



# Staff Instruction

**Subject:** **Airworthiness Evaluation of the Installation of IFR Equipment to Allow the Removal of the “VFR Only” Operating Condition from the Special Certificate of Airworthiness – Amateur-Built**

Issuing Office:	Standards	Document No.:	SI 500-024
File Classification No.:	Z 5000-32	Issue No.:	01
RDIMS No.:	8684950-V4	Effective Date:	2013-09-26

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## **1.0 INTRODUCTION**

### **1.1 Purpose**

- (1) The purpose of this document is to establish the procedure to be used to conduct an airworthiness evaluation of the IFR equipment to allow the removal of the "VFR Only" operating condition from the Special Certificate of Airworthiness – Amateur-built.

### **1.2 Applicability**

- (1) This document applies to all Transport Canada Civil Aviation (TCCA) civil aviation safety inspectors – airworthiness (CASI-A). This information is also available to the aviation industry for information purposes.

### **1.3 Description of Changes**

- (1) Not applicable.

## **2.0 REFERENCES AND REQUIREMENTS**

### **2.1 Reference Documents**

- (1) It is intended that the following reference materials be used in conjunction with this document:
  - (a) Part V, Subpart 7 of the *Canadian Aviation Regulations (CARs) — Flight Authority and Certificate of Noise Compliance*;
  - (b) Part V, Subpart 71 of the *Canadian Aviation Regulations (CARs) — Aircraft Maintenance Requirements*;
  - (c) Part VI, Subpart 2 of the *Canadian Aviation Regulations (CARs) — Operating and Flight Rules*;
  - (d) Part VI, Subpart 5 of the *Canadian Aviation Regulations (CARs) — Aircraft Requirements*;
  - (e) Standard 507 of the CARs — *Flight Authority and Certificate of Noise Compliance*;
  - (f) Chapter 551 of the CARs — *Aircraft Equipment and Installation*;
  - (g) Standard 571 of the CARs — *Maintenance*;
  - (h) Standard 625 of the CARs — *Aircraft Equipment and Maintenance Standard*;
  - (i) *Exemption from Section 549.01 of the Canadian Aviation Regulations and Chapter 549 of the Airworthiness Manual – Airworthiness Standards - Amateur-Built Aircraft*, dated 2 April 2009;
  - (j) Staff Instruction (SI) MSI 14 — *Flight Authority, Revision 1*, 2004-08-26;
  - (k) Transport Canada form number 24-0074 — *Special Certificate of Airworthiness*; and
  - (l) Transport Canada form number 24-0090 — *Operating Conditions*.

### **2.2 Cancelled Documents**

- (1) As of the effective date of this document, the following document is cancelled:

- (a) Airworthiness Notice - B032, Edition 2 - 18 April 1996 – Procedure for the Removal of 'Visual Flight Rules Only' Limitation from the Special Certificate of Airworthiness (Amateur-Built Aircraft).
- (2) By default, it is understood that the publication of a new issue of a document automatically renders any earlier issues of the same document null and void.

### 2.3 Definitions and Abbreviations

- (1) The following **definitions** are used in this document:
  - (a) **Non-traditional equipment:** includes electronic display equipment.
  - (b) **Traditional equipment:** includes vacuum and electromechanical equipment.
  - (c) **TSO:** includes CAN-TSOs and FAA TSOs.
- (2) The following **abbreviations** are used in this document:
  - (a) **AME:** Aircraft Maintenance Engineer
  - (b) **CAR:** Canadian Aviation Regulations
  - (c) **CASI-A:** Civil Aviation Safety Inspector – Airworthiness
  - (d) **IFR:** Instrument Flight Rules
  - (e) **IMC:** Instrument Meteorological Conditions
  - (f) **STD:** Standard
  - (g) **TSO:** Technical Standards Order
  - (h) **VFR:** Visual Flight Rules

## 3.0 BACKGROUND

### 3.1 Operating Conditions

- (1) CAR 507.09 states that where an aircraft does not meet the requirements for the issue of a flight authority that conforms to Article 31 of the Convention, the Minister shall make the flight authority subject to operating conditions where the conditions are required to ensure the safety of the aircraft, other aircraft, persons, animals or property.
- (2) Standardised operating conditions have been developed for amateur-built aircraft to be entered on the Operating Conditions sheet (form 24-0090) that is part of the Special Certificate of Airworthiness – Amateur-built as initial operating conditions and subsequently, as modified operating conditions.
- (3) Standardised operating conditions can be found in Appendix D of STD 507.

### 3.2 Initial Operating Conditions

- (1) The initial operating conditions entered on a Special Certificate of Airworthiness – Amateur-built include, amongst others, such conditions as a specific base and area of operation, and the prohibition against the carriage of passengers, flight over built-up areas, and aerobatic flight. The operation of the aircraft is further restricted to day VFR only operations.

### **3.3 Standardised Modified Operating Conditions**

- (1) Once the aircraft has accumulated a specified number of flight hours, the owner can apply for standardised modified operating conditions to be entered on the Operating Limitations sheet. These standardised modified operating conditions are as follows: VFR only and aerobatic flight prohibited (except for aerobatic flight authorised types and models).
- (2) The owner can apply, at the time of application for standardised modified operating conditions or at any subsequent time, for the removal of the VFR only condition.

### **4.0 GUIDING PRINCIPLES IN RESPECT OF THE AIRWORTHINESS EVALUATION**

- (1) An application for the removal of the "VFR Only" operating condition of a Special Certificate of Airworthiness – Amateur-built shall be evaluated on the basis of the following principles:
  - (a) The evaluation is first and foremost an evaluation of the data, i.e., the documentation that supports the installation, testing and calibration of the IFR equipment;
  - (b) This procedure applies both to traditional and non-traditional IFR equipment installations;
  - (c) The aircraft has to be equipped in accordance with CAR 605.18;
  - (d) The IFR equipment does not need to be certified in accordance with TSO standards, and hence does not require authorised release certificates;
  - (e) Any measuring device or test equipment used during the IFR equipment installation must meet the specifications of the manufacturer of the measuring device or test equipment with respect to accuracy;
  - (f) The IFR equipment installation does not need to be approved by Transport Canada National Aircraft Certification;
  - (g) The IFR equipment installation must conform to technical data acceptable to the Minister; sources of acceptable data include, but are not limited to:
    - (i) the equipment manufacturer's installation, testing and calibration instructions, drawings and recommended methods;
    - (ii) Transport Canada advisory documents;
    - (iii) 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;
    - (iv) owner devised 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;
  - (h) The installation, testing and calibration of the IFR equipment can be performed by the aircraft owner or other person authorised by the owner. However, if it is determined that the complexity of the installation, testing and/or calibration, which includes the operation of the test equipment required for the completion of the work, is beyond their capability, an AME and/or AMO should be consulted and/or utilized; and
  - (i) The aircraft owner or an AME can sign the maintenance release in respect of the installation, testing and calibration of the IFR equipment.

## 5.0 APPLICATION

- (1) The following items must be submitted at the time of application to support the removal of the "VFR Only" operating condition:
  - (a) A letter requesting the removal of the "VFR Only" operating condition;
  - (b) Copy of the front page of the applicable logbook that identifies the aircraft by its registration marks and make, model and serial number;
  - (c) The list of the IFR equipment installed;
  - (d) Documentation demonstrating that the data that was used to perform the installation of the required IFR equipment, including such data as installation and wiring diagrams, power distribution and equipment interface, as required, conforms to the relevant data acceptable to the Minister;
  - (e) Documentation demonstrating that the source of electrical energy for all electrical and radio equipment is adequate;
  - (f) Copy of the up-to-date weight and balance report and equipment list;
  - (g) A copy of the pertinent pages of the maintenance records and associated maintenance release(s) related to the IFR equipment that has been installed, tested and calibrated but not yet evaluated; and
  - (h) The applicable fee.

## 6.0 EVALUATION

### 6.1 Instrument Flight Rules

- (1) The CASI-A is to review the list of IFR equipment installed against the requirements of CAR 605.18 to ensure that all required equipment for IFR operation has been installed.

**Information Note:** transponder and automatic pressure-altitude reporting equipment is required by CAR 605.35 for flight in transponder airspace, not solely for flight under instrument flight rules; transponder and automatic pressure-altitude reporting equipment must be certified in accordance with the applicable TSO standards specified in Chapter 551 of the *Airworthiness Manual*.

### 6.2 Evaluation

- (1) The purpose of the evaluation is to determine that the IFR equipment installation was performed in accordance with acceptable data and the applicable regulatory requirements.
- (2) During the course of the evaluation, the CASI-A will determine that:
  - (a) The aircraft has been operated the minimum number of flight hours specified in paragraph 4.1 of Appendix D of STD 507 in order to be eligible for the standardised modified operating conditions to be entered on the Operating Limitations sheet;
  - (b) The equipment required by CAR 605.18 has been installed;
  - (c) The data to perform the modification is acceptable to the Minister;
  - (d) The test equipment used in the installation of the IFR equipment was calibrated in accordance with the test equipment manufacturer's recommendations and the requirements of CAR 571.02;

- (e) The installation includes an adequate source of electrical energy for all of the electrical and radio equipment, taking into consideration such items as the aircraft main battery capacity, back-up batteries in the case of non-traditional equipment, aircraft electrical power system loading emergency buses, load meters;
- (f) The weight and balance report and equipment list have been updated; and
- (g) The maintenance release(s) have been signed in accordance with the requirements of CAR 571.10 and entered in the technical records, quoting the relevant data used to perform the modification.

## **7.0 CONCLUSION**

- (1) Once the CASI-A has conducted the evaluation of the application and documentation provided in section 5.0 by the owner and has determined that the documentation indicates that the IFR equipment required by CAR 605.18 has been properly installed, tested and calibrated as per the relevant data acceptable to the Minister and the requirements of STD 571, that the weight & balance report and aircraft equipment list have been amended if necessary, and that all necessary maintenance releases have been completed, the Special Certificate of Airworthiness – Amateur-built and its Operating Conditions sheet can be amended to remove the VFR Only operating condition.
- (2) Where the evaluation demonstrates that the requirements with respect to IFR equipment, its installation, testing and calibration, weight and balance, equipment list and maintenance releases have been met, there is no requirement or obligation on the part of the CASI-A to conduct a physical inspection of the IFR equipment installation prior to the removal of the "VFR Only" operating condition.

## **8.0 ISSUANCE OF SPECIAL CERTIFICATE OF AIRWORTHINESS – AMATEUR-BUILT**

- (1) The CASI-A will ensure that the following is accomplished:
  - (a) Prepare the amended Special C of A – Amateur Built in accordance with MSI 14;
  - (b) Prepare the amended Operating Conditions in accordance with MSI 14;
  - (c) Prepare a cover letter;
  - (d) Mail the original documents to the aircraft owner, or arrange for pick-up; and
  - (e) Assemble all the documents for filing purposes.

## **9.0 INFORMATION MANAGEMENT**

- (1) The CASI-A will ensure that the following is accomplished:
  - (a) Scan all the documentation received from the client;
  - (b) Save the scanned documents into the 5008 aircraft file in RDIMS;
  - (c) Create a new record and applicable routing(s) in ccmMercury; and
  - (d) Collect the applicable fee.

**10.0 DOCUMENT HISTORY**

(1) Not applicable.

**11.0 CONTACT OFFICE**

For more information, please contact:

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Suggestions for amendment to this document are invited, and should be submitted via:

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*Transport Canada documents or intranet pages mentioned in this document are available upon request through the Contact Office.*

## APPENDIX A — IFR EQUIPMENT

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### Information Note:

CAR 605.18– **Power-driven Aircraft - IFR** prescribes the equipment that is required to conduct flight in accordance with instruments flight rules.

CAR 605.18 refers to equipment required by CAR 605.16 – **Power-driven Aircraft - Night VFR**, CAR 605.15 – **Power-driven Aircraft - VFR OTT** and CAR 605.14 – **Power-driven Aircraft - Day VFR**.

The aircraft and engine equipment prescribed by CAR 605.14 may not be all installed; configuration of the aircraft will dictate which piece of equipment has to be installed.

The following table lists the essential IFR equipment and its regulatory reference required to conduct flight in accordance with instruments flight rules.

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- 605.14 - sensitive altimeter adjustable for barometric pressure
  - 605.14 - airspeed indicator
  - 605.14 - magnetic (whisky) compass or a magnetic direction indicator
  - 605.14 - radiocommunication system [minimum = one piece of equipment]
  - 605.14 - radio navigation equipment [minimum = two pieces of equipment]
  
  - 605.15 - gyroscopic direction indicator or a stabilized magnetic direction indicator
  - 605.15 - attitude indicator
  - 605.15 - turn and slip indicator or turn coordinator;
  - 605.15 - heated pitot tube
  
  - 605.16 - adequate source of electrical energy
  - 605.16 - spare fuses
  - 605.16 - means of illumination for all of the instruments used to operate the aircraft;
  - 605.16 - landing light
  - 605.16 - position and anti-collision lights
  
  - 605.18 - vertical speed indicator
  - 605.18 - an outside air temperature gauge
  - 605.18 - power failure warning device or vacuum indicator
  - 605.18 - alternative source of static pressure
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- 605.14 - tachometer for each engine
  - 605.14 - oil pressure indicator for each engine employing an oil pressure system;
  - 605.14 - coolant temperature indicator for each liquid-cooled engine;
  - 605.14 - oil temperature indicator for each air-cooled engine having a separate oil system;
  - 605.14 - manifold pressure gauge for each reciprocating engine equipped with a variable-pitch propeller,
  - 605.14 - fuel quantity indicator for each main fuel tank
  - 605.14 - retractable landing gear position indicator