If DS2 is not available, wash ammunition in cool, soapy water, then dry it thoroughly.
  - (b) Decontaminate optical instruments by blotting them with rags, wiping with lens cleaning solvent, and then letting them dry.
  - (c) Decontaminate communications equipment by airing, weathering, or hot air (if available).
- (3) Biological- Agent Decontamination:
  - (a) Decontaminate your body by showering with soap and how water. Use germicide soap, if available. Clean your nails thoroughly and scrub the hairy parts of your body. Wash contaminated clothing in

hot, soapy water if it cannot be sent to a field laundry for decontamination. Cotton items may be boiled.

(b) Wash vehicles with soapy water (preferably hot). If possible, steam-clean them using detergent.

(c) Wash equipment in hot, soapy water and let it air dry.

(4) Field Expedient Decontamination.

DECONTAMINATE	USE	REMARKS	CAUTIONS
Water	N, B, C	Flush contamination from surface with large amounts of water.	Effective in physically removing contamination, but does not neutralize the contamination.
Steam	N, B, C	The use of steam accompanied by scrubbing is more effective than the use of steam alone.	Effective in physically removing contamination, however it may not be neutralized.
Absorbents (Earth, sawdust, ashes, rags, similar materials)	C	Used to physically remove gross contamination from surfaces.	The contamination is transferred from the surface to the absorbent then becomes contaminated and must be disposed of accordingly. Sufficient contamination to produce casualties may well remain on surfaces.

### **3. HAND-TO-HAND COMBAT:**

a. Fighting stance.

b. Falls:

(1) Basic, left/right/rear.

(2) Advanced, left/right/rear.

c. Punches:

(1) Front

(2) Heel of palm

(3) Knife edge

(4) Extended knuckle

(5) Solar plexus straight in/upward

(6) Elbow upward/rear

(7) Forearm sweep forward/rearward

d. Blocks:

(1) Front/right/left

(2) Upward/right/left

(3) Downward/right/left

(4) Upward cross

(5) Downward cross

e. Kicks:

(1) Front

(2) Side

(3) Rear

(4) Upward sweep

(5) Downward sweep

f. Take Downs:

(1) Cross lock

(2) Rear

(3) Front leg

(4) Hip throw

(5) Shoulder

(6) Over the shoulder

(7) Over the rear (sitting)

(8) Charging take down (sitting)

**Notes**

**4. RECON, SURVEILLANCE, TARGET ACQUISITION (RSTA) DEVICES:**

a. Binoculars.

b. Imaging Devices:

TYPE	USE	RANGE	WEIGHT	REMARKS
<b>IMAGE INTENSIFICATION DEVICES (Starlight scopes)</b>				
AN/PVS-2	M-16, M-60	400 m Moonlight 300 m Starlight	6.0 lb.	
AN/PVS-4	M-14, M-16, M-60, M72A1, M203	600 m Moonlight 400 m Starlight	3.7 lb.	Replaces AN/PVS-2
AN/TVS-2	.50 CAL, Tripod mount	1000 m Moonlight 800 m Starlight	15.0 lb.	
AN/TVS-5	.50 CAL, 106mm Recoilless	1200 m Moonlight 1000 m Starlight	7.7 lb.	Replaces AN/TVS-2
AN/TVS-4	Tripod mount	2000 m Moonlight 1200 m Starlight	34.0 lb.	Medium range night observation device
AN/PVS-5	Facial	150 m	1.9 lb.	Night vision goggles
<b>THERMAL IMAGERY DEVICES (Penetrates fog, smoke, dust, light, foliage, and darkness)</b>				
AN/TAS-5	Dragon	2000 m Target detection 1200 m Target recognition		Dragon night tracker
AN/TAS-6	Tripod	3500 m Target detection 3000 m Target recognition	48.0 lb.	Long range night observation device
AN/PAS-7	Handheld	400 m Troop detection 1000 m Vehicle recognition	12.0 lb.	Also detect mines and booby traps

d. PEWS- The AN/TRS-2 Platoon Early Warning System (PEWS) is a remote electromagnetic sensor (REMS). The PEWS has 10 ground-implanted sensors.

13-14

They transmit a radio or wire signal to a receiving set that indicates movement in the area and which sensor is reporting. Each sensor can detect targets up to 15M from the sensor location. Its signal can be transmitted 1,500M. Replaced the patrol seismic intrusion device (PSID).

**Notes:**

## 5. CONVERSION FACTORS:

<u>TO CHANGE</u>	<u>TO</u>	<u>MULTIPLY BY</u>
Inches	Centimeters	2.540
Feet	Meters	0.305
Yards	Meters	0.914
Miles	Kilometers	1.609
Square Inches	Square Centimeters	6.451
Square Feet	Square Meters	0.093
Square Yards	Square Meters	0.836
Square Miles	Square Kilometer	2.590
Acres	Square Hectometers	0.405
Cubic Feet	Cubic Meters	0.028
Cubic Yards	Cubic Meters	0.765
Fluid Ounces	Milliliters	29.573
Pints	Liters	0.473
Quarts	Liters	0.946
Gallons	Liters	3.785
Ounces	Grams	28.349
Pounds	Kilograms	0.454
Short Tons	Metric Tons	0.907
Pound-Feet	Newton-Meters	1.365
Pound-Inches	Newton-Meters	0.11375
Ounce-Inches	Newton Meters	0.007062
Centimeters	Inches	3.94
Meters	Feet	3.280
Meters	Yards	1.094
Kilometers	Miles	0.621
Square Centimeters	Square Inches	0.155
Square Meters	Square Feet	10.764
Square Meters	Square Yards	1.196
Square Kilometers	Square Miles	0.386
Square Hectometers	Acres	2.471
Cubic Meters	Cubic Feet	35.315
Cubic Meters	Cubic Yards	1.308
Milliliters	Fluid Ounces	0.034
Liters	Pints	2.113
Liters	Quarts	1.057
Liters	Gallons	0.264
Grams	Ounces	0.035
Kilograms	Pounds	2.205
Metric Tons	Short Tons	1.102

**6. WEIGHTS OF COMMON ITEMS:**

<u>ITEM</u>	<u>QUANTITY</u>	<u>WEIGHT (LB.)</u>
C-Rations	Case (12 Meals)	25
Water	5 Gallons	55
Water	250 Gallon Drum	2,550
Sandbags (Empty)	2,000 Each	660
Barbed Wire	25 Meters	33
Concertina	25 Meters	92.5
Cartridge, 40-mm, M79	6 Round Bandoleer	3
Cartridge, 7.62-mm Ball, Cartons	920 Rounds	75
Cartridge, 7.62-mm Ball, MLB	800 Rounds	68.5
Hand Grenades, Frag, MK II	25 Each	50
Machine-Gun, M60	Each	25
Mine, AP, M16	Each	8.25
Mine, AP, M18 Complete	Each	6.8
Mine, AT, M21	Each	18
Rifle, M16, w/20 Round Magazine	Each	7.6
Machine-Gun, .50 Cal, w/Tripod	Each	128
Radio, PRC-77, Complete	Each	24.7
Gasoline	55 Gallon Drum	404
Diesel	55 Gallon Drum	457
MOGAS	55 Gallon Drum	420
Lube Oil	55 Gallon Drum	479
Combat Troop Fully Loaded	Each	240
Trailer, Tank, Water, 400 Gal M149	Each Full	6,070
	Each Empty	2,900

## 7. TRICKS OF THE TRADE:

- a. Use a boat pump to pump out excess air when waterproofing equipment and packing your rucksack.
- b. Place wet socks down your pants or in your shirt to dry them out.
- c. Use a religion on your dog tags even if you have no preference. Certain Middle East countries view "no preference" as inhuman and kill you outright if captured.
- d. All personnel should wear loose-fitting clothing on field operation. Tight fitting clothing often tears or rips allowing easy access to exposed parts of the body for insects and leeches.
- e. Sprinkle CS powder on trash and garbage prior to burying to prevent animals from digging them up.
- f. The last couple of rounds in a magazine should be tracer to indicate to the firer that he will have to reload.
- g. Tape or remove all sling swivels on weapons to aid in noise discipline.
- h. Place magazines upside down with the bullets pointing away from your body in ammo pouches. This keeps dirt and water out of them and if rounds go off due to enemy fire, you will not be injured by your own ammo.
- i. Tape all snaps and buckles on your LBE.
- j. Canteen covers may be used to carry magazines. They hold more and are easier to open.
- k. Dummy cord everything.
- l. Tape grenade rings with paper tape. This keeps the ring open for your finger, stops noise, prevents snagging, and the paper tape will tear for fast use.
- m. Do not carry grenades on the upper portion of your harness because the enemy will shoot at them.
- n. Always use the water from your rucksack before using the water from your LBE. This will ensure a supply of water should you lose your rucksack.
- o. Use pencil to make notes during an operation. Ink smears when it becomes wet.

- p. Keep uniformity throughout the patrol in carrying equipment on your person, configuring your LBE and packing your rucksack. This ensures that important equipment will be quickly found on everyone and everything during limited visibility.
- q. Never take your LBE off.
- r. Change socks one foot at a time. Never take both boots off at the same time.
- s. Do not throw away dead or weak batteries. Small batteries can be recharged by placing them in arm pits or between the legs of the body. A larger battery can gain life by sleeping with the battery next to the body. Additional life can also be gained by placing batteries in the sun.
- t. If the sun is obscured by clouds, you can still signal an aircraft by placing your strobe light against your signal mirror.
- u. Do not send radio transmission from a patrol base.
- v. Claymores should be emplaced so that the blast parallels the patrol, ensuring that the firing wire does not lead straight back to the patrol's position. This way, if the enemy turns the claymore around, they will not point at the team.
- w. Cache your rucksack in the straps up position for faster and easier recovery prior to moving into an ambush position.

## Notes

## **CHAPTER FOURTEEN**

### **BATTLE DRILLS**

#### **1. CONDUCT A POINT/AREA RECON:**

##### a. Teams required:

###### (1) Left Recon & Security (R & S) Team:

(a) Team Leader: Number 1 man (Patrol Leader)

(b) Recorder: Number 2 man (PLs RTO) (Engineer unit)

(c) Security: Number 3 and Number 4 men (Maneuver unit)(Only take #4 if required by METT-T)

###### (2) Right Recon & Security (R & S) Team:

(a) Team Leader: Number 1 man (Engineer unit)

(b) Recorder: Number 2 man (RTO) (Engineer unit)

(c) Security: Number 3 and Number 4 men (Maneuver unit)(Only take #4 if required by METT-T)

##### b. Equipment needed: (per team)

(1) Binoculars/Night observation device

(2) 1 Set, sketch material

(3) 1 Each, camera with appropriate film and lenses

(4) 1 Each, AT-4 or LAW in case of compromise

##### c. Procedures:

(1) Patrol halts short of the objective and occupies a security perimeter (Tentative ORP)

- (2) PL conducts a leaders' recon of the objective with his R & S Team Leader and Surveillance Team and emplaces surveillance once the objective is pinpointed.
- (3) The PL establishes a release point out of sight and sound of the OBJ.
- (4) PL confirms the objective, defines a limit of advance, and returns to the ORP.
- (5) The R & S Teams move out to recon the objective using the fan method or the surveillance/vantage point method.
- (6) Number 1 Man gathers PIR using a SALUTE Report and passes it to the recorder (Number 2 man).
- (7) Number 2 man records all information, draws sketches, and photographs the area as appropriate.
- (8) Number 3 And Number 4 men provide local security.
- (9) R & S Teams complete recon and move back to the release point to compare notes (conduct additional reconnaissance if needed).
- (10) R & S Teams return to the ORP.
- (11) In the ORP, a detailed sketch of the objective is made and the information is disseminated throughout the patrol.
- (12) If the recon was compromised, the patrol moves one terrain feature or 1000 meters away to disseminate the information.
- (13) The PL gets an ACE Report and the patrol moves out.

**\*NOTE: Ensure special instructions with hard targets are given to the Surveillance in case the R&S TMs are compromised.**

## **2. CONDUCT A ZONE RECON:**

### a. Teams required:

- (1) Recon & Security (R & S) Team: as required per method.
  - (a) Team Leader: Number 1 man (Engineer unit)
  - (b) Recorder: Number 2 man (Engineer unit)
  - (c) Security: Number 3 and Number 4 men (Maneuver unit)
- (2) ORP Security: as required per method (Maneuver unit)

### b. Equipment needed: (per team)

- (1) Binoculars/Night observation device.
- (2) 1 Set, sketch material.
- (3) 1 Each, camera with appropriate film and lenses.
- (4) 1 Each, map and compass.

### c. Procedures:

- (1) Patrol halts short of the zone and occupies a security perimeter (Tentative ORP).
- (2) PL selects a series of ORPs or rendezvous points throughout the zone.
- (3) The patrol moves tactically to the first ORP.
- (4) PL selects recon routes out from and back to the ORP using the fan method and sends out the R & S Teams along the routes. (PL may also choose to use the converging routes method or successive sector method to recon the zone depending on METT-T.)
- (5) Number 1 man gathers PIR using a SALUTE report and passes it to the recorder (Number 2 man).

14-4

- (6) Number 2 man records all information, draws sketches of significant items of interest, and photographs the area as appropriate.
- (7) Number 3 and Number 4 men provide local security.
- (8) After the entire fan/area has been reconnoitered, the information is disseminated throughout the patrol in the ORP.
- (9) The patrol moves out to the next ORP/rendezvous point and repeats the procedure until the zone has been reconnoitered.
- (10) If the recon was compromised, the patrol moves one terrain feature or 1000 meters away to disseminate the information and continue the mission depending on METT-T.
- (11) Once the mission is complete, PL gets an ACE Report and the patrol moves out.

**Notes**

### **3. CONDUCT A ROUTE RECON FOR OBSTACLES:**

#### a. Teams required:

R & S Teams: (as required)

(a) Recon specialists: 2 men (Engineer unit)

(b) Security Team: 2 men (Maneuver unit)

(c) RTO (Engineer unit)

(d) Team Leader (Engineer unit)

#### b. Equipment needed: (per element)

(1) Binoculars

(2) Night observation devices

(3) Compass

(4) Map

(5) FM Radio

(6) DA Form 1711-R

(7) DA Form 1248

(8) Camera with appropriate film and lenses

(9) Sketch material

#### c. Procedure:

(1) Patrol halts short of the route to be reconned and occupies a security perimeter (Tentative ORP).

(2) PL conducts a leaders' recon to confirm his location taking his R & S Team Leaders with him.

(3) Prepare equipment and individuals for the recon in the ORP.

14-6

- (4) PL sends out R & S Teams, one on each side of the route. Teams conduct the recon using the staggered fan method. (Other methods may be used as situation dictates.)
- (5) As the R & S Team comes upon an obstacle, local left and right security is emplaced while the recon specialists record the information.
- (6) Upon completion of the recon, the R & S Teams return to the ORP by a different route, ensuring they are not followed. Notes are consolidated and DA Form 1711-R and DA Form 1248 are completed. All information is disseminated throughout the patrol.
- (7) If the recon was compromised, the patrol moves one terrain feature or 1000 meters away to disseminate the information.
- (8) The PL gets an ACE Report and the patrol moves out.

**Notes**

#### **4. CONDUCT A ROUTE CLEARING OPERATION:**

a. Teams required:

- (1) Sweep Teams- 2 each (Engineer unit)
  - (a) Mine detector operators- Number 1 and Number 7 men
  - (b) Marker/Prober: Number 2 man
  - (c) Team Leader: Number 3 man
  - (d) Demo Team: Number 4 and Number 5 men
  - (e) RTO: Number 6 man
  - (f) Security: Number 8 man
- (2) Obstacle Clearing Team: as required to clear obstacles (Engineer unit)
- (3) Flank Security: as required depending on situation. (Maneuver unit)
- (4) Perimeter Security: 2 men (Maneuver unit)

b. Equipment needed:

- (1) AN-PSS-11/AN-PRS-7 (two per sweep Team)
- (2) 1 each, probe per man
- (3) 1 each, body armor per man
- (4) Mine marking device (as required)
- (5) Engineer tape/assorted chem lights (as required)
- (6) Grappling hook with 150 foot wire (one per clearing Team)
- (7) Wire cutters (minimum two per sweep/Clearing Team)
- (8) Assault mine breaching charges (as required)

- (9) Demolitions and accessories (as required)
- (10) Demo kit/bag (one per team)
- (11) Vehicle (2½ ton or larger)
- (12) Sand bags (as required)
- (13) Engineer hand tools (as required)

c. Procedure:

- (1) Patrol halts short of the route to be cleared and occupies a security perimeter (Tentative ORP).
- (2) PL conducts a leaders' recon to verify his location, taking his sweep, obstacle clearing, and Security Team Leaders with him.
- (3) PL verifies the routes location.
- (4) Prepare equipment and individuals for the clearing operation in the ORP. All non-essential equipment remains in the ORP with the ORP Security Team.
- (5) Sweep Teams and Flank Security Teams move out to the route.
- (6) Obstacle Clearing Team follows.
- (7) Sweep Teams clear the route (switch mine detector operators every 20 minutes).
- (8) Mines are marked. Remove mines by blowing in place or using grappling hooks to pull off of the route.
- (9) Flank Security parallels Sweep Teams at safe distance.
- (10) If an obstacle is encountered (i.e., log crib, etc.) Call obstacle Team forward to neutralize.
- (11) Once route has been swept, have it proofed by sandbagged vehicle or tank roller, if available.
- (12) Mark cleared route and report to higher headquarters, as required.

(13) PL gets an ACE Report and the patrol moves out.

**5. BRIDGE RECON:**

a. Teams required:

(1) Bridge Recon Team: (Engineer unit)

(a) Bridge Recon (Bottom): Number 1, 2, and 3 man

(b) Bridge Recon/Security (Top): Number 4, 5, and 6 man

(c) Team Leader: Number 7 man

(2) Security Team: (Maneuver unit)

(a) Far Side Security (Left and Right): 4 men

(b) Near Side Security (Left and Right): 4 men

(c) Team Leader

b. Equipment required:

(1) 4 each, DA Form 1249 (Bridge Recon Report)

(2) 4 each, DA Form 2203-R (Demolition Recon Report)

(3) 2 each, 100 foot tape measure

(4) Binoculars/Night observation device

(5) Camera with film and lens

(6) Compass

(7) 3-man recon boat, if required.

c. Procedure:

(1) Patrol halts short of the bridge and occupies a security perimeter (Tentative ORP)

- (2) PL conducts a leaders' recon of the bridge site with the Bridge Recon and Security Team Leaders and the Surveillance Team. PL pinpoints objective and emplaces surveillance.
- (3) PL confirms bridge location.
- (4) Security Team Leader places Near and Far Side Security.
- (5) Bridge Recon Team moves to site.
- (6) Number 1 and 2 man (Bridge Recon - Bottom) gather required information and pass it to the Number 3 man who records the information.
- (7) Number 4 and 5 man (Bridge Recon/Security - Top) gather required information and pass it to the Number 6 man who records the information. Also provides local security.
- (8) Number 7 man provides command and control.
- (9) When the recon is complete, all teams are recovered. (Sec Teams return on their own as per OPORD)
- (10) DA Form 1249 and DA Form 2203-R are completed in the ORP and the information is disseminated throughout the patrol. If the patrol is compromised, move one terrain feature or 1000 meters to disseminate the information and complete.
- (11) PL receives an ACE REP and continues mission.

**6. EMPLOY A HASTY PROTECTIVE MINEFIELD:**

a. Teams required:

- (1) Mine Laying Team: (Engineer unit)
  - (a) Arming/Fusing: 2 men
  - (b) Digging/Burying/Camouflage: 2 men
  - (c) Team Leader
- (2) Recording Team: 2 men (Engineer unit)
- (3) Security Team: (Maneuver unit)
  - (a) Left and Right Side: 4 men
  - (b) Team Leader

b. Equipment needed: (per minefield)

- (1) AT and AP Mines with fuses as required
- (2) DA Form 1355-1-R
- (3) Body armor: 1 per soldier
- (4) Tripwire: 110 feet
- (5) Binoculars/Night observation devices
- (6) Map: 1:50,000
- (7) Compass, lensatic
- (8) Entrenching tool: as required
- (9) Machete: as required

c. Procedure:

- (1) Patrol halts short of the minefield location and occupies a security perimeter (Tentative ORP).
- (2) PL conducts a leaders' recon of the minefield site with his Mine Laying, Recording, and Security Team Leaders.
- (3) PL confirms the minefield site and determines the number of mines by type needed (based on the expected threat).
- (4) Mine Laying Team prepares mines and equipment for the minefield in the ORP.
- (5) PL submits report of intention to higher.
- (6) Security Team Leader emplaces Left and Right Security.
- (7) Mine Laying and Recording Teams move to minefield site.
- (8) PL establishes a landmark and sites the minefield.
- (9) PL submits Report of Initiation to higher.
- (10) Recording Team records the minefield on DA Form 1355-1-R.
- (11) Mine Laying Team installs mines from enemy to friendly side.  
(Dig, fuse, arm, bury/camouflage)
- (12) PL submits Report of Completion to higher headquarters.
- (13) Move all teams back to the ORP. Security Teams return by a different route, ensuring that they are not followed.
- (14) Depending on the mission, the patrol can either guard the minefield or transfer it to another unit. PL submits reports of change and transfer as required.
- (15) PL gets ACE Report in the ORP and the patrol moves out.
- (16) Upon mission accomplishment, DA Form 1355-1-R is submitted to higher headquarters by secure means.

## **7. BREACH ENEMY MINEFIELD:**

### a. Teams required:

- (1) Breach Team: (per lane) (Engineer unit)
  - (a) Prober/Marker: Number 1 and 2 man
  - (b) Local Security: Number 3 and 4 man
  - (c) Team Leader: Number 5 man
- (2) Security Team: (Maneuver unit)
  - (a) Near Side Security (Left and Right): 4 men
  - (b) Far Side Security (Left and Right): 4 men
  - (c) Team Leader
- (3) Overwatch Team: as required (Maneuver unit)

### b. Equipment needed: (per lane)

- (1) 1 each, probe, per man
- (2) 2 pair, wire cutters
- (3) 1 roll, engineer tape/assorted chem lights
- (4) 1 each, body armor, per man
- (5) 2 pair, wire gauntlets
- (6) Night observation devices or binoculars
- (7) Chem light holders

### c. Procedure:

- (1) Patrol halts short of the breaching site and occupies a security perimeter (Tentative ORP).

- (2) PL conducts a leaders' recon of the breaching site with his Breaching, Overwatch and Security Team Leaders and the Surveillance Team. Once the objective is pinpointed, surveillance is emplaced to maintain 'eyes on target.'
- (3) Conditions must be right for breaching the minefield (i.e., lack of enemy contact, conducting the mission during conditions of limited visibility, etc.)
- (4) PL confirms the breaching site.
- (5) The Number 1 and 2 man (Provers/Marker prepare themselves and their equipment for the breach in the ORP.
- (6) Security Team Leader emplaces Near Side Security.
- (7) Overwatch Team Leader emplaces Overwatch Team (Optional).
- (8) Breaching Team moves to the site.
- (9) If the mines are buried, Number 1 and 2 man each proof an area one meter wide while moving forward, overlapping each other. The Number 2 man is next to the Number 1 man.
- (10) Number 1 and 2 man mark detected mines and mark the cleared path.
- (11) If wire fencing is encountered, the Number 1 and 2 man clear the area with wire cutters. If trip wires are encountered, cut slack wires and mark taut ones.
- (12) The Number 3, 4, and 5 man follow 10 meter behind the Number 1 and 2 man.
- (13) Number 3 and 4 man carry Number 1 and 2 man's equipment, additional marking equipment, wire cutters and additional probes.
- (14) The Number 5 man provides command and control.
- (15) The Number 3 and 4 man become an Aid and Litter Team if needed.
- (16) Once the lane is cleared and marked, the security Team Leader emplaces Far Side Security.

(17) The maneuver unit moves through the cleared lane.

(18) Security teams are recovered, the PL gets an ACE REP and the patrol moves out.

**Notes:**

**8. BREACH ENEMY MINEFIELD WITH EXPLOSIVES:**

a. Teams required:

- (1) Breach Team: (per lane) (Engineer unit)
  - (a) Prober/Marker/Demo Specialist: Number 1 and 2 man.
  - (b) Local security: Number 3 and 4 man.
  - (c) Team Leader: Number 5 man.
- (2) Security Team: (Maneuver unit)
  - (a) Near Side Security (Left and Right): 4 men
  - (b) Far Side Security (Left and Right): 4 men
  - (c) Security Team Leader.
- (3) Support Team: as required (Maneuver unit)  
(Ensure Sup knows location of Breach for Fire Coordinations.)
- (4) Assault Team: as required (Maneuver unit)

b. Equipment required: (per breach site)

- (1) Grappling hook with 150 foot wire
- (2) 1 each, probe per man
- (3) 2 pair, wire cutters
- (4) 1 roll, engineer tape (or chem lights)
- (5) 1 each, body armor per soldier
- (6) Smoke generating device, if not conducting breach during limited visibility.
- (7) 5-8 assault mine breaching charges per 100 meters of minefield depth.
- (8) Demo kit/bag

- (9) 2 pair, wire handling gauntlets
- (10) Chem light holders
- (11) Night observation devices/binoculars

c. Procedures:

- (1) Patrol halts short of the breaching site and occupies a security perimeter (Tentative ORP).
- (2) PL conducts a leaders' recon of the breaching site with the Breach, Support, Assault and Security Team Leaders.
- (3) PL confirms the breaching sites and confirms the placement of the Support Team.
- (4) Number 1 and 2 man (Probers and Markers) prepare self and equipment for the breach in the ORP.
- (5) Security Team Leader emplaces Near Side Security a safe distance from the blast.
- (6) Support Team moves into position.
- (7) PL signals Support Team to suppress the enemy covering the minefield.
- (8) Breach Team moves to the site.
- (9) Employ smoke, if not conducting the mission during limited visibility.
- (10) If trip wires or wire fencing is encountered, the Breach Team pulls back while the Number 1 man clears the area with the grappling hook. Wire fencing is then removed by the Number 1 and 2 man with wire cutters.
- (11) If the mines are buried, Number 1 and 2 man probe an area one meter wide while moving forward, overlapping each other. Number 2 man is next to the Number 1 man.
- (12) Number 1 and 2 man mark detected lanes.

- (13) Number 3, 4, and 5 man follow ten meters behind the Number 1 and 2 man.
- (14) The Number 3 and 4 man carry Number 1 and 2 man's equipment, additional marking materials, wire cutters, grappling hook, additional probes, and assault mine breaching charges. They place the assault mine breaching charges on the marked mines and become an Aid and Litter Team if required.
- (15) Number 5 man provides command and control.
- (16) Once the team reaches the end of the minefield, they ignite the fuse igniters on the charges and return to the ORP.
- (17) After the blast, the PL and Breaching Team Leader return to the breach site to check the demolitions effectiveness. If more charges are required, repeat the process.
- (18) The Breach Team proofs the lane and marks any unexploded mines.
- (19) The Breach Team destroys any marked mines with assault mine breaching charges.
- (20) Once the lane is cleared, the Security Team Leader places Far Side Security and the Marking Team marks the cleared lane.
- (21) The Assault Element is then ordered to assault through the minefield.
- (22) Support and Security Teams are recovered, PL receives an ACE REP and the patrol moves out.

## **9. BREACH ENEMY MINEFIELD WITH BANGALORE TORPEDO:**

### a. Teams required:

- (1) Breach Team: (per lane) (Engineer unit)
  - (a) Torpedo Team: (as required), each man carries two torpedoes.
  - (b) Firing Team: 1 man
  - (c) Prober/Marker: 2 men
  - (d) Team Leader
- (2) Security team: as required (Maneuver unit)
  - (a) Near Side Security (Left and Right): 4 men
  - (b) Far Side Security (Left and Right): 4 men
  - (c) Team Leader
- (3) Support Team: as required (Maneuver unit)
- (4) Assault Team: as required (Maneuver unit)

### b. Equipment required: (per lane)

- (1) Bangalore kit, as required
- (2) Dummy bangalore nose piece
- (3) Dual detonation system
- (4) 1 roll, engineer tape/assorted chem lights
- (5) Smoke generating device, if not conducting the mission under limited visibility.
- (6) Demo kit/bag
- (7) Chem light holders

- (8) Night observation device/binoculars
- (9) Assault mine breaching charges (as required)

c. Procedure.

- (1) Patrol halts short of the breaching site and occupies a security perimeter (Tentative ORP).
- (2) PL conducts a leaders' recon of the breaching site with the Breaching, Support, Assault, and Security Team Leaders and the Surveillance Team. Once the objective is pinpointed, surveillance is emplaced to maintain 'eyes on target.'
- (3) PL confirms the breach site, designates a release point and confirms the location of the of the support team. The Breaching Team Leader determines the number of bangalore sections needed to breach two lanes in the minefield.
- (4) The Breach Team prepares the torpedoes and dual detonation systems in the ORP.
- (5) The Security Team Leader emplaces Near Side Security (safe distance from blast).
- (6) Support Team moves into position.
- (7) PL signals Support Team to suppress the enemy covering the minefield.
- (8) Employ smoke, if not conducting the mission during limited visibility.
- (9) Breach Team moves to the release point.
- (10) The Breach Team Leader moves to the breaching site. He then calls forward the torpedo team, one man at a time. Team Member. After the Torpedo Team Members deliver their sections of the bangalore, they return to the release point.
- (11) Once the torpedo is in place, all non-essential personnel will move back to the ORP (or a safe distance from the blast). The Firing Team connects the dual detonation systems, start the fuse igniters and move back to the ORP.

- (12) After the blast, the PL and Breaching Team Leader return to the site to confirm the demolitions effectiveness. If more torpedoes are required, repeat the process.
- (13) The Breach Team proofs the lane and marks exposed mines.
- (14) The Breach Team destroys any marked mines with assault mine breaching charges.
- (15) Once the lane is cleared, the Security Team Leader emplaces Far Side Security and the Marking Team marks the lane.
- (16) The Assault Element is then ordered to assault through the cleared minefield lane.
- (17) The Security and Support Teams are recovered and the PL receives an ACE REP and the patrol moves out.

**Notes:**

**10. BREACH WIRE OBSTACLE WITH WIRE CUTTERS:**

a. Teams required:

- (1) Breach Team: (per lane) (Engineer unit)
  - (a) Cutter/Prober/Marker: Number 1 and 2 man
  - (b) Local Security: Number 3 and 4 man
  - (c) Team Leader: Number 5 man
- (2) Security team: (Maneuver unit)
  - (a) Near Side Security (Left and Right): 4 men
  - (b) Far Side Security (Left and Right): 4 men
  - (c) Team Leader
- (3) Overwatch Team: as required (optional) Maneuver unit)

b. Equipment required: (per lane)

- (1) 1 each, wire cutters per man
- (2) 1 each, probe per man
- (3) 1 roll, engineer tape (or assorted chem lights)
- (4) 1 each, body armor per man
- (5) 1 pair, wire handling gauntlets per man
- (6) Night observation device or binoculars
- (7) Chem light holders

c. Procedures:

- (1) Patrol halts short of the breaching site and occupies a security perimeter (Tentative ORP).
- (2) PL conducts a leaders' recon of the breaching site with his Breach, Overwatch, and Security Team Leaders and the Surveillance

Team. Once the objective is pinpointed, surveillance is laid in to maintain 'eyes on target.'

- (3) Conditions must be right for breaching the wire (i.e. lack of enemy contact, conducting the mission under conditions of limited visibility, etc.).
- (4) PL confirms the breaching site.
- (5) Number 1 and 2 man (cutters) prepare themselves and equipment for the breach in the ORP.
- (6) Security Team Leader places Near Side Security.
- (7) Overwatch Team Leader emplaces Overwatch Team (optional).
- (8) Breach Team moves to site.
- (9) Number 1 and 2 man cut through the wire using cloth to muffle sounds.
- (10) If buried mines are encountered, the Number 1 and 2 man probe an area one meter wide while moving forward, overlapping each other. Number 2 man is next to the Number 1 man.
- (11) If trip wires are encountered, cut slack wires and mark taut wires.
- (12) Number 1 and 2 man mark any detected mines and mark the cleared path.
- (13) Number 3, 4, and 5 man follow 10 meters behind the Number 1 and 2 man.
- (14) The Number 3 and 4 man provide Local Security, carry Number 1 and 2 man's equipment, additional probes, wire cutters, and marking material. Act as an Aid and Litter Team if necessary.
- (15) Number 5 man provides command and control.
- (16) Once the wire is breached, the Security Team Leader emplaces Far Side Security.
- (17) The maneuver unit moves through the cleared lane.

14-24

- (18) 2 Man team remains at breach site to constantly upgrade the breach in case of withdrawal and casualties.
- (19) Security Teams are recovered, PL receives an ACE REP and the patrol moves out.

**Notes:**

**11. BREACH WIRE OBSTACLE WITH BANGALORE TORPEDO:**

a. Teams required:

- (1) Breach Team: (per lane) (Engineer unit)
  - (a) Torpedo Team: as required (each man carries two torpedoes)
  - (b) Prober/Markers: 2 men
  - (c) Firing Team: 1 man
  - (d) Team Leader
- (2) Security Team: (Maneuver unit)
  - (a) Near Side Security (Left and Right): 4 men
  - (b) Far Side Security (Left and Right): 4 men
  - (c) Team Leader
- (3) Support Team: as required (Maneuver unit)
- (4) Assault Team: as required (Maneuver unit)

b. Equipment required:

- (1) Bangalore kits, as required
- (2) Dual detonation system.
- (3) Dummy bangalore nose piece
- (4) 1 roll, engineer tape, or assorted chem lights
- (5) Smoke generating device, if not conducting the mission during limited visibility.
- (6) Assault mine breaching charges.
- (7) Binoculars or night observation devices.
- (8) Chem light holders

(9) Demo kit/bag

c. Procedure:

- (1) Patrol halts short of the breaching site and occupies a security perimeter (Tentative ORP).
- (2) PL conducts a leaders' recon of the breach site with the Breach, Assault, Support and Security Team Leaders and the Surveillance Team.
- (3) PL confirms the breach site, designates a release point, emplaced the Surveillance Team, and locates the support position. The breach Team Leader determines the number of torpedoes required to breach two lanes in the obstacle.
- (4) The Breach Team prepares torpedoes and dual detonation systems in the ORP.
- (5) Security Team places Near Side Security a safe distance from the blast.
- (6) Support Team moves into position.
- (7) PL signals the Support Team to suppress the enemy covering the obstacle.
- (8) Employ smoke generation if not breaching the obstacle during limited visibility.
- (9) Breach Team moves to the release point.
- (10) The Breach Team Leader moves to the breach site. He calls the Torpedo Team forward, one man at a time. The bangalore sections are assembled and pushed into the obstacle by the Team Leader and Torpedo Team Member. After the Torpedo Team Members deliver each section of the bangalore, he returns to the release point.
- (11) Once the torpedo is in place, all non-essential personnel move back to the ORP. The firing team connects and initiates the firing system and moves to the ORP.

- (12) After the detonation, the PL and Breach Team Leader inspect the lane, if more torpedoes are required, repeat the process.
- (13) The Breach Team proofs the lane and marks any exposed mines.
- (14) The Breach Team destroys any marked mines with assault mine breaching charges.
- (15) Once the lane is cleared, the Marking Team marks the cleared lane and the Security Team Leader places the Far Side Security.
- (16) The Assault Element is ordered through the obstacle.
- (17) 2 Man team remains at breach site to constantly upgrade the breach in case of withdrawal and casualties.
- (18) The PL recovers the Support and Security Teams, receives an ACE REP and continues the mission.

### **Notes**

**12. INSTALL A TRIPLE STANDARD CONCERTINA FENCE:**

a. Teams required:

- (1) Fence Team: (Engineer unit)
  - (a) Picket men. (As required)
  - (b) Wire men. (As required)
  - (c) Support men.(As required)
- (2) Security Team: (Maneuver unit)
  - (a) Left and Right Side: 4 men.
  - (b) ORP Security: 2 men.
  - (c) Team Leader.
- (3) Overwatch Element. (As required) (Maneuver unit)

b. Equipment needed:

- (1) Long pickets. (53 Per 100 meters)
- (2) Short pickets. (4 Per section of fence)
- (3) Coils of concertina. (21 Per 100 meters)
- (4) Reel barb wire. (1 Per 100 meters)
- (5) Anchor staples. (106 Per 100 meters)
- (6) Sledgehammers. (4 Each)
- (7) Lineman's side cutters. (2 Each)
- (8) Picket drivers. (4 Each)
- (9) Wire gauntlets. (1 Pair per wire man)
- (10) Binoculars/Night observation devices.

c. Procedures:

- (1) Patrol halts short of the obstacle site and occupies a security perimeter (Tentative ORP).
- (2) PL conducts a leaders' recon of the fence site with his fence and Security Team Leaders.
- (3) PL confirms the fence site. The Fence Team Leader determines the length of the fence to create the obstacle.
- (4) Order/obtain/prepare equipment and materials for the fence in the ORP. Rucksacks and all non-essential equipment are left in the ORP.
- (5) Security Team Leader emplaces Left and Right Security.
- (6) Fence Team moves to site.
- (7) Picket men install long pickets along front row at 5 pace intervals and short pickets 2 paces from each end picket. Work from right to left and front to rear (enemy side to friendly side).
- (8) Wire men lay out concertina along the rows of pickets by laying one roll of concertina in front of the third enemy picket and two rolls behind the third friendly picket. The wire men repeat this at every fourth picket.
- (9) The support men fasten the bottom of the concertina to the ground using staples and stretch a barbed wire strand along the top of the front row and fasten to the top eye of each long picket.
- (10) Install rear row of the concertina in the same manner.
- (11) The wire men install the top row of the concertina and the support men fasten the joints and rack the wire.
- (12) PL moves all teams back to the ORP. Security Teams return by a different route, ensuring that the patrol is not followed.
- (13) PL submits a report of completion to higher headquarters, gets an ACE Report, and the patrol moves.

**13. PREPARE A TARGET FOR DEMOLITION USING AN OBSTACLE FOLDER:**

a. Teams required: The number of personnel for each team will depend on the type of mission as stated in the obstacle folder. Listed here are the teams that may be used.

(1) ASP Team: (Engineer unit)

(2) Charge Placement Team: Minimum of 2 teams, 2 men per team (Engineer unit)

(3) Initiation/Firing System Team: (Engineer unit)

(4) Mine Laying Team: (Engineer unit)

(5) Security Team: (Maneuver unit)

(a) Near Side Security (Left and Right): 4 men

(b) Far Side Security (Left and Right): 4 men

(c) Team Leader

b. Equipment required:

(1) Complete demo kit

(2) FM 5-34

(3) STANAG 2017

(4) STANAG 2123

(5) STANAG 2036

(6) Demolitions as required

c. Procedure:

(1) The patrol halts short of the target and occupies a security perimeter (Tentative ORP).

(2) PL conducts coordination with the demo guard commander.

- (3) PL conducts a leaders' recon of the target with his Team Leaders.
- (4) PL confirms the location of the target and emplaces the Surveillance Team to maintain 'eyes on target.'
- (5) PL complies with his orders to the demo firing party commander (STANAG 2017).
- (6) Return to the ORP. PL sends ASP team to the ASP to pick-up the demolitions material. PL gives the ASP Team Leader pages 3, 7-12, and 14 from STANAG 2123 (Obstacle Folder).
- (7) Charge placement team prepares charges and initiation systems in the ORP.
- (8) Security Team Leader places site security.
- (9) As required, Charge Placement, Initiation System and Mine Laying Teams move to target and conduct their specific missions.
- (10) PL establishes the firing point.
- (11) All teams return to the ORP on the PL's signal. Security Teams return by a different route, ensuring the patrol is not followed.
- (12) PL updates STANAG 2017 and STANAG 2123 as required.
- (13) If and when ordered to, fire the demolitions. Complete paragraph 14 of STANAG 2017, pages 29 and 30 of STANAG 2123, and, if used, STANAG 2036 (Minefield Record) and send to the demolitions guard commander.
- (14) If and when ordered to, turn the demolitions over to a new demo firing party commander, complete paragraph 11 of STANAG 2017, pages 25-27 of STANAG 2123, and if used STANAG 2036 (Minefield Record) and turn over the target site.
- (15) PL receives an ACE Report and the patrol moves out.

**14. SECURE AN AIRFIELD/LANDING STRIP:**

- a. Teams required: METT-T dictates.

- (1) Security: (Maneuver unit)
  - (a) R & S Teams: as required (R & S Teams become the Security Teams.)
  - (b) Security Teams: as required.
  - (c) Team Leader.
- (2) Marking Team: as required. (Optional) (Engineer unit)
- (3) Obstacle Clearing Team: as required. (Optional)(Engineer unit)

b. Equipment needed:

- (1) 1 set, binoculars/night observation device per R&S Team.
- (2) Marking device. (Optional)
- (3) Engineer hand tools/demolitions. (Optional)
- (4) STANAG 3601. (If required)

c. Procedure:

- (1) Patrol halts short of the airfield/landing strip and occupies a security perimeter (Tentative ORP).
- (2) PL conducts a leaders' recon of the airfield/landing strip with his Security Team Leader and Surveillance Team.
- (3) PL confirms the airfield/landing strip's location and emplaces the Surveillance Team to maintain 'eyes on target.'
- (4) PL sends out R & S Teams to clear the area surrounding the airfield/landing strip.
- (5) R & S Teams return and report to the PL using OCOKA. R & S Teams then become the Security Teams. Security Teams are placed as the terrain and situation dictates (avenues of approach). 360 Degree perimeter is ideal if resources allow.
- (6) PL sends out Obstacle Clearing Team. (If required) mark obstacles at night. (If required)

- (7) If the patrol is to establish the airfield/landing strip they must mark the area.
- (8) PL sends out Marking Team. In the day, use one man with a VS-17 Panel, at night, set up a NATO-T or an Inverted Y for rotary wing aircraft. For fixed wing aircraft, coordinate with the aviation unit utilizing STANAG 3601.
- (9) Conduct link-up operations with supported unit for aerial extraction/insertion.

**Notes**

**15. ESTABLISH A LZ/PZ OF OPPORTUNITY:**

a. Teams required:

(1) Security Team: (Maneuver unit)

(a) R & S Teams: 2 man Teams. (As required) (R & S Teams become the Security Teams.)

(b) Team Leader.

(2) Marking Team: (as required) (Engineer unit)

(a) Day.

(b) Night.

(c) Team Leader.

(3) Obstacle Clearing Team. (As required) (Engineer unit)

(4) LZ/PZ Control Team: (Maneuver unit)

(a) PL

(b) RTO.

b. Equipment needed:

(1) Marking device. (i.e., VS-17 Panels, chem lights, etc.)

(2) Signaling devices. (i.e., signal mirror, smoke, etc.)

(3) Light batons. (Night use for sling loads.)

(4) Strobe light with blue or infrared lens cover. (Night)

(5) FM Radio.

(6) SOI.

(7) Wind sock.

(8) Engineer hand tools. (As required)

(9) Demolitions with accessories. (As required)

(10) Binoculars/Night observation devices.

c. Procedure:

(1) Patrol halts short of the LZ/PZ and occupies a security perimeter (Tentative ORP).

(2) PL conducts a leaders' recon of the LZ/PZ with the Security Team Leader.

(3) PL confirms the LZ/PZ and selects an assembly area.

(4) Security Team Leader sends out R & S Teams to clear the LZ/PZ and the assembly area.

(5) When the R & S Teams return and the area is cleared, Security Teams are placed around the assembly area by the Security Team Leader as the terrain and situation dictates (avenues of approach). R & S Teams become the Security Teams.

(6) Patrol occupies the assembly area.

(7) PL establishes the LZ/PZ control point, designates a release point and a straggler control point. The APL breaks the patrol down into chinks maintaining tactical integrity and self sufficiency (size depends on type aircraft).

(8) PL sends out Obstacle Clearing Team (as required). Mark obstacles at night.

(9) PL sends out Marking Team. At night, set up a NATO-T or Inverted Y for rotary wing aircraft, during the day, use one man with a VS-17 Panel (or other signalling device).

(10) APL conducts rehearsals/backbrief/inspection/ safety brief.

(11) Pilot contacts the Command and Control Team. (Use full call signs initially.)

(12) Pilot contacts the Command and Control Team once he is at the CCP.

- (13) Command and Control Team Leader (Ground-To-Air = GTA) transmits:
- (a) "... State number, type, and intentions ..." (Not necessary if given in the initial contact.)
  - (b) Heading from CCP to LZ/PZ. (degrees)
  - (c) Distance from CCP to LZ/PZ. (In meters)
  - (d) Land heading. (In degrees)
  - (e) Pertinent information. (Signal on call, Number and formation if two or more aircraft, field elevation- night only)
  - (f) Advisories. (Approach/departure, en route, surface, etc.)
  - (g) "...Continue approach for visual identification.."
- (14) GTA makes visual contact of aircraft, employs signal and then transmits: "... I am at your \_\_\_\_\_ o'clock, \_\_\_\_\_ meters, signal out, can you identify ..."
- (15) Pilot identifies signal.
- (16) GTA transmits: "... Wind (speed) at (direction), clear to land ..." (If not clear, GTA would tell the pilot, "... Go around ...")
- (17) As the aircraft lands, APL sends chalks through the release point to the aircraft.
- (18) PL departs with the bulk of the patrol.
- (19) APL departs with the last chalk taking any stragglers and the Security Teams. APL ensures the LZ/PZ is cleared of personnel and equipment.
- (20) At the completion of the airlift, PL gets an ACE Report and the patrol moves out.

**Notes:**

**16. CONSTRUCT A LZ/PZ/DZ USING DEMOLITIONS:**

a. Teams required:

- (1) Measuring/Marking Team: as required (Engineer unit)
- (2) Demolitions Team: (Engineer unit)
  - (a) Demolition Specialists: as required
  - (b) Firing Team: as required
  - (c) Team Leader
- (3) Obstacle Clearing Team: as required (Engineer/Maneuver unit)
- (4) Security Team: (Maneuver unit)
  - (a) Left and Right Side: 4 men
  - (b) ORP Security: 2 men
  - (c) Team Leader

b. Equipment needed:

- (1) Demolitions: (as required)
- (2) Firing systems (as required))
- (3) Tape measure- one per Measuring/Marking Team
- (4) Engineer Tape (as required)
- (5) Demolitions kit/bag- one per Firing Team
- (6) Engineer hand tools (as required)
- (7) Field expedient wind sock (optional)
- (8) Signaling device (if required)
- (9) Marking device (if required) (i.e. VS-17 panels, etc)

- (10) Radio (if required)
- (11) Compass (if required)
- (12) Binoculars/Night observation devices

c. Procedure:

- (1) Patrol halts short of the LZ/PZ/DZ site and occupies a security perimeter (Tentative ORP).
- (2) PL conducts a leaders' recon of the objective with his Measuring/Marking, Demo, and Security Team Leaders.
- (3) PL confirms the LZ/PZ/DZ location.
- (4) Security Team Leader emplaces Left and Right Security. (Safe distance from blasts)
- (5) PL sends out Measuring Team (measures and marks perimeter of LZ/PZ/DZ and marks obstacles to be taken out).
- (6) Measuring Team returns and Demo Team Leader calculates logistical requirements for the type obstacles to be removed.
- (7) Explosives and firing systems are prepared in the ORP.
- (8) Demo and Firing Teams move to site.
- (9) Demo Team Leader directs the placement of the charges on the trees/obstacles. Trees should be blown working from the outside of the LZ/PZ/DZ toward the center. Trees should fall away from the center of the LZ/PZ/DZ.
- (10) Firing Team sets up firing system.
- (11) All non-essential personnel move back to the ORP or a safe distance from the blast.
- (12) Firing Team primes the firing system.
- (13) Firing Team initiates the firing systems and returns to the ORP or a safe distance from the blast.

- (14) Charges detonate.
- (15) PL, Demo, and Clearing Team Leaders return to site to check the demo's effectiveness. If more obstacles need to be removed, follow the demo procedures again. If the site requires no further demo, PL directs the obstacle clearing Team Leader to remove the debris from the LZ/PZ/DZ. They return to the ORP.
- (16) Obstacle Clearing Team prepares equipment needed to remove the debris in the ORP.
- (17) Obstacle Clearing Team moves to site. (May be the bulk of the patrol, if necessary)
- (18) Obstacle Clearing Team removes debris as required.
- (19) Mark LZ/PZ/DZ as appropriate and erect a field expedient wind sock.(Optional)
- (20) Once complete, all teams move back to the ORP on order. Security Teams return by a different route, ensuring that the patrol is not followed. PL gets an ACE Report and the patrol moves out.
- (21) If the LZ/PZ/DZ is to be used by the patrol, secure and use.

**17. CONSTRUCT A LZ/PZ/DZ USING ENGINEER TOOLS:**

a. Teams required:

- (1) Measuring/Marking Team: as required (Engineer unit)
- (2) Obstacle Clearing Team: as required (Engineer unit)
- (3) Security Team: (Maneuver unit)
  - (a) Left and Right Side: 4 men
  - (b) ORP Security: 2 men
  - (c) Team Leader

b. Equipment needed:

- (1) Measuring tape- one per Measuring/Marking Team
- (2) Engineer tape- as required
- (3) Engineer hand tools- as required
- (4) Field expedient wind sock- optional
- (5) Signaling device- if required
- (6) Marking Device- if required (i.e. VS-17 Panel, etc)
- (7) Radio- if required
- (8) Compass- if required
- (9) Binoculars/Night observation devices
- (10) Chainsaws and fuel/oil - as required

c. Procedure:

- (1) Patrol halts short of the LZ/PZ/DZ site and occupies a security perimeter (tentative ORP).

- (2) PL conducts a leaders' recon of the objective with the measuring/Marking, Clearing and Security Team Leaders.
- (3) PL confirms the LZ/PZ/DZ location.
- (4) Security Team Leader emplaces Left and Right Security.
- (5) PL sends out Measuring Team (measures and marks perimeter of LZ/PZ/DZ and marks obstacles to be taken out).
- (6) Measuring Team returns. Clearing Team prepares equipment needed to remove the obstacles in the ORP. Rucksacks and non-essential equipment are left in the ORP.
- (7) PL directs the Clearing Team to moves to the site (may be the bulk of the patrol if necessary).
- (8) Clearing Team removes obstacles as required. Trees are removed working from the outside of the LZ/PZ/DZ toward the center. Trees are cut to fall away from the center.
- (9) Measuring/marketing Team marks LZ/PZ/DZ as appropriate and erect a field expedient wind sock (optional).
- (10) Once complete all Teams move back to the ORP on order. Security Teams return by a different route, ensuring that the patrol is not followed. PL gets an ACE Report and the patrol moves out.
- (11) If LZ/PZ/DZ is to be used by the patrol, secure and use.

**18. CONDUCT AERIAL RESUPPLY:**

a. Teams required:

(1) Command and Control Team: (Engineer unit)

(a) Patrol Leader.

(b) RTO.

(c) Marker Team: 2 men.

(2) Recovery Team: (Engineer unit)

(a) Two man teams: as required.

(b) Team Leader.

(3) Transportation/Distribution team: (optional) (Engineer unit)

(a) Two man teams: as required.

(b) Team Leader.

(4) Security Team: (Maneuver unit)

(a) Drop Zone Security: as required.

(b) ORP Security: 2 men.

(c) Team Leader.

b. Equipment needed:

(1) Radio (i.e., PRC-77).

(2) Signaling device (i.e., VS-17 Panel, signal mirror, smoke, etc.).

(3) Aircraft.

(4) Empty rucksacks.

(5) Binoculars/Night observation devices.

c. Procedures:

- (1) Patrol halts short of the Drop Zone and occupies a security perimeter (Tentative ORP).
- (2) PL conducts a leaders' recon of the drop zone with his Recovery, Transportation/Distribution (Optional), and Security Team Leaders.
- (3) PL confirms the DZ.
- (4) Prepare equipment for the aerial resupply (empty rucksacks) in the ORP.
- (5) Security Team Leader emplaces DZ Security (May require use of roving security teams).
- (6) Command and Control Team moves to DZ. PL determines the point of impact, the Transportation/Distribution Teams location (optional), and the location of the Command and Control Team. Marking Team marks the area as required.
- (7) Recovery Team Leader emplaces Recovery Teams around area of impact.
- (8) Transportation/Distribution Team Leader emplaces Transportation/Distribution Team (optional).
- (9) Pilot contacts the Command and Control Team. (Use full call signs initially.)
- (10) Pilot contacts the Command and Control Team once he is at the CCP.
- (11) Command Control Team Leader (Ground-To-Air = GTA) transmits:
  - (a) "... State number, type and intentions ..." (Not necessary if given in the initial contact.)
  - (b) Heading from CCP to DZ. (degrees)
  - (c) Distance from CCP to DZ. (meters)
  - (d) Drop Heading. (degrees)

- (e) Drop Altitude. (feet)
  - (f) Drop Speed. (knots)
  - (g) Pertinent information (Number of jumpers/bundles per pass, signal on call, etc.)
  - (h) Advisories (approach/departure, enroute, surface, etc.)
  - (i) "...Continue approach for visual identification.."
- (12) GTA makes visual contact of aircraft, employs signal, and then transmits: "... I am at your \_\_\_ o'clock, \_\_\_\_\_ meters, signal out, can you identify ..."
- (13) Pilot identifies signal.
- (14) GTA transmits:
- (a) "...I have visual contact, turn to drop heading.."
  - (b) "... Steer Left/Right ..." (Use clock method. 12
  - (c) "... On course ..."
- (15) When aircraft is 8-10 seconds out from the release point, RTO keys the mike and the GTA transmits: "... with number bundles/jumpers ..."
- (16) When aircraft is directly over release point, GTA transmits: "... with number bundles/jumpers, execute, execute, execute (or) no drop, no drop, no drop ..." (GTA must say execute or no drop at least three times or until first load exits.)
- (17) At completion of operation GTA transmits: "... I observe (number) bundles/jumpers away and clear, state intention, and report when clear of my control zone..." (Issue any advisories.) (Use full call signs on last transmission.)
- (18) Recovery Teams grab bundles and carry them to the Transportation/Distribution Team's location (optional) where they load the bundles in the empty rucksacks or the Recovery Teams

grab the bundles, and load them in their empty rucksacks. DZ is sterilized prior to departure.

(19) PL signals for all teams to return to the ORP. Security Teams return by a different route, ensuring that the patrol is not followed.

(20) At the ORP, the PL gets an ACE Report and moves the patrol one terrain feature or 1000 meters away to redistribute the bundles and equipment. Security is maintained during redistribution.

(21) PL gets an ACE Report and the patrol moves out.

**Notes:**

**19. CONDUCT AN AIRBORNE/AIRMOBILE OPERATION:**

a. Teams required: (Engineer/Maneuver unit)

- (1) Chalks (as required for helicopter movement)
- (2) Sticks (as required for fixed wing aircraft- parachute insertion.)

b. Equipment needed:

- (1) Organic equipment and weapons.
- (2) Parachutes with accessories for airborne insertion.
- (3) Other equipment needed as per type insertion.

c. Procedure:

- (1) PL conducts preflight coordination for either an airborne or airmobile operation as applicable.
- (2) Patrol occupies a security perimeter in a designated assembly area. Manifests are prepared and chalks/sticks are organized maintaining tactical integrity and self-sufficiency. Personnel, equipment, and weapons are prepared for the insertion. Rehearsals are conducted as time allows.
- (3) PL moves patrol to a designated holding area and occupies a security perimeter.
- (4) PL notifies the PZ Control Party/DACO of the patrols arrival in the holding area.
- (5) In the holding area, the patrol separates into chalks/sticks. PL/Chalk Leaders conduct preflight briefings, conduct pre-jump training IAW unit's ASOP.
- (6) Maximum combat power moves in the first lift in order to secure LZ/DZ.
- (7) Maintain tactical integrity and be flexible to possible changes in the ACL.
- (8) Chalks/sticks move to PZ/Staging area.

- (9) Load aircraft.
- (10) During the aerial movement, PL/Chalk Leaders must remain oriented toward their location.
- (11) PL/Chalk Leader must assist in identifying the LZ/DZ.
- (12) Landing may consist of rappelling, troop ladders, fast rope, parachute, or by air landing.
- (13) The patrol assembles at a prearranged terrain feature.
- (14) Security is initial priority.
- (15) PL organizes the patrol, gets an ACE Report, and departs the area as quickly as possible.
- (16) Patrol conducts their ground tactical plan.

**20. CRATER A ROAD/AIRFIELD WITH EXPLOSIVES:**

a. Teams required: METT-T dictates.

- (1) Cratering Team: (Engineer unit)
  - (a) Demo/Measuring Team. (As required)
  - (b) Firing Team. (As required)
  - (c) Team Leader.
- (2) Security Team: (Maneuver unit)
  - (a) Left and Right Side: 4 men.
  - (b) Team Leader.

b. Equipment needed:

- (1) M180 Demolition Kit, Cratering. (If available)
- (2) Shape Charges. (As required)

- (3) Cratering Charges. (As required)
- (4) Firing systems. (As required)
- (5) DA Form 2203-R (Demolition Recon Report).
- (6) Measuring tape, 100 meter.
- (7) Demo kit/bag.
- (8) Engineer hand tools. (As required)

c. Procedures:

- (1) Patrol halts short of cratering site and occupies a security perimeter (Tentative ORP).
- (2) PL conducts a leaders' recon of the objective with his Cratering and Security Team Leaders and Surveillance Team.
- (3) PL confirms the cratering site and emplaces surveillance to maintain 'eyes on target.'
- (4) Security Team Leader emplaces Left and Right Security (safe distance from blast).
- (5) PL sends out Demolition/Measuring Team to gather information and take measurements of the site.
- (6) Demolition/Measuring Team returns and Demo Team Leader calculates logistical requirements for the type crater to be employed. (Hasty, deliberate, relief face)
- (7) Cratering Team prepares explosives and firing systems in the ORP.
- (8) Demo and Firing Teams move to site.
- (9) Demo Team places shape charges (or M180 cratering devices if used).
- (10) Firing Team sets up an electric (M180) or dual detonation firing system.

- (11) All non-essential personnel move back to the ORP/safe distance from the blast.
- (12) Firing Team primes the Firing System.
- (13) Firing Team initiates firing system and moves back to the ORP/safe distance from the blast.
- (14) Charges detonate.
- (15) If M180 cratering devices are used, PL and Demo Team Leaders return to site and check the obstacles effectiveness, pull in security, and return to the ORP (unless additional action is required). PL gets an ACE Report and the patrol moves out.
- (16) Demo and Firing Teams return to site.
- (17) Demo Team prepares (bore) holes as necessary with engineer hand tools and places cratering charges.
- (18) Firing Team sets up firing system.
- (19) All non-essential personnel move back to the ORP/safe distance from the blast.
- (20) Firing Team primes the firing system.
- (21) Firing Team initiates firing system and returns to the ORP/safe distance from the blast.
- (22) Charges detonate.
- (23) PL and Demo Team Leader return to site and check the obstacles effectiveness.
- (24) Mines and/or other obstacles (wire, log, etc.) are incorporated into the obstacle as required. (Optional) (the necessary teams needed to be organized.)
- (25) PL pulls in security, returns to the ORP (unless additional action is required), gets an ACE Report, and the patrol moves out.

**Notes:**

**21. ESTABLISH A PATROL BASE:**

a. Teams required:

- (1) Occupation Team (becomes the Patrol Base Security Team): one man per squad. (Maneuver unit)
- (2) Temporary LP/OP Team: 2-3 man team. (Maneuver unit)
- (3) R & S Teams: two man team per squad. (Maneuver unit)
- (4) Squad LP/OP Teams: 2-3 man team per squad. (Maneuver unit)

b. Equipment needed:

- (1) Organic equipment and weapons.
- (2) Early warning devices. (Optional)
- (3) Sketch material.

c. Procedure:

- (1) Patrol halts short (200-400 meters) of the tentative patrol base and occupies a security perimeter (Tentative ORP).
- (2) PL conducts a leaders' recon of the tentative patrol base with the Occupation Team, RTO, Point, and Compass man.
- (3) Occupation Team clears the tentative patrol base. Once cleared, they become the Patrol Base Security and are when emplaced by the PL, forming the basis of the perimeter.
- (4) The PL returns to the ORP and brings the patrol forward. At a 90 degree dogleg into the tentative patrol base, the PL drops off the Temporary LP/OP Team with a radio or land line.
- (5) The patrol files into the tentative patrol base filling in the perimeter set up by the Occupation Team (Patrol Base Security), maintaining squad integrity. Rear Security camouflages the patrol's tracks.
- (6) The PL checks security and emplaces the crew served weapons.
- (7) PL sends out squad R & S Teams.

- (8) When the R & S Teams return and the PL receives their input, he decides to occupy the patrol base or move to an alternate position.
- (9) Information gathered by the R & S Teams is disseminated throughout the patrol.
- (10) PL establishes alert plan and disseminates it throughout the patrol.
- (11) PL establishes evacuation plan (with distances and directions to rendezvous points and alternate patrol bases) then disseminates it throughout the patrol.
- (12) Squads send out LP/Ops as directed by the PL and develop fire plans.
- (13) PL's RTO (recorder) consolidates the squad fire plans into a platoon fire plan.
- (14) Patrol conducts priorities of work as directed by the PL:
  - (a) Security.
  - (b) Maintenance.
  - (c) Clean/service equipment.
  - (d) Thorough ACE Report.
  - (e) Hygiene.
  - (f) Chow/Water.
  - (g) Sleep.
  - (h) Stand to.
  - (i) Planning.

**22. ESTABLISH A HASTY DEFENSIVE PERIMETER:**

- a. Teams required:

- (1) LP/OP: 2-3 man teams as required (Maneuver unit)
- (2) Clearing Team: 2 men (Point and Compass men) (They become the perimeter security) (Maneuver unit)

b. Equipment required:

- (1) Organic equipment and weapons.
- (2) Early warning devices.

c. Procedure:

- (1) Patrol halts short of the defensive position and occupies a security perimeter (Tentative ORP).
- (2) PL conducts a leaders' recon of the defensive position with the Squad Leaders and the Clearing Team.
- (3) PL confirms the defensive position and sends forward the Clearing Team.
- (4) Once the area is cleared, the PL assigns the squads their sectors of the perimeter.
- (5) The PL and the squad Leaders return to the patrol, leaving the Clearing Team to secure the site. They become the Site Security Team.
- (6) The patrol moves into the defensive perimeter, maintaining squad integrity. Squads occupy their assigned sectors.
- (7) APL adjusts the perimeter.
- (8) PL positions crew served weapons.
- (9) Once the APL has positioned the perimeter, squad Leaders assign team sectors of fire. Team Leaders then assign individual sectors of fire.
- (10) PL sends LP/OP Teams as needed. (One per squad)
- (11) Individuals construct hasty fighting positions.

- (12) Squads prepare sector sketches and the PL's RTO draws platoon fire plan.
- (13) Security is maintained.
- (14) PL is given an ACE Report.
- (15) The defensive position is continuously improved as time allows.

**23. CONDUCT A POINT AMBUSH:**

a. Teams required:

- (1) Assault Team: (Optional)
  - (a) Demo Team: as required (Engineer unit)
  - (b) EPW and Search Team: as required (Maneuver unit)
  - (c) Aid and Litter Team: as required (Maneuver unit)
  - (d) Team Leader
- (2) Support Team: as required (Maneuver unit)
- (3) Security Team: (Maneuver unit)
  - (a) Left and Right side: 4 men
  - (b) ORP Security: 2 men
  - (c) Team Leader

b. Procedure:

- (1) Patrol halts short of the ambush site and occupies a security perimeter (Tentative ORP).
- (2) PL conducts a leaders' recon of the site with his Assault, Support, and Security Team Leaders and the Surveillance Team with all their required special equipment.

- (3) PL confirms the ambush site and determines the type of ambush to be used (i.e. linear, L-shaped, X-shaped, etc.) and emplaces the surveillance element.
- (4) Weapons and equipment are prepared in the ORP. Rucksacks and all non-essential equipment are left in the ORP.
- (5) Security Team Leader positions Left and Right Security Teams after checking with the Surveillance Team.
- (6) Support Team Leader moves to the ambush site and provides overwatch while the assault elements move into position.
- (7) Assault Team moves into the ambush position.
- (8) PL positions himself with the Assault Team. APL's RTO goes with the Support Team and the APL goes with the Assault Team for better command and control.
- (9) As the target approaches, the Security Team spotting it alerts the PL reports its size, composition and direction of movement.
- (10) When the bulk of the target is in the kill zone, the PL initiates the ambush on signal by having the most casualty producing weapon engage the target (You may want to use something other than the M-60). Complete surprise must be achieved. The Support Team then delivers a large volume of highly concentrated fire into the kill zone inflicting maximum damage while the Assault Team is moving forward on-line into the final assault line.
- (11) PL signals to lift fire when return fire has ceased.
- (12) If the patrol is not to assault through the kill zone, all teams return to the ORP on signal. Security Teams return by a different route, ensuring the patrol is not followed. The PL receives an ACE Report and the patrol moves out.
- (13) If the target is to be assaulted, the Assault Team charges across the kill zone destroying the remainder of the enemy.
- (14) Once across the kill zone, the Assault Team forms a reconsolidation line and changes magazines. The PL calls for an ACE Report. He then calls out the EPW and Search Teams and Aid and Litter Teams. PIR is gathered and enemy equipment is

recorded by type and amount and stock piled. The PL calls out the Demo Teams who set charges on the captured equipment. When all teams are up, the PL signals to peel-off and the Assault Team moves through the choke point to the ORP. The APL counts the men out at the choke point. The Demo Teams initiate the firing systems and move off the objective through the choke point to the ORP, followed by the APL.

- (15) The PL signals for all remaining teams to return to the ORP. Support and Security Teams return by an alternate route, ensuring the patrol is not followed.
- (16) When all teams are in the ORP, the PL receives an ACE Report and the patrol moves one terrain feature or 1000 meters to disseminate PIR, METT-T will dictate.

#### **24. CONDUCT AN ANTI-ARMOR / ANTI-VEHICULAR AMBUSH:**

##### a. Teams required:

- (1) Armor Kill Teams: two teams, size dependent on type of anti-armor weapons systems and METT-T. (Maneuver unit)
- (2) Assault Team: (Optional)
  - (a) Demo Teams: as required (Engineer unit)
  - (b) EPW and Search Teams: as required (Maneuver unit)
  - (c) Aid and Litter Teams: as required (Maneuver unit)
- (3) Support Team: as required (Maneuver unit)
- (4) Security Team: (Maneuver unit)
  - (a) ORP Security: 2 men
  - (b) Left and Right Side Security: 4 men
  - (c) Team Leader

##### b. Equipment required:

- (1) Anti-armor weapon systems as required
- (2) Satchel charges as required (Optional)
- (3) Dual detonation systems as required (Optional)
- (4) Demo kit/bag
- (5) Binoculars/Night observation devices

c. Procedure:

- (1) Patrol halts short of the ambush site and occupies a security perimeter (Tentative ORP).
- (2) PL conducts a leaders' recon of the ambush site with the Armor Killer, Assault, Support, and Security Team Leaders and the Surveillance Team.
- (3) PL confirms the location of the ambush site and determines the type of ambush to be used based on METT-T and emplaces the Surveillance Team.
- (4) Weapons and equipment are prepared in the ORP. Rucksacks and non-essential equipment are left in the ORP.
- (5) Security Team Leader positions Left and Right Side Security.
- (6) Armor Killer, Assault, and Support Teams move to the ambush site.
- (7) The PL positions himself with the Armor Killer Team at the head of the kill zone. The APL remains with Assault Element for better command and control to assist the PL.
- (8) As the target approaches, the Security Team spotting it alerts the PL and reports on its size, composition and direction of movement.
- (9) When the target is in the kill zone, the PL initiates the ambush on signal by engaging the lead target with the most casualty producing weapon. The second Armor Killer Team engages the last target in the kill zone, trapping the remaining targets in the column. Complete surprise must be achieved.

- (10) As the Armor Killer Teams rounds engage their targets, the Support Team (and Assault Team) engage the center of the kill zone with a large volume of fire to inflict maximum destruction.
- (11) The PL signals to lift fire when return fire has ceased.
- (12) If the patrol is not to assault through the kill zone, all teams return to the ORP on command. Security Teams return to the ORP by an alternate route, ensuring the patrol is not followed. If available, the PL calls for pre-planned artillery on the ambush site. The PL receives an ACE Report and the patrol moves out.
- (13) If the patrol is to assault through the kill zone, the PL orders the Assault Team into the kill zone destroying the remainder of the enemy.
- (14) Once across the kill zone, the Assault Team forms a reconsolidation line. Simultaneously, APL should stay w/assault element for better command and control and once element is on the reconsolidation line and special TM's being used, APL will be centered on the OBJ giving guidance to the special TM's this to include supervise once Demo TM is up, APL will move to and establish choke point. The PL calls out the EPW and Search Teams and the Aid and Litter Teams. PIR is gathered and enemy equipment is recorded by type and amount and stockpile. The PL calls the Demo Teams who set charges on the equipment and vehicles.
- (15) When all teams are up, the PL gives the order to peel off, the Assault Team moves through the choke point to the ORP. The APL counts the men out at the choke point. The Demo Teams initiate the dual detonation systems and move out through the choke point to the ORP, followed by the APL. The PL orders all remaining teams to return to the ORP. The Security Teams return by an alternate route, ensuring that the patrol is not followed.
- (16) If available, the PL calls in pre-planned artillery on the ambush site. The PL receives an ACE Report and the patrol moves one terrain feature or 1000 meters to disseminate information.

## **25. CONDUCT A HASTY AMBUSH:**

- a. Teams required: (Engineer/Maneuver unit)

- (1) EPW and Search Teams: as required
- (2) Aid and Litter Teams: as required
- (3) Demo Teams: as required

b. Equipment required:

- (1) While conducting a movement, the patrol encounters the enemy. The PL has two options depending on the situation and METT-T. The PL can direct the patrol to freeze in place and let the enemy pass if the patrol is undetected, or conduct a hasty ambush.
- (2) If the PL elects to initiate a hasty ambush, he halts the patrol and quickly positions the patrol on-line using hand and arm signals.
- (3) The PL positions himself to observe the enemies movement, initiate the ambush, and control the patrol.
- (4) When the bulk of the target is in the kill zone, the PL initiates the ambush by engaging the target with the most casualty producing weapon system. The remainder of the patrol engages targets in the kill zone.
- (5) The PL signals to lift fire when return fire has ceased.
- (6) If the patrol is not to assault through the kill zone, the PL employs smoke and the patrol withdraws on order of the PL. The PL issues a SITREP to higher headquarters and the patrol continues the mission.
- (7) If the patrol assaults through the kill zone, the PL orders the patrol to charge the kill zone on-line destroying the remainder of the targets.
- (8) Once across the kill zone, the patrol forms a reconsolidation line and change magazines. The PL is given an ACE Report. The PL calls out the EPW and Search and the Aid and Litter Teams. PIR is gathered and enemy equipment is recorded by the type and amount and stockpiled. The PL calls out the Demo Teams who set charges on the equipment.

- (9) When all teams are up, the PL is given an ACE Report and the patrol withdraws on order. The Demo Teams initiate dual detonation systems and follow the patrol, followed by the APL.
- (10) If available, the PL requests artillery on the ambush site in a security perimeter a safe distance from the kill zone.
- (11) The PL is given an ACE Report and submits a SITREP to higher headquarters and the patrol continues its mission.

**26. CONDUCT A RAID:**

a. Teams required:

- (1) Assault Team: (number of men as required)
  - (a) EPW and Search Team: minimum of two teams, two men each. (Maneuver unit)
  - (b) Aid and Litter Team: minimum of two teams, two men each. (Maneuver unit)
  - (c) Demo: minimum of two teams, two men each (Engineer unit)
  - (d) Team Leader (Maneuver unit)
- (2) Support Team. (Number of men as required) (Maneuver unit)
- (3) Security Team: (Maneuver unit)
  - (a) Left and Right Side: 4 men.
  - (b) ORP/Perimeter: 2 men.
  - (c) Team Leader.

b. Equipment needed:

- (1) Smoke generating device(s) (as required)
- (2) Binoculars/Night observation devices (as required)
- (3) Demolitions (as required)

- (4) Demo kit/bag (one per demo Team)
- (5) Prisoner restraining devices (i.e., Flexcuffs, rope, sandbags, tape, etc.)
- (6) First aid kits (one per Aid and Litter Team)
- (7) Expedient litters (one per Aid and Litter Team)
- (8) Signalling devices. (i.e., star clusters, parachute flares, etc.)

c. Procedure:

- (1) Patrol halts short of the objective and occupies a security perimeter (Tentative ORP).
- (2) PL conducts a leaders' recon of the objective taking his Assault, Support, and Security Team Leaders and Surveillance Team.
- (3) The PL locates the objective, defines a release point, emplaces surveillance, and confirms the locations of the Assault, Support, and Security elements. The PL assigns the support element priority targets for each gun.
- (4) Security Team Leader places the security elements. Security elements keep the PL informed of all enemy action as the patrol moves out for the objective.
- (5) Next in sequence after security goes out should be support and then after support in place, their assault
- (6) When all teams are in place, the PL signals the Support Team to open fire initiating the assault. The Assault Team moves forward on line using cover and concealment (individual movement techniques) as the Support Team sweeps the objective with intense fire.
- (7) Once the assault starts, security elements prevent enemy entry into, or escape from, the objective area.
- (8) As the PL gives the Support Team the signal to lift or shift fire, the Assault Team assaults, seizes, and secures the objective.

- (9) Once the objective is secure, the Assault Team forms a reconsolidation line. The PL calls for an ACE Report. He then falls out the EPW and Search Team(s) and the Aid and Litter Team(s). PIR is gathered and enemy equipment is recorded by type and amount and stockpiled. The PL falls out the Demo Team(s) who set charges on the equipment. When all teams are up, the PL signals peel off and the Assault Team moves out through the chokepoint to the ORP. The Demo Team(s) initiate the firing systems igniters and move out through the chokepoint to the ORP, followed by the APL.
- (10) When demo goes off (or when the signal is given) the Support Team again fires on the objective, covering the withdrawal of the Assault Team from the immediate area of the objective, if the enemy is reinforcing the objective area. The Support Team withdraws on order or signal covered by the Security Teams. The Security Teams withdraw on order or signal, returning to the ORP by a different route, ensuring that the patrol is not followed. The Support and Security Teams follow the most direct route back to the ORP. If there is no enemy consolidating on the objective, the Support Team does not fire on the objective.
- (11) In the ORP, the PL gets an ACE Report, the patrol reorganizes and then moves out one terrain feature or 1000 meters away to disseminate any information. METT-T will dictate.

**27. CONDUCT STREAM / GAP CROSSING:**

a. Teams required:

- (1) Security Team: (Maneuver unit)
- (a) Near Side Security (Left and Right): 4 men
  - (b) Far side security (Left and Right): 4 men
  - (c) Team Leader.
- (2) Bridge Team: (per crossing site) (Engineer unit)
- (a) Far Shore Lifeguard: Number 1 man
  - (b) Near Shore Lifeguard: Number 2 man

14-62

(c) Mule Team: Number 3 and 4 man

(d) Team Leader: Number 5 man

b. Equipment required:

- (1) 1 each, rope long enough to span the gap.
- (2) 1 each, 12-14 foot sling rope per soldier.
- (3) 2 each, snap-link per soldier.
- (4) 2 each, snap-link for bridge tightening system.
- (5) Binoculars or night observation device.
- (6) 2 each, life preservers.
- (7) 1 each, waterproof bag per radio.
- (8) 2 each, snap-links per piece of heavy equipment.
- (9) 1 each, 12-14 foot sling rope per each piece of heavy equipment.
- (10) 1 each snap link per lifeguard rucksack.

c. Procedure:

- (1) Patrol halts short of the crossing site and occupies a security perimeter (Tentative ORP).
- (2) PL conducts leaders' recon of the crossing site with the Bridge and Security Team Leaders and the Surveillance Team.
- (3) PL confirms the crossing site and emplaces surveillance.
- (4) Prepare weapons, equipment, and sensitive items for the crossing (waterproofed and secure) in the ORP.
- (5) Security Team Leader emplaces Near Side Security.
- (6) Bridge Team moves to bridge site.

- (7) Number 2 man (Near Side Lifeguard) leaves his rucksack with the Number 5 man (Team Leader) and takes up his position down stream.
- (8) Number 1 man (Far Side Lifeguard) leaves his rucksack with the Number 5 man and swims (carries) the bridge rope across the stream (gap). He quickly clears a small perimeter to hold the patrol. He temporarily secures eight feet of the bridge rope to the anchor point.
- (9) Number 3 man (Mule Team Member) ties a wireman's knot in the bridge rope as close to the near shore as possible and inserts a snap link into the knot. He then passes the running end of the bridge rope around the downstream side of the anchor point and through the snap link.
- (10) Number 1 man pulls the rope one fifth the distance across the water and ties his end with a round turn and two half-hitches with a quick release.
- (11) Number 3, 4, and 5 man (Mule Team) pull the slack out of the bridge rope and secure the end of the rope around the anchor point with a round turn and two half-hitches with a quick release and a transport wrap.
- (12) Number 1 man takes up his position downstream.
- (13) The Far Side Security Team is the first to cross the bridge. They take the Number 1 man's rucksack across. Once across, they assume their positions.
- (14) The maneuver unit crosses the bridge. The PL crosses with the bulk of the patrol. The APL counts personnel across and crosses with the Near Side Security and the Number 3, 4, and 5 man. The Number 5 man takes the Number 2 man's rucksack.
- (15) As the patrol crosses, they form a security perimeter on the far side, out of sight and sound of the crossing site.
- (16) The Number 2 man disassembles the transport tightening system and is pulled across the stream or assisted through the gap by the Number 3 and 4 man.

14-64

(17) Far Side Security is pulled in, the PL gets an ACE REP, and the patrol moves out.

**Notes**

## **28. CONDUCT A CLIFF ASSAULT:**

### a. Teams required:

(1) Cliff Assault Team: (Engineer unit)

(a) Climb Leader: Number 1 man

(b) Climb Member: Number 2 man

(c) Vertical Haul Line Team / Alternate Climb Team: Number 3 and 4 man

(d) Team Leader: Number 5 man

(2) Security Team: (Maneuver unit)

(a) Cliff Base Security (Left and Right): 4 men

(b) Cliff Top Security (Left and Right): 4 men

(c) Team Leader.

### b. Equipment required:

(1) 1 each, 120 foot rope (climbing/dynamic) per climbing lane.

(2) 1 each, 120 foot rope (ascent/static) per ascent lane.

(3) 1 each, Gibbs ascender per mechanical ascent lane.

(4) 1 each, Jumar ascender per mechanical ascent lane.

(5) 2 each, Prussik slings per non-mechanical ascent lane.

(6) Vertical haul line (per lane)

(a) 2 each, spars

(b) 4 each, 12-14 foot sling ropes (spar lashing)

(c) 2 each, 120 foot ropes (anchor lines)

(d) 1 each, 120 foot rope for every 60 feet of elevation.

- (e) 1 each, snap link
- (f) 1 each, machete or axe
- (7) 1 each, 12-14 foot sling rope per man
- (8) 1 each, snap link per man
- (9) 1 set, safety devices (pitons, hexcentrics, tricams)
- (10) 150 feet, 550 cord (utility line)
- (11) Binoculars or night observation device.

c. Procedure:

- (1) Patrol halts short of the assault site and occupies a security perimeter (Tentative ORP).
- (2) PL conducts a leaders' recon of the assault site with the Cliff Assault and Security Team Leaders.
- (3) PL confirms the cliff assault site.
- (4) Patrol prepares equipment and sensitive items for the assault in the ORP. Also prepare shears as logistical and tactical situation dictates.
- (5) Security Team Leader emplaces Cliff Base Security.
- (6) Cliff Assault Team moves to site.
- (7) Number 1 and 2 man (Climbing Team) leave their rucksacks with the Number 5 man (Team Leader) and begin their two party climb up the cliff face, alternating the lead.
- (8) Once at the top, the Number 1 and 2 man, conduct a security sweep through the cliff top assembly area and install primary and alternate ascent and climbing lane ropes, assisted as needed by the Number 3 and 4 man operating at the base of the cliff.
- (9) Once the ascent/climbing lane ropes are installed, the Cliff Top Security Team ascends the cliff and takes up their positions.

- (10) Simultaneously, the Number 1 and 2 man begin construction of the shears for the primary and alternate vertical hauling lines at the cliff top. The Number 3 and 4 man assist as needed at the base of the cliff.
- (11) Once complete, equipment is brought up the cliff face using a vertical hauling line. The Number 1 and 2 man's rucksack are the first brought up the cliff.
- (12) The maneuver unit ascends the cliff using the ascent lane and climbing lane ropes. Equipment is sent up the vertical haul lines. Number 1 and 2 man assist the first men off the lines, then retrieve the loads at the top. Number 3, 4, and 5 man will then secure and hoist any loads at the base. The PL ascends the cliff with the bulk of the patrol while the APL counts personnel up and ascends last with the Cliff Base Security and the Number 3, 4, and 5 man.
- (13) As the patrol reaches the top, they form a security perimeter out of sight and sound of the cliff top.
- (14) The Number 3 and 4 man will climb the cliff using the ascent lanes and intermediate anchor points as needed.
- (15) Cliff Top Security is pulled in. The PL gets an ACE REP and the patrol moves out.

## **29. KNOCK-OUT BUNKERS:**

### a. Teams required:

- (1) Assault Team:
  - (a) Demolitions: 2 men (Engineer unit)
  - (b) Alternate Demo: 2 men (Engineer unit)
  - (c) Clearing Team: 2 men (Maneuver unit)
  - (d) Assault: as required (Maneuver unit)
  - (e) Team Leader: (Maneuver unit)

(2) Support Team: as required (Maneuver unit)

(3) Security Team: (Maneuver team)

(a) ORP: 2 men

(b) Left and Right Side Security: 4 men

(c) Team Leader

(4) Breach Team: as required (Engineer unit)

b. Equipment needed:

(1) Smoke generating devices, if not conducting the mission under limited visibility.

(2) Satchel charges or grenades.

(3) 1 roll, engineer tape or assorted chem lights

(4) Signaling device

(5) Demo kit/bag

(6) Binoculars/Night observation devices

(7) 1 AT-4/ LAW

c. Procedure:

(1) Patrol halts short of the objective and occupies a security perimeter (Tentative ORP).

(2) PL conducts a leaders' recon of the bunker complex with his Security, Assault and Support Team Leaders.

(3) PL confirms location of the objective and positions the Support Team.

(4) If the bunker system is reinforced with obstacles, the PL must also organize a Breach Team and incorporate a breach operation into the mission.

- (5) Prepare demolitions, equipment, and weapons in the ORP.
- (6) Security Team Leader positions Left and Right Side Security.
- (7) PL sends Support Team with APL.
- (8) PL sends Assault Team and positions himself with them.
- (9) PL signals the Support Team to engage the objective.
- (10) The Assault Team moves to the last covered and concealed position near the objective.
- (11) PL directs the employment of smoke on the objective.
- (12) The Assault Team opens fire on the bunker while the Demo Team conducts the final preparation of the demo (or grenades) to knock out the bunker.
- (13) PL signals all teams to lift or shift fire.
- (14) Demo/Clearing Teams move to the bunker. Demo Team initiates charge and throw it into the bunker, and immediately take cover. The Clearing Team covers the exit.
- (15) After detonation, the Clearing Team enters the bunker and kills any remaining enemy. The Demo Team provides local security.
- (16) Clearing Team marks the bunker after it has been cleared.
- (17) Repeat procedures for additional bunkers as required.
- (18) PL signals for all teams to return to the ORP. Security Teams return by alternate route, ensuring the patrol is not followed.
- (19) PL receives an ACE Report and the patrol moves out.

### **30. ENTER BUILDING/CLEAR ROOM**

#### a. Teams Required:

##### (1) Primary Entry Team:

##### (a) Team Leader: Number 1 man

- (b) Soldiers for clearing: Number 2 and 3 man
- (c) Squad Leader with radio: Between Teams for command and control/ marking of cleared rooms.
- (d) Remainder of the squad and (PL positioned for best overall control): Security/reserve.

(2) Security/Reserve Team:

- (a) Second squad: The squad broke down ready to assume duties as primary team.

(3) Casualty Evac/Aid Team:

- (a) APL with radio: Control the evacuation of soldiers and locates a casualty collection point.
- (b) Aid and Litter Teams: 4 man element, to evac and give aid to casualties.

(4) Support Team:

- (a) Support Team Leader with radio, controls the Support Teams direction and volume of fire and follows the marked rooms to prevent Friendly Fire situations.
- (b) Support Team: Gunners, Assistant Gunners, and Ammo bearers.

b. Equipment needed:

- (1) Smoke generating devices, if not conducting the mission under limited visibility.
- (2) Satchel charges or grenades.
- (3) 1 roll, engineer tape or assorted chem lights
- (4) Signalling device
- (5) Demo kit/bag

(6) Binoculars/Night observation devices

(7) All AT-4s/ LAWs to Support Team.

(8) Poleless Litters

NOTE: The discussion that follows assumes that the Engineer squad is supported only by the platoon's organic weapons. The preferred method of entering a building is to use a tank main gun round; direct-fire artillery round; or TOW, Dragon, or Hellfire missile to clear the first room. Additionally, some MOUT situations may require precise application of firepower. This is true of a MOUT-environment where the enemy is mixed with noncombatants. The presence of civilians can restrict the use of fires and reduce the combat power available to a platoon leader. His platoon may have to operate with "no fire" areas. Rules of engagement (ROE) can prohibit the use of certain weapons until a specific hostile action takes place. The use of hand grenades and suppressive fire to enter rooms may be prohibited to preclude noncombatant casualties and collateral damage. All leaders must be aware of the ROE. They must include the precise use of weapons in their planning for MOUT missions. This includes how the platoon will employ its organic weapons including snipers and other weapon systems it may have in support; for example, AC 130 or AH 64 aircraft. They must coordinate the use of marking systems to prevent casualties due to friendly fire. FM 90-10 and FM 90-10-1 provide additional techniques for platoons and squads in MOUT.

- (1) The Support team initiating contact establishes a base of fire and suppresses the enemy in and around the building.
- (2) The squad leader determines that he can maneuver by identifying-
  - (a) The building and any obstacles.
  - (b) The size of the enemy force engaging the squad.
  - (c) An entry point. (Assaulting fire teams should enter the building at the highest level possible.)
  - (d) A covered and concealed route to the entry point.
- (3) The Support team in contact-
  - (a) Destroys or suppresses enemy crew-served weapons first.
  - (b) Obscures the enemy position with smoke (M203).

- (c) Sustains suppressive fires.
- (4) The squad leader directs the fire team in contact to support the entry of the other fire team into the building.
- (5) If necessary, the supporting fire team reposition to isolate the building as well as continue suppressive fires. (Normally, the platoon has added its supporting fires against the enemy.)
- (6) The squad leader designates the entry point of the building platoon and squad shift direct fires and continue to suppress the enemy in adjacent positions and to isolate the building. The platoon FO lifts indirect fires or shifts them beyond the building.
- (7) The squad leader and the assaulting fire team approach the building and position themselves at either side of the entrance. (Soldiers should avoid entering buildings through doors and windows, because they will normally be covered by enemy weapons inside the building.)
- (8) Allowing cook-off time (two seconds minimum), and shouting FRAG OUT, the lead soldier of the assaulting fire team prepares and throws a grenade into the building.

**DANGER If walls and doors are thin, they do not provide protection from hand grenade fragments.**

- (9) After the explosion, the next soldier enters the building and positions himself to the right (left) of the entrance, up against the wall, engages all identified or likely enemy positions with rapid, short burst of automatic fire, and scans the room. The rest of the team provides immediate security outside the building.
  - (a) The size and shape of the room may cause the soldier entering the room to move to the left or right. The first soldier in the room decides where the next man should position himself and gives the command NEXT MAN IN, LEFT (or RIGHT). The next man shouts COMING IN, LEFT (RIGHT), enters the building, positions himself to the left of the entrance, up against the wall, and scans the room. Once in position, he shouts NEXT' MAN IN (RIGHT or LEFT).
  - (b) Depending on the enemy's situation, the size of the entry and the training of the squad, two soldiers can enter the room simultaneously after the grenade detonates. The soldier from the

right side of the entry enters, fires from left to right, and moves to right with his back to the wall. At the same time, the soldier on the left enters from the left, fires from right to left, and moves to the left with his back to the wall. One soldier goes high, the other low, to prevent firing at one another. This method puts more firepower in the room more quickly, but is more difficult and requires more practice. When both soldiers are in position, the senior soldier gives the command NEXT MAN IN (RIGHT or LEFT).

- (10) The assaulting fire team leader shouts COMING IN (RIGHT or LEFT), enters the building initially moving left or right and against the wall, and positions himself where he can control the actions of his team. He does not block the entrance way. He makes a quick assessment of the size and shape of the room, and begins to clear the room. He determines if the remaining man in his team is required to assist in clearing the room.
  - (a) If the team leader decides to bring the last man in, he shouts NEXT MAN IN LEFT (or RIGHT). The last man in the fire team shouts COMING IN LEFT (or RIGHT), enters the building, and begins to clear through the room.
  - (b) If the team leader decides not to bring the last man in, he shouts NEXT MAN, STAND FAST. The last man remains outside the building and provides security from there. The team leader then directs the soldier on the right of the entrance to begin clearing. The team leader reports to the squad leader and then assumes the duties of the soldier on the right of the entrance to provide support.

**DANGER While clearing rooms, soldiers must be alert for trip wires, and booby traps. They should not expose themselves through open doors or windows.**

- (11) Once the room is cleared, the team leader signals to the squad leader that the room is cleared.
- (12) The squad leader enters the building and marks the entry point in accordance with the SOP. The squad leader determines whether or not his squad can continue to clear rooms and still maintain suppressive fires outside the building. Normally, it takes a platoon to clear a building.
- (13) The squad leader and assault fire team move to the entrance of the next room to be cleared and position themselves on either side of the

entrance. The squad enters and clears all subsequent rooms by repeating the actions discussed in paragraphs 8 through 12, above.

- (14) The squad leader directs the team to continue and clear the next room. The squad leader rotates fire teams as necessary to keep the soldiers fresh, to equitably distribute the dangerous duties, and to continue the momentum of the attack.
- (15) The squad leader follows the fire team that is clearing to ensure cleared rooms are properly marked in accordance with the SOP.
- (16) The squad leader assesses the situation to determine if he can continue clearing the building. He reports the situation to the platoon leader. The platoon follows the success of the entry into the building.
- (17) The squad consolidates its position in the building and then reorganizes as necessary. Leaders redistribute ammunition.

**NOTE: Normally the squad/platoons will suppress enemy in buildings with large caliber weapons (particularly if HMMWVs with caliber .50, BFVs, or tanks are available).**

### **31. SUPPORT BY DIRECT FIRE:**

#### a. Personnel required

##### (1) Support (per position)

##### (a) Machine gun crew

- 1) One each ammunition bearer
- 2) One each assistant gunner
- 3) One each machine gunner

##### (b) Support team control element

- 1) One each support team leader
- 2) One each RTO

- b. Support team leader reconnoiters the tentative support position and the routes to it.
  - (1) Establishes local security.
  - (2) Ensures the position provides observation of the objective and overwatch of the assault element.
  - (3) Ensures the support position enables the support element to place suppressive fire on the objective.
- c. The support element moves by a covered and concealed route to the support position.
  - (1) Maintain 360 degree security during movement
  - (2) Maintain noise and light discipline
  - (3) Avoid sky lining
- d. The support element occupies the support position
  - (1) The support team leader assigns covered and concealed positions, sectors of fire and other control measures.
  - (2) Enemy positions are identified
  - (3) Weapons are oriented on enemy positions
  - (4) Maintain 360 degree security while in position
- e. The support team overwatches the breach force and assault elements movement
  - (1) Maintains continuous communications with and observation of the assault element, its routes and any terrain that can influence the route
  - (2) Does not block the moving element route by fire
  - (3) Alerts the assault/breaching force and patrol leader of any detected enemy
- f. The support element suppresses the objective with direct fire

- (1) Support personnel engages or reports targets IAW the operation order
- (2) M60s/SAWs engage dismounted enemy
- (3) M203s engage lightly armored vehicles and dismounted enemy
- (4) Dragons and LAWs engage armored vehicles and tanks
- (5) Support team personnel fire only in assigned sectors unless ordered by the support team leader to do otherwise
- (6) If an individual is firing on a target out of his assigned sector and detects a target in his sector, he shifts fire without orders
- (7) M60s/SAWs and grenadiers engage automatic weapons anywhere within the support sector (controlled by the support team leader)
- (8) M60s/SAWs work together; reloading and firing is staggered so that there is no lull in firing
- (9) Support personnel alert support team leader and other personnel of enemy location(s)
- (10) Only M60's/SAW's gunners fire in the automatic mode (priority to automatic and anti-armor weapons)
- (11) As additional targets appear support team leader shifts fire as needed to engage them
- (12) As the situation changes the support team leader will move individuals and weapons where they can be most effective
- (13) Support team leader reports the situation to the patrol leader throughout the engagement
- (14) When enemy fire becomes ineffective, the volume of fire is reduced
- (15) When the movement element nears the objective, the support team increases the volume of fire

g. The support team lifts or shifts fire on signal or when the assault begins

- (1) Lift fire but continue to observe assigned sector and is prepared to engage any threat to the movement element
- (2) Shift fires to another target
- (3) Walks its fires across the objective in front of the movement element

h. Support element ceases fire

- (1) The support team leader ceases fire after the movement element is on the objective or when all enemy are destroyed or withdrawn from the engagement area
- (2) Withdraws from the support position according to the operation order or patrol leaders new directive
- (3) Charlie Mike

**Notes:**

## ANNEX A

### References:

1. Air Force Pamphlet (AF Pam):
  - a. 64-5, Air Crew Survival
2. Army Regulation (AR):
  - a. 310-25, Dictionary of U.S. Military Terms
  - b. 310-50, Authorized Abbreviations, Brevity Codes, and Acronyms
  - c. 350-3, Code of Conduct/SERE Training
3. Army Training Evaluation Program (ARTEP):
  - a. 7-17-10-Drill, Battle Drills, for the Light Infantry, Infantry, Airborne, and Air Assault Platoon and Squad.
4. DA Forms:
  - a. 355-1-R, Hasty Protective Minefield Record
  - b. 2203-R, Demolition Recon Report
5. Field Circulars (FC):
  - a. 5-102, Mine Warfare
  - b. 7-93, Long Range Surveillance Unit Operations
  - c. 57-230, Advanced Parachuting Techniques and Training
6. Field Manuals (FM):
  - a. 1-400, Aviator's Handbook
  - b. 3-100, NBC Operations
  - c. 5-15, Field Fortifications
  - d. 5-250, Explosives and Demolitions

- e. 5-30, Engineer Intelligence
- f. 5-34, Engineer Field Data
- g. 5-36, Route Recon and Classification
- h. 5-100, Engineer Combat Operations
- i. 5-101, Mobility
- j. 5-102, Counter mobility
- k. 6-20, Fire Support in Combined Arms Operations
- l. 6-30, Observed Fire Procedures
- m. 7-8, The Infantry Platoon and Squad
- n. 7-10, The Infantry Rifle Company
- o. 7-70, Light Infantry Platoon/Squad
- p. 7-71, Light Infantry Company
- q. 7-85, Ranger Unit Operations
- r. 8-35, Evacuation of the Sick and Wounded
- s. 20-32, Mine/Countermine Operations
- t. 20-33, Combat Flame Operations
- u. 21-10, Field Hygiene and Sanitation
- v. 21-11, First Aid for Soldiers
- w. 21-20, Physical Fitness Training
- x. 21-26, Map Reading and Land Navigation
- y. 21-60, Visual Signals
- z. 21-75, Combat Skills of the Soldier

- aa 21-76, Survival
- bb 23-9, M16A2 Rifle and Rifle Marksmanship
- cc 23-14, Squad Automatic Weapon
- dd 23-31, 40mm Grenade Launcher, M203 and M79
- ee 23-33, 66mm HEAT Rocket, M72A1 and M72A2 (LAW)
- ff. 23-67, Machine Gun, 7.62mm M60
- gg 23-85, 60mm Mortar, M19
- hh. 23-90, 81mm Mortar
- ii. 23-92, 4.2 inch Mortar, M30
- jj. 24-18, Tactical Single-Channel Radio Communications Techniques
- kk. 31-24, Special Forces Air Operations
- ll. 31-25, Special Forces Waterborne Operations
- mm. 57-38, Pathfinder Operations
- nn. 57-220, Basic Parachuting Techniques and Training
- oo. 90-4, Air Assault Operations
- pp. 100-2-3, The Soviet Army
- qq. 100-27, USA/USAF Doctrine for Joint Airborne and Tactical Airlift Operations

7. Graphic Training Aids (GTA):

- a. 5-10-27, Mine Card
- b. 5-10-28, Demolition Card

8. Student Handouts (SH):

- a. 21-76, Ranger Handbook
- b. 21-77, Dismounted Patrolling
- c. 57-2, Pathfinder Student Handbook

9. STANAG:

- a. 2017, Orders to the Demo Guard Commander and Demo Firing Party Commander (Non-Nuclear)
- b. 2036, Land Minefield
- c. 2123, Non-Nuclear Demolition target Folder

10. Student Training Pamphlet (STP):

- a. 5-12B24-SM-TG, Combat Engineer
- b. 7-11BCHM14-SM-TG, Infantry Soldier's Manual

11. Training Circulars (TC):

- a. 24-19, Radio Operator's handbook
- b. 90-6-1, Military Mountaineering

12. Technical Manuals (TM):

- a. 5-1940-271-10, 3-Person Pneumatic Recon Boat
- b. 5-1940-272-10, 7-Person CO2 Inflatable Landing Boat
- c. 5-1940-273-10, 15-Person Inflatable Assault Boat
- d. 9-1005-317-10, M9, 9mm Semiautomatic Pistol
- e. 9-1375-213-12, Demo Materials
- f. 9-1375-213-12-1, M180 Cratering Demo Kit
- g. 9-1375-213-12-3 & P, Firing Device, Demolition M122
- h. 43-0001-38, Army Ammo Data Sheets for Demo Materials

13. Cards and Handbooks:

- a. Pathfinder Card
- b. The Rappel Master's Handbook
- c. The Air Assault Handbook

## GLOSSARY

<b>A -</b>	Area of cross section Area (Box) = Length x Width Area (Circle) = 3.14 x Radius
<b>ABF -</b>	Area of Bottom Flange (I-Beam)
<b>ACE REP -</b>	Ammunition, Casualties, and Equipment Report
<b>ACL -</b>	Allowable Cargo Load
<b>ADAM -</b>	Area Denial Artillery Munition
<b>ADER -</b>	Authentication Down, Encrypt Right
<b>ADS -</b>	Aerial Delivery System
<b>AeroMedivac -</b>	Aerial Medical Evacuation
<b>AF -</b>	Air Force
<b>AGL -</b>	Above Ground Level
<b>AHD -</b>	Anti-Handling Device
<b>ALT -</b>	Alternate
<b>AMMO -</b>	Ammunition
<b>AMP -</b>	Amperes
<b>AP -</b>	Antipersonnel Mine
<b>APL -</b>	Assistant Patrol Leader
<b>ASOP -</b>	Airborne Standard Operating Procedure
<b>AT4 -</b>	Light Antitank Weapon
<b>AT -</b>	Antitank Mine
<b>ATF -</b>	Area of Top Flange (I- Beam)
<b>AW -</b>	Area of Web (I- Beam)

<b>AWG -</b>	Average Wire Gauge
<b>BF -</b>	Bottom Flange (I- Beam)
<b>BMNT -</b>	Before Morning Nautical Twilight
<b>C -</b>	Tamping / Material Placement Factor
<b>c -</b>	Circumference (Box) = (Length + Width) x 2 Circumference (Circle) = 2 x 3.14 x Radius
<b>CAS -</b>	Close Air Support
<b>CCP -</b>	Communications Checkpoint
<b>CEOI -</b>	Communications Electronics Operating Instructions
<b>CL -</b>	Charge Length
<b>COA -</b>	Course of Action
<b>COMP -</b>	Composition
<b>CP -</b>	Command Post
<b>CPR -</b>	cardiopulmonary Resuscitation
<b>CT -</b>	Charge Thickness
<b>CV -</b>	Charge Volume
<b>CW -</b>	Charge Width
<b>D -</b>	Diameter
<b>DA -</b>	Department of the Army
<b>DACO -</b>	Departure Airfield Commanding Officer
<b>Demo -</b>	Demolitions
<b>DET CORD -</b>	Detonating Cord
<b>DET VEL -</b>	Detonating Velocity
<b>DODAC -</b>	Department of Defense Accounting Classification

<b>DTG -</b>	Date Time Group
<b>DZ -</b>	Drop Zone
<b>DZSTL -</b>	Drop Zone Support Team Leader
<b>ECM -</b>	Electronic Counter Measures
<b>EENT -</b>	Early Evening Nautical Twilight
<b>Elev -</b>	Elevation
<b>EOD -</b>	Explosive Ordnance Detachment
<b>EPW -</b>	Enemy Prisoner of War
<b>EQT -</b>	Equipment
<b>ERP -</b>	Enroute Rally Point
<b>Evac -</b>	Evacuation
<b>Exp -</b>	Expedient
<b>Expl -</b>	Explosive
<b>FAC -</b>	Forward Air Controller
<b>FASCAM -</b>	Family of Scatterable Mines
<b>FDC -</b>	Fire Direction Center
<b>FT/SEC -</b>	Feet per Second
<b>FFU -</b>	Forward Friendly Unit
<b>FITT -</b>	Frequency, Intensity, Time, Type
<b>FLIR -</b>	Forward Looking Infrared Radar
<b>FM -</b>	Field Manual
<b>FRAGO -</b>	Fragmentary Order
<b>GEMSS -</b>	Ground Emplaced Mine Scattering System

<b>gm -</b>	gram
<b>GMRS -</b>	Ground Marker Release System
<b>GN -</b>	Grid North
<b>GOTWA -</b>	Going where to do what, Others going with me, Time I'm do back, What to do if I don't return, Actions on enemy contact you and me.
<b>grd -</b>	ground
<b>GTA -</b>	Ground To Air
<b>H2O -</b>	Water
<b>HE -</b>	High Explosive
<b>HEMMS -</b>	Hand Emplaced Mine Marking System
<b>HLP -</b>	Helicopter Landing Point
<b>HLS -</b>	Helicopter Landing Site
<b>HLZ -</b>	Helicopter Landing Zone
<b>IBS -</b>	Inflatable Boat Small
<b>ICM -</b>	I Conventional Munitions
<b>Illum -</b>	Illumination Rounds, Artillery
<b>in -</b>	Inch
<b>IR -</b>	Intelligence Requirements
<b>IR -</b>	Infrared
<b>IRP -</b>	Initial Rally Point
<b>ITV -</b>	Improved Tow Vehicle
<b>IV -</b>	Intravenous
<b>JOES -</b>	Jungle Operations Extraction System

<b>K -</b>	material factor
<b>KIA -</b>	Killed in Action
<b>KT -</b>	Kiloton
<b>L -</b>	Length
<b>LAW -</b>	Light Antitank Weapon
<b>lb -</b>	pound
<b>Ldrs -</b>	Leaders
<b>LP/OP -</b>	Listening Post/ Observation Post
<b>LPO -</b>	(bladder)
<b>LZ -</b>	Landing Zone
<b>m -</b>	meters
<b>m/s -</b>	meters per second
<b>Max -</b>	Maximum
<b>MEDEVAC -</b>	Medical Evacuation
<b>METT-T -</b>	Mission, Equipment, Terrain/weather, Time, Troops available
<b>MIA -</b>	Missing in Action
<b>MICLIC -</b>	Mine Clearing Line Charge
<b>Min -</b>	Minimum
<b>mm -</b>	Millimeter
<b>MOGAS -</b>	Motor Gas
<b>MOPMS -</b>	Modular Pack Mine System
<b>MOPP -</b>	Mission Oriented Protective Posture
<b>NA -</b>	Not Applicable

<b>NATO -</b>	North Atlantic Treaty Organization
<b>NAV -</b>	Navigation
<b>NBC -</b>	Nuclear, Biological, Chemical
<b>NG -</b>	National guard
<b>NP -</b>	Non-persistent
<b>NSN -</b>	National Stock Number
<b>OBJ -</b>	Objective
<b>OBSTINTEL -</b>	Obstacle Intelligence
<b>OCOKA -</b>	Observation and fields of fire, Cover and concealment, Obstacles, Key terrain, Avenues of approach
<b>OIR -</b>	Other Intelligence Requirements
<b>OP -</b>	Observation Post
<b>OPCON -</b>	Operational Control
<b>OPORDER -</b>	Operations Order
<b>ORP -</b>	Objective Rally Point
<b>OT -</b>	Observer to Target
<b>P -</b>	Pounds of TNT
<b>PB -</b>	Patrol Base
<b>PETN -</b>	Penorithornite Tetranitrate
<b>PEWS -</b>	Platoon Early Warning System
<b>PIR -</b>	Priority Intelligence Requirements
<b>PL -</b>	Patrol Leader
<b>PLT -</b>	Platoon
<b>ppm -</b>	parts per million

**pri -** primary

**PSG -** Platoon Sergeant

**PSID -** Patrol Seismic Intrusion Device

**PT -** Physical Training

**PYRO -** Pyrotechnics

**PZ -** Pick-up Zone

**R -** Radius

**RAAM -** Remote Anti-Armor Mine system

**RCU -** Remote Control Unit

**Rds -** Rounds

**RP -** Rally Point -- Location to be physically passed through by a patrol  
Rendezvous Point -- Location not yet physically passed through by a patrol

**RB -** Rubber Boat

**RDX -** Cyclonite

**RE -** Relative Effectiveness factor

**RECON -** Reconnaissance

**REMS -** Remote Sensors

**RRP -** Re-entry Rally Point

**RSTA -** Reconnaissance, Surveillance, Target Acquisition (Formerly STANO)

**RTO -** Radio Telephone Operator

**R&S -** Reconnaissance and Security

**SALUTE -** Size, Activity, Location, Unit, Time, Equipment

**SCATMINWARN -** Scatterable Mine Warning

<b>SF -</b>	Special Forces
<b>SINGARS -</b>	Single Channel Ground and Air Radio System
<b>SITREP -</b>	Situation Report
<b>SL -</b>	Squad Leader
<b>SLLS -</b>	Stop, Look, Listen, Smell
<b>SOI -</b>	Signal Operating Instruction
<b>SOSR -</b>	Suppress, Obscure, Secure, Reduce
<b>SQD -</b>	Squad
<b>STABO -</b>	Stabilized Tactical Airborne Body Operation
<b>STANAG -</b>	Standardization Agreement
<b>SUBORDS -</b>	Subordinates
<b>TA -</b>	Total Area
<b>TCV -</b>	Total Charge Volume
<b>TDP -</b>	Touch Down Point
<b>TF -</b>	Top Flange
<b>TGT -</b>	Target
<b>TM -</b>	Technical Manual
<b>TNT -</b>	Trinitrotoluene
<b>TORP -</b>	Tentative Operational Rally Point
<b>TPV -</b>	Total Package volume
<b>Trlr Mtd -</b>	Trailer Mounted
<b>TRP -</b>	Target Reference Point
<b>US -</b>	United States

<b>VX -</b>	Nerve Agent
<b>W -</b>	Width
<b>WASPM -</b>	Wide Area Side Penetrator Mine
<b>WIA -</b>	Wounded in Action
<b>WGT -</b>	Weight
<b>WPN -</b>	Weapon