From the Tech' Desk

'I WANT TO BUILD MY OWN AIRCRAFT'

PART 13, ONGOING AIRWORTHINESS

"My last 'to do' list is completed. All outstanding snags have been looked after. What have I missed? Is there anything left to do?

Mandatory Journey Log Book Entries:

Your final inspection (see our last column), will include three entries in your Journey Log book. They include the date of entry, the entry, and the signature of the builder. In our Log Book they read:

April 23/04 I hereby certify that the magnetic compass was calibrated Jean Dueck

April 23/04 I certify that all applicable requirements mandated by the Airworthiness Manual Chapter 549 have been complied with and the aircraft is deemed to be serviceable. Jean Dueck

April 23/04 This aircraft will be maintained in compliance with the Canadian Air Regulations 625 Appendixes B & C. Jean Dueck

Instructions on calibration of the magnetic compass are covered in CAR 571.215, and compass deviation in flight may not exceed 10 degrees. This means that starting with a compass rose (or other means of assuring magnetic headings) the compass is calibrated to within the 10 degree limit in four heading vectors on the ground. These can then later be verified in an actual flight test.

The second entry is self explanatory and means that you are very familiar with Chapter 549 of the Airworthiness Chapter.

The third entry brings us to this months discussion; 'Ongoing Maintenance of your Amateur-built aircraft.

Who can Maintain your Amateur-built Aircraft?

To eliminate any confusion here, let us remember that anyone can maintain all aspects of all aircraft. **However**, only qualified individuals can sign out the maintenance work for any specific aircraft. Depending on the aircraft class and category, Canadian rules and regulations clearly specify who can take the signatory responsibility of all maintenance work and repairs.

With Canadian amateur-built aircraft, the builder is entitled to carry out these maintenance tasks and sign the subsequent release. This is the one great advantage that this category of aircraft offers and currently extends to second owners; individuals who purchase completed amateur-built category aircraft in Canada.

Continuing Airworthiness:

Part VII of our Rules and Regulations (Chapter 549) summarizes these ongoing airworthiness oversight requirements. Let's go through them in some detail and see what is required of owners and operators of Amateur-built aircraft.

'(71) Except where specifically stated to the contrary, amateur-built aircraft are subject to the same operating and maintenance regulations as type certificated aircraft.

In other words, log books and paperwork will look the same for amateur-built as for type certificated aircraft. The only difference will be the signing authority, which for amateur-built aircraft will be the owner, or a licensed aircraft engineer, whereas for type certificated it would be a licensed engineer only.

Information Notes:

> *The details of all maintenance work performed on amateur-built aircraft must be entered in the aircraft's technical record.*

You are required to maintain a technical record of the airframe, the power-plant, and the propeller (if adjustable or constant speed). Electronic logs are acceptable, but I would strongly suggest that you always follow up with

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backup storage and/or hard copy to ensure that records are not lost.

All maintenance activities require a maintenance release.

Your name and signature showing that the work has been 'signed off' must appear on the technical records.

The owner of an amateur-built aircraft may sign the release for the maintenance of his or her aircraft. Elementary work does not require a maintenance release; however, it must be recorded in the aircraft technical record, together with the signature of the person who performed the work.

This would include the elementary type of work that would be performed in normal maintenance, such as an oil change, checking and topping up brake fluid reservoirs, tire replacement, etc.

The maintenance schedule requirements detailed in STD 625 Appendix B are approved by the Minister for use with amateur-built aircraft, at intervals not exceeding 12 months. STD 625 specifies that Appendix B must be supplemented by the applicable requirements of STD 625 Appendix C, for out out-of-phase tasks and equipment maintenance requirements.

Google onto 'Canadian Aviation Regulations. Part VI, STD 625, Appendix B & C', and download a typical maintenance checklist that you can use for your aircraft's annual inspection. Note that an annual inspection is required every twelve months. This means that if the date of the previous annual inspection and sign-off is June 3, 2006, the next inspection and sign off can be no later than June 3, 2007. There is confusion between this annual maintenance inspection and sign-off, and a '50' or a '100 hour' maintenance inspection. The first can take the place of the second, but the **'50'** or the **'100 hour'** maintenance inspection does not replace the **'annual'.**

All entries in respect of the technical records for the airframe, engine, and propeller for an amateur-built aircraft may be kept in the journey log, provided the requirements with respect to the technical records are met.

'Getting to the Oil Filter' for the '50 hour' Oil Change On Bravo Juliet Juliet'

It is a good idea to summarize the maintenance work done in the journey log, referencing the technical log or records where the full detailed descriptions would be recorded.

A weight and balance report is required for each aircraft configuration.

For instance, if you own an aircraft with wheels, skis, and floats, you will need a separate weight and balance report for each.

Amateur-built aircraft are not required to comply with airworthiness directives (AD's); however, operators are strongly encouraged

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to review applicable airworthiness directives to determine if they wish to comply voluntarily, in order to enhance the safety of the aircraft.

Although not necessary, it would be foolish not to observe any AD's that could compromise the safety and performance of your aircraft. In the event of an incident resulting in litigation, your due diligence to safety issues, recorded in the appropriate log records, will be a strong tool mitigating in your favour.

Repairs and modifications to amateur-built aircraft must conform to technical data acceptable to the Minister; sources of acceptable data include, but are not limited to:
drawings and methods recommended by the manufacturer of the aircraft kit, component, or appliance;
Transport Canada documents;
FAA Advisory Circular 43.13-1 and -2, UK CAA Civil Aircraft Inspection Procedures (CAIP), JAA Advisory Circulars, (ACJ) and publications issued by recognized authorities on the subject matter concerned.

Your best source of information as well as supporting data is AC 43-13. Always reference any repair or maintenance work to a specific Section, and paragraph.

Owners may devise their own data, which need not be approved, but must be subject to an appropriate level of review or analysis, or be shown to comply with recognized industry standards, or commonly accepted practice.

This is where you would show your own analysis or calculations to support the decisions and applications that deviate from your kit manufacturer's design.

Changes that affect the structural strength, performance, power plant operation, or flight characteristics of an amateur-built aircraft must be reported to the Minister before further flight of the aircraft; such changes may require re-evaluation to confirm that the aircraft continues to comply with acceptable standards.

Although this may seem subjective, you are advised to ere on the safe or conservative side. This would include changing an engine, a propeller, modifying a structural component, (perhaps to accommodate a new flight instrument), etc. You may well be required to repeat your initial 25 hours of flight before a new permanent Special C of A is issued, but that is a lot better than trying to explain why you didn't consider needing a new weight and balance report, etc. when you replaced that Rotax with a Chevy block.

The Minister is the final authority for determining the acceptability of data.

In our next column, we'll take a closer look at maintenance schedules, time intervals, and documenting requirements.

Jack Dueck, EAAHAC

VIP: Very Important Party
It's time to have some fun with our members and their families.
Come out on Jan 4 and help us plan a good one!!