



Advisory Circular

AC 21.10(0)

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EXPERIMENTAL CERTIFICATES

CONTENTS

1. References	1	17. Associated matters	20
2. Purpose	1	18. CASA Liability	21
3. Status of this AC	1	Attachment 1: Applicability Chart for Experimental Aircraft - Operating Limitations.	22
4. Background	2	1. REFERENCES	
5. General guidelines	2	Civil Aviation Safety Regulations (CASRs) Part 21 Subpart H, and <i>Civil Aviation Regulation 1988</i> (CAR 1988) 262AP.	
6. Prescribed purposes	2	<i>Note: CASRs referred to above are currently enacted as CAR 1998.</i>	
7. Discussion of prescribed purposes	3	2. PURPOSE	
8. Registration and marking	5	This Advisory Circular (AC) provides guidance and information for CASA staff and to applicants applying for experimental certificates issued in Australia, subsequent to the issue of the CASRs and specifically CASR Part 21 Subpart H, "Certificates of Airworthiness".	
9. Application for the experimental certificate	6	3. STATUS OF THIS AC	
10. Issue of the experimental certificate	9	This is the first AC to be produced on this subject.	
11. Flight test areas	10		
12. Pilot qualifications	11		
13. Flight test program	12		
14. Procedures for production certificate and approved production certificate system holders	13		
15. Experimental military aircraft	14		
16. Operating conditions and limitations	15		

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.

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, which includes an experimental certificate and a special flight permit.

4.4 CASR 21.191 allows an authorised person or CASA to issue experimental certificates to allow specific operations of aircraft which are not by their very nature type certificated. This is primarily intended for genuine experimental aircraft, and to foster creative design and development by established manufacturers and individuals.

5. GENERAL GUIDELINES

The following general guidelines establish the working base for the regulatory oversight of experimental certificates:

- (a) experimental aircraft are not type certificated;
- (b) “experimental” is not an airworthiness category per se; rather, it is a designation;
- (c) an experimental certificate does not attest to the airworthiness of the aircraft;
- (d) specific conditions and limitations pertaining to the operations of the aircraft are contained in an annex to the certificate;
- (e) the experimental certificate system allows any person or commercial concern to construct an aircraft of any size and seating capacity, and with any number and type of engines;
- (f) experimental certificates can be issued for one or more of a number of prescribed purposes;
- (g) passengers or cargo cannot be carried for compensation or hire.

6. PRESCRIBED PURPOSES

6.1 An experimental certificate may be issued on an aircraft only for one or more of the following prescribed purposes:

- (a) research and development (R&D);
- (b) showing compliance with regulations;
- (c) training the applicant’s flight crew;
- (d) exhibition of the aircraft;
- (e) air racing;
- (f) market survey operations;
- (g) operating amateur-built aircraft;
- (h) operating kit-built aircraft;

- (i) private operations of a prototype aircraft previously (experimentally) certificated for specific purposes.

6.2 An experimental aircraft may also be used for any or all of the following operations but only in support of a prescribed purpose for which the experimental certificate was issued:

- (a) taking the aircraft to or from a place where maintenance on the aircraft may be carried out, or has been carried out, as the case may be;
- (b) carrying out a test of the aircraft following maintenance or rectification of defects;
- (c) training a person to qualify for an aircraft endorsement on the aircraft;
- (d) practice in flying the aircraft;
- (e) carrying out a demonstration or test of the aircraft with a view to sale, or delivering the aircraft to a person under contract of sale; and
- (f) in the case of an amateur-built or kit-built aircraft, flying training given in the aircraft to the owner of the aircraft.

6.3 The bulk of experimental aircraft constructed in Australia are expected to be amateur-built. To this end, a dedicated advisory circular, AC 21.4, “Amateur-Built Experimental Aircraft - Certification” has been produced. Applicants wishing to pursue this area of certification activity and those interested in kit-built aircraft, are referred to that advisory circular. Note that there will be no further elaboration of amateur-built and kit-built aircraft in this AC.

7. DISCUSSION OF PRESCRIBED PURPOSES

7.1 Research and development

7.1.1 Examples are testing new aircraft design concepts, new aircraft equipment, new aircraft installations, new aircraft operating techniques, or new uses for aircraft.

7.1.2 This purpose is primarily intended for bona-fide R&D operations which lead to subsequent issue of a type certificate, including proof-of-concept flying, or for operations which may be pure R&D in nature, such as determining whether an idea warrants further investigation.

7.1.3 Both commercially-built and amateur-built aircraft are eligible for issue of an experimental certificate under this purpose. Operations are limited to genuine R&D activities. An experimental certificate is valid only for the period of time specified on the certificate, normally one year, and for the number of flights necessary to complete the R&D program.

Note: Further operations of amateur-built aircraft are covered by AC 21.4 “Amateur-Built Experimental Aircraft – Certification”.

7.1.4 The R&D purpose is essentially a transitory one, and indefinite operation under this purpose is not intended. Any other aircraft necessary to support the R&D project (such as a chase plane etc.) are also eligible for certification under this purpose.

7.2 Showing compliance with regulations

7.2.1 Some examples are conducting flight tests and other operations to show compliance with the airworthiness regulations including flights to show compliance for issue of type and supplemental type certificates, flights to substantiate major design changes, and flights to show compliance with the function and reliability requirements of the regulations. Production test flights are carried out under special flight permits.

7.2.2 This purpose provides for operations to show compliance with the CASRs or other relevant design codes after completion of testing under the R&D purpose, where a type certificate holder has revised the relevant design data; or where a person has applied for approval of a major modification or design change under a supplemental type certificate. It also provides for test flying undertaken by CASA as part of a type certification program.

7.2.3 An experimental certificate for this purpose is valid only for the period of time specified on the certificate, normally one year, and for the number of flights necessary to accomplish the purpose.

7.3 Training the applicant's flight crew

7.3.1 Operations under this purpose are limited to flight crews (normally the aircraft manufacturer's employees), for whom training in the experimental aircraft is necessary for subsequent operations of the aircraft in type certification programs or for production flight testing.

7.3.2 An experimental certificate for this purpose is valid only for the period of time specified on the certificate, normally one year, and for the number of flights necessary to accomplish the training.

7.4 Exhibition

7.4.1 Some examples are exhibiting the aircraft's flight capabilities, performance, or unusual characteristics at air shows; motion picture and television productions; and the maintenance of exhibition flight proficiency, including (for persons exhibiting the aircraft) flying to and from such air shows and productions.

7.4.2 Operations covered under this purpose are for valid exhibition purposes only, as described immediately above. Also included is:

- (a) the exhibition of historic and ex-military aircraft which do not have a standard CoA in a standard category, or a special CoA in the limited category; and
- (b) operations for the purpose of training for the exhibition or maintaining proficiency.

7.4.3 An experimental certificate for this purpose is normally valid for an unlimited period of time. However, operations under this purpose are normally limited to a specified area in the vicinity of the airport at which the aircraft is permanently based, or at the venue of the intended exhibition, including flying to and from the venue, and are based on a submitted list of events to be attended.

7.5 Air racing

Some examples are participating in air races, including (for participants) practicing for air races, and flying to and from racing events. An experimental certificate for this purpose is normally valid for an unlimited period of time. Operations under this purpose are normally limited to a specified area in the vicinity of the airport at which the aircraft is permanently based, or at the venue of the intended race, and are based on a submitted list of events to be attended.

7.6 Market surveys

7.6.1 Examples include the use of aircraft for the purposes of conducting market surveys, sales demonstrations, and customer crew training.

7.6.2 Issue of experimental certificates for this purpose are confined to:

- (a) a manufacturer of an aircraft manufactured within Australia that is to be used for market surveys, sales demonstrations, or customer crew training;
- (b) a manufacturer of aircraft engines who has altered a type certificated aircraft by installing different engines, manufactured by the manufacturer within Australia, and who then may apply for an experimental certificate for market surveys if the basic aircraft, before alteration, was type certificated in the normal, utility, acrobatic, commuter, primary, intermediate or transport category;
- (c) a person who has altered the design of a type certificated aircraft to be used for market surveys if the basic aircraft, before alteration, was type certificated in the normal, utility, acrobatic, commuter, or transport category.

7.6.3 An experimental certificate for this purpose is normally limited to the time needed for the prescribed operations, and normally does not exceed one year. The applicant must have established an inspection and maintenance program and have had the aircraft flown for at least 50 hours, or at least five if it is a type certificated aircraft which has been modified.

7.7 Private operations of prototype aircraft previously issued with experimental certificates for the purposes of R&D, showing compliance with regulations, and/or exhibition.

7.7.1 This purpose provides for limited private use of prototype aircraft subsequent to operations for purposes as per the heading above. Note that there can be only one prototype for any series of an aircraft type.

7.7.2 Operations are confined to the carriage of six occupants maximum (unless otherwise approved by CASA or an authorised person), and not for compensation or hire. The aircraft is subject to the same limitations and conditions as amateur-built experimental aircraft. (See AC 21.4 “Amateur-built Experimental Aircraft-Certification”). A prototype may be eligible for subsequent certification, as a standard category aircraft, if the aircraft has been shown to comply with the applicable airworthiness standards for the category sought, and conformance has been demonstrated throughout the aircraft’s construction period.

7.7.3 An experimental certificate for this purpose is normally valid for an unlimited period of time.

8. REGISTRATION AND MARKING

8.1 Prior to application for issue of the experimental certificate, the aircraft must be registered.

8.2 In addition to the nationality and aircraft registration marks, as required by CAR 1998 Part III, the following markings are also required:

- (a) an aircraft registration identification plate must be attached to an accessible location near an entrance.
- (b) an aircraft data plate with specific information imprinted on it must be fixed to the aircraft;
- (c) the word “EXPERIMENTAL” must be displayed on the aircraft near each entrance (interior or exterior) to the cabin or cockpit in letters not less than 5 cm nor more than 15 cm in height. The letters should be in block capitals of a style that is conspicuous and legible, and easily read by each person entering the aircraft; and

- (d) for other than single seat aircraft, a warning placard must be displayed in the cabin or cockpit at a location in full view of all passengers, with the wording:

“WARNING

THIS AIRCRAFT IS NOT REQUIRED TO COMPLY WITH THE
SAFETY REGULATIONS FOR STANDARD AIRCRAFT.

YOU FLY IN THIS AIRCRAFT AT YOUR OWN RISK”

9. APPLICATION FOR THE EXPERIMENTAL CERTIFICATE

9.1 Who may apply

The holder of the certificate of registration (CoR) is usually the applicant.

Note: Only relevant manufacturers or aircraft modifiers may apply for issue of an experimental certificate for the purposes of market surveys, sales demonstrations and/or customer crew training.

9.2 Where to apply

9.2.1 Applicants for an experimental certificate should apply to the CASA District Office which covers the geographical prime base of the intended permit operation. However, nothing precludes an applicant making the initial approach to the nearest CASA District Office, and requesting CASA to coordinate the application.

9.2.2 The above applies to an initial application approach being directed to CASA. However, an applicant may wish the processing of an application for an experimental certificate to be undertaken from the outset by a person who is authorised by CASA to process and issue the certificate on CASA’s behalf. In this case, the person authorised under CASR 21.191 will undertake any necessary initial coordination with CASA District and Central Offices.

9.2.3 A list of CASA District Offices and contact details is given in AC 11.1 “Advisory Circulars - Guidelines”.

9.3 When to apply

The ideal time to make application for issue of the certificate is after construction and initial ground testing on the aircraft is complete, and thus when the aircraft is ready for its first test flight. The certificate must be in force before the aircraft can be flown legally.

9.4 The application form

9.4.1 Application is made on CASA Form No. 718, “Special Certificate of Airworthiness”. Forms may be obtained from any CASA District Office.

9.4.2 The initial form details should be typed, or filled in using neat block letters and a blue or black pen, as follows:

- (a) **registration mark:** enter the aircraft’s registration mark after the VH-designator;
- (b) **manufacturer:** enter the name of the manufacturer as it appears on the aircraft data plate;
- (c) **serial number:** enter the serial number as it appears on the aircraft data plate;
- (d) **type and model:** enter the type and model designations as they appear on the aircraft data plate;
- (e) **place and year of construction:** this is self-explanatory;

- (f) **category/designation/purpose (Block No.2):** tick the “Experimental” box, and the appropriate purpose box(s), (see paragraph 9.5 immediately below);
- (g) **details of applicant (Block No.3):** this is self-explanatory.

9.5 Multiple purpose certificates

9.5.1 An experimental certificate may be issued for more than one of the purposes shown in paragraph 6.1 when more than one purpose is requested. CASA or the authorised person will ensure that adequately controlled conditions exist as specified in the certificate operating limitations. When issuing a certificate for the purposes of research and development, showing compliance with regulations, crew training, and market surveys, the certificate will be made effective for only the length of time reasonable to accomplish the applicant’s program, not to exceed one year. The issue of multiple purpose certificates for research and development and showing compliance will be limited to Production Certificate/Approved Production Inspection System (PC/APIS) holders. This may be extended to aircraft modifiers only when adequately substantiated, for complex programs. Applicants for a multiple purpose certificate must justify the requested purposes to the satisfaction of CASA or the authorised person. For more information on PC/APIS aspects, see advisory circular AC 21.27, “Manufacturing Approval - Overview”.

9.5.2 “Exhibition” and “air racing” purposes may be applied for and specified on multiple purpose experimental certificates. However, if any flight testing prior to use of an aircraft in one or both of these purposes is required to be carried out, then the original experimental certificate issued for one or both of the purposes is effective for the period necessary to complete the flight testing, but not to exceed one year. If the testing is not completed within the terms of the certificate, the aircraft must be submitted for re-inspection, and a new certificate issued.

9.5.3 When an exhibition or air racing aircraft has successfully completed its flight testing, the owner can then apply for an experimental certificate of unlimited duration. The certificate will show the word “unlimited” against the expiry block of the certificate and the operating conditions will be revised to reflect those applicable limitations. A certificate of unlimited duration will not be issued until the aircraft has successfully completed its flight testing. This paragraph does not infer that unlimited expiry is granted automatically, each case must be evaluated to ensure the request is warranted.

9.6 Lodgement of data

9.6.1 An applicant for an experimental certificate must provide the following minimum data at the time of application for the certificate:

- (a) a statement, in a form and manner acceptable to CASA or the authorised person, setting forth the purpose for which the aircraft is to be used;
- (b) enough data (such as photographs and three-view drawings) to identify the aircraft, and describe the external configuration; and
- (c) upon the inspection of the aircraft (see paragraph 10.1), any further pertinent information reasonably needed by CASA or the authorised person to enable the imposition of any conditions or operational limitations necessary in the interests of the safety of other airspace users, and persons on the ground or water. For other than prototype aircraft, e.g. those to be used for air racing or exhibition, this could include a copy of the flight manual/pilot’s notes, weight and balance report, aircraft logbooks or equivalent documents, maintenance

manual or equivalent document, and a list of the relevant airworthiness directives (ADs).

9.6.2 Additionally, where the purposes for certificate issue are R&D and/or showing compliance, the applicant must provide a program letter, which should contain the following information:

- (a) ***purpose of experiment:*** the applicant must describe the purpose in sufficient detail to outline the aircraft configuration and program objectives, in a manner that will permit CASA or the authorised person to prescribe adequate limitations and conditions necessary to ensure safe operation. The main objective is to outline the aircraft configuration and program objectives and not describe everything in minute detail. The use of the same aircraft for overlapping programs is not precluded, and the program letter can outline one or more programs. Upon the applicant showing that:
 - (i) the aircraft is controllable throughout its normal range of speeds and throughout all manoeuvres to be executed; and
 - (ii) the aircraft has no hazardous operating characteristics or design features;

then the aircraft can be used to support other aircraft in the program or other experimental programs the manufacturer has underway, e.g. support crew movements, carrying spare engines, etc. This support activity, in addition to the purpose for which the certificate is to be issued, should be included in the program letter or be included in the procedure described in paragraph 14 below;

- (b) ***time and number of flights:*** the applicant's program letter must include the estimated time (days), number of flight hours and number of flights required to accomplish the program. CASA or the authorised person will evaluate the request in comparison to the overall program in order to establish an approximate time duration for the experimental certificate to be in force;
- (c) ***areas:*** The applicant must provide in the program letter sufficient details to describe the areas over which the flights are to be conducted, in addition to the address of the base operation. It will be the responsibility of CASA or the authorised person to establish boundaries of the flight test area, and in densely populated areas or congested airways, the take-off, departure and landing approach corridors that will ensure hazards to persons on the ground or water are minimised (see paragraph 11).

9.7 Payment of fees

9.7.1 Section 97 of the Civil Aviation Act allows prescribed fees to be payable to CASA in advance of work to be done.

9.7.2 In the case of issue of experimental certificates, an hourly fee is specified in the CASA schedule of fees. An estimate, payment and reconciliation procedure is as follows:

- (a) the CASA District Office which receives the application form 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.

9.7.3 A different fee structure would usually apply in the case of application through a person authorised under CASR 21.191. This is a matter for the applicant and authorised person to negotiate, which in turn is outside CASA control.

10. ISSUE OF THE EXPERIMENTAL CERTIFICATE

10.1 Prior to the issue of the experimental certificate, the authorised person or CASA may require an inspection of the aircraft. The applicant should facilitate this, and understand that such an inspection would only be required to resolve issues associated with the imposition of conditions or operational limitations necessary in the interests of other airspace users, and persons on the ground or water in consideration of the intended purpose(s). The inspection could be carried out by the relevant authorised person or CASA inspector, or by another entity, e.g. a LAME, as directed by the authorised person or CASA inspector.

10.2 Subsequent to any inspection, and after consideration of all the facts presented to the authorised person or CASA inspector, he or she will then decide on the conditions, limitations and directions which shall be applied, and then reflect these in the completion of CASA Form No. 720, "Special Certificate of Airworthiness".

10.3 The very large range of conditions, limitations and directions which could be reflected in the Annex to the certificate are fully discussed later in paragraph 16.

10.4 Duration

As discussed previously in paragraph 7, the certificate will be in force for the specified period, or until cancelled, or until the aircraft ceases to be registered, whichever occurs first. Note that if the authorised person or CASA does not specify a period of less than one year, then, in the case of experimental certificates issued for the purposes of R&D, showing compliance, crew training or market surveys, the certificate will be in force for a period of one year after the date it was issued, or until cancellation, whichever occurs first.

10.5 Cancellation/Suspension

An authorised person or CASA has the power to suspend or cancel an Australian CoA; including experimental certificates. Such action will be taken if maintenance on the aircraft is not carried out in accordance with the requirements of the maintenance regulations, or if the authorised person or CASA otherwise considers cancellation/suspension action is warranted in the interests of safety of other airspace users and persons on the ground or water. An aircraft's CoA is suspended when an experimental certificate is issued to the aircraft. A suspension on a certificate will be lifted on a date prescribed by an authorised person or CASA. If the certificate has been cancelled, either through action as described above, or after an aircraft ceases to be on the Australian register, then a new certificate will have to be applied for. There is no provision for a "reissue" in the CARs or CASRs, as existed in the now-repealed CAO 100.2.

10.6 Surrender

The holder of an experimental certificate must surrender the certificate to CASA, on written request from an authorised person or CASA if it is no longer in force, expired, suspended or cancelled.

11. FLIGHT TEST AREAS

11.1 An unproven aircraft is required to be assigned to a flight test area. The desired flight test area should be requested by the applicant and, if found acceptable by an authorised person or CASA (in consultation with Airservices Australia, and other persons as necessary and appropriate), will be approved and specified in the operating limitations. It will usually encompass the area within 25 nm in radius (or larger depending on the type and speed characteristics of the test aircraft) from the aircraft's base of operation or in a designated test area established by CASA and Airservices Australia. The area selected by the applicant and submitted to the authorised person or CASA for approval should not be over built-up areas of a city or town or in congested airways, so that the flight testing, during which passengers may not be carried, would not likely pose any hazard to persons in the airways or on the ground or water. Furthermore, takeoff and landing approach paths, and trajectory directions of the aircraft should control of the aircraft be lost, will not be allowed to pass over populated areas.

11.2 The initial confined area operations should be prioritised to show that the aircraft is controllable throughout its normal speed range and all manoeuvres to be executed, and has not displayed any hazardous operating characteristics or design features.

11.3 In the case of the first flight of an aircraft from an airport surrounded by a densely populated area, but with at least one acceptable approach/departure corridor, the authorised person or CASA will ensure that a flight corridor is selected where no persons may be subjected to possible hazards. In addition, upon leaving such an airport, the aircraft should be required to operate from an outlying airport until its controllability, airworthiness, and safety are established, after which the aircraft may return to its base and use the established corridor for subsequent operations. The description of the area selected, as well as details defining any established approach/departure corridor(s) shall be made a part of the operating limitations.

11.4 In the case of an aircraft located at any airport surrounded by built-up areas of a city or town and lacking any acceptable approach/departure corridor, CASA or the authorised person will not normally issue the experimental certificate. The applicant will be advised to relocate the aircraft by other means to a suitable airport.

Note: An acceptable approach/departure corridor may be considered to exist when the corridor provides reasonable opportunities for the pilot to execute an off-airport emergency landing that will not jeopardise the safety of other airspace users or persons on the ground or water, and also allows a safe trajectory path if control of the aircraft is lost during take-offs and landings.

11.5 Except for amateur-built aircraft (see AC 21.4 "Amateur-built Experimental Aircraft-Certification", paragraph 13), there are no specific time recommendations for operation of an experimental aircraft within an assigned test area. Each case must be judged on the individual conditions, such as the type and complexity of the aircraft. For example, flight testing in conjunction with a modification may require only one hour in an assigned flight test area, whilst the initial operation of a prototype jet aircraft may require twenty or more

hours before the safety certification can be made. In any event, the authorised person or CASA should not amend the operating limitations to permit flight outside the assigned flight test area until the applicant certifies and the authorised person or CASA finds compliance with the safety certification. This finding may be a review of the aircraft records containing the statement by the pilot that the aircraft is controllable, and has no hazardous operating characteristics. Also, the maintenance history whilst the aircraft is in the test area must be satisfactory. The authorised person or CASA may witness flights or inspect the aircraft if deemed necessary. PC/APIIS holders may show compliance with the certification in accordance with their approved experimental operating procedures; see paragraph 14 of this AC.

11.6 Aerobatics (Acrobatics has same meaning)

11.6.1 Aerobic manoeuvres may be permitted whilst the aircraft is in the assigned flight test area if, in the judgment of the authorised person or CASA, the aircraft has the capability of such flight. However, these manoeuvres should not be attempted until sufficient flight experience has been gained to establish that the aircraft is satisfactorily controllable.

11.6.2 Aerobic manoeuvres which have been demonstrated in the assigned flight test area should be documented in the aircraft records. Only those aerobic manoeuvres which have been successfully accomplished should be permitted after leaving the assigned flight test area. Appropriate limitations, which identify the manoeuvres and conditions under which they may be performed, should be prescribed.

11.6.3 Those aircraft owners/operators wishing to include new aerobic manoeuvres will need to make a request for a new flight test area and follow the same conditions as noted immediately above.

11.7 Aircraft which have satisfied the requirements outlined under paragraph 11.5 above may be operated outside of an assigned flight test area. Except as provided for in paragraph 14, operation of the aircraft outside an assigned flight test area will require the issue of a new experimental certificate with the new amended operating limitations. A new CASA Form No. 718, "Special Certificate of Airworthiness — Application" is required to be submitted whenever operating limitations are amended, since the date of the old limitations shown on the corresponding certificate would not be in accordance with the date of the new limitations, and alteration of the certificate to change the date is not permitted. If any major changes are made to an aircraft after it has been certificated for operation outside of a previously assigned flight test area, the authorised person or CASA must be notified and the response received in writing prior to flying the aircraft.

12 PILOT QUALIFICATIONS

12.1 The minimum qualification a pilot must hold to carry out the initial flight testing on an experimental aircraft is a Private Pilot Licence (PPL) with the appropriate endorsements.

12.2 CAR 1988 5.79 (2) (b) allows a PPL holder to fly an aircraft without the appropriate endorsement for the purpose of "(i) testing the aeroplane; or (ii) carrying out an experiment in relation to the aeroplane", if CASA has given the holder permission in writing under CAR 1988 5.50 (1) to fly the aeroplane in those circumstances.

12.3 Similar provisions exist for the holders of PPLs in helicopter and gyroplane classes. When experimental gliders, balloons and unconventional aircraft are involved, CASA will advise the applicant on minimum pilot qualifications as appropriate.

12.4 Although the regulations do not call for the initial 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. Stability and control problems might only become apparent after first flight liftoff, and the appropriate technical knowledge and experience may be essential to avert a catastrophic event.

12.5 Further advice in this respect can be obtained from the following sources:

- (a) Flight Test Society of Australia (FTSA), GPO Box 2603, Canberra, A.C.T., 2601;
- (b) CASA Test Pilot, Airworthiness Branch, CASA, GPO Box 2005, Canberra, ACT, 2601, telephone 131 757.

12.6 Notwithstanding all of the above, an authorised person or CASA may impose the requirements for further experience and qualifications in the case of high-performance or complex aircraft, e.g. minimum hours in high-performance combat aircraft, military Qualified Flying Instructor or Fighter Combat Instructor qualification etc.

12.7 All of the above relates to initial test flying of experimental aircraft. When test flying of an experimental aircraft involves the preparation, flight testing, and approval of flight test data relating to aircraft certification (showing compliance with the regulations), then an authorised test pilot may be involved.

12.8 An authorised test pilot is an authorised representative of CASA. There are distinct advantages in the involvement of an authorised test pilot at an early stage of an aircraft type certification program. For further information, contact the CASA Test Pilot, using the contact information at paragraph 12.5 above.

13 FLIGHT TEST PROGRAM

13.1 The complexity of a flight test program will be essentially a function of the nature of the program, for example:

- (a) a pure R&D program without type certification being involved;
- (b) flight testing of a modification;
- (c) initial testing of an aircraft destined to carry out exhibition flying and/or air racing; or
- (d) full type certification of a new aircraft type.

13.2 The degree of the involvement of an authorised person or CASA in a flight test program will in turn be a function of the complexity of the program, as well as the size and experience of the entity wishing to undertake the program.

13.3 Further information on flight test program planning and control, and safety aspects, can be found in AC 21.13, “Australian-Designed Aircraft Type Certification”.

13.4 Entities undertaking flight test programs will 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”;

- (d) U.S. FAA AC 27-1A, “Certification of Normal Category Rotorcraft”;
- (e) U.S. FAA AC 25-7, “Flight Test Guide for Certification of Transport Category Airplanes”;
- (f) U.S. FAA AC 29-2B, “Certification of Transport Category Rotorcraft”.

14. PROCEDURES FOR PRODUCTION CERTIFICATE AND APPROVED PRODUCTION INSPECTION SYSTEM HOLDERS

14.1 Production certificate and APIS holders may submit, for an authorised person’s or CASA’s approval, a procedure describing the operation of experimental aircraft. The approved procedure may be listed in the operating limitations and conditions, as indicated in paragraph 16.

14.2 The procedure should include at least the following:

- (a) a description of the test area that will be used to show compliance with the requirements in paragraph 11. This area shall be described by a radius, coordinates, and/or landmarks, and be over open water or sparsely populated areas having light air traffic. The size of the area shall be that required to safely conduct the type of anticipated manoeuvres and tests. Multiple purpose certificates may require the designation of individually prescribed geographical areas;
- (b) a daily flight record should be maintained by the pilot showing compliance with area requirements, and the inspection of the aircraft prior to release for flights in the expanded test area. The flight record will be maintained for the duration of the certificate for review by an authorised person or CASA;
- (c) a description of the method used to conduct and record necessary flights outside the test area, and for maintaining these records. This procedure will remain active for the duration of the certificate, and will eliminate the need for the PC/APIS holder to obtain approval for each flight;
- (d) a description of a method used to define the persons that may be carried during these operations. This procedure must incorporate the following:
 - (i) a requirement that the pilot-in-command advise each person carried of the experimental nature of the aircraft;
 - (ii) a method of recording persons carried on each flight. These records must be maintained for the duration of the certificate for review by an authorised person or CASA;
 - (iii) a provision that no person may be carried in the aircraft during flight unless that person is required for the purpose of the flight, except as provided immediately below; and
 - (iv) a provision that persons other than flight crew may be carried when the following conditions are met:
 - (A) the aircraft is of the same basic model that has previously shown compliance with CASR 21.195, and it has been shown that, to the satisfaction of an authorised person or CASA that the aircraft:
 - is controllable throughout its normal range of speeds and throughout all the manoeuvres to be executed; and

- has no hazardous operating characteristics or design features;
 - (B) flight tests do not include intentional manoeuvres involving abrupt changes in the aircraft's attitude, abnormal attitudes, or abnormal accelerations/decelerations not necessary for normal flight;
 - (C) the procedures specifically cover the types of flying to be permitted while carrying persons other than crew members; and
 - (D) the warning placard as described in paragraph 8.2 has been brought to the attention of all persons carried;
- (iv) a description of the method used to determine that the aircraft is in a condition appropriate for the purpose intended when changing from one purpose to another (multiple purpose certificates), and to document the results of this determination in a maintenance record or daily flight record, has been established, e.g. changing from R&D to market survey;
- (v) any other condition deemed necessary in the interests of safety by an authorised person or CASA; and
- (vi) a copy of this procedure must be carried in the aircraft whilst operating under the privileges of this procedure. A copy of this procedure may also be included or directly referenced in the PC/APIS holder's quality manual for the convenience of the manufacturer and an authorised person or CASA.

15. EXPERIMENTAL MILITARY AIRCRAFT

15.1 Experimental military aircraft built under an Australian military contract in Australia and identified by Australian military aircraft identification marks, do not require civil registration or the issue of experimental certificates, pursuant to CASR 21.191, for flight testing or demonstration prior to acceptance by the Australian Defence Force.

15.2 However, aircraft of military design built independently by manufacturers with the intention of demonstrating to prospective military purchasers, in Australian territory, and not having military identification, will be required to obtain civil registration and experimental certificates, since such aircraft would be considered as civil aircraft.

16. OPERATING CONDITIONS AND LIMITATIONS

16.1 Conditions, limitations and directions for operation of experimental aircraft are entered in the Annex to the experimental certificate. They will be designed to fit the specific purpose(s) and situations that apply to the aircraft. The authorised person or CASA may impose any additional conditions, limitations or directions deemed necessary in the interests of safety of other airspace users, and persons on the ground or water. The authorised person or CASA will review each operating condition, limitation or direction imposed, with the applicant, to ensure that they are fully understood by the applicant.

16.2 The following operating conditions, limitations and directions may be prescribed in accordance with the applicability chart at Attachment 1:

- (1) No person may operate this aircraft for other than the purposes of.....
(R&D, showing compliance with regulations, etc.) to accomplish the flight operations outlined in the applicant's statement dated....., *(and if for the purposes of R&D and/or showing compliance, the applicant's program letter dated).....*, and made available to the pilot-in-command of the aircraft. Additionally, this aircraft shall be operated in accordance with applicable air traffic control and general operating rules of the Civil Aviation Regulations, and all additional limitations herein prescribed. The aircraft must be operated in accordance with the
(aircraft's flight manual, pilot's notes, or drafts thereof, or other approved handling instructions).

- (2) All flights shall be conducted within the geographical area described as follows:

(The area shall be described by radius, or coordinates and/or landmarks). The designated area must be over open water or sparsely populated areas having light air traffic. The size of the area shall be that required to safely conduct the type of anticipated manoeuvres and tests, as appropriate. *(Multiple purpose certificates may require individually prescribed geographical areas).*

Note: When an authorised person or CASA finds compliance with the operating safety certification, the operating limitations will be revised to remove the limitation. The aircraft will not be allowed to operate over built-up areas of cities or towns, or in congested airways. The authorised person or CASA may permit take-offs and landings to be conducted over the built-up areas of cities or towns as described in paragraph 11. If this operating limitation is issued, it should read "Except for take-offs and landings, this aircraft shall not be operated over built-up areas of cities or towns". Limitation #4 may be specified in lieu of this operating limitation for PC/APIS holders who have submitted a procedure in accordance with paragraph 14. This modified limitation will not be issued for highly modified turbine powered and highly modified high-performance piston powered aircraft used for air racing or aerobatics, where the flight performance or characteristics of the aircraft have been changed.

- (3) All flights shall be conducted within the geographic area described as follows:

Note: This limitation will be prescribed to expand the area after the authorised person or CASA finds compliance with the safety certification as per limitation #35. This limitation applies to the following purposes: R&D, showing compliance, crew training, and market surveys. Limitation #4 may be specified in lieu of this operating limitation for PC/APIS holders who have submitted a procedure as described in paragraph 14.

- (4) All flights shall be conducted in accordance with:

(Describe the PC/APIS holder's approved operating procedure. e.g. Acme Aircraft Co. Experimental Operating Procedure No. 12 (dated).....)
- Note: Limitation #4 may be specified in lieu of limitations #2 and #3, for PC/APIS holders who have submitted a procedure as described in paragraph 14.*
- (5) Upon changing between operating purposes of a multiple purpose certificate, the operator shall determine that the aircraft is in a condition appropriate for the purpose intended and document that finding in the aircraft record, e.g. changing from R&D to market surveys.
- Note: This limitation is not applicable when a PC/APIS holder's experimental operating procedure is specified, and for exhibition and air racing purposes.*
- (6) This aircraft shall not be operated unless it is maintained in accordance with the manufacturer's recommendations and/or appropriate military publications. The owner/operator shall establish an inspection program approved by an authorised person or CASA. This inspection program shall be recorded in the aircraft maintenance records.
- (7) The pilot-in-command of this aircraft must hold:

(the appropriately rated pilot's licence).
- (8) This aircraft is to be operated under VFR, day only.
- (9) Day/night VFR operation is authorised.
- (10) Unless appropriately equipped for night and/or instrument flight in accordance with CAO 20.18, this aircraft is to be operated under day only VFR.
- (11) No person may operate this aircraft for carrying persons or property for compensation or hire.
- (12) No person may be carried in this aircraft during flight unless that person is required for the purpose of the flight.
- Note: This limitation may be deleted for PC/APIS holders and instead specify limitation #11.*
- (13) Persons may be carried in accordance with:

(Describe the PC/APIS holder's approved operating procedure; see again example in limitation #4)
- Note: This limitation is applicable only for PC/APIS holders that have submitted a procedure as described in paragraph 14.*
- (14) The person operating this aircraft shall advise each person carried of the experimental nature of this aircraft.
- (15) This aircraft is prohibited from aerobatic flight. i.e. an intentional manoeuvre involving an abrupt change in the aircraft's attitude, an abnormal attitude, or abnormal acceleration not necessary for normal flight.
- Note: Aerobatic flights may be permitted in the assigned test area. The applicant should be advised that aerobatics or violent manoeuvres should not be attempted until sufficient flight experience has been gained to establish that*

the aircraft is satisfactorily controllable. These operating limitations may be modified to include only those aerobatics which have been satisfactorily accomplished and recorded in the aircraft records during the flight test. These aerobatic manoeuvres should be permitted upon leaving that assigned test area. Appropriate limitations identifying the aerobatics and conditions under which they may be performed should be prescribed. The authorised person or CASA inspector may witness aerobatic manoeuvres if deemed necessary. If aerobatic flights are permitted, limitation #16 will be specified in lieu of this limitation.

- (16) This aircraft may conduct aerobatic flight in accordance with the provisions of CAR 155. Aerobatics shall not be attempted until sufficient flight experience has been gained to establish that the aircraft is satisfactorily controllable and the safety certification has been recorded by the operator in the aircraft records. Aerobatic manoeuvres which have been accomplished shall be recorded in the aircraft maintenance record.
- (17) The authorised person or CASA 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.

Note: Limitation #4 may be specified in lieu of this limitation for PC/APIS holders that have submitted a procedure as described in paragraph 14.

- (18) This aircraft shall not be operated for glider towing, banner towing, parachute jumping or aerial spraying operations, unless approved by an authorised person or CASA.
- (19) No person shall operate this aircraft unless within the preceding 12 calendar months, it has had a condition inspection performed in accordance with the CASA maintenance regulations, or other approved programs, and found to be in a condition for safe operation.
- (20) Only CASA licensed or certificated persons with appropriate ratings as authorised by the Civil Aviation Regulations may perform inspections required by these operating limitations.
- (21) 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 details of, (*insert identification of the approved maintenance program*) 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.
- (22) If aircraft, engine, or propeller operating limitations are exceeded, an appropriate entry must be made in the aircraft records.

Note: This limitation applies only when an aircraft is temporarily experimental and will be returned to the original certificate status e.g. an STC project.

- (23) No person may operate this aircraft unless the experimental certificate for the aircraft is available in the aircraft.
- (24) Application must be made to an authorised person or CASA for any revision to these operating limitations.

- (25) The pilot-in-command of this aircraft should notify air traffic control of the experimental nature of this aircraft when operating under IFR, and shall request routing that will avoid built-up areas of cities and towns, and congested airways, if possible. Air traffic control approval to fly over a built up area of a city or town does not constitute approval under CAR 262AP (5).
- (26) This aircraft does not meet the requirements of the applicable comprehensive and detailed national airworthiness code as provided by Annex 8 to the Convention on International Civil Aviation. A CoA is required for each aircraft engaged in international operations. The owner/operator of this aircraft must obtain written permission from another country's National Airworthiness Authority (NAA) prior to operating this aircraft on or above that country. That written permission must be carried aboard the aircraft together with this certificate and these operating limitations; and must be made available to CASA or the NAA in the country of operation at any time.
- (27) Aircraft instruments and equipment fitted in accordance with CAO 20-series requirements must be inspected and maintained in accordance with the requirements of the applicable Civil Aviation Regulations. Any maintenance or inspection of this equipment must be recorded in the aircraft maintenance records.
- (28) This aircraft may only operate from
(identify name of outlying airport) until the safety certification has been made. The operator will use the following described corridor to transition to that airport.....
(enter description of the corridor). After the safety certification has been made, the aircraft may return to
(enter home base airport name) but the established corridor shall be used for all subsequent operations.

Note: This limitation will be used when the aircraft's home base is located in a densely populated area and/or in a congested airway.

- (29) The pilot-in-command of this aircraft should be knowledgeable of and utilise the procedures described in the U.S. Experimental Aircraft Association's "Jet Operations Manual" or other procedures acceptable to an authorised person or CASA.

Note: This shall apply to high-performance ex-military aircraft used for exhibition flying and/or air racing.

- (30) The ejection seat system must be maintained in accordance with the manufacturer's procedures and inspected in accordance with CASA-approved program entitled
(identify program title) dated
(enter approval date).
- (31) The ejection seat system must be secured to prevent inadvertent operation of the system whenever the aircraft is parked.
- (32) All systems that provide a means of in-flight jettison of external stores must be maintained in accordance with the manufacturer's procedures and be inspected in accordance with CASA-approved program titled
(identify program title) dated
(enter approval date).

Note: In-flight jettison systems are only allowed to be operational on aircraft used for the purpose of R&D.

- (33) External stores systems must be secured to prevent inadvertent operation of these systems whenever the aircraft is parked.
- (34) This aircraft is prohibited from flight with any externally mounted equipment unless the equipment is permanently installed, in a manner that will prevent in-flight jettison of the equipment. This permanent installation must be recorded in the aircraft records.
- (35) Following satisfactory completion of the required number of flight hours in the flight test area, the pilot shall make a safety certification in the aircraft records. The certification shall be the following or a 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”.(Signature) (Date).
- (36) No person may operate this aircraft other than to participate in events described in the approved schedule of events for
.....(exhibition/air racing) identified as (number/date).
- (37) The owner/operator of this aircraft must submit an annual program letter to an authorised person or CASA for approval, that includes a schedule of events that will be attended during the next year. This schedule will be subject to amendments, as required, by letter or facsimile transmission.
- (38) The owner/operator of this aircraft must ensure that a copy of the current program letter, schedule of events, any relevant amendments, and copy of the highlighted aeronautical chart showing operating areas and corridors, are carried aboard this aircraft at all times.
- (39) No person may be carried in this aircraft during the exhibition of the aircraft’s flight capabilities, performance, or unusual characteristics at air shows, or motion picture, television or similar productions, unless essential for the purpose of the flight.
- (40) Supersonic flight (true flight Mach number > 1.0) is prohibited unless specifically authorised by CASA.

Note: Relevant to any aircraft capable of exceeding Mach 1.0.

- (41) These operating limitations and the experimental certificate bear no expiry date. However, when the aircraft’s base of operation is changed or there is a transfer of ownership, the new owner/operator will provide the nearest CASA District Office with a copy of the approved inspection program identifying the person responsible for scheduling and performing the inspections.
- (42) Flights to maintenance facilities located inside or outside the proficiency area to have maintenance performed are allowed. For facilities outside the proficiency area stated in the operating limitations, identify the operating limitation number. The owner/operator must notify and receive permission from the geographically-responsible CASA District Office prior to flight. The maintenance performed must be recorded in the aircraft records.
- (43) A parachute must be worn for..... (flights/hours/operations).
- (44) Flight into known or forecast icing conditions is prohibited.

Note: For major modification programs where external configuration changes would impact on the icing certification of the aircraft.

- (45) This aircraft shall not be operated unless it is maintained and inspected in accordance with the maintenance requirements of the Civil Aviation Regulations.
- (46) Maximum number of occupants (including crew) is six (6).

Note: For private operations purpose.

17 ASSOCIATED MATTERS

17.1 The following matters are associated with CoA exercises. In some countries, they are integral with CoA application/issue procedures, and this may cause confusion for some Australian CoA applicants, including those applying for experimental certificates.

17.2 Noise Certification

17.2.1 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.

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 (0)2 6268 4210
email: environment@airservices.gov.au

17.2.2 Some aircraft being issued experimental certificates pursuant to CASR 21.191 may already have individual valid noise certification issued. If this is not the case, then noise certification must be applied for to the address above.

17.2.3 In the event that a long-term noise certification cannot be granted, then Environment Monitoring Branch of Airservices Australia in Canberra may, as an alternative, issue a "Permission to Operate" under subregulation 9A (2) of the Air Navigation (Aircraft Noise) Regulations. This may be on a limited duration/restricted route basis, and in that sense could be aligned to the terms of the experimental certificate.

17.2.4 Applicants for issue of experimental certificates for ex-military aircraft to be used for exhibition flying or air racing should very carefully note that many of these aircraft types do not meet the Australian aircraft noise limitations. If civil use of such aircraft is contemplated, then, as a matter of priority, contact should be made with the Manager of Environment Monitoring, Airservices Australia, at the address given above. Noise characteristics of the type involved may preclude civil use in Australia, even as long-term experimental aircraft.

17.3 Aircraft Import

17.3.1 The formalities of aircraft import (in a regulatory Customs sense) are not matters which involve CASA.

17.3.2 The liaison required between the applicant and the Australian Customs Service in regard to import formalities is straightforward. The applicant may choose to use a customs broker, or lodge an application directly to the Australian Customs Service.

17.4 Operation of Historic and Ex-military Aircraft

In the past, CAR 134 allowed extended operations of historic and ex-military aircraft on a dedicated Permit to Fly (Form CASA/AW/062). These types of aircraft are now operated as experimental aircraft (as described in this AC for exhibition and/or air racing purposes) or as limited category aircraft. For further information on the latter, see AC 21.5, "Limited Category Aircraft - Certification".

17.5 Maintenance Release

17.5.1 A maintenance release does not have to be issued prior to the issue of an experimental certificate. However, an aircraft operating on an experimental certificate cannot fly legally until a maintenance release has been issued and is in force.

17.5.2 A maintenance release may be issued by the owner/builder of an experimental aircraft certificate issued for CASR 191(g) and (h) on the condition that the owner/builder holds a maintenance authority issued under CAR 1988 33B(a). Additionally, the experimental certificate will need to include conditions 20 and 21 in paragraph 16.2.

Note: The certificated person referred to in condition 20 is the owner/builder holding the appropriate maintenance authority. A general instrument of appointment authorises this maintenance holder to issue a maintenance release for his/her aircraft only. The maintenance authority must be endorsed to permit the issue of the maintenance release.

18. CASA LIABILITY

18.1 Experimental certificate holders should note the content of *Civil Aviation Regulation 1998* (CAR 1998) 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.”

18.2 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 Yates
Assistant Director
AviationStandards Division

ATTACHMENT 1

APPLICABILITY CHART FOR EXPERIMENTAL AIRCRAFT – OPERATING LIMITATIONS

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
RESEARCH & DEVELOPMENT	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X
SHOWING COMPLIANCE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X
CREW TRAINING	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X
MARKET SURVEYS	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X
EXHIBITION	X	X				X	X	X	X	X	X		X	X	X	X	X	X	X	X	X		X	X
AIR RACING	X	X				X	X	X	X	X	X		X	X	X	X	X	X	X	X	X		X	X
PRIVATE OPERATIONS	X					X	X	X	X	X	X			X	X	X	X	X	X	X	X		X	X

	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46		
RESEARCH & DEVELOPMENT	X	X	X	X	X	X	X	X	X		X					X	X		X	X	X			
SHOWING COMPLIANCE	X	X	X	X							X					X	X		X	X	X			
CREW TRAINING	X	X	X			X	X			X						X	X			X	X			
MARKET SURVEYS	X	X	X													X	X			X	X			
EXHIBITION	X	X	X		X	X	X			X		X	X	X	X	X	X	X	X	X	X			
AIR RACING	X	X	X		X	X	X			X		X	X	X		X	X	X	X	X	X			
PRIVATE OPERATIONS	X	X	X													X	X			X	X	X		

- NOTE:**
- (1) “CREW TRAINING “ REFERS TO APPLICANT’S CREW TRAINING
 - (2) “MARKET SURVEYS” REFERS ALSO TO SALES DEMONSTRATIONS AND CUSTOMER CREW TRAINING
 - (3) “PRIVATE OPERATIONS” REFERS TO PRIVATE USE OF A PROTOTYPE USED FOR PREVIOUS EXPERIMENTAL PURPOSES SUCH AS R&D AND SHOWING COMPLIANCE
 - (4) AMATEUR-BUILT AND KIT-BUILT LIMITATIONS ARE COVERED IN AC 21.4 “AMATEUR-BUILT EXPERIMENTAL AIRCRAFT – CERTIFICATION.”