



## 適航指令發布單

### Airworthiness Directive Issuance Form

民航局AD編號 AD Number	CAA-2017-11-003	發布日期 Date issued	2017/11/14
適用之航空產品 Applied to (models, serial numbers or part numbers, as applicable)	Rockwell Collins, Inc. TSSA-4100 Field Loadable Software (FLS) Rockwell Collins partnumbers (RCPNs) 810-0052-002, -003, -010, -011, -012, -100, or -101 found on TSS-4100 Traffic Surveillance System Processing Units, (RCPN) 822-2132-001 installed on airplanes.		
主旨摘要	To prevent erroneous extrapolation of position/velocity and altitude data that could result in misleading position and/or altitude being reported by the airplane and possibly lead to mid-air collision.		
民航局 CAA  <input type="checkbox"/> 本國產品 Native products  <input type="checkbox"/> 其他個案 Other	設計國民航主關機構 Original Authorities <div style="display: flex; justify-content: space-between;"> <div> <input checked="" type="checkbox"/> FAA  <input type="checkbox"/> EASA  <input type="checkbox"/> Brazil  <input type="checkbox"/> Transport Canada Civil Aviation  <input type="checkbox"/> DGAC               </div> <div> <input type="checkbox"/> Germany LBA  <input type="checkbox"/> CAA-NL  <input type="checkbox"/> UK CAA  <input type="checkbox"/> Japan CAB  <input type="checkbox"/> CAA of Israel  <input type="checkbox"/> Other _____               </div> </div>		
	設計國AD編號 Original AD number	2017-22-14	
	1. 直接採用原AD之內容?(Is the original AD directly adopted?) <input checked="" type="checkbox"/> 是(Yes) <input type="checkbox"/> 否(No) ____ a. 生效日期另訂為(Re-specify the effective date as) : _____ b. 執行時限另訂為(Re-specify the compliance time or period as) : _____ 2. 使用人是否需要將AD執行結果向民航局提出報告?(Do Users need to report the status of compliance to the CAA?) <input type="checkbox"/> 是(Yes) <input checked="" type="checkbox"/> 否(No)		
備註 Note	Rockwell Collins Service Information Letter, TSSA-4100-SIL-10-1, Revision No. 9, dated March 31, 2017. Rockwell Collins Service Information Letter, TSSA-4100-SIL-10-1, Revision No. 10, dated July 10, 2017.		

註：1. AD內容後附。

2. 航空器產品使用人得向民航局提出豁免、替代符合方法、執行時限之展延之申請。

3. 如有任何問題，請聯絡交通部民用航空局初始適航科。Tel：(02)2349-6331~3, Fax：(02)2545-8464, e-mail：adcaa@mail.caa.gov.tw

Note：1. The AD text is enclosed.

2. Exemption, an alternative method of compliance or adjustment of the compliance time may be proposed to the CAA for approval.

3. For further information, please contact Civil Aeronautics Administration on Tel：(02)2349-6331~3, Fax：(02)2545-8464, e-mail：adcaa@mail.caa.gov.tw

[Federal Register Volume 82, Number 219 (Wednesday, November 15, 2017)]  
[Rules and Regulations]  
[Pages 52827-52830]  
From the Federal Register Online via the Government Publishing Office [www.gpo.gov]  
[FR Doc No: 2017-24066]

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## **DEPARTMENT OF TRANSPORTATION**

### **Federal Aviation Administration**

#### **14 CFR Part 39**

**[Docket No. FAA-2017-0659; Product Identifier 2017-CE-014-AD; Amendment 39-19094; AD 2017-22-14]**

**RIN 2120-AA64**

**Airworthiness Directives; Rockwell Collins, Inc. Traffic Surveillance System Processing Unit**

**AGENCY:** Federal Aviation Administration (FAA), DOT.

**ACTION:** Final rule.

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**SUMMARY:** We are adopting a new airworthiness directive (AD) for certain Rockwell Collins, Inc. TSS-4100 Traffic Surveillance System Processing Units that incorporate TSSA-4100 Field Loadable Software (FLS) Rockwell Collins part numbers 810-0052-002/-003/-010/-011/-012/-100/-101 and are installed on airplanes. This AD was prompted by five instances of air traffic control observing coasting (extrapolated stale data) of automatic dependent surveillance-broadcast data (position/velocity data). This AD requires installing the TSSA-4100 FLS upgrades on the TSS-4100 units. We are issuing this AD to address the unsafe condition on these products.

**DATES:** This AD is effective December 20, 2017.

The Director of the Federal Register approved the incorporation by reference of a certain publication listed in this AD as of December 20, 2017.

**ADDRESSES:** For service information identified in this final rule, contact Rockwell Collins, Inc., Collins Aviation Services, 400 Collins Road NE., M/S 164-100, Cedar Rapids, IA 52498-0001; telephone: 888-265-5467 (U.S.) or 319-265-5467; fax: 319-295-4941 (outside U.S.); email: techmanuals@rockwellcollins.com; Internet: <https://portal.rockwellcollins.com/web/publications-and-training>. You may view this service information at the FAA, Policy and Innovation Division, 901 Locust, Kansas City, Missouri 64106. For information on the availability of this material at the FAA, call (816) 329-4148. It is also available on the internet at <http://www.regulations.gov> by searching for and locating Docket No. FAA-2017-0659.

#### **Examining the AD Docket**

You may examine the AD docket on the Internet at <http://www.regulations.gov> by searching for and locating Docket No. FAA-2017-0659; or in person at the Docket Management Facility between 9

a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this final rule, the regulatory evaluation, any comments received, and other information. The address for the Docket Office (phone: 800-647-5527) is Document Management Facility, 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, Aerospace Engineer, Wichita Aircraft Certification Office, FAA, 1801 Airport Road, Room 100, Wichita, Kansas 67209; phone: 316-946-4149; fax: 316-946-4107; email: paul.rau@faa.gov.

## **SUPPLEMENTARY INFORMATION:**

### **Discussion**

We issued a notice of proposed rulemaking (NPRM) to amend 14 CFR part 39 by adding an AD that would apply to certain Rockwell Collins, Inc. TSS-4100 Traffic Surveillance System Processing Units that incorporate TSSA-4100 Field Loadable Software (FLS) Rockwell Collins part numbers 810-0052-002/-003/-010/-011/-012/-100/-101 and are installed on airplanes. The NPRM published in the Federal Register on July 3, 2017 (82 FR 30802). The NPRM was prompted by five instances of air traffic control observing coasting (extrapolated stale data) automatic dependent surveillance-broadcast data (ADS-B position/velocity data) on a related Rockwell Collins, Inc. platform that shares a common architecture with the TSS-4100 Traffic Surveillance System Processing Units. An investigation of the events determined that the ADS-B position and the Mode S/traffic alert and collision avoidance system (TCAS) altitude of the TSS-4100 are affected. This condition, if not corrected, could result in misleading position and/or altitude being reported by the airplane. Misleading altitude data can adversely affect TCAS and possibly lead to mid-air collision due to an incorrect initial resolution advisory (RA) and/or an incorrect RA modification. The extrapolation of the data occurs with no warning to the crew. The NPRM proposed to require updating the TSSA-4100 FLS on the TSS-4100 Traffic Surveillance System Processing Unit. We are issuing this AD to correct the unsafe condition on these products.

### **Comments**

We gave the public the opportunity to participate in developing this final rule. The following presents the comments received on the NPRM and the FAA's response to each comment.

### **Request Reduced Compliance Time**

The Air Line Pilots Association (ALPA) requested we reduce the compliance time for the AD actions. The ALPA requested this change because of the high number of reports the FAA received and because the equipment is installed on a variety of airframe types that may operate in heavily trafficked airspace.

We disagree with this comment. We considered the variety of airframe types and operations when we determined the compliance time for the proposed AD. We proposed within 12 months or 750 hours time-in-service (TIS), whichever occurs first, and we expect that airframes with the heaviest usage will require compliance in less than 4 months after the effective date of the AD. Reducing the compliance time would create an additional burden not supported by the risk assessments.

We have not changed this AD based on this comment.

## **Request a Delayed Effective Date**

Bombardier, Inc. requested we delay the effective date of this AD until January 1, 2020, when the requirements of 14 CFR 91.225 take effect. In November 2017, Bombardier, Inc. plans to release service information for CRJ airplane models that will change the affected TSSA-4100 FLS part numbers to different part numbers that are not included the applicability of the AD. Because of the heavy usage of the CRJ airplanes and the 750 hours TIS of the AD, most CRJ airplanes will require compliance with the AD by the end of 2017. Also, Bombardier, Inc. states that air traffic controllers cannot use ADS-B data as a primary source until 2020; as such, the mid-air collision risk does not seem clear to them.

We disagree with this comment. Based on the stated usage, a delay of the effective date until January 1, 2020, could result in airplanes accumulating an additional 5,000 hours TIS beyond the 750 hours TIS compliance proposed in the NPRM. The risk assessment does not support that significant of an increase in the compliance time for this AD. The stale or coasting Mode S altitude data interferes with proper TCAS operation, potentially resulting in an incorrect RA or RA modification. ADS-B operation is not required for that unsafe condition to exist. As of August 1, 2017, ADS-B is the primary source of data by air traffic controllers for separation at all FAA enroute air traffic control facilities and at over 60 percent of U.S. terminal air traffic control facilities. ADS-B is also widely used by general aviation airplanes for traffic awareness. You may provide substantiating data to adjust the compliance time of this AD and request an alternative method of compliance (AMOC) using the procedures found in 14 CFR 39.19.

We have not changed this AD based on this comment.

## **Request To Allow Subsequent FLS Part Numbers for Compliance**

Delta Air Lines, Inc. requested we change the language in this AD to allow the use of subsequent FLS part numbers for compliance with this AD. They request, for example, we add the words, “or subsequent” or “any subsequent FLS part number that complies with the intent of this AD” to allow the use of future part numbers that may comply with the AD actions.

We disagree with this comment. RCPN 810-0052-013 or 810-0052-102 are the only part numbers currently available that comply with this AD. We cannot use language “or subsequent” or similar language because we cannot approve documents or materials that do not currently exist. The AD only applies to the FLS part numbers listed in the Applicability, paragraph (c) of this AD, so future software upgrades not listed in paragraph (c) of this AD are not affected by this AD. Operators may request an alternative method of compliance (AMOC) to use future FLS part numbers if they become available using the procedures found in 14 CFR 39.19.

We have not changed this AD based on this comment.

## **Request To Allow Credit for Work Done With Other Instructions**

Bombardier, Inc. requested that we allow AD credit for operators who have already completed the replacement of the affected part numbers using parts found in aircraft illustrated parts catalogs (AIPCs) not identified in the Applicability, paragraph (c) of this AD. Certain AIPCs already allow operators to replace some of the affected TSSA-4100 FLS part numbers with part numbers not identified in the Applicability, paragraph (c) of this AD.

We disagree with this comment. We recognize that other instructions for upgrade of the TSSA-4100 exist. However, the actions of this AD must be completed using the service information cited in the AD and incorporated by reference into the AD. Operators may request an AMOC, using the procedures found in 14 CFR 39.19, to use service information other than those referenced in this AD. If, as of the effective date of this AD, the affected TSSA-4100 FLS part numbers identified in the Applicability, paragraph (c) of this AD, are not installed on the airplane, the AD does not apply to that airplane. Therefore, if before the effective date of this AD, operators replaced the affected TSSA-

4100 FLS part numbers with part numbers not identified in the Applicability, paragraph (c) of this AD, using the AIPC, they do not require credit for compliance with this AD because this AD does not apply to those airplanes.

We have not changed this AD based on this comment.

### **Request Changes to the List of Possible Affected Airplanes**

Delta Air Lines, Inc. and Bombardier, Inc. requested we add Bombardier, Inc. Models CS 100 (BD-500-1A10) and CS300 (BD-500-1A11) airplanes and remove Bombardier, Inc. Models Global 5000 (BD-700-1A11) and Challenger 605 (CL-600-2B16) from the Applicability, paragraph (c) of this AD. The C series include the TSSA-4100 system; however, the Global 5000 and the Challenger 605 do not have the affected part numbers installed.

We agree with this comment. The list of possible affected airplanes is intended to include airplanes known to have the TSS-4100 installed. The Bombardier C series airplanes were inadvertently omitted, and we added them to the Applicability, paragraph (c) of this AD. The Global 5000 without the Global Vision Flight Deck and the Challenger 605 did not include the installation of the TSS-4100, and we removed them from the Applicability, paragraph (c) of this AD. However, this AD applies specifically to TSS-4100 units, RCPN 822-2132-001, that incorporate TSSA-4100 FLS RCPN 810-0052-002/-003/-010/-011/-012/-100/-101 installed on airplanes. If the TSS-4100 unit with the affected part numbers is installed, for example, through an avionics upgrade, on an airplane not listed in paragraph (c) of this AD, the AD would apply to that airplane.

### **Request Clarification of the Unsafe Condition**

Bombardier, Inc. requested we change the language in the Unsafe Condition, paragraph (e) of this AD, to more accurately describe the instances of coasting errors. The five observed coasting errors were not observed on the TSS-4100 units but on different units with similar software.

We agree with this comment. We did include more descriptive language in the preamble of the NPRM and this final rule. We added similar language to the Unsafe Condition in paragraph (e) of this AD to clarify the specific units where coasting error were observed.

### **Conclusion**

We reviewed the relevant data, considered the comments received, and determined that air safety and the public interest require adopting this final rule with the changes described previously and minor editorial changes. We have determined that these minor changes:

- Are consistent with the intent that was proposed in the NPRM for correcting the unsafe condition; and
- Do not add any additional burden upon the public than was already proposed in the NPRM.

We also determined that these changes will not increase the economic burden on any operator or increase the scope of this final rule.

### **Related Service Information Under 1 CFR Part 51**

We reviewed Rockwell Collins Service Information Letter, TSSA-4100-SIL-10-1, Revision No. 9, dated March 31, 2017; and Rockwell Collins Service Information Letter, TSSA-4100-SIL-10-1, Revision No. 10, dated July 10, 2017. The service letters both describe procedures for determining the part number of the affected FLS and the installation procedure for updating the FLS; however, Revision No. 10 contains minor editorial changes not included Revision No. 9. This service information is reasonably available because the interested parties have access to it through their normal course of business or by the means identified in the ADDRESSES section.

## Costs of Compliance

We estimate that this AD affects 1,000 products installed on airplanes of U.S. registry.

We estimate the following costs to comply with this AD:

### Estimated Costs

Action	Labor cost	Parts cost	Cost per product	Cost on U.S. operators
Upgrade the FLS to RCPN 810-0052-013 or 810-0052-102	1 work-hour × \$85 per hour = \$85	\$700	\$785	\$785,000

According to the manufacturer, some of the costs of this proposed AD may be covered by the manufacturer, thereby reducing the cost impact on affected individuals. We do not control manufacturer coverage for affected individuals. As a result, we have included all costs in our cost estimate.

## 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.

We are 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.

This AD is issued in accordance with authority delegated by the Executive Director, Aircraft Certification Service, as authorized by FAA Order 8000.51C. In accordance with that order, issuance of ADs is normally a function of the Compliance and Airworthiness Division, but during this transition period, the Executive Director has delegated the authority to issue ADs applicable to small airplanes and domestic business jet transport airplanes to the Director of the Policy and Innovation Division.

## 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) Is not a “significant rule” under DOT Regulatory Policies and Procedures (44 FR 11034, February 26, 1979),
- (3) Will not affect intrastate aviation in Alaska, and
- (4) 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.

### **Adoption of 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 (AD):



**2017-22-14 Rockwell Collins, Inc.:** Amendment 39-19094; Docket No. FAA-2017-0659; Product Identifier 2017-CE-014-AD.

**(a) Effective Date**

This AD is effective December 20, 2017.

**(b) Affected ADs**

None.

**(c) Applicability**

Rockwell Collins, Inc. TSSA-4100 Field Loadable Software (FLS) Rockwell Collins part numbers (RCPNs) 810-0052-002, -003, -010, -011, -012, -100, or -101 found on TSS-4100 Traffic Surveillance System Processing Units, (RCPN) 822-2132-001 installed on airplanes.

(1) The FLS RCPNs 810-0052-002, -003, -010, -011, -012, -100, or -101 found on TSS-4100 Traffic Surveillance System Processing Units are known to be installed on but not limited to the airplanes listed in paragraphs (c)(1)(i) through (14) of this AD and are certificated in any category.

- (i) Bombardier Challenger 300 (BD-100-1A10)
- (ii) Bombardier Challenger 350 (BD-100-1A10)
- (iii) Bombardier Challenger 650 (CL-600-2B16)
- (iv) Bombardier CRJ-700 (CL-600-2C10)
- (v) Bombardier CRJ-900 (CL-600-2D24)
- (vi) Bombardier CRJ-1000 (CL-600-2E25)
- (vii) Bombardier CS100 (BD-500-1A10)
- (viii) Bombardier CS300 (BD-500-1A11)
- (ix) Bombardier Global 5000 equipped with Global Vision Flight Deck (BD-700-1A11)
- (x) Bombardier Global 6000 (BD-700-1A10)
- (xi) Cessna Citation CJ4 (525C)
- (xii) Embraer Legacy (EMB-550)
- (xiii) Embraer Legacy 450 (EMB-545)
- (xiv) Gulfstream G280

(2) Earlier revision levels of the Rockwell Collins, Inc. service information and service information issued by airplane manufacturers before the effective date of this AD may have specified the installation of FLS with different FAA-approved part numbers than the part numbers listed in paragraph (c) of this AD. If, before December 20, 2017 (the effective date of this AD), a part number that is different than the TSSA-4100 RCPNs listed in paragraph (c) of this AD is installed on the airplane, this AD does not apply to that airplane.



**(d) Subject**

Joint Aircraft System Component (JASC)/Air Transport Association (ATA) of America Code 34, Navigation.

**(e) Unsafe Condition**

This AD was prompted by five instances of air traffic control observing coasting (extrapolated stale data) automatic dependent surveillance-broadcast data (ADS-B position/velocity data) on a related Rockwell Collins, Inc. platform that shares a common architecture with the TSS-4100 Traffic Surveillance System Processing Units. We are issuing this AD to prevent erroneous extrapolation of position/velocity and altitude data that could result in misleading position and/or altitude being reported by the airplane and possibly lead to mid-air collision.

**(f) Compliance**

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

**(g) Upgrade of FLS**

Within the next 12 months after December 20, 2017 (the effective date of this AD) or within the next 750 hours time-in-service after December 20, 2017 (the effective date of this AD), whichever occurs first, upgrade the TSSA-4100 FLS to RCPN 810-0052-013 or 810-0052-102, as applicable, following Rockwell Collins Service Information Letter, TSSA-4100-SIL-10-1, Revision No. 9, dated March 31, 2017; or Rockwell Collins Service Information Letter TSSA-4100-SIL-10-1, Revision No. 10, dated July 10, 2017.

**(h) 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 ACO, send it to the attention of the person identified in paragraph (i) of this AD.

(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.

**(i) Related Information**

For more information about this AD, contact Paul Rau, Aerospace Engineer, Wichita ACO, FAA, 1801 Airport Road, Room 100, Wichita, Kansas 67209; phone: 316-946-4149; fax: 316-946-4107; email: paul.rau@faa.gov.

**(j) Material Incorporated by Reference**

(1) The Director of the Federal Register approved the incorporation by reference (IBR) of the service information listed in this paragraph under 5 U.S.C. 552(a) and 1 CFR part 51.

(2) You must use this service information as applicable to do the actions required by this AD, unless the AD specifies otherwise.

(i) Rockwell Collins Service Information Letter, TSSA-4100-SIL-10-1, Revision No. 9, dated March 31, 2017.

(ii) Rockwell Collins Service Information Letter, TSSA-4100-SIL-10-1, Revision No. 10, dated July 10, 2017.

(3) For service information identified in this AD, contact Rockwell Collins, Inc., Collins Aviation Services, 400 Collins Road NE., M/S 164-100, Cedar Rapids, IA 52498-0001; telephone: 888-265-5467 (U.S.) or 319-265-5467; fax: 319-295-4941 (outside U.S.); email: techmanuals@rockwellcollins.com; Internet: <https://portal.rockwellcollins.com/web/publications-and-training>.

(4) You may view this service information at FAA, Policy and Innovation Division, 901 Locust, Kansas City, Missouri 64106. For information on the availability of this material at the FAA, call (816) 329-4148. It is also available on the internet at <http://www.regulations.gov> by searching for and locating Docket No. FAA-2017-0659.

(5) You may view this service information that is incorporated by reference at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030, or go to:

Issued in Kansas City, Missouri, on October 26, 2017.

Pat Mullen,  
Acting Manager, Small Airplane Directorate,  
Aircraft Certification Service.