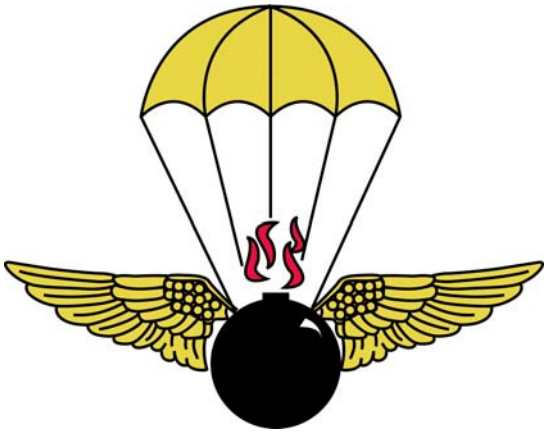
U.S. Department of
Homeland Security

United States
Coast Guard

AVIATION LIFE SUPPORT EQUIPMENT (ALSE) MANUAL



COMDTINST M13520.1C
May 2011

U.S. Department of Homeland Security
United States Coast Guard

Commandant
United States Coast Guard

2100 2nd ST, SW Stop 7901
Washington, DC 20593-7901
Staff Symbol: CG-41
Phone: (202) 475-5570
Fax: (202) 475-5958

COMDTINST M13520.1C
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COMMANDANT INSTRUCTION M13520.1C

Subj: COAST GUARD AVIATION LIFE SUPPORT EQUIPMENT (ALSE) MANUAL

1. PURPOSE. This Manual promulgates release of the Coast Guard Aviation Life Support Equipment (ALSE) Manual, formerly the Aviation Life Support Systems Manual. It prescribes policy, guidance and technical information related to the configuration, maintenance and inspection of all Coast Guard aviation life support equipment. This Manual dictates policy and procedural guidance for users within the Aeronautical Engineering community.

2. ACTION. All Coast Guard unit commanders, commanding officers, officers-in-charge, deputy/assistant commandants, and chiefs of headquarters staff elements shall ensure comply with the provisions of this Manual. Internet release is authorized.

3. DIRECTIVES AFFECTED. The Coast Guard Aviation Life Support Systems Manual, COMDTINST M13520.1B is cancelled.

4. DISCUSSION. This Manual supersedes the Aviation Life Support Systems Manual, COMDTINST M13520.1B, dated 10 July 2000, in its entirety. This revision reflects extensive content and format changes; therefore, a careful review is highly recommended. Maintenance and inspection procedures were removed to process guide, PG 85-00-310, new equipment integrated, and obsolete gear and procedures were completely eliminated.

5. MAJOR CHANGES. Major changes to the Manual include, but are not limited to: Multi-Climate Protections System (MCPS); new survival knives; an improved, reverse osmosis water filtration system; LRU-25A 6-man raft; redesigned rescue basket; and an authorized AUF equipment support list. The majority of included equipment possesses detailed descriptions and is now fully supported by color illustrations and pictures.

6. REQUESTS FOR CHANGES. Units and individuals may recommend changes to this manual utilizing Form CG-22, Aeronautical Publication Change Recommendation, as outlined in Coast Guard Process Guide, PG 85-00-20. This Manual will be reviewed on a regular basis.

DISTRIBUTION – SDL No. 158

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NON-STANDARD DISTRIBUTION: Commandant CG-41 (1), CG-531 (1), CG-1131 (1)

7. ENVIRONMENTAL ASPECT AND IMPACT CONSIDERATIONS. Environmental considerations were examined in the development of this Manual and have been determined not to be applicable.

8. FORMS/REPORTS. The forms referenced in this Manual are available in USCG Electronic Forms on the Standard Workstation or on the Internet: http://www.uscg.mil/forms/ ; CGPortal at https://cgportal.uscg.mil/delivery/Satellite/uscg/References; and, the Coast Guard intranet at http://cgweb.comdt.uscg.mil/CGForms

R. J. RÁBAGO /s/
Assistant Commandant for
Engineering & Logistics

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CHAPTER 1. INTRODUCTION.

A. OVERVIEW.

1. Deviation and Modification Authority Policy. Deviations from equipment configurations are unauthorized. Deviations and peculiar configurations or modifications of the equipment by individual aircrew members are not authorized, and the Aviation Survival Technician (AST) has no authority or responsibility to perform them. Recommendations for equipment configuration changes, deletions, or replacements shall be submitted for investigation and action to Aviation Logistics Center (ALC) Aviation Life Support Equipment (ALSE) Systems Manager, via the applicable chain of command.

2. Organization. Aviation Life Support Equipment (ALSE) is an essential element in the Coast Guard mission support structure. The following is a condensed description of the ALSE management structure. Commandant Aviation Forces is the Rescue Swimmer Program Manager and Aviation Life Support Requirements Manager. As such, Commandant (CG-711) sets the operational requirements for ALSE. Commandant (CG-41) is the Aviation Life Support Equipment Systems Manager and ALC ALSE Technical Services is the Aviation Life Support Equipment Product Line Manager. As such, ALC Technical Services act as the project manager for new ALSE acquisitions, and manage in-service ALSE.

   ALSE Prime Unit is responsible for technical responsiveness to field level ALSE maintenance managers. As such, ALSE Prime Unit is the first point of contact for field level ALSE maintenance manager's technical inquiries. A detailed description of the structure of the ALSE organization is located in the Aeronautical Engineering Maintenance Management Manual, COMDTINST M13020.1 (series).

3. Manual Release Authority. This manual is prepared and released under the authority of the Commandant, United States Coast Guard.

4. Purpose. The purpose of this manual is to furnish its users with an up-to-date, single source of technical information concerning Aviation Life Support Systems and Rescue Equipment in use by Coast Guard Aviation. Life Support and Rescue Equipment, as referred to herein, is defined as survival, protective, emergency, and rescue devices employed for use by Coast Guard Aviation.

5. Contents. This manual contains policies, guidance, illustrations, and descriptions pertinent to configuration, modification, application, and use of Coast Guard Aviation Life Support Systems and Rescue Equipment. All relevant data formerly contained in Coast Guard, Air Force, and Navy publications have been assimilated by the Coast Guard Aviation Life Support Systems Process Guide, CGTO PG-85-00-310. ALC maintains the NAVAIR 13-1-6 (Aviation Crew System) series manuals. Commandant (CG-41) will formulate, produce, and distribute applicable equipment change action to the equipment and to respective sections of this manual.

6. Updates. This manual will be updated periodically. The superseded publication shall be discarded. All directives (Commandant Instructions, Coast Guard Technical Orders, etc.) issued after the date of latest index shall be

complied with. These directives will be incorporated in the next revision of this manual.

7. Recent Developments. The Coast Guard Aviation Life Support Equipment Systems Process Guide, CGTO PG-85-00-310, reflects major changes recently initiated in the area of life support equipment. Changes such as forms, testing procedures, equipment configuration, reporting procedures, inspection intervals, and general information are included in applicable chapters.

8. Comments and Recommendations. Comments concerning this manual may be submitted via the Aeronautical Publication Change Recommendation Form, CG-22. All personnel are encouraged to submit this form as necessary.

9. Supplementary Publications. All AST shops shall maintain a library of applicable publications associated with the equipment their shop maintains. The following publications supplement this manual and the Life Support Systems Facility:

   a. Technical Information Management and Ordering System (TIMOS)

   b. Directives, Publications, and Report Index (DPRI), COMDTNOTE 5600

   c. Aeronautical Engineering Maintenance Management Manual, COMDTINST M13020.1 (series)

   d. Coast Guard Air Operations Manual, COMDTINST M3710.1 (series)

   e. Coast Guard Helicopter Rescue Swimmer Manual, COMDTINST M3710.4 (series)

   f. CG Rescue and Survival Systems Manual, COMDTINST M10470.10 (series)

   g. Coast Guard Mandatory Special Requirement (MSR) Cards

   h. Maintenance Procedure Card (MPC)

   i. Poynter Parachute Manual

   j. Ordnance Publication Index, COMDTINST M8000.3 (series)

   k. Ordnance Manual, COMDTINST M8000.2 (series)

   l. Pyrotechnics, Screening, Marking, and Countermeasures Devices, NASEA SW050-AB-MMA-010 (Volume 1)

   m. Applicable Aircraft Manuals

   n. Prevention of Blood Borne Pathogen Transmission, COMDTINST M6220.8 (series)

   o. Information and Life Cycle Management Manual, COMDTINST M5212.12 (series).

B. ALSE POLICIES AND PROCEDURES.

1. **Special Policy Note**.

NOTE

Only graduates of USCG Aviation Survival Technician School are authorized to inspect, maintain, and modify Coast Guard Aviation rescue and survival equipment.

During an extended deployment, air station Engineering Officers may authorize a primary Quality Assurance (QA) to perform visual and post usage inspections to ALSE, excluding inflatable equipment and parachutes.

2. Aviation Survival Technicians (AST). ASTs will not be required to perform maintenance on life support equipment whose maintenance procedures are not outlined in this manual, PG-85-00-310, or the appropriate ACMS Maintenance Procedure Cards, maintained by USCG Aviation Logistics Center, Elizabeth City, NC. Additionally, ASTs will not be required to provide maintenance on Aviation Life Support Equipment for agencies outside of the United States Coast Guard.

3. Mandatory Special Requirements. MSR Cards have precedence over all other maintenance and inspection procedures.

4. MSR Life Support Equipment Extensions. No extensions are authorized at the unit level on life support equipment. Under special circumstances, extensions may be authorized by ALC ALSE System Manager.

5. General ALSE Policies and Procedures. Policies and procedures for use of Aviation Life Support Systems and Rescue Equipment in Coast Guard aircraft are contained in the Coast Guard Air Operations Manual, COMDTINST M3710.1 (series). Those policies pertaining to all other aspects of the systems and equipment are listed as follows:

WARNING

APPLICABLE MATERIAL SAFETY DATA SHEET(S) (MSDS) SHALL BE REVIEWED PRIOR TO PERFORMING ANY MAINTENANCE REQUIRING THE USE OF HAZARDOUS MATERIALS.

a. Inflatable Survival Equipment. Aviation units shall maintain a sufficient quantity of inflatable equipment to meet the requirements of Coast Guard Air Operations Manual, COMDTINST M3710.1 (series). Coast Guard inflatable equipment shall be maintained, configured, and tested in accordance with (IAW) Chapter 2. The issuance of inflatable equipment shall be IAW COMDTINST M3710.1 (series).

b. Parachutes. Aviation units shall maintain sufficient quantity of the specified type of parachutes needed to meet the requirements of Coast Guard Air Operations Manual, COMDTINST M3710.1 (series). The

issuance and maintenance of parachutes used in life support equipment shall comply with Chapter 3.

c. Survival Items and Kits. Aviation units shall maintain a sufficient quantity and type of survival items and kits to meet the requirements of COMDTINST M3710.1 (series). Survival items and kits shall be maintained IAW the guidelines and principles stated in Chapter 4.

d. Oxygen Equipment. Aviation units shall maintain sufficient oxygen equipment to meet the requirements of Coast Guard Air Operations Manual, COMDTINST M3710.1 (series). This equipment shall be maintained IAW instructions stated in Chapter 5 of this manual. Applicable aircraft maintenance manuals and parts/item identification manuals shall be used for direct oxygen equipment maintenance of aircraft installed items. Shop and storage conditions will comply with the minimum shop conditions described in Chapter 2, Chapter 3, and Chapter 5 of this manual as they pertain to the survival equipment shop and the parachute loft and storage areas.

e. Rescue Equipment. Aviation units shall maintain sufficient quantity and type of the specified types of rescue equipment to meet the requirements of Coast Guard Air Operations Manual, COMDTINST M3710.1 (series). This rescue equipment shall be maintained IAW Chapter 7 of this manual.

f. **Protective Equipment**. **All aircrew members shall be permanently issued the minimum flight clothing and equipment as described in** COMDTINST M3710.1 (series), **Chapter 7, Section A.**

g. Supplemental and Auxiliary Equipment. Commanding Officers are encouraged to supplement this equipment as necessary to fit the needs of the unit regarding mission environment, operational type, and range. The use of winter flight clothing in northern climates is mandatory during winter months. Protective clothing and auxiliary survival equipment appropriate for aircrew operating in northern or tropical climates, shall be provided and issued as applicable for safe mission completion. All protective equipment shall be issued, configured, and maintained IAW CGTO PG-85-00-310, Chapters 4 and 7.

h. Cartridges and Cartridge-Activated Devices, Pyrotechnics, and Ordnance Equipment. Cartridges and cartridge-activated devices shall be maintained IAW applicable DoD manuals listed in the Ordnance Publications Index, COMDTNOTE 8000.3 (series). Pyrotechnic ordnance and ordnance equipment shall be maintained IAW the Ordnance Manual, COMDTINST M8000.2 (series).

i. Emergency Communication Equipment. All emergency transceivers/transmitters shall be procured and maintained IAW Chapter 4.

j. Airborne Use of Force Missions. Airborne Use of Force missions require tactical items in addition to the normal aircrew issued personal protective equipment mandates. These items are listed on the ALC web page http://cgweb.arsc.uscg.mil/aviation_life_support.php This is the only equipment authorized for use by the Aviation Gunner community.

k. Allocation. Aircraft type, mission to be accomplished, number of aircrew members/passengers aboard, and geographical flying environment/range will determine allocation of life support equipment. A specific spare allocation is necessary for crewmembers and passengers, assemblies down for rework, for lead time replacement items, and repack/overhaul cycle spares.

l. Procurement Data. The Aviation Life Support Information and Procurement Sheet (ALSIPS) and the AST Authorized Chemical List (ACL) will be used to obtain procurement information for all components of life support equipment or personally issued gear.

In certain situations, at the Commanding Officer's discretion and when authorized by ALC ALSE System Manager, it may be necessary to procure survival equipment commercially to augment the ALSIPS. **Any acquisition of equipment shall comply with procurement laws.**

(1) ALSIPS. The ALSIPS will be maintained at ALC and available on the ALC web site.

(2) ACL. The ACL will be maintained in the MSR MPC.

m. Quality Assurance. The most critical periods for assuring the performance of rescue and survival equipment are the acceptance/calendar/condition inspections, repairing, and the repacking of the assemblies. Therefore, QA steps are underlined or noted, as QA REQUIRED AT THIS POINT. The AST shall perform the step and then have the performance verified by supervising personnel.

QA Inspectors shall be designated in writing by the Engineering Officer IAW the Aeronautical Engineering Maintenance Management Manual, COMDTINST M13020.1 (series).

Supervisors are primarily responsible for QA, but they may delegate to experienced QA designated personnel, in the survival shop, to perform these inspections.

CHAPTER 2. INFLATABLE EQUIPMENT.

A. OVERVIEW.

1. Introduction. This chapter covers all applicable information relating to inflatable survival equipment. It is sectioned to reflect the different functions and equipment data covered in this chapter.

2. Quality Assurance. QA steps are provided in the appropriate Maintenance Procedure Card (MPC) for critical maintenance operations. When a maintenance step is followed by QA REQUIRED, the Aviation Survival Technician (AST) shall perform that step and then have an authorized QA Inspector perform the inspection prior to continuing with the next maintenance or inspection step.

NOTE

Under no circumstances shall any AST perform their own QA inspections.

3. Records. All inflatable survival equipment shall be subjected to periodic inspections and maintenance. These tasks are the primary assurance of survival equipment functioning properly and no instance of carelessness or willful neglect shall be allowed to pass unnoticed.

4. Mandatory Special Requirements (MSR). MSRs are used by the AST to provide a systematic means of standardizing maintenance procedures. The MSR MPCs provide a logical sequence for inspection and maintenance of equipment. Additionally, a remarks section is provided on each MPC to record any specific information determined relevant which is not recorded by completing the card.

NOTE

The remarks section shall be used when any discrepancy is found and corrected if repairable. The information provided in this section is critical in determining equipment reliability, failure trends, and maintenance intervals.

B. INFLATABLE MAINTENANCE AREAS.

1. General Inflatable Maintenance Area Requirements. The survival shop or specific designated areas are utilized for inspection and maintenance of inflatable equipment. However, since the area must also be used to support many other life support system collateral functions, the details of equipment condition, shop property, environmental control, and cleanliness are of extreme importance. When inflatable maintenance is performed, the following facility requirements shall be met.

CAUTION

DO NOT INSPECT OR MAINTAIN INFLATABLE SURVIVAL EQUIPMENT ON CARPET, ASPHALT, CONCRETE, HARDWOOD, OR WOOD DECKS WHERE NAILS, SPLINTERS, LIME, GRIT, OR PEBBLES MAY DAMAGE THE INFLATABLE ITEMS.

The survival shop/inflatable equipment inspection and maintenance area shall be large enough to service the largest inflatable item, as well as the greatest number of inflatable items per set, that will be inspected and maintained during any one-phased interval inspection. Inflatable packing and inspection tables shall be large enough to accommodate the entire set being tested and permit a maintenance work area for each unit. The table shall have a smooth surface and be totally free of sharp edges, points, burrs, or slivers. Decks where rafts are serviced, tested, and maintained shall be covered with linoleum, asphalt tile, polished terrazzo stone, tile, or a similar smooth, padded (rubber), clean surface.

Decks must be thoroughly cleaned prior to performing any maintenance or testing procedures.

2. Environmental Conditions. The following environmental conditions shall be met to ensure proper conditions for curing adhesives, applying retroreflective surfaces, stenciling, cleaning, and maintaining all inflatable equipment.

   a. Lighting. All lighting shall be recessed or shrouded fluorescent lighting. Windows shall be fitted with protective blinds or drapes to exclude extended sunlight exposure periods which degrade synthetics and polybonded fabrics.

   b. Ventilation. Adequate ventilation shall be provided to prevent accumulation of fumes or gases from solvents, adhesives, CO_2, and any other substance that may pose a risk to environmental safety.

   c. Temperature and Humidity Control. The temperature and humidity ranges shall be maintained between 65 °F and 75 °F and 40-60% humidity. The ideal method of controlling temperature and humidity is an air conditioning system. To obtain maximum effectiveness, a check of physical conditions shall be made in the survival/inflatables shop. A notation shall be made several times each day of the temperature and humidity levels when inflatables are being tested, maintained, modified, or inspected.

3. Shop Air Requirements. Shop air will be regulated, no higher than 40 PSIG. The air source will be filtered to ensure no oil or moisture is present.

   a. Shop Air Source Certification. The shop air source will be tested and certified with a current air quality certificate for breathable air.

   b. SEAS-1 Mandatory Breathing Air Testing. The air quality for SEAS-1 shall meet modified GCA Grade E (ANSI/CGA G-7.1) air requirements as depicted below:

      (1) CGA Modified Grade E (ANSI/GCA G-7.1)

      (2) Oxygen 20-22%

      (3) Carbon Dioxide (CO_2) 500 PPM

      (4) Carbon Monoxide (CO) 10 PPM

      (5) Methane (CH4) 25 PPM

      (6) Water Vapor 67 PPM

(7) Dew Point -50 °F

(8) Odor - none

Air stations filling SEAS-1 compressed air cylinders are required to test their air compressor supply through enrollment in the Defense Compressed Air Testing Program (DCAT).

Enrollment is accomplished on the internet through www.airtesting.com. Select "Aviation Breathing Air Sampling Program," which links to the Defense Compressed Air Testing page. The access code for the website is "MISSION." After entering the access code the user must proceed to the drop-down menu, select "Aviation" and select "Submit." Once enrolled, an air sampling kit can be ordered for SEAS-1 air supply testing. If your unit has been previously enrolled in the air testing program, you may use the previously assigned activity code. If not previously enrolled, follow the online instructions to receive an activity code prior to ordering a testing kit. After placing an order, the unit will receive an email containing the shipping date and tracking number. Online test results are available within 2 days after receipt of the unit's air sample kits. Air stations with SEAS-1 breathing air compressors lubricated with oil shall be tested quarterly. Compressors lubricated with non-oil lubricants (water, etc.) shall be tested semiannually.

NOTE

Any unit that fails the air sample test must discontinue use of their equipment and the compressor must be tagged out/locked until a satisfactory test has been accomplished and documented. Current air quality test results must be posted visibly in the immediate area of the compressor or stationary supply cylinders filled by the compressor.

See the ALSIPS for program testing contact information. For technical assistance, contact ALC ALSE Technical Services, Elizabeth City, NC. Units using commercial sources for breathing air testing, must obtain current laboratory air quality test results indicating the breathing air meets the modified CGA GRADE E (ANSI/CGA G-7.1) air requirements.

c. Shop Air Pressure. Shop air pressure will be determined by specific instruction found in equipment MPCs when referring to inflation and deflation. Shop air pressure shall be capable of constant pressure to 100 PSIG.

C. LIFERAFT MAINTENANCE GUIDELINES.

1. Types of Maintenance. Maintenance of liferafts consists of the following:

   a. Calendar Inspections

   b. Acceptance Inspections

   c. Special Inspections

   d. Cleaning of liferafts (see CGTO PG-85-00-310)

e. Cleaning of containers and/or cases (see CGTO PG-85-00-310)

f. Fabrication of inspection streamers (see CGTO PG-85-00-310)

2. Calendar Inspections. All liferafts will be inspected on a calendar basis IAW the applicable MSR MPC. Inspection intervals can be found in this manual under the applicable liferaft section. Three types of calendar inspections will be performed: the acceptance, leak test, and functional test.

3. Acceptance Inspections. All liferafts will be inspected on receipt from manufacturer or ALC. This will serve to enroll the raft into the Asset Computerized Maintenance System (ACMS), and ensure that the raft is suitable for service. Once enrolled, the item may be processed as INACTIVE until needed.

4. Special Inspections. A special inspection of liferafts in storage or in service will be performed whenever conditions warrant. The AST Shop Supervisor, following review of the circumstances or conditions to which the liferaft has been subjected, will determine the extent of the special inspection. If another inspection is warranted the AST Shop Supervisor will direct the appropriate inspection, regardless of the last inspection date.

5. Cleaning Containers and/or Cases. Containers and/or cases shall be cleaned IAW CGTO PG-85-00-310, Paragraph 2.B.

D. LIFERAFT REPAIRS.

1. Overview. This section contains policy applicable to the determination of repairability, and repair limitation guidelines of Coast Guard liferaft assemblies and subassemblies maintained at Coast Guard Air Stations. Reference numbers for replacement parts, which are defective and require replacement, can be found on the ALSIPS. Reference numbers for chemicals, which are needed to effect repairs, can be found on the AST Authorized Chemical List (ACL). All repairs shall be documented on the applicable MSR MPC.

2. Determination of Repairability. Liferafts shall be considered beyond unit level repair for any of the following reasons:

a. Porous fabric areas on tubes that cause a visible leak

b. Open seam or seam tape separation that causes a visible leak

c. Damaged, malfunctioning, excessively worn, or corroded inlet valve, manifold, oral inflation valve, or oral inflation tube, as applicable

d. Damaged, malfunctioning, excessively worn, or corroded inflate/deflate valves that cannot be corrected by replacement

e. Holes or tears larger than 1 inch

f. Holes or tears within 1 inch of seams

g. Holes or tears on noninflatable floors larger than 7 inches

h. Internal bulkhead leakage

3. Nonrepairable/Drill Liferafts. If inspection indicates damage which is beyond capabilities of unit level maintenance, the assembly shall be tagged Condition Code F Not Ready For Issue (NRFI) and returned to ALC. All ALC (approved)

condemned rafts and containers utilized for water survival training purposes shall be marked in a contrasting color, “DRILL ONLY” in 4-inch letters on raft floor, buoyancy tubes, and containers.

E. LRU-33/A LIFERAFT.

1. Introduction. The LRU-33/A liferaft (Figure 2-1) is designed to provide an emergency flotation system in the event of emergency water ditching for the involved aircrew and passengers. The LRU-33/A is a dual-tube, nonreversible liferaft with a self-erecting canopy. The LRU-33/A is manufactured from yellow urethane-coated nylon, has a volume of 86.3 cubic feet, and the operating pressure is 1.5 to 3.6 PSIG at 70 ºF.

   Normal capacity is 20 persons and overload capacity is 30 persons. Inflation time is 30 seconds. It has a water-activated internal light system. The LRU-33/A 20-person liferaft assembly is used as an HC-130 wing raft.

2. Configuration. The liferaft is configured for manual deployment and inflation and consists of five major subsystems: the inflatable liferaft, an inflation assembly, a repair kit, a urethane-coated nylon carrying case, and a survival items container.

NOTE

HC-130J installation: Left wing installations utilize a red color-coded cable assembly. Right wing installations utilize a green color-coded cable assembly.

HC-130H installation: Left wing installations utilize a red/white color-coded cable assembly. Right wing installations utilize a green/white color-coded cable assembly.

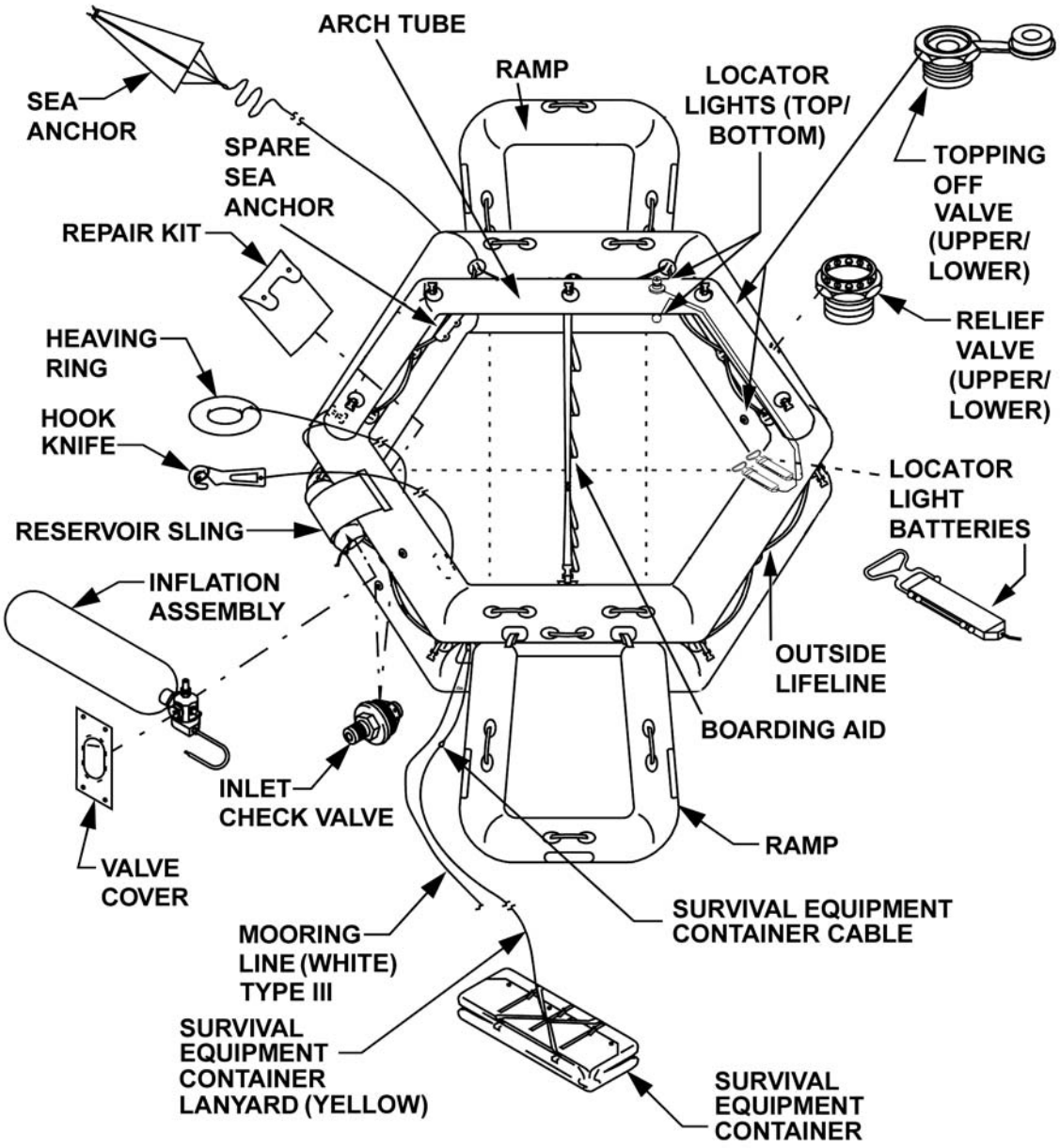

Figure 2-1. LRU-33/A Liferaft

3. Description. The LRU-33/A liferaft is hexagonal in shape, composed of two structurally joined pneumatically independent tube assemblies. It is inflated from one CO_2 composite cylinder. The top tube incorporates an arch-tube which supports the canopy and when fully inflated prevents collapse in severe conditions. The bottom tube incorporates a ballast system that provides stability and two inflatable boarding ramps. A noninflatable insulated floor is

suspended below the bottom tube. The floor is covered with a foam fabric which provides minimal insulation and partial protection from hypothermia. Topping-off valves are spring-loaded poppet valves and are located in both the upper and lower tubes. These valves open automatically with the insertion of the adapter on the hand inflation pump. The valve closes automatically when the adapter is removed from the topping-off valve. The hand inflation pump and adapter are stored in the raft repair kit. To increase the air pressure in either tube, insert the pump adapter into the topping off valve and squeeze the pump repeatedly until the desired pressure has been obtained. The relief valve is a spring-loaded piston sealed by an O-ring, and limits the maximum pressure when rising internal gas temperature increases the internal pressure. The relief valve opening pressure is approximately 3.2 PSIG (2.2 N/cm2) and the closing pressure is 2.4 PSIG (1.7 N/cm2).

4. Functions. Inflation and deployment of the LRU-33/A from the wing raft compartment is accomplished by pulling the inflation handles located at either of two aircraft flight station pull-handles, or at either of two handles located in lightning compartments on the upper surface of the wing. The LRU-33/A inflation cable is attached to the aircraft's cable and fair lead assembly and routed through the aircraft fuselage and wing compartments. The valve release cable activates the inflation cylinder discharge valve releasing compressed gas equally into each flotation tube. Check valves located at the inflation assembly hose attachment point on the liferaft prevents pressure from moving between tubes. The canopy support tube facilitates upright inflation of the liferaft in the water. In the case of the raft inflating inverted or being overturned, a righting strap is manufactured into the underside of the floor to aid in righting the raft.

5. Inspection Intervals. The following are inspection intervals for the LRU-33/A liferaft:

   a. The acceptance inspection (which includes a functional test) will be performed upon original issue, when received from supply, or accepted from another unit for permanent custody.

   b. The leak test inspection will be performed at intervals not to exceed 180 days.

   c. The functional test will normally be performed as part of the acceptance inspection and at intervals that coincide with every sixth leak test inspection or every 36 months.

6. Repair Procedures. Repair procedures for the LRU-33/A crew liferaft are found in the Aviation Life Support Process Guide, CGTO PG-85-00-310, Chapter 2.

   For repairability of the LRU-33/A, refer to Paragraph D.2. Also see the applicable MPC detailing inspections and repairs.

7. CO2 Inflation Assembly Configuration. The LRU-33/A inflation assembly consists of an aluminum cylinder, reinforced with overlapping carbon filaments bonded with epoxy resin. It is rated at 3,500 PSIG (+/-100 PSIG) with a combination charge of 3.06 pounds of CO_2, and 5.7 pounds of N_2 A pull force of 6-5 pounds is required to actuate the inflation valve. The overpressure rupture disk will burst at 4,500-4,950 PSIG. The cylinder pressure gauge

utilizes a numbered GO-NO-GO color band to indicate cylinder pressure. The inflation valve utilizes a common filler valve for inflation assembly filling and bleeding. The valve requires no disassembly or rebuild after actuation, prior to recharge. The cylinder is required to be hydrostatically tested every 5 years.

8. Liferaft Storage Cradle. Figure 2-2 shows the construction dimensions for building an LRU-33/A liferaft storage cradle. The wood used shall be 1- X 4-inch pine shelving or equal.

   The purpose of this cradle is for storage, not packing. Storing the LRU-33/A liferafts in these cradles will provide shape integrity and facilitate fitting the packed wing raft into the wing raft compartment on the aircraft.

F. RSLR-1 LIFERAFT.

1. Configuration. The RSLR-1 liferaft is a single place liferaft used in rotor wing aircraft for deployment to a helicopter rescue swimmer (RS). It is constructed of polyurethane-coated nylon fabric using radio frequency (RF) welding. It weighs 7 pounds and provides 180 pounds of flotation.

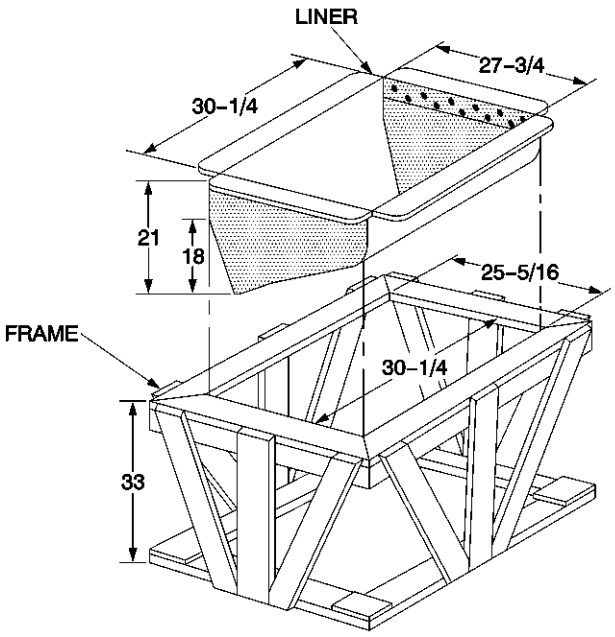

Figure 2-2. LRU-33/A Packing Frame

a. Main Inflation Tube.

(1) The buoyancy tube is a single, U-shaped tube constructed of polyurethane-coated nylon fabric using radio frequency welding for seam construction. Internally, the tube is divided into two independent air holding chambers, upper and lower, separated by a bulkhead. In the event that one air holding chamber is deflated, the remaining chamber may be inflated to regain the raft's original shape.

(2) The upper and lower chambers of the main tube are inflated mechanically through CO_2 inflation assemblies located on the main tube.

NOTE

When the inflation assembly is activated, the actuation levers will separate from the main valve body.

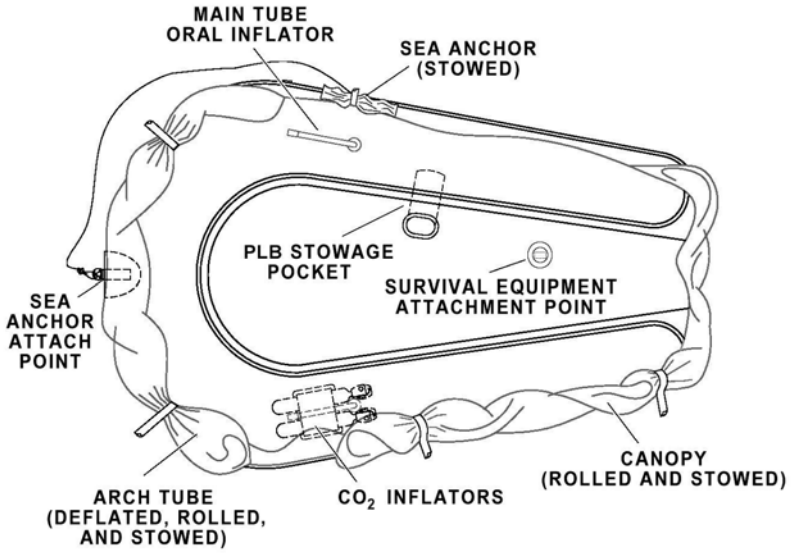

Figure 2-3. (Sheet 1 of 2)
RSLR-1 Liferaft

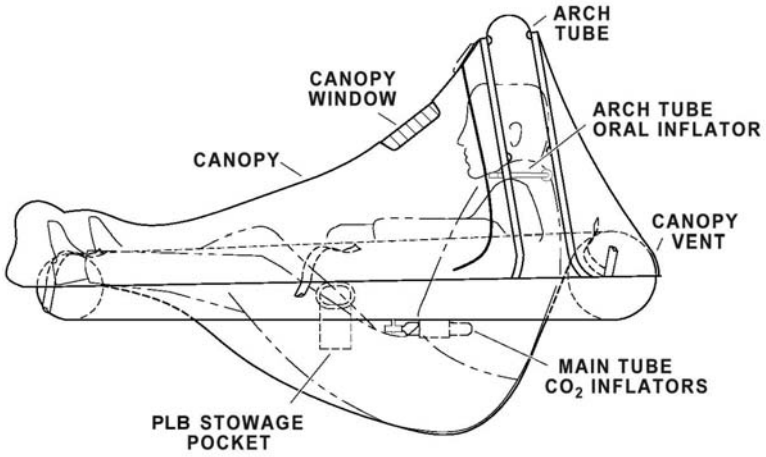

Figure 2-3. (Sheet 2 of 2)
RSLR-1 Liferaft

(3) There are two locking oral inflation valves on the main tube: at the CO_2 inflation assembly and on the opposite side of the main tube. These valves will inflate the chamber on that side of the main tube. In the event that one air holding chamber of the main inflation tube is damaged and deflates, the remaining chamber may be inflated to regain the raft's original shape.

(4) The inflation lanyard is also the retention lanyard and is connected to the raft by a Lark's Head knot around the CO_2 inflation assembly valve.

b. Canopy/Canopy Tube.

(1) The canopy tube is independent of the main tube. It is inflated only through a locking oral inflation valve located to the users left inside the raft.

(2) The canopy support tube supports the canopy above and away from the head of the user to provide head room and ventilation when the canopy is closed.

(3) When unzipped, the canopy may be rolled and stowed under hook and pile tape located in four positions on the rear and right side of the main tube perimeter.

(4) The canopy has a window to provide external visual reference and a vent above the sea anchor attachment point.

(5) The sea anchor attaches at the back of the raft allowing the raft to face downwind when deployed.

c. Raft Floor.

(1) The raft floor design allows for a slight recline position with the center of gravity below the waterline, increasing inherent stability.

(2) There is a survival item attachment point in the floor 16.5 inches from the foot of the raft. There is a reversible radio/PLB stowage pocket fabricated into the floor, dimensions are 10 x 4 x 3 inches.

2. Liferaft Functions.

Prior to raft inflation, the RS will attach the inflation/retention lanyard clip to the RS harness. To inflate, pull on the inflation/retention lanyard. The raft should inflate to the design shape within 30 seconds. After boarding the raft, the canopy may be raised by releasing the hook and pile stow straps and orally inflating the arch. Complete canopy erection is achieved by pulling one or two of the supplied zippers.

3. Inspection Intervals. The following are inspection intervals for the RSLR-1 liferaft.

a. The acceptance inspection (which includes a functional test) will be performed upon original issue, when received from supply, or accepted from another unit for permanent custody.

b. The leak test inspection will be performed at intervals not to exceed 180 days.

c. The functional test will normally be performed as part of the acceptance inspection and at intervals that coincide with every sixth leak test inspection or every 36 months.

4. Repair Procedures. For repairability of the RSLR-1, refer to Paragraph 2.D.2., Technical Manual (USCG) 25-61-23, pages 401-407, and the applicable MPC detailing inspections and repairs.

G. LRU-25/A CREW RAFT.

1. Introduction. The LRU-25/A crew raft (Figure 2-4) is designed to provide an emergency flotation system in the event of emergency water ditching for the involved aircrew and passengers. The LRU-25/A is a dual-tube, non-reversible liferaft with a self-erecting canopy. The LRU-25/A is manufactured from yellow urethane-coated nylon, has a volume of 26.8 cubic feet, and the operating pressure is 1.3 to 4.7 PSIG.

   Normal capacity is six persons and overload capacity is nine persons. Inflation time is 30 seconds. It has a water-activated internal light system. The LRU-25/A six-person liferaft assembly is used as an aircrew liferaft in HH-60, HH-65, HU-25, and C-144 aircraft.

2. Configuration. The LRU-25/A crew raft is configured for manual deployment and inflation. It consists of five major subsystems: the inflatable liferaft, an inflation assembly, a repair kit, a urethane-coated nylon carrying case, and a survival items container.

3. Description. The liferaft is composed of two structurally joined, pneumatically independent tube assemblies which are hexagonal in shape. The top tube incorporates an arch-tube that is a separate air holding chamber inflated by utilizing an internal relief valve that directs pressure from the top tube into the arch tube. The canopy arch tube supports the canopy and when fully inflated prevents collapse in severe conditions. The bottom tube incorporates a ballasting system to provide stability and an inflatable boarding ramp. The boarding ramp is made of a separate air holding chamber inflated through an internal relief valve. A non-inflatable insulated floor is suspended below the bottom tube.

   a. Manual inflation/deflation valves are located in the upper and lower tubes, canopy arch tube and ramp. A manual inflation pump and adapter with cover are located on the inside of the upper tube in one of two stowage pockets.

   b. The inflation/deflation valves are spring-loaded poppet-type valves which open or close automatically by the attachment or removal of the valve adapter on the manual inflation pump. To increase the air pressure in either tube, push the pump adapter firmly into the inflation/deflation valve of that tube. Squeeze the pump until the desired pressure has been obtained.

   c. Each overpressure relief valve is operated by a spring loaded piston and sealed by an O-ring. The external relief valve operating pressure is approximately 3.2 PSIG. The internal relief valve operating pressure is approximately 2.9 PSIG.

   d. A heaving ring and line assembly is provided as a rescue aid which may be hand thrown to persons in the water who are unable to reach the liferaft. The heaving line incorporates a length of nylon cord which is tied off to the lifeline on the inside of the liferaft. The free end of the line has a 6-inch floating, rubber tossing ring or quoit attached.

e. A retention lanyard is attached to the inflation lanyard on the liferaft. When attached to the aircraft fuselage by the snaphook, it prevents the liferaft from drifting away from survivors.

f. A floating knife is located in a pocket on the interior of the top liferaft tube near the raft entrance.

g. Lifelines located externally on the lower tube perimeter, and internally on the upper tube, serve as aids for survivors to grasp from the water and while seated in the liferaft. The lifelines are constructed of 1-inch wide webbing attached to the inflatable at intervals by means of fabric patch material.

h. Boarding handles and a boarding ladder are located at one end of the inflatable. They are constructed of 1 and 2-inch wide webbing, and enable survivors to climb aboard the liferaft from the water. The lower tube has a boarding ramp equipped with boarding handles on the side opposite the boarding ladder. This enables survivors to climb aboard the liferaft from the water.

i. The sea anchor, stowed in a fabric pouch, is connected by the sea anchor cord to a high strength patch on the inflatable. The sea anchor is a cone-shaped cloth bag with a cord bridle attached to the cable and is used to control the drift rate and orientation of the liferaft with respect to the wind.

j. Two locator lights are provided; one located on the canopy of the raft aids in locating the liferaft at night, the other light illuminates the interior of the liferaft. The lights are operated by a water activated battery that is automatically deployed into the water during raft deployment. The locator lights are located in light holders atop and below (inside) the canopy arch.

k. A lightweight canopy is packed, installed, on the liferaft and is automatically erected upon deployment of liferaft. The canopy can be detached for ease of rescue and in hot environments.

l. The carrying case has a pocket for stowing the lanyard, and lacing strips to compress the liferaft to pack size.

4. Function. Deployment and inflation of the LRU-25/A is accomplished in the following steps:

a. Attach the retention lanyard clip (which is attached to the inflation lanyard on the liferaft) to a solid point near the aircraft exit.

b. Push or throw the liferaft away from the aircraft, and pull the entire length of the retention lanyard from the liferaft case. When the retention lanyard becomes taught, jerk the remaining lanyard away from the liferaft container, inflating the raft. (The retention lanyard is attached to the inflation lanyard and the liferaft, so it will inflate the raft and keep it attached to the aircraft until removed by the aircrew after boarding the liferaft.)

NOTE

The LRU-25/A liferaft is not reversible. If it inflates upside down and does not self-right, pulling on the righting strap will easily right the liferaft to the upright position. The location of the righting strap is indicated on the bottom of the liferaft. To right the liferaft, find the righting strap where it attaches to the raft near the inflation assembly. Turn the raft until the wind is in your face. Pull the righting strap hand over hand, lifting the far side of the raft out of the water. It may be necessary to push your feet or knees into the side of the raft and lean back when pulling. As the raft comes over, protect your face and head, then use the righting strap to pull your self out from under the liferaft.

c. If the aircraft stays afloat and is not a danger to the integrity of the liferaft or the safety of the crew, the crew may choose to stay attached to the aircraft by the retention lanyard. If the aircraft is sinking, or poses a damage hazard to the liferaft, the crew will cut the liferaft retention line with the j-hook knife provided on the upper liferaft tube inside the liferaft entrance.

5. Inspection Intervals/Repair Procedures. Inspection intervals and repair procedures for the LRU-25/A crew liferaft are found in the Aviation Life Support Process Guide, CGTO PG-85-00-310, Chapter 2.

   For repairability of the LRU-25/A, see Paragraph D.2. Also see the applicable MPC detailing inspections and repairs.

6. CO2 Inflation Assembly Configuration.

   a. The LRU-25/A Liferaft Inflation Assembly consists of an aluminum cylinder reinforced with overlapping carbon filaments bonded with epoxy resin. It is rated at 3,500 PSIG (+/-100) at 70 °F, with a combination charge of 2.20 pounds of CO_2 and 1.7 pounds of N_2.

   b. A pull force of 6-15 pounds is required to actuate the inflation valve.

   c. The overpressure rupture disk will rupture at 4,500-4,900 PSIG.

   d. The cylinder pressure gauge utilizes a GO-NO-GO color band to indicate cylinder pressure.

   e. The inflation valve utilizes a common filler valve for inflation assembly filling and bleeding.

   f. The inflation assembly will be returned to ALC after actuation for replacement. The cylinder is required to be hydrostatically tested every 3 years.

H. CO2/N2 SERVICING SYSTEM.

NOTE

To ensure a minimal amount of moisture input to inflation assemblies, all CO_2 shall pass through two purifier assemblies connected in series. The purifier cartridges in each assembly shall be replaced after 250 pounds of CO_2 have passed through cartridges.

1. CO2/N2 Charging System Features.
   a. Charges the cylinders with N_2 and CO_2 with a single filler nozzle attachment.
   b. Air dryer that provides the shop and charging system with desiccated and filtered air.
2. Compressed Air Dryer Features.
   a. Dries compressed air to protect the CO_2/N_2 pump from freezing during operation, and to provide high-grade filtered dry air for general shop use
   b. Dries air to a dew point of -40 °F (IOS 8573.1 Class 1.2.1)
   c. Maximum pressure: 150 PSIG
   d. Operating temperature: 41-122 °F
   e. Need not be mounted in the shop
3. Operation. The dryer column contains two chambers of desiccant material. While one is drying the compressed air (absorption), the other is simultaneously undergoing regeneration (desorption). Approximately every 2 minutes, the two columns automatically reverse in function. At change over, the air in the desorption column is vented to the atmosphere.
4. System Maintenance.
   a. The compressed air dryer desiccant material typically exceeds 10,000 hours (3½ years, 8 hours per day). The primary indication that the desiccant requires changing is the CO_2/N_2 pump freezing during operation. The dryer filters typically last 2 to 3 years. Before the system is used, check for debris or liquid in the filter bowls and clean as required to assure proper operation.
   b. Before each use, visually check the conditions of the valves and hoses.
   c. Scale calibration (QA).

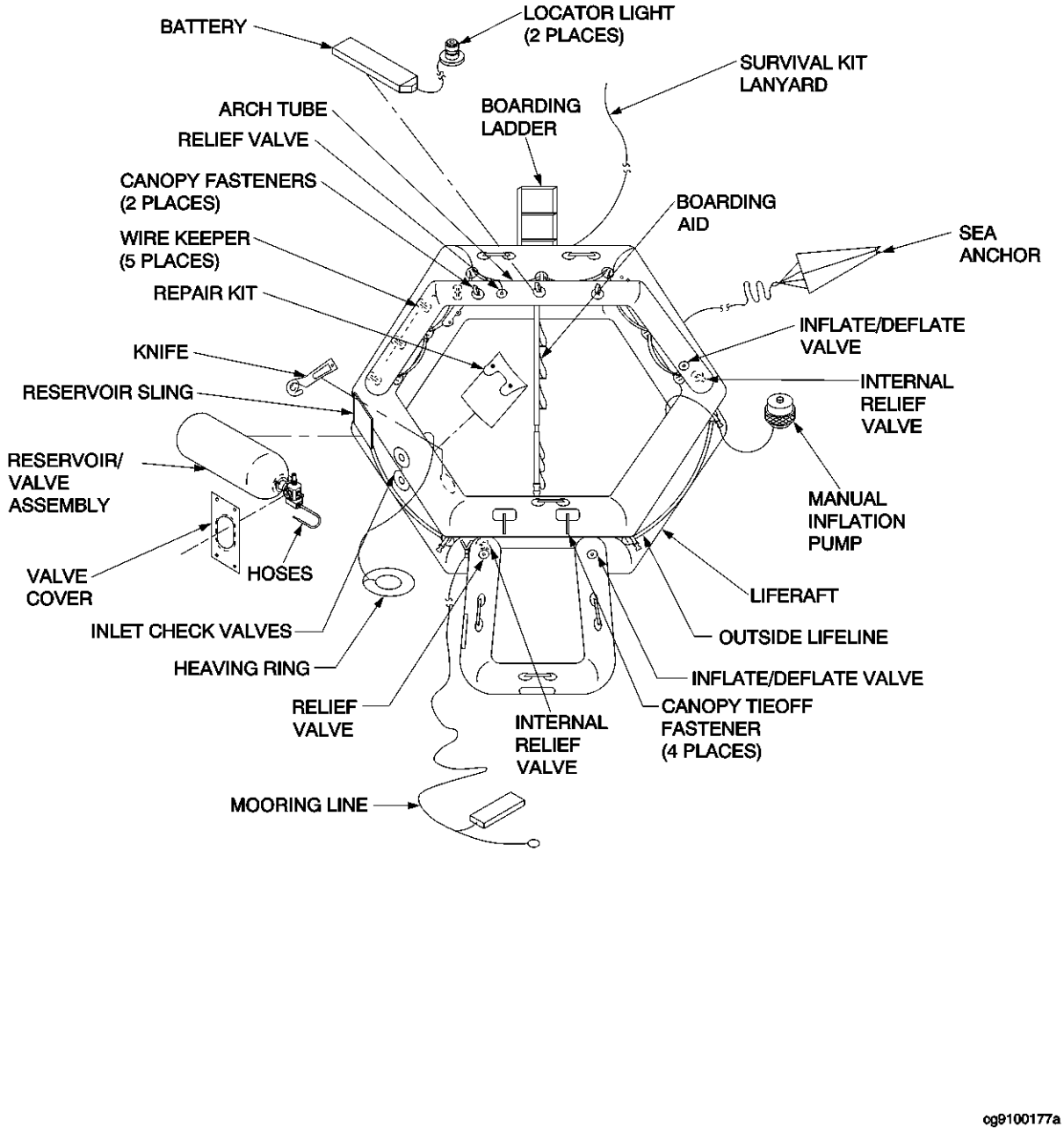

Figure 2-4. LRU-25/A Crew Raft

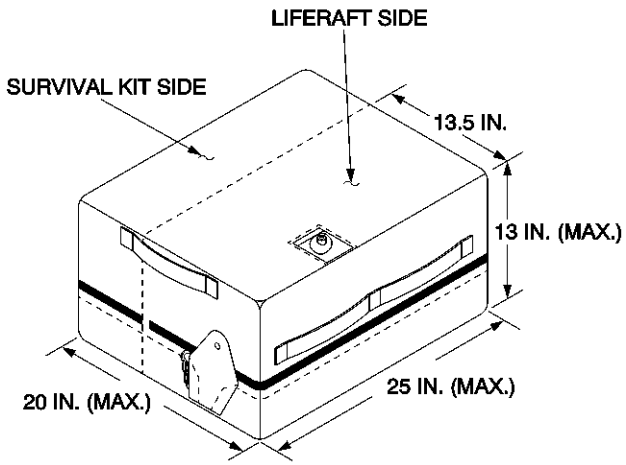

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Figure 2-5. LRU-25/A Liferaft Diagram (Packed)

I. LIFE PRESERVER/SURVIVAL VEST MAINTENANCE.

1. Types of Maintenance. The maintenance of life preservers and survival vest consist of the following:

   a. Routine Inspections

   b. Calendar Inspections

   c. Special Inspections

   d. Cleaning of air bladders

   e. Cleaning of vest cases and bladder containers

2. Routine Inspections. All life preservers and survival vests will be inspected on a routine basis IAW this manual. The frequency of these inspections prohibits use of the computer for scheduling. Specific criteria for each type of preserver and survival vest inspection will be given in their respective section. Required routine inspections are as follows:

   a. Preflight Inspection. This inspection shall be performed prior to each flight by the crewmember that will wear it. In the case of a non-qualified passenger, one of the crewmembers assigned to the flight shall preflight the life preserver or survival vest worn by the non-qualified passenger.

   b. Postflight Inspection. Only the SEAS-1 device requires this inspection. This inspection shall be performed after each flight by the crewmember that wore it.

   c. Weekly Inspections. This inspection is designed to provide verification of satisfactory condition of critical components at frequent intervals. An AST shall perform this inspection.

3. Acceptance and Calendar Inspections. All life preservers and survival vests will be inspected on a calendar basis IAW the applicable MSR MPC, not to exceed 180 days. Inspection intervals can be found in this manual under the applicable life preserver and survival vest section. Three types of inspections are listed below:

   NOTE

   When equipment is received from ALC or another unit, a RECEIVE MPC will be completed and entered into the ACMS system. This is required to ensure unit and ALC inventories are maintained correctly.

   a. An acceptance inspection is completed when the equipment is received from the manufacturer, ALC, or another unit. An acceptance inspection will typically include a functional acceptance inspection, and subsequent leak test inspection. Refer to the specific steps described in the applicable MSR MPC.

   b. A leak test inspection is required to ensure that life preservers and survival vest bladders will maintain designed inflation pressure when required in an emergency.

c. A functional test inspection is required on life preservers and survival vest bladders prior to being placed in service. This test is designed to functionally test all components of the device for proper operation. A functional leak inspection will typically include a leak test inspection. Refer to the specific steps described in the applicable MSR MPC.

4. Special Inspections. A special inspection of life preservers or survival vests, in storage or in service, will be performed whenever conditions warrant. The AST shop supervisor will determine the extent of the special inspection following review of the circumstances or conditions to which the life preserver or survival vest bladder has been subjected. If a special inspection is warranted the AST shop supervisor will direct the appropriate inspection, regardless of the last inspection type or inspection date.

J. LIFE PRESERVER AND SURVIVAL VEST REPAIRS.

1. Overview. This section contains instructions for determining the repairability of various components and subassemblies of life preservers to ensure that appropriate items of equipment remain in Ready For Issue (RFI) status. Reference numbers for replacement parts that are defective and require replacement can be found on the ALSIPS. All repairs shall be documented on the applicable MSR MPC, including comments that will guide future reference to that equipment.

2. Determination of Repairability. Life preserver and survival vest bladders shall be considered beyond repair for any of the following reasons:

   a. Porous fabric areas on tubes that cause a visible leak

   b. Split or open bladder seams

   c. Holes, cuts, tears, or punctures over 1 inch square or within 1 inch of a seam on an LPP-1A

NOTE

There are no repairs authorized on the LPU-27/P (SAR Warrior), LPU-26/P, LPU-26/PE survival vest bladders, carrier, or bladder shell.

3. Condemned Life Preserver/Survival Vest. If inspection indicates damage, which is beyond capabilities of the AST shop, the assembly shall be condemned. Condemned life preservers/survival vests will be stripped. All serviceable parts shall be retained in local stock for repair purposes. Condemned life preservers/survival vests shall be utilized for drill purposes. All preservers/vests utilized in this manner shall be marked, “DRILL ONLY” in ¾-inch black letters on 1-inch white webbing attached to vest/container to preclude mixing drill equipment with RFI equipment.

K. LPP-1A LIFE PRESERVER.

1. Configuration.

   The LPP-1A life preserver assembly weighs approximately 3 pounds and provides a minimum of 29 pounds of buoyancy (Figure 2-6). The LPP-1A life preserver assembly consists of the following:

a. Flotation Bladder Assembly. Single yoke-type compartment polychloroprene-coated nylon cloth constructed.

b. Inflation Assemblies. CO_2 cartridge-type inflation valve and a built-in oral inflation valve.

c. Pouch and Belt Assembly. Adjustable to waist sizes 30 to 52 inches and attaches the flotation assembly and pouch to the wearer by means of the belt loop on the flotation assembly and the slots in the back of the pouch.

d. Storage Container. Orange nylon cloth, with operating instructions stenciled on the container.

e. Survival Equipment.

(1) Emergency whistle

(2) Sea dye marker

(3) Saltwater activated survivor locator light

(4) Toggle assembly consisting of a wooden toggle and line is provided for survivors to secure themselves together while they are in the water. When not in use, the toggle line is wrapped around the wooden toggle and stowed in a pocket located in the belt.

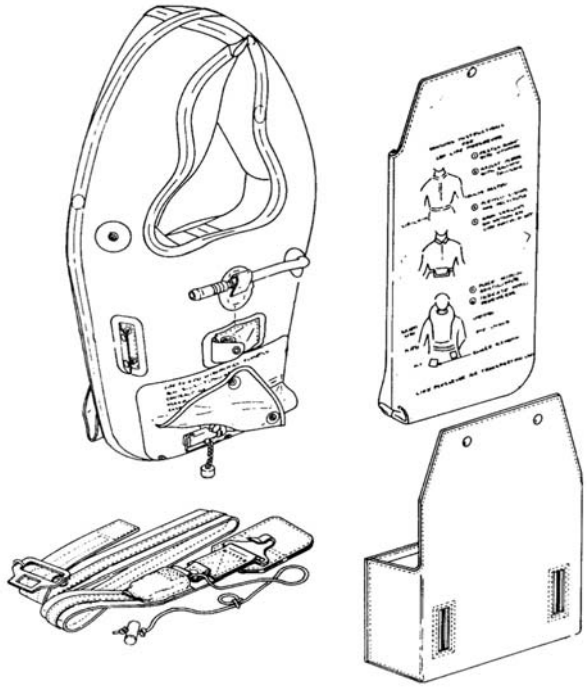

Figure 2-6. LPP-1A Life Preserver

2. Function. Inflation of the LPP-1A is either by a CO_2 cartridge contained in the vest or by the built-in oral inflation valve. After emergency aircraft egress, inflate the LPP-1A by pulling down and slightly outward on the CO_2 inflation valve assembly pull toggle. In an emergency, the oral inflation tube should be

used to top off an inflated preserver, or to inflate a preserver if the inflation valve assembly malfunctions.

3. Inspection Intervals. The following are inspection intervals for the LPP-1A:

   a. The acceptance inspection (which includes a functional test) will be performed upon original issue, when received from supply, or accepted from another unit for permanent custody.

   b. The leak test inspection will be performed at intervals not to exceed 180 days.

   c. The functional test will normally be performed as part of the acceptance inspection and at intervals that coincide with every sixth leak test inspection or every 36 months.

L. MD1127 ROTOR WING PASSENGER VEST.

1. Configuration. The MD1127 Rotor Wing Passenger Vest is a constant wear vest that weighs 2.2 pounds (with inflation cylinder installed). It is designed to provide passenger emergency flotation on Coast Guard rotor wing aircraft. When inflated, the MD1127 provides sufficient buoyancy to turn an unconscious person face up. When fully inflated, the MD1127 provides a minimum effective buoyancy of 35 lb. The MD1127 is universal in size and is designed to fit most adults. This can be worn over bulky outer clothing, and has adjustable nylon waist belts which secure an easy-to-wear position allowing for maximum freedom of movement.

Rotor Wing Life Preserver Donned/Uninflated

Rotor Wing Life Preserver Donned/Inflated

Figure 2-7. MD1127 Life Preserver

   a. Flotation Bladder Assembly. The MD1127 incorporates a dual chamber inflatable cell constructed from polyurethane coated nylon, which is separated by an internal floating baffle. The floating baffle allows either chamber to fully inflate the life preserver.

   b. Inflation Assemblies. The MD1127 dual chamber inflatable cell design incorporates a primary inflation cell accessed from a CO_2 inflation

system and an oral inflation system, along with a secondary cell accessed from its own oral inflation system.

c. Vest/Flotation Casing. The life preserver is styled as a protective collar fitted around the neck and front chest. The protective collar is constructed from 6 oz. Nomex®. The outer shell of the MD1127 is not integral with the inflation cell, but acts as a cell enclosure by opening the Velcro® seals; when deflated, the inflation cell is folded and placed back into the cell enclosure.

d. Survival Equipment. A signal whistle, emergency strobe signal, and a signal mirror are located in the equipment pocket, left side on the waist belt (when worn).

2. Function. The CO_2 inflation assembly pull lanyard is identified by five red plastic beads that extend below the inflation assembly protective flap on the right side of the vest (when worn). In case the primary inflation cell has been punctured, or fails to inflate, the life preserver may be inflated orally by the secondary inflation cell, inside protective collar, left side of vest (when worn). The oral inflation systems consist of an oral tube and oral valve. The oral inflation valve is normally closed, and is opened by depressing the mouthpiece when inflating or deflating.

3. Inspection Interval. The following are inspection intervals for the MD1127 Rotor Wing Passenger Vest:

a. The acceptance inspection which includes a functional test will be performed upon original issue, when received from supply, or accepted from another unit for permanent custody.

b. The leak test inspection will be performed at intervals not to exceed 180 days

c. The functional test will normally be performed as part of the acceptance inspection and at intervals that coincide with every sixth leak test or every 36 months.

M. AV-35 FIXED WING PASSENGER LIFEVEST. The Passenger Life Preserver is an airline-style life preserver in a vacuum sealed package. These are sealed at the manufacturer and are not opened for inspection at the unit level.

CAUTION

THE AV-35A, AV-35H, AND FV-35/3505-401 ARE THE ONLY AUTHORIZED AIRLINE-STYLE PASSENGER LIFE PRESERVERS FOR USE ON COAST GUARD FIXED WING AIRCRAFT.

1. Configuration. The AV-35 life preserver is stored on fixed wing aircraft, and is not a constant wear vest. It is a CO_2 inflated, heat sealed, dual-chamber configuration equipped with oral inflators for each chamber (Figure 2-7). This life preserver is manufactured IAW TSO-C13f Adult-Child category and has a buoyancy of 35 lb (min) for a person weighing 35 lb and over. A survivor locator light is attached to the upper edge of the floatation cell. The battery is suspended below the bottom edge of the floatation cell.

Fixed Wing Life Preserver Uninflated

Fixed Wing Life Preserver Donned/Uninflated

Figure 2-8. AV-35 Fixed Wing Passenger Lifevest Un-inflated and Donned Un-inflated

Fixed Wing Life Preserver Donned / Inflated

Figure 2-9. AV-35 Fixed Wing Passenger Lifevest Donned / Inflated

2. Function. Two inflators are operated by pulling each red plastic handle labeled "JERK TO INFLATE." Actuation of the inflation valve punctures the CO_2 cartridge and inflates the two buoyancy chambers through the manifold in the CO_2 inflation assembly. Secondary inflation of each buoyancy chamber can be accomplished through the oral inflators if one or both of the primary inflation systems fails to operate, or if additional pressure is required.

3. Inspection Intervals. The following inspections are to be accomplished using the appropriate MSR MPC.

   a. The acceptance inspection is required on original issue, when received from supply, or when accepted from another unit for permanent custody.

   b. The visual inspection is due every 12 months, not to exceed 60 months from the date of manufacture. If date of manufacture is 60 months or greater, send passenger life preserver back to approved FAA certified facility or to the manufacturer for inspection.

NOTE

The leak inspection is to be accomplished at the manufacturer, IAW the appropriate MSR MPC.

   c. The leak inspection is to be completed every 60 months from the date of manufacture. The date of manufacture is located on the inside back of the sealed bag.

4. Modifications and Repairs. No modifications are required nor authorized for the fixed wing passenger lifevest. Required repairs will be accomplished at the manufacturer IAW the appropriate MSR MPC.

N. LPU-26/P SURVIVAL VEST.

1. Configuration. The LPU-26/P survival vest (Figure 2-9) is designed for constant wear, and is used by fixed wing aircrew members. It weighs approximately 5 pounds, including equipment, and provides a minimum of 22 pounds of buoyancy. The LPU-26/P survival vest consists of the following subassemblies:

   a. Flotation Bladder Assembly. The LPU-26/P flotation bladder consists of a single bladder with two (upper and lower) chambers.

   b. Inflation Assemblies. The upper and lower chambers are inflated mechanically through CO_2 inflation valves, or orally by means of built-in oral inflation tubes.

   c. Vest/Flotation Casing. The vest/flotation casing is constructed of lightweight blue Nomex® mesh with a belt assembly that contains the pocket subassemblies for individual survival equipment stowage. The bladder assembly is attached to the vest/flotation casing with gutted type III, nylon cord. The LPU-26/P comes in one size, and is secured to the wearer with a slide fastener closure and an adjustable belt assembly.

d. Survival Equipment. Two pockets are provided (one on the wearer's left and one on the right) for stowage of survival equipment. The type and quantity of survival equipment shall be IAW the applicable MPC.

2. Function. Inflation of the LPU-26/P is either by a CO_2 cartridge contained in the vest or by the built-in oral inflation valve. After aircraft egress, inflate the LPU-26/P by pulling down and slightly outward on the CO_2 inflation valve assembly pull toggle. The oral inflation tubes should be used to top off an inflated preserver, or to inflate a preserver if the inflation valve assembly malfunctions.

3. Inspection Intervals. The following are inspection intervals for the LPU-26/P survival vest.

   a. The acceptance inspection (which includes a functional test) will be performed upon original issue, when received from supply, or accepted from another unit for permanent custody.

   b. The leak test inspection will be performed at intervals not to exceed 180 days.

   c. The functional test will normally be performed as part of the acceptance inspection and at intervals that coincide with every sixth leak test inspection or every 36 months.

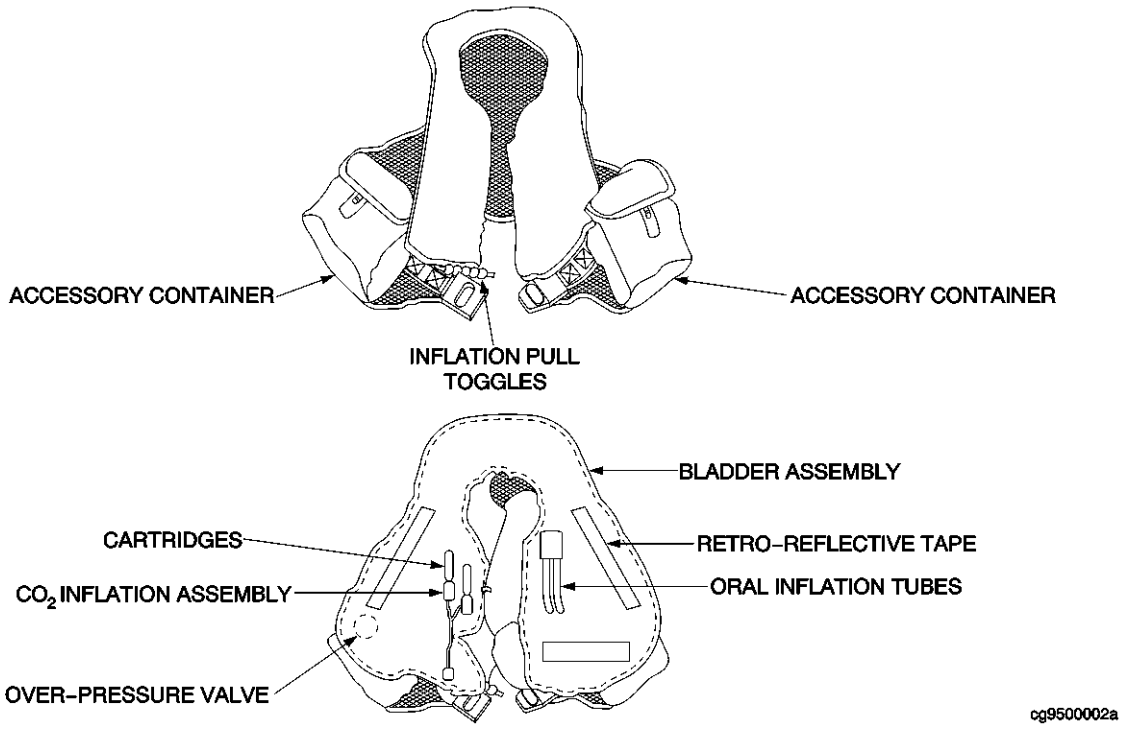

Figure 2-10. LPU-26/P Survival Vest

O. LPU-26/PE SURVIVAL VEST.

1. Configuration. The LPU-26/PE survival vest (Figure 2-11) is designed for constant wear and is used by rotary wing aircrew members. It weighs approximately 5 pounds including equipment and provides a minimum of 22 pounds of buoyancy. The LPU-26/PE survival vest consists of the following assemblies:
   a. Flotation Bladder Assembly. The LPU-26/PE flotation bladder consists of a single bladder with two (upper and lower) chambers. This is the same bladder used in the LPU-26/P survival vest.
   b. Inflation Assemblies. The inboard and outboard chambers are inflated mechanically through CO_2 inflation valves or orally by means of oral inflation tubes.
   c. Vest/Flotation Casing. The vest/flotation casing is constructed of lightweight blue Nomex® mesh with a belt assembly that contains the pocket subassemblies for individual survival equipment stowage. The bladder assembly is attached to the vest/flotation casing with gutted type III, nylon cord. The LPU-26/PE comes in one size, and is secured to the wearer with a slide fastener closure and an adjustable belt assembly.
2. Function. Inflation of the LPU-26/PE is either by CO_2 cartridge contained in the vest or by the oral inflation valve. After aircraft egress, inflate the LPU-26/PE by pulling down and slightly outward on the beaded CO_2 inflation valve lanyard. The oral inflation tubes should be used to top off an inflated preserver, or to inflate a preserver if the inflation valve assembly malfunctions.
3. Inspection Intervals. The following are inspection intervals for the LPU-26/PE survival vest:
   a. The acceptance inspection (which includes a functional test) will be performed upon original issue, when received from supply, or accepted from another unit for permanent custody.
   b. The leak test inspection will be performed at intervals not to exceed 180 days.
   c. The functional test will normally be performed as part of the acceptance inspection and at intervals that coincide with every sixth leak test inspection or every 36 months.

P. LPU-27/PE SURVIVAL VEST.

1. Configuration. The LPU-27/PE survival vest (Figure 2-12) is designed for constant wear in rotor wing aircraft and is used only by aircrew members trained in their use. When worn correctly the design is sufficient to keep an aircrew member in a head back, airway open position in a moderate sea-state whether conscious or unconscious. The weight of the LPU-27/PE is 12.5 pounds including equipment and provides 65 pounds of buoyancy. The LPU-27/PE survival vest consists of the following three assemblies:
   a. Carrier Vest Assembly. Constructed from mesh panels with supporting webbing frame, utilizing adjustable leg and torso straps to adjust the fit to individual aircrew member. The LPU-27/PE comes in one size and

secures to the wearer with a 10-inch nylon slide fastener, a chest strap and leg straps that secure with Cobra® fittings.

There are six pockets for storing survival items. The type and quantity of survival equipment shall be determined by the applicable MPC. The SEAS-1 pocket has two vertical rows of four pull-the-dot snaps. This serves as the platform for the Chemical, Biological, and Radiological (CBR) adapting bracket.

b. Flotation Collar Assembly. The flotation collar assembly is made up of the following subassemblies:

(1) Flotation Bladder. The LPU-27PE flotation bladder is a dual-chamber bladder. The upper and lower chambers of the bladder are inflated mechanically through CO_2 inflation assemblies located on the wearer's left and identified by a pull lanyard laced through 10 black, ½-inch diameter plastic beads. There are two locking oral inflation valves located on the bladder on the wearer's right.

(2) Flotation Casing. The flotation bladder casing is constructed of Nomex® and attaches to the vest carrier with four bayonet fittings and two pull-the-dot snaps.

(3) Holster. The holster is for use by authorized units only.

c. Survival Equipment. Figure 2-12 illustrates the survival equipment location on the LPU-27/P SAR Warrior. The vest contains much of the same equipment as the LPU-26/P, however, the equipment is carried in various pockets, with the SEAS-1 in a separate pocket on the wearer's left side. An asterisk indicates optional equipment. The survival equipment is as listed:

(1) Pyrotechnic Emergency Signal Kit MK-79 MOD 0 (1 kit)

(2) Pyrotechnic Emergency Signal MK-124 MOD 0 (1 flare)

(3) Emergency Signal Whistle

(4) 406 Personal Locator Beacon (PLB)

(5) Emergency Signal Mirror

(6) Emergency Strobe Light

(7) SEAS-1

(8) Seatbelt Webbing Cutter

(9) Folding Survival Knife

(10) **Holster***

(11) **Flashlight***

(12) **Magnesium Fire Starter***

2. Function. The LPU-27PE should be inflated after egress from the aircraft. The manual inflation lanyard is on the wearer's left and the oral inflation valves are on the wearer's right. The locking oral inflation valves may be used to top off an inflated bladder.

3. Inspection Intervals. The following are inspection intervals for the LPU-27/PE survival vest:

   a. The acceptance inspection (which includes a functional test) will be performed upon original issue, when received from supply, or accepted from another unit for permanent custody.

   b. The leak test inspection will be performed at intervals not to exceed 180 days.

   c. The functional test will normally be performed as part of the acceptance inspection and at intervals that coincide with every sixth leak test inspection or every 36 months.

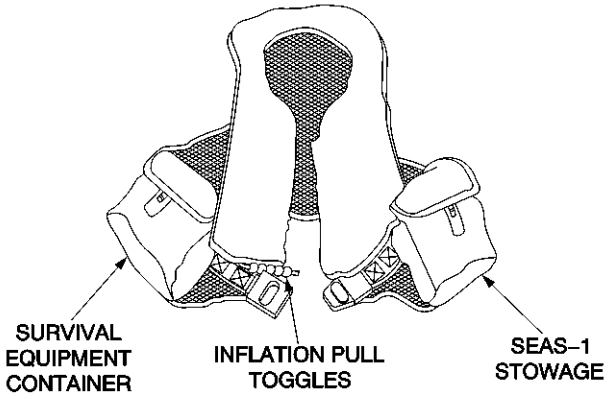

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Figure 2-11. LPU-26/PE Survival Vest

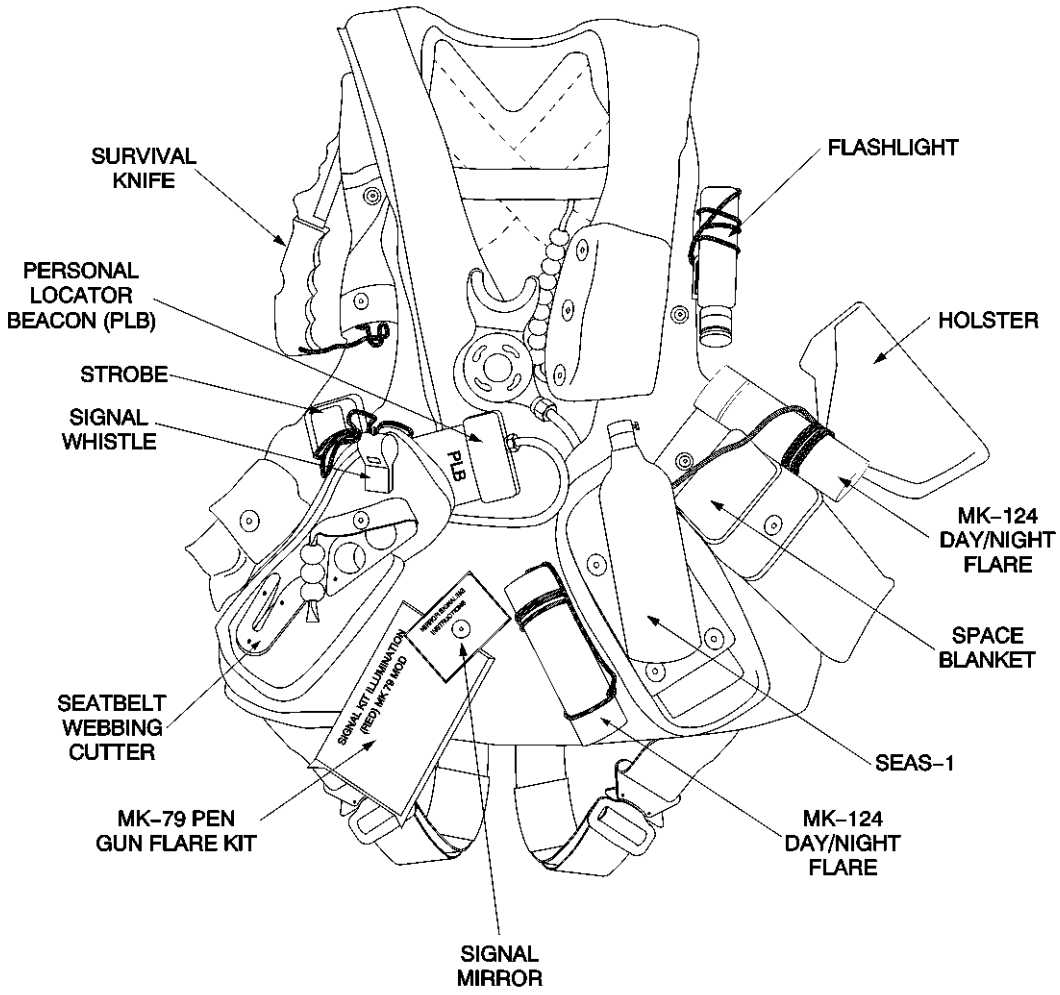


Figure 2-12. LPU-27/PE SAR Warrior Survivor Vest

Q. MASS CASUALTY RAFT.

1. Introduction. The Mass Casualty Raft is used as an emergency flotation platform to be dropped from rotor wing aircraft to large groups of survivors in the water. Unlike other inflatable lifesaving devices in the Coat Guard aviation inventory, the Mass Casualty Raft is not maintained by Air Station ASTs. Acceptance, Leak, and Functional Inspections are carried out by the manufacturer.

2. Configuration. The Mass Casualty Raft is configured to be dropped and subsequently inflated from a helicopter in a hover, or minimum forward airspeed.

3. Inspection. Mass Casualty Rafts are inspected and repacked at the factory at 5-year intervals. AST shops will do an annual visual inspection of the raft to verify location of the raft and condition of the packaging. This annual visual inspection will be enrolled in ACMS as a Special Requirement (SR) item. The 5-year inspection will be enrolled in ACMS as an SR inspection to ensure tracking on the Maintenance Due List (MDL) to allow for planning of asset availability.

CHAPTER 3. AERIAL DELIVERY SYSTEM (ADS).

A. OVERVIEW.

1. Introduction. This chapter contains information relating to Aerial Delivery Systems (ADS). It is sectioned to reflect the different functions and equipment data in addition to specific requirements for use by the Coast Guard. The AST has the responsibility of maintaining and servicing the cargo parachute assemblies.

2. Standardization. ADS utilized by the Coast Guard will be of a standardized size and configuration. Only Coast Guard fixed wing standardization units are authorized to certify cargo drop equipment and configurations. Only configurations and equipment in this section are authorized for aerial deployment by Coast Guard aircraft. ADS are locally manufactured by following buildup procedures on the applicable ACMS card.

3. Quality Assurance.

CAUTION
UNDER NO CIRCUMSTANCES SHALL ANY AST PERFORM THEIR OWN QA INSPECTIONS.

QA steps are provided in the appropriate MPC for critical maintenance operations. When a maintenance step is followed by QA REQUIRED, the AST shall perform that step and then have an authorized QA Inspector perform the inspection prior to continuing with the next maintenance or inspection step.

4. Records. All ADS shall be subjected to scheduled periodic inspections and maintenance. Unscheduled inspections may be authorized by AST supervisors if it is determined that circumstances warrant such an inspection. These tasks are the primary assurance of cargo parachutes functioning properly, and no instance of carelessness or willful neglect shall be allowed to pass unnoticed. MSRs are used by the AST to provide a systematic means of tracking, scheduling, and recording maintenance.

The MSR MPC provides the sequence for inspection and maintenance of equipment. Additionally, a remarks section is provided on the signoff portion of the MPC to record any maintenance performed on equipment or make specific notations concerning pyrotechnic lot numbers or survival equipment information.

NOTE
The remarks section of the MPC shall be used when any repairable discrepancy is found and corrected. The information provided in this section is critical in determining equipment reliability, failure trends, and maintenance intervals.

B. PARACHUTE LOFT.

1. Introduction. The parachute loft is the work area designated for the maintenance of parachute assemblies, systems, and components. The parachute loft shall be large enough to accommodate a parachute packing table with the required dimensions of 45 feet by 36 inches by 36 inches. Space shall be made available to accommodate additional equipment required for parachute maintenance. Additional space is required for additional shops, such as survival equipment, protective clothing, and oxygen equipment.

2. Layout. The wet locker and washroom shall be separate areas. The packing area, storage facilities, and fabric areas should be separated if room is available. The packing tables shall be kept clean. All local fire regulations shall be adhered to at all times.

CAUTION

ALL TALC POWDERS REQUIRED FOR MAINTENANCE SHALL BE KEPT AWAY FROM PACKING AND FABRIC AREAS TO AVOID CONTAMINATION OF PARACHUTE ITEMS.

a. Wet Locker. The wet locker is used for washing and drying parachutes and other equipment. The following conditions shall be met:

(1) Floor drains and environmental control equipment should be provided to maintain required environmental conditions.

(2) The ceiling should be high enough to permit the parachutes to be hung full-length without touching the walls, floor, or other parachutes.

(3) The wet locker shall not have windows or skylights.

(4) If adequate ceiling height is not available, the suspension lines shall be chained to prevent entanglement. The hoist lines shall be spaced a minimum of 24 inches apart and at least 12 inches from the wall.

(5) An adequate number of low heat, flush-type incandescent lighting fixtures shall be installed in wet locker walls and ceiling.

(6) Drying racks shall be provided for parachute containers, dry suits, wet suits, dry flight coveralls, etc

b. Washroom. The washroom is used for cleaning parachutes and other rescue and survival equipment. It shall contain a large wash tub or deep sink as well as a large capacity industrial washer and dryer.

c. Storage Facilities. Parachute loft storage facilities shall be designed to accommodate short or long term storage needs. The following conditions shall be met:

(1) Bins and other storage facilities should be procured or constructed to accommodate packed and unpacked parachutes.

(2) The facilities should consist of closed lockers or cupboards divided into compartments large enough to accommodate single ADS.

(3) Open racks or shelves may be used as a substitute for closed lockers. The shelves should be designed to allow storage of a parachute or an ADS at least 4 inches from walls and 12 inches from the floor.

(4) Storage facilities shall be well-ventilated and free of dust and other contaminants such as oil, acid, and cleaning fluids.

(5) ADS or component parachutes shall not be stored directly over hot water pipes, heating apparatus, or in direct sunlight.

d. Packing Area. The packing area is used for inspection, rigging and packing of parachutes, and related equipment.

e. Fabric Area. All fabric layout, cutting, and fabrication or fabric repairs shall be performed in the fabric area. The fabric area shall be equipped with a cutting table, a sewing machine appropriate for the type of work being accomplished, nylon searing machine, and necessary miscellaneous hand tools.

NOTE

Hand tools utilized and stored in the fabric area will be subject to AST Shop tool control policies.

3. Environmental Conditions. Parachutes should be inspected, repaired, and packed under regulated temperature and humidity conditions. Accordingly, these conditions must be controlled in all parachute lofts. In general, the loft will not be excessively damp or dusty. It will be continuously or frequently ventilated.

a. Regulating Environmental Conditions. The ideal method for regulating air temperature and humidity is an air conditioner appropriate to the size of the room in which it is to be used. For the air conditioning to be most effective, a continuous check will be made of the physical conditions of the loft.

b. Temperature and Humidity. The temperature and relative humidity in the packing loft and dry locker will be maintained within limits indicated in Figure 3-1. Ideal conditions are a temperature of 75 °F (24 °C) and a relative humidity of 60%. The shaded area on the temperature-humidity chart, shown in Figure 3-1, outlines the allowable environmental limits inside the parachute loft and illustrates favorable and unfavorable conditions. These limits are affected by two variables: relative humidity and temperature.

Recordings of these variables shall be taken at least three times daily using the relative humidity and temperature indicator. Relative humidity and temperature indicator are available though commercial sources. This instrument will ensure that favorable conditions are being constantly maintained in the packing loft, storage, and dry locker areas.

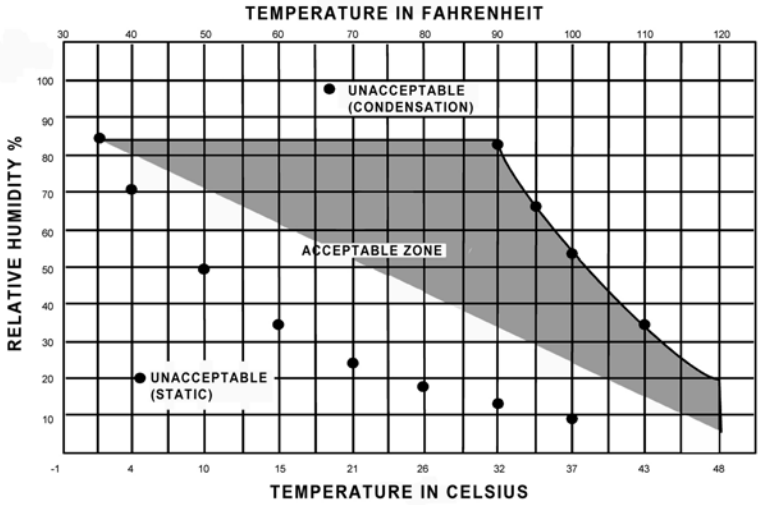


Figure 3-1. Temperature Humidity Chart

4. Lighting. The nylon material in parachutes is subject to deterioration by exposure to sunlight and some forms of artificial lighting. Avoid exposure of parachutes to sunlight as well as prolonged exposure to inspection lights. Lighting should be adequate and free of shadows. Fluorescent lighting is the most desirable for this purpose. However, parachutes should not be exposed to fluorescent lights closer than 5 feet for long periods of time. Keep parachutes under cover except when being worked on and/or inspected.

5. Loft Personnel. Only graduates of Aviation Survival Technicians School (AST A) shall be permitted to service or supervise the servicing of cargo parachute assemblies.

6. Loft Equipment. All parachute lofts are equipped to perform specific levels of maintenance procedures. These lofts should be equipped with the following equipment.

   a. Parachute Inspection Packing Table. A packing table is required to have sufficient length to lay out a complete parachute assembly for inspection and servicing. Required dimensions for a packing table are 45 feet by 36 inches by 36 inches. It is necessary and required that it be smooth and free of slivers and burrs. Each packing table can be equipped with tension attachments and tension device attachment points.

CAUTION

UNDER NO CIRCUMSTANCES WILL PACKING TABLES BE USED AS CUTTING TABLES.

   b. Cutting Tables. Cutting tables are used for fabric layout and cut out. They are located in the fabric area and shall have clean, smooth surfaces. The fabric rack shall be located in the vicinity of the cutting table.

c. Sewing Machines. Operating and maintenance manuals covering each class and variety of sewing machine are furnished with new machines. Replacement manuals may be ordered through open purchase from the sewing machine manufacturer. Servicing of all sewing machines shall be performed IAW the applicable sewing machine maintenance manual. Qualified ASTs shall perform operations and adjustments to sewing machines. A certified repair specialist may be contracted to perform required maintenance beyond the capability of AST Shop personnel.

d. Small Tools and Equipment. A set of hand tools and equipment is required for each packing table. Most tools and equipment are stowed in a drawer or container attached to the table. A tool and equipment inventory shall be performed prior to and after rigging and packing a parachute, and verified by an AST QA.

7. Safety Requirements. The following parachute loft working safety requirements shall be strictly adhered to at all times.

a. Warning signs shall be clearly posted around equipment that is hazardous or requires special training or skills.

b. Loft personnel shall not work at packing tables with objects in their shirt pockets or on belt loops.

c. Brushes used to clean packing tabletops shall not be used on anything but the packing tabletop.

d. Prior to use, inspect all parachute packing tools for signs of corrosion, rough or sharp edges, and burrs. Tools shall be repaired, polished, and cleaned if any of these conditions exist

e. Parachute assemblies shall not be stacked on top of each other or on the floor, unless in suitable shipping containers.

f. Parachutes or any component parts shall not be allowed to drag on the floor.

g. During any one repack and inspection cycle, a parachute shall not be exposed to incandescent light or indirect sunlight for more than 36 hours. Exposure to direct sunlight should be avoided

h. Do not allow a parachute to come in contact with lighting fixtures or heat sources.

i. Do not allow parachutes to become contaminated by talc or mica powders. Contamination of this type will weaken the fabric.

j. Every precaution shall be taken to prevent soiling or contamination of parachute assemblies.

k. Vehicles used to transport parachute assemblies shall be thoroughly cleaned, checked for contamination, and provided with suitable covers during inclement weather.

l. To prevent hair and body oil contamination, do not place lines on hair, neck, or around body during whipping and folding procedures.

CAUTION

APPROPRIATE MEASURES WILL BE TAKEN TO ASSURE VENTILATION OF SMOKE AND FUMES WHEN WEBBING CUTTERS AND HOT KNIFE MATERIAL KNIVES ARE BEING UTILIZED DURING COMPONENT REPAIR AND FABRICATION.

8. Weight Limitations. Only 12-foot and 28-foot diameter parachutes are approved for ADS described in this section. The size of the canopy shall be determined by cargo weight.

WARNING

DEVIATIONS FROM THE FOLLOWING PROCEDURES AND POLICES ARE NOT AUTHORIZED.

PALLETIZED DROPPABLE CARGO CONFIGURATIONS ARE NOT AUTHORIZED.

ONLY THE ADS-CAN, POLYURETHANE PUMP CONTAINER, AND THE PAK 383 BULK CARGO CONTAINER MAY BE USED FOR AERIAL PARACHUTE DELIVERY.

NOTE

Any cargo weights below 40 pounds will be ballasted to bring weight to a 40-pound minimum.

Cargo Weight	Canopy Diameter
40 to 70 pounds	12 feet
70 to 250 pounds	28 feet
Over 250 pounds	Not Authorized

9. Configurations. The 28-foot and 12-foot ADS consist of the following components:

a. The 28-foot ADS is a combination of two deployment containers. The first container stows the 28-foot diameter cargo canopy. The second container stows 430 feet of trail line with a 10- or 15-foot static line connected to the trail line container. A harness assembly with two snap hooks, one D-ring, and a 10-second delay cutting device connect the ADS to the droppable cargo.

b. The 12-foot ADS is one deployment container which stows the 12-foot diameter cargo canopy, the 430 feet of trail line, and a 10- or 15-foot static line which is connected to the trail line container. A harness assembly with two snap hooks, one D-ring, and a 10-second delay cutting device connect the ADS to the droppable cargo.

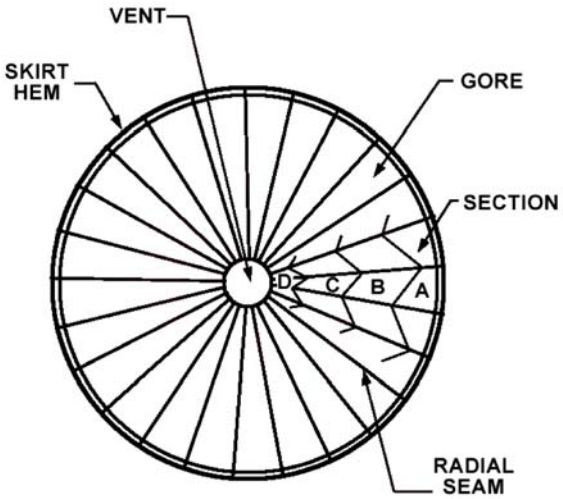


Figure 3-2. Parachute Canopy

10. Function. The cargo ADS is designed to be used for air delivery of equipment from Coast Guard fixed wing aircraft. The static line is designed to provide the 15-foot length required for the HC-130 or shortened to provide the 10-foot length used in the HU-25. This system, which is mounted on top of the drop equipment, is rigged in such a manner that when deployed the trail line container is retained with the static line for retrieval.

    A pyrotechnic 10-second delay cutter is configured into the riser assembly. When actuated, it releases the parachute from the drop equipment 10 seconds after deployment. This cutter system prevents loss of the equipment if the canopy remains inflated in windy conditions.

C. AERIAL DELIVERY SYSTEM MAINTENANCE POLICY.

1. Maintenance. Maintenance of the ADS assemblies will consist of the following tasks:
    a. Inspection intervals
    b. Contamination inspection and removal
    c. Cleaning of parachute assemblies
2. Inspection Intervals. Inspection of the ADS assemblies will be performed IAW the applicable MSR MPC. The following are inspection intervals for the ADS assemblies:
    a. The acceptance inspection will be performed upon original issue, when received from supply, or accepted from another unit for permanent custody.
    b. The 7-day inspection will be performed IAW procedures found in CGTO PG-85-00-310, Chapter 3. No MPC signoff is required for this inspection.
    c. The 180-day inspection will normally be performed at intervals not to exceed 180 days.

d. A special inspection shall be performed whenever deemed necessary by the AST Shop supervisor.

D. AERIAL DELIVERY SYSTEM REPAIRS.

1. Introduction. This section contains policy and guidelines for the repair of various components of ADS assemblies, to ensure appropriate items of equipment remain in RFI status. All repairs shall be documented on the applicable MSR MPC.

2. Repairs Criteria. The primary concern in repairing any assembly is ensuring that the basic structural integrity designed into the assembly is maintained.

3. Repairs Procedures. When repairs are performed on ADS components and systems, the following policy will be observed:

   a. Supervisory personnel are responsible for determining if repairs may be performed locally or if the assembly should be condemned.

   b. The applicable parachute drawings and specifications shall be reviewed and followed.

   c. Extreme care shall be observed in removal or opening of seams to ensure no damage to material results.

   d. All repair work shall be carefully inspected and compared to drawings and specifications at completion of work to ensure conformity.

   e. A QA Inspector shall examine the finished work to ensure conformance with applicable drawings and specifications.

4. Determining ADS Component Repairability. An ADS component shall be considered beyond repair for any of the following reasons:

   a. One or more complete gore is torn

   b. Holes larger than 8 inches long in four or more panels

   c. If more than three panels per canopy require replacement

   d. Not more than 50 darned areas shall be permitted in any adjacent 8 gores, and no more than 200 darned areas shall be permitted in any canopy

   e. Severed suspension line

   f. Ruptured or frayed suspension lines as described in CGTO PG-85-00-310, Chapter 3

   g. For training and operational ADS canopy suspension lines, one burn spot or hard spot per line is acceptable, provided the length is less than 1 inch and remains flexible at that point

   h. Deployment bags and trail line bibs that have tears longer than 3 inches or holes larger than 1-inch

   i. Deployment bags that have any wear, fraying, or damage to the webbing loop

   j. Frayed riser assembly

NOTE

There are no limitations of service/total life for canopy repair materials.

Any ADS component that is damaged beyond repair shall be destroyed and disposed of locally.

CHAPTER 4. SURVIVAL EQUIPMENT AND SURVIVAL KITS.

A. OVERVIEW.

1. Survival Item Inspection Schedule. All survival equipment and survival kits shall be inspected IAW the phase cycle of the equipment in which the items are installed.

NOTE

If a survival item has an expiration date, that date shall be noted on the remarks section of the MPC for which it is installed and inspected without exception.

Individual issue equipment and survival kits shall be inspected at intervals not to exceed 180 days, unless stated otherwise in this chapter, or the appropriate MSR MPC. All equipment that has been immersed in water shall immediately undergo a post-usage inspection and maintenance as noted for each specific piece of equipment.

2. Personal Survival Equipment . No personal survival equipment may be carried by Coast Guard aircrew on Coast Guard aircraft unless it is approved by the Engineering Officer.

B. SURVIVAL EQUIPMENT.

1. Introduction. Survival equipment is intended to sustain life, assist in egress, and facilitate detection and subsequent rescue by rescue resources.

2. Water Storage Bag. The water storage bag is a plastic bag used for storing fresh water or for protecting miscellaneous from dirt or moisture.

   a. Configuration. The water storage bag (Figure 4-1) is constructed of flexible plastic capable of holding 5 quarts of water. A plastic buckle and flexible nylon strap enable the opening of the water storage bag to be rolled down and closed. This strap also can be used to attach the bag to personnel or equipment.

Figure 4-1. Water Storage Bag

   b. Function. The water storage bag may be used for:

      (1) Storing fresh water

      (2) Protecting miscellaneous items from exposure to moisture

(3) When inflated and closed securely, the water bag may be used for supplemental flotation

3. Nylon Cord. Nylon cord is used primarily for attaching survival items to the liferaft to prevent loss, but is also used as a survival tool.

a. Configuration. Nylon cord is supplied in 50-foot lengths of Type I parachute cord (Figure 4-2) and has a breaking strength of 100 pounds.

Figure 4-2. Nylon Cord

b. Function. Nylon cord is used to attach survival items after removal from the container. It may be used as a fishing line or snare, to construct fish nets, secure spring traps, in shelter construction, to construct a bow or sling, or to repair clothes.

4. Dye Marker. The dye marker is an active day use visual signal that is used to attract the attention of rescue resources.

a. Configuration. The dye marker (Figure 4-3) consists of a yellow, vinyl resin-coated cloth pouch with an attaching tape at each corner. The dye medium is contained within the pouch.

Figure 4-3. Sea Dye Marker

b. Function. The dye marker may be attached to a life preserver, clothing, or other equipment. To open, grasp material at top of packet between fingers and palm of hand and tear pull-tab.

If rapid dispersion is desired, agitate the packet of dye vigorously in the water. For best results, the dye marker should be used in calm to moderate seas only. Other effective uses of the dye marker are placing it in a stream/river or dragging it in the snow.

(1) Visibility. When the sea dye is dispersed it releases a fluorescent green colored dye. It is visible at approximately 2 miles at 3,000 feet altitude.

NOTE

Although the dye that is released from the sea dye marker is fluorescent in appearance, it does not glow. This characteristic makes it a day use-signal only.

(2) Duration. Dye marker (powder) is exhausted in 20 to 30 minutes and ceases to be a good target after 1 hour.

5. First Aid Kits. The first aid kits are used to treat personnel with injuries or illness under emergency conditions.

a. Configuration. The first aid kit (Figure 4-4) contains medical supplies to aid injured personnel and help prevent infection after injury. First aid kits or medical supplies may be included as part of a survival kit or mounted inside an aircraft.

Figure 4-4. First Aid Kit

b. Function. The first aid kit is intended for use when medical assistance is required as a result of injury or infection. The contents are labeled for easy access and placed in individual packages.

c. Inspection Intervals. The following are inspection intervals for first aid kits:

(1) First aid kits installed on aircraft shall be inspected every 12 months IAW ACMS MPC to ensure availability of all listed components and that life limited items are replaced, and should include a standardized list of contents.

(2) First aid kits installed in liferafts and survival kits will be inspected on a calendar basis that normally coincides with the inspection interval of the raft or survival kit in which they are installed.

6. Waterproof Lightweight Casualty Blanket . The waterproof lightweight casualty blanket provides the aircrew member with a shelter component and an active or passive signaling device.

a. Configuration. The space blanket (Figure 4-5) is a lightweight, waterproof blanket made of aluminized plastic. The blanket is orange/silver and measures 96 inches by 56 inches.

Figure 4-5. Waterproof Lightweight Casualty Blanket

b. Function. The waterproof lightweight casualty blanket acts as a windbreak, sunshade, and poncho. It does not act as insulation, but reflects body heat back to the user when held close to the body. The blanket furnishes some radar reflectivity over water and may be used for signaling as a position indicator.

7. Forward Osmosis Filtration System. The Forward Osmosis Filtration System converts saltwater or contaminated freshwater into a potable energy providing drink (Figure 4-6).

a. Configuration. There are two configurations for the Forward Osmosis Filtration System. Both are vacuum packed in clear PVC bags.

(1) The Crew Pack contains 5 filtration bags and 10 nutrient syrup charge flex-packs. These are included in the survival equipment bag packed into the six-person crew raft configuration and the wing raft configuration.

(2) The One Man Pack contains one filtration bag and one nutrient syrup charge flex-pack.

Figure 4-6. Forward Osmosis Filtration System

b. Function. The Forward Osmosis Filtration System uses a nutrient syrup charge to draw water molecules out of a contaminated source, across a filtration membrane into a catch bag, requiring no pumping. The pores in the filtration membrane are 0.0003 microns in diameter. This process removes 97% of salt from sea water as well as bacteria, virus, parasites, heavy metals, petroleum, and pesticides. The nutrient syrup charge required for the forward osmosis provides a carbohydrate-electrolyte drink of 6% carbohydrates, with standard electrolyte ratios provided by the salt remaining in the water after filtration. One 4-ounce syrup charge will produce 17 ounces of drink from 60 ounces of 60 °F saltwater in 5 hours. The operating procedures for the filtration bag are located on the filtration bag and the syrup charge flex-pack.

8. Emergency Drinking Water Packet. The emergency drinking water packet is intended for use when no other clean water is available.

a. Configuration. The emergency water packet (Figure 4-7) contains 4½ ounces of pure drinking water and may be carried in this ready-to-use state in all liferaft packages.

Figure 4-7. Emergency Drinking Water Packet

b. Life Limit. The emergency drinking water packet shall be removed from service or storage if the date stamped on the packet is more than 5 years old, or the date stamp is illegible. Additionally, emergency water packets shall be removed from a liferaft/survival kit if the storage limit will expire prior to the next inspection.

9. Bailing Sponge. The bailing sponge (Figure 4-8) is provided in all liferafts except the RSLR-1 and has several uses. It may be used to collect rainwater for drinking, to bail excessive water from a liferaft interior, or for personal hygiene. A small piece of the sponge may be placed on a fishing hook and used as a fishing lure. The sponge is made from cellulose and comes in various sizes.

Figure 4-8. Bailing Sponge

10. Mini Flashlight. The mini flashlight (Figure 4-9) shall be procured locally for use by aircrew members. Only explosive-proof type pocket flashlights are authorized. The brand purchased shall be left to the discretion of the command. Mini flashlights with Light Emitting Diode (LED) bulbs will generally have extended battery and bulb life.

Figure 4-9. Mini Flashlight

11. Pocketknife. The pocketknife is a multipurpose survival tool.

    a. Configuration. The pocketknife (Figure 4-10) is constructed of stainless steel and consists of one blade, can opener, bottle opener, screwdriver, and leather awl.

Figure 4-10. Pocketknife

    b. Function.

WARNING
USE CAUTION WHEN INSPECTING THE POCKET KNIFE TO AVOID INJURY. GREAT CARE SHOULD BE TAKEN WHEN USING THE KNIFE WHILE IN A LIFERAFT TO PREVENT PUNCTURING THE RAFT FABRIC.

The pocketknife is intended to aid aircraft personnel in cutting wood or material, opening cans and bottles, to prepare food, as a screwdriver, awl, and weapon if necessary.

12. Pocket Survival Multi-tool. The pocket survival tool is a multifunction survival tool.

    a. Configuration. The pocket survival multitool (Figure 4-11) is made of corrosion resistant stainless steel and will have a variable combination of the following components depending on manufacturer and model. Components of a pocket survival multitool can include pliers, wire cutters, ruler, can/bottle opener, flat head and Phillips head screwdrivers, file, and a leather awl/punch, saw. The pocket survival tool is carried in a leather or nylon sheath.

Figure 4-11. Pocket Survival Tool

    b. Function. The pocket survival multitool is a multifunction tool that can be used for cutting wood, webbing, material, opening cans, and accomplishing emergency mechanical repairs. The pocket survival multitool should be kept clean, sharpened, and returned to the sheath when not in use.

13. Pushbutton Release (PBR) Knife. The Pushbutton Release (PBR) Knife is the standard issue push button automatic opening knife for helicopter rescue swimmers, providing one-handed operation when required.

WARNING

THE PBR KNIFE WILL BE ISSUED TO HELICOPTER RESCUE SWIMMERS ONLY. NO PERSON SHALL REMOVE A PBR KNIFE FROM COAST GUARD FACILITIES EXCEPT WHILE IN THE PERFORMANCE OF OPERATIONAL HELICOPTER RESCUE SWIMMER DUTIES. PERSONS VIOLATING THIS REGULATION MAY BE SUBJECTED TO PRISON AND/OR FINES UNDER THE UNIFORM CODE OF MILITARY JUSTICE (UCMJ), STATE AND/OR FEDERAL WEAPONS LAWS.

a. Configuration. The PBR knife (Figure 4-12) features a handle of solid 6061-T6 aluminum. It is bead-blasted and hard anodized. The blade is ground high carbon stainless steel, and features a serration pattern which is particularly well suited for rapid cutting of fibrous materials like rope or nylon webbing.

Figure 4-12. Pushbuton Release Knife (PBR)

b. Function. The PBR knife provides helicopter rescue swimmers with an efficient tool to cut fibrous materials. The auto-opening mechanism allows for rapid blade opening with gloves, under water, yet still allows the knife to be easily closed with one hand and safely returned to the storage pocket on the helicopter rescue swimmer harness.

14. Aircrew Folding Knife. The Aircrew Folding Knife is carried in the LPU-27P/E survival vest.

a. Configuration. The blade of the Aircrew Folding Knife (Figure 4-13) is serrated for 80% of its length for aggressive cutting of webbing, harnesses, and fibrous materials. Twenty percent of the blade at the tip is a standard straight edge. The tip of the blade is blunt to decrease the likelihood of inflicting injury during use as an emergency egress cutting tool. The blade is designed with a raised opening on the back of the blade that facilitates opening with one hand, rotating the blade into the open position using the thumb. By squeezing the blade firmly into the handle in the closed position, a retractable carbide tip protrudes out from the base for breaking glass. A survival whistle is outlined in safety orange on the handle's spine.

The length of the knife when open is 8 3/8 inch. Blade length is 3 11/16 inches. Cutting edge is 3 3/16 inches. Length of the knife when closed is 4 7/8 inches. There is a tension wire clip on the knife for clipping the knife into a pocket or on a belt.

Figure 4-13. Aircrew Folding Knife

15. Pocket Hook Knife. The pocket hook knife (Figure 4-14) is 6 3/8 inches long, 1½ inches wide, and ¼ inch thick. The cutting blades are opposing, stainless steel, and replaceable. The opening for the cutting surface is ¼-inch wide and 1½ inches deep. There are two 13/16-inch holes on the handle for gripping with two fingers. A slot measuring 13/16-inch is located at the base of the handle for webbing installation.

Figure 4-14. Pocket Hook Knife

a. Function.

The pocket hook knife is intended for cutting through webbing, parachute shroud lines, and line that is less than ¼ inch in diameter. It will not cut through steel cable.

16. Aircrew Survival Egress Knife (ASEK). The ASEK (Figure 4-15) is a system comprised of the following components:

a. Knife.

(1) Carbon steel blade 5 inches in length, 0.1875 inch thick
(2) 10.25 inches knife length
(3) Saw teeth on back of blade (non-offset)
(4) Partially serrated blade
(5) Lanyard hole
(6) Zinc phosphate finish to inhibit rust
(7) Insulated guard
(8) Spear lashing holes
(9) Butt of the handle may be used as a hammer

Figure 4-15. Aircrew Survival Egress Knife

b. Anodized Aluminum Strap Cutter. (Figure 4-16)

(1) Replaceable razor blades (spares kept in sheath)

(2) Ceramic honing rod on back edge of strap cutter for field sharpening cutter blades and the ASEK

(3) Wrist lanyard

Figure 4-16. Anodized Aluminum Webbing Cutter

c. Function. The ASEK is used for emergency aircraft egress and survival in the land and marine environment. For use as an emergency egress tool, the knife has a Plexiglas breaker, hammer, saw teeth and blade serrations. It is hunting knife as well as a weapon, incorporating spear holes and a lanyard hole. The anodized strap cutter will cut webbing, clothing, parachute shroud cord. It has a screwdriver and oxygen valve wrench. There is a ceramic blade honing rod on the back for field sharpening of the knife. Webbing cutter replacement blades are stored in the scabbard of the webbing cutter. The survival knife should be kept clean, sharpened,

17. Chemical Light Wand. The chemical light is a foil-wrapped plastic wand, which emits a chemically activated light during night training and rescue operations (Figure 4-17).

a. Configuration. There are two types of chemical lights available for general survival and signaling applications:

(1) 4-inch green/yellow/orange chemical light (6-hour duration)

(2) 6-inch green/yellow/orange chemical light (12-hour duration)

Figure 4-17. Chemical Light Wand

b. Function. The chemical lights are used to provide a visual reference for the hoist hook and rescue equipment during nighttime hoisting evolutions. It may also be used as an active signal to attract the attention of rescue resources. Remove from foil package, bend plastic tube until an audible snap is heard, then shake vigorously.

18. Distress Strobe Marker. The distress strobe marker (Figure 4-18) is a battery-operated strobe light used to signal rescue resources. A list of authorized distress marker lights can be found on the ALSIPS at the ALSE Technical Services web site.

Figure 4-18. Distress Strobe Marker

a. Configuration. The distress strobe marker is lightweight, compact, and battery operated. All circuitry is encapsulated within the case. The case is high impact-resistant thermoplastic with provisions in the bottom end for receiving the AA batteries. The battery compartment, switch and case are watertight. The operation of the sliding ON/OFF switch permits one hand operation if required.

b. Function. The distress strobe marker is intended for equipping aircrew members with a high-intensity active visual distress signal in the event of aircraft abandonment. The following are minimum requirements of the distress strobe marker:

(1) 150,000 peak lumens per flash

(2) Omnidirectional 360º

(3) Flash Rate = 60 (+/-10) flashes per minute

(4) Visibility = 2 miles minimum

(5) Duration = 8 hours continuous at 32 ºF

(6) Waterproof to 33 feet (1 atmosphere)

19. Survivor Locator Light. The survivor locator light (Figure 4-19) is a passive signal, water-activated light used to signal rescue resources and provide light to survivors in conditions of darkness.

Figure 4-19. Survivor Locator Light

a. Configuration. The survivor locator light is a compact unit consisting of a halogen bulb encased in a plastic lens. This assembly is connected to the water-activated battery by a connecting wire. The light intensity of the survivor locator light is 1-candlepower, horizontally and vertically. Although this light may not appear bright, it is detectable by night vision goggles at substantial distances and provides adequate ambient light inside a liferaft canopy during hours of darkness. It will produce light continuously for 8 hours once the battery is activated.

b. Function. Survivor locator lights are installed on passenger lifevests, on the fixed wing aircrew liferaft, and the helicopter aircrew liferaft. In each application the battery hangs below the light to ensure contact with the water. The plug must be removed prior to immersion to allow water into the battery.

20. Emergency Signal Mirror. The emergency signal mirror (Figure 4-20) is an active emergency signal that utilizes reflected sunlight to attract rescue resources.

Figure 4-20. Emergency Signal Mirror

a. Configuration. The emergency signal mirror is made of plastic, and floats. Encapsulated between each side is retroreflective bead fabric that enables the user to accurately aim the reflected signal at the target rescue resource. There is an opening in the corner of the mirror frame through which a lanyard passes, allowing the mirror to be worn around the neck, or secured inside the liferaft or liferaft equipment container.

The front mirrored side of the emergency signal mirror is covered with a thin black plastic film. This protective cover must be removed prior to the mirror becoming an effective signal. This device measures 2 x 3 inches. Operating instructions are printed on the back of the device.

b. Function. When used on a sunny day, the reflected glare from the emergency signal mirror has a brightness of approximately 8 million candlepower and is visible up to 40 miles. This device will continue to provide an effective signal in overcast conditions. The signal from the emergency signal mirror is aimed at the target through the opening located at the center of the device. Step-by-step instructions are printed on the back of the emergency signal mirror.

21. Sunburn Preventive. Sunburn preventive (Figure 4-21) is a liquid cream used for protection against sunburn. It will have a minimum SPF of 30. Sunscreen can become ineffective during storage after approximately 2 years. When ordering sunscreen, ensure that you will not stock in supply or pack any sunscreen into a survival kit that exceeds a 2-year shelf life.

Figure 4-21. Sunburn Preventative

a. Configuration. Sunburn preventive is packaged in a plastic squeeze container.

NOTE

Because there is a possibility of allergic reaction to para-amino benzoic acid (PABA), any sunscreen utilized in survival kits are required to be free of PABA. For source of supply, refer to the ALSE ALSIPS, on the ALC ALSE website.

Sunburn preventive containers may leak. To prevent leakage, secure the lid with two layers of electrical tape with a tab for easy removal.

22. Emergency Signaling Whistle. The emergency signaling whistle (Figure 4-22) is an active emergency signal that emits an audible signal to attract fellow crewmembers and rescue resources.

Figure 4-22. Emergency Signal Whistle

a. Configuration. The signal whistle requires no moving parts to function properly. It is manufactured from plastic. It incorporates a split ring to facilitate the attachment of a lanyard for easy access and to prevent loss.

b. Function. The whistle is an active audible emergency signal used to attract the attention of search and rescue resources and additional survivors. It is highly effective in limited visibility and darkness. Audible range is approximately 1,000 yards depending on wind and surface conditions and user.

23. Meals Ready to Eat (MRE). MREs (Figure 4-23) are a portable, complete meal that provides protein, carbohydrates, and fat. Each MRE contains an entrée and a variety of other food and drink items. Each meal provides approximately 800-1,200 calories. The packaging is designed to maintain a minimum shelf life of 3 years at 80 °F or 6 months at 100 °F. Each MRE weighs 13 to 18 oz depending on the menu. Some MREs will include a flameless ration heater that when water is added, creates hyper-corrosion of a magnesium-iron alloy to produce adequate heat to warm an unopened ration packet.

Figure 4-23. Meals Ready To Eat (MRE)

a. Configuration. MREs are found on the HC-130 as a supplemental crew meal when no other meals are provided due to short notice flights or extended patrol flight hours. MREs are also packed in the ASRK-18 and other survival kits.

WARNING

THE FLAMELESS RATION HEATER (FRH) MAY REACH TEMPERATURES OF 200 ºF AND UP TO 250 ºF IF ADEQUATE MOISTURE IS NOT ADDED AT THE TIME OF HEATER ACTIVATION. THIS IS SUFFICIENT HEAT TO CAUSE SEVERE BURNS IF PROLONGED CONTACT IS MAINTAINED WITH THE BARE SKIN. WHEN ACTIVATED, THE FRH PRODUCES HYDROGEN IN SMALL AMOUNTS. HYDROGEN WILL DISPLACE OXYGEN AND IS FLAMMABLE.

24. Abandon Ship Rations. Abandon ship ration packets (Figure 4-24) consist of candy and gum contained in a foil-coated plastic bag. These rations can be a source of quick energy when no other food is available because of their sugar content.

Figure 4-24. Abandon Ship Rations

25. Liferaft Hand Pump. A hand pump is supplied in the liferaft survival equipment container. It is used to inflate sections of the liferaft that are not filled from the inflation cylinder when the inflation assembly is activated, or if there is a leak in the raft material.

    a. Configuration. The liferaft hand pump (Figure 4-25) is packed into the liferaft survival equipment bag of each liferaft. It has an attachment allowing it to be connected to the topping off valves of each liferaft. After removal from the survival equipment bag it should be tied to a handle inside the liferaft to prevent loss.

    b. Function. The liferaft hand pump must be attached to inflation ports located on the body of the raft after inflation and manually operated to fill compartments not filled with compressed gas from the inflation cylinder, or to top off inadequately inflated compartments.

Figure 4-25. Liferaft Hand Pump

26. Mechanical Raft Patch. The mechanical raft patch is designed to provide a rapid method of repair to a liferaft that has become damaged during inflation, or at other stages of emergency or survival use.

NOTE

The mechanical raft patch is not considered a permanent repair and should not be used in a shop environment. All liferaft repairs should be made IAW the applicable MSR MPC.

a. Configuration. The mechanical patch (Figure 4-26) consists of two alloy plates, a threaded connecting shaft connected by a hinge to the lower plate that extends through a cutout in the upper plate and held in place by a wing nut. The bottom plate may be fitted with a rubber gasket which seals between the liferaft fabric and the cover plate; however this rubber seal is not necessary to produce an effective seal. There is a looped flexible wire soldered to the threaded connecting shaft. The flexible wire is designed to keep the components of the mechanical raft patch together prior to and during installation. A nylon lanyard is tied through the loop of the soldered wire. This lanyard is used to prevent loss of the patch from the raft patching kit. The mechanical raft patch kit will include a pair of pliers that may be used to tighten the wing nut when emergency repairs are made to the liferaft.

Figure 4-26. Mechanical Liferaft Patch

27. Pyrotechnic Allowances, Storage Safety, and Operation. Refer to:
    a. Ordnance Manual, COMDTINST M8000.2 (series) for MK 124MOD-0 and MK-79 MOD-0 allowances, storage, and safety precautions
    b. NAVAIR 11-15-7, Pyrotechnics, Screening, Marking, and Countermeasure Devices for operational procedures
    c. NAVSEA OP 5, VOLUME 1, Ammunition and Explosives Ashore for storage and handling
28. MK-124 MOD-0 Signal Flare. The MK-124 MOD-0 signal flare is an active emergency signal intended to attract the attention of rescue resources. The day/smoke end of this signal may be used to indicate wind direction.
    a. Configuration. The MK-124 MOD-0 signal flare (Figure 4-27) is an active day and night distress signal with the following distinguishable characteristics:
        (1) Night End.
            (a) Black rubber end cap
            (b) Two raised ridges that encircle the night end
            (c) White ignition lever
            (d) Red inscription “NIGHT USE FLARE END”

(e) 3,600 candlepower red flame
(f) 20-second duration
(g) Visible up to 8 miles

(2) Day End.

(a) Black rubber end cap
(b) Red ignition lever
(c) Orange inscription “DAY USE SMOKE END”
(d) Orange Smoke
(e) 20-second duration
(f) Visible up to ½-mile depending on wind conditions

Figure 4-27. MK-124 MOD-0 Signal Flare

b. Function. The MK-124 MOD-0 signal flare has two compartments, each holding a phosphorous element or candle. Each candle creates a different type of signal. The day end produces orange smoke. The night end produces a red flare. Each candle is ignited by activating the igniter levers located on each end. Only one end can be safely ignited at a time.

WARNING
THE BURNING END OF THE FLARE WILL BECOME EXTREMELY HOT. ENSURE THAT THE FLARE IS HELD CLOSE TO THE UNIGNITED END OF THE SIGNAL FLARE WHEN IT IS BURNING.

CAUTION
THE MK-124 MOD-0 SIGNAL FLARE PRODUCES A NOXIOUS SMOKE WHEN IGNITED. ENSURE THE FLARE IS POINTED DOWNWIND AND EXTENDED BEYOND THE EDGE OF ANY PART OF THE RAFT OR INFLATABLE LIFESAVING DEVICE. AVOID BREATHING THE SMOKE.

29. MK-79 MOD-0 Signal Flare Kit. The MK-79 MOD-0 signal flare is a hand launched aerial signal flare intended to attract the attention of rescue resources. It is an active emergency signal.

a. Configuration. The MK-79 MOD-0 signal kit (Figure 4-28) has the following components and characteristics:

(1) One MK-31 Projector

(2) Seven MK-80 Flare Cartridges

(3) Fires a 12,000 candlepower red pyrotechnic star

(4) Reaches altitude of 250-650 feet

(5) 4.5-second duration

(6) Visible up to ¾-mile during daylight and 10 miles at night

Figure 4-28. MK-79 MOD-0 Signal Kit

b. Function. The MK-79 MOD-0 Signal Flare Kit is a hand launched aerial signal flare.

WARNING

WHEN FIRED, THE MK-79 MOD-0 SIGNAL FLARE LAUNCHES A PYROTECHNIC PROJECTILE APPROXIMATELY 250-650 FEET IN ALTITUDE. BEFORE FIRING ENSURE THAT THE PROJECTOR IS POINTED DOWNWIND, AWAY FROM OTHER PERSONNEL AND YOURSELF.

CAUTION

TO PREVENT PREMATURE IGNITION OF THE MK-80 PROJECTILE, ENSURE THAT THE FIRING LEVER IS PULLED BACK AND LOCKED INTO THE COCKED POSITION PRIOR TO INSTALLING THE CARTRIDGE INTO THE MK-31 PROJECTOR.

30. Bearing Compass. The bearing compass (Figure 4-29) is intended for the use of downed aircrew personnel and is stowed in liferaft equipment containers.

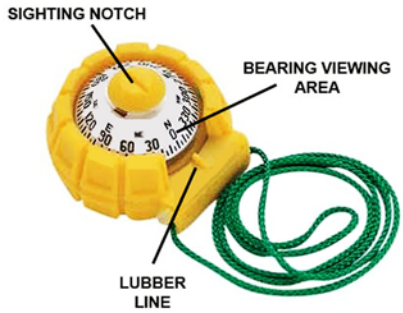


Figure 4-29. Bearing Compass

a. Configuration. The bearing compass is a waterproof handheld, fluid filled compass. It has a silicone case, making it impact resistant. The lanyard routed through the silicone case may be used to attach the compass to the liferaft, or allow it to be worn around the neck. The bearing compass is used to establish a bearing to an object, such as a rescue vessel, or aircraft. If radio communications are established with rescue resources, a reciprocal bearing may be established to aid in recovery.

b. Function. The bearing compass is used in survival conditions to establish a bearing to an object, such as land, an aircraft or vessel. This is a valuable capability, as it allows the user to record and relay relative position to rescue resources if radio communications are established. This is a direct reading compass. To take a sighting, hold the compass approximately 18 inches in front of you. Line up your target with the sighting notch located at the top of the compass and the lubber line located in the center of the viewing notch. The direction you read on the dial is the direction you are facing.

31. Baseplate Compass. The baseplate compass (Figure 4-30) is intended for the use of downed aircrew personnel and is stowed in liferaft equipment containers.

Figure 4-30. Baseplate Compass

a. Configuration. The baseplate compass is a hand held folding case compass. The compass can be pinned to the clothing to prevent loss, and keep it available for use. It is a liquid-filled precision compass utilizing a sighting mirror, jeweled bearing and a steel needle.

b. Function. The baseplate compass is primarily for vectoring aircraft and navigational purposes. It can be used to take bearings from maps as well as line of sight. The sighting mirror may also function as a signal mirror.

32. SEAS-1 Helicopter Emergency Egress Breathing Device. The SEAS-1 is an emergency breathing device intended for use by properly trained, rotor wing aircrew and special mission (Airborne Use of Force, Aids To Navigation, Tactical Law Enforcement Team) personnel only. The SEAS-1 (Figure 4-31) is used in the LPU-27/PE and LPU-27/PEG survival vests and the SEAS-1 belt.

Figure 4-31. SEAS-1 Survival Egress Air System

a. Configuration. The SEAS-1 device is comprised of the following three assemblies:

(1) Cylinder. The cylinder is aluminum alloy, 7.32 inches long, cylinder volume is 1.48-cubic foot and rated to 3,000 PSIG.

(2) Regulator first stage. Integrated valve, pressure indicator gauge, overpressure burst disk, and fill port.

(3) Low-pressure second stage regulator and hose.

(a) The SEAS-1 low-pressure hose incorporated into the LPU-27/PE is 20 inches long.

(b) The SEAS-1 low-pressure hose incorporated into the SEAS-1 belt is 27 inches long and swivels 360º at the first and second stage connectors.

NOTE

First and Second Stage Regulators: Only the USCG second stage regulator hardcover is authorized for use on Coast Guard aircraft. It can be identified by the anchor and the letters, "AC" on the second stage cover. The first stage has no on/off valve handle.

33. Rescue Swimmer SEAS-1 Belt. The RS SEAS-1 belt provides helicopter rescue swimmers with the ability to carry a SEAS-1 while wearing a water deployment ensemble.

a. Configuration. The RS SEAS-1 belt (Figure 4-32) consists of a webbing belt and two-layer holster, an adjustable quick-release polycarbonate buckle, and a SEAS-1 cylinder with hose, second stage regulator/mouthpiece. The regulator/mouthpiece retainer is tied to a loop of ¾-inch black webbing, between the buckle and the holster.

Figure 4-32. Helicopter Rescue Swimmer SEAS-1 Belt

b. Function. The SEAS-1 belt is to be worn at the waist with the holster positioned near the left hip, clear of other equipment worn by the crewmember. Positioning the belt in this manner ensures a standardized location consistent with standardized helicopter egress training.

34. Helicopter Rescue Swimmer Radio.

a. Configuration. The specification requirements for the helicopter rescue swimmer radio are as follows:

(1) 5-1 watt output power (high/low settings)

(2) Operating temperature range of -4 ºF to 140 ºF (-20 ºC to +60 ºC)

(3) Waterproof rating (IPX8, 1.5 m. (4.9-feet) of water for 30 minutes

(4) 2,000 mAh Lithium battery allows 15-16 hours of operation under normal conditions

(5) One hand operation

(6) Instant access to Channels 9 and 16

(7) Ability to lock the radio on a selected frequency

(8) United States, international, and weather monitoring channels

Figure 4-33. Helicopter Rescue Swimmer Radio

b. Function. Operating procedures for the helicopter rescue swimmer radio (Figure 4-33) are found in the radio operating guide that is packaged with the radio from the manufacturer.

35. Drop Radios. The specification requirements for the VHF handheld radios intended for use as an aerial deliverable radio to aid survivors in communicating with rescue resources are as follows:

a. Waterproof to IPX7 standard or better (ability to function properly after submersion at one meter for 30 minutes)

b. Backlighting

c. 5-watt output

d. Alkaline battery tray

NOTE

The ADSK or rotary wing deployment packs are the preferred methods of aerial delivery of VHF radios to survivors.

36. 406 Personal Locator Beacon (PLB) with GPS Receiver.

NOTE

As of 1 February 2009, satellite processing of 121.5 MHz beacons will be terminated as per the COSPAS-SARSAT Council.

Figure 4-34. 406 Personal Locator Beacon (PLB) with GPS Receiver

a. Configuration. The 406 MHz PLB (Figure 4-34) is a manually activated emergency signaling device incorporating a 12-channel GPS receiver, and a VHF transmitter that operates on 121.5 MHz.

b. Operation / Activation. For operation and activation instructions, refer to CGTO PG-85-00-310, Chapter 4.

NOTE

The 406 PLB does not float. When used in Coast Guard Aviation Life Support Equipment, it will be secured by a lanyard as per the appropriate MSR MPC that pertains to the equipment it is configured into.

c. Self Test. Refer to the appropriate MSR MPC for the PLB self test procedures.

d. Reporting Inadvertent PLB Activation. An inadvertent activation is an activation of the beacon not resulting from a situation of grave and imminent danger.

The COSPAS - SARSAT system will normally detect PLB transmissions immediately after PLB activation. The COSPAS - SARSAT satellite constellation will locate the transmission within a few minutes of beacon activation and location procedures will be initiated by the Unites States Air Force Rescue Coordination Center (AFRCC).

If the PLB is activated accidently, it should be deactivated immediately and reported to:

Unites States Air Force Rescue Coordination Center (AFRCC)
Tel: 1-800-851-3051

The information reported must include:

(1) Beacon Unique Identifier (UIN), found on back of PLB

(2) Date

(3) Time

(4) Duration and cause of activation

(5) Location of beacon and the time of activation

NOTE

It is possible that when an inadvertent activation is reported to the U.S. Air Force, the authorities will not have received the signal. This may indicate that the beacon was defective before the COSPAS - SARSAT system received and processed the beacon signal.

e. PLB Registration. Each PLB will be registered with NOAA to assure appropriate response when the PLB is activated. Registration will be accomplished at the accepting unit upon receipt IAW the appropriate MSR MPC. Refer to Chapter 8, Coast Guard Aviation Life Support Process Guide, CGTO PG-85-00-310, for the PLB registration instructions.

NOTE

Because each PLB will be registered to a specific unit, they will not be loaned or transferred to another unit under a temporary or permanent basis. If additional PLBs are needed for reason of operational necessary, contact ALC ALSE Technical Services.

f. Power and Signal Output and Duration.

(1) The PLB is powered by an internal Lithium battery.

(2) Battery replacement interval.

(a) 5 years from date of manufacture

(b) After emergency use of the PLB

(3) The PLB transmits on 121.5 MHz for a minimum of 48 hours at 25 mW at -4 °F (-20 °C) to +131°F(+55 °C).

(4) The PLB transmits on 406 MHz for a minimum of 24 hours at 5 W at -4 °F (-20 °C) to +131°F(+55 °C).

(5) The 406 MHz signal transmits every 52.5 seconds.

(6) The emitted signal contains information about the user, including;

(a) The emergency contact information for the registered owner/carrier of the PLB.

(b) The location (in latitude and longitude) of the PLB when the GPS receiver is functioning correctly.

NOTE

Department of Transportation (DOT) regulations require that minimum packaging standards be met when shipping certain materials. The original shipping container should be retained for this reason. If the original container is lost, contact ALSE Technical Services for shipment container procurement information prior to shipment of unit. Air station supply division shall be informed of the shipment (hazardous material).

(7) Measures approximately 6 X 22.5 X 1.25 inches

(8) Weighs 9.8 oz with battery

(9) Waterproof to 3.28-feet (1 meter) for 1 hour and 32.8 feet (10 meters) for 10 minutes

g. PLB Registration. Each PLB will be registered at NOAA to assure appropriate response when activated. Activation will be accomplished at ALC when enrolled by ALSE Technical Services. The subsequent 2-year re-registration of the PLB will be scheduled in ACMS MSR and accomplished at ALSE Technical Services. Refer to CGTO PG-85-00-310 for registration procedures.

NOTE

PLBs will remain at the unit for re-registration. Upon re-registration, new registration stickers will be shipped to the units to be applied to the corresponding PLBs.

h. Modifications and Repairs to the PLB. Unless described in the applicable MSR MPC, there are no modifications authorized for the PLB. All maintenance and inspections performed on the PLB will be IAW the appropriate MSR MPC or CGTO PG-85-00-310.

C. SURVIVAL KITS.

1. Overview. There are three types of survival kits used in Coast Guard Aviation. Each kit will contain basic components to address each element of surviving extreme conditions. These elements are: shelter, signals, water, food, and medical.

   a. Arctic/Antarctic Survival Kit (AASK)

   b. Cold Weather Aircrew Survival Kit (CWASK)

   c. Aerial Delivery Survival Kit (ADSK)

2. Equipment Procurement. Contents of the AASK, CWASK, and the ADSK will vary depending on the geographical operational areas, and will address the five survival elements described in Paragraph 4.C.1. With advances in commercial survival equipment technology, equipment that is better suited for a given unit's geographical operating area may be commercially purchased at the Commanding Officer's discretion.

A list of all equipment carried in the survival kits shall be documented on a locally generated Survival Kit Inventory Form. Survival equipment is listed and updated in the ALSE ALSIPS database on the ALSE web site.

NOTE

Procurement authorization is only for procurement of AASK, CWASK, and the ADSK related equipment. All other survival equipment deviations must be authorized through ALSE Technical Services.

3. Arctic/Antarctic Survival Kit (AASK). The AASK provides the necessary survival items required by aircrew members and passengers to survive in the Arctic or Antarctic regions for 15 days. The two variations of the AASK are as follows:

   a. AASK-Core: Accommodates a three person aircrew

   b. AASK-PAX: Accommodates up to three passengers

      (1) Configuration. The AASK-Core contains a tent, signaling devices, fuel-fired stove as well as survival equipment appropriate for the unit's operating environment. The AASK-PAX contains extreme cold weather clothing, sleeping bags, eye protection, basic first aid supplies, and food.

NOTE

The selection of the type of containers for packing and transporting the AASKs will be at the AST Shop Supervisors discretion, taking aircraft type, primary mission, and aircraft configuration into consideration.

      (2) Function. Helicopter crews operating in polar environments will utilize the AASK when they are forced to land away from their ship due to mechanical failure, emergency, or weather. The AASK will be carried by the operational helicopter to assure availability when return to station is delayed by unforeseen circumstances.

4. Cold Weather Aircrew Survival Kit (CWASK). The CWASK is designed for use by aircrew members for cold weather survival.

NOTE

The selection of the type of containers for packing and transporting the CWASK will be at the AST Shop Supervisors discretion, taking aircraft type, mission needs and aircraft configuration into consideration.

   a. Configuration. Each container in the CWASK will contain sufficient survival equipment for four crewmembers. Additional containers will be placed onboard aircraft to support the entire crew for each mission. The CWASK has a tent, four sleeping bags, food, fuel-fired stove, signaling devices, skin and eye protection, as well as additional survival equipment appropriate for aircrew survival in the specific area of operation.

NOTE

The additional equipment will be at the discretion of the AST Shop Supervisor, and will be determined considering the area of operations and the conditions under which the aircraft is operated.

b. Function. The CWASK provides the crewmembers with sufficient survival equipment when an aircraft has landed in a remote location due to mishap, mechanical failure, or weather condition.

5. Personal Survival Kits. Personal survival kits are defined as kits whose contents are procured, assembled, and packaged to address the specific survival needs presented in the operating area of the member's current unit. The contents of these kits must not contain firearms, ammunition, explosives, pyrotechnics, or caustic chemicals. The contents must be approved by the unit Engineering Officer, and inspected in conjunction with annual flight gear inspections.

6. Aerial Delivery System Can (ADS-CAN). The ADS-CAN is designed for aerial delivery of survival items on land or at sea.

a. Configuration. The ADS-CAN (Figure 4-35) is an orange cylindrical steel container, approximately 20 inches in height. A quick access V-band locking ring requiring no tools to open or close is used to keep the removable lid on tight enough to ensure watertight integrity.

Figure 4-35. ADS-CAN

b. Function. The ADS-CAN may carry spare parts, water, food, signal devices, and other survival items necessary to sustain survivors until rescue efforts can reach them. The can has a maximum gross weight capacity of 90 pounds, for heavier equipment the ballast bag may be removed to gain weight capacity.

CHAPTER 5. OXYGEN EQUIPMENT.

A. OVERVIEW.

1. Introduction. This chapter contains information relating to oxygen equipment. It is sectioned to reflect the different functions and equipment data. The AST has the responsibility of maintaining and servicing all aircraft oxygen masks and emergency oxygen bottles.

2. Quality Assurance.

CAUTION

IN NO CASE SHALL THE AST PERFORM THEIR OWN QA INSPECTIONS.

QA steps are provided in the appropriate MPC for critical maintenance operations. When a maintenance step is followed by QA REQUIRED, the AST shall perform that step and then have an authorized QA Inspector perform the inspection prior to continuing with the next maintenance or inspection step.

3. Records. All oxygen equipment shall be subjected to periodic inspections and maintenance. These tasks are the primary assurance of oxygen equipment functioning properly and no instance of carelessness or willful neglect shall be allowed to pass unnoticed. The ACMS and MSR are used by the AST to provide a systematic means of control. The ACMS and MSR MPC provide logical sequences for inspection and maintenance of equipment. Additionally, they provide a remarks section to denote any maintenance performed on equipment.

NOTE

The remarks section shall be used when any discrepancy is found and corrected if repairable. The information provided in this section is critical in determining equipment reliability, failure trends, and maintenance intervals.

4. Repair of Oxygen Equipment. Repair of oxygen equipment is restricted to replacement of components that fail inspection, unless stated otherwise.

B. SAFETY AND HANDLING PRECAUTIONS.

1. Gaseous Oxygen.

a. Introduction.

WARNING

TOOLS USED FOR OXYGEN EQUIPMENT SHALL NOT BE USED FOR ANY OTHER OPERATIONS WHERE CONTAMINATION (OIL, GREASE) COULD OCCUR. ALL TOOLS SHALL BE OF NON-SPARKING MATERIALS. AVIATORS BREATHING OXYGEN SHALL NOT BE USED IN WELDING OPERATIONS.

The importance of strict adherence to safety and handling procedures cannot be over-emphasized and is critical to preventing injuries during maintenance procedures. Aviator breathing oxygen is intended for use in aircraft life support systems and may be used in similar applications. Cylinders of aviator breathing oxygen shall not be used for applications that only require technical grade oxygen. This may introduce contaminants into the cylinder, which are difficult to remove by ordinary methods and thereby increase the probability of a product unacceptable for its intended use.

b. Safety and Precautions.

WARNING

GASEOUS OXYGEN IS EXTREMELY HAZARDOUS WHEN USED IN THE PRESENCE OF READILY COMBUSTIBLE MATERIALS. DO NOT PERMIT OIL, GREASE, KEROSENE, AVIATION FUEL, OR ANY PETROLEUM PRODUCT TO COME IN CONTACT WITH OXYGEN.

All personnel responsible for handling gaseous oxygen shall follow safety precautions presented in this manual. To ensure personal safety and efficient handling of gaseous oxygen, all personnel shall be thoroughly familiar with hazards involved.

The following safety precautions shall be followed by all personnel handling oxygen:

(1) Only oxygen conforming to MIL-0-27210, Type I, shall be used in gaseous oxygen systems or components.

(2) Exercise care that compressed oxygen does not become contaminated in any way with hydrogen, hydrocarbon gases, or oil-based liquids as a serious explosion can result.

(3) Oil or grease must never be allowed to come into contact with or be used in the presence of oxygen cylinders, valves, regulators, gauges, or fittings. Fire or explosion may result.

(4) Never lubricate oxygen valves, regulators, gauges, or fittings with oils or any substance except an approved oxygen compatible lubricant.

(5) Hands should be clean and free from oil before using oxygen equipment. Do not wear greasy gloves or clothing.

(6) A spark is not necessary to cause fire or explosion. The chemical reaction caused by a combination of fuel gases and oils with oxygen is sufficient to develop spontaneous combustion and could cause fire or explosion.

(7) Never permit oxygen cylinders to come into contact with electrical welding circuits or apparatus.

(8) Do not allow sparks or flames from welding or cutting torch or any other source to contact cylinders.

(9) Never use oxygen from a cylinder without reducing the pressure through a pressure reducing regulator.

(10) Never mix other gases or compressed air in an oxygen cylinder.

(11) To aid in preventing leakage or material failure due to overtorque of gaseous fittings, strict adherence to torque values is mandatory.

(12) Do not confuse air with breathing oxygen. Oxygen is one of several elements contained in air and should always be described by its proper name. Any attempt to use breathing oxygen in place of compressed air may result in an accident. Never use breathing oxygen for pneumatic tools, for starting diesel engines, as pressure agent in oil reservoirs, for paint spraying, or for any use other than breathing, welding, or cutting.

(13) The cylinder's green color and 3-inch wide white band around the upper circumference of the cylinder can readily identify aviator's breathing oxygen supply cylinders.

(14) "OXYGEN AVIATOR'S" shall be stenciled in white, parallel to the longitudinal axis, and on diametrically opposed sides in letters 2 inches high.

(15) Never pressurize an oxygen system without the proper adapter and safety disc installed on the transfer line.

(16) The amount of oxygen in a cylinder is determined by pressure.

(17) Before connecting oxygen cylinders to oxygen systems, be sure that each cylinder is properly and correctly identified as containing aviator's breathing oxygen.

(18) Under no circumstances shall carbon tetrachloride or similar cleaning fluids be used. Minute quantities of these materials will contaminate the oxygen supply.

(19) Do not clean any elastomer parts (rubberized) that have become contaminated with oil or grease. All such parts shall be replaced. Prior to using leak detection compound (MIL-L-25567A), inspect carefully. Leak detection compound which is not clear and free of suspended material/sediment, is considered contaminated and shall be disposed of. Leak detection compound exhibiting peculiar odors such as acetone or alcohol are considered contaminated and shall be disposed of properly.

(20) Use leak detection compound sparingly as any solution entering oxygen equipment will contaminate the system. Remove all traces of the compound after test with a clean, damp, lint-free cloth.

(21) The pressures in oxygen supply cylinders which service/replenish aircraft oxygen cylinders should not fall below 50 PSIG. Keep valve closed when not in use. Oxygen cylinders depleted to a pressure of approximately 50 PSIG shall be marked “EMPTY,” tagged appropriately, and stored separately from charged oxygen cylinders. All cylinders which have a pressure below 15 PSIG shall be removed from service for heat vacuum treatment.

NOTE

A full oxygen cylinder is a cylinder that is charged to its maximum service pressure. With respect to high-pressure emergency oxygen bottles, 1,800 PSIG or low-pressure emergency oxygen bottles, 300 PSIG is considered full. To refill is to recharge a bottle to its maximum service pressure, regardless of the residual pressure remaining within the bottle.

(22) Never refill an emergency oxygen bottle that has gone beyond its hydrostatic test date.

(23) Do not confuse aviator’s breathing oxygen with welding or hospital oxygen. The latter types of oxygen usually have moisture content that would freeze and plug lines and valves of an aircraft oxygen system.

(24) Leave cap on cylinder when not in use to protect valve. A broken valve may cause a cylinder to rocket like a torpedo and could cause serious injury or death.

(25) Before opening an oxygen cylinder valve, ensure cylinder is firmly supported. Cylinder valves are to be closed by hand only. If a valve cannot be fully opened by hand, it shall be returned with cylinder for repair. A protective cap shall be installed on the valve of any cylinder not in use.

(26) Open valves slowly. Rapid surges in pressure can damage sensitive equipment and cause extreme temperature rise in small orifices and components.

(27) Use existing or formulate charging stages when refilling oxygen cylinders and systems. Rapid pressurization creates heat, which can result in fire or explosion.

(28) Remove high-pressure emergency oxygen bottles from aircraft for servicing.

(29) Never fill emergency oxygen bottles without using a pressure reducing regulator. Deaths have occurred by failure to observe this precaution.

(30) All aircraft oxygen components (mask connection hoses and emergency oxygen bottles discharge or filler ports) not connected to a system or in use, shall be capped or plugged immediately.

(31) Use only clean caps or plugs. Under no circumstance will tape, rag, or paper be used to plug or cap openings.

(32) Ensure all servicing equipment is stored in an appropriate location.

(33) Do not store emergency oxygen bottles in the same bin or cabinet with any materials that are likely to start or accelerate fire.

(34) Pressure shall be released before attempting to tighten or loosen any oxygen tubing, fittings, or unions.

(35) Two personnel shall be required to service emergency oxygen bottles with gaseous oxygen. One person shall be stationed at the control valves of the servicing equipment and one person shall be stationed where he or she can observe the pressure in the emergency oxygen bottle. Communication between the two personnel is required in case of emergency.

(36) A servicing control valve shall not be opened more than ¾ of a turn, so it can be shut off quickly in an emergency.

2. Liquid Oxygen Breathing Systems (LOX).

a. Introduction. The HC-130J utilizes a liquid oxygen-supplied breathing oxygen system. All safety precautions that apply to aircraft with gaseous oxygen-supplied systems apply, as well as additional precautions required by the unique hazards presented by handling cryogenic liquids. Always refer to the applicable airframe MPC when preparing to service any aircraft oxygen system. The applicable MPC will be located at Coast Guard Air Station QA offices, and the ALC web site.

b. Properties. Liquid Oxygen is a pale blue, non viscous water-like fluid. Liquid oxygen boils at -279 °F (-183 °C). At atmospheric pressure it is 1.14 times heavier than water and weighs 9.527 pounds per gallon. When converted to gaseous oxygen at ambient temperature it expands to approximately 860 times its original volume. One cubic foot of liquid oxygen expands to approximately 860-cubic feet of gas at 70 °F (21 °C) at sea level.

c. Safety and Precautions. Hazards to personnel handling liquid oxygen are due primarily to its extremely cold temperature. LOX can freeze and seriously damage skin tissue on contact. The effect is similar to frostbite or thermal burns. Use extreme caution when filling warm containers, because vigorous boiling, splashing, and evaporation (rapid expansion) will occur within that container. The following safety precautions must be followed by all personnel working with liquid oxygen (LOX).

(1) Handling Precautions. Below is a continuation of liquid oxygen safety and handling precautions:

(a) Keep work areas and equipment free of oil, grease, or any other combustible material.

(b) Place a clean drip pan constructed of stainless steel, aluminum, or copper under outlet (overflow) vents of servicing units, samplers, etc. This precaution is taken to prevent the contact of spilled LOX with oil, grease, or other material that may be in the surrounding area.

(c) When transferring LOX, do not leave valves completely open. This may cause the valves to freeze in the open position. To prevent this, valves should initially be completely opened, then immediately closed approximately 1/4-turn.

(d) Disconnect filling or transfer lines as soon as the transfer process is complete.

(e) Do not leave LOX in a closed container or trapped in a line.

(f) Prevent introducing moisture into the LOX system by inspecting the filler valve nozzle when connecting and disconnecting during the transfer process.

(g) To aid in preventing leaks or material failure, do not overtorque LOX tubing and fittings.

(2) Protective Clothing. Because of the hazards involved in handling liquid oxygen, servicing personnel shall wear the appropriate protective clothing, described below:

(a) Face shield: Ensure all personnel involved in servicing are wearing a face shield over safety glasses.

(b) Gloves: Loose-fitting thermal insulated or leather welder-type gloves.

(c) Coveralls: Cotton coveralls, free from any oil, grease, or other combustible material.

(d) Apron: Constructed of impermeable cotton duck, coated with rubber. The apron will be tied in such a way that it will be easy to remove in case of an emergency.

(e) Shoes: Boots should be free of any oil, grease, or other combustibles. They should also be easily removed in an emergency.

C. OXYGEN MAINTENANCE SHOP.

1. Introduction. Since the exclusion of airborne particles is an extremely costly process requiring pressurized rooms, expensive filtration equipment, and elaborate procedures, the cleanliness standards of the oxygen component maintenance shop need not be of clean room quality. An enclosed, air-conditioned, clean area, segregated from contaminant producing operations, shall be considered adequate.

2. Environmental Conditions. The oxygen shop shall be environmentally controlled as follows:

a. Temperature and Humidity. The climate control system must be able to maintain a temperature of 65 ºF to 75 ºF and keep humidity below

50%. Oxygen facilities may be heated by steam heating units or direct fired heaters employing an air distribution duct system, providing the heating unit is not located in the transfer shop. Open-fired heaters shall not be used.

b. Ventilation. All air supplied to a shop where gaseous oxygen is transferred from one unit to another shall be exhausted directly into the atmosphere. Under no circumstances shall exhaust air be returned to the oxygen transfer area. Ventilation shall be provided in the oxygen component maintenance shop, test laboratory of storage facilities, and enclosed spaces to prevent accumulation of potentially dangerous concentrations of oxygen. Mechanical exhaust fans capable of providing a minimum of 10 air changes per hour shall be used as a positive means of exhausting the air. Although oxygen is about 10% denser than air, it is not necessary to evacuate the air near the floor because oxygen rapidly diffuses into the air.

3. Electrical Equipment. All electrical equipment and electrical wiring shall be procured and maintained IAW NAVFAC Specification 9Y (latest revision). The following information has been extracted from this specification:

   a. Conduit. Rigid conduit shall be used in all wiring installations.

   b. Receptacles. Electrical receptacles on the outside of buildings shall be weather proof, 250 VAC, 20 amp (minimum), 3-wire grounding type, and shall be furnished with plugs. Receptacles shall be connected to 220 VAC, single-phase service.

   c. Lighting Fixtures. Lighting fixtures may be standard types, except that where exposed to mechanical injury, a suitable guard or cover shall be provided.

   d. Switches. Switches and motor starting switches shall be enclosed and of the general use type.

   e. Motors. Motors shall be of a type that does not have arcing or contact making parts. Three-phase motors of squirrel cage type shall be used wherever possible.

   f. Grounding. All equipment shall be static grounded.

   g. Transformers. Transformer banks shall be located a minimum of 50 feet from transfer shop or storage areas.

4. Interior Finishing and Fixtures. Interior finishing and fixtures must minimize potentially hazardous conditions.

   a. Floors. In shops where gaseous oxygen transfer operations are conducted, a concrete floor or vinyl type floor covering is considered adequate. Non-glazed or rough glazed ceramic tile is also a suitable floor finish.

   b. Walls. The walls shall be finished with a smooth, impact-resistant, non-chipping, non-flaking material.

   c. Ceilings. The ceiling shall be easily cleanable, non-dust accumulating acoustical type material.

d. Workbenches, Tables, and Storage Bins. Workbenches and tabletops shall be of seamless, nonporous material free of hydrocarbon finishes. Color shall contrast with walls and ceilings to minimize eye fatigue. Storage bins shall not contain more than the required parts to maintain an orderly production rate. Workbenches, tables, and storage bins shall be maintained free of grease, oil, and other combustible materials.

5. Work Area Cleanliness Requirements. The following are oxygen work area cleanliness requirements that shall be adhered to at all times:

   a. Work areas shall be kept clean at all times.

   b. Dust and dirt removal shall be accomplished by a vacuum system at any time that dust is evident at any location in the work area.

   c. Damp mopping will be used to follow up the vacuum cleaning for dirt and dust removal.

   d. Heel and chair marks or other discoloration of the floors shall be removed by scrubbing.

   e. All spare parts shall be removed from the workbenches or covered with lint-free covering at the end of the last work shift each day.

   f. Workbenches and test equipment will be wiped clean prior to the start of each workday.

   g. Smoking or refreshments of any kind shall not be permitted in the work area.

   h. Only ball-type pens are permitted for use in the shop.

6. Personal Cleanliness Requirements. The following are personal cleanliness requirements during oxygen equipment maintenance that shall be adhered to at all times:

   a. Solvent contact with the skin should be avoided where possible.

   b. Fingernail polish shall be removed prior to entering shop.

   c. Personnel shall not wear cosmetics and medication that may produce contamination.

   d. Personnel with skin and/or upper respiratory diseases should not be allowed to work in the overhaul shop area.

   e. Personnel with colds, temporary coughing, sneezing, and severe sunburn should be assigned temporary jobs outside the shop until they have sufficiently recovered.

7. Tool Requirements. The following are oxygen tool requirements that shall be adhered to at all times:

   a. All oxygen equipment maintenance tools shall be constructed of a non-sparking material.

   b. All tools and equipment shall be maintained free of grease, oil, and other combustible materials.

   c. Tools used on oxygen equipment shall not be used for any other purpose.

d. Tools should be marked “OXYGEN USE ONLY.” Other suitable methods of identification may be used.

8. Approved Oxygen Lubricants. Specific lubricants approved for use with oxygen equipment are listed in applicable ACMS and MSR MPCs.

NOTE

Type III Krytox and Type III Tribolube 16 shall not be used on aluminum or magnesium fittings in applications where shear stress would be encountered. MIL-T-27730 Teflon tape shall be used specifically as a thread sealant.

MIL-M-7866 Molybdenum Disulfide shall be used on stainless steel flared fittings and on those applications where MIL-T-27730 Teflon tapes cannot be used.

9. Training Requirements. Shop supervisors shall be responsible for conducting a continuing training program stressing the significance of oxygen system cleanliness, personal cleanliness, and the oxygen safety program. Conscientious adherence to all cleanliness requirements and safety regulations shall be observed at all times.

D. GASEOUS OXYGEN SYSTEMS.

1. Introduction. Aircraft oxygen systems provide the aircrew member with diluted or 100% oxygen for breathing. The gaseous oxygen system provides facilities to store gaseous oxygen in cylinders at either high or low pressure and deliver it to the aircrew member at a reduced pressure for breathing.

2. Configuration. Gaseous oxygen systems are used primarily in aircraft where space and weight considerations are less important. All Coast Guard gaseous oxygen systems consist of the following components.

Table 5-1.

Parts	Functions
Main Supply Cylinders	For storing the oxygen supply.
Valves	Oxygen system valves direct oxygen through the system tubing.
Regulators	Used to control the flow of oxygen to users.
Pressure Gauges	Indicates oxygen pressure.
Crew Oxygen Masks	Directs the flow of oxygen to each user.
Emergency Oxygen Bottles	Provides emergency oxygen in a portable bottle that allows the user to move freely around the aircraft to perform emergency procedures.

3. Gaseous Oxygen Systems Categories. Aircraft gaseous oxygen systems installed in Coast Guard aircraft fall into one of the following categories:

   a. **High-pressure (500-1,800 PSIG)**

   b. Low-pressure (0-500 PSIG)

4. Maintenance Categories. Maintenance is divided into the following two categories:

   a. Preventive Maintenance . Maintenance is the care and servicing needed to maintain equipment and facilities in satisfactory operating condition by providing for systematic inspection, detection, and correction of incipient failures either before they occur or before they develop into major defects.

   b. Corrective Maintenance. Corrective maintenance is comprised of actions performed as a result of failure to detect and/or correct discrepancies during preventive maintenance.

      (1) Functional Check. When maintenance action involves the removal and reinstallation of system hardware involving connecting hardware without a change in adjustment/alignment to the system, a thorough ground functional check shall be conducted prior to the aircraft being released for flight.

      (2) Torque Values. When maintenance actions involve the removal and reinstallation of connecting hardware, strict adherence to torque value is mandatory.

E. GASEOUS OXYGEN SERVICING TRAILER.

1. Introduction. The oxygen-servicing trailer is designed to charge both high and low-pressure oxygen systems installed on aircraft.

2. Configuration. The Gaseous Oxygen Servicing Trailer (Figure 5-1) consists of eight oxygen cylinders mounted on a trailer with associated lines behind a control panel necessary for operation of the unit. The storage box is also mounted on the trailer for storing the servicing hoses. The trailer has three wheels. The front wheel or jack assembly may be retracted or extended manually. The front wheel will be extended while parked and retracted while towing. The front wheel assembly also has a hand crank that will raise or lower to facilitate connecting the towing eye to tow vehicles with the pintle hooks at different heights above the ground. The trailer is designed for towing over smooth paved surfaces or steel landing mats and over unimproved surfaces, such as an open field or rough road conditions.

Figure 5-1. Gaseous Oxygen Servicing Trailer

The Gaseous Oxygen Servicing Trailer Control Panel (Figure 5-2) safely controls the flow of supply oxygen from the supply cylinders to either high or low-pressure aircraft oxygen systems.

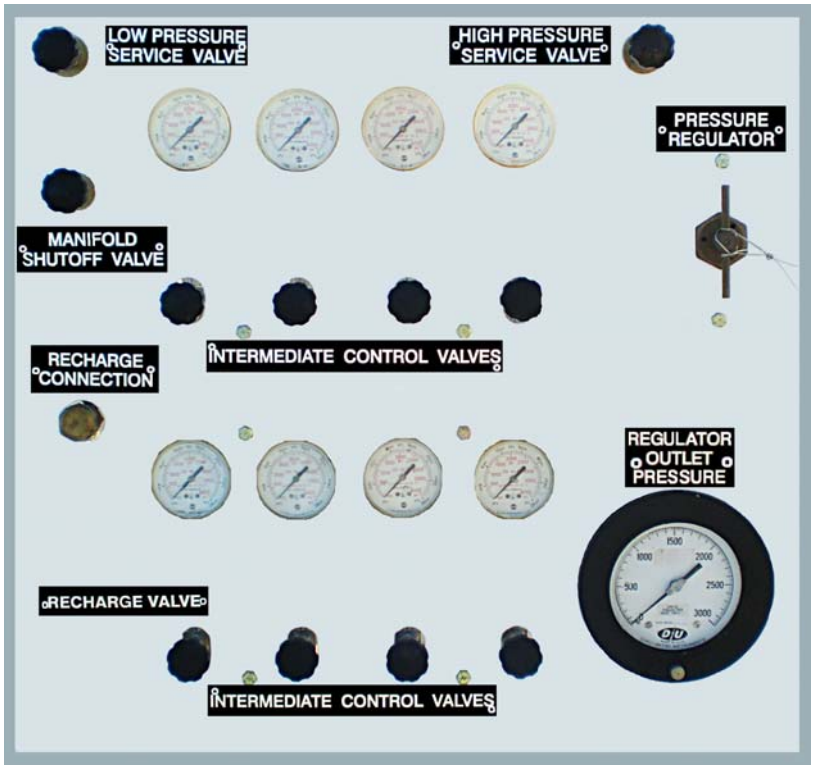


Figure 5-2. Gaseous Oxygen Servicing Trailer Control Panel

F. LIQUID OXYGEN SERVICING TRAILER.

1. Introduction. The Liquid Oxygen Servicing Trailer is intended for the storage and transfer of liquid aviator breathing oxygen. The design maintains the product until needed at a low evaporation (boil off) rate.

2. Configuration.

   a. The Liquid Oxygen Servicing Trailer (Figure 5-3 and Figure 5-4) is a complete, self-contained, mobile unit. Approximate weight when full is 1,200 pounds. It is designed to store 50 gallons of liquid oxygen with a low evaporation rate, and transfer liquid oxygen into aircraft as required. A chassis with wheels and towing eye has been provided for towing. Tiedown rings have been provided for lifting and tiedown during transport.

Figure 5-3. (Sheet 1 of 2)
Liquid Oxygen Servicing Trailer

Figure 5-3. (Sheet 2 of 2)
Liquid Oxygen Servicing Trailer

b. The LOX servicing cart consists of an inner shell suspended inside an outer shell. The space between the shells is called the annular space. The annular space is insulated and holds a vacuum.

c. The control housing (Figure 5-4) is located at the rear of the LOX servicing cart. This control housing contains and protects the operating controls and indicators. The control panel is located inside the control housing. The control panel contains the LOX servicing cart operating instruction, insulation information, and control identification.

Figure 5-4. LOX Servicing Cart Control Housing

d. The buildup coil is located beneath the outer shell and is mounted to the chassis. The buildup coil performs as a heat exchanger where the LOX is converted to gaseous oxygen. This conversion provides pressure within the inner shell for oxygen transfer and drainage.

e. The relief devices contained within the tank protect against pressure buildups in the inner shell, fill/drain line, and servicing line. These relief devices exceed the design parameters.

f. The fill/drain line is located at the control housing. The fill/drain line allows the tank to be filled and drained. The fill/drain components consist of a control valve, relief valve, drain valve, filter, and LOX coupling.

g. The servicing line is located within the control housing. The servicing line components consist of a control valve, relief valve, drain valve, filter, and LOX coupling. Attached to the servicing line on the outside of the control housing is a service hose and filler valve.

h. The vapor vent line is located within the control housing. The vapor vent line components consist of a control valve, inner shell relief valve, and inner shell safety head. The vapor phase pressure indicator is tied into the vapor vent line. The vapor vent line discharges beneath control housing and contains an adapter for attaching a vent line for air transportation.

i. The chassis provides the means to which the outer shell, control housing, running gear, towing eye, and static ground reel are mounted.

j. The running gear consists of two large wheels and one retractable front wheel. The side wheels contain automotive-type parking brakes. These brakes are operated by a single hand lever near the front of the tank. A towing eye is attached to the front of the chassis and is utilized with pintle-type towing hooks.

G. EMERGENCY GASEOUS OXYGEN BOTTLES.

1. Introduction. Aircraft emergency gaseous oxygen bottles are self-contained portable breathing devices capable of supplying breathing oxygen to flight personnel for normal or emergency use. Emergency oxygen bottles installed in Coast Guard aircraft are as follows:

   a. Low-pressure (50-500 PSIG) used in the HC-130

   b. High-pressure (50-1,850 PSIG) used in the HU-25

2. MA-1 Emergency Oxygen Bottle. The HC-130 Emergency Oxygen Bottle (regulator and cylinder) type MA-1 (Figure 5-5) is a self-contained portable breathing device capable of supplying breathing oxygen to flight personnel for normal or emergency use. The regulator hereafter referred to as the A-21 which forms part of the unit, is a demand/pressure breathing type regulator which will deliver oxygen to the user upon demand or provide a positive pressure to the mask depending upon the positioning of the selector knob. The unit is intended for emergency use with the full-face smoke mask (P/N 651-280), the MBU-10 oxygen mask.

Figure 5-5. MA-1 Emergency Oxygen Bottle

a. Characteristics. Characteristics for the type MA-1 emergency oxygen bottle are provided below:

(1) Operating Altitude Range Sea Level to 43,000 ft

(2) Normal Operating Service Pressure 375 psi (at 70 °F)

(3) Visual Indicator Pressure gauge

(4) Selector knob

(a) NORM - 100% Oxygen on demand

(b) 30M - Provides 100% oxygen at a positive pressure of 1.6-2.4 in H_2O (inches of water pressure)

(c) 42M - Provides 100% oxygen at a positive pressure of 5.5-6.5 in H_2O

(d) EMER - Provides 100% oxygen at a positive pressure of 12.0-14.0 in H_2O

b. Overall Dimensions.

(1) Length 5 9/16 in

(2) Diameter 5 7/8 in

(3) Circumference 18 ½ in

(4) Height 4 9/16 in

(5) Weight 2.1 lb

3. 5500 Series Emergency Oxygen Bottle (HU-25) High-Pressure. The 5500 series (high-pressure) emergency oxygen bottle (Figure 5-6) provides a portable-breathing source. It contains an outlet assembly (7) for quick installation of the MF10-03-01 full-face quick donning mask. Additional information on the 5500 emergency oxygen bottle may be found in the Scott Maintenance Manual, 35-30-77.

   a. Characteristics. Characteristics for the type 5500 series emergency oxygen bottle are provided below:

      (1) Operating Altitude Range Sea Level to 40,000 ft

      (2) Normal Operating Service Pressure 1800 +50/-0 psi (at 70 °F)

      (3) Visual Indicator Pressure gauge

      (4) ON/OFF Selector knob 100% Oxygen on demand

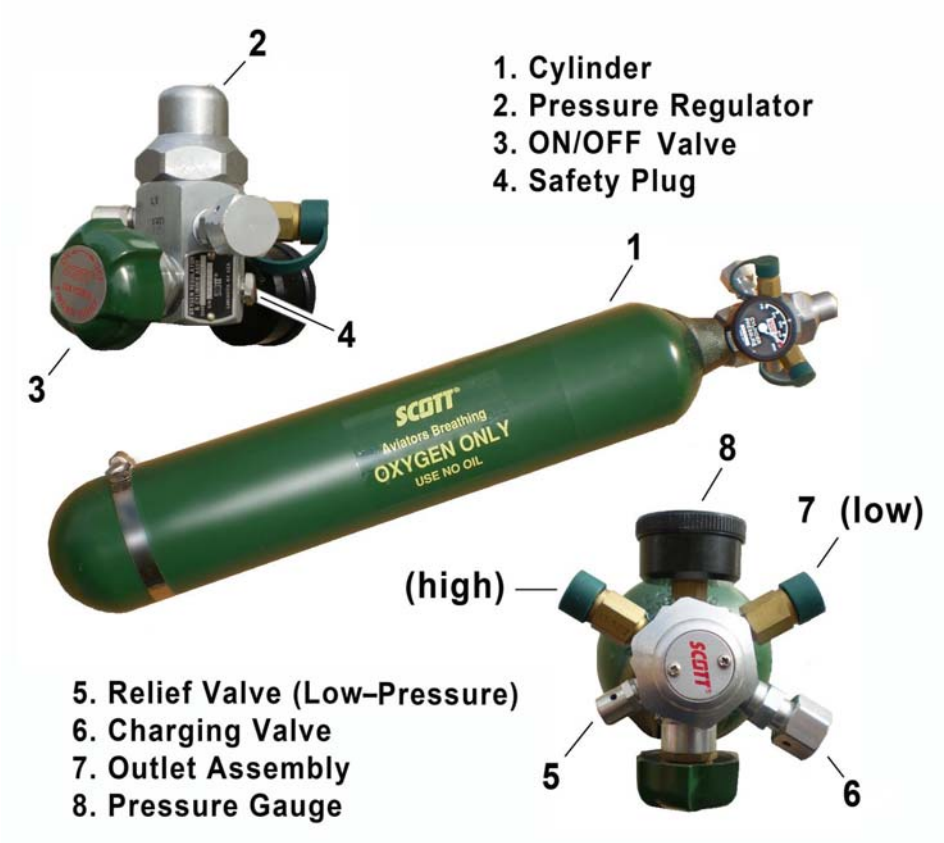


Figure 5-6. 5500 Series Emergency Oxygen Bottle

H. FULL FACE QUICK-DON MASK (HU-25).

1. Introduction. The full face quick-don mask (Figure 5-7) is an emergency breathing apparatus designed for HU-25 flight crews operating at high altitudes. The mask protects the flight crew against the effects of depressurization, contaminated air and toxic fumes. It is used for both respiratory and eye

protection. It is supplied with oxygen at a rated pressure of 72.5 PSIG (5 bar) through a hose coupling and can be donned single handed in less than 5 seconds. The wide clear lens of high optical quality allows aircrew to wear corrective regulation glasses. This unit incorporates several anti-mist devices.

Figure 5-7. Full Face Quick-Don Mask

2. Characteristics. Characteristics for the full face quick-don mask are provided below in two separated groups.

   a. General Characteristics.

      (1) Weight 0.730 kg (1.61 lb)

      (2) Operating temperature + 20 ºC to + 60 ºC (4 ºF to + 140 ºF)

   b. Mechanical Characteristics.

      (1) Rated supply pressure 72.5 PSIG (5 bar)

      (2) Operating pressure 60/25 PSIG (4.2/5, 9 bar)

      (3) Maximum flow rate 120 l/min NTPD

      (4) Maximum operating altitude 40,000 feet (12,192 m)

      (5) Readiness time (donning) 5 seconds maximum

c. Subassemblies. The full face quick-don mask consists of the following five subassemblies:

(1) Inflatable Harness

(2) Mask

(3) Microphone

(4) Oxygen Regulator

(5) Hose Assembly

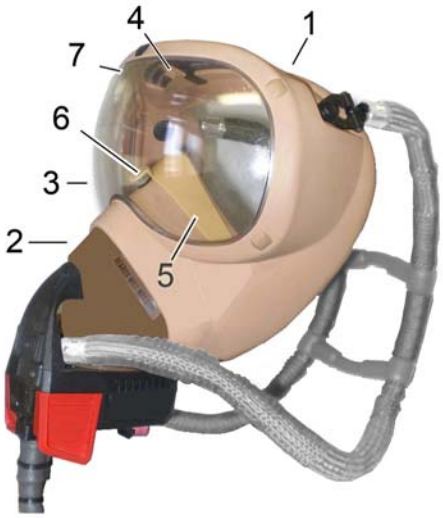
(6) Inflatable Harness Subassembly. The inflatable harness subassembly (Figure 5-8) consists of a mechanical and pneumatic coupling block, made of self extinguishing plastic, to which are fitted the silicone elastomer harness tubes covered with an expanding braid. Two flexible spacers attach the tubes. Each tube end is provided with a buckle, secured to a pin for attachment to the mask face piece. A sealing ring fitting into a recess in the lower section of the coupling block seals the connection between the harness and the regulator, allowing the harness to be supplied with oxygen under pressure.

1. Mechanical/pneumatic coupling block
2. Silicone elastomer harness tubes
3. Flexible harness tube spacers
4. Buckle/pin harness securing device

Figure 5-8. Inflatable Harness Subassembly

(7) Mask Subassembly. The mask subassembly (Figure 5-9) consists of a silicone elastomer face piece fitted with a plastic mask shell. The mask includes a double plastic window providing a wide angle of view. This window is inserted into a groove on the face piece,

held in place on the upper part by a lock, and on the lower part by a pin. The hose cup is provided with a stiffener which protects a venting valve consisting of a housing valve and a flapper. The electrostatic protective film with a detachment tab is applied on the upper part of the window to protect it against scratches.



1. Silicone elastomer face piece
2. Plastic mask shell
3. Double layer plastic window
4. Window frame lock
5. Hose cup stiffener
6. Venting valve
7. Electrostatic protective film

Figure 5-9. Mask Subassembly

(8) Mask Interior/Microphone Subassembly. The upper part of the face piece houses an anti-mist aluminum alloy condenser (Figure 5-10). The lower section of the mask shell is provided with an opening through which it is directly connected to the regulator. This subassembly consists of a silicone elastomer protector that houses the microphone housing capsule. The protector is provided with a fitting for the passage of the intermediate radio cord. This subassembly is secured to the regulator dilution nozzle and to the mask lock by means of two fittings. This arrangement enables the separation of the regulator from the mask without removing the microphone.

1. Anti-mist aluminum condensor
2. Mask opening to regulator
3. Silicone elastomer protector
4. Microphone housing capsule

Figure 5-10. Mask Interior/Microphone Subassembly

(9) Regulator Subassembly. The regulator subassembly (Figure 5-11) is provided with three red manual controls.

(a) Oxygen Dilution Selector Switch: Wearer's right side when donned. The dilution plate assembly is composed of an "N - 100%" spring-loaded rocker which maintains a valve in open or, "N" for normal oxygen, or closed for 100% oxygen.

(b) Harness Inflation/Deflation: Wearer's left side when donned. The inflation control plate actuates a bypass valve which, when pressed, inflates or when released, deflates the harness.

(c) On the lower face, a TEST and EMERGENCY knob which performs the following two functions:

[1] Functional test of the regulator when depressed

[2] Delivery of positive safety pressure at any altitude when turned clockwise

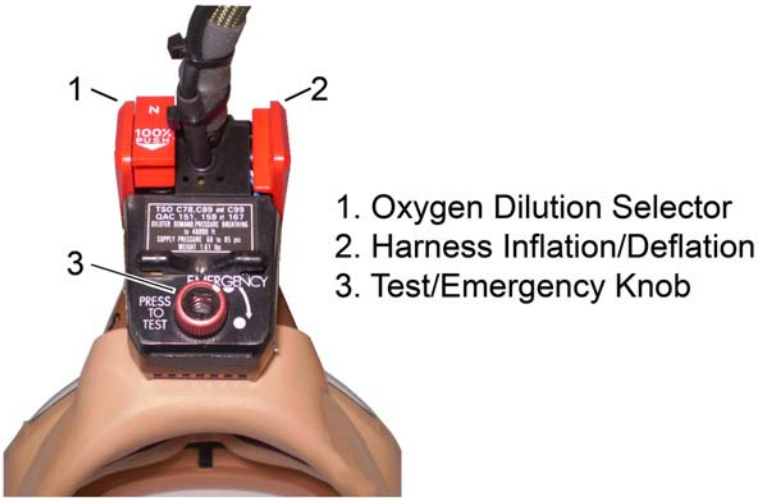


Figure 5-11. Regulator Subassembly

(10) Hose Subassembly. The hose assembly gathers the supply hose and radio cord attached by means of sleeves. Identification tape of the hose assembly is attached to the hose, on bayonet coupling side. The supply hose consists of a silicone elastomer tube with a fitting crimped to each end: a male bayonet coupling at one end and at the other end, a special coupling which connects the tube to the regulator. This coupling is secured to the regulator inlet by a locking block riveted over by a hot iron. An O-ring housed in a groove in the special coupling seals the connection. Two silicone sleeves fitted to each end cover the crimping ferrules. One end of the radio cord is connected to the regulator under the cover plate and the other end is fitted with a locking electrical connector.

d. Mask Operation. The oxygen for the full face quick-don mask is delivered by the aircraft supply oxygen system, through the supply hose, at a rated pressure of 72.5 PSIG, or 5 bar. The various operating features of the mask are separated into the following operation descriptions:

(1) Operation of Inflatable Harness

(2) Operation of Regulator

I. 1506V FOLDING QUICK-DON MASK.

1. Introduction. The 1506V Folding Quick-Don Mask (Figure 5-12) permits an HC-130 aircrew member to breathe gaseous oxygen from the aircraft oxygen supply system or the MA-1 emergency oxygen bottle. The quick-don feature permits rapid removal from storage, and donning with one hand in the event of an emergency. In the event of smoke, the vented anti-smoke goggles are worn with the mask assembly.

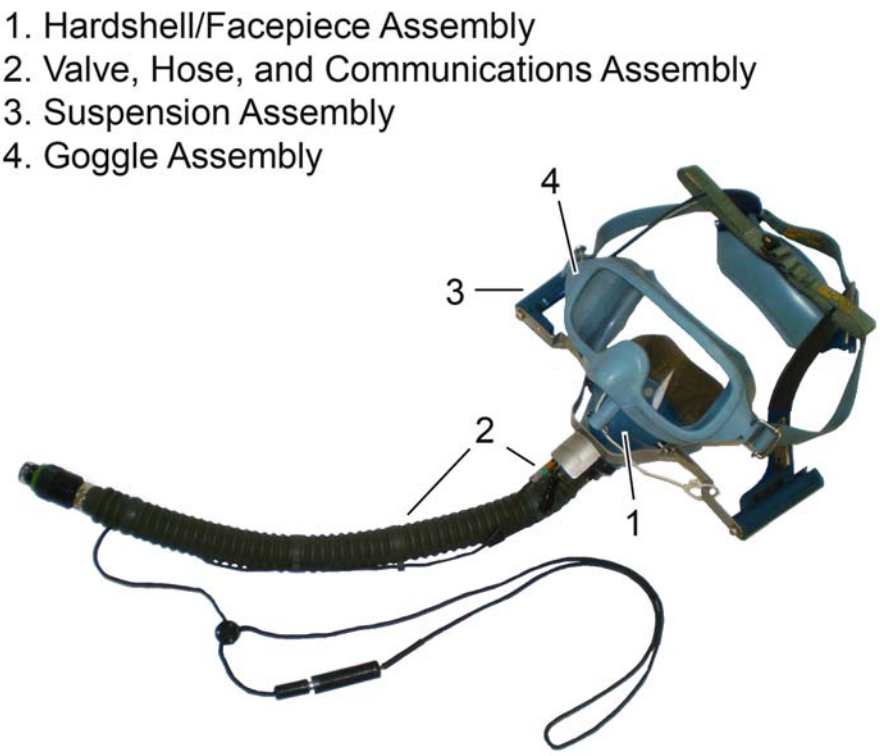


Figure 5-12. 1506V Folding Quick-Don Mask

2. Mask Subassemblies. The 1506V Folding Quick-Don Mask consists of the following five subassemblies (Figure 5-12).

   a. Hard Shell/Face Piece Assembly

   b. Valve, Hose, and Communication Assembly

   c. Suspension Assembly

   d. Goggle Assembly

   e. Holder Strap (not shown)

Table 5-2.

Parts	Functions
Hard Shell/Face Piece Assembly	The hard shell/face piece assembly consists of a silicone face piece attached to the hard shell by means of a receiver assembly. Attached to the anti-smoke goggles vent valve, vent valve guard, and yoke attachment pins.
NOTE All the hard shells will have a reinforcement metal strip in the nose ridge.	
Valve, Hose, and Communication Assembly	The valve, hose, and communication assembly consists of a combination inhalation/exhalation valve, which connects to the mask and hard-shell assembly by means of a three-pin bayonet connector. Attached to the valve assembly is a silicone oxygen hose terminating with a quick-release connector with an integral disconnect warning device. The communication system consists of a microphone, cable, and connectors.
Suspension Assembly	The suspension assembly consists of a yoke, which is attached to the folding aluminum head-harness assembly by means of a telescoping retention system. The head-harness assembly includes a cushioned neck pad, head straps, and electrical switching system.
Goggle Assembly	The goggle assembly consists of a lens, frame, and head strap. The frame and head strap are made from silicone rubber. The lens is replaceable if it becomes scratched or damaged.
Holder Strap	The holding strap (P/N 358-643E), provides secure mounting of the mask in the stowed position. The mask assembly will be automatically released from the holding strap assembly when pulling the mask assembly from the holder prior to the donning the mask.

3. Communications Capability. Full communication capabilities are provided when the mask assembly is connected to a set of headphones and the aircraft communication system. Microphone switching between the headset boom microphone and the mask microphone is initiated when the suspension frame is unfolded.

4. Operation.

WARNING
IF THE INSPECTION CANNOT BE COMPLETED IMMEDIATELY, THE MASK WILL BE REPLACED WITH AN RFI MASK.

Oxygen supply enters the face piece through the valve located at the bottom of the mask (Figure 5-13). Exhaled air passes out through the same valve. The exhalation portion of the valve is constructed so that only a pressure of 1 millimeter of mercury greater than the inlet pressure being supplied by the regulator will force open the valve and allow exhaled air to flow from the mask.

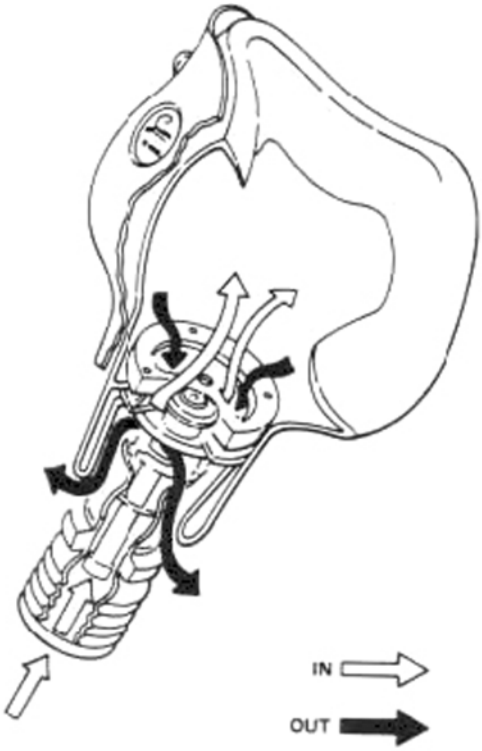


Figure 5-13. Quick-Don Mask Operation

5. Modifications. There are no modifications required or authorized for the 1506V Folding Quick-Don mask at this time.

CHAPTER 6. RESCUE EQUIPMENT.

A. OVERVIEW.

1. Introduction. This chapter contains information relating to Coast Guard Aviation rescue equipment. It is sectioned to reflect the different functions and equipment data, in addition to specific requirements for use by the Coast Guard. The AST has the responsibility of maintaining and servicing the aircraft rescue equipment.

2. Quality Assurance.

CAUTION
UNDER NO CIRCUMSTANCES SHALL ANY AST PERFORM THEIR OWN QA INSPECTIONS.

QA steps are provided in the appropriate MPC for critical maintenance operations. When a maintenance step is followed by QA REQUIRED, the AST shall perform that step and then have an authorized QA Inspector perform the inspection prior to continuing with the next maintenance or inspection step.

3. Records. All rescue equipment shall be subjected to periodic inspections and maintenance. These tasks are the primary assurance of rescue equipment functioning properly and no instance of carelessness or willful neglect shall be allowed to pass unnoticed. The ACSM and MSR are used by the AST to provide a system of standardized maintenance and maintenance scheduling. The MPCs provide the correct sequence for inspection and maintenance of equipment. Additionally, the MPCs provide a remarks section to denote any maintenance performed on equipment.

NOTE
The remarks section found on the MPC shall be used when any discrepancy is found and corrected if repairable. The information provided in this section is critical in determining equipment reliability, failure trends, and maintenance intervals.

B. FOLDING RESCUE LITTER.

1. Introduction. The folding rescue litter (Figure 6-1) is a stainless steel stretcher designed to evacuate a single injured person from land or sea during rescue operations. The litter folds in half, which provides compact storage.

2. Configuration. **The folding rescue litter is a stretcher constructed of stainless steel tubing and weighs approximately 45 pounds and has a load capacity in excess of 600 lbs.** As an assembly, the folding rescue litter consists of the following components:

   a. Folding Litter Body. The folding litter body is comprised of two halves that join and secure at four points on each half. The perimeter and bottom are constructed of stainless tubing. Flat stainless bar material joins the tubes for strength and rigidity. Each half of the folding litter body is lined with a semi-rigid black reinforced nylon mesh for patient support and comfort.

b. Folding Litter Couplers. The litter may be folded for storage by releasing the two couplers at each side of the litter and separating the halves, then nesting the lower half of the litter into the upper half. The top tube couplers are threaded with self-aligning pins. The bottom skid tubes join with hook and pin couplers.

c. Flotation Half Logs and Floating Chest Pads. The flotation half logs and chest pads are constructed of polyethylene foam with removable nylon covers. The flotation half logs are attached to the outside of the litter. The flotation logs and chest pads provide flotation for the litter.

d. 5-Pound Ballast Weight. A ballast weight provides counterweight stability so the litter will remain horizontal with a patient in the litter.

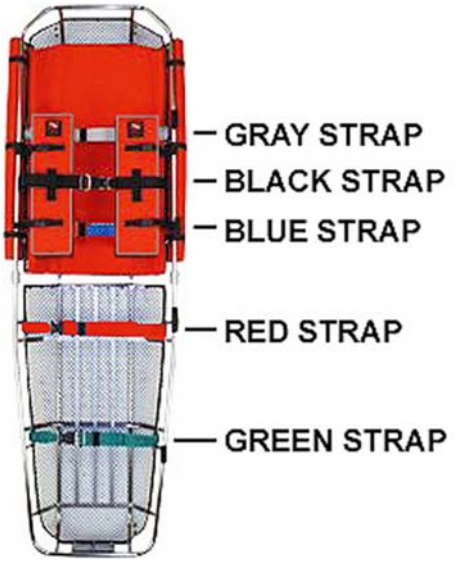


Figure 6-1. Folding Rescue Litter

e. Removable Hoisting Slings. Hoisting slings provide the means to attach the litter to the helicopter hoist cable.

f. Patient Restraint Straps. Five patient restraint straps are provided for use restraining a patient in the folding litter. The floating chest pads are attached to the litter with this assembly.

g. Patient Lift Insert. A patient lift insert is attached inside the litter frame to provide rapid and easy removal of patient from the litter.

NOTE

Two wool blankets are rolled and placed at the foot of the litter. These blankets are used to cover the patient, providing warmth during hoist and flight.

3. Function. The folding rescue litter can be unfolded, locked, then lowered from and hoisted to a helicopter by means of a hoist cable in land/sea rescue operations. The folding rescue litter is used to hoist non-ambulatory subjects

from land or water. The folding capabilities allow it to be stored efficiently in the airframe cabin and to be assembled in flight when required.

4. Optional Equipment. A face shield designed specifically for use on the folding litter may be installed on the folding rescue litter to provide protection for a patient's head.

C. MEDEVAC BOARD.

1. Introduction. The MEDEVAC board is designed to stabilize a patient who has or may have a back or neck injury. The MEDEVAC board folds in half, which provides compact storage.

2. Configuration. The MEDEVAC board weighs approximately 19 pounds and has a load capacity in excess of 300 lb. It is a two-piece full length aluminum backboard constructed with stainless steel screw couplers for strength and rigidity, allowing it to separate into halves for stowage. It is equipped with a protective storage/carrying case. The MEDEVAC board is designed for compact stowage inside the folding rescue litter. The MEDEVAC board has a nonporous surface making it impervious to contaminants. Oversized, replaceable hand straps assist in carrying and maneuvering the MEDEVAC board. The board has replaceable, color-coded, patient restraint straps with quick-close buckles and a disposable head restraint.

3. Function.

WARNING
WHEN USING THE MEDEVAC BOARD, ALL PATIENT RESTRAINT STRAPS SHALL BE USED.

CAUTION
THE MEDEVAC BOARD HAS NO FLOTATION CAPABILITY AND IS NOT ATTACHED TO THE RESCUE LITTER. TO PREVENT LOSS, REMOVE THE MEDEVAC BOARD PRIOR TO IN-WATER USE.

The MEDEVAC board is suited for stabilizing and removing a patient from a confined space to an area where the patient may be prepared for a litter hoist.

D. RESCUE BASKET.

1. Introduction. The rescue basket is intended for hoisting survivors from land or sea during helicopter rescue operations. It will float when placed in the water.

2. Configuration. The rescue basket (Figure 6-2) weighs approximately 40 pounds and has a load limit of 600 pounds. The basket is constructed of stainless steel. The design of the basket eliminates sharp corners, minimizing the potential for damaging the skin of the aircraft during operation. The rescue basket consists of the following components:

Figure 6-2. Rescue Basket

a. Flotation Tubes. Two nylon covered rigid foam floats silk-screened with "REMAIN SEATED," and a diagram of a seated individual. These floats provide flotation for the rescue basket.

b. Folding Bail. The folding bail hinges at each corner to allow it to fold down into the basket. The bail is equipped with a bail retention pin. When inserted correctly through both sides of the raised bail, the retention pin will prevent the bail arms from falling back into the basket.

3. Function. The rescue basket is lowered to rescue personnel and survivors from a helicopter by means of a rescue hoist. The rescue basket is used for in-water and land rescue.

E. SURVIVOR STROP.

1. Introduction. The survivor strop (Figure 6-3) is a buoyant device designed for use in hoisting a single survivor during helicopter rescue operations.

Figure 6-3. Survivor Strop

2. Configuration. The survivor strop is constructed of closed cell foam encased in a red ballistic nylon cloth cover and has a load capacity of 600 pounds. Webbing passes through and attached with stitching to the cover of the sling. The survivor strop is attached to the helicopter rescue hook by the two V-rings sewn at each end of the webbing.

   There are two retaining straps that make up the chest retainer strap assembly. A stainless steel adjustable V-ring and snap hook join to secure the survivor into the survivor strop. The chest retainer strap assembly is secured to the cover of the survivor strop with three webbing straps. Both are secured by three, 1-inch webbing straps with snap fasteners. The survivor strop is approximately 71 inches long.

3. Function.

WARNING
USE OF CHEST RETAINER STRAPS IS MANDATORY DURING USE OF THE SURVIVOR STROP, EXCEPT WHEN HOISTING COAST GUARD HELICOPTER RESCUE SWIMMERS.

   The survivor strop is a buoyant rescue device used to hoist trained (military) personnel only. The strop will accommodate one survivor wearing flight gear, integrated torso harness and life preserver.

F. QUICK STROP.

1. Introduction. The quick strop is used in conjunction with the helicopter rescue swimmer harness for survivor rescue.

2. Configuration. The quick strop (Figure 6-4) is similar in design and materials to the survivor strop with some minor differences. The quick strop has a friction slide to snug the strop to the survivor. There is a length-adjustable strap that is folded into a pocket on the back of the quick strop. The strap terminates in a snap hook. This strap is routed between the survivor's legs and then clipped into the friction slide when the survivor is unconscious.

Figure 6-4. Quick Strop

3. Function.

WARNING
THE CROTCH STRAP SHALL BE UTILIZED AT ALL TIMES WHEN SURVIVOR IS UNCONSCIOUS, UNRESPONSIVE, OR INCAPACITATED.

CAUTION
WHENEVER POSSIBLE, THE QUICK STROP SHOULD BE PLACED ON THE SURVIVOR TO FACILITATE FACING THE RESCUE SWIMMER DURING HOIST.

The quick strop is utilized by the rescue swimmer for rapid survivor recovery or when the rescue area is restrictive (i.e., cliff rescue or direct deployment rescue).

G. PORTABLE SALVAGE PUMP.

1. Introduction. The Portable Salvage Pump is a portable dewatering pump kit used for the emergency dewatering of vessels in danger of sinking. The kit is configured into a plastic or metal watertight container to allow delivery by airdrop or helicopter hoist.

2. Configuration. The CG-P1 portable salvage pump has a rated output of 120 gallons per minute at a 10-foot suction lift, and will operate for approximately 4 to 5 hours on the gasoline supplied with the kit. The kit consists of a three-horsepower, four-cycle gasoline engine attached to a straight centrifugal pump that requires priming. A priming hand pump assembly is located on top of the centrifugal pump. The engine-pump assembly is bolted to a metal frame. The nonrigid discharge hose is 3 inches in diameter and is permanently attached to the pump assembly. The discharge check valve is attached at the end of the nonrigid discharge hose. The discharge check valve is a snug-fitting flexible rubber sleeve over a rigid, vented end cap providing back pressure to the pump, allowing the pump to maintain prime once it is operating. The intake hose is a clear, reinforced rigid hose with a debris strainer attached on one end. The intake hose is 2 inches in diameter, and must be connected to the pump for the dewatering operation. A debris strainer on the end of the intake hose prevents ingestion of large debris that may disable the pump. The intake hose must be immersed in water to maintain pump prime and suction. If the debris strainer lifts out of the water while pumping, it must be re-immersed, and the pump re-primed to continue dewatering operations and prevent pump damage. Included with the components is an explosion-proof flashlight, attached to a laminated assembly and operation instruction sheet.

3. Function. The Portable Salvage Pump is delivered to vessels taking on water and in danger of sinking. It may be delivered from fixed wing aircraft with the ADS or from rotor wing aircraft by hoist (direct) or by trail line (indirect).

H. HELICOPTER TRAIL LINE/WEIGHT BAG.

1. Introduction. The helicopter trail line is used in helicopter hoisting operations when direct hoisting methods are not practicable. It may be used to aid rescue personnel in preventing oscillation and spinning of the rescue device during hoist. The weight bag enables the aircrew to deliver the trail line to the hoist area through the effect of wind and rotor-wash. If severe winds are encountered, additional weight bags may be added to provide stability.

   Commercial purchase of the weight bag is authorized. Refer to the ALSIPS for source information.

2. Configuration. The trail line consists of 105 feet of orange polypropylene line with a weak link with snap hook at one end and a snap hook at the opposite end. Both the snap hook and the weak link are attached to the trail line with an eye splice. When used for hoisting, weight must be attached to the trail line snap hook in the form of one or more 5-pound weight bags.

3. Function. The trail line is utilized to stabilize rescue devices being hoisted to and from the helicopter. This reduces the time the pilot is required to maintain a precise stable hover without a reference. The helicopter rescue swimmer may also be stabilized and directed using a trail line during hoisting. The use of the eye splice and snap hook on each trail line allow the connection of two trail lines together to form a 210-foot trail line, if required. The weak link is incorporated to prevent damage to the rescue equipment and/or helicopter by preventing entanglement with a vessel or ground structure. If the trail line becomes entangled, the weak link will break at approximately 300 pounds. The trail line weight bag is used to stabilize the trail line when delivered through wind and rotor wash.

Figure 6-5. Weight Bag

I. MESSAGE STREAMER.

1. Introduction. The message streamer is used to communicate with individuals when no other means of communications are available.

2. Configuration. The message streamer dimensions are 5 by 6½ inches. It is a plastic pouch with a brightly colored 7-foot vinyl streamer attached. The pouch has a water tight pressure lock seal to contain the message. There is a smaller inner bag of sand for weight. The streamer stabilizes and slows the message streamer during its descent when deployed from an aircraft.

3. Function. The message streamer may be deployed to survivors on a vessel, in the water, or on land. It may be deployed from fixed wing and rotor wing

aircraft, giving instructions to survivors on rescue preparation, to inform individuals of severe weather, forest fire, or tsunami.

J. HOIST QUICK SPLICE.

1. Introduction. The hoist quick splice is used by the helicopter flight mechanic when the rescue hoist cable has been cut, broken, or has become frayed, and must be severed to continue to operate the rescue hoist.

2. Configuration.

WARNING

IF THE HOIST CABLE IS NOT INSERTED COMPLETELY INTO SLOT NUMBER 5 AND ENGAGED BY THE RETAINING CLIP, THE CABLE WILL DISENGAGE THE QUICK SPLICE DURING HOISTING, RESULTING IN SEPARATION FROM THE QUICK SPLICE.

CAUTION

WITH THE QUICK SPLICE INSTALLED ON THE HOIST CABLE, THE HOIST UP-LIMIT SWITCH MAY NOT FUNCTION NORMALLY TO PREVENT THE QUICK SPLICE FROM DAMAGING THE HOIST IF RECOVERED INTO THE HOIST DRUM.

The hoist quick splice (Figure 6-6) consists of a plate constructed of ¼-inch aluminum. Numbered 1-5, the slots are machined into the plate for secure attachment of a hoist cable. A standard rescue hook is attached to the plate with a stainless steel shackle. Cable routing slots 1, 3, and 5 are stamped on one side of the plate, slots 2 and 4 on the opposite side. A spring clip is provided in slot number 5, which secures the hoist cable into place.

Figure 6-6. Hoist Quick Splice

3. Function. To install the quick splice onto the hoist cable, route the hoist cable into each slot following the engraved directional arrows beginning at the START position.

4. Modifications and Repairs to the Hoist Quick Splice. There are no modifications authorized to the hoist quick splice. The only authorized repairs to the hoist quick splice are removal of corrosion, burrs, and sharp edges with emery cloth IAW the appropriate MSR MPC.

K. CREWMEMBER AIRCRAFT SAFETY BELTS.

1. Introduction. Crewmember aircraft safety belts are designed as a safety restraint for use by crewmembers and passengers who are not strapped into a seat retention system when a door, ramp, or hatch is open.

2. Configuration. Each crewmember aircraft safety belt is made of nylon webbing and is provided with pull tabs and adjusting buckles for adjustment. Each type of aircraft safety belts have a latch and link assembly with a leather protector. Both rotary and fixed wing crewmember aircraft safety belts utilize the flat slide lock snap hook to attach to airframe attachment points. They are both designed for a right-hand release.

   a. Rotary Wing Crewmember Aircraft Safety Belt. The rotary wing crewmember aircraft safety belt is designed for single hand release. A triangle-shaped, perforated lever is operational with thumb and forefinger while wearing flight gloves (Figure 6-7).

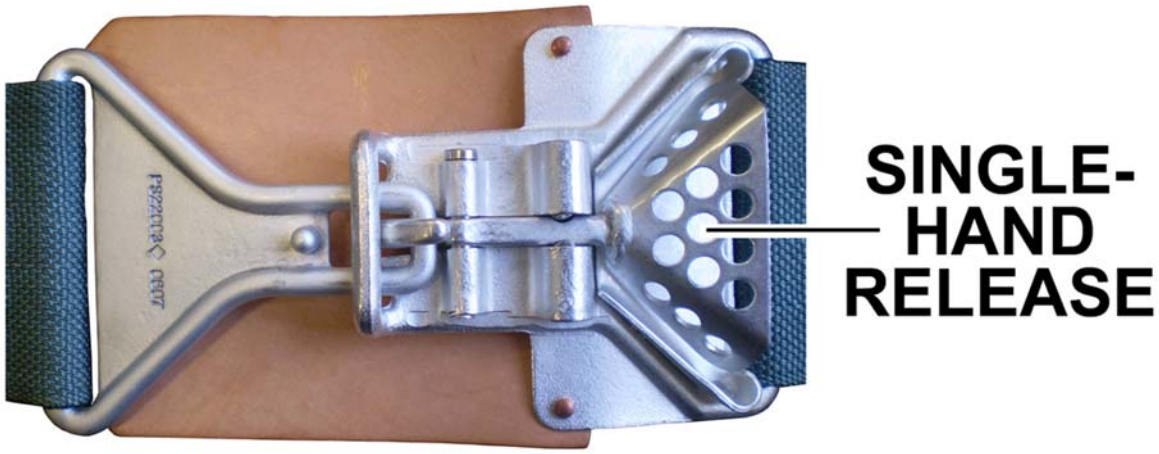


Figure 6-7. Rotary Wing Crewmember Aircraft Safety Belt

   b. Fixed Wing Crewmember Aircraft Safety Belt. The fixed wing crewmember aircraft safety belt has a buckle latch-lock incorporated into the buckle that prevents inadvertent opening of the buckle when worn correctly (Figure 6-8).

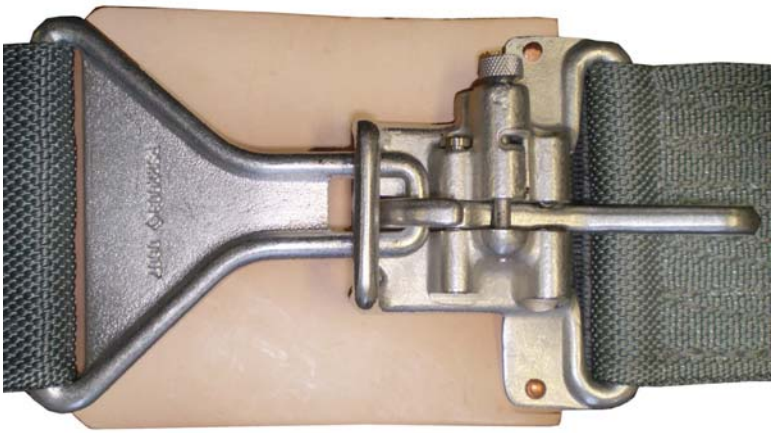


Figure 6-8. Fixed Wing Crewmember Aircraft Safety Belt

When the locking pin is up and locked into the detent (Figure 6-9), it allows the buckle to be opened. When the locking pin is rotated and released from the detent a spring pulls it down into the locked position, the buckle is locked and cannot be opened.

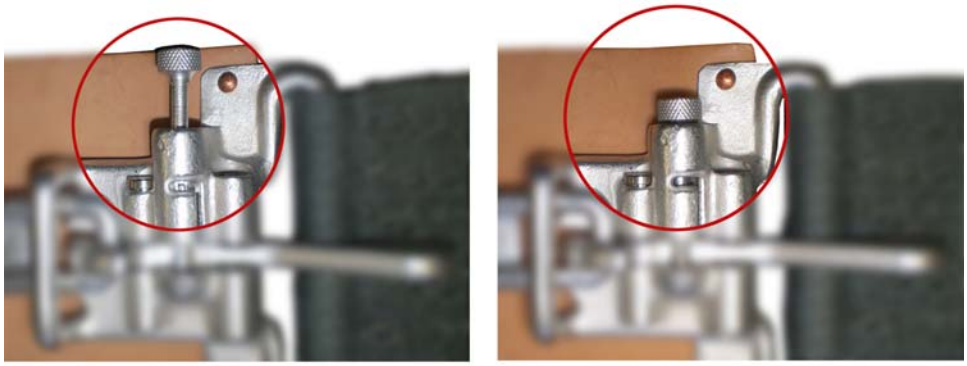


Figure 6-9. Fixed Wing Crewmember Aircraft Safety Belt Locking Pin

c. Crewmember Aircraft Safety Belt Deck Connector. Both fixed wing and rotary wing crewmember aircraft safety belts attach to the deck of the airframe by means of a flat slide lock snap-hook connector. This connector is opened by depressing the spring-loaded button that extends up through the opening of the side of the sliding body of the

connector, then sliding the body of the connector towards the webbing loop. To close, slide the body of the connector away from the webbing loop until the spring-loaded button snaps back into the detent of the body of the connector (Figure 6-10).

Figure 6-10. Aircraft Safety Belt Airframe Deck Connector

L. EMERGENCY RECOVERY DEVICE.

1. Introduction. The Emergency Recovery Device (ERD) is designed for use in the HH-60J to recover the helicopter rescue swimmer in the event the rescue hoist becomes unusable and no other means is available to recover the rescue swimmer.

2. Configuration. The ERD (Figure 6-11) consists of the following features:

   a. Base Plate Assembly. The skyhook base plate assembly consists of the base plate, roller guide assembly, and capstan speed winch. There are two with winch handles.

   b. Self-Arresting Pulley. This pulley is a side opening, self-arresting pulley used to direct the rescue line to the helicopter rescue swimmer from the ERD. This pulley is attached to the hard point on the helicopter hoist extension arm.

   c. Kermantle Static Line. The line consists of 155 feet of kermantle static line.

   d. Service life. The Crewmember Aircraft Safety Belt has a service life of 5 years.

3. Function. When properly rigged the emergency recovery device provides approximately 140 feet of usable line for rescue swimmer recovery. The maximum hoisting weight for the emergency recovery device is 300 pounds.

NOTE

The ERD was designed to recover rescue swimmers; however this does not prevent it from being used to recover survivors.

4. Emergency Recovery Device Modifications and Repairs. There are no modifications authorized for the ERD. Repairs are limited to the replacement of parts and components IAW appropriate MSR MPC.

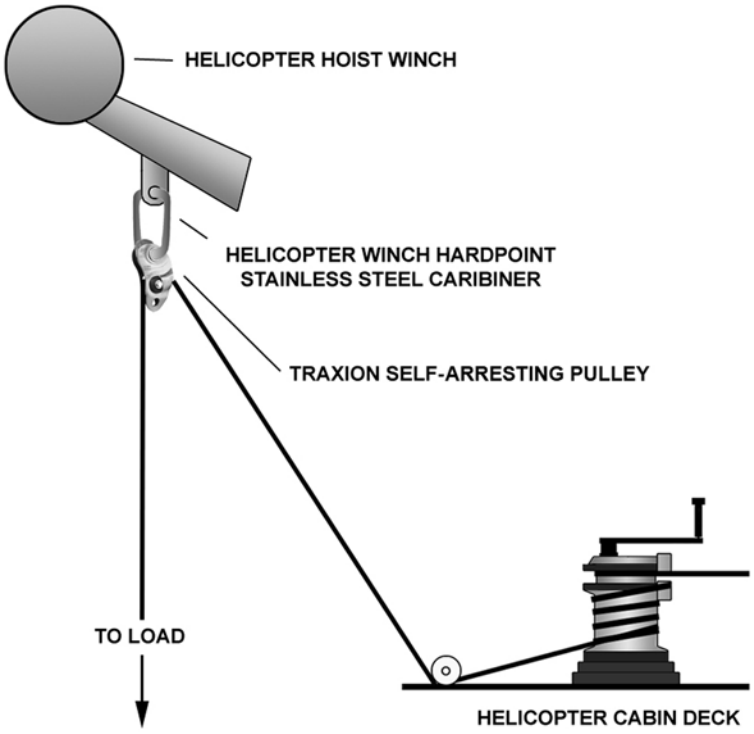


Figure 6-11. Emergency Recovery Device

M. MA-3 (ASRK-24).

1. Introduction. The MA-3 is an aerial sea rescue kit comprised of five containers. It may be deployed to a stricken vessel, or to persons in the water. Containers one, three, and five each contain a multiplace lilferaft. Each raft is equipped with an inflation lanyard, allowing the rafts to be deployed inflated. Containers two and four are waterproof survival equipment supply containers, each designed to remain afloat for 6 hours after deployment. Four, 250-foot long, buoyant polypropylene lines connect the containers. The total length of the kit when fully deployed is 1,000 feet. The contents of the survival equipment container bags two and four are listed in Table 6-1.

Table 6-1.

ASRK Survival Equipment Container Bag Contents	
Water storage bag	406 PLB (optional)
First Aid Kit	Liferaft rations
MK-124 flare	Raft repair kit

Table 6-1. Continued

Pocket knife	Sponge, bailing
Strobe light	Sunburn preventive
Lipstick, anti-chap	Water packs
Mirror, signal	Whistle, signal
Mylar® space blanket	Mirror, reflection
Hand pump	

2. Configuration. The MA-3 configuration may be modified for mission response requirements using the following configurations:

   a. MA-3 Modified (ASRK Modified). The MA-3 Modified (ASRK Modified) is an aerial sea rescue kit consisting of two multiplace lilferafts and two waterproof survival equipment supply container bags, each designed to stay afloat for 6 hours after deployment. Each raft is equipped with an inflation lanyard, allowing the rafts to be deployed inflated. The containers are connected by three 250-foot long buoyant polypropylene lines. The total length of the kit is 750 feet when fully deployed.

   b. MA-1 (ADR-8) Liferaft. The MA-1 (ADR-8) is a single multi-place aerial drop raft. The MA-1 is equipped with an inflation lanyard and can be dropped inflated or uninflated. The 12-foot ADS shall be used for its deployment.

   c. ASRK Deployment Procedures. These procedures are found in the C130H Flight Manual, CGTO 1C-130H-1-C.

CHAPTER 7. PROTECTIVE EQUIPMENT.

A. OVERVIEW.

1. Introduction. This chapter contains information relating to protective equipment. It is sectioned to reflect the different functions and equipment data, in addition to specific requirements for use by the Coast Guard. The AST has the responsibility of issuing and repairing protective equipment.

2. **Issue and Return of Protective Equipment**. **All flight clothing and equipment will be issued IAW the Minimum equipment list found in CGTO PG-85-00-310. All protective equipment issues and returns will be documented on the Minimum Flight Gear Form, Enclosure 11, PG-85-00-310, Aviation Life Support Process Guide. Disposition of flight clothing will be IAW the policies set forth in Chapter 12-B of the Coast Guard Personnel Manual, COMDTINST 1000.6 (series). It is the responsibility of the AST Shop to maintain each aircrew member's Minimum Flight Gear Form when gear is issued or removed from the member's custody. It is also the responsibility of the AST shop to forward the member's Minimum Flight Gear Form to the member's next duty station upon transfer.**

3. Inspections and Maintenance. All protective equipment will be inspected by an AST at intervals not to exceed 360 days. In addition to these inspections, all protective equipment shall be subjected to periodic maintenance. These tasks are the primary assurance of protective equipment functioning properly and no instance of carelessness or willful neglect shall be allowed to pass unnoticed.

4. Maintenance Records. For some of the protective equipment the ACMS and MSR are used by the AST to provide a systematic means of control. The ACMS and MSR MPC provide a logical sequence for inspection and maintenance of equipment. Additionally, they provide a remarks section to denote any maintenance performed on equipment.

NOTE

The remarks section shall be used when any discrepancy is found and corrected if repairable. The information provided in this section is critical in determining equipment reliability, failure trends, and maintenance intervals.

5. Quality Assurance.

CAUTION

UNDER NO CIRCUMSTANCES SHALL ANY AST PERFORM THEIR OWN QA INSPECTIONS.

QA steps are provided in the appropriate MPC for critical maintenance operations. When a maintenance step is followed by QA REQUIRED, the AST shall perform that step and then have an authorized QA Inspector perform the inspection before moving to the next step in the inspection or maintenance procedure.

B. SUMMER FLYER'S COVERALLS.

1. Introduction. The summer flyer's coveralls is designed to be worn as an outer garment to provide protection in the event of an aircraft fire. It is worn in warmer climates. The only authorized color is olive drab. If necessary, commercial procurement is authorized.

2. Configuration. The summer flyer's coveralls (Figure 7-1) is a one-piece unlined garment fabricated from polyamide cloth, a high temperature resistant, inherently flame-retardant synthetic fabric with no hot melt point or drip characteristics. The fabric is lightweight, and although it will not support combustion, it will begin to char at 700 °F to 800 °F. The fabric is abrasion resistant and is nonabsorbent. The summer flyer's coveralls is sized in 24 male and 48 female sizes. The coveralls incorporates a slide fastener front closure, a bi-swing back. There is hook and pile fastener tape adjustments on each sleeve and leg opening. There are two chest pockets, one multiple pencil compartment on the left sleeve, two thigh pockets, and two lower leg pockets.

Figure 7-1. Summer Flyer's Coveralls

3. Application. The summer flyer's coveralls is designated for use by all aircrew on all flights in Coast Guard aircraft except as directed by Commandant. These coveralls are not supplemental uniform clothing and shall be worn only while in the performance of flight duties (assigned B-0 Ready, or when waiting for scheduled operational and maintenance test flights).

C. FLIGHT SUNGLASSES.

1. Policy. Sunglasses that meet the following requirements are authorized for use by all aircrews in Coast Guard Aircraft:

   a. ANSI Z87.1 safety

   b. ANSI Z 80.3 optical

c. Nonpolarized lenses

d. Nongradient lenses

e. Nonlight adjusting lenses

Aircrew personnel that require prescription sunglasses for aircrew duty will utilize the HGU-4/P sunglasses, generally issued through unit medical facilities.

2. Configuration. Sunglasses that meet the safety standards for use by Coast Guard aircrew must also met the following configuration criteria:

a. The sunglasses frame must be black/nonreflective material.

b. The sunglasses frame must not impede the donning of emergency oxygen breathing equipment.

c. The sunglasses must not impede proper fitting of any authorized flight helmet.

3. HGU-4/P Configuration. The HGU-4/P sunglasses consist of a metal frame, clear acetate nose pads, temple tips, and high quality, ophthalmic crown glass lenses of neutral density. They are carried in a crush resistant carrying case.

4. Application . Aviation flight sunglasses provide protection against sun glare. They are not to be used during flight operations that require the use of a flight helmet visor.

D. FLIGHT JACKET.

1. Introduction. Two types of flyer's jackets are authorized for procurement and issue to all aircrew.

a. G-1 Leather Jacket

b. Multiclimate Protection System (MCPS) Shell Jacket

Taking the annual climate and geographical flying area into consideration, each Commanding Officer will determine the appropriate jacket that shall be worn, regardless of the procurement source.

2. G-1 Flight Jacket Configuration. The G-1 leather flight jacket (Figure 7-2) is constructed of brown leather with a nylon cloth lining. The collar is mouton (sheep's wool). The cuffs and waistband are stretch knit to provide a snug fit. The jacket is generally equipped with two external pockets and one inner pocket. Bellows extend from the shoulders to the waist and prevent the jacket body from riding up or binding with arm movement.

Figure 7-2. G-1 Flight Jacket

3. Application. The G-1 jacket is designed to provide thermal protection in temperatures of 50 °F and above.

E. MULTICLIMATE PROTECTION SYSTEM.

1. Introduction. The Multiclimate Protective System or MCPS is an environmental protective clothing system comprised of a waterproof, windproof, and breathable outer shell and four weights of insulating undergarments. Because of the different layering options aircrew may adjust the amount of insulation needed for varying environmental conditions.

2. Shell Jacket Configuration. The MCPS Shell Jacket (Figure 7-3) is the outer layer of the system. A waterproof slide fastener front closure is incorporated into the jacket. A hook and pile tab at the top of the slide fastener is used to secure the collar. The jacket is equipped with two external slash pockets covered with envelope storm flaps secured by hook and pile tape. Hand warmer pockets are located behind the slash pockets. The breast pocket located on the front left side is secured with a vertical waterproof slide fastener. There is a pen compartment covered with a flap and secured with hook and pile tape on the left sleeve, directly below the shoulder seam. There is a pocket that closes with a vertical slide fastener located beneath the pen compartment. The waist is kept snug with 2-inch elastic to reduce torso drafting.

A removable hood is located inside the left side of the jacket in a pouch that is secured by hook and pile tape. The hood has a flexible bill to deflect rain. The removable hood attaches behind the collar of the jacket with four snaps. At the chin on each side of the hood are two snaps to secure the hood as well as an elastic drawstring to tighten the perimeter of the hood opening around the face. A flap at the nape of the hood adjusts the hood to the head.

The jacket has provisions for:

a. Mounting a name tape and USCG patch with a 2- X 4-inch hook and pile tape area on each side of the jacket breast.

b. A 4-inch diameter round hook and pile tape area on the right shoulder for a unit patch.

c. A 2- X 4-inch hook and pile tape area on the left shoulder for the American flag patch.

Figure 7-3. MCPS Shell Jacket

3. Shell Trouser Configuration. The MCPS Shell Trouser (Figure 7-4) may be donned and worn over the summer flight coveralls. Incorporated into the shell trouser is a slide fastener at the fly and a tab with a snap to secure the waist, and elastic suspenders are provided to support the fit of the trouser. The suspenders are adjustable and attach to loops found inside the waist, using hook and pile tape. There are two pockets, one located on the outside of each trouser leg at the upper thigh. They have a slide fastener closure, and a flap

that closes with hook and pile tape. There are two vertical slide fasteners approximately 16 inches long, located at the outside of each leg opening to aid in donning while wearing boots. This opening is secured by a tab using hook and pile tape.

Figure 7-4. MCPS Shell Trouser

4. MPCS Insulation and Underwear. The MCPS Insulation and underwear layers allow aircrew personnel to achieve a personal level of comfort over a broad range of environmental conditions with modifiable insulating layers that wick moisture away from the body. The underwear also provides flame protection. There are four levels of insulating layers.
   a. Silk Weight Underwear (base layer)
   b. Mid-Weight Insulation (mid-layer)
   c. Heavyweight Insulation and Bib Overall (mid-layer)
   d. Fleece Vest and Jacket and Balaclava (face shield) (mid-layer)
5. MCPS Silk Weight Underwear. The MCPS Silk Weight Underwear (Figure 7-5) is a base insulating layer. It is made up of 97% Nomex® and 3% Lycra®. It may be worn under summer flight coveralls or as a layer under a dry suit. The silk weight underwear top is a long sleeve crew neck pullover garment. On the sleeve is a thumb hole that holds the sleeve down during donning and keeps cold air off of the wrist during flight. When worn without utilizing the thumb hole, the cuff of the sleeve is folded back over the wrist. When worn with

the silk weight underwear bottoms the waistline of the underwear top is tucked in with at least 3 inches extending down into the waistline for a correct fit. The silk weight underwear bottom is a pull-on full leg garment with an elastic waist line. There is ¾-inch wide elastic stirrups at the end of each leg opening that keep the underwear legs down when pulling on outer garments and boots.

Figure 7-5. MCPS Silk Weight Underwear

6. MCPS Mid-Weight Insulation. The MCPS Mid-Weight Insulation Garment (Figure 7-6) is the mid-layer for the MCPS System that may be worn under a flight suit or a dry suit. It is 70% Nomex®, 24% Nylon, and 6% Spandex®. The inside of each garment is Nomex® fleece, the smooth outside surface is Nylon and Spandex. The mid-weight insulation top is a long sleeve mock turtle neck garment. This garment is to be worn tucked into the waistline of the pants. The waistline of the garment is a mesh material that prevents excess bulking when the garment is tucked into the bottoms. The mid-weight insulation bottom is a pull-on full leg garment with an elastic waist line. There are ¾-inch wide elastic stirrups at the end of each leg opening that keep the underwear legs down when pulling on outer garments and boots.

WARNING
TO PREVENT INJURY IN THE EVENT OF A CABIN FIRE, THIS GARMENT SHALL REMAIN COVERED BY THE FLIGHT SUIT OR AIRCREW DRY COVERALL.

Figure 7-6. MCPS Mid-Weight Insulation

7. MCPS Heavyweight Insulation and Bib Overall. The MCPS Heavyweight Insulation and Bib Overall (Figure 7-7) are the heavy weight mid-layers for the MCPS system. It is 87% Nomex®, 13% FR polyester. The inside and outside of the material is Nomex® fleece. The heavyweight insulation underwear top is a long sleeve pullover garment. On the sleeve is a thumb hole that holds the sleeve down during donning and keeps cold air off of the wrist during flight. When worn without utilizing the thumb hole, the cuff of the sleeve is folded back over the wrist. The top has a crew neck with a slide fastener at the neck opening extending down to the chest. The heavyweight insulation bottom is a pull-on full leg garment with an elastic waist line. The heavyweight insulation bib overalls is designed to be worn over the flight suit, and under the outer shell trouser. It has suspenders that adjust with hook and pile tape and a slide fastener opening at the front. It is designed to be donned with boots on. The material is thinner around the knee to add flexibility and prevent binding.

NOTE

To provide a level of protection required for in water immersion in water that is 45 °F or colder the heavyweight insulating layer should be worn with either the mid-weight or silk-weight layers. These items replace the liner previously worn under dry suits.

Figure 7-7. MCPS Heavyweight Insulation and Bib Overall

8. MCPS Fleece Vest and Jacket. The Fleece Vest and Jacket (Figure 7-8) may be worn under the shell jacket as an insulating layer or as an outer garment. Vest and jacket have inner and outer pockets. The collars on both garments have a tab with hook and pile tape used to keep the collar up if desired. Both garments are treated with a durable water repellent finish. Machine washing will not diminish the finish. Machine drying in medium heat will reactivate the water resistant finish.

Figure 7-8. MCPS Fleece Vest and Jacket

9. MCPS Face Mask. The MCPS Face Mask (Figure 7-9) is designed to be worn alone as an insulating layer, or with a flight helmet. It protects the neck and throat areas from cold exposure. There is an opening for the nose and a microphone. It is not wind proof, but acts as an insulating layer.

Figure 7-9. MCPS Face Mask

F. AVIATION FLIGHT BOOTS.

1. Introduction. Aviation flight boots are authorized safety equipment. The purchase of safety equipment is authorized by 14 USC 477. Flight boots shall be used in-flight and during flight related ground operations IAW Air Operations

Manual, COMDTINST M3710.1 (series), Chapter 7. Aviation flight boots are not to be used as uniform items with Operational Dress Uniforms (ODU). Flight boots are to be provided to aircrew at no cost to the member. Uniform items such as work boots are purchased by members utilizing their uniform allowance and are not to be confused with flight boots.

2. Requirements. Flight boots are at a minimum, required to meet the following standards:

   a. Safety Toe, steel or composite, conforming to ANSI Z41, Part 99, I/75, C/75.

   b. Boots shall be tested for flame resistance IAW National Fire Protection Association test method, NFPA Section 6-5, or Department of Defense (DoD) flame test specification.

   c. Soles shall comply with NFPA 1971, Section 6-49 or DoD flame test specification. Soles shall be constructed of black rubber and shall be non-marking, non-melting and resistant to petroleum products. All stitching shall be black.

   d. Boot upper shall be black and be constructed of non-melting materials such as full grain cattle leather or 1,000 weight Cordura® nylon (fire resistant) or equivalent. Uppers shall be 8 inches (+/- 0.5 in) as measured from top of welt to top of upper. All stitching shall be black.

   e. Boot shall contain steel or fiberglass shanks bonded to insole.

   f. Inner bootie shall be comprised of soft, tanned cattle hide glove, pig skin liner or a synthetic, breathable waterproof material. If synthetic is selected, the liner will consist of a polytetrafluoroethylene micro-porous material such as Gore-Tex®, at a minimum weight of 0.5-oz/yd sq. There shall be a cloth or synthetic comfort lining that protects the wearer's skin. For winter boots, insulation must be a minimum of 200-gram Thinsulate® material or equivalent. Lacing eyelets shall be metal construction and black in color. Laces shall be of black synthetic material.

   No substitutions are authorized IAW the Coast Guard Air Operations Manual, COMDTINST M3710.1 (series) and this manual. Requests for waiver or substitution should be submitted to ALC ALSE Tech Services via ALSE Prime Unit (ATC Mobile).

   The following flight boot models are authorized:

   g. Summer Weight. Boot, Safety, 8 inch, PCG 02593 available through National Stock System (NSN), SOS S9T. Stock numbers 8430-01-464-5358, size 3N, to 8430-01-502-9199 size 16XW.

   h. Winter Weight. Boot, Intermediate Cold/Wet, Safety Toe, PCG 02428 available Through NSN, SOS S9T. Stock numbers 8430-01-451-0360, size 3N, to 8430-01-451-1261, size 14XW.

NOTE

For authorized commercial equivalents purchasing, consult the latest AIRLOG boot authorization message posted on the ALSE Technical Services website.

Each aviation unit will select the flight boot model that satisfies unit environmental and operational requirements. Requirements for a non-steel toe boot for Helicopter Rescue Swimmers in COMDTINST M3710.1 (series), the Helicopter Rescue Swimmer Manual,COMDTINST M3710.4 (series), and this manual are hereby rescinded. All aircrew regardless of position are required to follow these instructions.

G. SUMMER WEIGHT FLIGHT GLOVES.

1. Introduction. The summer flyer's gloves are designated for use in warm to moderate temperature zones and provide protection in the event of aircraft fire.

2. Configuration.

WARNING

THE SUMMER FLYERS GLOVES ARE TO BE USED DURING AIRCRAFT FLIGHT ONLY. THEY ARE NOT TO BE USED DURING ROUTINE MAINTENANCE SUCH AS AIRCRAFT INSPECTIONS OR SERVICING WHERE THEY MAY BECOME CONTAMINATED WITH OILS OR FUEL. CONTAMINATION WITH FUEL OR OIL WILL NEGATE THE PROTECTIVE FIRE RESISTANT CHARACTERISTICS OF THE GLOVE AND ENDANGER THE WEARER.

CAUTION

THE LEATHER PORTION OF THE GLOVE WILL BECOME SLIPPERY WHEN IT BECOMES WET.

Summer flyer's gloves (Figure 7-10) are snug fitting and are designed to provide maximum dexterity and sense of touch so as not to interfere with the operation of the aircraft and use of survival equipment. The gloves are available in sizes 7 through 11. Since the fabric is stretchable, this range of sizes will accommodate any hand. The summer flyer's gloves are constructed of soft gray leather on the palm and front portion of fingers, and a stretchable sage green, lightweight polyamide (Aramide) fabric covering the entire back of hand and wrist. The cloth portion of the glove does not melt or drip and will not support combustion. The fabric will begin to char at 700 to 800 ^{0}F. The summer flyer's gloves are designated for use by all aircrew.

The summer flyer's gloves are constructed of soft gray leather (palm and front portion of fingers) and a stretchable sage green, lightweight polyamide (Aramide) fabric covering the entire back of hand and wrist. The cloth portion of the glove does not melt or drip and will not support combustion. The fabric will begin to char at 700 to 800 ^{0}F.

Figure 7-10. Summer Weight Flight Gloves

H. WINTER WEIGHT FLIGHT GLOVES.

1. Introduction. The winter weight flight gloves (Model no. MP11911) (Figure 7-11) are designated for use in cold temperature zones and provide protection in the event of aircraft fire.

2. Configuration. The winter weight flight glove is snug fitting and is designed to provide moderate dexterity and sense of touch so as not to interfere with the operation of the aircraft hoist and use of survival equipment. The gloves are available in sizes Small through XX-Large. Since the fabric is stretchable, this range of sizes will accommodate any hand. The winter weight flight glove is constructed of soft black leather (palm and front portion of fingers) and a stretchable black, lightweight polyamide (Aramide) fabric covering the entire back of the wearers' hand. The cloth portion of the glove does not melt or drip and will not support combustion when exposed to high heat or flame. The fabric will begin to char at 700 to 800 ^{0}F.

   The combination of fiber, fabric, and foam construction of the glove is designed to absorb, store, and release body heat evenly, and minimize hot and cold spots, even when wet or compressed.

Figure 7-11. Winter Weight Flight Gloves

3. Application.

WARNING

THE WINTER WEIGHT FLIGHT GLOVE IS TO BE USED DURING AIRCRAFT FLIGHT ONLY. THEY ARE NOT TO BE USED DURING ROUTINE MAINTENANCE SUCH AS AIRCRAFT INSPECTIONS OR SERVICING WHERE THEY MAY BECOME CONTAMINATED WITH OILS OR FUEL. CONTAMINATION WITH FUEL OR OIL WILL NEGATE THE PROTECTIVE FIRE RESISTANT CHARACTERISTICS OF THE GLOVE AND ENDANGER THE WEARER.

The winter weight flight glove is designated for use by nonpilot aircrew members only. Air station Commanding Officers are authorized to identify commercially procured winter gloves that assigned pilots may wear during nonflying operations such as pre/postflight operations or survival situations.

4. Modifications and Repairs. All modifications shall be performed by the AST Shop and will be restricted to alteration and re-stitching finger sections to accommodate a person with a finger amputation. Repairs are limited to restitching seams. Temperature resistant thread, MIL-T-83193 shall be used for restitching.

I. SPH-5CG FLIGHT HELMET.

1. Introduction. The SPH-5CG is a lightweight helmet assembly providing head protection, noise reduction, and communication enhancement for helicopter aircrew and passengers.

2. Configuration. The SPH-5CG helmet assembly (Figure 7-12) features a dual visor system with a mounting platform for Night Vision Goggle (NVG) attachment. The helmet assembly consists of an energy absorbing rigid foam liner and a preformed Thermoplastic Liner (TPL), yoke style retention with adjustable chin and nape straps, and a communications assembly featuring a quick-disconnect, boom-mounted microphone, and sound attenuating ear cups. The helmet is available in three sizes: small, medium, and large. Communications Ear Plugs (CEP) system (optional) can be installed to improve hearing protection and communications.

Figure 7-12. SPH-5CG Flight Helmet

It allows sound from the Internal Communications System (ICS) system to travel unimpeded directly into the ear canal. It provides for improved volume and clarity while allowing the crewmember to reduce ICS volume settings.

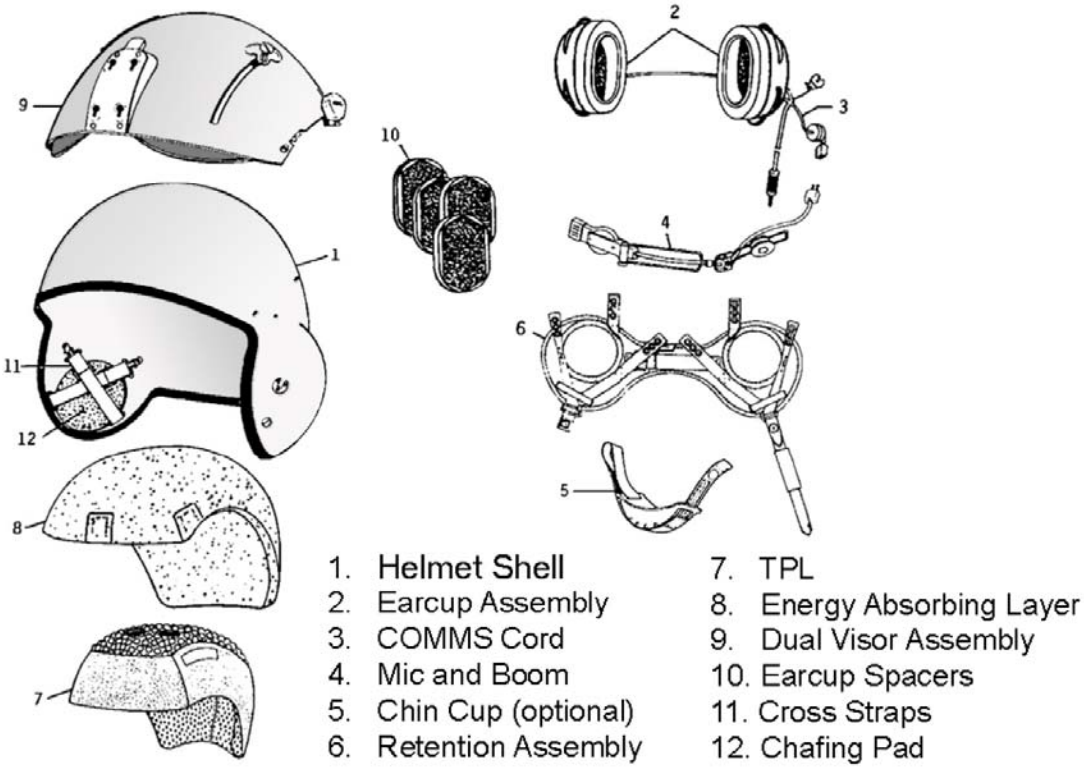


Figure 7-13. SPH-5CG Exploded View

3. Helmet Shell. The SPH-5CG helmet shell is made of nylon, graphite, and fiberglass cloth composition, edged with black rubber edge beading. Two cross straps and a chafing pad, located inside the helmet at each ear cup area, improve ear cup-to-head tension and prevent ear cup chafing on the shell. Two helmet shell sizes (medium and large) are used for the three sizes of helmets. The helmet shell size medium is used for the small and medium helmets, and the size large shell is used for the size large helmet.

4. Liner System. The SPH-5CG helmet incorporates a two-part liner system. The energy absorbing liner attaches to the inside surface of the helmet shell and provides impact protection. The preformed TPL seats inside the energy absorbing liner and provides a comfortable inner helmet liner which can be custom fit to an individual head size. Together they maintain an approximate 7/8-inch offset between the head and outer shell surface. Both liners are available in medium and large.

5. Energy Absorbing Liner. The primary purpose of the energy absorbing liner is to absorb and reduce impact forces. The liner is formed from rigid foamed polystyrene plastic and is molded to conform to the contour of the inner shell surface. Hook fastener tabs on the outside surface of the liner mate with pile fastener on the inside of the shell to secure the liner in place. Hook fastener tabs on the inside surface of the liner secure the TPL to the energy absorbing

liner. The energy absorbing liner is available in four sizes small, medium, large, and extra large.

6. Thermoplastic Liner (TPL). The preformed TPL consists of a plastic layer assembly and a removable, washable cloth cover. The TPL cloth cover is ventilated black fabric featuring sides made of pile material to allow attachment to the hook fastener tabs on the energy absorbing liner. The TPL is preformed in sizes small, medium, and large to fit a majority of head sizes without requiring custom fitting. However, if necessary, the TPL can be heat softened and custom fit to an individual head shape.

CAUTION

DO NOT STORE HELMET IN A CLOSED COCKPIT OR AUTOMOBILE. GREENHOUSE EFFECT HEAT CAN CAUSE TEMPERATURES TO EXCEED 200 °F (93.3 °C) ON AN 85 °F (30 °C) DAY AND DAMAGE THE HELMET.

7. Retention Assembly. The yoke style retention assembly (Figure 7-14) is designed to minimize forward rotation of the helmet and improve overall helmet retention. The retention assembly chin strap employs a double D-ring design for attachment and an adjustable nape strap at the rear. An adjustment buckle over the back of the nape strap allows further tightening of the retention assembly in the nape area. An optional chin cup is available for use when wearing night vision goggles. The chin cup snaps over the chin strap D-rings and helps minimize forward movement of the helmet when using night vision goggles. Depending on crew member preference, the use of the chin cup in conjunction with night vision goggles may eliminate the need for counterbalance weights normally worn on the rear of the helmet.

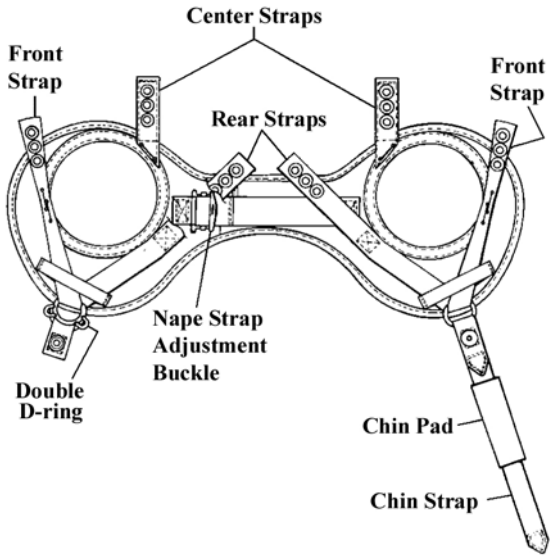


Figure 7-14. Retention Assembly

8. Ear Cup Assembly. Each group assembly consists of a contoured plastic ear cup, cushioned ear seal, foam earphone holder, and spacer pad set (Figure 7-15). The contour of the ear cup assists in increasing the fit to the wearer's head and the cushioned ear seal with the raised inner ring design helps increase sound attenuation and comfort. The ear cups attach to the retention assembly and can be rotated within the retention assembly to further enhance the fit.

   The spacer pad set consists of two thin (¼-in) and two thick (½-inch) pads. The pads may be trimmed as necessary to achieve the best fit. The size and number of pads placed behind the ear cups to improve ear cup fit depends on the crewmember's comfort and sound attenuation needs.

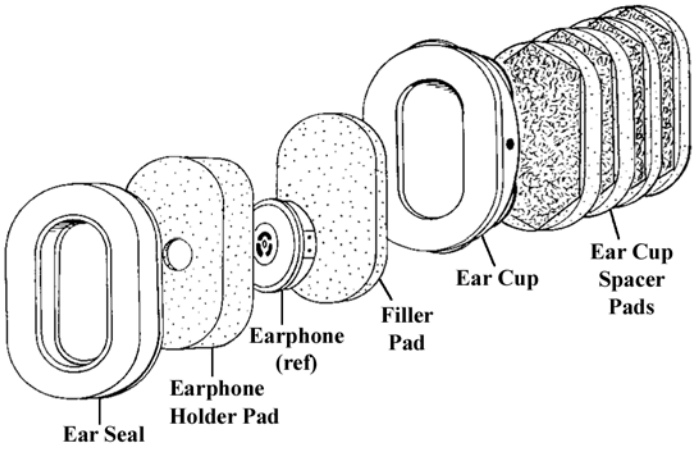


Figure 7-15. Ear Cup Assembly

9. COMM Cord, Earphones, and Connector. The SPH-5CG helmet communications assembly consist of a quick-disconnect, boom-mounted microphone, a swivel assembly, dual earphones, a microphone cord, and a rear-mounted connector (Figure 7-16). The quick-disconnect feature allows installation or removal of the boom-mounted microphone and swivel assembly without requiring tools or disassembly of the boom. The boom-mounted microphone and swivel assembly slide into (or out of) a bracket mounted on the helmet.

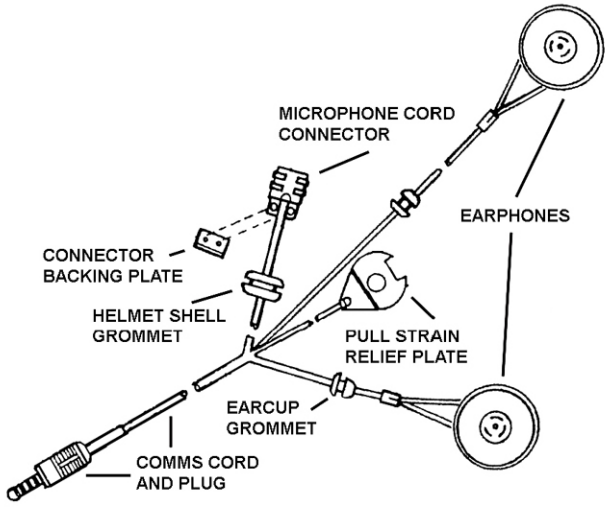


Figure 7-16. COMM Cord, Earphones, and Connector

10. Microphone Boom, Helmet Mount, Microphone. The microphone boom bracket mount on the swivel assembly hand-tightens or loosens the microphone as required (Figure 7-17). The microphone is covered with a foam pad to reduce wind interference. The microphone cord extends from the microphone and plugs into a connector mounted on the left rear of the helmet shell. The connector is part of the communications cord, which extends to an earphone inside each ear cup and also to a radio and intercom plug, which extends from the rear of the helmet.

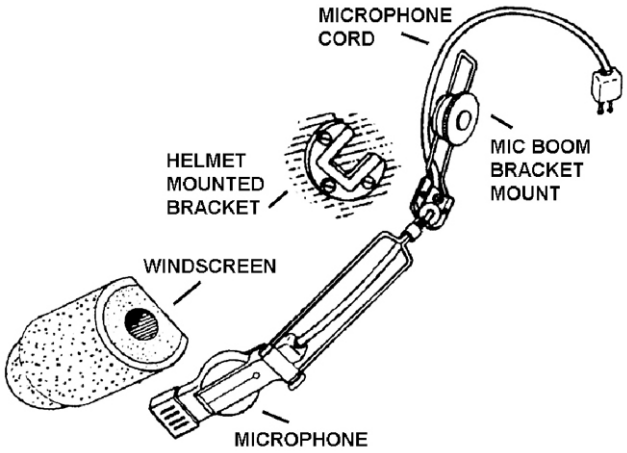


Figure 7-17. Microphone Boom, Helmet Mount, Microphone

11. Dual Visor Assembly. The SPH-5CG helmet dual visor assembly consists of the inner neutral visor, outer clear visor, and mounting platform for attachment of night vision equipment (Figure 7-18). The inner visor control knob is located

at the left side of the visor housing and can be locked in one of three separate down positions. The outer visor control knob is installed in the left side slot of the visor housing and can be locked in place at any position.

The outer visor control knob may be changed to the right side to permit right hand operation of the outer visor if so desired. The center of the dual visor housing serves as the mounting platform for the ANVIS-6 NVG attachment. The ANVIS-6 NVG mount snaps onto and is locked in place by the housing mounting plate. The NVG mount is removed by depressing the spring-loaded tab at the top of the mounting plate. A 2- X 2-inch piece of pile material attaches to the visor housing for anchoring the ANVIS-6 cable.

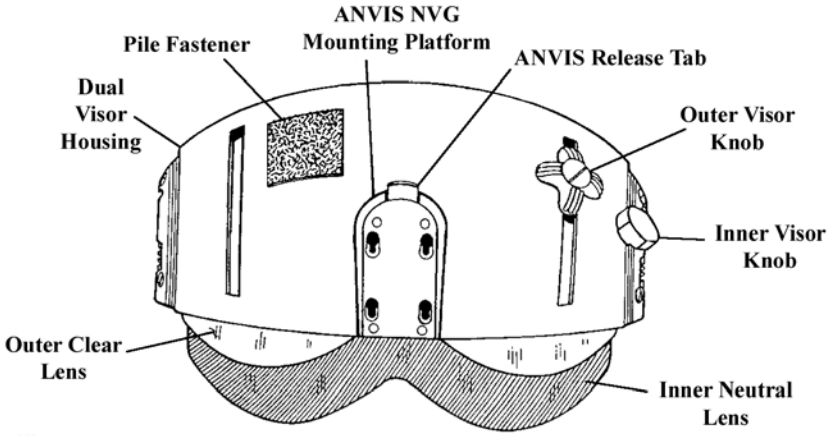


Figure 7-18. SPH-5CG Dual Visor Assembly

12. Modifications and Repairs to the SPH-5CG Flight Helmet. Modifications, repairs, and component replacement to the SPH-5CG helmet will be IAW CGTO PG-85-00-310, Chapter 10.

J. HGU-56/P FLIGHT HELMET.

1. Introduction. The HGU-56/P Helmet (Figure 7-19) is a lightweight assembly providing cranial protection, noise reduction, and communication enhancement for rotor wing flight crew.

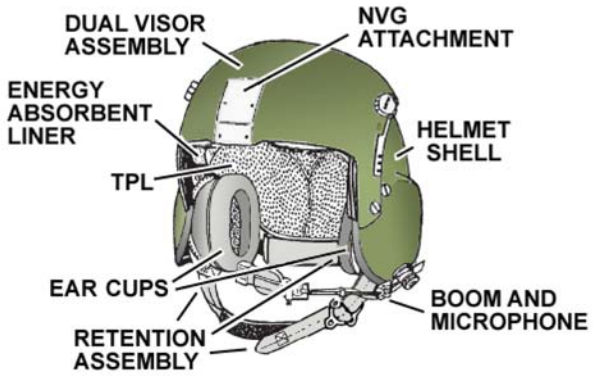


Figure 7-19. HGU-56/P Flight Helmet

2. Configuration. The HGU-56/P helmet assembly features a dual visor system which protects the wearer's eyes from sun glare, flash fires, ballistic spall, dust, and foreign particles. The dual visor assembly provides a mounting area for ANVIS night vision goggles. The helmet assembly consists of an energy absorbing liner which absorbs and reduces impact forces. The preformed TPL can be heat-softened and custom-fitted if necessary to optimizes fit and comfort.

3. Helmet Shell. The HGU-56/P shell is made of composite material, tested to 150 g in the crown, and 175 g in the headband area. Lateral impact is tested to 150 g in the ear cup area with a drop velocity of 6.0-m/sec. The retention assembly stabilizes the helmet on the head. It consists of ear cup retaining pads, a chin strap, and a nape strap pad with adjustable straps. The ear cup retaining pads are constructed with pile Velcro® to accommodate adjustment of ear cups and fitting of spacer pads. The retention assembly is attached with hardware at five points to the helmet shell.

4. Energy Absorbing Liner. The primary purpose of the energy absorbing liner is to absorb and reduce impact forces. The liner is formed from rigid foamed polystyrene plastic and is molded to conform to the contour of the inner shell surface. It attaches to the shell with hook and pile tape.

5. Thermoplastic Liner. The preformed TPL consists of a plastic layer assembly and a removable, washable cloth cover which optimizes fit and comfort; can be heat-softened and custom-fitted if necessary. The TPL cloth cover interior is ventilated black material, while the material which makes up the exterior will attach to the hook fastener tabs on the energy absorbing liner and the nape pad of the retention system.

6. Retention Assembly. The HGU-56/P retention assembly (Figure 7-20) consists of ear cup retaining pads, a chin strap, and a nape strap pad with adjustable straps. The ear cup retaining pads are constructed with pile Velcro® to accommodate adjusting placement of ear cups and fitting of spacer pads. The retention assembly is attached at five points with hardware to the helmet shell.

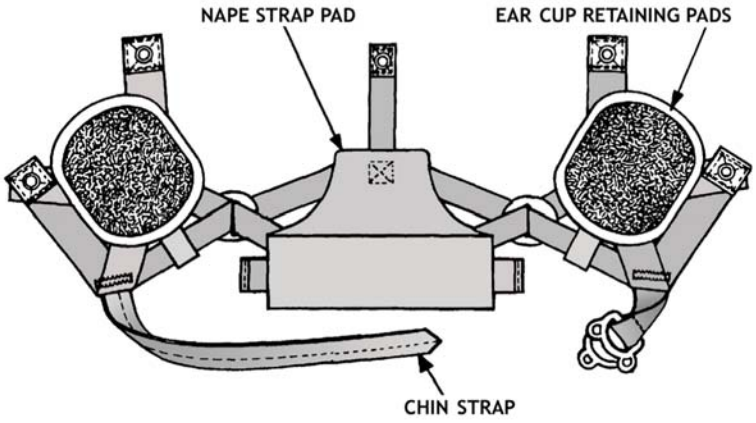


Figure 7-20. Retention Assembly

7. Ear Cup and Communications Assembly. The AIHS ear cup assembly and communication system (Figure 7-21) consists of the following:

   a. Ear Cup Assembly. Each ear cup (3, 9) is attached to an ear cup retaining pad (10). Spacer pads (11, 12) may be installed behind each ear cup retaining pad (against the helmet shell) if needed to improve ear cup fit. Ear seals (5) provide comfort and sound attenuation.

   b. Communications Assembly. Assembly consists of a pair of earphones (7), one tucked inside each receiver retainer (6) and backed by a filler pad (8). A communications cord (4), attached to the outside of the ear cups and microphone, anchored to the helmet shell, and a boom swivel assembly (2), located on the left side of the helmet, serves as the mount for the boom and microphone (1).

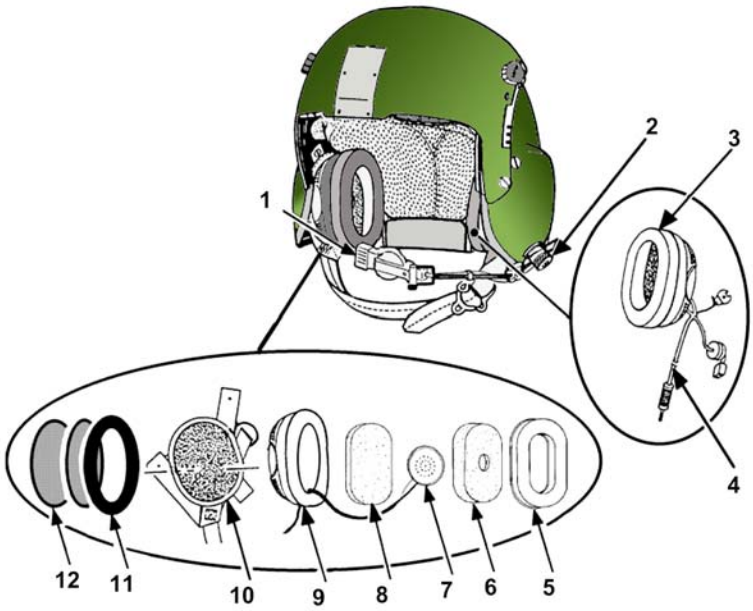


Figure 7-21. Ear Cup and Communications Assembly

8. Dual Visor Assembly. The dual visor assembly (Figure 7-22) has clear and neutral visor lenses, which are operated via actuating knobs. The housing visor assembly housing provides a mounting area for ANVIS goggles. Use the left-hand knob to raise or lower the outer visor. Use the right-hand knob to raise or lower the inner visor. To move the visor knob, brace your thumb against the visor track, squeeze the knob with your forefinger, and rotate the visor down or up as desired.

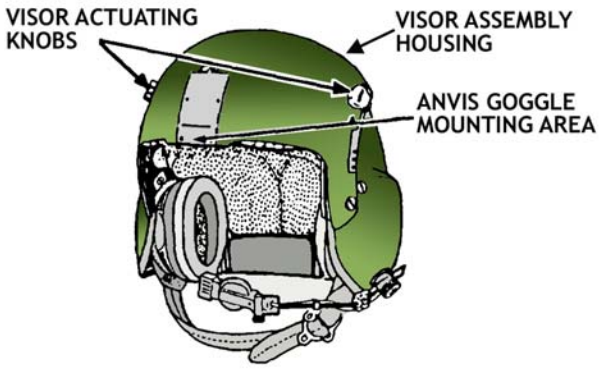


Figure 7-22. Dual Visor Assembly

9. Modifications and Repairs to the HGU-56/P Flight Helmet. Modifications, repairs, and component replacement to the HGU-56/P flight helmet will be IAW CGTO PG-85-00-310, Chapter 10.

K. AIRCREW IMMERSION COVERALLS.

1. Introduction. The Aircrew Immersion Coveralls (AAEC) is designed to be worn as an outer garment to extend survival time in the event of cold water immersion as well as provide protection in the event of an aircraft fire and radiant heat.

2. Configuration. The AAEC (Figure 7-23) is a one piece, lined garment fabricated from 79% Aramid, 20% PolyBenzimidazole fiber (PBI) and 1% stainless steel material. The AAEC fabric is high temperature, flame retardant, and prevents static electricity buildup. The insulating liner is constructed from closed cell fire retardant 3/16-inch foam. The inner lining is made of a 3-ounce Aramid fabric. Slide fasteners at the leg opening secure the legs after donning. Pockets are provided for stowage of mittens and thermal headgear. Chest pockets are provided for stowage of personal items.

Figure 7-23. Aircrew Immersion Coveralls (AAEC)

3. Application. For all flights in Coast Guard aircraft during cold weather operations as directed by the Coast Guard Air Operations Manual, COMDTINST M3710.1 (series). The AAEC has been authorized for use by all passengers and aircrew members that have not been issued Aircrew Dry Coveralls.

L. COLD WEATHER UNDERWEAR.

1. Introduction. The high temperature resistant cold weather underwear CWU-43/P and CWU-44/P is designed to provide added thermal insulation.

2. Configuration. The Aramid high temperature resistant cold weather underwear consists of two pieces of clothing:

   a. Drawers. The drawers are full-length with ankles of tight weave to fit snugly. They have a boxer style fly closure and an elastic waistband.

   b. Undershirt. The undershirt has full sleeves. The cuffs and neck band are of a tight weave to fit snugly.

3. Application. The cold weather underwear is designated for use by all aircrew operating in cold temperatures.

M. WOOL SOCKS.

1. Introduction. Wool socks are to be worn with the boots during cold, wet operations in which added insulation to the feet is required. Layering wool socks with a thin silk or polypropylene sock will increase the insulating properties of both types of socks. Never layer wool over cotton socks, as cotton will hold moisture against the skin, causing cold discomfort of the foot, and creating conditions conducive to cold weather injury.

2. Configuration. The socks are made of a wool/cotton blend with a ribbed, knitted top and plain knit leg and foot. The leg is 12 1/2 inches long. Socks shall be individually fitted to each aircrew member.

3. Application.

WARNING

ENSURE THAT WHEN WORN, INSULATING SOCKS DO NOT CAUSE THE BOOT TO FIT TOO TIGHT. IF THE BOOT IS TOO TIGHT, IT MAY RESTRICT CIRCULATION, AND CREATE CONDITIONS CONDUCIVE TO COLD WEATHER INJURIES, SUCH AS FROST NIP, OR FROST BITE. TO PREVENT THIS CONDITION, LOOSEN THE BOOT LACES TO ASSURE A SNUG FIT.

Wool socks are intended for aircrew members operating in a cold environment where added thermal protection to the feet is necessary.

N. COLD WEATHER INSULATING POLYPROPYLENE SOCKS.

1. Introduction. Cold weather insulating poly socks may be worn with the boots during cold, wet operations in which added insulation to the feet is required. Layering insulating polypropylene socks with a thinner silk or polypropylene sock will increase the insulating properties of both layers of socks. Never layer polypropylene over cotton socks, as cotton will hold moisture against the skin, causing cold discomfort of the foot, and creating conditions conducive to cold weather injury.

2. Configuration. Cold weather insulating socks made from man made fibers are generally manufactured from a polypropylene-based fiber which is hydrophobic (repels water). Socks made from this material will transfer moisture away from the skin, and will also insulate from the cold. Like wool, it retains much of its insulating qualities even when wet. Cold weather insulating socks worn with flight boots should extend no further than ½-1 inch above the top of the boot.

3. Application.

WARNING
ENSURE THAT WHEN WORN, INSULATING SOCKS DO NOT CAUSE THE BOOT TO FIT TOO TIGHT. IF THE BOOT IS TOO TIGHT, IT MAY RESTRICT CIRCULATION, AND CREATE CONDITIONS CONDUCIVE TO COLD WEATHER INJURIES, SUCH AS FROST NIP, OR FROST BITE.

Cold weather poly socks may be worn by aircrew members in fixed wing or rotary wing aircraft. It is especially valuable when worn under an aircrew dry coveralls by rotary wing aircrew. To prevent this condition, loosen the boot laces to assure a snug fit, or wear a larger boot to facilitate the sock layers.

O. IMMERSION SUIT.

1. Introduction. The immersion suit may be utilized by fixed and rotary wing crewmembers in survival situations. When worn correctly, the suit affords protection from exposure to cold water, wind, and spray. The neoprene fabric is a durable and elastic material possessing high flotation and insulating characteristics. The suit provides approximately 35 pounds of buoyancy.

2. Configuration. The immersion suit (Figure 7-24) is designed to fit a range of adults. The suit sizes can be determined by its stowage bag. The size most commonly used is Adult Intermediate. This will be found in an orange bag from the manufacturer. The suit has a supplemental buoyancy device attached around the waist. This device is orally inflated. When inflated after donning, it provides additional buoyancy to assist the wearer in keeping the head and upper torso higher out of the water.

WARNING

ENSURE THAT EACH CREWMEMBER HAS AN OPPORTUNITY TO TRY ON AN IMMERSION SUIT TO DETERMINE THE CORRECT SIZING. ANY INDIVIDUAL WHO IS 6 FT 4 IN TALL OR TALLER WILL NEED TO UTILIZE A JUMBO SIZE SUIT, IDENTIFIED BY THE GREEN STOWAGE BAG LABELED "JUMBO" FROM THE MANUFACTURER. A CORRECT FITTING SUIT IS CRITICAL FOR OPTIMUM PROTECTION.

AVOID ENTERING THE WATER HEAD FIRST WHEN WEARING THE IMMERSION SUIT. IT MAY BE DIFFICULT TO RIGHT YOURSELF IN THE WATER, AS AIR BECOMES TRAPPED IN THE LEGS OF THE SUIT.

CAUTION

DO NOT REMOVE BUOYANCY DEVICE FROM SURVIVAL SUITS.

The immersion suit is configured with a waterproof zipper, an attached hood with chin flap and face seal. If worn correctly, the hood will protect the head from accelerated rapid heat loss from immersion or exposure to winds. The chin flap and face seal serve to seal out excessive water intake when the crewmember is immersed. Three-finger mitts or lobster style mitts are attached to the suit sleeve, and will hinder dexterity once the suit is donned. There are vents in each foot to allow trapped air to escape without allowing water into the suit. When worn correctly, the immersion suit will provide approximately 35 pounds of buoyancy, more if the supplemental buoyancy device is inflated. The neoprene material of which the suit is constructed provides insulation, enabling extended retention of body heat. If the crewmember becomes wet before or after donning the suit, it will continue to provide insulation, although heat retention will be diminished.

3. Application. For application, see the Coast Guard Air Operations Manual, COMDTINST M3710.1 (series), which lists climate conditions that shall warrant the carrying of the immersion apparel on Coast Guard aircraft.

Figure 7-24. Immersion Suit

P. AIRCREW DRY COVERALLS.

1. Introduction. The Aircrew Dry Coveralls (ADC) and components are intended for use by rotary wing personnel on flights over water where exposure to existing climatic and water conditions, as a result of abandonment of the aircraft, could be hazardous or fatal. The ADC assembly will afford protection from exposure to 32 °F water for a period up to 14 hours.

2. Configuration. The ADC (Figure 7-25) is designed to be custom fit to the aircrew members. Each rotary wing aircrew member shall be issued one ADC. This suit will be configured using the appropriate MSR MPC. A complete ADC assembly consists of the following:

   a. Aircrew Dry Coveralls (Orange)

   b. Articulated knee with removable foam knee pads

   c. Single-person waterproof zipper

   d. Abrasion resistant Nomex®/Kevlar® rip-stop seat and elbow chafe pads

e. Flame resistant shawl collar over neck seal

f. Internal Nomex® neck guard

g. Internal suspender system

h. Relief zipper

i. Articulated flame resistant wrist seal over-cuffs

j. Gore-Tex® socks

k. Sleeve and thigh pockets

l. Undergarment suitable for local weather extremes

Figure 7-25. Aircrew Dry Coveralls (ADC)

3. Application. For application, see the Coast Guard Air Operations Manual, COMDTINST M3710.1 (series) that lists climate conditions that warrant the carrying of the immersion apparel on Coast Guard aircraft.

4. Inspection Intervals. Inspection of the ADC shall be in accordance with the applicable MSR MPC. The following are inspection intervals for the ADC:

a. The acceptance inspection will be performed upon original issue, when received from supply, or accepted from another unit for permanent custody.

b. The preflight/post-flight inspection shall be performed on the ADC by the aircrew member to whom the ADC is issued prior to and after each flight.

c. The visual inspection will be performed at intervals not to exceed 180 days.

d. The screening inspection will be performed at intervals not to exceed 365 days.

NOTE

The service life of the ADC is seven years, but may be extended to ten years. Determine date of manufacture found on the interior label. If the ADC will exceed seven years of age during the next inspection cycle AND is in excessively worn condition, remove from service and destroy locally. If ADC is in serviceable condition, send to manufacturer for inspection and leak test to extend the service life another three years. After manufacturer's inspection, write "+3 YEARS" on the label in indelible ink. No ADC shall be in service beyond ten years from the date of manufacture.

NOTE

Although not required, incoming transferred aircrew should have their ADC(s) inspected by the AST shop to assure a serviceable condition prior to flight activities at that unit.

CHAPTER 8. HELICOPTER RESCUE SWIMMER EQUIPMENT.

A. OVERVIEW.

1. Introduction. This chapter contains information related to configuration, application and inspection policies of equipment used by Coast Guard helicopter rescue swimmers. Information contained here may be useful to USCG surface swimmers, but does not reflect policy set by that program. The AST is responsible for equipment issue, tracking, maintenance and proper disposal of the equipment covered in this chapter.

B. RESCUE SWIMMER WET SUIT ENSEMBLE.

1. Introduction. The helicopter Rescue Swimmer (RS) wet suit ensemble (Figure 8-1) is a system of neoprene garments designed for continuous wear and will protect the rescue swimmer from exposure to moderate water temperatures, wind, and spray experienced during emergency rescue actions at sea.

2. Configuration. The helicopter RS wet suit ensemble consists of the following components, listed by name and material thickness.

   a. Jumpsuit, 3 mm, 5/3 mm, and 7/5 mm

   b. Shorty, 3 mm

   c. Hooded Vest, 5/3 mm

   d. Core Warmer, 3 mm

   e. Swimmer Cap, 3 mm

   f. Full Hood, 7/5 mm

   g. Glove, 5 mm

   h. Zipper Boot, 5 mm

   i. Molded Sole Boot, 5 mm

Figure 8-1. (Sheet 1 of 3)
Rescue Swimmer Wet Suit Ensemble

Figure 8-1. (Sheet 2 of 3)
Rescue Swimmer Wet Suit Ensemble

Figure 8-1. (Sheet 3 of 3)
Rescue Swimmer Wet Suit Ensemble

3. Modifications. There are no modifications authorized for the RS wet suit ensemble. All repairs will be completed IAW repair guidelines listed in CGTO PG-85-00-310, Chapter 10 or the appropriate MPC.

C. RESCUE SWIMMER DRY SUIT.

1. Introduction. The RS dry suit is designed to be worn as a flame retardant flight garment, and a dry garment for cold water environment protection for the helicopter RS. It can be worn with flight boots or swim fins.

2. Configuration. The RS dry suit is a one-piece, fire retardant, waterproof and breathable garment with attached socks of the same fabric (Figure 8-2). The wrist and neck seals are latex. The suit color is high-visibility orange with yellow sleeves. The face fabric is Nomex III®, twill construction; the functional layer is a bi-component membrane based on ePTFE (Expanded Polytetrafluoroethylene). The backing fabric is 100% Nomex® single jersey construction.

Figure 8-2. Rescue Swimmer Dry Suit

The rescue swimmer dry suit is self-donning by means of a waterproof zipper, placed diagonally across the front torso from the left shoulder to the right hip. The suit is equipped with a fold-to-fit adjustable telescoping torso system, with internal suspenders and adjustable crotch strap. The suit system is sized for a range of users with different torso dimensions. The knees are reinforced with an additional layer of breathable Nomex® and with a Kevlar® kneepad on top for maximum protection. The seat of the suit has an additional layer of 1000-denier Cordura for added abrasion resistance.

The shoulders of the suit have an additional layer of the Nomex® fabric for durability. A waterproof relief zipper is installed at the crotch area of the dry suit. A cargo pocket is installed on each thigh. A pen pocket is located on the left shoulder. SOLAS reflective tape is placed vertically and horizontally on the arms of the suit for added visibility. The wrist seals are covered with a cuff protector. The socks are attached and consist of the Nomex® fabric. Boots are supplied and worn over the socks for foot protection. Latex neck and wrist seals are trimmed to fit each user. The automatic, nonadjustable exhaust valve located on the left forearm allows excess air to be vented from the suit. An internal Nomex® flap provides a barrier between the suit and the valve.

3. Modifications and Repairs. Modifications to the RS dry suit are limited to fitting the neck and wrist seals. Modifications and repairs will be completed IAW repair guidelines listed in CGTO PG-85-00-310, Chapter 10, or the appropriate MSR MPC.

D. RESCUE SWIMMER MASK.

1. Introduction. Two masks are acceptable for use as rescue swimmer masks. One is constructed with a split vision window, low volume design. The other has a wraparound tri-view window construction, and is not a low-volume mask. Both utilize UV protection. The chemical light bar is attached. The RS mask is black silicone rubber.

WARNING
LENSES ARE NOT UNBREAKABLE

NOTE
Prescription lenses are also available (P/N SV-1202C).

2. Modifications. Installation of a light bar at the top of the mask frame is the only authorized modification to the RS mask, if it is not installed at the manufacturer. Repairs will be made IAW the appropriate MSR MPC or CGTO PG-85-00-310, Chapter 10.

E. RESCUE SWIMMER SNORKEL.

1. Introduction. The RS snorkel is made of a rigid silicone upper tube with a flexible hose and mouthpiece attached. The top of the rigid tube is taped with “GLO-TOP” high visibility tape and silver SOLAS-grade reflective tape. A silicone snorkel keeper attaches snorkel to RS mask.

2. Modifications. Modifications and repairs to the RS snorkel will be IAW the appropriate MSR MPC and CGTO PG-85-00-310, Chapter 10.

F. RESCUE SWIMMER FINS.

1. Introduction. The RS swimmer fin is a black rubber pliable vented fin with adjustable straps and buckles. The fin comes in two sizes; medium and large. Refer to Helicopter Rescue Swimmer ALSIPS at the ALSE Technical Services website for source of supply information.

2. Modifications. Modifications and repairs to the rescue swimmer fins will be IAW the appropriate MSR MPC and CGTO PG-85-00-310, Chapter 10.

G. HELICOPTER RESCUE SWIMMER HARNESS.

1. Configuration. The helicopter RS Harness (Figure 8-3) is designed for constant wear, and is always worn by helicopter rescue swimmers whenever they are deployed from the aircraft. It weighs approximately 9.5 lb including equipment. It provides the user with variable buoyancy up to 35 pounds and a harness by which to be hoisted into and out of the aircraft. The helicopter RS Harness consists of the following assemblies.

   a. Flotation Assembly. The flotation assembly consists of a single flotation cell encased in a heavy weight, puncture and abrasion-resistant nylon cover. The flotation cell requires no repacking after use, only refolding and snapping into place with 8 plastic snaps, 4 on each side of the bladder. There are three pockets located on the front cover. There is a single pocket on the right side measuring 4 X 3 X 1 inches. There are two pockets on the left side. One measures 5 X 1 X 1.5 inches. The

second pocket measures 3 X 1.5 X 0.5 inches. On the back flap of the Triton Harness is a 9 X 5 inches SOLAS reflective patch, stenciled with “USCG” in 2.5-inch black lettering.

b. Inflation Assemblies. The bladder is inflated pneumatically through a CO_2 inflation valve, or orally by means of an oral inflation tube. The CO_2 inflation lanyard consists of nylon webbing with three, ¾-inch diameter red plastic beads. This is attached to a nylon cord with metal crimp. The nylon line is looped through the inflation toggle at the inflation valve. A plastic snap on the nylon webbing attaches the inflation lanyard to the vest bladder. The oral inflator is a locking press-to-inflate valve located on the left side of the bladder cover. It is stowed in a small inverted pouch when not in use. The bladder assembly is attached to the harness assembly at three points with titanium buckles and stainless steel hardware. The harness webbing is kept in place inside two 7-inch webbing pockets secured with slide fasteners on the back of the bladder cover. There is a 1- X 4-inch piece of SOLAS retroreflective tape on each side of the front of the vest. A 3.25-inch helicopter rescue swimmer patch is stitched on the left side of the vest front.

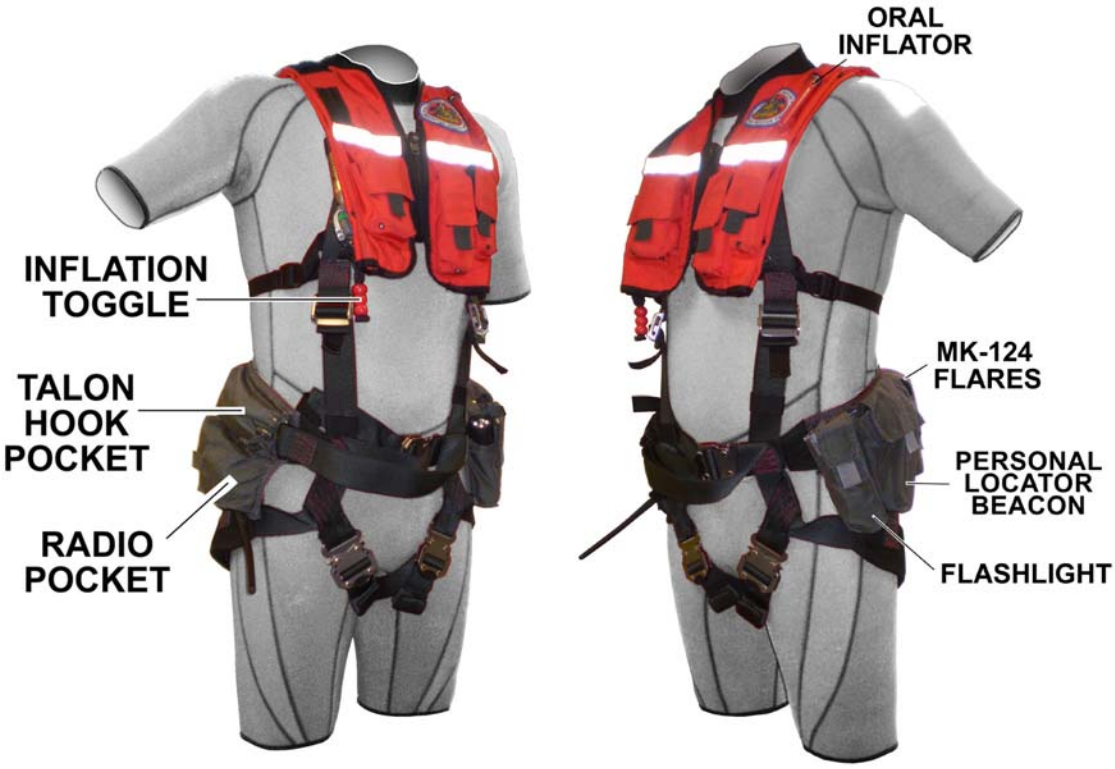


Figure 8-3. (Sheet 1 of 2)
Helicopter Rescue Swimmer Harness

Figure 8-3. (Sheet 2 of 2)
Helicopter Rescue Swimmer Harness

c. Harness Assembly. The full body harness assembly is constructed primarily of MIL-SPEC type VIII and XIII webbing. The harness torso is size-adjusted using 2-inch titanium adjustable hardware. The leg straps are fitted and adjusted using adjustable connector buckles. There are 1-inch horizontal adjustment straps with adjusting buckles located on each side of the harness torso. The hoisting hook is sewn into the apex of the lifting webbing of the harness. The lifting V-ring is sewn directly behind the hoisting hook.

d. Equipment Pockets. Equipment pockets are incorporated into each side of the padded waist belt. The pockets on the right side are forward opening. The upper pocket houses the Talon-II hoisting hook and closes with a draw cord secured with a spring loaded barrel lock.

2. Function. The Helicopter Rescue Swimmer Harness has three functions.

a. The flotation assembly provides additional flotation for the helicopter rescue swimmer when it is determined necessary by the RS for mission completion. It can be mechanically inflated by pulling down and slightly outward on the beaded CO_2 inflation valve lanyard, or through the oral inflation valve.

b. **The harness assembly allows the helicopter rescue swimmer to be hoisted directly to the aircraft by attaching the lifting V-ring to the hoist hook of the helicopter.** The Talon hook is used to attach to a rescue device or harness used to hoist the survivor with the rescue swimmer.

c. The harness assembly and bladder cover provide pockets for rescue swimmer equipment stowage.

GLOSSARY

ABRASION A fuzzy spot or area on cloth usually caused by rubbing against an object.

ACID A fundamental chemical class distinguished by having reactive hydrogen radicals (pH below 7.0). Acids can be extremely corrosive to metal and damaging to fabric.

ALKALINE A substance, which is opposite to an acid, a base. Also, any substance which has the properties of an alkali (metallic hydroxide).

AMBIENT TEMPERATURE When performing maintenance on survival kits, ambient temperature is considered to be the temperature of the surrounding atmosphere.

ARAMIDE A heat resistant knit material with excellent stability to 700 °F. (Replaces polyamide material.)

ASSEMBLY A grouping of parts fitted together to form a complete unit.

ATTENUATION Reduction or lessening. For example, sound attenuation is the reduction of ambient noise in an aircraft by use of a helmet equipped with sound attenuating earphones, sonic cup.

ATMOSPHERIC PRESSURE Pressure at sea level, expressed as 14.696 pounds per square inch, absolute, or 29.92 inches of mercury column (barometer).

AWL A stitch made by inserting the needle a stitch length behind and bringing it up a stitch length ahead of the last stitch. Also, sewing back over a row of stitches.

BAG, BALLAST An open pouch located on the underside of a raft to allow stabilization.

BINDING A piece of tape or fabric folded over and stitched to a raw edge of cloth to prevent raveling or fraying.

BREATHING The pulsating action of the parachute canopy when fully opened.

C Abbreviation for Celsius. A thermometric scale of which the interval between the freezing point and boiling point of water is divided into 100°. 0 °C represents the freezing point and 100 ° C represents the boiling point of water.

CALENDAR INSPECTION A detailed, searching inspection for material degradation that may have occurred during the preceding calendar interval and provide an opportunity to perform essential preventative maintenance. The inspections are programmed in multiple calendar weeks.

CANOPY The main supporting surface of a parachute which, when opened, reduces the rate of descent. It is usually made of nylon and includes a framework of cords, called suspension lines, from which the load is suspended.

CARTRIDGE A cylindrical, nonrefillable container.

CASING (SLEEVE) The outer woven cover of the suspension line.

CAUTION Indicates danger to the equipment. The caution precedes the step or item to which it refers.

CLIP A device that fastens, holds together, or retains (e.g., the clip, which is tacked to a riser and holds the ripcord housing in place).

CLOTH, CANOPY The cloth used in parachute canopies. It is woven to withstand the impact of air pressure when the parachute opens. The canopy cloth is woven from nylon yarns, usually in a ripstop weave. See also CANOPY.

CO2 Abbreviation for carbon dioxide.

COMBUSTIBLE MATERIAL/SUBSTANCE Any material or substance capable of burning in the presence of oxygen.

COMPONENT Item of equipment making up part of an assembly (e.g., a ripcord housing is a component part of a ripcord assembly).

CONDUIT A thin, hollow, metal tube that serves to protect and guide a cable or wire.

CONFIGURATION The makeup, size, shape and relative location of parts in an item of equipment and its accessories. This includes the composition of the materials as well as marking details. Government drawings, military specifications and modification instructions specify the configuration of each piece of equipment.

CONTAINER An assembly that encloses and protects the canopy, suspension lines and risers until the parachute is opened. Sometimes called the Pack assembly.

CONTRASTING COLOR A color which stands out from its background.

D-RING A metal fitting shaped in the form of a letter D.

DIAMETER The greatest straight distance across a circle: specifically, the greatest distance across a flat canopy, from skirt to skirt, measured when the canopy is lying flat. Used to designate the size of a flat canopy.

DISCONNECT, QUICK A method of attachment allowing separation of two components by a single, rapid motion or action.

DISPOSITION Instructions on what is to be done with items which are obsolete, worn out or beyond repair.

DON To put on an item of clothing or equipment.

DROPPABLE A hand launched liferaft assembly.

DRY LOCKER A tower or compartment of suitable height that will satisfactorily air fully suspended parachutes.

EGRESS Outlet or means of getting out.

EQUIPMENT CONTAINER Any mixture of a combustible material or substance and oxygen capable of violent burning (detonation) either spontaneously or with the external application of heat.

EYE A small, steel-wire loop. For example, the loops attached to the parachute container into which a hook on a container spring opening band is fastened.

EYELET A small metal reinforcement for a hole in cloth, similar to a grommet, except thinner and smaller, and having no washer. The eyelet is used to reinforce lacing holes in small covers, etc.

F Fahrenheit.

FABRICATE To make up or construct an item of equipment, accessory or material.

FAIR-LEAD Pulley, ring or hole used to guide a line, to prevent chafing or fouling, or to change its direction.

FAKE To fold a line or lanyard in a back and forth fashion.

FASTENER, SLIDE A type of fastener made of two lengths of tape with a series of metal or plastic scoops fastened to one side of each. A metal slide is provided which causes the scoops to mesh or lock in place as the fastener is closed, or to separate as the fastener is opened. Colloquial: ZIPPER.

FASTENER, SNAP A metal fastener containing essentially a ball and a socket attached to opposite parts of a material and used to hold mating surfaces together.

FIBER A natural or synthetic filament (as of wool, cotton, rayon, etc.) capable of being spun into yarn.

FILLING Threads, which are perpendicular to salvage edges, and extend across the width of cloth.

FLOTATION CELL The inflatable compartments of a life preserver.

FRAYED (SUSPENSION LINE) A fuzzy condition in which short lengths or pieces of thread or yarn protrude from surface of suspension line.

FUNCTIONAL CHECK A test which puts an item to use to determine if it operates properly.

GAUGE An instrument for measuring pressure. A measurement of size or thickness.

GORE That portion of the canopy located between two adjacent radial seams and the vent skirt hem. It consists of cloth sections sewn together.

GROSS WEIGHT The gross weight of a carbon dioxide cylinder includes the weight of the cylinder, the weight of the carbon dioxide contained by the cylinder, and the weight of the inflation valve attached to the cylinder.

HARDWARE Items made of metal such as tools, fittings, fasteners, and appliances.

HARNESS An arrangement of webbing straps used to support the rescue swimmer during hoist evolutions.

HEAT EXCHANGER An apparatus in which heat is exchanged from one fluid to another.

LINE, STATIC A line used to open a parachute assembly without the necessity of pulling a ripcord manually. A static line is attached to the ripcord and the aircraft or ejection seat. When the line becomes taut, it withdraws the ripcord locking pins or deployment bag and the parachute then opens.

LINE, SUSPENSION Nylon cords which connect the canopy of the parachute to the harness assembly.

LINE, VENT Nylon cord which crosses the vent opening of a canopy.

LOOP A warp or filling thread pulled out to form a loop on a cloth surface.

HYDROSTATIC TEST This is a permanent volumetric expansion of multi-place liferaft CO_2 cylinders. This test is conducted hydrostatically every 5 years at 5/3, the working pressure of the tested cylinder.

IAW In Accordance With.

INFLATION ASSEMBLY Inflation valve and carbon dioxide cylinder as a unit.

INSPECTION A close examination for damage, wear, dirt, and serviceability.

KEEPER Small strip of tape or loop used to retain an object (e.g., riser and back pad keepers).

MULTIPLACE Capable of holding more than one person.

NOTE An information item. A note may precede or follow the item or step to which it refers.

NRFI Not Ready For Issue.

OVERLAP To extend over and cover a piece of cloth.

PACK To put together compactly, to store neatly. For example, the act of packing a parachute consists of stowing suspension lines and canopy in the container assembly in such a way as to ensure safe storage and proper opening of the parachute assembly.

PARACHUTE A device that offers resistance to the air, thereby decreasing the velocity of a descending body to permit landing at a suitable rate of descent.

PARACHUTE ASSEMBLY A complete parachute, including the canopy assembly, container assembly, harness assembly, and riser/lift web assembly.

PARACHUTE, CARGO A parachute used to airdrop materials such as food, water, explosives, clothing, weapons, and supplies.

RAVEL (UNRAVEL) To separate, untwist, or unwind, leaving a frayed or ragged edge. Ravel is the preferred word to describe such a condition.

REINFORCEMENT Any strengthening which enhances the basic integrity of an assembly (e.g., the tape or webbing used to strengthen parts of a canopy, container, harness, etc., in a parachute assembly). See also WEBBING, REINFORCEMENT.

RISER The webbing which connects the rescue equipment harness to the cargo parachute assembly. The riser is composed of two lift-webs and there are two risers on each parachute assembly.

RUPTURE One or more yarns of suspension line casing being cut or severed, sometimes exposing the inner core. Occasionally, tears, cuts or other forms of damage to the canopy are defined as a rupture when caused by dynamic load conditions.

SEAM A series of stitches joining two or more pieces of cloth. For government work, the type of seam is indicated by a symbol, which gives the class of seam, the number of stitching, and the number of rows of stitching.

SEAM RADIAL A seam, joining two gores, which extends radially from the vent to the skirt hem.

STRAP, CHEST The harness webbing which is secured across the chest with a snap and a V-ring to prevent the wearer from falling out of the harness.

TAPE, HOOK Strip of nylon tape with small nylon hooks on one side. Hook tape issued with pile tape as a fastener.

TAPE, PILE A strip of nylon tape with small nylon loops on one side. Pile tape is used with hook tape as a fastener.

TOTAL LIFE Total life is the period of time commencing with the date of manufacture that an item may be retained in a packaged, out-of-service condition and remains acceptable for service.

V-RING A metal fitting shaped in the form of a closed letter V.

VENT The circular opening at the peak or top of the canopy. As the parachute opens and descends, some of the air in the canopy escapes through this vent, thus reducing the strain on the canopy and steadying descent. It is about 18 inches in diameter for personnel parachutes.

WEAVE To manufacture a web or cloth on a loom by interlacing the warp and filling yarns. Also the particular pattern employed in weaving cloth. The cloth for parachute use is one up and one down (plain weave), two up and one down (twill weave), or ripstop.

WEB (WEBBING) A strong, narrow, closely woven tape of synthetic, cotton, or linen fiber designed for bearing weight (e.g., manufacture of the parachute harness).

WET LOCKER A tower or compartment maintained for hanging parachutes that are damp or have been immersed in water.