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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2020-0991; Project Identifier AD-2020-00478-Q; Amendment 39-21509; AD 2021-08-15]

RIN 2120-AA64

Airworthiness Directives; Garmin International GMN-00962 GTS Processor Units

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: The FAA is adopting a new airworthiness directive (AD) for certain Garmin International (Garmin) GMN-00962 GTS processor units (GTS 825, GTS 855, GTS 8000). This AD was prompted by reports of GTS processor units issuing resolution advisories (RAs) when no risk of collision or loss of separation exists between the airplanes involved. This AD requires updating the software version of the affected GTS Processor units. The FAA is issuing this AD to address the unsafe condition on these products.

DATES: This AD is effective May 17, 2021.

ADDRESSES: For service information identified in this final rule, contact Garmin International, Garmin Aviation Support 1200 E. 151st Street, Olathe, KS 66062; phone: (866) 739-5687; website: <https://fly.garmin.com/fly-garmin/support/>. You may view this service information at the FAA, Airworthiness Products Section, Operational Safety Branch, 901 Locust St., Kansas City, MO 64106. For information on the availability of this material at the FAA, call (816) 329-4148.

Examining the AD Docket

You may examine the AD docket at <https://www.regulations.gov> by searching for and locating Docket No. FAA-2020-0991; 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 address for Docket Operations is U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE, Washington, DC 20590.

FOR FURTHER INFORMATION CONTACT: Paul Rau, Aviation Safety Engineer, Wichita ACO Branch, FAA, 1801 Airport Road, Wichita, KS 67209; phone: (316) 946-4149; fax: (316) 946-4107; email: paul.rau@faa.gov or Wichita-COS@faa.gov.

SUPPLEMENTARY INFORMATION:

Background

The FAA issued a notice of proposed rulemaking (NPRM) to amend 14 CFR part 39 by adding an AD that would apply to Garmin GMN-00962 GTS processor units (GTS 825, GTS 855, GTS 8000) with part number 011-02571-0() and software version 3.13 or earlier (except version 3.12.1). The NPRM published in the Federal Register on December 14, 2020 (85 FR 80696). The NPRM was prompted by seven reports of false RAs involving aircraft equipped with Garmin GMN-00962 GTS processor configured for traffic collision avoidance system II (TCAS II) (configuration marketed as GTS-8000 units). The Garmin GMN-00962 GTS processor units are marketed by Garmin as the GTS 825, GTS 855 or GTS 8000, with the marketing name representing the traffic system configuration.

A false RA occurs when there is no risk of collision or loss of separation of the airplanes. These false RAs result from the GTS Processor software potentially calculating incorrect range rates. This results in traffic advisories or RAs being generated when targets are greater than 10 nautical miles (NM) away. A TCAS event involving three or more airplanes can result in mid-air collision by increasing the risk that the TCAS, in resolving the false RA with the initial airplane, will create an actual loss of separation with a third airplane. This condition, if not addressed, could result in an RA being generated when no risk of loss of separation or risk of collision exists between the airplanes involved, which can lead to a mid-air collision with a third airplane.

In the NPRM, the FAA proposed to require updating the GTS processor unit software. The FAA is issuing this AD to address the unsafe condition on these products.

The affected GTS processor units were installed on the airplanes listed below during production and via an STC; however, the affected units may have been installed on other airplane models as a supplemental type certificate (STC). Although the names found in parenthesis may not be listed on the type certificate, the manufacturer may use those names as marketing names for the airplanes.

- Textron Aviation Inc. (type certificate previously held by Cessna Aircraft Company) Model 525 (Cessna Citation M2), Model 525B (Cessna Citation CJ3+), Model Model 680 Sovereign, Model 680A Latitude, and Model 700 (Cessna Citation Longitude);
- Embraer S.A. Model EMB-500 (Phenom 100) and Model EMB-505 (Phenom 300);
- Learjet Inc. Model 45 (Learjet 70) and Model 45 (Learjet 75); and
- Viking Air Limited (type certificate previously held by Shorts Brothers PLC, Shorts Brothers Limited) Model SD3-60 SHERPA, modified by Field Aerospace STC No. ST00865DE.

Discussion of Final Airworthiness Directive Comments

The FAA received comments from six commenters. The commenters were Garmin, Learjet Inc. (Learjet), Textron Aviation Inc. (Textron), NetJets, Field Aerospace, and an individual. The following presents the comments received on the NPRM and the FAA's response to each comment.

Supportive

An individual commenter supported the NPRM without change.

Request Regarding Applicability

Garmin requested the FAA clarify the AD applicability, as the proposed AD applies to GTS 825 and GTS 855, which are not affected by the false RA issue. Garmin suggested that the FAA add a

clarifying statement to the background section, and revise the applicability paragraph to remove references to the GTS 825 and GTS 855.

The FAA disagrees. This AD applies to the GTS Processor part number 011-02571-0() units with software version 3.13 or earlier, except software version 3.12.1. The GTS 825, GTS 855, and GTS 8000 marketing labels describe different installation configurations rather than different appliances. While the GTS Processor will not generate false RAs when configured as TAS (GTS 825) or TCAS I (GTS 855), the appliance itself is still susceptible to the issue, and the unsafe condition would occur if an operator enables the TCAS II option without also updating the software.

The FAA did not change this AD based on this comment.

Request Regarding Affected Aircraft

Field Aerospace stated that the proposed AD would affect Shorts Sherpa Model SD3-60 airplanes that have been modified under Field Aerospace STC No. ST00865DE.

The FAA agrees with this comment. The FAA issued this AD against the Garmin appliance because the unsafe condition exists in the appliance. The FAA has added Model SD3-60 SHERPA airplanes modified by Field Aerospace STC No. ST00865DE to the list of known affected aircraft in the background section. This is not an all-inclusive list; all operators must check their airplanes for the affected appliance, regardless of whether the model of their airplane is listed.

Request Regarding Unsafe Condition

Garmin requested the FAA add information relevant to the actual risk in the discussion of the unsafe condition in the background section. Specifically, Garmin stated that loss of separation with a third airplane is not inevitable when a false RA occurs. Garmin further stated that the TCAS II implemented by the GTS 8000 is capable of negotiating threats with more than one airplane and will adjust the RA in a situation should loss of separation to a third airplane result in a collision threat.

The FAA disagrees. The unsafe condition statement describes the condition the FAA is trying to prevent; as such, it does not describe all possible outcomes. The FAA assessed the likelihood of the unsafe condition in determining whether an AD or other action was warranted. While the FAA acknowledges that no loss of separation event has been associated with this issue on Garmin equipment, a similar issue with other TCAS II equipment has resulted in loss of separation events. Additionally, the rate of false RAs observed with GTS Processor-equipped aircraft far exceeds the acceptable probability of a false RA due to a failure of the system specified in Advisory Circular No. 20-151C, Airworthiness Approval of Traffic Alert and Collision Avoidance Systems (TCAS II), Versions 7.0 & 7.1 and Associated Mode S Transponders, dated July 21, 2017. Further, the potential for a loss of separation is not limited to the GTS Processor-equipped aircraft, as the second aircraft may also contain equipment that attempts to resolve the multi-threat encounter. Although the TCAS II is capable of resolving conflicts with more than one aircraft, since the current design of TCAS RAs is limited to vertical maneuvers, it is not able to provide conflict resolution for all encounters involving multiple aircraft.

The FAA did not change this AD based on this comment.

Request Regarding Required Actions and Compliance

Garmin requested the FAA revise the AD to require updating the affected software to version 3.12.1, or to version 3.14 or later. Garmin stated that, as proposed, the AD would not allow update of software to version 3.12.1, which is not affected by the issue.

The FAA agrees with this comment. The unsafe condition is also resolved in version 3.12.1. The FAA has changed the Required Actions and Compliance paragraph to also allow updating the GTS processor software to version 3.12.1.

Learjet, Textron, and NetJets requested the FAA extend the compliance time to allow adequate time for the certification and deployment of the required changes to all affected products. Learjet requested a compliance time of 18 months, while Textron requested a compliance time of 24 months.

The FAA agrees. In addition to the reasons provided by the commenters, the FAA's risk assessment, in consideration of the ongoing pandemic and resulting reduction in air traffic, supports extending the compliance time from 12 to 24 months.

Request Regarding Costs

Textron requested the FAA update the estimated cost information to include additional work for Textron aircraft. Textron stated it has prior agreements with Garmin to accomplish this software change as part of a package of other product improvements, for a per-aircraft cost of approximately \$3,000.

The FAA disagrees with this comment. The cost analysis in AD rulemaking actions typically includes only the costs associated with complying with the AD. This AD does not mandate the entire package of changes for Textron aircraft.

The FAA has not made changes to this AD based on this comment.

Request Regarding Certificate of Airworthiness

Learjet requested the FAA revise the AD to allow initial Certificates of Airworthiness to be issued to newly-manufactured aircraft prior to complying with the AD. Learjet stated that certification of new software to comply with the AD (software later than version 3.13) will take a minimum of 9 months.

The FAA disagrees with this comment. The AD does not prohibit the issuance of a Certificate of Airworthiness to eligible aircraft. Newly-manufactured aircraft need to comply with the AD actions within the same timeframe as aircraft in the current U.S. fleet.

The FAA has not made changes to this AD based on this comment.

Conclusion

The FAA reviewed the relevant data, considered any comments received, and determined that air safety requires adopting this AD as proposed. Accordingly, the FAA is issuing this AD to address the unsafe condition on these products. Except for minor editorial changes and any other changes described previously, this AD is adopted as proposed in the NPRM. None of the changes will increase the economic burden on any operator.

Related Service Information

The FAA reviewed Garmin Service Bulletin No. 2065, Revision A, dated May 7, 2020; and Garmin Service Bulletin No. 1948, Revision B, dated March 26, 2020. These service bulletins contain procedures for uploading the software update to the GMN-00962 GTS Processor units (GTS 825, GTS 855, GTS 8000).

Costs of Compliance

The FAA estimates that this AD affects 700 appliances installed on airplanes of U.S. registry. 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
Update GTS Processor software	4.00 work-hours × \$85 per hour = \$340	\$0	\$340	\$238,000

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,
- (2) Will not affect intrastate aviation in Alaska, and
- (3) Will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

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:



2021-08-15 Garmin International: Amendment 39-21509; Docket No. FAA-2020-0991; Project Identifier AD-2020-00478-Q.

(a) Effective Date

This airworthiness directive (AD) is effective May 17, 2021.

(b) Affected ADs

None.

(c) Applicability

This AD applies to Garmin International GMN-00962 GTS processor units, part number 011-02571-0(), with software version 3.13 or earlier, except software version 3.12.1, installed on airplanes certificated in any category. These units are marketed as the GTS 825, GTS 855, or GTS 8000.

(d) Subject

Joint Aircraft System Component (JASC) Code 3445, AIR COLLISION AVOIDANCE SYSTEM (TCAS).

(e) Unsafe Condition

This AD was prompted by the GTS processor unit issuing false resolution advisories (RAs) when no risk of collision or loss of separation exists between the airplanes involved. A traffic collision avoidance system (TCAS) event involving three or more airplanes can result in mid-air collision by increasing the risk that the TCAS, in resolving the false RA between the initial airplane, will create an actual loss of separation with a third airplane. The FAA is issuing this AD to prevent these false RAs, which can lead to a mid-air collision with a third airplane.

(f) Required Action and Compliance

Within 24 months after the effective date of this AD, update the GTS processor software to a version that is not 3.13 or earlier, except 3.12.1. Software version 3.12.1 does not contain the unsafe condition.

(g) Alternative Methods of Compliance (AMOCs)

(1) The Manager, Wichita ACO 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 local Flight Standards District Office, as appropriate. If

sending information directly to the manager of the certification office, send it to the attention of the person identified in Related Information.

(2) Before using any approved AMOC, notify your appropriate principal inspector, or lacking a principal inspector, the manager of the local flight standards district office/certificate holding district office.

(h) Related Information

(1) For more information about this AD, contact Paul Rau, Aviation Safety Engineer, Wichita ACO Branch, FAA, 1801 Airport Road, Wichita, KS 67209; phone: (316) 946-4149; fax: (316) 946-4107; email: paul.rau@faa.gov or Wichita-COS@faa.gov.

(2) For service information identified in this AD contact Garmin International, Garmin Aviation Support 1200 E. 151st Street, Olathe, KS 66062; phone: (866) 739-5687; website: <https://fly.garmin.com/fly-garmin/support/>. You may also view this service information at FAA, Airworthiness Products Section, Operational Safety Branch, 901 Locust St., Kansas City, MO 64106. For information on the availability of this material at the FAA, call (816) 329-4148.

Issued on April 7, 2021.

Lance T. Gant,

Director, Compliance & Airworthiness Division, Aircraft Certification Service.

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