



Standard Specification for Fixed Wing Advanced Life Support Transport Units¹

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INTRODUCTION

Committee F-30 was established on a voluntary basis to edit, update, and create where necessary, voluntary standards for all facets of emergency medical services (EMS).

Task Group F30.01.02 is responsible for water and air vehicles and has prepared standards that cover the medical transport units for the three levels of general patient care, namely basic, advanced, and specialized.

The specifications for these units have been prepared as separate standards, each standing alone, for the convenience of the unit's personnel.

It cannot be emphasized enough 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.

The specifications are concerned only with the three broad categories of general EMS. They do not cover any aspect of rescue and they do not preclude unique configurations such as the units that are used exclusively as neonatal transports.

This specification covers the second of the three fixed wing medical transport unit categories. It is solely concerned with the minimum requirements for the fixed wing advanced life support transport unit. 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 specification pertains to fixed wing transport units involved in patient transportation and care, at the advanced life support level. It outlines the minimum requirements, including personnel and the patient care equipment, that must be met before the unit can be classified as an advanced life support transport unit.

1.2 This specification describes the minimum configuration and capability required for the vehicle, the minimum number of seats for personnel, and the provisions for the minimum medical equipment and supplies.

1.3 Other specifications of Committee F-30 will apply.

2. Referenced Documents²

2.1 ASTM Standards:

F 1149 Practice for Qualifications, Responsibilities and Authority of Individuals and Institutions Providing Medical Direction of Emergency Medical Services^{2,3}

F 1177 Terminology Relating to Emergency Medical Services³

F 1220 Standard Guide for Emergency Medical Systems (EMSS) Telecommunications³

F 1229 Guide for Establishing the Qualifications, Education and Training of EMS Aeromedical Patient Care Providers³

2.2 Other Standard:

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

3. Terminology

3.1 Definitions:

3.1.1 Specific terms used throughout this specification are defined in 3.2. Other applicable terms are contained in Terminology F 1177.

3.2 Descriptions of Terms Specific to The Standard:

3.2.1 Descriptions of Terms Relating to Personnel:

3.2.1.1 *air ambulance provider*—the individual or entity that holds the license or certificate issued by the appropriate governmental authority. The air ambulance provider is responsible for and manages the operation of the aviation medical transport unit.

3.2.1.2 *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 medical transport unit. They are qualified to perform the medical

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² Appendix X1 contains a list of documents that relate to medical transportation.

³ *Annual Book of ASTM Standards*, Vol 13.01.

responsibilities of the mission to the standard established for the designated air medical transport unit category, (basic life support, advanced life support or specialized).

3.2.1.3 *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.

3.2.1.4 *transport personnel*—flight crewmembers and air-medical crewmembers who, by specialized training and certification (as defined in Guide F 1229 or applicable FAA regulations) are currently qualified to carry out their assigned duties.

3.2.2 *Descriptions of Terms Relating to Vehicles:*

3.2.2.1 *fixed wing aircraft*—aircraft that use a wing to fly. The wing is generally immovable. Jet engines or propellers provide the required forward motion. A takeoff and landing roll is essential.

3.2.2.2 *medical transport vehicle*—a vehicle 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 on board medical equipment and supplies.

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

3.2.3.1 *permanently installed patient care equipment*—designed to be used inside the aviation medical transport vehicle. It may be self contained or it may depend on the vehicle's power source, or a combination of both.

3.2.3.2 *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 vehicle's sources of power and medical gases.

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

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

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

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

3.2.4.3 *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 selected medical control, and with EMS systems dispatch centers. It can include equipment for the transmission of graphic data.

3.2.5 *Description of Term Relating to Documentation:*

3.2.5.1 *National Air Medical Transport Units Resources Catalog*—the documents 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 aviation medical transport units. The short title "Resources Catalog" may be used when the meaning is clear.

3.2.6 *Descriptions of Terms Related to the Mission:*

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

3.2.6.2 *category*—a level of patient care, relating to the capability of the aviation medical transport unit. There are three levels; basic life support, advanced life support, and specialized.

3.2.6.3 *declared effective service range*—the number of nautical miles, without resupply of aviation or medical requirements, within which the fixed wing medical transport unit can be expected to operate at full capacity. The two items can be listed separately and, if more convenient, the medical limitations can be given in hours of available use.

3.2.6.4 *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.

3.2.6.5 *declared service area*—the area designated by the air ambulance provider where the fixed wing medical transport unit is operationally capable of response. There are usually no restrictions but if such exist they will be clearly indicated in the "Resources Catalog."

3.2.6.6 *fixed wing advanced life support transport unit*—a unit that meets the standard described in this specification.

3.2.6.7 *fixed wing medical transport unit*—a fixed wing medical transport vehicle, the transport personnel, and on board equipment that meets the standard for the named category.

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

4. Classification

4.1 Air ambulance providers will use the title "Fixed Wing Advanced Life Support Transport Unit" to indicate that the minimums contained in this specification have been met.

5. General Requirements

5.1 The fixed wing advanced life support transport unit shall consist of the medical transport vehicle, transport personnel, and patient care equipment and supplies in accordance with this specification.

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

5.2.1 Current air ambulance license or certificate.

5.2.2 Appropriate license or certificate for the aircraft under applicable Federal Aviation regulations.

5.3 To comply with this specification, the fixed wing advanced life support transport unit must be part of a designated medical control system as described in Practice F 1149.

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

5.5 The specific aircraft, personnel, equipment and supplies

that have been licensed/certificated as a fixed wing advanced life support transport unit will be available for the medical mission as stated in the “Resources Catalog.” The aircraft will be configured to accept the personnel, equipment and supplies as stated. The equipment and supplies 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 standard specification criteria. The aircraft must have the equipment and supplies and air-medical personnel on board prior to patient transport as an advanced life support transport unit.

5.6 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.

5.7 The fixed wing aircraft that responds to the medical mission as an advanced life support transport vehicle shall be capable of performing as stated in the “Resources Catalog.”

5.8 The fixed wing advanced life support transport unit shall be capable of transporting one supine patient and shall have sufficient space to allow the performance of medical treatment at the advanced life support level, en route. 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.

5.9 When in the best interest of patient care, a decision has to be made that runs counter to this specification, a mission deviation will be recorded. Such a mission deviation from the accepted medical norm will be regulated and disciplined by state, regional and local medical control. A written report will be made to the medical control point responsible for the units operation, within 24 h, describing the mission deviation, its cause, and its impact.

5.10 The license/certification authority may accept and record transient deviations for a particular medical transport vehicle pending receipt of adequate equipment. Such transient deviations must be clearly documented in the “Resources Catalog,” together with the alternate solution until the deviation is resolved. Such deviations must not be extended beyond July 1, 1995.

6. Significance and Use

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

6.2 Application of this specification will ensure that the fixed wing medical transport unit will be able to provide a well-established level of advanced patient care. The known minimum capability will improve mutual aid and increase the capability for improved cooperation throughout the nation.

6.3 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 the following:

6.3.1 A scale upon which to evaluate resources and capabilities.

6.3.2 The incentive to improve the vehicle, personnel and medical components, to meet an acceptable standard of patient care. This will include configuration, equipping, and training.

6.3.3 A means of identifying inappropriate advertising.

6.3.4 Consistent criteria for correct performance and cost effective comparisons.

7. Personnel

7.1 The minimum personnel requirement for the fixed wing advanced life support transport until 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.

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

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

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

7.2 *Flight Crewmember*—The minimum flight crew for the fixed wing advanced life support transport until 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 *Air-Medical Crewmembers*—The minimum air-medical crew for the fixed wing advanced life support transport unit shall be one advanced life support air-medical crewmember as defined by F30.02.01 in Guide F 1229, for each patient. Accommodation for a second medical attendant, with access to the primary patient, will always be available.

7.3.1 In addition to the assigned medical duties, the senior air-medical crewmember on board 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.

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

7.3.3 Passengers, such as family members, may be carried at the discretion of the medical director and the pilot, providing all applicable FAA regulation are met.

8. Patient Care Equipment and Supplies

8.1 Requirements for the fixed wing advanced life support 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 will have FAA approval.

8.1.1.1 The stretcher shall be large enough to carry the 95

percentile adult American male patient,⁴ full length in the supine position.

8.1.1.2 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.

8.2 *Medical Equipment and Supplies*—Patient care equipment and supplies for advanced life support will be available and maintained in an airworthy condition. The medical equipment and supplies appropriate to the particular mission will be on board and will be readily accessible. All will have provisions for easy and secure stowage.

8.2.1 All items that may have to be carried with the patient during transport to and from the aircraft, will be appropriately packaged.

8.3 As a minimum, the following items of medical equipment shall be available to be carried on board:

8.3.1 *Medical Oxygen Supply Systems*—A sufficient volume of oxygen to provide each patient with up to a 15 L/min flow during patient transport for the declared service range. If the oxygen is stored as a pressurized/compressed gas, a pressure reducing valve with regulator and gage shall be provided. The pressure reducing valve shall be preset to 50 lb/in.², ± 10 lb/in.² and be able to deliver a minimum flow of 100 L/min.

8.3.2 *Medical Gases and Airway Management Equipment*—The minimums are shown in Table 1.

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

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

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

8.3.6 *Medications*—The minimums are shown in Table 5.

8.3.6.1 Drugs are grouped by classification and a reference quantity of a class drug is listed. Medical control may determine which drug of each class is actually carried on board the unit, but the quantity must be comparable in practical use to the reference quantity listed.

8.3.7 *Intravenous Access, Needles and Syringes*—The minimums are shown in Table 6.

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 in strength at patient level.

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

9. Vehicle Configuration

9.1 Requirements for the fixed wing advanced life support transport unit 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 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

TABLE 1 Medical Gas Delivery and Airway Management Equipment

| Color/Numerical Code—Green and 1 | |
|--|----------|
| 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 |
| Mask, total non-rebreathing | 1 |
| Regulator, oxygen | 1 |
| Flowmeter, oxygen, capable of providing 2 through 15 L/min flow, throughout all normal flight altitudes and attitudes | 1 |
| Oxygen Outlet | 1 |
| Endotracheal tubes, neonate, pediatric and adult, each | 1 |
| Magill forceps | 1 |
| Laryngoscope, handle with adult, child and infant blades, both curved and straight | 1 |
| Artificial ventilation device (bag valve mask) capable of receiving oxygen through an inlet and capable of delivering 80 to 100 % oxygen through a reservoir system. It is manually operated, self-refilling and portable. Neonate, pediatric, and adult sizes, each | 1 |
| Suction device, portable | 1 |
| Set of oropharyngeal airways for neonates, pediatrics, and adults | 1 |
| Set of nasopharyngeal airways for neonates, pediatrics, and adults | 1 |
| Suction catheters, flexible, neonate, pediatric, and adult | 1 |
| Suction catheter, rigid | 1 |
| Suction connective tubing | 2 |
| Suction rinsing bottle, shatter proof | 1 |
| Suction bulb | 1 |
| Tongue depressors or bite sticks | 4 |

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 50 yd, adhesive, rolls | 2 |
| Tape, adhesive, 1 in. by 50 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 | 2 |
| Eye patches, sterile | 4 |
| Tissues, box of | 1 |
| Air-sick bags | 4 |
| Cutting shears with protective tip | 1 |
| Tourniquet, for IV starts | 4 |
| Water-soluble lubricant | 4 oz |
| Eye protection, transparent for medical attendants | 4 |

interference by the supine patient, air-medical crewmembers, or equipment and supplies.

⁴ The 95 percentile adult American male is 6 ft (1.83 m) and 212 lb (96.2 kg).