



AEROSPACE INFORMATION REPORT

AIR6448™**REV. A**Issued 2011-06
Cancelled 2019-08

Superseded by ARP6448

Gaining Approval for Seats with Integrated Electronics in Accordance with
AC21-49 Option 7b

RATIONALE

The technical content of AIR6448 issued 2011-06 has been totally superseded by ARP6448, issued 2012-06.

CANCELLATION NOTICE

This Technical Report has been declared "CANCELLED" as of August 2019 and has been superseded by ARP6448. By this action, this document will remain listed in the respective index, if applicable. Cancelled Technical Reports are available from SAE.

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1. SCOPE

This document provides an industry recommended framework for establishing a multi-party agreement to support approval of electronic components (e.g., actuation system, reading light, inflatable restraint, IFE, etc.) integrated in aircraft seats and provide a framework that allows seat manufacturers to build and ship completed, integrated, and approved seat assemblies with electronics included. The primary purpose of this document is to provide roles, responsibilities and accountabilities to meet AC 21-49 Section 7.b 'Type Certification using TSO-approved seat with electronic components defined in TSO design'. This document may be applied to all applicable seat TSOs (C39(), C127())...etc).

The approval for the integration of the electronics will fall, in part or in full, under the type design authority of the Seat Installer rather than the Seat Supplier shipping the integrated seat. The defined responsibilities, areas of authority and accountability of each party, as well as necessary communication protocols, must ensure configuration management, design control and quality control. These definitions, controls and protocols are agreed (thru normal commercial agreements and binding contracts) and adhered to by all parties ensuring all parts in the supply chain remain approved (e.g. certified and conformed).

Table A1 of Appendix A of this document contains information which details the key characteristics of electronic equipment that require review to ensure proper compliance with the TSO requirements per Table 1 of AC 21-49.

1.1 Regulatory and Business Model

It is important to recognize that industry and the FAA have different needs when it comes to getting a seat with electronics approved for use in an aircraft. The FAA looks at certification strictly from a regulatory point of view and to whom they issue the various approvals. The FAA holds the approval holder responsible for ensuring all aspects under that approval are met, regardless of how industry establishes the business arrangements. For industry, we have to meet regulatory obligations under each approval, but have the flexibility of establishing business arrangements to achieve those obligations. This document will define the responsibilities from both a regulatory perspective and a business perspective. Without commitment to establish and maintain these business arrangements, success will not be achieved in meeting regulatory responsibilities.

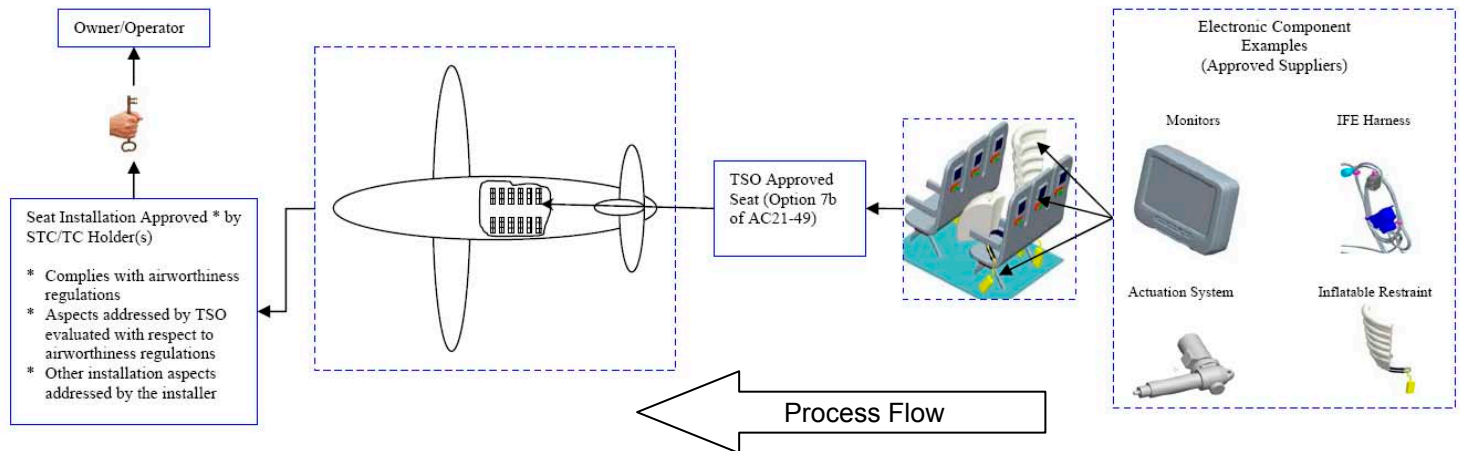
There are many different ways a seat with electronic components can be approved for use in an aircraft. However, the guidance that follows is based on one acceptable model that has widespread use and involves three entities - a Seat Installer, a Seat Supplier, and an Electronics Manufacturer as defined below.

Seat Supplier: The party that attains a TSO approval for the seat with integrated electronic components. A TSO approval can be either a TSO authorization (TSOA) or letter of TSO design approval (LODA).

Seat Installer: The party that attains a TC (or STC) for the installation and activation of the seat with integrated electronic components in the aircraft. The TC/STC approval covers the seat's installation into the aircraft and the installation and activation of the electronic components into the aircraft.

Electronics Manufacturer: The party that manufactures electronic components to be used in the installation and collaborates with both the Seat Supplier and the Seat Installer. The Electronics Manufacturer may be a production approval holder.

1.1.1 Overview of Responsibilities (Post AC 21-49 Business Practice)



2. REFERENCES

The following publications form a part of this document to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of the other publications shall be the issue in effect on the date of the purchase order. In the event of conflict between the text of this document and references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

2.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or 724-776-4970 (outside USA), www.sae.org.

AS8049 Seat Performance Standard

2.2 FAA Publications

Available from Federal Aviation Administration, 800 Independence Avenue, SW, Washington, DC 20591, Tel: 866-835-5322, www.faa.gov.

AC 21-49 Gaining Approval of Electronic Components in Seats

AC25.562-1 FAA Advisory Circular - Dynamic Evaluation of Seat Restraint Systems and Occupant Protection on Transport Airplanes

AC25.853-1 FAA Advisory Circular - Flammability Requirements for Aircraft Seat Cushions

AC25.785-1 FAA Advisory Circular - Flight Attendant Seat and Torso Restraint System Installations

AC25-17 FAA Advisory Circular - Transport Airplane Cabin Interiors Crashworthiness Handbook

Major/Minor Change Memo: Classification of Design Changes to TSO-C39b, TSO-C127, & TSO-C127a Articles, Dated: Sept. 8, 2003

2.3 Code of Federal Regulations (CFR)

Available from the United States Government Printing Office, 732 North Capitol Street, NW, Washington, DC 20401, Tel: 202-512-0000, www.gpoaccess.gov.

14 CFR Part 25 Airworthiness Standards: Transport Category Airplanes

14 CFR Part 21 Certification Procedures For Products and Parts

3. DEFINITIONS

AIRxxxx	Aerospace Information Report
AIR	Aircraft Certification Service (FAA)
Applicant	Person who fills out FAA form 8110-12, Application For Type Certification, Production Certification, or Supplement Type Certification
Compliance Inspection	Compliance inspections are physical inspections performed by the ACO engineer or their designee, when authorized. This inspection provides an opportunity to review an installation and its relationship to other installations on a product to determine compliance with CFR PART/CAR requirements which cannot be determined adequately from an evaluation of the technical data
Contractors	Individuals or companies used to design, manufacture (suppliers) or conform components of passenger seats
Owner/Operator	A person who, for compensation or hire, engages in the carriage by aircraft in air commerce of persons or property. In the context of this document the owner/operator is a person who is requesting to have aircraft modified
Product	Aircraft, aircraft engine, or propeller
Project ACO	The geographic ACO that is processing the TC/STC project
STC	Approval under 14 CFR part 21.113 for modification of a Type Certificated airplane
Design Definition	Design definition involves the establishment and implementation of documented procedures to define and control the design of a product in order to ensure that specified requirements are met.
Configuration Management	Configuration Management is the systematic process that establishes and maintains the consistency of a product and its functional and physical attributes with its requirements, design, and operational information throughout its life. The goal of configuration management is to ensure that a certified baseline product (or article) definition is established and maintained throughout the product's life cycle. This is accomplished through the establishment of clear configuration and quality management processes throughout the supply chain with appropriate agreements between parties that ensure changes are clearly communicated in advance of their incorporation and both quality as well as the certified nature of the product/article definition is maintained. It is understood that changes deemed minor by one party may have a major certification and configuration control impact on the part of another. Processes and agreements shall be established between parties to ensure that configuration goals continue to be met.
Design Change	As related to the scope of this document, changes to Electronic equipment which impact the ability of the Seat Supplier or Seat Installer to show compliance to regulatory requirements.

Integrated Seat	An airplane seat approved under a seat TSOA/LODA that includes electronic components in the TSO design. The electronic components may include IFE, PED power systems, and electrically actuated seat.
Multi-party agreement	A binding agreement between a Seat Supplier, a Seat Installer, one or more Electronics Manufacturers, and possibly one or more Electronic System Installers that assigns responsibilities to the parties to ensure that the TSO and TC/STC approval holders have design and quality control over the electronics in an Integrated Seat.
Electronic System Activator	If the party who installs the seats acts only as the physical Seat Installer and does not obtain TC/STC approval to include the installation and activation of the electronic system in the aircraft, then the Electronic System Activator is the person obtaining a TC/STC approval for the installation and activation of an electronic system on a Type Certificated airplane, when a part of the electronic system is incorporated in the TSO design of an integrated seat.
Physical Seat Installer	A party who attains a TC (or STC) for the physical installation (not including activation of the electronic components) of the seat with integrated electronic components in the aircraft. This type of TC/STC approval covers the seat's physical installation into the aircraft only (with electronic components mounted to the seat but not operating), but does not include the activation of the electronic components in the aircraft.
Seat Installer	The party that attains a TC (or STC) for the installation and activation of the seat with integrated electronic components in the aircraft. The TC/STC approval covers the seat's installation into the aircraft and the installation and activation of the electronic components into the aircraft.
Supplier	Vendors supplying parts and/or services
Seat Supplier	The party that attains a TSO approval for the seat with integrated electronic components. A TSO approval can be either a TSO authorization (TSOA) or letter of TSO design approval (LODA).
Electronics Manufacturer	The party that manufactures electronic components to be used in the installation and collaborates with both the Seat Supplier and the Seat Installer. The Electronics Manufacturer may be a production approval holder.

4. ACRONYMS

AC	Advisory Circular
ACO	Air Certification Office
AL	Aluminum
ARP	Aerospace Recommended Practice
AS	Aerospace Standard
CAA	Civil Aviation Authority
CAR	Civil Air Regulation
CFR (FAR)	Code of Federal Regulations
CG	Center of Gravity
EASA	European Aviation Safety Agency
EMI	Electromagnetic interference