Designation: F 2318 – 04

Standard Specification for Rotary Wing Basic Life Support, Advanced Life Support, and Specialized Medical Support Air Ambulances[1]

This standard is issued under the fixed designation F 2318; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This specification covers rotary wing aircraft involved in patient prehospital emergency medical care and transportation. It outlines the minimum requirements, including personnel, and patient care equipment and supplies, that must be met before the aircraft can be classified as a rotary wing air ambulance unit.

1.2 The first part of this specification (Sections 1 through 13.2) describes the minimum aircraft configuration and capability, the minimum number of seats for personnel, and the provisions for the minimum medical equipment and supplies for rotary wing basic life support air ambulances.

1.3 The provisions of this specification plus the provisions of the Advanced Life Support (ALS) Annex comprise the specification for rotary wing advanced life support air ambulances.(See Section 1 and 1.1 of the Advanced Life Support (ALS) Annex for the scope for rotary wing advanced life support air ambulances.)

1.4 The provisions of this specification plus the provisions of the Advanced Life Support Annex, plus the provisions in the Specialized Medical Support (SMS) Annex comprise the specification for rotary wing specialized medical support air ambulances. (See Sections 1 through 1.3 of the Specialized Medical Support (SMS) Annex for the scope for rotary wing specialized medical support air ambulances.)

2. Referenced Documents

2.1 *ASTM Standards:* [2]

D 3577 Specification for Rubber Surgical Gloves

D 3578 Specification for Rubber Examination Gloves

F 920 Specification for Minimum Performance and Safety Requirements for Resuscitators Intended for Use with Humans

F 960 Specification for Medical and Surgical Suction and Drainage Systems[3]

F 1031 Practice for Training the Emergency Medical Technician (Basic)

F 1118 Specification for National Air Medical Transport Units Resources Catalog

F 1149 Practice for Qualifications, Responsibilities, and Authority of Individuals and Institutions Providing Medical Direction of Emergency Medical Services

F 1177 Terminology Relating to Emergency Medical Services

F 1219 Guide for Training the Emergency Medical Technician (Basic) to Perform Patient Primary Assessment

F 1220 Guide for Emergency Medical Services System (EMSS) Telecommunications

F 1229 Guide for Establishing the Qualifications, Education, and Training of EMS, Air-Medical Patient Care Providers

F 1555 Guide for Characteristics for Extremity Splints

F 1556 Guide for Spinal Immobilization and Extrication (Spined) Device Characteristics

F 1557 Guide for Full Body Spinal Immobilization Devices (FBSID) Characteristics

F 1558 Guide for Characteristics for Adjunct Cervical Spine Immobilization Devices (ACSID)

F 1559 Guide for Characteristics for Cervical Spine Immobilization Collar(s) (CSIC)

2.2 *NTIS Document:*[4]

USARTL-TR-79-22D Aircraft Crash Survival Design Guide

2.3 *Federal Laws and Regulations:*[5]

14 CFR Chapter 1—Federal Aviation Administration (FAA) Rules and Regulations, Parts 1-49 and 61-139; specifically, Subpart 135.19—Emergency Operations, and Subpart 135.271—Helicopter Hospital Emergency Medical

[1] This specification is under the jurisdiction of ASTM Committee F30 on Emergency Medical Services and is the direct responsibility of Subcommittee F30.01 on EMS Equipment.

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[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[3] Withdrawn.

[4] Available from the National Technical Information Service (NTIS) , 5285 Port Royal Rd., Springfield, VA 22161. http://www.ntis.gov. Accession Number ADA 2118434.

[5] Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. When indicated, reprints of certain regulations may be obtained from the Federal agency responsible for issuance thereof.

Evacuation Services

2.4 *Federal Standards/Specifications:*[6]

FAA Technical Standard Orders C-22g Safety Belts, and C114 Torso Restraint Systems

29 CFR Occupational Safety and Health Administration—Standard 1910.120, Hazardous Waste Operations and Emergency Response

29 CFR Occupational Safety and Health Administration—Standard 1910.1030, Bloodborne Pathogens

29 CFR Occupational Safety and Health Administration—Standard 1010.134, Respiratory Protection

21 CFR Food and Drug Administration—Medical Devices

DOT Specification RR-C-901/3 Cylinders Compressed Gas: With Valve or Plug and Cap; ICC3aa

2.5 *FAA Advisory Circulars (AC):*[7]

AC 43.13-2A Acceptable Methods, Techniques and Practices, Aircraft Alterations

AC 135.14 Emergency Medical Services/Helicopter (EMS/H)

2.6 *Military Standards:*[8]

MIL-STD-101 Color Coding, Medical Gases

MIL-STD-202 Test Methods For Electronic and Electric Component Parts

MIL-STD-461 Department of Defense Interface Standard, Requirements for the Control of Electromagnetic Interference Characteristics of Subsystems and Equipment

MIL-STD-704 Aircraft Electric Power Characteristics

MIL-STD-810E Environmental Test Methods and Engineering Guidelines

MIL-STD-39226 Compressed Gas Cylinders

MIL-STD-1472 Human Factors

2.7 *National Fire Protection Association Standards:*[9]

NFPA 56F Standard for Nonflammable Medical Gas Systems

NFPA 70 National Electrical Code

NFPA 407-8 Aircraft Fuel Servicing, paragraphs 2–4.1

NFPA 99 Electrical Safety

2.8 *Compressed Gas Association (CGA) Standards:*[10]

CGA C-9 Standard for Color-Marking of Compressed Gas Cylinders Intended for Medical Use

CGA E-7 Standard for Flow meters, Pressure Reducing Regulators, regulator/Flow Meter and Regulator/Flow gage Combinations for the Administration of Medical Gases

CGA P-2 Characteristics and Safe Handling of Medical Gases

CGA P-4 Safe Handling of Cylinders by Emergency Rescue Squads

CGA V-1 Compressed Gas Cylinder Valve Outlet and Inlet Connections

CGA V-5 Diameter Index Safety System

2.9 *Canadian Standards Association (CSA):*[11]

CSA Standard Z305.1M Nonflammable Medical Gas Piping Systems

CSA Standard Z305.2M Low Pressure Connecting Assemblies for Medical Gas Systems

CSA Standard Z305.3M Pressure Regulators, Gages and Flow Metering Devices for Medical Gas Systems

2.10 *American National Standards Institute and Association for Advancement of Medical Instrumentation (ANSI/AAMI):*[12]

ANSI Z79.3 Anesthetic Equipment—Oropharyngeal and Nasopharyngeal Airways

ANSI Z79.6 Breathing Tubes

ANSI Z79.14 Anesthetic Equipment—Tracheal Tubes

ANSI/AAMI SP9 Standard for Nonautomated Sphygmomanometers

ANSI/AAMI SP10 Standard for Automated Sphygmomanometers

2.11 *Society of Automotive Engineers (SAE):*[13]

SAE Air 825B Oxygen Equipment for Aircraft

SAE AS 1198 Continuous Flow Oxygen Regulator

2.12 *Underwriters Laboratory (UL):*[14]

UL 2601-1 Standard for Safety—Medical Electrical Equipment—Part 1: General Requirements for Safety

3. Terminology

3.1 Following are definitions used in this specification.

3.2 *Definitions Relating to Personnel:*

3.2.1 *air ambulance provider*—the individual or entity that holds the state (or equivalent) air ambulance provider certificate and is responsible for and manages the operation of the air ambulance.

3.2.2 *air-medical crewmembers*—transport personnel whose primary function is to carry out the medical duties of the medical mission that has been accepted by an air ambulance. They are qualified to perform the medical responsibilities of the mission to the standard established for the designated air ambulance category (basic life support, advanced life support, or specialized).

3.2.3 *flight crewmembers*—transport personnel whose primary function is to operate and navigate the aircraft under the specified conditions, in accordance with all the applicable Federal Aviation regulations. Flight crewmembers include pilots, navigators, radio operators, and crew chiefs.

3.2.4 *transport personnel*—flight crewmembers and air-medical crewmembers who by specialized training (as defined

[6] Copies of Federal standards and specifications are available from Federal Standards and Specifications, Superintendent of Documents, U.S. Government Printing Office, 732 N. Capital St., NW, Mail Stop: SDE, Washington, DC 20401.

[7] FAA Advisory Circulars are available online at http://www.faa.gov/Regulatory Advisory/ac_index.htm.

[8] Copies of Military specifications and standards required by suppliers in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.

[9] Available from National Fire Protection Association (NFPA), 1 Batterymarch Park, Quincy, MA 02269, http://www.nfpa.org.

[10] Available from Compressed Gas Association (CGA), 1725 Jefferson Davis Hwy., Suite 1004, Arlington, VA 22202-4102, http://www.cganet.com.

[11] Available from Canadian Standards Association (CSA), 178 Rexdale Blvd., Toronto, ON Canada M9W 1R3, http://www.csa.ca..

[12] Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, http://www.ansi.org.

[13] Available from Technical Division, Society of Automotive Engineers (SAE), 400 Commonwealth Dr., Warrendale, PA 15096, http://www.sae.org.

[14] Available from Underwriters Laboratories (UL), Corporate Progress, 333 Pfingsten Rd., Northbrook, IL 60062, http://www.ul.com.

in Guide F 1229 or applicable FAA regulations) are currently qualified to carry out their assigned duties.

3.3 *Descriptions of Terms Relating to Aircraft:*

3.3.1 *air ambulance*—an aircraft that is capable of meeting the standard for a medical transport unit if the requisite personnel, equipment, and supplies are added. It does not include the personnel and the onboard medical equipment.

3.3.2 *rotary wing aircraft*—aircraft that use a rotor system to take off and land vertically. They include helicopters and tiltrotor aircraft.

3.4 *Descriptions of Terms Relating to Patient Care Equipment*—Patient care equipment is defined as that equipment related to the medical mission. It includes:

3.4.1 *permanently installed patient care equipment*—designed to be used inside the air ambulance. It may be self-contained or it may depend on the aircraft's power source, or a combination of both.

3.4.2 *portable patient care equipment*—self-contained and designed for use en route, at the pick-up point, and in transit. It implies being capable of being hand carried. Some items of portable patient care equipment may have the option of using the aircraft's sources of power and medical gases.

3.4.3 *transportable patient care equipment*—not necessarily self-contained. It may be used en route if qualified for use in flight, and if power and accessibility are available.

3.5 *Descriptions of Terms Relating to Communications*—Airborne communication equipment consists of three groups, depending on its primary function:

3.5.1 *aviation communication equipment*—equipment installed in the aircraft, used by the flight crew for traffic control, navigation of the aircraft, and receiving weather information.

3.5.2 *intercommunication equipment*—equipment, used by the transport personnel to facilitate conversations between the flight crew and air-medical crewmembers and, in some cases, with the patient.

3.5.3 *medical communication equipment*—equipment installed in the aircraft, used by the transport personnel to facilitate conversations between the air-medical crewmembers and the emergency medical system in which they operate. It includes voice communication with public service and medical ground units, with selected medical control, and with EMS systems dispatch centers. It can include equipment for the transmission of graphic data.

3.6 *Descriptions of Terms Relating to Documentation:*

3.6.1 *national air ambulance resources catalog*—the document produced in accordance with the format that is contained in Specification F 1118. The format is a guideline so that the catalog will contain standardized, comparable data on existing air medical transport units. The short title "Resources Catalog" may be used when the meaning is clear.

3.7 *Descriptions of Terms Relating to the Mission:*

3.7.1 *basic life support level*—a level of patient care where all the skills required for basic life support can be effectively applied at any time during the complete mission.

3.7.2 *category*—a level of patient care, relating to the capability of the air medical transport unit. There are various levels including, but not limited to, basic life support, advanced life support, and specialized medical care.

3.7.3 *declared effective service range*—the number of nautical miles, without resupply of aviation or medical requirements, within which the rotary wing medical transport unit can be expected to operate.

3.7.4 *declared response time*—the normal minimum number of minutes required between the initial notification of the medical mission and the liftoff of the air medical transport unit.

3.7.5 *declared service area*—the area designated by the air ambulance provider where the rotary wing medical transport unit is operationally capable of response. It includes predefined limits in range, altitude and weather, over water, instrument flight, and day/night capability.

3.7.6 *medical mission*—an accepted medical flight from the initial notification to the completion or cancellation.

3.7.7 *rotary wing air ambulance*—a rotary wing medical transport vehicle, the crew, and onboard equipment that meets the standard for the named category.

3.7.8 *rotary wing advanced life support air ambulance*—a unit that meets the standard described in the Annex entitled ALS Advanced Life Support.

3.7.9 *specialized medical support level of patient care*—a level of patient care that is directed to particular problems that are usually already undergoing advanced treatment. Typically, the patient is being moved to a facility that can provide additional service. It may also include the need for special equipment not normally required in air ambulances, such as incubators, left ventricular assist devices, pressure chambers, and so forth.

3.7.10 *independent accredited testing laboratory*—a testing facility that is accredited in accordance with the National Institute of Standards and Technology (NIST) National Voluntary Laboratory Accreditation Program (NVLAP) to perform specific calibrations and tests that it is contracted to perform and (*1*) has no business relationship with the company whose product it is testing other than the fee-for-service testing of that company's product; (*2*) has no corporate stock that is directly owned by a principal of the company whose product is being tested; and (*3*) has no conflict-of-interest by accepting fee-for-service testing of a company's product.

4. Significance and Use

4.1 This specification describes a suitable rotary wing aircraft, which together with the specified personnel, equipment, and supplies, will provide patient care, at least to national standards for basic life support, throughout the medical mission.

4.1.1 It applies to all the medical activities that involve rotary wing air ambulance operation at the basic life support level, including on-scene work and interhospital transfer.

4.1.2 See sections 4.1 and 4.1.1 of the ALS Annex for advanced life support provisions.

4.2 Application of this specification will ensure that the air ambulance will be able to provide a well-established level of patient care. The known minimum capability will improve interstate mutual aid and increase the capability for improved cooperation throughout the nation.

4.3 This specification will assist in the definition of appropriate care, increase public awareness of the high standard available, and provide a nationally accepted guideline. It will also provide:

4.3.1 A scale upon which to evaluate resources and capabilities,

4.3.2 The incentive to improve the air ambulance, personnel, and medical components, to meet an acceptable standard of patient care (this will include configuration, equipping, and training).

4.3.3 A means of identifying inappropriate advertising.

4.3.4 Consistent criteria permitting performance and cost-effectiveness comparisons.

5. Classification

5.1 Air ambulance providers will use the title "Rotary Wing Basic Life Support Air Ambulance" to indicate that the minimums contained in this specification have been met. See Sections 5 and 5.1 of the ALS Annex for classification provisions for advanced life support air ambulances.

6. General Requirements

6.1 The rotary wing basic life support air ambulance shall consist of three components: the rotary wing medical transport vehicle, transport personnel, and patient care equipment and supplies in accordance with this specification. See section 6.1 of the ALS Annex for ALS requirements.

6.2 The three components must be licensed/certified by the appropriate governmental authority. The air ambulance provider is the individual or entity responsible for ensuring that the following exist:

6.2.1 Current air ambulance license or certificate.

6.2.2 Appropriate license or certificate for the aircraft under applicable Federal Aviation Regulations.

6.3 To comply with this specification, the rotary wing basic life support transport unit must be part of a designated medical control system, as described in Practice F 1149.See section 6.3 of ALS Annex for ALS requirements.

6.4 The unit will have medical direction provided by a medical director, as defined in Practice F 1149.

6.5 The specific aircraft and personnel that have been state licensed (or equivalent) as part of the unit will be available for the medical mission as stated in the Resources Catalog. The aircraft will be configured to accept the personnel and equipment as stated. The equipment as listed in the Resources Catalog may be in the aircraft or held in readiness in an airworthy condition, in a specific location. More than one team and set of equipment may be provided for any particular aircraft, in more than one location, providing they each meet the requirements contained in the resource catalog. The aircraft must have both the air-medical personnel and the medical equipment and supplies onboard prior to patient transport as a basic life support unit. See section 6.5 of ALS Annex for ALS requirements.

6.6 The air ambulance provider and medical director will complete the resources format (see Specification F 1118) and submit it to the state EMS director (or equivalent official). The format will be updated annually and each time significant changes to its content occur.

6.7 The rotary wing aircraft that responds to the medical mission as a rotary wing basic life support air ambulance shall be capable of performing as stated in the Resources Catalog. See section 6.7 of ALS Annex for ALS requirements.

6.8 The rotary wing basic life support air ambulance shall be capable of transporting one supine patient inside the cabin and shall have sufficient space to allow the performance of medical treatment at the basic life support level, en route to definitive care. At least one qualified air-medical crewmember, as defined in Guide F 1229, accompanies each patient, and has access to the patient at all times. Basic life support equipment and supplies shall be carried on board, to be accessible for use during patient transport and to provide emergency care at the scene.

NOTE 1—BLS (Basic Life Support) equipment that may affect the safety of flight or in-flight patient care shall be tested by an independent accredited laboratory as compliant with applicable standards listed in Section 2. See section 6.8 of ALS Annex for ALS requirements. See section 6.8 of SM Annex for SM requirements.

6.9 The rotary wing basic life support transport unit shall be capable of departing directly to the requested site under the flight conditions and during the hours of operation stated in the Resources Catalog. See section 6.9 of ALS Annex for ALS requirements. See section 6.9 of SM Annex for SM requirements.

6.10 When, in the best interest of patient care, a medical decision has to be made that runs counter to this specification, a mission deviation shall be recorded. The record shall describe the mission deviation, its cause and its impact, and it shall be included in the air ambulance mission report. Review and disposition of such a deviation shall be conducted by the local medical director. Such deviations should be reported to regional and state EMS regulatory and licensing authorities as requested or required.

6.11 The air ambulance license/certification government authority may accept and record transient deviations for a particular air ambulance, pending receipt of adequate equipment. Such transient deviations must be clearly documented in the Resources Catalog, together with the alternative solution until the deviation is resolved.

7. Personnel

7.1 The minimum personnel requirement for the rotary wing basic life support air ambulance shall be the FAA flight crew requirement for the aircraft and for each patient, one qualified air-medical crewmember, as defined in Guide F 1229. See section 7.1 of the ALS Annex for ALS requirements. See sections 7.1 and 7.1.1 of the SM Annex for SM requirements.

7.2 *Medical Director*—Each program shall have a medical director, as defined by Practice F 1149, to supervise the medical operation of the unit. This individual will be responsible for:

7.2.1 Assessing and accepting the mission. Once accepted, the director will maintain overall supervision of the mission.

7.2.2 Ensuring that the correct configuration of the aircraft, equipment, and supplies has been arranged for the mission.

7.3 *Flight Crewmember*:

7.3.1 The minimum flight crew for the rotary wing basic life support air ambulance shall be the FAA flight crew requirement, for the type of aircraft and the flight plan parameters, under the applicable Federal Aviation regulations. The pilot shall be appropriately rated.

7.3.2 All flight crewmembers shall be thoroughly conversant with the emergency medical services system they serve. They shall be familiar with the area of operation, particularly those aspects that affect flight.

7.4 *Air-Medical Crewmembers*—The minimum air-medical crew for the rotary wing basic life support air ambulance shall be one basic air-medical crewmember, as defined in Guide F 1229, for each patient. See section 7.4 of ALS Annex for ALS requirements.

7.4.1 In addition to the basic life support medical requirement, the air-medical crewmember shall be responsible to the pilot for the in-flight security of the patient and the security of the medical equipment and supplies throughout the medical mission. Responsibilities also include assisting the pilot with evacuation procedures. See section 7.4.1 of ALS Annex for ALS requirements.

7.4.2 In instances where patient care must be continued by personnel other than the air-medical crewmember, the patient shall not be transported unless one air-medical crewmember can also be accommodated to maintain supervision of aircraft medical systems.

8. Patient Care Equipment and Supplies

8.1 Requirements for the rotary wing basic life support transport unit are as follows:

8.1.1 *Stretcher*—A minimum of one (*1*) stretcher shall be provided that can be carried to the patient. The stretcher and the means of securing it for flight shall have FAA approval.

8.1.1.1 The stretcher shall be large enough to carry the 95th-percentile adult American patient[15] full length in the supine position.

8.1.1.2 The stretcher shall be provided with handles, hand holds, or straps that permit carriage of the stretcher, with patient, over rough ground, or up and down stairs.

8.1.1.3 The stretcher shall be sturdy and rigid enough that it can support cardiopulmonary resuscitation. If a backboard or equivalent device is required to achieve this, such device will be readily available.

8.1.2 *Medical Equipment and Supplies*—As a minimum, the following items of medical equipment and supplies shall be available for deployment on rotary wing basic life support transport air ambulance missions, based on specific anticipated mission requirements as provided in 7.2.2:

8.1.2.1 *Medical Gases Supply Systems*:

(1) Capacity—A sufficient capacity of oxygen shall be provided for each patient, with up to 15 L/min flow during patient transport for the declared service range, plus the medical oxygen contained in the two D cylinders listed in Table 1.

TABLE 1 Medical Gas Delivery and Airway Management Equipment Color/Numerical Code—Green

Item	Quantity
Oxygen mask, adult	2
Oxygen mask, child	1
Oxygen mask, infant	1
Key, oxygen valve	1
Tubing, oxygen connective/extension	2
Nasal cannulas, medium and small, each	1
Oxygen mask, non-rebreathing, adult and pediatric	1 each
Regulator, oxygen	1
Flowmeter, oxygen, capable of providing 1 through 15 L/min flow, throughout all normal flight altitudes and attitudes	1
Artificial ventilation device (bag valve mask) capable of receiving oxygen	1 each
Artificial ventilation device (bag valve mask) capable of receiving oxygen through an inlet and capable of delivering 80 to 100 % oxygen through a a reservoir system. It is manually operated, self-refilling and portable. Adult, child, infant sizes	1
Suction device, portable	1
Set of oropharyngeal airways for neonates, pediatrics, and adults	1
Set of nasopharyngeal airways for pediatrics and adults	1
Suction catheters, flexible, set of sizes 6 fr, 14 fr and 18 fr	1
Suction catheter, rigid	1
Suction connective tubing	2
Suction rinsing bottle, shatter proof	1
Oxygen D Cylinder	2

NOTE—BLS Equipment that may affect the safety of flight or in-flight patient care shall be tested by an independent accredited laboratory for compliance with appropriate standards listed in Section 2 of the Standard Specification for Rotary Wing Basic Life Support Air Ambulances.

(2) Flow Rate—The oxygen supply, whether stored as a liquid or compressed gas, will use a pressure-reducing regulator pre-set to 50 ± 5 psi and capable of delivering a minimum flow of 100 L/min.

(3) Gage—An oxygen quantity gage for liquid oxygen or a pressure gage for compressed oxygen shall be provided to measure on the high side of the regulator.

8.1.2.2 *Medical Gas Delivery and Airway Management Equipment*—The minimums are shown in Table 1.

8.1.2.3 *Bandages and Medical Supplies*—The minimums are shown in Table 2.

8.1.2.4 *Musculoskeletal Appliances*—The minimums are shown in Table 3.

8.1.2.5 *Miscellaneous Medical Equipment*—The minimums are shown in Table 4.

8.2 Adequate supplies of medications and administrative devices approved for use by basic life support personnel, for the management of patients, as approved by the EMS system's medical director, in accordance with 7.2.2, shall be carried on board.

8.3 All items will be readily accessible and all will have provisions for easy and secure stowage. All items likely to be required outside the rotary wing transport will be packaged so that they can be carried to the patient.

8.4 *Lighting*:

8.4.1 In the patient compartment, normal white lighting shall be available over each patient's head and torso. It will be at least 35 fc at patient level.

9. Vehicle Configuration

9.1 Requirements for the rotary wing basic life support air ambulance are as follows:

[15] The 95th-percentile adult American male is 6 ft (1.83 m) and 212 lb (96.2 kg).

TABLE 2 Bandages and Medical Supplies Color/Numerical Code—White and 2

Item	Quantity
Sheets	2
Bandages, triangular	4
Safety pins	6
Trauma dressings, sterile	4
Dressings, 4 by 4, sterile	24
Bandages, 1 by ¾ in., adhesive	12
Tape, 2 in. (or more) by 5 yd, adhesive, rolls	2
Tape, adhesive, 1 in. by 5 yd, roll	1
Bandage, gauze, roller soft sterile, 4 in. wide (or more) rolls	4
Bandage, elastic, 3 in. wide (or more), non-sterile, rolls	2
Alcohol preps, disposable	24
Dressings, 3 by 8 in. (or larger), sterile petroleum gauze	2
Gloves, examination, pairs	8
Surgical face masks, disposable (meets NIOSH N95 requirement)	2
Eye patches, sterile	4
Tissues, box of	1
Air-sick bags	4
Tongue depressors	4
Cutting shears with protective tip	1
Water-soluble lubricant	4 oz
Eye protection, transparent, for medical attendants	4
Personal protective equipment for blood/body fluid clean-up, including:	
Disposable (one-use) plastic gloves	4
Body fluid-resistant gown	4
Blood/body fluid clean-up kit	1

TABLE 3 Musculoskeletal Appliances Color/Numerical Code—Yellow and 3

Item	Quantity
Spinal immobilization device, long	1
Spinal immobilization device, short	1
Traction splint, adult and pediatric or a combination, each	1
Immobilization devices, upper and lower extremity, non-pneumatic	2 each
Cervical spine immobilization device for adult, child and infant, each	1

TABLE 4 Miscellaneous Medical Equipment

Item	Quantity
Stethoscope with bell and diaphragm	1
Blood pressure cuffs, adult, obese and pediatric, each	1
Sphygmomanometer	1
Childbirth kit, emergency, disposable, sterile	1
Flashlight	1
Blanket	1
Sterile irrigation fluid, liters	2
Semi Automatic Defibrillator	1

NOTE—BLS Equipment that may affect the safety of flight or in-flight patient care shall be tested by an independent accredited laboratory for compliance with appropriate standards listed in Section 2 of the Standard Specification for Rotary Wing Basic Life Support Air Ambulances.

9.1.1 *Flight Crew Isolation*—The flight crew compartment shall be isolated throughout the medical mission such that:

9.1.1.1 The medically related activities do not interfere with the safety of the occupants and the safe operation of the aircraft.

9.1.1.2 The flight crew, flight controls, throttles, and radios are physically protected from any intended or accidental interference by the supine patient, air-medical crewmembers, or equipment and supplies.

9.1.1.3 A blackout curtain, or equivalent, shall be immediately available to the pilot, when needed, to protect the pilot's out-of-aircraft and flight deck vision from the reflections of cabin lighting, without interruption of adequate illumination for patient care. Such curtain or equivalent must not interfere with safe operation of the aircraft or the viewing of instrumentation.

9.2 *Patient Envelope*—Adequate cabin space shall be available to enable the 95th-percentile American adult male air-medical crewmember to perform basic life support care on a 95th-percentile American adult male.

9.2.1 Adequate cabin space shall be construed to mean that the complete basic life support intervention can be initiated on the primary patient including, but not limited to, cardiopulmonary resuscitation (CPR) performed according to American Heart Association standards.

9.2.2 The patient envelope requires a minimum rectangle of space, above the stretcher, free of all projections and encumbrances, 18 in. (45.7 cm) wide, 28 in. (71.1 cm) high and 30 in. (76.2 cm) long. There shall be an additional contiguous envelope of space, 18 in. (45.7 cm) wide, 18 in. (45.7 cm) high and 42 in. (106.7 cm) long to accommodate the lower extremities of the patient. See Fig. 1.

9.2.3 The cabin shall have an FAA approved seat for each air-medical crewmember, within the area shown in Fig. 2. The allowable area, as shown, has a mandatory space extending from the head of the stretcher a minimum of 18 in. (45.7 cm) toward the foot and a minimum of 14 in. (35.6 cm) in width, to permit access for treatment to the patient's head and torso.

9.2.4 Two or more patients may be carried on the same mission if they are within the aircraft's weight and balance limitations and if approved accommodation and security devices, and the appropriate medical equipment and supplies are available. However, the presence of the other patient(s) must not hinder the air-medical crewmember's ability to initiate and maintain full basic life support intervention procedures to the primary patient.

9.3 *Equipment and Supplies Stowage Space and Accessibility*—In addition to the space required for the patient and air-medical crewmember, there shall be a minimum of 3 ft^3(0.085 m^3) of space designated on the rotary wing basic life support transport vehicle for the storage of basic life support supplies and equipment. The location is dictated by the priority given to items necessary to provide basic life support while in route.

9.4 *Night Operations*—For all activities involving night operations, away from FAA approved sites, the rotary wing basic life support air ambulance shall be fitted with an FAA approved, externally mounted searchlight of at least 300 000 cp and capable of being controlled by the pilot without removing his hands from the flight controls. It will have a minimum motion of 90° vertical and 180° horizontal.

9.5 *Environmental Control*—An environmental control system shall be available, capable of raising cabin temperature from 0 to 68°F (−17°C to 20°C), within 30 min, and maintaining it under expected regional operating conditions.

9.6 Fresh air ventilation shall be available during flight.

10. Installation Requirements

10.1 Installation requirements for the rotary wing basic life support air ambulance are as follows:

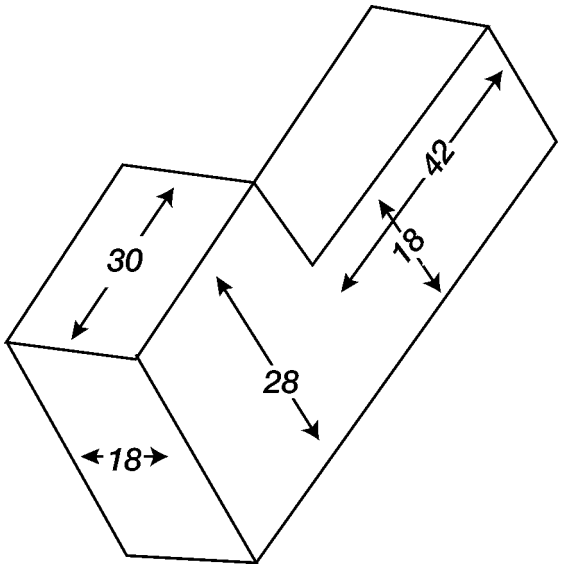

FIG. 1 Minimum Space for One Patient (dimensions are shown in inches)

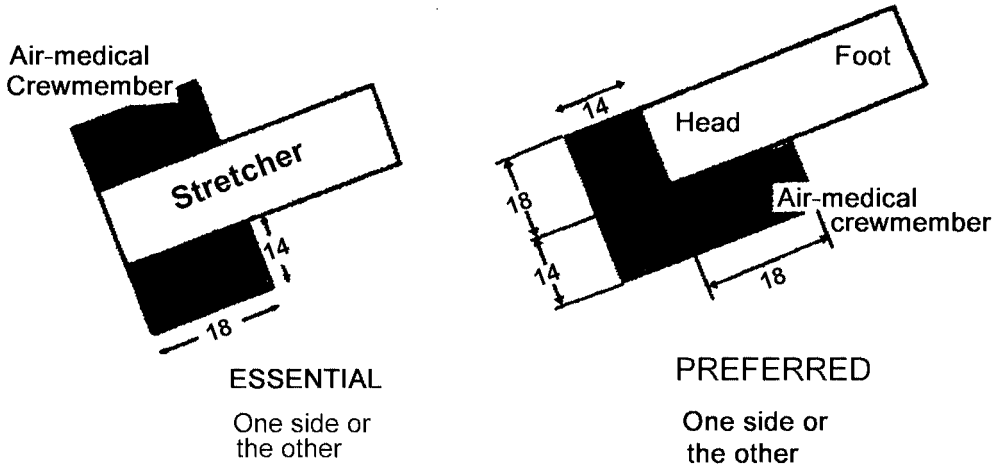

FIG. 2 Location and Minimum Space for One Air-Medical Crewmember

10.1.1 *General*—The complete configuration shall be approved for airworthiness by the appropriate agency. Such approval is based on:

10.1.1.1 Structural integrity and protection from impact hazards that meet or exceed the FAA standards.

10.1.1.2 An analysis of all the authorized equipment, to ensure that adequate power is available.

10.1.1.3 An airborne test report showing that the aircraft systems are not adversely affected by the use of installed and carry-on electrical medical equipment and also that the aircraft instrumentation and flight control systems do not interfere with the medical systems.

10.1.1.4 Tracking and positionable seats and stretcher systems shall be tested in every position that will be utilized in flight.

10.2 *Doors*—Entrances for patient loading shall be constructed so that under normal circumstances the stretcher does not require tilting or rotation around the pitch or roll axis.

10.3 *Seating and Stretcher Supports*—All additional seat structures, stretcher supports, and loading devices for the stretchers shall be manufactured and installed to meet or exceed published FAA requirements.

10.3.1 The aircraft shall have an FAA approved seat for each flight crew and air-medical crewmember.

10.3.2 The air-medical crew head-strike-envelope, as defined in USARTL-TR-79-22D, will be clear of all obstructions. The envelope is illustrated in Fig. 3.

10.4 *Restraint Devices*—Each seat shall be equipped with a torso restraint that meets the FAA Technical Service Orders C 114 and C-22F.

10.4.1 Each stretcher support shall have FAA approved provisions for securing as a minimum, a 95th-percentile adult American male patient. This consists of three individual restraints, across the chest, hips, and legs. If the patient is loaded either laterally or head forward, a shoulder harness shall also be provided.

10.4.2 Patients under 60 lb (27 kg), excluding transport incubator patients, shall be provided with an appropriately sized restraining device, which is further secured by an FAA approved locking device.

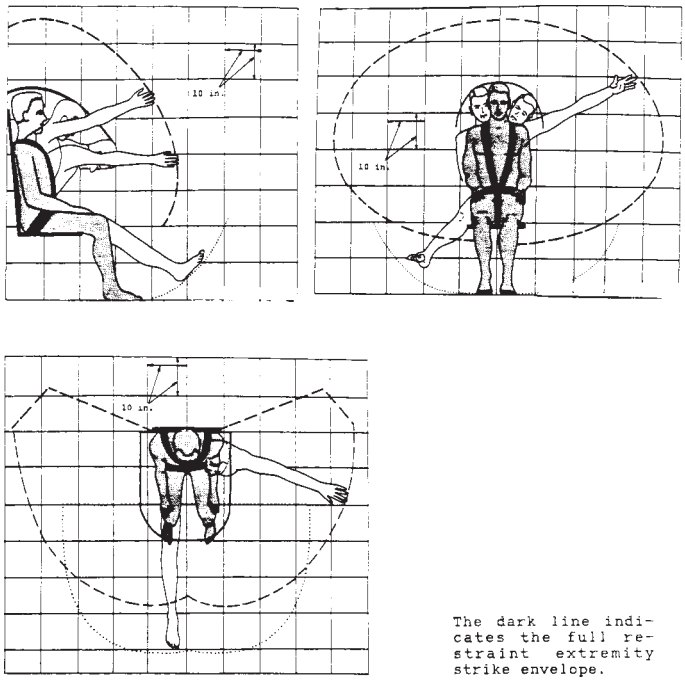

FIG. 3 USARTL-TR-79-22D Aircraft Crash Survival Design Guide

10.4.3 Patient restraints shall be used during flight. For injuries such as a severely burned lower torso, the thigh restraints may be loosely fastened. The chest restraint may be moved or loosened during critical medical procedures in the chest area.

10.5 *Materials*—All materials, including seat covers, curtains, stretchers, stretcher mattresses, see-through drawer fronts, and drug packs shall meet the FAA standards for flammability. They shall be washable and capable of being disinfected in accordance with Occupational Safety and Health Administration (OSHA) standards for blood borne pathogens.

10.6 *Interior Fixtures*—The interior fixtures, including the cabinets and drawers and their latches, meet FAA standards.

10.6.1 Storage cabinets, drawers, and kits shall be easy to open but will not come open, on their own, in flight or on landing. Drawers shall be removable for cleaning. For rapid identification of contents, see-through fronts may be provided.

10.6.2 All containers and carry-on cases will be coded or labeled so that the users can quickly identify the general content. The following color/numerical coding will be used:

Green 1—Oxygen delivery and airway management equipment
White 2—Bandages and medical supplies
Yellow 3—Musculoskeletal appliances

10.6.3 The colors and numbers may be used separately or in combination.

10.6.4 Two hooks shall be available to support two intravenous systems above or immediately adjacent to the patient.

10.6.5 All installed and carry on medical equipment, will be properly secured in all phases of flight. Access to drug cases and supply drawers, etc. will be of immediate nature and resecured as soon as possible.

10.7 *Medical Gas Systems*—The complete installation shall conform to FAA standards.

10.7.1 *Cylinders*—All medical gas cylinders without valves will meet the requirements of CFR 49 or Military Specifications. If cylinders are purchased with valves they must incorporate the standards in 10.7.2.

10.7.2 *Medical Gas Cylinder Valves*—All valves shall meet Military Specifications, or FAA approved commercial aviation valves and CGA 346 for air service.

10.8 A shut-off will be provided for each installed system of medical gases that contain oxygen, accessible to the pilot in flight. The shut-off mechanism can be activated either electrically or mechanically and will stop the gas flow within 8 in. (20 cm) of the cylinder head.

10.8.1 *Fittings*—All fittings shall meet Military Specifications, National Aerospace standards or shall be a gageable, flairless, ferruled fitting with the manufacturer's warranted certification for pressure, proof, and burst testing.

10.8.2 *Medical Gas Lines*—Non-flexible medical gas lines shall meet Military Specifications (MS) and National Aerospace Standards (NAS) or Federal Aviation Administration (FAA) standards. All flexible medical gas lines, regardless of the manufacturer or service pressure must be replaced every three years. Low pressure flexible oxygen lines that do not meet MS, NAS, or FAA standards will not be installed upstream from the cabin oxygen outlet panel. Low pressure Underwriters Laboratories (UL) approved or other color-coded hospital hoses may not be installed behind any partitions or equipment and must be 100 % visible during normal operations.

10.8.2.1 All lines shall be adequately supported to prevent chafing and fatigue due to vibration.

10.8.2.2 Color coding of the installation of medical gases will conform to MIL-STD-101.

10.8.3 *Flow Meters*—All medical gas flow meters shall meet standards of the Compressed Gas Association or the Underwriters Laboratories, Military Specifications, National Aerospace Standards.

10.8.3.1 All medical gas flow meters and regulators located in the cabin will be recessed, not to protrude beyond the surface of the cabinet/panel structure, or will have a protective barrier to prevent injury to occupants.

10.8.4 *Medical Gas Outlets*—All medical gas outlets shall be the positive shut-off type. Diameter Index Safety System (DISS) components will be used. Each outlet will be clearly marked to identify the gas.

11. Communications

11.1 The flight crew shall have direct communication with the aviation controlling agency, ground medical units and the EMS coordination/dispatch center.

11.2 Communication equipment and its installation shall meet FAA standards.

11.3 Flight following or communications, or both, should be maintained with the air ambulance during each mission at specified intervals, not to exceed 20 min.

12. Safety Requirements

12.1 *Smoking*—"No Smoking" signs will be prominently displayed inside the cabin and on the outside of the aircraft. The latter will be easily visible to the non-transport personnel who may be required to work in the vicinity of the aircraft.

12.2 *Medical Gases*—High pressure containers and lines should not be positioned in the scatter zone of the engine turbine wheels, unless adequate protection is provided, to prevent penetration by turbine blade and wheel parts.

12.3 *Smoke Detector*—An FAA approved smoke detection device shall be installed in the compartment occupied by the oxygen cylinders, when separate from the occupied space.

12.4 *Safety Apparel*—Transport personnel who are required on board in order to meet this specification, will wear appropriate protective clothing and equipment.

12.5 *Survival Gear*—Survival gear, applicable to the needs of the area of operation, and the number of occupants, will be carried on board. It will be appropriately maintained.

13. Maintenance of Medical Equipment and Supplies

13.1 Linens, blankets, covers, mattresses, and all equipment coming in contact with a patient shall be cleaned and where necessary disinfected in accordance with OSHA standards before re-use.

13.2 All pieces of medical equipment and supplies used in rotary wing operations shall be maintained in accordance with the manufacturers' recommendations. Maintenance records will show that the required maintenance has been performed.

ANNEXES

(Mandatory Information)

A1. ADVANCED LIFE SUPPORT (ALS) ANNEX

Standard Specification for Rotary Wing Advanced Life Support Air Ambulances

(Formerly ASTM Designation: F 1124 – 91)

INTRODUCTION

This specification covers the provisions of the specification for rotary wing basic life support air ambulances plus the additional requirements for the rotary wing advanced life support air ambulances contained in this ALS Annex.

This ALS Annex sets forth additional minimum provisions for rotary wing advanced life support air ambulances. It is emphasized that the requirements contained in these specifications are minimums. Additional personnel, equipment, and supplies can be carried at any time, providing the stated minimums are not violated.

A unit, staffed and equipped as specified in this specification, will be capable of meeting today's accepted standard of advanced life support.

1. Scope

1.1 This ALS Annex pertains to rotary wing air ambulances involved in patient transportation and care at the advanced life support level. It outlines the minimum requirements, in addition to those in specification for rotary wing basic life support air ambulances, that must be met before the unit can be classified as an advanced life support transport unit.

4. Significance and Use

4.1 The intent of this specification is to define a unit, a suitable vehicle with the proper personnel, equipment and supplies, that will provide patient care, at least to national standards for advanced life support, throughout the medical mission.

4.1.1 It applies to all the medical activities that involve rotary wing transportation at the advanced life support level, including on-scene work and interhospital transfer.

5. Classification

5.1 Air ambulance providers will use the title "Rotary Wing Advanced Life Support Air Ambulance" to indicate that the minimums contained in the specification for rotary wing basic life support air ambulance and the provisions of this ALS Annex have been met.

6. General Requirements

6.1 The rotary wing advanced life support air ambulance shall consist of the rotary wing medical transport vehicle, transport personnel and patient care equipment, and supplies in accordance with this specification.

6.3 To comply with this specification, the rotary wing advanced life support air ambulance must be part of a designated medical control system, as described in Practice F 1149.

6.5 The specific aircraft and personnel that have been State licensed (or equivalent) as part of the unit, will be available for the medical mission as stated in the Resources Catalog. The aircraft will be configured to accept the personnel, patient, and supplies as stated. The equipment and supplies as listed in the Resources Catalog may be in the aircraft or held in readiness in an airworthy condition, in a specific location. More than one team and set of equipment and supplies may be provided for any particular aircraft, in more than one location, providing they each meet the specification criteria. The aircraft must have both the equipment and supplies and air-medical personnel on board prior to patient transport as an advanced life support air ambulance.

6.7 The rotary wing aircraft that responds to the medical mission as a rotary wing advanced life support air ambulance shall be capable of performing as stated in the Resources Catalog.

6.8 The rotary wing advanced life support air ambulance shall be capable of transporting one supine patient inside the cabin and shall have sufficient space to allow the performance of medical treatment at the advanced life support level, en route to definitive care. At least one qualified advanced life support air-medical crewmember, as defined in Guide F 1229, shall accompany each patient, and have access to the patient at all times. Advanced life support equipment and supplies shall be carried on board to be accessible for use during patient transport, and to provide emergency care at the scene.

NOTE A1.1—ALS equipment that may affect the safety of flight or in-flight patient care shall be tested by an independent accredited laboratory for compliance with appropriate standards listed in Section 2 of the specification for rotary wing basic life support air ambulances.

6.9 The rotary wing advanced life support air ambulance shall be capable of departing directly to the requested site under the flight conditions and during the h of operation stated in the Resources Catalog.

7. Personnel

7.1 The minimum personnel requirement for the rotary wing advanced life support air ambulance shall be the FAA required flight crew, and for each patient, one advanced life support air-medical crewmember, with accommodation for a second attendant, as required and defined in Guide F 1229.

7.2 *Air-Medical Crewmembers*—The minimum air-medical crew for the rotary wing advanced life support air ambulance shall be one advanced life support air-medical crewmember, as defined in Guide F 1229, for each patient. Accommodation for a second medical attendant, with access to the primary patient, will always be available.

7.3 In addition to the advanced life support medical requirement, the air-medical crewmember shall be responsible to the pilot for the in-flight security of the patient and the security of the medical equipment and supplies throughout the medical mission. Responsibilities also include assisting the pilot with evacuation procedures.

8. Patient Care Equipment and Supplies

8.1 Requirements for the rotary wing advanced life support transport unit are as follows:

8.1.2 *Medical Equipment and Supplies*—In addition to the medical equipment and supplies listed in Tables 1-4 of the specification for rotary wing basic life support air ambulances, as a minimum, the items in Table A1.1 (ALS) through (ALS) shall be carried on board the rotary wing advanced life support air ambulance:

8.1.2.2 *Medical Gas Delivery and Airway Management Equipment*—See Table A1.1 (ALS).

8.1.2.3 *Bandages and Medical Supplies*—See Table A1.2 (ALS).

8.1.2.4 *Musculoskeletal Appliances*—See Table A1.3 (ALS).

8.1.2.5 *Miscellaneous Medical Equipment*—See Table A1.4 (ALS).

8.1.2.6 *Medications*—The minimums to be carried shall be in compliance with national standards as determined by the medical director.

8.1.2.7 *Installed Suction Aspirator System*—An electrically powered suction aspirator system shall be furnished. The system shall include the following elements: an electric vacuum pump; an illuminated power switch; a panel-mounted connector; a means to adjust and display vacuum; a collection canister; interconnecting hoses and fittings. Major system components shall be clearly marked with manufacturer's name, address, and any applicable standards ratings. The system may consist of a prepackaged module or discrete components. If discrete components are assembled to construct the system, they shall be assembled and tested by a FDA-registered medical device manufacturer in accordance with U.S. FDA QSR requirements. The following characteristics apply, as

TABLE A1.1 ALS Medical Gas Delivery and Airway Management Equipment Color/Numerical Code—Green

Item	Quantity
Oxygen outlet	1
Nasal cannulas, medium and small, each	1
Endotracheal tubes, neonate, pediatric and adult	1each
Magill forceps	1
Laryngoscope, handle with adult, child and infant blades, both curved and straight	1each
Ventilator	1

NOTE—ALS Equipment that may affect the safety of flight or in-flight patient care shall be tested by an independent accredited laboratory for compliance with appropriate standards listed in Section 2 of the Standard Specification for Rotary Wing Basic Life Support Air Ambulances.

TABLE A1.2 ALS (same as BLS) Bandages and Medical Supplies Color/Numerical Code—White and 2

Item	Quantity
Sheets	2
Bandages, triangular	4
Safety pins	6
Trauma dressings, sterile	4
Dressings, 4 by 4, sterile	24
Bandages, 1 by ¾ in., adhesive	12
Tape, 2 in. (or more) by 5 yd, adhesive, rolls	2
Tape, adhesive, 1 in. by 5 yd, roll	1
Bandage, gauze, roller soft sterile, 4 in. wide (or more) rolls	4
Bandage, elastic, 3 in. wide (or more), non-sterile, rolls	2
Alcohol preps, disposable	24
Dressings, 3 by 8 in. (or larger), sterile petroleum gauze	2
Gloves, examination, pairs	8
Surgical face masks, disposable (meets NIOSH N95 requirement)	2
Eye patches, sterile	4
Tissues, box of	1
Air-sick bags	4
Tongue depressors	4
Cutting shears with protective tip	1
Water-soluble lubricant	4 oz
Eye protection, transparent, for medical attendants	4

TABLE A1.3 ALS Musculoskeletal Appliances Color/Numerical Code—Yellow and 3

Item	Quantity
Adjunct cervical spine immobilization devices, for adult, child, and infant (for use with cervical collars to provide lateral stabilization)	1 each

TABLE A1.4 ALS Miscellaneous Medical Equipment

Item	Quantity
Cardiac monitor/defibrillator with adult paddles and appropriate accessories—as provided by local medical control	1
Vital Signs Monitor—as provided by local medical control	1

NOTE—ALS Equipment that may affect the safety of flight or in-flight patient care shall be tested by an independent accredited laboratory for compliance with appropriate standards listed in Section 2 of the Standard Specification for Rotary Wing Basic Life Support Air Ambulances.

applicable, to prepackaged modules; and apply entirely to discrete component systems.

(*1*) The vacuum pump shall be located in an area that is accessible for maintenance, but sound and vibration insulated from the patient area. Its exhaust shall be vented to the aircraft's exterior to protect patient area occupants and maintenance personnel from expelled aerosols. Electrical wiring between the power source, illuminated power switch, and vacuum pump and tubing and fittings between the vacuum pump, panel-mounted connector, and exhaust, shall be securely mounted yet readily accessible to maintenance personnel. The electrically powered suction aspirator system shall be electromagnetic radiation suppressed in accordance with requirements set forth elsewhere within this specification.

(*2*) The illuminated power switch shall be appropriately rated to handle the vacuum pump current under maximum load and have a safety margin of at least 25 %.

(*3*) The panel-mounted connector shall be clearly labeled "VACUUM". Diameter Index Safety System (DISS) quick-disconnects are acceptable for use, as are proprietary type quick-disconnects as long as their use does not preclude the complete system from meeting the vacuum, free air flow, and pump down time requirements cited below.

(*4*) A means to adjust and display vacuum shall be supplied. It shall attach to the panel-mounted connector via tubing, or via quick-disconnect that attaches to a corresponding panel-mounted quick-disconnect. It shall permit a user to limit the maximum deliverable vacuum and to discontinue aspiration instantly. The outside diameter of the vacuum indicator gage shall be 76 ± 13 mm (3 ± 0.5 in.), have numerical markers at least every 100 mm Hg, and a total range of 0 to 760 mm Hg. Hospital-type vacuum regulators capable to meeting the vacuum, free air flow, and pump down time requirements cited below shall be acceptable.

(*5*) The collection canister shall be disposable, non-breakable, transparent, and have a minimum capacity of 1000 mL. It shall be securely mounted adjacent to the vacuum adjust/display. Collection canisters shall be equipped with a shutoff means by which to prevent overflow aspirate from entering other system components and include an integral bacterial filter. Reusable canisters having similar properties are acceptable, but should be discouraged from use to limit risk from cross contamination.

(*6*) All components, electrical, vacuum, and other lines and accessories, shall be securely mounted yet readily accessible. The aspirator system shall provide a free airflow of at least 30 L/min and achieve a minimum of 300 mm (11.81 in. Hg) vacuum within 4 s after the suction tube is closed. To ensure high air flows and free passage of aspirate, minimum inside diameters of all suction tubing and tubing connectors shall be a least 6.4-mm (¼ in.).

(*7*) The following accessories shall be furnished: one 6 ft length of non-kinking suction tubing, which will not collapse at high vacuum levels; one spare collection canister (if a disposable canister is provided.

8.2 Adequate supplies of medications, drugs, and administrative devices approved for use by advanced life support personnel, for the management of patients, as approved by the EMS system's medical director shall be carried on board.

8.3 All items will be readily accessible and all will have provisions for easy and secure stowage. All items likely to be required outside the rotary wing transport will be packaged so that they can be carried to the patient.

NOTE A1.2—ALS Equipment that may affect the safety of flight or in-flight patient care shall be tested by an independent accredited laboratory for compliance with appropriate standards listed in Section 2 of the specification for rotary wing basic life support air ambulances.

8.4 *Lighting:*

8.4.1 In the patient compartment, normal white lighting shall be available over each patient's head and torso. It will be at least 35 fc at patient level.

8.4.2 The pilot shall be provided with an emergency over-ride switch for patient compartment lighting.

9. Vehicle Configuration

9.1 Requirements for the rotary wing advanced life support air ambulance are those set forth for the rotary wing basic life support air ambulance plus the following requirements:

9.2.4 Two or more patients may be carried on the same mission if within the aircraft's weight and balance limitations and if approved accommodation, security devices, and medical care equipment and supplies are available. However, the presence of the other patient(s) must not hinder the air-medical crewmember's ability to initiate and maintain full advanced life support intervention procedures for the primary patient. The other patient(s) may have already received life support intervention but in the medical judgment of the senior air-medical crewmember, must not be likely to require cardiopulmonary resuscitation en route unless adequate space and qualified air-medical crewmembers are available.

9.3 *Equipment and Supplies Stowage Space and Accessibility*—In addition to the space required for the patient and air-medical crewmember, there shall be a minimum of 5 ft^3 (0.14 m^3) of space designated on the rotary wing advanced life support air ambulance for the storage of advanced life support supplies and equipment. The location is dictated by the priority given to items necessary to cope with life- threatening conditions at the scene and in transit. Thus, the equipment and supplies necessary for airway care, artificial ventilation, oxygenation, and suction are within reach near the head of the patient and those for cardiac resuscitation, control of external hemorrhage, administration of intravenous agents, and the monitoring of blood pressure are readily available at the side of the patient.

10. Installation Requirements

10.1 Installation requirements for the rotary wing advanced life support air ambulance are those set forth for the rotary wing basic life support air ambulance plus the following:

10.1.1.2 An analysis of all the authorized advanced life support equipment to ensure that adequate power is available.

10.4.1 Each stretcher support shall have FAA approved provisions for securing as a minimum, a 95th-percentile adult American male patient. This consists of three individual restraints, across the chest, hips, and legs. If the patient is loaded either laterally or head forward, a shoulder harness shall also be provided.

10.6.2 All containers and carrying cases will be coded so that the users can quickly identify the general content. The following color and numerical coding will be used:

Green 1—Oxygen delivery and airway management equipment
White 2—Bandages and medical supplies
Yellow 3—Musculoskeletal appliances
Blue 5—Intravenous access, needles and syringes
Red and Black Stripe 6—ALS medications

11. Communications

11.1 In addition to the requirements for rotary wing basic life support air ambulances, the following requirements apply to rotary wing advanced life support air ambulances:

11.1.1 An electronic audio system shall be installed to provide intercommunication for all transport personnel within the unit.

12. Safety Requirements

12.1 The provisions of Section 12 of the specification for rotary wing basic life support air ambulances apply.

A2. SPECIALIZED MEDICAL SUPPORT (SMS) ANNEX

Standard Specification for Rotary Wing Advanced Life Support Air Ambulances

(Formerly ASTM Designation: F 1146)

1. Scope

1.1 This specification pertains to rotary wing air ambulances involved in patient transportation and care at the specialized medical support level. It outlines the minimum requirements, including personnel and the patient care equipment and supplies that must be met before the unit can be classified as a rotary wing specialized medical support air ambulance.

3. Terminology

3.1 Definitions contained in Section 3 of the specification for rotary wing basic life support air ambulances apply to this annex.

6. General Requirements

6.1 The rotary wing specialized medical support air ambulance shall consist of the rotary wing aircraft, medical, transport personnel and patient care equipment, and supplies in accordance with this specification.

6.3 To comply with this specification, the rotary wing specialized medical support air ambulance must be a part of a designated medical control system, as described in Practice F 1149.

6.7 The rotary wing specialized medical support air ambulance shall be capable of transporting the patients, medical team, and medical equipment and supplies for the designated specialized medical mission. It has onboard the provisions for the requested patients, medical equipment, and supplies. It provides the space to allow the performance of the specialized medical care mission, and medical treatment at the advanced life support level. At least one advanced life support air-medical crewmember, as defined in Guide F 1229, accompanies each patient, and has access to the patient at all times. Additional personnel will be dictated by each specialized medical mission.

6.8.1 Appropriate Advanced Life Support and specialized medical support equipment and supplies shall be available as needed to provide emergency care at the patient pick-up point. They will be accessible for use during patient transport.

NOTE A2.1—ALS and SMS Equipment that may affect the safety of flight or in-flight patient care shall be tested by an independent accredited laboratory for compliance with appropriate standards listed in Section 2 of the specification for rotary wing basic life support air ambulances.

6.9 The rotary wing specialized medical support air ambulance shall be capable of departing directly to the requested site under the flight conditions and during the h of operation stated in the Resources Catalog.

7. Personnel

7.1 The minimum personnel requirement for the rotary wing specialized medical support air ambulance shall be the flight crew, and for each patient, one advanced life support air-medical crewmember, with accommodation for a second attendant, as required and defined in Guide F 1229, plus additional or alternative specialized medical support personnel and equipment as dictated by each specialized medical mission.

7.1.1 The minimum flight crew for the rotary wing specialized medical air ambulance shall be the FAA flight crew requirement, for the type of aircraft and the flight plan parameters, under the applicable Federal Aviation Regulations. The pilot shall be appropriately rated.

10. Installation Requirements

10.1 Installation requirements for the rotary wing specialized medical support air ambulance are those set forth for the rotary wing advanced life support air ambulance plus the following:

10.1.1.2 An analysis of all the authorized specialized medical support equipment to ensure that adequate power is available.