

Regulations Governing Unmanned Air Vehicles

By Robin Poot, O.L.S., O.L.I.P.

At the spring conference for the American Society for Photogrammetry and Remote Sensing (ASPRS) the concept of Unmanned Air Vehicles (UAVs) was a popular topic.

I observed one special session by the National Oceanographic and Atmospheric Administration's (NOAAs) UAV Program. The scope of UAV applications at NOAA was breathtaking; from a 200 dollar glider that was lifted to 100,000 feet by a balloon to study a column of air and land exactly where it was launched, to a multi-million dollar Global Hawk that can cruise at 50,000 feet for 24 hours, to which NOAA has integrated over 100 different sensors for various missions. It is staggering to imagine all the applications.

Technical matters aside, what was also discussed was that the regulatory environment in the United States (US) does not permit private civilian use. At that time only one single-use permit to conduct a project was issued to a private commercial operator. Interestingly, as they were operating beyond visual line of sight to a ground observer, they used a manned chase aircraft in order to keep the UAV within visual-line-of-sight.

To back up a minute, in 2007 there were companies in the US operating UAVs under the premise that they were model aircraft, which are governed by different regulations than UAVs. In a 2007 circular, the Federal Aviation Administration (FAA) clarified that when such vehicles are used for commercial use, they are classified as UAV and may not be operated without authorization, effectively restricting UAV from commercial use (FAA Docket 2006-25714).

In 2012, President Obama signed the FAA Modernization Act which amongst other things gave instruction for the FAA to integrate UAVs into the National Airspace System (NAS) by 2015. Before 2013, they were supposed to make a ruling on a "broad class of smaller UAVs", however that ruling is now nearing a year past due.

One thing I did hear was that "Canada is great, you can do anything up there," which prompted some reading and discussions.

In Canada the regulations for UAVs are similar to the US in that any commercial use designates the aircraft as a UAV and not a model aircraft. Canada is however more advanced in this process and is more permissive in that they do allow permitted flights of UAVs.

UAVs in Canada are regulated by the Aeronautics Act and the Canadian Aviation Regulations (CARs).

Being two rather hefty documents that cover all aircraft operations, Transport Canada wrote a 62 page circular advisory called Staff Instruction (SI) 623-001. The advisory gives

guidance to Transport Canada staff on what to look for and what conditions may be applied to a permit, called Special Flight Operation Certificates (SFOCs) as defined by CARs 602.41, which are required for all UAV flights in Canada.



Figure 1: Clip of a Visual Navigation Chart (VNC) used by manned aircraft to navigate the 3D airspace and includes hazards such as glider operations and towers.

SFOCs are operation certificates issued by Transport Canada and are generally issued for each site and occurrence of an operation. The user is to provide details about the equipment, site, risk mitigation plan and other pertinent details.

The instructions touch on items like organizational requirements of a commercial operation, staff training, liability insurance requirements, staff role requirements (manager, supervisor, pilot, observer, and other potential roles that may be required to safely carry out an operation), and operational factors.

Items that limit the scope of operations include the *permission to access* adjoining properties, the need for *continuous and unaided visual line of sight*, restriction of flight to 30 metres lateral distance from *people not involved in the operation, inhabited houses, livestock, and manned vehicles* (i.e. travelled roadway).

A major reason for the visual line of sight rule is that the pilot in a normal aircraft is required to watch for and avoid ground obstacles and other aircraft. Unlike manned aircraft, for UAVs that responsibility goes to the Observer.

As the flight operations for manned aircraft has a floor of 500 feet above ground level in rural areas (except things such as aerodromes and crop spraying operations), Transport Canada has taken the approach that keeping UAV operations to a ceiling of 400 feet reduces risk to other aircraft.

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Figure 2: Clip of same area as Figure 1 showing areas of potential UAV deployment challenges due to road restrictions.

The flight restrictions for ground objects include *all portions of flight* including takeoff, landing, flight to project, and flight during the project including *turning manoeuvres*. During a project, for example, if a fixed-wing UAV were to have a turning circle of, say, 300 metres, then one could not generally design flight-lines ending within 330 metres of such ground objects (under zero wind conditions, as wind changes flight dynamics relative to the ground).

Visual line of sight is the other major limitation, being in place to ensure safety with air and ground objects. Given an

observable distance of, say, 500 metres for a small UAV, this would mean that one could not generally design flight-lines ending further than 200 metres from a central observer (assuming the same 300 metre turning circle). The actual visible line-of-sight, however, has many determining factors and can change depending on the conditions.

As SFOCs are issued on a case-by-case basis, experienced operators may receive greater flexibility in the issuance of an SFOC; however, the basic operating challenges for UAVs remain.

We will see what the FAA proposes for the so-called “broad class of smaller UAVs” and if it impacts or follows the way Transport Canada regulates UAVs. In the meantime, while technologically speaking you could launch a UAV from Mississauga, take a picture of Queen’s Park, and return the vehicle to base, this is not actually possible under the regulations. Potential UAV users need to be aware of the regulatory reality that affects the actual deployment of this interesting technology.



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NEWS FROM 1043

Changes to the Register

MEMBERS DECEASED

Stephen Bernard (Barney) Panting	831	April 18, 2013
Patrick Anthony Monaghan	814	June 9, 2013

RETIREMENTS/RESIGNATIONS

Bernard J. Bezaire	1502	March 1, 2013
John P. Bacon	CR197	March 4, 2013
Gordon W. Garrard	CR89	April 3, 2013
Donald A. Redmond	1342	April 16, 2013
Valerie I. Higgin	CR164	April 29, 2013

COFA’S REVISED

Was: **Halliday Surveying Inc.**

Is: **Tulloch Geomatics Inc.**, Espanola, May 9, 2013

COFA’S ISSUED

Story Geomatics Inc. Haileybury, May 14, 2013

CORRECTION:

In the photos of the 2013 Veterans’ Dinner published on page 25 of the Spring 2013 issue of this magazine, Kirk Stidwill’s name was spelled incorrectly. We apologize for the error.

Surveyors in Transit

Rafal Kaczmarek is now in the Thunder Bay location of **J.D. Barnes Limited**.

Robert D. Halliday is now the managing OLS of **Tulloch**

Geomatics Inc., 449 Second Ave., Espanola, ON, P5E 1L2. Phone: 705-869-5792.

Stantec Geomatics Ltd. has moved to 1331 Clyde Avenue, Suite 400, Ottawa, ON, K2C 3G4.

Vineetha S. Rathnayake is now with **Young & Young Surveying Inc.** in Bolton.

Angela Jeffray is now with the **Ministry of Transportation** in Kingston. Phone: 613-545-4816.

Ryan Seguin is no longer with **exp Geomatics** and is now the managing OLS of **Story Geomatics Inc.** located at 332 Main Street, Haileybury, ON, P0J 1K0. Phone: 705-672-3324.

Ken Ketchum is now with **Collett Surveying Inc.** in Brockville.

Brian A. Coad is now the managing OLS at **Verhaegen Stubberfield Hartley Brewer Bezaire Inc.** in Leamington.

Gabriel Laframboise has transferred to the Whitby office of **J.D. Barnes Limited**.

Raymond Sibthorp is now with **J.D. Barnes Limited** in Milton.

Frank Mauro is no longer with **J.D. Barnes Limited**.

John P. Knowles is no longer with **J.D. Barnes Limited**.

Dan Cormier is no longer with **J.D. Barnes Limited**.

Michael Fisher is now with **J.D. Barnes Limited** in Markham.

Doug Jordens is now the managing OLS at the Dryden office of **exp Geomatics Inc.**