Radio Racks and Radio Equipment Installation  
7/30/09

In order to ensure proper regulatory compliance this checklist should be completed for each radio equipment installation and submitted as an attachment to the Field Approval Package.

1. FAR 23 Aircraft

2. § APPLICABLE FEDERAL AVIATION REGULATIONS §

   - 21.305 Approval of Materials, Parts, Processes and Appliances
   - 23.25 Weight Limitations
   - 23.29 Empty Weight and Corresponding Center of Gravity
   - 23.301 Loads
   - 23.303 Factory of Safety
   - 23.305 Strength and Deformation
   - 23.307 Proof of Structure
   - 23.321 Flight Loads General
   - 23.471 Ground Loads General
   - 23.561 Emergency Landing Conditions General
   - 23.603 Materials and Workmanship
   - 23.605 Fabrication Methods
   - 23.607 Fastenings
   - 23.609 Protection of Structure
   - 23.611 Accessibility Provisions
   - 23.613 Material Strength Properties and Design Values
   - 23.771 Pilot Compartment
   - 23.1301 Function and Installation
   - 23.1309 Equipments, Systems, and Installations
   - 23.1311 Electronic Display Instrument Systems
   - 23.1321 Arrangement and Visibility
   - 23.1351 Electrical System Capacity
   - 23.1357 Circuit Protective Devices
   - 23.1359 Electrical System Fire Protection
   - 23.1365 Electrical Cables and Equipment
   - 23.1431 Electronic Equipment
   - 23.1529 Instructions for Continued Airworthiness
   - 23.1585 Operating Procedures

Radio racks and radio equipment installations, which are the same as those, made by the airframe manufacturer, or other installations which are already approved, may be accepted without further investigation. On other installations, the following points should be checked to determine that the installation is satisfactory.

3. CHECKLIST:

Please initial as indicated and provide requested data. You can reference information contained on other documents such as STC, Block 8 of FAA Form 337, or other attachments.

   a. Approval of Materials, Parts Processes and Appliances
(1) Are all parts, processes and/or appliances previously approved by FAA Technical Standard Order (TSO, Supplemental Type Certificate (STC) Original Type Design (TC) or Parts Manufacturing Approval (PMA)? (§21.305)

Yes    No

Explain:

NOTE: If no previous approval exists the parts, processes and/or appliances may not be eligible for Field Approval.

(2) Do all wiring, circuit breakers, and other materials meet aircraft quality standards, i.e., Military Specification, TSO, etc. (§§ 23.1357, 23.1359, 23.1365, and 23.1431).

Yes    No

Explain:

b. Structural Requirements:

(1) Is the equipment installed in such a manner that it can withstand the required loads? (§§ 23.301, 23.305, 23.307, 23.321, 23.471, and 23.561)

NOTE: See item 4 below.

Yes    No

Explain:

(2) Do shock mounted items have sufficient clearance for normal vibration and swaying of the equipment without hitting adjacent equipment or parts of the airplane? (§ 23.1309)

Yes    No

Explain:

(3) Are junction boxes of sufficiently rigid construction to prevent "oil-canning" of the sides to avoid possibility of inside shorting? (§§ 23.301, 23.305, and 23.1309)

Yes    No
(4) Is the structure of the radio rack adequate to support the required loads? The effect on other structure (either primary or secondary) should be considered. (§§ 23.301, 23.303, 23.307, 23.321, 23.471 and 23.561)

This answer can be determined by either of two methods:

(a) By direct comparison with an existing approved installation having the same or similar (approximately the same weight, size, and arrangement) equipment installed.

(b) By structural analysis or static test. Such installations do not necessarily lend themselves to analysis but are adaptable to static test. In conducting the test, the following procedure may be used?

1 Determine the wt. and c.g. position of the equipment item.

2 Mount the rack either in its position in the airplane or in a rig simulating the actual installation insofar as attachments to the airplane are concerned.

3 Dummy equipment or a rig simulating the equipment items should be installed utilizing the attaching points to which the equipment is to be attached. The dummy equipment or rig should be so that the required loads can be applied at the c.g. position of the actual equipment.

4 The required loads should then be applied by any suitable means.

All items of mass which would be apt to injure the passengers or crew in the event of a crash landing should have their supporting structure designed to the crash load requirements of FAR 23.561 or the applicable critical flight or landing load factors of § 23.321, whichever is greater. (§§ 23.321, and 23.471)

Supporting structure of other mass items should be designed to the critical flight or landing load factors of §§ 23.321 and 23.471. The values shown in § 23.561 may be used in lieu of a determination of these values.

5 Are suitable materials used in the construction, including standard fasteners, and will the method of fabrication result in a consistently sound structure? (§§ 23.603, 23.605, 23.607, 23.609, 23.613 and 21.305)

Yes_________     No__________

Explain:________________________________________________________

_________________________________________________________________

_________________________________________________________________

_________________________________________________________________

_________________________________________________________________

_________________________________________________________________

_________________________________________________________________

_________________________________________________________________

_________________________________________________________________

c. Hazards to the Aircraft or its Occupants:

Avichecklist23.doc
7/12/2012
(1) Is the rack installed so that it does not adversely affect other structure (either primary or secondary) or cause interference with any controls, emergency exits, or necessary access provisions? (§ 23.1309)

Yes_______  No________
Explain: ____________________________________________________________
____________________________________________________________________
____________________________________________________________________

(2) Will the installation of the rack and related equipment adversely affect weight and balance and c.g. position? (§§ 23.25 and 23.29)

Yes_______  No________
Explain: ____________________________________________________________
____________________________________________________________________
____________________________________________________________________

(3) Is a fuse or circuit breaker of the rating appropriate to the cable used installed? (§ 23.1357)

Yes_______  No________
Explain: ____________________________________________________________
____________________________________________________________________
____________________________________________________________________

(4) Do all the appliances, parts, and materials meet the fire protection requirements of §§ 23.863 and 23.1182? (§ 23.1359)

Yes_______  No________
Explain: ____________________________________________________________
____________________________________________________________________
____________________________________________________________________

d. Operating Aspects:

(1) In the case of dual installations, are the operating controls and instruments suitably identified to prevent misapplication by the pilot? (§ 23.1309)

Yes_______  No________
(2) Have the necessary operational tests been performed to assure that the equipment will not adversely affect the operation of other communication or navigation systems? (§ 23.1431 and 23.1301)

Yes_______   No________

Explain:
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

(3) Do all electronic displays meet the applicable visibility, color and lighting requirements? (§ 23.1311)

Yes_______   No________

Explain:
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

(4) Does the arrangement and visibility of the instruments and indicators meet the requirements of § 23.1321 and 23.771?

Yes_______   No________

Explain:
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

(5) Is A Flight Manual Supplement or Supplemental Flight Manual required and/or was one issued with the original STC approval for the equipment? (§ 23.1585)

Yes_______   No________

Explain:
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

e. Detail Design Standards:

(1) Is the battery-generator combination adequate for the electrical loads imposed? (§§ 23.1309 and 23.1351)
(2) Are terminal strips designed or mounted so that loose metallic objects cannot fall across the terminal posts? (§ 23.1309)

Yes_______  No_________

Explain:

(3) If plug and receptacle type of connections are used, are the soldered connections of the wire to the plug and receptacle inserts individually insulated from each other and from metallic parts of the plug and receptacle? (§ 23.1309)

Yes_______  No_________

Explain:

(4) Are junction boxes made of fire-resistant or nonabsorbent plastic material? (§ 23.1309)

Yes_______  No_________

Explain:

(5) Are interconnecting wires and cables supported by insulated clamps to avoid chafing? (§ 23.1309)

Yes_______  No_________

Explain:

(6) Are the interconnecting cables and wires installed in such a manner that they are suitably protected from fuel, oil, water, and other detrimental substances, and mechanical damage? (§ 23.1309)

Yes_______  No_________
(7) Is the equipment located where it will obtain sufficient cooling and will not be a smoke hazard or ignite readily flammable parts of the airplane? (§ 23.1309)

Yes _______ No _______

Explain: ____________________________________________

(8) Are adequate means provided for inspection of the rack, related equipment, or adjacent components, which require periodic inspections? (§ 23.611)

Yes _______ No _______

Explain: ____________________________________________

(9) Do the Instructions For Continued Airworthiness meet the requirements of Part 23 Appendix G? (§ 23.1529)

Yes _______ No _______

Explain: ____________________________________________

I certify the alteration described above has been made in accordance with the requirements of the applicable regulations and that the information contained herein is true and correct to the best of my knowledge.

Date: ___________

Signature: __________________________ Certificate# __________________________