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-2023-46

Effective Date:

30 June 2023

ATA:

34

Type Certificate:

See Applicability

Subject:

Navigation – Aeroplane – Prohibition of Operations Requiring Radio Altimeter When Operating in the Contiguous United States due to 5G C-Band Wireless Broadband Interference

Replacement:

Supersedes AD CF-2021-52, issued 24 December 2021.

Applicability:

This AD applies to all transport and commuter category airplanes equipped with a radio (also known as radar) altimeter. These radio altimeters are installed on various transport and commuter category airplanes including, but not limited to, the airplanes for which the design approval holder is identified below:

1) Airbus SAS
2) Bombardier Inc.
3) Embraer S.A.
4) Gulfstream Aerospace LP
5) Pilatus Aircraft Limited
6) Fokker Services B.V.
7) Saab AB, Support and Services
8) De Havilland Aircraft of Canada Limited
9) Airbus Canada Limited Partnership
10) ATR-GIE Avions de Transport Régional
11) Yaborã Indústria Aeronáutica S.A.
12) MHI RJ Aviation ULC.
13) BAE Systems (Operations) Limited
14) Viking Air Limited
15) Dassault Aviation

Compliance:

As indicated below, unless already accomplished.

Background:

On 9 December 2021, the FAA published and made effective AD 2021-23-12, which indicated that 5G C-Band would become active in certain regions of the United States of America (U.S.) on 5 January 2022. The FAA determined that, at that time, no information had been presented that showed radio altimeters are not susceptible to interference caused by C-Band emissions permitted in the U.S., and that as a result an unsafe condition was likely to exist once C-Band emissions became active.

Transport Canada agreed with the FAA's conclusions and issued AD CF-2021-52 to require the same actions as FAA AD 2021-23-12 for Canadian-registered aeroplanes, that are not of U.S. state of design, when operating in U.S. airspace. FAA AD 2021-23-12 was applicable to Canadian-registered U.S. state of design products pursuant to CAR 605.84(1)(c)(i).

Since Transport Canada issued AD CF-2021-52, the FAA has issued AD 2023-10-02 which was prompted by a determination that radio altimeters cannot be relied upon to perform their intended function if they experience interference from wireless broadband operations in the 3.7-3.98 GHz frequency band (5G C-Band). The FAA issued this AD because radio altimeter anomalies that are undetected by the automation or pilot, particularly close to the ground (e.g., landing flare), 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.

TCCA agrees with the FAA's conclusions. This AD requires the similar actions as FAA AD 2023-10-02 for Canadian registered aeroplanes, that are not of U.S. state of design, when operating in contiguous U.S. airspace. One difference with respect to FAA AD 2023-10-02 is that this AD does not prohibit operation in the contiguous U.S. under 14 CFR Part 121 after 1 February 2023. The text of this requirement is under review and additional AD action may follow. FAA AD 2023-10-02 is applicable to Canadian-registered U.S. state of design products pursuant to CAR 605.84(1)(c)(i).

Corrective Actions:

Part I - Definitions

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

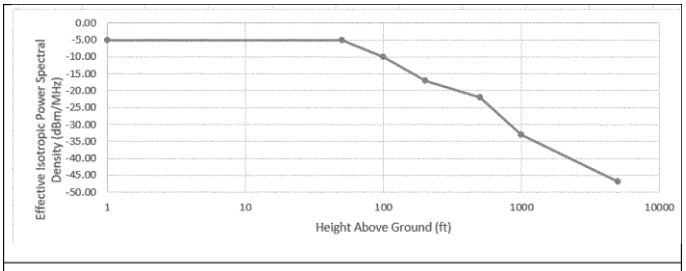
A. A **radio altimeter tolerant aeroplane** is one for which the radio altimeter, as installed, demonstrates the tolerances specified in Part I paragraphs A.1 and A.2. of this AD, using a method approved by the FAA or Transport Canada. No actions are required by this AD for radio altimeter tolerant aeroplanes.

   1. Tolerance to radio altimeter interference, for the fundamental emissions (3.7–3.98 GHz), at or above the power spectral density (PSD) curve threshold specified in Figure 1 of this AD.

   2. Tolerance to radio altimeter interference, for the spurious emissions (4.2–4.4 GHz), at or above the PSD curve threshold specified in Figure 2 of this AD.

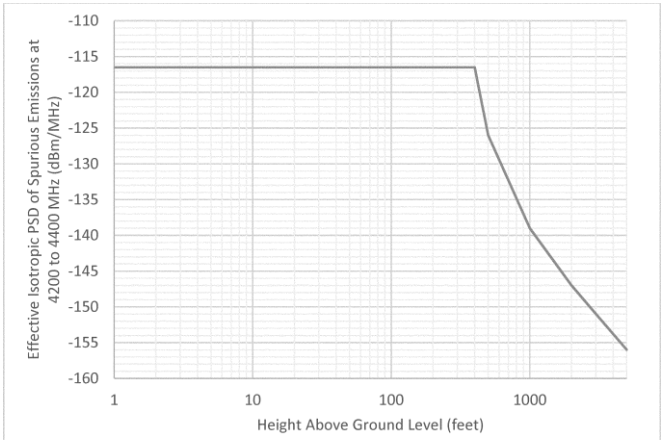
B. A **non-radio altimeter tolerant aeroplane** is one for which the radio altimeter, as installed, does not demonstrate the tolerances specified in Part I paragraphs A.1. and A.2. of this AD.

Figure 1 - Fundamental Effective Isotropic PSD at Outside Interface of Aircraft Antenna



Height above ground (ft)	Effective Isotropic PSD (dBm/MHz)
Aircraft on the ground	-5
50	-5
100	-10
200	-17
500	-22
1000	-33
5000	-47

Figure 2 - Spurious Effective Isotropic PSD at Outside Interface of Airplane Antenna



Airplane Altitude (ft AGL)	Effective Isotropic PSD (dBm/MHz)
1	-116.50
400	-116.50
500	-126.00
1000	-139.00
2000	-147.00
3000	-151.00
5000	-156.00

Part II – Airplane/Aircraft Flight Manual (AFM) Revision until 30 June 2023

A. For non-radio altimeter tolerant aeroplanes, before further flight, revise the Limitations Section of the existing AFM to include the information specified in Figure 3 of this AD. This may be done by inserting a copy of Figure 3 of this AD, or the AD itself, into the existing AFM. If an operator has complied with AD CF-2021-52, that action satisfies the requirements of this paragraph.

B. Inform all flight crews of these new limitations and thereafter operate the aeroplane according to the limitations outlined in Figure 3 of this AD.

C. AMOCs approved for AD CF-2021-52 and FAA AD 2021–23–12 are approved as AMOCs for the requirements specified in Part II of this AD.

Figure 3 – AFM Revision for Non-Radio Altimeter Tolerant Aeroplanes, Until 30 June 2023

Radio Altimeter Flight Restrictions

When operating in U.S. airspace, the following operations requiring radio altimeter are prohibited in the presence of 5G C-Band wireless broadband interference as identified by NOTAM (NOTAMs will be issued to state the specific airports where the radio altimeter is unreliable due to the presence of 5G C-Band wireless broadband interference):

- Instrument Landing System (ILS) Instrument Approach Procedures (IAP) SA CAT I, SA CAT II, CAT II, and CAT III
- Automatic Landing operations
- Manual Flight Control Guidance System operations to landing/head-up display (HUD) to touchdown operation
- Use of Enhanced Flight Vision System (EFVS) to touchdown under 14 CFR 91.176(a)

Part III – AFM Revision After 30 June 2023

For non-radio altimeter tolerant aeroplanes, do the actions specified in Part III of this AD.

A. On or before June 30, 2023, revise the Limitations Section of the existing AFM to include the information specified in Figure 4 of this AD. This may be done by inserting a copy of Figure 4 of this AD, or the AD itself, into the existing AFM. Incorporating the AFM revision required by this paragraph terminates the AFM revision required by Part II of this AD.

B. Before further flight after incorporating the limitations specified in Figure 4 of this AD, remove the AFM revision required by Part II of this AD.

C. Inform all flight crews of these new limitations and thereafter operate the aeroplane according to the limitations outlined in Figure 4 of this AD.

Figure 4 – AFM Revision for Non-Radio Altimeter Tolerant Aeroplanes, After 30 June 2023

Radio Altimeter Flight Restrictions

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

- Instrument Landing System (ILS) Instrument Approach Procedures (IAP) SA CAT I, SA CAT II, CAT II, and CAT III
- Automatic Landing operations
- Manual Flight Control Guidance System operations to landing/head-up display (HUD) to touchdown operation
- Use of Enhanced Flight Vision System (EFVS) to touchdown under 14 CFR 91.176(a).

Part IV – Terminating Action for AFM Limitations

A. Modifying the aeroplane from a non-radio altimeter tolerant airplane to a radio altimeter tolerant airplane terminates the limitations in Part III of this AD for that aeroplane.

B. After modifying the aeroplane to a radio altimeter tolerant airplane, the limitations specified by Part III of this AD may be removed from the AFM.

Authorization:

For the Minister of Transport,

ORIGINAL SIGNED BY

Jenny Young
Chief, Continuing Airworthiness
Issued on 26 June 2023

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