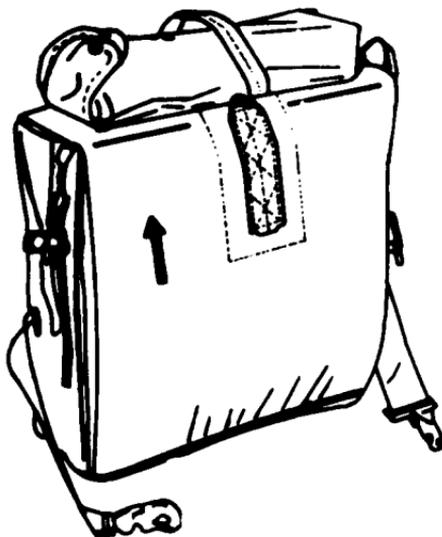


**TECHNICAL MANUAL**



**OPERATOR'S MANUAL  
SURVIVAL KIT, OVERWATER  
INDIVIDUAL**

**(NSN 1680-00-973-1863)**

**"Approved for public release; distribution is unlimited."**

---

**HEADQUARTERS, DEPARTMENT OF THE ARMY  
2 SEPTEMBER 1986**

**WARNING**

**Insure survival kit is secured to your person of parachute harness to prevent loss of kit.**

**Keep all flight clothing, crewmember's helmet and sunglasses for protection from adverse environmental conditions.**

**Crewmember's helmet shall be worn during helicopter rescue hoisting operations.**

**When righting an inverted lifraft, the procedure shall be done from the carbon dioxide side of the raft.**

**The life preserver shall be worn and inflated at all times while in the life raft.**

**Do not ignite both ends of an illumination signal at the same time.**

**Use extreme care when using the illumination signal.**

**Never drink untreated seawater.**

**Trioxane fuel contains metaformaldehyde, which is highly toxic. Wash hands after handling.**

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**TECHNICAL MANUAL**

**NO. 55-1680-350-10**

**HEADQUARTERS  
DEPARTMENT OF THE ARMY  
WASHINGTON, D.C., 2 SEPTEMBER 1986**

**OPERATOR'S MANUAL**

**SURVIVAL KIT, OVERWATER, INDIVIDUAL  
(NSN 1680-00-973-1863)**

**REPORTING ERRORS AND  
RECOMMENDING IMPROVEMENTS**

You can help improve this manual. If you find any mistakes, or if you know of a way to improve the procedures, please let us know. Mail your letter or DA Form 2028 (Recommended Changes to Publications) direct to Commander, US Army Aviation Systems Command, ATTN: AMSAV-MPSD, 4300 Goodfellow Blvd., St. Louis, Mo., 63120-1798. A reply will be furnished to you.

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**\*This manual supersedes TM 55-8465-214-10 2 August 1971**

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## CHAPTER 1 INTRODUCTION

---

### Section I. GENERAL

---

**1-1. Scope and Purpose****1-1.**

---

This manual is for your use, as an aircraft crewmember or passenger, you are required to operate and apply the components of the individual, overwater, survival kit in a survival situation. The survival kit is designed for use on all US Army aircraft, except the OV-1 (Mohawk) aircraft. The purpose of this publication is to provide you with a description of the kit contents and brief instructions on the use of each item.

---

**1-2. Reporting of Equipment Publications  
Improvements****1-2.**

---

Report of errors, omissions, and recommendations for improving this publication by the individual user is encouraged. Reports should be submitted DA Form 2028 (Recommended Changes to Publications) and forwarded direct to

Commanding General, US Army Aviation Systems Command, ATTN: AMSAV-MPSD, 4300 Goodfellow Blvd., St. Louis, No., 63120 1798.

## Section II. DESCRIPTION AND DATA

---

### 1-3. Description

---

1-3.

The Individual, overwater, survival kit (fig 1-1) consists of a cotton/nylon duck outer case which is equipped with a web carrying handle (2), an outside stowage pocket (3) with closing flap (1), two adjustable parachute attaching straps (4) with snap fasteners (5), and a slide fastener (zipper) (7), with a retaining snap (6) which is used to contain the kit inner case with kit survival components and as a means of activating the life raft inflation system. The survival components are exposed when the slide fastener (zipper) on the kit inner case is opened. Upon opening of the kit inner case, the kit packing fiat is located on top of the survival components. This list provides you with the location and identification of each survival component.

### NOTE

**In an emergency bailout, the survival kit may be attached to either a back type or chest-type personnel parachute harness.**

**1-4. Tabulated Data**

**1-4.**

Weight.....	29 pounds
Height.....	5 1/2 inches
Width.....	15 inches
Length .....	19 inches



- 1 Pocket closing flap
- 2 Carrying handle
- 3 Stowage pocket
- 4 Parachute attaching strap

- 5 Snap fastener
- 6 Retaining snap
- 7 Slide fastener

**Figure 1-1. The individual, overwater, survival kit packed**

1-3/(1-4 blank)

## CHAPTER 2

OPERATING INSTRUCTIONS

---

Section I. GENERAL

---

**2-1. Kit Assembly****2-1.**

---

The survival components of the individual, overwater, survival kit including the raft are assembled within the kit as shown in Fig. 2-1. Either the LRU-17/P (fig. 2-2) or LRU-16/P (fig. 2-3) life raft is used.

**2-2. Initial Survival Procedures****2-2.**

---

After entry has been made into the water, either by parachute or crash landing, the following survival procedures should be initiated.

<b>WARNING</b>
----------------

**Insure the overwater survival kit is secured to either your person or the parachute harness , if applicable, at all times to prevent loss of the survival kit components.**

**WARNING**

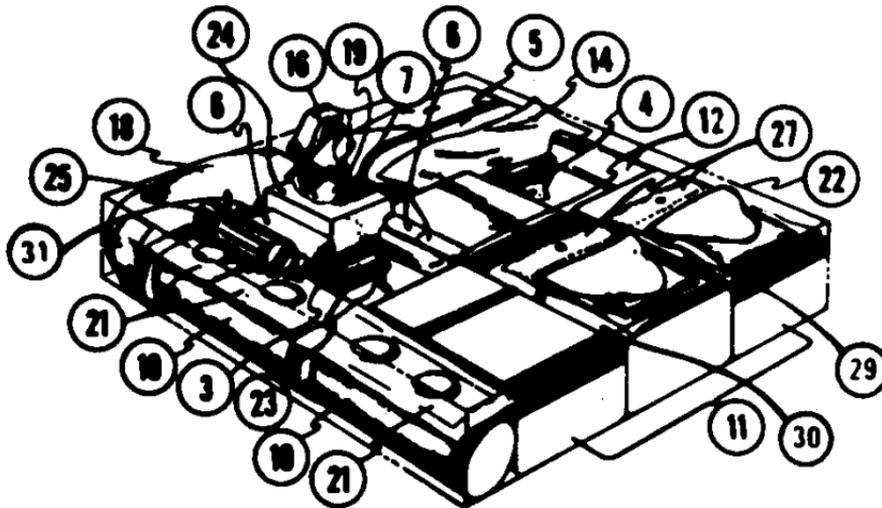
**For protection against environmental condition, insure you keep all flight clothing and equipment which includes the aircraft crewmember's helmet and sunglasses.**

**WARNING**

**It available, the aircraft crewmember's helmet shall be worn with the visor locking In the unlocked position and the visor extended down over the face to prevent head injuries during holding operations used In rescue helicopter pickup.**

a. Inflating and Boarding the Life Raft.

(1) If water entry was by parachute, disconnect parachute, then inflate life raft. This is to prevent entanglement in the parachute canopy suspension lines. If water entry was by aircraft, insure that you are away from the aircraft before Inflating life raft. This will keep the raft from being damaged by sharp parts of the aircraft.



BOTTOM LAYER (INNER - CASE ARRANGEMENT)

Figure 2-1. The individual, overwater, survival kit assembly (Sheet 1 of 4)

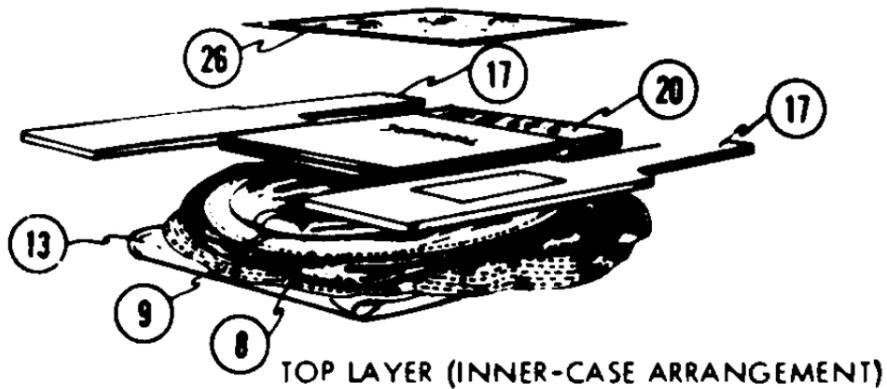


Figure 2-1. The individual, overwater, survival kit assembly (Sheet 2 of 4)

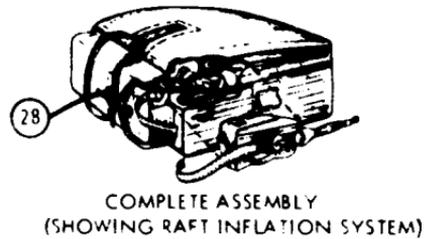
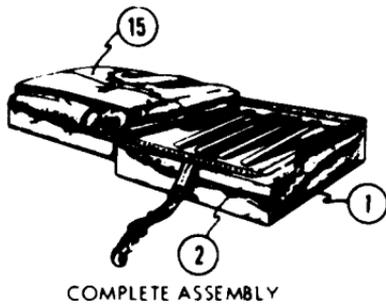


Figure 2-1. The individual, overwater, survival kit assembly (Sheet 3 of 4)

1	Outer case	11	Seawater desalter kit	21	Trioxane compressed fuel
2	Inner case	12	Food packets	22	Frying pan
3	Fishing tackle kit	13	Water storage bag	23	Signaling mirror
4	Pocket knife	14	Plastic spoon	24	Magnetic compass
5	First aid kit	15	Inflatable life raft	25	Waterproof matchbox
6	Wood matches	16	Boat bailer	26	Packing list
7	Sunburn-preventive preparation	17	Boat paddles	27	Fluorescein sea marker
8	Hat and mosquito net	18	Inflatable craft repair kit	28	Operator's manual
9	Reversible sun hat	19	Cellulose sponge	29	Fire starter
10	Smoke and illumination signal	20	Survival manual	30	Saw, Hand, finger grip
				31	Blanket, Combat casualty

Figure 2-1. The Individual, overwater, survival kit assembly (Sheet 4 of 4)

(2) Activate the life raft inflation system by grasping the slide fastener (zipper) release lanyard located on the side of the survival kit outer case (fig. 1-1) and pulling the slide fastener straight up until the slide is disengaged from the fastener. Continue the upward pull on the lanyard until an audible hissing noise is heard which indicates the carbon dioxide cylinder on the raft inflation system has been activated and inflation of the life raft inflation cells has begun. While becoming inflated, the life raft will open the kit outer case fastener (zipper) and deploy outside of the case.

(3) If the life raft inflation system fails to function, remove the life raft from the outer case and orally inflate the life raft as follows in (5)-(6)

(4) Locate and grasp the oral inflation tube. Unlock the tube locking unit by rotating the nut clockwise to the fullest extent away from the mouthpiece (fig. 2 4).

(5) Push the inflation tube mouthpiece in with your mouth and simultaneously blow into the tube. Continue this oral inflation method until the sides of the raft are firm.

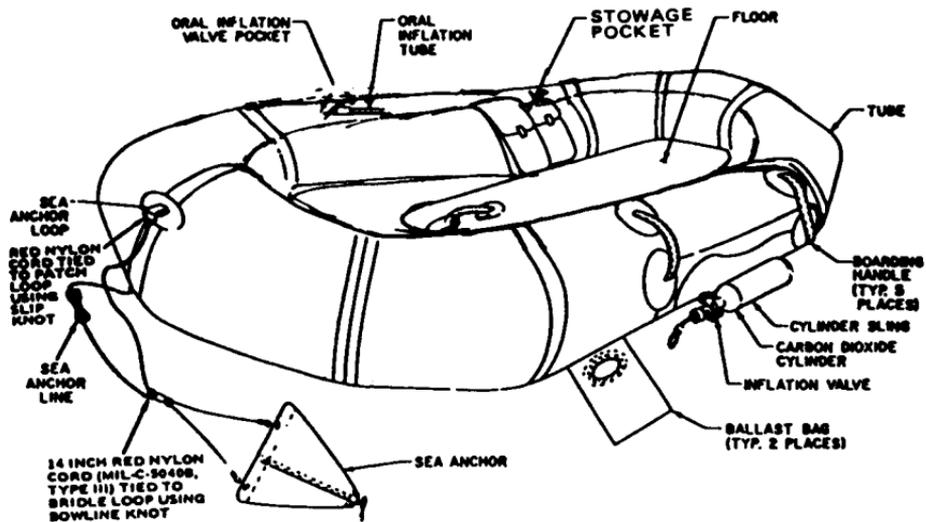


Figure 2-2. LRU-17/P Life Raft Assembly, Parts Nomenclature.

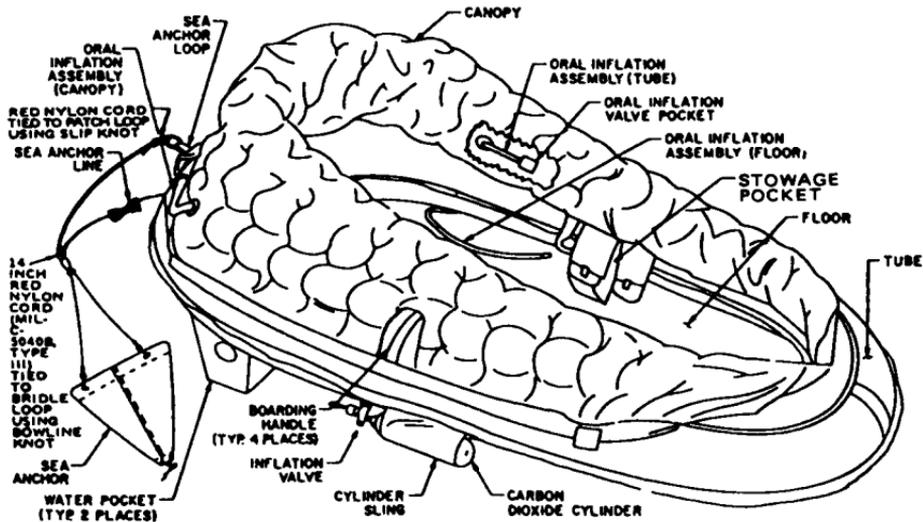


Figure 2-3. LRU-16/P Life Raft Assembly, Parts Nomenclature.

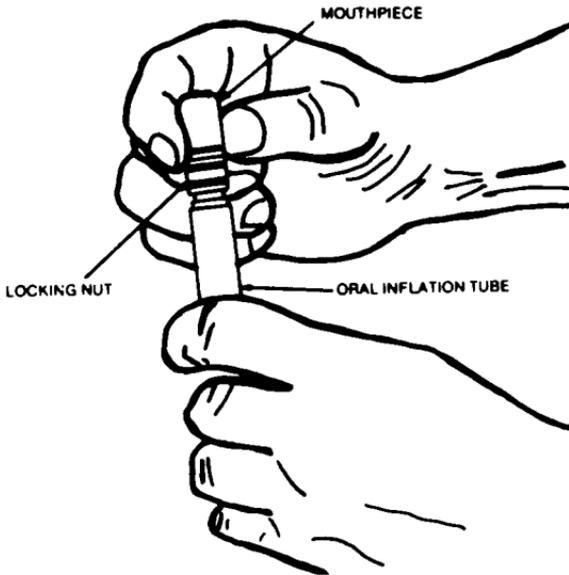


Figure 2-4. The life raft oral inflation tube.

(6) After oral inflation of a life raft has been completed, insure the oral inflation tube locking nut is rotated counterclockwise to a point at which the nut is snug against the mouthpiece which will prevent the raft from being inadvertently deflated. Stow the oral inflation tube in the adjacent oral inflation tube stowage pocket (fig. 2-5).

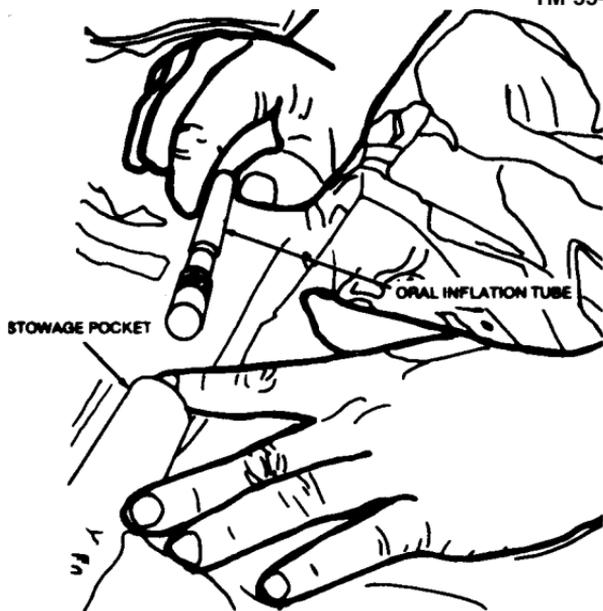


Figure 2-5. Stowing the oral inflation tuba in the stowage pocket.

**WARNING**

When righting an inverted life raft, insure the procedure is performed born the car bon dioxide cylinder side of the raft to avoid being struck by the cylinder during the righting process.

(7) Board the inflated life raft as quickly as possible with the least amount of effort using one of the following recommended raft boarding methods:

**NOTE**

**If the raft becomes inverted or capsizes, note the wind direction, position yourself downwind on the carbon dioxide cylinder side of the raft, reach across the raft bottom to the opposite side of the raft and grasp the boarding handle. Turn the raft over by sliding back into the water while simultaneously pulling on the raft boarding handle.**

**The raft should always be boarded from the small end.**

(a) Release one side of the kit from the parachute harness, if applicable, and place the bottom of your life over the small end of the raft. Elevate your feet and with your hands grasping the boarding handles on the raft sides, pull yourself into the raft.

(b) Place the bottom of your life preserver over the small end of the raft and push down on the raft end until you can place one knee into the raft. Gripping the raft boarding handles, pull yourself into the raft.

(c) Turn your back to the small end of the raft and pull the raft under your buttocks. Gripping the raft sides, push yourself into the raft.

b. Life Raft Survival Instructions.

**WARNING**

**The life preserver shall be kept inflated and will not be removed for any reason when aboard a life raft.**

(1) After you have boarded the life raft, put out the raft sea anchor to minimize the drift of the raft. In addition the sea anchor will stabilize the raft and orient the raft into the waves to prevent the raft from capsizing

(2) If applicable and necessary, prepare to remove the parachute harness by insuring the survival kit and the life raft are secured to your person and not the harness .

**NOTE**

**It is recommended that the parachute harness not be removed unless it is necessary, as the harness may be useful during rescue operations.**

(3) Partially deflate one cell of the life preserver and pull it inside of the harness. Slip out of that side of the harness which contains the partially deflated life preserver cell. Reinflate the deflated cell orally using the cell oral inflation tube.

(4) Repeat the procedure in (3) to remove the opposite side of the harness. Do not discard the parachute harness, as it may be of further use.

(5) Check the inflated pressure in the life raft and, if required, increase the inflation pressure using the oral inflation tube and the procedures in paragraph 2-2a.

(6) Cover yourself with the spray shield installed on the life raft as protection against saltwater spray, hot sunrays or cold.

(7) Pull the survival kit aboard the raft. Open

the kit inner case, check the packing list, and ascertain which items are required for immediate use. It is recommended that priority be given to considering the use of the signaling devices and secure these items within the stowage pocket (3, fig. 1-1) on top of the outer case. This will allow you immediate accessibility to the signal equipment when required. Further, remove the signaling mirror and slip the mirror retaining cord over your head to your neck. Unzip the top of your flying suit or jacket and slip the mirror inside the clothing to prevent the mirror from dangling out and being broken.

## Section II. OPERATING PROCEDURES

---

### 2-3. General

**2-3.**

---

This section provides instruction on the operation and use of all the components contained in the individual, overwater, survival kit (fig. 2-1).

---

### 2 4. Smoke and Illuminations

**2 4.**

---

The smoke and illumination signal (10, fig. 2-1) is a hand-actuated combination day or night distress signal. One end of the signal device contains orange smoke for daytime use and the opposite

end (flare end) contains a pyrotechnic composition for illumination during nighttime use. The illumination end of the signal can be identified by a series of embossed projections located 1/4 inch below the end cap. The average burning time of the illumination signal is 18 seconds and when used at night as recommended, it can be seen at a distance of two to three miles from an altitude of 3000 feet. To activate the smoke and illumination signal, proceed as follows:

**WARNING**

**Do not attempt to ignite both ends of a signal at the same time.**

- a. Remove paper or plastic cap from either the smoke or illumination end of the signal, as applicable.
- b. Grasp the signal firmly with one hand and hold the signal close to the chest in a horizontal position with each end of the signal pointed away from the body.
- c. Insert the index finger of your free hand into the pull ring which shall break the soldered end of the cap free. If the soldered cap does not release, bring the pull ring down over the rim of the can and press down with the heel of your hand, using the ring as a lever to break the seal.

**WARNING**

Use extreme care when using the signal as an illumination device as hot, molten residue dripping from the burning signal can cause serious burns on the body or burn holes in the life raft.

**CAUTION**

When exerting pull on the pull ring, do not use a twisting motion as the pull tab may tear off resulting in a defective signal.

d. Make a steady, straight, horizontal pull until the pull ring and tab separate from the signal. Continue pulling upwards until a full arm's length is reached and point the activated signal end upward at a 45° angle until the signal has burned out.

**NOTE**

Do not discard a smoke and illumination signal until both ends of the device have been used. The smoke end of the signal device will burn in an illumination manner providing that once the smoke end has been activated, an open flame is placed against the smoking end.

---

**2-5. First Aid Kit**

---

**2-5.**

The aviator's camouflaged first aid kit (5, fig. 2-1) contains medical items necessary for applying first aid and instructions on the use of each medical item. Instructions for first aid treatment of injuries are specified in the survival manual (AFM 64-5 or FM 21-76).

---

**2-6. Pocket Knife**

---

**2-6.**

The pocket knife (4, fig. 2-1) is furnished for use as an aid in the cleaning of fish or small game and for light-duty cutting such as small branches for game traps, shelter, or fire building materials.

---

**2-7. Fishing Tackle Kit**

---

**2-7.**

The fishing tackle kit (3, fig. 2-1) is equipped with hooks, line, and artificial lures for catching fish. Instructions for use of this kit are furnished with the kit. Supplemental fishing instructions are provided in the survival manual (AFM 64-5 or FM 21-76).

---

**2-8. Wood Matches**

---

**2-8.****CAUTION**

**It matches are used while afloat in the life raft, insure you use extreme care to prevent damage to the life raft or the life preserver.**

The individual, overwater, survival kit is equipped with one box of non-safety wood matches (6. fig. 2-1). The matches are to be used on land as a fire starter when you are in need of warmth, when cooking rations, or to produce smoke signals for attracting rescue parties. Upon opening a container of matches, insure the container contents are transferred to the waterproof matchbox for further protection from moisture or damage.

---

**2-9. Sunburn-preventive Preparation**

---

**2-9.**

The sunburn preventive preparation (7. fig. 2-1) is a lotion type preparation contained in a plastic bottle. This preparation is for application to the exposed areas of the face, neck, or other parts of the body to prevent or treat sun and windburn.

---

**2-10. Hat and Mosquito Net**

---

**2-10.**

The hat and mosquito net (8, fig. 2-1) is a combination net and hat unit used to protect your face and neck from insects. The net is equipped with a drawstring to allow the net to be drawn snug around the neck and tied. To keep the netting away from the face when the drawstring is to be drawn snug, place a small, flexible branch inside the net and bend it in a circle around your head. The branch will then lift the net away from the exposed skin of the face and neck.

---

**2-11. Reversible Sun Hat**

---

**2-11.**

The reversible sun hat (9, fig. 2-1) is furnished to protect the eyes and neck from exposure to the sun. The hat can also be used for signaling or camouflage. When being worn, the brim of the hat should be pulled down to achieve the maximum benefits of head coverage.

---

**2-12. Seawater Desalter Kit**

---

**2-12.**

<b>WARNING</b>
----------------

**Never drink untreated seawater.**

The MK-2 seawater desalter kit (11, fig. 2-1) provides a means of converting salt water to suitable drinking water. There are three desalter kits in the overwater survival kit, each of which consists of a metal container with eight packs of chemicals, a plastic water processing bag, and tape which is used for mending holes in the plastic bag. To desalt one bag of water, proceed as follows:

**NOTE**

**Additional instructions on the use of a kit are furnished on the sides of each metal container.**

- a. Fill the bag with salt water to the heavy line located near the 16-ounce mark on the bag.
- b. Remove a pack of chemicals from the one container and reclose the container. Further remove the outer wrapper from the pack of chemicals and place the chemical pack into the bag of water. Insure the valve on the plastic bag bottom is closed.

**NOTE**

**One pack of chemicals is capable of purifying 16 ounces of water**

c. Fold the top of the bag down tightly and roll the folded top toward the fastener. Secure the fastener to make a watertight seal in the bag top.

d. Allow the bag of water to stand a few minutes which will permit the chemical to disintegrate. If necessary, gently knead the chemical until it has completely dissolved.

e. Gently agitate the bag of water for 60 minutes before attempting to drink the water.

f. To drink the desalted water, unscrew the valve at the bottom of the bag without squeezing the bag. put the valve in your mouth, and gently squeeze the bag or suck on the valve.

#### NOTE

**The first few drops of newly desalted water may taste very salty and should not be swallowed. However, a small amount of salt is left in the desalted water intentionally to compensate for perspiration losses.**

g. After drinking. close the bag valve to conserve the remaining water.

h. When the water contents of the bag have been completely used, rinse the desalting chemical from the bag with seawater. The bag is then ready for repeating the desalting process.

i. Should the plastic bag develop a puncture or a tear, carefully dry the affected area and then apply a patch to the area using the furnished mending tape.

---

**2-13. Survival Food Packet****2-13.**

---

The individual, overwater, survival kit contains three survival food packets (12, fig. 2-1) which are to be used if no other food source is available. The food in each packet is in concentrated form and should only be consumed with water to prevent personal dehydration.

---

**2-14. Water Storage Bag****2-14.**

---

**CAUTION**

**When exposed to cold temperatures, the water bag will become hard and rigid. Exercise care when removing the bag from the survival kit and do not attempt to unfold the bag until it has been warmed, which may be accomplished by placing the bag next to your body.**

**CAUTION**

**Do not store water in the water storage bag in below freezing temperatures.**

The water storage bag (13, fig. 2-1) is a soft, pliable, plastic bag which may be used for storing water accumulated from rainfall or some other water source.

---

**2-15. Plastic Spoon****2-15.**

---

The plastic spoon (14, fig. 2-1) is provided for use as a utensil when cooking or eating survival rations. If used in cooking, insure the spoon is not placed near open flame or hot metal. After use, clean and dry the spoon and store it in the original wrapper.

---

**2-16. Boat Bailer****2-16.**

---

The boat bailer (16, fig. 2-1) is a 6-inch-diameter rubberized, cup-shaped device which is used to remove seawater that may spill into your raft. The bailer is equipped with a retaining lanyard which allows the bailer to be secured to the raft.

**NOTE**

**Insure the inside bottom of the life raft is kept as dry as possible to prevent chafed skin, cuts, or sores from becoming infected by the salt water.**

---

**2-17. Boat Paddles****2-17.**

---

The individual overwater survival kit is equipped with two wooden boat paddles (17 fig. 2-1, which are 14 inches long by 3 1/4 inches wide and provide a means of moving and steering the life raft when afloat. Each paddle has a webbing loop attached on one end and one side of the paddle is coated with reflective material. The webbing loop is slipped over the hand to prevent loss of the paddle during use. The reflective material will reflect light flashes from the sun or night search lights and these flashes, which can be seen for a long distance, may alert rescue parties in your area.

---

**2-18. Inflatable Craft Repair Kit****2-18.**

---

The inflatable craft repair kit (18 fig 2 1) is used to plug a hole which may develop in the raft. The kit consists of two oblong-shaped plates with a retaining lanyard. Procedures for using the kit are as follows:

- a. Loop the retaining lanyard around your wrist to prevent loss of the plates.
- b. Dip the plate, which has a threaded screw located in the center, into the seawater. This plate is considered the bottom plate of the plus.
- c. Insert the bottom plate through the hole in the raft and allow the threaded screw to protrude up out of the hole. If the original hole is too small to accept the plate, carefully enlarge the hole to a point at which the plate can be inserted.
- d. Pull the bottom plate against the inner fabric surface and slide the top plate over the threaded screw and push the top plate down against the outer fabric surface to form the hole plug
- e. Adjust the plug to cover the hole entirely and while holding it in place, screw the furnished wing nut onto the screw and secure the nut firmly place against the plug top plate.

---

**2-19. Sponge**

**2 - 19.**

---

The cellulose sponge (19 fig. 2-1) may be used for removing excess seawater from the life raft or to

gather drinking water from the formation of early morning dew on the life raft or from the leaves of trees and plants it on land. In addition, bits of the sponge may be used as fish bait provided the sponge bits have been dipped in animal blood prior to baiting the fish hook.

---

**2-20. Survival Manual****2-20.**

---

The survival manual (AFM 64-5 or FM 21-76) (20, fig. 2-1) is included in the survival kit to provide instructions on survival under all climatic and environmental conditions. Reference the survival manual for all survival methods and practices.

---

**2-21. Trioxne Compressed Fuel****2-21.**

---

<b>WARNING</b>
----------------

**Trioxane fuel contains metaformaldehyde, which is highly toxic. Ingestion constitutes a medical emergency. Wash hands immediately after handling opened or leaking packages.**

The trioxane compressed fuel (21, fig 2-1) is in a block form with each block individually wrapped and contained in a paper box which furnishes detailed instruction on use of the fuel. The fuel may be used on land for heating food or as a firestarting aid when trying to burn green or wet wood and other hard-to-burn fuel items.

---

**2-22. Frying Pan**

**2-22.**

---

The frying pan (22. fig. 2-1) is a lightweight aluminum device which may be used on land for cooking, melting snow and ice for drinking water, as a wash basin for personal hygiene or when on water for collecting rainwater. Holes are drilled in the side panels of the pan to provide a means of inserting a wire or small branch for use when lifting the pan when it is hot.

---

**2-23. Signaling Mirror**

**2-23.**

---

The signaling mirror (23. fig. 2-1) is a glass signaling instrument equipped with a retaining cord on one corner and a see-through sighting device in the center of the glass. When used in daytime and with good visibility, a mirror flash can be seen at a distance of 30 miles at an altitude of 10,000 feet.

Though less effective, and with possible shorter range, mirror flashes can also be seen on cloudy days with limited visibility. Procedures for using the mirror are as follows:

- a. Hold the mirror in a manner which will allow the sunlight to reflect on a nearby surface such as the hand or other close object.
- b. Bring the mirror up to eye level and using one eye, look through the sighting device until an intense bright spot is located. This is the aim indicator.
- c. Hold the mirror close to the eye and slowly turn it until the bright spot is on the target (fig. 2-6).

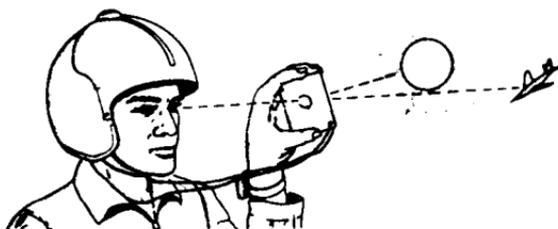


Figure 2-6. Using the signaling mirror.

**CAUTION**

**When not being used, the magnetic compass must be stored in an position to prevent unnecessary wear on the compass pivot and jewel.**

The type MC-1 pocket magnetic compass (24, fig. 2-1), is a very important aid in ascertaining your direction of travel. The compass is equipped with a transparent plastic top, a long line for determining the directional course reading, and two lanyard attaching rings located on the bottom of the compass case for use in attaching a retaining lanyard. To use the compass, hold the compass erect in a manner which places the lubber line parallel to your line-of-sight, or in the fore and aft position to your line-of-travel. Your course heading may then be read on the top or the side of the compass dial under the forward end of the lubber line.

**NOTE**

**The arrow on the compass dial always points to magnetic "NORTH".**

**NOTE**

Items which contain Iron or steel, and other types of compasses may cause the MC-1 magnetic compass to give incorrect readings.

---

**2-25. Waterproof Matchbox****2-25.**

---

**CAUTION**

Matches should be put in plastic water proof container with the match heads down. Do not try to overfill the container.

The matchbox (25, fig. 2-1) is a plastic waterproof container with a screw-type cap which has a striker plate on the inside. When the matchbox is filled with matches, the striker plate should be covered with scrap paper to prevent the matches from inadvertently igniting when removing or installing the cap on the box.

---

**2-26. Fluorescein Sea Marker****2-26.**

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The fluorescein sea marker (27, fig. 2-1) is a sodium salt-type dye which is for use in making a yellow-green color of the seawater surrounding your raft to attract rescue aircraft. The marker dye is contained in a small, waterproof fabric packet and there are two packets provided in the individual, overwater, survival kit. Each packet is equipped with a retaining tape for securing the dye packet to your person. During clear weather and calm seas, the sea marker is visible for about 1 hour at an altitude of 3,000 feet, and a distance of 3 to 5 miles. However, rough seas will dissipate the sea marker very quickly and visibility from any altitude or distance shall be limited. To use the sea marker, pull the marked "pack-opening" tab on the outside of the packet and disperse the packet contents in the water alongside your raft. For rapid dispersion of sea marker, apply vigorous agitation to the packet in the water.

**NOTE**

**To conserve the sea marker, do not release the packet contents until you are sure that a rescue aircraft is in your immediate area.**

**NOTE**

**It you are on land, the sea marker can be used in rivers, streams, or lakes to attract rescue attention.**

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**2-27. Fire Starter**

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**2-27.**

The Fire Starter (29, fig. 21) is a magnesium bar with a sparking insert located on one side Use a knife or other hard surface to scrape shavings off the magnesium side Make a pile of magnesium shavings in the center of a nest of tinder With a knife or other hard metal object. strike the sparking insert side of the her with a downward motion to create sparks which should be directed onto the pile of magnesium shavings. For tire building and maintaining various types of cooking and heating fires, follow the instructions in the survival manual (AFM 64-5 or FM 21-76) If the magnesium bar is inadvertently dropped into the fire, it will not explode or flare up

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**2-28. Saw, Hand, Finger Grip**

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**2-28**

**CAUTION**

**Do not exert heavy pressure or put the blade in a bind.  
This may cause the blade to bend or break.**

The saw (30, fig. 2-1) has a wire saw blade with two finger grip rings for using and has finger screws to adjust the saw blade. When using the saw, keep the blade taut by pulling on one arm as the other arm pulls the blade for cutting. Then reverse the arm action. Use short strokes. If the blade breaks, unscrew the finger grip on the shortest piece and insert the longest piece in the slot. Tighten the thumb screw and continue sawing.

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**2-29. Blanket, Combat Casualty.****2-29.**

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**CAUTION**

**In cold/freezing weather do not put blanket next to body .  
It will cause you to sweat and possibly freeze.**

The blanket (31, fig. 2-1) is a versatile piece of survival gear having a multiplicity of uses in an emergency situation, some of which are:

- A protective ground cloth for sleeping and sitting. (Protects from wetness and dampness; some Insulation Is given If folded several times.)

- A shelter. (Is waterproof and protects from rain, snow, fog as well as sun. Can be spread over a framework constructed from natural materials. Is a fair windbreak if supported by framework.)
- A water collector. (Used in conjunction with a depression dug into the soil; depression is lined with blanket as waterproof water collector.)
- A signal panel. (Ground to air emergency signal.)
- A waterproof cover for injured. (Provides protection from becoming wet.)
- A protective cover for equipment.
- A heat conductor. (Used in conjunction with an open fire; blanket is supported on framework, and individual positions himself between the fire and the reflective surface of the blanket.)

**APPENDIX A**

**REFERENCES**

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TM 10-1670-1	Survival Uses of the Parachute
TM 10-1670-213-10	Operator's Manual for Parachute Personnel, Types: 28-Foot-Diameter Back, 28- Foot-Diameter Chest, and NB_8 Back
AFM 64-5	Search and Rescue Survival
FM 21-76	Survival, Evasion and Escape
DA Pam 738-751	Functional Users Manual for the Army Maintenance Management System- Aviation (TAMMS-A)

**A-1/(A-2 blank)**

By Order of the Secretary of the Army

JOHN H. WICKHAM, JR.  
*General, United States Army*  
*Chief of Staff*

*Official:*

R. L. DILWORTH  
*Brigadier General, United States Army*  
*The Adjutant General*

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# THE METRIC SYSTEM AND EQUIVALENTS

## WEIGHT MEASURE

1 Centimeter = 10 Millimeters = 0.01 Meters = 0.3937 Inches  
 1 Meter = 100 Centimeters = 1000 Millimeters = 39.37 Inches  
 1 Kilometer = 1000 Meters = 0.621 Miles

## WEIGHTS

1 Gram = 0.001 Kilograms = 1000 Milligrams = 0.035 Ounces  
 1 Kilogram = 1000 Grams = 2.2 lb.  
 1 Metric Ton = 1000 Kilograms = 1 Megagram = 1.1 Short Tons

## LIQUID MEASURE

1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces  
 1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

## SQUARE MEASURE

1 Sq. Centimeter = 100 Sq. Millimeters = 0.155 Sq. Inches  
 1 Sq. Meter = 10,000 Sq. Centimeters = 10.76 Sq. Feet  
 1 Sq. Kilometer = 1,000,000 Sq. Meters = 0.386 Sq. Miles

## CUBIC MEASURE

1 Cu. Centimeter = 1000 Cu. Millimeters = 0.06 Cu. Inches  
 1 Cu. Meter = 1,000,000 Cu. Centimeters = 35.31 Cu. Feet

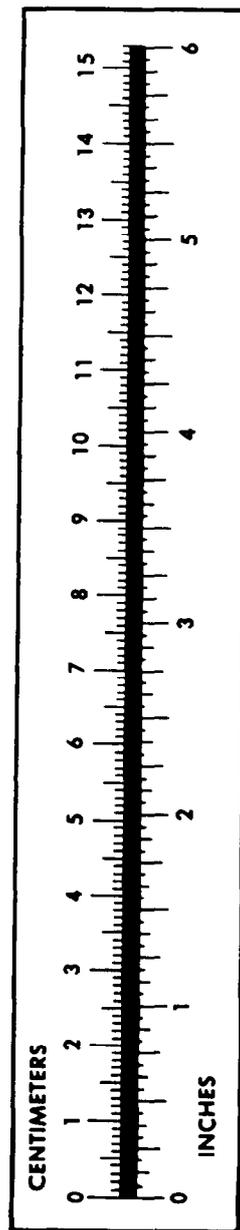
## TEMPERATURE

$5/9(^{\circ}\text{F} - 32) = ^{\circ}\text{C}$   
 212° Fahrenheit is equivalent to 100° Celsius  
 90° Fahrenheit is equivalent to 32.2° Celsius  
 32° Fahrenheit is equivalent to 0° Celsius  
 $9/5^{\circ}\text{C} + 32 = ^{\circ}\text{F}$

## APPROXIMATE CONVERSION FACTORS

TO CHANGE	TO	MULTIPLY BY
Inches	Centimeters	2.540
Feet	Meters	0.305
Yards	Meters	0.914
Miles	Kilometers	1.609
Square Inches	Square Centimeters	6.451
Square Feet	Square Meters	0.093
Square Yards	Square Meters	0.836
Square Miles	Square Kilometers	2.590
Acres	Square Hectometers	0.405
Cubic Feet	Cubic Meters	0.028
Cubic Yards	Cubic Meters	0.765
Fluid Ounces	Milliliters	29.573
its	Liters	0.473
arts	Liters	0.946
allons	Liters	3.785
Ounces	Grams	28.349
Pounds	Kilograms	0.454
Short Tons	Metric Tons	0.907
Pound-Feet	Newton-Meters	1.356
Pounds per Square Inch	Kilopascals	6.895
Miles per Gallon	Kilometers per Liter	0.425
Miles per Hour	Kilometers per Hour	1.609

TO CHANGE	TO	MULTIPLY BY
Centimeters	Inches	0.394
Meters	Feet	3.280
Meters	Yards	1.094
Kilometers	Miles	0.621
Square Centimeters	Square Inches	0.155
Square Meters	Square Feet	10.764
Square Meters	Square Yards	1.196
Square Kilometers	Square Miles	0.386
Square Hectometers	Acres	2.471
Cubic Meters	Cubic Feet	35.315
Cubic Meters	Cubic Yards	1.308
Milliliters	Fluid Ounces	0.034
Liters	Pints	2.113
Liters	Quarts	1.057
ers	Gallons	0.264
ms	Ounces	0.035
ograms	Pounds	2.205
Metric Tons	Short Tons	1.102
Newton-Meters	Pounds-Feet	0.738
Kilopascals	Pounds per Square Inch	0.145
ometers per Liter	Miles per Gallon	2.354
ometers per Hour	Miles per Hour	0.621



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