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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2026-7205; Project Identifier AD-2026-00549-T; Amendment 39-23397; AD 2026-13-14]

RIN 2120-AA64

Airworthiness Directives; The Boeing Company Airplanes

AGENCY:

Federal Aviation Administration (FAA), DOT.

ACTION:

Final rule; request for comments.

SUMMARY:

The FAA is adopting a new airworthiness directive (AD) for all The Boeing Company Model 747-100, -100B, -100B SUD, -200B, -200C, -200F, -300, -400, -400D, and -400F series airplanes. This AD was prompted by the 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 Lower C-Band) while operating in Canadian airspace, and a determination that during takeoff, approach, landings, and go-arounds, as a result of this interference, certain airplane systems may not properly function, resulting in increased flightcrew workload while on approach with the flight director, autothrottle, or autopilot engaged, which could result in reduced ability of the flightcrew to maintain safe flight and landing of the airplane. This AD requires revising the existing airplane flight manual (AFM) to incorporate limitations prohibiting certain operations requiring radio altimeter data when operating in Canadian airspace. The FAA is issuing this AD to address the unsafe condition on these products.

DATES:

This AD is effective July 1, 2026.

The FAA must receive comments on this AD by August 14, 2026.

ADDRESSES:

You may send comments, using the procedures found in [14 CFR 11.43](#) and [11.45](#), by any of the following methods:

- *Federal eRulemaking Portal:* Go to *regulations.gov*. Follow the instructions for submitting comments.
- *Fax:* 202-493-2251.
- *Mail:* U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE, Washington, DC 20590.
- *Hand Delivery:* Deliver to Mail address above between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

AD Docket: You may examine the AD docket at *regulations.gov* by searching for and locating Docket No. FAA-2026-7205; or in person at Docket Operations between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this final rule, any comments received, and other information. The street address for Docket Operations is listed above.

FOR FURTHER INFORMATION CONTACT:

Ken Fairhurst, Continued Operational Safety Technical Advisor, FAA, 2200 South 216th St., Des Moines, WA 98198; phone: 817-222-5390; email: operationalsafety@faa.gov.

SUPPLEMENTARY INFORMATION:

Comments Invited

The FAA invites you to send any written data, views, or arguments about this final rule. Send your comments using a method listed under the **ADDRESSES** section. Include Docket No. FAA-2026-7205 and Project Identifier AD-2026-00549-T at the beginning of your comments. The most helpful comments reference a specific portion of the final rule, explain the reason for any recommended change, and include supporting data. The FAA will consider all comments received by the closing date and may amend this final rule because of those comments.

Except for Confidential Business Information (CBI) as described in the following paragraph, and other information as described in [14 CFR 11.35](#), the FAA will post all comments received, without change, to *regulations.gov*, including any personal information you provide. The agency will also post a report summarizing each substantive verbal contact received about this final rule.

Confidential Business Information

CBI is commercial or financial information that is both customarily and actually treated as private by its owner. Under the Freedom of Information Act (FOIA) ([5 U.S.C. 552](#)), CBI is exempt from public disclosure. If your comments responsive to this AD contain commercial or financial information that is customarily treated as private, that you actually treat as private, and that is relevant or responsive to this AD, it is important that you clearly designate the submitted comments as CBI. Please mark each page of your submission containing CBI as “PROPIN.” The FAA will treat such marked submissions as confidential under the FOIA, and they will not be placed in the public docket of this AD. Submissions containing CBI should be sent to Ken Fairhurst, Continued Operational Safety Technical Advisor, FAA,

2200 South 216th St., Des Moines, WA 98198; phone: 817-222-5390; email: operationalsafety@faa.gov. Any commentary that the FAA receives that is not specifically designated as CBI will be placed in the public docket for this rulemaking.

Background

The FAA issued AD 2021-23-12, Amendment 39-21810 ([86 FR 69984](#), December 9, 2021) (AD 2021-23-12), for all transport and commuter category airplanes equipped with a radio altimeter. AD 2021-23-12 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 5G Lower C-Band, which is close to the frequency bands used by radio altimeters (4.2-4.4 GHz). AD 2021-23-12 required revising the limitations section of the existing AFM to incorporate limitations prohibiting certain operations requiring radio altimeter data when in the presence of 5G Lower C-Band interference as identified by Notices to Air Missions (NOTAMs). The agency issued AD 2021-23-12 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.

The FAA subsequently identified an additional hazard presented by 5G Lower C-Band interference on Boeing Model 747-100, -100B, -100B SUD, -200B, -200C, -200F, -300, -400, -400D, and -400F series airplanes and issued AD 2022-06-16, Amendment 39-21982 ([87 FR 14780](#), March 16, 2022) (AD 2022-06-16). AD 2022-06-16 was prompted by the unsafe condition in AD 2021-23-12, as well as a determination that, during takeoff, approach, landings, and go-arounds, as a result of interference from the 5G Lower C-Band, certain airplane systems may not properly function, resulting in increased flightcrew workload while on approach with the flight director, autothrottle, or autopilot engaged, which could result in reduced ability of the flightcrew to maintain safe flight and landing of the airplane. AD 2022-06-16 required revising the limitations and operating procedures sections of the existing AFM to incorporate specific operating procedures for takeoff, instrument landing system (ILS) approaches, non-precision approaches, and go-around and missed approaches, when in the presence of 5G Lower C-Band interference as identified by NOTAMs.

After the FAA issued AD 2021-23-12 and AD 2022-06-16, the agency determined that additional limitations were needed due to the continued deployment of new 5G Lower C-Band base stations whose signals were expected to cover most of the contiguous U.S., as well as the determination that radio altimeter anomalies could lead to increased flightcrew workload and flightcrew desensitization to warnings. Therefore, the FAA issued AD 2023-10-02, Amendment 39-22438 ([88 FR 34065](#), May 26, 2023) (AD 2023-10-02), to supersede AD 2021-23-12, and the FAA issued AD 2023-12-14, Amendment 39-22472 ([88 FR 40003](#), June 21, 2023) (AD 2023-12-14), to supersede AD 2022-06-16.

Currently, AD 2023-12-14 requires revising the limitations section of the existing AFM to incorporate limitations for dispatch or release to airports, and takeoff, approach, landing, and go-around on runways at all airports in the entire contiguous U.S. airspace instead of only in areas identified by NOTAM; however, AD 2023-12-14 permits radio altimeter tolerant airplanes to perform these operations at 5G Lower C-Band mitigated airports as identified in an FAA Domestic Notice.

Actions Since AD 2023-12-14 Was Issued

Since the FAA issued AD 2023-12-14, Transport Canada, which is the aviation authority for Canada, issued AD CF-2024-14, dated May 15, 2024 (Transport Canada AD CF-2024-14), to correct an unsafe

condition for all transport and commuter category airplanes with a radio altimeter. Transport Canada AD CF-2024-14 states that in July 2023, Innovation, Science and Economic Development Canada (ISED), Canada's spectrum regulator, published Standard Radio System Plans (SRSP)-520 Issue 3 [1] and Radio Standard Specifications (RSS)-192 Issue 5,[2] which define the spectrum environment for the 3.45-3.90 GHz frequency band in Canada. Transport Canada AD CF-2024-14 further states that spectrum auctions for the 3.45-3.65 GHz and the 3.65-3.9 GHz band were completed in 2021 and 2023, respectively.

In July 2023, ISED implemented measures to mitigate Lower C-Band interference to radio altimeters, which provide the Canadian airspace greater protection from 5G Lower C-Band interference to radio altimeters as compared to the Lower C-Band environment in the contiguous U.S. airspace. These measures include exclusion and protection zones and airport effective isotropic radiated power (EIRP) elevation mask (a restriction that requires nearby cell tower signals to be angled downward so they do not interfere with aircraft altimeters) at certain airport runways covering the majority of air traffic in Canada, as well as nationwide reduced fundamental power emissions based on the degree of antenna uptilt above the horizon to minimize emissions from 5G base stations toward aircraft.

In late March 2026, Transport Canada notified the FAA that, beginning July 1, 2026, changes in the 5G Lower C-band protection mitigations established by ISED in 2023 would result in a more severe 5G interference environment in the Canadian airspace. Exclusion and protection zones at airports will no longer exist and updates to the airport EIRP elevation mask, nationwide tilt restriction, emitter height limitation and reduced spurious emissions will only protect airplanes that are radio altimeter tolerant. The change in mitigations will result in an unsafe condition in the Canadian 5G interference environment.

Transport Canada determined that radio altimeters cannot be relied upon to perform their intended function if they experience interference from wireless broadband operations in the 3.45-3.98 GHz frequency band. Transport Canada based its determination on the same unsafe condition found by the FAA in AD 2023-10-02. As a result, Transport Canada AD CF-2024-14 requires revising the limitations section of the existing AFM to incorporate limitations prohibiting certain operations requiring radio altimeter data, due to the presence of 5G Lower C-Band interference, while operating in Canadian airspace. As terminating action for the operating limitations, Transport Canada AD CF-2024-14 provides that operators may upgrade their radio altimeters to demonstrate the tolerances for emissions as specified in Transport Canada AD CF-2024-14.

Boeing subsequently conducted an analysis of the expected changes in the 5G Lower C-Band environment in Canada and the effects of interference with radio altimeters with respect to the Boeing fleet. In May 2026, Boeing reported that certain airplane configurations will not demonstrate tolerance to radio altimeter interference in the new 5G environment in Canada. Therefore, based on this information, the FAA determined that the unsafe condition identified in AD 2023-12-14 exists for Model 747-100, -100B, -100B SUD, -200B, -200C, -200F, -300, -400, -400D, and -400F series airplanes when operating in the Canadian airspace. As a result, operating limitations similar to the limitations required by AD 2023-12-14 are necessary.

The FAA is issuing this AD to address the unsafe condition on these products.

FAA's Determination

The FAA is issuing this AD because the agency has determined the unsafe condition described previously is likely to exist or develop in other products of the same type design.

AD Requirements

For non-radio altimeter tolerant airplanes, this AD requires, before further flight in Canadian airspace, revising the existing AFM to incorporate limitations for dispatch or release to airports, and takeoff, approach, landing, and go-around on runways when operating in Canadian airspace. This AD provides that modifying the airplane from a non-radio altimeter tolerant airplane to a radio altimeter tolerant airplane terminates the AFM operating limitations for that airplane.

While AD 2023-12-14 also specifies limitations for dispatch or release to airports and takeoff, approach, landing, and go-around on runways for radio altimeter tolerant airplanes except at 5G Lower C-Band mitigated airports, this AD has no limitations for radio altimeter tolerant airplanes. The interference environment at Canadian airports after July 1, 2026, will be mitigated enough such that those limitations are not necessary for radio altimeter tolerant airplanes. The FAA also notes that most Model 747-100, -100B, -100B SUD, -200B, -200C, -200F, -300, -400, -400D, and -400F series radio altimeter tolerant airplanes are not subject to the limitations in AD 2023-12-14 under the provisions of an FAA-approved AMOC.

An airplane that is a radio altimeter tolerant airplane using a method approved by the FAA for AD 2023-12-14 is also a radio altimeter tolerant airplane for the purposes of paragraph (g)(1) of this AD. Alternative methods of compliance (AMOC) listed in paragraph (j)(3) of this AD are approved for this AD.

Differences From Transport Canada AD CF-2024-14

Transport Canada AD CF-2024-14 specifies the fundamental emissions are in the 3.45-3.98 GHz frequency band, while this AD specifies the 3.7-3.98 GHz frequency band. AD 2023-10-02 and AD 2023-12-14 identified an unsafe condition from wireless broadband transmissions in the 3.7-3.98 GHz frequency band, and this AD is based on that same determination. In addition, an airplane determined to be a radio altimeter tolerant airplane for the purposes of AD 2023-12-14, which has demonstrated the performance tolerances for fundamental emissions within the 3.7-3.98 GHz frequency band, would also be a radio altimeter tolerant airplane for purposes of this AD. Frequencies less than 3.7 GHz are further away from the frequency bands used by radio altimeters (4.2-4.4 GHz), so an airplane determined to be tolerant in the range of 3.7-3.98 GHz is also tolerant to emissions less than 3.7 GHz.

Interim Action

The FAA considers this AD to be an interim action. The FAA may consider further rulemaking if the Canadian 5G C-Band interference environment changes or if Canada issues an operational rule to address 5G C-Band interference with radio altimeters.

Justification for Immediate Adoption and Determination of the Effective Date

Section 553(b) of the Administrative Procedure Act (APA) ([5 U.S.C. 551](#) *et seq.*) authorizes agencies to dispense with notice and comment procedures for rules when the agency, for “good cause,” finds that those procedures are “impracticable, unnecessary, or contrary to the public interest.” Under this

section, an agency, upon finding good cause, may issue a final rule without providing notice and seeking comment prior to issuance. Further, section 553(d) of the APA authorizes agencies to make rules effective in less than thirty days, upon a finding of good cause.

An unsafe condition exists that requires the immediate adoption of this AD without providing an opportunity for public comments prior to adoption. The FAA has found that the risk to the flying public justifies forgoing notice and comment prior to adoption of this rule because radio altimeters cannot be relied upon to perform their intended function if they experience interference from wireless broadband operations in the 5G Lower C-Band. This interference can cause other airplane systems to not properly function, resulting in increased flightcrew workload, which could lead to reduced ability of the flightcrew to maintain safe flight and landing of the airplane. The urgency is based on a change in the 5G Lower C-band environment in Canada, which is scheduled to occur on July 1, 2026. Accordingly, notice and opportunity for prior public comment are impracticable and contrary to the public interest pursuant to [5 U.S.C. 553\(b\)](#).

In addition, the FAA finds that good cause exists pursuant to [5 U.S.C. 553\(d\)](#) for making this amendment effective in less than 30 days, for the same reasons the FAA found good cause to forgo notice and comment.

Regulatory Flexibility Act

The requirements of the Regulatory Flexibility Act (RFA) do not apply when an agency finds good cause pursuant to [5 U.S.C. 553](#) to adopt a rule without prior notice and comment. Because the FAA has determined that it has good cause to adopt this rule without notice and comment, RFA analysis is not required.

Costs of Compliance

The FAA notes that since operators must comply with this AD before further flight in Canadian airspace, airplanes that do not operate in Canada will not have to comply and therefore will have no costs under this AD.

The FAA estimates that this AD affects 114 airplanes of U.S. registry. The FAA expects that many of the affected airplanes have upgraded radio altimeters; therefore, the FAA estimates the total number of airplanes affected by this AD to be less than the total fleet size provided in this AD. The FAA estimates the following costs to comply with this AD:

Estimated Costs

Action	Labor cost	Parts cost	Cost per product	Cost on U.S. operators
AFM revision for non-RAT airplanes	1 work-hour × \$85 per hour = \$85	\$0	\$85	Up to \$9,690.

Estimated Costs for Optional Actions

Action	Labor cost	Parts cost	Cost per product
Modification (radio altimeter replacement option)			Up to \$120,000 (includes parts and labor).
Modification (filter addition option)	24 work-hours × \$85 per hour = \$2,040 per filter	\$12,000 per filter	Up to \$14,040 (includes parts and labor).

Authority for This Rulemaking

Title 49 of the United States Code specifies the FAA's authority to issue rules on aviation safety. Subtitle I, section 106, describes the authority of the FAA Administrator. Subtitle VII: Aviation Programs describes in more detail the scope of the Agency's authority.

The FAA is issuing this rulemaking under the authority described in Subtitle VII, Part A, Subpart III, Section 44701: General requirements. Under that section, Congress charges the FAA with promoting safe flight of civil aircraft in air commerce by prescribing regulations for practices, methods, and procedures the Administrator finds necessary for safety in air commerce. This regulation is within the scope of that authority because it addresses an unsafe condition that is likely to exist or develop on products identified in this rulemaking action.

Regulatory Findings

This AD will not have federalism implications under [Executive Order 13132](#). This AD will not have a substantial direct effect on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.

For the reasons discussed above, I certify that this AD:

- (1) Is not a “significant regulatory action” under [Executive Order 12866](#), and
- (2) Will not affect intrastate aviation in Alaska.

List of Subjects in [14 CFR Part 39](#)

- Air transportation
- Aircraft
- Aviation safety
- Incorporation by reference
- Safety

The Amendment

Accordingly, under the authority delegated to me by the Administrator, the FAA amends [14 CFR part 39](#) as follows:

PART 39—AIRWORTHINESS DIRECTIVES

1. The authority citation for part 39 continues to read as follows:

Authority: [49 U.S.C. 106\(g\)](#), [40113](#), [44701](#).

[§ 39.13](#) [Amended]

2. The FAA amends § 39.13 by adding the following new airworthiness directive:

2026-13-14 The Boeing Company: Amendment 39-23397; Docket No. FAA-2026-7205; Project Identifier AD-2026-00549-T.

(a) Effective Date

This airworthiness directive (AD) is effective July 1, 2026.

(b) Affected ADs

None.

(c) Applicability

This AD applies to all The Boeing Company Model 747-100, -100B, -100B SUD, -200B, -200C, -200F, -300, -400, -400D, and -400F series airplanes, certificated in any category.

(d) Subject

Air Transport Association (ATA) of America Code 34, Navigation.

(e) Unsafe Condition

This AD was prompted by the 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 Lower C-Band) when operating in Canadian airspace, and the determination that during takeoff, approach, landings, and go-arounds, as a result of this interference, certain airplane systems may not properly function, resulting in increased flightcrew workload while on approach with the flight director, autothrottle, or autopilot engaged. The FAA is issuing this AD to address 5G Lower C-Band interference that could result in increased flightcrew workload and could lead to reduced ability of the flightcrew to maintain safe flight and landing of the airplane.

(f) Compliance

Comply with this AD within the compliance times specified, unless already done.

(g) Definitions

(1) For purposes of this AD, a “radio altimeter tolerant airplane” is one for which the radio altimeter, as installed, demonstrates the tolerances specified in paragraphs (g)(1)(i) and (ii) of this AD, using a

method approved by the FAA. No actions are required by this AD for radio altimeter tolerant airplanes.

(i) 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 to paragraph (g)(1)(i) of this AD.

Figure 1 to paragraph (g)(1)(i) - Fundamental Effective Isotropic PSD at

(ii) 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 to paragraph (g)(1)(ii) of this AD.

Figure 2 to paragraph (g)(1)(ii) - Spurious Effective Isotropic PSD at Outside Interface of Aircraft Antenna

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(2) For purposes of this AD, a “non-radio altimeter tolerant airplane” is one for which the radio altimeter, as installed, does not demonstrate the tolerances specified in paragraphs (g)(1)(i) and (ii) of this AD.

(h) Airplane Flight Manual (AFM) Revision

For non-radio altimeter tolerant airplanes: Before further flight in Canadian airspace, do the actions specified in paragraphs (h)(1) and (2) of this AD.

(1) Revise the Limitations Section of the existing AFM to include the information specified in figure 3 to paragraph (h)(1) of this AD. This may be done by inserting a copy of figure 3 to paragraph (h)(1) of this AD into the existing AFM.

**Figure 3 to paragraph (h)(1) – AFM Limitations for Non-Radio Altimeter Tolerant
Airplanes in Canadian Airspace**

(As required by AD 2026-13-14)

Radio Altimeter 50 Lower C Band Interference Takeoff Approach Landing

(2) Revise the Operating Procedures Section of the existing AFM to include the information specified in figure 4 to paragraph (h)(2) of this AD. This may be done by inserting a copy of figure 4 to paragraph (h)(2) of this AD into the existing AFM. An AFM with an Operating Procedures Section that complies with paragraph (h)(2) of AD 2023-12-14, Amendment 39-22472 ([88 FR 40003](#), June 21, 2023) is acceptable for compliance with the requirements of this paragraph of this AD.

Figure 4 to paragraph (h)(2) – AFM Operating Procedures Revision

(i) Terminating Action for AFM Revision

(1) Modifying the airplane from a non-radio altimeter tolerant airplane to a radio altimeter tolerant airplane terminates the limitations in paragraph (h)(1) of this AD and the operating procedures in paragraph (h)(2) of this AD for that airplane.

(2) After modifying the airplane to a radio altimeter tolerant airplane, the limitations in paragraph (h)(1) of this AD and the operating procedures in paragraph (h)(2) of this AD may be removed from the AFM.

(j) Alternative Methods of Compliance (AMOCs)

(1) The Manager, AIR-520, Continued Operational Safety Branch, FAA, has the authority to approve AMOCs for this AD, if requested using the procedures found in [14 CFR 39.19](#). In accordance with [14 CFR 39.19](#), send your request to your principal inspector or responsible Flight Standards Office, as appropriate. If sending information directly to the manager of AIR-520, Continued Operational Safety

Branch, send it to the attention of the person identified in paragraph (k) of this AD and email to: AMOC@faa.gov.

(2) Before using any approved AMOC, notify your appropriate principal inspector, or lacking a principal inspector, the manager of the responsible Flight Standards Office.

(3) The following AMOCs approved previously for AD 2023-12-14, Amendment 39-22472 ([88 FR 40003](#), June 21, 2023) are approved as AMOCs for paragraph (g)(1) of this AD: FAA AMOC letters 720-23-00133, 720-23-00137, 720-23-00138, and 720-23-00169.

(k) Additional Information

For more information about this AD, contact Ken Fairhurst, Continued Operational Safety Technical Advisor, FAA, 2200 South 216th St., Des Moines, WA 98198; phone: 817-222-5390; email: operationalsafety@faa.gov.

(l) Material Incorporated by Reference

None.

Issued on June 25, 2026.

Brian Knaup,

Acting Deputy Director, Integrated Certificate Management Division, Aircraft Certification Service.

Footnotes

1. <https://ised-isde.canada.ca/site/spectrum-management-telecommunications/en/devices-and-equipment/standard-radio-system-plans/srsp-520-technical-requirements-fixed-andor-mobile-systems-including-flexible-use-broadband-systems>.

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2. <https://ised-isde.canada.ca/site/spectrum-management-telecommunications/en/devices-and-equipment/radio-equipment-standards/radio-standards-specifications-rss/rss-192-flexible-use-broadband-equipment-operating-band-3450-3900-mhz>.

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