

Advisory Wire

REFERENCE NO:	AW000-34-0010, Rev 05	INFORMATION TYPE:	Maintenance Operational
ATA:	34-44	EFFECTIVITY:	All Challenger models All Global models
SUBJECT:	5G – Risk of Potential Adverse Effects on Radio Altimeters		

1. REFERENCES:

- 1.1. Federal Aviation Administration (FAA) Airworthiness Directive (AD) 2021-23-12 – Transport and Commuter Category Airplanes
[https://rgl.faa.gov/Regulatory_and_Guidance_Library/rgad.nsf/0/625b2b44ac41e39a862587a600628feb/\\$FILE/2021-23-12.pdf](https://rgl.faa.gov/Regulatory_and_Guidance_Library/rgad.nsf/0/625b2b44ac41e39a862587a600628feb/$FILE/2021-23-12.pdf)
- 1.2. Federal Aviation Administration (FAA) Special Airworthiness Information Bulletin (SAIB) AIR-21-18R1 – Risk of Potential Adverse Effects on Radio Altimeters
[https://rgl.faa.gov/Regulatory_and_Guidance_Library/rgSAIB.nsf/dc7bd4f27e5f107486257221005f069d/379cfb187d16db10862587b4005b26fc/\\$FILE/AIR-21-18R1.pdf](https://rgl.faa.gov/Regulatory_and_Guidance_Library/rgSAIB.nsf/dc7bd4f27e5f107486257221005f069d/379cfb187d16db10862587b4005b26fc/$FILE/AIR-21-18R1.pdf)
- 1.3. Transport Canada (TC) Civil Aviation Safety Alert (CASA) 2021-08 Issue 02 – Potential Risk of Interference of 5G Signals on Radio Altimeter
<https://tc.canada.ca/sites/default/files/2021-12/CASA-ASAC-2021-08.pdf>
- 1.4. Collins Aerospace Service Information Letter (SIL) ALT-4000-21-1 – 5G Effects on Collins Aerospace Radio Altimeter Transceivers
- 1.5. Collins Aerospace Service Information Letter (SIL) ALT-55B-21-1 – 5G Effects on Collins Aerospace Radio Altimeter Transceivers
- 1.6. Honeywell Service Information Letter (SIL) D202101001580 – Potential Interference to AA-300 Radio Altimeter Systems from 5G Communication Devices

Above references 1.4, 1.5 and 1.6 are posted and available on the Bombardier Customer Portal:
<https://my.businessaircraft.bombardier.com/> > Library > Search by Keyword

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- 1.7. RTCA Paper No. 274-20/PMC-2073 – Assessment of C-Band Mobile Telecommunications Interference Impact on Low Range Radar Altimeter Operations
https://www.rtca.org/wp-content/uploads/2020/10/SC-239-5G-Interference-Assessment-Report_274-20-PMC-2073_accepted_changes.pdf
https://www.rtca.org/wp-content/uploads/2021/09/7-F-SC-239_White_Paper_Errata.pdf
- 1.8. European Aviation Safety Agency (EASA) Mandatory Continuing Airworthiness Information - US-2021-23-12: Not Eligible for Adoption – EASA Position Attached
[EASA_AD_US-2021-23-12_1.pdf](#)
- 1.9. Federal Aviation Administration (FAA) Special Alert for Operators (SAFO) 21007 – Risk of Potential Adverse Effects on Radio Altimeters when Operating in the Presence of 5G C-Band Interference
https://www.faa.gov/other_visit/aviation_industry/airline_operators/airline_safety/safo/all_safos/media/2021/SAFO21007.pdf
- 1.10. Transport Canada Civil Aviation (TCCA) Airworthiness Directive (AD) CF-2021-52 – Navigation – Aeroplane – Prohibition of Operations Requiring Radio Altimeter in the Presence of 5G C-Band Wireless Broadband Interference
https://wwwapps.tc.gc.ca/Saf-Sec-Sur/2/cawis-swimn/AD_dl.aspx?ad=CF-2021-52&cn=CF&ft=pdf&l=E
- 1.11. European Aviation Safety Agency (EASA) Mandatory Continuing Airworthiness Information – TCCA AD CF-2021-52: Not Eligible for Adoption – EASA Position Attached
<https://ad.easa.europa.eu/ad/CF-2021-52>
- 1.12. United States Department of Transport (US DOT) and Federal Aviation Administration (FAA) Letter to AT&T and Verizon on Voluntary 5G Delay and Mitigations
<https://www.faa.gov/newsroom/dot-and-faa-letter-att-and-verizon-voluntary-5g-delay-and-mitigations>
- 1.13. FAA global Alternate Means Of Compliance (AMOC) BD_700_GX_AW-1_1016, FAA AMOC per aircraft model & associated Airport Runway List Cleared For Minimized 5G C-Band Interference and Global_Challenger Additional Airport List Cleared For 5G C-Band Interference letter supplement are co located with this Advisory Wire (AW000-34-0010) on the Bombardier Customer Portal. Due to the dynamics and ongoing updates related to 5G, operators should always refer to the Portal for new or latest revisions of existing AMOCs and associated documents.
- 1.14. Flight Operation Notifications (FON) Manuals AVNC-038 (Global) and FON AVNC-002 (Challenger) 5G – Risk of Potential Adverse Effects on Radio Altimeter

2. INTRODUCTION:

Revision 5 of this Advisory Wire (AW) is to inform operators that the FAA has recently released a letter supplement (Ref. 1.13 – Global_Challenger Additional Airport List Cleared For 5G C-Band Interference, Exp June 30, 2022) to previously released AMOC letter per aircraft model (Ref. 1.13) containing a list of 52 cleared airports since the susceptibility to interference to 5G emissions has been minimized.

In addition, flight crews should also be familiar with the associated FONs – 5G Risk of Potential Adverse Effects on Radio Altimeter (Ref. 1.14).

The FAA has agreed with the Bombardier proposal to allow operation to the airports and runways, listed in an AMOC to paragraph (g) of the AD 2021-23-12 (Ref. 1), in the areas identified by NOTAMs where Bombardier listed aircraft can safely operate because the susceptibility to interference from 5G C-band emissions has been minimized (Ref. 1.13).

3. DESCRIPTION:

Radio altimeter transceivers operate in an Aeronautical Radio Navigation Service (ARNS) spectrum allocation in the 4.2 to 4.4 Gigahertz (GHz) band, which is internationally recognized and protected by the International Telecommunications Union (ITU). Radio altimeter transceivers may be susceptible to Radio Frequency (RF) interference either within this band or nearby frequency bands of operation.

The radio altimeter is an important aircraft instrument; its intended function is to provide direct height-above-terrain/water information to a variety of aircraft systems. Bombardier has worked with its radio altimeter suppliers to address the aircraft-level risk of harmful RF interference to aircraft radio altimeters due to 5G emissions in all spectrums. The full list of the impacted systems and the associated effects is under evaluation and will be published in the next revision of this AW or as soon as the information becomes available.

In April 2020, Radio Technical Commission for Aeronautics (RTCA) formed a 5G Task Force, including members from RTCA, the FAA, aircraft and radio altimeter manufacturers, European Organization for Civil Aviation Equipment (EUROCAE), industry organizations, and operators, to perform “a quantitative evaluation of radio altimeter performance regarding RF interference from expected 5G emissions in the 3.7-3.98 GHz band, as well as a detailed assessment of the risk of such interference occurring and impacting aviation safety.” Based on the work of the task force, RTCA published a report (Ref. 1.7) which concludes that there is “a major risk that 5G telecommunications systems in the 3.7-3.98 GHz band will cause harmful interference to radio altimeters on all types of civil aircraft”.

In June 2021, Transport Canada (TC) issued Civil Aviation Safety Alert (CASA) 2021-08 titled “Potential Risk of Interference of 5G Signals on Radio Altimeters”, revised to Issue 02 in December 2021 (Ref. 1.3), to raise awareness of the potential risk of 5G interference and to recommend precautionary operational measures. Revised similar document initially issued in November 2021 by the FAA, in the form of a Special Airworthiness Information Bulletin (SAIB) AIR-21-18R1 – Risk of Potential Adverse Effects on Radio Altimeters (Ref. 1.2) and recently FAA Safety Alert for Operators (SAFO) 21007 – Risk of Potential Adverse Effects on Radio Altimeters when Operating in the Presence of 5G C-Band Interference (Ref. 1.9) are available to be consulted on the same topic.

Collins Aerospace addresses the potential radio frequency interference to Radio Altimeter Receiver-Transmitters ALT-1000, ATL-4000 and ALT-55B in Service Information Letter (SIL) (Ref. 1.4 and 1.5); while Honeywell, addresses this issue in SIL - Potential Interference to AA-300 Radio Altimeter Systems from 5G Communication Devices (Ref. 1.6).

While many jurisdictions in the world are implementing technical mitigation measures to prevent harmful RF interference to aircraft radio altimeters from expected 5G emissions in the 3.7-3.98 GHz band, in the United States, the Federal Communications Commission (FCC) recently reallocated and concluded an auction of the frequency spectrum from 3.7 to 3.98 GHz (C-band), to be used specifically by the telecommunications industry for 5G mobile communications. Due to this reallocation without similar technical mitigation measures, there is a potential for harmful RF interference from 5G to occur against aircraft radio altimeter transceivers.

The FAA is now using data provided by telecommunications providers to determine which airports within the United States have or will have C-Band base stations or other devices that could potentially impact airplane systems. NOTAMs will be issued, as necessary, to state the specific airports where the data from a radio altimeter may be unreliable due to the presence of 5G C-Band wireless broadband signals.

In response to a Bombardier's request, the FAA have agreed to provide Bombardier aircraft operators with a global AMOC Ref. BD700/GX/AW-1/1016 (Ref 1.13) which allows aircraft operators to carry paper copies of the limitations, as outlined in paragraph (g) of FAA AD 2021-23-12 (Ref. 1.1), as an acceptable means to comply with the subject AD.

As of December 24, 2021, TCCA have published an AD (Ref. 1.10) that mandates identical US airspace restrictions as identified in the FAA AD (Ref. 1.1) per published NOTAMs. This AD came into effect January 4, 2022 and is applicable to Canadian registered aircrafts or aircraft that are registered in states that endorse TCCA ADs or have endorsed TCCA AD CF-2021-52 (Ref. 1.10) and are not of US state of design when operating in US.

EASA concluded that FAA AD 2021-23-12 (Ref. 1.1) or TCCA AD CF-2021-52 (Ref. 1.10) is not eligible for adoption under the provisions of ED Decision 2019/018/ED (Ref. 1.8 & 1.11). Furthermore, EASA has not been able to determine the presence of an unsafe condition due to 5G implementation and therefore, at this time, no restrictions are imposed for the Radio Altimeter operation inside the European airspace but continues to closely monitor the situation.

4. ACTION:

US aircraft owners/operators are therefore required to insert a copy of the FAA AD into their existing AFMs per paragraph (g) of the FAA AD, copied below, and to carry a paper copy of the Ref 1.1 AD and of the global AMOC (Ref. 1.13) aboard the aircraft and inform their flight crews where the paper copy is located on or before January 4th, 2022.

“(g) Airplane/Aircraft Flight Manual (AFM) Revision

On or before January 4, 2022: Revise the Limitations Section of the existing AFM by incorporating the limitations specified in figure 1 to paragraph (g) of this AD. This may be done by inserting a copy of this AD into the existing AFM.”

(Required by AD 2021-23-12)

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
- Required Navigation Performance (RNP) Procedures with Authorization Required (AR), RNP AR IAP
- 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)

Figure. 1 – Radio Altimeter Restrictions

All other operators that fall under TCCA jurisdiction or are registered in states that endorse TCCA ADs or have endorsed TCCA AD CF-2021-52 (Ref. 1.10), are required to carry and follow the limitations prohibiting certain operations requiring radio altimeter data when in the presence of 5G C-Band wireless broadband signals as identified by NOTAMs and as specified in Figure 2 below by January 4, 2022. This may be done by inserting a copy of the TCCA AD CF-2021-52 (Ref. 1.10) into the existing AFM of the aeroplane or by carrying a paper copy of the AD on board the aircraft separately from the AFM. Operators are then required to inform all flight crews of these new procedures and thereafter operate according to the limitations outlined in Figure 2.

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
- Required Navigation Performance (RNP) Procedures with Authorization Required (AR), RNP AR IAP
- 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)

Figure. 2 – Radio Altimeter Restrictions

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To clarify the situation for owners/operators and flight crews, see below in which format each document should be carried aboard the aircraft in areas identified by NOTAMs where operation is permitted:

- Paper copy
 - FAA AD 2021-23-12 (Ref. 1.1)
 - FAA global AMOC BD_700_GX_AW-1_1016_amended_Dated Apr. 1, 2022 (Ref. 1.13)
- Either paper copy or electronic format
 - FAA AMOC per aircraft model and associated Airport Runway List Cleared For Minimized 5G C-Band Interference (Ref. 1.13)
 - Global_Challenger Additional Airport List Cleared for 5G C-Band Interference (Ref. 1.13)

All operators should make sure their flight crews are aware of the content of this AW and FONs (Ref. 1.14) regarding the radio altimeter flight restrictions when in the presence of 5G C-Band interference as identified by NOTAMs.

All operators and flight crews regardless the registration of their aircraft should check NOTAMs for the US airports and airspace where they will be operating to ensure proper flight planning considering these restrictions.

Operators experiencing RA anomalies in US airspace should notify air traffic control, as soon as practical. Post flight, pilots are encouraged to submit detailed reports of RA disruptions or interference events, as soon as practical, using the Radio Altimeter Anomaly Reporting Form available on the FAA website (Ref. 1.2) or from their Bombardier Field Service Representative (FSR) or the Customer Response Center (CRC).

FAA website: https://www.faa.gov/air_traffic/nas/RADALT_reports/

This AW will not be revised as new AMOC per aircraft model, associated Airport Runway List Cleared For Minimized 5G C-Band Interference addendum and Global_Challenger Additional Airport List Cleared For 5G C-Band Interference letter supplement revisions are released. Operators are reminded to monitor and consult on a regular basis, any updates to the documents referenced by this AW and co-located with this Advisory Wire (AW) on the Bombardier Customer Portal (Ref. 1.13). Please ensure that all search filters are removed to ease finding this AW and associated documents.

Note that, Airport Runway List Cleared For Minimized 5G C-Band Interference and Global_Challenger Additional Airport List Cleared For 5G C-Band Interference letter supplement are ONLY valid for a limited period. Each revision provided by the FAA include a start and expiration date and are not always aligned; owners/operators and flight crews should maintain awareness of differing coverage periods.

Revised AFM limitations associated with 5G operations were submitted to the different authorities and are pending approvals. Upon publication of the revised AFMs, this AW will be revised accordingly.

Should you have any query pertaining to this AW, please contact your FSR or the CRC.