(c) *Amateur-Built Aircraft*: Amateur-built aircraft will be eligible for an Experimental Airworthiness Certificate when the applicant presents satisfactory evidence that the aircraft was designed and/or fabricated by an individual or groups of individuals, the project having been undertaken for educational or recreation purposes and the CAA finds that the aircraft complies with the amateur-built aircraft requirements set forth in section 1.74-3.

CAR 1.74 Experimental Certificates; Requirements for Issuance

The requirements for issuance of experimental certificates are as stated in paragraphs (a) and (b) of this section.

(a) In applying for an experimental certificate the applicant shall submit:

(1) A statement upon a form and in a manner prescribed by the Administrator setting forth the purpose for which the aircraft is to be used.

(2) Sufficient data, such as photographs, to identify the aircraft, and,

(3) Upon inspection of the aircraft, any pertinent information found necessary by the Administrator to safeguard the general public.

(b) The Administrator shall prescribe appropriate operating restrictions for the use of experimental aircraft. Such restrictions shall include the prohibition of carrying persons or property for compensation or hire.

CAM 1.74-3 Certification of Amateur-Built Aircraft

(CAA policies which apply to section 1.74)

The following policies will apply to the certification and operation of aircraft of amateur design and construction designed and built by educational institutions and individuals without complying with all the requirements of "standard" aircraft:

(a) *Scope:* While amateur-built aircraft are issued "experimental" airworthiness certificates, the airworthiness requirements for this type of aircraft are of greater scope than those for other types of "experimental" aircraft. The reason is that after the aircraft has completed the flights specified in paragraph (g) and paragraph (h) of this section, the aircraft operation limitations, upon application, may be modified to permit the carriage of non-revenue passengers. In addition, the area restrictions normally prescribed for "experimental" aircraft may be modified to authorize extended flights.

(d) *Examination and Inspection:* As part of the certification procedure the aircraft will be subjected to examination and general inspection for airworthiness by an authorized CAA representative. Compliance with specific design requirements contained in paragraph (b) of this section as well as good areronautical practice will be determined by means of this inspection and examination. Any apparent unairworthy feature, workmanship or device disclosed by the inspection will be repaired, reworked, or otherwise be changed to be acceptable to the CAA prior to certification of an amateur-built aircraft.

(h) *Flight Test Demonstration:* Application should be made in writing to the local CAA Aviation Safety District Office. An aviation safety agent will re-examine the aircraft and the flight experience record and upon finding them satisfactory will witness the flight test demonstration. The flight test will be conducted by a certificated pilot holding at least a private pilot's rating. The flight tests will be of such scope as to demonstrate that the aircraft performance is adequate for such operations with respect to take-off, climb, and landing at maximum and minimum weights, for which the aircrat is to be certificated. The aircraft will be demonstrated to be satisfactorily controllable and reasonably maneuverable during taxiing, take-off, climb, level flight, dive and landing, with or without power. Adequate provisions should be made for emergency egress and use of parachutes by the crew during the flight test.

TECHNICAL AEROMODELING

by HENRY R. JEX

That there is far more than just sporting value in aeromodelling is the central idea of this article.

In the helter-skelter rush to build and fly contest models, our youth are usually missing that great sense of accomplishment which accompanies understanding of what they are doing, and our aircraft industries are being starved of vitally needed enthusiasts to create and handle new airplanes. Not that competition should be discouraged; it supplies drive towards completing a task. Rather there should also be fostered those fundamental attitudes and concepts which give purpose to aeromodelling. The main difficulty in the United States seems to be a general apathy of those engaged in any sport towards study and research in that field on their own. Gambling is one exception!

Let me enlarge on the need for enthusiastic and fundamental thinkers from the ranks of aeromodellers. Whether it be theoretical work in aerodynamics, creative engineering of a new design, piloting of a modern aircraft, or the operating of a system of such complex devices, there arise daily unexpected problems which we never worried about until this "transonic era." These are not problems of the "classical" type encountered before 1940, but are entirely new. The classical aeronautics of the 'thirties and 'forties progressed well enough so that definite answers were found for most every situation. As proof, look at the similarity of post-war transport aircraft and late wartime bomber designs. But just look at the fantastic designs coming off the boards today! Some of these are bound for trouble because previous rules of design were blindly used or some new effect was ignored.

In the past there has been an argument that the problems of very low speed aerodynamics (that is of model aircraft) were too remote from full scale aeronautics to be a valuable training ground. Today this is not so, as the accompanying comparative table shows. (See Table I). Though the reasons for their occurence may be fundamentally different in the transonic and low speed regimes, the phenomena are remarkably similar! (A brief discussion of the terms used in Table I follows in a later article.)

Now no one is proposing that amateur investigation of the aerodynamics and performance of model airplanes will revolutionize our high speed aircraft. But it should be apparent that a person familiar with low speed peculiarities can readily grasp the corresponding ones in the transonic regime. Furthermore, the cost of experimental equipment suitable for low speed aerodynamics is a minute fraction of even the simplest transonic wind tunnel.

Here, then, is a perfect situation for the introduction to interested young people of the art and science of aeronautical engineering. It is almost directly analogous to the more glamorous transonic regime, yet the phenomena are easily observed and inexpensively exploited. Direct application of the results of experiments in low speed aerodynamics and on the performance of model aircraft to the investigator's own contest model airplanes provides that vital practical outlet which youth seek. If only our schools and recreational leaders would recognize the opportunity they are missing for both fun and value from this relatively unexplored realm of nature!

Our European cousins, as usual in such things, are far beyond us in utilizing model aeronautics as an introduction to physics, in general, and to flying and engineering as careers.

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