

## 'I WANT TO BUILD MY OWN AIRCRAFT'

### PART 12, GETTING READY FOR THE FINAL INSPECTION

*"Just a few more details to work out and then it's complete and ready to fly!"*

These few more details can and do work themselves into a longer time-frame to complete than anticipated, but they are important to prepare a safe aircraft. Let's look at some of these items and how to go about getting them done.

#### **Fuel-Flow Check and Report:**

To ensure a proper quality and quantity of fuel-flow available to your carburetor and engine, you will want to do a fuel-flow check, and in doing so, you should consider the various flight conditions that you will encounter. The first would be with the aircraft in a climbing attitude. Another might be with the aircraft in a steep descent or glide. In addition, you will want to determine the amount of any useable fuel in each tank.

Without going into the details, please see EAA Experimenter, May 2003 issue, for a simple procedure. (Or contact the writer at [CGYRV@yahoo.com](mailto:CGYRV@yahoo.com) for a copy.)

#### **Weight and Balance Report:**

A second, mandatory test before you aircraft is completed is the weight and balance report. Since each amateur-built aircraft is unique, each requires its own weight and balance report and you cannot simply download a representative report to cover your aircraft.

In addition, you will want to determine the 'Centre of Gravity' (C of G) range for your specific aircraft. If you're building project has not deviated appreciably from the kit supplier's prototype, the C of G range of this prototype will probably be right for your aircraft as well. If you have changed the design, or if your empty weight deviates appreciably, you will want to determine exact C of G limits for

your aircraft. In this case you will want to start with conservative values and expand your C of G envelope through the flight-test program. (More on this later when we examine 'Flight-Testing your own Aircraft').

Again, without going into the details of this 'weight and balance' exercise, please contact the writer for copy of this procedure, at [CGYRV@yahoo.com](mailto:CGYRV@yahoo.com). There are other reference programs available, and one excellent visual reference is a CD on 'Weight and Balance' produced by UPAC at [www.upac.ca](http://www.upac.ca).

#### **Final Inspection Request:**

Sometime before you are expecting to have your aircraft completely ready for its final inspection, you will want to contact MD-RA at [www.md-ra.com](http://www.md-ra.com) for this inspection. Of course it's going to cost you some money and when the MD-RA office has received an appropriate portion of your children's inheritance, you will be sent a package of paperwork including the required registration form, a checklist of what the inspector will be looking for, certification documents, and the name of your appointed inspector. This will give you an excellent review of what you need to do to meet the requirements to get your flight authority.

Some of the items that you will need to address are:

**Snag Sheet:** You will have had at least one previous inspection (pre-cover) and you may have had some items snagged by the inspector. You are required to remedy these defects and to record this on the reverse side of the snag sheet, together with the date of the remedial action and the signature of the person doing so.

**Registration:** If not already done so, you need to register your aircraft with Transport Canada. You can request a personal call sign, or simply accept

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one issued by TC. But your inspector will require this to be in place before beginning the inspection.

**Fire Extinguisher:** You will need to have an approved Fire Extinguisher on board your aircraft, mounted in a **steel** frame, and in a location that can be reached from each seat with the seat belts tightly fastened. Ensure that the fire extinguisher meets the requirements for aircraft. Note, there are no Halon 1211 handheld replacement agents/systems approved for installation/use on Canadian-registered aircraft. ( For more information contact the Technical Projects Department, Regulatory Standards, Aircraft Certification, Transport Canada.)

**Records:** Your inspector will want to see the records that you have kept during the construction of your aircraft. These would include the construction manual and the logged entries of the date and time spent on doing the specific tasks. It would involve the photographs taken during the construction phases. It would include any EAA 'Technical Counselor' visits and their reports. And it would likely

*maintained.*

2. *These records should clearly document the builder's oversight of any professional assistance and identity of the person/s providing the assistance.*
3. *All communications with regards to the project will be between the builder and the Minister or his delegate.*
4. *Any materials may be used in the construction of an amateur-built aircraft, provided . . . and documented in the project records".*

Your records will include your Fuel-flow Test results and the un-useable fuel quantity for each fuel tank.

Your records will show any structural changes that you have made to your aircraft kit, together with any engineering design calculations to qualify these changes and any effects they may have on the structural loadings to the kit manufacturer's design parameters, or his weight and balance and C of G limits.

***Final Inspection Snags: Should your inspector determine any un-safe issues, he will snag them on the inspection sheet, and they will need to be rectified before a flight permit is issued.***

include the information on any 'Builder Assist' as adopted at the Toronto TC meeting that adds and amends para. 15 of Section 549 of the Airworthiness Manual, adding the following definition:

- *"personally oversee" means overall control of all aspects of the project, including knowledgeable participation in all required inspections.*
- And amending para 15 to read:

*Information Notes:*

1. *In order to demonstrate personal over-sight, the builder is expected to establish record/s that include decision making and a description on how overall control of the project was*

*Note: . . . it is not necessary to obtain the kit manufacturer's approval for design changes or changes to the gross weight of the aircraft. Paragraphs 18 and 19 of CAR 549 Part III – Design Standards clearly state that the **builder is responsible** for evaluating the design and any changes he/she makes to that design to ensure that they are safe, adequate, and in conformity with the standards. It is also stated that the inspections done do not constitute evaluation or acceptance of the design. . . . the requirements to submit details of modifications in Box 4 of the Application for C of A, . . . simply make the inspector aware of changes, not to have him evaluate them.*

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**Final Inspection Snags:** Should your inspector determine any un-safe issues, he will snag them on the inspection sheet, and they will need to be rectified before a flight permit is issued. Besides the check list items supplied by MD-RA, here are some of the items that have held up a flight permit:

- Fireproof firewall, sealed to the cabin
- Gascolator and fuel drains at the lowest point of the fuel system
- Electrical wire bundles not adequately bundled, and fastened to prevent chafing
- Inadequate control cable size for control loads
- Shoulder harness and seatbelts suitable for aircraft operations
- General workmanship and attention to aircraft construction detail, especially fasteners and fittings
- Closed components that have not been inspected prior to closure

**Final Inspection:** With your aircraft at the airport at which your flight-test is planned and having checked off all the items that apply to your project you must remove all access covers and open all inspection areas for your final inspection. The inspec-

tor will spend an appropriate time to satisfy himself that all the requirements have been met. He may then ask you to re-assemble the aircraft, get into it, buckle up, and demonstrate that all the controls can be operated while the seat belts are restraining the operator. He may ask you to start the engine and bring it up to temperature to make sure all gauges and controls are functioning properly. A short taxi demonstration will show satisfactory operation of the brakes. After shutdown and allowing the engine to



cool off, the cowling can be removed and a final inspection of the engine made to check for any system leaks.

The inspector needs to be satisfied that the builder has met the build-standards of the rules and regulations. He signs off the temporary flight authority, and as such is the final link between the builder and his safe aircraft. The joint objective is to finalize the process of a safe and enjoyable amateur-built aircraft.

Jack Dueck, EAAHAC