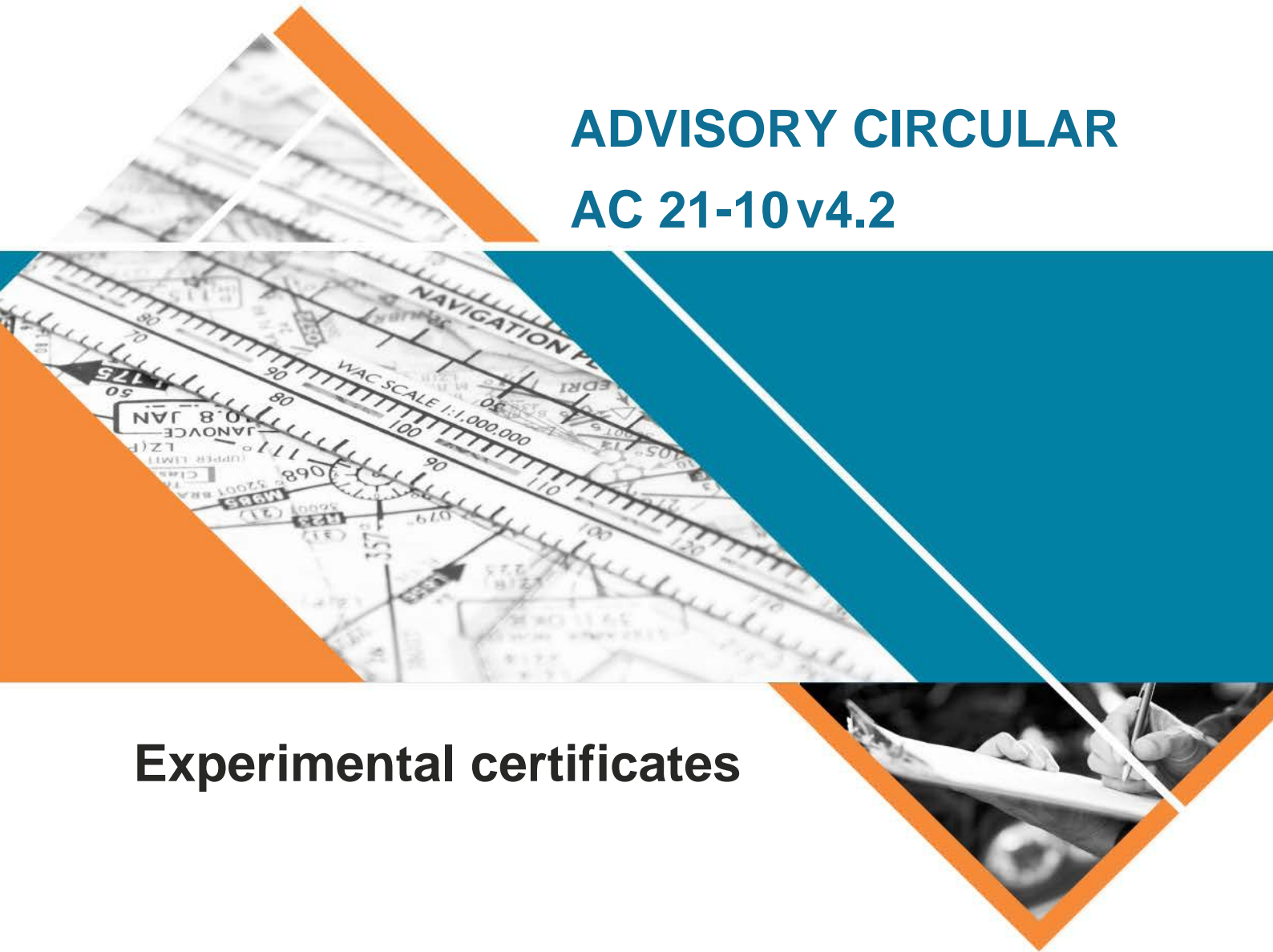




ADVISORY CIRCULAR

AC 21-10v4.2



Experimental certificates

Date	March 2019
File ref	D18/503181

Advisory Circulars are intended to provide advice and guidance to illustrate a means, but not necessarily the only means, of complying with the Regulations, or to explain certain regulatory requirements by providing informative, interpretative and explanatory material.

Advisory Circulars should always be read in conjunction with the relevant regulations.

Audience

This Advisory Circular (AC) applies to:

- persons who are authorised to issue experimental certificates of airworthiness
- aircraft owners and pilots
- aircraft designers and constructors
- aircraft maintainers.

Purpose

This Advisory Circular (AC) provides guidance and information to applicants applying for experimental certificates.

For further information

For further information on this AC, contact CASA's Airworthiness and Engineering Branch (telephone 131 757).

Unless specified otherwise, all subregulations, regulations, divisions, subparts and parts referenced in this AC are references to the *Civil Aviation Safety Regulations 1998 (CASR)*.

Status

This version of the AC is approved by the Manager, Airworthiness and Engineering Branch.

Note: Changes made in the current version are annotated with change bars.

Version	Date	Details
v4.2	March 2019	Risk management advice reviewed and clarified. The risk assessment matrices at Appendix A have been changed with the previous scoring system being removed and replaced with a simpler and more generic rating scale. Minor editorial changes.
v4.1	June 2018	Minor correction of the definition of authorised person to match the regulations.
v4.0	February 2017	This AC has been amended to explain changes to Part 21 of CASR that have been introduced with the introduction of Part 132 of CASR (Limited Category Aircraft Operations). In particular, eligibility for an experimental certificate has been amended to clarify the Civil Aviation Safety Authority (CASA) policy in regard to ex-armed forces aircraft which will be mainly confined to certification in the limited category. The AC has been transferred to the new Advisory Circular format however except as indicated by change bars, the content has not been substantially changed.
v2.1	January 2016	Amended to provide further clarification on flights outside Australian Airspace.
(2)	July 2011	Amended to update certain information and guidance for further clarification. In particular, it provides additional advice on risk management assessment for consideration by authorised persons or Civil Aviation Safety Authority (CASA) officers when issuing experimental certificates.
(1)	August 2009	It has been amended to update certain information and guidance for further clarification. In particular, it provides advice on risk management for test pilots during experimental flight testing.
(0)	October 1998	Initial release.

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1 Reference material

1.1 Acronyms

The acronyms and abbreviations used in this AC are listed in the table below.

Acronym	Description
AC	advisory circular
CAA	Civil Aviation Authority
CAO	Civil Aviation Order
CAR	<i>Civil Aviation Regulations 1988</i>
CASA	Civil Aviation Safety Authority
CASR	<i>Civil Aviation Safety Regulations 1998</i>
CofA	certificate of airworthiness
FAA	Federal Aviation Administration (of the USA)
R&D	research and development
LSA	light sport aircraft
NAA	national airworthiness authority
PPL	private pilot licence
R&D	research and development
STC	supplemental type certificate
UAV	unmanned aerial vehicle
VFR	visual flight rules

1.2 Definitions

Terms that have specific meaning within this AC are defined in the table below.

Term	Definition
authorised person	A person who has been appointed by CASA under regulation 6 of the <i>Civil Aviation Regulations 1988 (CAR 1988)</i> or regulation 201.001 of CASR to perform certain functions under the regulations. An authorised person will have been authorised by means of a CASA Instrument of Appointment.
ex-armed forces aircraft	(a) A version of an aircraft that has been manufactured in accordance with the requirements of, and accepted for use by, an armed force of any country (whether or not it has been used by such a force); or (b) A particular aircraft: (i) to which paragraph (a) does not apply; and (ii) that has been operated by an armed force of any country.

1.3 References

Regulations

Regulations are available on the Federal Register of Legislation website <https://www.legislation.gov.au/>

Document	Title
International Civil Aviation Organization Annex 8	Airworthiness of Aircraft
Civil Aviation Act 1988	
Part 45	Display of nationality and registration marks and aircraft registration identification plates
Part 47	Registration of aircraft and related matters
Part 61	Flight Crew licensing
Part 132	Limited category aircraft
Subpart 21.H	Certificates of airworthiness and special flight permits
Regulation 262AP of CAR	Experimental aircraft--operating limitations
Subregulation 43(9) of CAR	Maintenance releases in respect of Australian aircraft

Advisory material

CASA's advisory circulars are available at <http://www.casa.gov.au/AC>

CASA's Civil Aviation Advisory Publications are available at <http://www.casa.gov.au/CAAP>

Document	Title
AC 21-04	Amateur-built experimental aircraft – certification
AC 21-43	Experimental Certificates for Unmanned Aircraft
AC 21-47	Flight Test Safety

1.4 Forms

CASA's forms are available at <http://www.casa.gov.au/forms>

Form number	Title
718	Application for Issue of a Special Certificate of Airworthiness
720	Special Certificate of Airworthiness

2 Introduction

2.1 Background

- 2.1.1 Special certificates of airworthiness (CofA), which include experimental certificates, are issued to permit certain kinds of operations of aircraft that do not meet the requirements for a standard CoA¹ or that, because of certain modifications, do not conform to their type certificates, but are capable of safe operations under defined operating conditions and purposes.
- 2.1.2 In recognition of the lack of compliance with some of the airworthiness standards, the aircraft is normally permitted to be operated under more restrictive operating conditions than in the case of a comparable aircraft operating on a standard CofA.
- 2.1.3 Under regulation 21.191 of CASR, CASA or an authorised person can issue experimental certificates to allow specific operations of aircraft which are not by their nature type certificated or have certain unapproved modifications embodied. While processing an application for the issue of an experimental certificate, CASA or an authorised person may rely on the relevant information provided by, and the engineering judgment of, the applicant.
- 2.1.4 The owner/operator of an experimental aircraft is responsible for taking care to minimise safety risks and to be satisfied that the aircraft is reasonably capable to carry out flights without damage or injury to the aircraft and its occupants or to other property or persons whether in the air or on the ground or water.
- 2.1.5 If an aircraft is operating on a special CofA and the flight involves operations in the airspace of foreign countries, the operator of the aircraft must obtain special flight approvals from the appropriate authorities of each of those countries prior to undertaking the flight in their airspace.

2.1.6 Ex-armed forces aircraft

- 2.1.6.1 Government policy as articulated by the introduction of Part 132 of CASR is that ongoing operations of ex-armed forces aircraft are to be administered by an organisation approved under subregulation 262AN(1) of CAR. In order to support this policy, CASA requires ex-armed forces aircraft to be certified in the limited category. Exceptions to this policy requirement are for:
- aircraft undergoing flight testing to determine regulatory compliance
 - aircraft that have been highly modified for air racing
 - aircraft that are certified in the standard or restricted category.

2.2 General guidelines

- 2.2.1 The following general guidelines establish the working basis for the regulatory oversight of experimental certificates:

¹ International Civil Aviation Organisation Annex 8 – ‘Airworthiness of Aircraft’

- An experimental aircraft is not required to have a type certificate or to meet the requirements of a type certificate.
- 'Experimental' is a designation and not an airworthiness category. An experimental certificate does not attest to the airworthiness of the aircraft.
- Specific conditions and limitations relating to the operations of the aircraft are contained in an Annex to the certificate.
- The experimental certificate system allows any person or commercial entity to construct an aircraft of any size and seating capacity, and with any number and type of engines.
- If an experimental certificate is issued for an aircraft already having a standard CofA, then the previously issued standard CofA is suspended for the duration of the experimental certificate.
- Experimental certificates can be issued for one or more prescribed purposes (see paragraph 3.1.1).
- Passengers or cargo cannot be carried for compensation or hire.

3 Prescribed purposes

3.1 Overview

- 3.1.1 An experimental certificate for an aircraft may be issued 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 issued with an experimental certificate for specific purposes
 - j. operating a light sport aircraft (LSA) assembled from a kit or manufactured by a qualified manufacturer and covered by regulation 21.186 of CASR.
- 3.1.2 An aircraft on an experimental certificate 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:
- 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
 - carrying out a test of the aircraft following maintenance or rectification of defects
 - training a person to qualify for an aircraft endorsement on the aircraft
 - practice in flying the aircraft
 - 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
 - in the case of an amateur-built or kit-built aircraft, flying training given in the aircraft to the owner of the aircraft.
- 3.1.3 The bulk of experimental aircraft constructed or operated in Australia are expected to be amateur-built or light sport aircraft. To this end, CASA has published dedicated advisory circulars (ACs) AC 21-04 and AC 21-41. Applicants wishing to pursue this area of certification activity and those interested in kit-built aircraft should refer to that advisory circular. Note that there will be no further elaboration of amateur-built and kit-built aircraft in this AC.
- 3.1.4 Unmanned aerial vehicles (UAVs) having maximum take-off weight greater than 150 kg may be operated on an experimental certificate for purposes (a), (b), (c), (d) and (f) in paragraph 3.1.1 above. For further information regarding experimental certificates for UAVs refer to AC 21-43.

3.2 Research and development

- 3.2.1 This purpose is primarily intended for bona-fide R&D operations that lead to the subsequent issue of a type certificate, including proof-of-concept flying; or for operations which may be purely R&D in nature, such as determining whether an idea warrants further investigation. Examples of this activity include testing new aircraft design concepts, new aircraft equipment installations, new aircraft operating techniques, or new uses for aircraft.
- 3.2.2 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 for this purpose is valid only for the period of time specified on the certificate, but not exceeding one year, and for the number of flights necessary to complete the R&D program.
- 3.2.3 The R&D purpose is essentially a transitory one, and operation under this purpose for an indefinite period is not permitted.²

3.3 Showing compliance with regulations

- 3.3.1 This purpose provides for operations to show compliance with the CASR 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 (STC). It also provides for test flying undertaken by CASA as part of a type certification program.
- 3.3.2 Examples of this purpose are conducting flight tests and other operations to show compliance with the airworthiness regulations, including flights to:
- show compliance for issue of type certificates and STCs
 - substantiate major design changes
 - verify compliance with the function and reliability requirements of the regulations.

Note: Production test flights are carried out under special flight permits.

- 3.3.3 An experimental certificate for this purpose is valid only for the period of time specified on the certificate, but not exceeding one year, and for the number of flights necessary to accomplish the purpose.

3.4 Training the applicant's flight crew

- 3.4.1 Operations under this purpose are limited to flight crews for whom training in the experimental aircraft is necessary for subsequent operations of the aircraft in type certification programs or for production flight testing.
- 3.4.2 An experimental certificate for this purpose is valid only for the period of time specified on the certificate, but not exceeding one year, and for the number of flights necessary to accomplish the training.³

² Subregulation 21.195B(1).

³ Subregulation 21.195B(1).

3.5 Exhibition

- 3.5.1 Operations covered under this purpose are for valid exhibition purposes only and include operations for the purpose of training for the exhibition or maintaining proficiency. Some examples of this purpose 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 flying to and from such air shows and productions.
- 3.5.2 An experimental certificate for this purpose is normally valid for an unlimited period of time. However, operations under this provision are normally limited to a specified area in the vicinity of the aerodrome 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.

3.5.3 Ex-armed forces aircraft

- 3.5.3.1 Exhibition of ex-armed forces aircraft is not normally provided for under the experimental rules as they should be conducted under the exhibition provisions in regulation 21.189 of CASR.
- 3.5.3.2 In adherence to this policy, CASA authorised persons are not authorised to issue an experimental certificate to an ex-armed forces aircraft for the purpose of subregulation 21.191(d) (exhibition). Certificates for this purpose are only available by making application to CASA using Form 718.
- 3.5.3.3 A CASA delegate may issue an experimental certificate to an ex-armed forces aircraft for exhibition however, the applicant will be required to provide details of the proposed exhibition flight. The certificate will be issued for the duration of time necessary to participate in the nominated event.

3.6 Air racing

- 3.6.1 An experimental certificate for this purpose is issued for participating in air races, including practicing for air races, and flying to and from racing events. It 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 aerodrome 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.

3.6.2 Ex-armed forces aircraft

- 3.6.2.1 Ex-armed forces aircraft that have been extensively modified for the sole purpose of air racing must be operated on an experimental certificate, which will specify on the certificate, the races for which the certificate has been issued.
- 3.6.2.2 Ex-armed forces aircraft that have not been extensively modified for air racing may be flown in air races under the provisions Part 132 of CASR and should not be operated on an experimental certificate.

- 3.6.2.3 In keeping with Government policy, CASA-authorized persons are not authorized to issue experimental certificates for the purpose of air racing an ex-armed forces aircraft if it has not been extensively modified for air racing.
- 3.6.2.4 Air races are not normally conducted in Australia; however, if an operator of an ex-armed forces aircraft wishes to participate in an event and does not have a limited certificate they may apply to CASA for an experimental certificate for the purpose of participating in an air race. The certificate would only be issued for the duration necessary to participate in a nominated event.

3.7 Market surveys and sales demonstrations

- 3.7.1 An experimental certificate for this purpose is issued to conduct market surveys and/or sales demonstrations. Issue of experimental certificates for this purpose are confined to:
- a manufacturer of an aircraft manufactured within Australia that is to be used for market surveys and/or sales demonstrations
 - 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
 - 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, aerobatic, commuter, or transport category.
- 3.7.2 Before an experimental certificate for this purpose can be issued, the applicant must have established a maintenance program for the continued airworthiness of the aircraft and have had the aircraft flown for at least 50 hours, or at least 5 hours if it is a type certificated aircraft that has been modified. An experimental certificate for this purpose is normally limited to the time needed for the prescribed operations and does not exceed one year.

3.8 Private operations of prototype aircraft

- 3.8.1 This purpose provides for limited private use of prototype aircraft that were previously issued with experimental certificates for the purposes of R&D, showing compliance with regulations, and/or exhibition.
- 3.8.2 Operations of the aircraft are confined to the carriage of maximum 6 occupants, unless otherwise approved by CASA or an authorized person. The aircraft cannot be used for compensation or hire. The aircraft is subject to the same limitations and conditions as amateur-built experimental aircraft (see AC 21-04).
- 3.8.3 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.

3.9 Registration and marking

3.9.1 Before an application is submitted for issue of the experimental certificate, the aircraft must be registered. In addition to the nationality and aircraft registration marks, as required by Part 45 of CASR, the following markings are also required:

- the aircraft registration identification plate must be attached to an accessible location near an entrance, where applicable
- the aircraft data plate with specific information imprinted on it must be fixed to the aircraft
- the word 'EXPERIMENTAL' must be displayed on the aircraft near each entrance to the cabin or cockpit in letters not less than 5 cm.⁴ The letters should be in capitals without ornamentation.
- 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:⁵

'WARNING

PERSONS FLY IN THIS AIRCRAFT AT THEIR OWN RISK

**THIS AIRCRAFT IS NOT OPERATED TO THE SAME SAFETY STANDARDS AS A NORMAL
COMMERCIAL PASSENGER FLIGHT**

CASA DOES NOT SET AIRWORTHINESS STANDARDS FOR EXPERIMENTAL AIRCRAFT'

⁴ Regulation 45.090 and section 10 of the Part 45 MOS.

⁵ Regulation 262AP of CAR.

4 Application for an experimental certificate

4.1 Who may apply?

- 4.1.1 A registered operator, or the owner of an aircraft that is registered with a sport aviation body, is usually the applicant.
- 4.1.2 Only relevant manufacturers or aircraft modifiers may apply for the issue of an experimental certificate for the purposes of market surveys, sales demonstrations and/or customer's crew training.

4.2 Where to apply?

- 4.2.1 An application for an experimental certificate can be made to a person who is authorised by CASA for the purpose of regulation 21.195A of CASR to process and issue experimental certificates.
- 4.2.2 An application for an experimental certificate can also be made at any CASA office, but preferably at the office in the region where the aircraft will be operated.
- 4.2.3 A list of CASA regional offices and contact details is available on CASA's website www.casa.gov.au.

4.3 The application form

- 4.3.1 Application is made on CASA Form 718, available from CASA's website.

4.4 Multiple purpose certificates

- 4.4.1 An experimental certificate may be issued for more than one purpose mentioned in paragraph 3.1.1. If more than one purpose is requested, CASA or the authorised person will ensure that adequately controlled conditions are specified in the certificate's 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, but not to exceed one year.
- 4.4.2 '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.
- 4.4.3 When an exhibition or air racing aircraft has successfully completed its flight testing, the registered operator 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. This

paragraph does not infer that unlimited expiry is granted automatically, each case must be evaluated to ensure the request is warranted.

- 4.4.4 'Crew training' and 'market survey' purposes may be applied for and specified on multiple purpose experimental certificates. These certificates are issued only for the length of time reasonable to accomplish the applicant's program, and their validity date cannot exceed more than one year.

4.5 Lodgement of data

- 4.5.1 An applicant for an experimental certificate must provide a completed CASA Form 718 along with the following information:

- a statement, setting forth the purpose for which the aircraft is to be used
- enough data (such as photographs and three-view drawings) to identify the aircraft, and describe the external configuration
- any other relevant 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.

- 4.5.2 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:

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 objective is to outline the aircraft configuration and program objectives and not to 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.

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 to establish an approximate time duration for the experimental certificate to be in force.

Area

In addition to the address of the base operation, the applicant must provide in the program letter sufficient details of the areas over which the flights are to be conducted. CASA or the authorised person will establish boundaries of the flight test area and will ensure that hazards to persons on the ground or water are minimised in densely

populated areas or congested airways, and the take-off, departure and landing approach corridors (see Chapter 6 of this AC).

4.6 Payment of fees

4.6.1 Section 97 of the *Civil Aviation Act 1988* allows prescribed fees to be payable to CASA in advance of work to be done. In the case of work carried out by CASA leading to the issue of an experimental certificate, an hourly fee in accordance with the CASA schedule of fees is applicable. The estimate, payment and reconciliation procedure is as follows:

- a. the CASA office that receives the application form prepares an estimate based on experience, work time for the staff involved
- b. the applicant pays the estimated fee
- c. actual time expended is recorded on timesheets as the task is undertaken
- d. a reconciliation is made before the issue of the experimental certificate:
 - i. If the initial CASA fee was overestimated, a refund of the difference will be paid to the applicant.
 - ii. If the initial estimate fee was underestimated, a final additional payment from the applicant will be required prior to the issue of the experimental certificate.

4.6.2 Where an applicant engages an authorised person for the issue of an experimental certificate, any fees involved are a matter between the applicant and the authorised person.

5 Issue of an experimental certificate

- 5.1.1 Before an experimental certificate is issued, 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 officer, or by another entity, for example, an approved maintenance organisation or a licensed aircraft maintenance engineer, as directed by the authorised person or CASA officer.
- 5.1.2 Subsequent to any inspection and after considering all the available facts, the authorised person or CASA officer will decide on the relevant operating conditions, limitations and directions. These conditions and limitations relating to the operation of the aircraft are reflected in the Annex to the certificate (CASA Form 720).
- 5.1.3 A range of conditions, limitations and directions which could be reflected in the Annex to an experimental certificate are further discussed in paragraph 9.

5.2 Duration

- 5.2.1 An experimental certificate remains in force for the specified period, or until it is cancelled, whichever occurs first. However, an experimental certificate issued for the purposes of R&D, showing compliance, crew training or market surveys remain in force for the specified period or for one year after the date it was issued, or until it is cancelled, whichever occurs first. An experimental certificate for an aircraft stops being in force if the aircraft ceases to be registered in Australia.
- 5.2.2 An experimental certificate that is issued to an ex-armed forces aircraft by a CASA delegate for the purpose of air racing or exhibition will have an expiry date that will provide sufficient time for the aircraft to participate in a nominated event and return to home base if required after completion of the exhibition or air racing event.

5.3 Cancellation/Suspension

- 5.3.1 Regulation 21.195B allows CASA or an authorised person to suspend or cancel experimental certificates. Such action may be taken if maintenance on the aircraft is not carried out in accordance with the applicable requirements, 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.
- 5.3.2 A suspension on a certificate is lifted on a date prescribed by CASA or an authorised person. If the certificate has been cancelled, either through action as described above, or after an aircraft ceases to be on the Australian civil aircraft register, then the applicant will have to apply for a new certificate.

5.4 Surrender

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

6 Flight test areas

- 6.1.1 An unproven aircraft is required to be operated in a flight test area. The desired flight test area should be requested by the applicant and it will be approved and specified in the operating limitations, if found acceptable by CASA or an authorised person (in consultation with Airservices Australia, and other persons as necessary and appropriate). 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 an authorised person or CASA.
- 6.1.2 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 other aircraft in the airways or persons on the ground or water. Furthermore, take-off 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.
- 6.1.3 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.
- 6.1.4 In the case of the first flight of an aircraft from an aerodrome 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 aerodrome, the aircraft should be required to operate from an outlying aerodrome 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.
- 6.1.5 In the case of an aircraft located at any aerodrome 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 aerodrome.
- Note:** An acceptable approach/departure corridor may be considered to exist when the corridor provides reasonable opportunities for the pilot to execute an off- aerodrome 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.
- 6.1.6 Except for amateur-built aircraft (see AC 21-04), 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 connection 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.
- 6.1.7 The authorised person or CASA may amend the operating limitations to permit flight outside the assigned flight test area when they are satisfied that the applicant has

conducted sufficient test flights to determine that the aircraft is controllable throughout all its range of speeds and throughout all the manoeuvres to be executed and has no hazardous operating characteristics. A certification to that effect must be made in the aircraft's records.

- 6.1.8 The authorised person or CASA may choose to observe flights, inspect the aircraft or carry out a review of the aircraft's maintenance records for the flight test period if deemed necessary, prior to amending the operating conditions.

6.2 Aerobatics (acrobatics has same meaning)

- 6.2.1 Aerobatic 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.
- 6.2.2 Aerobatic manoeuvres which have been demonstrated in the assigned flight test area should be documented in the aircraft records. Only those aerobatic 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 in the Annex to the certificate.
- 6.2.3 Those aircraft owners/operators wishing to include new aerobatic manoeuvres will need to make a request for a new flight test area and follow the same conditions as noted immediately above.
- 6.2.4 Aircraft which have satisfied the requirements outlined in paragraph 6.1.7 may be operated outside of an assigned flight test area. 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 718 is required to be submitted whenever amended operating limitations are requested, 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.

7 Pilot qualifications

- 7.1.1 To carry out flight testing on an experimental aircraft the pilot must have at least a private pilot licence (PPL) with the appropriate endorsements.
- 7.1.2 A suitably qualified pilot may 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', only if CASA has given the holder permission⁶ to fly the aeroplane in those circumstances.
- 7.1.3 Similar provisions exist for flight testing experimental rotorcraft. The pilot must hold a helicopter or gyroplane licence at the PPL level or higher. When experimental gliders, balloons and unconventional aircraft are involved, CASA will advise the applicant on minimum pilot qualifications as appropriate.
- 7.1.4 Although the regulations do not require 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 lift-off, and the appropriate technical knowledge and experience may be essential to avert a catastrophic event.
- 7.1.5 Further advice in this respect can be obtained from the following sources:
- Flight Test Society of Australia (FTSA), GPO Box 2603, Canberra, ACT, 2601, via the website <<http://www.ftsa.org.au>>
 - or
 - CASA Test Pilot, Airworthiness and Engineering Branch, CASA, GPO Box 2005, Canberra, ACT, 2601, telephone 131 757.
- 7.1.6 Notwithstanding all of the above, CASA or an authorised person 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.
- 7.1.7 All 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), the involvement of a professional test pilot and /or flight test engineer should ensure the results meet the required standards.
- 7.1.8 There are distinct advantages in the involvement of professional flight test personnel at an early stage of an aircraft type certification program. For further information, contact the CASA Test Pilot, using the contact information at paragraph 7.1.5.

⁶ Regulation 61.140 of CASR refers

8 Flight test program

- 8.1.1 The complexity of a flight test program will essentially be a function of the nature of the program, for example:
- a pure R&D program without type certification being involved
 - flight testing of a modification
 - initial testing of an aircraft destined to carry out exhibition flying and/or air racing
 - full type certification of a new aircraft type.
- 8.1.2 The degree of the involvement of CASA or an authorised person in a flight test program will in turn be a function of the complexity of the program, as well as the experience of the entity wishing to undertake the program.
- 8.1.3 Further information on flight test program planning and control, and safety aspects, can be found in AC 21-13 Australian-Designed Aircraft Type Certification.
- 8.1.4 Entities undertaking flight test programs may also derive benefit in consulting the following additional references, as applicable to the class of aircraft involved:
- The Flight Test and Evaluation page on the CASA website
<<https://www.casa.gov.au/airworthiness/standard-page/flight-test-and-evaluation>>
 - Civil Aviation Authority (CAA) publication dated January 1991, Flight Test Guide for Certification of CAO 101.28 Category Aeroplanes
 - CAA report AF-56, Flight Test Guide for Certification of CAO 101.55 Aeroplanes
 - Federal Aviation Authority of the USA (FAA) AC 23-8 Flight Test Guide for Certification of Part 23 Airplanes
 - FAA AC 27-1 Certification of Normal Category Rotorcraft
 - FAA AC 25-7 Flight Test Guide for Certification of Transport Category Airplanes
 - FAA AC 29-2 Certification of Transport Category Rotorcraft.

9 Flight test safety

9.1.1 All flight testing involves some degree of risk. In many cases risk levels will be low and possibly no more than encountered during the normal operations of certificated aircraft. In other instances, significant hazards may be lurking – for example, during the initial flying for a newly designed aircraft or a substantially modified one. Also, some phases of many test programs, like evaluating stall handling, spinning or flutter characteristics, should always be approached with an extra measure of caution. Advice regarding flight test safety can be obtained from the references or by contacting the specialists mentioned at paragraph 7.1.5.

9.1.2 Some basic flight test safety aspects worth considering during any flight test program are as follows:

- Aircrew
 - Flight test aircrew should be trained, current and practised in the type of aircraft or operation under test. Pilot experience and qualifications, in themselves, do not necessarily make for a fully prepared test pilot.
- Work-Up
 - Testing may be preceded by a training and work-up program during which specific flight test techniques and sortie profiles are rehearsed. This is particularly relevant to any testing that involves elevated risk profiles. Planning and risk management processes should be applied to work-up training programs in the same manner as they are applied to the actual testing.
- Test Planning
 - All flight testing should be subject to a thorough planning process. Plan to test ‘from inside-out’ – from the centre of the envelope to the edges, from low risk areas to those of higher risk. Have an idea where the limits will be and approach them with caution. Then ‘plan the flight, fly the plan’ – only planned test points should be addressed during any sortie. Contingency test points may be carried into a sortie however ad-hoc testing should not occur.
- Hazard Analysis and Risk Management
 - The applicants are strongly urged to conduct a detailed Hazard Analysis / Risk Management exercise as part of the test planning and the ongoing flight-testing processes. Risk management is the process by which:
 - o hazards are identified
 - o an assessment is made of the risks involved to the test pilot, other space users and person on the ground or water
 - o mitigating procedures are established to reduce or eliminate the risks; and
 - o a conscious decision is made, at the appropriate level of authority, to accept residual risk.

Guidance for formal risk management procedures can be gleaned from AS/NZS 4360:2004 Risk Management or by contacting the CASA Test Pilot.
- Test Conduct
 - There are many general safety issues for consideration during conduct of the actual test program. Some are as follows:
 - Crew Resource Management

- o Crew Resource Management (CRM) principles, as expanded into the flight testing arena by the FAA and other authorities, are well worth practising;
- Knock-it-Off (KIO)
 - o KIO criteria are worth defining especially for any testing entailing elevated risk levels. Any team member should have the authority to make a KIO call; and
- Crew Duty / Fatigue / Perceived Pressure
 - o Team members should be aware of the propensity for personal fatigue to create a flight safety hazard. The job needs to be completed but not at the expense of the aircraft. An extra day or two is probably the least costly option.

9.1.3 CASA AC 21-47, Flight Test Safety, provides more detail.

10 Experimental certificate risk assessment - regulatory requirements

- 10.1.1 The operation of experimental aircraft, especially those flown during the test phases of developmental or modification projects, can involve elevated levels of risk. There are no regulations attempting to control the risks involved or indeed stipulating that an operator of such experimental aircraft carry out the formal risk management procedures, as advised at chapter 9 above, with respect to the aircraft itself or the occupants thereof.
- 10.1.2 Paragraph 21.193 (c) of CASR requires that an applicant for an experimental certificate provide CASA or the authorised person with any information reasonably needed to enable the imposition of conditions or limitations necessary in the interests of the safety of other airspace users and persons on the ground or water. This implies that at least a fundamental hazard analysis risk management process considering the safety of other persons must be conducted.
- 10.1.3 Appendix A provides some extra guidance for applicants and for those CASA officers or authorised persons who, in the course of contemplating an application for an experimental certificate, need to assess whether information sufficient to satisfy the requirements of CASR 21.193(c) has been submitted. CASR 21.195A states that CASA or the authorised person must issue the experimental certificate if this information has been provided (and the additional requirements of CASRs 21.191 to 21.193 have been met).

11 Operating conditions and limitations

- 11.1.1 Conditions, limitations and directions for operation of an aircraft on special CofA are entered in the Annex to the certificate. They should be designed to fit the specific purpose(s) and situations that apply to the aircraft. The operating conditions, limitations and directions that may be prescribed, in accordance with the applicability chart at Appendix B, are listed at Appendix C. The authorised person or CASA may impose any additional conditions, limitations or directions as deemed necessary in the interests of safety of other airspace users, and persons on the ground or water. The risk assessment called for in chapter 10 should be considered when imposing conditions or limitations. The authorised person or CASA officer should review each operating condition, limitation or direction imposed, with the applicant, to ensure that they are fully understood.

12 Associated matters

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

12.2 Noise certification

- 12.2.1 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 CofA 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 CofA.

Application for noise assessment for individual aircraft can be made to Airservices Australia by following the link:

<http://www.airservicesaustralia.com/services/assessment-of-environmental-regulations-for-aircraft/>

- 12.2.2 Some aircraft being issued with experimental certificates pursuant to Subpart 21.191 of CASR may already have individual valid noise certification issued. If this is not the case, then application for noise certification must be made to the address above.
- 12.2.3 In the event that a long-term noise certification cannot be granted, then the Environment Monitoring Branch of Airservices Australia 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.
- 12.2.4 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.

12.3 Maintenance release

- 12.3.1 Before issuing an experimental certificate, an authorised person will expect to see that a maintenance release inspection has been recorded and certified as completed in the aircraft log book and that the aircraft has been determined to be fit for flight.
- 12.3.2 Once the authorised person has issued the experimental certificate, the maintenance release may then be issued and the aircraft may be flown.

12.4 CASA liability

12.4.1 Experimental certificate holders should note 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.’

12.4.2 A reference to CASA in the above regulation includes a reference to a person who is a delegate of CASA. This, however, does not include reference to an authorised person.

Appendix A

Experimental certificate risk assessment

A.1 General flight test hazard analysis/risk management references

A.1.1 CASA officers, authorised persons or applicants for experimental certificates requiring advice regarding flight test safety and hazard analysis/risk management procedures, additional to that provided, can refer to the following:

- CASA Test Pilot or CASA Flight Test Engineer
- CASA AC 21-47, Flight Test Safety
- General CASA risk assessment advice⁷
- Federal Aviation Administration (FAA) Order 4040.26B, available through the FAA website <<http://www.faa.gov>>
- National Aeronautics and Space Administration (NASA) Flight Test Safety Database
- National Test Pilot School website <<http://www.ntps.com>>

A.1.2 Basic risk management information is provided in AS/NZS 4630:2004, while a good reference for general flying risk management is the FAAs 'Risk Management Handbook'.

A.2 Risk assessment

A.2.1 Applicants for experimental certificates, especially those under CASR 21.191(a) – research and development, and CASR 21.191(b) – showing compliance with regulations, are advised to use the references listed above to assist in developing focussed hazard analysis / risk management plans. Those plans can also be used as a basis for providing CASA or the authorised person with the information reasonably needed to enable the imposition of conditions or limitations necessary in the interests of the safety of other airspace users and persons on the ground or water (CASR 21.193(c)).

A.2.2 Tables 1 and 2 below are also available for use, and are preferred, when presenting risk assessment information to CASA in relation to applications for experimental certificates. The risk factor matrix and worksheet provided at Table 1 offers a list of organisational, testing and safety elements, with associated evaluation information, that should normally be considered with respect to a flight test program. Aggregation of the individual Table 1 assessments gives an idea of the overall program risk level which can then be used in conjunction with Table 2, the risk assessment summation, by CASA or the authorised person in deciding what operating conditions and limitations should be applied to the experimental certificate in accordance with Appendices B and C of this AC. Additional considerations when using Tables 1 and 2 are as follows:

- The tables are intended as a general guide only and to assist in the application of judgement and common-sense. The listed risk factors may or may not be relevant to the specific flight test program under consideration. If one or more of the listed factors is not applicable mark N/A in the appropriate box of the Table 1 Assessment column. Alternatively, if there are considerations not covered by the listed factors, additional information should be appended onto the table.

⁷ The CASA website provides broader aviation risk management advice and applications that can be adapted to specific flight test programs (e.g. the Risk Assessment Template at Form 1589).

- Table 1 offers a broad aggregate of general risk factors and does not necessarily provide for an accurate assessment in individual cases. For example, if an established and professional engineering organisation, with good flight test capabilities and conservative safety practices in place, was proposing to fly a radically new powerplant concept, the risk level would probably be elevated even though the Table 1 Assessment column indicated a low risk level. On the other hand, an amateur builder or inexperienced organisation, acting in good faith, heeding all available advice and operating well away from populated areas, should not be unduly penalised if the Table 1 Assessment column indicates a medium or high risk level.

A.2.3 It is important to understand that, regardless of whether the completed Table 1 indicates the flight test program involves low, medium or high levels of risk, as long as the assessment has been conducted conscientiously and the information presented to CASA or an authorised person is valid, an experimental certificate must be issued. Therefore, while the completion of Table 1 can and should be used in trying to mitigate identified risks as much as possible, it is more important that the information provided gives an accurate assessment of the levels of residual risk involved in the flight testing program. Declarations that risk levels are artificially 'low' are of no use or benefit.

A.2.4 While Tables 1 and 2 have been developed around flight test programs related generally to CASR 21.191(a) and (b) they may also be adapted to address the other purposes under CASR 21.191 for which experimental certificates can be issued.

Table 1 – Risk Factor Worksheet

FACTOR	RATING				
	LOW	MEDIUM	ELEVATED or HIGH	Mitigating or Amplifying Comments (If Required)	Assessment
Applicant	Established aeronautical engineering organisation employing experienced design office and flight test staff involved in modifications requiring flight test within the last 12 months.	Established engineering and/or aviation organisation but with limited flight test experience/recency Flight analyst capability but only every few years.	Organisation or individual with no flight test experience or no involvement for many years.		
Program	Conventional modification or developmental program. Predictable outcomes are expected.	Developmental program with some unconventional challenges. Particular unusual or untried features may affect outcomes.	Development of completely new or substantially modified aircraft or major subsystem. Novel or untested experimental features or concepts may be involved.		
	No commercial or external imperatives. Delays acceptable.	Some commercial or external imperatives. Delays create pressure.	Significant commercial or external imperatives. Delays create substantial pressure.		
	Testing involves simple performance and handling assessment, usually comparative.	Testing involves manoeuvres and operations at the limit of the normal flight envelope, e.g. stalls, flight up to Vne, etc. or developing new flight manual normal	Testing involves manoeuvres and operations outside the flight envelope, e.g. flight above Vne, spinning, flight outside weight and c.g. limits, etc., or involving emergency		

FACTOR	RATING				Assessment
	LOW	MEDIUM	ELEVATED or HIGH	Mitigating or Amplifying Comments (If Required)	
		procedures.	operations, e.g. OEI, engine out glide, inflight restart.		
Aircraft	Certificated type involving minor modifications or modifications not expected to affect flight performance or handling.	Certificated type involving major systems modifications or modifications expected to affect flight performance or handling.	Non-certificated developmental or experimental aircraft.		
	Normal (or transport) category aircraft of conventional configuration.	Normal (or transport) category aircraft with some 'non-conventional' configuration features (e.g. tailwheel, float or ski landing gear; unmatched powerplant, etc).	Acrobatic (or limited) category aircraft with novel or 'non-conventional' configuration features.		
Flight Crew	Test Pilot and Flight Test Engineer.- qualified and experienced.	Some crew qualified and experienced in flight testing, e.g. pilot with solid general experience under the direction of a qualified Flight Test Engineer.	No crew experienced in flight test operations.		
	Pilot/s current and experienced on type.	Pilot/s current and experienced on similar types.	Pilot/s not current or experienced on type or similar types.		
	Flight crew practised at specific test techniques	Flight crew practised at general test techniques	Flight crew unpractised at test techniques and		

FACTOR	RATING				Assessment
	LOW	MEDIUM	ELEVATED or HIGH	Mitigating or Amplifying Comments (If Required)	
	and sortie profiles.	but not at specific sortie profiles.	unexposed to sortie profiles.		
Safety Equipment	Relevant, complete and tested suite of safety equipment provided (e.g. anti-spin chute or recovery and escape features, personal protective equipment for test crewmembers).	Incomplete suite of relevant safety equipment provided or some items untested.	No relevant safety equipment provided.		
Airfield / Airspace / Altitude	Certified, Registered, or equivalent, airfield with appropriate runways, facilities and operating environment.	Airfield with appropriate runways but with limited facilities or obstructed operating environment.	Remote or poorly maintained airfield/ALA with inappropriate operating environment.		
	Minimal or no air-traffic problems. Few or no other airspace users.	Some air-traffic problems or other airspace users.	Significant air-traffic problems or busy airspace environment.		
	No built-up or significantly populated areas near airfield or under designated flight test area.	Some built-up or populated areas near airfield or under designated flight test area.	Substantially built-up or populated areas near airfield or under intended flight test area.		
	Clear approach and departure lanes between airfield and flight test area.	Limited approach and departure lanes or approach and departure lanes require complicated navigational procedures to negotiate.	No clear approach and departure lanes between airfield and flight test area.		

FACTOR	RATING				Assessment
	LOW	MEDIUM	ELEVATED or HIGH	Mitigating or Amplifying Comments (If Required)	
	Requires flight testing at high altitude only. Normal category aeroplane /Rotorcraft >5,000ft AGL Transport category aeroplane >10,000ft AGL	Requires flight testing at medium altitudes. Normal category aeroplane /Rotorcraft 2,000-5,000ft AGL Transport category aeroplane 5,000-10,000ft AGL	Requires some or all flight testing at low altitude. Normal category aeroplane /Rotorcraft <2,000ft AGL Transport category aeroplane <5,000ft AGL		
Ground Support	Flight test support facilities (e.g. telemetry) and flight following in place.	Some flight test support or flight following available.	No flight test support or flight following available.		
	Emergency, crash recovery, firefighting and medical services available and on stand-by.	Some or limited emergency, crash recovery, firefighting and medical services available.	No emergency, crash recovery, firefighting and medical services available.		
Any Other Aspects					
				OVERALL ASSESSMENT	

Table 2 – Risk Assessment

Low Risk	Overall risk level, to both the aircraft and flight test crews themselves, and to people on the ground or water and other airspace users, is low and / or manageable.	<ol style="list-style-type: none"> 1. The Applicant can be advised to go ahead with the flight testing using extant planning and risk management procedures. 2. Experimental Certificate can be issued with standard or minimal operating conditions, limitations and directions as per AC 21.10.
Medium Risk	Overall risk level, to both the aircraft and flight test crews themselves, and to people on the ground or water and other airspace users, is elevated and / or deserving of further mitigation.	<ol style="list-style-type: none"> 1. The Applicant should be advised to consider further risk reduction procedures before going ahead with the flight testing. 2. Experimental Certificate can be issued however restrictive operating conditions, limitations and directions as per AC 21.10 should be imposed in the interests of the safety of people on the ground or water and other airspace users.
High Risk	Overall risk level, to either the aircraft or flight test crews themselves, OR to people on the ground or water and other airspace users, is high and / or difficult to manage.	<ol style="list-style-type: none"> 1. The Applicant should be advised that the flight testing is assessed as involving a high level of risk to both the aircraft and flight test crews themselves, and / or to people on the ground or water and other airspace users. He or she should be strongly urged to consider further risk reduction procedures or to reconsider the intent or scope of the proposed flight test operation. 2. Experimental Certificate should still be issued however stringent operating conditions, limitations and directions must be imposed in order to ensure the safety of people on the ground or water and other airspace users. Only if the safety of other parties cannot be guaranteed by the imposition of operating limitations will the Experimental Certificate not be issued.

Appendix B

Applicability chart for experimental aircraft – operating limitations

EXPERIMENTAL CERTIFICATES

	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 and Development	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
Crew training	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
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 of prototype aircraft	X					X	X	X	X	X	X			X	X	X	X	X	X	X	X		X	X
Light sport aircraft	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 and 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 of prototype aircraft	X	X	X													X	X			X	X	X
Light sport aircraft	X	X	X														X			X	X	

Notes:

1. Numbers in this chart refer to the operating conditions, limitations and directions listed at Appendix B.
2. 'Crew training' refers to applicant's crew training.
3. 'Market surveys' refers also to sales demonstrations and customer's crew training.
4. 'Private operations' refers to private use of a prototype used for previous experimental purposes such as R&D and showing compliance.
5. Amateur-built and kit-built limitations are covered in AC 21-4 Amateur-built experimental aircraft - certification.

Appendix C

Operating conditions and limitations

The following operating conditions, limitations and directions may be prescribed in accordance with the applicability chart at Appendix A:

(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 CARs, 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 CASA or an authorised person 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. CASA or the authorised person may permit take-offs and landings to be conducted over the built-up areas of cities or towns as described in paragraph 12.

(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.

(4) This aircraft is prohibited from being flown over a populous area unless a written authorisation has been granted by a person who is authorised by CASA for the purpose of subregulation 262AP(5)

(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.

(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 a maintenance program approved by CASA or an authorised person. This maintenance program shall be recorded in the aircraft’s 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 Visual Flight Rules (VFR), day only.
- (9) Night VFR operation is authorised.
- (10) Unless a written authorisation to the contrary has been granted by a person authorised by CASA for the purpose of subregulation 262AP(6) this aircraft is to be operated under VFR and by day only.
- (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.
- (13) Persons may be carried in accordance with the approved procedures:
.....
- (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 officer 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.
- (18) This aircraft shall not be operated for glider towing, banner towing, parachute jumping or aerial spraying operations, unless approved by CASA or an authorised person.
- (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 CASRs/CARs, 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 CASA or an authorised person 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 Instrument Flight Rules (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 Chicago Convention on International Civil Aviation. Flights outside Australian Administered Airspace, defined as the Australian Flight Information Region (FIR), will require the approval of the respective NAA. The approval 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. Flights within the Australian FIR will not require additional approvals.

(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 aerodrome*) until the safety certification has been made. The operator will use the following described corridor to transition to that aerodrome

..... (*enter description of the corridor*). After the safety certification has been made, the aircraft may return to

..... (*enter home base aerodrome 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 CASA or an authorised person.

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 CASA or an authorised person for approval, which 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 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 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 CARs.

(46) Maximum number of occupants (including crew) is six (6).

Note: For private operations purpose.