



# AIR ASSAULT SCHOOL

## HANDBOOK



FY2018

Version 1.6

**RANGER**



**In remembrance of  
1LT Christopher D. Holbrook  
13 August 1981 – 16 March 2014**



TABLE OF CONTENTS

CHAPTER I

**AIR MOBILE OPERATIONS**

	PART I	
ROTARY WING AIRCRAFT		7
	PART II	
AIR CRAFT SAFETY		24
	PART III	
AEROMEDICAL EVACUATION PROCEDURES		25
	PART IV	
PATHFINDER OPERATIONS		30
	PART V	
HAND AND ARM SIGNALS		42
	PART VI	
COMBAT ASSAULT		51
AIR MISSION BRIEF		59
COLD LOAD TRAINING		60
	PART VII	
CLOSE COMBAT ATTACK		64

## CHAPTER II

### HELICOPTER EXTERNAL LOAD OPERATIONS

#### PART I

GENERAL	69
---------	----

#### PART II

5,000 AND 10,000 POUND CAPACITY CARGO NET	92
A-22 CARGO BAG	97
ONE TO FOUR 500 GALLON FUEL DRUMS	103
M102 105mm HOWITZER	111
M119A2 105mm HOWITZER	116
M149-SERIES WATER TRAILER (Unique)	122
M998/M1038 TRUCK, CARGO, 1 ¼ TON (HMMWV)	126
M1097/M1097 A2 TRUCK, CARGO, 1 ¼ TON (HMMWV)	132
SIDE BY SIDE RIGGING PROCEDURES FOR M998/1038 CARGO TROOP (HMMWV), (SHOTGUN) M996/M1036/M1045/ M1078/M1078A1/M1079A1/M1081 LMTV	140 148

## CHAPTER III

### RAPPELLING

BASIC COMBAT RAPPELLING	156
-------------------------	-----

APPENDICES

APPENDIX A

NINE LINE MEDEVAC REQUEST 169

APPENDIX B

AIR MISSION BRIEF 174

APPENDIX C

EXAMPLE AIR MOVEMENT TABLE 177

APPENDIX D

EXAMPLE AIR LOAD TABLE 178

APPENDIX E

CLOSE COMBAT ATTACK 179

APPENDIX F

SLINGLOAD INSPECTION SEQUENCE 181

APPENDIX G

SLING CONVERSION TABLE 191

APPENDIX H

SLINGLOAD INSPECTION RECORD INSTRUCTIONS 194  
DA FORM 7382-R SLINGLOAD INSPECTION RECORD 195

APPENDIX I

DA FORM 5752-R ROPE USAGE LOG 196

## CHAPTER ONE

### AIR MOBILE OPERATIONS

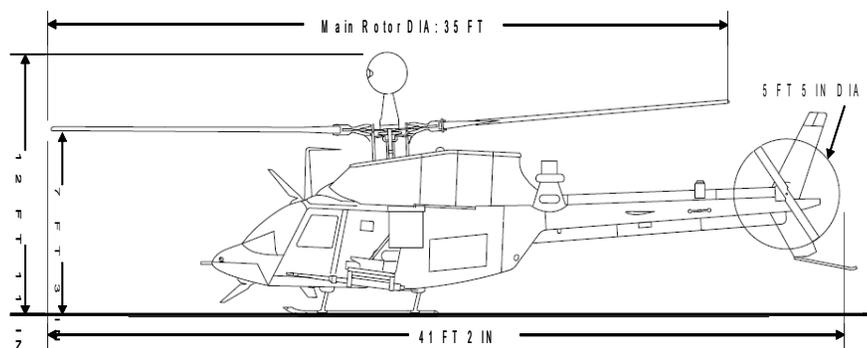
#### REFERENCES:

- A. ATTP 3-18.12, Air Assault Operations, March 2011
- B. FM 3-21.38, Pathfinder Operations, April 2006
- C. FM 8-10-6, Medical Evacuation in a Theater of Operation, 14 April 2000
- D. TM 1-1520-248-10, Army Model OH-58D Helicopter, 15 November 2001 (w/ changes 1 through 7, dated 15 October 2003)
- E. TM 1-1520-237-10, Army Model UH-60A/L Helicopter, 1 May 2003
- F. TM 1-1520-238-10, Army Model AH-64A Helicopter, 13 August 1994 (w/ changes 1 through 11, dated 14 February 2003).
- G. TM 1-1520-251-10, Army Model AH-64D Helicopter, March 2002 (w/ changes 1 through 3, dated 30 April 2004)
- H. TM 1-1520-240-10, Army Model CH-47D Helicopter, 31 January 2003 (w/ changes 1 through 4, dated 21 January 2005)
- I. TM 1-1520-252-10, Army Model MH-47E Helicopter, 28 June 1995 (w/ changes 1 through 13, dated 30 June 2003)
- J. FM 3-04.111, Aviation Brigades, August 2003
- K. FM 3-04.126, Attack Reconnaissance Helicopter Operations, 27 Feb 2007
- L. FM 3-04.113, Utility and Cargo Helicopter Operations, 11 December 2007
- M. FM 3-21.8, Infantry Rifle Platoon and Squad, March 2007

## PART I

### ROTARY WING AIRCRAFT OF THE UNITED STATES ARMY

#### OBSERVATION AIRCRAFT



#### OH-58D KIOWA WARRIOR

Reference TM 1-1520-248-10  
FM 3-04.126

Airspeed  
     Max 110 knots  
     Cruise 90 knots

Flight time 2hours, 30min.

Crew Pilot, Co-Pilot

ACL 0

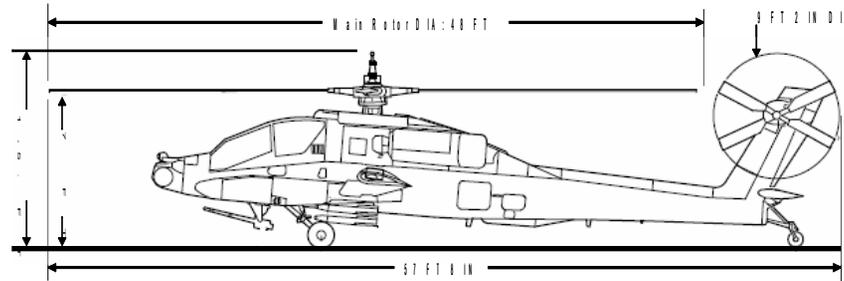
Missions

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>1. Reconnaissance</li> <li>2. Security</li> </ul> | <ul style="list-style-type: none"> <li>3. Target acquisition/ designation</li> <li>4. Defensive air-to-air combat</li> </ul> |
|--|--|

ARMAMENT	MAX LOAD	MIN RANGES	MAX	MAX EFFECT
.50 cal (left side only)	500 rds			2000 m
2.75 FFAR	14 rds		9000 m	2-5000 m
Hellfire II Missile - LG	4 rds	500 m	8000 m	8,000 m
Stinger ATA Missile	4 rds			5,000 m

Digital call for fire capability (to artillery, AH-64D, other OH-58's)

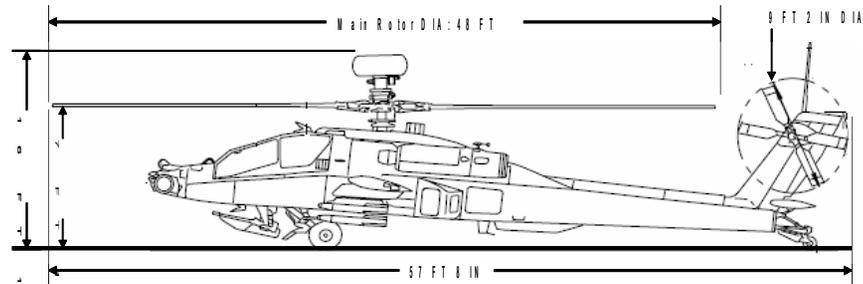
## ATTACK AIRCRAFT



**AH-64A Apache**

Reference	TM 1-1520-238-10 FM 3-04.126
Airspeed	164 knots 100 knots
Maximum Cruise	164 knots 100 knots
Flight Time	1 hr, 50 min
Crew	2 (Pilot- rear, Co-pilot/ gunner-front)
Missions	1. Anti-armor (primary) 2. Close air support 3. Reconnaissance 4. Air to air combat

ARMAMENT	MAX LOAD	MIN RANGES	MAX RANGES	MAX EFFECT
30mm Chain Gun	1200 rds		4000 m	1500 m point 3000 m area
2.75 FFAR	76 rds		9000 m	3-5000m
Hellfire II Missile - LG	16 rds	500 m	8000 m	8,000 m
Stinger ATA Missile	2 rds—can carry but not auth			5,000 m
Sidewinder ATA Missile	2 rds—can carry but not auth			10-18 mi



**AH-64D Longbow Apache**

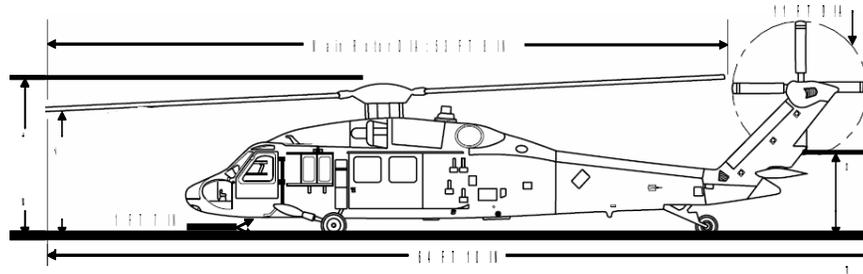
Reference	TM 1-1520-251-10 FM 3-04.126
Airspeed	
Maximum	164 knots
Cruise	100 knots
Flight Time	1 hr, 50 min
Crew	2 (Pilot- rear, Co-pilot/ gunner-front)

- Missions
1. Anti-armor (primary)
  2. Close air support
  3. Reconnaissance
  4. Air to air combat

ARMAMENT	MAX LOAD	MIN RANGES	MAX RANGES	MAX EFFECT
30mm Chain Gun	1200 rds		4000 m	1500 m point 3000 m area
2.75 FFAR	76 rds		9000 m	3-5000m
Hellfire II Missile - LG	16 rds	500 m	8,000 m	8000 m
Stinger ATA Missile	4 rds—can carry but not auth			5,000 m
Sidewinder ATA Missile	2 rds—can carry but not auth			10-18 mi
Longbow Hellfire F&F	16 rds	500 m	8,000 m	8000 m

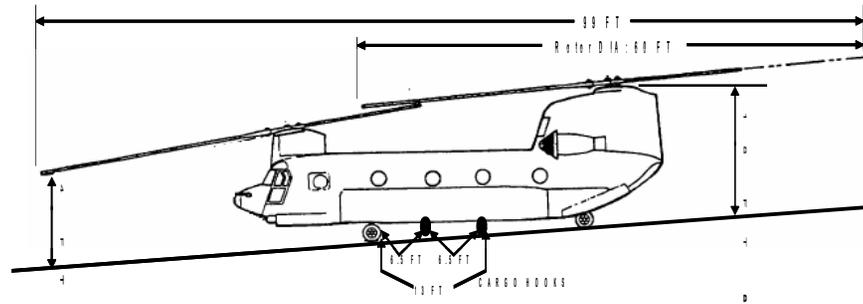
**May or may not have Fire Control Radar (FCR) mounted on rotor mast**

## ASSAULT / LIFT AIRCRAFT



**UH-60A/L/M Blackhawk**

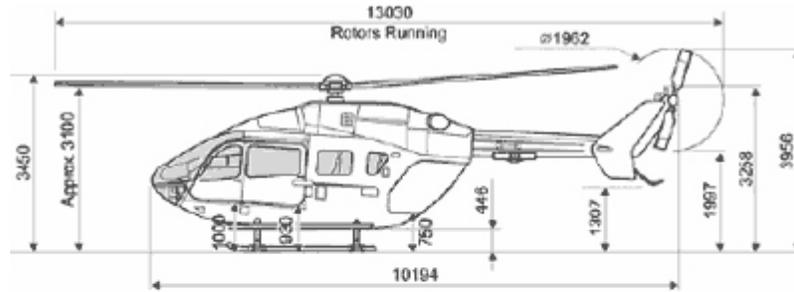
Reference	TM 1-1520-237-10 FM 3-04.113
Maximum Airspeed	156 knots
Normal cruise speed	130 knots
Normal cruise speed UH60M	151 knots
Crew for tactical operations:	4- Pilot, Co-pilot, 2 Crew Chiefs
Allowable Cargo Load (ACL) for planning Combat equipped troops:	with seats – 11 without seats – 16
Cargo Hook Capacity UH-60A UH-60L/M	8,000 lbs 9,000/ 9,000 lbs
Max Gross Weight for internal load A/L/M	22,000 lbs
Max Gross Weight for external load L/M	23,500 lbs
Flight Time	2 hrs, 30 min
Missions	<ol style="list-style-type: none"> <li>1. Air Assault &amp; Air Movement</li> <li>2. Casualty Evacuation / Aero-Medical Evacuation</li> <li>3. Sling load &amp; Re-supply Operations</li> <li>4. FRIES/SPIES, Rappelling and Parachute Operations</li> </ol>
UH60M unique characteristics:	<ul style="list-style-type: none"> <li>-Upgraded avionics and engines</li> <li>-Fly by Wire capability</li> </ul>



**CH-47D/F Chinook**

Reference	TM 1-1520-240-10 FM 3-04.113
Airspeed	
Maximum	170 knots
Cruising	130 knots
Flight time	2 hrs, 30 min
Crew for tactical operations:	4- Pilot, Co-pilot, Flight Engineer, Crew Chief
Allowable Cargo Load (ACL) for planning	
Combat Equipped Troops	33
Maximum Litter Capacity	24 + 1 Ambulatory
Cargo Hook Capacity	
Front Hook	17,000 lbs
Rear Hook	17,000 lbs
Center Hook	26,000 lbs
Dual Hook Load (fore & aft combined)	25,000 lbs
Planning Weight	19,000 lbs
Maximum Gross Weight	50,000 lbs
Missions	
1. Troop and Cargo Transport	
2. Slingload Operations	
3. Waterborne Operations	
4. Mass casualty evacuation when used during CASEVAC missions	

**“F” Model has improved avionics, upgraded engine and digital cockpit**



**LUH-72A Lakota Light Utility Helicopter( LUH)**

Airspeed

Maximum	145 knots
Cruising	133 knots

Max Range

420 Miles

Crew for tactical operations:

2- Pilot, Co-pilot

Allowable Cargo Load (ACL) for planning

Combat Equipped Troops	8
Number of litters can carry with med crew	2

Cargo Hook Capacity

3953 lbs

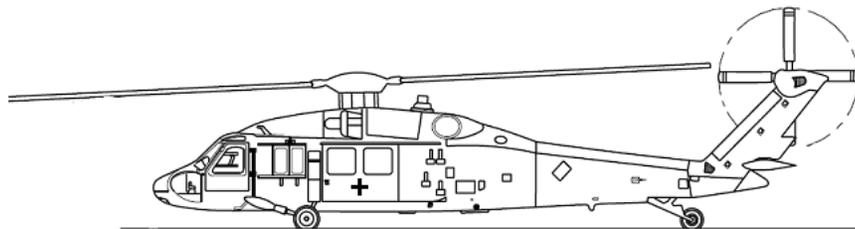
Max gross weight

7903 lbs

Missions

1. Homeland Security
2. Drug Interdiction
3. General Support
4. Logistics
5. MEDEVAC

## MEDEVAC AIRCRAFT

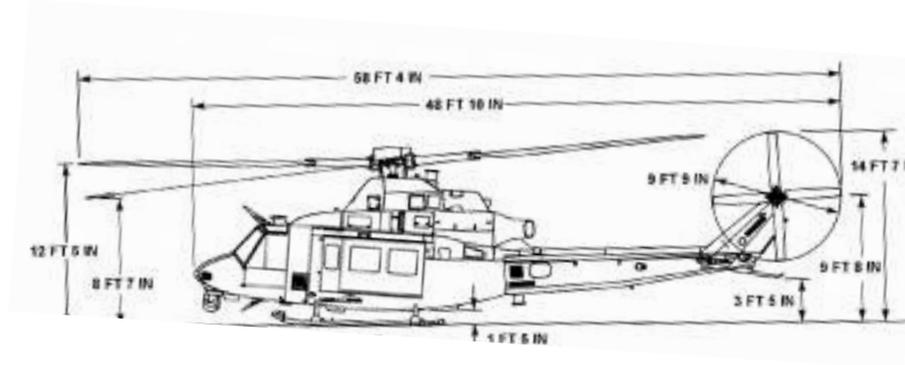


### UH-60Q/ HH-60M MEDEVAC

Reference	TM 1-1520-237-10 FM 8-10-6 FM 3-04.113
Maximum Airspeed	156 knots
Flight Time	2 hrs, 30 min
Crew	4 (Pilot, Co-pilot, Crew chief and In-flight Medic)
Internal Rescue Hoist Capability	600 lbs
Hoist Speed	Fast 250 FPM 300 lbs. Slow 125 FPM 600 lbs.
Hoist Cable Length	256 ft. total, 250 ft. usable
Normal Configuration	4 litter patients and 1 ambulatory patients
Maximum Configuration	6 litter & 1 Ambulatory or 7 ambulatory

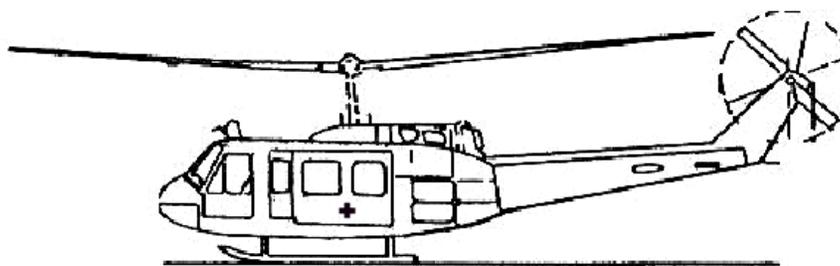
**NOTE:** HH-60M platform design also includes oxygen distribution and suction systems, an airway management capability, and provisions for stowing intravenous solutions. The interior also features the following capabilities: Oxygen generating systems; NVG-compatible lighting throughout; an environmental control system; medical equipment; patient monitoring equipment; neonatal isolates.

## USMC



### UH-1Y Iroquois (Venom/ Super Huey)

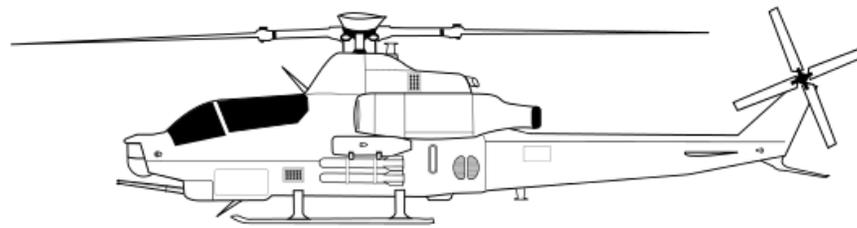
Reference	TM 1-1520-22-010 TM 4-48.09
Airspeed	
Maximum	164 knots
Cruise	135 knots
Crew for tactical operations	3 (Pilot, Co-pilot, Crew Chief)
ACL Combat equipped troops	10 with seats
Maximum Hook Capacity	5,000 lbs
Planning Weight	6,660 lbs
Max Gross Weight	18,500 lbs
Flight Time	2 hrs, 30 min
Missions	
1. Combat Assault	
2. Casualty Evacuation	
3. Sling load & re-supply operations	



### UH-1V Iroquois MEDEVAC

Reference	TM 10-1520-210-10
Maximum Airspeed	124 knots
Flight Time	2 hrs, 20 min
Crew	4 (Pilot, Co-pilot, Crew chief, and Medic)
Internal Hoist Capacity	600 lbs
Hoist Cable Length	256 ft. total, 250 ft. usable
ACL Normal Configuration	3 litter patients and 4 ambulatory patients
Maximum Configuration	6 litter or 9 ambulatory with prior notification

USMC



**AH-1W/Z SUPER COBRA/ VIPER**

Reference TM 1-1520-236-10

Airspeed

Maximum 170 knots  
Cruise 160 knots

Flight Time 3 hr, 20 min

Crew 2 (Pilot- rear, Co-pilot/  
gunner-front)

ACL 0

Missions

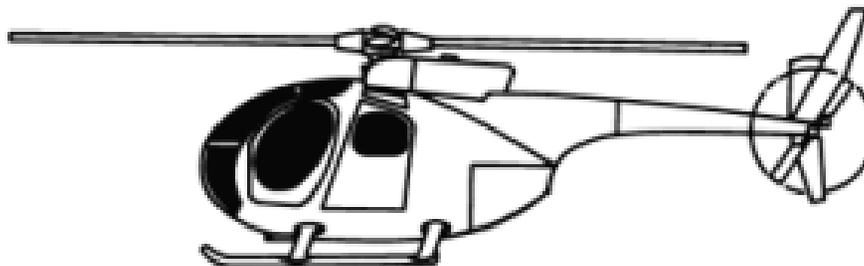
1. Anti-armor (primary)
2. Close air support
3. Air to air combat
4. Armed escort

ARMAMENT	MAX LOAD	MIN RANGES	MAX	MAX EFFECT
20 mm Gatling Gun	750 rds			
2.75 FFAR	76 rds		9000 m	3-5000m
Hellfire II Missile - LB	16 rds	500 m		8000 m
Sidewinder ATA Missile	1 rds			10-18 mi
*TOW Missile	4 rds		3750 m	3750 m

\* TOW system only available on AH-1W model.

**NOTE:** The AH-1Z Viper has upgraded avionics including the Longbow FCR.

## SPECIAL OPERATIONS



### OH-6/AH-6J/MH-6J CAYUSE "Little Bird"

#### Airspeed

Maximum allowable airspeed:	150 knots
Maximum endurance (unrefueled):	5.1 hours
Maximum range (unrefueled):	480 nautical miles

#### Crew

2 (pilot, co-pilot)

#### ACL

up to six (6) personnel on  
outboard seats

#### Missions:

Perform infiltration, exfiltration and close air support of special operations forces.

#### Armament available:

2x seven-tube 2.75 inch rocket launchers  
two 7.62mm M134 "mini-guns"  
.50 Cal. machine guns  
MK19 40mm grenade machine gun  
Hellfire missiles  
Air-to-Air Stinger (ATAS) missiles.

## SPECIAL OPERATIONS



### MH-60 K/ L Direct Action Penetrator (DAP)

#### Airspeed

Normal cruise airspeed	120 knots
Maximum dash airspeed	178 knots
Normal mission range (no A/R)	450 NM
Normal mission endurance (no A/R)	4 hrs, 20 min

#### Crew

4 (pilot, co-pilot, one flight engineer and one gunner)

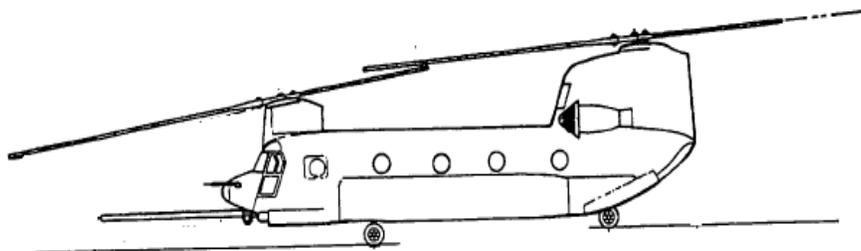
#### Missions:

Overt or covert infiltration, exfiltration, and resupply of special operations forces in day, night or marginal weather conditions.

#### DAP mission:

Conduct attack helicopter operations utilizing area fire or precision guided munitions and armed infiltration or exfiltration of small units.

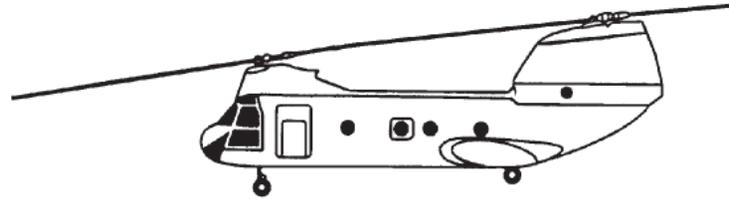
## SPECIAL OPERATIONS



### MH-47 D/E Chinook

Airspeed		
Maximum		170 knots
Cruising		130 knots
Flight time		2 hrs, 30 min
Crew for tactical operations:		4 (Pilot, Co-pilot, Flight Engineer, Crew Chief)
Allowable Cargo Load (ACL) for planning		
Combat Equipped Troops		33
Maximum Litter Capacity		24
Cargo Hook Capacity		
Front Hook		17,000 lbs
Rear Hook		17,000 lbs
Center Hook		26,000 lbs
Dual Hook Load (fore & aft combined)		25,000 lbs
Planning Weight		19,000 lbs
Maximum Gross Weight		50,000 lbs
Internal rescue hoist with a 600 lb capacity		
Missions:		
	Overt and covert infiltrations, exfiltrations, air assault, resupply, and sling operations in support of special operations forces in all terrain and environments.	
Defensive armament:		
	Two M-134 machine-guns	
	One M-60D machine-gun	

## USMC



### CH-46D/E SEA KNIGHT

#### Airspeed

Maximum allowable airspeed:	144 knots
Maximum range (unrefueled):	550 nautical miles

#### Crew

4 (pilot, co-pilot,  
engineer, gunner)

#### ACL

Troops 24

#### Cargo Hook Capacity

10,000 lbs

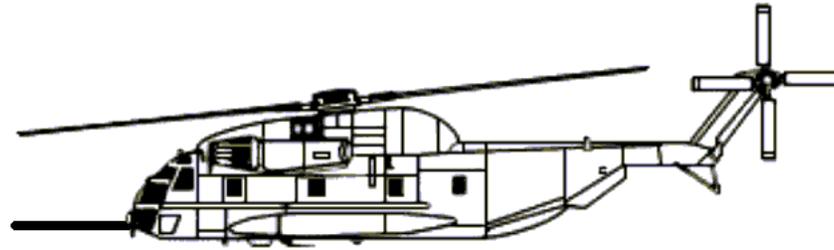
#### Missions:

Rapidly deliver combat troops, support equipment, supplies, and perform vertical replenishment.

#### Armament:

Two .50 cal machineguns; or one .50 cal machinegun and one 240 machinegun.

## USMC



### CH-53E SUPER STALLION

#### Airspeed

Maximum allowable airspeed:	150 knots
Maximum endurance (unrefueled):	5.1 hours
Maximum range (unrefueled):	480 nautical miles

#### Crew

6 (pilot, co-pilot, 2 flight engineers, 2 gunners)

#### ACL

Troops 38 troops or 14 litters

#### Cargo Hook Capacity

Center Hook	32,000 lbs
Dual Hook Load (fore & aft combined)	32,000 lbs

#### Missions:

Perform low-level, long-range, undetected penetration into denied areas, day or night, in adverse weather, for infiltration, exfiltration, and resupply of Marine Corps personnel.

#### Armament:

Combination of three 7.62mm mini-guns or .50 caliber machineguns

#### CAUTION

Loads weighing less than 6,000 lbs. may not fly in a stable condition and may incur jettisoning problems when flown under the CH-53E helicopter. CH-53E units may have restrictions on flying light loads. Direct coordination with the CH-53E unit is highly encouraged.

**USAF/ USMC**



**MV-22 OSPREY**

Reference:	TC 1-21-1
Airspeed	
Maximum	275 knots
Cruise	241 knots
Crew	2 (pilot, co-pilot)
ACL	
Troops	24 with seats 32 without seats
Internal Load	20,000 lbs
Cargo Hook Capacity	
Dual Hook Load (fore & aft combined)	15,000 lbs

Missions:  
Perform infiltration, exfiltration, air assault, resupply, and slingload operations in support of US Forces in all terrain environments.

Armament:  
1x 7.62 mm M240B Machineguns  
1x .50 cal M2 Browning HMG  
(prototype) 1x 7.62 mm GAU-17 Retractable Belly Mounted Minigun

## Rotary Wing Aircraft Overview

Reference: AR 70-50, DESIGNATING AND NAMING DEFENSE  
MILITARY AEROSPACE VEHICLES, 14 March 2005

- A. First Letter designator indicates basic mission:
  - 1. AH = Attack Helicopter
  - 2. OH = Observation Helicopter
  - 3. CH = Transport / Cargo Helicopter
  - 4. UH = Utility Helicopter
  - 4. MH = Multi-mission Helicopter
  
- B. Second Letter designator indicates basic type:
  - 1. OH-58 = Helicopter
  
- C. Two number designator indicates design number of aircraft:
  - 1. UH-60 = Blackhawk
  - 2. AH-64 = Apache
  - 3. OH-58 = Kiowa
  
- D. Letter Designator after numbers indicates series / model:
  - 1. OH-58A = Kiowa
  - 2. OH-58D = Kiowa Warrior
  
- E. Primary Rotary Wing Aircraft in the Army:
  - 1. UH-60L/M Blackhawk
  - 2. UH-60Q Blackhawk MEDEVAC
  - 2. CH-47D Chinook
  - 3. OH-58D Kiowa Warrior
  - 4. AH-64D Apache

## PART II

### AIRCRAFT SAFETY

REFERENCE: ATTP 3-18.12 Air Assault Operations

#### A. SAFETY BRIEFING CHECKLIST

##### 1. ITEMS YOU WILL HAVE ON YOU AT ALL TIMES:

- a. ID card
- b. ID tags
- c. Earplugs

##### 2. HELMET WITH CHINSTRAP FASTENED (FREE OF TWISTS AND TAPE)

##### 3. WEAPON CARRIED MUZZLE DOWN, NO ROUNDS CHAMBERED, ON SAFE

##### 4. SLEEVES DOWN:

- a. Protection from flying debris
- b. Protection from flash fires

##### 5. SECURE LOOSE EQUIPMENT:

- a. IAW unit SOP
- b. Grenades secured
- c. Antennas tied down or removed
- d. Unfix bayonets

##### 6. APPROACH DIRECTION

- a. From DOWN slope side
- b. UH-60: 90 degrees from side. Away from tail rotor & front (lowest main rotor position)
- c. UH-1H: 45 degrees from the front
- d. CH-47: 45 degrees from rear. Away from engine exhaust

##### 7. BEND FORWARD AT THE WAIST when approaching A/C:

- a. Added stability
- b. Maintain low silhouette
- c. Stay clear of main rotor blades, tail rotor blades and cargo hook

##### 8. FASTEN SEAT BELT

##### 9. CRASH POSITIONS: (Magazine well facing away from body)

- a. UH-60L: Sit upright, muzzle pointed down
- b. UH-1H: Bend forward at waist, muzzle pointed up
- c. CH-47D: Bend forward at waist, muzzle pointed down

	<b>EMERGENCY EXITS</b>	<b>FIRST AID KITS</b>	<b>FIRE EXTINGUISHERS</b>
<b>UH-60L</b>	4 Windows fall out	3	2
<b>UH-1H</b>	4 Windows fall in	4	1
<b>CH-47D</b>	10 Windows fall out	7	3

10. IMMEDIATE ACTIONS IN EMERGENCY SITUATIONS:

Take commands from crew, wait for rotor blades to stop. Exit 3, 9, 12, o'clock and move 500 meters away from the crash site. In case of fire exit immediately, secure fire extinguishers, first aid kits, and unconscious personnel. In water wait for aircraft to belly roll, exit 3, 9, 12 and swim up stream.

PART III

**AEROMEDICAL EVACUATION PROCEDURES**

REFERENCE: FM 4-02.2 Aeromedical Evacuation, FM 8-10-6 Medical Evacuation in a Theatre of Operation, Tactics, Techniques, & Procedures

A. DEFINITIONS

1. MEDEVAC (Medical Evacuation): movement and en route care by medical personnel of wounded, injured, or ill persons from the battlefield and/or other locations to Medical Treatment Facilities.
2. CASEVAC (Casualty Evacuation): Movement of casualties aboard non-medical vehicles or aircraft. Casualties transported in this manner do not receive en route medical care.
3. MASCAS (Mass Casualty): Any large number of casualties produced in a relatively short period of time, that exceeds unit support capabilities.
4. MTF: Medical Treatment Facility

**\*\* Normal medical support capabilities are six (6) casualties to one (1) Medic.**

## B. HISTORY

### 1. OH-13 Sioux:

- a. The Angel of Mercy had distinct disadvantages
  - (1) No in-flight medical treatment
  - (2) Casualties exposed to the elements
  - (3) Casualties exposed to enemy fire

## C. ADVANTAGES OF AEROMEDICAL EVACUATION

### 1. The speed, range, flexibility, and versatility of aero medical evacuation allows:

- a. timely treatment, contributing to saving lives & reducing permanent disability
- b. movement of patients over relatively long distances in short periods of time
- c. movement of patients over terrain where ground evacuation would be difficult or impossible fewer and less frequent movement of MTFs
- d. patients to be moved directly to the MTF best equipped to deal with their condition

## D. BASIC AEROMEDEVAC MISSIONS/CAPABILITIES

- 1. Delivery of whole blood and biologicals
- 2. Air-crash rescue support
- 3. Movement of medical personnel and supplies
- 4. Evacuation of selected casualties

## E. AEROMEDEVAC ASSETS

### 1. UH-1V:

- a. 4 Red Cross markings (1 each cargo door, 1 nose, 1 belly)
- b. CREW:
  - (1) pilot
  - (2) co-pilot
  - (3) crew chief
  - (4) in-flight medic
- c. ACL NORMAL CONFIGURATION
  - (1) 3 litters and 4 ambulatory
- d. ACL PRIOR NOTIFICATION
  - (1) 6 litters
  - (2) 9 ambulatory
- e. LOADING SEQUENCE
  - (1) litters from top to bottom, ambulatory loaded either first or last. Generally, most seriously injured loaded last, first to be unloaded.

2. UH-60/ HH-60:
    - a. 5 Red Cross markings ( 1 each cargo door, 1 nose, 1 belly, 1 on top)
    - b. CREW:
      - (1) pilot
      - (2) co-pilot
      - (3) crew chief
      - (4) in-flight medic
    - c. ACL NORMAL CONFIGURATION:
      - (1) 4 litters and 1 ambulatory
    - d. ACL PRIOR NOTIFICATION:
      - (1) 6 litters & 1 ambulatory
      - (2) 7 ambulatory
    - e. LOADING SEQUENCE:
      - (1) ambulatory first then litter in “Z” pattern from top to bottom generally, most seriously injured loaded last, first to be unloaded.
  3. CH-47:
    - a. PRIMARY USE:
      - (1) mass casualty evacuation
    - b. IDENTIFIABLE MARKS:
      - (2) none
    - c. CREW:
      - (1) pilot
      - (2) co-pilot
      - (3) crew chief
      - (4) in-flight engineer
    - d. ACL:
      - (1) 24 litters + 1 ambulatory
      - (2) 31 ambulatory
    - e. LOADING SEQUENCE:
      - (1) Ambulatory first then litter from front to back & top to bottom, in a “Z” pattern. Generally, most seriously injured loaded last , first to be unloaded.
- F. METHODS OF CASUALTY EXTRACTION
1. Sit down method has a landing zone
  2. Hoist method does not have a landing zone
- G. SPECIAL EQUIPMENT:
1. HIGH PERFORMANCE UTILITY HOIST
    - a. TENSILE STRENGTH: 600lbs
    - b. SLOW SPEED: 600lbs at a rate of 125 ft per min
    - c. FAST SPEED: 300lbs at a rate of 250ft per min
    - d. HOIST CABLE TENSION STRENGTH: 600lbs

- e. HOIST CABLE LENGTH:
  - (1) 256 ft long, only 250 is usable

2. JUNGLE FOREST PENETRATOR

- a. PRIMARY USE:
  - (1) Evacuation of casualties through thick vegetation
- b. TENSILE STRENGTH:
  - (1) 600 lbs
- b. ACL:
  - (1) 3 ambulatory casualties

3. SKED RESCUE SYSTEM

- a. PRIMARY USE:
  - (1) ground evacuation; sit down mission, hoist extraction, water rescue
- b. TENSILE STRENGTH:
  - (2) 400 lbs
- c. ACL:
  - (1) 1

4. BASIC RIDGED LITTER

- a. PRIMARY USE:
  - (1) ground evacuation, sit down mission
- b. TENSILE STRENGTH:
  - (1) 400 lbs
- c. ACL:
  - (1) 1

5. KENDRICK'S EXTRICATION DEVICE

- a. PRIMARY USE:
  - (1) Casualty with suspected spinal injury
- b. TENSILE STRENGTH:
  - (1) 400 lbs
- c. ACL:
  - (1) 1

H. PATIENT CLASSIFICATION BY TYPE:

- 1. Litter- head, neck, or back injury (Non- walking wounded)
- 2. Ambulatory- walking wounded

I. PATIENT CLASSIFICATION BY PRECEDENCE:

- 1. Priority I: URGENT- Immediate evacuation is necessary to save LIFE, LIMB, or EYESIGHT within TWO hours.
- 2. Priority IA: URGENT SURGICAL- Must receive far forward surgical intervention to save life and to stabilize them for further evacuation.
- 3. Priority II: PRIORITY- Evacuation is required as soon as possible. LIFE, LIMB or EYESIGHT is not in immediate danger. Evacuation should be within FOUR hours.

4. Priority III. ROUTINE – Evacuation is required, but it may be delayed up to TWENTY FOUR hours
5. Priority IV: CONVENIENCE – Evacuation is not urgent nor priority, but it is required so as not to endanger the accomplishment of the unit tactical mission.

J. NINE LINE REQUEST FOR AEROMEDEVAC

1. LINE 1: Location of pick up site. Use grid location.
2. LINE 2: Radio Frequency & Call sign and Suffix. (unit on ground at PZ)
3. LINE 3: Number of patients by precedence.
  - a. urgent
  - b. urgent surgical
  - c. priority
  - d. routine
  - e. convenience
4. LINE 4: Special Equipment needed.
  - a. none
  - b. hoist
  - c. extraction equipment
  - d. ventilator
5. LINE 5: Number of patients by type of casualty (litter or ambulatory)
  - a. L + # of patients
  - b. A + # of patients
6. LINE 6
  - a. (COMBAT): Security of pick up site
    - (1) N= no enemy troops in area
    - (2) P= possible enemy troops in area
    - (3) E= enemy troops in area
    - (4) X= armed escort required
  - b. (PEACETIME): Wounds, injuries, and illness
7. LINE 7: Method of marking pick up site
8. LINE 8: Casualty Nationality and status
  - a. US Military
  - b. US Civilian
  - c. Non-US Military
  - d. Non- US Civilian
  - e. Enemy Prisoner of War (EPW)
9. LINE 9
  - a. (COMBAT): NBC Contamination
    - (1) N= nuclear
    - (2) B= biological
    - (3) C= chemical
  - b. (PEACETIME): Description of pick up site

NOTE: Need Line 1-5 to get aircraft into air. Lines 6-9 can be sent while A/C is enroute

## PART IV

### PATHFINDER OPERATIONS

#### REFERENCES:

- A. FM 3-21.38 Pathfinder Operations
- B. TM 4-48.09, July 2012, Multi Service Helicopter Sling Load: Basic Operations and Equipment
- C. ATTP 3-18.12 , March 2011, Air Assault Operations

#### D. DEFINITION:

- 1. To provide navigational assistance and air traffic advisories to army aircraft that encompass selecting, improving, marking, and controlling PZ/LZ that supports any phase of an air assault or ground operation.

#### B. PHASES OF LZ/PZ OPERATIONS

- 1. selection
- 2. marking
- 3. controlling

#### C. SELECTION PHASE

##### 1. LANDING POINT:

- a. Cleared circular area, can support one A/C
- b. LANDING POINT SIZES (CLEARED DIAMETER DISTANCES)
  - (1) SIZE 1: 25 meters OH-58D, MH-6J, LUH-72A
  - (2) SIZE 2: 35 meters UH-1H, AH-1
  - (3) SIZE 3: 50 meters UH-60, AH-64
  - (4) SIZE 4: 80 meters CH-47
  - (5) SIZE 5: 100 meters S/L aircraft and UNK aircraft
  - (6) SIZE 6: 125 meters S/L with extended long lines
  - (7) SIZE 7: 150 meters S/L (Night with NVGs)

2. LANDING SITE: One or more landing points (must have control facilities)

3. LANDING ZONE: One or more landing sites (may or may not have control facilities)

#### D. REQUIREMENTS OF LZ: Must consider the following:

- 1. NUMBER OF A/C: PZ/LZ must support both number and type of A/C
- 2. FLYING/ LANDING FORMATIONS: 9 standard formations:
  - a. trail
  - b. echelon Left/Right
  - c. heavy Left/Right
  - d. staggered trail left/right
  - e. vee
  - f. diamond
- 3. SURFACE CONDITIONS: Must support the weight of the A/C and be free from debris. Clear to ground level.

4. GROUND SLOPE: Land on an up-slope whenever possible. Avoid down slope. If slope exceeds 7 degree's Aircraft with skids cannot land. No A/C can land if the slope exceeds 15 degrees, terminate at hover.
5. APPROACH AND DEPARTURE ROUTES:
  - a. into the wind
  - b. over lowest obstacles
  - c. along the long axis of the PZ / LZ
6. PREVAILING WINDS: Head Wind, Cross Wind, Tail Wind
  - a. 0-5 knots: A/C can land in any direction
  - b. 6-9 knots: Must land head or cross wind
  - c. Maximum varies by Aircraft
7. DENSITY ALTITUDE: As these factors increase, the A/C performance decreases
  - a. humidity
  - b. altitude above sea level
  - c. temperature
8. LOADS: Considerations
  - a. weight of load
  - b. personnel and/or equipment
  - c. internal or external
  - d. insertion or extraction
9. OBSTACLES: An obstacle is anything that is 18 inches (or greater) high, wide or deep
  - a. obstacle ratio- 10:1
  - b. obstacles- four "R"s
    - (1) Remove
    - (2) Reduce
    - (3) Red (mark it)
    - (4) Radio (advise pilot)

#### E. MARKING PHASE

1. Marking the Landing Zone: Use minimum identifiable means, mark as tactically as possible.
2. Basic Equipment:
  - a. Anemometer; wind-measuring device
  - b. goggles
  - c. FM Communications
  - d. map and compass
  - e. daytime marking; VS-17 panel
  - f. night time marking; Lights, chem-lites, strobe light

3. Markings:

- A. obstacle ratio- 10:1
- B. mark obstacles - red
- C. inverted "Y": 7m x 14m x 14m. Directional light, Base light, left and right stem lights, used to mark #1 TDP at night. NO RED
- E. additional TDP's:
  - (1) Size 3: 5m x 5m- for observation and utility A/C
  - (2) Size 4: 10m x 10m- used for sling load A/C and cargo A/C
  - (3) Separate A/C that require a different landing point size by 100m ( Like Airframes 80m, Unlike Airframes 100M)

F. CONTROLLING PHASE

- 1. visual
- 2. electronic
- 3. verbal

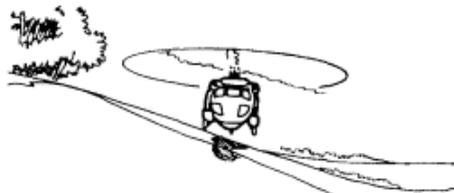
G. WHEN ESTABLISHING AN LZ:

- 1. Establish control facilities:
  - a. must have "Ground To Air" communications (GTA)
  - b. must be able to observe the entire PZ/LZ
- 2. Determine length and width of LZ/PZ:
  - a. pace both and make a record of it
- 3. Obstacles:
  - a. four "R"s: (**R**emove, **R**educe, mark in **R**ed, **R**adio the pilot)
- 4. Determine area of unusable:
  - a. 10:1 ratio, straight edge method
  - b. #1 TDP at edge of unusable

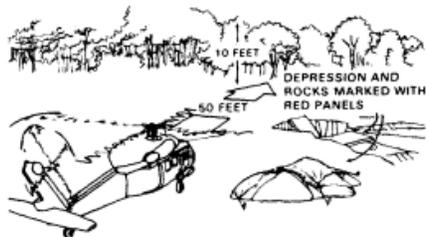
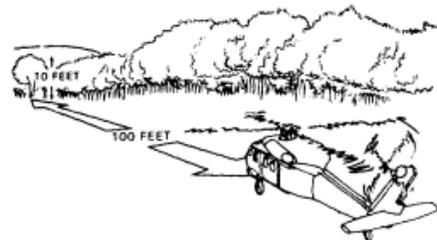
5. Mark and clear TDP's:
  - a. VS 17 panel during daylight
  - b. inverted "Y" at night
  - c. clear the PZ/LZ using "zig-zag" method in each cardinal direction.
6. TECHNICAL FACTORS IN PZ AND LZ SELECTION



IF SLOPE IS 0% - 6%, LAND UPSLOPE.

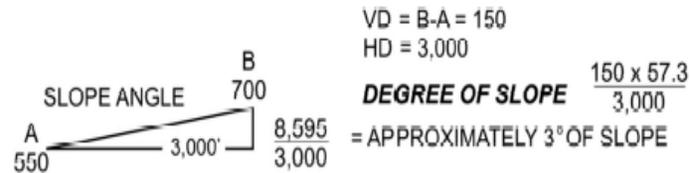


IF SLOPE IS 7% - 15%, LAND SIDESLOPE.  
NOTE: EXIT ON DOWNHILL SIDE TO AVOID ROTOR BLADES.



### GROUND SLOPE EXPRESSED IN DEGREES

The approximate slope angle may be calculated by multiplying the gradient by 57.3. This method is reasonably accurate for slope angles under 20 degrees.

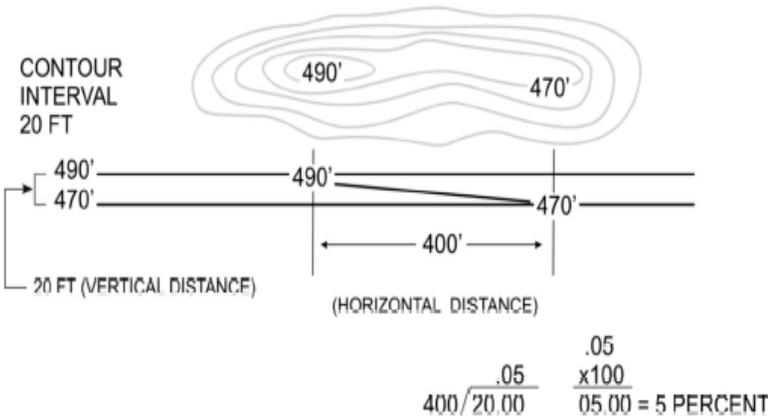


### GROUND SLOPE EXPRESSED AS PERCENTAGE

To determine the percent of ground slope, divide the vertical distance (VD) by the horizontal distance (HD) and multiply by 100.

$$\text{PERCENT OF SLOPE} = \frac{VD}{HD} \times 100$$

Verticle distance is the difference in field elevation between the two ends of the landing site. Always round number up to the next whole number.

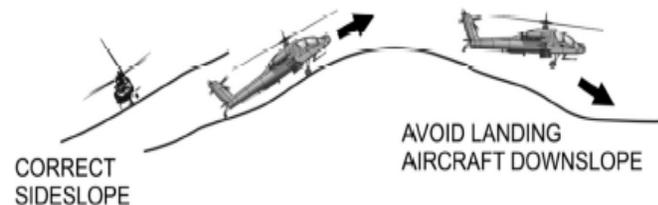


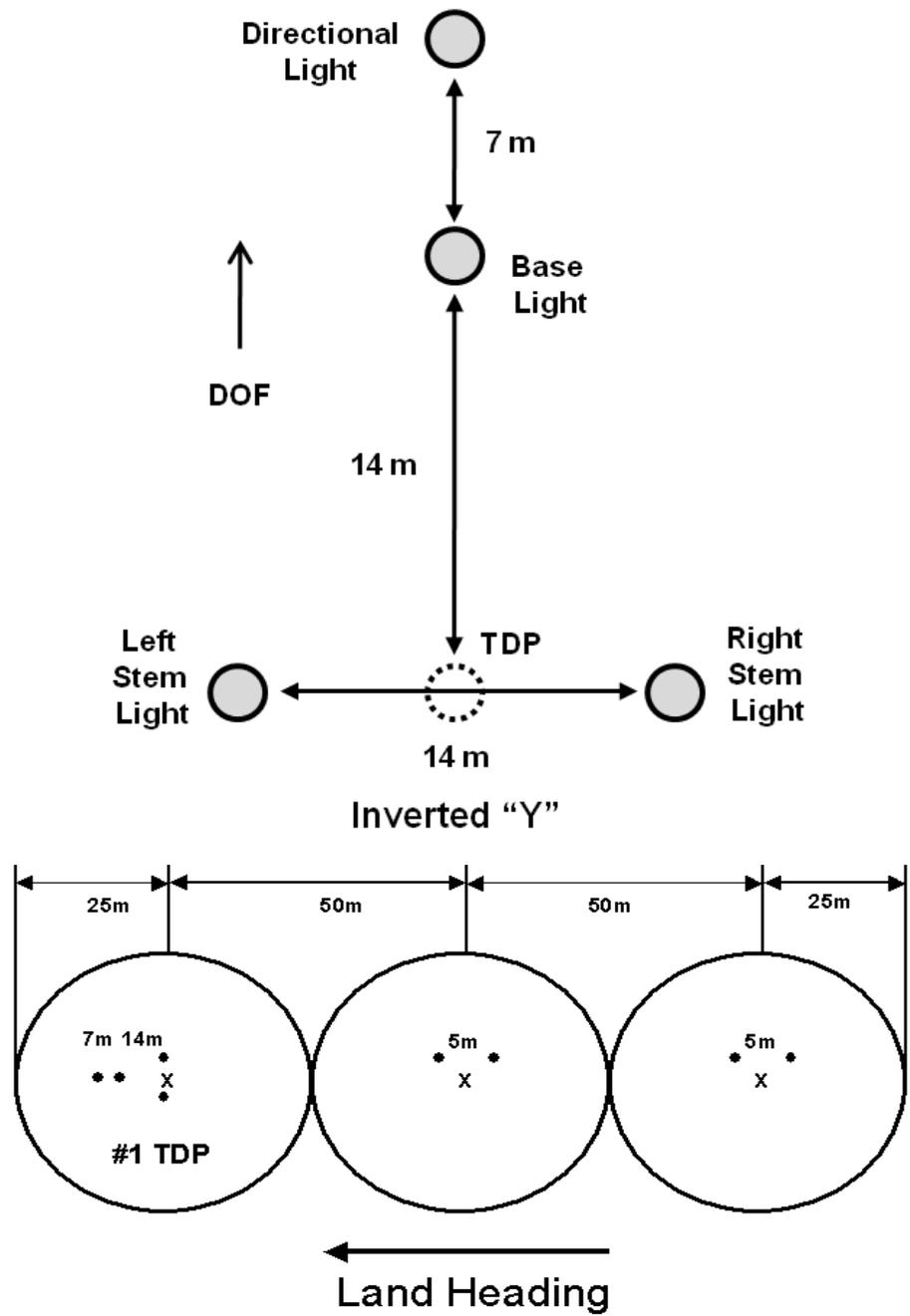
### PATHFINDER SLOPE LANDING RULES

Do not land small utility and observation aircraft on slopes exceeding 7 degrees.

Give large utility and cargo aircraft an advisory if ground-slope is between 7 and 15 degrees.

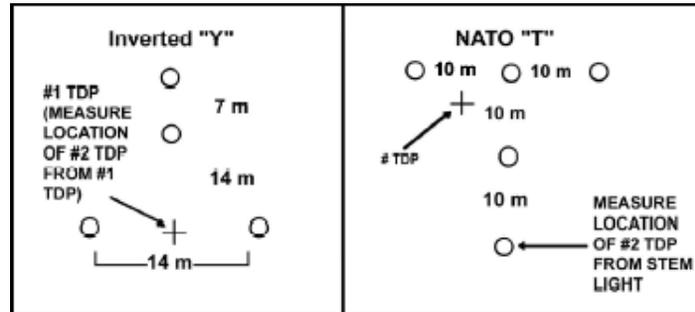
Always advise pilot when landing wheeled aircraft on a sideslope.



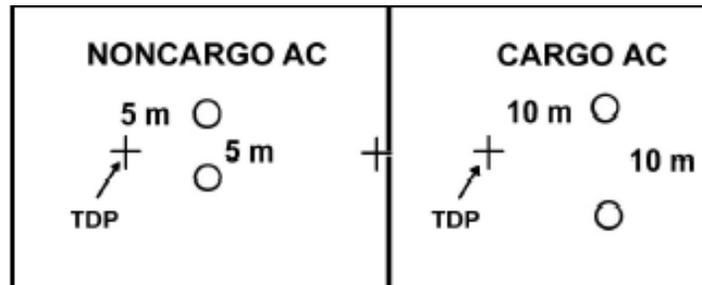


EXAMPLE LANDING ZONE FOR THREE SIZE 3 AIRCRAFT IN A TRAIL FORMATION

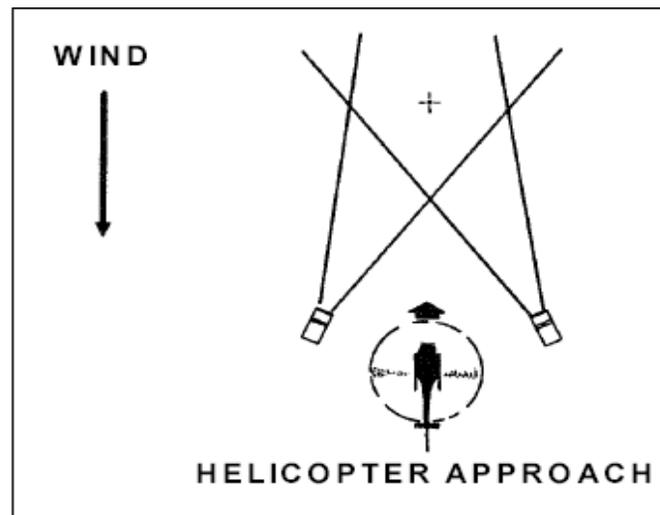
COMMON PATHFINDER LANDING SYMBOLS



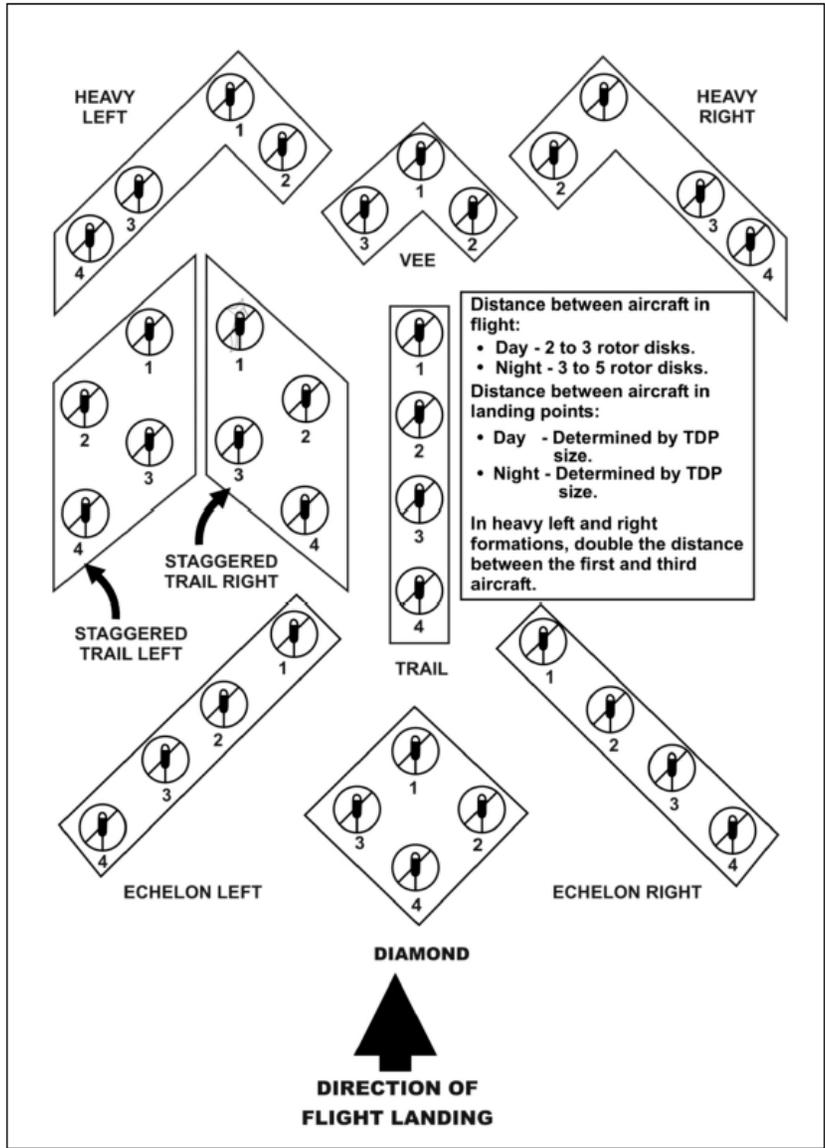
#1 TDP Marking Methods



ADDITIONAL TDP LIGHTS



EMERGENCY LIGHTING



AIRCRAFT FORMATIONS  
 AIRCRAFT ARE SPACED ACCORDING TO LANDING POINT SIZE

## H. LANDING FORMATION ADVANTAGES AND DISADVANTAGES

### 1. TRAIL

#### a. Advantages

- (1) Suitable for long narrow LZs
- (2) Each aircraft has the freedom of lateral movement
- (3) Allows unrestricted fire for door gunners.
- (4) Simple for troop line-up on PZ
- (5) Allows the infantry assault element to depart the aircraft in line formation

#### b. Disadvantages

- (1) The highest vulnerability to enemy fire of any formation
- (2) Long time to cross an area due to the length of the formation
- (3) The use of identical ground track for all aircraft
- (4) Requires step-up due to rotor wash
- (5) Hazardous during take off and landing due to rotor wash and stacking on the final approach
- (6) Requires a long LZ.

### 2. ECHELON LEFT/RIGHT

#### a. Advantages

- (1) Each aircraft has freedom of lateral movement
- (2) No rotor wash encountered by trailing aircraft
- (3) No step-up required
- (4) Formation take-off possible
- (5) Separate ground tracks for all aircraft
- (6) Suitable for low-level flight

#### b. Disadvantages

- (1) Requires relatively large loading zones
- (2) Difficult to hold positions in turns
- (3) Requires special training of troops to line-up on the PZ
- (4) Difficult for attack helicopter escort to cover

### 3. HEAVY LEFT/RIGHT

#### a. Advantages

- (1) Each aircraft has freedom of lateral movement
- (2) No rotor wash encountered by trailing aircraft
- (3) No step-up required
- (4) Separate ground tracks for all aircraft
- (5) Suitable for low-level flying
- (6) Formation take-off possible
- (7) Short turning radius

#### b. Disadvantages

- (1) Requires relatively large LZs
- (2) Some restrictions to inboard gunners
- (3) Requires special training of troops to line-up on the PZ

### 4. STAGGERED TRAIL

#### a. Advantages

- (1) Provides shorter linear disposition of aircraft and vulnerability to enemy fire as compared to trail.
- (2) Offers flexibility
- (3) Simple for infantry to load

#### b. Disadvantages

- (1) Long time to cross an area due to the length of the formation
- (2) Requires step-up due to rotor wash
- (3) The use of the same ground track by trailing aircraft
- (4) Hazardous during take-off and landing due to rotor wash and stacking on the final approach
- (5) Restrictions to inboard gunners
- (6) Vulnerable to enemy fire
- (7) Requires a wider area for a LZ

### 5. V FORMATION

#### a. Advantages

- (1) No rotor wash encountered by trailing aircraft
- (2) No-step required
- (3) Formation take-off possible
- (4) Separate ground tracks for all aircraft
- (5) Short time to cross an area due to the length of the formation
- (6) Ease of escort by attack helicopters

#### b. Disadvantages

- (1) Air maneuverability limited
- (2) Need wider LZ
- (3) Control is more difficult.

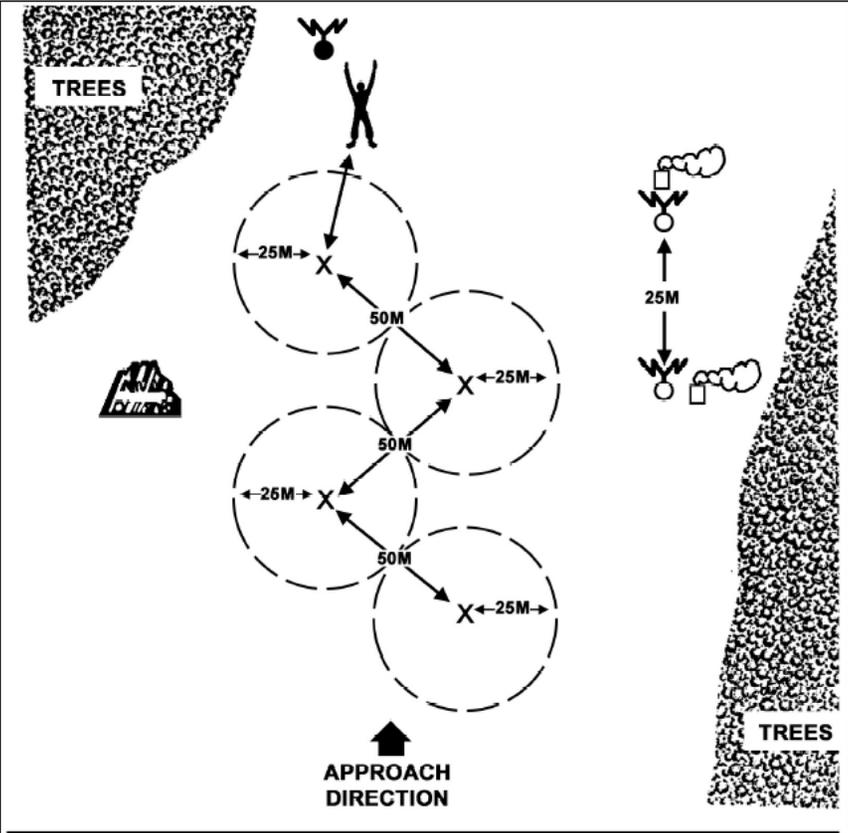
### 6. DIAMOND

#### a. Advantages

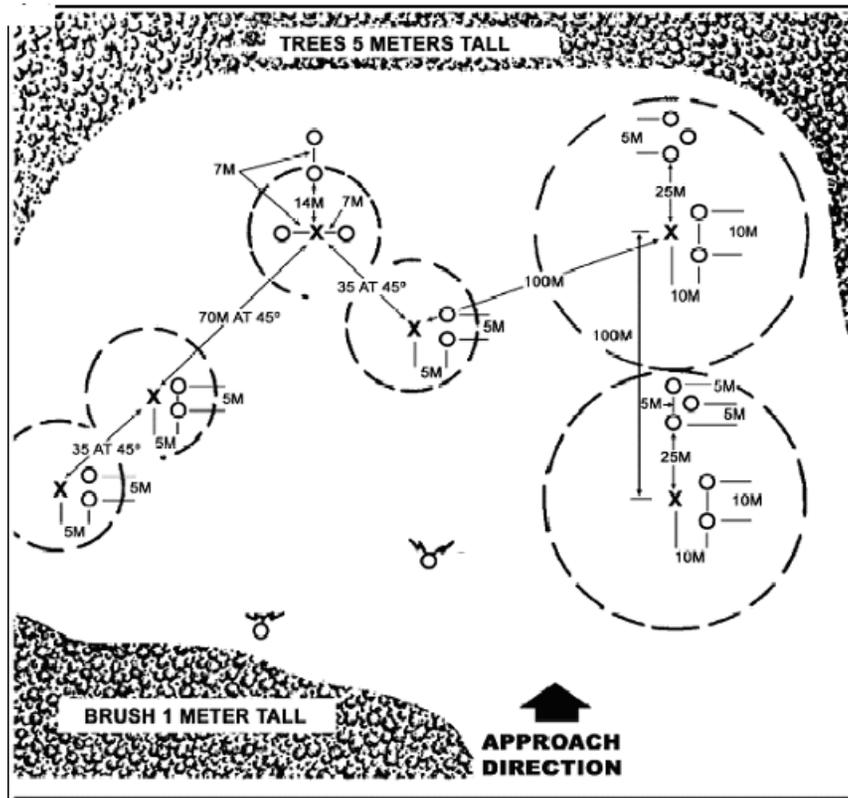
- (1) Good overall security
- (2) Formation take off is possible

#### b. Disadvantages

- (1) Requires special training for troops to align on the PZ



FOUR SIZE 3 AIRCRAFT  
IN A STAGGERED TRAIL RIGHT



FOUR SIZE 2 AIRCRAFT  
 IN A HEAVY LEFT FORMATION  
 ALSO TWO SIZE 4 AIRCRAFT IN TRAIL WITH SLING LOAD  
 (SLING LOAD AIRCRAFT NOT LANDING)  
 SHOWING 100-METER SEPARATION  
 BETWEEN AIRCRAFT OF DIFFERENT SIZE LANDING POINTS

## PART V

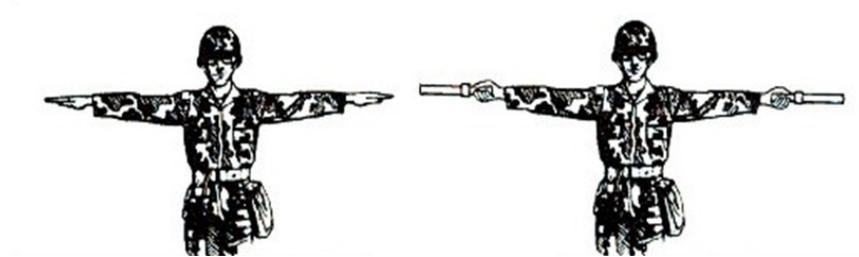
### HAND AND ARM SIGNALS

- A. Standard hand-and-arm signals may be used to assist in landing and moving aircraft.
- B. Position of the signal person
  1. The signal person is located at a predetermined location outside the rotor disk diameter of the aircraft.
  2. The signal person is generally located 20 meters to the right front of an aircraft that is conducting Slingloads and 40 meters to the right front of an aircraft that is landing.
  3. The signal person must keep eye-to-eye contact with the pilot at all times.
- C. Signals at night are given by using lighted batons/chem-lights or flashlights in each hand.
  1. The signals given at night are basically identical to the day signals.
  2. When using flashlights, care must be taken to avoid blinding the pilot.
  3. Batons and flashlights should remain lighted at all times when signaling. They should be off otherwise.



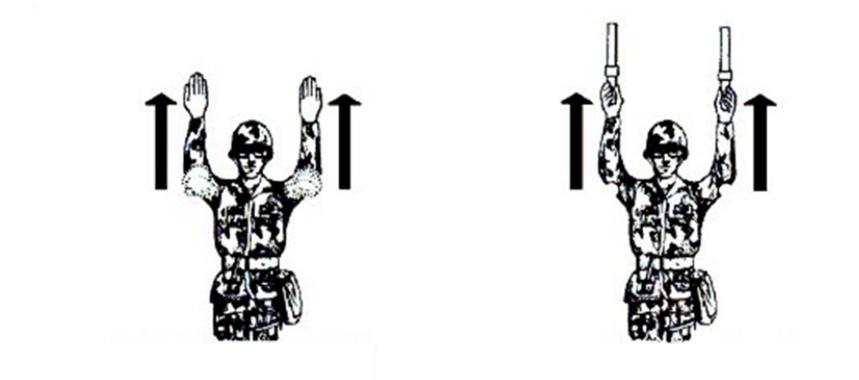
#### ASSUME GUIDANCE

The arms are extended above the head in vertical position with the palms facing forward.



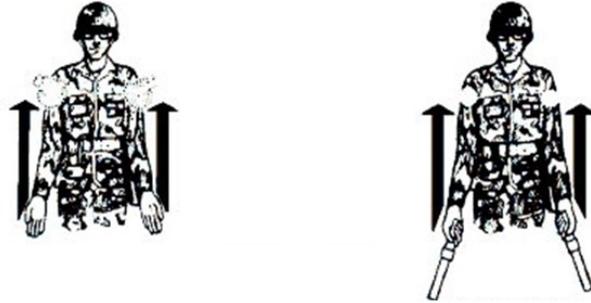
### HOVER

The arms are extended horizontally towards the sides at shoulder level with the palms facing downward.



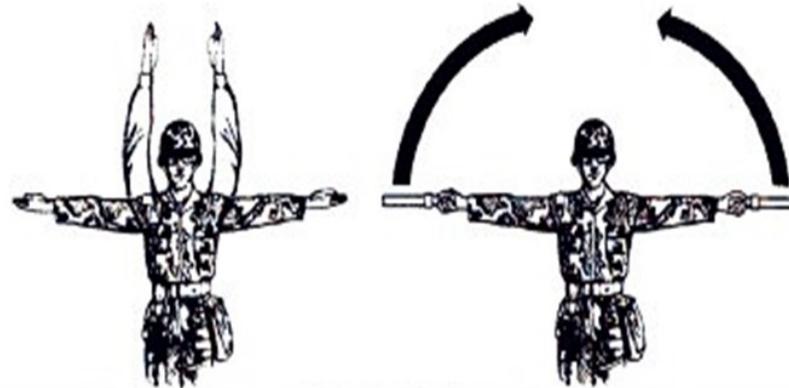
### MOVE AIRCRAFT FORWARD

The arms are pointed directly forward at shoulder height with the palms facing upward. The forearms are repeatedly moved upwards and to the rear by breaking at the elbows.



### MOVE AIRCRAFT BACKWARD

The arms by the side of the body with the palms facing forward. The arms are swept forward and upward repeatedly to shoulder height .



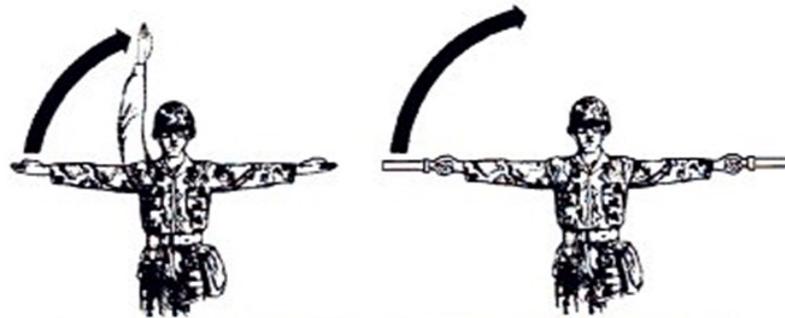
### MOVE AIRCRAFT UPWARDS

The arms are extended horizontally sideways at the shoulders. The arms are repeatedly moved with the palms turned up. The hands should not touch above the head.



#### **MOVE AIRCRAFT DOWNWARD**

The arms are extended horizontally sideways at the shoulders. The arms are repeatedly moved with the palms turned down.



#### **MOVE AIRCRAFT RIGHT**

The arms are extended horizontally sideways with the palms facing upwards. The right arm is repeatedly raised from the horizontal position by breaking at the shoulder.



#### **MOVE AIRCRAFT LEFT**

The arms are extended horizontally sideways with the palms facing upwards. The left arm is repeatedly raised to the horizontal position by breaking at the shoulder.



**HOOKUP COMPLETE**

The right fist is placed on the top of the head and the left fist is placed over the right fist in a rope climbing motion.



**TAKE**



**OFF**

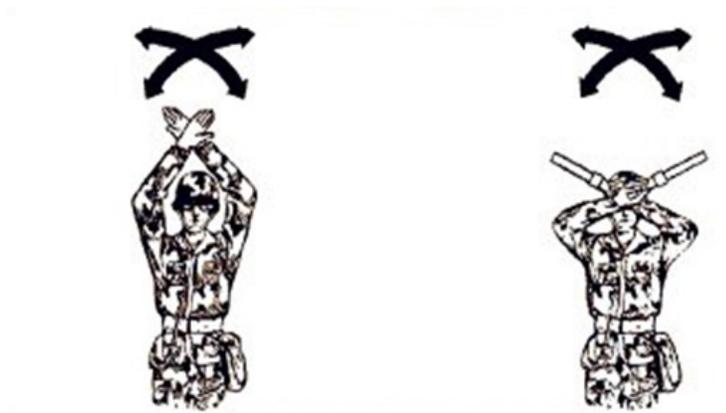
Place his left hand at his side. At the same time, a circular motion is made with the right arm over the head and then the right arm is thrust in the direction of take off. If it is take off to the 12 O' clock he steps off with the right foot in the direction of take off.



### **LAND**

The arms are extended in front of the body and the wrists are crossed. Fingers are extended and joined.

### **WAVE OFF—DO NOT LAND**



The arms are repeatedly crossed in a waving motion above the head.



### CUT SLING LOAD

The left arm is extended horizontally with a clenched fist toward the sling load while the right arm with palm facing down makes a horizontally slicing motion under the left arm. The left foot is planted 10 - 12 inches to the front.



### SPOT TURN

Both arms are extended to the front. The palm of the hand nearest the desired direction of tail movement is turned upwards and the forearm is repeatedly moved upwards and backwards from the horizontal position by breaking the elbow. The other arm should remain extended to the front with the palm facing down. The signalman rotates with the aircraft by stepping off in the direction of tail movement.

An example series of hand signals for a pickup zone during a one aircraft operation.

**ASSUME GUIDANCE**



**MOVE YOUR AIRCRAFT**



**LEFT**



**RIGHT**



**BACK**



**FORWARD**



**HOVER**



**HOOKUP COMPLETE**



**MOVE UPWARD**



**TAKE OFF**

If a problem occurs on a load when the aircraft raises up and the slings tighten, follow these directions:



**STEP 1**

**(HOVER)**



**STEP 2 (MOVE**

**WARD)**

**AIRCRAFT DOWN-**



**STEP 3 (CUT SLING**

**LOAD)**

Once the load is corrected go back to normal hook up procedures.

If the problem cannot be corrected by this method, give the pilot the "release the load" signal.

## PART VI

### COMBAT ASSAULT

#### REFERENCES

ATTP 3-18.12 Air Assault Operations

#### A. DEFINITION

1. Air Assault: Operations in which assault forces (combat, combat support, and combat service support), using the mobility of rotary-wing assets and total integration of available firepower, maneuver on the battlefield under the control of the ground or air maneuver *commander* to engage enemy forces or to hold and seize key terrain.

B. Air Movement Operations are those operations involving the use of Army air-lift assets for other than Air Assaults.

#### 1. CAPABILITIES

- a. attack enemy from any direction
- b. delay a much larger force
- c. over fly or bypass barriers, obstacles or enemy positions.
- d. conduct deep attacks and raids well beyond the FLOT
- e. rapidly secure and defend key terrain

#### 2. LIMITATIONS

- a. adverse weather
- b. LZ/PZ availability
- c. initial reliance on air re-supply & lines of communication
- d. high fuel and ammunition consumption
- e. reduced ground mobility after insertion

#### 3. VULNERABILITIES

- a. attack by ground, air, artillery on PZ/LZ
- b. attack by A/C or ADA during movement
- c. attack by NBC
- d. electronic warfare
- e. small arms fire

#### 4. TACTICAL EMPLOYMENT

- a. mass or shift combat power rapidly
- b. use of surprise
- c. flexibility, mobility, speed
- d. gain and maintain initiative
- e. extending depth, width of battlefield with little regard to terrain

## AIR ASSAULT TASK FORCE

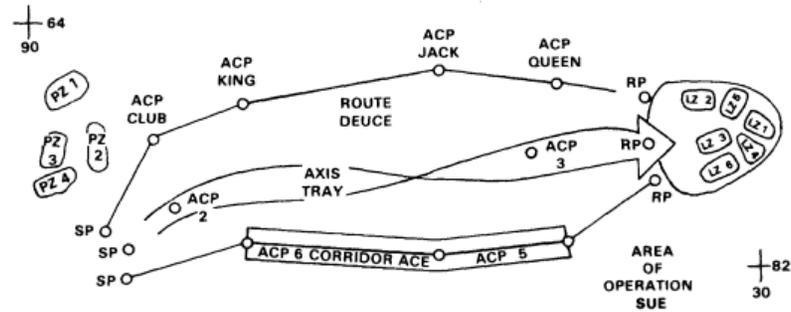
### A. INDIVIDUAL UNITS

1. INFANTRY: Nucleus of AIR ASSAULT TASK FORCE
2. AVIATION: Assault, Attack, Reconnaissance and Assault Support (medium) aircraft under the control of the AATF CDR
3. ARTILLERY: Provide fire support if contact is made
4. ENGINEER: Emplace/ breach obstacles/ minefields
5. AIR DEFENSE ARTILLERY: Ground to air fire support
6. MILITARY INTELLIGENCE: Conduct electronic warfare, collect and disseminate information
7. RESERVE: AATF requires fewer reserve forces due to superior mobility, flexibility, and speed
8. COMBAT SUPPORT: Mission specific support
  - a. all units placed under the command of a single *command headquarters*
  - b. Air Assault Task Force Commander (AATFC) is normally an Infantry Commander
9. DIVISION LEVEL: Lowest level with assets for an Air Assault.
10. BATTALION LEVEL: Lowest level at which an AASLT operation can be planned or coordinated
11. COMPANY LEVEL: Lowest level with a Command Headquarters to execute an Air Assault Operation
  - a. Successful air assault execution is based on a careful analysis of METT-TC and detailed, precise, reverse planning. There are five basic plans that comprise the reverse planning sequence. They are developed for each air assault operation

### B. FIVE STAGE REVERSE PLANNING SEQUENCE

1. GROUND TACTICAL PLAN: Actions on the objective
  - a. H-HOUR: Time that first A/C of the first lift touches down on the LZ
  - b. all planning times based from H-Hour
2. LANDING PLAN: Actions on the LZ. Must support ground tactical plan. Ensures units arrive at designated locations and times prepared to execute the ground tactical plan. General considerations:
  - a. availability, location, and size of LZs
  - b. elements land with tactical integrity
  - c. troops are kept informed of changes; land prepared to fight in any direction.
  - d. supporting fires must be planned in and around each LZ
  - e. the plan includes resupply and medical evacuation by air
  - f. alternate LZs should be planned for each primary LZ selected to ensure flexibility

3. AIR MOVEMENT PLAN: Actions during flight
- based on the ground tactical and landing plans
  - specifies the schedule & instructions of air movement of troops, equipment, and supplies from PZs to LZs
  - provides instructions regarding air routes, control points, and aircraft speeds, altitudes, and formations
  - includes use of attack helicopters



#### FLIGHT ROUTES

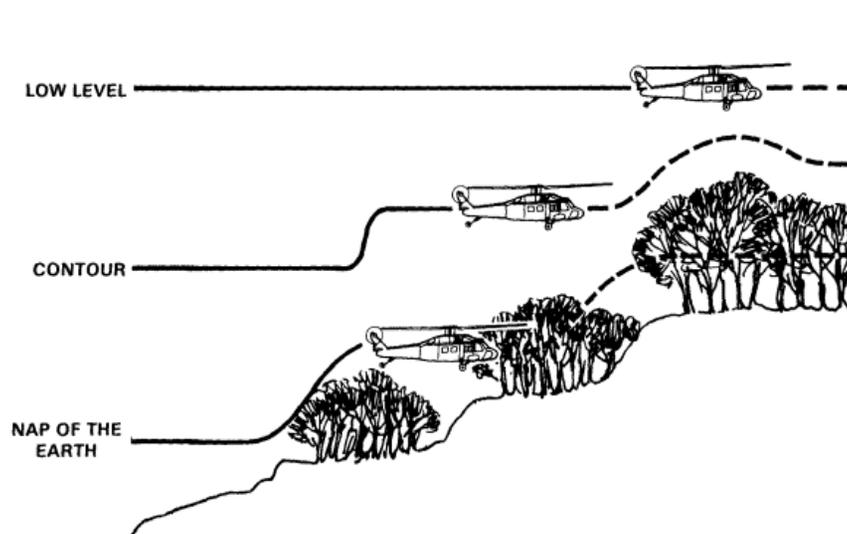
Four Flight Routes:

- 1) Restricted
- 2) Corridor
- 3) Axis
- 4) Expedient

Maps or overlays containing flight route information are prepared at AATF headquarters and disseminated to subordinate and support units (Overlays are often used). A letter, number, or word designates flight routes and corridors.

#### DEPICTING FLIGHT ROUTES ON AN OVERLAY

AIR MOVEMENT TABLES: Tasking list organizing aviation to mission. Detailed list of units, aircraft, routes, PZ/LZs, and times. All times are derived from H-Hour.



#### TERRAIN FLIGHT MODES

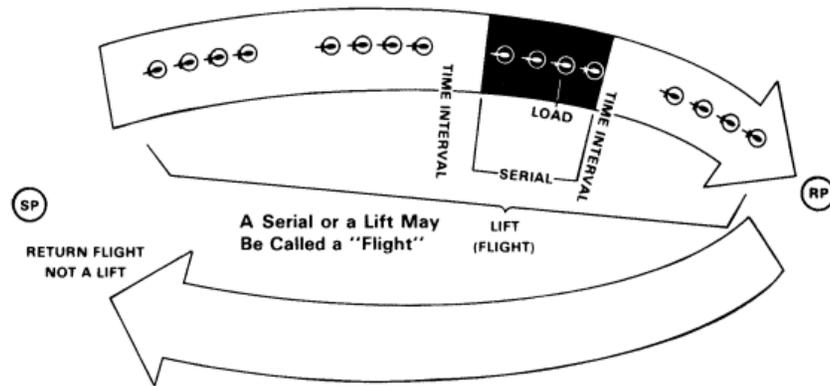
Pilots may use one of three terrain-flight modes as dictated by the mission and the Threat.

NAP-OF-THE-EARTH (NOE): Various speeds, attitudes flying near as possible to the earth surface.

CONTOUR: Various speeds, altitudes, generally conforming to the earth surface.

LOW LEVEL FLIGHT: Constant speed, heading, and altitude.

4. **LOADING PLAN:** Actions on the PZ
- a. ensures that troops, equipment, and supplies are loaded on the correct aircraft. It is based on the Air Movement Plan.
  - b. **CONSIDERATIONS:**
    - (1) **TACTICAL INTEGRITY:** Fire teams & squads loaded on same A/C, PLTs on same Serial. Maintains fighting units upon landing.
  - c. **SELF-SUFFICIENCY** of loads:
    - (1) crews w/ vehicle/weapon
    - (2) ammo with weapon system
    - (3) commo within serial
    - (4) personnel available to unload equipment
  - d. **CROSS LOADING:**
    - (1) ensures key personnel/ equip are not on same A/C & spread throughout lift
  - e. **BUMP PLAN:**
    - (1) Ensures key personnel/ equip arrive on LZ first. Bumped pax/loads arrive later. Ensures key personnel & equipment not left on PZ. Bump plan is executed if fewer A/C are available than planned because of maintenance, accident, or enemy fire.
  - f. **DUTIES ON PZ:**
  - g. **PZ CONTROL PARTY:**
    - (1) OIC
    - (2) NCOIC
    - (3) RTO
    - (4) chalk guide
    - (5) signal person
    - (6) hook up team
    - (7) straggler control
    - (8) to maximize operational control, aviation assets are designated into lifts, serials, and loads
  - h. **LIFT:**
    - (1) all A/C designated to move personnel/ equipment
    - (2) 2 or more A/C separated by time or space from there tactical groupings within the same lift
  - i. **LOAD/CHALK:**
    - (1) personnel or equipment designated to be moved by a specific A/C



### LIFTS, SERIALS, AND LOADS

**LIFTS** A lift is one sortie of all utility and cargo aircraft assigned to a mission. Each time all assigned aircraft pick up troops and/or equipment and set them down on the LZ, one lift is completed. The second lift begins when an aircraft returns to the PZ for a second load.

**SERIALS** There may be times when a lift has too many aircraft to fly in one formation. In such cases, the lift is organized into a number of serials. A serial is a tactical grouping of two or more aircraft under the control of a serial commander (aviator), and separated from other tactical groupings within the lift by time or space. The use of serials may be necessary to maintain effective control of aviation assets. For example, if a NOE flight were used, it would be difficult to control sixteen aircraft as a single increment. However, a sixteen aircraft lift with four serials of four aircraft with a 2-minute time separation is more easily controlled.

Serials may also be required when the capacity of available PZs or LZs is limited. If there is a lift of sixteen aircraft and available PZs and/or LZs will accommodate only four aircraft, it is best to organize into four serials of four aircraft each.

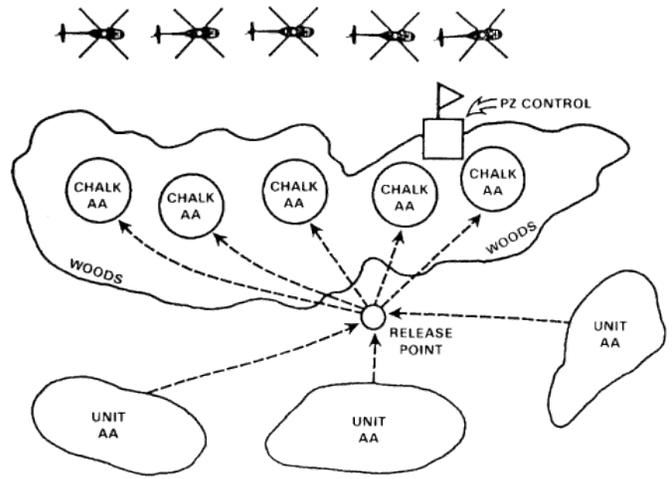
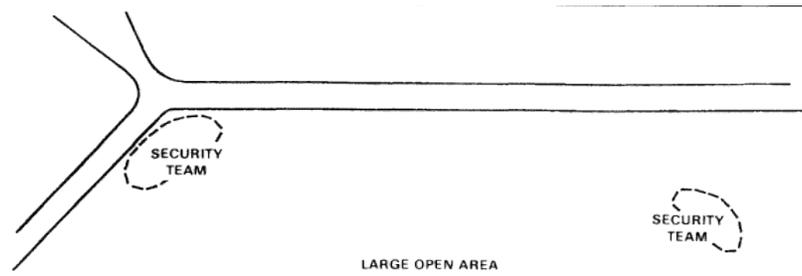
Serials are also employed to allow flexibility with flight routes. If there are several acceptable flight routes, the AATFC may choose to employ serials to avoid concentrating his force along one flight route. If the commander wants all his forces to land simultaneously in a single LZ, he does so by having the serials converge at a aerial rally point before landing. With a lift of sixteen aircraft and four available flight routes, the AATFC could use four serials of four aircraft each. Each serial should use a different flight mode. Each time there is a new lift a new serial begins. For example, in lift one there are serials one through four. In lift two, serials again start with one.

**LOADS** Within each lift there is also a specific number of loads. A load is personnel and/or equipment designated to be moved by a specific aircraft. When planning the air movement, each aircraft is termed a load. For example, within a lift of ten aircraft, the loads are numbered one through ten. For each lift thereafter, the loads remain one through ten. For example, lift one loads are numbered one through ten; next lift is lift two, loads are numbered one through ten.

An aircraft load may also be referred to as a “chalk load,” “chalk number,” or a “chalk.” Loads also must be designated within serials just as they are within lifts. Counting within the serials is continuous up to the total number of aircraft in the lift.

For example, in a lift of sixteen aircraft with four serials of four aircraft. Serial two’s loads are numbered five through eight. In lift one, serial three, loads are numbered nine through twelve. Finally, in lift one, serial four, loads are numbered thirteen through sixteen (Figure 1-5).

5. STAGING PLAN: Actions prior to mission.
  - a. troops, equipment, and supplies at the PZ in the proper order for movement.
  - b. units should be in PZ posture 15 minutes before aircraft arrive
  - c. AIR LOAD TABLE:
    - (1) detailed tasking list assigning personnel/load to a specific A/C.
  - d. AIR MISSION BRIEF:
    - (1) last meeting of key persons in an AASLT mission.
    - (2) finalizes details of plan.



NOTE ARTILLERY AND/OR MORTAR FIRE SUPPORT IS PLANNED 360 DEGREES AROUND PZ WITH PRIORITY TO FAR SIDE OF THE LARGE OPEN AREA.

EXAMPLE LARGE ONE-SIDED PZ

## AIR MISSION BRIEFING

### A. GENERAL

1. The air mission briefing (AMB) is the final face-to-face meeting between the ground tactical commander and the aviators flying the mission. It is the last chance to confirm changes and make final coordination.

### B. CONTENT

1. The AMB briefing covers all details for planning and preparation of the mission. The operation is briefed including all five stages, as explained previously, and finally the air movement table is completed.

### C. PARTICIPANTS

1. The AMB should include the key ground and aviation unit personnel. They may include: the ground tactical commander of the unit being inserted, the AMC, S2, S3, fire support officer, aviation liaison officer (LNO), ADA liaisons, aviation unit operations officer, and battle team captains (BTC) from air reconnaissance and attack helicopter units. It may also include the S3 Air, signal officer (SIGO), and the S4.

### D. LOCATION

1. The briefing is conducted at a location specified by the AATFC and is dependent upon the amount of time available before execution of the mission. In determining the location, the factors to consider are as follows:

- a. time required to assemble key personnel
- b. availability of information (intelligence and status of the aviation assets)
- c. availability of planners
- d. operations security (multiple aircraft in forward battalion locations)
- e. vulnerability to enemy observation and fires

### E. TIME

1. The AMB should be held as soon as possible after the reverse planning sequence is completed. Applying the one-third, two-thirds rule should allow enough time for all element leaders to brief their subordinate units. For example, with a 12-hour warning, the briefing should be conducted eight hours before the first aircraft arrives at the PZ. This allows four hours to plan the operation.

### F. AIR MISSION BRIEFING FORMAT

1. Its use will help ensure that essential information is included in an air assault mission briefings.

## PLATOON LEVEL ACTIONS FOR AN AIR ASSAULT

### REFERENCE:

A. ATTP 3-18.12 Air Assault Operations

## 1. DUTIES AND RESPONSIBILITIES

### a. Platoon leader

- (1) overall responsibility for mission
- (2) plans operation
- (3) issue operations order and conducts rehearsals
- (4) briefs leaders
- (5) maintains comms with HQ

### b. Platoon sergeant

- (1) overall responsibility for PZ
- (2) set up PZ
- (3) briefs chalk leaders
- (4) devises and disseminates bump plan
- (5) ensures everything has cleared the PZ
- (6) rides in last A/C for control purposes

### c. Chalk leader

- (1) ensures his personnel know their tasks & position on the A/C
- (2) ensures lights or panels for A/C are emplaced
- (3) assigns area of security to his personnel, supervise area of security
- (4) supervises everyone on A/C while in flight
- (5) ensures rapid off loading and security for the A/C

## 2. COLD LOAD TRAINING

### a. The KEY to a successful mission.

- (1) supervised by chalk leader & unit leadership
- (2) conducted prior to PZ posture (can be done on PZ)
- (3) all personnel must be present, including attachments (medic, FO, translators, etc)
- (4) use equipment that will be on mission

### b. Designate:

- (1) order of movement to the A/C
- (2) who will sit where
- (3) who will open/close door (pri & alt)
- (4) chalk leader may lead chalk to A/C, then count them on/off

### c. during training, actually open/close doors during both load & unload

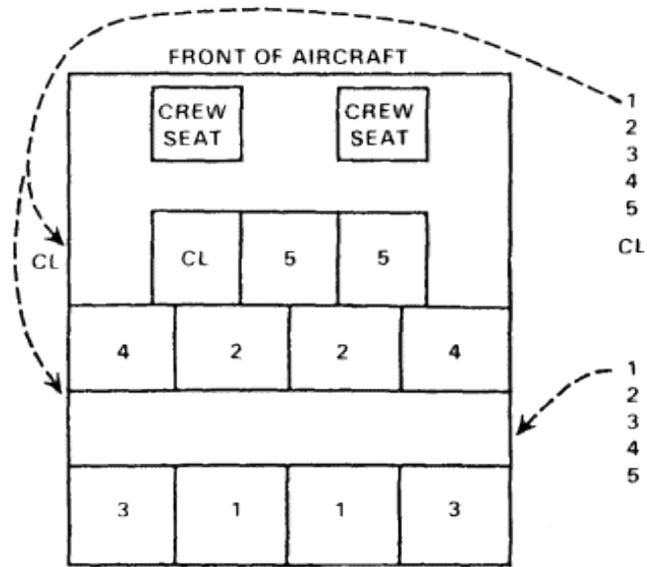
### d. coordinate with crew if door will be open/closed when A/C arrive, if doors open/closed during flight, if open/ closed after unload

### e. line up on PZ in load order

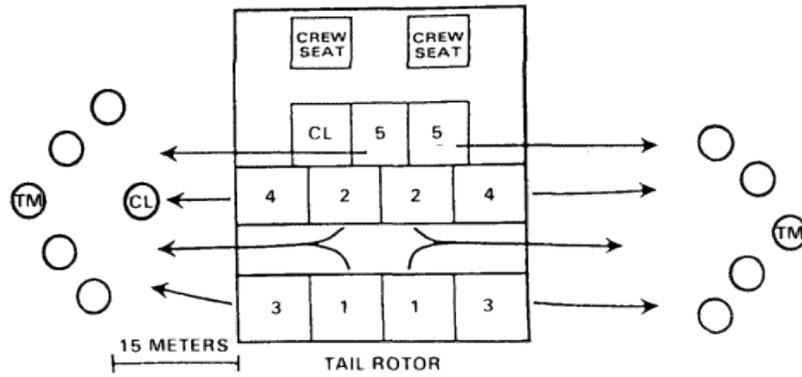
### f. cold load using the same load plan for mission, i.e.: 1 or 2 door load/unload

B. BOTTOM LINE- Rehearse EXACTLY the same way you will execute mission

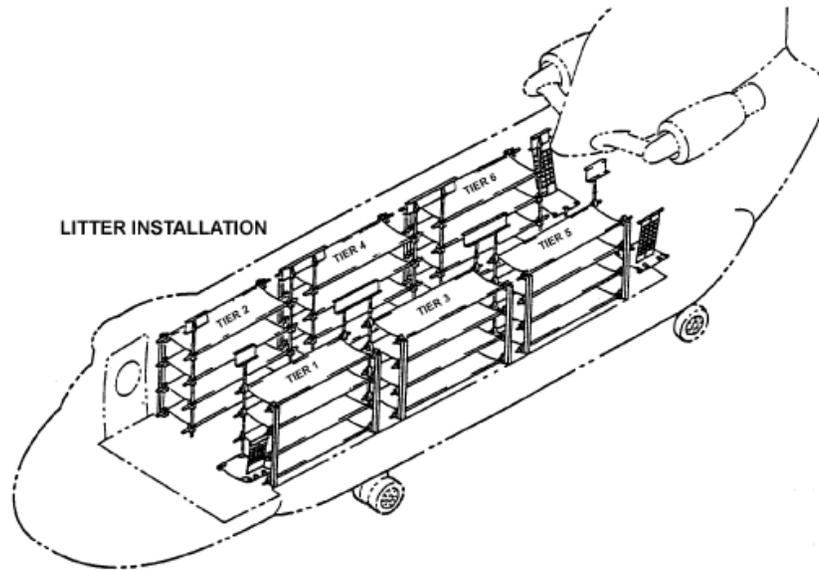
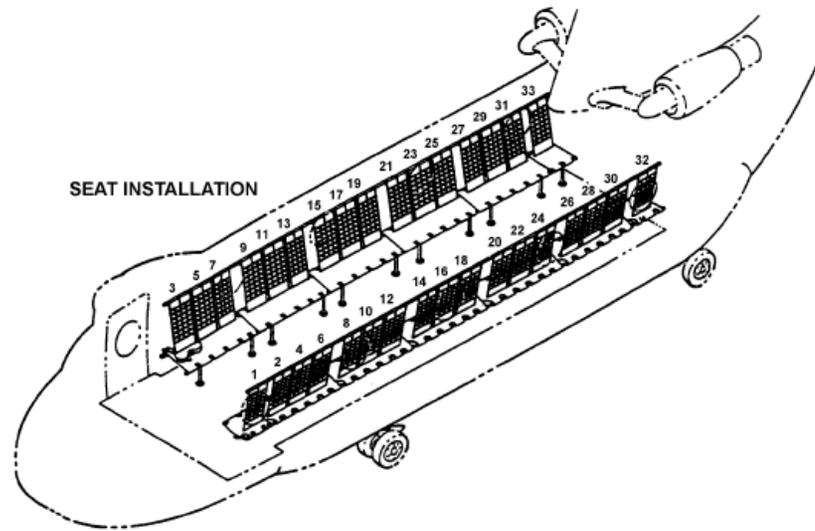
1. Troop Exit techniques:
  - a. 3-step drop: Most common. Used when cover is readily available, or limited visibility (night, brownout).
  - b. all pax exit A/C from designated door(s) take approx 3 steps from A/C (approximately 10 meters) ensure all equip is cleared from A/C (away from landing wheels) & doors closed (if reqd) drop to prone behind equipment place weapon into operation.
  - c. provide security & wait for A/C to take off
  - d. move out tactically to AA or OBJ
  - e. Right/Left/2 door rush: Used when no cover available, Visibility is good, speed is of the essence, landing on OBJ
  - f. all pax exit A/C from designated door(s) with all equipment
  - g. immediately move away from A/C in tactical formation
  - h. chalk leader or designated rep ensures all equip is cleared from A/C & doors closed (if reqd)
  - i. continue rapid movement from LZ to AA or OBJ
  - j. A/C depart on own
  - k. one vs. two door exit or entrance
  - l. based on METT-T, training level of troops, direction of OBJ from LZ
  - m. two door exit faster, but more difficult control
  - n. one door exit slower, easier control



EXAMPLE LOAD SEQUENCE FOR UH-60



EXAMPLE UNLOAD SEQUENCE FOR UH-60



CH-47 SEAT & LITTER CONFIGURATION

## PART VII

### CLOSE COMBAT ATTACK

#### Reference:

- A. FM 3-04.111 Aviation Brigades, August 2003.
- B. FM 3-04.126 Attack Reconnaissance Helicopter Operations
- C. CCA is a technique to control attack helicopters (AH-64 or OH-58D) in a close air support role, usually very near to friendly troops in contact. It is a method to get the pilot to see the target that you are seeing. It is similar to the Call for Fire for artillery or mortars. The primary difference is that you have to talk to the pilots, who also need to see the target.
- D. 5 Steps to control CCA:
  - 1. Gain communication with pilot
  - 2. Describe and mark your location on the ground
  - 3. Target location
  - 4. Target description and method of marking
  - 5. Remarks
    - a. Gain communication with pilot
      - (1) frequency & Call signs, use prearranged frequency. It is preferred that the AVN unit changes to the frequency of the ground unit.
      - (2) give the pilot a SITREP i.e.: what the enemy is doing, type of weapons you are being engaged with, how friendly forces are arrayed & your actions, the best direction for the pilot to approach from, etc.
      - (3) Pilot should respond with number and type aircraft he is with, number and type weapons available, and how long he can support.
    - b. Describe your location on the ground and mark it:
      - (1) The critical aspect is for the pilot to identify your location. Once that happens, you can use your position as a reference for everything else (e.g. the enemy is 180 degrees, 400 meters, from my position). Also, it greatly reduces the chance of fratricide.
      - (2) Go from “big picture” to “small picture.” Best to use grid and, an identifiable terrain feature that the aircraft will be able to see, e.g. “I am 2 km Southwest of hill 1450.” Then describe your location, and start marking your location.
      - (3) If you can see the aircraft, but they cannot see you, describe your location from them, e.g. “I am at your 3 o’clock, 1500m.” Once the pilot had identified your location, you can usually stop marking unless the pilot requests you to continue.

- c. Target location:
  - (1) Bearing magnetic and range in meters
  - (2) TRP, grid, etc.
- d. Target description and method of marking
  - (1) Use multiple methods to mark, e.g. "enemy is vicinity grid AB123456. From my location- 270 degrees, 500 meters
  - (2) Mark with IR laser, tracer, etc.
  - (3) Target handover occurs once the pilot had identified your position on the ground and the enemy position. The crew then engages the target while you provide adjustments and feedback to the pilot.
- e. Remarks
  - (1) Target destroyed- End of Mission
  - (2) Target missed- adjust fire (direction & distance in meters from impact to the target) e.g. "adjust fire, add 200, right 50"
  - (3) At my command
  - (4) Danger close clearance

E. Common CCA Unit and Target Marking

1. Marking targets for arriving attack aircraft is very difficult. Most CCA occur within 500 meters and may occur within 50 meters of friendly troops. Based on Apache and Kiowa thermal sights and NVGs, the following marking means are available. They are noted for effectiveness for day and night (NVG and thermal):

Unit Marking	Day	Night NVG	Night Thermal
VS-17 panel	go	no go	no go
smoke	go	no go	no go
mirror	go	no go	no go
IR strobe	no go	go	no go
Target Marking	Day	Night NVG	Night Thermal
tracer bullets	go	go	go
AN/PAQ-4C	no go	go	no go
briefing pointer	no go	go	no go
GCP	no go	go	no go
M-203 Illum	go	go	go

The BEST technique is to have all signals pre-coordinated between the ground and aviation units BEFORE the mission. Additionally, you should have multiple means for marking available, and talk it out over the radio.

F. Bottom Line:

1. CCA cannot be conducted without positive ID of friendly and enemy forces. Both aviation and ground must agree that they know where everybody is before the Apaches / Kiowas open fire.

G. Attack Aviation Weapons & Munitions

1. In order for you to effectively employ attack aviation in CCA, you need to know what their weapon capabilities are & how they can best support you on the ground.

**30 mm chain gun**

Max Range	Max Effective Rg	Danger close	Burst radius	Remarks
4000m	1500m- point 3000m- area	150m	4m	Rate of fire: 600-650 rpm

**2.75 inch FFAR**

Max Range	Max Effective Rg	Danger close	Burst radius	Remarks
9000m	3000-5000m	200m	10m	Lethal to 50m

**Hellfire Missile**

Max Range	Max Effective Rg	Danger close	Min Range	Remarks
8000m	8000m	75m	500m Burst radius 10 m	Penetrating warhead

If the enemy is being engaged within the 'danger close' range, friendly forces must be behind adequate cover to prevent fratricide.

J. Close Combat Attack request

1. Here is what a CCA might sound like on the radio

## Example CCA Format

\***Bold** is Aviation Unit Speaking

1. ATTACK UNIT this is *Ground unit*, request CCA.
2. **Ground unit this is ATTACK UNIT is a:**
  - A. **Flight of \_\_\_\_ Apaches w/wo goggles,**
  - B. **\_\_\_\_ min of station time.****Requesting:**
  - A. **Your grid**
  - B. **SITREP**
  - C. **Target description, location, and how marking**
3. *Ground unit* is:
  - A. Located at Grid \_\_\_\_
  - B. SITREP is \_\_\_\_\_ Over.
  - D. Target from my location is:
    1. \_\_\_\_ meters
    2. at \_\_\_\_ degrees magnetic
    3. Grid \_\_\_\_\_
    4. Marking target with \_\_\_\_\_
4. **This is ATTACK UNIT :**
  - A. **I have positive ID on your location at Grid \_\_\_\_**
  - B. **Mark target, Over**
5. This is *Ground unit* – Marking target
6. **ATTACK UNIT has positively identified target**
7. *Ground unit Clears Aircraft* – ATK UNIT You are clear to engage.”
8. **ATTACK UNIT is engaging with (30 / RKTS / MISSLES)**
9. ATTACK UNIT this is *Ground unit*:
  - A. Engagement complete, OR Re-engage target
  - B. Target Effect is \_\_\_\_\_
  - C. End of mission, Over
10. ***Ground unit Releases Aircraft* – Roger, End of mission, Out.”**

THIS PAGE INTENTIONALLY LEFT BLANK

## CHAPTER TWO

### **HELICOPTER EXTERNAL LOAD OPERATIONS**

#### A. REFERENCES

1. TM 4-48.09 (FM 4-20.197 ), Multi Service Helicopter Sling Load: Basic Operations and Equipment, July 2012
2. TM 4-48.10, Single-Point Load Rigging Procedures, July 2013
3. TM 4-48.11, Dual-Point Load Rigging Procedures, July 2013
4. TM 10-1670-295-23&P. Technical Manual for 10,000 lb. & 25,000 lb
5. External Transport Sling Assembly and 5,000 lb. & 10,000 lb. External Transport Cargo Net, dated 22 May 1991
6. ATTP 3-18.12, Air Assault Operations, March 2011

#### B. INTRODUCTION

1. The helicopter sling load method of carrying cargo and equipment can overcome many of the obstacles that hinder other modes of movement. Helicopter move cargo by external sling load when
  - a. the cargo compartment cannot hold the load
  - b. the load exceeds the helicopter's internal load limitation
  - c. the ground crew must load or unload the cargo at once
  - d. landing zone conditions prevent the aircraft from touching down

#### C. EMPLOYMENT CONSIDERATIONS

1. Advantages of Sling Load
  - a. allows rapid movement of heavy, oversized equipment, or emergency supplies directly to the user
    - b. the rapid relocation of supplies and equipment
    - c. the ability to bypass surface obstacles
    - d. the use of multiple flight routes and landing sites to enhance sustainability and security of ground units
    - e. the establishment of multiple landing sites to support the maneuvering unit requirements
    - f. greater movement flexibility for the ground commander to accomplish the tactical mission

## 2. Limitations of Sling Load

- a. the weight of the load is restricted to the aircraft's operating capability.
- b. load instability during flight may restrict aircraft air speed or maneuvering capabilities.
- c. adverse weather and darkness (low visibility) may limit sling load operations.
- d. atmospheric conditions (pressure, altitude, temperature, and winds) affect the helicopter's lift capacity.
- e. a limited number of helicopters are available for sling load missions.
- f. landing site surface conditions may restrict helicopter operation. Loose debris, dust, and snow are safety hazards that also limit pilot visibility.
- g. landing site size must be increased during the hours of darkness or reduced visibility to allow the pilot more room to maneuver.

## D. AIRCRAFT

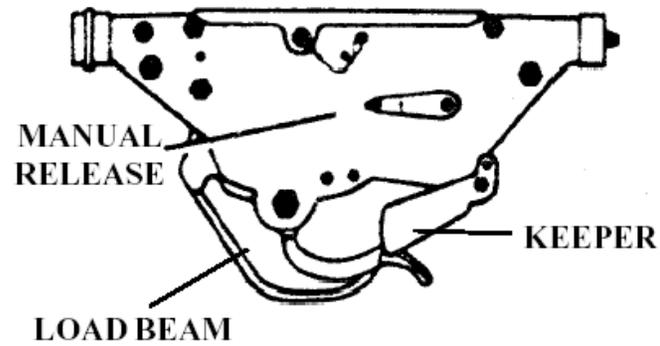
### 1. Allowable Cargo Load (ACL) for external loads

- a. actual maximum weight is determined by factors such as fuel (7 lbs per gallon) in A/C, distance to be flown, density altitude, temperature, altitude, humidity, and airframe.
  - (1) UH-60A: 8,000 lbs
  - (2) UH-60L: 9,000 lbs
  - (3) CH-47D:
    - (a) 17,000 lbs front or rear hook
    - (b) 26,000 lbs center hook
    - (c) 25,000 lbs combination of front and rear hooks

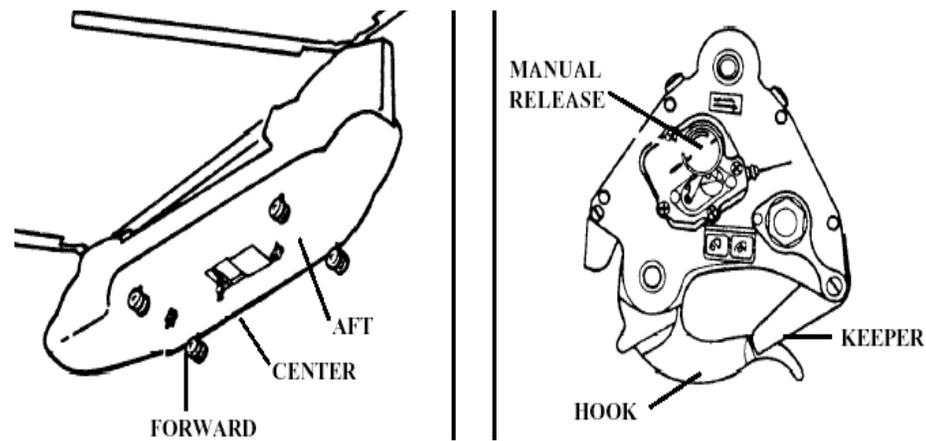
### 2. Cargo Hook Release

- a. ground crew may manually release cargo hook. Only done when the hook malfunctions & will not release by other means
  - (1) UH-60
    - (a) pilot or crew chief can release hook electronically; manual release lever on right side
  - (2) CH-47D
    - (a) pilot or crew chief can release all hooks electrically
    - (b) crew can release all hooks manually from inside
    - (c) fore & Aft hooks have manual release knob on right side; turn counter-clockwise to activate; they are 13 ft apart.

Center hook has no release lever for ground crew. Manually depress the spring loaded keeper & remove apex.



UH-60 CARGO HOOK



CH 47 CARGO HOOK LOCATIONS

CH-47 FORE & AFT HOOKS

E. UNITS

1. There are normally three different units involved in a sling load operation: supported unit, aviation unit, and receiving unit. Their responsibilities are:

## 2. SUPPORTED UNIT

- a. selecting, preparing, and controlling the PZ
- b. requisitioning all the equipment needed for sling load operations
- c. storing, inspecting, and maintaining all sling load equipment
- d. providing trained ground crews for rigging and inspecting and inspection forms, controlling aircraft, aircraft guides, hooking up loads, and clearing the aircraft for departure
- e. securing and protecting all sensitive items
- f. providing load dispositions and instructions to the aviation and receiving unit for the sling load equipment
- g. verify the load weight (to include rigging equipment)
- h. designate a safe rendezvous point in case of in flight emergency

## 3. AVIATION UNIT

- a. establish coordination with the supported and receiving units
- b. advises the supported unit on load limitations
- c. advises the supported and receiving units on the suitability of selected LZ's and PZ's
- d. provides assistance in the recovery and return of sling load equipment
- e. establishes safety procedures and understanding of duties and responsibility between the flight crew and ground crew

NOTE : The pilots make the final decision on whether the cargo will be moved.

## 4. RECEIVING UNIT

- a. selects, prepares, and controls the LZ
- b. provides trained ground crews to guide the aircraft and de-rig the loads
- c. coordinates with the supporting unit for the control and return of the sling load equipment
- d. inspects the rigging of back loads (sling load equipment returning to supporting unit)

NOTE: See TM 4-48.09, TM 4-48.10/11 for additional information on these procedures.

## F. EQUIPMENT

### 1. Helicopter sling sets

#### a. Items

- (1) Sling set, helicopter, 10,000 lbs. capacity, NSN 1607-01-027-2902
- (2) Sling set, helicopter, 25,000 lbs. capacity, NSN 1670-01-027-2900

Data: There are two models, a 10,000 lbs. and a 25,000 lbs capacity. Both sets consist of an apex fitting assembly, four sling leg assemblies, and an aviator's kit bag.

### 2. 10,000 lbs. set

#### a. Rope

- (1) Double-braided nylon
- (2) Olive drab colored
- (3) 7/8 inch in diameter
- (4) 12 feet long
- (5) Chain and grab hook assemblies
  - aa. Forged steel
  - bb. 8 feet long (chain)
  - cc. 110-115 chain links
- (6) Apex fitting is dull gray aluminum.
- (7) The pin portion is 1 1/8 inches in diameter.
- (8) Weight is 52 pounds (with four leg assemblies).

### 3. 25,000 lbs. set

#### a. Rope

- (1) Double-braided nylon
- (2) Black colored
- (3) 1 1/4 inch in diameter
- (4) 12 feet long
- (5) Chain and grab hook assemblies
  - aa. Forged steel
  - bb. 8 feet long (chain)
  - cc. 84-88 chain links
- (6) Apex fitting is alloy steel
- (7) The pin portion is 1 1/2 inches in diameter.
- (8) Weight is 114 pounds (with four leg assemblies).

### 4. Storage

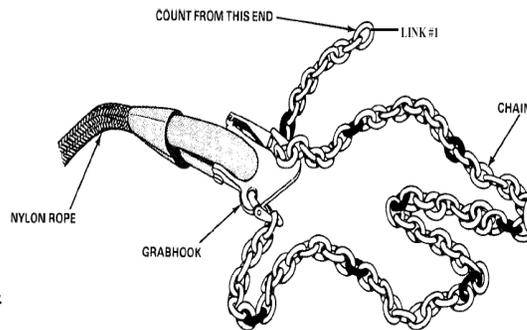
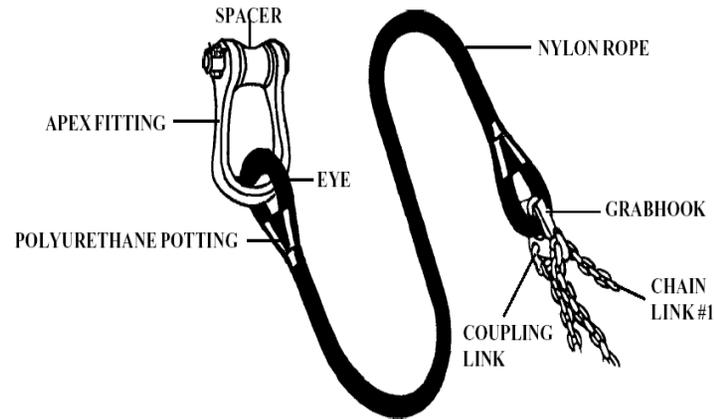
- a. These sling sets should be stored in the aviator's kit bag, which is furnished with each sling set
- b. The kit bag should be stored in a dry place protected from direct sunlight
- c. Off from concrete floors

5. Inspection

- a. Inspect equipment IAW TM 4-48.09, damage criteria-chart in Chapter 6
- b. Inspect before and after every use or every 6 months
- c. Inspect metal for rusts, nicks, burrs, cracks, dents, metal distortion, and proper operation.
- d. Inspect nylon portion for grease, oil, and acid, foreign matter.

6. Maintenance

- a. Wash off dirt and all substances with a mild detergent and/or soap.
- b. After washing, rinse thoroughly and then air dry. Do not wring water out or dry in the sun.
- c. Remove corrosion from metal part with a wire brush, emery cloth, or similar material.
- d. Remove burrs or sharp edges from metal parts with a file. 1/8 in dents or metal distortion or missing components will render equipment unserviceable.
- e. Replace any defective components



10,000 lb &  
capacity  
components

25,000 lb Ca-  
Sling Set Com-

## 7. COMMON ADDITIONAL EQUIPMENT

### a. Two-inch tape:

- (1) rated capacity, 80 lbs per wrap
- (2) Used to shatterproof glass and plastic surfaces and for padding material. It is also used to secure most excess on loads.
- (3) Can be used as a breakaway

### b. Type III nylon:

- (1) Rated Capacity, 550 lbs
- (2) Used as a permanent tie and to secure portions of different loads
- (3) It is round and smooth to the touch

### c. ¼ inch cotton webbing:

- (1) Rated Capacity: 80 lbs
- (2) Used as breakaway material on various loads. Breakaway material prevents sling legs from becoming misrouted or tangled during sling load operations.
- (3) It is flat and rough to the touch

### d. 3/8 inch hemp rope:

- (1) Rated Capacity: 3,180 lbs
- (2) Used to secure items

### e. 7/16 inch nylon rope:

- (1) Rated Capacity: 4,500 lbs
- (2) Used as a collar on the Cargo Net, to secure items, rappelling, and hip rappel seats.

### f. CGU-1B:

- (1) Rated capacity: 5,000 lbs
- (2) Used to secure two items together and to secure cargo in vehicles and trailers

### g. Static Probe:

- (1) Used to protect the hook-up person from static electricity during sling load operations. TM 4-48.09, Appendix D, provides instructions needed to fabricate a field expedient static discharge wand.

### h. Cargo Hook Reach Pendant:

- (1) Rated capacity: 11,000 lbs (Green bottom loop), 25,000 lbs (black bottom loop).
- (2) The large looped end is attached to the apex and the small looped end is placed into the cargo hook of the aircraft. The CHRP is approved for use with all loads and all aircraft. The CHRP reduces hook up time and gives the hook up team more room & safety. Reach pendants should not be used on loads that have a tendency to spin during flight. A static discharge person is not required when using a CHRP.

8. OTHER EQUIPMENT:

a. Clevises

- (1) Large clevis:
  - aa. rated capacity- 12,500 lbs.
  - bb. Used as a field expedient apex.
- (2) Medium clevis:
  - aa. rated capacity- 6,250 lbs.
  - bb. Used on the A-22 cargo bag.
- (3) Small clevis:
  - aa. rated capacity- 6,250 lbs.
  - bb. Used as a lift point.
- (4) 5/8 in screw pin clevis:
  - aa. rated capacity- 4,420 lbs.
  - bb. Used as a lift point on fuel blivets.
- (5) Small screw pin clevis:
  - aa. rated capacity- 8,650 lbs.
  - bb. Used as a tie down or lift point.
- (6) Platform clevis:
  - aa. rated capacity: 7,000 lbs.
  - bb. Used on Air Force pallets.
- (7) Manufactured Apex:
  - aa. rated capacity- 10,000 lbs.
  - bb. Used on 5,000 lbs and 10,000 lbs cargo nets.
- (8) ½ inch Tubular Nylon:
  - aa. Rated Capacity: 1,000 lbs
  - bb. Used for securing equipment and excess. Used to secure links on the 119 Howitzer.
- (9) ADS (Aerial Delivery Sling) Type XXVI Multi-loop line:
  - aa. rated capacity, 10,000 lbs
  - bb. Available in varying lengths
    1. 3 ft ADS is used in conjunction with the Type IV connector link to construct a 3' apex ring.
- (10) Type IV connector link:
  - aa. Rated capacity: 12,500 lbs
  - bb. Used to construct a three foot apex ring or connect ADS slings
    1. Component parts:
      - (a) Base plate
      - (b) 2 aluminum rollers
      - (c) 1 locking plate

9. INSPECTION OF THE AERIAL DELIVERY SLING

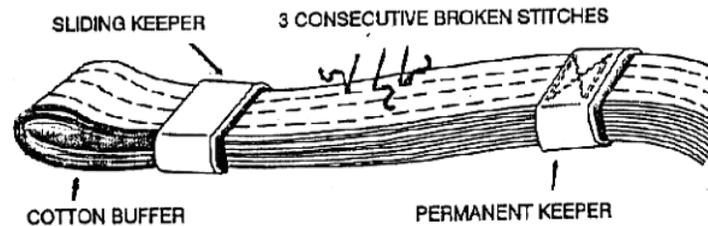
- a. The unit will inspect all ADS before and after every use and every six months
- b. Serviceable slings will be stenciled with the inspection month and year using one (1) inch stencils and parachute marking black or blue ink
- c. Unserviceable slings will be stenciled "unserviceable" and disposed of according to unit SOP

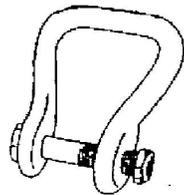
10. CRITERIA FOR UNSERVICEABILITY

- a. Three or more consecutive loose or broken stitches or five stitches loose or broken in a row in the same area,
- b. Petroleum, rust or mildew stains that cannot be removed
- c. Any cuts
- d. Excessively worn or frayed
- e. Missing cotton buffers
- f. Missing keepers

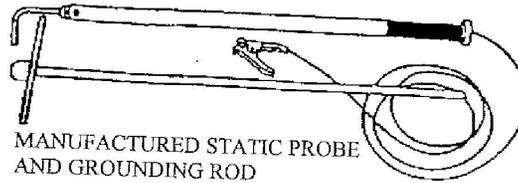
NOTE: Tetrachlolethylene (dry cleaning solvent) should be used to clean slings, A-22 bags or ADS. Use only in well vented areas.

AIR DELIVERY SLING W/ BROKEN OR LOOSE STITCHES

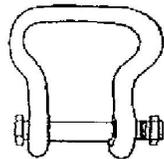




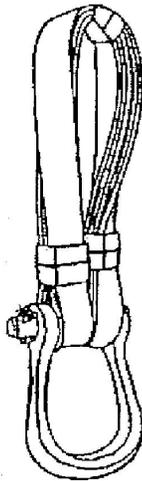
LARGE CLEVIS



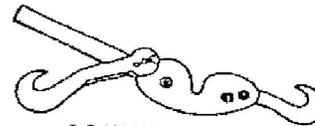
MANUFACTURED STATIC PROBE AND GROUNDING ROD



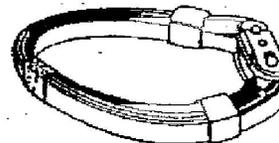
MEDIUM CLEVIS



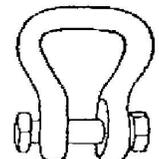
BASKET HITCH



LOAD BINDER



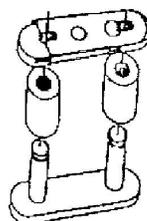
3 ft APEX RING



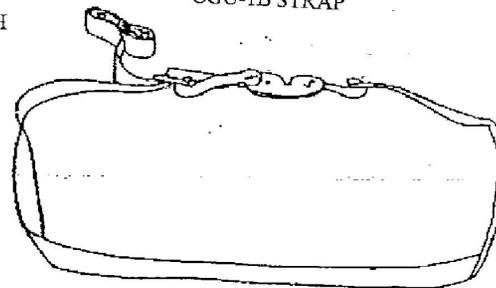
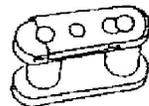
SMALL CLEVIS



CGU-1B STRAP



TYPE IV CONNECTOR LINK



15 ft TIE DOWN STRAP

11. PERSONNEL REQUIRED FOR SLINGLOAD OPERATIONS
  - a. General Three personnel are normally used for the ground crew in external helicopter rations on the PZ/LZ:
    - a signal person, a static probe person and a hookup person.
  - b. Static Probe Equipment The static electricity probe consists of an insulated contact rod joined by a length of metallic tape or electrical wire to a ground rod, NSN 1670-01-194-0926. The ground rod is driven into the ground and the hookup team's static probe person holds the contact rod to the cargo hook of the aircraft.
  - c. Protective Equipment. All ground crew personnel will wear the following equipment:
    - (1) ACH, chinstrap fastened
    - (2) Goggles
    - (3) Earplugs
    - (4) Gloves
    - (5) Sleeves rolled down and fastened
  - d. Ground Crew Emergency Procedures. In an emergency, the ground crew will move to a pre-designated rendezvous point identified by prior coordination with the aviation unit.
12. HOOKUP PROCEDURES
  - a. General The aircraft approaches the hookup site and is guided into position over the load by the signal person. The static probe person discharges the static electricity from the aircraft cargo hook. The hookup person then attaches the apex fitting to the aircraft cargo hook.
  - b. Duties of the Hookup Team Before the arrival of the aircraft, the signal person directs the spotting of the sling load for hookup, inspects the load to ensure that the slings are not fouled and ensures that the load is ready for hookup. Prior to the aircraft approaching the hookup site, the hookup team dons their protective equipment and the signal person positions himself at the pre-coordinated location so that he maintains eye-to-eye contact with the pilot. He must stay outside of the rotor disk diameter of the aircraft at all times. The hookup team will position themselves next to the load on the assembly area side. The hookup person will stand next to the load, with the sling legs between the load and themselves. They will hold the bell portion of the apex high above their head and will ensure the pin portion of the apex is skyward and the sling legs are not routed or tangled around their body.

The static probe person stands next to the hookup person, closest to the assembly area.

The static probe person will wrap their arm around the waist of the hookup person for added stability. With their outside hand, the static probe person will hold the static probe high above their head.

The signal person must station himself so that the pilot can plan his approach on him. He remains in this position unless terrain features or obstructions prevent an upwind approach. If this occurs, the signal person observes the approaching helicopter and moves to a position, which will allow the pilot to guide in on him. As the pilot maneuvers the aircraft into the wind, the signal person adjusts his position to remain to the front of the aircraft and in view of the pilot.

The signal person guides the aircraft until the aircraft is approximately centered over the load. The signal person gives the hand and arm signal of hover. At this time, the pilots will use the signal person as a reference point. The crew chief or flight engineer will guide the aircraft over the load.

Once the cargo hook is within reach, the static probe person will place the static probe into the cargo hook of the aircraft discharging all static electricity. The static probe person will maintain constant contact with the cargo hook. The hookup person will then place the pin portion of the apex into the cargo hook of the aircraft. The hookup person will ensure the pin portion of the apex is seated properly, and will release the apex. At this time, the static probe can be removed from the cargo hook. Both the static probe person and the hookup person will then police up the static probe and double time toward the assembly area. Once they are a safe distance outside the rotor disk diameter of the aircraft, they will turn, face the load, and kneel. When the hookup team is clear of the aircraft, the signal person gives the pilot the "hookup complete" signal, then the "move upward" signal. This signal is given so that the aircraft rises slowly taking up slack in the slings, and the load is six to eight inches off the ground. The signal person is alert to ensure that the sling legs are not fouled and the load is properly attached to the cargo hook.

If the legs are fouled or if the load is improperly suspended, the signal person gives the "move downward" signal and directs the release of the load. The hookup person and the static probe person will conduct an inspection of the load from their position. If everything looks proper and the load appears safe to fly, they will give the "thumbs up" signal to the signal person. After the signal person ensures the loads correctly suspended, he gives the pilot the "takeoff" signal.

### 13. RELEASE PROCEDURES

#### A. General:

The aircraft approaches the release site and is guided into position by the signal person. The hookup release team stands by, but is not actively employed unless the slings cannot be released from the aircraft. Normally, the ground crew consists of one signal person and two release personnel.

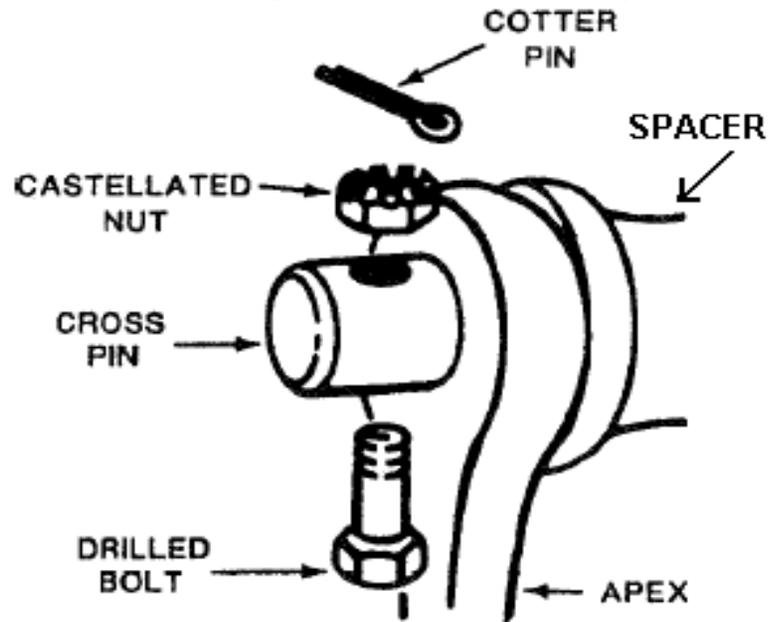
#### B. Duties of the Signal person:

As the aircraft approaches the cargo release site, the signal person positions himself as he would for a hook-up. Using appropriate hand and arm signals, the signal person guides the pilot in maneuvering the aircraft until the sling load is positioned a few feet above the cargo release points. He directs a gentle lowering of the aircraft until the load rests firmly on the ground. After the cargo load is safely landed and there is slack in the sling legs the signal person gives the pilot the "release sling load" signal. The signal person ensures that the load is properly on the ground and that the sling load is released entirely from the hook. When the load is free of the hook, the signal person gives the pilot the "takeoff" signal.

C. Duties of the Release Team:

Prior to the aircraft approaching the cargo release site, the release team dons protective equipment and moves to their pre-coordinated positions. The cargo release team remains in this position unless directed by the signal person to move under the aircraft and manually release the load from the fouled or jammed cargo hook. If directed by the signal person, both soldiers move in under the helicopter. The soldier handling the static electricity probe grounds the cargo hook by contacting it with the probe, then grabs the hook. The second soldier manually operates the cargo hook release or disengages the fouled sling from the hook. If required, both soldiers work to accomplish cargo release. When the sling load is released from the hook, the soldiers move quickly aside of the aircraft take-off path. Night Operations- Greater care and thorough planning must be taken for night operations. The signal person will use baton flashlights and the release team will carry flashlights.

### Six components of the Apex



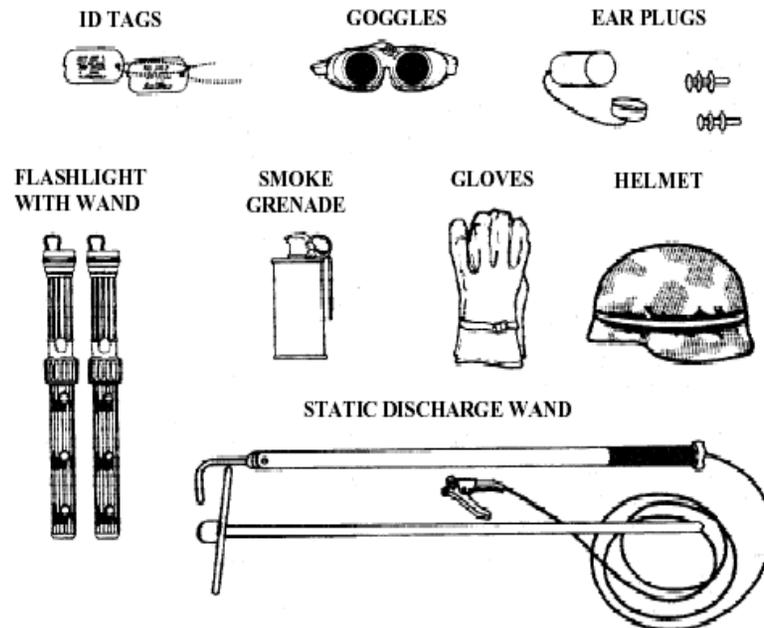
14. APEX SET UP

- a. UH-60 requires an aluminum spacer when using a 10,000lb apex
- b. CH-47 has no special apex requirement
- c. The apex will ALWAYS be configured with the pin facing up (toward the aircraft)

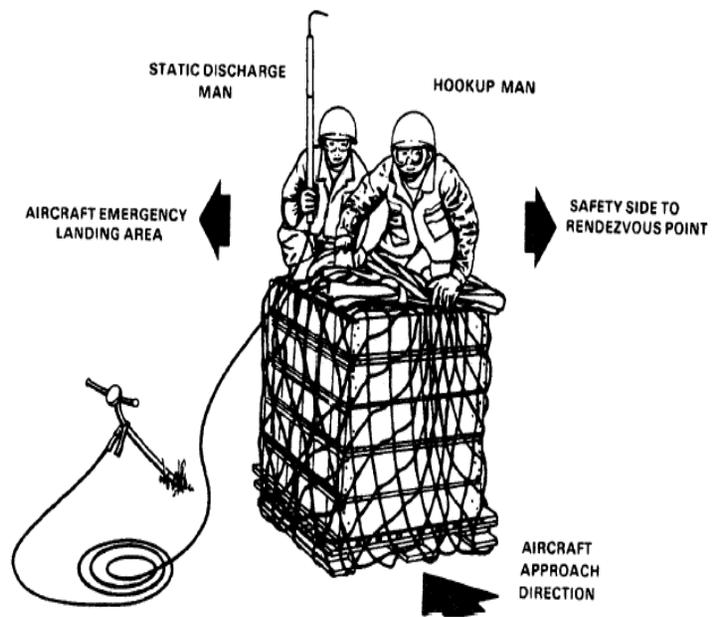
NOTE: When using a 25K sling set on a UH-60 the aluminum spacer must be removed.

15. SAFETY CONSIDERATIONS:

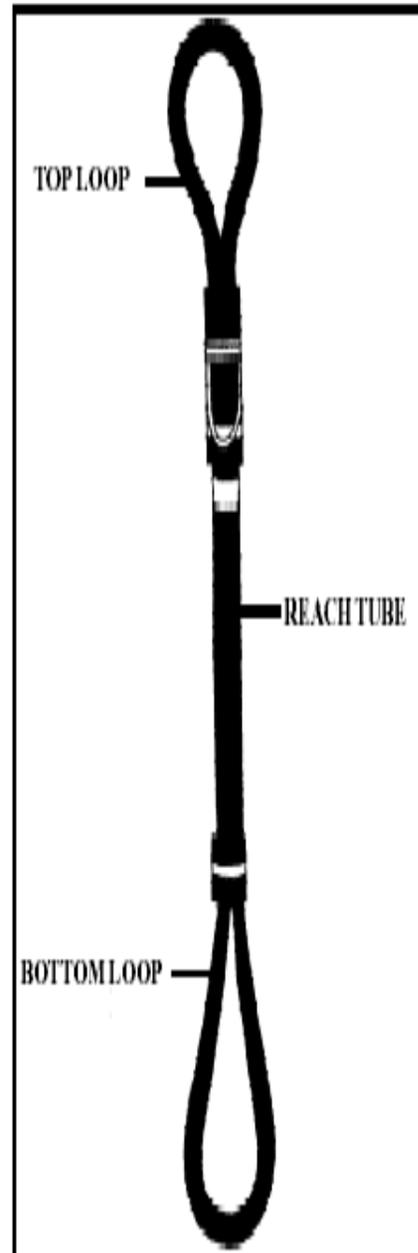
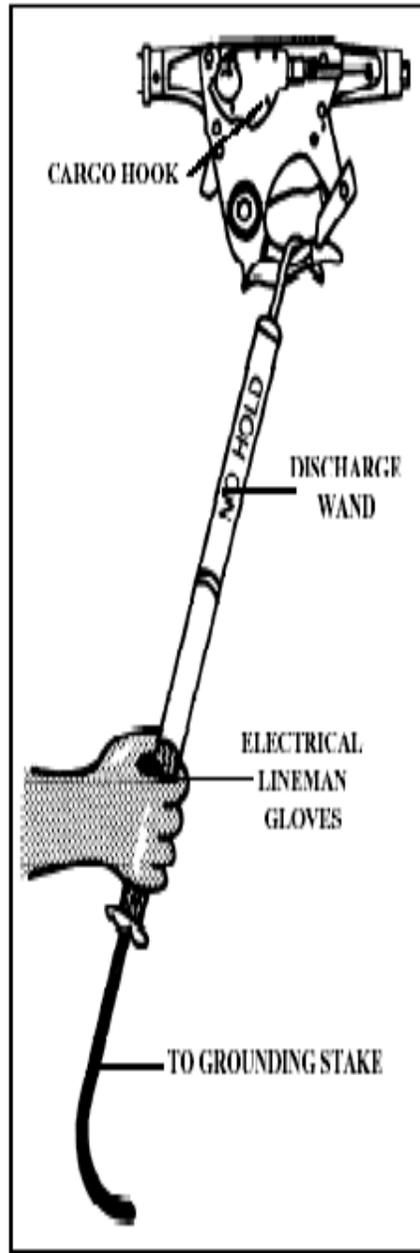
- a. Protective Equipment All ground crew personnel will wear the following equipment:
  - (1) ACH, chinstrap fastened
  - (2) Goggles
  - (3) Earplugs
  - (4) Gloves
  - (5) Sleeves rolled down and fastened
  - (6) ID card and tags
- b. Stay away from the tail rotor of all aircraft.
- c. Stay away from the main exhaust of the CH-47
- d. Ground Crew Emergency Procedures
  - (1) In an emergency, the ground crew will move to a pre-designated rendezvous point identified by prior coordination with the aviation unit.



PERSONAL PROTECTIVE EQUIPMENT



HOOK UP TEAM POSITION



STATIC PROBE

CARGO HOOK REACH PENDANT

## 16. PHASES OF A SLINGLOAD OPERATION

a. There are three phases to external load operations:

- (1) Phase I: Preparation and Rigging - Loads are prepared and rigged IAW the proper manuals. Section II and III of this chapter outline preparation and rigging of selected loads.
- (2) Phase II: Inspection - A Pathfinder School Graduate, SLICC (Sling Load Inspector Certification Course) Graduate, or an Air Assault School Graduate in the rank of E-4 and above. All loads will be inspected a minimum of two times. Individual who rigged the load cannot inspect same load. Recorded on a DA FORM 7382-R Sling Load Inspection Record
- (3) Phase III: Sling Load Operation - trained ground crews hook up loads.

## CERTIFIED SLINGLOADS

### A. GENERAL:

All procedures outlined in this chapter are in accordance with TM 4-48.09, TM 4-48.10/11. Additional safety requirements have been added to the preparation and rigging procedures outlined in the reference material. Inspection sequences discussed in this chapter are the recommended procedures for use at The Air Assault School.

### B. GENERAL RIGGING INSTRUCTIONS:

1. Preparation: The preparation steps are intended to reduce the possibility of damage to the equipment caused by sling leg entanglement during the hookup and lift-off operation or by wind resistance encountered during the flight. Since these preparation steps are not directive in nature, the commander assumes responsibility for any damage to the equipment caused by deviation from the preparation steps. Typical preparation instructions will provide information to secure loose items, remove and secure canvas covers, and remove obstructions, such as antennas. Place protective padding on windshields and other components that could be damaged by the metal parts of the sling set during hookup or release. The load should be secure enough to withstand winds in excess of 120 knots caused by the forward airspeed of the aircraft. If possible, position the load in the takeoff direction so the pilot does not have to pick the load up and then turn the aircraft into the takeoff direction.
2. Rigging: The rigging steps give information as to the position of the apex fitting on the load, routing orientation of the sling legs, location of the lift provisions, chain link number for each sling leg, and steps required to prevent the sling legs from becoming entangled on the load. Do not change the chain link number in the rigging procedures under any circumstances as it may change sling leg loading and cause lift provision failure.
3. Breakaway safety ties: Used to temporarily restrain the sling legs to keep them from becoming entangled on the load as the helicopter lifts the load. These safety ties are made of Type I, 1/4-inch cotton webbing or 2" (duct) tape.

4. View of the Load: Left, right, front, and rear directions are designated from the driver's perspective for vehicles and towed equipment. Howitzer gun tubes are considered the front of the load. To improve flight stability, some loads are transported backwards. Do not confuse the front of the load as it is carried with the end designated as the front for rigging purposes.
5. Sling Load Inspection Record: Load verified as safe by a qualified inspector
  - a. give a copy to the supporting aviation unit (not necessarily the pilot)
  - b. securely tape or tie a copy to the load
  - c. give a copy to the supported unit
6. Factors of In-flight Stability:
  - a. Proper weight
    - (1). Minimum safe weight for any sling load is 500lbs
    - (2) The maximum weight cannot exceed the lift capacity or the hook tensile strength of the aircraft or the maximum rated capacity of the load/rigging.
  - b. Proper drag surface:
    - (1). load must be as aerodynamic as possible
    - (2). balanced loads fly best when level
    - (3). unbalanced loads must have a nose (heavy end) down attitude which is achieved by the proper link count
  - c. Proper air speed: Determined by the Aviation Unit Commander or, in his/her absence, the pilot in command.
  - d. To improve in-flight stability:
    - (1). increase weight of load
    - (2). redistribute weight (load plan)
    - (3). alter drag surface (link count)
    - (4). install drogue chute
    - (5). reduce airspeed (least preferred)

## CLASSIFICATION OF SLING LOADS

### A. CLASSIFICATION DEFINITIONS OF SLING LOADS

#### 1. Certified Sling Loads:

- a. Certified sling loads are those items of equipment and their associated rigging procedures which have completed the evaluation and testing required for sling load certification. These rigging procedures are in TM 4-48.09, TM 4-48.10/11.
- b. The following restrictions apply to certified for sling loads:
  - (1) The load must be within the lifting capability of the desired helicopter model and not exceed the rated capacity of the sling set being used.
  - (2) The load shall be rigged in accordance with the certified rigging procedure.
  - (3) The recommended stable airspeed specified for the load in the applicability section of the rigging procedure is a recommendation and not a restriction, unless so stated.

NOTE: When carrying loads at weights close to the aircraft hook limitations, close coordination with the aviation unit is required.

#### 2. Suitable Sling Loads:

- a. Suitable sling loads are those items of equipment and their associated rigging procedures that have not been certified but have demonstrated acceptable static lift and flight characteristics during a flight test. In most cases these loads were not pull tested in accordance with MIL STD 913, but are known loads which have been flown without incident for years and which are considered to be proven safe. These rigging procedures can be found in TM 4-48.09, TM 4-48.10/11.

#### 3. Unique Sling Loads:

- a. Unique loads are equipment carried on a one time or low-frequency basis, such as telephone poles, artillery targets, or barrier material. The lack of sling load certification in itself does not preclude a unit commander from carrying a load that is not certified. The movement of unique loads should be approved by the high risk approving authority.

#### 4. Prohibited Sling Loads:

a. Prohibited sling loads are items of equipment that are prohibited from sling loading. These loads have been denied sling load certification and are a safety hazard if carried. They have either structural deficiencies or have exhibited unstable flight characteristics during flight testing.

#### B. SLING LOAD OF UNIQUE ITEMS OF EQUIPMENT:

Helicopter sling loading of unique items, due to operational requirements, will be at the discretion of the commander. Equipment not listed in TM 4-48.09, TM 4-48.10/11. should be static lifted (when possible) by a crane to determine proper rigging and stability characteristics. Personnel thoroughly familiar with sling load rigging procedures should assist in the static lift testing / rigging and hookup. Flight evaluating may be conducted after a satisfactory static rigging configuration has been determined.

Other examples of unique sling loads:

Destroyed or mined vehicles

Construction materials

Downed aircraft will be rigged using procedures in FM 3-04.513 Battlefield Recovery and Evacuation of Aircraft, dated 27 September 2000.

#### C. TECHNIQUES FOR RIGGING A UNIQUE LOAD:

SAFETY NOTE: This is only a technique and not a doctrinal method of conducting sling load operations. The Warrior Training Center (Air Assault) assume no liability in the sling load of unique loads while using this technique. Rigging and sling loading unique loads is inherently dangerous and should only be conducted by the most qualified and experienced personnel and crews, when the mission dictates, there is no other way to accomplish the same mission, and the commander has conducted a thorough risk assessment with appropriate risk reduction measures applied. The commander with "high" risk approval authority (O-6) is the approval authority for flying non-standard loads.

1. Acquire suitable air items and special equipment such as a sling set of appropriate capacity, applicable apex setup for the aircraft to be used, additional chains, tie down and break away material, A7A straps, ADS slings, clevises, etc.
2. Determine if the load is structurally sound and strong enough to be lifted and sling loaded.
3. Determine center of balance of load. Consider that the heaviest portion will fly forward.
4. Determine suitable lifting points on the load. Must be strong enough to lift the load and will allow the air items (sling legs and chains) to be routed in a manner that will not damage them.
5. Determine link count. Start with 3. This will provide the most distance between the load and the aircraft on the initial pick up attempt in the event the load shifts or rolls. It also makes adjustments quickly and easily because the hookup team will only need to shorten the appropriate legs, if required, instead of both lengthening & shortening.
6. Use extended sling legs if possible/feasible. This will reduce the amount of time the A/C needs to spend hovering over the load, as it can land next to the load while link count & rigging procedures are modified, and creates more space between the load & A/C.
7. Hook up using the appropriate techniques then clear the hookup team from the load. The signal person then has the aircraft move upward slowly, take up slack in the sling legs, and begin to lift the load. At the same time, all hookup team members observe the load. If at anytime the load appears to become unstable, unbalanced, or structurally weak, the signal person will immediately indicate to move the load back down, and cut sling load. The hookup team moves back to the load, and attempts to fix the problem, if possible. This process may have to be repeated several times until the desired result is achieved. Whenever possible, there should be ground to air communication between the ground crew and pilot.

NOTE: Low density equipment with low weight and large surface area (flat surfaces), such as shelters, empty trailers, pallet loads, boat shaped items, and empty fuel or water drums, are likely to become extremely unstable when flown during sling load operations, even at low airspeeds, and should be flown with extreme caution.

## Part II Sling Loads

### CARGO NETS 5,000 AND 10,000 POUND CAPACITY

- A. LOAD DESCRIPTION: Cargo Net, 5,000 lbs and 10,000 lbs
1. Characteristics: 5,000 lbs capacity
    - a. Weight- 58 lbs
    - b. Size- 15 ft x 15 ft
    - c. Load bearing zone- 5 ft x 5 ft
    - d. Mesh size- 6 in x 6 in
    - e. Color- OD Green (when new) Yellow (when used)
  2. Characteristics: 10,000 lbs capacity:
    - a. Weight- 96 lbs
    - b. Size- 18 ft x 18 ft
    - c. Load bearing zone- 6 ft x 6 ft
    - d. Mesh size- 7.5 in x 7.5 in
    - e. Color- Black (when new) Grey (when used)
- B. MATERIALS.
1. Sling set with one to four sling legs dependent on load weight
  2. One 5,000 lbs. or 10,000 lbs. capacity cargo net
  3. 2" Adhesive Tape, rated capacity of 80 lbs. per wrap
  4. ¼ inch Cotton Webbing, rated capacity 80 lbs
  5. Minimum of 12 feet, rope or strap with a rated capacity of 550 lbs. or greater.( i.e. 7/16 inch nylon rope, 3/8 inch hemp rope, or A7A strap)
- C. PERSONNEL: Four personnel can prepare and rig this load in 5 minutes

### PHASE I (PART 1)

#### PREPARATION

- A. To prepare the cargo net, you must first lay it out flat on the ground. You will then place your cargo in the net so that 75% or more of the cargo is inside of the (LBZ) Load bearing zone. Ensure you have a minimum weight of 500 lbs. Now, pull the net up around the sides of the load ensuring all slack is pulled tight. Next, thread a piece of the 7/16 or 3/8 nylon or hemp rope (or A7A strap) through the web portion of the net approximately every 3<sup>rd</sup> to 5<sup>th</sup> square . Tighten the rope so that the hole created is smaller than the smallest object inside the net, and tie the rope in a square knot. Roll and tape excess to itself.

You are now ready to place your hooks on the manufactured apex. The hooks are numbered in a clockwise, or counter clockwise direction, starting from the number 1 hook. Remember, the #1 hook will have the manufactured apex tied to it with a piece of type III nylon. The hook sequence will be 1, 3, 4, 2 or 1, 3, 2, 4. The hook openings should be alternated on the manufactured apex. Place your #1 hook on the apex. Then go to the opposite side of the load and place the #3 hook on the apex. Move to either the left or the right side of the load and place either the #2 or the #4 hook on the apex. Finally, take a piece of 2-inch tape and tape around all the hooks so they will not come off the apex. You have just completed part one of Phase I, Preparation.

## PHASE I (PART 2)

### RIGGING

- A. You will use the appropriate number of sling legs for the weight in the cargo net. One sling leg of a 10K set has the rated capacity of 2,500 lbs. One sling leg of a 25K set has the rated capacity of 6,250 lbs. Take the free running end of the chain and route it through the manufactured apex 1 time and 1 time only and secure a link count of 3 by dropping the third link into the keeper portion of the grab hook assembly.
- B. You are now ready to tie your three mandatory breakaways. You will take 3 pieces of ¼ inch cotton webbing and tie them around all the lifting legs on the cargo net approximately 3 feet apart.
- C. The final step for rigging is to check the apex on the 10,000 lbs sling set. If you have a UH-60A Blackhawk coming to pick up the load, you must have an aluminum spacer on the pin portion of the apex. For a UH-1H, you need a donut ring or a basket hitch on the pin portion of the apex. A CH-47 does not need any additional equipment. Check the pin to ensure it has been secured with a bolt.
- D. The bolt has been secured with a castellated nut facing outward; cotter pin must be present.

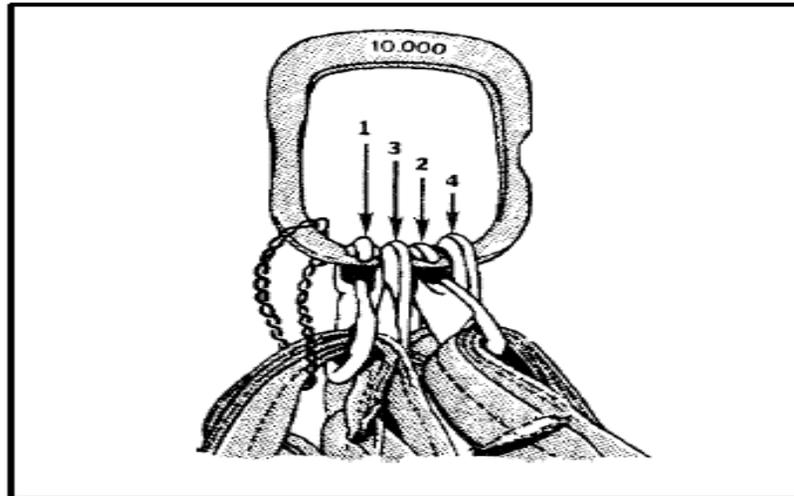
## PHASE II

### INSPECTION OF PREPARATION AND RIGGING

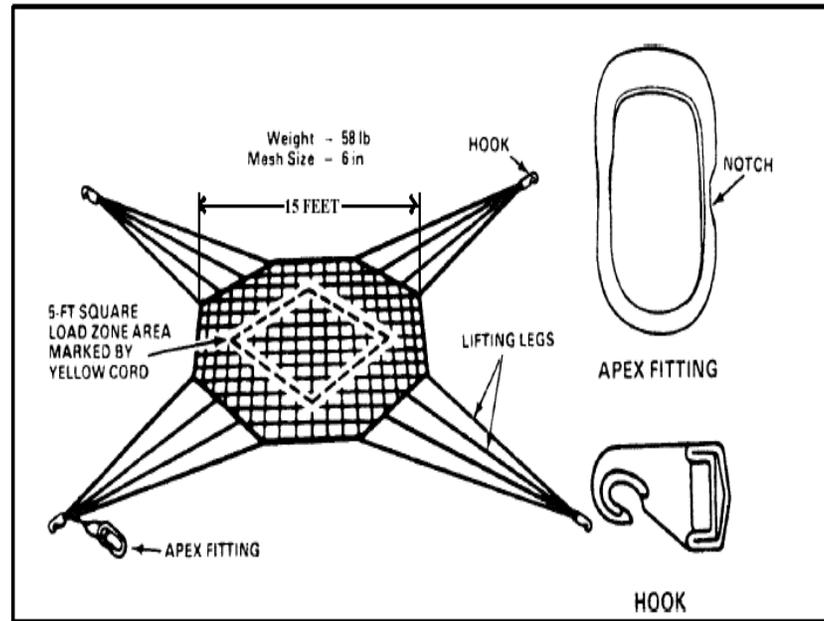
- A. There are three personnel who can inspect a sling load. They are a Pathfinder School Graduate, SLICC (Sling Load Inspector Certification Course) Graduate, and an Air Assault School Graduate. When you inspect a sling load you will inspect it a minimum of 2 times or until you are 100% sure the load will fly safely.
- B. To inspect a sling load you will start at one point and work your way around the load in a clockwise or counter-clockwise method. You will correct all preparation and rigging deficiencies when you come to them. After correcting a deficiency, that point will become your new start point.
- C. Start at the apex of the cargo net. You will check the apex for the following: If a UH-60A Blackhawk is picking up the load, it must have an aluminum spacer when using the 10K apex. A CH-47 does not need a spacer, but you can pick up the load if one is present. Ensure that the pin of the apex has been secured with a bolt. The castellated nut facing outward; cotter pin must be present.
- D. You then should determine if you have enough sling legs to support the weight of the cargo inside the net. One sling has a rated capacity of 2,500 lbs. For accountability purposes, it is best to rig the cargo net with all four sling legs, but is not mandatory.
- E. You can then move to the grab hook assembly on your sling leg. Ensure the grab hook assembly is not inverted and you should have a link count of 3. Remember, if you use all four sling legs, the chain link count will be 3 for all sling legs. Continue to follow the chain down to the manufactured apex to ensure the chain or chains have been routed through the manufactured apex 1 time and 1 time only.
- F. Check the hook sequence on the manufactured apex. To do this, determine which side of the apex has the small indentation/notch on it. Then go to the hooks, the #1 hook or the one with the lanyard tied to it should be the farthest from the indentation/notch with the #3 hook being next. The last two hooks will be #2 and #4 in any order. To ensure the lifting legs are in the correct sequence, you will slightly pull on one of the lifting legs on the #1 hook and see where the movement of the lifting leg came from. You will then check the next hook which is the #3 hook and slightly pull on one of the lifting legs to make sure the movement of the leg comes from the opposite side of the #1 lifting legs. You also want to ensure that the hooks have been taped with 2-inch tape; this is so the hooks will not come off the apex. Lastly ensure that the hooks are facing in alternating directions. Now, you are ready to check your mandatory breakaways. They must be 1/4 inch cotton webbing and must be tied around all of the lifting legs in three places.

- G. You are ready to inspect the net itself. First, check the securing collar on top of the load to make sure the rope isn't routed through any excess net or through a lifting leg. Next, make sure none of the lifting legs are routed through any of the mesh squares of the Cargo Net. The rope should be tightened down so that the hole is smaller than the smallest object inside of the net. Also, check the knot to ensure it is a square knot and that all excess rope has been secured to itself with 2-inch tape.
- H. The final check is to ensure that the load is centered. At least 75% or more of the cargo must be inside the LBZ and nothing can be protruding from the net.

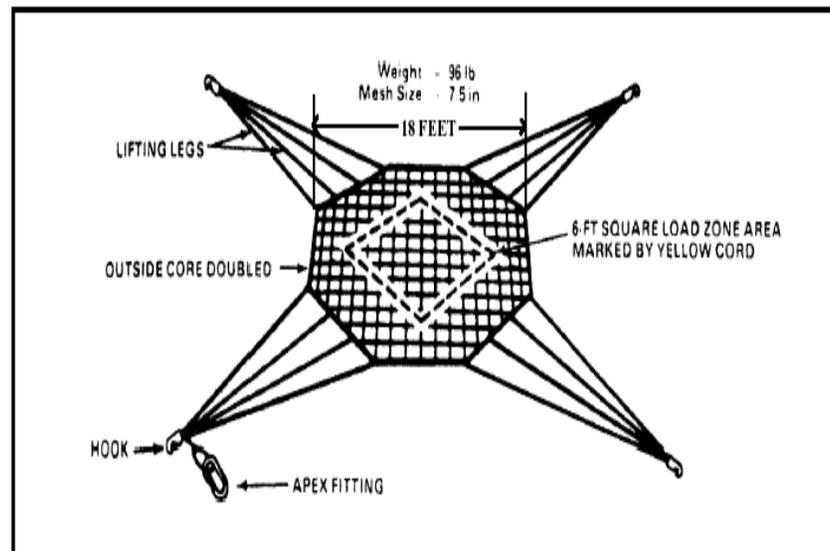
NOTE: DA Form 7382-R must be filled out IAW TM 4-48.09 see Appendix I.



CARGO NET HOOK SEQUENCE (before taping)



**5,000 LB CARGO NET**



**10,000 LB CARGO NET**

## A-22 CARGO BAG

- A. **LOAD DESCRIPTION:** The A22 Cargo Bag is an adjustable cotton duck cotton / nylon and nylon webbing container consisting of a sling assembly, cover, and four suspension webs. The weight of the A22 Cargo Bag is 58 lbs.
- B. **MATERIALS.**
  - 1. Sling set with one sling leg
  - 2. One A22 Cargo Bag, with or without dust cover, maximum weight of 2,200 lbs.
  - 3. 2" Adhesive Tape, rated capacity of 80 lbs. per wrap
  - 4. Type III Nylon, four sections twelve foot in length, rated capacity of 550 lbs.
- C. **PERSONNEL:** Two personnel can prepare and rig this load in 15 minutes

### SERVICEABILITY AND ACCOUNTABILITY INSPECTION

- A. The minimum safe sling load weight for the A-22 bag is 500 lbs. The maximum weight is 2,200 lbs.
- B. Prior to preparing or rigging the A-22 bag for a sling load operation, you must inspect all of its component parts for serviceability and accountability.
- C. Inspect for holes, rips, or frays in excess of one inch in diameter. If any holes, rips, or frays are present, you must replace or repair that component.
- D. Inspect for petroleum base stains, rust, or mildew. If these are present, attempt to remove them with warm soapy water and a stiff brush.
- E. Inspect all stitching for loose or broken stitches. Utilize the stitch rule: If 3 consecutive stitches or 5 in one area are loose or broken, you must repair or replace the component.
- F. Inspect the lacing loops to ensure that they have not been sewn closed and are present.
- G. Inspect the rectangular portion of the canvas cover for a current inspection date. It must be current within 6 months of the inspection date. It will be in 1 inch block letters (in black or blue parachute rigging ink) indicating the month and year it was inspected.
- H. You will then inspect the scuff pad assembly.
- I. Inspect for holes, rips, or frays in excess of 1 inch in diameter.
- J. Check for petroleum base stains, rust, or mildew.
- K. Inspect all stitching using the stitch rule.
- L. Inspect the vertical and lateral straps for cuts, frays, and stains.
- M. Inspect the metal portions of the A-22 bag for rust, cracks, dents, nicks, or burns.

- N. Inspect the two 188 inch straps for cuts, frays, or stains.  
Inspect the suspension webbing straps. There should be 4. Each strap has a rated capacity of 2,200 lbs. There are two types of straps. They are cotton and nylon. You will never mix the two types of straps due to different stretch rates. You can identify a cotton strap by its off white color and the red stitching. The nylon strap is OD green in color. Inspect the straps for frays, cuts, or stains.
- O. Check for loose or broken stitches using the stitch rule.
- P. Inspect all metal portions for rust, cracks, dents, nicks, or burns.
- Q. Ensure butterfly hooks are spring loaded and move freely.
- R. There are three types of lacing ropes that can be used with the A-22 bag. They are 3/8 inch hemp rope, 7/16 inch nylon rope, and type III nylon. A total of four ropes are needed.
- S. The rated capacity 3/8 inch hemp rope is 3,180 lbs. The rated capacity for 7/16 inch nylon rope is 4,500 lbs. Type III nylon has a rated capacity of 550 lbs.
- T. Inspect the free running ends of your ropes to ensure that they are not excessively frayed, and have been secured with 2 inch tape or have been whipped and dipped. When using 3/8 inch hemp rope or 7/16 inch nylon rope
- U. Inspect each strand of rope to ensure it is not cut or frayed more than half the diameter of an individual strand.
- V. Check the medium clevis (FIG 2-22) for rust, cracks, nicks, dents, and burrs. Also, ensure the clevis has the bolt and nut and that they are not stripped out.

#### PHASE I (PART 1)

##### PREPARATION

- A. Place the scuff pad on the ground with the over sewn portion facing down.
- B. Place the canvas cover on top of the scuff pad assembly. Match up the rectangular portions.
- C. Pull the canvas cover on top of the scuff pad assembly. Match up the rectangular portions.
- D. Place the load on the rectangular portion of the canvas cover so that it is centered.
- E. Inspect all stitching for loose or broken stitches. Utilize the stitch rule: If 3 consecutive stitches or 5 in one area are loose or broken, you must repair or replace the component.
- F. Inspect the lacing loops to ensure that they have not been sewn closed and are present.
- G. Inspect the rectangular portion of the canvas cover for a current inspection date. It must be current within 6 months of the inspection date. It will be in 1 inch block letters (in black or blue parachute rigging ink) indicating the month and year it was inspected.

- H. You will then inspect the scuff pad assembly.
- I. Inspect for holes, rips, or frays in excess of 1 inch in diameter.
- J. Check for petroleum base stains, rust, or mildew.
- K. Inspect all stitching using the stitch rule.
- L. Inspect the vertical and lateral straps for cuts, frays, and stains.  
Inspect the metal portions of the A-22 bag for rust, cracks, dents, nicks, or burns.
- M. Inspect the two 188 inch straps for cuts, frays, or stains.
- N. Inspect the suspension webbing straps. There should be 4. Each strap has a rated capacity of 2,200 lbs. There are two types of straps. They are cotton and nylon. You will never mix the two types of straps. You can identify a cotton strap by its off white color and the red stitching. The nylon strap is OD green in color and is half the thickness of a cotton strap.
- O. Inspect the straps for frays, cuts, or stains.
- P. Check for loose or broken stitches using the stitch rule.
- Q. Inspect all metal portions for rust, cracks, dents, nicks, or burns.
- R. Ensure butterfly hooks are spring loaded and move freely.  
There are three types of lacing ropes that can be used with the A-22 bag. They are 3/8 inch hemp rope, 7/16 inch nylon rope, and type III nylon. A total of four ropes are needed.
- S. The rated capacity 3/8 inch hemp rope is 3,180 lbs. The rated capacity for 7/16 inch nylon rope is 4,500 lbs. Type III nylon has a rated capacity of 550 lbs.
- T. Inspect the free running ends of your ropes to ensure that they are not excessively frayed, and have been secured with 2 inch tape or have been whipped and dipped. When using 3/8 inch hemp rope or 7/16 inch nylon rope.
- U. Inspect each strand of rope to ensure it is not cut or frayed more than half the diameter of an individual strand.
- V. Check the medium clevis (FIG 2-22) for rust, cracks, nicks, dents, and burrs. Also, ensure the clevis has the bolt and nut and that they are not stripped out.

## PHASE I (PART 2)

### RIGGING

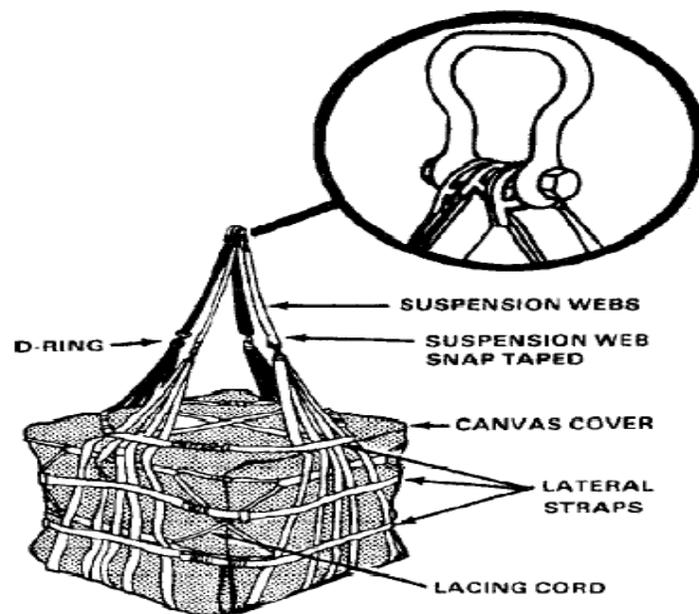
- A. Fold the canvas over the top of the load. Fold any excess cover material under the top flaps.
- B. Secure the corners with the lacing tapes. To do this, you will route your lacing rope from ground skyward through the bottom two loops. Then form an X with the lacing rope and route the free running ends through the top two lacing loops from ground to skyward. You will then secure the rope with a bow knot and tape the excess rope with 2 inch tape and ensure to leave a buddy tab
- C. Secure the 188 inch straps across the load so that they form a cross. Then locate the friction adapter buckle opposite of each strap. Route the 188 inch strap through the friction adapter and then tighten down. Do not incorporate any twists. Secure the excess strap with 2 inch tape or 1/4 inch cotton webbing.
- D. Route the lateral straps to their friction adapters. To tighten, start from the bottom and move to the top. Tighten down opposite corners at the same time. You will then roll and tape all excess straps; Do not incorporate any twists.
- E. Place your suspension webbing straps onto your suspension webbing D-rings. To do this, hook your butterfly fasteners onto the D-rings with the hooks facing down toward the load and tape the hooks with 2 inch tape.
- F. Attach the D-rings of all four suspension webs, to the bolt of the med. clevis, in a clock wise or counter clock wise sequence. Ensure that the straps are not twisted more than a 1/4 twist.
- G. Secure the bolt with the nut and tape both ends of the bolt with 2 inch tape.
- H. Route the free running end of the chain from the sling leg through the medium clevis and place a chain link count of 3 into the keeper portion of the grab hook assembly for a 10k sling set or link 5 for 25k.
- I. Rig the apex of the sling leg for the type of aircraft that will be picking up the load. A UH-60 Blackhawk must have an aluminum spacer on it, and a UH-1H must have an apex ring or a basket hitch. A CH-47 does not require any additional items on the apex. Check the nut on the apex. The castellated nut must have a cotter pin in it.

## PHASE II

### INSPECTION OF PREPARATION AND RIGGING

- A. There are three personnel who can inspect a sling load. They are a Pathfinder School Graduate, SLICC (Sling Load Inspector Certification Course) Graduate, and an Air Assault School Graduate. When you inspect a sling load you will inspect it a minimum of 2 times or until you are 100% sure the load will fly safely.
- B. Start your inspection at the apex. Check to ensure the bolt is present and secured with a nut. The castellated nut must have a cotter pin in it. Inspect to ensure that the apex is setup for the appropriate inbound aircraft. A UH-60 aluminum spacer, UH-1H basket hitch or donut ring, CH-47 does not require additional items on the apex.
- C. Check to make sure the grab hook assembly is not inverted and you have a link count of three.
- D. Check the medium clevis to ensure it has tape on both ends of the bolt and that the D-rings are on the bolt and in the proper sequence.
- E. Check to ensure your suspension webbing straps are all of the same type (either all cotton or all nylon). Check the butterfly snap hooks to ensure that they are all facing down toward the load and taped with 2 inch tape.
- F. Check the 188 inch straps to ensure they form a cross on top of the load. Ensure they are routed under the lateral straps. Also, check to ensure they have been tightened down, free of twists and do not have quick releases. Ensure that all of the excess strap has been taped with 2 inch tape.
- G. You will move to one corner and start at the top. Check the lateral strap for proper routing, it is free of twists, and verify that it has been tightened down and excess strap has been taped with 2 inch tape. Check the middle and bottom strap for the same things. Remember, if one strap has a quick release, all lateral straps must have a quick release.
- H. Check the lacing rope to ensure it has been properly routed through the lacing loops from ground to the sky. Check that the rope forms an X and is routed properly through the top lacing loops.
- I. Finally, check the rope to ensure it has been secured with a bow knot, and that the excess rope has been secured with 2 inch tape leaving a buddy tab.
- J. Inspect the other three corners in the same manner.

A-22 BAG



## ONE TO FOUR 500 GALLON FUEL DRUMS

### A. APPLICABILITY:

1. One fuel drum is certified by the U. S. Army NATICK for UH-60 and CH-53A/D/E helicopters at airspeeds up to and including 80 and 120 knots, respectively. One to four fuel drums is a suitable load for the CH-47 helicopter at airspeeds up to and including 80 knots.

### B. LOAD DESCRIPTION:

1. Drum
2. fabric
3. fuel
4. 500 gallons capacity

### C. WEIGHT:

1. Drum- empty, 275-285 lbs
2. One drum, maximum weight 4,200 lbs.
3. Two drums maximum weight 8,400 lbs.
4. Three drums maximum weight 12,600 lbs.
5. Four drums maximum weight 16,800 lbs.

### D. MATERIALS:

- a. Sling sets
  - (1) One drum, 10,000 or 25,000 lbs. capacity
  - (2) Two drums, 10,000 or 25,000 lbs. capacity
  - (3) Three drums, 25,000 lbs. capacity
- b. Four drums, 25,000 lbs. capacity
- c. Tape, adhesive, pressure-sensitive, 2 inch wide roll
- d. Webbing, cotton, 1/4 inch, 80 lbs. breaking strength
- e. Cord, nylon, Type III, 550 lbs. breaking strength

- E. PERSONNEL: Two people can rig one to four drums in 5 to 15 minutes.

NOTE: Exact weight of each drum may vary depending on type and amount of fuel and you must have a minimum of 6 blivets to fly empty.

## SERVICEABILITY AND ACCOUNTABILITY INSPECTION

- A. When preparing the fuel blivets, you must conduct a serviceability inspection. The three sections you will inspect are as follows,
  - 1. Front circular portion
  - 2. Rear circular portion
  - 3. Black rubber portion
- B. When inspecting the front circular portion, you will look for the following:
  - 1. Fuel nozzle
    - a. Foreign materials (if any, remove it).
    - b. Ensure black rubber gasket inside is present.
  - 2. Fuel cap
    - a. If the fuel cap is not present, cover fuel opening with 2 inch tape.
    - b. When the locking levers are folded to the sides, the cap is in the locked position. When the locking levers are extended, the cap is in the unlocked position.
  - 3. Inspect the inside of the cap. The black rubber gasket must be present.
  - 4. Lift points
    - a. Lift points are 5/8 inch screw pin clevis, which has a rated capacity of 4,420 lbs.
    - b. Inspect threads of screw pin clevis to ensure they are not stripped and the cotter pin is present.
    - c. Inspect for rust, cracks, nicks, dents, and burrs, then take the appropriate action.
  - 5. Bezel ring
    - a. Ensure the bezel ring rotates freely 360 degrees in both directions; because the fuel blivets tend to rotate while in-flight.
    - b. Check all hex head bolts to ensure none of them are protruding from the bezel ring or large circular portion.
    - c. When inspecting the rear circular portion, it is the same as the front, except there may or may not be a fuel nozzle.
    - d. When inspecting the black rubber portion, look for the following: Cuts, cracks, gouges, or areas worn to the white threading. Anything that is leaking or could become a leak, will deem the fuel blivets unserviceable.

## PHASE I

### PREPARATION AND RIGGING

- A. Install all fuel caps and ensure they are secured in the locked position with type III nylon
- B. If no dust cover is present, cover the fuel opening with 2 inch tape
- C. Ensure screw pin clevises have cotter pins
- D. Rigging of the 500 gallon fuel blivets with 25,000 lbs. sling set
  - 1. One fuel blivet
    - a. 2 sling legs with 1 apex
    - b. Lift points rotated to the 12 o'clock position
    - c. Link count 3 at each lift point
    - d. Tie one mandatory breakaway with ¼" cotton webbing

NOTE: General rule, one breakaway for every two sling legs.

- 2. Two fuel blivets
  - a. Four sling legs and apex
  - b. Apex order as follows
    - (1) The center legs to the lightest fuel blivet
    - (2) The outer legs to the heaviest fuel blivet
    - (3) Link count of three at each lift point

NOTE: If you have a 10,000 lbs. sling set available, you may sling load them exactly the same way you sling load 1 and 2 fuel blivets with a 25,000 lbs. sling set. However, 2 fuel blivets are the maximum you can lift on a 10,000 lbs. sling set with 4 legs.

- 3. Two fuel blivets (pilot preferred method)
  - a. Two fuel blivets rigged as a dual load on two sling legs from a 25K sling set
  - b. Rotate lift points to the 3 o'clock - 9 o'clock position
  - c. Route the free running end of the chain through the two inside lift points

NOTE: When routing the chain lift points, go same direction on both (i.e. left to right through lift point at the 9 o'clock position)

- d. Secure a link count of three
- e. Ensure you have no chain to chain contact on both lift points
- f. Apex order is as follows:
  - (1) The left sling leg to the left side of the blivets
  - (2) The right sling leg to the right side of the blivets

- g. There is one mandatory breakaway in the center of the blivets
- 4. Three fuel blivets:
  - a. Configuration: Two blivets in the dual hookup mode (pilot preferred), and one blivet in the single hookup mode
  - b. Utilize four sling legs and apex to the 25,000 lbs. sling set only
  - c. Apex order is as follows:
    - (1) The inside sling legs to the single fuel blivet
    - (2) The outside sling legs to the pilot preferred blivets
  - d. There are two mandatory breakaways. One breakaway around one set of dual hookups and one between the single hookup.
- 5. Four fuel blivets
  - a. Configuration. Rig two pair of pilot preferred methods.
  - b. Utilize four sling legs and apex to the 25,000 lbs. sling set only.
  - c. Apex order is as follows:
    - (1) The inside sling legs are routed to the lightest pilot preferred blivets
    - (2) The outside sling legs are routed to the heaviest pilot preferred blivets
  - d. There are two mandatory breakaways. One between each pilot preferred method.

## PHASE II

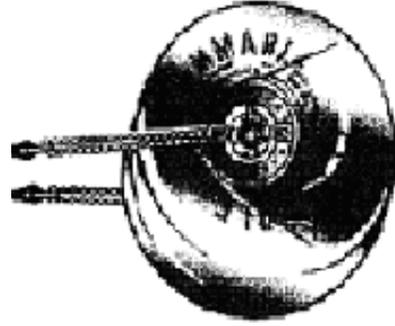
### INSPECTION OF PREPARATION AND RIGGING

- A. There are three personnel who can inspect a sling load. They are a Pathfinder School Graduate, SLICC (Sling Load Inspector Certification Course) Graduate, and an Air Assault School Graduate. When you inspect a sling load you will inspect it a minimum of 2 times or until you are 100% sure the load will fly safely.
- B. When you inspect this load, you will start at one end of the load, and work in a 360 degree manner and from top to bottom. If you find deficiency, you will stop and correct that deficiency, and restart your inspection process from there. Inspect a minimum of two times or until you are 100% sure the load will fly safely.
- C. The inspection sequence is as follows
  - 1. Apex has a castellated nut with cotter pin.
  - 2. Apex order is as follows:
    - a. One blivet:
      - (1) The left sling leg to the left side
      - (2) The right sling legs to the right side
    - b. Two blivets (Four legs):
      - (1) The inside sling legs to the lightest blivet
      - (2) The outside sling legs to the heaviest blivet (or forward flying blivet)
    - c. Three blivets:
      - (1) The inside sling legs to the single blivet
      - (2) The outside sling legs to the dual blivets
    - d. Four blivets
      - (1) The inside sling legs to lightest set of blivets
      - (2) The outside sling legs to heaviest of blivets (or forward flying blivet)
    - e. Sling legs:
      - (1) Ensure they are not crossed, misrouted through, or under the triangle on the dual blivets, or out of order
    - f. Breakaways:
      - (1) Ensure they are made of 1/4 inch cotton webbing. Ensure that there is one breakaway or every two sling legs, tied on top and is in the center of the fuel blivets or between the dual blivets.

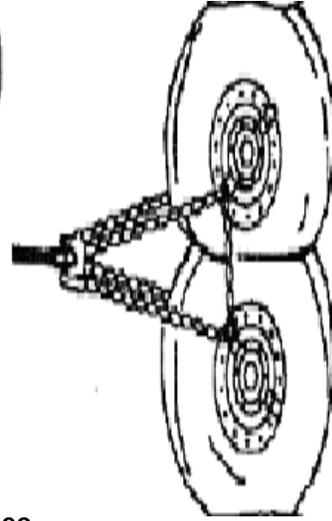
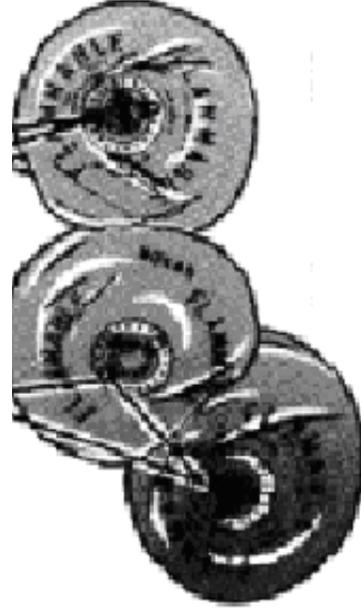
- g. Sling leg chains:
  - (1) Ensure a link count of 3 (or 55 for a single blivet in a three blivet configuration)
  - (2) Ensure the chain passes through one lift point and is not misrouted around the fuel cap/nozzle
  - (3) Ensure that the excess link count of 10 or more will be secured with type III nylon
  - (4) Ensure there is no chain to chain contact present on the pilot preferred blivets
- h. Lift points
  - (1) Ensure they are routed to the 12 o'clock position for the single blivet, or 3 to 9 o'clock position for dual blivets.
  - (2) Ensure the cotter pin is in the 5/8 inch screw pin clevis
- i. Fuel nozzle:
  - (1) Ensure the cap is in place and secured properly with type III nylon on the locking arms or with 2 inch tape over the fuel nozzle.

NOTE: Move to the rear of the fuel blivets and inspect it in the same sequence. Keep in mind that the fuel blivets might have a fuel nozzle on both sides. DA Form 7382-R must be filled out IAW TM 4-48.09 see Appendix I)

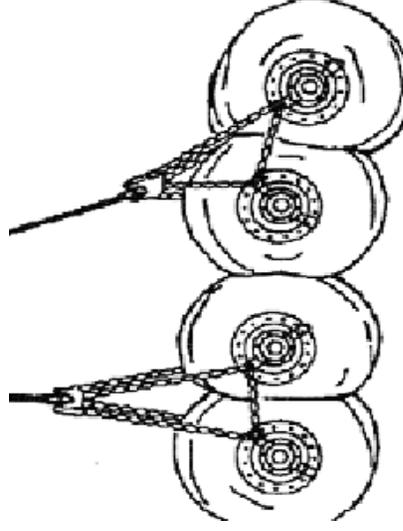
SINGLE BLIVET



THREE BLIVETS PILOT PREFERRED



TWO BLIVETS PILOT PREFERRED

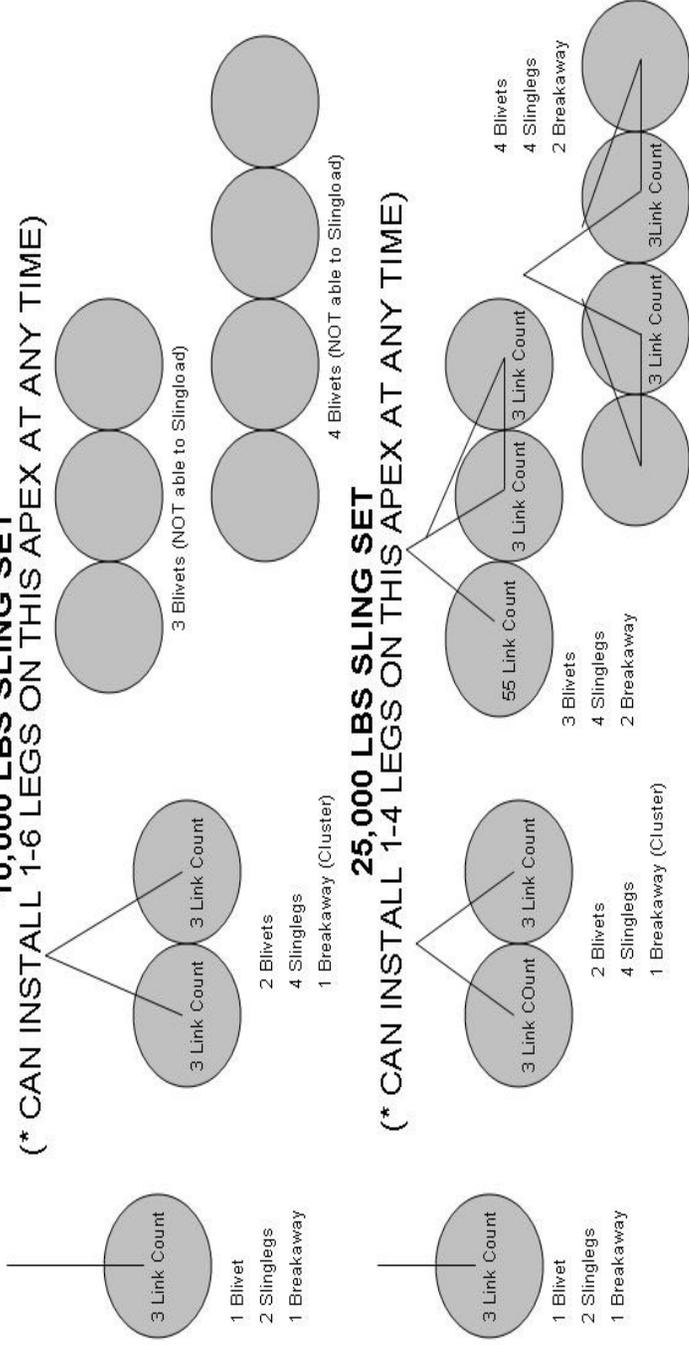


FOUR BLIVETS PILOT PREFERRED

## FUEL BLIVET CHART

### (COMBINATIONS OF BLIVETS AND SLING SETS)

**10,000 LBS SLING SET**  
 (\* CAN INSTALL 1-6 LEGS ON THIS APEX AT ANY TIME)



M102 105-MM Howitzer

- A. APPLICABILITY:
  - 1. The M102 105-MM Howitzer is certified by the U.S Army NATICK for all helicopters with suitable lift capacity
- B. LOAD DESCRIPTION: Cargo Net, 5,000 lbs. and 10,000 lbs.
  - 1. Characteristics: 5,000 lbs. capacity
    - a. Weight— 3,300 lbs.
    - b. Max Weight—5,830 lbs.
    - c. Max Accompanying Load—2,500 lbs.
- C. MATERIALS.
  - 1. Complete 10K Sling set
  - 2. 2" Adhesive Tape, rated capacity of 80 lbs. per wrap
  - 3. Type III Nylon 550-pound breaking strength.
  - 4. CGU-1B, Tie-down strap
- D. PERSONNEL: Two personnel can prepare and rig this load in 10 minutes

## PHASE I (PART 1)

### PREPARATION

- A. Begin preparing the load at any point and continue around in a 360 degree motion until you return to your start point either clockwise or counterclockwise.
- B. Place the muzzle cap and the muzzle cover on the muzzle. Shatterproof reflector located on the muzzle. Secure muzzle cover with the strap provided, additionally secure the strap with 2 inch tape. If the strap is missing or damaged secure the muzzle cover with type III nylon and additionally secure the type III nylon with 2 inch tape.
- C. Place the sight covers on the sight mount and secure them with the straps that are provided. Additionally secure them with Type III nylon.
- D. Secure the section equipment chest on the end of the trails with CGU-1B. Ensure there are no twist in the straps and the hook of the ratchet is facing out. Role the excess strap and secure it to itself. Tape the outward facing hook with two inch adhesive tape.
- E. Rotate the tow pintle to the up position and secure it with pin.
- F. Place the base plate in the travel configuration.
- G. Secure the gun tube is in the travel lock.

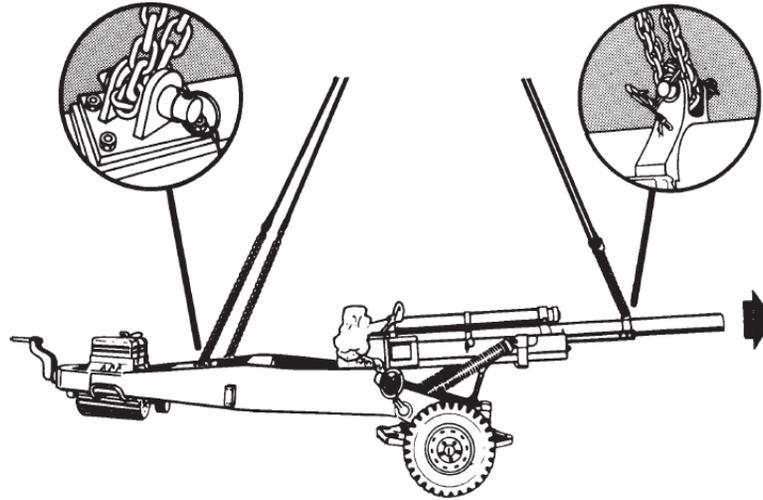
## PHASE I (Part 2)

### RIGGING

- A. Position the apex on top of the breach. Route outer sling legs 1 and 2 to the trails. Route the inner sling legs on the apex to the muzzle. Outside sling legs must be routed to the rear trails of the load.
- B. Remove the pin from the lift provision on the left trail. Center the chain end of sling leg in the lift provision. Get a link count of three. Place the third link in the hook portion of the grab hook assembly. Repeat with sling leg on the right trail. Secure the excess chain with type III nylon to one of three places, the eyelet of the grab hook assembly, the coupling link, or to the lifting chain itself. Ensure that you do not secure excess chain to excess chain.
- C. Remove the pin from the lift provision on the gun tube. Center the chain end of sling leg/s to the front lift point. Reinstall the pin in the lift provision. Get a link count of 55. Place the 55<sup>th</sup> link into the hook portion of the grab hook assembly. Secure the excess chain with type III nylon to one of three places, the eyelet of the grab hook assembly, the coupling link, or to the lifting chain itself. Ensure that you do not secure excess chain to excess chain.

D. Tie all sling legs together on top of the howitzer using a cluster breakaway to prevent entanglement during hookup and lift off.

NOTE: This load may be rigged with only three legs by eliminating one of the sling legs to the gun tube.



## PHASE II

### INSPECTION OF PREPARATION AND RIGGING

- A. There are three personnel qualified to inspect this load. They are as follows:
  - 1. Pathfinder School Graduate
  - 2. Air Assault School Graduate
  - 3. SLICC (Sling Load Inspector Certification Course) Graduate
- B. When you inspect this load, you will start at one end of the load and work in a 360 degree manner and from top to bottom. If you find a deficiency, you will stop and correct that deficiency, and restart your inspection process from there. Inspect a minimum of two times and until you are 100% sure the load will fly safely.
- C. The inspection sequence is as follows:
  - 1. Ensure that the reflector on the muzzle cover is shatter proofed. The muzzle cover needs to be secure with the strap provided or with type III nylon. It should also be secured with two inch adhesive tape.
  - 2. Check the lift point on the gun tube. The sling leg chain should be routed through the lift point one time only. The pin and safety pin needs to be in place. The excess chain must be secured with type III nylon to one of three places. The eyelet of the grab hook assembly, the coupling link, or to the lifting chain. (Do not secure excess chain to excess chain.) The chain must be secured in the hook portion of the grab hook assembly with a link count of 55 and the grab hook assembly must not be inverted.
  - 3. Ensure that the brakes are engaged. Verify that the travel lock is engaged and the base plate is in the travel configuration.
  - 4. Inspect at the sight mount covers. They should be in place and secured with the straps provided and additionally secured with type III nylon.
  - 5. Make sure the equipment chest is secured with the latches provided and additionally secured with two inch tape. A CGU-1B must be wrapped around the chest. There should be no twist in the strap, the hook will be facing out/up, and the hook and excess strap will be padded with 2 inch tape.

6. Inspect the lift points on the trails of the howitzer. The sling leg chains should be routed through the lift point one time only. The pin and safety pins need to be in place. The chain must be secured in the hook portion of the grab hook assembly with a link count of 3 and the grab hook assembly must not be inverted.
7. Ensure sling legs are routed correctly, apex is complete, and all sling legs are secure inside ¼ inch cotton webbing (breakaway). Breakaway will be tied to the plate above the breech.

### PHASE III

#### SLINGLOAD OPERATION

- A. The hookup team stands on top of the trails next to the breech. The static wand person discharges the static electricity with the static wand. The hookup person places the apex fitting onto the aircraft cargo hook. The hookup team then moves clear of the helicopter but remains close to the load as the helicopter removes slack from the sling legs. When successful hookup is assured, the hookup team quickly exits the area underneath the helicopter to the designated rendezvous point.

NOTE: DA Form 7382-R three hand written copies must be filled out IAW TM 4-48.09, see Appendix I.

## M119A2 105mm HOWITZER

Forward / Firing Position, Platform Down.

- A. APPLICABILITY:
  - 1. Those rigging procedures have been approved by the US Army NATICK for flight by all aircraft with suitable lift capacity up to 110 knots.
- B. LOAD DESCRIPTION: WEIGHTS
  - 1. MAXIMUM with 10K sling set: 4,400 lbs.
  - 2. MAXIMUM with accompanying load w/ 25K sling set: 7,400lbs.
  - 3. MAX ACCOMPANYING LOAD: 3,000 lbs.
- C. MATERIALS:
  - 1. 10,000 lbs. capacity sling set
  - 2. Tape, adhesive, pressure-sensitive, 2 inch wide roll
  - 3. Webbing, cotton, ¼ inch, 80 lbs. breaking strength
  - 4. Cord, nylon, Type III, 550 lbs. breaking strength
  - 5. Cord, nylon, Tubular, ½ inch, 1,000 lbs. breaking strength
  - 6. Appropriate padding material
  - 7. Strap, tie-down, CGU-1B
  - 8. Clamp, chain link
- D. PERSONNEL: Two people can prepare and rig the load in 30 minutes.

### PHASE I (PART 1)

#### PREPARATION

- A. Begin preparing the load at any point and continue around in a 360 degree motion until you return to your start point either clockwise or counterclockwise.
- B. You will place the Howitzer in the forward/firing configuration. Place the tube in forward travel lock and secure it with the pushpins.
- C. Place the howitzer on the firing platform and secure it with the front and rear stays with push pins, once you tighten your front stays with the saddle clamp, you will secure the clamp with type III nylon.
- D. Pad the machined surface on the cross member.
- E. Additionally secure the firing platform with a CGU-1B, by routing it through the lifting holes and through the cradle of the howitzer. Ensure the CGU-1B is routed across the padding material on that machined surface.
- F. Place the muzzle cover on the muzzle and secure it with the strap provided.
- G. Pad the nitrogen reservoir with enough material to protect it from being damaged by the sling legs when the A/C picks up the load.

- H. Take a piece of type III nylon, approximately 8 to 10 feet long and route it through the hole portion of the cross bar on either side. Pull it tight and wrap it one complete time around the hex portion of the equilibrator shaft. Keeping it tight, you will wrap it around the buffer assembly. From the buffer you take the type III to the equilibrator shaft on the opposite side, and wrap it one complete time. Take it down through the hole portion of the cross member on the opposite side and secure it with a non-slip secure knot. This is done to prevent the sling legs from becoming caught on the equilibrator shafts and the buffer assembly.
- I. Place brakes in the on position.
- J. Place covers on equilibrators and secure them with straps provided.
- K. Rotate the gunner's site mount all the way back and in. Place the mount cover over the mount and secure it with the strap provided and additionally secure the cover with type III nylon to a fixed portion of the load.
- L. Install the run-back stop in the breech, and place the breech cover over it while securing it with the strap provided. Additionally secure cover with type III nylon to a fixed portion of the load. Take a piece of type III nylon, approximately 8 to 10 feet long and tie it to left trail. Pull it tight and place through the hole portion on the back of the equilibrator. Keeping it tight, you will go to the opposite trail. From that trail you will take the nylon through the hole portion of the opposite equilibrator, and tie it back to the original tie down point.
- N. Ensure firing platform clamps are hand tight.
- O. Jack strut secured with pin and additionally secured with 2" tape.
- P. Rear brake assembly padded.
- Q. Detachable spade secured with large pins and secured from pin to pin with type III nylon.
- R. Trail hand spike placed in the mounts provided and secured in two places with 2" tape.
- S. Ensure knock off hub is parallel with the ground.

## PHASE I (PART 2)

### RIGGING

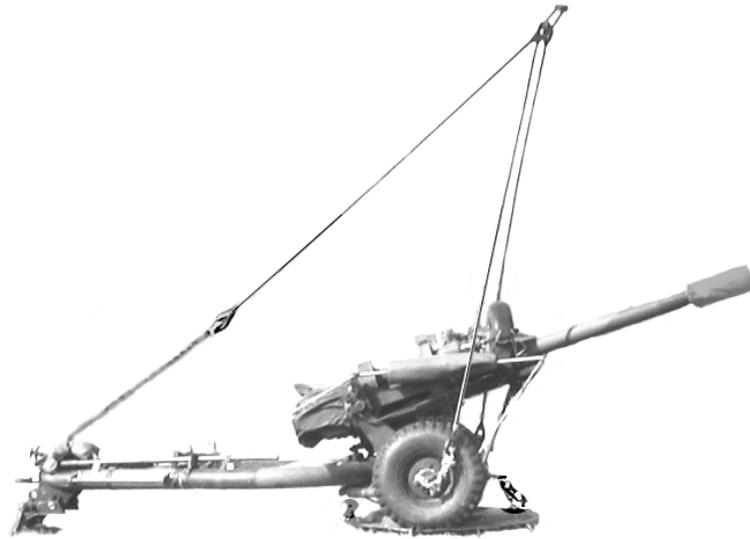
- A. Place three sling legs on the apex. Take fourth sling leg and remove the lifting chain. Add that lifting chain to the middle sling leg on apex. Place the sling set on top of load.
- B. Secure the free running end of left sling leg, route the chain around the center portion of the left tire. Secure a link count of 50. Additionally secure chains with chain clamp or ½ tubular nylon. Secure excess links with type III nylon.
- C. Secure the free running end of the center sling leg, route the chain through the towing lunette, securing a link count of 35. Additionally secure the excess with type III nylon.
- D. Secure the free running end of the right sling leg, route the chain around the knock off hub of right tire. Secure a link count of 55. Additionally securing the excess links with type III nylon. Ensure the knock off hub is parallel to ground.
- E. One cluster breakaway located on M90 chronograph mount. Second breakaway located on bar portion of rear travel lock assembly. Third breakaway is located on base portion behind the brake assembly above the lunette.

## PHASE II

### INSPECTION OF PREPARATION AND RIGGING

- A. There are three personnel who can inspect a sling load. They are a Pathfinder School Graduate, SLICC (Sling Load Inspector Certification Course) Graduate, or an Air Assault School Graduate. When you inspect a sling load you will inspect a minimum of 2 times or until you are 100% sure that it will fly safely. Your inspection will start on the passenger side of the vehicle.
- B. When you inspect this load, you will start at one end of the load and work in a 360 degree manner and from top to bottom. If you find a deficiency, you will stop and correct that deficiency, and restart your inspection process from there. Inspect a minimum of two times and until you are 100% sure the load will fly safely.
- C. The inspection sequence is as follows:
  - 1. Muzzle cover secure on muzzle
  - 2. Recuperate padded and secured with type III nylon
  - 3. Type III nylon spider web present
  - 4. Travel lock secured with push pins provided
  - 5. Saddle clamp in the up position and secured with type III nylon
  - 6. Machined plain padded
  - 7. CGU-1B present with no twist, ratchet portion secured with 2" tape, excess rolled and additionally secure with 2" tape
  - 8. Brake on
  - 9. Link count left side 50, excess secured with type III nylon
  - 10. Chain clamp or ½ tubular nylon (2 square knots) present on chains, additionally secured with 2" tape
  - 11. Equilibrator cover present
  - 12. Castellated nut and cotter pin
  - 13. Apex order, left-to left, right-to-right, center-to-rear
  - 14. Sling legs routed properly
  - 15. Breakaway (each leg wrapped individually)
  - 16. Gunners sight mount cover secured with strap and additionally with type III nylon
  - 17. Rear stays secure with push pins
  - 18. Spider web rear: line X line
  - 19. Breech cover secured with strap and additionally with type III nylon
  - 20. Run back stop present
  - 21. Firing platform clamp secured
  - 22. Jack strut secure and additionally with 2" tape
  - 23. Link count rear 35, excess secured with type III nylon

24. Breakaway around travel lock bar
25. Brake on
26. Brake assembly padded
27. Breakaway
28. 1 chain through rear lift point
29. Detachable spade secured with type III nylon
30. Firing Platform clamp secured
31. Trail hand spike secured in two places with 2" tape
32. Rear stays secure with push pins
33. Equilibrator cover present
34. Brake on
35. Knock off hub parallel to ground
36. Link count right side 55, excess links secured with type III nylon
37. Clamp or ½ tubular nylon (2 square knots)



M119 105mm HOWITZER  
Forward / Firing Position, Platform Down.

<p><b>WARNING</b> When moving the howitzer with an accompanying load, the 25,000-pound capacity sling set must be used.</p>	<p><b>WARNING</b> Accompanying loads must not exceed the weight limits of the cargo net, cargo bag, sling leg, or exceed the lift capability of the helicopter.</p>

## M149-SERIES WATER TRAILER

### A. APPLICABILITY:

1. This load is suitable for all Army helicopters with suitable lift capacity by the US Army Natick Soldier Center. Can fly at air speeds up to 80 knots.

### B. LOAD DESCRIPTION:

2. Trailer, water , 400 gallon, M149-series, with original lift provisions, LIN W98825.

Weight:	EMPTY	LOADED
M149	2,540 lbs.	6,060 lbs. (see Warning)
M149A1	2,540 lbs.	6,060 lbs. (see Warning)
M149A2	2,800 lbs.	6,320 lbs. (see Warning)

### WARNING

The M149, M149A1, and M149A2 water trailers, without the modified clevis-type lift provisions, are not currently certified for sling loading due to inadequate lift provision strength when the trailer is loaded.

### C. MATERIALS:

1. Sling set (10,000 lbs. capacity)
2. Tape, adhesive, pressure-sensitive, 2 inch wide roll
3. Cord, nylon, Type III, 550 lbs. breaking strength
4. Webbing, cotton, 1/4 inch, 80 lbs. breaking strength

- D. PERSONNEL: Two personnel can prepare and rig this load in 10 minutes.

## PROCEDURES

### PHASE I (PART 1)

#### PREPARATION

- A. Secure the light cable and air hoses to the drawbar with tape or type III nylon
- B. Place the support leg and wheel in the down position
- C. Additionally secure faucet boxes with type 3 nylon
- D. Shatter proof all glass and plastics
- E. Secure jack handle in the bracket provided and additionally secured with type 3 nylon
- F. Tape the top edge of the aft end of the water tank to prevent the sling legs from chafing on the top of the tank
- G. Engage both hand brakes
- H. Make sure that the fill port is securely closed. Tape if necessary.
- I. Water trailer must be empty or full

### PHASE I (PART 2)

#### RIGGING

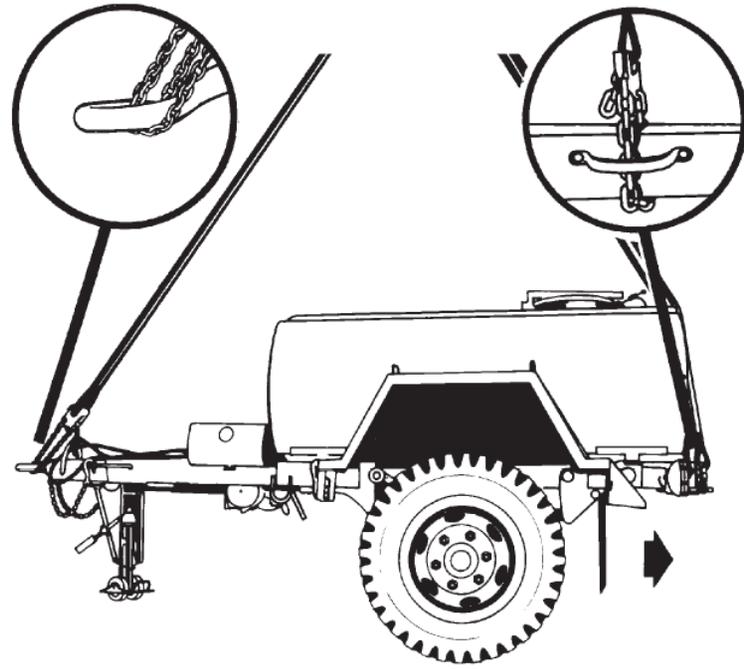
- A. Position apex on top of the tank. Route the outer sling legs to the front of the trailer and the inner sling legs to the rear.
- B. Route the free running ends of the front chain legs through the lunette front eye from sky to ground and insert a link count of 75 in the grab hook assembly.
- C. Using the rear lift provisions as a guide to keep the chains in place, route the free running end of the left chain leg down between the tank and the frame, under the rear frame and back up through the lift provision. Secure a link count of 90 in the grab hook assembly. Repeat the same process on the right side and remember both sides must mirror.
- D. Secure all excess chain links of 10 or more with type III nylon.
- E. Cluster and tie or tape your 1 mandatory cluster breakaway on all four sling legs with a piece of 1/4" cotton webbing on top of water tank to prevent entanglement during hook up.

PHASE II  
INSPECTION

- A. Begin inspection sequence at the towing lunette
  - 1. Inspect for a link count of 75 on both chain legs
  - 2. Excess chain secured
  - 3. Light cable secured
  - 4. Air hoses secured
  - 5. Support leg and wheel in down position
  - 6. Right hand brake engaged
  - 7. Faucet boxes secured with Type III Nylon
- B. Move around the right side of the load
  - 1. Right rear link count of 90
  - 2. Excess chain secured
- C. Step up onto right rear bumper
  - 1. Top edge of trailer taped and padded
  - 2. Fill port secured
  - 3. Trailer full or empty
  - 4. Cluster breakaway 1/4 inch cotton webbing around all four sling legs
  - 5. Apex order, outer front, inner rear
  - 6. Castellated nut, cotter pin
- D. Move to the left rear lift point
  - 1. Left rear link count 90
  - 2. Excess chain secured
  - 3. Left hand brake engaged

PHASE III  
SLINGLOAD OPERATION

- A. The hookup team stands on each wheel fender. The static wand person discharges the static electricity with the static wand. The hookup person places the apex fitting onto the aircraft cargo hook. The hookup team then moves clear of the load but remains close to the load as the helicopter removes slack from the sling legs. When successful hookup is assured, the hookup team quickly exits the area underneath the helicopter to the designated rendezvous point.



M149A2 WATER TRAILER

M998/M1038 TRUCK, CARGO, 1 1/4-TON (HMMWV)

A. Applicability:

1. Certified by US Army NATICK for all aircraft with suitable lift capability at airspeeds up to and including 90 knots. Both trucks are also certified by NATICK for the UH-60 helicopter with the following limitations:

- a. With a vehicle gross rigged weight of less than 7,300 lbs., the UH-60 is restricted to airspeeds up to and including 100 knots.
- b. With a vehicle gross rigged weight between 7,300 lbs. and 7,700 lbs., the UH-60 is limited to 70 knots.

NOTE: When using UH-60 support, coordinate closely with the aviation unit in reference to the vehicle weight.

2. Load Description:

- a. M998 truck, 1 1/4 ton (HMMWV)
- b. M1038 truck, 1 1/4 ton (HMMWV)

3. Weight

- a. Empty, 5,200 lbs.
- b. ACL, 2,500 lbs.
- c. Loaded, 7,700 lbs.

VEHICLE GROSS RIGGED WEIGHT IS RESTRICTED TO 7,700 LBS

B. Materials:

1. Sling set (10,000 lbs. capacity) (UH-60 or CH-47)
2. Tape, adhesive, pressure-sensitive, 2-inch wide roll
3. Cord, nylon, Type III, 550 lbs. breaking strength
4. Webbing, cotton, 1/4 inch, 80-pound breaking strength

C. Personnel: Two people can prepare and rig the load in 15 minutes

PHASE I (PART 1)

PREPARATION

- A. Begin preparing the load at any point and continue around in a 360-degree motion until you return to your start point either clockwise or counterclockwise. Start at the passenger side windshield.
- B. The windshield will be taped and padded IAW your unit SOP. At minimum make an X configuration with two-inch tape both inside and outside. Rotate the mirrors forward towards the windshield and secure them with type III nylon. Inspect your front lift points for any rust, dents, cracks, nicks, and burrs.

- C. The hood will be secured with latches provided and additionally secured with two-inch tape. Wheels will be in the straightforward position. All glass and plastic, i.e. turn signals and headlights will be taped IAW your unit SOP. Again, the other side of the hood will be latched and taped with two-inch tape. You now come to the other rearview mirror. It also is rotated forward and secured with type III nylon and the windshield is shatterproof with two-inch tape in an X configuration both inside and outside. The ends of the vehicle bumper guides will be padded with two-inch tape or antenna balls.
- D. Now, when preparing the interior of the vehicle, work your way from the inside towards the outside.
- E. Start with the transmission and make sure it is in neutral. Check the hand brake and make sure it is in the engaged position. The steering wheel will be secured with type III nylon to a fixed portion of the load in at least two places. Also, make sure that electrical switches and the engine ignition switch are in the off position, and check for a proper fuel level of 75 % or less. The last thing to prepare on the inside is the seat belts. The male portion must be rolled, taped and tucked behind the seat and the female portion will be rotated up behind the data plate and taped in place with two-inch tape. If the vehicle has the three-point lap belt, it will be secured as worn. All canvas doors and other cargo will be secured in the rear of the vehicle.
- F. Move towards the rear. The troop seats will be up and secured with the pins provided. If one of the pins is missing, the troop seat will be secured with type III nylon in two places and the seatbelts will be secured as worn.
- G. All glass and plastic will be taped and padded IAW your unit SOP. Rotate the tailgate to the up position, secure it with the hooks facing outward and chains provided and secure the hooks with type III nylon. The sling guides will be padded IAW your unit SOP.
- H. Inspect your rear lift points for any rust, dents, cracks, nicks, or burrs. If any are present, take the appropriate action. Ensure the towing pintle is closed and secured with a cotter pin, two-inch tape, or type III nylon. The electrical connector needs to be spring loaded and have a rubber gasket in it. If no gasket is found, tape it closed with two-inch tape.

- I. Move around the other side of the vehicle and the first thing you should come to is the fuel cap, make sure the cap is hand tight. You will roll, tape and tuck the male portion of the seat belt behind the seat and rotate the female portion up behind the seat and the data plate and tape it with two-inch tape. If the vehicle has the three-point lap belt, it will be secured as worn.
- J. The last thing you will prepare is the battery and battery box. The battery will be free from all corrosion and have a good connection. Once the batteries have been checked, close the battery box, latch it and additionally secured with 2 inch tape.

#### PHASE I (PART 2)

#### RIGGING

- A. Place one 10K sling set on the load with the inner two sling legs routed to the rear of the vehicle and the outer two sling legs routed to the front of the vehicle (FIG 2-19), over the roll bar and secured to the roll bar with  $\frac{1}{4}$  inch cotton webbing, over the windshield and routed to the two lift points. The apex must be secured with the bolt, castellated nut, and cotter pin provided.
- B. Move to the front right lift point. The link count to the front is eighty. Grab the free running end of the chain and route it through the lift point, inside out or outside in (it does not matter). Secure a link count of eighty by dropping the 80th link in the keeper portion of the grab hook assembly. Secure all excess links by wrapping the excess around the lifting chains and securing it with type III nylon. Repeat this process on the left front lift point.
- C. Move to the rear of the vehicle. Begin with the left rear lift point. Grab the free running end of the chain and route it down through the sling guide, through the lift point and back up through the sling guide (FIG 2-20). Secure a link count of three by dropping the 3rd link into the keeper portion of the grab hook assembly. Repeat this process on the right rear lift point.

- D. Next you will tie the appropriate breakaways. All breakaways are tied with one wrap of 1/4" cotton webbing. Before tying the first breakaway, pull all slack toward the rear of the vehicle.
- E. The first mandatory breakaway is tied around the roll bar and the front two sling legs centered on the roll bar and tied in a secured knot. If your vehicle is equipped with troop seats, you must tie additional breakaways.
- F. Lay the grab hook assembly across the troop seat next to the troop strap retainer ring. Route a piece of 1/4" cotton webbing through the troop strap retainer ring and through both lifting chains and tied in a secured knot.
- G. Repeat this process on the opposite side. If the vehicle is not equipped with troop seats you will tie the breakaway to the canvas retaining brackets or the sling guide.
- H. Pull all slack upwards on both rear sling legs and pull both grab hook assemblies together.
- I. Then tie a breakaway in one of four authorized positions. These are around the sling legs, through the potted eye, through the eye portion of the grab hook assembly or routed through all four lifting chains.

## PHASE II

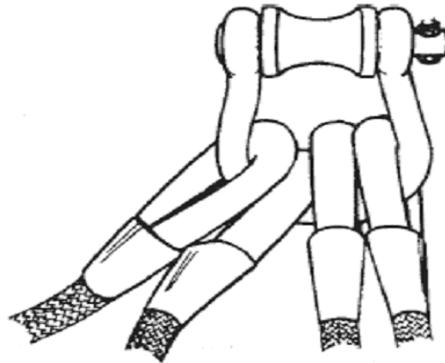
### INSPECTION OF PREPARATION AND RIGGING

- A. There are three personnel who can inspect a sling load. They are a Pathfinder School Graduate, SLICC (Sling Load Inspector Certification Course) Graduate, or an Air Assault School Graduate. When you inspect a sling load you will inspect a minimum of 2 times or until you are 100% sure that it will fly safely. Your inspection will start on the passenger side of the vehicle.
- B. First, inspect the windshield and make sure it is properly shatter-proofed. Then, check the mirrors and make sure they are rotated forward and secured with type III nylon. Check the hood latches to make sure they are secured and taped with two inch tape and that the wheel is straight.
- C. Move around to the front and inspect for a link count of 80 and that the excess links are secured with type III nylon. Then check all the glass and plastic in the front and make sure it is taped and padded IAW unit SOP. Moving to the other side you once again check to see that the wheels are straight, the hood is latched and taped with two-inch tape, the mirrors are rotated forward and secured with type III nylon and that the windshield is shatterproof with two-inch tape in an X configuration both inside and out.

D. On the inside of the vehicle check the transmission and make sure that it is in neutral and the parking brake is engaged. Then check all the electrical switches and the engine ignition switch to make sure they are off, and the fuel level is 75 % or less. Check to ensure the steering wheel is secured with type III nylon to a fixed portion of the load and then check the seat belts. Make sure the male portion is rolled, taped and tucked, and that the female portion is rotated up behind the data plate and taped with two-inch tape. If the vehicle has the three-point lap belt, it will be secured as worn. Move to the rear of the load and inspect the troop seats to ensure that they are secured in the up position with the pins provided, or secured in two places with type III nylon. At the rear of the vehicle you will inspect a vehicle with troop seats in a U shaped sequence. Begin by inspecting for a link count of three. Move to the breakaway and inspect for 1/4" cotton webbing. Move down to ensure the chains are routed through the sling guides. Ensure the tailgate is secured with the hooks and chains (hooks are facing outward), and that the hooks are secured with type III nylon. Inspect glass and plastic for tape and padding IAW unit SOP. Ensure chains are routed through the lift point. Inspect the towing pintle to ensure that it is secured closed with the cotter pin or two inch tape or type III nylon. Check the electrical connector for a rubber gasket and ensure it is spring loaded. Moving to the front, ensure the chains are routed through the lift point. Inspect glass and plastic for tape and padding. Ensure the tailgate is secured with the hooks and chains and the hooks are secured with type III nylon. Ensure two chains are routed up through the sling guide. Ensure breakaway is tied with 1/4" cotton webbing. Inspect for a link count of three. If the vehicle is not equipped with troop seats, begin at the breakaway using the same sequence as discussed above. Upon completion of the rear inspection, move down the passenger side ensuring the troop seats are secured with the pins or secured in two places with type III nylon. Ensure the fuel cap is hand tight. Move to the passenger compartment and work from the inside out starting with the engine access panel. If a radio mount is present, you must inspect to ensure all excess cable is wrapped and taped. If no radio mount is present, ensure the panel is secured with two-inch tape. The male seat belt must be rolled, taped, and tucked. Ensure the female seat belt is rotated behind the data panel and taped with two-inch tape. The battery box must be latched with the latches provided and taped with two-inch tape. Move inside the vehicle and inspect the breakaway on the roll bar to ensure it is 1/4" cotton webbing. Grab the apex and ensure the inner legs are to the rear and twist free and the outer legs are to the front and twist free. Inspect the castellated nut for a cotter pin. If the load is rigged with a 10K sling set and apex and being picked up by a UH-60, inspect for an aluminum spacer.

M998 HMMWV SINGLE CONFIGURATION  
FIGURE 2-20

APEX ORDER TO THE M998  
LEFT & RIGHT ARE DETERMINED BY FACING DIRECTION OF FLIGHT  
FIGURE 2-19

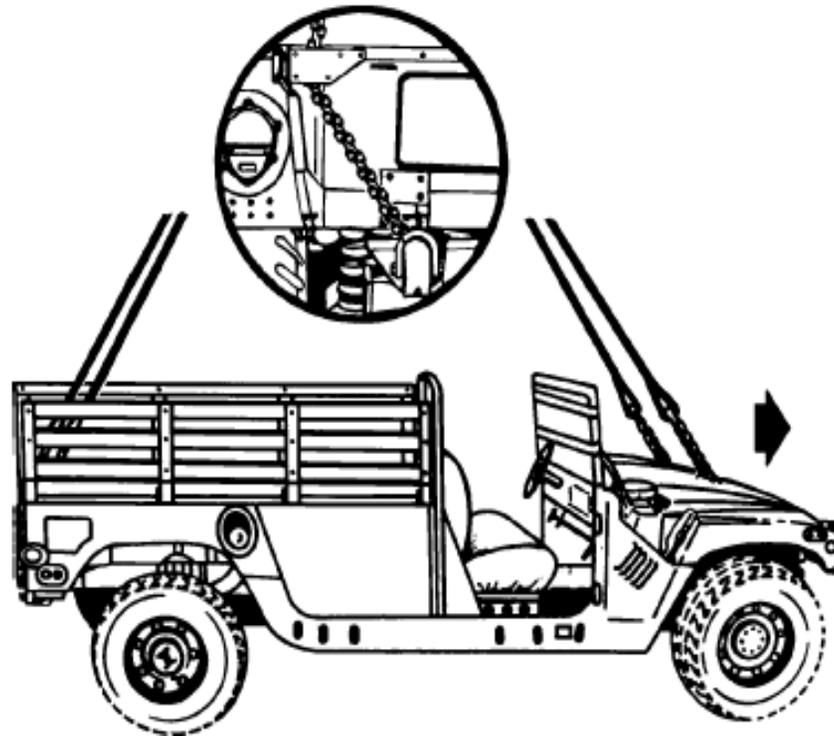


LEFT FRONT

RIGHT FRONT

LEFT REAR

RIGHT REAR



M1097/M1097A2 TRUCK, CARGO, 1 1/4-TON (HMMWV)

A. Applicability:

1. Certified by US Army NATICK for all helicopters with suitable lift capability at airspeeds up to and including 90 knots.

a. Load Description.

- (1) M1097 truck, 1 1/4 ton (HMMWV)
- (2) M1097A2 truck, 1 1/4 ton (HMMWV)

b. Weight

- (1) Empty: 5,900 lbs
- (2) ACL: 4,100 lbs
- (3) Loaded: 10,000 lbs

WARNING VEHICLE GROSS RIGGED WEIGHT IS RESTRICTED TO  
10,001 LBS

c. Materials

- (1) Sling set (25,000 lbs. capacity)
- (2) Tape, adhesive, pressure-sensitive, 2-inch wide roll
- (3) Cord, nylon, Type III, 550 lbs. breaking strength
- (4) Webbing, cotton, 1/4 inch, 80-pound breaking strength
- (5) Personnel
  - a. Two people can prepare and rig the load in 15 minutes.

NOTE: IF 10,000 LB SLINGSET IS USED THE LINK COUNT IS 60 IN THE FRONT AND 3 IN THE REAR.

## PHASE I (PART 1)

### PREPARATION

- A. Begin preparing the load at any point and continue around in a 360-degree motion until you return to your start point either clockwise or counterclockwise. Start at the passenger side windshield.
- B. The windshield will be taped and padded IAW your unit SOP. At minimum make an X configuration with two-inch tape both inside and outside. Rotate the mirrors forward towards the windshield and secure them with type III nylon. Inspect your front lift points for any rust, dents, cracks, nicks, and burrs.
- C. The hood will be secured with latches provided and two-inch tape. Wheels will be in the straightforward position. All glass and plastic, i.e. turn signals and headlights will be taped IAW your unit SOP. Again, the other side of the hood will be latched and taped with two-inch tape. You now come to the other rearview mirror. It also is rotated forward and secured with type III nylon and the windshield is shatterproof with two-inch tape in an X configuration both inside and outside. The ends of the vehicle bumper guides will be padded with two-inch tape or antenna balls. Now, when preparing the interior of the vehicle, work your way from the inside towards the outside.
- D. Start with the transmission and make sure it is in neutral. Check the hand brake and make sure it is in the engaged position. The steering wheel will be secured with type III nylon to a fixed portion of the load in at least two places. Also, make sure that electrical switches and the engine ignition switch are in the off position, and check for a proper fuel level of 75 % or less. The last thing to prepare on the inside is the seat belts. The male portion must be rolled, taped and tucked behind the seat and the female portion will be rotated up behind the data plate and taped in place with two-inch tape. If the vehicle has the three-point lap belt, it will be secured as worn. All canvas doors and other cargo will be secured in the rear of the vehicle.

- E. Move towards the rear. The troop seats will be up and secured with the pins provided. If one of the pins is missing, the troop seat will be secured with type III nylon in two places. All glass and plastic will be taped and padded IAW your unit SOP. Rotate the tailgate to the up position, secure it with the hooks and chains provided and secure the hooks with type III nylon. The sling guides will be padded IAW your unit SOP.
- F. Inspect your rear lift points for any rust, dents, cracks, nicks, or burrs. If any are present, take the appropriate action. Ensure the towing pin-tle is closed and secured with a cotter pin, two-inch tape, or type III nylon. The electrical connector needs to be spring loaded and have a rubber gasket in it. If no gasket is found, tape it closed with two-inch tape.
- G. Move around the other side of the vehicle and the first thing you should come to is the fuel cap, make sure it is hand tight. You will roll, tape and tuck the male portion of the seat belt behind the seat and rotate the female portion up behind the seat and the data plate and tape it with two-inch tape.
- H. If the vehicle has the three-point lap belt, it will be secured as worn.
- I. The last thing you will prepare is the battery and battery box. The battery will be free from all corrosion and have a good connection. Once the batteries have been checked, close the battery box, latch it and tape the latches with two-inch tape.

## PHASE I (PART 2)

### RIGGING

- A. Place one 25K sling set on the load with the inner two sling legs routed to the rear of the vehicle and the outer two sling legs routed to the front of the vehicle (FIG 2-19), over the roll bar, over the windshield and routed to the two lift points. The apex must be secured with the bolt, castellated nut, and cotter pin provided.
- B. Move to the front right lift point. The link count to the front is 60. Grab the free running end of the chain and route it through the lift point, inside out or outside in (it does not matter). Secure all excess links by wrapping the excess around the lifting chains and securing it with type III nylon. Repeat this process on the left front lift point.
- C. Move to the rear of the vehicle. Begin with the left rear lift point. Grab the free running end of the chain and route it down through the sling guide, through the lift point and back up through the sling guide (FIG 2-20). Secure a link count of 10 by placing the 10th link into the keeper portion of the grab hook assembly. Repeat this process on the left front lift point.
- D. Next you will tie the appropriate breakaways. All breakaways are tied with one turn of 1/4" cotton webbing. Before tying the first breakaway, pull all slack toward the rear of the vehicle. The first mandatory breakaway is the cluster breakaway tie which will secure all sling legs together right above the roll bar, next you will secure both rear grab-hooks with a breakaway tie to the vehicle. If your vehicle is equipped with troop seats, you must tie additional breakaways. Lay the grab hook assembly across the troop seat next to the troop strap retainer ring. Route a piece of 1/4" cotton webbing through the troop strap retainer ring and through both lifting chains and tied in a secured knot. Repeat this process on the opposite side. If the vehicle is not equipped with troop seats you will tie a tight "T." To tie a tight "T," pull all slack upwards on both rear sling legs and pull both grab hook assemblies together. Then tie a breakaway in one of four authorized positions. These are around the sling legs, through the potted eye, through the eye portion of the grab hook assembly or routed through all four lifting chains.

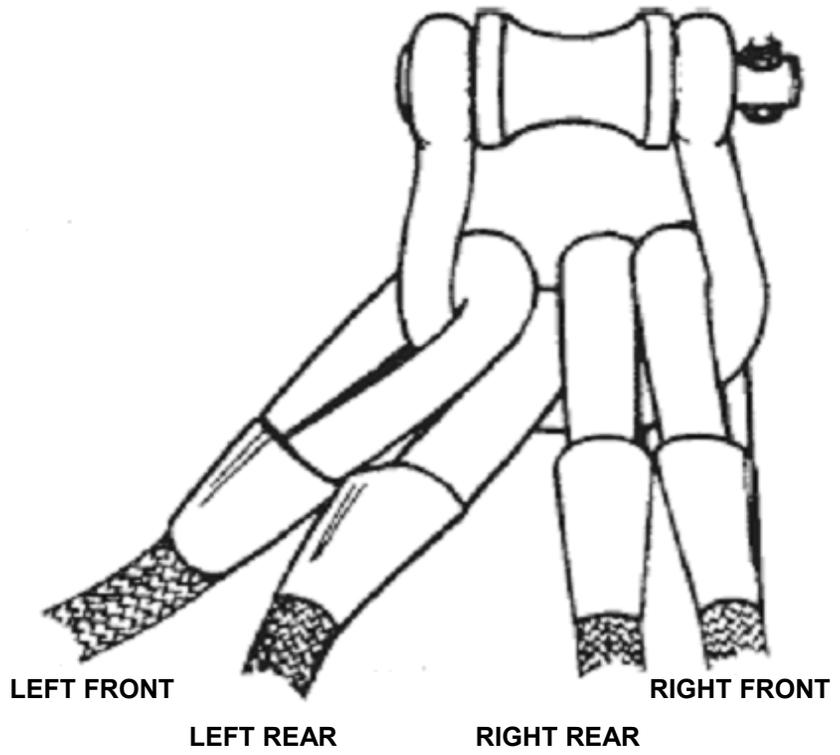
## PHASE II

### INSPECTION OF PREPARATION AND RIGGING

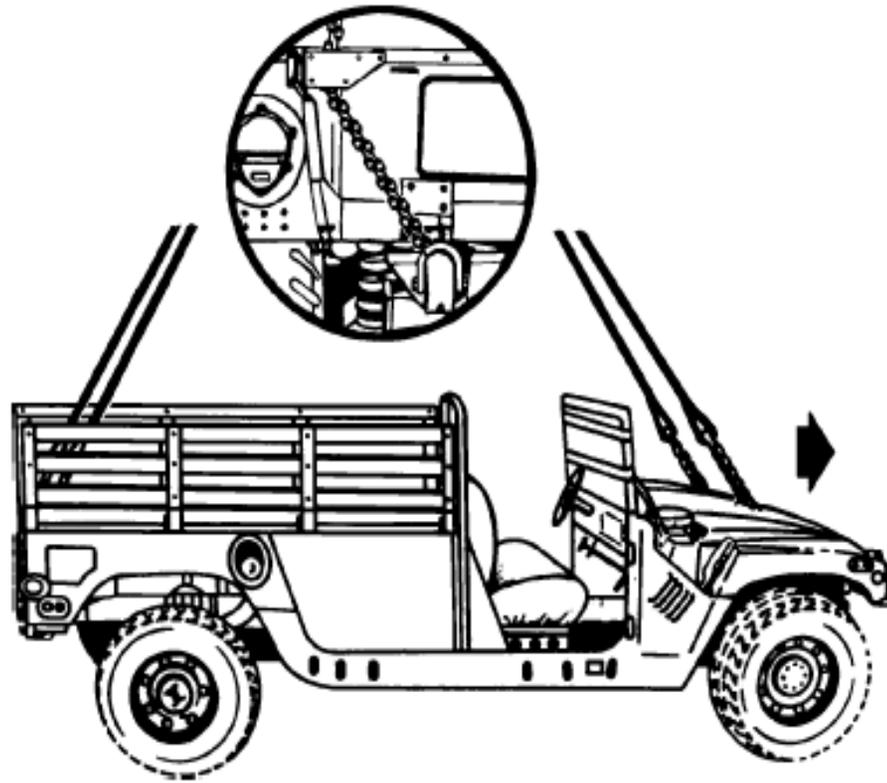
- A. The only personnel qualified to inspect this load are a Pathfinder School Graduate, SLICC (Sling Load Inspector Certification Course) Graduate, or an Air Assault School Graduate. You will inspect this load at least twice or until you are 100% sure that it will fly safely. Your inspection will start on the passenger side of the vehicle.
- B. First, inspect the windshield and make sure it is properly shatter-proofed. Then, check the mirrors and make sure they are rotated forward and secured with type III nylon. Check the hood latches to make sure they are secured and taped with two inch tape and that the wheel is straight.
- C. Move around to the front and inspect for a link count of 60 and that the excess links are secured with type III nylon. Then check all the glass and plastic in the front and make sure it is taped and padded IAW unit SOP. Moving to the other side you once again check to see that the wheels are straight, the hood is latched and taped with two-inch tape, the mirrors are rotated forward and secured with type III nylon and that the windshield is shatterproof with two-inch tape in an X configuration both inside and out.
- D. On the inside of the vehicle check the transmission and make sure that it is in neutral and the parking brake is engaged. Then check all the electrical switches and the engine ignition switch to make sure they are off, and the fuel level is 75 % or less. Check to ensure the steering wheel is secured with type III nylon to a fixed portion of the load and then check the seat belts. Make sure the male portion is rolled, taped and tucked, and that the female portion is rotated up behind the data plate and taped with two-inch tape. If the vehicle has the three-point lap belt, it will be secured as worn.
- E. Move to the rear of the load and inspect the troop seats to ensure that they are secured in the up position with the pins provided, or secured in two places with type III nylon. At the rear of the vehicle you will inspect a vehicle with troop seats in a U shaped sequence. Begin by inspecting for a link count of 10. Move to the breakaway and inspect for 1/4" cotton webbing. Move down to ensure the chains are routed through the sling guides. Ensure the tailgate is secured with the hooks and chains and that the hooks are secured with type III nylon. Inspect glass and plastic for tape and padding IAW unit SOP. Ensure chains are routed through the lift point. Inspect the towing pintle to ensure that it is secured closed with the cotter pin or two inch tape or type III nylon. Check the electrical connector for a rubber gasket and ensure it is spring loaded. Moving to the front, ensure the chains are routed through the lift point. Inspect glass and plastic for tape and padding. Ensure the tailgate is secured with the hooks and

chains and the hooks are secured with type III nylon. Ensure two chains are routed up through the sling guide. Ensure breakaway is tied with 1/4" cotton webbing. Inspect for a link count of 10. If the vehicle is not equipped with troop seats, begin at the breakaway using the same sequence as discussed above.

- F. Upon completion of the rear inspection, move down the passenger side ensuring the troop seats are secured with the pins or secured in two places with type III nylon. Ensure the fuel cap is hand tight. Move to the passenger compartment and work from the inside out starting with the engine access panel. If a radio mount is present, you must inspect to ensure all excess cable is wrapped and taped. If no radio mount is present, ensure the panel is secured with two-inch tape. The male seat belt must be rolled, taped, and tucked. Ensure the female seat belt is rotated behind the data panel and taped with two-inch tape. The battery box must be latched with the latches provided and taped with two-inch tape. Move inside the vehicle and inspect the breakaway on the roll bar to insure it is 1/4" cotton webbing. Grab the apex and ensure the inner legs are to the rear and twist free and the outer legs are to the front and twist free. Inspect the castellated nut for a cotter pin.



APEX ORDER TO THE M1097  
LEFT & RIGHT ARE DETERMINED BY FACING DIRECTION OF FLIGHT  
FIGURE 2-19



M1097 HMMWV SINGLE CONFIGURATION  
FIGURE 2-20

## DUAL POINT SLING LOAD

### DUAL HMMWV SIDE BY SIDE (SHOTGUN) RIGGING PROCEDURES FOR THE M998/M1038 CARGO/TROOP CARRIER (HMMWV) M996/M1036/M1045/M1046 TOW MISSILE CARRIER (HMMWV) LMTV

#### A. APPLICABILITY:

Those rigging procedures have been approved by the U. S. Army NATICK for flight testing by CH-47D helicopters at the appropriated speeds.

#### B. LOAD DESCRIPTION:

1. Cargo/Troop Carrier (HMMWV)
  - a. M996, NSN 2320-01-107-7155
  - b. M1038, NSN 2320-01-107-7156
2. TOW Missile Carrier (HMMWV)
  - a. M996, NSN 2320-01-107-7155
  - b. M1026, NSN 2320-01-107-7154
  - c. M1045, NSN 2320-01-146-7191
  - d. M1046, NSN 2320-01-146-7188
3. Armament Carrier (HMMWV)
  - a. M1025, NSN 2320-01-128-9551
  - b. M1026, NSN 2320-01-128-0552
  - c. M1043, NSN 2320-01-146-7190
  - d. M1044, NSN 2320-01-146-7188

#### C. WEIGHTS:

<u>VARIANTS</u>	<u>CURB WEIGHT(lbs)</u>	<u>MAXIMUM WEIGHT</u>
M998	5,200	7,700
M1038	5,200	7,700
M996	5,913	8,200
M1036	6,040	8,400
M1045	6,364	8,400
M1046	6,491	8,400
M1025	5,822	8,200
M1026	5,949	8,200
M1043	6,273	8,400
M1044	6,400	8,400

- C. MATERIALS:
1. Sling set, 10,000 lbs. capacity, 2 each
  2. Tape, adhesive, pressure-sensitive, 2 inch roll
  3. Webbing, nylon, type III, 550 lbs. breaking strength
  4. Strap, tie-down, CGU-1B, 2 each
- D. PERSONNEL: Four personnel can prepare and rig the load in 15 minutes.

## PHASE I

### PREPARATION AND RIGGING

- A. Prepare both HMMWVs in the same manner as you would for single load. However, You must ensure that the front lifting points have been replaced. You must take off the 5/8 inch lift and replace them with 3/4 inch lift points, if it has not already been done. Once both HMMWVs are prepared, you need to position them side by side.

NOTE: The vehicles must both be the same type.

- B. The reason that you will position them in this manner, is to help ease the rigging procedure. The first thing you will do after the HMMWV's have been prepared, is to secure the padding material on each vehicle. Type III nylon is acceptable. One pad will be placed over the gas cap that will end up in the middle of the load. The other pad will be hung from the forward portion of the door under the windshield. The padding will hang vertically.
- C. Once the padding material is secured in place, drive the vehicles side by side as close together as possible, ensuring that the bumpers are lined up. Place one 10,000 lbs. sling set on the hood of one vehicle. Route the outer two sling legs to the outermost lifting provisions on the two vehicles and the inner two sling legs to the inner two lifting provisions. The link counts to the front are 30, 50, 50, 30. Begin by grabbing the free running end of the chain on the outer lifting provision and secure a link count of 30 (does not matter routing of the chain, inside out or outside in), by dropping the thirtieth link in the keeper portion of the grab hook assembly. Wrap and secure all excess chain with type III nylon. Grab the free running end of the inner left chain and route it through the inner left lifting provision and secure a link count of 50, by dropping the fiftieth link in the keeper of the grab hook assembly. Wrap and secure all excess chain with type III nylon. Grab the free running end of the inner right chain and route it through the inner right lifting provision, securing a link count of 50 by dropping the fiftieth link in the keeper portion of the grab hook assembly. Wrap and secure all excess chain with type III nylon. Grab the free running end of the outer chain and route it through the outer right lift provisions and secure a link count of 30, by dropping the thirtieth link in the keeper of the grab hook assembly. Wrap and secure all excess chain with type III nylon.

- D. There are two mandatory breakaways tied on the front sling set. The first mandatory breakaway is tied on the two inner sling legs. Form a tight T on the inner two sling legs by pulling them together in the center and tying a breakaway through the two potted eyes. This will prevent the inner two legs from becoming entangled with the bumper guides and corners of the vehicles. The second mandatory breakaway will be tied three feet below the apex by clustering all four legs together and tying a breakaway. Next, rotate the inner two towing shackles skyward and route a CGU-1B strap through both of them and secure it to itself being sure to leave the ratchet handle exposed to the outside for tightening. It must be twist free and hand tight. Fold the excess CGU-1B strap on top of itself and tape the excess approximately 12 to 18 inches away from the ratchet assembly.
- D. Move to the rear of the two vehicles with a 10,000 lbs. sling set and one CGU-1B strap. For a vehicle with troop seats, route the outer two legs to the outer two lift points and the inner two legs to the inner two lift points. The link count to the rear is 3, 7, 7, 3. Begin on the outer left chain. Route it through the outer left lift point and secure a link count of 3. Grab the free running end of the inner left chain and route it down through the inner left sling guide through the inner left lifting point back up through the inner left sling guide and secure a link count of 7. Grab the free running end of the inner right chain and route it down through the inner right sling guide through the inner right lifting point, back up through the inner ring sling guide and secure a link count of 7. Grab the free running end of the outer right chain and route it through the outer right lifting point and secure a link count of 3.

NOTE: Only the inner two chains are routed through the sling guides.

- F. There are five mandatory breakaways on the rear of this load. Begin on the left outer sling leg. Pull the chains to the outer left sling guide and tie a breakaway through the chains and through the sling guide. Move the inner left sling leg. Pull all slack upward and tie a breakaway through the chains and through the troop strap retainer. Repeat this process on the second vehicle. The fifth mandatory breakaway will be tied three feet down from the apex by clustering all sling legs together.
- G. For a HMMWV without troop seats, you will have five mandatory breakaways on the rear. The outer two chain sets will have breakaways tied to the outer two sling guides. Pull all slack up through the two inner chain sets and form a tight T in the center by routing 1/4 inch cotton webbing through all four chains. Pull all slack toward the apex and tie a cluster of three feet down from the apex and an additional cluster of three feet down from the apex by clustering all sling legs together.

- H. For a M996 , TOW Carrier, the link counts and breakaways are the same as the M998 without troop seats.
  - 1. Route the CGU-1B strap through the two inside lifting points facing skyward ensuring the CGU-1B strap is not misrouted around the chains and attach the same way as the front. Upon completion of rigging, roll the excess CGU-1B strap in the front and the rear and tape the excess to the strap, allowing enough slack for tightening during the hook up operation. A two feet loop of excess should be sufficient.

## PHASE II

### INSPECTION OF PREPARATION AND RIGGING

- A. There are three personnel who can inspect a sling load. They are a Pathfinder School Graduate, SLICC (Sling Load Inspector Certification Course) Graduate, and an Air Assault School Graduate. When you inspect a sling load you will inspect it a minimum of 2 times or until you are 100% sure the load will fly safely.
- B. Begin the inspection process at the driver's side of the right vehicle as viewed from the front. You must climb through the two vehicles driver's compartments. Ensure the following has properly been completed:
  - 1. The driver's side windshield is taped in a X configuration
  - 2. Mirrors are secured with type III nylon to a fixed part of the load
  - 3. The electrical switches are off
  - 4. The fuel level is 75% or less
  - 5. The steering wheel is secured with two pieces of type III nylon
  - 6. The driver's side female portion of the seatbelt is rolled up and taped
  - 7. The driver's side male portion of the seat belt is rolled, taped and tucked away

NOTE: 3 point seatbelts will be secured as worn.

8. The hand brake is on
9. The transmission is in the neutral position
10. The engine access panel is secured with the latches and taped with two inch tape (If radio mount is present latches do not have to be taped)
11. If radio mounts are present, all excess cable is secured
12. The passenger's side windshield is taped in a X configuration
13. Mirrors are secured with type III nylon to a fixed portion of the load
14. The passenger's side female portion of the seat belt is routed up and taped
15. The passenger's side male portion of the seat belt is rolled, taped, and tucked away ( If 3 point they will be secured as worn)
16. The battery box is latched and taped

NOTE: Continue the same sequence through the second vehicle.

- C. Upon completing the inspection process of the interior of the vehicles, begin the exterior process sequence from the passenger's side mirror. Ensure the following has been properly completed:
1. The hood is latched and taped with two inch tape
  2. The wheels are straight in the forward position
  3. The bumper guides are removed or padded
  4. The outer link count is 30, and the excess is secured
  5. The inner link count is fifty, and the excess is secured
  6. The breakaways are tied on the inner two sling legs
  7. The cluster breakaways are tied three feet below the apex
  8. The apex order is correct
  9. The castellated nut has the cotter pin in place
  10. The CGU-1B is twist free and hand tight, the excess is secured, and the ratchet is exposed
  11. The glass and plastic is taped and padded IAW your unit's SOP
  12. The inner link count is 50, and the excess is secured
  13. The outer link count is 30, and the excess is secured
  14. Move towards the rear of the vehicles
  15. The troop seats are secured with the cotter pins, or secured in two places with type III nylon
  16. Start the inspection process at the right rear on the outside
  17. The grab hook assembly is present and not inverted
  18. The link count is 3, and excess is secured
  19. The breakaways are tied to the sling guides

20. The chains are not routed through the sling guides
21. The tailgate is secured with the chains and hooks
22. The hooks are secured with type III nylon
23. The chains are routed through the lifting point
24. The towing pintle is secured with the cotter pin, two inch tape, or type III nylon
25. The electrical connector is spring loaded with the rubber gasket
26. The chains are routed through the lift point
27. The tailgate is secured with chains and hooks
28. The hooks are secure with type III nylon
29. The chains are routed through the sling guides
30. The breakaways are tied to the troop strap retainer ring
31. The link count is 7, and the excess is secured
32. The cluster breakaway is three feet below the apex
33. The castellated nut has the cotter pin in place
34. The CGU-1B is twist free and hand tight, the excess is secured, and the ratchet is exposed
35. The inner troop seats are secured with cotter pins or secured in two places with type III nylon
36. Move down the passenger's side of second vehicle
37. The troop seats are secured with cotter pins or secured in two places with type III nylon
38. The fuel cap is hand tight

NOTE: Inspect the second vehicle using the same sequence.

NOTE: DA Form 7382-R must be filled out IAW TM 4-48.09 see Appendix I

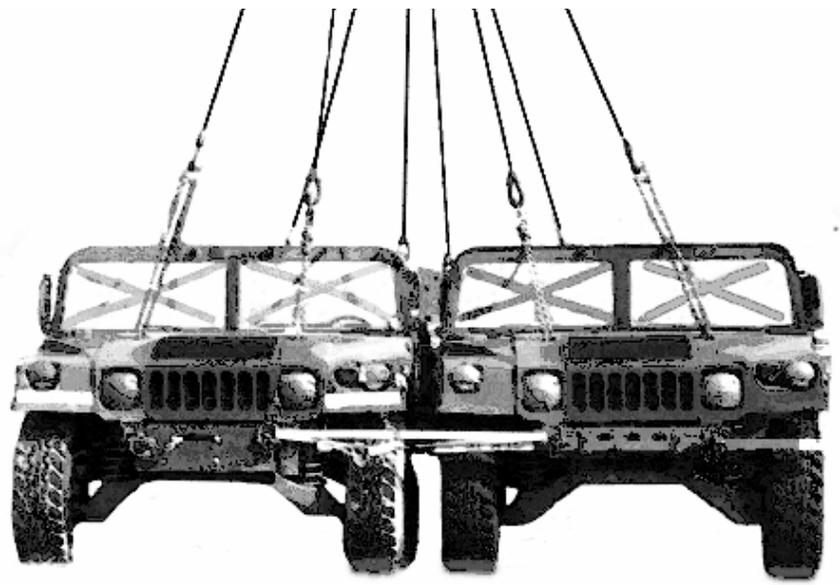
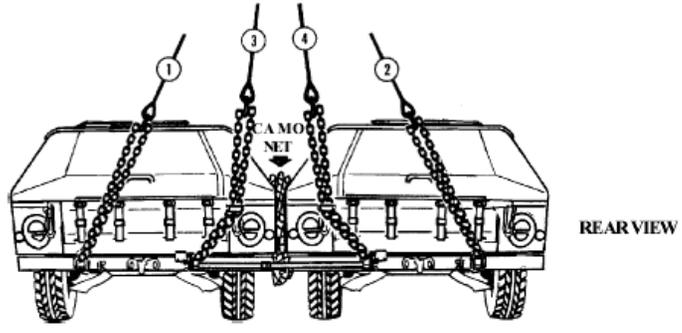
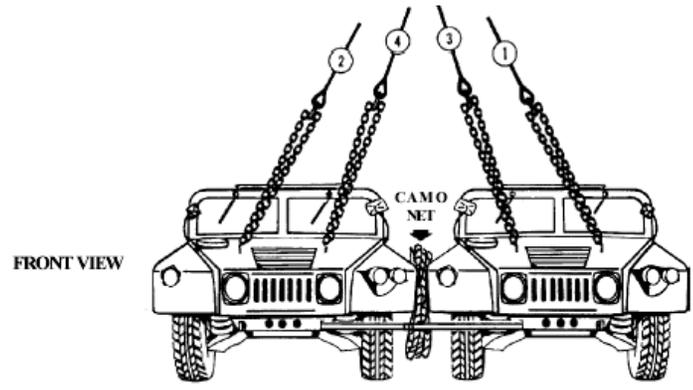
During Hookup: Once A/C lifts load, CGU-1Bs must be re-tightened.

- Q. Grab the rear apex. Make sure that it has a pin, a spacer (if the front apex has a spacer), a case-hardened steel bolt, a castellated nut with the castle portion facing out, and a cotter pin. Ensure the sling legs are secured with ¼-inch cotton webbing in a figure 8. Also, ensure both sling legs are routed over the cargo bed.
- R. Move under sling legs to front set of sling legs. Grab the front apex. Make sure that it has a pin, a spacer (if the rear apex has a spacer), a case-hardened steel bolt, a castellated nut with the castle portion facing out, and a cotter pin. Ensure the sling legs are secured with ¼-inch cotton webbing to the tire bracket. Also, ensure that the driver side sling leg is routed between the cab and the intake stack and that the passenger sling leg is routed over the tire.
- S. Verify that the intake stack hole is covered with 2-inch tape.

### PHASE III

#### SLINGLOAD OPERATION

- A. The hookup team stands in the bed of the vehicle. The static wand person discharges the static electricity with the static wand. The forward hookup person places apex fitting 1 onto the forward cargo hook. The aft hookup person places apex fitting 2 onto the aft cargo hook. The hookup team then carefully dismounts the vehicle and remains close to the load as the helicopter removes slack from the sling legs. When successful hookup is assured, the hookup team quickly exits the area underneath the helicopter to the designated rendezvous point.



DUAL HMMWV SIDE-BY-SIDE (SHOTGUN) RIGGING

M1078/M1078A1/M1079A1/M1081 LMTV

A. Applicability:

1. Certified by US Army NATICK for CH-47 helicopter at airspeed up to and including 110 knots.

NOTE: When using CH-47 support, coordinate closely with the aviation unit in reference to the vehicle weight.

B. Load Description;

1. M1078, 2 ½ ton (LMTV)
2. M1078A1 , 2 ½ ton (LMTV)
3. M1079A1, 2 ½ ton (LMTV)
4. Weights - M1078 (most common LMTV)
  - a. Empty, 17,770 lbs.
  - b. ACL, 5,430 lbs.
  - c. Max weight, 23,200 lbs.

C. Materials:

1. Sling set (25,000 lbs. capacity) (CH-47)
2. Tape, adhesive, pressure-sensitive, 2-inch wide roll
3. Cord, nylon, Type III, 550 lbs. breaking strength
  - a. Webbing, cotton, 1/4 inch, 80-pound breaking strength
  - b. Chain link From a 25,000 lbs. sling set (6 each)
  - c. Coupling link from a 25,000 lbs. sling set (6 each)

D. Personnel: Two people can prepare and rig the load in 15 minutes

**WARNING:**

Exceeding recommended airspeed listed in TM 4-48.11 Appendix C may result in damage to the windshield of this vehicle.

## PHASE I (PART 1)

### PREPARATION

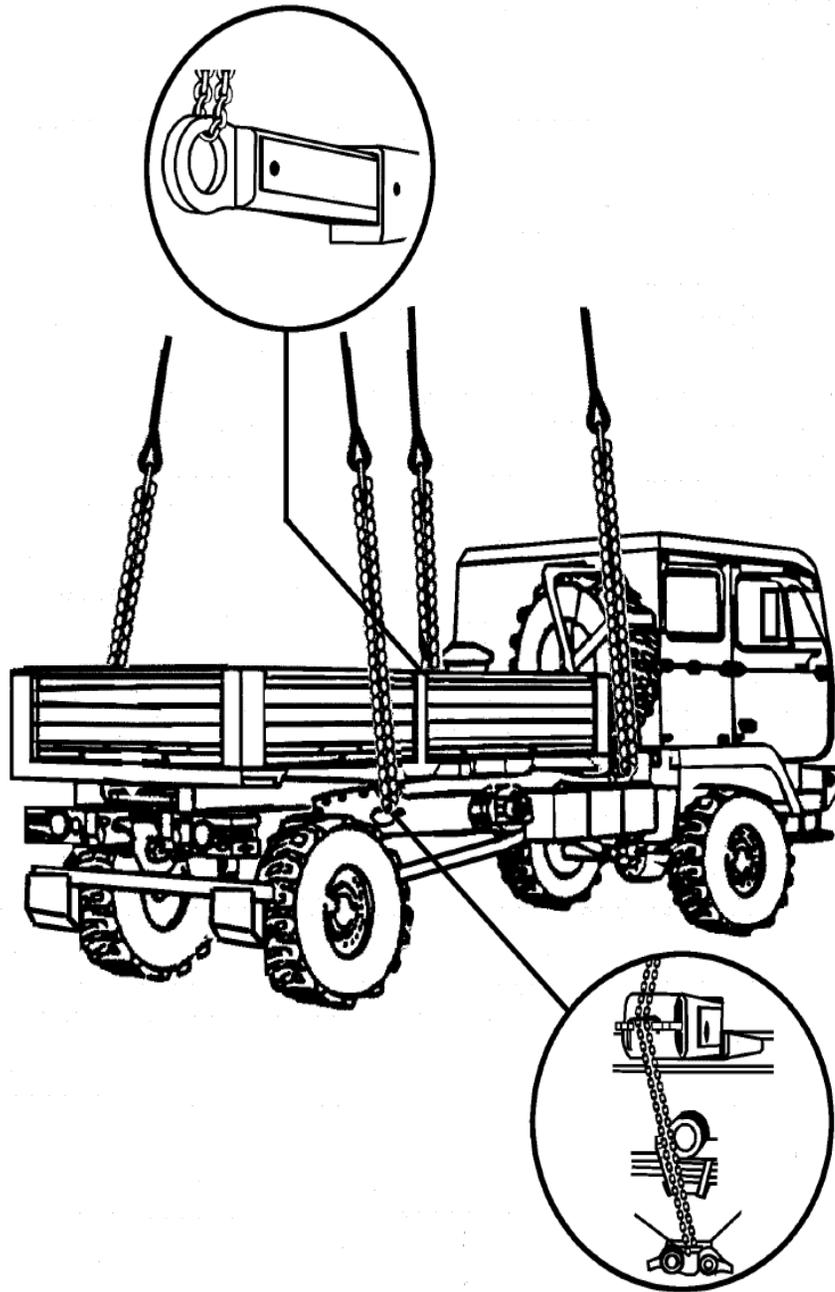
- A. Begin preparing the load at the passenger side mud flaps. Stow the mud flaps by bending and hooking on the mud flap hooks.
- B. Extend the load spreader and secure with pin and secure pin with safety pin.
- C. Mud flaps will be secured in bracket provided. If bracket is missing the mud flaps will be rolled and secured with 2-inch tape to a fixed portion on the load.
- E. Safety the cargo bed walls securing clips in the secured position and additional secure with 2-inch tape. (Only if the cargo bed walls are not stowed in the racks under the bed.)
- F. Ensure the fuel tank is not over  $\frac{3}{4}$  full. Inspect the fuel tank cap for proper installation.
- G. All glass will be taped and padded IAW your unit SOP. At minimum make an X configuration with 2 inch tape both inside and outside. Rotate the mirrors inward and secure them with type III nylon to fixed portion of the inside door.
- H. Engage the vehicle parking brake and put the transmission in neutral.
- I. Ensure the front wheels are pointed straight ahead. Secure the steering wheel using the driver's side seat belt. All other seat belts will be secured as worn.
- J. Move to the front of the vehicle and shatter-proof all glass and plastic, i.e. turn signals, headlights, and running lights will be taped IAW your unit SOP.
- K. Pad the filler pipes behind the cab on the driver's side door to create a buffer that will prevent the sling legs from becoming entangled.
- L. Extend the front lift provisions and lock in place using the attached pip pin and safety pin.
- M. Ensure the battery box is secured with latches provided and additional secured with two-inch tape.
- N. Ensure the cap on the slave receptacle is in place and hand tight. (If the cap is missing, tape over the slave receptacle.)
- O. Secure the cargo bed latches in the secured position and additional secure with 2 inch tape.
- P. Front mud flaps will be secured in bracket provided. If bracket is missing the mud flaps will be rolled and secured with 2-inch tape to a fixed portion on the load.
- Q. Extend the load spreader and secure with pin and secure pin with safety pin.

- R. Secure the mud flaps in the rear by bending and hooking on the hooks provided
- S. Move to the rear of the vehicle and shatter-proof all glass and plastic, i.e. turn signals, brake lights, and running lights will be taped IAW your unit SOP
- T. Ensure that the ladder is secured with securing devices. Tailgate will be placed in the up position and secured with latches provided and additional secured with 2-inch tape
- U. Ensure towing pintle is closed and secured with a cotter pin. (If cotter pin is missing, run type III nylon through cotter pin hole and secure it to itself or use 2-inch tape to wrap around tow pintle.)
- V. Ensure the intervehicular cable electrical connector is spring-loaded and contains buffer
- W. Move into the bed of the vehicle and secure the troop seats in the upright position with straps provided or type III nylon
- X. Secure any cargo in the bed of the vehicle
- Y. Remove the air intake cowling. Place the cowling in the passenger side seat securing with seat belt
- Z. Tape over the intake stack to prevent water from entering

## PHASE I (PART 2)

### RIGGING

- A. Connect two sling legs to the front over the spare tire and connect to the apex.
- B. Loop the chain end of the sling legs through their prospective lift provisions located behind the vehicle cab. Get a link count of 30 and place that numbered link in the grab hook assembly and secure all excess chain with type III nylon cord.
- C. Cluster tie with ¼-inch cotton webbing (breakaway technique) the sling legs to top of the spare tire retaining bracket to prevent entanglement during hookup and lift-off.
- D. Connect two sling legs to apex in the rear. Attach one extra chain length to each existing chain on each slingleg using one coupling link and one additional chain to extend each slingleg in the rear.
- E. Route the left and right chains through their respective rear load spreader and loop the chain end of the sling legs through their respective lift rings, located on the frame. Route the chain back through the rear load spreader and get a link count of 20. Place that link in the grab hook assembly. Secure all excess chain with type III nylon cord.
- F. Tie sling legs together using ¼-inch cotton webbing in a figure 8 to prevent entanglement during hookup and lift-off.



## PHASE II

### INSPECTION OF PREPARATION AND RIGGING

- A. The only personnel qualified to inspect this load are a Pathfinder School Graduate, SLICC (Sling Load Inspector Certification Course) Graduate, or an Air Assault School Graduate. You will inspect this load at least twice or until you are 100% sure that it will fly safely. Your inspection will start on the rear passenger side of the vehicle.
- B. First, inspect the rear mud flap to ensure that it is placed in the hook in the up position. You will ensure the side lights are shatter-proofed. You will ensure that the cargo bed walls are in the up position and they are secured with the latches provided and additional secured with 2-inch tape. Work your way down the load until you get to your center mud flaps and ensure that the mud flaps are secured inside the brackets.
- C. Next, you'll ensure that the sling legs are routed over the cargo bed. You'll ensure that the grab hook assembly is not inverted and you have a link count of 2. Next, you will ensure that the excess chain is secured with type III nylon and secured to one of three places, the eyelet of the grab hook assembly, the coupling link, or the lifting chain itself. Do not tie excess to excess. Make sure that the load spreader is in the out position. It is secured with a pin and additional secured safety pin. Make sure chain is routed through the lifting ring one time and one time only.
- D. Next, make sure that the center mud flap is secured in bracket provided.
- E. Ensure gas cap is hand tight and the fuel level is at 75% or less.
- F. Check the routing of the front passenger side lifting leg to make sure the sling leg is routed over the tire. Check to verify that the grab hook assembly is not inverted and there is a link count of 30. Ensure the excess is secured with type III nylon to one of three places, the eyelet of the grab hook assembly, the coupling link, or the lifting chain itself. Do not tie excess to excess. The chain is routed through the lift provision one time and one time only. Next, pull the load spreader to ensure that it is extended and check to make sure that two pip pins are in place.
- G. Move to the passenger side of the cab and ensure the windows are shatter-proofed in the X configuration. Then, check the mirrors and make sure they are shatter-proofed in the X configuration. The brackets will be rotated forward and secured with type III nylon to a fixed portion inside the door. Also make sure all reflectors are shatter-proofed.

- H. With door open, check seat belts to ensure they are secured as worn. Identify intake cowling is in the passenger seat secured with seat belt. Check inside windshield and windows are shatter-proofed in the X configuration. Make sure that the parking brake is engaged and driver side seat belt is securing steering wheel. Exit the same door and check front tires. They should be in the forward drive configuration.
- I. Move around to the front then check all the glass and plastic in the front and make sure it is taped and padded IAW unit SOP.
- J. Moving to the other side you once again ensure glass and plastic are shatter-proofed. Take the mirror bracket, press it towards the door, and secure it with type III nylon to a fixed portion of the inside of the door.
- K. Move to the rear of the cab. Sling leg should be routed between the cab and the intake stack of the vehicle. Ensure that the grab hook assembly is not inverted and the link count in the grab hook assembly is 30. Excess chain must be secured with type III nylon to one of three places, the eyelet of the grab hook assembly, the coupling link, or to the lifting chain itself. Excess chain will not be secured excess to excess. The chain will be routed through the lift provision one time and one time only. The lift provision should be extended and secured with two pip pins provided.
- L. All fuel ports will be buffered.
- M. Check battery box latches to ensure latches are secured and additional secured with 2-inch tape. The slave cable receptacle should have a cap or be secured with 2-inch tape. Verify the cargo bed walls are in the up position and that the securing latches are secured and additional secured with 2-inch tape. The center mud flap must be secured inside a bracket.
- N. Chain must be routed through the lifting ring one time and one time only. Chain must be routed through the load spreader two times. Load spreader should be extended. There should be a pin secured with a safety pin. Excess chain will be secured to one of three places, the eyelet of the grab hook assembly, the coupling link, or to the lifting chain itself not excess chain to excess chain. The chain will be secured with type III nylon. The link count will be 20 and the grab hook assembly will not be inverted. Ensure that the sling leg is routed over the cargo bed. Check rear driver side mud flap. Mud flap should be secured in the hook provided.
- O. Move to the rear of the truck, ensure all glass and plastic are shatter-proofed. Tailgate is in the up position and secured with the latches provided and additional secured with 2-inch tape. Ladder must be secured with the securing device provided. Check tow pintle to make sure it is closed and secured with a cotter pin. Check intervehicular cable electrical connector. It should be spring-loaded and contain a buffer.
- P. Climb into the bed of the vehicle and check the troop seats. They should be in the upright position and secured with straps provided or tied with type III nylon.

NOTES

## CHAPTER THREE

### RAPPELLING

#### A. REFERENCES:

1. TC 21-24, RAPPELLING, dated January 2008
2. USSOCOM Reg 350-6, dated 25 August 2004
3. FM 3-97.61 Military Mountaineering, dated August 2002

#### B. EQUIPMENT:

1. Rope, climbing, nylon, NSN 4020-00-931-8793
  - a. 120 feet in length
  - b. 7/16 inches in diameter
  - c. 3 strand, multi-filament, twisted with a right-hand lay
  - d. 4,500 pounds of tensile strength (15 percent less when wet, knotted or frozen)
  - e. It will stretch 1/3 of its length
2. Rope, sling. This is the rope used to construct the Hip and Australian rappel seats. Cut a 120 foot nylon climbing rope into 12 to 15 foot sections to make the seats
3. Link, snap, mountain piton, NSN 8465-00-360-0228, 2,000 lbs. capacity with the gate closed. Steel, with a locking barrel
4. Glove, leather, workman's, NSN 8415-00-268-7868
5. Insert, wool glove, OG-208, NSN 8415-00-682-6577

#### C. PERSONNEL:

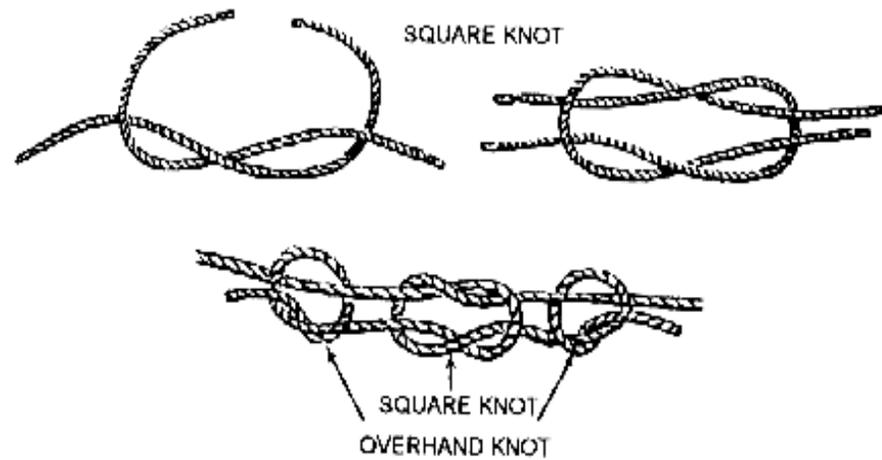
1. The following are the minimum personnel required to conduct rappelling operations from towers, ground, or aircraft:
  - a. Rappel Safety NCOIC or OIC – SFC or above  
Air Assault or Ranger qualified. Must have commo with A/C and other required agencies, such as range control or higher HQ.

2. Rappel Master – Responsible for safety of rappellers. There must be a qualified Rappel Master in each aircraft and one with each tower rappel site at all times. A qualified Rappel Master must be a CPL or above and graduate of both the Air Assault Course and the Rappel Master Course. A qualified Rappel Master must maintain currency by performing duties at least once every six months. If a rappel master becomes un-current, they must attend a rappel master refresher course conducted by a current rappel master IAW TC 21-24, Chapter 1. The Rappel Master is responsible for all matters of training and safety, to include:
  - a. Inspection of all equipment
  - b. Inspection of aircraft, tower and ground anchor point rigging
  - c. Aircrew briefing and rappel safety briefings
  - d. Training of all rappellers, lane NCOs, belaymen, & belay controllers
3. Rappel Lane NCO – Must be a CPL or above and Air Assault or Ranger qualified. Responsible for safety of a rappel lane, to include:
  - a. Inspection of proper hook-ups
  - b. Rappel commands and control of rappeller
  - c. Emergency procedures
4. Belay control - Ensures belay personnel are performing their duties properly. A belay controller must be a graduate of the Air Assault Course or Ranger Course. There must be at least one belay controller for every four ropes during tower and ground rappels. There must be a belay controller for every two sets of rappel ropes on A/C rappels.
5. Belayman - There must be a belayman on every set of rappel ropes. The belayman will wear a helmet for protection from falling objects. The belay will not wear gloves.
6. Medic - A medically qualified individual with a medical aid bag and equipment (backboard, neck brace, etc) will be present at the rappel site at all times. In addition, there must be military transportation for the evacuation of injured personnel at the site.

#### D. CONSTRUCTION OF THE RAPPEL SEAT:

1. Rappel Seat (seat – hip rappel).
  - a. Locate the midpoint (center) of the length of the sling rope and form a 3 to 5 inch bite. Place the midpoint on the guide hand hip (opposite the brake hand the brake hand is the strong hand)
  - b. Bring the sling rope around the waist above the hip-bone. Tie a double overhand lay above the belt and below the rib cage. This forms the 'waist-rope.'

- c. Let the two free running ends of the sling rope fall to the ground to the front.
- d. Bring the two free running ends of the sling rope down between the legs, and up over the buttocks. Ensure that the two free running ends do not cross. The free running ends will form the 'leg-ropes.'
- e. Pass the ends of the rope *over* then *behind* the rope that is tied around the waist (waist-rope) at the two points above the centers of the two rear seat pockets, resulting in the 'leg-ropes' being routed from top-to-bottom behind the waist-rope. Ensure that the free running ends are running towards the center of the buttocks, and are between the waist-rope and the rappeller's body.
- f. Grab the free end of the rope that is on the left side of the body with the left hand, and the free end of the rope that is on the right side of the body with the right hand.
- g. Squat down and simultaneously pull down on both running ends of the ropes and stand up. This will tighten the seat.
- h. Take the two free running ends of the rope over to your guide hand side trouser seam.
- i. Tie the two running ends into a square knot with overhand knots securing each side of the square knot. The square knot is tied on the opposite side of the body from the brake hand.
- j. Place any excess rope in the trouser pocket near the square knot.
- k. With the gate down and the hooked end of the snaplink against the navel, place the snaplink through the single rope that is around the waist and the two ropes forming the double overhand lay.
- l. Rotate the snaplink a half turn so that the gate is facing up and will open away from the body.



#### E. RAPPELLER PREPARATION

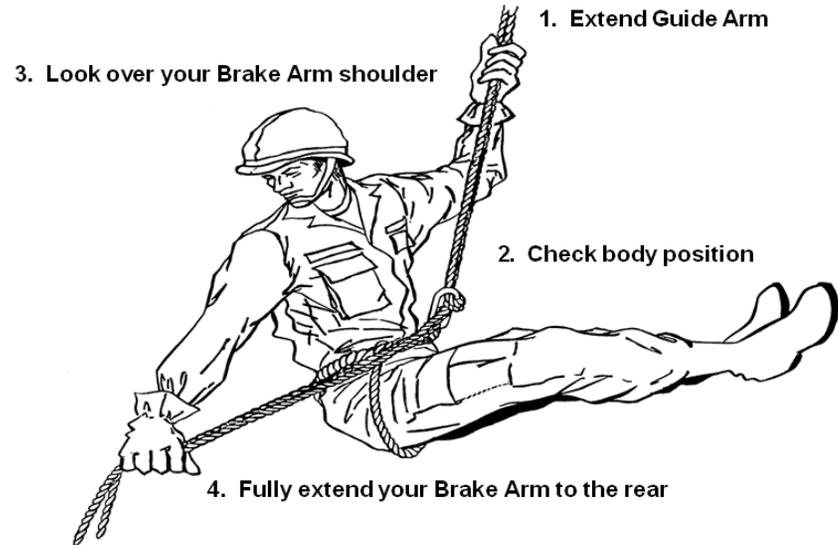
1. Shirt tails, loose clothing, and equipment straps must be tucked, tied or taped. Sleeves will be rolled down and secured.
2. Helmets will be worn during rappelling. All straps will be properly fastened and the helmet will be in serviceable condition.
3. Heavy leather workman's gloves will be worn when rappelling. Glove inserts are worn when the gloves do not have a friction bearing surface or as determined by the unit leadership.
4. Rappellers will have identification tags and I. D. card

5. Eye and ear protection will be worn when rappelling from a helicopter.
  6. When rappelling with equipment, MOLLE vest will be zipped.. The rucksack should be worn high and tight on the back of the rappeller to allow the brake hand to reach the small of the back. Rucksack adjustment straps will be tied across the chest or tucked away. If not tied across the chest ensure a chest strap is present with either type 3 nylon or a chest strap provided.
  7. The rappellers weapon will be slung diagonally across the back, muzzle down near hip on guide hand side, with the weapon's butt stock on the brake hand side near the shoulder.
- F. RAPPEL HOOK-UP PROCEDURES:
1. Seat – Hip Rappel Hookup
    - a. The rappeller's square knot with two overhand knots should be facing the anchor point.
    - b. Grasp the two ropes with both hands and drop the two ropes through the gate of the snaplink. At this point, there should be two (2) ropes running through the snaplink.
    - c. Using the guide hand, pull slack towards the anchor point, rotate the slack down, under, and over the top of the snaplink.
    - d. Drop the two ropes a second time through the gate of the snaplink. At this point there should be four (4) ropes running through the snaplink.
    - e. Place the guide hand on the rope between the anchor point and the snaplink, palm facing upward.
    - f. Place the brake hand around the running end of the rope, palm facing downward, and place the brake hand with the rope in the small of the back (knuckle to spine).
- G. RAPPEL COMMANDS.
1. Verbal and Hand and Arm Signals for Tower or Ground Rappels.
    - a. Get Ready Extend both arms to your front with elbows locked, fists clenched and thumbs pointing upward.
    - b. Position
      - (1) Primary method. Extend both arms to the front, elbows bent, forearms pointed upward, fists clinched and index fingers pointing upward. Make a circular motion with both forearms rotating in opposite directions.
      - (2) Alternate method. Extend both arms to the front with elbows locked, fists clenched and index fingers extended. Bend at the waist so that your arms below your waist. Make a circular motion with arms rotating in opposite directions.

- c. Go. Extend an arm with elbow locked, fingers extended and thumb along the index finger and point directly at the rappeller.

2. UH-60 Tactical Rappel Commands:

- a. On the UH-60, the edge of the floor along the door of the helicopter is used as a pivot point to assume the “L” shaped rappelling position.
- b. The commands for a tactical rappel from a UH-60 are as follows:
  - (1) Get Ready. alerts the rappeller. The rappeller and the Rappel Master of the hookup, rappel seat, snaplink and equipment should make final checks. The rappeller also checks his deployment bag to ensure that it is not entangled and that it is ready to toss.
  - (2) Throw Ropes Keeping his brake hand in the small of his back, the rappeller will toss his deployment bag with ropes OUT AND AWAY from the helicopter with his guide hand. The rappeller will observe that the ropes are touching the ground and are not knotted or entangled.
  - (3) Position Form a squatting position with the brake hand in the small of the back, the rappeller rotates 90 degrees so that he is facing the inside of the aircraft and the Rappel Master. The rappeller then places his heels on the edge of the floor of the helicopter doorway and leans out into a good “L” shaped body position. Feet should be shoulder width apart, balls of the feet on the edge of the doorway, knees locked and body bent at the waist towards the helicopter.
  - (4) Go Initiates the rappel. The rappeller flexes his knees and jumps vigorously backwards. At the same time the rappeller throws his brake hand out at a 45 degree angle, letting the running ends of the ropes slide through both the brake hand and the guide hand.



3. The commands for basic UH-60 helicopter rappels are the same as for tactical rappel except that the command “THROW ROPES” is omitted. In addition, when the command “GET READY” is given, the rappeller also checks to ensure that there is a belayman on his ropes.

#### H. EXITING THE AIRCRAFT:

1. There is one way to exit the aircraft
  - a. The rappel master will send rappellers diagonally across the aircraft, i.e., left front, right rear, right front, and left rear.
  - b. After the final rappeller has exited, the rappel master will ensure that the rappeler has reached the ground safely prior to lowering the A/C.
2. The Rappel Master will maintain a minimum of one (1) second delay between rappellers.

#### I. CONDUCT THE RAPPEL:

1. The rappeller will approach the helicopter from the sides of the aircraft.
2. Upon boarding the helicopter the rappeller will sit or kneel, hookup and apply his brake hand to the small of his back prior to helicopter ascent.

3. Rappellers will not step over a rappel rope
4. Rappellers will not exit the helicopter until told to do so by the Rappel Master
5. Rappellers will not release their brake hand from the rappel rope while conducting rappelling
6. During the descent the rappeller will keep his feet together and legs straight while maintaining an “L” shaped body position by bending at the waist (Figure 3-2)
7. After leaving the aircraft, the rappeller will maintain eye to ground contact while bounding
8. The rappeller will brake a minimum of three (3) times during descent

J. BELAY:

1. A basic rappeller will not be permitted to rappel without a belayman.
2. During helicopter rappelling a minimum of 20 feet of rope will be on the ground. The last 20 feet of rappel rope may be color-coded so the Rappel Master and the rappeller may more rapidly and accurately determine if 20 feet of rope is on the ground. For tower rappelling a minimum of 10 feet of rappel rope will be on the ground.
3. The belayman will grasp the rappel ropes with both hands above head and eye level in such a manner as to allow the rappeller to acquire slack and the belayman the ability to quickly apply a downward pull. Gloves will not normally be worn. If the rappeller states “FALLING”, or loses control during descent the belayman will immediately stop the rappeller by pulling the excess slack into their chest and taking a knee.
4. The belayman will position himself below the anchor point.

NOTE: For non-tactical helicopter rappelling, the belayman will maintain control of the ropes at all times. When the aircraft is on the ground the belayman will take a knee 5 meters outside the rotor wash diameter. As the aircraft moves up, the belay will let the rope slide through his hands until the aircraft is 25-30 feet off the ground. At this time the belayman will walk in and position himself under the aircraft. When the aircraft starts down, the belayman will keep the ropes taut and away from the aircraft at a 45 degree angle. Once the aircraft is on the ground, the belayman will work his way to his original position while still maintaining positive control of the rope.

5. The belayman will focus his attention on the rappeller and maintain visual contact with the anchor point.
6. The belayman will wear a correctly fastened kevlar helmet to prevent injuries from falling rappellers, equipment, etc.

K. EMERGENCY PROCEDURES FOR HELICOPTER RAPPELLING.

1. If the helicopter gains altitude above the length of the rappel ropes, the rappeller will immediately brake and lock-in and wait for the descent of the aircraft. Procedures for lock-in are as follows:
  - a. Place the brake hand in the small of the back and brake to a complete stop.
  - b. Release the guide hand from the ropes.
  - c. Bring the guide hand around the back and grasp the running ends of the two rappel ropes behind the brake hand. (Do not release the brake hand.)
  - d. Using the guide hand, bring the two running ends of the rappel ropes around to the front of the body.
  - e. Secure these two running ends of the rappel ropes with the two anchor ends of the rappel ropes in your guide hand. This is now your NEW brake hand.
  - f. Take your old brake hand out of the small of your back. Bring it around to your front and place your previous brake hand above your new brake hand and grasp the two ropes. Your old brake hand is now your NEW guide hand.
  - g. Place your head and eyes back on the Rappel Master to continue the descent, bring the new brake hand to a 90 degree angle to the side. When you want to brake, bring the new brake hand around to your front, diagonally across your chest to your guide hand shoulder.
2. In case of an engine failure or an aircraft emergency during rappelling, the rappellers on the ropes will descend as rapidly as possible and move from beneath the aircraft by moving to the sides of the aircraft. If possible, maintain control of the rope to prevent it from entangling in the rotor. The aircraft should move forward and down.

L. MAINTENANCE OF EQUIPMENT.

1. A rappel rope is unserviceable if it is saturated with petroleum products, mildewed, excessively frayed or if one of the three strands is cut more than 1/2 of it's diameter.
2. The life of the rappel rope is directly related to the care that the rope receives. Ropes will remain serviceable for approximately 200 rappels under good conditions. To maximize rope life, follow these simple do's and don't s:
3. Records should be maintained on all rappel ropes to indicate the number of times used and the dates used using a DA Form 5752-R. See Appendix H. Unserviceable ropes will be marked, segregated, and disposed of properly.
4. Gloves will be checked for holes on the friction bearing surfaces and any holes along the seams. Holes in the friction bearing surface or fingers that expose skin will cause the glove to be unserviceable.
5. Snaplinks will be checked for excessive rust and sharp edges inside and out. Opening gates must open and close freely. The pins for the gates must not move left or right and gate must not be able to move past the hook portion. Any of these deficiencies will cause the snaplink to be unserviceable.

DON'T

1. Do not allow a nylon rope to contact heat
2. Do not smoke around the rope
3. Do not allow the rope to come in contact with any petroleum based products
4. Do not store a wet rope without daisy chaining
5. Do not store a dirty rope without cleaning in a mild soap

DO

1. Remove all knots after use
2. Clean and dry after use
3. Store in a ventilated place
4. Mountain coil neatly before storage
5. Inspect the ropes before and after use

M. RAPPEL SAFETY BRIEFING.

1. Prior to the conduct of any rappelling, the Rappel Master should give a safety briefing to all personnel.
2. This briefing should include at a minimum the following instructions:

TOWER RAPPELLING

1. Loose clothing and equipment will be secured.
2. Rappel seats will be tied by the soldier and inspected by a Rappel Master before ascending the tower.
3. Rappellers will ascend the tower only when directed by a Rappel Master.
4. Rappellers will stay in the center of the tower until instructed to move a rappel point.
5. All Rappel Masters, instructors and anyone else standing near the edge of the top of the tower or in the A/C will wear a restraint strap or safety rope at all times to mitigate the falling risk.
6. No one will be allowed to lean or sit on the railings or the banisters of the tower.
7. No one will be allowed within three (3) feet of the edge of the tower without being secured, unless moving to a hookup point.
8. When attaching the rappel rope to the snaplink, the slack will always be pulled towards the anchor point.
9. Only a qualified Rappel Master will hook up an Australian rappeller.
10. Combat equipment will be positioned on the individual so as not to be in the way of the brake hand. The weapon will be slung diagonally across the back with the muzzle pointing down and on the opposite side of the brake hand and the canteen will be worn on the guide hand hip. Ensure that equipment is worn in a manner that nothing interferes with the placement of the brake hand, or the routing of the rappel rope on the brake hand side to the snap link.

11. Heavy duty gloves are required for all rappels
12. Kevlar helmets with chin straps fastened will be worn during rappel training
13. While on the tower or ground hook-up point, the rappeller will maintain eye to eye contact with the Rappel Master and take all commands from him.
14. The rappeller will ensure that he has a belayman on his rope.
15. The belayman will not wear gloves and will keep both hands on the ropes at all times. He will also keep his head and eyes on the rappeller at all times.
16. No slack rappels will be allowed.
17. All tower rappelling will be done with a double strand of rope
18. There will be no running on the tower
19. There will be no smoking or eating near the tower

NOTE: The only slack rappelling to be done will be by a Rappel Master qualified, Air Assault School Instructor for demonstrations and as approved by the Commander of the Air Assault School. When slack rappel is approved, only 8-10 feet of slack will be coiled. Slack rappelling is to be considered dangerous.

NOTE: After each rappel, the rappellers must untie, retie, and get reinspected before conducting another rappel.

## HELICOPTER RAPPELLING

### (Nontactical)

(These areas which apply will be briefed before tactical rappelling)

1. Loose clothing and equipment will be secured
2. Kevlar helmets will be worn with chin straps fastened
3. Identification tags and earplugs will be worn
4. Sleeves will be rolled down and secured
5. Weapons will be slung diagonally across the back with the muzzle pointing down and on the side opposite the brake hand.
6. A Rappel Master prior to rappelling must inspect all equipment
7. Personnel will approach and depart a UH-60 helicopter at a 90 degree angle from the side of the aircraft. When approaching or departing the helicopter, personnel will also bend their bodies forward at the waist to ensure clearance of the rotor blades. At no time will personnel go near the rear of the aircraft.
8. Upon boarding the aircraft the rappeller will kneel down in the UH-60, hookup, and apply his brake hand to the small of his back.
9. While in the helicopter, the rappeller will maintain eye to eye contact with the Rappel Master and take all commands from him.
10. The rappeller will ensure that he has a belayman on his rope at all times.
11. During descent the rappeller will maintain eye to ground contact.
12. If the rappeller sees his ropes coming off of the ground or sees that his belayman has lost control of his ropes, the rappeller will immediately brake and execute a lock-in. He will then wait for commands from the Rappel Master.
13. The rappeller will brake a minimum of three (3) times during descent.
14. The belayman will not wear gloves and will keep both hands on the ropes at all times. He will also keep his head and eyes on the aircraft at all times. Positive control of the rappel rope will be maintained by the belayman at all times.
15. All rappelling will be conducted using a double strand of rope.
16. While the helicopter is on the ground the belayman and belaymaster will stay outside of the rotor wash.

## APPENDIX A

- A. MEDEVAC- The movement and en route care by medical personnel of wounded, injured or ill persons from the battlefield and/or other locations to a Medical treatment facility.
- B. CASEVAC- Is the movement of casualties aboard non-medical vehicles or aircraft. Casualties transported in this manner do not receive en route medical care.
- C. ARMY AIRCRAFT DESIGNED FOR MEDEVAC:
  - 1. UH-1V
  - 2. UH-60A
  - 3. CH-47

\*NOTE: The capacity of all aircraft may be reduced because of temperature, humidity or age of the aircraft. Any aircraft may be used for casevac.

### D. THE MISSION OF AEROMEDEVAC, ADVANTAGES AND DISADVANTAGES:

- 1. MISSION:
  - a. The primary mission of aeromedevac is to move casualties to an area where they can receive proper medical care
  - b. Medevac aircraft may be used to move personnel and equipment
  - c. Because of the specialized equipment on board a medevac aircraft, it may be used for crash rescue
- 2. ADVANTAGES OF AEROMEDEVAC:
  - a. Enroute treatment
  - b. Speed
  - c. Flexibility
- 3. DISADVANTAGES OF AEROMEDEVAC:
  - a. Weather and limited visibility
  - b. Enemy situation
  - c. Limited / priority aircraft
- 4. RESPONSIBILITIES OF THE REQUESTING UNIT:
  - a. Lighting and marking the pick-up site
  - b. Tactical support and security
  - c. Patient preparation and consolidation
  - d. Assignment of litter teams to load the aircraft
  - e. Brief the pilot of the enemy situation and any other units in your area of operations if asked
  - f. Mark friendly positions when an armed escort is required
  - g. Have an English speaking representative present for non U.S. personnel
  - h. Guide in aircraft (GTA / Signalman)

## THE STANDARDIZED NINE-LINE MEDEVAC REQUEST:

- A. Line #1:
  - 1. 6 digit grid coordinate of the pick-up site to include the grid zone identifier.
- B. Line #2:
  - 1. Radio frequency, call sign and suffix of the requesting unit.
- C. Line #3:
  - 1. Number of patients by precedence.
    - a. The purpose of classifying patients by precedence is so that the medevac element can establish a priority as to which patients are to be evacuated first. Normally, time is a factor, which determines the categories of precedence.
    - b. There are four priorities of precedence:
      - (1) Urgent: Is assigned to emergency cases that should be evacuated as soon as possible and within a maximum of 2 hours to save life, limb or eyesight, to prevent complication of serious illness, or to avoid permanent disability.
      - (2) Urgent-Surgical: Is assigned to patients who must receive far forward surgical intervention to SAVE LIFE and stabilize for permanent evacuation. These patients need to be evacuated within a maximum of 2 hours.
      - (3) Priority: Is assigned to sick and wounded personnel requiring prompt medical care. This precedence is used when the individual should be evacuated within 4 hours or his/her condition could deteriorate to such a degree that he will become an Urgent precedence, or whose requirements for special treatment are not readily available locally, or who will suffer unnecessary pain or disability.
      - (4) Routine: Is assigned to sick and wounded personnel requiring evacuation but whose condition is not expected to deteriorate significantly. The sick and wounded in this category should be evacuated within 24 hours.
      - (5) Convenience: Is assigned to patients for whom evacuation by medical vehicle is a matter of medical convenience rather than necessity.

D. Line #4:

1. Special equipment needed:

- a. Aircraft Rescue Hoist: Utilized on the UH1V, UH-60 and the CH47D. The cable is 256 feet long with 250 feet of usable cable, with a tensile strength of 600 pounds. The hoist has two settings. A fast and a slow setting; the fast setting can lift 300 pounds at 250 feet per minute, the slow setting can lift 600 pounds at 125 feet per minute. To prepare a patient for rescue via the Stokes Basic Litter, the ground personnel must:
- (1) Allow the SBL to touch the ground to discharge any built up static electricity.
  - (2) Unhook the litter(s) from the helicopter.
  - (3) Move the suspension cables to the sides of the litter and unfasten the restraining straps.
  - (4) Place the patient in the litter and fasten the restraining straps.

CAUTION: PATIENT MUST BE REMOVED FROM THE STANDARD OR IMPROVISED LITTER PRIOR TO BEING PLACED IN THE STOKES BASIC LITTER.

- (5) Bring the lift rings to the center position and fasten them to the helicopter rescue hoist hook.
  - (6) Signal the hoist operator when ready to lift. Be prepared to steady the litter to prevent oscillation until it is out of reach.
- b. Jungle / Forest Penetrator:
- (1) When a landing zone is not available or vegetation is too dense, a Jungle/Forest penetrator can be attached to the rescue hoist. The Penetrator is limited to three (3) casualties or 600 pounds. The Jungle/Forest Penetrator weighs 21 1/2 lb., is 34 in. long and 8 in. in diameter. The three legs are 11 1/2 in. long and 4 3/4 in. wide.
  - (2) Allow the penetrator to touch the ground to discharge any built up static electricity.
  - (3) Fold down only wing seats necessary and snap into place.
  - (4) Unzip one of the protective covers containing a safety strap, remove the strap, placing it around the patient's back and under their arm pits.
  - (5) Signal the aircrew when the patient is ready to be lifted

- c. Semi-Rigid Litter: Used for evacuating casualties with other than back injuries. Limited to one 1 casualty or 400 pounds.
- d. Stokes Basic Litter: Used for casualties with injuries to include neck and back requiring immobilization. Is constructed of aluminum or steel framed basket and is 84 in. long 23 in. wide and weighs 31.5 lbs. It is limited to 1 casualty or 400 lbs.
- e. Kendrick Extrication Device (KED): Semi-rigid support used to immobilize casualties with minor neck and back injuries, same limitations as the Stokes Basic Litter.

E. Line #5:

- 1. Number of patients by type:
  - a. Litter patients
  - b. Ambulatory patients

F. Line #6:

- 1. Line #6 is broken into two (2) situations; wartime and peace time
  - a. Wartime Situation: Security of the Pickup Zone
    - (1) No enemy troops in the area
    - (2) Possible enemy troops in the area
    - (3) Enemy in the area, approach with caution
    - (4) Enemy troops in the area, armed escort required
  - b. Peacetime Situation: Type of injury
    - (1) Gunshot, shrapnel
    - (2) Broken bones
    - (3) Illness

G. Line #7: Method of marking the site

H. Line #8: Patient nationality and status

- 1. U.S. Military
- 2. U.S. Civilian
- 3. Non U.S. Military
- 4. Non U.S. Civilian
- 5. Prisoner of War

I. Line #9:

- 1. Like line #6, line #9 has two (2) situations; wartime and peacetime.
  - a. Wartime Situation: NBC contamination - Report RADS/Hour or type agent used, if known, in the area of the pick-up site.
  - b. Peacetime Situation: Description of the terrain in and around the pick-up site to aide the pilot in locating your site.

J. Guidelines for loading patients:

1. Patients are normally loaded from the top tier to the bottom tier with the most seriously injured loaded last.
2. Litter patients should be positioned in the helicopter according to the nature of their injuries or conditions. Personnel aboard the helicopter supervise the loading and positioning of the patients.
3. The most seriously injured patients must be on the bottom tiers to permit the onboard medical personnel to provide the necessary in-flight care.
4. Litter patients requiring IV fluids should be positioned as low as possible on the litter rack.
5. Patients in Thomas Leg Splint support and footrest must be loaded last and placed directly on the floor.
6. Loading and securing patients:
7. In loading six litter patients with a 4-man litter squad, the litters are loaded from both sides of the aircraft and from top to bottom.
8. When the helicopter is equipped for mixed loading, 3 litters are loaded crosswise and 4 ambulatory patients are loaded in the side seats.
9. When loading from the left, the litter squad moves to the left side of the helicopter with the litter perpendicular to the cargo compartment, then the squad moves onto the post litter carry. Numbers 1 and 3 give their litter handles to the aircrew who place the handles in the litter support brackets on the far left side of the aircraft. Numbers 2 and 4 secure the foot of the litter.
10. After the first litter is loaded, the squad leaves the helicopter as a team to obtain another litter patient. The second and third litters are loaded in the same way as the first one. After the three litter patients are loaded, the ambulatory patients are loaded. The ambulatory patients are taken to the aircraft and placed in their seats.

K. Unloading patients:

1. The aircraft is unloaded in the reverse order of the loading process. The tiers are unloaded from the bottom to the top on one side and then the other. At the unloading command, the litter squad moves to the helicopter and the bearers take their proper place at the litter. Then each member of the squad then performs his duties in reverse order of the loading sequence.

REFERENCES:

FM 3-21. 38  
FM 8-10-26

## APPENDIX B

### AIR MISSION BRIEFING FORMAT

Reference: FM 90-4 Air Assault Operations

The following format is a guide. Its use will help ensure that essential information is included in air assault mission briefings.

#### (Classification) TASK FORCE ORGANIZATION

##### 1. Situation:

- a. Enemy forces (especially troop concentrations and locations and types of ADA assets)
- b. Friendly forces
- c. Weather (ceiling, visibility, wind, temperature, pressure and density altitude, sunrise and sunset, moonrise and moonset, percent of moon illumination, end evening nautical twilight, beginning morning nautical twilight, PZ and LZ altitudes, and weather outlook)

##### 2. Mission:

- a. Clear, concise statement of the task that is to be accomplished (who, what, and when, and, as appropriate, why and where)

##### 3. Execution:

- a. Ground tactical plan
- b. Fire support plan to include suppression of enemy air defenses
- c. Air defense artillery plans
- d. Engineer support plans
- e. Tactical air support
- f. Aviation unit tasks
- g. Staging plan (both primary and alternate PZs)
  - (1) Pickup zone location
  - (2) Pickup zone time
  - (3) Pickup zone security
  - (4) Flight route to PZ
  - (5) Pickup zone marking and control
  - (6) Landing formation and direction
  - (7) Attack and air reconnaissance helicopter linkup with lift elements
  - (8) Troop and equipment load

- h. Air movement plan:
  - (1) Primary and alternate flight routes (SPs, ACPS, and RPs)
  - (2) Penetration points
  - (3) Flight formations) and airspeeds
  - (4) Deception measures
  - (5) Air reconnaissance and attack helicopter missions
  - (6) Abort criteria
  - (7) Air movement table
  
- i. Landing plan: (both primary and alternate LZs)
  - (1) Landing zone location
  - (2) Landing zone time
  - (3) Landing formation and direction
  - (4) Landing zone marking and control
  - (5) Air reconnaissance and attack helicopter missions
  - (6) Abort criteria
  
- j. Laager plan: (both primary and alternate laager sites)
  - (1) Laager location
  - (2) Laager type (air or ground, shut down or running)
  - (3) Laager time
  - (4) Laager security plan
  - (5) Call forward procedure
  
- k. Extraction plan: (both primary and alternate PZs)
  - (1) Pickup location
  - (2) Pickup time
  - (3) Air reconnaissance and attack helicopter missions
  - (4) Supporting plans
  
- l. Return air movement plan:
  - (1) Primary and alternate flight routes (SPs, ACPS, and RPs).
  - (2) Penetration points
  - (3) Flight formations and airspeed
  - (4) Air reconnaissance and attack helicopter missions
  - (5) Landing zone locations
  - (6) Landing zone landing formation and direction
  - (7) Landing zone marking and control

- m. Coordinating instructions
  - (1) Mission abort.
  - (2) Downed aircraft procedures
  - (3) Vertical helicopter instrument flight recovery procedures
  - (4) Weather decision by one-hour increments and weather abort time
  - (5) Passenger briefing
- 4. Service Support:
  - a. FARP locations (primary and alternate)
  - b. Ammunition and fuel requirements
  - c. Backup aircraft
  - d. Aircraft special equipment requirements, such as cargo hooks and command consoles with headsets
  - e. Health service support
- 5. Command Signal:
  - a. Signal
    - (1) Radio nets, frequencies, and call signs
    - (2) Communications-electronics operation instructions in effect and time of change
    - (3) Challenge and password
    - (4) Authentication table in effect
    - (5) Visual signals
    - (6) Navigational aids (frequencies, locations, and operational times)
    - (7) Identification friend or foe (radar) codes
    - (8) Code words for PZ secure, hot, and clean; abort missions; go to alternate PZ and LZ; fire preparation; request extraction; and use alternate route
  - b. Command
    - (1) Location of air assault task force commander
    - (2) Point where air reconnaissance and attack helicopters come under OPCON as aerial maneuver elements
- 6. Time Hack:
  - a. All watches are synchronized

APPENDIX C

1	AVN UNIT	2	LIFTED UNIT	3	LIFT #	4	SERIAL	5	CHALK	6	PZ	7	LOAD TIME	8	LIFT OFF TIME	9	SP TIME	10	RP TIME	11	LZ	12	LAND TIME	13	RE-MARKS

APPENDIX D

1	2	3	4	5	6	7	8	9
PERSON- NEL EQUIP- MENT	PICKUP ZONE	ARRIVAL TIME	LOAD TIME	AVN	LIFT	SERIAL	LOAD	REMARKS
NAME RANK DUTY POSITION	NAME OF PZ FORMATION 8 DIGIT GRID	ARRIVAL TIME OF UNIT TO BE LIFT- ED	SAME AS AIR MOVEMENT TABLE	ANY ADDI- TIONAL INFO TO INCLUDE A BUMP PLAN, PRI- ORITY OF BUMP, SLING LOAD PRIORITY				

APPENDIX E

METHOD	DAY	NIGHT	NVG	NVS	FRIENDLY MARKS	TARGET MARKS	REMARKS
Smoke	Go	No Go	Marginal	No Go	Good	Good	Easy ID. May compromise friendly position, obscure target, or warn of FS employment. Placement may be difficult because of terrain, trees, or structures.
Smoke (IR)	Go	Go	Go	No Go	Good	Good	Easy ID. May compromise friendly position, obscure target, or warn of FS employment. Placement may be difficult because of terrain, trees, or structures. Night marking is greatly enhanced by the use of IR reflective smoke.
Illumination, Ground Burst	Go	Go	Go	No Go	NA	Good	Easy ID. May wash out NVDs.
Signal Mirror	Go	No Go	No Go	No Go	Good	NA	Avoids compromise of friendly location. Depends on weather and available light. May be lost in reflections from other reflective surfaces such as windshields, windows, or water.
Spot Light	No Go	Go	Go	No Go	Good	Marginal	Highly visible to all. Compromises friendly position and warns of FS employment. Effectiveness depends on the degree of ambient lighting.
IR Spot Light	No Go	No Go	Go	No Go	Good	Marginal	Visible to all NVGs. Effectiveness depends on the degree of ambient lighting.
IR Laser Pointer (below .4 watts)	No Go	No Go	Go	No Go	Good	Marginal	Effectiveness depends on the degree of ambient lighting.
IR Laser Pointer (above .4 watts)	No Go	No Go	Go	No Go	Good	Good	Less affected by ambient light and weather conditions. Highly effective under all but the most highly lit or worst weather conditions. IZLID-2 is the current example.
Visual Laser	No Go	Go	Go	No Go	Good	Marginal	Highly visible to all. High risk of compromise. Effective, depending upon degree of ambient light.
Laser Designator	Go	Go	No Go	Go	NA	Good	Highly effective with precision-guided munitions. Very restrictive laser-acquisition cone and requires LOS to target. May require precoordination of laser codes. Requires PGM or LST equipped.

EXAMPLE METHODS OF MARKING FRIENDLY AND  
ENEMY POSITIONS

METHOD	DAY	NIGHT	NVG	NVS	FRIENDLY MARKS	TARGET MARKS	REMARKS
Tracers	Go	Go	Go	No Go	No Go	Marginal	May compromise position. May be difficult to distinguish mark from other gunfire. During daytime use, may be more effective to kick up dust surrounding target.
VS-17 Panel	Go	No Go	No Go	No Go	Good	NA	Easy to see when visibility is good. Must be shielded from the enemy.
IR Paper	No Go	No Go	No Go	Go	Good	NA	Must be shielded from the enemy. Affected by ambient temperature.
AN/PAQ-4C IR Aiming Light	No Go	No Go	Go	No Go	NA	Good	Effective to about 600 meters.
AN/PEQ-2A IR Aiming Light, Pointer, Illuminator	No Go	No Go	Go	No Go	NA	Good	Effective to about 1,300 meters. Can illuminate the target.
Chem Light	No Go	Go	Go	No Go	Good	NA	Must be shielded from enemy observation. Affected by ambient light. Spin to give unique signature.
IR Chem Light	No Go	No Go	Go	No Go	Good	NA	Must be shielded from enemy observation. Affected by ambient light. Spin to give unique signature.
Strobe	No Go	Go	Go	No Go	Excellent	NA	Visible to all. Affected by ambient light.
IR Strobe	No Go	No Go	Go	No Go	Excellent	NA	Effectiveness depends on ambient light. Coded strobes aid acquisition. Visible to all with NVGs.
Flare	Go	Go	Go	Marginal	Excellent	NA	Visible to all. Easily seen by aircrew.
IR Flare	No Go	No Go	Go	No Go	Excellent	NA	Easily seen by aircrews with NVGs.
Glint/IR Panel	No Go	No Go	No Go	Go	Good	NA	Not readily detected by enemy. Effective except in high ambient light.
Combat ID Panel	Go	No Go	No Go	No Go	Good	NA	Provides temperature contrast on vehicles or building.
Chemical Heat Sources, MRE Heater	No Go	No Go	No Go	Go	Poor	NA	Can be lost in thermal clutter. Difficult to acquire. Best to contrast a cold background.
Briefing Pointer	No Go	Go	Go	No Go	Fair	Poor	Short range.
Electronic Beacon	NA	NA	NA	NA	Excellent	Good	Ideal friendly marking for AC-130 and some USAF CAS. Not compatible with Navy/Marines. Can be used as a TRP. Coordination with aircrew essential.
Hydra 70 Illumination	Go	Go	Go	Go	NA	Good	Assists with direct fire and adjustment of indirect fire.

APPENDIX F

PLANNING WEIGHTS & SPECIAL EQUIPMENT  
NEEDED FOR A/C DURING SLINGLOAD OPS

A/C	CARGO HOOK ACL	REQUIRED EQUIPMENT
UH-60A	8,000 lbs	ALUMINUM SPACER on 10K apex
UH-60L	9,000 lbs	ALUMINUM SPACER on 10K apex
CH-47	26,000 lbs Center hook 17,000 lbs Fore and Aft hook separate 25,000 lbs Fore and Aft hook combined	

**M1097 HMMWV**

EMPTY WEIGHT	5,900 lbs
ACL	4,100 lbs
TOTAL COMBINED WEIGHT	10,000 lbs
LINK COUNT, 25K sling set	60 FRONT / 10 REAR

INSPECTION SEQUENCE:

PASSENGER SIDE WINDSHIELD W/2" TAPE  
MIRROR  
HOOD LATCH  
FRONT WHEEL – PASSENGER SIDE  
GLASS & PLASTIC SHATTERPROOFED W/ 2" TAPE  
FRONT LINK COUNT 60, SECURE  
HOOD LATCH – DRIVER SIDE  
FRONT WHEEL – DRIVER SIDE  
MIRROR  
WINDSHIELD – DRIVER SIDE  
REAR LINK COUNT 10  
BREAKAWAY  
HOOKS AND CHAINS, SECURED  
GLASS AND PLASTIC SHATTERPROOFED W/ 2" TAPE  
LIFT POINT  
TOWING PINTLE-COTTER PIN  
ELECTRICAL CONNECTOR  
LIFT POINT  
GLASS AND PLASTIC SHATTERPROOFED W/ 2" TAPE  
HOOKS AND CHAINS, SECURED  
BREAKAWAY  
REAR LINK COUNT 3  
TROOP SEAT – SECURED IN 2 PLACES  
FUEL CAP  
SEATBELT – PASSENGER SIDE  
BATTERY BOX  
ENGINE ACCESS PANEL

TRANSMISSION SELECTOR LEVER IN NEUTRAL  
HAND BRAKE  
STEERING WHEEL  
ELECTRICAL AND IGNITION SWITCHES  
FUEL LEVEL  
SEATBELT – DRIVER SIDE  
APEX PIN SECURE  
APEX ORDER  
BREAKAWAY - ROLLBAR

NOTES

## M119A2 105mm HOWITZER

EMPTY WEIGHT	4,690lbs
ACCOMPANYING LOAD	3,000 lbs
TOTAL WEIGHT	7,690 lbs
LINK COUNT, 10K sling set	55 (LEFT); 50 (RIGHT), 35 (REAR)

### INSPECTION SEQUENCE:

- MUZZLE COVER
- RECUPERATOR PADDING
- SPIDER WEB (FRONT) - TYPE III NYLON
- TRAVEL LOCK (2 PINS)
- SADDLE CLAMP (FRONT STAYS, TYPE III NYLON)
- MACHINED PLAIN PADDING
- CGU-1B SECURED W/ 2 PIECES OF 2" TAPE
- BRAKES - ON
- APEX SET UP FOR RIGHT A/C
- APEX PIN SECURE
- APEX ORDER
- BREAKAWAY - CLUSTER
- EQUILIBRATOR COVER
- LINK COUNT - 55
- EXCESS LINKS SECURE - TYPE III NYLON
- CHAIN CLAMP OR ½" TUBULAR NYLON
- GUNNERS SIGHT MOUNT SECURE – TYPE III NYLON
- BREECH COVER SECURE – TYPE III NYLON
- RUN BACK STOP
- REAR SPIDER WEB – TYPE III NYLON
- REAR STAY
- FIRING PLATFORM CLAMP HAND TIGHT
- JACK STRUT SECURE W/ 1 PIECE OF 2" TAPE
- BREAKAWAY – TRAVEL LOCK BAR
- EXCESS LINKS SECURE – TYPE III NYLON
- LINK COUNT - 35
- REAR BREAK OFF
- BRAKE ASSEMBLY PADDED
- BREAKAWAY – BEHIND REAR BRAKE ASSEMBLY
- LIFT POINT
- DETACHABLE SPADE SECURE – TYPE III NYLON
- TRAIL HAND SPIKE SECURE W/ 2 PIECES OF 2" TAPE
- FIRING PLATFORM CLAMP HAND TIGHT
- REAR STAY
- EQUILIBRATOR COVER
- LINK COUNT – 50
- EXCESS LINKS SECURE – TYPE III NYLON
- CHAIN CLAMP OR ½" TUBULAR NYLON
- KNOCK OFF HUB PARALLEL TO GROUND

NOTES

## **CARGO NET**

MINIMUM WEIGHT	500 lbs
15' x 15" ACL	5,000 lbs
18' x 18" ACL	10,000 lbs
LINK COUNT, 10K sling set	3

### **INSPECTION SEQUENCE:**

APEX PIN SECURE  
APEX SET UP FOR APPROPRIATE A/C  
CORRECT # OF SLINGLEGS TO SUPPORT WEIGHT  
GRABHOOK ASSEMBLY NOT INVERTED  
LINK COUNT, 3  
LIFT POINT  
NUMBER 1 HOOK SECURED TO APEX W/ TYPEIII NYLON  
HOOK ORDER (1,3,2,4 / 1,3,4,2)  
HOOKS TAPED  
HOOKS ALTERNATING  
BREAKAWAYS, 3  
HOLE IN ROPE W/ KNOT (SECURE – NON SLIP)  
EXCESS ROPE SECURE  
LOAD CENTERED

### NOTES

## SHOTGUN

EMPTY WEIGHT	10,400 lbs
ACL	5,000 lbs
TOTAL COMBINED WEIGHT	15,400 lbs
LINK COUNT, -10K sling set	FRONT (30, 50, 50, 30) REAR (3, 7, 7, 3)

### INSPECTION SEQUENCE:

- APEX PIN SECURE
- APEX ORDER (OUTER/OUT – INNER/IN)
- BREAKAWAY - CLUSTER
- GLASS AND PLASTIC (FRONT OF RIGHT VEH)
- RIGHT FRONT LINK COUNT – 30 – EXCESS SECURE
- INNER RIGHT LINK COUNT -50- EXCESS SECURE
- INNER LEFT LINK COUNT -50- EXCESS SECURE
- INNER HOOD LATCHES
- BREAKAWAY – TIGHT “T”
- GLASS AND PLASTIC (FRONT OF LEFT VEH)
- CGU-1B
- LEFT FRONT LINK COUNT – 30 EXCESS SECURE
- FRONT WHEEL (LEFT VEH)
- HOOD LATCH – DRIVER SIDE
- WINDSHIELD – DRIVER SIDE
- MIRROR
- SEATBELT – DRIVER SIDE
- ELECTRICAL / IGNITION SWITCHES
- FUEL LEVEL
- STEERING WHEEL
- HAND BRAKE
- TRANSMISSION SELECTOR LEVER IN NEUTRAL
- ENGINE ACCESS PANEL
- WINDSHIELD – PASSANGER SIDE
- BATTERY BOX
- PADDING MATERIAL – TROOP SEATS
- SEATBELT – PASSANGER SIDE
- MIRROR - PASSANGER SIDE
- WINDSHIELD – DRIVER SIDE (RIGHT VEH)
- MIRROR (RIGHT VEH)
- SEATBELT – DRIVER SIDE (RIGHT VEH)
- ELECTRICAL / IGNITION SWITCHES (RIGHT VEH)
- FUEL LEVEL (RIGHT VEH)
- STEERING WHEEL (RIGHT VEH)
- HAND BRAKE (RIGHT VEH)
- TRANSMISSION SELECTOR LEVER IN NEUTRAL (RT VEH)
- ENGINE ACCESS PANEL (RIGHT VEH)
- WINDSHIELD – PASSANGER SIDE (RIGHT VEH)
- BATTERY BOX (RIGHT VEH)
- SEATBELT – PASSANGER SIDE (RIGHT VEH)
- MIRROR - PASSANGER SIDE (RIGHT VEH)
- TROOP SEATS SECURE (LEFT VEH)

REAR OF LOAD

APEX PIN SECURE - REAR  
APEX ORDER (OUTER/OUT – INNER/IN)  
BREAKAWAY - CLUSTER  
GLASS AND PLASTIC (LEFT SIDE OF VEH)  
OUTER LEFT LINK COUNT - 3  
BREAKAWAY  
CHAINS OUTSIDE THE SLINGLEGS  
HOOKS AND CHAINS - SECURE  
LIFTPOINT  
TOW PINTLE  
ELECTRICAL CONNECTOR ASSEMBLY  
LIFT POINT  
CHAINS IN SLING GUIDE  
HOOKS AND CHAINS SECURE  
BREAKAWAY – TROOP SEAT RETAINING RING  
INNER LEFT LINK COUNT - 7  
INNER TROOP SEATS – BOTH VEHICLES  
GLASS AND PLASTIC (RIGHT SIDE OF VEH)  
CGU-1B  
INNER RIGHT LINK COUNT - 7  
BREAKAWAY – TROOP SEAT RETAINING RING  
CHAIN IN SLING GUIDE  
LIFT POINT  
TOW PINTLE  
CHAINS OUTSIDE SLING GUIDES  
BREAKAWAY  
LINK COUNT - 3  
TROOP SEAT  
FUEL CAP  
HOOD LATCH – PASSANGER SIDE  
FRONT WHEEL (RIGHT VEH)

NOTES

### 3 FUEL BLIVETS

EMPTY WEIGHT (each)	275-285lbs
RATED CAPACITY (each)	500 gal
TOTAL WEIGHT (each)	4,200 lbs (full)
LINK COUNT, 25K sling set	3 (DUAL) 55 (SINGLE)

#### INSPECTION SEQUENCE:

APEX (25 K )  
APEX PIN SECURE  
APEX ORDER (Single inside, Dual outside)  
BREAKAWAY, (Single)  
LINK COUNT 55 (SINGLE)  
CHAINS ROUTED THRU ONE CLEVIS  
EXCESS LINKS SECURE  
COTTER PIN, (LIFT POINT)  
FUEL CAP  
COTTER PIN, (LIFT POINT)  
REPEAT STEPS 1-8 (SINGLE) ON OTHER SIDE

COTTER PIN, (LIFT POINT)  
FUEL CAP  
COTTER PIN (LIFT POINT)  
BREAKWAY, (DUAL)  
CHECK FOR OPPOSING TRIANGLES  
LINK COUNT 3 (DUAL)  
CHAIN TO CHAIN CONTACT  
SLINGLEGS NOT MISROUTED  
COTTER PIN (LIFT POINT)  
FUEL CAP  
COTTER PIN (LIFT POINT)  
REPEAT STEPS 9—18 (DUAL) ON OTHER SIDE

#### NOTES

## M149A2 WATER TRAILER

EMPTY WEIGHT	2,800 lbs
RATED CAPACITY	400 gal
TOTAL WEIGHT	6,320 lbs
LINK COUNT, 10K sling set	90 (REAR); 75 (FRONT)

### INSPECTION SEQUENCE:

CHAIN THROUGH LIFT POINT ON TIME  
LINK COUNT – 75 FRONT EXCESS SECURED W/ TYPE III  
SAFETY CHAINS SECURE W/ TYPE III NYLON  
AIR/ELECTRICAL HOSES SECURE W/ TYPE III NYLON  
JACK HANDLE SECURE W/ TYPE III NYLON  
FAUCET BOX SECURE W/ TYPE III NYLON  
REFLECTOR SHATTERPROOFED FAUCET BOX W/ 2" TAPE  
HAND BREAK ON  
REFLECTOR SHATTERPROOFED – REAR OF WHEEL WELL  
W/ 2" TAPE  
REFLECTOR SHATTERPROOFED – UNDER BRACKET W/ 2"  
TAPE  
BRAKE LIGHT SHATTERPROOFED W/ 2" TAPE  
LINK COUNT REAR – 90 EXCESS SECURED W/ TYPE III  
NYLON  
PADDING MATERIAL MADE OUT OF 2" TAPE  
LINK COUNT REAR – 90 EXCESS SECURED W/ TYPE III  
NYLON  
BRAKE LIGHT SHATTERPROOFED W/ 2" TAPE  
REFLECTOR SHATTERPROOFED – REAR OF WHEEL  
WELL W/ 2" TAPE  
REFLECTOR SHATTERPROOFED – UNDER BRACKET  
W/ 2" TAPE  
APEX SET FOR PROPER A/C  
APEX PIN – SECURE  
APEX ORDER CORRECT  
BREAKAWAY – CLUSTER W/ ¼" COTTON WEBBING  
FILL PORT COVER SECURE W/ TYPE III NYLON  
FAUCET BOX SECURE W/ TYPE III NYLON  
REFLECTOR SHATTERPROOFED – FAUCET BOX W/ 2"  
TAPE  
HAND BREAK - ON  
AIRHOSE SECURE W/ TYPE III NYLON

## A-22 CARGO BAG

MINIMUM FLY WEIGHT	500 lbs
ACL	2200 lbs
LINK COUNT 10K sling set	3
A-22 RULE OF THUMB:	GREEN, GREEN, METAL, GREEN

### INSPECTION SEQUENCE:

- APEX SET UP FOR PROPER A/C
- APEX PIN SECURED
- LINK COUNT 3
- MEDIUM CLEVIS
- LIFT POINT
- MEDIUM CLEVIS – BOLT TAPED ON EACH END
- SUSPENSION WEBBING-ALL COTTON OR ALL NYLON
- SUSPENSION WEBBING-PROPER ORDER
- SUSPENSION WEBBING-NO MORE THAN 1/2 TWIST
- BUTTERFLY HOOKS-FACING DOWN AND TOWARDS THE LOAD
- BUTTERFLY HOOKS-SECURED WITH 2" TAPE
- 188" STRAPS-CROSS CONFIGURATION
- 188" STRAPS-NO QUICK RELEASE
- 188"STRAPS-NO TWISTS
- 188"STRAPS-PROPERLY SECURED WITH 2" TAPE
- REPEAT STEPS 13-15 FOR 2<sup>ND</sup> 188" STRAPS
- TOP LATERAL STRAP-NO TWISTS
- TOP LATERAL STRAP-NO QUICK RELEASE
- TOP LATERAL STRAP-PROPERLY SECURED TO SELF WITH 2" TAPE
- REPEAT STEPS 17-19 FOR MIDDLE AND BOTTOM STRAPS
- LACING ROPE-550 LBS OR MORE
- LACING ROPE-ONE TIME THROUGH LACING LOOP
- LACING ROPE-GROUND TO SKY THROUGH LACING LOOP
- LACING ROPE-MAKES CROSS CORNERS
- LACING ROPE-ONE TIME THROUGH LACING LOOP
- LACING ROPE-GROUND TO SKY THROUGH LACING LOOP
- LACING ROPE-TIED WITH BOW KNOT (NON-SECURE)
- EXCESS SECURED WITH 2" TAPE
- REPEAT STEPS 21-28 FOR CORNERS 2,3 AND 4
- SCUFF PAD NOT INVERTED
- NO EXPOSED CARGO

APPENDIX G

10,000-POUND SLING SET CHAIN LINK NUMBER	25,000-POUND SLING SET CHAIN LINK NUMBER	40,000-POUND SLING SET CHAIN LINK NUMBER	15,000-POUND MULTILEG SLING SET CHAIN LINK NUMBER
	3		51
	4		52
3	5		53
4	6		54
5	6		54
6	7	3	55
7	8	4	56
8	9	4	57
9	9	5	57
10	10	6	58
11	11	6	59
12	11	7	59
13	12	7	60
14	13	8	61
15	14	9	62
16	14	9	62
17	15	10	No further conversions for 15,000-pound multileg sling set
18	16	11	
19	16	11	
20	17	12	
21	18	13	
22	19	13	
23	19	14	
24	20	15	
25	21	15	
26	21	16	
27	22	16	
28	23	17	
29	24	18	
30	24	18	
31	25	19	
32	26	20	
33	27	20	
34	27	21	
35	28	21	
36	29	22	
37	30	22	
38	31	23	
39	31	24	
40	32	24	

### SLING CONVERSION CHARTS

10,000-POUND SLING SET CHAIN LINK NUMBER	25,000-POUND SLING SET CHAIN LINK NUMBER	40,000-POUND SLING SET CHAIN LINK NUMBER	15,000-POUND MULTILEG SLING SET CHAIN LINK NUMBER
41	33	25	No further conversion for 15,000-pound multileg sling set
42	34	25	
43	34	26	
44	35	26	
45	36	27	
46	37	28	
47	38	28	
48	39	29	
49	39	29	
50	40	30	
51	41	30	
52	42	31	
53	43	32	
54	44	32	
55	45	33	
56	45	33	
57	46	34	
58	47	34	
59	48	35	
60	49	36	
61	50	36	
62	50	37	
63	51	37	
64	52	38	
65	53	38	
66	54	39	
67	54	40	
68	55	40	
69	56	41	
70	57	41	
71	57	42	
72	58	42	
73	59	43	
74	60	44	
75	61	44	
76	61	45	
77	62	46	
78	63	46	
79	64	47	
80	65	48	

10,000-POUND SLING SET CHAIN LINK NUMBER	25,000-POUND SLING SET CHAIN LINK NUMBER	40,000-POUND SLING SET CHAIN LINK NUMBER	15,000-POUND MULTILEG SLING SET CHAIN LINK NUMBER
81	65	48	No further conversion for 15,000-pound multileg sling set
82	66	49	
83	67	49	
84	68	50	
85	68	51	
86	69	51	
87	70	52	
88	71	53	
89	72	53	
90	72	54	
91	73	55	
92	74	55	
93	75	56	
94	76	57	
95	76	57	
96	77	58	
97	78	58	
98	79	59	
99	79	60	
100	80	60	
101	81	61	
102	82	62	
103	83	62	
104	83	63	
105	84	64	
106		64	
107		65	

## APPENDIX H

### SLING LOAD INSPECTION RECORD

#### INTRODUCTION:

In order to improve sling load safety, all Army loads require an inspection by a qualified inspector prior to the arrival of the supporting aircraft using the Sling Load Inspection Record.

#### INSPECTOR QUALIFICATIONS:

Inspectors must meet the following qualifications:

Be in the grade of E4 or above AND

Be a graduate of one of the following courses:

Pathfinder

Air Assault

Sling Load Inspector Certification Course (SLICC)

#### DISTRIBUTION OF THE SLING LOAD INSPECTION RECORD:

The Sling Load Inspection Record requires three copies.

Distribute the form as follows:

Copy One - To the supporting aviation unit

Copy Two - Securely taped or tied to the load

Copy Three - To the supported unit

The Sling Load Inspection Record form may be reproduced locally pending official distribution.

#### COMPLETING THE SLING LOAD INSPECTION RECORD:

Procedures for completing the Sling Load Inspection Record are as follows:

Block 1 - Supported unit identification

Block 2 - Item description and serial/bumper number

Block 3 - Weight of load

Block 4 - Supporting aviation unit identification

Block 5 - Type of aircraft used

Block 6 - FM used to rig the load

Blocks 7 through 10 - Fill out only blocks that pertain to your load.

Persons rigging and inspecting the load must INITIAL the appropriate blocks

Block 11 - Identifies the supported unit person rigging the load and the date the load was rigged

Block 12 - Identifies the supported unit person inspecting the load and the date the load was inspected

Remarks - List any deficiencies found in the load

<b>SLING LOAD INSPECTION RECORD</b>			
For use of this form, see FM 10-450-3; the proponent agency is TRADOC			
1. SUPPORTED UNIT	2. ITEM DESCRIPTION AND SERIAL/BUMPER NO.	3. WEIGHT	
4. SUPPORTING AVIATION UNIT	5. TYPE AIRCRAFT	6. RIGGED IAW FM NO	
<b>INITIAL ONLY ITEMS APPLICABLE TO YOUR SPECIFIC LOAD</b>		LOAD RIGGED BY	LOAD INSPECTED BY
<b>7. VEHICLE OR LOAD</b>			
A. CORRECTLY POSITIONED			
B. EMERGENCY BRAKE SERVICEABLE AND SET			
C. FUEL LEVEL NOT TO EXCEED 3/4 TANK			
D. PREPARED AND PADDED IAW THE APPROPRIATE FM			
<b>8. SLING SET</b>			
A. CORRECT NUMBER AND SIZE (10K OR 25K)			
B. INSPECTED FOR SERVICEABILITY IAW FM 10-450-3			
C. SLING LEGS PROPERLY ROUTED AND ATTACHED TO LIFT POINT			
D. CORRECT LINK COUNT FRONT AND REAR			
E. CHAIN SECURED IN GRAB LINK			
F. EXCESS CHAIN TIED OR TAPED (10 LINKS OR MORE)			
G. BREAKAWAY TIES INSTALLED			
H. APEX ATTACHED			
I. APEX SPACER INSTALLED IF REQUIRED			
J. REACH PENDANT INSTALLED IF REQUIRED			
<b>9. A-22 CARGO BAG</b>			
A. INSPECTED FOR SERVICEABILITY IAW FM 10-450-3			
B. RIGGED IAW FM 10-450-3			
C. SUSPENSION WEBS ATTACHED TO CONTAINER AND TAPED			
D. CLEVIS BOLT THROUGH SUSPENSION WEB D-RINGS (4 EACH)			
E. CORRECT SLING LEG ATTACHED			
F. APEX ATTACHED (CORRECT TYPE)			
G. APEX SPACER INSTALLED IF REQUIRED			
<b>10. CARGO NETS</b>			
A. CORRECT SIZE (5K OR 10K)			
B. INSPECTED FOR SERVICEABILITY IAW FM 10-450-3			
C. LOAD CORRECTLY POSITIONED			
D. LIFTING LEGS PROPERLY CONNECTED TO APEX FITTING			
E. HOOKS TAPED			
F. LIFTING LEGS TAPED OR TIED (BREAKAWAY)			
G. CORRECT NUMBER AND SIZE SLING LEGS			
REMARKS:			
<b>11. LOAD RIGGED BY:</b>			
UNIT (PRINT)	NAME (PRINT)	INITIALS	RANK
SIGNATURE		DATE	
<b>12. LOAD INSPECTED BY:</b>			
UNIT (PRINT)	NAME (PRINT)	INITIALS	RANK
SIGNATURE		DATE	

DA FORM 7382-R, MAR 97

