



PURSUANT to Sections 28, 29 and 30 of the Civil Aviation Act 1990

I, Hon Julie Anne Genter, Associate Minister of Transport,

HEREBY MAKE the following ordinary rules.

SIGNED AT Wellington

This 15th day of June 2018

A handwritten signature in black ink, appearing to read 'Julie A Genter', is written over a faint, larger version of the same signature.

by Hon Julie Anne Genter

Associate Minister of Transport

Civil Aviation Rules

Part 43, Amendment 15

General Maintenance Rules

Docket 16/CAR/12

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Rule objective

The objective of amendment 15 to Part 43 is to make consequential amendments resulting from amendment 30 to Part 91. This amendment updates the reference from ‘SSR’ to ‘surveillance’ in respect of a transponder, in rule 43.63, and inserts Appendix E.12.

Appendix E.12 provides for the verifying of ADS-B systems having met the transponder performance requirements specified in a notice required by rule 91.258, as specified in the rule.

Amendment 15 to Part 43 is associated with the following amendments to other rule Parts –

- amendment 54 to Part 1
- amendment 6 to Part 66
- amendment 30 to Part 91
- amendment 9 to Part 101
- amendment 8 to Part 103
- amendment 13 to Part 172

Extent of consultation

A Notice of Proposed Rulemaking, NPRM 18-02, containing the proposed NPRM was issued for public consultation on the CAA website under Docket 16/CAR/12 on 14 September 2017. Submissions closed on 27 October 2017.

The publication of this NPRM was notified in the *Gazette* on 21 September 2017. A period of 44 days was allowed for comment on the proposed rule.

Summary of submissions

A total of six submitters provided written submissions on the NPRM. There were no oral comments received. These submissions have been considered. There were no amendments to this Part as a result of the

submissions. A summary of submissions for this NPRM is available on the CAA website.

Examination of submissions

Submissions may be examined by application to the Docket Clerk at the Civil Aviation Authority between 8:30 am and 4:30 pm on weekdays, except statutory holidays.

Insertion of Amendments

The amendments to the rules in this Part are reflected by –

- revoking and replacing rule 43.63; and
- revoking and replacing Appendix E.

Effective date of rule

Amendment 15 to Part 43 comes into force on 20 July 2018

Availability of rules

Civil Aviation Rules are available from–

CAA web site: <http://www.caa.govt.nz/>
Freephone: 0800 GET RULES (0800 438 785)

Part 43 General Maintenance Rules

Subpart B – Maintenance

Rule 43.63 is revoked and replaced with the following rule.

43.63 Surveillance transponder tests and inspections

A person performing an inspection of the surveillance transponder required by Part 91 must perform the tests and inspections specified in Appendix E.

Appendix E is revoked and replaced with the following Appendix.

Appendix E—ATC Transponder Tests and Inspections

This appendix applies to a person referred to in rule 43.63.

E.1 General

- (a) The ATC transponder tests may be conducted using a suitable bench check or portable test equipment.
- (b) If portable test equipment with appropriate coupling to the aircraft antenna system is used, operate the test equipment for ATCRBS transponders at a nominal rate of 235 interrogations per second to avoid possible ATCRBS interference.
- (c) For Mode S, operate the test equipment at a nominal rate of 50 Mode S interrogations per second.
- (d) An additional 3 dB loss is allowed to compensate for antenna coupling errors during receiver sensitivity measurements conducted under paragraph E.4 (a)(3) below when using portable test equipment.

E.2 Radio reply frequency test

- (a) For all classes of ATCRBS transponders, interrogate the transponder and verify that the reply frequency is 1090 ± 3 MHz.
- (b) For classes 1B, 2B, and 3B Mode S transponders, interrogate the transponder and verify that the reply frequency is 1090 ± 3 MHz.

(c) For classes 1B, 2B, and 3B Mode S transponders that incorporate the optional 1090 ± 1 MHz reply frequency, interrogate the transponder and verify that the reply frequency is correct.

(d) For classes 1A, 2A, 3A, and 4 Mode S transponders, interrogate the transponder and verify that the reply frequency is 1090 ± 1 MHz.

E.3 Suppression test

(a) When classes 1B and 2B ATCRBS Transponders, or Classes 1B, 2B, and 3B Mode S transponders are interrogated at a rate between 230 and 1000 Mode 3/A interrogations per second or when Classes 1A and 2A ATCRBS Transponders, or Classes 1B, 2A, 3A, and 4 Mode S transponders are interrogated at a rate between 230 and 1200 Mode 3/A interrogations per second—

- (1) verify that the transponder does not respond to more than 1 % of ATCRBS interrogations when the amplitude of P2 pulse is equal to the P1 pulse; and
- (2) verify that the transponder replies to at least 90 % of ATCRBS interrogations when the amplitude of the P2 pulse is 9 dB less than the P1 pulse.

(b) If the test is conducted with a radiated test signal, the interrogation rate shall be 235 ± 5 interrogations per second unless a higher rate has been approved for the test equipment used at that location.

E.4 Receiver sensitivity test

(a) Verify that, for any class of ATCRBS Transponder, the minimum triggering level of the receiver for the system is -73 ± 4 dBm, or that for any class of Mode S transponder, the minimum triggering level of the receiver for Mode S format (P6 type) interrogations is 74 ± 3 dBm by use of a test set—

- (1) connected to the antenna end of the transmission line; or
- (2) connected to the antenna terminal of the transponder with a correction for transmission line loss; or
- (3) utilising radiated signals.

(b) Verify that the difference in Mode 3/A and Mode C receiver sensitivity does not exceed 1 dBm for either any class of ATCRBS transponder or any class of Mode S transponder.

E.5 RF peak output power test

Verify that the transponder RF output power is within the following specifications for the class of transponder using the conditions prescribed in paragraph E.4 (a):

(a) For class 1A and 2A ATCRBS transponders, the minimum RF peak output power is at least 21.0 dbw (125 watts):

(b) For class 1B and 2B ATCRBS transponders, the minimum RF peak output power is at least 18.5 dbw (70 watts):

(c) For class 1A, 2A, 3A, and 4 and those Class 1B, 2B, and 3B Mode S transponders that include the optional high RF peak output power, the minimum RF peak output power is at least 21.0 dbw (125 watts):

(d) For class 1B, 2B, and 3B Mode S transponders, the minimum RF peak output power is at least 18.5 dbw (70 watts):

(e) For any class of ATCRBS or any class of Mode S transponders, the maximum RF peak output power does not exceed 27.0 dbw (500 watts).

E.6 Mode S diversity transmission channel isolation test

For any class of Mode S transponder that incorporates diversity operation, verify that the RF peak output power transmitted from the selected antenna exceeds the power transmitted from the non-selected antenna by at least 20 dB.

E.7 Mode S address test

Interrogate the Mode S transponder using the correct address and at least 2 incorrect addresses and making the interrogations at a nominal rate of 50 interrogations per second and verify that it replies only to its assigned address.

E.8 Mode S formats test

- (a) Interrogate the Mode S transponder with UF for which it is equipped and verify that the replies are made in the correct format using the surveillance formats UF=4 and 5.
- (b) Verify that the altitude reported in the replies to UF=4 are the same as that reported in a valid ATCRBS Mode C reply.
- (c) Verify that the identity reported in the replies to UF=5 are the same as that reported in a valid ATCRBS Mode 3/A reply, if the transponder is so equipped, using the communication formats UF=20, 21, and 24.

E.9 Mode S all-call interrogations test

Interrogate the Mode S transponder with the Mode S-only all-call format UF=11, and the ATCRBS/Mode S all-call formats (1.6 microsecond P4 pulse) and verify that the correct address and capability are reported in the replies (downlink format DF=11).

E.10 Mode S ATCRBS-only all-call interrogation test

Interrogate the Mode S transponder with the ATCRBS-only all-call interrogation (0.8 microsecond P4 pulse) and verify that no reply is generated.

E.11 Mode S Squitter test

Verify that the Mode S transponder generates a correct squitter approximately once per second.

E.12 ADS-B (Mode S Extender Squitter)

- (a) Verify that the ADS-B system meets the transponder performance requirements specified in a notice required by rule 91.258, demonstrated using an appropriate transponder test set.
- (b) Test reports must be retained in the aircraft maintenance records.