AIRWORTHINESS DIRECTIVE

This Airworthiness Directive (AD) is issued pursuant to Canadian Aviation Regulation (CAR) 521.427. No person shall conduct a take-off or permit a take-off to be conducted in an aircraft that is in their legal custody and control, unless the requirements of CAR 605.84 pertaining to ADs are met. Standard 625 - Aircraft Equipment and Maintenance Standards Appendix H provides information concerning alternative means of compliance (AMOC) with ADs.

Number:

CF-2024-15

Effective Date:

29 May 2024

ATA:

34

Type Certificate:

See Applicability

Subject:

Navigation – Rotorcraft – Limitations of Operations with Non-Tolerant Radio Altimeter when Operating in Canada due to 5G C-Band Wireless Broadband Interference

Applicability:

This AD applies to all helicopters, certified in any category, equipped with a radio (also known as radar) altimeter. These radio altimeters are installed on various helicopter models including, but not limited to, the helicopters for which the design approval holder is identified below:

1) Airbus Helicopters
2) Airbus Helicopters Deutschland GmbH
3) Air Space Design and Manufacturing, LLC
4) Bell Textron Canada Limited
5) Bell Textron Inc.
6) Brantly International, Inc.
7) Centerpointe Aerospace Inc.
8) Columbia Helicopters, Inc.
9) The Enstrom Helicopter Corporation
10) Erickson Air-Crane Incorporated, DBA Erickson Air-Crane
11) Hélicoptères Guimbal
12) Siam Hiller Holdings, Inc.
13) Kaman Aerospace Corporation
14) Leonardo S.p.a.
15) MD Helicopters Inc.
16) PZL Swidnik S.A.
17) Robinson Helicopter Company
18) Schweizer RSG LLC
19) Scotts-Bell 47 Inc.
20) Sikorsky Aircraft Corporation

Compliance:

As indicated below, unless already accomplished.

Background:

In July 2023, Innovation, Science and Economic Development Canada (ISED), Canada's spectrum regulator, published Standard Radio System Plans (SRSP)-520 Issue 3 and Radio Standard Specifications (RSS)-192 Issue 5. These publications define the spectrum environment for the 5G C-Band in Canada. The spectrum auctions for 5G C-Band in the 3.45 to 3.65 GHz (3.5 GHz) and the 3.65-3.9 GHz (3.8 GHz) band were completed in 2021 and 2023, respectively. Deployment in the 3.8 GHz band may occur as early as May 2024. Furthermore, ISED recently concluded a consultation on non-competitive local licensing (NCL) framework for operation in the frequency bands of 3.9 to 3.98 GHz.

The frequency bands allocated to these services are close to those used by helicopters' radio altimeters (4.2 to 4.4 GHz). Transport Canada has determined that radio altimeters cannot be relied upon to perform their intended function if they experience interference from wireless broadband operations in the 3.45 to 3.98 GHz frequency band (5G C-Band). Radio altimeter anomalies that are undetected by the automation or pilot, particularly close to the ground, could lead to loss of continued safe flight and landing. Additionally, radio altimeter anomalies could lead to increased flight crew workload and flight crew desensitization to warnings.

Transport Canada does not anticipate having the capability to assess the actual risk of interference by tracking 5G deployment locations in Canada. Therefore, to protect aviation safety, this AD mandates limitations that must be applied everywhere 5G deployment is permitted – the entire Canadian airspace.

Currently, based on ISED's resolutions regarding the Canadian spectrum environment, Transport Canada has determined that helicopters equipped with radio altimeters deemed compliant with the Federal Aviation Administration (FAA) AD 2023-11-07, are less susceptible to 5G interference in the Canadian environment, considering the existing spectrum mitigations. Given the sunset of certain spectrum mitigations in January 2026 and January 2028, it is not certain that a standard can be established for radio altimeter tolerant rotorcraft to the full scope of 5G emissions permitted in Canada after January 2026. This AD is considered an interim action, and further AD action may follow.

Transport Canada is cognizant of an exemption that the FAA has granted to the Helicopter Association International, which allows for night vision googles (NVG) operations under certain conditions, even with an inoperative radio altimeter. Considering that the conditions and limitations of the FAA's decision might not be applicable to Canadian operators, the provisions of the FAA exemption are not reflected in this AD.

Corrective Actions:

Part I – Definitions

For the purpose of this AD, the following definitions apply:

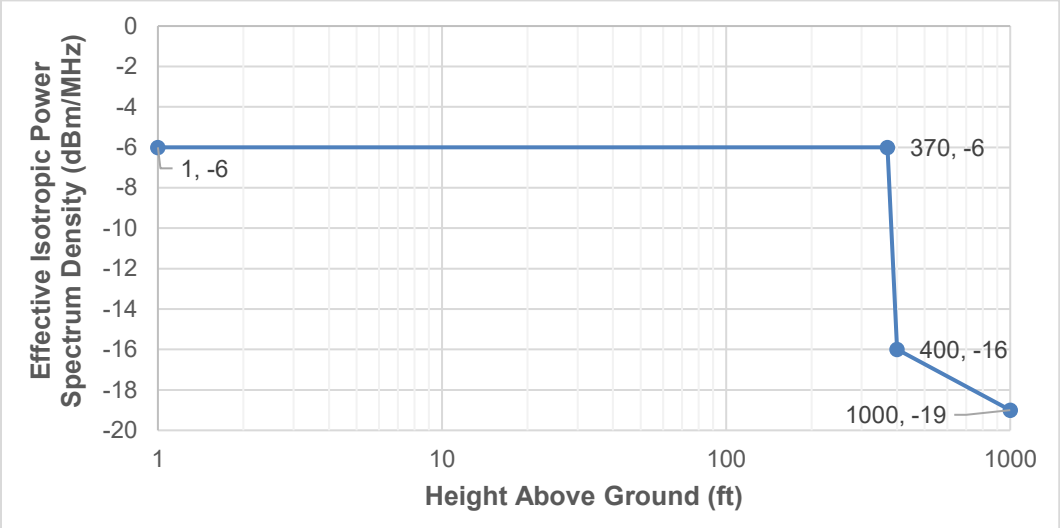
Radio Altimeter Tolerant Rotorcraft is one for which the radio altimeter, as installed, demonstrates the tolerances for emissions specified in Paragraph A and Paragraph B, Part I, of this AD, using a method approved by the FAA or Transport Canada. Currently, helicopters that meet the requirements of the FAA definition of "radio altimeter tolerant rotorcraft", as per Paragraph (g) Definitions of FAA AD 2023-11-07, are considered radio altimeter tolerant rotorcraft in Canada.

Non-Radio Altimeter Tolerant Rotorcraft is one for which the radio altimeter, as installed, does not demonstrate the tolerances for emissions specified in Paragraph A and Paragraph B, Part I, of this AD. Currently, helicopters that meet the requirements of the FAA definition of "non-radio altimeter tolerant rotorcraft", as per Paragraph (g) Definitions of FAA AD 2023-11-07, are considered non-radio altimeter tolerant rotorcraft in Canada.

Tolerance for Emissions:

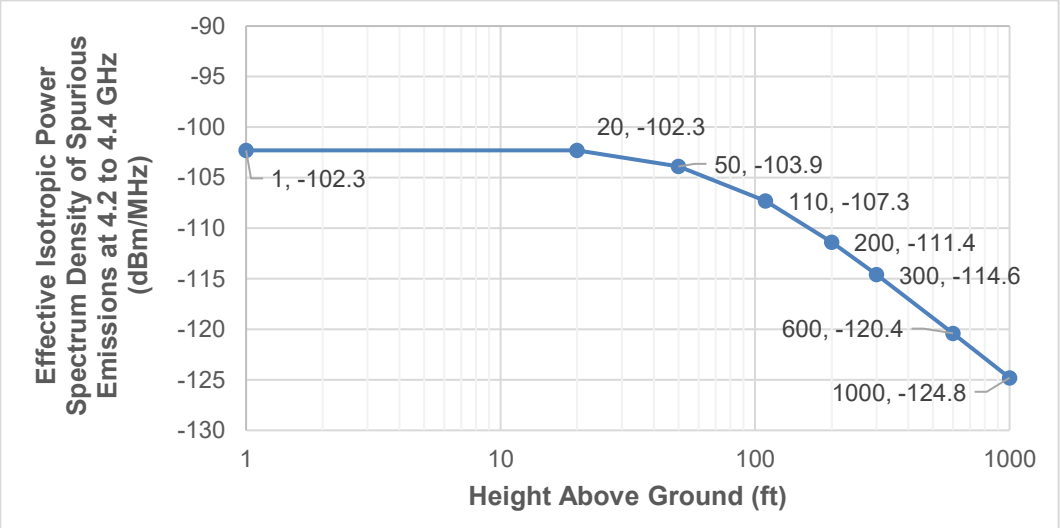
A. Tolerance to radio altimeter interference, for the fundamental emissions (3.45–3.98 GHz), at or above the power spectral density (PSD) curve threshold, are specified in Figure 1 of this AD.
B. Tolerance to radio altimeter interference, for the spurious emissions (4.2–4.4 GHz), at or above the PSD curve threshold, are specified in Figure 2 of this AD.

Figure 1 - Fundamental Effective Isotropic PSD at Outside Interface of Rotorcraft Antenna, as per FAA AD 2023-11-07.



Height above ground (ft)	Effective Isotropic PSD (dBm/MHz)
Rotorcraft on the ground	-6
370	-6
400	-16
1000	-19

Figure 2 - Spurious Effective Isotropic PSD at Outside Interface of Rotorcraft Antenna, as per FAA AD 2023-11-07.



Height above ground (ft)	Effective Isotropic PSD (dBm/MHz)
Rotorcraft on the ground	-102.3
20	-102.6
50	-103.9
110	-107.3
200	-111.4
300	-114.6
600	-120.4
1000	-124.8

Part II – Rotorcraft Flight Manual (RFM) Revision

A. For non-radio altimeter tolerant rotorcraft, as of the effective date of this AD, revise the Limitations Section of the existing RFM to include the information specified in Figure 3 of this AD. This may be accomplished by inserting a copy of Figure 3 of this AD, or the AD itself, into the existing RFM.
B. After revising the Limitations Section of the existing RFM, inform all flight crews of these new limitations and thereafter operate the rotorcraft according to the limitations outlined in Figure 3 of this AD.
C. No actions are required by this AD for radio altimeter tolerant rotorcraft.
D. AMOCs approved with FAA AD 2023-11-07 for the U.S. airspace are approved as AMOCs with this AD for the Canadian airspace.

Figure 3 – RFM Revision for Non-Radio Altimeter Tolerant Rotorcraft

Radio Altimeter Flight Restrictions

Due to the presence of 5G C-Band wireless broadband interference, when operating in Canadian airspace, the following operations requiring radio altimeter are prohibited:

- Performing approaches that require radio altimeter minimums for rotorcraft offshore operations. Barometric minimums must be used for these operations instead.
- Engaging hover autopilot modes that require radio altimeter data.
- Engaging Search and Rescue (SAR) autopilot modes that require radio altimeter data.
- Performing takeoffs and landings in accordance with any procedure (Category A, Category B, or by Performance Class in the RFM or Operations Specification) that requires the use of radio altimeter data.

Part III – Terminating Action for RFM Limitations

A. Modifying the rotorcraft from a non-radio altimeter tolerant to a radio altimeter tolerant rotorcraft, as defined in Part I of this AD, terminates the limitations specified by Part II of this AD, which may be removed from the RFM.

Authorization:

For the Minister of Transport,

ORIGINAL SIGNED BY

Jenny Young
Chief, Continuing Airworthiness
Issued on 15 May 2024

Contact:

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