

# ASSESSING the approach

NAV CANADA'S FLIGHT INSPECTION CREWS TRAVEL TO MORE THAN 130 CANADIAN AIRPORTS EVERY YEAR TO CONDUCT A RIGOROUS REVIEW OF THE COUNTRY'S NAVIGATIONAL AIDS.


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BY CAPT ANTHONY MACKAY





Nav Canada operates three flight inspection aircraft consisting of two Bombardier CRJ-200s (shown here) and one Dash 8-100. On any given day, two of them are normally airborne and sometimes all three.  
**Stuart Sanders Photo**

 [Watch the video here!](#)

**F**or most people, the sight of an aircraft descending and making numerous gear-up approaches to a runway is unusual and may suggest that the flight is in distress. But for Nav Canada's flight inspection crew, this is simply a routine operation that ensures the accuracy and safety of the country's navigational aids (nav aids) and instrument approach procedures.

Nav Canada operates three flight inspection aircraft consisting of two Bombardier CRJ-200s and one Dash 8-100. These aircraft are crewed by specially trained pilots, technical flight inspectors (operating the onboard flight calibration instruments), and additional technical flight inspectors working on the ground to adjust the nav aids if issues are found.

The aircraft are equipped with technology to measure, analyze and calibrate the electronic signals emanating from such nav aids as instrument landing systems (ILS), VHF omnidirectional range (VOR) and non-directional beacons (NDBs) at more than 130 airports.

Additionally, the aircraft calibrate surveillance systems such as radar and automatic dependent surveillance – broadcast (ADS-B) and troubleshoot communications issues with VHF/UHF and HF radios. The aircraft also flight check all instrument approach procedures based on global navigation satellite systems (GNSS).

An ILS is a precision approach system that provides navigational guidance signals and information on a cockpit display to guide pilots accurately to the point of landing in periods of reduced visibility. This information is especially necessary in inclement weather with low ceilings, snow, fog or rain, when pilots have poor visibility. The ILS data transmitted to the cockpit provides lateral and vertical guidance.

VORs, while being replaced with GNSS navigation, continue to provide highways in the sky for older aircraft navigating across the country.

Each ILS and VOR in Canada receives two annual inspections to ensure the accuracy and integrity of the signal. If a navigation aid experiences a failure or requires repair, it must be inspected again prior to being returned to service.

A typical ILS test at an airport will take about one to 1.5 hours and consists of the pilots making repeated approaches to a runway at varying combinations of height, speed and direction. No two approaches are the same. Each approach tests the ILS signal in a different way and it is up to the technologist to inform the pilot of what type of approach is required next or any manoeuvre that requires repetition.



Technical flight inspectors operate the onboard flight calibration instruments, while additional inspectors work on the ground to adjust the nav aids if issues are discovered. **Nav Canada Photo**

Your car's GPS may be precise enough to guide you around town, but the flight inspection crew is able to test and calibrate an airport's ILS using precise differential GPS that is accurate to within one centimetre!

The pilots' knowledge of approach procedures and requirements allows them to properly evaluate current procedures and best practices for a particular airport.

On any given day, there are normally two flight inspection aircraft airborne and sometimes all three are operational for eight to 12 hours at a time. Depending on the complexity of the task, each aircraft will complete up to 10 different daily inspections.

The flight inspection aircraft and crew operate out of two bases, Kelowna, B.C., and Ottawa, with a series of tasks strung together into a four-to-six-day mission. A typical day will see the aircraft depart airport X, fly one

to two hours of inspection, land, pick up the ground crew and travel to the next airport, possibly inspecting airways, air routes or en route navigation aids along the way.

The process is repeated until the crew duty day limit, weather, or high traffic volumes end the day. A team of dispatchers at the Ottawa base keeps a close eye on the weather, operational restrictions and ATC requirements to shift the aircraft and crew around the country as required, keeping the operation moving as efficiently as possible.

There is no doubt that the unusual flight patterns of these three planes attract a lot of attention, interest and concern. Radio stations and other news outlets often receive calls from citizens reporting what they think is an aircraft in trouble. That's understandable. If you see a plane making multiple low passes over a runway with its wheels up, one could easily





**ABOVE:**  
A typical ILS test at an airport will take about one to 1.5 hours and consists of the pilots making repeated approaches to a runway at varying combinations of height, speed and direction. **Eric Dumigan Photo**

**RIGHT:**  
Onboard technology measures, analyzes and calibrates the electronic signals emanating from navigational aids. **Nav Canada Photo**

**OPPOSITE:**  
Nav Canada flight inspection pilots Jim Manton, left, and Nick Cobbett. **Nav Canada Photo**

assume that plane can't land because of malfunctioning landing gear.  
Our flight inspection aircraft are popular with plane spotters and self-described "avgeeks" from all over Canada. Social media has been a facilitator of this phenomenon. Seldom does a day go by when a photo or video doesn't appear on Twitter, Instagram, Tumblr, Facebook or myriad other platforms.  
Some of our followers even like to tweet photos of the flight tracks from Flightradar24.

One of our pilots summed up the job well: "The flying is unique, challenging, and requires a lot of teamwork. For me, the best part of the job is the low level operations and being able to put the CRJ into manoeuvres that most pilots never get to do."  
So the next time you see a blue and white plane banking hard, going in circles, swiftly changing altitudes and approaching the runway without landing, don't be alarmed. It's just Nav Canada's flight operations team making sure our nav aids are accurate and safe. ✚

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*Capt MacKay is director of flight operations with Nav Canada. He is a former airline pilot who has been with the air navigation service provider for 11 years.*







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