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DEPARTMENT OF TRANSPORTATION 14 CFR Part 39

[Docket No. 93-NM-68-AD; Amendment 39-8786; AD 94-01-04]

Airworthiness Directives; Honeywell Traffic Alert and Collision Avoidance System II Computer Units, as Installed on Various Transport Category Airplanes

AGENCY: Federal Aviation Administration, DOT.

ACTION: Final rule.

SUMMARY: This amendment adopts a new airworthiness directive (AD), applicable to all Honeywell Traffic Alert and Collision Avoidance System II (TCAS II) computer units, installed on various transport category airplanes, that requires replacing certain TCAS II computer units with new units that incorporate updated collision avoidance system (CAS) logic, and modifying the computer surveillance logic. This amendment is prompted by the development of candidate enhancements to TCAS II logic that will improve its utility and increase its overall operational acceptance. The actions specified by this AD are intended to prevent collisions or near misses caused by incompatibility between the TCAS II processors and the current air traffic control system.

DATES: Effective February 4, 1994.

The incorporation by reference of certain publications listed in the regulations is approved by the Director of the Federal Register as of February 4, 1994.

ADDRESSES: The service information referenced in this AD may be obtained from Honeywell Inc., Commercial Flight Systems Group, Air Transport Systems Division, P.O. Box 21111, Phoenix, Arizona 85036.

This information may be examined at the Federal Aviation Administration (FAA), Transport Airplane Directorate, Rules Docket, 1601 Lind Avenue, SW., Renton, Washington; at the FAA, Transport Airplane Directorate, Los Angeles Aircraft Certification Office, 3229 East Spring Street, Long Beach, California; or at the Office of the Federal Register, 800 North Capitol Street, NW., suite 700, Washington, DC.

FOR FURTHER INFORMATION CONTACT: Abby Malmir, Aerospace Engineer, Systems and Equipment Branch, ANM-132L, FAA, Transport Airplane Directorate, Los Angeles Aircraft Certification Office, 3229 East Spring Street, Long Beach, California 90806-2425; telephone (310) 988-5351; fax (310) 988-5210.

SUPPLEMENTARY INFORMATION: A proposal to amend part 39 of the Federal Aviation Regulations to include an airworthiness directive (AD) that is applicable to all Honeywell Traffic Alert and Collision Avoidance System II (TCAS II) computer units installed on various transport category airplanes was published in the Federal Register on September 9, 1993 (58 FR 47407). That action proposed to require replacing certain TCAS II computer units with new units that incorporate updated collision avoidance system (CAS) logic, and modifying the computer surveillance logic.

Since the issuance of the notice, an additional change to Version 6.04A collision avoidance system (CAS) logic was recommended at a meeting held to discuss the progress made in implementing logic modification 6.04A. Meeting attendees included representatives from the FAA and European civil aviation authorities, U.S. and European aviation industry, and U.S. operators. The logic change that was recommended involves reducing unnecessary crossing resolution advisories (RA). That change is included in a new enhanced software package (identified as Version 6.04A), specified in Mitre letter F046-L-0069, dated September 21, 1993.

Subsequently, Honeywell Inc. has issued Service Bulletin 4066010-34-SW16, dated December 20, 1993. The service bulletin describes procedures for converting certain TCAS II computer units to new units (Version 6.04A). The new units incorporate all of the logic changes specified in the preamble to the notice, including updating CAS logic, modifying the computer surveillance logic to ensure that these units accommodate Mode C altitude input of 100-foot increments, and ensuring that the system will be tracked and coordinated by intruding aircraft when the Mode S transponder CA field is set at CA=7. The conversion is onboard-loadable, or it may be accomplished at a field repair shop. The first method involves data loading the TCAS II computer unit in the aircraft equipment bay using an ARINC 615 or 603 data loader. The second method entails performing a final test, and then programming the TCAS II computer unit to convert it to the latest enhanced version at a field repair shop.

The notice proposed that operators accomplish the modification requirements of this AD in accordance with a method approved by the FAA. However, the FAA has reviewed and approved the Honeywell service bulletin discussed previously, and has determined that accomplishment of this service bulletin is an appropriate method of compliance.

Consequently, the FAA has revised paragraph (a) of the final rule to cite the Honeywell service bulletin as the appropriate source of service information, and has removed the language referring to accomplishing the actions ``in accordance with a method approved by the

FAA." Even though this language has been deleted from paragraph (a), operators may still be permitted to accomplish the actions in accordance with an FAA-approved method under the provisions of paragraph (c) of the final rule.

In light of this new data and software development, the FAA has revised the final rule by changing the reference to Mitre letter F046-L-0056, dated July 20, 1993, which appeared in paragraph (a)(1) of the NPRM, to Mitre letter F046-L-0069, dated September 21, 1993, since the latter identifies the enhanced software package. Since the original Version 6.04A software was never issued, no operator could have installed that version. Therefore, no redundant actions would be required on the part of any operator as a result of this change.

Since the enhanced Version 6.04A software introduces a change in the operation of the aircraft, the FAA also finds that a revision to the Airplane Flight Manual (AFM) is necessary as a conforming change to correspond with that new software configuration. The AFM revision is advisory only, and will ensure that the flight crew is aware of the changes associated with the new software installation. Consequently, paragraph (b) has been added to the final rule to reflect this informational AFM revision.

Interested persons have been afforded an opportunity to participate in the making of this amendment. Due consideration has been given to the comments received in response to the notice:

One commenter, Honeywell, objects to the proposed compliance date of December 30, 1993, and states that December 31, 1994, represents a more realistic compliance timeframe. Honeywell indicates that operators vary in their ability to load the updated software due to maintenance and aircraft schedules and data-load/test resources. Honeywell states that, although it has been working aggressively to implement the latest change, that change has resulted in a delay in the date operators will be able to implement the latest change.

Several other commenters also request that the FAA extend the proposed compliance date from 3 to 18 months after the date specified in the proposal in order to accommodate implementation, verification, certification, and incorporation of the proposed software change into existing installations. One commenter, the Air Transport Association (ATA) of America, supports implementation of the latest enhanced Version 6.04A, and requests that the FAA issue a supplemental notice of proposed rulemaking (NPRM) to propose that this revised software be retrofitted by June 30, 1995. ATA contends that significant differences exist between Version 6.04A and the latest enhanced version. Another commenter requests that the FAA solicit comments from foreign agencies participating in TCAS evaluation and simulations to help ensure that the proposed Version 6.04A revision will be compatible and acceptable.

The FAA concurs partially with these requests to extend the compliance time. The FAA has considered the safety implications, the time necessary for approval of the enhanced Version 6.04A software, the size of the fleet, and normal maintenance schedules for timely accomplishment of implementation of the modification. In light of these considerations, the FAA has determined that a compliance date of December 31, 1994, is appropriate. Paragraph (a) of the final rule has been revised to specify the revised compliance date.

However, in response to the requests that a supplemental NPRM be issued and that further public comments be solicited, the FAA submits the following. Comments received in response to the proposal reflect unanimous support for implementation of the latest enhanced Version 6.04A software. The FAA considers the logic change (reduction of unnecessary crossing RA's) incorporated in the enhanced software to be a minor change. The intent of this AD is to require that the addressed unsafe condition be corrected by installing modified TCAS II computer units that incorporate updated CAS logic. The FAA has determined that a requirement to implement Version 6.04A software, including the latest enhancement, will meet that intent, will not alter the substance of the rule, and will impose no additional burden on any member of the public. Additionally, issuance of a supplemental NPRM would necessitate (under the provisions of the Administrative Procedure Act) reissuing the notice, reopening the period for public comment, considering additional comments received, and eventually issuing a final rule; the time required for that procedure may be as long as four additional months. In light of this, and in consideration of the amount of time that has already elapsed since issuance of the original NPRM, the FAA concludes that solicitation of further public comment is not necessary and that further delay of this final rule action is not appropriate.

One commenter requests that the FAA require Honeywell TCAS II processors that are already installed be operated in the "traffic advisory (TA) only" mode until the updated software package is installed. The commenter indicates that ``possible hidden problems" could exist between the different versions of logic that are installed currently in the TCAS II processors.

The FAA does not concur with the commenter's request. Operation of currently installed TCAS II processors in the ``TA only" mode would impair the capability of those processors to alert the flight crew of appropriate aircraft maneuvers that must be taken to prevent mid-air collisions.

Further, the FAA is unaware of any ``possible hidden problems" between the different versions of logic installed currently in the TCAS II processors, as suggested by the commenter. Therefore, the FAA concludes that currently installed TCAS II processors should not be operated in the ``TA only" mode until the updated software packaged is installed.

One commenter requests clarification of the unsafe condition specified in the proposed rule. This commenter points out differences in the wording of the unsafe condition between this proposed rule and two existing proposals that address the same CAS logic change for Rockwell International/Collins Air Transport Division (Collins), and Allied Signal Aerospace Company/Air Transport Avionics (Allied Signal), TCAS II processors. From this comment, the FAA infers that the commenter requests that the proposed statement of unsafe condition more closely parallels the statement of unsafe condition in the other two proposals addressing the same subject.

The FAA concurs. The FAA has revised the unsafe condition specified in this final rule to coincide with the proposals that address Collins and Allied Signal TCAS II processors to more explicitly reference safety considerations, as follows: ``* * * to prevent collisions or near misses caused by incompatibility between the TCAS II processors and the current air traffic control system."

One commenter, Falcon Jet Corporation, indicates that Honeywell TCAS II processors are installed on Mystere-Falcon Model 50 and 900 series airplanes, and requests that these airplanes be included in the portion of the applicability of the AD that lists airplanes on which this TCAS II processor may be installed. The FAA concurs with the commenter's request and has revised the final rule accordingly. In addition, the FAA has become aware of other airplane models affected by this AD and has included those models in that portion of the applicability statement of the final rule. The FAA clarifies that, as stated in the preamble and the applicability of the proposal, the affected Honeywell TCAS II processors are installed on various transport category airplanes and are not limited only to those airplanes listed in the applicability of this AD.

Several commenters request that the FAA revise the economic impact information specified in the proposal to reflect costs borne by suppliers, installers, and airline operators associated with development, testing, and certification of the modified processor.

The FAA does not concur with the commenters' request to revise the economic impact information contained in this AD. The appropriate number of hours required to accomplish the required actions, specified as 3 in the economic impact information, below, was provided to the FAA by the processor manufacturer based on the best data available to date. This number represents the time required to gain access, remove the existing processor, install a diskette containing the revised software, and close up. The cost analysis in AD rulemaking actions typically does not include costs associated with development, testing, and certification of a modified processor, as suggested by the commenter.

After careful review of the available data, including the comments noted above, the FAA has determined that air safety and the public interest require the adoption of the rule with the changes previously described. The FAA has determined that these changes will neither increase the economic burden on any operator nor increase the scope of the AD.

There are approximately 2,700 transport category airplanes in the worldwide fleet on which the Honeywell TCAS II computer units may be installed. The FAA estimates that 1,150 airplanes of U.S. registry will be affected by this AD, that it will take approximately 3 work hours per airplane to accomplish the required actions, and that the average labor rate is \$55 per work hour.

Required parts will be supplied by the manufacturer at no cost to operators. Based on these figures, the total cost impact of the AD on U.S. operators is estimated to be \$189,750, or \$165 per airplane. This total cost figure assumes that no operator has yet accomplished the requirements of this AD.

The regulations adopted herein will not have substantial direct effects 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. Therefore, in accordance with Executive Order 12612, it is determined that this final rule does not have sufficient federalism implications to warrant the preparation of a Federalism Assessment.

For the reasons discussed above, I certify that this action

(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); 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. A final evaluation has been prepared for this action and it is contained in the Rules Docket. A copy of it may be obtained from the Rules Docket at the location provided under the caption ADDRESSES.

List of Subjects in 14 CFR Part 39

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

Adoption of the Amendment

Accordingly, pursuant to the authority delegated to me by the Administrator, the Federal Aviation Administration amends 14 CFR part 39 of the Federal Aviation Regulations as follows:

PART 39--AIRWORTHINESS DIRECTIVES

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

Authority: 49 U.S.C. App. 1354(a), 1421 and 1423; 49 U.S.C. 106(g); and 14 CFR 11.89.

Sec. 39.13 [Amended]

2. Section 39.13 is amended by adding the following new airworthiness directive:

AIRWORTHINESS DIRECTIVE



Aircraft Certification Service Washington, DC

U.S. Department of Transportation Federal Aviation Administration

The following Airworthiness Directive issued by the Federal Aviation Administration in accordance with the provisions of Federal Aviation Regulations, Part 39, applies to an aircraft model of which our records indicate you may be the registered owner. Airworthiness Directives affect aviation safety and are regulations which require immediate attention. You are cautioned that no person may operate an aircraft to which an Airworthiness Directive applies, except in accordance with the requirements of the Airworthiness Directive (reference 14 CFR part 39, subpart 39.3).

94-01-04 HONEYWELL: Amendment 39-8786. Docket 93-NM-68-AD.

Applicability: Traffic Alert and Collision Avoidance System (TCAS) II computer units; part numbers 4066010-901, -902, and -903; as installed on, but not limited to, the following airplanes, certificated in any category:

Airbus Industrie Model A300-600, A310-200, A310-300, A320-200, and A340 series airplanes; Boeing Model 727-100 and -200; 737-100, -200, -300, -400, and -500; 747-100, -200, -300, -400 and 747SP; 757-200; and 767-200 and -300 series airplanes;

Cessna Citation Model C550 and C560 series airplanes, and Cessna Citation III and VII series airplanes;

Canadair Challenger Model CL-600-2B16 and -2A12 series airplanes;

British Aerospace Model 125-800A;

Gulfstream Model GII, GIIB, GIII, and GIV series airplanes;

Lockheed Model L-1011 series airplanes;

McDonnell Douglas Model DC-9-10, -20, -30-, -40, and -50; DC-10-10, -15, -30, and -40; MD-11; and DC-9-80 series airplanes; and Model MD-88 airplanes;

Dassault Aviation Model Mystere-Falcon 50 and 900 series airplanes;

Short Brothers Model SD3-60 series airplanes;

de Havilland Model DHC-8-100 and DHC-7 series airplanes;

Fokker Model F27 series airplanes; and

Corporate Jets Limited Model BAe 125-800A and BAe 125-1000A series airplanes.

Compliance: Required as indicated, unless accomplished previously.

To prevent collisions or near misses caused by incompatibility between the TCAS II processors and the current air traffic control system, accomplish the following:

(a) Before December 31, 1994, accomplish the requirements of paragraphs (a)(1) and (a)(2) of this AD in accordance with Honeywell Service Bulletin 4066010-34-SW16, dated December 20, 1993.

(1) Remove existing Honeywell TCAS II computer units, part numbers 4066010-901, -902, and -903, and replace those units with new units that incorporate updated collision avoidance system (CAS) logic, identified as Version 6.04A in Mitre letter F046-L-0069, dated September 21, 1993.

(2) Modify the computer surveillance logic on Honeywell TCAS II computer units, part numbers 4066010-901, -902, and -903, to ensure that these units accommodate Mode C altitude input of 100-foot increments and that the system will be tracked and coordinated by intruding aircraft when the Mode S transponder CA field is set at CA=7.

(b) Prior to further flight after accomplishing the requirements of paragraph (a) of this AD, revise the Airplane Flight Manual (AFM) or AFM Supplement by accomplishing either paragraph (b)(1) or (b)(2) of this AD.

(1) Revise the Normal Procedures Section of the AFM to include the appropriate TCAS operating characteristic relative to the modifications required by paragraph (a) of this AD, in accordance with a method approved by the Manager, Los Angeles Aircraft Certification Office (ACO), FAA, Transport Airplane Directorate. Or

(2) Revise the Normal Procedures Section of the AFM to include the following TCAS operating characteristic relative to the modification required by paragraph (a) of this AD. This may be accomplished by inserting a copy of this AD in the AFM or AFM Supplement.

"All Resolution Advisory (RA) and Traffic Advisory (TA) aural messages are inhibited at a radio altitude of less than 1,100 feet above ground level (AGL) climbing, and less than 900 feel AGL descending."

(c) An alternative method of compliance or adjustment of the compliance time that provides an acceptable level of safety may be used if approved by the Manager, Los Angeles Aircraft Certification Office (ACO), FAA, Transport Airplane Directorate. Operators shall submit their requests through an appropriate FAA Principal Avionics Inspector, who may add comments and then send it to the Manager, Los Angeles ACO.

NOTE: Information concerning the existence of approved alternative methods of compliance with this AD, if any, may be obtained from the Los Angeles ACO.

(d) Special flight permits may be issued in accordance with FAR 21.197 and 21.199 to operate the airplane to a location where the requirements of this AD can be accomplished.

(e) The replacement and modification shall be done in accordance with Honeywell Service Bulletin 4066010-34-SW16, dated December 20, 1993. This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR Part 51. Copies may be obtained from Honeywell Inc., Commercial Flight Systems Group, Air Transport Systems Division, P.O. Box 21111, Phoenix, Arizona 85036. Copies may be inspected at the FAA, Transport Airplane Directorate, 1601 Lind Avenue, SW., Renton, Washington; at the FAA, Transport Airplane Directorate, Los Angeles Aircraft Certification Office, 3229 East Spring Street, Long Beach, California; or at the Office of the Federal Register, 800 North Capitol Street, NW., suite 700, Washington, DC.

(f) This amendment becomes effective on February 4, 1994.