



Advisory Circular

AC 21.29(0)

JUNE 2000

COMMERCIAL ASSISTANCE DURING CONSTRUCTION OF AMATEUR-BUILT EXPERIMENTAL AIRCRAFT AND AMATEUR- BUILT (ABAA) AIRCRAFT

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1. REFERENCES

This AC is to be read in conjunction with Civil Aviation Safety Regulations (CASRs), Part 21 Subpart H, and *Civil Aviation Regulations 1988* (CAR 1988) 262AP, and AC 21.4(1) "Amateur-Built Experimental Aircraft - Certification", and AC 21.11(0) "Amateur-Built (ABAA) Aircraft - Certification".

Note: CASRs referred to above are currently enacted as CAR 1998.

Advisory Circulars (ACs) are advisory only. ACs provide recommendations and guidance to illustrate a method, or several methods, not necessarily being the only method by which legislative requirements may be met. They also provide a means of illustrating the meaning of certain requirements by offering interpretive and explanatory guidance. ACs should always be read in conjunction with the referenced regulations.

2. PURPOSE

This AC gives guidance as to the interpretation and determination of the major portion requirement for persons involved in the construction of amateur-built aircraft, the manufacture of kits designed to be assembled into aircraft by amateur-builders, builders of aircraft fabricated from plans for certification as amateur-built and persons providing assistance to amateur builders.

3. STATUS OF THIS AC

This is the first AC to be written on the subject.

4. BACKGROUND

4.1 CASR 21.191(g) provides for the issue of Experimental Certificates for the operation of amateur-built experimental aircraft. An Experimental Certificate is a Special Certificate of Airworthiness (CoA) (reference CASR 21.175). Special CoAs issued under CASR 21.190 provide for the operation of amateur-built (ABAA) aircraft (where ABAA means Amateur-Built Aircraft Acceptance under Civil Aviation Order CAO 101.28 or CASR 21.190). An amateur-built aircraft is defined as an aircraft, the MAJOR PORTION of which has been FABRICATED AND ASSEMBLED BY PERSONS who undertook the construction project SOLELY FOR THEIR OWN EDUCATION OR RECREATION”.

4.2 This AC addresses the fabrication and assembly of amateur-built aircraft that are:

- (a) an original design of the builder;
- (b) built from purchased plans; or
- (c) built from a kit supplied by a kit manufacturer.

An acceptable method for the determination of the major portion requirement is provided in this AC to determine whether an aircraft has actually been built by the person or persons who claim amateur-built status, and not merely for commercial gain.

4.3 Some aircraft are constructed from plans, fabricated and assembled essentially from raw materials. Others are fabricated and assembled from kits supplied by a kit manufacturer. A mere mechanical assembly of a kit would clearly not meet the intent of the major portion requirement; the builder must undertake some of the fabrication work.

4.4 The Authority does not certificate amateur-built experimental aircraft kits, nor approve amateur-built experimental aircraft kit manufacturers. Prior to the introduction of CASR Part 21, the Authority did approve Australian kit manufacturers under regulation 30 of CAR 1988; however, this is not available to new entrants, and there is no similar provision in CASR Part 21.

4.5 The Authority has introduced a system of evaluation of kits that, at the request of a kit manufacturer, the Authority will use to determine if a kit is capable of meeting the major portion requirement when assembled in accordance with the kit manufacturer’s instructions, and without further commercial assistance, could meet the major portion requirement. This evaluation should NOT be construed as meaning the kit or the kit manufacturer is CERTIFIED, CERTIFICATED, or APPROVED by the Authority, and it is not appropriate to represent it as such. Kits supplied by an Australian manufacturer approved as a

Certificate of Approval holder to manufacture under regulation 30 of CAR 1988 may continue to be represented as such.

4.6 Persons contemplating purchasing a kit are strongly advised to determine that the kit has been assessed by the Authority, or another National Airworthiness Authority (NAA) whose assessments are acceptable to CASA (such as the Federal Aviation Administration (FAA) of the USA), as capable of meeting the major portion requirement. Failure to do this could result in the completed aircraft not being eligible for amateur-built certification.

4.7 Persons contemplating building an aircraft from purchased plans or an original aircraft of their own design should be cognizant of the major portion requirement. The completed aircraft will still be subject to a major portion assessment for eligibility as an amateur-built aircraft.

4.8 All completed aircraft must be evaluated by an authorised person or the Authority to establish that the major portion requirement has in fact been met, prior to the issue of the Special CoA.

4.9 For further information on the procedures associated with the construction of amateur-built aircraft refer to:

- (a) AC 21.4 — Amateur-built Experimental Aircraft – Certification; and
- (b) AC 21.11 — Amateur-built (ABAA) Aircraft – Certification

5. DEFINITIONS

As used in this Advisory Circular, the following definitions apply:

aircraft evaluation: the evaluation carried out for the purpose of determining if a specific amateur-built aircraft meets the major portion requirement of CASR 21.191(g) for Amateur-built Experimental Aircraft, or CAO 101.28 for Amateur-built (ABAA) Aircraft.

commercial assistance: assistance in the building of an amateur-built aircraft in exchange for compensation. This does not include one builder helping another.

compensation: payment by the amateur-builder applicant in cash, services, or other tender, to any person who provides assistance on a commercial basis in the building of an aircraft.

checklist: the CASA Fabrication/Assembly Operation Checklist contained in Appendix 1 of this AC, is used as an aid in determining whether a manufacturer's aircraft kit could meet the major portion requirement. It is also used for determining whether a completed aircraft is eligible for certification as an amateur-built aircraft.

kit: a collection of prefabricated components, parts and materials that constitute all or a part of what is required to produce a finished aircraft.

kit-built aircraft: this does **not** refer to amateur building; this is a primary category aircraft that meets the criteria of CASR 21.24(1)(a) and that was assembled by a person from a kit manufactured by the holder of a Production Certificate under CASR 21.184(1). The major portion requirement does not apply to such aircraft, which are eligible for an experimental certificate for the purpose of operating a kit-built aircraft under CASR 21.191(h). Further information is contained in section 16 of AC 21.4 "Amateur-built Experimental Aircraft – Certification". However, aircraft manufactured from such kits may qualify as amateur-built if the major portion requirement is met.

kit evaluation: an evaluation by the Authority to determine whether an aircraft built from, and according to kit instructions, could meet the major portion requirement for amateur-built certification.

letter of eligibility: a letter provided by the Authority to an aircraft kit manufacturer advising that the aircraft kit requested to be evaluated could meet the major portion requirement.

major portion: as related to a Special CoA issued for the purpose of operating amateur-built aircraft, major portion means that when the aircraft is completed, more than 50% of the fabrication and assembly tasks have been carried out by an amateur builder or builders.

plans-built aircraft: an aircraft that is constructed exclusively from plans/blueprints without the aid of purchased major sub-assemblies or pre-assembled kit components. This also includes aircraft of a builder's original design.

unacceptable commercial assistance: any commercial assistance that reduces the work carried out by the amateur builder or builders to less than the major portion of the aircraft construction.

6. EVALUATION FOR MAJOR PORTION REQUIREMENT

6.1 Initial Evaluation of Kits

6.1.1 Aircraft kit manufacturers requesting a kit evaluation should submit a letter to the local CASA Office. Contact details for CASA Offices are given in AC 11.1 "Advisory Circulars - Guidelines".

6.1.2 The evaluation to determine compliance with the major portion requirement is carried out by an Airworthiness Inspector (AWI) from the CASA Office. When the kit is evaluated using the checklist in Appendix 1 as a guide and found to be able to comply with the major portion requirement, a Letter of Eligibility is sent to the kit manufacturer. The kit is then acceptable to be included in the list of eligible amateur-built aircraft kits that have been evaluated by the Authority, and contained in Appendix 2 of this AC.

6.1.3 The purpose of the listing is to eliminate the duplication of evaluations for the major portion determination.

6.1.4 If the kit manufacturer later offers an option or makes changes to the kit that decreases the amount of fabrication and assembly required by the builder, the manufacturer should request a new Letter of Eligibility. The kit manufacturer should provide a revised checklist and a description of the option or change to the Authority with drawings and or photographs as necessary. If the Authority determines that the revised kit still meets the major portion requirement, the Authority will issue a new Letter of Eligibility for the amended checklist without conducting a physical inspection or complete re-evaluation of the kit. If the Authority determines that the option or change was of sufficient magnitude, a physical inspection and re-evaluation of the kit will be carried out.

6.2 Evaluation of Completed Kit Aircraft

6.2.1 When an aircraft has been constructed from an eligible kit, and no further commercial assistance was used, a further major portion determination will not be required

6.2.2 A re-evaluation for compliance with the major portion requirement will be required if:

- (a) the aircraft was built using some prefabricated major components that are readily available from aircraft parts suppliers;
- (b) the aircraft was built using some salvaged or used sections from type certificated aircraft;
- (c) the aircraft was built from a kit for which there has not been a prior assessment for eligibility for amateur-built certification; or
- (d) the aircraft was built from a kit that had been changed by the kit manufacturer after the date of eligibility had been established.

6.3 Evaluation of plans-built aircraft

6.3.1 During final inspection for issue of a Special CoA, a plans-built aircraft must be evaluated for compliance with the major portion requirement. Where the builder's records, data, and signed CASA Form 727 "Eligibility Statement – Amateur-Built Aircraft" provide evidence that the builder fabricated and assembled the major portion of the aircraft, the use of the checklist in Appendix 1 is not necessary. In all other cases, the checklist should be used.

6.3.2 A person may provide commercial assistance to a builder of a plans-built aircraft or non-evaluated kit. This assistance or task must be listed in the KIT MANUFACTURER column on the checklist when the completed aircraft is presented for evaluation/certification to the authorised person or the CASA AWI.

6.3.3 If the builder intends to utilise commercial assistance, the checklist can be submitted to the authorised person or the Authority prior to construction, listing the tasks or processes for which the commercial assistance is proposed. It should also show the intended fabrication and assembly tasks the builder is to perform. On the basis of this pre-construction checklist, a builder of a plans-built aircraft should be able to obtain an evaluation in writing from the authorised person or the Authority of the effect that the proposed commercial assistance will have on the major portion requirement for the completed aircraft.

6.3.4 Factors which will affect the evaluation for compliance with the major portion requirement include:

- (a) using some prefabricated major components that are readily available from aircraft parts suppliers; and
- (b) using some salvaged or used sections from type certificated aircraft.

7. COMMERCIAL ASSISTANCE NOT REQUIRING RE-EVALUATION OF THE COMPLETED AIRCRAFT

7.1 Commercial instructional assistance may be obtained by the amateur builder in the fabrication or assembly of specific parts and in the completion of certain tasks or processes involved in the construction of the aircraft. During all instructional activity, the amateur builder must be present to accomplish the instructional tasks and must accomplish all subsequent fabrication and assembly of parts for which instruction is being given. Tasks completed by the amateur-builder would be identified on the checklist under AMATEUR or in the assembly manual. For example, assume fabrication of the wing ribs is listed on the

checklist or in the assembly manual as a task to be completed by the amateur-builder. Instructional activity could be provided to build the first few ribs with the remainder to be completed by the amateur-builder.

7.2 Commercial assistance may be obtained for non-checklist items on a kit that has been evaluated by the Authority. A non-checklist item is a task or process that is not listed in the checklist. These items also include painting and the installation of interior upholstery or avionics. Such a task or process would not be required to be personally completed by the amateur-builder for the aircraft to be eligible for amateur-built certification.

7.3 The amateur builder is not expected to have fabricated every component that makes up the completed aircraft. Non-checklist items include the fabrication of engines, propellers, wheels and brake assemblies, and standard aircraft hardware. However, if the installation of these items is checked in the AMATEUR column on the checklist, they must be accomplished by the builder.

8. COMMERCIAL ASSISTANCE REQUIRING RE-EVALUATION OF THE COMPLETED AIRCRAFT

For an evaluated kit, if commercial assistance is carried out on items listed in the checklist under AMATEUR, the major portion evaluation previously carried out by the Authority will be invalid for that specific aircraft project. Consequently, it may result in a complete re-evaluation of the fabrication and assembly of the aircraft. This could put the amateur-built status of the aircraft in jeopardy. In other words, the aircraft will be treated as a non-evaluated kit and subject to complete evaluation by an authorised person or the Authority when presented for certification as an amateur-built aircraft.

9. SALE OF INCOMPLETE AIRCRAFT

Commercial assistance does not include the instance where an incomplete aircraft is sold to another builder and the second or subsequent builder completes the aircraft. In such a case, the work carried out by the first builder will count toward completion of the major portion by the second builder. The second or subsequent builder should obtain as much detailed information and documentation, e.g. logbooks, material receipts, photographs, etc. from the original builder as possible. This information will be helpful in the authorised person's, or the Authority's, determination for the major portion requirement of the aircraft.

10. NON-EVALUATED KIT AIRCRAFT

An aircraft constructed from a non-evaluated kit must be evaluated upon completion for compliance with the major portion requirements by an authorised person or CASA using the CASA Fabrication/Assembly Operation Checklist in Appendix 1.

11. ELIGIBILITY STATEMENT

The CASA Form No 727 "Eligibility Statement – Amateur-built Aircraft", is one of the forms required to be submitted by the applicant for a Special CoA for the purpose of operating an amateur-built aircraft. It includes sections for the builder(s) and aircraft information along with the applicant's declaration certifying that all statements and answers are complete and true. It also provides notice of the potential penalty that could be applied

if false or fraudulent statements are made. Copies of the CASA Form 727 are available from CASA Offices.

12. INFORMATION SUPPLIED BY INDUSTRY TO PROSPECTIVE CUSTOMERS

Kit manufacturers are encouraged to include in their information packages a document explaining the intent and purpose of the amateur-built requirements. Prospective customers would then be made aware of their responsibility and limitations under the Regulations. The information package should summarise the process used to determine kit eligibility and the inspection of the completed aircraft. It should also advise potential customers of the statement that they must sign certifying that they fabricated and assembled the major portion of the aircraft. Additionally, the customer should be advised of the need for and the availability of flight training, as well as the value of membership of organisations such as the Sport Aircraft Association of Australia (SAAA).

13. INFORMATION SUPPLIED BY INDUSTRY TO PURCHASERS

Kit manufacturers are encouraged to include a copy of the amateur-built Regulations and to advise the purchaser of the requirement for applicants to certify that they have fabricated and assembled the major portion of the aircraft for their own education or recreation. In addition to the aircraft assembly manual, the kit manufacturer should reference this AC regarding acceptable commercial assistance. Manufacturers should inform purchasers of the help available to them through organisations such as the SAAA.

Richard G. Yates
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Appendix 1**CASA Fabrication/Assembly Operation Checklist****GUIDANCE.**

1. This form may be used by any person to establish the eligibility of an aircraft to be issued with a Special CoA, for the purpose of operating as an amateur-built experimental aircraft. Prepare the form as follows:
2. Enter the company name and address, aircraft model, (by name and/or number), document name and date (manufacturer's parts list, assembly manual, etc., with latest revision) and type of aircraft (land, sea, fixed-wing, rotorcraft, etc.).
3. Mark the specific tasks required to fabricate and assemble the aircraft. Mark, an "X" under the column heading "Accomplished By" in the appropriate space when the task is carried out by the AMATEUR. If the task is carried out by the kit manufacturer or by a person providing commercial assistance, a mark will be placed in the kit manufacturer column. Additional blank lines are provided to list any tasks not on the checklist. If a task is listed and not applicable to the construction of the aircraft enter N/A in the appropriate space.
4. Use the comments area to enter any additional comments, information or statements, as necessary.
5. Print or type the name of the person carrying out the evaluation of the kit or aircraft.
6. The person carrying out the evaluation of the kit or aircraft should sign their name in the signature block.
7. Enter the date the evaluation was carried out.
8. To meet the major portion requirement, the number of check marks in the AMATEUR BUILDER column must exceed the number of check marks in the KIT MANUFACTURER column.
9. For additional guidance or interpretation of requirements in unusual circumstances, contact your local CASA office.

Fabrication/Assembly Operation Checklist

Company Name: _____

Address: _____

Aircraft Model: _____

Document Name and Date: _____

Type of Aircraft: _____

Fuselage

	Kit Manufacturer	Amateur Builder
1. Fabricate Special Tools or Fixtures		
2. Fabricate Longitudinal Members, Cores or Shells		
3. Fabricate Bulkheads or Cross Members		
4. Assemble Fuselage Basic Structure		
5. Fabricate Brackets and Fittings		
6. Install Brackets and Fittings		
7. Fabricate Cables, Wire and Lines		
8. Install Cables, Wires and Lines		
9. Fabricate Fuselage Covering or Skin		
10. Install Fuselage Covering or Skin		
11. Fabricate Windshield/Windows/Canopy		
12. Install Windshield/Windows/Canopy		

Wings

	Kit Manufacturer	Amateur Builder
1. Fabricate Special Tools or Fixtures		
2. Fabricate Wing Spars		
3. Fabricate Wings Ribs or Cores		
4. Fabricate Wing Leading and Trailing Edge		
5. Fabricate Drag/Anti-Drag Truss Members		
6. Fabricate Wing Brackets and Fittings		
7. Fabricate Wing Tips		
8. Assemble Basic Wing Structures		
9. Install Wing Leading/Trailing Edge and Tips		
10. Install Drag/Anti-Drag Truss		
11. Fabricate Cables, Wires and Lines		
12. Install Cables, Wires and Lines		
13. Fabricate Wing Covering or Skin		
14. Install Wing Covering or Skin		
15. Fabricate Wing Struts/Wires		
16. Install and Rig Wings and Struts		

Flight Controls

	Kit Manufacturer	Amateur Builder
1. Fabricate Special Tools or Fixtures		
2. Fabricate Aileron Spars		
3. Fabricate Aileron Ribs or Cores		
4. Assemble Aileron Structure		
5. Fabricate Aileron Leading and Trailing Edge		

6. Assemble Aileron Leading and Trailing Edge		
7. Fabricate Aileron Brackets and Fittings		
8. Install Aileron Brackets and Fittings		
9. Fabricate Aileron Covering or Skin		
10. Install Aileron Covering or Skin		
11. Fabricate Aileron Trim Tab		
12. Install Aileron Trim Tab		
13. Install and Rig Aileron		
14. Fabricate Flap Spars		
15. Fabricate Flap Ribs or Cores		
16. Assemble Flap Structure		
17. Fabricate Flap Leading and Trailing Edge		
18. Assemble Flap Leading and Trailing Edge		
19. Fabricate Flap Brackets and Fittings		
20. Install Flap Brackets and Fittings		
21. Fabricate Flap Covering or Skin		
22. Install Flap Covering or Skin		
23. Install and Rig Flap		
24. Fabricate Elevator Spars		
25. Fabricate Elevator Ribs or Cores		
26. Assemble Elevator Structure		
27. Fabricate Elevator Leading and Trailing Edge		
28. Assemble Elevator Leading and Trailing Edge		
29. Fabricate Elevator Brackets and Fittings		
30. Install Elevator Brackets and Fittings		
31. Fabricate Elevator Covering or Skin		
32. Install Elevator Covering or Skin		
33. Fabricate Elevator Trim Tab		
34. Install Elevator Trim Tab		
35. Install and Rig Elevator		
36. Fabricate Rudder Spars		
37. Fabricate Rudder Ribs or Cores		

38. Assemble Rudder Structure		
39. Fabricate Rudder Leading and Trailing Edge		
40. Assemble Rudder Leading and Trailing Edge		
41. Fabricate Rudder Brackets and Fittings		
42. Install Rudder Brackets and Fittings		
43. Fabricate Rudder Covering or Skin		
44. Install Rudder Covering or Skin		
45. Fabricate Rudder Trim Tab		
46. Install Rudder Trim Tab		
47. Install and Rig Rudder		

Empennage

	Kit Manufacturer	Amateur Builder
1. Fabricate Special Tools or Fixtures		
2. Fabricate Spars		
3. Fabricate Ribs or Cores		
4. Fabricate Leading and Trailing Edges		
5. Fabricate Tips		
6. Fabricate Brackets and Fittings		
7. Assemble Empennage Structures		
8. Install Leading/Trailing Edges and Tips		
9. Install Fittings		
10. Fabricate Cables, Wires and Lines		
11. Install Cables, Wires and Lines		
12. Fabricate Empennage Covering or Skin		
13. Install Empennage Covering or Skin		

Canard

	Kit Manufacturer	Amateur Builder
1. Fabricate Canard		
2. Assemble Canard Structure		
3. Install and Rig Canard		

Landing Gear

	Kit Manufacturer	Amateur Builder
1. Fabricate Special Tools or Fixtures		
2. Fabricate Struts		
3. Fabricate Brakes System		
4. Fabricate Retraction System		
5. Fabricate Cables, Wires and Lines		
6. Assemble Wheels, Brakes, Tires and Landing Gear		
7. Install Landing Gear System Components		

Propulsion

	Kit Manufacturer	Amateur Builder
1. Fabricate Special Tools or Fixtures		
2. Fabricate Engine Mount		
3. Fabricate Engine Cooling System/Baffles		
4. Fabricate Induction System		
5. Fabricate Exhaust System		
6. Fabricate Engine Controls		
7. Fabricate Brackets and Fittings		
8. Fabricate Cables, Wires and Lines		
9. Assemble Engine		
10. Install Engine and Items Listed Above		
11. Fabricate Engine Cowling		

12. Install Engine Cowling		
13. Fabricate Propeller		
14. Install Propeller		
15. Fabricate Fuel Tank		
16. Install Fuel Tank		
17. Fabricate Fuel System Components		
18. Install Fuel System Components		

Main Rotor Drive Systems and Control Mechanism(s)

	Kit Manufacturer	Amateur Builder
1. Fabricate Special Static and Dynamic Rotor Rigging Tools		
2. Fabricate/Assemble Main Rotor Drive Train		
3. Install Main Rotor Drive Train Assembly		
4. Fabricate/Assemble Main Rotor Shaft and Hub Assembly		
5. Install Main Rotor Shaft and Hub Assembly		
6. Align Main Rotor Shaft, Drive Train Shaft and Hub Assembly		
7. Fabricate Main Rotor Rotating Controls		
8. Install Main Rotor Rotating Controls		
9. Fabricate Main Rotor Non-Rotating Controls		
10. Rig Main Rotor Rotating and Non-Rotating Controls		
11. Fabricate Main Rotor Blades		
12. Install Main Rotor Blades on Rotor Hub		
13. Statically Balance and Rig Main Rotor System		
14. Dynamically Track and Balance Main Rotor System		

Tail Rotor Drive Systems and Control Mechanism(s)

	Kit Manufacturer	Amateur Builder
1. Fabricate Special Static Tail Rotor Rigging Tools		
2. Fabricate Vertical Trim Fin		
3. Install Vertical Trim Fin		
4. Fabricate Horizontal Stabiliser		
5. Install Horizontal Stabiliser		
6. Fabricate Tail Rotor Drive System		
7. Install Tail Rotor Drive System		
8. Fabricate Tail Cone or Frame		
9. Install and Rig Tail Cone or Frame		
10. Rig Vertical Trim Fin		
11. Fabricate Tail Rotor Shaft and Hub Assembly		
12. Install Tail Rotor Shaft and Hub Assembly		
13. Fabricate Tail Rotor Rotating and Non-Rotating Controls		
14. Rig Tail Rotor Rotating and Non-Rotating Controls		
15. Fabricate/Assemble Tail Rotor Blades		
16. Install Tail Rotor Blades		
17. Statically Balance and Rig Tail Rotor System		
18. Dynamically Track and Balance Tail Rotor System		

Cockpit/Interior

	Kit Manufacturer	Amateur Builder
1. Fabricate Instrument Panel		
2. Install Instrument Panel and Instruments		
3. Fabricate Seats		
4. Install Seats		
5. Fabricate Electrical Wiring, Controls and Switches		
6. Install Electrical System, Controls and Switches		

Totals

Add total number of marks in each of the columns		
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Appendix 2**LISTING OF ELIGIBLE AMATEUR-BUILT AIRCRAFT KITS ASSESSED BY
THE AUTHORITY****(To be advised)**

Note: The listing of eligible kits assessed by the FAA is posted on FEDWORLD and may also be viewed via the Internet on the FAA Regulatory Support division home page at address <http://www.mmac.jccbi.gov/afs/afs600/>.