CIVIL AVIATION SAFETY AUTHORITY AUSTRALIA

Advisory Circular

AC 21.4(2) SEPTEMBER 2000

AMATEUR-BUILT EXPERIMENTAL AIRCRAFT — CERTIFICATION

CONTENTS

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.

1. REFERENCES

Civil Aviation Safety Regulations (CASRs) Part 21 Subpart H, and *Civil Aviation Regulations 1988* (CAR 1988) 262AP.

Note: CASRs referred to above are currently enacted as Civil Aviation Regulations 1998 *(CAR 1998).*

2. PURPOSE

This Advisory Circular (AC) provides guidance and information to applicants applying for an experimental certificate issued for an amateur-built aircraft in Australia, subsequent to the issue of the CASRs, and specifically CASR Part 21 Subpart H, "Certificates of Airworthiness". This AC also elaborates on the procedures for building, certificating and operating experimental amateur-built aircraft of all types; explains how much fabrication and assembly the amateur builder must accomplish for the aircraft to be eligible for amateur-built certification; and describes the Civil Aviation Safety Authority (CASA) and authorised persons' roles in the certification process.

3. STATUS OF THIS AC

This AC has been revised to include a reference to AC 21.29, to include a procedure if the aircraft is modified and for minor noted editorial changes.. This AC replaces AC 21.4(1).

4. BACKGROUND

4.1 Standard Certificates of Airworthiness (CoAs) are issued to individual Australian aircraft which:

(a) meet the requirements of an applicable comprehensive airworthiness code as required by Part II, Section 2.2 of the International Civil Aviation Organisation (ICAO) Annex 8, "Airworthiness of Aircraft"; and

(b) have been issued with a type certificate.

4.2 A CoA is required for each aircraft engaged in international operations.

4.3 Any aircraft which does not have a standard CoA cannot be operated unless it has been issued a special CoA (including an experimental certificate), or a special flight permit.

4.4 CASR 21.195A allows an authorised person or CASA to issue experimental certificates to allow operation of amateur-built and kit built aircraft. However, the CASRs do not preclude an amateur builder undertaking a project involving a type with the relevant CASA approval, ie. an Amateur-Built Aircraft Acceptance (ABAA). CASR 21.190 allows CASA or an authorised person to issue special certificates of airworthiness in the amateur-built category as aircraft accepted under an ABAA. This process is described in full in a companion AC 21.11, "Amateur-Built (ABAA) Aircraft - Certification".

5. DEFINITIONS

5.1 An ***amateur-built aircraft*** is an aircraft, the major portion of which has been fabricated and assembled by a person or persons who undertook the construction project solely for their own education or recreation.

5.2 Subsidiary definitions, as they apply to this AC, are as follows:

aircraft evaluation: an evaluation performed for the purpose of determining if a specific amateur-built aircraft meets the major portion requirements as per 5.1 above;

amateur: one who follows a sport or pursuit for the satisfaction of it, not for financial reward;

amateur builder: a person who constructs an aircraft under amateur-built aircraft guidelines, and who does not receive any form of payment for such an activity;

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 in cash, services, or other tender, to any person who provides assistance on a commercial basis in the building of an aircraft;

checklist: the Fabrication/Assembly Operation Checklist is used as an aid in determining if the manufacturer's aircraft kit meets the major portion requirements as referred to above. It is also used for determining if the completed aircraft is eligible for certification as an amateur-built aircraft;

kit: a collection of prefabricated components, parts and materials that constitute all or part of what is required to produce a finished aircraft, as sold by a manufacturer of that kit, whether or not the manufacturer actually fabricates some or all of the kit contents;

kit built aircraft: 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 for the kit, without the supervision and quality control of the production certificate holder under CASR 21.184 (1);

kit evaluation: an evaluation to determine if an aircraft built from, and according to, the kit instructions will meet the major portion requirements referred to above;

major portion: as related to an experimental certificate issued for the purpose of operating amateur-built aircraft, major portion means that when the aircraft is completed, the majority of the fabrication and assembly tasks have been performed by the amateur builder(s) who submit the application for certification. The major portion means more than 50% of the aircraft;

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. (as opposed to aircraft built from a kit);

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

*Note 1**:** An aircraft built from a kit need not necessarily be a "kit built aircraft".*

Note 2: For further information as to the permitted commercial assistance refer to AC 21.29 "Commercial Assistance During Construction of Amateur-built Experimental Aircraft and Amateur-built (ABAA) Aircraft."

6. INSPECTION CRITERIA

6.1 The amateur-built program was designed to permit person(s) to build an aircraft solely for educational or recreational purposes. CASA permits amateur builders the freedom to select their own designs. CASA does not formally approve these designs since

it is not practicable to develop design standards for the multitude of unique design configurations generated by kit manufacturers and amateur builders.

6.2 Amateur builders should call upon persons having experience with aircraft construction techniques, such as the SAAA technical counsellors, suitably qualified engineers, GFA gliding inspectors and other experienced persons to inspect particular components eg. wing assemblies, fuselages etc. prior to closure and to conduct other inspections as necessary. This practice is an effective means of monitoring construction integrity. Previously, CASA inspected amateur-built aircraft at several stages during construction and upon completion before the initial issue of a permit to fly. Overseas experience has shown that, for experimental amateur built aircraft, it is appropriate that the aircraft be inspected only once by an authorised person or CASA prior to the initial test flight..

6.3 The purpose of the inspection is to allow the inspector to make a subjective assessment of the workshop methods, techniques and practices used in the construction of the aircraft solely for the purpose of prescribing appropriate conditions and operating limitations necessary to protect other airspace users and persons on the ground or water, ie. to protect persons and property not involved in the activity.

6.4 The inspection should establish that:

(a) the aircraft is registered and marked in accordance with the requirements of paragraphs 9 and 10;

(b) the aircraft meets the major portion rule;

(c) the weight and balance data is available and the aircraft has been correctly weighed;

(d) the engine(s) and flight controls operate properly;

(e) the pitot static system and associated instruments operate properly.

Note: The person carrying out the inspection is not responsible for the integrity of the design or construction of the amateur-built experimental aircraft, nor for the identification of any structural design or construction deficiencies — responsibility for the design, construction and integrity of the aircraft rests with the amateur builder.

6.5 CASA authorises persons to act on behalf of CASA in the inspection of amateur-built aircraft and the issue of airworthiness certificates. These authorised persons may charge for their services. These charges are not governed by CASA. The amateur-builder may contact the SAAA, the GFA or the local CASA District Office to locate an authorised person. Refer to advisory circular AC 11.1 "Advisory Circulars – Guidelines" for locations and contact details for CASA District Offices.

6.6 In view of the foregoing considerations, CASA has concluded that safety objectives, relative to the amateur-built program, can continue to be met by the use of the following criteria:

(a) amateur builders should have knowledgeable persons (ie., LAMEs, SAAA Technical Counsellors, professional engineers, GFA glider inspectors, etc.) perform pre-closure inspections and other inspections as appropriate. In addition, builders should document the construction using photographs taken at appropriate times prior to covering. The photographs should clearly show

methods of construction and quality of workmanship. Such photographic records should be included with the builder's log or other construction records;

(b) the authorised person or CASA inspector will conduct an inspection of the aircraft prior to the issue of the initial CASA Form No 720 "Special Airworthiness Certificate" to enable the applicant to demonstrate compliance with the requirements of CAR 1988 262AP(3). This inspection will include a review of the information required by CASR 21.193, the aircraft builder's logbook, and an examination of the completed aircraft as per paragraphs 6.3 and 6.4 above; and

(c) the authorised person or CASA inspector may elect to issue amateur-built airworthiness certificates on a one-time basis to the builder for showing compliance with CAR 1988 262AP(3) and continued operation under CASR 21.191(g). Under this procedure, the aircraft will be inspected only once prior to flight testing. The CoA will be issued, but its validity will be subject to compliance with the operating limitations. The limitations will provide for operation in an assigned flight test area for a certain number of hours before the second part of the limitations becomes effective, releasing the aircraft from the test area.

6.7 If major modifications are carried out after the experimental certificate has been issued, a re-evaluation by an authorised person or CASA must be carried out and a new experimental certificate issued.

7. DESIGN AND CONSTRUCTION

7.1 Many individuals who desire to build their own aircraft have little or no experience with respect to aeronautical practices, workmanship or design. One source for advice in such matters is the SAAA, whose contact details are given at Attachment 1. The SAAA is an organisation established for the purpose of promoting amateur aircraft building and giving technical advice and assistance to its members. The SAAA has implemented a Technical Counsellors program whose aim is to ensure the safety and dependability of amateur-built aircraft. Most SAAA Technical Counsellors are willing to inspect amateur-built aircraft projects and offer constructive advice regarding workmanship and/or design. Another organisation is the Gliding Federation of Australia (GFA) who has a network of glider technical inspectors. Contact details are given at Attachment 1.

7.2 Any choice of engines, propellers, wheels, other components, and any choice of materials may be used in the construction of amateur-built aircraft. However, it is strongly recommended that approved components and established aircraft quality material be used, especially in fabricating parts constituting the primary structure, such as wing spars, critical attachment fittings, and fuselage structural members. Inferior materials, whose identity cannot be established, should not be used. Major sections i.e. wings, fuselage, empennage, etc. from type certificated aircraft may be used in the construction as long as the sections are in a condition for safe operation. These sections are to be considered by the authorised person or CASA inspector in determining the major portion requirements in CASR 21.191(g), but no credit for fabrication and assembly would be given the builder for these sections. It is recommended that builders contact the authorised person with whom they intend to deal, or contact the local CASA District Office to discuss whether the use of such sections might jeopardise the eligibility of the aircraft for amateur-built status.

7.3 The design of the cockpit or cabin of the aircraft should avoid, or provide for padding on, sharp corners or edges, protrusions, knobs and similar objects which may cause injury to the pilot or passengers in the event of an accident. It is strongly recommended that US FAA Technical Standard Order (TSO) approved or equivalent seat belts be installed along with approved shoulder harnesses.

7.4 An engine installation should ensure that adequate fuel is supplied to the engine in all anticipated flight attitudes. Also, a suitable means, consistent with the size and complexity of the aircraft, should be provided to reduce fire hazard wherever possible, including a fireproof firewall between the engine compartment and the cabin. When applicable, a carburettor heat system should also be provided to minimise the possibility of carburettor icing.

7.5 Additional information and guidance concerning acceptable fabrication and assembly are provided in AC 43.13-lA, Acceptable Methods, Techniques, and Practices - Aircraft Inspection and Repair, and AC 43.13-2A, Acceptable Methods, Techniques, and Practices - Aircraft Alterations.

7.6 The builder should obtain the services of a qualified aeronautical engineer or consult with the designer of purchased plans or construction kits, as appropriate, to discuss the proposal if the aircraft design is modified during construction.

8. CONSTRUCTION KITS

8.1 Construction kits containing raw materials and some prefabricated components may be used in building an amateur-built aircraft. However, aircraft which are assembled entirely from kits composed of completely finished prefabricated components, parts and pre-cut and pre-drilled materials are not considered to be eligible for certification as amateur-built aircraft since the major portion of the aircraft would not have been fabricated and assembled by the builder.

8.2 An aircraft built from a kit may be eligible for amateur-built certification, provided the major portion has been fabricated and assembled by the amateur builder. Kit owner(s) may jeopardise eligibility for amateur-built certification under CASR 21.191(g) if they allow someone else to build the aircraft. The major portion of such kits may consist of raw stock such as lengths of wood, tubing, extrusions, etc., which may have been cut to an approximate length. A certain quantity of prefabricated parts such as heat treated ribs, bulkheads or complex parts made from sheet metal, fibre glass, or polystyrene would also be acceptable, provided the kit still meets the major portion of the fabrication and assembly requirement, and the amateur builder satisfies the authorised person or CASA inspector that completion of the aircraft kit is not merely an assembly operation.

> CAUTION: Purchasers of partially completed kits should obtain all fabrication and assembly records from the previous owner(s). This may enable the builder who completes the aircraft to be eligible for amateur-built certification.

8.3 Various material/part kits for the construction of aircraft are commercially available for use by aircraft builders. Advertisements may tend to be somewhat vague and may be misleading as to whether a kit is eligible for amateur-built certification. It is not advisable to order a kit before verifying with an authorised person or CASA inspector if the aircraft, upon completion, may be eligible for certification as an amateur-built under existing rules and established policy.

8.4 Note that CASA does not certify experimental amateur-built aircraft kits or approve experimental amateur-built aircraft kit manufacturers. However, an authorised person or CASA may perform evaluations of kits which have potential for national sales interest, but only for the purpose of determining if an aircraft built from the kits will meet the major portion criteria. CASA will normally accept kit evaluations performed by the FAA.

8.5 Prospective amateur builders should note that an alternative route for certification of amateur-built aircraft in Australia exists under the so-called ABAA (Amateur-Built Aircraft Acceptance) procedure, administered jointly by CASA and the SAAA. This is fully described in a companion AC 21.11, "Amateur-Built (ABAA) Aircraft - Certification".

9. REGISTRATION AND MARKING INFORMATION

These procedures are described in Advisory Circular AC 47.1 "Registration of Aircraft", currently specified in Part III of the CAR 1988.

10. IDENTIFICATION AND REGISTRATION MARKS

These procedures are described in Advisory Circular AC 45.1 "Nationality and Registration Marks", currently specified in Part III of the CAR 1988.

11. CERTIFICATION STEPS

The following procedures are in the general order to be followed in the certification process:

(a) ***initial step***. The prospective builder should contact an authorised person or the nearest CASA office to discuss the plans for building the aircraft. During this contact, the type of aircraft, its complexity and/or materials should be discussed. The authorised person or CASA Inspector may provide the prospective builder with any guidance necessary to ensure a thorough understanding of applicable regulations;

(b) ***registration***. As per paragraph 9 of this AC. This must be done before submitting a CASA Form No. 718 "Special Certificate of Airworthiness-Application" to an authorised person or CASA;

(c) ***marking***. The registration (VH-Letters) assigned to the aircraft and an identification plate must be affixed in accordance with CASR Parts 45 and 47, as per paragraphs 9 and 10 of this AC;

(d) ***application***. The builder may apply for a special airworthiness certificate by submitting the following documents and data to an authorised person or to the nearest CASA office:

(i) CASA Form No. 718 "Application for Issue of a Special Certificate of Airworthiness", available from the CASA District Offices;

(ii) enough data, such as photographs or three-view drawings, to identify the aircraft;

(iii) a CASA Form No. 727 "Eligibility Statement – Amateur-Built Aircraft", certifying the major portion was fabricated and assembled for education or recreation, and that evidence is available to support this statement upon request;

(iv) a letter identifying the aircraft and the area over which the aircraft will be tested should accompany the application;

(e) ***payment of fees to an authorised person***. Authorised persons may charge a fee in accordance with their quoted rates. This is a matter for the applicant and authorised person to negotiate, which in turn is outside CASA control;

(f) ***payment of fees to CASA*:**

(i) section 97 of the Civil Aviation Act allows prescribed fees to be payable to CASA in advance of work to be done;

(ii) in the case of issue of CoAs (including experimental certificates), an hourly fee is specified in the CASA schedule of fees. An estimate, payment and reconciliation procedure is as follows:

(A) the Airworthiness District Office which may receive the application CASA Form No. 718 "Application for Issue of a Special Certificate of Airworthiness" prepares an estimate based on experience, and the specific tasks to be undertaken. This is usually when the applicant makes initial contact with the Airworthiness Inspector (AWI) assigned to the task. General eligibility, timeframe and operational role aspects are discussed. The estimate is based on time estimates, and travel costs as applicable;

(B) the applicant pays the estimated fee;

(C) actual manhours expended are recorded as the task is undertaken; and

(D) a reconciliation will be made just before the certificate is issued. If an overestimate has been made, a refund will be paid to the applicant. If underestimated, a final payment from the applicant will be required prior to certificate issue;

(iii) a different fee structure would usually apply in the case of application through a 21.172 authorised person. This is a matter for the applicant and authorised person to negotiate, which in turn is outside CASA control.

12. AIRCRAFT INSPECTION

The applicant should be prepared to furnish the following to the authorised person or CASA Inspector:

(a) an aircraft complete and ready to fly except for cowlings, fairings, and panels opened for inspection;

(b) an Aircraft Registration Certificate;

(c) evidence of inspections, such as logbook entries signed by the amateur builder, describing all inspections conducted during construction of the aircraft in addition to photographic documentation of construction details. This will substantiate that the construction has been accomplished in accordance with acceptable workmanship methods, techniques, and practices. It is recommended that this evidence be documented in some form eg., the 'Amateur Builders Log Book' available from the SAAA; and

(d) a logbook for the aircraft, engine, and propeller to allow for review of service records and recording of inspection and certification by the authorised person or CASA Inspector.

13. INSPECTION AND ISSUE OF SPECIAL CERTIFICATE OF AIRWORTHINESS

13.1 After inspection of the documents and data submitted with the application, the applicant should expect the authorised person or CASA Inspector to inspect the aircraft in order to compose conditions, together with appropriate operating limitations. The applicant should expect the authorised person or CASA Inspector to verify that all required markings are properly applied, including the following placard which must be displayed in the cabin or the cockpit at a location in full view of all passengers. The placard is not applicable to single-place aircraft.

WARNING
THIS AIRCRAFT IS NOT REQUIRED TO COMPLY WITH THE
SAFETY REGULATIONS FOR STANDARD AIRCRAFT.
YOU FLY IN THIS AIRCRAFT AT YOUR OWN RISK.

13.2 Details concerning flight test areas are contained in paragraph 14. The operating limitations are a part of the special certificate of airworthiness and must be available with the certificate when the aircraft is operated. It is the responsibility of the pilot to conduct all flights in accordance with the operating limitations, as well as the operating rules of CAR 1988 262AP.

13.3 In the case of a limited duration special certificate of airworthiness, upon satisfactory completion of operations in accordance with CAR 1988 262AP(3) in the assigned test area, the owner of the aircraft may apply to the authorised person or CASA District Office for amended operating limitations by submitting another CASA Form No. 718 “Application for Issue of a Special Certificate of Airworthiness”, along with a letter requesting amendment of operating limitations. Prior to issue of the amended limitations and a new CASA Form No. 720 “Special Airworthiness Certificate”, the applicant should expect the authorised person or CASA Inspector to review the flight log to determine whether corrective actions have been taken on any problems encountered during the testing and that the aircraft's condition for safe operation has been established. Re-inspection of the aircraft may be necessary.

13.4 Refer to paragraph 14.8 (a) and (b) for the processing of unlimited duration special certificates of airworthiness.

14. FLIGHT TEST AREAS

14.1 Amateur-built aircraft and rotorcraft will initially be limited to operation within an assigned flight test area for at least 25 hours when a type certificated engine/propeller combination is installed, or 40 hours when a non-certificated (i.e. modified type certificated or automobile) engine/propeller combination is installed. Amateur-built gliders, balloons, and dirigibles found eligible to meet requirements of CASR 21.191(g), will be limited to operation within an assigned flight test area for at least 10 hours of satisfactory operation, including at least five takeoffs and landings.

14.2 The desired flight test area should be requested by the applicant and, if found acceptable by the authorised person or CASA Inspector, will be approved and specified in the operating limitations. It will usually encompass the area within a 25-statute mile radius (or larger depending on the type of aircraft) from the aircraft's base of operation or in a designated test area. The area selected by the applicant and submitted for approval should

not be over densely populated areas or in congested airways, so that the flight testing, during which passengers may not be carried, would not likely impose any hazard to persons or property on the ground.

14.3 The minimum qualification a pilot must hold to carry out the initial flight testing on an amateur-built experimental aircraft is a private pilot licence (PPL) with the appropriate endorsements. CASA will advise the builder on minimum pilot qualifications for amateur-built experimental gliders, balloons and unconventional aircraft as appropriate. Although the regulations do not call for the amateur-built experimental aircraft test pilot to have any specific test flying qualifications or knowledge, it would be most unwise for the initial flight tests to be carried out by other than a pilot with such knowledge, especially in the case of a totally unproven design.

14.4 Amateur-built experimental aircraft builders are most strongly urged to make detailed reference to the U.S. FAA Advisory Circular AC 90-89, "Amateur-Built Aircraft Flight Testing Handbook", prior to their flight programs commencing, and follow the guidance provided.

14.5 Those undertaking flight test programs may also derive benefit in consulting the following additional references, as applicable to the class of aircraft involved:

(a) CAA publication dated January 91, "Flight Test Guide for Certification of CAO 101.28 Category Aeroplanes";

(b) CAA Report AF - 56, "Flight Test Guide for Certification of CAO 101.55 Aeroplanes";

(c) U.S. FAA AC 23 - 8A, "Flight Test Guide for Certification of Part 23 Airplanes"; and

(d) U.S. FAA AC 27 - 1, "Certification of Normal Category Rotorcraft".

14.6 Amateur builders can receive further advice in this respect from the following sources:

(a) The SAAA. (contact details are given in Attachment 2);

(b) The Flight Test Society of Australia (FTSA), GPO Box 2603, Canberra, ACT, 2601; and

(c) The CASA Test Pilot, CASA, GPO Box 2005, Canberra, ACT, 2601 (tel. 131 757).

14.7 The carriage of passengers will not be permitted while the aircraft is restricted to the flight test area. It is suggested that a tape recorder, for example, be used by the pilot for recording readings, etc. Flight instruction will not be allowed in the aircraft while in the flight test area.

14.8 In those instances where the unlimited duration special airworthiness certificate was issued, the operating limitations may be prescribed in two phases in the same document as follows:

(a) for the Phase I limitations, the applicant will receive from the authorised person or CASA Inspector all those operating limitations, as appropriate, for the applicant to demonstrate compliance with CAR 1988 262AP(3) in the assigned test area. This would further include a limitation requiring the owner/operator to endorse the aircraft logbook with a statement certifying when the aircraft has been shown to satisfy the requirements of CAR 1988 262AP(3); and

(b) for the Phase II limitations, the applicant will receive from the authorised person or CASA Inspector all those operating limitations, as appropriate, to the issuance of an unlimited duration CASA Form No. 720 "Special Certificate of Airworthiness" for the operation of an amateur-built aircraft. Attachment 3 contains a sample of typical operating limitations that may be issued. Special conditions may vary for each aircraft.

15. SAFETY PRECAUTION RECOMMENDATIONS

15.1 All aircraft

15.1.1 The pilot should become thoroughly familiar with the brake tests, engine operation, and ground handling characteristics of the aircraft by conducting taxi tests before attempting flight operations. Lift-off is not permitted during taxi tests without a special certificate of airworthiness.

15.1.2 Before the first flight of an amateur-built aircraft, the pilot should take precautions to ensure that emergency equipment and personnel are readily available in the event of an accident.

15.1.3 Violent or aerobatic manoeuvres should not be attempted until sufficient flight experience has been gained to establish that the aircraft is satisfactorily controllable throughout its normal range of speeds and manoeuvres. Those manoeuvres successfully demonstrated while in the test area may continue to be permitted by the authorised person or CASA Inspector, when the operating limitations are modified to eliminate the test area. All manoeuvres satisfactorily conducted are to be documented in the aircraft logbook by the pilot.

15.1.4 The operating limitations issued by the authorised person or CASA Inspector do not exempt the pilot from compliance with relevant CARs and CAOs.

15.1.5 Unless authorisation to deviate is obtained from Air Traffic Control, any aircraft equipped with a Mode C transponder shall have a calibrated airspeed/static pressure system to prevent an error in altitude reporting. (Reference CASR Part 23 eg. FARs 23.1323 and 23.1325.)

15.2 Rotorcraft

The appropriately rated rotorcraft pilot should be aware of the following operating characteristics:

(a) operators of rotorcraft having fully articulated rotor systems should be particularly cautious of "ground resonance." This condition of rotor unbalance, if maintained or allowed to progress, can be extremely dangerous and usually results in structural failure; and

(b) tests showing that stability, vibration, and balance are satisfactory should normally be completed with the rotorcraft tied down, before beginning hover or horizontal flight operations.

16 KIT BUILT AIRCRAFT

16.1 Paragraph 8 described the use of kits in general in the construction of amateur-built experimental aircraft in Australia. There is a further sub-category of experimental aircraft , in a different context, and these are referred to as "Kit Built" aircraft. This is reflected in

the CASRs, in that CASR 21.191 makes provision for operating amateur-built experimental aircraft (CASR 21.191 (g)), and kit built experimental aircraft (CASR 21.191 (h)).

16.2 The boundaries of kit built aircraft are as follows:

(a) the aircraft is constructed from a manufactured kit that may include some major sub-assemblies and/or pre-assembled components;

(b) the kit is manufactured by a person holding a Production Certificate (PC) for the kit; and

(c) the kit aircraft as a type is certificated in the primary category, but the kit is assembled without the benefit of the PC holder's supervision.

16.3 A person assembling an aircraft within the boundaries as described above will then be eligible for an experimental certificate, subject to the requirements of paragraphs 6 to 12 of this AC being satisfied, with the exception that the major portion rule does not apply to kit built aircraft. The aircraft will be designated Experimental (Kit Built), not Experimental (Amateur-Built).

17 FLIGHT REQUIREMENTS

17.1 Since experimental amateur-built aircraft are not required to conform with an ICAO Annex 8 design standard, there is no formal requirement for a flight manual. However, useful information should be available to the pilot. Design standards such as FAR 23 indicate the sort of information. The General Aviation Manufacturer's Association (GAMA) format flight manual is recommended.

17.2 Flight training will be permitted under certain circumstances, ie type endorsement training and training given in the aircraft to its owner.

18 MAINTENANCE ASPECTS

18.1 For the original owner/builder

18.1.1 The owner/builder is authorised under subregulation 42ZC(6) of CAR 1988 to carry out maintenance on the aircraft, if the owner/builder is the primary builder of the aircraft. Therefore, the owner/builder is fully responsible for the maintenance and may carry out that maintenance under the legislation.

18.1.2 All owner/builders performing maintenance are advised to make themselves fully aware of their legal responsibility under the aviation legislation. Maintenance may only be carried out to approved data and all maintenance must be certified for by the owner/builder.

18.1.3 Guidance as to the maintenance required may be developed from documents such as FAA AC 43.13-1A "Acceptable Methods, Techniques, and Practices — Aircraft Inspection and Repair" and the UK CAA Civil Aircraft Inspection Procedures (CAIPs).

18.2 For subsequent owners

18.2.1 If an experimental amateur-built aircraft is sold, the new owner cannot certify for the maintenance. All maintenance must be certified by a LAME, or the holder of an appropriately endorsed maintenance authority.

18.2.2 A pilot/owner who is not the builder may be able to obtain an authority to perform certain maintenance by applying at the local CASA District Office.

19 AMATEUR-BUILT AIRCRAFT CONSTRUCTED OUTSIDE AUSTRALIA AND PURCHASED BY AUSTRALIAN CITIZENS

19.1 If an Australian citizen purchases such an aircraft, acceptable procedures for obtaining airworthiness certification for amateur-built operations are as follows:

(a) the previous owner should have conducted or had a condition/annual type inspection performed on the aircraft within 90 days of the new (Australian) owner applying for certification. This inspection shall be recorded in the aircraft records; and

(b) the previous owner should obtain documentation from the National Airworthiness Authority of the country where the aircraft was built to verify that the aircraft is/was originally certificated in that country as an amateur-built. This documentation should be furnished to the new owner.

19.2 The new owner of such aircraft shall submit a properly completed CASA Form No. 718, "Application for Issue of a Special Certificate of Airworthiness" to the authorised person or CASA Inspector along with the following documentation:

(a) all letters and records of inspections called for in paragraph 19.1 (a) and (b);

(b) proper documentation of registration in accordance with CASR 47; and

(c) a letter of request to accompany the application for special CoA.

19.3 The applicant should expect the authorised person or CASA Inspector to:

(a) conduct a thorough review of all documentation called for under paragraphs 19.1 and 19.2;

(b) determine the amateur-built eligibility of the aircraft presented;

(c) inspect the aircraft like any other amateur-built aircraft, since these airworthiness certifications are considered original;

(d) determine if the required flight time has been met. If there is some question regarding the aircraft's flight capability, flight testing may be required. If the aircraft is found to be eligible and inspection is satisfactory, the experimental certificate CASA Form No. 720 with proper operating limitations will be issued; and

(e) advise that the condition inspection on the aircraft can only be performed by the original builder or a LAME.

20 AMATEUR-BUILT AIRCRAFT BUILT BY AUSTRALIAN CITIZENS OUTSIDE AUSTRALIA

20.1 An Australian citizen, or a prospective Australian citizen, intending to bring the aircraft to Australia and operate the aircraft as an amateur-built experimental aircraft may build an amateur-built experimental aircraft under the guidelines provided in this AC outside Australian territory.

20.2 There are two cases:

(a) the aircraft may have commenced flight under another country's regulations; or

(b) the inspection and issue of the experimental certificate is to commence after shipping the aircraft to Australia.

20.3 In either case, the issue of the experimental certificate, subsequent to the aircraft coming to Australia, may be processed if the builder has all the construction proof, in terms of standards of workmanship, and the major portion rule proof as described in sections 7 and 8 of this AC.

21 NOISE CERTIFICATION

21.1 Noise certification for individual aircraft is required before the aircraft can legally be operated in Australian territory. Aircraft noise is regulated through the Air Navigation (Aircraft Noise) Regulations, introduced under the Air Navigation Act 1920, in 1984. Noise certification or lack of such has no legal impact on type approval, or individual CoA issue. However, if an individual aircraft does not meet the Australian noise requirements, then it is illegal for that aircraft to operate in Australian territory, even though the aircraft may have a valid special CoA.

21.2 Application for noise assessment for individual aircraft can be made to:

The Manager Environment Monitoring
Airservices Australia
GPO Box 367
Canberra. ACT 2601
AUSTRALIA

Facsimile: +61 2 6268 4201
email: environment@airservices.gov.au

22 CASA LIABILITY

Amateur-built experimental aircraft builders should note the content of CASR 201.3, which reads as follows:

> "Neither the Commonwealth nor CASA is liable in negligence or otherwise for any loss or damage incurred by anyone because of, or arising out of, the design, construction, restoration, repair, maintenance or operation of a limited category aircraft or an experimental aircraft, or any act or omission of CASA done in good faith in relation to any of those things".

A reference in this regulation to CASA includes a reference to a person who is a delegate of CASA.

Note: This does not include reference to an authorised person.

Richard G. Yates
Assistant Director
Aviation Safety Standards

ATTACHMENT 1

CONTACT DETAILS OF ADVISORY ORGANISATIONS

Sport Aircraft Association of Australia
265 Queens Parade
Clifton Hill
Victoria 3068

PO Box 169
Clifton Hill
Victoria 3068

Telephone (03) 9482 4716
Fax (03) 9482 3936

Gliding Federation of Australia
Building 130 Wirraway Road
Essendon Airport
Victoria 3041

Telephone (03) 9379 7411 or (03) 9379 4629
Fax (03) 9379 5519

Email for Chief Technical Officer: CTOA@gfa.org.au

ATTACHMENT 2

SAMPLE LETTER TO ACCOMPANY THE APPLICATION FOR THE SPECIAL CERTIFICATE OF AIRWORTHINESS

To:

……..
……..
……..
……..

(*Insert here the name and address of the authorised person or CASA District Office)*

Attached is completed CASA Form No. 718 "Special Certificate of Airworthiness - application" for my amateur-built aircraft for the purpose of operating amateur-built aircraft. The aircraft description is as follows:

Builder …… Registration No: VH-……
(Insert name of builder(s))

Model: …… Serial No: ……...…….

No. of Engines: …….. No. of seats: ……..……..

Design Criteria: own design…… , plans…… , kit ……kit built …….....…..
(Tick one space as appropriate)..

The aircraft has been completely assembled and the following has been accomplished:

Yes …. No ….. I enclose a three-view drawing or photographs of the aircraft as required by CASR 21.193(b).

Yes …. No ….. I have weighed the aircraft to determine that the most forward and aft centre of gravity positions are within established limits. The weight and balance report is available at the aircraft, and a copy is submitted with this application.

Yes ….. No ….. I have maintained a construction log for the project, including photographs taken during the construction. Log entries describe all inspections conducted during construction.

Yes ….. No ….. The marking requirements of CASR Part 45 have been complied with, including permanent attachment of a fireproof aircraft identification (data) plate, permanent application of appropriate registration marks, and the word "EXPERIMENTAL" near each entrance.

Yes …..No ….. The following placard has been displayed in the cockpit in full view of all occupants (not required for single-place aircraft):

WARNING
THIS AIRCRAFT IS NOT REQUIRED TO COMPLY WITH THE SAFETY REGULATIONS FOR STANDARD AIRCRAFT.
YOU FLY IN THIS AIRCRAFT AT YOUR OWN RISK.

The aircraft will be available for inspection at this location, and directions are as follows:
……
……
……
……
(*Insert here the address where the aircraft may be inspected, and any necessary directions to get there.)*

I request that the initial operating limitations be issued to permit me to operate the aircraft within the following geographical area for flight test:
……
……
……

My after hours telephone number is: ……..

My business hours telephone number is ……..

……..
Signature (owner/builder)
……..
Date

ATTACHMENT 3

SAMPLE LIST OF OPERATING LIMITATIONS

THESE OPERATING LIMITATIONS SHALL BE ACCESSIBLE TO THE PILOT
EXPERIMENTAL OPERATING LIMITATIONS OPERATING
AMATEUR-BUILT AIRCRAFT

Registration No. VH-……. Serial No. ……..

Make …….. Model ……

Phase I. Initial Flight Test in Restricted Area:

1. No person may operate this aircraft for other than the purpose of operating amateur-built aircraft to accomplish the operation and flight test outline in the applicant's letter dated …….. in accordance with CASR 21.193(3). Pilots engaged in Phase I and II amateur-built operations are not exempt from compliance with relevant CARs and CAOs.
2. The initial …… hours of flight shall be conducted within the geographical area described as follows:

…….
…….
…….
…….

3. Except for takeoffs and landings, no person may operate this aircraft over densely populated areas or in congested airways.
4. This aircraft is approved for day VFR operation only.
5. Unless prohibited by design, acrobatics are permitted in the assigned flight test area. All acrobatics are to be conducted under the provisions of CAR 155.
6. No person may be carried in this aircraft during flight unless that person is required for the purpose of the flight.
7. The authorised person or cognisant CASA District Office must be notified and the response received in writing prior to flying this aircraft after incorporating a major change as defined by CASR 21.93.
8. The operator of this aircraft should notify the control tower of the experimental nature of this aircraft when operating into or out of airports with operating control towers.
9. The pilot-in-command of this aircraft must, as applicable, hold an appropriate category/class rating, have an aircraft type rating, have a flight instructor's logbook endorsement or possess a “Letter of Authorisation” issued by an authorised person or CASA.
10. This aircraft does not meet the requirements of the applicable, comprehensive, and detailed airworthiness code as provided by Annex 8 to the Convention on International Civil Aviation.

Phase II:

Following satisfactory completion of the required number of flight hours in the flight test area, the pilot shall certify in the logbook that the aircraft has been shown to satisfy the requirements of CAR 262(AP). This shall be recorded in the aircraft logbook with the following or similarly worded statement:

> *"I certify that the prescribed flight test hours have been completed and the aircraft is controllable throughout its range of speeds and throughout all manoeuvres to be executed, has no hazardous operating characteristics or design features, and is safe for operation."*

The Following Limitations Apply Outside of Flight Test Area:

1. Limitations 1, 3, 7, 9, and 10 from Phase I are applicable.
2. This aircraft is approved for day VFR only, unless equipped for night VFR and/or IFR in accordance with relevant CARs and CAOs.
3. This aircraft shall contain the placards, markings, etc., required by CAR 1998, Part III.
4. This aircraft is prohibited from acrobatic flight, unless such flights were satisfactorily accomplished and recorded in the aircraft logbook during the flight test period.
5. No person may operate this aircraft for carrying persons or property for compensation or hire.
6. The person operating this aircraft shall advise each person carried of the experimental nature of this aircraft.
7. This aircraft shall not be operated for glider towing or parachute jumping operations, unless so equipped and authorised.
8. No person shall operate this aircraft unless within the preceding 12 calendar months it has had a condition inspection performed in accordance with the conditions entered on the special airworthiness certificate, and has been found to be in a condition for safe operation. In addition, this inspection shall be recorded in accordance with limitation 10 listed below.
9. The builder of this aircraft, if holding a Maintenance Authority issued by CASA for the particular aircraft, or a LAME may perform condition inspections in accordance with the conditions entered on the special airworthiness certificate.
10. Condition inspections shall be recorded in the aircraft maintenance records showing the following or a similarly worded statement:

"I certify that this aircraft has been inspected on (insert date) in accordance with the scope and detail of the conditions entered on the special airworthiness certificate, and found to be in a condition for safe operation."

The entry will include the aircraft total time in service, the name, signature, and certificate type and number of the person performing the inspection.

Authorised Person or CASA Inspector …….
(signature)

Authorised Person or CASA Inspector ……
(Print Name)

CASA District Office ……
(*If appropriate)*

Date Issued …….