Designation: F2318 – 15

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 F2318; 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 pertains to fixed (airplanes) and rotary-wing (helicopters) aircraft used for prehospital emergency medical care and transportation of patients by air, collectively air ambulances. It outlines the minimum requirements, including personnel, patient care equipment, and supplies that shall be met before the aircraft can be classified as an air ambulance.

1.2 Recommendations for basic life support (BLS) air ambulances are contained in the first part of this specification that defines the minimum requirements for aircraft configuration and capability, the minimum number of seats for personnel, and the minimum medical equipment and supplies.

1.3 Recommendations for advanced life support (ALS) air ambulances include the first part of this specification that defines the minimum requirements for aircraft configuration and capability, the minimum number of seats for personnel, and the minimum medical equipment and supplies. Additional requirements for ALS are found in Annex A1.

1.4 Recommendations for specialized medical support (SMS) air ambulances include those for BLS and may include some or all of the ALS requirements that define the minimum requirements for aircraft configuration and capability, the minimum number of seats for personnel, and the minimum medical equipment and supplies. Additional requirements for SMS air ambulances are found in Annex A2.

1.5 In this specification, minimum requirements for air ambulances providers are identified, however, ambulance services, under the direction of their medical director, are encouraged to use them as a core list and adjust their configuration or manifest or both according to their mission profile and patient population.

1.6 *Units*—The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.7 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

F1149 Practice for Qualifications, Responsibilities, and Authority of Individuals and Institutions Providing Medical Direction of Emergency Medical Services

F1229 Guide for Qualification and Training of EMS Air Medical Patient Care Providers

2.2 *AHA Standard:*[3]

2010 Guidelines for CPR and ECC

National EMS Scope of Practice Model DOT HS 810 657 (current 2/2007)[4]

CAMTS: 9th Edition Accreditation Standards of the Commission on Accreditation of Medical Transport System, approved August 2012

Association of Air Medical Services (AAMS) Model State Guidelines, first edition approved 2012

2.3 *CGA Standards:*[5]

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

[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] Available from the American Heart Association, ahajournals.org.

[4] http://www.ems.gov/education/EMSScope.pdf

[5] Available from the Compressed Gas Association, 14501 George Carter Way, Suite 103, Chantilly VA 20151-2923.

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

2.4 *ADAMS Document:*[6]
Atlas and Database of Air Medical Services Resource Document

2.5 *UL Standard:*[7]
UL 60601-1 Standard for Safety—Medical Electrical Equipment—Part 1: General

2.6 *ISO Standard:*[8]
ISO 10079-1 Medical suction equipment—Part 1: Electrically powered suction equipment—Safety requirements

2.7 *Military Standards:*[9]
MIL-STD-101 Color Code for Pipelines and for Compressed Gas Cylinders
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-810 Environmental Test Methods and Engineering Guidelines
MIL-STD-1472 Human Factors

2.8 *Federal Standards:*[9]
FAA Order 8400.10, Vol. 4, Chapter 5 Air Ambulance Operations FAA Technical Standard Orders C-22g Safety Belts, and C114 Torso Restraint Systems
14 CFR Chapter 1 Federal Aviation Administration (FAA) Rules and Regulations, Parts 1-49 and 61-139; specifically, Subpart 135.19—Emergency Operations
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
49 CFR 238.5 Title 49 – Transportation; Subtitle B – Other Regulations Relating to Transportation; Chapter II – Federal Railroad Administration, Department of Transportation; Part 238 – Passenger Equipment Safety Standards
Joint En Route Care Equipment Testing Standard (JECETS), March 2012, U.S. Army Aeromedical Research Laboratory and U.S. Air Force Aeromedical Branch
USARTL-TR-79-22D Aircraft Crash Survival Design Guide

3. Terminology

3.1 *Definitions Relating to Aircraft:*

3.1.1 *air ambulance, n*—aircraft, rotary or fixed-wing, that is capable of meeting the standard for a medical transport unit if the requisite personnel, equipment, and supplies are added and it does not include the personnel and the onboard medical equipment.

3.1.2 *fixed wing aircraft (airplane), n*—aircraft that uses the lift generated by the airflow over fixed wings to take off and land on a prepared landing strip.

3.1.3 *rotary wing aircraft (helicopter), n*—aircraft that uses a rotor system to take off and land vertically; they include helicopters and tiltrotor aircraft.

3.2 *Definitions Relating to Communications:*

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

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

3.2.3 *medical communication equipment, n*—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.

3.2.3.1 *Discussion*—It includes voice communication with public service and medical ground units, selected medical control, and emergency medical services (EMS) systems dispatch centers. It can include equipment for the transmission of graphical data.

3.3 *Definitions Relating to Documentation:*

3.3.1 *national air ambulance, n*—document produced in accordance with the format that is contained in the ADAMS resource document.

3.3.1.1 *Discussion*—The format is a guideline so that the catalog will contain standardized, comparable data on existing air ambulances. The short title ADAMS may be used when the meaning is clear.

3.4 *Definitions Relating to the Mission:*

3.4.1 *advanced life support level*—transport of a patient who receives care during an interfacility or scene response commensurate with the scope of practice of an Paramedic as defined in NHS. An advanced life support (ALS) mission is defined as the transport of a patient from an emergency department, critical care unit or scene who receives care commensurate with the scope of practice of a paramedic. The medical team shall at a minimum consist of one certified EMT-Paramedic as the primary care provider (National EMS Scope of Practice DOT HS 810 657).

3.4.1.1 *Discussion*—There are adequate personnel to provide full coverage with EMT-Paramedics who are primarily assigned to the medical service and are readily available within the response time determined by the service (if the majority of transports are ALS missions) (9th Edition CAMTS 8/20/2012).

3.4.2 *basic life support level, n*—The transport of a patient who receives care during an interfacility or scene response that

[6] http://www.adamsairmed.org/public_site.html
[7] Available from the Underwriters Laboratories, Corporate Progress, 333 Pfingsten Rd., Northbrook, IL 60062.
[8] Available from the American National Standards Institute, 25 W. 43rd St., New York, NY 10036.
[9] Available from the U.S. Government Printing Office, Superintendent of Documents, 732 N. Capital St., NW, Washington, DC 20402-0001.

is commensurate with the scope of practice of an EMT or Advanced EMT as defined (National EMS Scope of Practice DOT HS 810 657)

3.4.3 *category, n*—level of patient care relating to the capability of the air medical transport unit.

3.4.3.1 *Discussion*—There are various levels including, but not limited to, basic life support (BLS), advanced life support (ALS), and specialized medical care.

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

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

3.4.6 *declared service area, n*—area designated by the air ambulance provider where the air medical transport unit is operationally capable of response.

3.4.6.1 *Discussion*—It includes predefined limits in range, altitude and weather, over water, instrument flight, and day/night capability.

3.4.7 *fixed-wing air ambulance, n*—fixed wing medical transport vehicle, the crew, and on-board equipment that meets the standard for the named category.

3.4.8 *fixed-wing advanced life support air ambulance, n*—unit that meets the standard described in Annex A1.

3.4.9 *independent accredited testing laboratory, n*—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.

3.4.10 *medical crew/crewmembers, n*—personnel responsible for patient care with sufficient training as applicable to the scope of service required during transport via ground or air ambulance.

3.4.11 *medical mission, n*—accepted medical flight from the initial notification to the completion or cancellation.

3.4.12 *specialized medical support level of patient care, n*—transport of a patient requiring specialty patient care (neonatal, pediatric, perinatal, and so forth) by one or more professionals who can be added to the medical transport team as necessary.

4. Significance and Use

4.1 This specification defines an air ambulance that, together with the specified personnel, equipment, and supplies, will provide patient care, at least to national standards for BLS, throughout the medical mission.

4.1.1 It applies to all the medical activities that involve air ambulance operation at the BLS level, including on-scene work and inter-hospital transfer.

4.1.2 See Annex A1 as well as Annex A2 for additional information on ALS and SMS air ambulances.

4.2 Application of this specification will ensure that the air ambulance will be able to provide patient care to recognized standards of care. Defining and implementing minimum requirements for various ambulances' known minimum capability will also 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; and

4.3.4 Consistent criteria permitting performance and cost-effectiveness comparisons.

5. Classification

5.1 Air ambulance providers shall reference this specification to indicate that the minimums for configuration, equipping, and training contained in this specification have been met. Section A1.6 describes ALS requirements and A2.3 describes SMS requirements.

6. General Requirements

6.1 The fixed-wing BLS air ambulance shall consist of three components: *(1)* the fixed-wing medical transport vehicle (airplane), *(2)* transport personnel, and *(3)* patient care equipment and supplies in accordance with this specification and medical service's mission statement and scope of practice. Medical supplies, treatment procedures, crew and training requirements are the direct responsibility of the Medical Director (National EMS Scope of Practice DOT HS 8 10 657).

6.1.1 The aircraft shall be configured for CPR (see 9.2.1).

6.2 The rotary wing BLS air ambulance shall consist of a rotary wing medical transport vehicle, the crew, and patient care equipment and supplies in accordance with this specification. The three components shall 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, and

6.2.2 Appropriate license or certificate for the aircraft under applicable federal aviation regulations.

6.3 To comply with this specification, the air ambulance BLS transport unit shall be part of a designated medical control system with medical direction provided by a medical director as described in Practice F1149.

6.4 The specific aircraft and personnel that have been state licensed (or equivalent) as part of the unit shall be available for the medical mission as stated in the ADAMS resource document. The aircraft shall be configured to accept the personnel and equipment as stated. The equipment as listed in Tables 1-4 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 mission requirements contained in the ADAMS resource document. The aircraft shall have both the medical crew and the medical equipment and supplies on board before patient transport as a BLS unit.

6.5 The aircraft that responds to the medical mission as a BLS air ambulance shall be capable of performing as stated in the ADAMS resource document.

6.6 The BLS 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

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

Item	Quantity
AED or semi-automatic defibrillator	1 each
Vital signs monitor	1 each
Oxygen mask, adult	2 each
Oxygen mask, child	1 each
Oxygen mask, infant	1 each
Key, oxygen valve	1 each
Tubing, oxygen connective/extension	2 each
Nasal cannulas, medium and small, each	1 each
Oxygen mask, non-rebreathing, adult and pediatric	1 each
Regulator, oxygen	1 each
Flowmeter, oxygen, capable of providing 0.0003- through 0.004-gal/min (1- through 15-L/min) flow, throughout all normal flight altitudes and attitudes	2 each
Artificial ventilation device (bag valve mask) capable of receiving oxygen through an inlet and delivering 80 to 100 % oxygen using a reservoir system. It shall be manually operated, self-refilling, provide for positive end-expiratory pressure (PEEP), and portable. Adult, child, infant sizes.	1 each
CPAP device that provides adequate monitoring of airway pressure, apnea, breathing rate, and tidal volume	1 each
Pulse oximeter with patient sensors for infants, children, and adults	1 each
Waveform capnography device	1 each
Sample line, nonintubated adult	1 each
Sample line, nonintubated pediatric	1 each
Suction device, portable: Suction shall meet the performance requirements of the Installed Suction Aspirator System (A1.8.1.1.1 (6)) and the collection container requirements found in ISO Standard 10079-1, section 59.11.1.	1 each
Suction catheters, flexible, set of sizes 6, 14, and 18 fr	1 each
Suction catheter, rigid	1 each
Suction connective tubing	1 each
Suction rinsing bottle, shatterproof	1 each
Portable oxygen cylinder containing at least the volume of a D cylinder	2 each
Set of oropharyngeal airways for neonates, pediatrics, and adults	1 each
Set of nasopharyngeal airways for pediatrics and adults	1 each
Alternative airways (such as LMA, Combitube, King Airway, and so forth) for adult, child, and infant that provide protection of the airway and positive pressure ventilation	2 each

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

Item	Quantity
Sheets	2 each
Bandages, triangular	4 each
Safety pins	6 each
Trauma dressings, sterile	4 each
Dressings, 4 by 4, sterile	24 each
Bandages, 1 by ¾ in. (2.5 by 2 cm), adhesive	12 each
Tape, 2 in. (5 cm) (or more) by 5 yd (4.6 cm), adhesive, rolls	2 each
Tape, adhesive, 1 in. (2.5 cm) by 5 yd (4.6 cm), roll	1 each
Bandage, gauze, roller soft sterile, 4-in. (10-cm) wide (or more) rolls	4 each
Bandage, elastic, 3-in. (7.6-cm) wide (or more), nonsterile, rolls	2 each
Alcohol preps, disposable	24 each
Dressings, 3- by 8-in. (7.6- by 20-cm) (or larger), sterile petroleum gauze	2 each
Gloves, examination, pair	8 each
Body fluid-resistant gowns	4 each
Hand sanitizer	1 each
Surgical face masks, disposable (meets NIOSH N95 requirement)	2 each
Eye patches, sterile	4 each
Tissues, box	1 each
Air-sick bags	4 each
Tongue depressors	4 each
Cutting shears with protective tip	1 each
Water-soluble lubricant 4 oz (113 g), or equivalent	1 each
Eye protection, transparent, for medical attendants	4 each
Blood/body fluid cleanup kit	1 each

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

Item	Quantity
Spinal immobilization device, long, as pertinent to the program scope of service	1 each
Spinal immobilization device, short	1 each
Traction splint, adult and pediatric or a combination, each	1 each
Immobilization devices, upper and lower extremity, non-pneumatic	1 each
Cervical spine immobilization device for adult, child, and infant	1 each

BLS level en route to definitive care. At least one qualified medical crewmember, as defined in Guide F1229, shall accompany each patient and have access to the patient at all times. BLS equipment and supplies shall be carried on board to be accessible for use during patient transport and provide emergency care at the scene.

NOTE 1—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 as determined by the JECETS standard.

6.7 The BLS air ambulance shall be capable of departing from its home base; proceeding directly to a designated landing strip, helipad, or landing zone for patient pickup; and then proceeding directly to a designated landing strip, helipad, or landing zone for patient delivery under the flight conditions and during the hours of operation stated in the ADAMS resource document. Continuity of medical direction (see 7.2)

TABLE 4 Miscellaneous Medical Equipment

Item	Quantity
Stethoscope with bell and diaphragm	1 each
Blood pressure cuffs, adult, obese, and pediatric	1 each
Sphygmomanometer	1 each
Childbirth kit, emergency, disposable, sterile	1 each
Flashlight or headlamp	1 each
Blanket	1 each
Sterile irrigation fluid, litre bottle	2 each
Penlights (package of six)	1 each

and medical care (see 7.4.2) shall be maintained throughout the duration of the patient pickup, transportation, and delivery to an appropriate destination as determined by the medical director.

6.8 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.

6.9 The air ambulance license/certification government authority may accept and record transient deviations for a particular air ambulance.

7. Personnel

7.1 The minimum personnel requirement for the BLS air ambulance shall be the FAA flight crew requirement for the aircraft and for each patient, one qualified medical crewmember, as defined in Guide F1229.

7.2 *Medical Director*—Each program shall have a medical director, as defined by Practice F1149, to supervise the medical operation of the unit. This individual shall be responsible for:

7.2.1 Providing medical oversight of the medical team that includes policies, protocols and training. This individual has the responsibility for all medical care provided.

7.2.2 Ensuring that the correct configuration of the aircraft, equipment, and supplies has been arranged for the types of missions accepted by the medical control physician as defined by the scope of service.

7.3 *Flight Crewmember:*

7.3.1 The minimum flight crew for the fixed wing BLS 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 *Medical Crewmembers*—The minimum air-medical crew for the fixed-wing BLS air ambulance shall be one basic medical crewmember, as defined in Guide F1229, for each patient.

7.4.1 In addition to the BLS medical requirement, the medical crewmember shall be responsible to the pilot in command for the in-flight security of the patient and the security of the medical equipment and supplies throughout the medical mission.

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

8. Patient Care Equipment and Supplies

8.1 Requirements for air ambulance BLS transport unit are as follows:

8.1.1 *Stretcher*—A minimum of one 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/compliance and shall be appropriate for the patient being transported.

8.1.1.1 The stretcher shall be large enough to carry the 95th-percentile adult American patient full length in the supine position as defined by 49 CFR 238.5.

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 CPR. If a backboard or equivalent device is required to achieve this, such device shall be readily available.

8.1.2 *Medical Equipment and Supplies*—At a minimum, the following items of medical equipment and supplies shall be available for deployment on a BLS 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 0.53 ft^3/min (~15-L/min) flow during patient transport for the declared service range plus the medical oxygen contained in the volume of at least two D cylinders as listed in Table 1.

(2) Flow Rate—The oxygen supply, whether stored as a liquid or compressed gas, shall use a pressure-reducing regulator preset to 50 ± 5 psig (345 ± 34.5 kPa) and capable of delivering a minimum flow of 3.53 ft^3/min (100 L/min).

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

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

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

8.1.2.4 *Musculoskeletal Appliances*—Minimums are shown in Table 3.

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

8.2 Supplies of medications and administrative devices approved for use by BLS 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 patient care items shall be readily accessible and shall have provisions for easy and secure stowage.

8.4 *Lighting:*

8.4.1 In the patient compartment, normal white lighting shall be available over each patient's head and torso. It shall be at least 35 fc (377 lux) at patient level. The lighting system shall also provide for visualization, examination, and treatment of the entire patient. The system shall also comply with FAA safety regulations.

8.4.2 A self-contained lighting system that has battery backup or a portable light that operated with a battery shall be immediately available.

8.4.3 In the absence of a blackout curtain or equivalent that prevents light from contaminating the cockpit area (see 9.1.1.3), the lighting system shall provide for a low-intensity level or red lighting that does not interfere with the operation of the aircraft.

8.4.4 Night vision goggles (NVG) (blue light for rotary wing aircraft) for programs that are using NVG.

9. Vehicle Configuration

9.1 Requirements for BLS air ambulance are as follows:

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; and

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 shall 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 BLS care on a 95th-percentile American adult male.

9.2.1 *Discussion*—Aequate cabin space shall be construed to mean that the complete BLS intervention can be initiated on the primary patient including, but not limited to, CPR performed according to American Heart Association 2010 standards allowing for both compression and emergency airway management.

9.2.2 The patient envelope requires a minimum rectangle of space, above the stretcher, free of all projections and encumbrances18 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 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 approved accommodation and security devices and the appropriate medical equipment and supplies are available. However, the presence of the other patient(s) shall not hinder the air-medical crewmember's ability to initiate and maintain full BLS 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 air ambulance for BLS

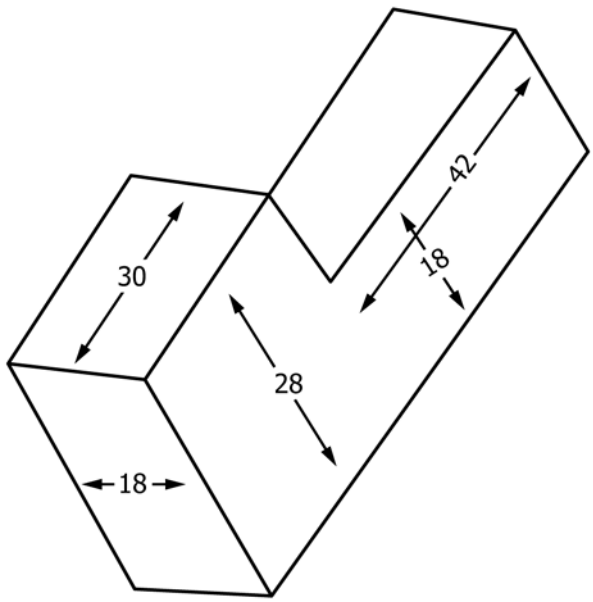

FIG. 1 Minimum Space for One Patient (Dimensions Shown in Inches)

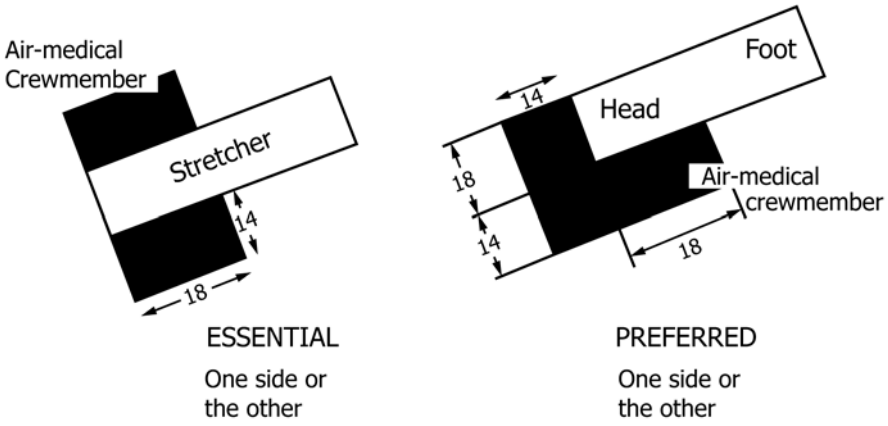

FIG. 2 Location and Minimum Space for One Air-Medical Crewmember

equipment and the storage of BLS supplies. The location is dictated by the priority given to items necessary to provide BLS while in route.

9.4 *Night Operations*—For all activities involving night operations, away from FAA-approved sites, the rotary wing BLS air ambulance shall be fitted with an FAA-approved, externally mounted searchlight of at least 300 000 cp (3 229 173 lux) and capable of being controlled by the pilot without removing his hands from the flight controls. It shall have a minimum motion of 90° vertical and 180° horizontal.

9.5 *Environmental Control:*

9.5.1 The interior of the aircraft shall be able to maintain climate control to avoid adverse effects on the patients and personnel on board. In the event that climate controls are not used, available, or adequate, the air medical service shall have a policy to compensate for adverse effects on patient cooling or warming measures (see AAMS document).

9.5.1.1 Cabin temperatures shall be measured and documented every 15 min during a patient transport until temperatures are maintained within the range of 50 to 95°F (10 to 35°C) using a thermometer that is mounted inside the cabin.

9.5.1.2 Written policies are available to address measures to be taken to avoid adverse effects of temperature extremes on patents and personnel on board.

9.5.2 In the event cabin temperatures are less than 50°F or greater than 95°F, the program shall require that documentation be flagged for the QM process to evaluate what measures were taken to mitigate adverse effects on the patient and personnel and what outcomes resulted.

10. Installation Requirements

10.1 Installation requirements for the BLS air ambulance are as follows:

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

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 (See JECETS and MIL-STD-461);

10.1.1.4 Tracking and positionable seats and stretcher systems shall be tested in every position that will be used 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, shall 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 C114 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 isolette patients, shall be provided with an appropriately sized restraining device, which is further secured by an FAA-approved locking device.

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

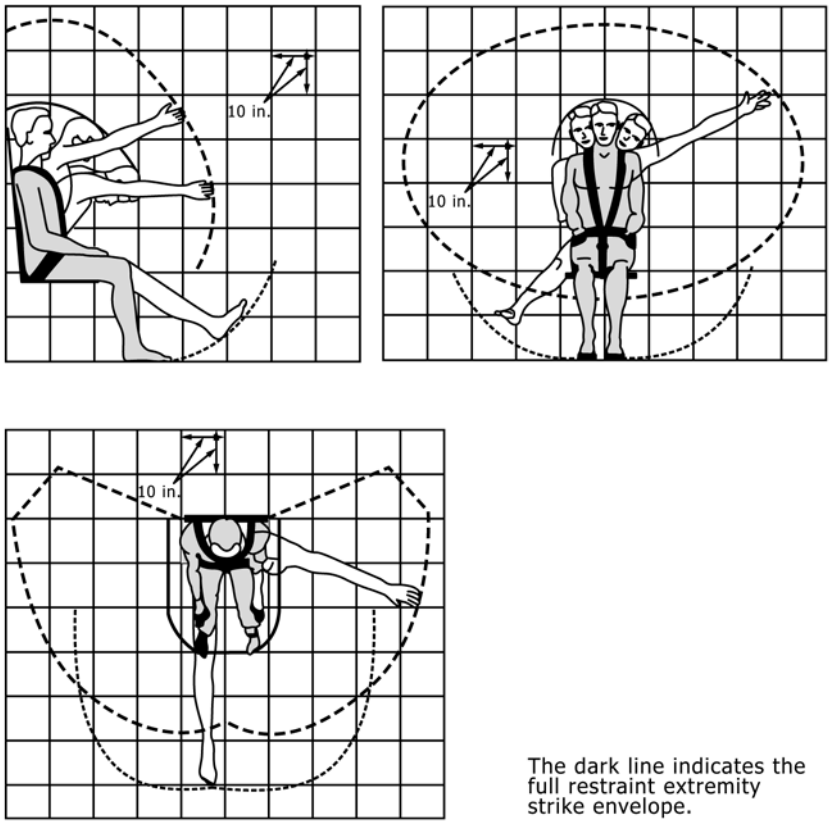

FIG. 3 USARTL-TR-79-22D Aircraft Crash Survival Design Guide

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 (29 CFR Standard 1910.120, Standard 1910.1030, and Standard 1010.134) 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 shall 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 shall be coded or labeled so that the users can quickly identify the general content. The following color/numerical coding is recommended:

10.6.2.1 *Green 1*—Oxygen delivery and airway management equipment,

10.6.2.2 *White 2*—Bandages and medical supplies, and

10.6.2.3 *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 shall be properly secured in all phases of flight. Access to drug cases, supply drawers, and so forth shall 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 shall meet the requirements of 49 CFR or military specifications (MS). If cylinders are purchased with valves, they shall 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 for air service.

10.8 A shut off shall 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 shall stop the gas flow within 8 in. (20 cm) of the cylinder head.

10.8.1 *Fittings*—All fittings shall meet MS, National Aerospace (NAS) 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*—Nonflexible medical gas lines shall meet MS and NAS or FAA standards. All flexible medical gas lines, regardless of the manufacturer or service pressure, shall be replaced every three years. Low-pressure flexible oxygen lines that do not meet MS, NAS, or FAA standards shall 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 shall be 100 % visible during normal operations.

10.8.2.1 All lines shall be adequately supported to prevent chafing and fatigue as a result of vibration.

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

10.8.3 *Flow Meters*—All medical gas flow meters shall meet standards of the Compressed Gas Association (CGA) or UL, MS, and NAS.

10.8.3.1 All medical gas flow meters and regulators located in the cabin shall be recessed not to protrude beyond the surface of the cabinet/panel structure or shall 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 shall be used. Each outlet shall be clearly marked to identify the gas.

10.9 *Electrical Outlets*—Electrical power outlet shall be provided with an inverter or appropriate power source of sufficient output to meet requirements of the complete specialized equipment package without compromising the operation of any electrical aircraft/ambulance equipment. Extra batteries are required for critical care patient care equipment. Any supplemental power source or amplified power source shall meet applicable federal aviation safety requirements.

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 shall be prominently displayed inside the cabin. The latter shall be easily visible to the nontransport 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 to meet this specification shall 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, shall be carried on board. It shall 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, when necessary, disinfected in accordance with OSHA standards before reuse.

13.2 All pieces of medical equipment and supplies used in air ambulances shall be maintained in accordance with the manufacturers' recommendations and shall have an FDA intended use statement of use during air transport. Maintenance records shall demonstrate that the required maintenance has been performed.

13.3 Medical crew shall ensure that all equipment is operational following defined procedures.

ANNEXES

(Mandatory Information)

ADVANCED LIFE SUPPORT (ALS) STANDARD SPECIFICATION FOR FIXED AND ROTARY WING ADVANCED LIFE SUPPORT AIR AMBULANCES (FORMERLY ASTM SPECIFICATION F1274–91)

INTRODUCTION

This specification for advanced life support (ALS) air ambulances consists of the provisions for basic life support (BLS) air ambulances plus the additional requirements for the fixed wing ALS air ambulances contained in this ALS Annex. This ALS Annex sets forth additional minimum provisions for ALS 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 ALS.

A1.1 Scope

A1.1.1 This annex pertains to air ambulances involved in patient transportation and care at the ALS level. It outlines the minimum requirements, in addition to those for fixed wing BLS air ambulances, that shall be met before the unit may be classified as an ALS air ambulance.

A1.2 Referenced Documents

A1.2.1 The provisions of 1.2 apply.

A1.3 Definitions

A1.3.1 The provisions of 1.3 apply.

A1.4 Significance and Use

A1.4.1 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 ALS, throughout the medical mission.

A1.4.1.1 It applies to all the medical activities that involve fixed and rotary wing transportation at the ALS level patients, including on-scene work and interhospital transfer.

A1.5 Classification

A1.5.1 Air ambulance providers shall use the title "Advanced Life Support Air Ambulance" to indicate that the minimums contained in the specification for fixed wing BLS air ambulance and the provisions of this annex have been met.

A1.6 General Requirements

A1.6.1 The ALS air ambulance shall consist of the medical transport vehicle (airplane or helicopter), transport personnel and patient care equipment, and supplies in accordance with this specification.

A1.6.2 The ALS air ambulance shall consist of the vehicle, transport personnel and patient care equipment, and supplies in accordance with this specification.

A1.6.3 To comply with this specification, the ALS air ambulance shall be part of a designated medical control system as described in Practice F1149.

A1.6.4 The specific aircraft and personnel that have been state licensed (or equivalent) as part of the unit shall be available for the medical mission as stated in the ADAMS resource document. The aircraft shall be configured to accept the personnel, patient, and mission-specific equipment and supplies as stated. The equipment 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 standard specification criteria. The aircraft shall have both the equipment and supplies and air-medical personnel on board before patient transport as an ALS air ambulance.

A1.6.5 The air ambulance that responds to the medical mission as an ALS air ambulance shall be capable of performing as stated in the ADAMS resource document.

A1.6.6 The ALS 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 ALS level en route to definitive care. At least one qualified ALS medical crewmember, as defined in Guide F1229, shall accompany each patient and have access to the patient at all times. ALS equipment and supplies shall be carried on board to be accessible for use during patient transport and provide emergency care at the scene.

A1.6.7 The ALS transport unit shall be capable of departing from its home base, proceeding directly to a designated landing strip for patient pick up, and proceeding directly to a designated landing strip or helipad for patient delivery under the flight conditions and during the hours of operation stated in the ADAMS resource document. Continuity of medical direction and ALS medical care shall be maintained throughout the duration of the patient pick up, transportation, and delivery to and an appropriate destination. See Annex A2 for SMs requirements.

A1.7 Personnel

A1.7.1 The minimum personnel requirement for the ALS air ambulance shall be the FAA-required flight crew and, for each patient, one ALS medical crewmember, with accommodation for a second attendant, as required and defined in Guide F1229.

A1.7.2 *Medical Crewmembers*—The minimum medical crew for the ALS air ambulance shall be one ALS air-medical crewmember, as defined in Guide F1229, for each patient. Accommodation for a second medical attendant, with access to the primary patient, shall always be available.

A1.7.3 In addition to the ALS medical requirement, the 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.

A1.8 Patient Care Equipment and Supplies

A1.8.1 Requirements for the ALS transport unit are as follows:

A1.8.1.1 *Medical Equipment and Supplies*—In addition to the medical equipment and supplies listed in Tables 1-4 of the specification for BLS air ambulances, at a minimum, the items in Tables A1.1-A1.3 shall be carried on board the ALS air ambulance:

(1) Medical gas delivery and airway management equipment (see Table A1.1).

(2) Bandages and medical supplies (see Table A1.2).

(3) Musculoskeletal appliances (see Table A1.3).

(4) Miscellaneous medical equipment (see Table 4).

(5) Medications—Minimums to be carried shall be in compliance with national standards as determined by the medical director.

(6) 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, and 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 (21 CFR 820). The following characteristics apply, as applicable, to prepackaged modules and apply entirely to discrete component systems.

A1.8.1.2 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 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 panel-mounted connector shall be clearly labeled "VACUUM." Diameter Index Safety System (DISS) quick disconnects are acceptable for use, as are proprietary 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 in the following.

(3) 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 discontinue aspiration instantly. The outside diameter of the vacuum indicator gage shall be 3 in. (76 mm) in diameter, have numerical markers at least every 100 mm Hg (13.3 kPa), and a total range of 0 to 760 mm Hg (0 to 101 kPa). Hospital-type vacuum regulators capable of meeting the vacuum, free air flow, and pump down time requirements cited in the following shall be acceptable.

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

Item	Quantity
Cardiac monitor/defibrillator with external pacing capability (the unit and accessories shall be appropriate for the patient being transported)	1 each
Vital signs monitor	1 each
Oxygen outlet	1 each
Endotracheal tubes, neonate, pediatric, and adult	2 each
Magill forceps	1 each
Laryngoscope, handle with adult, child and infant blades, both curved and straight	1 each
Set of batteries for the laryngoscope	1 each
Automated mechanical ventilator, that shall be appropriate for the patient being transported. At a minimum, the ventilator shall be operable on patients >5 Kg, be altitude compensable to ensure its delivered tidal volume remains stable when the aircraft is ascending, cruising, or descending; and be able to deliver a set FiO_2 from 21 to 100 %.	1 each
Suction device, one unit shall be portable	2 each
Intubated waveform capnography sample lines adult	2 each
Intubated waveform capnography sample lines infant/neonate	2 each
Alternative airway (LMA, Combitube, King Airway, and so forth) for adult, child, and infant	2 each

TABLE A1.2 ALS Bandages and Medical Supplies Color/Numerical Code—White and 2

Item	Quantity
Sheets	2 each
Bandages, triangular	4 each
Safety pins	6 each
Trauma dressings, sterile	4 each
Dressings, 4 by 4, sterile	24 each
Bandages, 1 by ¾ in. (2.5 by 2 cm), adhesive	12 each
Tape, 2 in. (5 cm) (or more) by 5 yd (4.6 cm), adhesive, rolls	2 each
Tape, adhesive, 1-in. (2.5-cm) by 5 yd (4.6-cm), roll	1 each
Bandage, gauze, roller soft sterile, 4-in. (10-cm) wide (or more) rolls	4 each
Bandage, elastic, 3-in. (7.6-cm) wide (or more), non-sterile, rolls	2 each
Alcohol preps, disposable	24 each
Dressings, 3- by 8-in. (7.6- by 20-cm) (or larger), sterile petroleum gauze	2 each
Gloves, examination, pair	8 each
Surgical face masks, disposable (meets NIOSH N95 requirement)	2 each
Eye patches, sterile	4 each
Tissues, box	1 each
Air-sick bags	4 each
Tongue depressors	4 each
Cutting shears with protective tip	1 each
Water-soluble lubricant 4 oz (113 g) or equivalent	1 each
Eye protection, transparent, for medical attendants	4 each

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

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

(4) The collection canister shall be disposable, not breakable, transparent, and have a minimum capacity of 34 fl oz (1000 mL). It shall be securely mounted adjacent to the vacuum adjust/display. Collection canisters shall be equipped with a shut-off means by which to prevent overflow aspirate from entering other system components and shall include an integral bacterial filter. Reusable canisters having similar properties are acceptable but should be discouraged.

(5) 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 8 gal/min (30 L/min) and achieve a minimum of 300 mm Hg (40 kPa) 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 ¼ in. (6.4 mm) in diameter.

(6) The following accessories shall be furnished: one 6-ft (1.8-m) length of nonkinking suction tubing that shall not collapse at high vacuum levels and one spare collection canister (if a disposable canister is provided).

A1.8.2 Adequate supplies of medications, drugs, and administrative devices approved for use by ALS personnel for the management of patients, as approved by the EMS system's medical director, shall be carried on board.

A1.8.3 All items shall be readily accessible and shall have provisions for easy and secure stowage. All items likely to be required outside the fixed wing transport shall be packaged so that they can be carried to the patient.

A1.8.4 *Lighting:*

A1.8.4.1 The provisions of 8.4 apply.

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.

A1.8.4.2 The pilot shall be provided with an emergency override switch for patient compartment lighting.

A1.9 Vehicle Configuration

A1.9.1 Requirements for the ALS air ambulance are those set forth for the BLS air ambulance plus the following requirement:

A1.9.1.1 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) shall not hinder the air-medical crewmember's ability to initiate and maintain full ALS 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, shall not be likely to require CPR en route unless adequate space and qualified air-medical crewmembers are available.

A1.9.2 *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 fixed wing ALS air ambulance for the storage of ALS 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 management, 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.

A1.10 Installation Requirements

A1.10.1 Installation requirements for the ALS air ambulance are those set forth for the BLS air ambulance plus the following:

A1.10.1.1 An analysis of all the authorized ALS equipment to ensure that adequate power is available.

A1.10.1.2 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.

A1.10.1.3 All containers and carrying cases shall be coded so that the users can quickly identify the general content. The following color and numerical coding is recommended:

(1) Green 1—Oxygen delivery and airway management equipment;

(2) White 2—Bandages and medical supplies;

(3) Yellow 3—Musculoskeletal appliances;

(4) Blue 5—Intravenous access, needles and syringes; and

(5) Red and Black Stripe 6—ALS medications.

A1.11 Communications

A1.11.1 In addition to the requirements for BLS air ambulances, the following requirement applies to fixed wing ALS air ambulances:

A1.11.1.1 An electronic audio system shall be installed to provide intercom capability for all transport personnel within the unit.

A1.12 Safety Requirements

A1.12.1 The provisions of Section 12 apply.

SPECIALIZED MEDICAL SUPPORT (SMS) ANNEX STANDARD SPECIFICATION FOR ADVANCED LIFE SUPPORT AIR AMBULANCES (FORMERLY ASTM SPECIFICATION F1283–91)

A2.1 Scope

A2.1.1 This specification pertains to air ambulances involved in patient transportation and care at the specialized medical support (SMS) level. It outlines the minimum requirements, including personnel and the patient care equipment and supplies that shall be met before the unit can be classified as a SMS air ambulance.

A2.2 Terminology

A2.2.1 Definitions contained in Section 3 apply to this annex.

A2.3 General Requirements

A2.3.1 An SMS air ambulance shall consist of either a rotary winged (helicopter) or fixed wing aircraft (airplane), medical and transport personnel, and patient care equipment and supplies in accordance with this specification.

A2.3.2 To comply with this specification, the SMS air ambulance shall be a part of a designated medical control system as described in Practice F1149 and the ADAMS resource document.

A2.3.3 The SMS air ambulance shall be capable of transporting the patients, medical team, and medical equipment and supplies for the designated specialized medical mission. It shall have on board the provisions for the requested patients, medical equipment, and supplies. It shall provide the space to allow the performance of the specialized medical care mission and medical treatment at the ALS level. At least one ALS medical crewmember, as defined in Guide F1229, accompanies each patient and has access to the patient at all times. Additional personnel shall be dictated by each specialized medical mission.

A2.3.4 Appropriate ALS and SMS equipment and supplies shall be available as needed to provide emergency care at the patient pickup point. They shall 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.

A2.3.5 The SMS air ambulance shall be capable of departing directly to the requested site under the flight conditions and during the hours of operation stated in the ADAMS resource document.

A2.4 Personnel

A2.4.1 The minimum personnel requirement for the SMS air ambulance shall be the flight crew and, for each patient, one specialty medical crewmember with accommodation for a second attendant as required and defined in Guide F1229 plus additional or alternative SMS personnel and equipment as dictated by each specialized medical mission.

A2.4.1.1 The minimum flight crew for the 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.

A2.5 Installation Requirements

A2.5.1 Installation requirements for the SMS air ambulance are those set forth for the ALS air ambulance plus the following:

A2.5.1.1 An analysis of all the authorized SMS equipment to ensure that adequate power is available.