GOVERNMENT OF INDIA
OFFICE OF THE DIRECTOR GENERAL OF CIVIL AVIATION
TECHNICAL CENTRE, OPPOSITE SAFDRJUNG AIRPORT,
NEW DELHI

CIVIL AVIATION REQUIREMENTS
SECTION 6 – Design Standards & Type Certification
SERIES 'A', PART III
Date of Issue: XX-XX-2017

Effective: Forthwith

Subject: Acceptance procedure for design and development of amateur built aircraft.

1. Introduction:

1.1 Rule 49I of the Aircraft Rules, 1937 states that notwithstanding anything contained in rules 49A to 49G, the Director General may accept the design of an aircraft after evaluation against minimum standards laid down under these rules and on being satisfied that it is in a condition for safe operation.

1.2 This CAR is issued under Rule 133A of the Aircraft Rules, 1937, and explains the acceptance procedure for design and development of amateur built aircraft.

2. Basic requirements and process involved:

2.1 As far as 'minimum standards' as mentioned in paragraph 1.1 of this CAR is concerned, in the context of 'amateur built aircraft' the minimum standards will be a consensus standard in consultation between the applicant and DGCA on case-to-case basis depending on the complexities of the aircraft.

2.2 The major portion of the aircraft has to be built by the applicant to be qualified to be considered as 'amateur built aircraft'. The maximum permitted all-up-weight (AUW) for an amateur built aircraft is 1500 kg.

2.3 As regards to the minimum standards mentioned in paragraph 1.1 and 2.1 of this CAR, once the consensus is reached between applicant and DGCA, the standards will be signed by the authorized signatories of both the parties, and this will form the basis of consideration of 'design acceptance' by DGCA.

2.4 After compliance to the minimum standards are demonstrated by the applicant to the DGCA by analysis, ground tests, etc., flight tests would be necessary for assessment of performance/ compliance to certain standards. In this regard, upon submission of requisite documentation as deemed necessary by DGCA, a 'special flight permit' will be issued.

2.5 In order to ascertain capability for safe flight for such aircraft by DGCA, substantial evaluation from design, fabrication and operational perspectives of the aircraft is required to be demonstrated by the applicant.

3. Definition:

Amateur built aircraft: Amateur built aircraft means an aircraft with all up weight not exceeding 1500 kg, the major portion of which has been fabricated and assembled by person or persons who undertook the construction project solely for their own hobby, education or recreation.

4. Applicability:

4.1 The provision of this CAR shall apply to a new design of aircraft intended for conducting test flight.

4.2 Other activity such as flight crew familiarisation/ training, participation in demonstration flight, etc. shall be subject to the prior approval from DGCA upon submission by applicant specific to the flight operating conditions with appropriate plan to mitigate associated safety hazards.

4.3 As regards to license/ authorization of pilot to fly the amateur built aircraft, the same would be issued by Directorate of Training & Licensing (DTL) of DGCA as per the requirements laid down in the applicable CAR.

4.4 The Aircraft Engineering Directorate (AED) of DGCA shall be responsible for (a) consultation with applicant to form 'minimum standards', (b) granting of special flight permit for 'test flight purpose only', and (c) on being satisfied with the safety assessment of the aircraft and satisfactory compliance demonstration to the agreed minimum standards, to grant 'design acceptance'.

4.5 Upon receipt of 'design acceptance', the applicant may approach Directorate of Airworthiness (DAW) of DGCA for consideration of grant of 'special C of A' as per the applicable CAR.

5. Design acceptance requirements:

Prior to application

5.1 Applicant desiring/intending to develop a new aircraft design should contact Director, Aircraft Engineering Directorate to discuss the type of aircraft, its complexity, systems and materials, place of construction/assembly before starting major developmental activities on a mutually agreed place, date and time.

5.2 During the meeting, applicant is required to make a detailed presentation to DGCA in respect of its design, system fabrication & testing aspects of aircraft including competent manpower & adequate facilities. The applicant is expected to explain and indicate all such activities, tentative project timeline to accomplish the different phases of project, utilisation of resources such as design & test facilities, design & assembly staff, flight crew, aircraft maintenance/inspection, storage, etc.

5.3 During the meeting concerned Directorates of DGCA will be associated to examine the proposal from their statutory functional perspective such as issue of special certificate of airworthiness, aircraft registration, authorization of flight crew, maintenance & inspection personnel, logbook requirements, draft maintenance manual & operating handbook, etc. and provide input to applicant in order to identify and define the special conditions specific to the new design concept to mitigate operational safety hazards.

5.4 Based on the details provided by the applicant and his agreement for compliance to special conditions and other operational aspects in stipulated time frame with DGCA, the applicant will be advised for submission of application.

Application

5.5 The application should be sent to the Director General of Civil Aviation, Opposite Safdarjung Airport, Aurbindo Marg, New Delhi-110003. Kind Attn: Director (Aircraft Engineering).

5.6 Application should be made following the preliminary discussions in the Form CA-21A (Refer Annex-I). The form should be submitted along with substantiation analysis documents as specified at flight conditions for permit to fly, project plan, expected timeline to accomplish the major activities.

5.7 Applicant should also submit system safety assessment report which includes hazards, severity, and probability of failure and mitigation actions.

5.8 During design and/or construction, applicant may seek expert advice of persons with aviation design or engineering experience, other builders, mechanics with aircraft, airframe, and powerplant experience, and other persons with relevant expertise to advise the applicant on the design and/or construction of aircraft.

Design & fabrication

5.9 The sole responsibility of construction of an amateur built aircraft lies with the applicant.

5.10 The applicant should develop a procedure manual comprising of systematic approach for managing safety during design, fabrication, test, assembly, ground, and test flight including the necessary organizational structures, accountabilities, policies and procedures.

5.11 In the process of building an aircraft, engage the expertise having appropriate knowledge and background of applicable system design and development techniques.

5.12 Materials tested for their strength and quality shall only be used in the construction of an amateur built aircraft. Inferior materials, whose identity & traceability cannot be established, should not be used.

5.13 Any choice of engines and propellers with test reports as acceptable to DGCA may be used in the construction of the aircraft. However, it is strongly recommended that engines and propellers approved by a civil aviation authority (CAA) and having a valid Type Certificate and TCDS should be used. In case type certified engine/ propeller are not used, then intensity/ quantum of safety assessment by DGCA will increase substantially and the project timeline also will increase.

5.14 Any choice of components such as tyre, actuator, indicators/display systems, brake, filter, fuel pump, electronic hardware & associated software, etc. as acceptable to DGCA may be used in the construction of the aircraft. However it is strongly recommended that approved components should be used.

5.15 An engine installation should be such that adequate fuel is supplied to the engine in all anticipated flight attitudes. A suitable means consistent with the size and complexity of the aircraft should be provided to reduce fire hazard wherever possible including a firewall between the engine compartment and the fuselage.

5.16 The use of used or salvaged assemblies (for example, landing gear, horizontal stabilizer, and engine mount) from type-certificated aircraft is permitted, as long as they are in a condition for safe operation. However, applicant should contact DGCA prior to using a major assembly or subassembly, such as wings, fuselage, or tail assembly from a type-certificated aircraft. Applicant will not receive credit for work done on, or the use of, salvaged major assemblies or subassemblies when determining whether his amateur-built aircraft has met the major portion requirement. This would include any “rebuilding” or “alteration” activities to return these components to an airworthy condition. Applicants are cautioned against using parts from accident damaged aircraft unless they have been assessed as being airworthy by an expert source and the applicant has obtained the guidance and agreement of DGCA, as appropriate.

5.17 Aircraft should be equipped with mandatory operating equipment to address the safety hazards associated with the design in addition to the mandatory equipment as per aircraft rules.

5.18 Marking and placards should be put at appropriate places on aircraft. The following placard must be displayed in the cabin or the cockpit.

WARNING:
THIS AIRCRAFT IS AMATEUR BUILT AND DOES NOT COMPLY WITH DGCA/ INTERNATIONAL SAFETY REGULATIONS AS APPLICABLE FOR STANDARD AIRCRAFT.

5.19 Design and fabrication including inspection processes must be recorded, and maintained in safe custody. Applicant is free to develop their own designs or build from existing designs. Fabrication including inspection processes must be recorded, and maintained in safe custody. The builders should document the construction using photographs taken at appropriate times prior to covering. The photographs should clearly show methods of construction and quality of workmanship.

5.20 Applicant is strongly recommended to draw parallels from available design/manufacturing/inspection/operational standards available worldwide for components/system/type of aircraft and adopt the same in order to satisfy safety concerns. Alternately, an equivalent means may be proposed.

Operations

5.21 Applicant should get his aircraft registered before conducting test flights. In order to get the registration mark, the applicant may seek information from the nearest regional/sub-regional airworthiness office.

5.22 In order to establish the operating conditions and limitations for such aircraft, the applicant will be required to do/ establish the following:

5.22.1 Conformity to the aircraft's technical data.
5.22.2 Operational equipment necessary for safe operation of the aircraft.
5.22.3 Special qualifications required for the pilot and crewmembers. For flights that involve long distances over which various weather conditions may be encountered, the pilot also must have valid and appropriate instrument-rating.
5.22.4 Aircraft weight limits.
5.22.5 Fuel and fuel distribution limits.
5.22.6 CG limits.
5.22.7 Manoeuvres to which the aircraft is limited.
5.22.8 Limits on use of flight equipment, such as autopilots, etc.
5.22.9 Adverse meteorological conditions to be avoided and the inspections required if inadvertently encountered.
5.22.10 Airspeed limits.
5.22.11 Operation should avoid cities, towns, villages, congested areas, or any other areas where the flights might create hazardous exposure to persons or property.
5.22.12 Runway selections, if considered necessary for safety.

5.22.13 Communications required with airport tower personnel to inform them prior to take-off or landing of the non-standard condition of the aircraft.

5.22.14 The area of operation should have adequate protection from possible runway incursion and safety of aircraft.

5.22.15 Provisional flight manual and maintenance schedules, inspection logbooks must be in place.

Note: It is the obligation of applicant to seek security clearance, ADC clearance, ATC clearance, etc. as applicable. Applicant must seek information from concerned authorities. Applicable information as available with DGCA will be provided to applicant during pre-application meeting.

6. Inspections:

The inspections of the amateur built aircraft will be conducted by DGCA in two stages. The first inspection will be "pre-cover" inspection. There is generally an inspection before external covering is applied or before an area is permanently closed. The second inspection is the inspection which is a generic airworthiness inspection conducted after the aircraft is ready for flight.

7. Flight conditions:

The applicant seeking special flight permit for his amateur built aircraft should submit duly filled Form CA 21B (Refer Annex-II). Information on Flight conditions include as follows:

(a) The configuration(s) for which the special permit to fly is requested;

(b) Any condition or restriction necessary for safe operation of the aircraft, including:

1. The conditions or restrictions put on itineraries or airspace, or both, required for the flight(s);
2. The conditions and restrictions put on the flight crew to fly the aircraft;
3. The restrictions regarding carriage of persons other than flight crew;
4. The operating limitations, specific procedures or technical conditions to be met;
5. The specific flight test programme (if applicable);
6. The specific continuing airworthiness arrangements including maintenance instructions and regime under which they will be performed;

(c) The substantiation that the aircraft is capable of safe flight under the conditions or restrictions of subparagraph (b);

(d) The method used for the control of the aircraft configuration, in order to remain within the established conditions.

8. Issuance of Special Flight Permit:

8.1 Based on satisfactory inspection and assessment, special flight permit will be issued to carry out amateur built test flights specifying the operating conditions and limitations.

8.2 Violation of conditions attached to special flight permit may lead to its revocation, suspension or modification.

8.3 The validity of Special Flight Permit will be subject to compliance with the operating limitations.

9. Grant of design acceptance:

Upon satisfactory compliance demonstration by the applicant against the agreed minimum standards, and on satisfactory completion of entire spectrum of test flight, the 'design acceptance' would be granted. For processing the case, the checklist (Refer Annex-III) needs to be adequately filled and followed.

10. Cancellation/ revoking the design acceptance:

The letter indicating the design acceptance shall have certain conditions specified, adherence to which would be absolutely necessary for the applicant/ design acceptance holder. Violation of the said conditions will lead to cancellation or revoking the 'design acceptance'.

(B.S. Bhullar)
Director General of Civil Aviation

ANNEX-I
Form CA-21A

Application	
1. Applicant:	*[Name of applicant]*
2. Aircraft nationality and identification marks:	
3. Aircraft owner:	
4. Aircraft manufacturer/type	5. Serial number
6. Purpose of flight *[Use terminology of Para 3 and add any additional information for accurate description of the purpose, e.g. place, itinerary, duration…]* *[For an application due to a change of purpose, reference to initial request and description of new purpose]*	
7. Expected target date(s) for the flight(s) and duration	
8. Aircraft configuration as relevant for the permit to fly 8.1 The above aircraft for which a permit to fly is requested is defined in *[add reference to the document(s) identifying the configuration of the aircraft.* 8.2 The aircraft is in the following situation related to its maintenance schedule: *[Describe status]*	
9. Approval of flight conditions *[if not available at the time of application, indicate reference of request for approval]* *[Reference to: DGCA approval]*	
10. Date	11. Name and signature *[Authorised signatory]*

ANNEX-II
Form CA-21B

FLIGHT CONDITIONS FOR SPECIAL FLIGHT PERMIT – APPROVAL FORM	
1. Applicant *[Name of organisation providing the flight conditions and associated substantiations]*	2. Approval form number. Issue: *[number and issue, for traceability purpose]*
3. Aircraft manufacturer/type	4. Serial number(s)
5. Purpose [Purpose in accordance with Para 3]	
6. Aircraft configuration The above aircraft for which a permit to fly is requested is defined in *[add reference to the document(s) identifying the configuration of the aircraft]* *[For change(s) affecting the initial approval form: description of change(s). This form must be re-issued]*	
7. Substantiations *[References to the document(s) justifying that the aircraft (as described in 5.) can perform the intended flight(s) safely under the defined conditions or restrictions.]* *[For change(s) affecting the initial approval form: reference(s) to additional substantiation(s). This form must be re-issued]*	
8. Conditions/Restrictions The above aircraft must be used with the following conditions or restrictions: *[Details of these conditions/restrictions, or reference to relevant document, including specific maintenance instructions and conditions to perform these instructions)*	
9. Statement The flight conditions have been established and justified in accordance with Para 6. The aircraft as defined in block 6 above has no features and characteristics making it unsafe for the intended operation under the identified conditions and restrictions.	
10. Date of issue	11. Name and signature *[Authorised signatory]*

ANNEX-III

CHECKLIST FOR DESIGN ACCEPTANCE OF AMATEUR BUILT AIRCRAFT

Sl. No.	Checklist Item	Remarks
1.	Name of Amateur Built Aircraft	
2.	Name of the Applicant	
3.	Type of aircraft (Fixed-wing / Rotary wing)	
4.	Name, Type and numbers of Engine / Propeller along with their certification status (if applicable).	
5.	Maximum All-Up-Weight (AUW) of the Aircraft (The maximum permitted AUW is 1500 kg).	
6.	Check whether the project is undertaken for sport, educational or recreational purposes.	
7.	Has the applicant submitted the application for design acceptance in Form CA-21A? Check substantiation analysis documents for permit to fly, project plan, three-view sketch, drawings, photograph and expected timeline for major activities.	
8.	Whether the aircraft is a new design and intended for conducting test flight.	
9.	Whether minimum standards, depending on the complexity of the aircraft, have been derived in consultation with the DGCA and mutually signed.	
10.	Check if the applicant has submitted the comprehensive compliance matrix of the minimum standards.	
11.	Whether all the analysis, ground test, flight test reports etc. for assessment of compliance to minimum standards have been submitted.	
12.	Any special conditions have been identified for the new design concept.	
13.	Did the applicant perform majority of fabrication and assembly operations. Is evidence available to support this?	
14.	Evidence that the aircraft was fabricated and assembled by an individual or group of	

	individuals with the applicant being a party to that and that the aircraft is not intended for commercial use or personal gain.	
15.	Was special flight permit for 'test flight purpose' granted to the applicant to prove operating characteristics or design features? Has any report of violation to the specified flight conditions been reported?	
16.	Has the applicant submitted the system safety assessment report?	
17.	Check whether the applicant has developed a procedure manual encompassing the design, development, maintenance and associated organizational policies and procedures.	
18.	Whether the following two inspections of the amateur built aircraft was conducted and report of the outcome of the inspections: a) "Pre-cover" inspection b) Generic airworthiness inspection after the aircraft is ready for flight.	
19.	Has the applicant submitted substantiation documents for design, fabrication and operational perspectives of the aircraft?	
20.	Check, if the Materials used in fabrication are tested for their strength and quality and are acceptable for construction of an amateur built aircraft.	
21.	Whether all certificates, release notes (and descriptive receipts if appropriate) for all the materials, components, bought in parts, and sub contract activities used in the construction of aircraft have been submitted.	
22.	Whether fabrication including inspection processes (i.e. complete documentary history and photographic record of the construction of the aircraft) are recorded and maintained in safe custody.	
23.	Whether all applicable placards, listings, and markings are installed as per civil requirements.	

24.	Has acceptable workmanship, methods, materials, techniques and practices, and issuing operating limitations necessary to protect persons and property not involved in operating the aircraft been evaluated.	
25.	Has applicant weighed the aircraft to determine: a. Forward most CG loading b. Aft most CG loading c. Center of gravity limits d. Location of datum e. Is ballast used, amount and location?	
26.	Have all required documents and records (flight manual, weight and CG limits, equipment list, maintenance records, etc.) been approved, as applicable, and provided to DGCA?	
27.	If applicant intends to use radio equipment for the purpose of communicating, then check whether the aircraft has a valid Aircraft Radio/ Aero Mobile License.	
28.	Examined all the above Certification documents/ information.	
29.	Signature of the officer scrutinizing the case.	
30.	Name and designation of the officer scrutinizing the case.	
31.	Signature of the officer reviewing the case.	
32.	Name and designation of the officer reviewing the case.	
33.	When found satisfactory, prepare a detailed note recommending for the acceptance and submit to the competent authority through reviewing officer(s).	
34.	When approved, put up 'letter of design acceptance', and get the same signed by the competent authority.	