

# IS YOUR GPS/FMS LEGAL FOR IFR?

BY DARYL MACINTOSH



Three main requirements must be met before you can use your global positioning system (GPS) during instrument flight rules (IFR) operations.

Never assume that the capable-looking global positioning system (GPS) or flight management system (FMS) installed in your panel can be legally utilized for IFR flight operations.

There are three main requirements which must be met in order for GPS to be used for IFR operations:

- 1) The equipment must be designed and certified to meet minimum IFR operational capabilities.
- 2) The installation must be Transport Canada-approved for IFR operations.
- 3) The aircraft operator must be authorized for the type of flight operations undertaken.

## EQUIPMENT AND INSTALLATION

*VFR GPS Equipment:* A number of older panel-mounted GPS models are type-approved for permanent installation in aircraft, but are limited to VFR operations because they were not manufactured with any IFR capabilities. This type of equipment is now considered obsolete and is no longer in production by any of the major avionics manufacturers.

*IFR GPS Equipment:* Transport Canada Policy Letter 551-003 states that GPS equipment intended to be used for IFR operations shall meet FAA TSO-C129a, TSO-C145a or TSO-C146a, or later accepted revisions, and that the equipment class (i.e. A1, A2, B, etc.) must be appropriate for the intended use. The

policy letter also includes a list of older TSO-129 GPS equipment models that are eligible for IFR installation.

*Portable GPS Equipment:* This category of equipment is not certified to meet any aviation standards at all. Portable GPS equipment is relatively inexpensive, has loads of cool features and can help greatly with situational awareness, but it can't be considered as a primary reference even for VFR navigation. This equipment generally can't be permanently installed in a certified aircraft due to its lack of qualifications. A GPS receiver in this category is typically mounted in some sort of quick release bracket, because it is legally considered to be a portable device carried on board by the pilot.

*IFR GPS Equipment - VFR Installation:* There are a significant number of aircraft equipped with GPS receivers that were designed for IFR operations, but the installations were not certified for IFR use. These aircraft are required to have a placard near the GPS stating "GPS LIMITED TO VFR OPERATIONS ONLY." We regularly encounter aircraft that are missing the limitations placard and the pilot/owner is unaware that the system is not approved for IFR operations.

*IFR GPS Equipment - IFR Installation:* In order to legally conduct IFR GPS flight operations, an aircraft must be equipped with an approved GPS receiver and appropriate peripheral equipment, and the installation must be approved by

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Transport Canada for IFR use. A basic IFR installation requires connection of GPS data to the pilot's HSI or to a dedicated NAV indicator. Fully integrated IFR GPS installations may also include remote annunciators and connections to autopilot, air data, fuel flow and compass heading, as applicable.

*How to determine if an installation is IFR approved:* The easiest way for a pilot to determine if the GPS system is approved for IFR flight operations is to review the airplane flight manual supplement (AFMS) or rotorcraft flight manual supplement (RFMS). This required document, which must be Transport Canada-approved or FAA-approved (TC accepted), provides specific details of the installed system's operational capabilities and limitations.

If you don't have an AFMS/RFMS which specifically applies to the system as installed in your aircraft, it is not approved for IFR operations. If an installed GPS system was previously approved for IFR operations but the AFMS/RFMS has since been lost, a replacement copy must be obtained from the STC holder or aircraft manufacturer as applicable.

## OTHER REQUIRED AVIONICS

In addition to an approved IFR GPS, aircraft also require some conventional avionics equipment to meet minimum IFR requirements. The regulation states that an aircraft to be used for IFR flight shall be equipped with sufficient radio navigation equipment to permit the pilot – in the event of a failure at any stage of the flight, of any item of that equipment, including any associated flight instrument display –

- I. To proceed to the destination aerodrome or proceed to another aerodrome that is suitable for landing; and
- II. Where the aircraft is operated in IMC, to complete an instrument approach and, if necessary, conduct a missed approach procedure.

If the subject aircraft is equipped with at least a VOR/ILS system, it can meet this minimum requirement, provided it is flying between airports which also have published VOR and/or ILS approaches. For IFR operations at smaller aerodromes, the minimum additional installed equipment should also include an ADF and/or DME, or perhaps a second IFR GPS.

## OPERATIONAL APPROVAL REQUIREMENTS

### *Private (Non-Business) Aircraft:*

Private operators of small, non-turbojet aircraft may utilize an approved GPS system for IFR operations in accordance with the applicable AFMS/RFMS, without any requirement to obtain additional operational approvals. Aircraft operators in this category can fly approaches as published in the Canada Air Pilot (CAP), but they cannot fly approaches published in the Restricted Canada Air Pilot (RCAP).

### *Commercial Aircraft and Private Business Aircraft:*

Holders of air operator certificates issued under CARs, Part VII, "Commercial Air Services," or private operator certificates issued under CARs, Part VI, Subpart 4, "Private Operator Passenger Transportation," are required to be authorized by an operations specification to conduct GPS-

based (including WAAS) instrument approach operations in instrument meteorological conditions (IMC).

The following are some of the common "operation specifications" which are based on GPS:

- Operations Specification 099: RESTRICTED INSTRUMENT PROCEDURES (RIP)
- Operations Specification 100: IFR INSTRUMENT APPROACHES - GLOBAL POSITIONING SYSTEM (GPS)
- Operations Specification 611: REQUIRED NAVIGATION PERFORMANCE 10 (RNP-10) AIRSPACE
- Operations Specification 612: TERMINAL & EN ROUTE AREA NAVIGATION OPERATIONS (RNAV 1 & 2)
- Operations Specification 613: EN ROUTE AREA NAVIGATION OPERATIONS (RNAV 5)
- Operations Specification 614: REQUIRED NAVIGATION PERFORMANCE 4 (RNP 4) AIRSPACE
- In order to obtain approval for any of the operation specifications listed above, the air operator is required to:
  - Demonstrate that each aircraft is properly equipped with the required systems.
  - Establish procedures in its company operations manual for the guidance of its personnel and any other procedures that are necessary for safe operation. These procedures shall include at least a system description and any limitations; the operational aspects, including normal, abnormal and emergency operations; and any effects or dependencies on other aircraft systems.
  - Provide initial and recurrent training to operations personnel and to each aircrew member to ensure they are proficient in flight planning, normal and contingency procedures.

## FINAL WORD

The regulations pertaining to IFR GPS operations are not overly onerous and they seem to be based mostly on common sense. It is important that pilots are familiar with the content of each GPS system's applicable flight manual supplement, as it defines the system's only approved (and safe) operational capabilities as installed in a particular aircraft. System training is essential; pilots should not even consider attempting IFR operations using a GPS or FMS system with which they are unfamiliar. Modern GPS systems are highly capable, but they will still follow every command given to them, even if that command is wrong. 

*Daryl MacIntosh is founder and president of Maxcraft Avionics. Located at the Pitt Meadows Airport, about 35 kilometres east of Vancouver, Maxcraft is one of the largest full-service avionics shops in Canada, and provides professional avionics services to operators of all types of private and commercial aircraft, including piston, turboprops, jets and helicopters. He can be reached at [daryl@maxcraft.ca](mailto:daryl@maxcraft.ca).*

