

## **SECTION 6.1 AIRCRAFT MODIFICATIONS (EXCLUDING LIGHTWEIGHT AEROPLANES)**

**WARNING:** An unapproved major modification to a RAAus registered aeroplane will render the aircraft's special certificate of airworthiness, permit to fly, RAAus Registration and any other approval null and void. Additionally, operation of an aircraft with an unapproved modification would be in breach of the relevant CAO.

### **REFERENCES**

- a) CASR Part 21
- b) CASA Advisory Circular AC 21-08v2.0 Approval of modification and repair designs under Subpart 21.M
- c) CASA Advisory Circular AC 21-12 v1.0 Classification of design changes

### **DEFINITIONS FOR THIS SECTION**

<b>Modification:</b>	A change in the physical characteristics of an aircraft, or an aeronautical product fitted to an aircraft, accomplished either by a change in production specifications or by alteration of items already produced which is not a repair.
<b>Major Change:</b>	A change that is not a minor change. (AC21-12v1.0)
<b>Minor Change:</b>	A change that has no appreciable effect on the weight, balance, structural strength, reliability, operational characteristics, or other characteristics affecting the airworthiness of an aircraft, aircraft engine or propeller. (AC21-12v1.0)
<b>Modification/Repair:</b>	An approval granted by a CASA or a CASA approved person under regulation 21.435 or 21.
<b>Design Approval:</b>	437

#### **6.1.1 AIRCRAFT TYPES TO WHICH THIS SECTION APPLIES**

RAAus amateur built and type accepted aircraft types that operate in accordance with the requirements of CAO 95.32 & 95.55

For production LSA (RAAus "23" and some legacy "24" prefix registered aircraft) issued with a special certificate of airworthiness under regulation 21.186, the aircraft may only be modified if the manufacturer authorises the modification. All modifications should be made in accordance with the LSA requirements applicable to the aircraft. A manufacturer must also approve a modification that has been assessed and found acceptable by a Subpart 21M authorised person. Modifications that are not authorised by the manufacturer will result in the the Special Certificate of Airworthiness issued under regulation 21.181(4)(c). Also refer to CAO 95.32 4 and CAO 95.55 4). being no longer in force.

**NOTE:** An LSA that has been modified without approval by the manufacturer may be eligible for the issue of an experimental certificate under regulation 21.191(k).

#### **6.1.2 MODIFICATIONS**

Modifications are classified as **minor**, or **major**.

A **minor change** is one that has no appreciable effect on the weight, balance, structural strength, reliability, operational characteristics, or other characteristics affecting the airworthiness of an aircraft, aircraft engine or propeller. **All other changes are major changes.**

### 6.1.3 MODIFICATION – Origins

Modifications (both mandatory and discretionary) may originate by Service Bulletin (SB), Supplemental Type Certificate (STC), Airworthiness Notice or Service Instruction from:

- a) aircraft manufacturer; or
- b) engine or propeller manufacturer; or
- c) aircraft kit manufacturer; or
- d) aircraft plans designer; or
- e) CASA Airworthiness Directive

Modifications may also be “**owner or other third party initiated**” - meaning, a modification that has been designed, manufactured, and installed by the owner or a third party with the owner’s approval.

### 6.1.4 APPROVAL OF MODIFICATIONS

Modifications to an aircraft, other than those initiated by a source listed in paragraph 3.1 above require approval by CASA, a CASA approved person prior to first flight. (CAO 95.55, 7.1 (iv) refers)

Sub-sections 5 to 10 describe the approval processes for owner or third party-initiated modifications to certified aircraft or an amateur built aircraft where the owner is not the builder of the aircraft (51% major portion rule).

The owner/operator of the aircraft or aeronautical product is responsible for the airworthiness of the aircraft or product. This includes ensuring that any modification has been approved and is compatible with the configuration of the aircraft, that the conditions of any approval have been complied with, that the airworthiness records for the aircraft or product are up to date, and for reporting major defects to RAAus associated with the modification.

The applicant (Owner or the CoR holder is responsible for showing that the proposed modification complies with the applicable airworthiness requirements. This involves providing all data and documents for the design to the approver and carrying out the necessary tests.

### 6.1.5 WHO MAY PERFORM MODIFICATION WORK

Holders of an RAAus Maintenance Authority appropriate to the Group and class of operation (private / flying training / hire) may perform modification work. See Section 11.1.3.2 and Section 11.2.2 of this Technical Manual.

The maintainer (the person who carries out the modification) is responsible for ensuring the modification has been approved, is carried out in accordance with the associated maintenance data, and for updating maintenance data and maintenance records for the aircraft or the aeronautical product. (refer to 6.6.1).

If the maintainer becomes aware that the modification would make the aircraft unsafe or the product unfit for use, then the maintainer cannot certify for the modification when fitted.

Aircraft, component, and equipment manufacturers may perform manufacturer authorised/ mandated modification work to their aircraft and/or aviation components fitted to an aircraft. Where a component or equipment manufacturer is required to endorse an aircraft for return to service on completion of a modification the work must be signed off by a L2 or higher maintenance authority holder. (Refer Section 6.6.)

### 6.1.6 RECORDING OF MODIFICATION WORK

Work performed on an aircraft, or an aircraft component must be recorded in the aircraft, the aircraft engine, or the propeller maintenance logbook. The entry or entries must detail the work completed, who the work was completed by including the approved person’s full name, signature, membership and/or CASA license number, maintenance authority level and the date. A copy of (or specific reference to) any aircraft, component, or

equipment manufacturer's instructions e.g. Service Bulletin, Service Instruction, Airworthiness Direction, or work standard e.g. FAA AC43-13- (*current issue*) must also be included.

#### **6.1.7 MODIFICATIONS TO AMATEUR BUILT AIRCRAFT**

The owner of an amateur-built aircraft (who is not the aircraft builder - refer to sub-section 5.1) may incorporate an owner initiated major modification.

Further flight is not permitted once work on the modification has commenced until a RAAus L4 or other authorised person has examined the aircraft, provided the RAAus HAM with a recommendation in relation to acceptance of the workmanship completed and the fit for purpose of the design and manufacture of the modification and the RAAus HAM has approved the modification in writing.

The recommendation to the HAM for approval of the aircraft for further flight must be signed by the L4 or other authorised person and be accompanied by a completed RAAus Tech Form 19 and all supporting documentation.

The L4 or other authorised person recommendation may specify that:

- a) the modification is acceptable with no further test flying; or
- b) the modification is acceptable, with more uneventful ground testing or test flying (hours or period to be specified) prior to final acceptance; or
- c) the modification is NOT recommended supported by a statement of reasons why the modification has not been recommended for acceptance.

The HAM will notify the acceptance or otherwise of the modifications to the applicant in writing. If the modification/s is not accepted the HAM will provide the applicant with a statement of reason why the modification is not accepted.

#### **6.1.8 MODIFICATIONS TO FACTORY BUILT LSA WEIGHT SHIFT CONTROLLED AEROPLANES, POWERED PARACHUTES and AEROPLANES**

CASA regulations prohibit a Light Sport Aircraft (LSA) with a Special Certificate of Airworthiness to be modified using an owner generated modification under any circumstances.

Modifications of any kind that have not been approved by the aircraft manufacturer will render the aircraft's Special Certificate of Airworthiness as taken to not be in force, until such time that the modification has been approved OR in the case of no approval being given, until the SCoA is cancelled and an Experimental Certificate issued if appropriate. see CASR 21.181(4)(c).

The aircraft may be registered by RAAus as an Experimental LSA (E-LSA) however, depending on the modification, who has done it and what they have done, may render the aircraft unairworthy for the issue of a CoA (how so-ever called), including experimental. Refer to subsection 9 below.

Further flight is not permitted until the modifications referenced at subsection 8.2 are approved or an Experimental Certificate of Airworthiness has been issued by a CASA or a CASA authorised person.

#### **6.1.9 WHAT MUST THE AIRCRAFT OWNER DO?**

The owner must:

- a) Surrender the Special Certificate of Airworthiness to RAAus, CASA or a CASA Authorised Person; and
- b) Apply to CASA or a CASA Authorised Person for the issue of an Experimental Certificate of Airworthiness (E-LSA), advising of the modification made or proposed to be made; and
- c) affix a prominent "EXPERIMENTAL" placard as detailed in Section 9.1 of this manual; and affix the passenger

- warning placard required by CAO 95.32 or CAO 95.55; and
- d) apply to RAAus for a registration change to E-LSA aircraft using Tech Form 10; and
- e) affix the “E” prefix letter to the aircraft registration markings.

#### **6.1.10 MODIFICATIONS TO E-LSA AEROPLANES, E-LSA WEIGHT SHIFT CONTROLLED AEROPLANES and E-LSA POWERED PARACHUTES**

Experimental Light Sport Aircraft (E-LSA) operating on an Experimental Certificate of Airworthiness which are undergoing or about to undergo owner initiated major modifications, must advise CASA or a CASA Authorised Person for assessment of the modification and issue of a new Special Certificate of Airworthiness.

Kit Built E-LSA aircraft CASR 21.191(j) – require manufacturer approved modifications – unapproved modifications can be applied, but aircraft will need to be transferred to non- conforming production E-LSA.

Non-conforming production E-LSA aircraft CASR 21.191(k) – do not require manufacturer approved modifications.

The owner must:

- a) notify RAAus, and CASA or a CASA Authorised Person (preferably the authorised person who issued the Experimental LSA Certificate); and
- b) advise the nature and details of the modification/s; and
- c) apply for a revised Experimental Certificate to be issued with an updated Annex of operating conditions and limitations (if any). Additional test flying may be required by CASA or CASA authorised person as one of the revised operating conditions.