

Aviation Rescue Swimmer School

Primary Rescue Devices and
Procedures

LT 4.3

ENABLING OBJECTIVES

- Explain the functional operation of the following Rescue Devices per NWP 3-50.1:
 - Double Rescue Hook
 - Modified Rescue Strop
 - Quick Strop
 - Rescue Net
 - Rescue Litter/ SAR MEDEVAC Litter, Trail line and Gloves
 - Rescue Seat

ENABLING OBJECTIVES

- Demonstrate procedures for placing a survivor into the following rescue devices in a water environment:
 - Double Rescue Hook
 - Modified Rescue Strop
 - Rescue Litter/ SAR MEDEVAC Litter

COMMUNICATION PROCEDURES

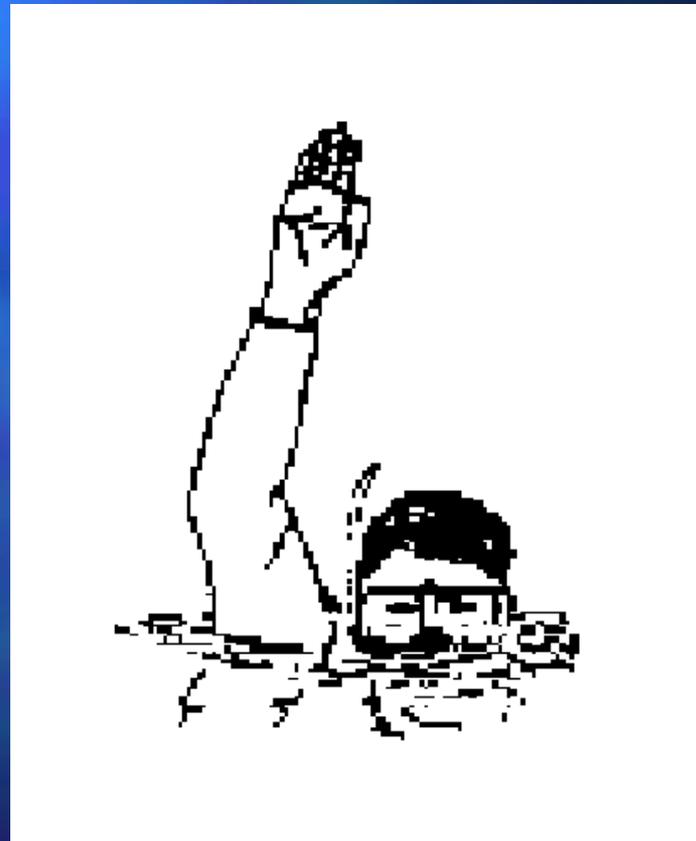
- Efficient communications keeps pilot, hoist operator, deck crew and swimmer aware of a developing rescue situation and allows rescue platform to provide needed support to swimmer (i.e., deployment of rescue devices).
- The radio offers an optimal secondary means of communications.

COMMUNICATION PROCEDURES

- Hand signals are the primary means of communication between Rescue Swimmer and the rescue platform in a maritime environment.
- All crewmembers must be familiar with the meaning of standard hand signals.

HAND SIGNALS

- I am all right
(Raised arm, open hand, fingers extended).



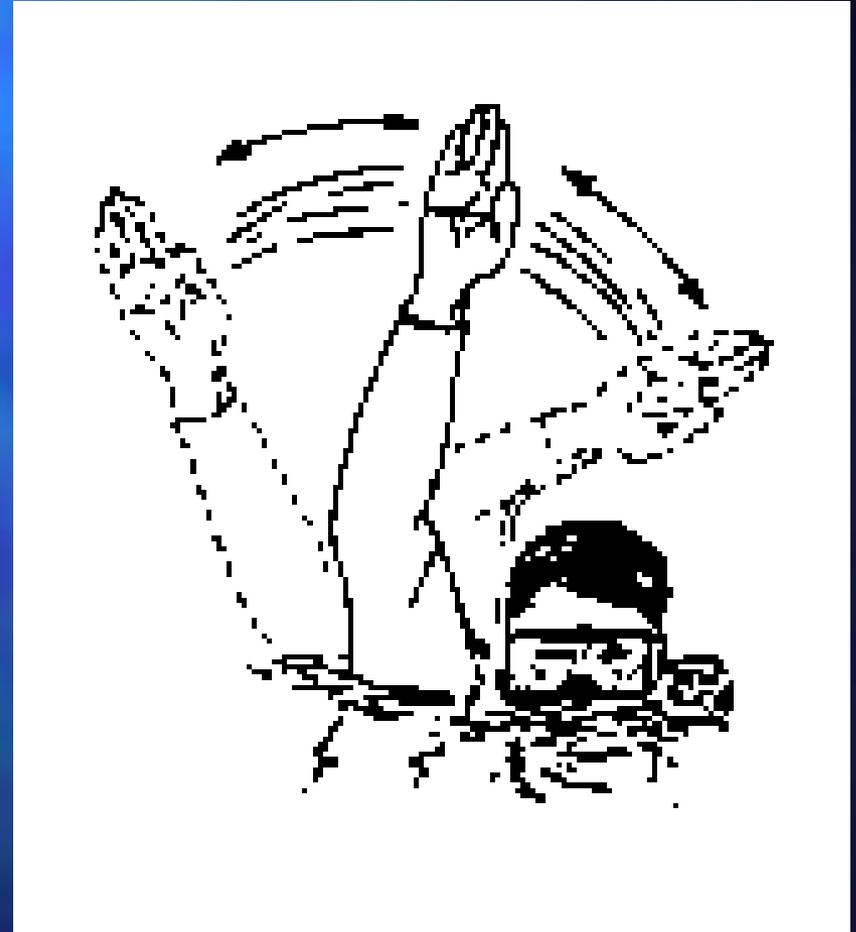
HAND SIGNALS

- Move in for pickup -
Raised arm, thumb
up.



HAND SIGNALS

- In trouble, need assistance - Vigorous waving of one arm.



HAND SIGNALS



- Deploy Raft-
Clenched fists, arms
crossed overhead.

HAND SIGNALS

- Deploy Radio - Hand held to ear.



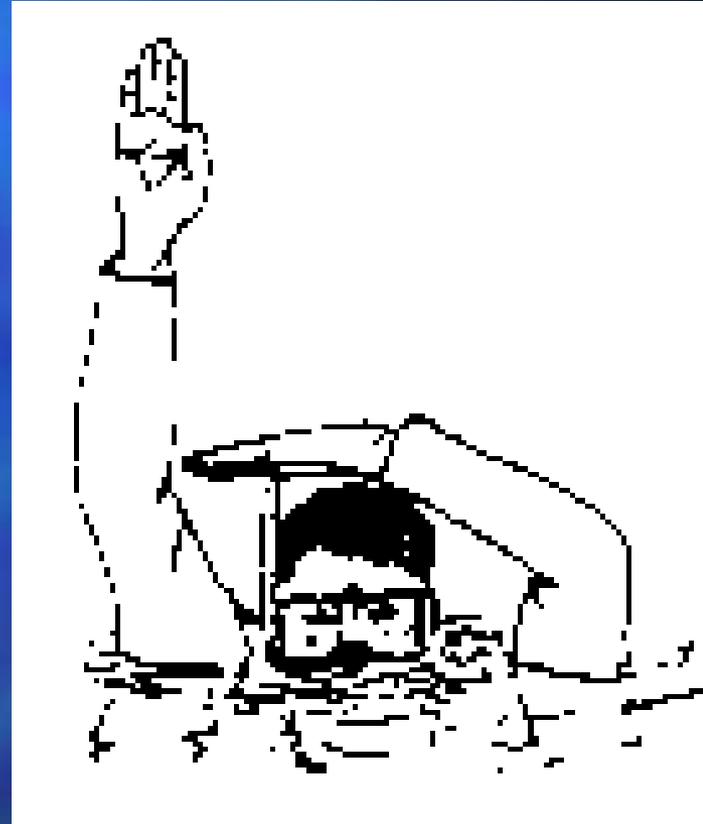
HAND SIGNALS



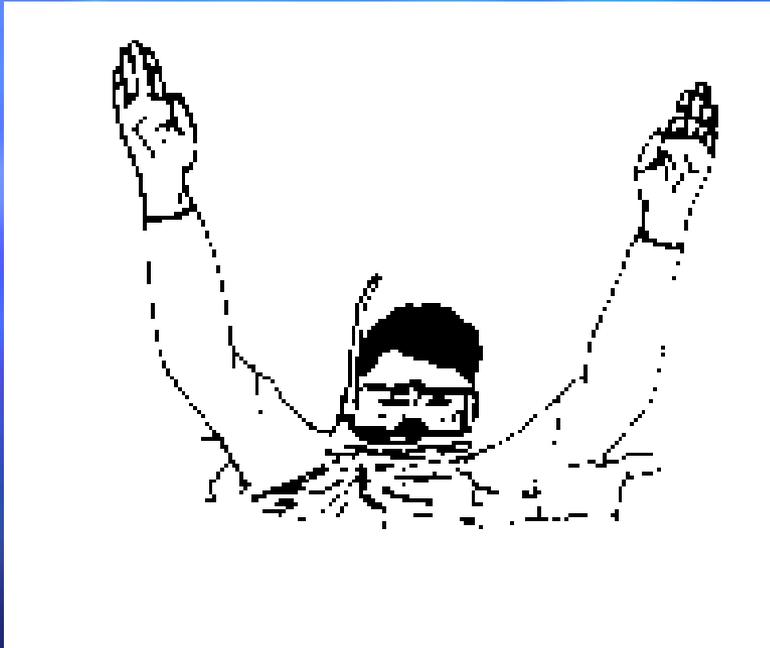
- Deploy Pneumatic Webbing Cutter -
Clenched fist, arm pumping motion

HAND SIGNALS

- Deploy Rescue Litter
 - One arm raised with open palm, fingers extended over the swimmer's head and touching the first arm at the elbow.

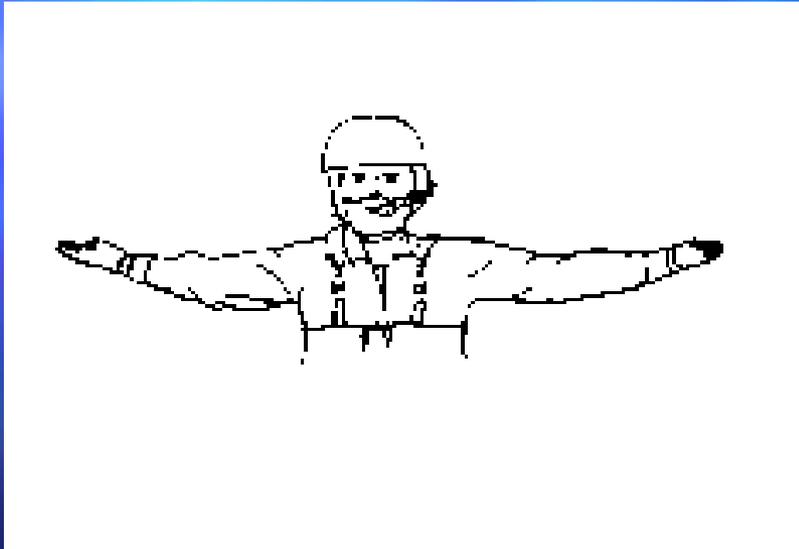


HAND SIGNALS



- **Deploy Rescue Net-**
Both arms raised, palms open, fingers extended at a 45 degree angle to the swimmer's head.

HAND SIGNALS



- Rescue Seat - Both arms out stretched palms up.

HAND SIGNALS

- **Deploy oxygen/suction unit-**
One palm cupped over mouth and nose, clenched fist in front.



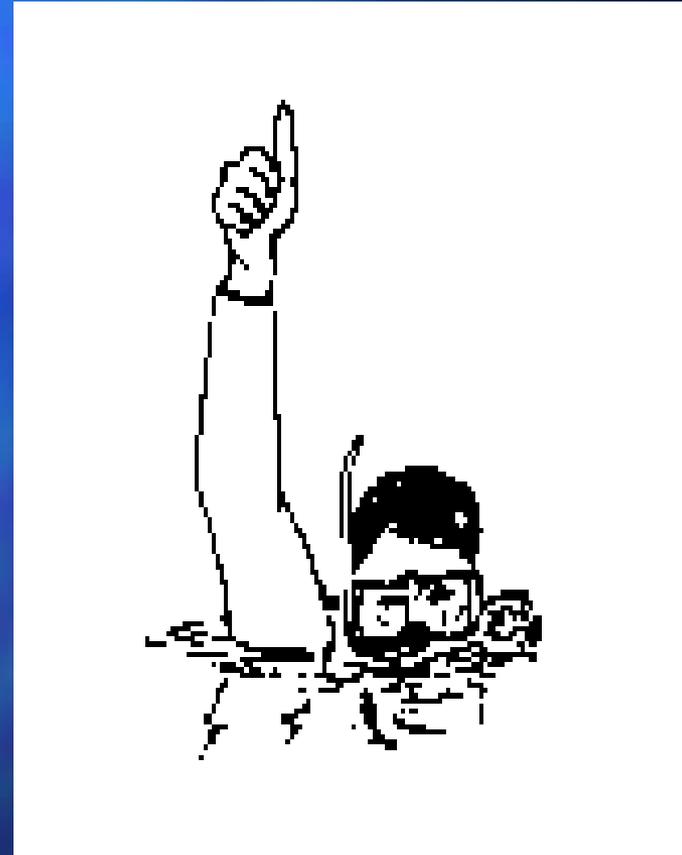
HAND SIGNALS



- **Deploy medical kit-**
Both arms raised,
palms overlapping
and touching top of
head.

HAND SIGNALS

- **Ready to be hoisted-**
Raised arm, thumb
up



HAND SIGNALS

- Stop Hoisting -
Raised arm,
clenched fist



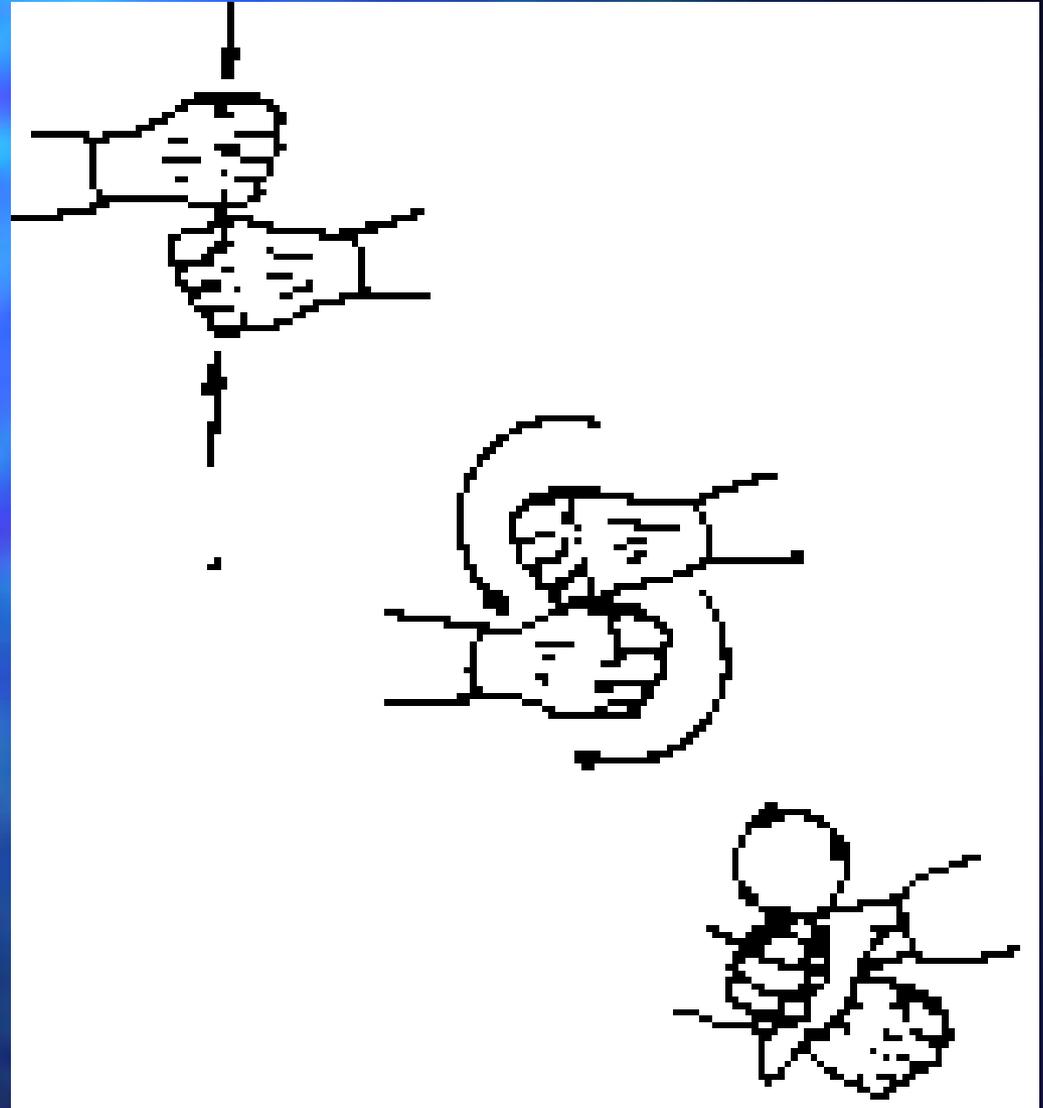
HAND SIGNALS



- Lower Cable -
Raised arm, thumb
down.

HAND SIGNALS

- Failed Hoist -
Clenched fist
over
clenched fist
followed by a
thumbs down
by hoist
operator



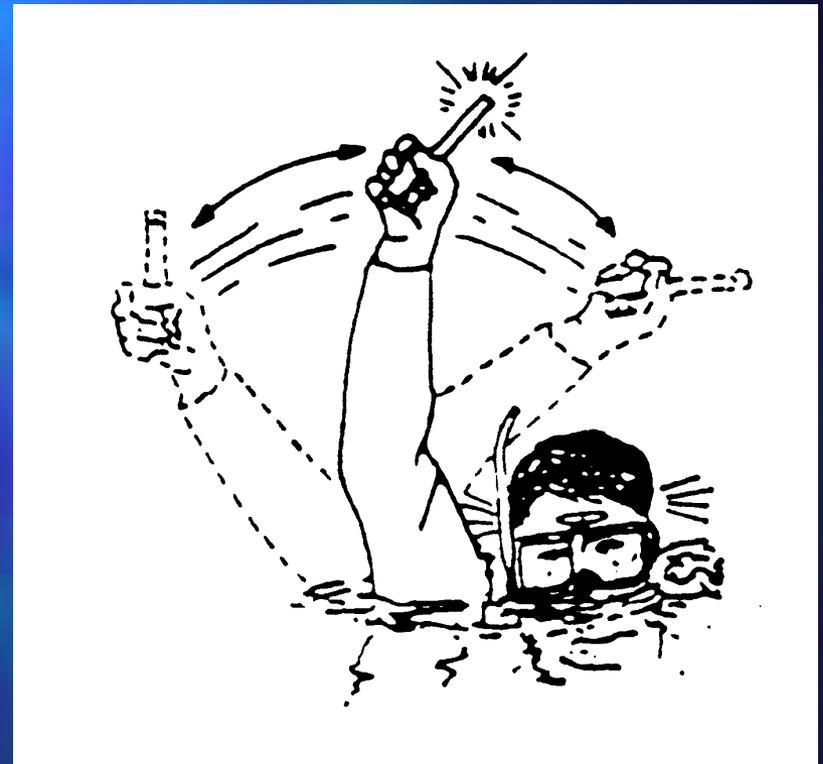
HAND SIGNALS (NIGHT)



- I'm all right - Swimmer's lighting device (chemlight) on, raised arm, palm open, fingers extended.

HAND SIGNALS (NIGHT)

- Move in for pick-up -
Wave chemlight



HAND SIGNALS (NIGHT)



- In trouble need assistance - Wave signal device (smoke flare)

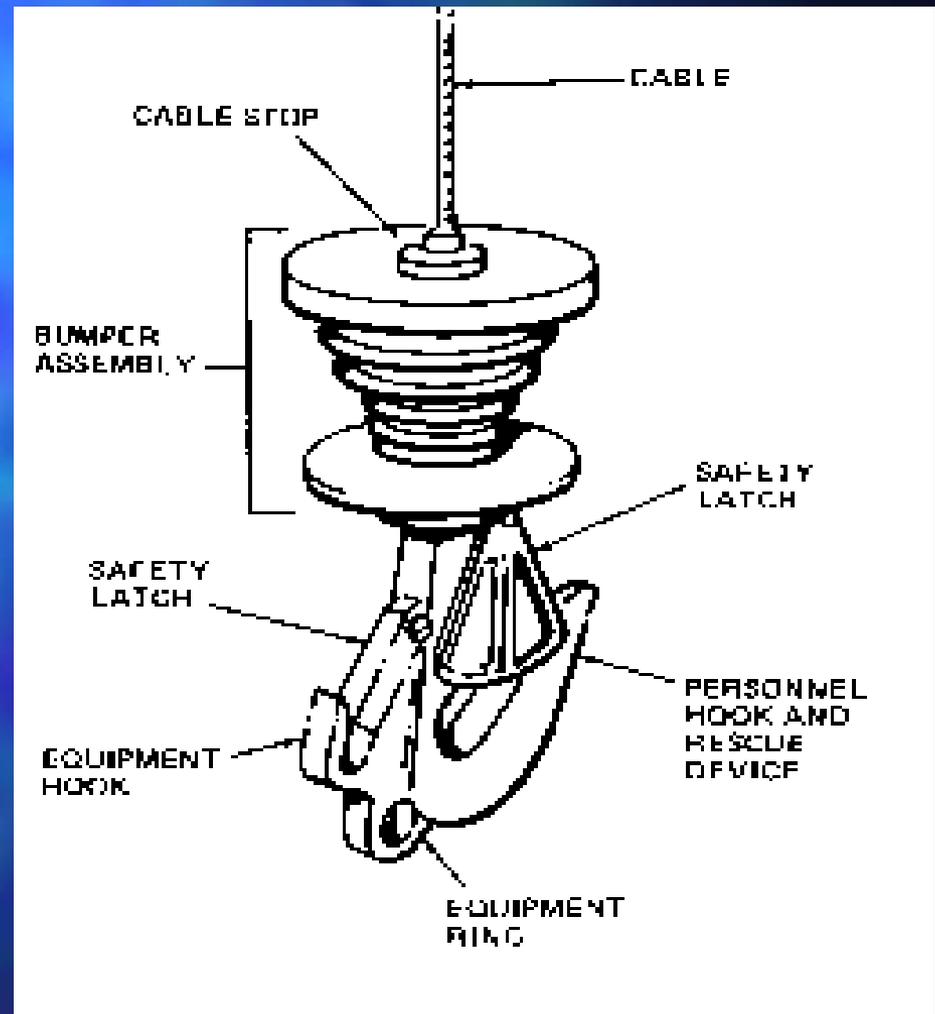
HAND SIGNALS (NIGHT)

- In trouble need assistance - Blue strobe on.



DOUBLE RESCUE HOOK

- The Double Rescue Hook is the primary rescue device
- All other rescue devices can only be used with the Double Rescue Hook

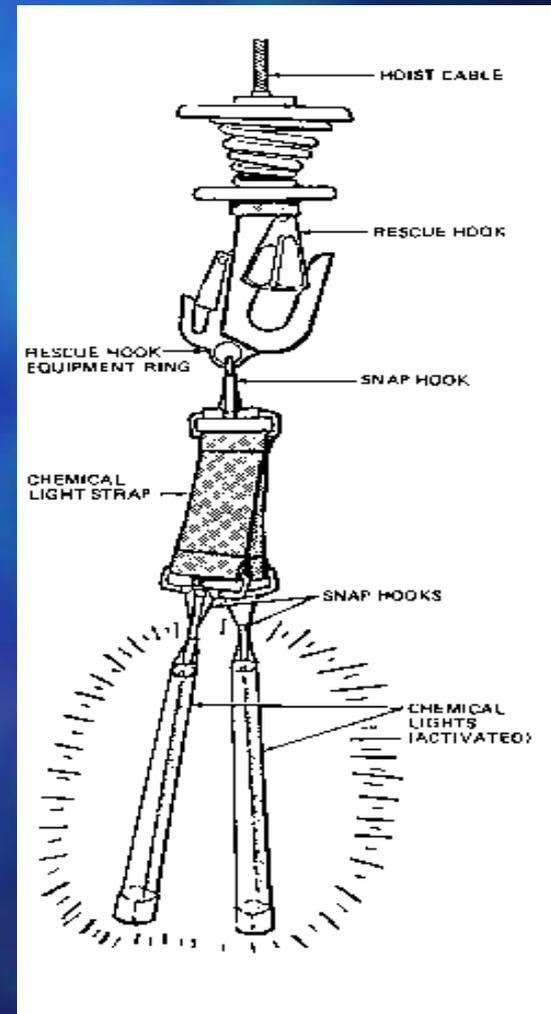


LOAD RATINGS OF THE DOUBLE RESCUE HOOK NAVAIR 13-1-6.5.

- Large hook, rated @ 3000 lbs., shall be the only hook used to hoist personnel.
- Small hook, rated @ 1000 lbs., is to be used only for lightweight items such as mail.
- The equipment ring, rated @ 1500 lbs., can be used to hoist light equipment and mail .

DOUBLE RESCUE HOOK

- Night time illumination
- Attach chemlight strap to equipment ring and attach two chemlights to strap.



PROCEDURES FOR HELO-DEPLOYED RESCUE HOOK

WARNING

Never touch any device before it is grounded on deck or by water entry, as doing so may cause electrical shock. Helicopter rotors can build up a significant static electrical charge.

PROCEDURES FOR HOISTING SWIMMER ALONE

- Signal for pickup.
- Allow hook to ground.
- Connect "V"- ring to large hook.

PROCEDURES FOR HOISTING SWIMMER ALONE.

- Perform safety check
 - Double check connections.
 - Ensure cable is clear and taut.
- Signal for “up- hoist”.

PROCEDURES FOR HOISTING SURVIVOR ALONE

- Signal for pickup
- Allow hook to ground
- Connect survivor's "V"- ring (center of chest) or "D"- ring (right shoulder) to large hook
- Perform safety check to ensure survivor is not entangled in the hoist cable
- Signal for "up-hoist"

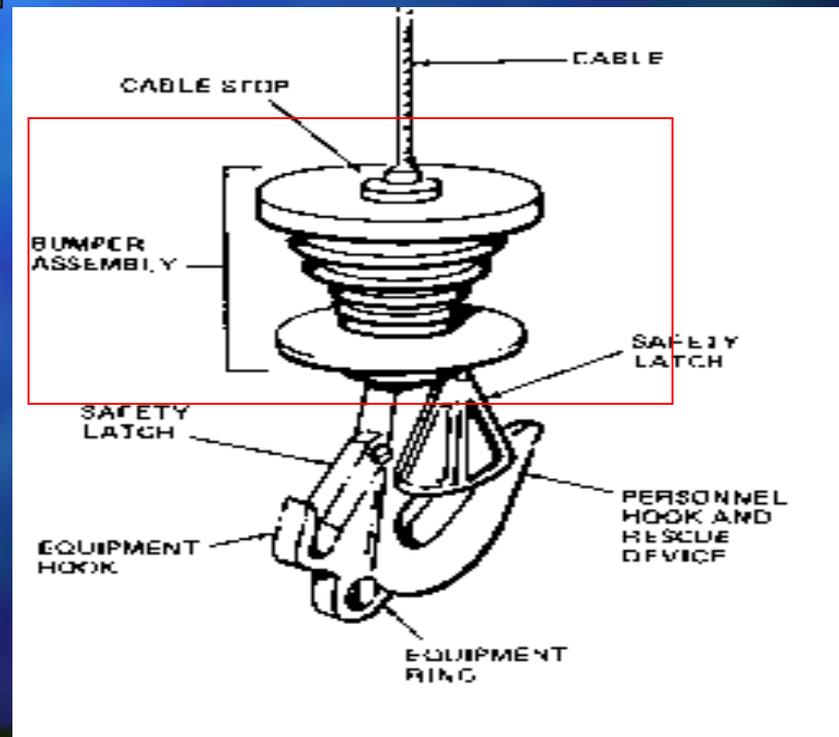
PROCEDURES FOR HOISTING SURVIVOR AND SWIMMER SIMULTANEOUSLY

- Connect the Rescue Swimmer's harness snap hook to the survivor's lifting device
- Signal ready for pickup
- Allow hook to ground
- Connect lifting "V"-ring of Rescue Swimmer's harness to large rescue hook
- Perform safety check.
- Signal for "up-hoist"

PROCEDURES FOR HOISTING SURVIVOR AND SWIMMER SIMULTANEOUSLY

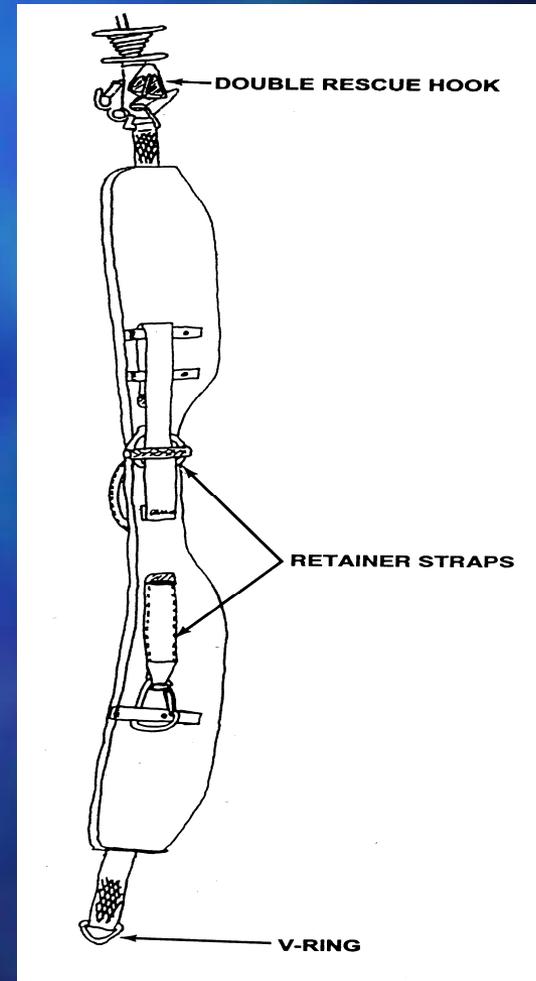
WARNING

Do not place fingers in or around the bumper compression spring due to the possibility of a crushing injury during hoisting operations when the hoist reaches the upper limit switch.



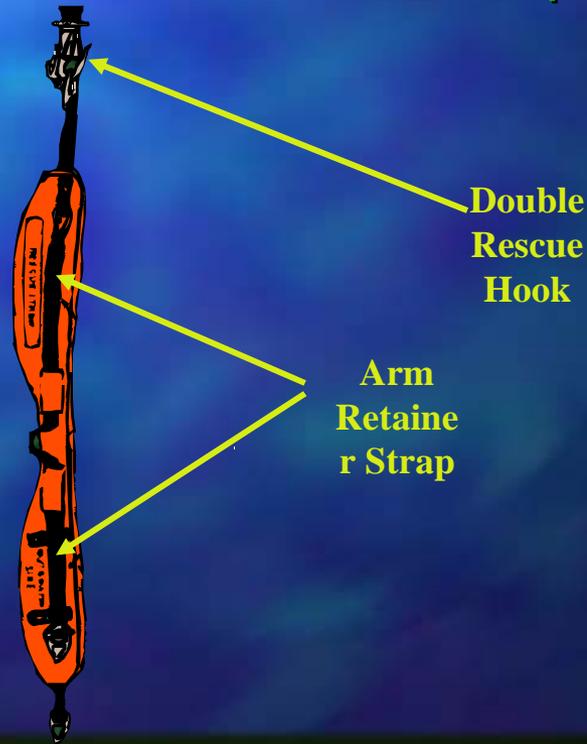
MODIFIED RESCUE STROP

- Rescue device used with Double Rescue Hook. The Modified Rescue Strop is a buoyant device with a red waterproof cover designed to accommodate one survivor.



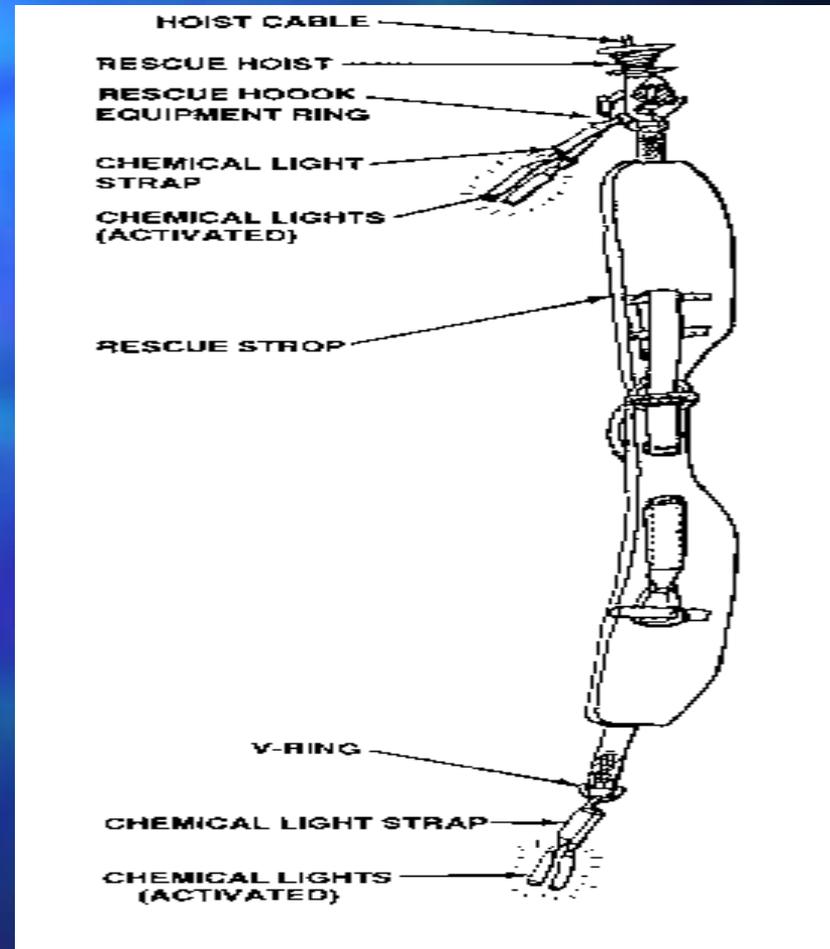
MODIFIED RESCUE STROP

- A webbing strap runs through the cover and has a "V"-ring at both ends for attaching the Double Rescue Hook. Two arm retainer straps are attached on the outside to hold survivor in the strop.



MODIFIED RESCUE STROP

- Night time illumination:
 - **Two** chemlights are attached to the strap. Strap is attached to Rescue Strop lower "V"-ring by the crewman



MODIFIED RESCUE STROP

NOTE

Arm retainer straps shall be in the stowed position when lowering the Rescue Strop.

PROCEDURES FOR MODIFIED RESCUE STROP

- Signal for pickup.
- Allow rescue device to touch water.
- Approach hoist with survivor in an appropriate carry.
- Working behind the survivor, with arm retainer straps outboard, the Rescue Swimmer shall pass the free end of the strop under one arm, around the back and under the other arm.

MODIFIED RESCUE STROP

- Connect the Rescue Strop free end lifting "V"-ring to the large hook.
- Position the Rescue Strop tightly under the survivor's armpits and on the upper half of the survivor's back.

Modified Rescue Strop

WARNING

Arm retainer straps shall always be used when hoisting with the Rescue Strop. This prevents the survivor's arms from rising and the survivor from slipping out of the Rescue Strop.

MODIFIED RESCUE STROP

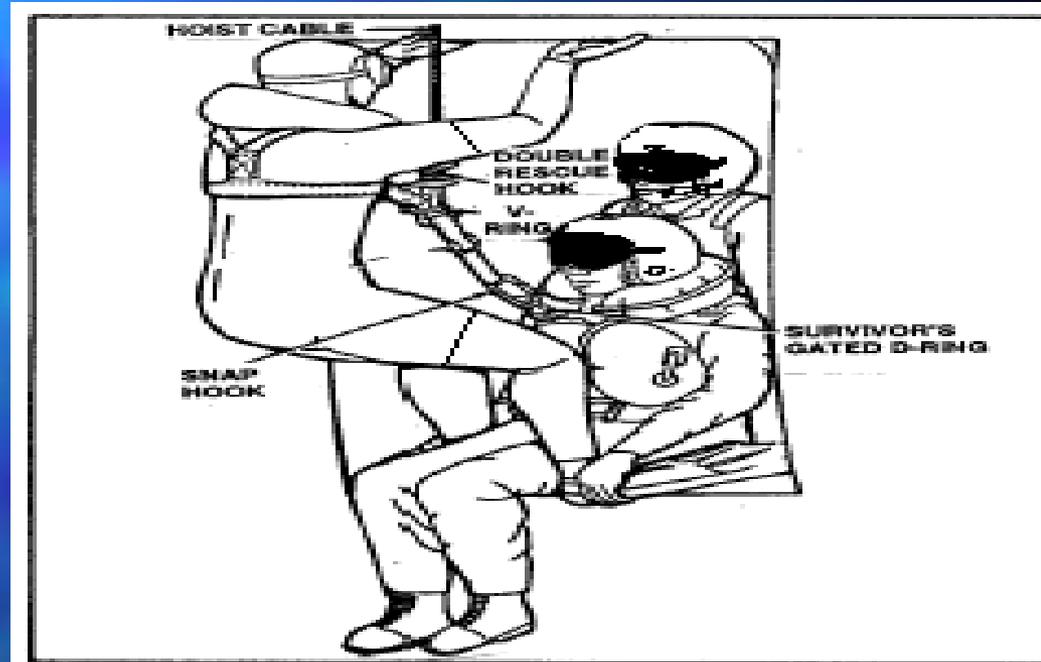
- Pass the arm retainer straps over the survivor's arms, route under the Rescue Strop and across the survivor's chest.
- Connect the snap- hook arm retainer strap to the "V"-ring arm retainer strap.
- Pull webbing on the "V"-ring arm retainer strap until the arm retainer straps are secured tightly around the survivor's arms.

MODIFIED RESCUE STROP

- If swimmer is to be hoisted, connect swimmer's lifting "V"-ring to the large Hook.
- Perform safety check.
- Signal ready to be hoisted.

MODIFIED RESCUE STROP

- Rescue Swimmer and survivor are hoisted up to the aircraft. After reaching the aircraft, the Rescue Swimmer and crewman shall assist the survivor inside the aircraft.

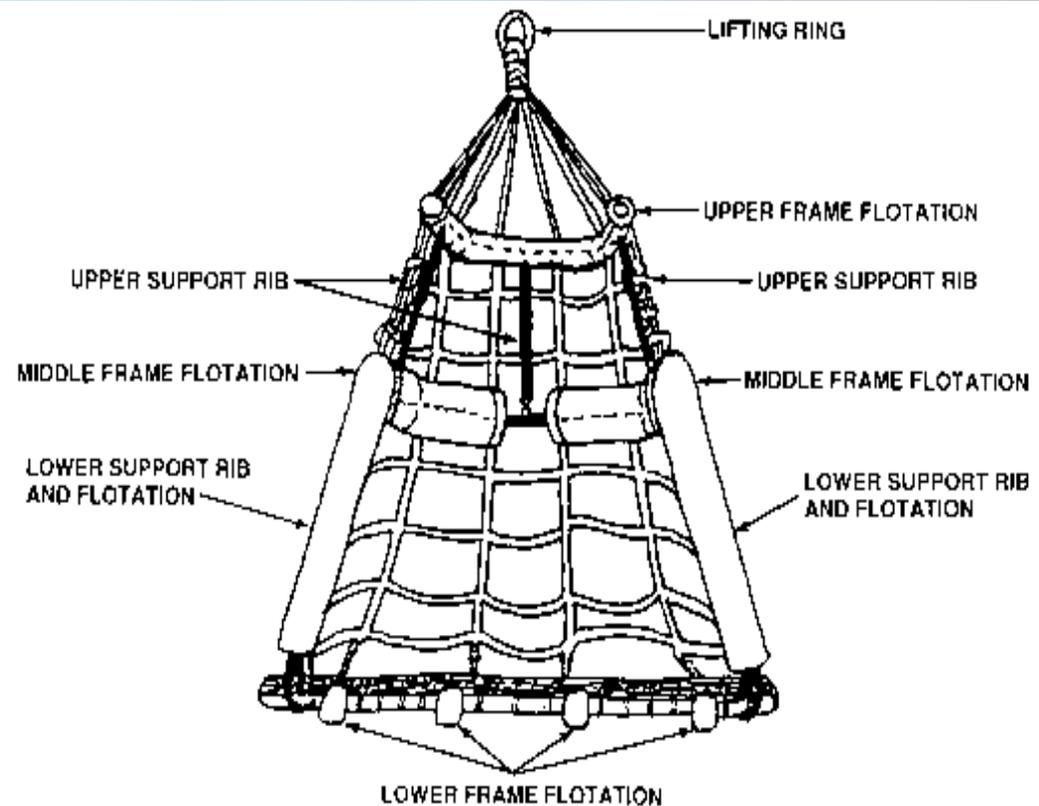


MODIFIED RESCUE STROP

- Once the survivor is inside and on the deck of the aircraft, the Rescue Swimmer shall maintain positive control of the survivor until the crewman gives a thumbs up. A thumbs up indicates to the Rescue Swimmer that the crewman has the survivor in positive control within the aircraft.

RESCUE NET

- Conically-Shaped Bird Cage.



RESCUE NET

WARNING

In order to utilize the net, the front support rods must be locked in place to prevent the net from collapsing on the survivors. Collapsing of the net could result in the survivor(s) drowning.

- Primarily used for multiple rescue.
- Never send unconscious victim up alone in rescue net.

RESCUE NET

- Flotation for two persons.
- A "V"-strap is provided for securing the net in the rescue vehicle door.
- Night time illumination
 - Two chemlights are attached to the strap. Chemlight straps are attached to nylon rope just above the middle frame flotation on both sides of the net opening.

RESCUE NET PROCEDURES

- Signal for net
- Allow device to ground
- Place Rescue Net opening directly in front of the Rescue Swimmer without disconnecting it from rescue hook.
- Place survivor in a collar/equipment tow and swim into rescue net backwards while positioning the survivor on either side of the net facing out.

RESCUE NET PROCEDURES

- Ensure that survivors body is entirely in the net.

WARNING

Survivor shall not attempt to get out of the rescue net until directed by the crewman

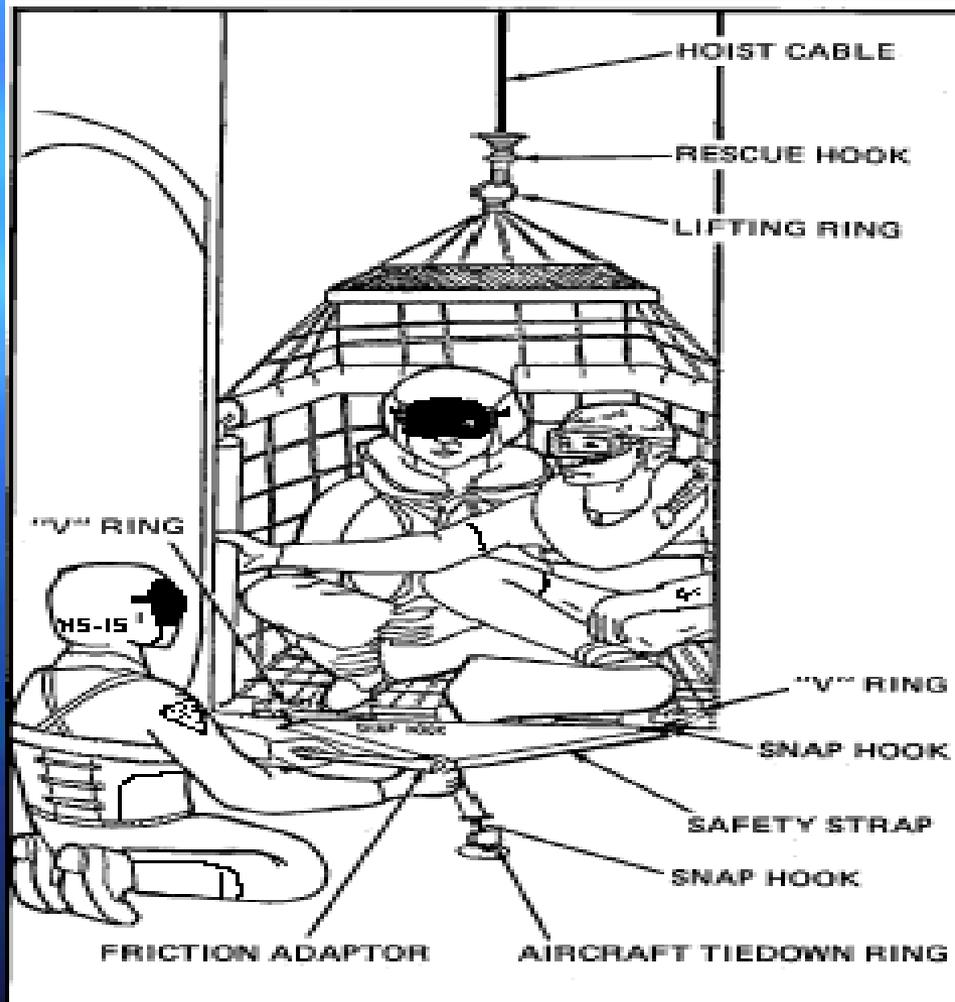
- Place one arm across the net.
- Signal for "up-hoist".

RESCUE NET PROCEDURES

- When net reaches the helicopter, the crewman shall hook up the safety strap from the Rescue Net to the decking of the helicopter. The crewman shall assist the survivor inside the helicopter.

RESCUE NET

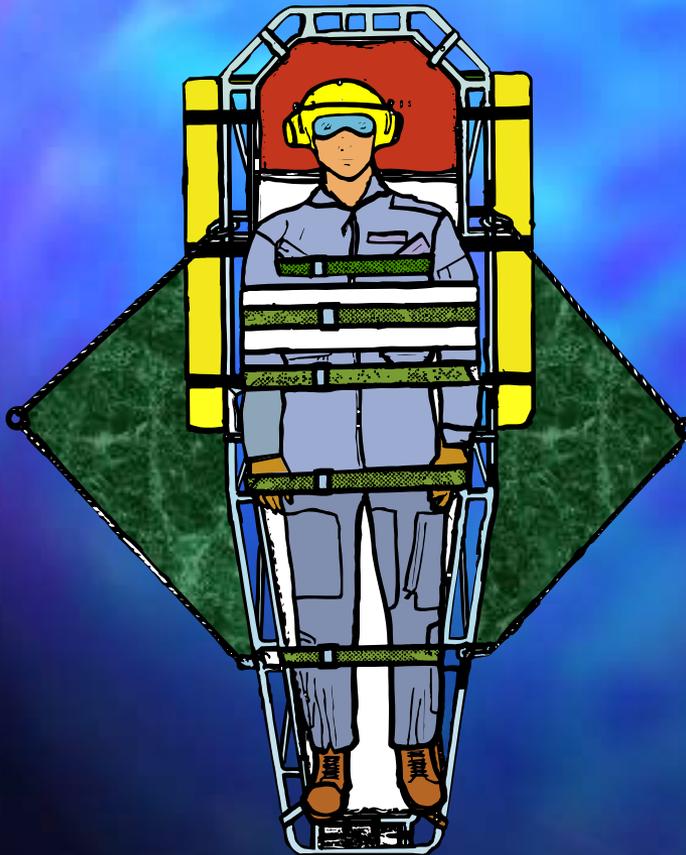
V-Strap attachment to aircraft:



RESCUE LITTER/SAR MEDEVAC LITTER CHARACTERISTICS

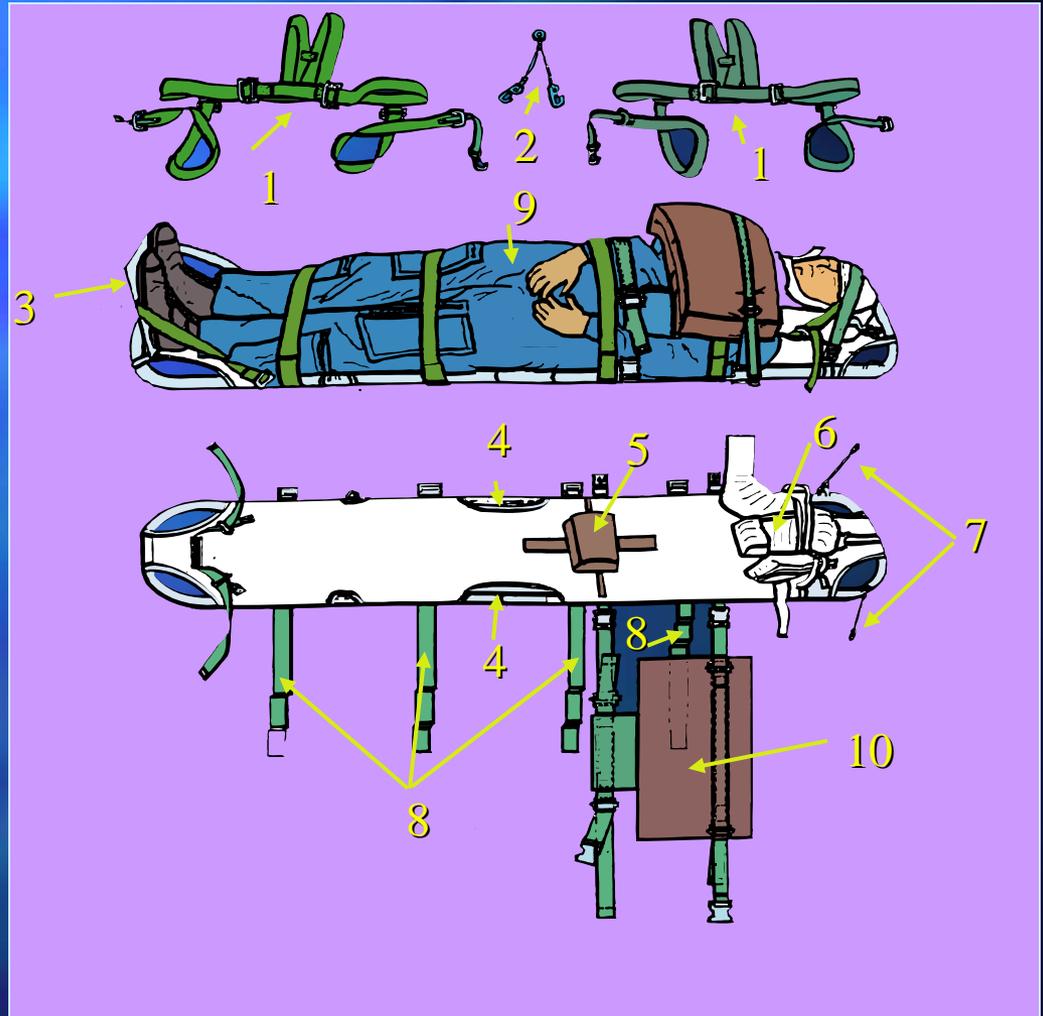
- Both are for use with suspected back injury victims and unconscious survivors.
- Both are designed to be used over land or in water with flotation assemblies.
- Rescue Litter requires a flotation kit for over water use. When flotation is installed, litter floats with patients head slightly reclined from vertical.

RESCUE LITTER



SAR MEDEVAC LITTER

- 1. Adjustable Carrying Harness (2 ea.)
- 2. Vertical Hoisting Sling
- 3. Foot Restraint Assembly
- 4. Locking Couplers
- 5. Lumbar Support Pad
- 6. Head Restraint
- 7. Hoisting Connecting Cable
- 8. Patient Straps
- 9. Patient in Litter
- 10. Chest Flotation



RESCUE LITTER/SAR MEDEVAC LITTER CHARACTERISTICS

WARNING

If survivor is wearing the bright orange Quick Donning Anti-exposure Suit, it may counteract the self-righting feature of the Rescue Litter and the SAR MEDEVAC Litter.

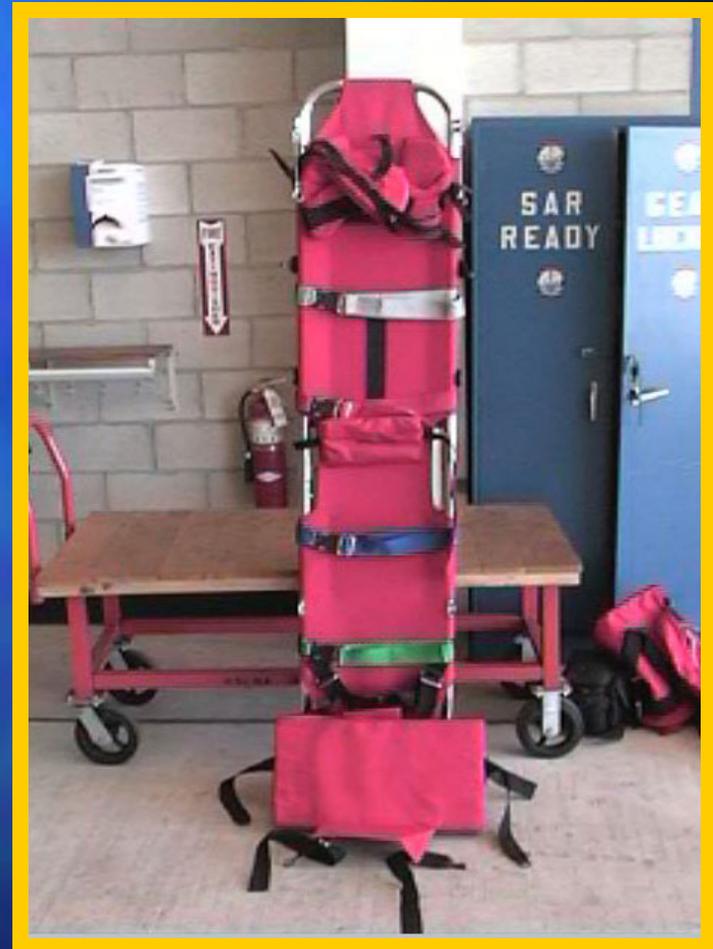
RESCUE LITTER/SAR MEDEVAC LITTER CHARACTERISTICS

- Both have a two piece rescue litter hoisting sling which attached to the Double Rescue Hook. Sling is color coded short red to head and long white to feet.

RESCUE LITTER/ SAR MEDEVAC LITTER CHARACTERISTICS

- The SAR MEDEVAC Litter folds in half and can be stored in a backpack and weighs approximately 40 lbs. It can be hoisted vertically or horizontally with its own sling, making it especially useful in restricted access situations. Overland, two rescuers can carry the litter between them using the two adjustable carrying harnesses.

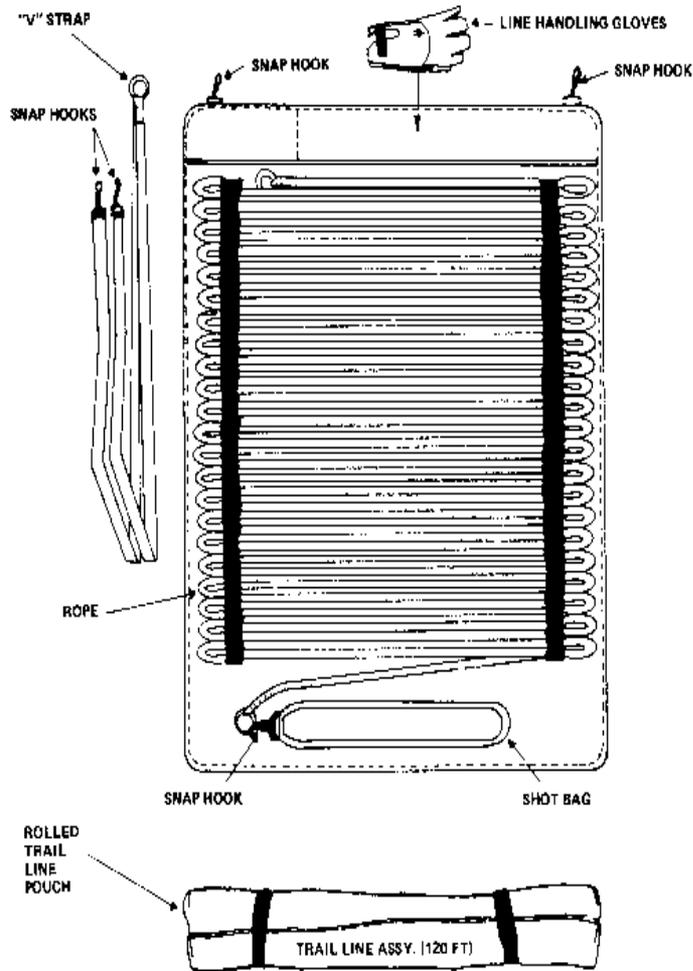
SAR MEDEVAC LITTER



RESCUE LITTER/ SAR MEDEVAC LITTER CHARACTERISTICS

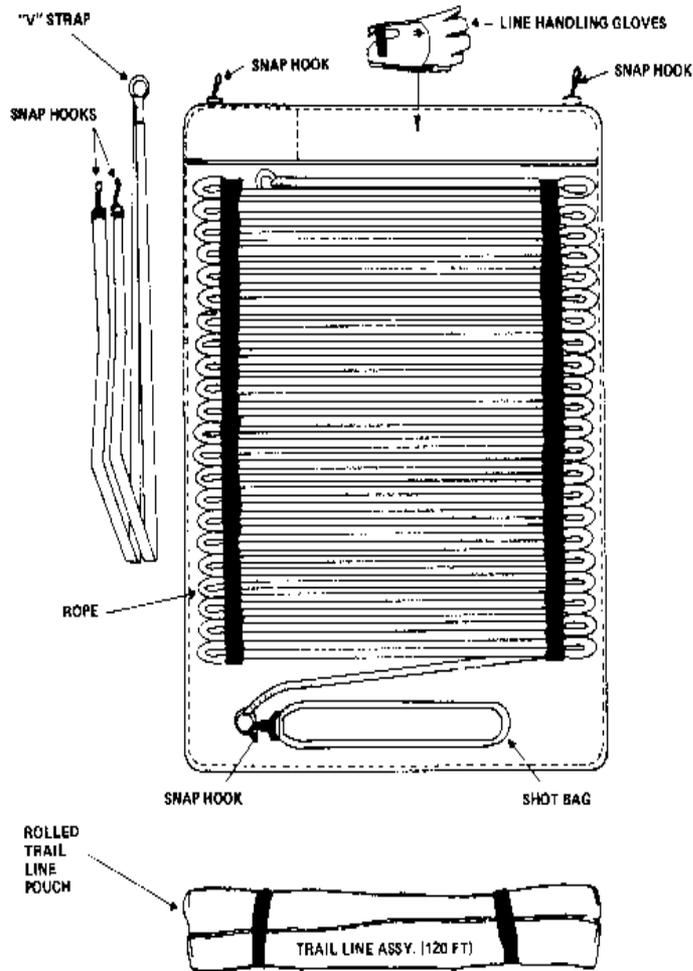
- Night time illumination:
 - Two chemlights are attached to each strap. One strap is attached to the head of the litter, one to the foot.
- Both litters utilize a "trail line" controlled by the swimmer in the water to control litter deployment and stabilize the litter during hoisting.

TRAIL LINE ASSEMBLY



- One hundred and twenty (120') feet in length.
- Three eighths inch thick polyethylene, diamond braided rope.

TRAIL LINE ASSEMBLY



- A weak link is incorporated, designed to break if the trail line becomes entangled.
- Gloves and line are deployed together via a 5 pound shot bag.

SECURING SURVIVOR TO THE RESCUE LITTER

- Rescue Litter has five restraint straps. They are stowed with four retaining straps.
- Procedure for securing survivor:
 - The rescue swimmer shall guide the survivor into the positioned litter by using the collar tow or equipment carry.

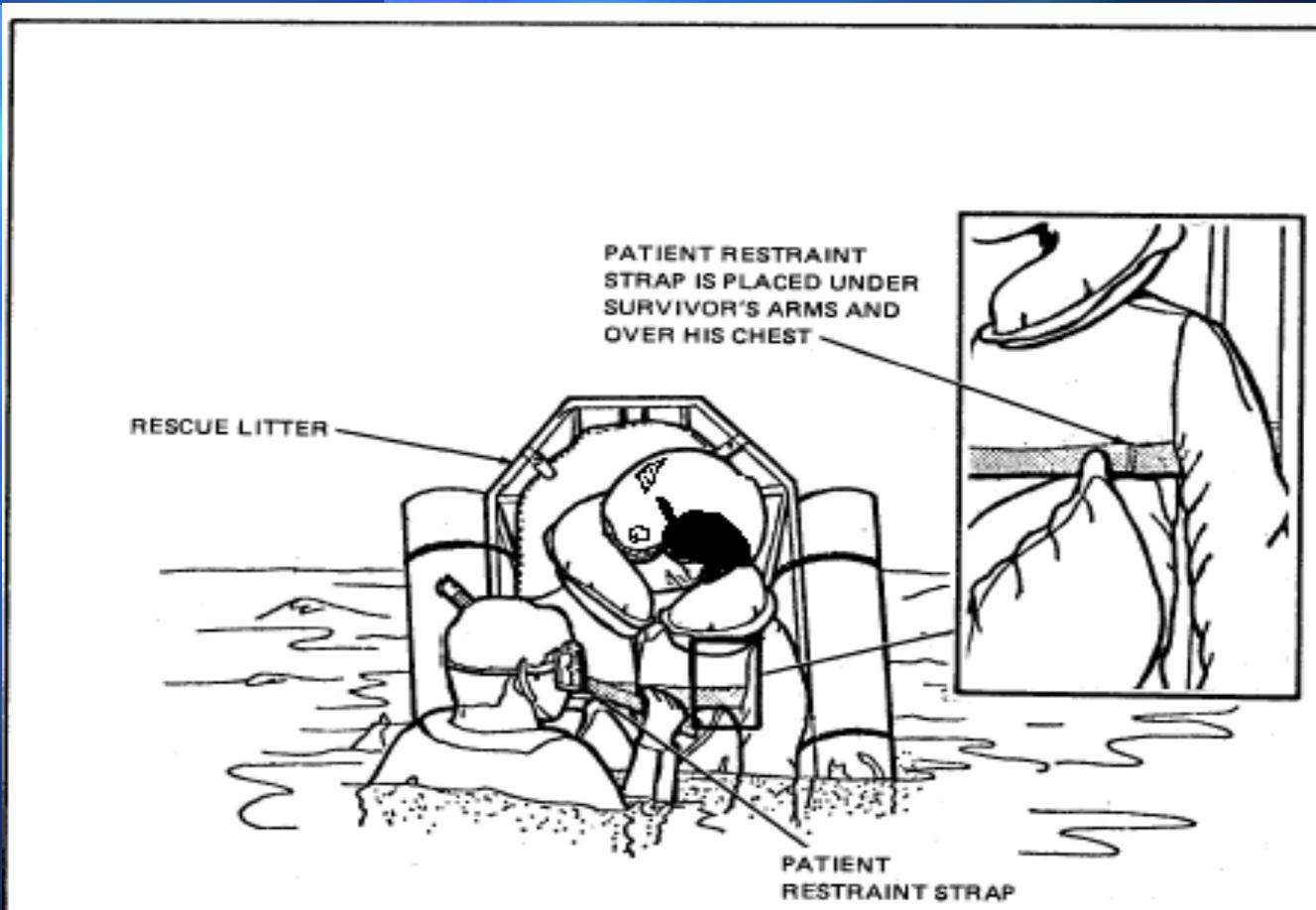
SECURING SURVIVOR TO THE RESCUE LITTER

- Once positioned, the swimmer shall the the top restraint strap from the front of the litter and secure it around the survivor's chest. The strap is pulled loose from the right side, placed under the arms but over the chest, and attached to the fitting on the left. (Swimmer facing litter)
- Next, working from the chest strap down, secure the rest of the restraint straps.

SECURING SURVIVOR TO THE RESCUE LITTER

- Once the restraint straps are secured, attach the chest pad over the survivor's arms. The rescue swimmer may encounter some difficulty if survivor has flotation; however, flotation shall not be removed. Instead, remove chest pad from litter and continue with rescue. If practical swimmer will return chest pad back to helicopter when hoisted.

SECURING SURVIVOR TO THE RESCUE LITTER



SECURING SURVIVOR TO THE SAR MEDEVAC LITTER

- Litter will need to be assembled by hoist operator prior to lowering to swimmer.
- Litter has integral cervical collar and head restraint, four patient restraint straps, one chest flotation pad assembly strap, and one foot restraint assembly.

SECURING SURVIVOR TO THE SAR MEDEVAC LITTER

- The rescue swimmer shall guide the survivor into the positioned litter by using the collar tow or equipment carry.
- Once positioned, the swimmer shall take the top restraint strap from the front of the litter and secure it around the survivor's chest. The strap is pulled loose from the right side, placed under the arms but over the chest, and attached to the fitting on the left.

SECURING SURVIVOR TO THE SAR MEDEVAC LITTER

- Next, working from the chest strap down, secure the rest of the restraint straps.
- Properly adjust foot restraint assembly.
- Once the restraint straps are secured, attach the chest pad over survivor's arms. The rescue swimmer may encounter some difficulty if survivor has flotation; flotation shall not be removed. Instead, remove chest pad from litter and continue with rescue. If practical swimmer will return chest pad back to helicopter when hoisted.
- Secure head restraint assembly if possible. Do not remove survivor's helmet if neck/back injury is suspected.

GENERAL LITTER PROCEDURES

- Signal for litter.
(Trail line will come out first.)



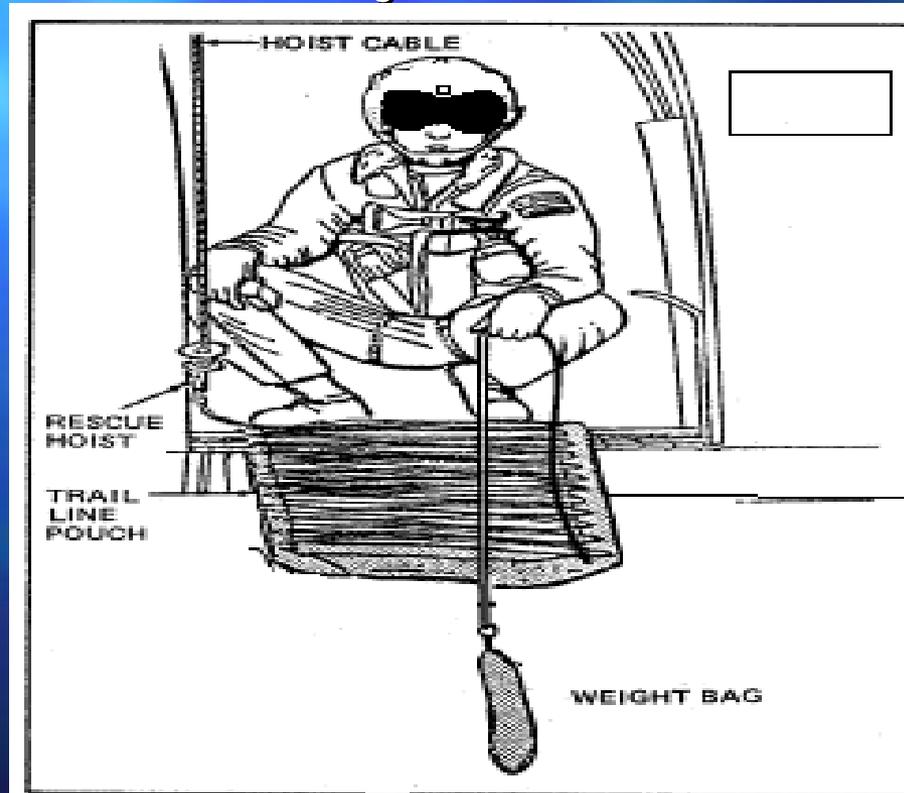
GENERAL LITTER PROCEDURES

WARNING

The weight bag shall be deployed so as not to strike Rescue Swimmer or survivor.

GENERAL LITTER PROCEDURES

- The hoist operator shall deploy the trail line ensuring that it is attached to the litter. The gloves shall be tied on by a slip knot located just above the weight bag.



GENERAL LITTER PROCEDURES

WARNING

The Rescue Swimmer shall wear trail line or authorized rescue swimmer gloves with leather palms in order to prevent rope burns to the hands.

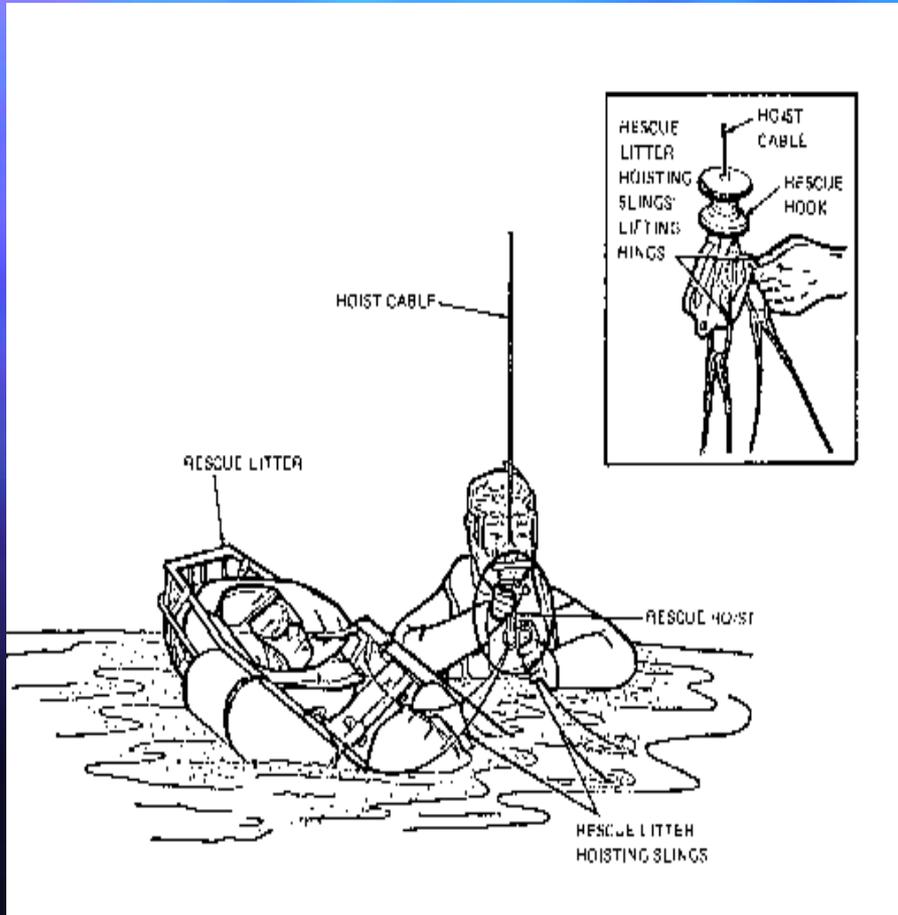
GENERAL LITTER PROCEDURES

- Put on gloves
- The Rescue Swimmer shall pull on the trail line gently until the entire line is deployed.
- Signal "thumbs-up" indicating ready for litter.
- Use trail line to control the litter and pull it into position as it is lowered.
- Allow rescue device to touch water.
- Disconnect hoisting slings from rescue hook placing hoisting slings outside of litter. Do not allow hoisting slings to foul restraining straps.

GENERAL LITTER PROCEDURES

- Position survivor on litter, adhering to warning regarding survivor's buoyancy and the self-righting feature of the litter.
- Secure survivor using procedures appropriate to the litter.

GENERAL LITTER PROCEDURES



- Ready the Rescue Litter hoisting sling and signal the aircraft to move in for pickup.
- Hook the Rescue Litter hoisting sling (both sides) to the large hook.

GENERAL LITTER PROCEDURES

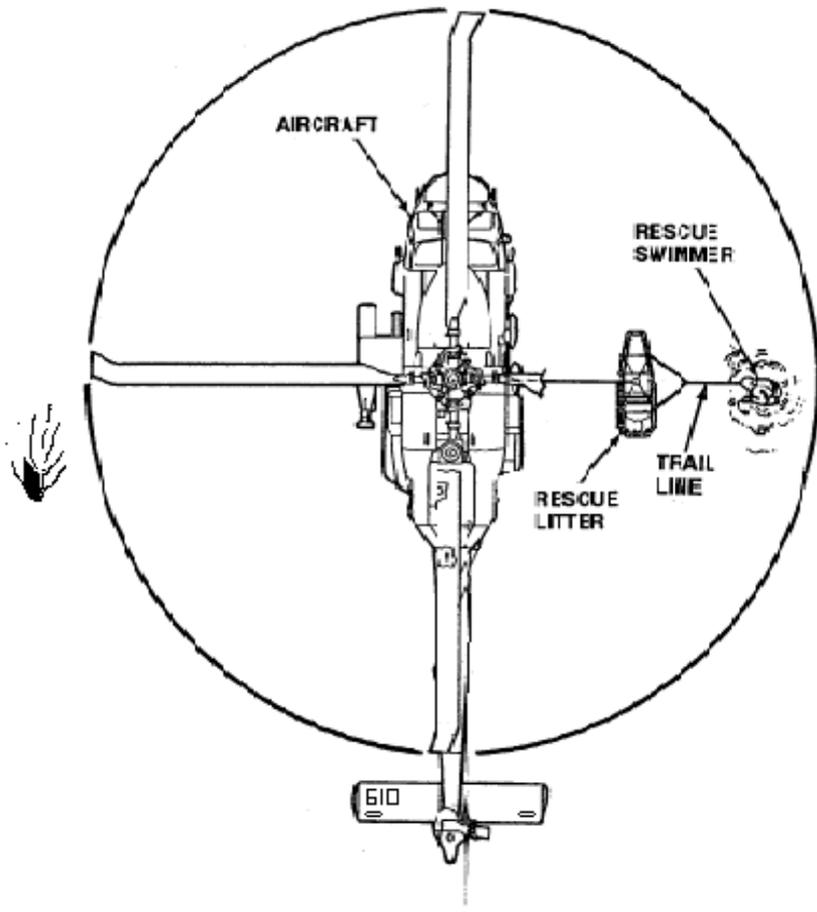
- Conduct pre-hoisting safety check, ensuring survivor is securely within litter, litter is attached to large hook, trail line is attached to proper side of the litter (aircraft dependent), sling cables are in correct positioning, swimmer is wearing gloves, and cable is clear and not wrapped around the litter or the swimmer.
- Signal for "up-hoist".

GENERAL LITTER PROCEDURES

NOTE

Extreme care shall be utilized during trail line evolutions in shallow waters. Cease hoisting immediately if the weighted bag becomes snagged on the bottom. Hoisting when this occurs may cause possible harm to personnel and/or equipment.

GENERAL LITTER PROCEDURES



- Swimmer remains in water, taking a slight strain on trail line, stabilizing the hoist, and keeping the litter oriented parallel to the longitudinal axis of the rescue platform. Upon reaching the rescue platform, maneuver survivor aboard per platform specific procedures.

GENERAL LITTER PROCEDURES

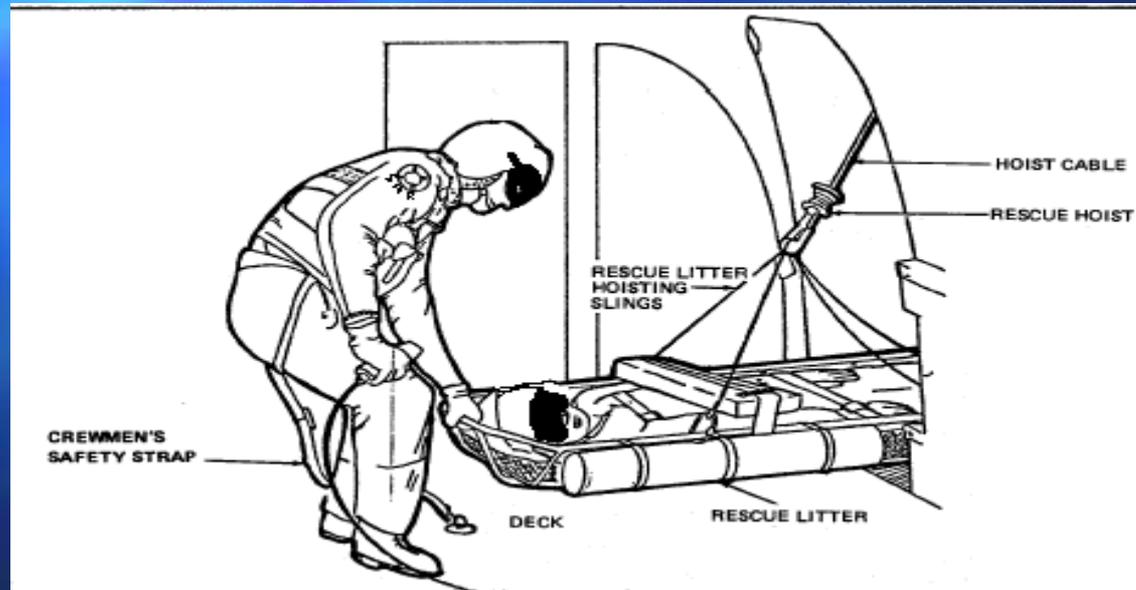
- When the litter is at the aircraft entrance, the swimmer shall use the trail line to maneuver the litter such that the survivor enters headfirst.

NOTE

The confined space in the H-60 cabin requires the litter to enter feet first in order for the crewman to properly attend to the survivor.

GENERAL LITTER PROCEDURES

- With the litter and trail line on board, the crewman shall lower the hoist cable and recover Rescue Swimmer.



RESCUE SEAT



- Two folding flukes for sitting.
- Bright orange flotation collar for high visibility.
- Swimmer or survivor must lower the flukes.
- Two adjustable yellow safety straps with friction adjusters.
- Used for both land and sea rescue.

RESCUE SEAT

- Night time illumination
 - Chemlights are attached to the rescue hook equipment ring.
- Procedures for use:
 - Signal for device.
 - Allow device to ground.
 - Pull down fluke and have survivor sit on it, facing the rescue seat.

RESCUE SEAT

NOTE

If survivor is wearing an inflated LPU Life Preserver, the waist lobes may need to be disconnected prior to attaching the adjustable safety strap.

- Pass adjustable safety straps under riders arms and around their back and secure strap to the "V" ring. Tighten until survivor is secured against flotation collar.

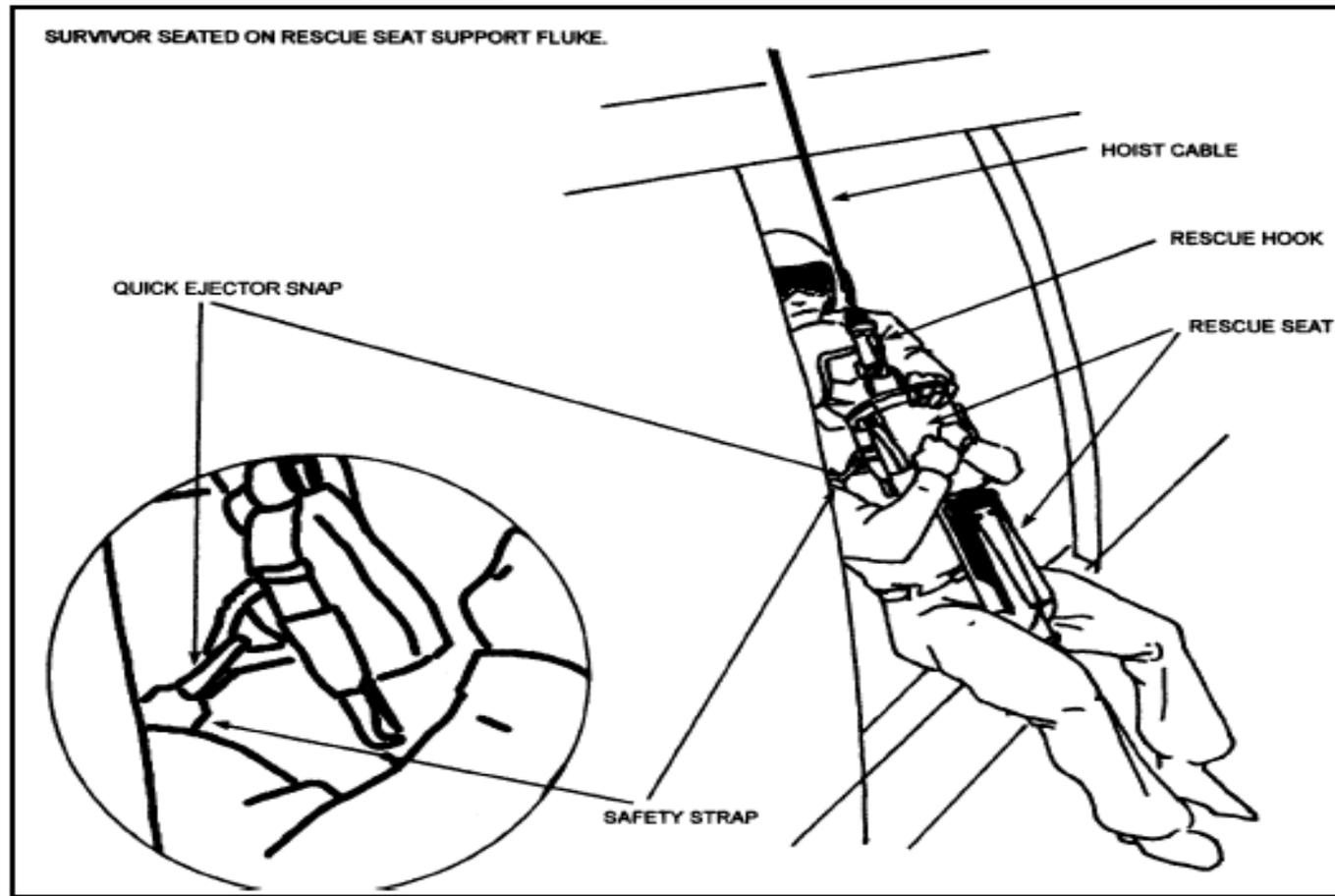
RESCUE SEAT

- Have the survivor wrap arms and legs around the flotation collar.
- Perform final safety check.
- Signal for “Up-hoist”.

NOTE

If the rescue swimmer elects to be hoisted with the survivor, the rescue swimmer shall wear the adjustable safety strap in the same manner as the survivor.

RESCUE SEAT



NIGHT UTILIZATION OF RESCUE DEVICES

- Normal hook-up procedures are used at night. Chemlights are attached as appropriate.

WARNING

Due to low visibility at night, the Rescue Swimmer must pay particular attention to ensure all safety straps, harnesses, etc., are properly installed. Failure to do so could result in injury or death to the survivor/Rescue Swimmer.

RESCUE EQUIPMENT INSPECTION

- Visual Inspection Prior to Use
 - Inspect fabric for cuts, deterioration, and abrasion.
 - Inspect seams for proper adhesion and stitching
 - Inspect all hardware for security of attachment, corrosion, damage, wear, and if applicable, ease of operation.
 - Check for sharp edges and projections.
 - Ninety day inspection cycle for equipment conducted by maintenance personnel.

RESCUE EQUIPMENT INSPECTION

WARNING

Unauthorized modification to, and deviation from, prescribed life support and survival equipment by individual crewmembers could create unknown safety hazards.

SUMMARY

- True or False: The swimmer is the only one on the crew who must know his/her hand signals?

False: All crewmembers must be familiar with the meaning of standard hand signals.

- What is the night hand signal for “move in for pickup”?

Wave chemlight

SUMMARY

- What are the load ratings of the Double Rescue Hook?

Large Hook: 3000 lbs

Small Hook: 1000 lbs

*Equipment Ring: 1500
lbs*

- The rescue net provides flotation for how many?

Two (2) persons.

SUMMARY

- When stored in the backpack, how much does the SAR MEDEVAC Litter weigh?

40 lbs

Questions?

