**RTCA Special Committee 209**

**Working Group #1**

**Mode S Transponder Development & Maintenance**

**Meeting #2**

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# Comparison of the Shalls from DO 181Dv08 and ED 73Cv2

Prepared by:
William A. Thedford, Ph. D., AACAS LLC

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Approved for Distribution:
BENJAMIN M. BRANDT, Capt, USAF
Acting Chief, GATM Division
853d Electronic Systems Group

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# Introduction

This work has been done in support of RTCA 209 and WG 49 as part of the effort to document the relationship between the final products of these two working groups. This document consists of several hundred tables like the one below. Each table summarizes the relationship between a shall in DO 181Dv8 and ED 73Cv2.

I appreciate the support from Bob Grappel of Lincoln Laboratory in reviewing some of this material. The review will continue through the next several weeks.

This document should be considered an initial release and is not final. The final version of this document will compare the final versions of the two documents and will include comments from the working groups where necessary.

Each table in this document is structured as shown in this sample.

| | | | | | |
|---|---|---|---|---|---|
| Different | ID=847 | | | | |
| DO 181D v08 | shall0120 | Page 30 | ED 73C v01 | shall0207 | Page 40 |
| WAT | Comment: ED additionally refers to "acquisition squitter…" | | second shall | | |
| | | | | | |
| 2.2.7.3.2 Mode S Reply Rate Limiting | | | 3.11 REPLY RATE LIMITING | | |
| If a reply rate limiting device is provided for Mode S replies, it shall <<shall0120>> permit at least the reply rates required in §2.2.3.4.2. A limiting device may be used to protect the transponder from accidental over-interrogation. | | | If a reply rate limiting device is provided for Mode S replies, it shall <<shall0206>> permit at least the reply rates specified in paragraph 3.4 and shall <<shall0207>> not prevent acquisition squitter transmission as per 3.20.2.6 and extended squitter as per 3.21.2.6 nor the transmission of a DF=16 (3.21.1.4). | | |

Contents Description:

General Notes:

- A“shall0000” is used to indicate that not relationship to the other document was found.
- All of this work is preliminary and subject to finalization by the RTCA SC 209 and EUROCAE WG 49.
- The information is sorted by Relationship and then by the DO 181D v8 shall number.
- The relationship mapping between the documents is not yet complete. I expect to finish it approximately one week before the RTCA SC 209 meeting starting on May 29, 2007.

Cell(1,1): Relationship. In the example its value is “Different.” There are 5 values

- Comparable – The shalls are assessed as being either identical or different on only insignificant ways. For example, in Europe the collision avoidance system is referred to as ACAS and in the United States it is referred to as TCAS. This is considered to be an insignificant difference.

- Similar – This assessment is to indicate that the shalls convey substantially the same information but there may be differences in interpretation.
- Uncertain – The uncertain relationship between two shalls indicated that the relationship should be reviewed for final assessment.
- Different = Two shalls convey different standards if they are not the same in some distinct way.
- No Link – A summary table indicates no link when the relationship does not exist between a shall in one document with the other.

Cell(1,2): ID number. This is provided so that the source of the information can be traced to the summary analysis in an MS Access database.

Cell(2,1): Document name for data on the left

Cell(2.2): Shall number. The version of the document provided with this summary has this shall inserted in hidden text between "<<" and ">>" and bookmarked.

Cell(2,3): Page number in the provided document. The page number is not necessarily exact but will help in locating the information.

Cells (2,4) – (2,6): Same as for cells (2-1) – (2-3).

Cell(3,1): WAT refers to Wm. A. Thedford, the reviewer

Cell(3,2): The comment provided by the reviewer.

Cell(4,1) – (4,2): Space provided for comments from other reviewers.

Cell(5,1) – (5,2): Section titles that the shalls are under.

Cell(6,1) – (6,2): Paragraphs containing the shalls.

# Summary of Comparable Shalls

| Comparable | ID=726 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0005 | Page 12 | ED 73C v01 | shall0012 | Page 13 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.1.1 Airworthiness | | | 2.1 AIRWORTHINESS | | |
| The design and manufacture of the equipment shall <<shall0005>> provide for installation that does not impair the airworthiness of the aircraft. | | | The equipment shall <<shall0012>> not, under normal or fault conditions, impair the airworthiness of the aircraft in which it is installed. | | |

| Comparable | ID=730 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0009 | Page 12 | ED 73C v01 | shall0014 | Page 13 |
| WAT | Comment: | | | | |
| | | | | | |
| 2.1.4 Fire Protection | | | 2.3 FIRE PROTECTION | | |
| Except for small parts (such as knobs, fasteners, seals, grommets and small electrical parts) that would not contribute significantly to the propagation of a fire, all materials used shall <<shall0009>> be self-extinguishing. | | | Except for small parts (such as knobs, fasteners, seals, grommets and small electrical parts) that would not contribute significantly to the propagation of a fire, all materials used shall <<shall0014>> be self-extinguishing. | | |

| Comparable | ID=731 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0010 | Page 12 | ED 73C v01 | shall0015 | Page 13 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.1.5 Operation of Controls | | | 2.4 OPERATION OF CONTROLS | | |
| The operation of controls intended for use during flight, in all possible combinations and sequences, shall <<shall0010>> not result in a condition detrimental to the continued performance of the equipment (see §2.1.2). | | | The operation of controls intended for use during flight, in all possible positions, combinations and sequences, shall <<shall0015>> not result in a condition detrimental to the continued performance of the equipment. | | |

| Comparable | ID=732 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0011 | Page 12 | ED 73C v01 | shall0016 | Page 13 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.1.6 Accessibility of Controls | | | 2.4 OPERATION OF CONTROLS | | |
| Controls that are not normally adjusted in flight shall <<shall0011>> not be readily accessible to flight personnel. | | | Controls which are not intended to be operated in flight shall <<shall0016>> not be readily accessible to flight personnel. | | |

| Comparable | ID=734 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0013 | Page 13 | ED 73C v01 | shall0020 | Page 14 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.1.7 Flight Crew Control Functions | | | 2.5 CONTROL AND INDICATION FUNCTIONS | | |
| b. Means of selecting the condition in which the transponder is rendered incapable of generating replies to ATCRBS, ATCRBS/Mode S All Call, and Mode S-only All Call interrogations, but continues to generate Mode S squitter transmissions and continues to reply to discretely addressed Mode S interrogations when the aircraft is on the ground. Return to normal operation from this condition shall <<shall0013>> be possible within five seconds. If this condition is enabled automatically when the aircraft is on the ground, a flight crew switch is not necessary. If performed manually, this condition shall <<shall0014>> have no effect on the transmission of Extended Squitters (see §2.2.23.1.2) or on the reporting of on-the-ground state (see §2.2.13.1.2.c, and §2.2.18.2.7.b). Transponders that simulate ATCRBS/Mode S All Call interrogations in self-test/squitter transmission may occasionally open their window of non-acceptance for this purpose coincidental with an actual interrogation, thus generating a reply to the interrogation. Such coincidental acceptance periods may be considered tolerable, but must not exceed one percent of transponder operating time. | | | Return to normal operation from this condition shall <<shall0020>> be possible within five seconds. | | |

| Comparable | ID=736 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0015 | Page 13 | ED 73C v01 | shall0024 | Page 14 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.1.7 Flight Crew Control Functions | | | 2.5 CONTROL AND INDICATION FUNCTIONS | | |
| c. Means of selecting the condition in which all transponder functions, other than transmission on the reply frequency and associated self-testing, are operational (i.e., the Standby condition). Return to normal operation from this condition shall <<shall0015>> be possible within five seconds. | | | Means of selecting the condition in which all transponder functions, other than transmissions on the reply frequency and associated self-testing, are operational (i.e., the Standby condition) when NOT in the Hijack Mode (2.7). Return to normal operation from this condition shall <<shall0024>> be possible within five seconds. | | |

| Comparable | ID=737 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0016 | Page 13 | ED 73C v01 | shall0027 | Page 15 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.1.7 Flight Crew Control Functions | | | 2.5 CONTROL AND INDICATION FUNCTIONS | | |
| f. If the aircraft uses a flight number for aircraft identification, a means shall <<shall0016>> be provided for the variable aircraft identification to be inserted by the pilot. | | | h. If the aircraft uses a flight number for aircraft identification, a means shall <<shall0027>> be provided for the variable aircraft identification to be inserted by the pilot. | | |

| Comparable | ID=738 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0017 | Page 13 | ED 73C v01 | shall0089 | Page 23 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.1.9 Effects of Tests | | | 2.8 EFFECTS OF TESTS | | |
| Unless otherwise provided, the application of the specified tests shall <<shall0017>> produce no subsequently discernible condition detrimental to the continued performance of the equipment. | | | Unless otherwise stated, the design of the equipment shall <<shall0089>> be such that, during and after the application of the specified tests, no condition exists which would be detrimental to the subsequent performance of the equipment. | | |

| Comparable | ID=739 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0018 | Page 18 | ED 73C v01 | shall0094 | Page 25 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.2.1 Interrogation Tolerances | | | 3.2.1 Received Interrogation Tolerances | | |
| Paragraph §2.1.11 and its subparagraphs define a number of deviations allowed in the interrogation values. The transponder shall <<shall0018>> be tolerant to all such deviations within the ranges specified in §2.1.11. | | | The equipment shall <<shall0094>> meet all criteria of this minimum operational performance specification with interrogation signals within the tolerance range defined in paragraph 1.6. | | |

| Comparable | ID=740 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0019 | Page 18 | ED 73C v01 | shall0095 | Page 25 |
| WAT | Comment: 1st shall | | | | |
| | | | | | |
| 2.2.2.2 Sensitivity Variation With Frequency | | | 3.2.2 Sensitivity Variation with Frequency | | |
| The RF input level required to produce 90 percent replies shall <<shall0019>> not vary by more than 1 dB and shall <<shall0020>> at no time exceed a level of -69 dBm for standard ATCRBS interrogation signals in the frequency range between 1029.8 and 1030.2 MHz. | | | The RF input level needed to produce 90% Mode A or Mode C replies shall <<shall0095>> not vary by more than 1 dB and shall <<shall0096>> at no time exceed a level of -69 dBm for standard interrogation signals in the frequency range of 1 029.8 to 1 030.2 MHz. | | |

| Comparable | ID=741 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0020 | Page 18 | ED 73C v01 | shall0096 | Page 25 |
| WAT | Comment: 2d shall | | | | |
| | | | | | |
| 2.2.2.2 Sensitivity Variation With Frequency | | | 3.2.2 Sensitivity Variation with Frequency | | |
| The RF input level required to produce 90 percent replies shall <<shall0019>> not vary by more than 1 dB and shall <<shall0020>> at no time exceed a level of -69 dBm for standard ATCRBS interrogation signals in the frequency range between 1029.8 and 1030.2 MHz. | | | The RF input level needed to produce 90% Mode A or Mode C replies shall <<shall0095>> not vary by more than 1 dB and shall <<shall0096>> at no time exceed a level of -69 dBm for standard interrogation signals in the frequency range of 1 029.8 to 1 030.2 MHz. | | |

| Comparable | ID=742 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0021 | Page 18 | ED 73C v01 | shall0097 | Page 25 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.2.3 Bandwidth | | | 3.2.3 Bandwidth | | |
| The standard ATCRBS interrogation signal required to trigger the transponder below 1005 MHz and above 1055 MHz shall <<shall0021>> be at least 60 dB stronger than that required to trigger the transponder at 1030 MHz with the same reply efficiency. | | | The level of an interrogation signal needed to trigger the transponder at frequencies below 1 005 MHz and above 1 055 MHz shall <<shall0097>> be at least 60 dB above the level needed to trigger the transponder at 1 030 MHz with the same reply efficiency. | | |

| Comparable | ID=744 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0023 | Page 19 | ED 73C v01 | shall0099 | Page 26 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.2.4 Sensitivity and Dynamic Range | | | 3.2.4 Sensitivity and Dynamic Range | | |
| b. The MTL for Mode S format (P6 type) interrogations shall <<shall0023>> be -74 dBm ±3 dB. | | | b. The MTL for Mode S (P6 type) interrogations shall <<shall0099>> be -74 dBm, ±3 dB. | | |

| Comparable | ID=745 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0024 | Page 19 | ED 73C v01 | shall0100 | Page 26 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.2.4 Sensitivity and Dynamic Range | | | 3.2.4 Sensitivity and Dynamic Range | | |
| c. The reply ratio shall <<shall0024>> be at least 99 percent for all Mode S (P6 type) interrogations between MTL +3 dB and -21 dBm. | | | c. The reply ratio shall <<shall0100>> be at least 99% for all Mode S (P6 type) interrogations at signal levels between MTL+3dB and -21 dBm. | | |

| Comparable | ID=746 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0025 | Page 19 | ED 73C v01 | shall0101 | Page 26 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.2.4 Sensitivity and Dynamic Range | | | 3.2.4 Sensitivity and Dynamic Range | | |
| d. The reply ratio shall <<shall0025>> not be more than 10 percent for interrogations at signal levels below -81 dBm. | | | d. The reply ratio shall <<shall0101>> not be more than 10% for interrogations at signal levels equal to or below -81 dBm. | | |

| Comparable | ID=747 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0026 | Page 19 | ED 73C v01 | shall0102 | Page 26 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.2.4 Sensitivity and Dynamic Range | | | 3.2.4 Sensitivity and Dynamic Range | | |
| e. The variation of the MTL between ATCRBS Mode A and Mode C interrogations shall <<shall0026>> not exceed 1 dB. | | | e. The variation of the MTL between Mode A and Mode C interrogations shall <<shall0102>> not exceed 1 dB. | | |

| Comparable | ID=748 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0027 | Page 19 | ED 73C v01 | shall0103 | Page 26 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.2.4 Sensitivity and Dynamic Range | | | 3.2.4 Sensitivity and Dynamic Range | | |
| f. The reply ratio shall <<shall0027>> be at least 90 percent for ATCRBS and ATCRBS/Mode S All-Call interrogations between MTL and -21 dBm. | | | f. The reply ratio shall <<shall0103>> be at least 90% for Mode A/C and Mode A/C/S All-Call interrogations between MTL + 3 dB and -21 dBm. | | |

| Comparable | ID=749 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0028 | Page 19 | ED 73C v01 | shall0104 | Page 26 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.3.1 Reply Transmission Frequency | | | 3.3.1 Reply Transmission Frequency | | |
| The carrier frequency of all downlink transmissions from transponders with Mode S capabilities shall <<shall0028>> be 1090 MHz plus or minus 1 MHz. | | | The carrier frequency of reply transmissions shall <<shall0104>> be 1 090 ±1 MHz. | | |

| Comparable | ID=758 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0036 | Page 21 | ED 73C v01 | shall0113 | Page 27 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.3.4.2 Mode S Reply Rate Capability | | | 3.4.2 Reply Rate Capability - Mode S | | |
| a. A transponder equipped for only short Mode S downlink formats (DF), shall <<shall0036>> have the following minimum reply rate capabilities: | | | A transponder equipped for only short Mode S Downlink Formats (DF), shall <<shall0113>> have the following minimum reply rate capabilities. | | |

| Comparable | ID=759 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0037 | Page 21 | ED 73C v01 | shall0114 | Page 27 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.3.4.2 Mode S Reply Rate Capability | | | 3.4.2 Reply Rate Capability - Mode S | | |
| b. A transponder equipped for long Mode S reply formats shall <<shall0037>> be able to transmit as long replies: | | | A transponder equipped for long Mode S reply formats shall <<shall0114>> be able to transmit as long replies, | | |

| Comparable | ID=761 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0039 | Page 21 | ED 73C v01 | shall0109 | Page 27 |
| WAT | Comment: DO requirement in two places in ED | | | | |
| | | | | | |
| 2.2.3.4.2 Mode S Reply Rate Capability | | | 3.4 REPLY RATE CAPABILITY | | |
| All of the above reply rates shall <<shall0039>> be in addition to any squitter transmissions that the transponder is required to make. | | | All the reply rates mentioned in this section shall <<shall0109>> be in addition to any squitter transmissions that the transponder is required to make. | | |

| Comparable | ID=763 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0041 | Page 22 | ED 73C v01 | shall0117 | Page 28 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.4.1.1 Framing Pulses | | | 3.5.1 Mode A/C Framing Pulses | | |
| The reply function shall <<shall0041>> use two framing pulses nominally spaced 20.3 microseconds apart. | | | The reply function shall <<shall0117>> use two framing pulses nominally spaced 20.3 µs apart. | | |

| Comparable | ID=765 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0043 | Page 22 | ED 73C v01 | shall0118 | Page 28 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.4.1.3 ATCRBS-SPI | | | 3.5.3 Mode A/C Special Position Identification (SPI) Pulse | | |
| In addition to the information pulses provided, an SPI pulse, which may be used with any of the other information pulses upon request, shall <<shall0043>> be provided at a spacing 4.35 microseconds following the last framing pulse. The SPI pulse shall <<shall0044>> be initiated by an IDENT switch. Upon activation of the IDENT switch, the SPI pulse shall <<shall0045>> be transmitted when replying to ATCRBS Mode A interrogations for a period of 18 ±1.0 seconds. The SPI pulse shall <<shall0046>> be transmitted only if the IDENT switch is first activated. The SPI pulse shall <<shall0047>> not be transmitted when replying to Mode C interrogations. | | | a. In addition to the information pulses, a SPI pulse, which may be used with any of the other information pulses upon request, shall <<shall0118>> be provided at a spacing 4.35 µs following the last framing pulse of Mode A replies only. | | |

| Comparable | ID=767 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0045 | Page 22 | ED 73C v01 | shall0120 | Page 28 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.4.1.3 ATCRBS-SPI | | | 3.5.3 Mode A/C Special Position Identification (SPI) Pulse | | |
| In addition to the information pulses provided, an SPI pulse, which may be used with any of the other information pulses upon request, shall <<shall0043>> be provided at a spacing 4.35 microseconds following the last framing pulse. The SPI pulse shall <<shall0044>> be initiated by an IDENT switch. Upon activation of the IDENT switch, the SPI pulse shall <<shall0045>> be transmitted when replying to ATCRBS Mode A interrogations for a period of 18 ±1.0 seconds. The SPI pulse shall <<shall0046>> be transmitted only if the IDENT switch is first activated. The SPI pulse shall <<shall0047>> not be transmitted when replying to Mode C interrogations. | | | c. Upon activation of the IDENT switch, the SPI pulse shall <<shall0120>> be transmitted when replying to Mode A interrogations for a period of 18 ±1.0 seconds. | | |

| Comparable | ID=770 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0048 | Page 22 | ED 73C v01 | shall0121 | Page 28 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.4.1.4 ATCRBS Reply Pulse Shape | | | 3.5.4 Mode A/C Reply Pulse Shape | | |
| All reply pulses and SPI pulses shall <<shall0048>> be 0.45 ±0.10 microsecond duration and have rise times of from 0.05 to 0.1 microsecond and decay times of from 0.05 to 0.2 microsecond. The rise and decay time may be less, providing the sideband radiation is no greater than that which would be produced theoretically by a trapezoidal wave having the stated rise and decay time. The Mode S reply spectrum requirement of §2.2.4.2.3.d is an acceptable specification for meeting ATCRBS minimum rise and fall time requirements. | | | a. All reply pulses including SPI pulses shall <<shall0121>> have the following characteristics. | | |

| Comparable | ID=771 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0049 | Page 23 | ED 73C v01 | shall0122 | Page 29 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.4.1.4 ATCRBS Reply Pulse Shape | | | 3.5.4 Mode A/C Reply Pulse Shape | | |
| The pulse amplitude variation of one pulse, with respect to any other pulse in a reply train, shall <<shall0049>> not exceed l dB. | | | d. The pulse amplitude variation of one pulse, with respect to any other pulse in a reply train, shall <<shall0122>> not exceed 1 dB. | | |

| Comparable | ID=772 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0050 | Page 23 | ED 73C v01 | shall0123 | Page 29 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.4.1.5 ATCRBS Reply Pulse Spacing Tolerance | | | 3.5.5 Mode A/C Reply Pulse Position Tolerance | | |
| The pulse spacing tolerances for each pulse (including the last framing pulse) with respect to the first framing pulse of the reply group shall <<shall0050>> be ±0.10 microsecond. The pulse spacing tolerance of the SPI pulse with respect to the last framing pulse of the reply group shall <<shall0051>> be ±0.10 microsecond. The pulse spacing tolerance of any pulse in the reply group with respect to any other pulse (except the first framing pulse) shall <<shall0052>> be no more than ±0.15 microsecond. | | | a. The pulse position tolerance for each pulse (including the last framing pulse) with respect to the first framing pulse of the reply group shall <<shall0123>> be ±0.1 µs. | | |

| Comparable | ID=773 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0051 | Page 23 | ED 73C v01 | shall0124 | Page 29 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.4.1.5 ATCRBS Reply Pulse Spacing Tolerance | | | 3.5.5 Mode A/C Reply Pulse Position Tolerance | | |
| The pulse spacing tolerances for each pulse (including the last framing pulse) with respect to the first framing pulse of the reply group shall <<shall0050>> be ±0.10 microsecond. The pulse spacing tolerance of the SPI pulse with respect to the last framing pulse of the reply group shall <<shall0051>> be ±0.10 microsecond. The pulse spacing tolerance of any pulse in the reply group with respect to any other pulse (except the first framing pulse) shall <<shall0052>> be no more than ±0.15 microsecond. | | | b. The pulse position tolerance of the SPI pulse with respect to the last framing pulse of the reply group shall <<shall0124>> be ±0.1 µs. | | |

| Comparable | ID=774 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0052 | Page 23 | ED 73C v01 | shall0125 | Page 29 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.4.1.5 ATCRBS Reply Pulse Spacing Tolerance | | | 3.5.5 Mode A/C Reply Pulse Position Tolerance | | |
| The pulse spacing tolerances for each pulse (including the last framing pulse) with respect to the first framing pulse of the reply group shall <<shall0050>> be ±0.10 microsecond. The pulse spacing tolerance of the SPI pulse with respect to the last framing pulse of the reply group shall <<shall0051>> be ±0.10 microsecond. The pulse spacing tolerance of any pulse in the reply group with respect to any other pulse (except the first framing pulse) shall <<shall0052>> be no more than ±0.15 microsecond. | | | c. The pulse position tolerance of any pulse in the reply group with respect to any other pulse (except the first framing pulse) shall <<shall0125>> be ±0.15 µs. | | |

| Comparable | ID=775 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0053 | Page 23 | ED 73C v01 | shall0145 | Page 31 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.4.1.6 ATCRBS Reply Delay and Jitter | | | 3.7.1 Mode A/C Reply Delay and Jitter | | |
| a. At all RF input levels from MTL to -21 dBm, the time delay between the arrival at the transponder input of the leading edge of P3 and the transmission of the leading edge of the first pulse of the reply shall <<shall0053>> be 3.0 ±0.5 microseconds. | | | a. At all RF input levels from MTL to -21 dBm, the time delay between the arrival at the transponder input of the leading edge of P3 and the transmission of the leading edge of the first pulse of the reply shall <<shall0145>> be 3.0 ±0.5 µs. | | |

| Comparable | ID=776 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0054 | Page 23 | ED 73C v01 | shall0146 | Page 31 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.4.1.6 ATCRBS Reply Delay and Jitter | | | 3.7.1 Mode A/C Reply Delay and Jitter | | |
| b. At all RF input levels from 3 dB above MTL to -21 dBm, the jitter at the leading edge of the first pulse of the reply with respect to P3 shall <<shall0054>> not exceed ±0.1 microsecond. | | | b. At all RF input levels from MTL+3dB to -21 dBm, the jitter at the leading edge of the first pulse of the reply with respect to P3 shall <<shall0146>> not exceed 0.1 µs. | | |

| Comparable | ID=777 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0055 | Page 23 | ED 73C v01 | shall0147 | Page 32 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.4.1.6 ATCRBS Reply Delay and Jitter | | | 3.7.1 Mode A/C Reply Delay and Jitter | | |
| c. At all RF input levels from 3 dB above MTL to -21 dBm, the time delay variations between ATCRBS modes shall <<shall0055>> not exceed 0.2 microsecond. | | | c. At all RF input levels from MTL+3dB to -21 dBm, the time delay variations between Modes A and C shall <<shall0147>> not exceed 0.2 µs. | | |

| Comparable | ID=778 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0056 | Page 23 | ED 73C v01 | shall0133 | Page 31 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.4.2.1 Mode S Preamble | | | 3.6.1 Mode S Reply Preamble | | |
| The preamble shall <<shall0056>> consist of 4 0.5 ±0.05 microsecond pulses. The second, third and fourth pulses shall <<shall0057>> be spaced 1.0, 3.5 and 4.5 microseconds, respectively, from the first transmitted pulse. The spacing tolerance shall <<shall0058>> be in accordance with §2.2.4.2.4. | | | a. The preamble shall <<shall0133>> consist of four 0.5 ±0.05 µs, pulses. | | |

| Comparable | ID=779 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0057 | Page 23 | ED 73C v01 | shall0134 | Page 31 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.4.2.1 Mode S Preamble | | | 3.6.1 Mode S Reply Preamble | | |
| The preamble shall <<shall0056>> consist of 4 0.5 ±0.05 microsecond pulses. The second, third and fourth pulses shall <<shall0057>> be spaced 1.0, 3.5 and 4.5 microseconds, respectively, from the first transmitted pulse. The spacing tolerance shall <<shall0058>> be in accordance with §2.2.4.2.4. | | | b. The second, third and fourth pulses shall <<shall0134>> be spaced 1.0, 3.5 and 4.5 µs respectively from the first transmitted pulse. | | |

| Comparable | ID=780 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0058 | Page 23 | ED 73C v01 | shall0135 | Page 31 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.4.2.1 Mode S Preamble | | | 3.6.1 Mode S Reply Preamble | | |
| The preamble shall <<shall0056>> consist of 4 0.5 ±0.05 microsecond pulses. The second, third and fourth pulses shall <<shall0057>> be spaced 1.0, 3.5 and 4.5 microseconds, respectively, from the first transmitted pulse. The spacing tolerance shall <<shall0058>> be in accordance with §2.2.4.2.4. | | | c. The position tolerance shall <<shall0135>> be in accordance with paragraph 3.6.5. | | |

| Comparable | ID=781 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0059 | Page 24 | ED 73C v01 | shall0136 | Page 31 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.4.2.2 Mode S Data Pulses | | | 3.6.2 Mode S Reply Data Pulses | | |
| The block of reply data pulses shall <<shall0059>> begin 8.0 microseconds after the first transmitted pulse. Either 56 or 112 1-microsecond intervals shall <<shall0060>> be assigned to each transmission. A pulse with a width of 0.5 ±0.05 microsecond shall <<shall0061>> be transmitted either in the first or the second half of each interval. If a pulse transmitted in the second half of one interval is followed by another pulse transmitted in the first half of the next interval, the two pulses shall <<shall0062>> merge and a 1.0 ±0.05 microsecond pulse shall <<shall0063>> be transmitted. | | | a. The block of reply data pulses shall <<shall0136>> begin 8.0 µs after the first transmitted pulse. | | |

| Comparable | ID=782 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0060 | Page 24 | ED 73C v01 | shall0137 | Page 31 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.4.2.2 Mode S Data Pulses | | | 3.6.2 Mode S Reply Data Pulses | | |
| The block of reply data pulses shall <<shall0059>> begin 8.0 microseconds after the first transmitted pulse. Either 56 or 112 1-microsecond intervals shall <<shall0060>> be assigned to each transmission. A pulse with a width of 0.5 ±0.05 microsecond shall <<shall0061>> be transmitted either in the first or the second half of each interval. If a pulse transmitted in the second half of one interval is followed by another pulse transmitted in the first half of the next interval, the two pulses shall <<shall0062>> merge and a 1.0 ±0.05 microsecond pulse shall <<shall0063>> be transmitted. | | | b. Either 56 or 112 one-microsecond intervals shall <<shall0137>> be assigned to each transmission. | | |

| Comparable | ID=783 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0061 | Page 24 | ED 73C v01 | shall0138 | Page 31 |
| WAT | Comment: 0 | | | | |
| | | | | | |

| 2.2.4.2.2 Mode S Data Pulses | 3.6.2 Mode S Reply Data Pulses |
|---|---|
| The block of reply data pulses shall <<shall0059>> begin 8.0 microseconds after the first transmitted pulse. Either 56 or 112 1-microsecond intervals shall <<shall0060>> be assigned to each transmission. A pulse with a width of 0.5 ±0.05 microsecond shall <<shall0061>> be transmitted either in the first or the second half of each interval. If a pulse transmitted in the second half of one interval is followed by another pulse transmitted in the first half of the next interval, the two pulses shall <<shall0062>> merge and a 1.0 ±0.05 microsecond pulse shall <<shall0063>> be transmitted. | c. A pulse with a width of 0.5 ±0.05 µs shall <<shall0138>> be transmitted either in the first or in the second half of each interval. |

| Comparable | ID=784 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0062 | Page 24 | ED 73C v01 | shall0139 | Page 31 |
| WAT | Comment: 0 | | | | |
| | | | | | |

| 2.2.4.2.2 Mode S Data Pulses | 3.6.2 Mode S Reply Data Pulses |
|---|---|
| The block of reply data pulses shall <<shall0059>> begin 8.0 microseconds after the first transmitted pulse. Either 56 or 112 1-microsecond intervals shall <<shall0060>> be assigned to each transmission. A pulse with a width of 0.5 ±0.05 microsecond shall <<shall0061>> be transmitted either in the first or the second half of each interval. If a pulse transmitted in the second half of one interval is followed by another pulse transmitted in the first half of the next interval, the two pulses shall <<shall0062>> merge and a 1.0 ±0.05 microsecond pulse shall <<shall0063>> be transmitted. | d. If a pulse transmitted in the second half of one interval is followed by another pulse transmitted in the first half of the next interval, the two pulses shall <<shall0139>> merge in a 1.0 ±0.05 µs pulse. |

| Comparable | ID=785 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0063 | Page 24 | ED 73C v01 | shall0139 | Page 31 |
| WAT | Comment: DO has two shalls in the sentence. ED puts into one sentence. | | | | |
| | | | | | |
| 2.2.4.2.2 Mode S Data Pulses | | | 3.6.2 Mode S Reply Data Pulses | | |
| The block of reply data pulses shall <<shall0059>> begin 8.0 microseconds after the first transmitted pulse. Either 56 or 112 1-microsecond intervals shall <<shall0060>> be assigned to each transmission. A pulse with a width of 0.5 ±0.05 microsecond shall <<shall0061>> be transmitted either in the first or the second half of each interval. If a pulse transmitted in the second half of one interval is followed by another pulse transmitted in the first half of the next interval, the two pulses shall <<shall0062>> merge and a 1.0 ±0.05 microsecond pulse shall <<shall0063>> be transmitted. | | | d. If a pulse transmitted in the second half of one interval is followed by another pulse transmitted in the first half of the next interval, the two pulses shall <<shall0139>> merge in a 1.0 ±0.05 µs pulse. | | |

| Comparable | ID=786 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0064 | Page 24 | ED 73C v01 | shall0142 | Page 31 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.4.2.3 Mode S Reply Pulse Shape | | | 3.6.4 Mode S Reply Pulse Shape | | |
| a. The pulse amplitude variation between one pulse and any other pulse in a reply shall <<shall0064>> not exceed 2 dB. | | | b. The pulse amplitude variation between one pulse and any other pulse in a reply shall <<shall0142>> not exceed 2 dB. | | |

| Comparable | ID=789 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0067 | Page 24 | ED 73C v01 | shall0105 | Page 26 |
| WAT | Comment: both refer to comparable tables | | | | |
| | | | | | |
| 2.2.4.2.3 Mode S Reply Pulse Shape | | | 3.3.2 Transmitter Reply Spectrum | | |
| d. The spectrum of a reply shall <<shall0067>> not exceed the following bounds: | | | The spectrum of the transponder transmitter output shall <<shall0105>> not exceed the limits shown in Table 3.1 and Figure 3.1. | | |

| Comparable | ID=790 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0068 | Page 24 | ED 73C v01 | shall0143 | Page 31 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.4.2.4 Mode S Reply Pulse Spacing Tolerance | | | 3.6.5 Mode S Reply Pulse Intervals | | |
| Mode S reply pulses shall <<shall0068>> start at a defined multiple of 0.5 microsecond from the first transmitted pulse. The pulse position tolerance shall <<shall0069>> be ±0.05 microsecond, measured from the first pulse of the reply. | | | a. Mode S reply pulses shall <<shall0143>> start at a defined multiple of 0.5 µs from the first transmitted pulse of the preamble. | | |

| Comparable | ID=791 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0069 | Page 24 | ED 73C v01 | shall0144 | Page 31 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.4.2.4 Mode S Reply Pulse Spacing Tolerance | | | 3.6.5 Mode S Reply Pulse Intervals | | |
| Mode S reply pulses shall <<shall0068>> start at a defined multiple of 0.5 microsecond from the first transmitted pulse. The pulse position tolerance shall <<shall0069>> be ±0.05 microsecond, measured from the first pulse of the reply. | | | b. The pulse position tolerance shall <<shall0144>> be ±0.05 µs, measured from the first transmitted pulse of the preamble. | | |

| Comparable | ID=792 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0070 | Page 25 | ED 73C v01 | shall0148 | Page 32 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.4.2.5 Mode S Reply Delay and Jitter | | | 3.7.2 Mode S Reply Delay and Jitter | | |
| a. At all RF input levels from MTL to -21 dBm, the first preamble pulse of the reply shall <<shall0070>> occur 128 ±0.25 microseconds after the sync phase reversal of the received P6 of a Mode S interrogation. At all RF input levels from MTL to -21 dBm, the jitter of the reply delay shall <<shall0071>> not exceed ±0.08 microsecond, peak (99.9 percentile). | | | (1) At all RF input levels from MTL to -21 dBm, the first preamble pulse of the reply shall <<shall0148>> occur 128 ±0.25 µs, after the sync phase reversal of the received P6 of a Mode S interrogation. | | |

| Comparable | ID=793 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0071 | Page 25 | ED 73C v01 | shall0149 | Page 32 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.4.2.5 Mode S Reply Delay and Jitter | | | 3.7.2 Mode S Reply Delay and Jitter | | |
| a. At all RF input levels from MTL to -21 dBm, the first preamble pulse of the reply shall <<shall0070>> occur 128 ±0.25 microseconds after the sync phase reversal of the received P6 of a Mode S interrogation. At all RF input levels from MTL to -21 dBm, the jitter of the reply delay shall <<shall0071>> not exceed ±0.08 microsecond, peak (99.9 percentile). | | | (2) At all RF input levels from MTL to -21 dBm, the jitter of the reply delay shall <<shall0149>> not exceed 0.08 µs, peak (99.9 percentile). | | |

| Comparable | ID=794 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0072 | Page 25 | ED 73C v01 | shall0150 | Page 32 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.4.2.5 Mode S Reply Delay and Jitter | | | 3.7.2 Mode S Reply Delay and Jitter | | |
| b. At all RF input levels from MTL to -21 dBm, the first preamble pulse of the reply shall <<shall0072>> occur 128 ±0.5 microseconds after the P4 pulse of the ATCRBS/Mode S All-Call interrogation. At all RF input levels from MTL +3 dB to -21 dBm, the jitter of the reply delay shall <<shall0073>> not exceed ±0.1 microsecond, peak (99.9 percentile). | | | (1) At all RF input levels from MTL to -21 dBm, the first preamble pulse of the reply shall <<shall0150>> occur 128 ±0.5 µs, after the P4 pulse of the Mode A/C/S All-Call interrogation. | | |

| Comparable | ID=796 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0074 | Page 25 | ED 73C v01 | shall0159 | Page 32 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.5.1 Side Lobe Suppression, ATCRBS, ATCRBS-Only All-Call, and ATCRBS/Mode S All-Call | | | 3.8.2 Side Lobe Suppression, Mode A/C, Mode A/C-Only All-Call, and Mode A/C/S All-Call | | |
| The transponder shall <<shall0074>> react to side lobe interrogations as follows: | | | Assuming no lock-out condition is in effect, the transponder shall <<shall0159>> react to side lobe interrogations as follows. | | |

| Comparable | ID=797 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0075 | Page 25 | ED 73C v01 | shall0160 | Page 32 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.5.1 Side Lobe Suppression, ATCRBS, ATCRBS-Only All-Call, and ATCRBS/Mode S All-Call | | | 3.8.2 Side Lobe Suppression, Mode A/C, Mode A/C-Only All-Call, and Mode A/C/S All-Call | | |
| a. Conditions Under Which the Transponder SHALL <<shall0075>> Be Suppressed | | | a. Conditions Under Which the Transponder SHALL <<shall0160>> Be Suppressed | | |

| Comparable | ID=799 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0077 | Page 25 | ED 73C v01 | shall0162 | Page 34 |
| WAT | Comment: DO is in two parts while ED is in one | | | | |
| | | | | | |
| 2.2.5.1 Side Lobe Suppression, ATCRBS, ATCRBS-Only All-Call, and ATCRBS/Mode S All-Call | | | 3.8.2 Side Lobe Suppression, Mode A/C, Mode A/C-Only All-Call, and Mode A/C/S All-Call | | |
| b. Conditions Under Which the Transponder SHALL <<shall0077>> NOT Be Suppressed | | | b. Conditions Under Which the Transponder SHALL <<shall0162>> NOT Be Suppressed | | |

| Comparable | ID=800 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0078 | Page 25 | ED 73C v01 | shall0163 | Page 34 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.5.1 Side Lobe Suppression, ATCRBS, ATCRBS-Only All-Call, and ATCRBS/Mode S All-Call | | | 3.8.2 Side Lobe Suppression, Mode A/C, Mode A/C-Only All-Call, and Mode A/C/S All-Call | | |
| The transponder shall <<shall0078>> reply to at least 90 percent of the interrogations over the input signal level range of 3 dB above MTL to -21 dBm, when: | | | The transponder shall <<shall0163>> reply to at least 90% of the interrogations over the input signal level range of from MTL+3dB to -21 dBm, if | | |

| Comparable | ID=801 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0079 | Page 26 | ED 73C v01 | shall0164 | Page 34 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.5.1 Side Lobe Suppression, ATCRBS, ATCRBS-Only All-Call, and ATCRBS/Mode S All-Call | | | 3.8.2 Side Lobe Suppression, Mode A/C, Mode A/C-Only All-Call, and Mode A/C/S All-Call | | |
| c. Conditions Under Which Transponder SHALL <<shall0079>> NOT Reply but May Initiate Suppression | | | c. Conditions Under Which The Transponder SHALL <<shall0164>> NOT Reply, But May Initiate Suppression. | | |

| Comparable | ID=802 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0080 | Page 26 | ED 73C v01 | shall0165 | Page 34 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.5.1 Side Lobe Suppression, ATCRBS, ATCRBS-Only All-Call, and ATCRBS/Mode S All-Call | | | 3.8.2 Side Lobe Suppression, Mode A/C, Mode A/C-Only All-Call, and Mode A/C/S All-Call | | |
| The transponder shall <<shall0080>> not reply with more than 10 percent reply ratio over the RF input level range from MTL to MTL +3 dB, if the amplitude of P2 equals or is greater than the amplitude of P1. Under the same conditions, the transponder may or may not initiate suppression. | | | (1) The transponder shall <<shall0165>> not reply with more than a 10% reply rate over the RF input level range from MTL to MTL+3dB, if the amplitude of P2 equals or is greater than the amplitude of P1. | | |

| Comparable | ID=803 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0081 | Page 26 | ED 73C v01 | shall0152 | Page 32 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.5.1 Side Lobe Suppression, ATCRBS, ATCRBS-Only All-Call, and ATCRBS/Mode S All-Call | | | 3.8.1 General | | |
| (1) The suppression duration is defined as the time between the P2 pulse initiating the suppression and the P1 pulse of the earliest subsequent interrogation to which the transponder replies. The duration shall <<shall0081>> be between 25 and 45 microseconds for all ATCRBS and ATCRBS/Mode S All-Call modes. | | | a. The suppression period is defined as the time between the P2 pulse initiating the suppression and the P1 pulse of the earliest subsequent interrogation to which the transponder replies. The duration shall <<shall0152>> be between 25 and 45 µs for all Mode A/C and Mode A/C/S All-Call Modes. | | |

| Comparable | ID=804 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0082 | Page 26 | ED 73C v01 | shall0153 | Page 32 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.5.1 Side Lobe Suppression, ATCRBS, ATCRBS-Only All-Call, and ATCRBS/Mode S All-Call | | | 3.8.1 General | | |
| (2) The side lobe suppression period shall <<shall0082>> begin after receipt of the leading edge of P2. | | | b. The side lobe suppression period shall <<shall0153>> begin after receipt of the leading edge of P2. | | |

| Comparable | ID=805 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0083 | Page 26 | ED 73C v01 | shall0154 | Page 32 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.5.1 Side Lobe Suppression, ATCRBS, ATCRBS-Only All-Call, and ATCRBS/Mode S All-Call | | | 3.8.1 General | | |
| (3) The side lobe suppression period shall <<shall0083>> be capable of being reinitiated within two microseconds after the end of any suppression period. | | | c. The side lobe suppression period shall <<shall0154>> be capable of being re-initiated within 2 µs after the end of any suppression period. | | |

| Comparable | ID=806 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0084 | Page 26 | ED 73C v01 | shall0155 | Page 32 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.5.1 Side Lobe Suppression, ATCRBS, ATCRBS-Only All-Call, and ATCRBS/Mode S All-Call | | | 3.8.1 General | | |
| (4) The receiver sensitivity for ATCRBS signals shall <<shall0084>> be at MTL not later than one microsecond after the end of the suppression period. | | | d. The receiver sensitivity for Mode A/C signals shall <<shall0155>> be at MTL not later than one microsecond after the end of the suppression period. | | |

| Comparable | ID=807 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0085 | Page 26 | ED 73C v01 | shall0156 | Page 32 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.5.1 Side Lobe Suppression, ATCRBS, ATCRBS-Only All-Call, and ATCRBS/Mode S All-Call | | | 3.8.1 General | | |
| (5) The two-pulse sidelobe suppression pair shall <<shall0085>> initiate suppression in a Mode S transponder regardless of the position of the pulse pair in a group of pulses, provided the transponder is not already suppressed or in a transaction cycle (see §2.2.18.2.2.k.). | | | e. The two-pulse sidelobe suppression pair shall <<shall0156>> initiate suppression in a Mode S transponder regardless of the position of the pulse pair in a group of pulses, provided that the transponder is not already suppressed or in a transaction cycle. | | |

| Comparable | ID=808 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0086 | Page 27 | ED 73C v01 | shall0167 | Page 34 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.6 Pulse Decoder Characteristics | | | 3.9.1 General | | |
| Unless otherwise specified, the following pulse decoder characteristics shall <<shall0086>> apply over the RF input signal level range from MTL +1 dB to -21 dBm and nominal interrogation signal characteristics. Applicable "valid" interrogations shall <<shall0087>> result in at least 90 percent replies, and interrogations which are not valid shall <<shall0088>> result in less than 10 percent replies. | | | Unless otherwise specified, the following pulse decoder characteristics shall <<shall0167>> apply over the RF input signal level range from MTL+1dB to -21 dBm, with nominal interrogation signal characteristics. | | |

| Comparable | ID=809 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0087 | Page 27 | ED 73C v01 | shall0168 | Page 34 |
| WAT | Comment: ED in two parts | | | | |
| | | | | | |
| 2.2.6 Pulse Decoder Characteristics | | | 3.9.1 General | | |
| Unless otherwise specified, the following pulse decoder characteristics shall <<shall0086>> apply over the RF input signal level range from MTL +1 dB to -21 dBm and nominal interrogation signal characteristics. Applicable "valid" interrogations shall <<shall0087>> result in at least 90 percent replies, and interrogations which are not valid shall <<shall0088>> result in less than 10 percent replies. | | | a. Valid interrogations shall <<shall0168>> result in at least 90% replies. | | |

| Comparable | ID=810 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0088 | Page 27 | ED 73C v01 | shall0169 | Page 34 |
| WAT | Comment: ED in two parts | | | | |
| | | | | | |
| 2.2.6 Pulse Decoder Characteristics | | | 3.9.1 General | | |
| Unless otherwise specified, the following pulse decoder characteristics shall <<shall0086>> apply over the RF input signal level range from MTL +1 dB to -21 dBm and nominal interrogation signal characteristics. Applicable "valid" interrogations shall <<shall0087>> result in at least 90 percent replies, and interrogations which are not valid shall <<shall0088>> result in less than 10 percent replies. | | | b. Interrogations which are not valid shall <<shall0169>> result in less than 10% replies. | | |

| Comparable | ID=811 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0089 | Page 27 | ED 73C v01 | shall0170 | Page 35 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.6.1.1 ATCRBS/Mode S All-Call | | | 3.9.2 Pulse Level Tolerances | | |
| a. it shall <<shall0089>> accept the interrogation as an ATCRBS/Mode S All-Call interrogation if the received amplitude of P4 is above the amplitude of P3 minus 1 dB; | | | (1) it shall <<shall0170>> accept the interrogation as a Mode A/C/S All-Call interrogation if the received amplitude of the long P4 is greater than the amplitude of P3 minus 1 dB; | | |

| Comparable | ID=812 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0090 | Page 27 | ED 73C v01 | shall0171 | Page 35 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.6.1.1 ATCRBS/Mode S All-Call | | | 3.9.2 Pulse Level Tolerances | | |
| b. it shall <<shall0090>> accept the interrogation as an ATCRBS interrogation if the received amplitude of P4 is below the amplitude of P3 minus 6 dB. | | | (2) it shall <<shall0171>> accept the interrogation as a Mode A/C interrogation if the received amplitude of a long P4 is less than the amplitude of P3 minus 6 dB. | | |

| Comparable | ID=813 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0091 | Page 27 | ED 73C v01 | shall0172 | Page 35 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.6.1.2 ATCRBS-Only All-Call | | | 3.9.2 Pulse Level Tolerances | | |
| a. it shall <<shall0091>> accept the interrogation as an ATCRBS interrogation if the received amplitude of P4 is below the amplitude of P3 minus 6 dB; | | | (1) it shall <<shall0172>> accept the interrogation as a Mode A/C interrogation if the received amplitude of P4 is less than the amplitude of P3 minus 6 dB; | | |

| Comparable | ID=814 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0092 | Page 27 | ED 73C v01 | shall0173 | Page 35 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.6.1.2 ATCRBS-Only All-Call | | | 3.9.2 Pulse Level Tolerances | | |
| b. it shall <<shall0092>> not accept the interrogation if the received amplitude of P4 is above P3 minus l dB. | | | (2) it shall <<shall0173>> not accept the interrogation if the received amplitude of any P4 is greater than P3 minus 1 dB. | | |

| Comparable | ID=817 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0095 | Page 28 | ED 73C v01 | shall0176 | Page 35 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.6.2 Pulse Position Tolerances | | | 3.9.3 Pulse Position Tolerances | | |
| b. The transponder shall <<shall0095>> not accept the pulse position of ATCRBS, ATCRBS/Mode S All-Call and ATCRBS-Only All-Call interrogations as valid if the spacing between P1 and P3 differs from the nominal spacing by 1.0 microsecond or more. | | | The transponder shall <<shall0176>> not accept the pulse interval of Mode A/C, Mode A/C/S All-Call and Mode A/C-Only All-Call interrogations as valid if the interval between P1 and P3 differs from the nominal interval by 1.0 µs or more. | | |

| Comparable | ID=818 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0096 | Page 28 | ED 73C v01 | shall0177 | Page 35 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.6.2 Pulse Position Tolerances | | | 3.9.3 Pulse Position Tolerances | | |
| c. The transponder shall <<shall0096>> not accept an interrogation as an ATCRBS/Mode S All-Call if the leading edge of P4 is not detected within the interval from 1.7 to 2.3 microseconds following the leading edge of P3. | | | The transponder shall <<shall0177>> not accept an interrogation as a Mode A/C/S All-Call if the leading edge of P4 is not detected within the interval from 1.7 µs to 2.3 µs following the leading edge of P3. | | |

| Comparable | ID=819 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0097 | Page 28 | ED 73C v01 | shall0178 | Page 35 |
| WAT | Comment: 0 | | | | |
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| 2.2.6.3 Pulse Duration Tolerances | | | 3.9.4 Pulse Duration Tolerances | | |
| a. The transponder shall <<shall0097>> accept the pulses of an ATCRBS interrogation as valid if the duration of both P1 and P3 is between 0.7 and 0.9 microsecond. | | | The transponder shall <<shall0178>> accept the pulse durations of a Mode A/C interrogation as valid if the durations of both P1 and P3 are between 0.7 and 0.9 µs. | | |

| Comparable | ID=820 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0098 | Page 28 | ED 73C v01 | shall0179 | Page 35 |
| WAT | Comment: 0 | | | | |
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| 2.2.6.3 Pulse Duration Tolerances | | | 3.9.4 Pulse Duration Tolerances | | |
| The transponder shall <<shall0098>> accept an ATCRBS/Mode S All-Call interrogation as valid if the duration of both P1 and P3 is between 0.7 and 0.9 microsecond and if the duration of P4 is between 1.5 and 1.7 microseconds. | | | The transponder shall <<shall0179>> accept the pulse durations of a Mode A/C/S All-Call interrogation as valid if the durations of both P1 and P3 are between 0.7 µs and 0.9 µs and if the duration of P4 is between 1.5 and 1.7 µs (long P4). | | |

| Comparable | ID=821 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0099 | Page 28 | ED 73C v01 | shall0180 | Page 37 |
| WAT | Comment: 0 | | | | |
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| 2.2.6.3 Pulse Duration Tolerances | | | 3.9.4 Pulse Duration Tolerances | | |
| b. The transponder shall <<shall0099>> not accept an ATCRBS/Mode S All-Call interrogation as valid if the duration of the P4 pulse is outside of the range between 1.2 and 2.5 microseconds. | | | The transponder shall <<shall0180>> not accept a Mode A/C/S All-Call interrogation as valid if the duration of the P4 pulse is outside of the range between 1.2 and 2.5 µs. | | |

| Comparable | ID=822 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0100 | Page 28 | ED 73C v01 | shall0181 | Page 37 |
| WAT | Comment: 0 | | | | |
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| 2.2.6.3 Pulse Duration Tolerances | | | 3.9.4 Pulse Duration Tolerances | | |
| c. For all signal levels from MTL to -45 dBm, the transponder shall <<shall0100>> accept no more than 10 percent of ATCRBS or ATCRBS/Mode S All-Call interrogations if the duration of either the P1 pulse or the P3 pulse is less than 0.3 microsecond. | | | For all signal levels from MTL to -45 dBm, the transponder shall <<shall0181>> accept no more than 10% of Mode A/C or Mode A/C/S All-Call interrogations if the duration of either the P1 pulse or the P3 pulse is less than 0.3 µs. | | |

| Comparable | ID=823 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0101 | Page 28 | ED 73C v01 | shall0182 | Page 37 |
| WAT | Comment: 0 | | | | |
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| 2.2.6.4 Sync Phase Reversal Position Tolerance | | | 3.9.5 Sync Phase Reversal Position Tolerance | | |
| The transponder shall <<shall0101>> determine the location of the sync phase reversal relative to either the leading edge of P2 or the leading edge of P6. If the transponder determines the sync phase reversal from P2, the sync phase reversal shall <<shall0102>> be accepted if it is received within the interval from 2.7 to 2.8 microseconds following the leading edge of P2. The sync phase reversal shall <<shall0103>> be rejected if it is received outside of the interval from 2.55 to 2.95 microseconds following the leading edge of P2. In the gray zones between these limits (that is, in the zone from 2.55 to 2.7 microseconds and in the zone from 2.8 to 2.95 microseconds) the transponder may or may not accept the sync phase reversal. If the transponder determines the sync phase reversal from P6, the sync phase reversal shall <<shall0104>> be accepted if it is received within the interval from 1.2 to 1.3 microseconds following the leading edge of P6. The sync phase reversal shall <<shall0105>> be rejected if it is received outside of the interval from 1.05 to 1.45 microseconds following the leading edge of P6. In the gray zones | | | a. The transponder shall <<shall0182>> determine the location of the sync phase reversal relative to either the leading edge of P2 or the leading edge of P6. | | |

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| between these limits (that is, in the zone from 1.05 to 1.2 microseconds and in the zone from 1.3 to 1.45 microseconds) the transponder may or may not accept the sync phase reversal. | |

| Comparable | ID=824 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0102 | Page 28 | ED 73C v01 | shall0183 | Page 37 |
| WAT | Comment: 0 | | | | |
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| 2.2.6.4 Sync Phase Reversal Position Tolerance | 3.9.5 Sync Phase Reversal Position Tolerance |
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| The transponder shall <<shall0101>> determine the location of the sync phase reversal relative to either the leading edge of P2 or the leading edge of P6. If the transponder determines the sync phase reversal from P2, the sync phase reversal shall <<shall0102>> be accepted if it is received within the interval from 2.7 to 2.8 microseconds following the leading edge of P2. The sync phase reversal shall <<shall0103>> be rejected if it is received outside of the interval from 2.55 to 2.95 microseconds following the leading edge of P2. In the gray zones between these limits (that is, in the zone from 2.55 to 2.7 microseconds and in the zone from 2.8 to 2.95 microseconds) the transponder may or may not accept the sync phase reversal. If the transponder determines the sync phase reversal from P6, the sync phase reversal shall <<shall0104>> be accepted if it is received within the interval from 1.2 to 1.3 microseconds following the leading edge of P6. The sync phase reversal shall <<shall0105>> be rejected if it is received outside of the interval from 1.05 to 1.45 microseconds following the leading edge of P6. In the gray zones between these limits (that is, in the zone from 1.05 to 1.2 microseconds and in the zone from 1.3 to 1.45 microseconds) the transponder may or may not accept the sync phase reversal. | (1) the sync phase reversal shall <<shall0183>> be accepted if it is received within the interval between 2.7 and 2.8 µs following the leading edge of P2, |

| Comparable | ID=825 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0103 | Page 28 | ED 73C v01 | shall0184 | Page 37 |
| WAT | Comment: 0 | | | | |
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| 2.2.6.4 Sync Phase Reversal Position Tolerance | 3.9.5 Sync Phase Reversal Position Tolerance |
|---|---|
| The transponder shall <<shall0101>> determine the location of the sync phase reversal relative to either the leading edge of P2 or the leading edge of P6. If the transponder determines the sync phase reversal from P2, the sync phase reversal shall <<shall0102>> be accepted if it is received within the interval from 2.7 to 2.8 microseconds following the leading edge of P2. The sync phase reversal shall <<shall0103>> be rejected if it is received outside of the | (2) the sync phase reversal shall <<shall0184>> be rejected if it is received outside of the interval between 2.55 and 2.95 µs following the leading edge of P2. |

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| interval from 2.55 to 2.95 microseconds following the leading edge of P2. In the gray zones between these limits (that is, in the zone from 2.55 to 2.7 microseconds and in the zone from 2.8 to 2.95 microseconds) the transponder may or may not accept the sync phase reversal. If the transponder determines the sync phase reversal from P6, the sync phase reversal shall <<shall0104>> be accepted if it is received within the interval from 1.2 to 1.3 microseconds following the leading edge of P6. The sync phase reversal shall <<shall0105>> be rejected if it is received outside of the interval from 1.05 to 1.45 microseconds following the leading edge of P6. In the gray zones between these limits (that is, in the zone from 1.05 to 1.2 microseconds and in the zone from 1.3 to 1.45 microseconds) the transponder may or may not accept the sync phase reversal. | |

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|---|---|---|---|---|---|
| Comparable | ID=826 | | | | |
| DO 181D v08 | shall0104 | Page 28 | ED 73C v01 | shall0185 | Page 37 |
| WAT | Comment: 0 | | | | |
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| 2.2.6.4 Sync Phase Reversal Position Tolerance | | | 3.9.5 Sync Phase Reversal Position Tolerance | | |
| The transponder shall <<shall0101>> determine the location of the sync phase reversal relative to either the leading edge of P2 or the leading edge of P6. If the transponder determines the sync phase reversal from P2, the sync phase reversal shall <<shall0102>> be accepted if it is received within the interval from 2.7 to 2.8 microseconds following the leading edge of P2. The sync phase reversal shall <<shall0103>> be rejected if it is received outside of the interval from 2.55 to 2.95 microseconds following the leading edge of P2. In the gray zones between these limits (that is, in the zone from 2.55 to 2.7 microseconds and in the zone from 2.8 to 2.95 microseconds) the transponder may or may not accept the sync phase reversal. If the transponder determines the sync phase reversal from P6, the sync phase reversal shall <<shall0104>> be accepted if it is received within the interval from 1.2 to 1.3 microseconds following the leading edge of P6. The sync phase reversal shall <<shall0105>> be rejected if it is received outside of the interval from 1.05 to 1.45 microseconds following the leading edge of P6. In the gray zones between these limits (that is, in the zone from 1.05 to 1.2 microseconds and in the zone from 1.3 to 1.45 microseconds) the transponder may or may not accept the sync phase reversal. | | | (1) the sync phase reversal shall <<shall0185>> be accepted if it is received within the interval between 1.2 and 1.3 µs following the leading edge of P6; | | |

| Comparable | ID=827 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0105 | Page 28 | ED 73C v01 | shall0186 | Page 37 |
| WAT | Comment: 0 | | | | |
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| 2.2.6.4 Sync Phase Reversal Position Tolerance | 3.9.5 Sync Phase Reversal Position Tolerance |
|---|---|
| The transponder shall <<shall0101>> determine the location of the sync phase reversal relative to either the leading edge of P2 or the leading edge of P6. If the transponder determines the sync phase reversal from P2, the sync phase reversal shall <<shall0102>> be accepted if it is received within the interval from 2.7 to 2.8 microseconds following the leading edge of P2. The sync phase reversal shall <<shall0103>> be rejected if it is received outside of the interval from 2.55 to 2.95 microseconds following the leading edge of P2. In the gray zones between these limits (that is, in the zone from 2.55 to 2.7 microseconds and in the zone from 2.8 to 2.95 microseconds) the transponder may or may not accept the sync phase reversal. If the transponder determines the sync phase reversal from P6, the sync phase reversal shall <<shall0104>> be accepted if it is received within the interval from 1.2 to 1.3 microseconds following the leading edge of P6. The sync phase reversal shall <<shall0105>> be rejected if it is received outside of the interval from 1.05 to 1.45 microseconds following the leading edge of P6. In the gray zones between these limits (that is, in the zone from 1.05 to 1.2 microseconds and in the zone from 1.3 to 1.45 microseconds) the transponder may or may not accept the sync phase reversal. | (2) the sync phase reversal shall <<shall0186>> be rejected if it is received outside of the interval between 1.05 and 1.45 µs following the leading edge of P6. |

| Comparable | ID=828 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0106 | Page 29 | ED 73C v01 | shall0187 | Page 37 |
| WAT | Comment: 0 | | | | |
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| 2.2.7.1.1 Echo Suppression Desensitization | 3.10.1 Echo Suppression |
|---|---|
| Upon receipt of any pulse more than 0.7 microsecond in duration (desensitization pulse), the transponder shall <<shall0106>> be desensitized temporarily for all received signals by raising the receiver threshold. Immediately after the desensitization pulse, the receiver threshold shall <<shall0107>> be between the level of the desensitization pulse and 9 dB below that, except for a possible overshoot during the first microsecond following the desensitization pulse. | (1) Upon receipt of any pulse more than 0.7 µs in duration (desensitisation pulse), the transponder shall <<shall0187>> be temporarily desensitised to all received signals by raising the receiver threshold. |

| Comparable | ID=829 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0107 | Page 29 | ED 73C v01 | shall0188 | Page 37 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.7.1.1 Echo Suppression Desensitization | | | 3.10.1 Echo Suppression | | |
| Upon receipt of any pulse more than 0.7 microsecond in duration (desensitization pulse), the transponder shall <<shall0106>> be desensitized temporarily for all received signals by raising the receiver threshold. Immediately after the desensitization pulse, the receiver threshold shall <<shall0107>> be between the level of the desensitization pulse and 9 dB below that, except for a possible overshoot during the first microsecond following the desensitization pulse. | | | (2) Immediately after the desensitisation pulse, the receiver threshold shall <<shall0188>> be between the level of the desensitisation pulse and 9 dB less than that level, except for a possible overshoot during the first microsecond following the desensitisation pulse. | | |

| Comparable | ID=830 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0108 | Page 29 | ED 73C v01 | shall0189 | Page 37 |
| WAT | Comment: 0 | | | | |
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| 2.2.7.1.2 Narrow Pulse Performance | | | 3.10.1 Echo Suppression | | |
| Single pulses less than 0.7 microsecond in duration are not required to cause a specified desensitization, but if they occur shall <<shall0108>> not cause a desensitization of amplitude or duration greater than that permitted in §2.2.7.1.1 and §2.2.7.2. | | | Single pulses of less than 0.7 µs in duration need not cause a specified desensitisation, but in any case they shall <<shall0189>> not cause a desensitisation of amplitude or duration greater than permitted in paragraphs 3.10.1 a. and 3.10.2. | | |

| Comparable | ID=831 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0109 | Page 29 | ED 73C v01 | shall0190 | Page 38 |
| WAT | Comment: 0 | | | | |
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| 2.2.7.2 Recovery | | | 3.10.2 Recovery | | |
| Following desensitization, the receiver shall <<shall0109>> recover sensitivity within 3 dB of MTL, within 15 microseconds after reception of the trailing edge of a desensitizing pulse having a signal strength up to 50 dB above MTL. Recovery shall <<shall0110>> be at an average rate not exceeding 4.0 dB per microsecond. | | | Following desensitisation, the receiver shall <<shall0190>> recover sensitivity to within 3 dB of MTL, within 15 µs after reception of the trailing edge of a desensitising pulse having a signal strength up to MTL+50dB. | | |

| Comparable | ID=832 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0110 | Page 29 | ED 73C v01 | shall0191 | Page 39 |
| WAT | Comment: 0 | | | | |
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| 2.2.7.2 Recovery | | | 3.10.2 Recovery | | |
| Following desensitization, the receiver shall <<shall0109>> recover sensitivity within 3 dB of MTL, within 15 microseconds after reception of the trailing edge of a desensitizing pulse having a signal strength up to 50 dB above MTL. Recovery shall <<shall0110>> be at an average rate not exceeding 4.0 dB per microsecond. | | | Recovery shall <<shall0191>> be at an average rate not exceeding 4 dB per (s. | | |

| Comparable | ID=835 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0112 | Page 29 | ED 73C v01 | shall0194 | Page 39 |
| WAT | Comment: 0 | | | | |
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| 2.2.7.2.2 Recovery From a Suppression Pair | | | 3.10.2 Recovery | | |
| The receipt of P1 and P2 suppression pulses may temporarily desensitize the transponder according to §2.2.7.1.1, but the suppression pairs shall <<shall0112>> not otherwise interfere with the reception of Mode S interrogations. | | | The receipt of P1 and P2 suppression pulses may temporarily desensitise the transponder according to paragraph 3.10.2 a, but the suppression pairs shall <<shall0194>> not otherwise interfere with the reception of Mode S interrogations. | | |

| Comparable | ID=836 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0113 | Page 29 | ED 73C v01 | shall0195 | Page 39 |
| WAT | Comment: 0 | | | | |
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| 2.2.7.2.3 Recovery From a Mode S Interrogation Which Has Not Been Accepted | | | 3.10.2 Recovery | | |
| Following a Mode S interrogation that has not been accepted, the transponder shall <<shall0113>> recover sensitivity to within 3 dB of MTL no later than 45 microseconds after receipt of the sync phase reversal. | | | Following a Mode S interrogation which has not been accepted, the transponder shall <<shall0195>> recover sensitivity to within 3 dB of MTL no later than 45µs after the receipt of the sync phase reversal. | | |

| Comparable | ID=837 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0114 | Page 30 | ED 73C v01 | shall0197 | Page 39 |
| WAT | Comment: 0 | | | | |
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| 2.2.7.2.4 Recovery From Unaccepted ATCRBS/Mode S and ATCRBS-Only All-Calls | | | 3.10.2 Recovery | | |
| Following unaccepted ATCRBS/Mode S or ATCRBS-Only All-Calls, the transponder shall <<shall0114>> recover sensitivity according to §2.2.7.2. | | | Following unaccepted Mode A/C - Mode S or Mode A/C-only All-Calls, the transponder shall <<shall0197>> recover sensitivity according to paragraph 3.10.2 a. | | |

| Comparable | ID=839 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0115 | Page 30 | ED 73C v01 | shall0199 | Page 39 |
| WAT | Comment: DO shall 116 links to ED shalls 198-201. It is not clear that the material is comparable. | | | | |
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| 2.2.7.2.5 Dead Time | | | 3.10.3 Dead Time | | |
| The time interval beginning at the end of a reply transmission and ending when the receiver has regained its sensitivity to within 3 dB of MTL shall <<shall0115>> not exceed 125 microseconds. | | | After recognition of a valid interrogation, the transponder shall <<shall0198>> not reply to any other interrogation, at least for the duration of the reply pulse train. This dead time shall <<shall0199>> end no later than 125 µs after the transmission of the last reply pulse of the group. | | |

| Comparable | ID=840 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0115 | Page 30 | ED 73C v01 | shall0200 | Page 39 |
| WAT | Comment: DO shall 116 links to ED shalls 198-201. It is not clear that the material is comparable. | | | | |
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| 2.2.7.2.5 Dead Time | | | 3.10.3 Dead Time | | |
| The time interval beginning at the end of a reply transmission and ending when the receiver has regained its sensitivity to within 3 dB of MTL shall <<shall0115>> not exceed 125 microseconds. | | | The time interval beginning at the end of a reply transmission and ending when the receiver has regained its sensitivity to within 3 dB of MTL, shall <<shall0200>> be as short as possible, but, in any case, shall <<shall0201>> not exceed 125 µs. | | |

| Comparable | ID=841 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0115 | Page 30 | ED 73C v01 | shall0201 | Page 39 |
| WAT | Comment: DO shall 116 links to ED shalls 198-201. It is not clear that the material is comparable. | | | | |
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| 2.2.7.2.5 Dead Time | | | 3.10.3 Dead Time | | |
| The time interval beginning at the end of a reply transmission and ending when the receiver has regained its sensitivity to within 3 dB of MTL shall <<shall0115>> not exceed 125 microseconds. | | | The time interval beginning at the end of a reply transmission and ending when the receiver has regained its sensitivity to within 3 dB of MTL, shall <<shall0200>> be as short as possible, but, in any case, shall <<shall0201>> not exceed 125 µs. | | |

| Comparable | ID=842 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0116 | Page 30 | ED 73C v01 | shall0202 | Page 39 |
| WAT | Comment: 0 | | | | |
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| 2.2.7.3 Reply Rate Limiting | | | 3.11 REPLY RATE LIMITING | | |
| Reply rate limiting in a Mode S transponder shall <<shall0116>> be separate and independent for Mode S and ATCRBS replies. | | | Reply rate limiting in a Mode S transponder shall <<shall0202>> be separate and independent for Mode S and Mode A/C replies. | | |

| Comparable | ID=843 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0117 | Page 30 | ED 73C v01 | shall0203 | Page 39 |
| WAT | Comment: 0 | | | | |
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| 2.2.7.3.1 ATCRBS Reply Rate Limiting | | | 3.11 REPLY RATE LIMITING | | |
| A sensitivity-reduction reply rate limit shall <<shall0117>> be incorporated in the transponder for ATCRBS replies. The limit shall <<shall0118>> be capable of being adjusted between 500 continuous ATCRBS Mode A and Mode C replies per second and the maximum continuous rate of which the transponder is capable, or 2000 replies per second, whichever is less, without regard to the number of pulses in each reply. Sensitivity reduction shall <<shall0119>> apply only to the receipt of ATCRBS, ATCRBS/Mode S All-Call, and ATCRBS-Only All-Call interrogations. | | | A sensitivity reduction reply rate limit control shall <<shall0203>> be incorporated in the transponder for Mode A/C replies. | | |

| Comparable | ID=849 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0122 | Page 31 | ED 73C v01 | shall0213 | Page 41 |
| WAT | Comment: 0 | | | | |
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| 2.2.8.2 Response in the Presence of a Standard Interfering Pulse | | | 3.12.4 Standard Interfering Pulse | | |
| Given an interrogation that requires a reply, the reply ratio of a transponder shall <<shall0122>> be at least 95 percent if the level of the interfering pulse is 6 dB or more below the signal level for input signal levels between -68 and -21 dBm. | | | b. Given an interrogation that demands a reply, the reply ratio of a transponder shall <<shall0213>> be at least 95% if the level of the interfering pulse is 6 dB or more less than the signal level for input signal levels between -68 and -21 dBm. | | |

| Comparable | ID=850 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0123 | Page 31 | ED 73C v01 | shall0214 | Page 41 |
| WAT | Comment: 0 | | | | |
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| 2.2.8.2 Response in the Presence of a Standard Interfering Pulse | | | 3.12.4 Standard Interfering Pulse | | |
| Under the same conditions, the reply ratio shall <<shall0123>> be at least 50 percent if the interference pulse level is 3 dB or more below the signal level. | | | c. Under the same conditions, the reply ratio shall <<shall0214>> be at least 50% if the interference pulse level is 3 dB or more less than the signal level. | | |

| Comparable | ID=851 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0124 | Page 31 | ED 73C v01 | shall0215 | Page 41 |
| WAT | Comment: 0 | | | | |
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| 2.2.8.3 Response in the Presence of Pulse Pair Interference | | | 3.12.5 Pulse Pair Interference | | |
| The interfering signal shall <<shall0124>> consist of P1 and P2, spaced 2 microseconds apart, with a carrier frequency of 1030 ±0.2 MHz, that is incoherent with the Mode S signal of the test. The interfering pulse pair shall <<shall0125>> overlay any part of the Mode S interrogation except that the leading edge of the P1 interfering pulse shall <<shall0126>> occur no earlier than the P1 pulse of the Mode S signal. Given an interrogation that requires a reply, the reply ratio of a transponder shall <<shall0127>> be at least 90 percent if the level of the interfering signal is 9 dB or more below the signal levels for signal level inputs between -68 and -21 dBm. | | | a. The interfering signal shall <<shall0215>> consist of P1 and P2, spaced 2 µs apart, with a carrier frequency of 1 030 ±0.2 MHz, and incoherent with the Mode S signal of the test. | | |

| Comparable | ID=852 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0125 | Page 31 | ED 73C v01 | shall0216 | Page 41 |
| WAT | Comment: 0 | | | | |

| 2.2.8.3 Response in the Presence of Pulse Pair Interference | 3.12.5 Pulse Pair Interference |
|---|---|
| The interfering signal shall <<shall0124>> consist of P1 and P2, spaced 2 microseconds apart, with a carrier frequency of 1030 ±0.2 MHz, that is incoherent with the Mode S signal of the test. The interfering pulse pair shall <<shall0125>> overlay any part of the Mode S interrogation except that the leading edge of the P1 interfering pulse shall <<shall0126>> occur no earlier than the P1 pulse of the Mode S signal. Given an interrogation that requires a reply, the reply ratio of a transponder shall <<shall0127>> be at least 90 percent if the level of the interfering signal is 9 dB or more below the signal levels for signal level inputs between -68 and -21 dBm. | b. The interfering pulse pair shall <<shall0216>> overlay any part of the Mode S interrogation except that the leading edge of the P1 interfering pulse shall <<shall0217>> occur no earlier than the P1 pulse of the Mode S signal. |

| Comparable | ID=853 | | | | |
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| DO 181D v08 | shall0126 | Page 31 | ED 73C v01 | shall0217 | Page 41 |
| WAT | Comment: second shall | | | | |

| 2.2.8.3 Response in the Presence of Pulse Pair Interference | 3.12.5 Pulse Pair Interference |
|---|---|
| The interfering signal shall <<shall0124>> consist of P1 and P2, spaced 2 microseconds apart, with a carrier frequency of 1030 ±0.2 MHz, that is incoherent with the Mode S signal of the test. The interfering pulse pair shall <<shall0125>> overlay any part of the Mode S interrogation except that the leading edge of the P1 interfering pulse shall <<shall0126>> occur no earlier than the P1 pulse of the Mode S signal. Given an interrogation that requires a reply, the reply ratio of a transponder shall <<shall0127>> be at least 90 percent if the level of the interfering signal is 9 dB or more below the signal levels for signal level inputs between -68 and -21 dBm. | b. The interfering pulse pair shall <<shall0216>> overlay any part of the Mode S interrogation except that the leading edge of the P1 interfering pulse shall <<shall0217>> occur no earlier than the P1 pulse of the Mode S signal. |

| Comparable | ID=854 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0127 | Page 31 | ED 73C v01 | shall0218 | Page 41 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.8.3 Response in the Presence of Pulse Pair Interference | | | 3.12.5 Pulse Pair Interference | | |
| The interfering signal shall <<shall0124>> consist of P1 and P2, spaced 2 microseconds apart, with a carrier frequency of 1030 ±0.2 MHz, that is incoherent with the Mode S signal of the test. The interfering pulse pair shall <<shall0125>> overlay any part of the Mode S interrogation except that the leading edge of the P1 interfering pulse shall <<shall0126>> occur no earlier than the P1 pulse of the Mode S signal. Given an interrogation that requires a reply, the reply ratio of a transponder shall <<shall0127>> be at least 90 percent if the level of the interfering signal is 9 dB or more below the signal levels for signal level inputs between -68 and -21 dBm. | | | c. Given an interrogation that demands a reply, the reply ratio of the transponder shall <<shall0218>> be at least 90% if the level of the interfering signals is 9 dB or more less than the signal levels for signal level inputs between -68 and -21 dBm. | | |

| Comparable | ID=855 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0128 | Page 31 | ED 73C v01 | shall0220 | Page 41 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.8.4 Response in the Presence of TACAN/DME and JTIDS Interference | | | 3.12.6 TACAN/DME and other Spurious Pulse Interference | | |
| Given a Mode S interrogation that requires a reply, the reply ratio of the transponder shall <<shall0128>> be at least 90 percent for input signal levels between -68 and -21 dBm when either of the following signals is applied with the interrogation signal: | | | Given a Mode S interrogation that demands a reply, the reply ratio of the transponder shall <<shall0220>> be at least 90% for input signal levels between -68 and -21 dBm when either of the following signals is applied with the interrogation signal: | | |

| Comparable | ID=856 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0130 | Page 32 | ED 73C v01 | shall0221 | Page 42 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.9.1 ATCRBS | | | 3.13 UNDESIRED REPLIES | | |
| a. The random trigger rate squitter on all ATCRBS modes shall <<shall0130>> not be greater than 5 reply pulse groups or suppressions per second, averaged over a period of at least 30 seconds. | | | The random trigger rate on Modes A and C shall <<shall0221>> not be greater than 5 replies per second, or 5 mutual suppression pulses per second, averaged over any period of at least 30 seconds. | | |

| Comparable | ID=860 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0134 | Page 33 | ED 73C v01 | shall0223 | Page 42 |
| WAT | Comment: ED comparable to first sentence of DO. There is no shall in the first sentence of the DO | | | | |
| | | | | | |
| 2.2.10.1 Self Test | | | 3.14.1 Self Test | | |
| a. The device that radiates test interrogation signals or prevents transponder reply to proper interrogation during the test period shall <<shall0134>> be limited to intermittent use for no longer than that required to determine the transponder status. The test interrogation rate for ATCRBS and ATCRBS-Only All-Call interrogations shall <<shall0135>> be 235 ±5 interrogations per second or a sub-multiple thereof. Test interrogations using Mode S formats, including ATCRBS/ Mode S All-Call, shall <<shall0136>> not exceed one of each format for which the transponder is equipped in any given test sequence. | | | If a self-test feature or monitor is provided, the following shall <<shall0223>> apply. | | |

| Comparable | ID=859 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0134 | Page 33 | ED 73C v01 | shall0224 | Page 42 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.10.1 Self Test | | | 3.14.1 Self Test | | |
| a. The device that radiates test interrogation signals or prevents transponder reply to proper interrogation during the test period shall <<shall0134>> be limited to intermittent use for no longer than that required to determine the transponder status. The test interrogation rate for ATCRBS and ATCRBS-Only All-Call interrogations shall <<shall0135>> be 235 ±5 interrogations per second or a sub-multiple thereof. Test interrogations using Mode S formats, including ATCRBS/ Mode S All-Call, shall <<shall0136>> not exceed one of each format for which the transponder is equipped in any given test sequence. | | | shall <<shall0224>> be limited to intermittent use for a duration which is no longer than that needed to determine the transponder status. | | |

| Comparable | ID=861 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0135 | Page 33 | ED 73C v01 | shall0225 | Page 42 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.10.1 Self Test | | | 3.14.1 Self Test | | |
| a. The device that radiates test interrogation signals or prevents transponder reply to proper interrogation during the test period shall <<shall0134>> be limited to intermittent use for no longer than that required to determine the transponder status. The test interrogation rate for ATCRBS and ATCRBS-Only All-Call interrogations shall <<shall0135>> be 235 ±5 interrogations per second or a sub-multiple thereof. Test interrogations using Mode S formats, including ATCRBS/ Mode S All-Call, shall <<shall0136>> not exceed one of each format for which the transponder is equipped in any given test sequence. | | | b. The test rate for Mode A/C and Mode A/C-Only All-Call interrogations shall <<shall0225>> be 235 ±5 interrogations per second, or submultiples thereof. | | |

| Comparable | ID=862 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0136 | Page 33 | ED 73C v01 | shall0226 | Page 42 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.10.1 Self Test | | | 3.14.1 Self Test | | |
| a. The device that radiates test interrogation signals or prevents transponder reply to proper interrogation during the test period shall <<shall0134>> be limited to intermittent use for no longer than that required to determine the transponder status. The test interrogation rate for ATCRBS and ATCRBS-Only All-Call interrogations shall <<shall0135>> be 235 ±5 interrogations per second or a sub-multiple thereof. Test interrogations using Mode S formats, including ATCRBS/ Mode S All-Call, shall <<shall0136>> not exceed one of each format for which the transponder is equipped in any given test sequence. | | | c. Test interrogations using Mode S formats, including Mode A/C/S All-Call, shall <<shall0226>> not exceed one of each format for which the transponder is capable, in any given test sequence. | | |

| Comparable | ID=863 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0137 | Page 33 | ED 73C v01 | shall0227 | Page 42 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.10.1 Self Test | | | 3.14.1 Self Test | | |
| b. The self-test interrogation signal level at the antenna end of the transmission line shall <<shall0137>> not exceed -40 dBm. | | | d. The self-test interrogation signal level at the antenna end of the transmission line shall <<shall0227>> not exceed -40 dBm. | | |

| Comparable | ID=864 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0138 | Page 33 | ED 73C v01 | shall0228 | Page 42 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.10.1 Self Test | | | 3.14.1 Self Test | | |
| c. If provision is made for an automatic periodic self-test procedure, such self testing shall <<shall0138>> not radiate replies at an average rate exceeding one reply every ten seconds. | | | e. If provision is made for an automatic periodic self-test procedure, such self-testing shall <<shall0228>> not radiate replies at an average rate exceeding one reply every ten seconds. | | |

| Comparable | ID=865 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0139 | Page 33 | ED 73C v01 | shall0229 | Page 42 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.10.2 Squitter Monitor | | | 3.14.2 Squitter Monitor | | |
| A squitter monitor shall <<shall0139>> be provided to verify that the Mode S transponder generates short and Extended Squitters at their nominal rates (see §2.2.18.2.6 and §2.2.23.1). The transponder shall <<shall0140>> be considered failed when the monitor has detected squitter failure. | | | a. A squitter monitor shall <<shall0229>> be provided to verify that the Mode S transponder generates short and extended squitters at a nominal rate (subparagraphs 3.20.2.6 and 3.21.2.6). | | |

| Comparable | ID=866 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0140 | Page 33 | ED 73C v01 | shall0230 | Page 42 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.10.2 Squitter Monitor | | | 3.14.2 Squitter Monitor | | |
| A squitter monitor shall <<shall0139>> be provided to verify that the Mode S transponder generates short and Extended Squitters at their nominal rates (see §2.2.18.2.6 and §2.2.23.1). The transponder shall <<shall0140>> be considered failed when the monitor has detected squitter failure. | | | b. The equipment shall <<shall0230>> be considered FAILED when the monitor detects squitter failure. | | |

| Comparable | ID=868 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0142 | Page 34 | ED 73C v01 | shall0231 | Page 42 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.10.4 Failure Annunciation | | | 3.14.3 Failure Indication | | |
| An output shall <<shall0142>> be provided to indicate the validity/non-validity of the transponder. Failure to generate squitters at the nominal rate, a failure detected by self-test or the monitoring function, or failure of Mode S address verification shall <<shall0143>> cause the output to assume the invalid state. Momentary power interrupts shall <<shall0144>> not cause the output to assume the invalid state. The status of the transponder shall <<shall0145>> be annunciated to the flight crew. | | | a. An indication shall <<shall0231>> be provided of the validity/non-validity of the equipment. | | |

| Comparable | ID=870 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0144 | Page 34 | ED 73C v01 | shall0233 | Page 43 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.10.4 Failure Annunciation | | | 3.14.3 Failure Indication | | |
| An output shall <<shall0142>> be provided to indicate the validity/non-validity of the transponder. Failure to generate squitters at the nominal rate, a failure detected by self-test or the monitoring function, or failure of Mode S address verification shall <<shall0143>> cause the output to assume the invalid state. Momentary power interrupts shall <<shall0144>> not cause the output to assume the invalid state. The status of the transponder shall <<shall0145>> be annunciated to the flight crew. | | | c. Momentary power interruptions shall <<shall0233>> not cause indication of the invalid state. | | |

| Comparable | ID=871 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0145 | Page 34 | ED 73C v01 | shall0234 | Page 43 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.10.4 Failure Annunciation | | | 3.14.3 Failure Indication | | |
| An output shall <<shall0142>> be provided to indicate the validity/non-validity of the transponder. Failure to generate squitters at the nominal rate, a failure detected by self-test or the monitoring function, or failure of Mode S address verification shall <<shall0143>> cause the output to assume the invalid state. Momentary power interrupts shall <<shall0144>> not cause the output to assume the invalid state. The status of the transponder shall <<shall0145>> be annunciated to the flight crew. | | | The status of the equipment shall <<shall0234>> be indicated to the flight crew. | | |

| Comparable | ID=872 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0146 | Page 34 | ED 73C v01 | shall0236 | Page 43 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.11 Response to Mutual Suppression Pulses | | | 3.15.1 Response to Mutual Suppression Pulses | | |
| a. The equipment shall <<shall0146>> accept and respond to mutual suppression pulses from other electronic equipment in the aircraft (to disable it while the other equipment is transmitting), the equipment shall <<shall0147>> regain normal sensitivity, within 3 dB, not later than 15 microseconds after the end of the applied mutual suppression pulse. | | | If the equipment is designed to respond to mutual suppression pulses from other electronic equipment in the aircraft (to disable it while the other equipment is transmitting), the equipment shall <<shall0236>> regain normal sensitivity, within ±3 dB, not later than 15 µs after the end of the applied mutual suppression pulse. | | |

| Comparable | ID=873 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0147 | Page 34 | ED 73C v01 | shall0236 | Page 43 |
| WAT | Comment: Second shall of DO | | | | |
| | | | | | |
| 2.2.11 Response to Mutual Suppression Pulses | | | 3.15.1 Response to Mutual Suppression Pulses | | |
| a. The equipment shall <<shall0146>> accept and respond to mutual suppression pulses from other electronic equipment in the aircraft (to disable it while the other equipment is transmitting), the equipment shall <<shall0147>> regain normal sensitivity, within 3 dB, not later than 15 microseconds after the end of the applied mutual suppression pulse. | | | If the equipment is designed to respond to mutual suppression pulses from other electronic equipment in the aircraft (to disable it while the other equipment is transmitting), the equipment shall <<shall0236>> regain normal sensitivity, within ±3 dB, not later than 15 µs after the end of the applied mutual suppression pulse. | | |

| Comparable | ID=876 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0150 | Page 34 | ED 73C v01 | shall0241 | Page 43 |
| WAT | Comment: first shall of ED | | | | |
| | | | | | |
| 2.2.12 Diversity Operations | | | 3.16.1 General | | |
| Diversity Mode S transponders may be implemented for the purpose of improving air-to-air surveillance and communications. Such systems shall <<shall0149>> employ two antennas, one mounted on the top and the other on the bottom of the aircraft. Appropriate switching and signal processing channels to select the best antenna on the basis of the characteristics of the received interrogation signals shall <<shall0150>> also be provided. Such diversity systems, in their installed configuration, shall <<shall0151>> not result in degraded performance relative to that which would have been produced by a single system having a bottom-mounted antenna. | | | c. Appropriate switching and signal processing channels to select the best antenna on the basis of the characteristics of the received interrogation signals shall <<shall0241>> also be provided; replies shall <<shall0242>> only be transmitted from the selected antenna. | | |

| Comparable | ID=877 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0151 | Page 34 | ED 73C v01 | shall0243 | Page 43 |
| WAT | Comment: 0 | | | | |

| 2.2.12 Diversity Operations | 3.16.1 General |
|---|---|
| Diversity Mode S transponders may be implemented for the purpose of improving air-to-air surveillance and communications. Such systems shall <<shall0149>> employ two antennas, one mounted on the top and the other on the bottom of the aircraft. Appropriate switching and signal processing channels to select the best antenna on the basis of the characteristics of the received interrogation signals shall <<shall0150>> also be provided. Such diversity systems, in their installed configuration, shall <<shall0151>> not result in degraded performance relative to that which would have been produced by a single system having a bottom-mounted antenna. | d. Such diversity systems, in their installed configuration, shall <<shall0243>> not result in degraded performance relative to that which would have been produced by a single system having a bottom-mounted antenna. |

| Comparable | ID=879 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0153 | Page 34 | ED 73C v01 | shall0244 | Page 43 |
| WAT | Comment: 0 | | | | |

| 2.2.12.1 Diversity Antenna Selection and Selection Threshold | 3.16.2 Diversity Antenna Selection |
|---|---|
| Antenna selection shall <<shall0152>> be automatic. The transponder shall <<shall0153>> select one of the two antennas on the basis of the relative strengths of the detected interrogation signals, provided that both channels simultaneously receive a valid identical interrogation or pulse pair. Antenna selection and switching may occur after the receipt of one of the following. | a. Provided that both channels simultaneously receive valid, identical interrogations or pulse pairs, the transponder shall <<shall0244>> select one of the two antennas on the basis of the relative strengths of the detected interrogation signals at the two antennas. |

| Comparable | ID=887 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0158 | Page 35 | ED 73C v01 | shall0251 | Page 45 |
| WAT | Comment: Second DO shall | | | | |

| 2.2.12.2 Received Signal Delay Tolerance | 3.16.4 Received Signal Delay Threshold |
|---|---|
| If an interrogation is received at either antenna 0.125 microsecond or less in advance of reception at the other antenna, the interrogations shall <<shall0157>> be considered simultaneous and the reply antenna selection criteria shall <<shall0158>> be applied. If an interrogation is received at either antenna 0.375 microsecond or more in advance of reception at the other antenna, the antenna selected for the reply shall <<shall0159>> be the one which received the earlier interrogation. If the relative time of receipt is between 0.125 and 0.375 microsecond, the transponder shall <<shall0160>> select the reply antenna based on either the simultaneous interrogation criteria or the earlier time of arrival. | a. If an interrogation is received at either antenna 0.125 µs or less in advance of reception at the other antenna, the selection shall <<shall0251>> be made on the basis of received signal strength. |

| Comparable | ID=888 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0159 | Page 35 | ED 73C v01 | shall0252 | Page 45 |
| WAT | Comment: 0 | | | | |

| 2.2.12.2 Received Signal Delay Tolerance | 3.16.4 Received Signal Delay Threshold |
|---|---|
| If an interrogation is received at either antenna 0.125 microsecond or less in advance of reception at the other antenna, the interrogations shall <<shall0157>> be considered simultaneous and the reply antenna selection criteria shall <<shall0158>> be applied. If an interrogation is received at either antenna 0.375 microsecond or more in advance of reception at the other antenna, the antenna selected for the reply shall <<shall0159>> be the one which received the earlier interrogation. If the relative time of receipt is between 0.125 and 0.375 microsecond, the transponder shall <<shall0160>> select the reply antenna based on either the simultaneous interrogation criteria or the earlier time of arrival. | b. If an interrogation is received at either antenna 0.375 µs or more in advance of reception at the other antenna, the antenna selected for the reply shall <<shall0252>> be the one which received the earlier interrogation. |

| Comparable | ID=889 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0160 | Page 35 | ED 73C v01 | shall0253 | Page 45 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.12.2 Received Signal Delay Tolerance | | | 3.16.4 Received Signal Delay Threshold | | |
| If an interrogation is received at either antenna 0.125 microsecond or less in advance of reception at the other antenna, the interrogations shall <<shall0157>> be considered simultaneous and the reply antenna selection criteria shall <<shall0158>> be applied. If an interrogation is received at either antenna 0.375 microsecond or more in advance of reception at the other antenna, the antenna selected for the reply shall <<shall0159>> be the one which received the earlier interrogation. If the relative time of receipt is between 0.125 and 0.375 microsecond, the transponder shall <<shall0160>> select the reply antenna based on either the simultaneous interrogation criteria or the earlier time of arrival. | | | c. If the relative time of receipt is between 0.125 and 0.375 µs, the transponder shall <<shall0253>> select the reply antenna based on either | | |

| Comparable | ID=890 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0161 | Page 35 | ED 73C v01 | shall0254 | Page 45 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.12.3 Diversity Transmission Channel Isolation | | | 3.16.5 Diversity Transmission Channel Isolation | | |
| The peak RF power transmitted from the selected antenna shall <<shall0161>> exceed the power transmitted from the non-selected antenna by at least 20 dB. | | | The peak RF power transmitted from the selected antenna shall <<shall0254>> exceed the power transmitted from the non-selected antenna by at least 20 dB. | | |

| Comparable | ID=892 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0163 | Page 36 | ED 73C v01 | shall0257 | Page 45 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.12.5.1 Acquisition Squitter | | | 3.16.7.2 Acquisition Squitter | | |
| Transponders operating with antenna diversity (see §2.2.19.3.1) shall <<shall0163>> transmit acquisition squitters as follows: | | | Transponders operating with antenna diversity (paragraph 1.4.2.5) shall <<shall0257>> transmit acquisition squitters as follows: | | |

| Comparable | ID=893 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0164 | Page 36 | ED 73C v01 | shall0258 | Page 45 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.12.5.1 Acquisition Squitter | | | 3.16.7.2 Acquisition Squitter | | |
| a. When in the derived airborne state, the transponder shall <<shall0164>> transmit acquisition squitters alternately from the two antennas; and | | | a. when airborne, the transponder shall <<shall0258>> transmit acquisition squitters alternately from the two antennas; and | | |

| Comparable | ID=894 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0165 | Page 36 | ED 73C v01 | shall0259 | Page 45 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.12.5.1 Acquisition Squitter | | | 3.16.7.2 Acquisition Squitter | | |
| b. When in the derived on-the-ground state, the transponder shall <<shall0165>> transmit acquisition squitters under control of the SAS subfield (see §2.2.23.1.7). In the absence of any SAS commands, use of the top antenna only shall <<shall0166>> be the default condition. | | | b. when on the surface, the transponder shall <<shall0259>> transmit acquisition squitters under control of the SAS subfield (paragraph 3.21.2.6.7). In the absence of any SAS commands, use of the top antenna only shall <<shall0260>> be the default condition. | | |

| Comparable | ID=895 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0166 | Page 36 | ED 73C v01 | shall0260 | Page 45 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.12.5.1 Acquisition Squitter | | | 3.16.7.2 Acquisition Squitter | | |
| b. When in the derived on-the-ground state, the transponder shall <<shall0165>> transmit acquisition squitters under control of the SAS subfield (see §2.2.23.1.7). In the absence of any SAS commands, use of the top antenna only shall <<shall0166>> be the default condition. | | | b. when on the surface, the transponder shall <<shall0259>> transmit acquisition squitters under control of the SAS subfield (paragraph 3.21.2.6.7). In the absence of any SAS commands, use of the top antenna only shall <<shall0260>> be the default condition. | | |

| Comparable | ID=896 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0167 | Page 36 | ED 73C v01 | shall0262 | Page 46 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.12.5.2 Extended Squitter | | | 3.16.7.3 Extended Squitter | | |
| Transponders operating with antenna diversity (see §2.2.19.3.1) shall <<shall0167>> transmit Extended Squitters as follows: | | | Transponders equipped for extended squitter and operating with antenna diversity (paragraph 1.4.2.5) shall <<shall0262>> transmit extended squitters as follows: | | |

| Comparable | ID=897 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0168 | Page 36 | ED 73C v01 | shall0263 | Page 46 |
| WAT | Comment: DO refers to "derived airborne state" | | | | |
| | | | | | |
| 2.2.12.5.2 Extended Squitter | | | 3.16.7.3 Extended Squitter | | |
| a. When in the derived airborne state, the transponder shall <<shall0168>> transmit each type of Extended Squitter alternately from the two antennas; and | | | a. when airborne, the transponder shall <<shall0263>> transmit each type of extended squitters alternately from the two antennas; and | | |

| Comparable | ID=899 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0170 | Page 36 | ED 73C v01 | shall0265 | Page 46 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.12.5.2 Extended Squitter | | | 3.16.7.3 Extended Squitter | | |
| b. When broadcasting the surface position format (see §2.2.23.1.2.b), the transponder shall <<shall0169>> transmit Extended Squitters under control of the SAS subfield (see §2.2.23.1.7). In the absence of any SAS commands, use of the top antenna only shall <<shall0170>> be the default condition. | | | b. when on the surface, the transponder shall <<shall0264>> transmit extended squitters under control of the SAS subfield (paragraph 3.21.2.6.7). In the absence of any SAS commands, use of the top antenna only shall <<shall0265>> be the default condition | | |

| Comparable | ID=900 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0171 | Page 37 | ED 73C v01 | shall0266 | Page 46 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.13.1.1 Fixed Direct Data | | | 3.17.1 Direct Data | | |
| (1) Protection of Mode S address bits – During the power-on initialization process, the transponder shall <<shall0171>> read in and store its 24-bit discrete address. Thereafter, the address used by the transponder shall <<shall0172>> not change from the value stored at power-up. The transponder should continue to monitor the 24-bit discrete address after the initial read and store at power-up. If a change in the 24-bit discrete address is detected after the initial read and store, the transponder shall <<shall0173>> continue to use only the 24-bit discrete address stored at power-up and shall <<shall0174>> generate a diagnostic error message in order to alert maintenance personnel to the occurrence of intermittent discrete address bit input data. If the transponder 24-bit discrete address is set to all ONEs or all ZEROs at startup, then this error condition shall <<shall0175>> be indicated to the pilot, and the transponder shall <<shall0176>> either transition to Standby State, Power Off Condition, or operate as a pure Mode A/C Transponder. | | | Protection of 24 Bit address bits – During the power-on initialization process, the transponder shall <<shall0266>> read in and store its 24-bit aircraft address. Thereafter, the address used by the transponder shall <<shall0267>> not change from the value stored at power-up. The transponder should continue to monitor the 24-bit aircraft address after the initial read and store at power-up. If a change in the 24-bit aircraft address is detected after the initial read and store, the transponder shall <<shall0268>> continue to use only the 24-bit aircraft address stored at power-up and shall <<shall0269>> generate a diagnostic error message in order to alert maintenance personnel to the occurrence of intermittent discrete address bit input data. If the transponder 24-bit discrete address is set to all ONEs or all ZEROs at startup then this error condition shall <<shall0270>> be indicated to the pilot and the transponder shall <<shall0271>> either transition to Standby State, Power Off Condition, or operate as a pure Mode A/C transponder. . | | |

| Comparable | ID=901 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0172 | Page 37 | ED 73C v01 | shall0267 | Page 46 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.13.1.1 Fixed Direct Data | | | 3.17.1 Direct Data | | |
| (1) Protection of Mode S address bits – During the power-on initialization process, the transponder shall <<shall0171>> read in and store its 24-bit discrete address. Thereafter, the address used by the transponder shall <<shall0172>> not change from the value stored at power-up. The transponder should continue to monitor the 24-bit discrete address after the initial read and store at power-up. If a change in the 24-bit discrete address is detected after the initial read and store, the transponder shall <<shall0173>> continue to use only the 24-bit discrete address stored at power-up and shall <<shall0174>> generate a diagnostic error message in order to alert maintenance personnel to the occurrence of intermittent discrete address bit input data. If the transponder 24-bit discrete address is set to all ONEs or all ZEROs at startup, then this error condition shall <<shall0175>> be indicated to the pilot, and the transponder shall <<shall0176>> either transition to Standby State, Power Off Condition, or operate as a pure Mode A/C Transponder. | | | Protection of 24 Bit address bits – During the power-on initialization process, the transponder shall <<shall0266>> read in and store its 24-bit aircraft address. Thereafter, the address used by the transponder shall <<shall0267>> not change from the value stored at power-up. The transponder should continue to monitor the 24-bit aircraft address after the initial read and store at power-up. If a change in the 24-bit aircraft address is detected after the initial read and store, the transponder shall <<shall0268>> continue to use only the 24-bit aircraft address stored at power-up and shall <<shall0269>> generate a diagnostic error message in order to alert maintenance personnel to the occurrence of intermittent discrete address bit input data. If the transponder 24-bit discrete address is set to all ONEs or all ZEROs at startup then this error condition shall <<shall0270>> be indicated to the pilot and the transponder shall <<shall0271>> either transition to Standby State, Power Off Condition, or operate as a pure Mode A/C transponder. . | | |

| Comparable | ID=902 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0173 | Page 37 | ED 73C v01 | shall0268 | Page 46 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.13.1.1 Fixed Direct Data | | | 3.17.1 Direct Data | | |
| (1) Protection of Mode S address bits – During the power-on initialization process, the transponder shall <<shall0171>> read in and store its 24-bit discrete address. Thereafter, the address used by the transponder shall <<shall0172>> not change from the value stored at power-up. The transponder should continue to monitor the 24-bit discrete address after the initial read and store at power-up. If a change in the 24-bit discrete address is detected after the initial read and store, the transponder shall <<shall0173>> continue to use only the 24-bit discrete address stored at power-up and shall <<shall0174>> generate a diagnostic error message in order to alert maintenance personnel to the occurrence of intermittent discrete address bit input data. If the transponder 24-bit discrete address is set to all ONEs or all ZEROs at startup, then this error condition shall <<shall0175>> be indicated to the pilot, and the transponder shall <<shall0176>> either transition to | | | Protection of 24 Bit address bits – During the power-on initialization process, the transponder shall <<shall0266>> read in and store its 24-bit aircraft address. Thereafter, the address used by the transponder shall <<shall0267>> not change from the value stored at power-up. The transponder should continue to monitor the 24-bit aircraft address after the initial read and store at power-up. If a change in the 24-bit aircraft address is detected after the initial read and store, the transponder shall <<shall0268>> continue to use only the 24-bit aircraft address stored at power-up and shall <<shall0269>> generate a diagnostic error message in order to alert maintenance personnel to the occurrence of intermittent discrete address bit input data. If the transponder 24-bit discrete address is set to all ONEs or all ZEROs at startup then this error condition shall <<shall0270>> be indicated to the pilot and the transponder shall <<shall0271>> either transition to Standby State, Power Off Condition, | | |

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|---|---|
| Standby State, Power Off Condition, or operate as a pure Mode A/C Transponder. | or operate as a pure Mode A/C transponder. . |

| Comparable | ID=903 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0174 | Page 37 | ED 73C v01 | shall0269 | Page 46 |
| WAT | Comment: second shalls | | | | |
| | | | | | |

| 2.2.13.1.1 Fixed Direct Data | 3.17.1 Direct Data |
|---|---|
| (1) Protection of Mode S address bits – During the power-on initialization process, the transponder shall <<shall0171>> read in and store its 24-bit discrete address. Thereafter, the address used by the transponder shall <<shall0172>> not change from the value stored at power-up. The transponder should continue to monitor the 24-bit discrete address after the initial read and store at power-up. If a change in the 24-bit discrete address is detected after the initial read and store, the transponder shall <<shall0173>> continue to use only the 24-bit discrete address stored at power-up and shall <<shall0174>> generate a diagnostic error message in order to alert maintenance personnel to the occurrence of intermittent discrete address bit input data. If the transponder 24-bit discrete address is set to all ONEs or all ZEROs at startup, then this error condition shall <<shall0175>> be indicated to the pilot, and the transponder shall <<shall0176>> either transition to Standby State, Power Off Condition, or operate as a pure Mode A/C Transponder. | Protection of 24 Bit address bits – During the power-on initialization process, the transponder shall <<shall0266>> read in and store its 24-bit aircraft address. Thereafter, the address used by the transponder shall <<shall0267>> not change from the value stored at power-up. The transponder should continue to monitor the 24-bit aircraft address after the initial read and store at power-up. If a change in the 24-bit aircraft address is detected after the initial read and store, the transponder shall <<shall0268>> continue to use only the 24-bit aircraft address stored at power-up and shall <<shall0269>> generate a diagnostic error message in order to alert maintenance personnel to the occurrence of intermittent discrete address bit input data. If the transponder 24-bit discrete address is set to all ONEs or all ZEROs at startup then this error condition shall <<shall0270>> be indicated to the pilot and the transponder shall <<shall0271>> either transition to Standby State, Power Off Condition, or operate as a pure Mode A/C transponder. . |

| Comparable | ID=904 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0175 | Page 37 | ED 73C v01 | shall0270 | Page 46 |
| WAT | Comment: | | | | |
| | | | | | |

| 2.2.13.1.1 Fixed Direct Data | 3.17.1 Direct Data |
|---|---|
| (1) Protection of Mode S address bits – During the power-on initialization process, the transponder shall <<shall0171>> read in and store its 24-bit discrete address. Thereafter, the address used by the transponder shall <<shall0172>> not change from the value stored at power-up. The transponder should continue to monitor the 24-bit discrete address after the initial read and store at power-up. If a change in the 24-bit discrete address is detected after the initial read and store, the transponder shall <<shall0173>> continue to use only the 24-bit discrete address stored at power-up and shall <<shall0174>> generate a diagnostic error message in order to alert maintenance personnel to the occurrence of intermittent discrete address bit | Protection of 24 Bit address bits – During the power-on initialization process, the transponder shall <<shall0266>> read in and store its 24-bit aircraft address. Thereafter, the address used by the transponder shall <<shall0267>> not change from the value stored at power-up. The transponder should continue to monitor the 24-bit aircraft address after the initial read and store at power-up. If a change in the 24-bit aircraft address is detected after the initial read and store, the transponder shall <<shall0268>> continue to use only the 24-bit aircraft address stored at power-up and shall <<shall0269>> generate a diagnostic error message in order to alert maintenance personnel to the occurrence of intermittent discrete address bit input data. If the transponder |

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| input data. If the transponder 24-bit discrete address is set to all ONEs or all ZEROs at startup, then this error condition shall <<shall0175>> be indicated to the pilot, and the transponder shall <<shall0176>> either transition to Standby State, Power Off Condition, or operate as a pure Mode A/C Transponder. | 24-bit discrete address is set to all ONEs or all ZEROs at startup then this error condition shall <<shall0270>> be indicated to the pilot and the transponder shall <<shall0271>> either transition to Standby State, Power Off Condition, or operate as a pure Mode A/C transponder. . |

| Comparable | ID=905 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0176 | Page 37 | ED 73C v01 | shall0271 | Page 46 |
| WAT | Comment: | | | | |
| | | | | | |
| 2.2.13.1.1 Fixed Direct Data | | | 3.17.1 Direct Data | | |
| (1) Protection of Mode S address bits – During the power-on initialization process, the transponder shall <<shall0171>> read in and store its 24-bit discrete address. Thereafter, the address used by the transponder shall <<shall0172>> not change from the value stored at power-up. The transponder should continue to monitor the 24-bit discrete address after the initial read and store at power-up. If a change in the 24-bit discrete address is detected after the initial read and store, the transponder shall <<shall0173>> continue to use only the 24-bit discrete address stored at power-up and shall <<shall0174>> generate a diagnostic error message in order to alert maintenance personnel to the occurrence of intermittent discrete address bit input data. If the transponder 24-bit discrete address is set to all ONEs or all ZEROs at startup, then this error condition shall <<shall0175>> be indicated to the pilot, and the transponder shall <<shall0176>> either transition to Standby State, Power Off Condition, or operate as a pure Mode A/C Transponder. | | | Protection of 24 Bit address bits – During the power-on initialization process, the transponder shall <<shall0266>> read in and store its 24-bit aircraft address. Thereafter, the address used by the transponder shall <<shall0267>> not change from the value stored at power-up. The transponder should continue to monitor the 24-bit aircraft address after the initial read and store at power-up. If a change in the 24-bit aircraft address is detected after the initial read and store, the transponder shall <<shall0268>> continue to use only the 24-bit aircraft address stored at power-up and shall <<shall0269>> generate a diagnostic error message in order to alert maintenance personnel to the occurrence of intermittent discrete address bit input data. If the transponder 24-bit discrete address is set to all ONEs or all ZEROs at startup then this error condition shall <<shall0270>> be indicated to the pilot and the transponder shall <<shall0271>> either transition to Standby State, Power Off Condition, or operate as a pure Mode A/C transponder. . | | |

| Comparable | ID=908 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0179 | Page 38 | ED 73C v01 | shall0272 | Page 47 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.13.1.1 Fixed Direct Data | | | 3.17.1 Direct Data | | |
| In response to certain surveillance interrogations, the transponder shall <<shall0179>> place an encoded indication of the aircraft's maximum normal operating airspeed into bits 14-17 of the RI field. Coding is described in §2.2.14.4.33. | | | In response to certain surveillance interrogations, the transponder shall <<shall0272>> place an encoded indication of the aircraft's maximum cruising true airspeed into bits 14-17 of the RI field. Coding is described in subparagraph 3.18.4.30. | | |

| Comparable | ID=909 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0181 | Page 38 | ED 73C v01 | shall0273 | Page 47 |
| WAT | Comment: 0 | | | | |
| | | | | | |

| 2.2.13.1.2 Variable Direct Data | 3.17.1 Direct Data |
|---|---|
| When operated in conjunction with a pressure-altitude encoder (digitizer) or an air data system, the transponder shall <<shall0181>> have the capability for pressure-altitude transmission up to its designed maximum altitude. Pressure altitude reports shall <<shall0182>> be referenced to a standard pressure setting of 29.92 inches Hg (1013.25 hectopascals). | When operated in conjunction with a pressure-altitude encoder (digitizer) or an air data system, the transponder shall <<shall0273>> have the capability for pressure-altitude transmission in accordance with Annex 10 up to its designed maximum altitude. Pressure altitude reports shall <<shall0274>> be referenced to a standard pressure setting of 29.92 inches Hg (1013.25 hectopascals). |

| Comparable | ID=910 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0182 | Page 38 | ED 73C v01 | shall0274 | Page 47 |
| WAT | Comment: 0 | | | | |
| | | | | | |

| 2.2.13.1.2 Variable Direct Data | 3.17.1 Direct Data |
|---|---|
| When operated in conjunction with a pressure-altitude encoder (digitizer) or an air data system, the transponder shall <<shall0181>> have the capability for pressure-altitude transmission up to its designed maximum altitude. Pressure altitude reports shall <<shall0182>> be referenced to a standard pressure setting of 29.92 inches Hg (1013.25 hectopascals). | When operated in conjunction with a pressure-altitude encoder (digitizer) or an air data system, the transponder shall <<shall0273>> have the capability for pressure-altitude transmission in accordance with Annex 10 up to its designed maximum altitude. Pressure altitude reports shall <<shall0274>> be referenced to a standard pressure setting of 29.92 inches Hg (1013.25 hectopascals). |

| Comparable | ID=911 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0183 | Page 38 | ED 73C v01 | shall0275 | Page 47 |
| WAT | Comment: 0 | | | | |
| | | | | | |

| 2.2.13.1.2 Variable Direct Data | 3.17.1 Direct Data |
|---|---|
| (1) ATCRBS – When operated in the ATCRBS system, the altitude shall <<shall0183>> be transmitted in response to a Mode C interrogation, encoded in accordance with ICAO Annex 10. If valid altitude information is not available to the transponder, only the framing pulses required for a Mode C response shall <<shall0184>> be transmitted. | (i) Mode A/C - When operated in Mode A/C, the altitude shall <<shall0275>> be transmitted in response to a Mode C interrogation, encoded in accordance with ICAO Annex 10. If altitude information is not available to the transponder, only the framing pulses required for a Mode C response shall <<shall0276>> be transmitted. |

| Comparable | ID=912 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0184 | Page 39 | ED 73C v01 | shall0276 | Page 47 |
| WAT | Comment: 0 | | | | |

| 2.2.13.1.2 Variable Direct Data | 3.17.1 Direct Data |
|---|---|
| (1) ATCRBS – When operated in the ATCRBS system, the altitude shall <<shall0183>> be transmitted in response to a Mode C interrogation, encoded in accordance with ICAO Annex 10. If valid altitude information is not available to the transponder, only the framing pulses required for a Mode C response shall <<shall0184>> be transmitted. | (i) Mode A/C - When operated in Mode A/C, the altitude shall <<shall0275>> be transmitted in response to a Mode C interrogation, encoded in accordance with ICAO Annex 10. If altitude information is not available to the transponder, only the framing pulses required for a Mode C response shall <<shall0276>> be transmitted. |

| Comparable | ID=913 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0185 | Page 39 | ED 73C v01 | shall0277 | Page 47 |
| WAT | Comment: 0 | | | | |

| 2.2.13.1.2 Variable Direct Data | 3.17.1 Direct Data |
|---|---|
| (2) Mode S – When operated in the Mode S system, the 13-bit AC field (bits 20 – 32 transmitted in the short and long special surveillance reply, the altitude surveillance reply, and the altitude Comm-B reply) shall <<shall0185>> contain the encoded altitude of the aircraft. For aircraft with 25-foot or better pressure altitude sources, pressure altitude-information should be reported in 25-foot increments. Pressure altitude data obtained from a source with larger than 25-foot resolution shall <<shall0186>> not be reported using 25-foot increments. The altitude shall <<shall0187>> be encoded as follows: | (ii) Mode S - When operated in the Mode S system, the 13-bit AC field (bits 20-32 transmitted in the short and long special surveillance reply, the altitude surveillance reply, and the altitude Comm-B reply) shall <<shall0277>> contain the encoded altitude of the aircraft in accordance with ICAO Annex 10. For aircraft with 25-foot or better pressure altitude sources, pressure altitude-information should be reported in 25-foot increments. Pressure altitude data obtained from a source with larger than 25-foot resolution shall <<shall0278>> not be reported using 25-foot increments. The altitude shall <<shall0279>> be encoded as follows: |

| Comparable | ID=914 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0186 | Page 39 | ED 73C v01 | shall0278 | Page 47 |
| WAT | Comment: 0 | | | | |

| 2.2.13.1.2 Variable Direct Data | 3.17.1 Direct Data |
|---|---|
| (2) Mode S – When operated in the Mode S system, the 13-bit AC field (bits 20 – 32 transmitted in the short and long special surveillance reply, the altitude surveillance reply, and the altitude Comm-B reply) shall <<shall0185>> contain the encoded altitude of the aircraft. For aircraft with 25-foot or better pressure altitude sources, pressure altitude-information should be reported in 25-foot increments. Pressure altitude data obtained from a source with larger than 25-foot resolution shall <<shall0186>> not be reported using 25-foot increments. The altitude shall <<shall0187>> be | (ii) Mode S - When operated in the Mode S system, the 13-bit AC field (bits 20-32 transmitted in the short and long special surveillance reply, the altitude surveillance reply, and the altitude Comm-B reply) shall <<shall0277>> contain the encoded altitude of the aircraft in accordance with ICAO Annex 10. For aircraft with 25-foot or better pressure altitude sources, pressure altitude-information should be reported in 25-foot increments. Pressure altitude data obtained from a source with larger than 25-foot resolution shall <<shall0278>> not be reported using 25-foot increments. The |

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|---|---|
| encoded as follows: | altitude shall <<shall0279>> be encoded as follows: |

| Comparable | ID=915 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0187 | Page 39 | ED 73C v01 | shall0279 | Page 47 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.13.1.2 Variable Direct Data | | | 3.17.1 Direct Data | | |
| (2) Mode S – When operated in the Mode S system, the 13-bit AC field (bits 20 – 32 transmitted in the short and long special surveillance reply, the altitude surveillance reply, and the altitude Comm-B reply) shall <<shall0185>> contain the encoded altitude of the aircraft. For aircraft with 25-foot or better pressure altitude sources, pressure altitude-information should be reported in 25-foot increments. Pressure altitude data obtained from a source with larger than 25-foot resolution shall <<shall0186>> not be reported using 25-foot increments. The altitude shall <<shall0187>> be encoded as follows: | | | (ii) Mode S - When operated in the Mode S system, the 13-bit AC field (bits 20-32 transmitted in the short and long special surveillance reply, the altitude surveillance reply, and the altitude Comm-B reply) shall <<shall0277>> contain the encoded altitude of the aircraft in accordance with ICAO Annex 10. For aircraft with 25-foot or better pressure altitude sources, pressure altitude-information should be reported in 25-foot increments. Pressure altitude data obtained from a source with larger than 25-foot resolution shall <<shall0278>> not be reported using 25-foot increments. The altitude shall <<shall0279>> be encoded as follows: | | |

| Comparable | ID=916 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0188 | Page 39 | ED 73C v01 | shall0280 | Page 47 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.13.1.2 Variable Direct Data | | | 3.17.1 Direct Data | | |
| (a) Bit 26 shall <<shall0188>> be designated as the M bit and shall <<shall0189>> be ZERO if the altitude is reported in feet. M equals ONE shall <<shall0190>> be reserved for possible future use to indicate that the altitude reporting is in metric units. | | | Bit 26 shall <<shall0280>> be designated as the M bit and shall <<shall0281>> be ZERO if the altitude is reported in feet. M equals ONE shall <<shall0282>> be reserved for possible future use to indicate that the altitude reporting is in metric units. | | |

| Comparable | ID=917 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0189 | Page 39 | ED 73C v01 | shall0281 | Page 47 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.13.1.2 Variable Direct Data | | | 3.17.1 Direct Data | | |
| (a) Bit 26 shall <<shall0188>> be designated as the M bit and shall <<shall0189>> be ZERO if the altitude is reported in feet. M equals ONE shall <<shall0190>> be reserved for possible future use to indicate that the altitude reporting is in metric units. | | | Bit 26 shall <<shall0280>> be designated as the M bit and shall <<shall0281>> be ZERO if the altitude is reported in feet. M equals ONE shall <<shall0282>> be reserved for possible future use to indicate that the altitude reporting is in metric units. | | |

| Comparable | ID=918 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0190 | Page 39 | ED 73C v01 | shall0282 | Page 47 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.13.1.2 Variable Direct Data | | | 3.17.1 Direct Data | | |
| (a) Bit 26 shall <<shall0188>> be designated as the M bit and shall <<shall0189>> be ZERO if the altitude is reported in feet. M equals ONE shall <<shall0190>> be reserved for possible future use to indicate that the altitude reporting is in metric units. | | | Bit 26 shall <<shall0280>> be designated as the M bit and shall <<shall0281>> be ZERO if the altitude is reported in feet. M equals ONE shall <<shall0282>> be reserved for possible future use to indicate that the altitude reporting is in metric units. | | |

| Comparable | ID=919 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0191 | Page 39 | ED 73C v01 | shall0283 | Page 48 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.13.1.2 Variable Direct Data | | | 3.17.1 Direct Data | | |
| (b) If M equals ZERO, bit 28 shall <<shall0191>> be designated as the Q bit. Q equals ZERO shall <<shall0192>> be used to indicate that the Mode S altitude is reported in 100-foot increments as defined in c below. Q equals ONE shall <<shall0193>> be used to indicate that the altitude is reported in 25-foot increments as defined in d below. | | | (b) If M equals ZERO, bit 28 shall <<shall0283>> be designated as the Q bit. Q equals ZERO shall <<shall0284>> be used to indicate that the Mode S altitude is reported in 100-foot increments as defined in c below. Q equals ONE shall <<shall0285>> be used to indicate that the altitude is reported in 25-ft increments as defined in d below. | | |

| Comparable | ID=920 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0192 | Page 39 | ED 73C v01 | shall0284 | Page 48 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.13.1.2 Variable Direct Data | | | 3.17.1 Direct Data | | |
| (b) If M equals ZERO, bit 28 shall <<shall0191>> be designated as the Q bit. Q equals ZERO shall <<shall0192>> be used to indicate that the Mode S altitude is reported in 100-foot increments as defined in c below. Q equals ONE shall <<shall0193>> be used to indicate that the altitude is reported in 25-foot increments as defined in d below. | | | (b) If M equals ZERO, bit 28 shall <<shall0283>> be designated as the Q bit. Q equals ZERO shall <<shall0284>> be used to indicate that the Mode S altitude is reported in 100-foot increments as defined in c below. Q equals ONE shall <<shall0285>> be used to indicate that the altitude is reported in 25-ft increments as defined in d below. | | |

| Comparable | ID=921 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0193 | Page 39 | ED 73C v01 | shall0285 | Page 48 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.13.1.2 Variable Direct Data | | | 3.17.1 Direct Data | | |
| (b) If M equals ZERO, bit 28 shall <<shall0191>> be designated as the Q bit. Q equals ZERO shall <<shall0192>> be used to indicate that the Mode S altitude is reported in 100-foot increments as defined in c below. Q equals ONE shall <<shall0193>> be used to indicate that the altitude is reported in 25-foot increments as defined in d below. | | | (b) If M equals ZERO, bit 28 shall <<shall0283>> be designated as the Q bit. Q equals ZERO shall <<shall0284>> be used to indicate that the Mode S altitude is reported in 100-foot increments as defined in c below. Q equals ONE shall <<shall0285>> be used to indicate that the altitude is reported in 25-ft increments as defined in d below. | | |

| Comparable | ID=922 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0194 | Page 39 | ED 73C v01 | shall0286 | Page 48 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.13.1.2 Variable Direct Data | | | 3.17.1 Direct Data | | |
| (c) If M and Q both equal ZERO, the altitude shall <<shall0194>> be coded according to the pattern for Mode C replies specified in ICAO Annex 10. Starting with bit 20, the sequence shall <<shall0195>> be C1, A1, C2, A2, C4, A4, ZERO, B1, ZERO, B2, D2, B4, D4. | | | If M and Q both equal ZERO, the altitude shall <<shall0286>> be coded according to the pattern for Mode C replies specified in ICAO Annex 10. Starting with bit 20, the sequence shall <<shall0287>> be C1, A1, C2, A2, C4, A4, ZERO, B1, ZERO, B2, D2, B4, D4. | | |

| Comparable | ID=923 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0195 | Page 39 | ED 73C v01 | shall0287 | Page 48 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.13.1.2 Variable Direct Data | | | 3.17.1 Direct Data | | |
| (c) If M and Q both equal ZERO, the altitude shall <<shall0194>> be coded according to the pattern for Mode C replies specified in ICAO Annex 10. Starting with bit 20, the sequence shall <<shall0195>> be C1, A1, C2, A2, C4, A4, ZERO, B1, ZERO, B2, D2, B4, D4. | | | If M and Q both equal ZERO, the altitude shall <<shall0286>> be coded according to the pattern for Mode C replies specified in ICAO Annex 10. Starting with bit 20, the sequence shall <<shall0287>> be C1, A1, C2, A2, C4, A4, ZERO, B1, ZERO, B2, D2, B4, D4. | | |

| Comparable | ID=924 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0196 | Page 39 | ED 73C v01 | shall0288 | Page 48 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.13.1.2 Variable Direct Data | | | 3.17.1 Direct Data | | |
| (d) If M equals ZERO and Q equals ONE, the 11-bit field represented by | | | (d) If M equals ZERO and Q equals ONE, the 11-bit field | | |

| | |
|---|---|
| bits 20 to 25, 27, and 29 to 32 shall <<shall0196>> represent a binary-coded field whose least significant bit has a value of 25 feet. The binary value of the decimal number N shall <<shall0197>> be used to report pressure altitudes in the range (25 x N - 1000 ±12.5) feet. | represented by bits 20 to 25, 27, and 29 to 32 shall <<shall0288>> represent a binary-coded field whose least significant bit has a value of 25 feet. The binary value of the decimal number N shall <<shall0289>> be used to report pressure altitudes in the range (25 x N - 1000 ±12.5) feet. |

| Comparable | ID=925 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0197 | Page 39 | ED 73C v01 | shall0289 | Page 48 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.13.1.2 Variable Direct Data | | | 3.17.1 Direct Data | | |
| (d) If M equals ZERO and Q equals ONE, the 11-bit field represented by bits 20 to 25, 27, and 29 to 32 shall <<shall0196>> represent a binary-coded field whose least significant bit has a value of 25 feet. The binary value of the decimal number N shall <<shall0197>> be used to report pressure altitudes in the range (25 x N - 1000 ±12.5) feet. | | | (d) If M equals ZERO and Q equals ONE, the 11-bit field represented by bits 20 to 25, 27, and 29 to 32 shall <<shall0288>> represent a binary-coded field whose least significant bit has a value of 25 feet. The binary value of the decimal number N shall <<shall0289>> be used to report pressure altitudes in the range (25 x N - 1000 ±12.5) feet. | | |

| Comparable | ID=926 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0198 | Page 39 | ED 73C v01 | shall0290 | Page 48 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.13.1.2 Variable Direct Data | | | 3.17.1 Direct Data | | |
| (e) ZERO shall <<shall0198>> be transmitted in each of the 13 bits of the AC field if altitude information is not available or if the altitude has been determined to be invalid. | | | (e) ZERO shall <<shall0290>> be transmitted in each of the 13 bits of the AC field if altitude information is not available or if the altitude has been determined to be invalid. | | |

| Comparable | ID=927 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0199 | Page 40 | ED 73C v01 | shall0291 | Page 48 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.13.1.2 Variable Direct Data | | | 3.17.1 Direct Data | | |
| In response to an ATCRBS Mode A or Mode S surveillance or Comm-A identity interrogation, the transponder shall <<shall0199>> reply with a pilot-selectable identification code. The code designation shall <<shall0200>> consist of digits between 0 and 7 inclusive, and shall <<shall0201>> consist of the sum of the postscripts of the information pulse numbers defined in §2.2.4.1.2, employed as follows: | | | In response to an ATCRBS Mode A or Mode S surveillance or Comm-A identity interrogation, the transponder shall <<shall0291>> reply with a pilot-selectable identification code. The code designation shall <<shall0292>> consist of digits between 0 and 7 inclusive, and shall <<shall0293>> consist of the sum of the postscripts of the information pulse numbers defined in subparagraph 2.2.4.1.2, employed as follows: | | |

| Comparable | ID=928 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0200 | Page 40 | ED 73C v01 | shall0292 | Page 48 |
| WAT | Comment: 0 | | | | |
| | | | | | |

| 2.2.13.1.2 Variable Direct Data | 3.17.1 Direct Data |
|---|---|
| In response to an ATCRBS Mode A or Mode S surveillance or Comm-A identity interrogation, the transponder shall <<shall0199>> reply with a pilot-selectable identification code. The code designation shall <<shall0200>> consist of digits between 0 and 7 inclusive, and shall <<shall0201>> consist of the sum of the postscripts of the information pulse numbers defined in §2.2.4.1.2, employed as follows: | In response to an ATCRBS Mode A or Mode S surveillance or Comm-A identity interrogation, the transponder shall <<shall0291>> reply with a pilot-selectable identification code. The code designation shall <<shall0292>> consist of digits between 0 and 7 inclusive, and shall <<shall0293>> consist of the sum of the postscripts of the information pulse numbers defined in subparagraph 2.2.4.1.2, employed as follows: |

| Comparable | ID=929 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0201 | Page 40 | ED 73C v01 | shall0293 | Page 48 |
| WAT | Comment: second shalls | | | | |
| | | | | | |

| 2.2.13.1.2 Variable Direct Data | 3.17.1 Direct Data |
|---|---|
| In response to an ATCRBS Mode A or Mode S surveillance or Comm-A identity interrogation, the transponder shall <<shall0199>> reply with a pilot-selectable identification code. The code designation shall <<shall0200>> consist of digits between 0 and 7 inclusive, and shall <<shall0201>> consist of the sum of the postscripts of the information pulse numbers defined in §2.2.4.1.2, employed as follows: | In response to an ATCRBS Mode A or Mode S surveillance or Comm-A identity interrogation, the transponder shall <<shall0291>> reply with a pilot-selectable identification code. The code designation shall <<shall0292>> consist of digits between 0 and 7 inclusive, and shall <<shall0293>> consist of the sum of the postscripts of the information pulse numbers defined in subparagraph 2.2.4.1.2, employed as follows: |

| Comparable | ID=930 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0202 | Page 40 | ED 73C v01 | shall0294 | Page 49 |
| WAT | Comment: 0 | | | | |
| | | | | | |

| 2.2.13.1.2 Variable Direct Data | 3.17.1 Direct Data |
|---|---|
| The transponder shall <<shall0202>> report the automatically determined on-the-ground state as determined by the aircraft in the Flight Status (FS), Vertical Status (VS), and Capability (CA) fields (see §2.2.14.4.14, §2.2.14.4.42, and §2.2.14.4.6), except when reporting airborne status when on-the-ground is reported to the transponder under the conditions specified in §2.2.18.2.7. | The transponder shall <<shall0294>> report the automatically determined on-the-ground state as determined by the aircraft in the Flight Status (FS), Vertical Status (VS), and Capability (CA) fields except when reporting airborne status when on-the-ground is reported to the transponder under the conditions specified in subparagraph xxxx2.2.16.2.7xx. (Ed note: Check sub para No) |

| Comparable | ID=931 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0203 | Page 40 | ED 73C v01 | shall0295 | Page 49 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.13.1.2 Variable Direct Data | | | 3.17.1 Direct Data | | |
| In the ATCRBS mode, an SPI pulse shall <<shall0203>> be transmitted upon request, following a Mode A reply. In the FS field of Mode S replies, an equivalent of the ATCRBS SPI pulse shall <<shall0204>> be transmitted upon the same request. The code is transmitted for 18 ±1.0 seconds after initiation and can be reinitiated at any time. | | | In Mode A/C, an SPI pulse shall <<shall0295>> be transmitted upon request, following a Mode A reply. In the FS field of Mode S replies, an equivalent of the SPI pulse shall <<shall0296>> be transmitted upon the same request. The code is transmitted for 18 ±1.0 seconds after initiation and can be reinitiated at any time. | | |

| Comparable | ID=932 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0204 | Page 40 | ED 73C v01 | shall0296 | Page 49 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.13.1.2 Variable Direct Data | | | 3.17.1 Direct Data | | |
| In the ATCRBS mode, an SPI pulse shall <<shall0203>> be transmitted upon request, following a Mode A reply. In the FS field of Mode S replies, an equivalent of the ATCRBS SPI pulse shall <<shall0204>> be transmitted upon the same request. The code is transmitted for 18 ±1.0 seconds after initiation and can be reinitiated at any time. | | | In Mode A/C, an SPI pulse shall <<shall0295>> be transmitted upon request, following a Mode A reply. In the FS field of Mode S replies, an equivalent of the SPI pulse shall <<shall0296>> be transmitted upon the same request. The code is transmitted for 18 ±1.0 seconds after initiation and can be reinitiated at any time. | | |

| Comparable | ID=933 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0205 | Page 40 | ED 73C v01 | shall0297 | Page 49 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.13.1.2 Variable Direct Data | | | 3.17.1 Direct Data | | |
| If the aircraft uses a flight number for aircraft identification, a means shall <<shall0205>> be provided for the variable aircraft identification to be inserted by the pilot. | | | If the aircraft uses a flight number for aircraft identification, a means shall <<shall0297>> be provided for the variable aircraft identification to be inserted by the pilot. | | |

| Comparable | ID=934 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0206 | Page 41 | ED 73C v01 | shall0299 | Page 50 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.13.2.2 Integrity of Interface Data Transfer | | | 3.17.2 Indirect Data | | |
| If a data link interface is employed, the interface shall <<shall0206>> be designed to provide communication between the transponder and peripheral devices in the normal operational aircraft environment for that class of transponder to assure error rates of less than one detected error in 103 112-bit transmissions and less than one undetected error in 107 112-bit transmissions for both uplink and downlink transfers. | | | Data link interfaces shall <<shall0299>> be designed to ensure error rates of less than one detected error in 103 112-bit transmissions and less than one undetected error in 107 112-bit transmissions for both uplink and downlink transfers. | | |

| Comparable | ID=935 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0207 | Page 42 | ED 73C v01 | shall0301 | Page 50 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.13.3.1 Uplink Interface | | | 3.17.3 Standard Transaction Interfaces | | |
| a. Information Content – The interface shall <<shall0207>> transfer the entire content of both short and long accepted uplink interrogations (with the possible exception of the AP Field) except for interrogations UF=0, 11, 16 and a UF=24 interrogation containing a request for a downlink ELM transfer (RC=3). This permits the receiving devices to properly identify the data field contents and permits possible additional parity determination at the I/O device. | | | The interface shall <<shall0301>> transfer the entire content of both short and long received uplink transmissions, with the possible exception of the last 24 bits (address/parity bits) except for interrogations UF=0, 11,16 and a UF=24 interrogation containing a request for a downlink ELM transfer (RC=3).This permits the receiving devices to properly identify the data field contents. The additional transfer of the address/parity bits will permit parity determination at an I/O device. | | |

| Comparable | ID=936 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0208 | Page 42 | ED 73C v01 | shall0302 | Page 51 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.13.3.1 Uplink Interface | | | 3.17.3 Standard Transaction Interfaces | | |
| b. No-Storage Design – If the interface design is based on the concept of shifting data out of the transponder as they are received, the interface shall <<shall0208>> be capable of transferring uplink content before the start of the corresponding reply. | | | If the interface design is based on the concept of shifting data out of the transponder as they are received, the interface shall <<shall0302>> be capable of transferring uplink content before the start of the corresponding reply. | | |

| Comparable | ID=937 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0209 | Page 42 | ED 73C v01 | shall0303 | Page 51 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.13.3.1 Uplink Interface | | | 3.17.3 Standard Transaction Interfaces | | |
| c. Storage Design, Acceptance Rate – If the interface design is based on the concept of shifting data out at a slower rate, the internal storage system shall <<shall0209>> be able to process the content of Mode S interrogations (long or short) at a rate greater than or equal to: | | | If the interface design is based on the concept of shifting data out at a slower rate, the internal data system shall <<shall0303>> be able to process the content of Mode S interrogations (long or short) at a rate greater than or equal to: | | |

| Comparable | ID=939 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0211 | Page 43 | ED 73C v01 | shall0305 | Page 51 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.13.3.1 Uplink Interface | | | 3.17.3 Standard Transaction Interfaces | | |
| e. Broadcast Information – Regardless of design (No-Storage or Storage), the uplink interface shall <<shall0211>> have a means to indicate to the recipient that a received message was sent as a broadcast. | | | Regardless of design (No-Storage or Storage), the uplink interface shall <<shall0305>> have a means of indicating to the recipient that a received message was sent as a broadcast. | | |

| Comparable | ID=940 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0212 | Page 43 | ED 73C v01 | shall0306 | Page 51 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.13.3.1 Uplink Interface | | | 3.17.3 Standard Transaction Interfaces | | |
| f. Transponder Capability – The transponder datalink communication capacity information shall <<shall0212>> be made available to the ADLP. This information includes the ELM capacity of the transponder and the ability of the transponder to support the enhanced datalink protocols. | | | The interface shall <<shall0306>> be able to insert into the downlink transmission any bit not inserted by the transponder. | | |

| Comparable | ID=942 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0214 | Page 43 | ED 73C v01 | shall0307 | Page 51 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.13.3.2 Downlink Interface | | | 3.17.3 Standard Transaction Interfaces | | |
| b. No-Storage Design – If the interface is designed to insert bits into the transponder for immediate transmission, such bits shall <<shall0214>> occur at the interface at least one microsecond before actual transmission. | | | If the interface is designed to insert bits into the transponder for immediate transmission, such bits shall <<shall0307>> occur at the interface at least one microsecond before actual transmission. | | |

| Comparable | ID=946 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0218 | Page 43 | ED 73C v01 | shall0313 | Page 52 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.13.3.2 Downlink Interface | | | 3.17.3 Standard Transaction Interfaces | | |
| e. Unavailable Data – If an interrogation requests, as in c above, data that are not available, the transponder shall <<shall0218>> insert ZERO (0) into the affected fields of the reply. | | | If an interrogation requests, as in (3) above, data which are not available, the transponder shall <<shall0313>> insert "ZERO" into the affected fields of the reply. | | |

| Comparable | ID=947 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0219 | Page 44 | ED 73C v01 | shall0322 | Page 53 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.14.1 Format Structure, Interrogation and Reply | | | 3.18.1 Format Structure, Interrogation and Reply | | |
| Formats shall <<shall0219>> contain either 56 or 112 bits, the last 24 of which are used for address and parity while the rest are used for information transfer. A summary of interrogation and reply formats is presented in Figure 2-4 and Figure 2-5. | | | Formats shall <<shall0322>> contain either 56 or 112 bits, the last 24 of which are used for address and parity while the rest are used for information transfer. A summary of interrogation and reply formats is presented in Figures 3-3 and 3-4. | | |

| Comparable | ID=951 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0223 | Page 50 | ED 73C v01 | shall0323 | Page 55 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.14.4.6 CA Transponder Capability | | | 3.18.4.5 Transponder Capability CA | | |
| When the conditions for CA code 7 are not satisfied, installations that have communications capability but do not have automatic means to set on-the-ground conditions shall <<shall0223>> use CA code 6. Aircraft with automatic on-the-ground determination shall <<shall0224>> use CA codes 4 and 5. Data link capability reports (see §2.2.19.1.12.5) shall <<shall0225>> be available for CA codes 4, 5, 6 and 7. | | | When the conditions for CA code 7 are not satisfied, installations that have communications capability but do not have automatic means to set on-the-ground conditions shall <<shall0323>> use CA code 6. Aircraft with automatic on-the-ground determination shall <<shall0324>> use CA codes 4 and 5. Data link capability reports (paragraph 3.21.1.12 d) shall <<shall0325>> be available for CA codes 4, 5, 6 and 7. | | |

| Comparable | ID=952 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0224 | Page 50 | ED 73C v01 | shall0324 | Page 55 |
| WAT | Comment: 0 | | | | |
| | | | | | |

| 2.2.14.4.6 CA Transponder Capability | 3.18.4.5 Transponder Capability CA |
|---|---|
| When the conditions for CA code 7 are not satisfied, installations that have communications capability but do not have automatic means to set on-the-ground conditions shall <<shall0223>> use CA code 6. Aircraft with automatic on-the-ground determination shall <<shall0224>> use CA codes 4 and 5. Data link capability reports (see §2.2.19.1.12.5) shall <<shall0225>> be available for CA codes 4, 5, 6 and 7. | When the conditions for CA code 7 are not satisfied, installations that have communications capability but do not have automatic means to set on-the-ground conditions shall <<shall0323>> use CA code 6. Aircraft with automatic on-the-ground determination shall <<shall0324>> use CA codes 4 and 5. Data link capability reports (paragraph 3.21.1.12 d) shall <<shall0325>> be available for CA codes 4, 5, 6 and 7. |

| Comparable | ID=953 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0225 | Page 50 | ED 73C v01 | shall0325 | Page 55 |
| WAT | Comment: 0 | | | | |
| | | | | | |

| 2.2.14.4.6 CA Transponder Capability | 3.18.4.5 Transponder Capability CA |
|---|---|
| When the conditions for CA code 7 are not satisfied, installations that have communications capability but do not have automatic means to set on-the-ground conditions shall <<shall0223>> use CA code 6. Aircraft with automatic on-the-ground determination shall <<shall0224>> use CA codes 4 and 5. Data link capability reports (see §2.2.19.1.12.5) shall <<shall0225>> be available for CA codes 4, 5, 6 and 7. | When the conditions for CA code 7 are not satisfied, installations that have communications capability but do not have automatic means to set on-the-ground conditions shall <<shall0323>> use CA code 6. Aircraft with automatic on-the-ground determination shall <<shall0324>> use CA codes 4 and 5. Data link capability reports (paragraph 3.21.1.12 d) shall <<shall0325>> be available for CA codes 4, 5, 6 and 7. |

| Comparable | ID=954 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0226 | Page 51 | ED 73C v01 | shall0326 | Page 55 |
| WAT | Comment: 0 | | | | |
| | | | | | |

| 2.2.14.4.7 CC: Crosslink Capability | 3.18.4.6 Crosslink Capability CC |
|---|---|
| This 1-bit (7) downlink field shall <<shall0226>> indicate the ability of the transponder to support the crosslink capability, i.e., decode the contents of the DS field in a UF=0 interrogation and respond with the contents of the specified ground-initiated Comm-B register in the MV field of the corresponding DF=16 reply. It is used in format DF=0. The codes are: | This 1-bit (7) downlink field shall <<shall0326>> indicate the ability of the transponder to support the crosslink capability, i.e. decode the contents of the DS field in an interrogation with UF equals 0 and respond with the contents of the specified GICB register in the MV field of the corresponding reply with DF equals 16. This CC field is only used in format UF=0. |

| Comparable | ID=956 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0228 | Page 51 | ED 73C v01 | shall0327 | Page 55 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.14.4.9 CL Code Label | | | 3.18.4.7 Code Label CL | | |
| This 3-bit (14-16) uplink field shall <<shall0228>> define the contents of the IC field. | | | This 3-bit (14-16) uplink field shall <<shall0327>> define the contents of the IC field and is used in UF = 11. Coding (in binary): | | |

| Comparable | ID=957 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0229 | Page 51 | ED 73C v01 | shall0328 | Page 55 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.14.4.9 CL Code Label | | | 3.18.4.7 Code Label CL | | |
| The other values of the CL field shall <<shall0229>> not be used. | | | The other values of the CL field shall <<shall0328>> not be used. | | |

| Comparable | ID=958 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0230 | Page 52 | ED 73C v01 | shall0329 | Page 56 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.14.4.12 DR Downlink Request | | | 3.18.4.10 Downlink Request DR | | |
| Codes 1-15 shall <<shall0230>> take precedence over codes 16-31 to permit the announcement of a Comm-B message to interrupt the announcement of a downklink ELM. This gives priority to the announcement of the shorter message. Announcement of the downlink ELM shall <<shall0231>> resume when the Comm-B is cleared. | | | Codes 1-15 shall <<shall0329>> take precedence over codes 16-31 to permit the announcement of a Comm-B message to interrupt the announcement of a downlink ELM. This gives priority to the announcement of the shorter message. Announcement of the downlink ELM shall <<shall0330>> resume when the Comm-B is cleared. | | |

| Comparable | ID=959 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0231 | Page 52 | ED 73C v01 | shall0330 | Page 56 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.14.4.12 DR Downlink Request | | | 3.18.4.10 Downlink Request DR | | |
| Codes 1-15 shall <<shall0230>> take precedence over codes 16-31 to permit the announcement of a Comm-B message to interrupt the announcement of a downklink ELM. This gives priority to the announcement of the shorter message. Announcement of the downlink ELM shall <<shall0231>> resume when the Comm-B is cleared. | | | Codes 1-15 shall <<shall0329>> take precedence over codes 16-31 to permit the announcement of a Comm-B message to interrupt the announcement of a downlink ELM. This gives priority to the announcement of the shorter message. Announcement of the downlink ELM shall <<shall0330>> resume when the Comm-B is cleared. | | |

| Comparable | ID=960 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0232 | Page 52 | ED 73C v01 | shall0331 | Page 56 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.14.4.13 DS: Comm-B Data Selector | | | 3.18.4.11 Data Selector DS | | |
| This 8-bit (15-22) uplink field shall <<shall0232>> contain the identity of the ground-initiated Comm-B register whose contents are to appear in the MV field of the corresponding reply. It is used in format UF=0. | | | This 8 bit (15-22) uplink field shall <<shall0331>> contain the BDS code of the GICB register whose contents shall <<shall0332>> be returned in the MV field of the corresponding reply with DF equals 16.This DS field is only used in format UF=0. | | |

| Comparable | ID=961 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0232 | Page 52 | ED 73C v01 | shall0332 | Page 56 |
| WAT | Comment: ED 2d shall | | | | |
| | | | | | |
| 2.2.14.4.13 DS: Comm-B Data Selector | | | 3.18.4.11 Data Selector DS | | |
| This 8-bit (15-22) uplink field shall <<shall0232>> contain the identity of the ground-initiated Comm-B register whose contents are to appear in the MV field of the corresponding reply. It is used in format UF=0. | | | This 8 bit (15-22) uplink field shall <<shall0331>> contain the BDS code of the GICB register whose contents shall <<shall0332>> be returned in the MV field of the corresponding reply with DF equals 16.This DS field is only used in format UF=0. | | |

| Comparable | ID=963 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0234 | Page 53 | ED 73C v01 | shall0333 | Page 56 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.14.4.15 IC Interrogator Code | | | 3.18.4.13 Interrogator Code IC | | |
| This 4-bit (10-13) uplink field shall <<shall0234>> contain either the 4-bit II code (§2.2.14.4.17) or the lower 4 bits of the 6-bit SI code (§2.2.14.4.37) depending on the value of the CL field (§2.2.14.4.9). | | | This 4-bit (10-13) uplink field shall <<shall0333>> contain either the 4-bit II code (3.18.4.15) or the lower 4 bits of the 6-bit SI code (3.18.4.34) depending on the value of the CL field (3.18.4.7). | | |

| Comparable | ID=964 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0235 | Page 53 | ED 73C v01 | shall0334 | Page 57 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.14.4.17 II Interrogator Identification | | | 3.18.4.15 Interrogator Identification II | | |
| This 4-bit value shall <<shall0235>> define an interrogator identifier (II) code. These II codes shall <<shall0236>> be assigned to interrogators in the range of 0 to 15. An II code value of ZERO shall <<shall0237>> not be used by interrogators which use the multisite lockout protocols (see §2.2.18.2.5) or multisite communications protocols (see §2.2.19.2). | | | This 4-bit value shall <<shall0334>> define an interrogator identifier (II) code. These II codes shall <<shall0335>> be assigned to interrogators in the range of 0 to 15. An II code value of zero shall <<shall0336>> only be used in conjunction with acquisition based on lockout override. | | |

| Comparable | ID=965 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0236 | Page 53 | ED 73C v01 | shall0335 | Page 57 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.14.4.17 II Interrogator Identification | | | 3.18.4.15 Interrogator Identification II | | |
| This 4-bit value shall <<shall0235>> define an interrogator identifier (II) code. These II codes shall <<shall0236>> be assigned to interrogators in the range of 0 to 15. An II code value of ZERO shall <<shall0237>> not be used by interrogators which use the multisite lockout protocols (see §2.2.18.2.5) or multisite communications protocols (see §2.2.19.2). | | | This 4-bit value shall <<shall0334>> define an interrogator identifier (II) code. These II codes shall <<shall0335>> be assigned to interrogators in the range of 0 to 15. An II code value of zero shall <<shall0336>> only be used in conjunction with acquisition based on lockout override. | | |

| Comparable | ID=967 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0238 | Page 54 | ED 73C v01 | shall0338 | Page 57 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.14.4.21 MC Message, Comm-C | | | 3.18.4.19 Message, Comm-C MC | | |
| This 80-bit (9-88) uplink field shall <<shall0238>> contain: | | | This 80-bit (9-88) uplink field shall <<shall0338>> contain: | | |

| Comparable | ID=968 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0239 | Page 56 | ED 73C v01 | shall0341 | Page 58 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.14.4.29 PC Protocol | | | 3.18.4.26 Protocol PC | | |
| The PC field shall <<shall0239>> be ignored for the processing of surveillance or Comm-A interrogations containing DI=3 (see §2.2.19.2.1.1). | | | This 3-bit (6-8) uplink field contains operating commands to the transponder and is part of surveillance and Comm-A interrogations UF=4, 5, 20, 21. The PC field shall <<shall0341>> be ignored for the processing of surveillance or Comm-A interrogations containing DI=3 (3.21.2.1). The codes are: | | |

| Comparable | ID=971 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0242 | Page 60 | ED 73C v01 | shall0342 | Page 60 |
| WAT | Comment: DO has one shall, ED has multiple shalls | | | | |
| | | | | | |
| 2.2.14.4.37 SI Surveillance Identifier | | | 3.18.4.34 Surveillance Identifier SI | | |
| This 6-bit value shall <<shall0242>> define a surveillance identifier (SI) code which is derived from the CL and IC fields of UF=11, or received directly in the SIS subfield (see §2.2.19.2.1.1). These SI code values are assigned to interrogators in the range of 1 to 63. An SI value of ZERO will not be used. The SI codes are used with the multisite lockout protocols (see §2.2.18.2.5). The SI codes are not be used with the multisite communications protocols, which require the use of II codes. Therefore, an interrogator operating with an SI code will be limited to the following data link capabilities: | | | This 6-bit value shall <<shall0342>> define a surveillance identifier (SI) code. These SI code values shall <<shall0343>> be assigned to interrogators in the range of 1 to 63. An SI value of zero shall <<shall0344>> not be used. The SI codes shall <<shall0345>> be used with the multisite lockout protocols (3.20.2.5). The SI codes shall <<shall0346>> not be used with the multisite communications protocols. | | |

| Comparable | ID=972 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0242 | Page 60 | ED 73C v01 | shall0343 | Page 60 |
| WAT | Comment: DO has one shall, ED has multiple shalls | | | | |
| | | | | | |
| 2.2.14.4.37 SI Surveillance Identifier | | | 3.18.4.34 Surveillance Identifier SI | | |
| This 6-bit value shall <<shall0242>> define a surveillance identifier (SI) code which is derived from the CL and IC fields of UF=11, or received directly in the SIS subfield (see §2.2.19.2.1.1). These SI code values are assigned to interrogators in the range of 1 to 63. An SI value of ZERO will not be used. The SI codes are used with the multisite lockout protocols (see §2.2.18.2.5). The SI codes are not be used with the multisite communications protocols, which require the use of II codes. Therefore, an interrogator operating with an SI code will be limited to the following data link capabilities: | | | This 6-bit value shall <<shall0342>> define a surveillance identifier (SI) code. These SI code values shall <<shall0343>> be assigned to interrogators in the range of 1 to 63. An SI value of zero shall <<shall0344>> not be used. The SI codes shall <<shall0345>> be used with the multisite lockout protocols (3.20.2.5). The SI codes shall <<shall0346>> not be used with the multisite communications protocols. | | |

| Comparable | ID=973 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0242 | Page 60 | ED 73C v01 | shall0344 | Page 60 |
| WAT | Comment: DO has one shall, ED has multiple shalls | | | | |
| | | | | | |
| 2.2.14.4.37 SI Surveillance Identifier | | | 3.18.4.34 Surveillance Identifier SI | | |
| This 6-bit value shall <<shall0242>> define a surveillance identifier (SI) code which is derived from the CL and IC fields of UF=11, or received directly in the SIS subfield (see §2.2.19.2.1.1). These SI code values are assigned to interrogators in the range of 1 to 63. An SI value of ZERO will not be used. The SI codes are used with the multisite lockout protocols (see §2.2.18.2.5). | | | This 6-bit value shall <<shall0342>> define a surveillance identifier (SI) code. These SI code values shall <<shall0343>> be assigned to interrogators in the range of 1 to 63. An SI value of zero shall <<shall0344>> not be used. The SI codes shall <<shall0345>> be used with the multisite lockout protocols (3.20.2.5). The SI codes shall <<shall0346>> not be used with the multisite | | |

| | |
|---|---|
| The SI codes are not be used with the multisite communications protocols, which require the use of II codes. Therefore, an interrogator operating with an SI code will be limited to the following data link capabilities: | communications protocols. |

| Comparable | ID=974 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0242 | Page 60 | ED 73C v01 | shall0345 | Page 60 |
| WAT | Comment: DO has one shall, ED has multiple shalls | | | | |
| | | | | | |
| 2.2.14.4.37 SI Surveillance Identifier | | | 3.18.4.34 Surveillance Identifier SI | | |
| This 6-bit value shall <<shall0242>> define a surveillance identifier (SI) code which is derived from the CL and IC fields of UF=11, or received directly in the SIS subfield (see §2.2.19.2.1.1). These SI code values are assigned to interrogators in the range of 1 to 63. An SI value of ZERO will not be used. The SI codes are used with the multisite lockout protocols (see §2.2.18.2.5). The SI codes are not be used with the multisite communications protocols, which require the use of II codes. Therefore, an interrogator operating with an SI code will be limited to the following data link capabilities: | | | This 6-bit value shall <<shall0342>> define a surveillance identifier (SI) code. These SI code values shall <<shall0343>> be assigned to interrogators in the range of 1 to 63. An SI value of zero shall <<shall0344>> not be used. The SI codes shall <<shall0345>> be used with the multisite lockout protocols (3.20.2.5). The SI codes shall <<shall0346>> not be used with the multisite communications protocols. | | |

| Comparable | ID=975 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0242 | Page 60 | ED 73C v01 | shall0346 | Page 60 |
| WAT | Comment: DO has one shall, ED has multiple shalls | | | | |
| | | | | | |
| 2.2.14.4.37 SI Surveillance Identifier | | | 3.18.4.34 Surveillance Identifier SI | | |
| This 6-bit value shall <<shall0242>> define a surveillance identifier (SI) code which is derived from the CL and IC fields of UF=11, or received directly in the SIS subfield (see §2.2.19.2.1.1). These SI code values are assigned to interrogators in the range of 1 to 63. An SI value of ZERO will not be used. The SI codes are used with the multisite lockout protocols (see §2.2.18.2.5). The SI codes are not be used with the multisite communications protocols, which require the use of II codes. Therefore, an interrogator operating with an SI code will be limited to the following data link capabilities: | | | This 6-bit value shall <<shall0342>> define a surveillance identifier (SI) code. These SI code values shall <<shall0343>> be assigned to interrogators in the range of 1 to 63. An SI value of zero shall <<shall0344>> not be used. The SI codes shall <<shall0345>> be used with the multisite lockout protocols (3.20.2.5). The SI codes shall <<shall0346>> not be used with the multisite communications protocols. | | |

| Comparable | ID=977 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0244 | Page 61 | ED 73C v01 | shall0742 | Page 107 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.15.1 Frequency Requirements | | | 3.22.1 Frequency of Operation | | |
| The antenna shall <<shall0244>> be designed to receive and transmit vertically polarized signals in the frequency range of 1030 to 1090 MHz. | | | The antenna shall <<shall0742>> receive and transmit signals on the nominal operating frequencies of 1 030 and 1 090 MHz. | | |

| Comparable | ID=978 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0245 | Page 61 | ED 73C v01 | shall0743 | Page 107 |
| WAT | Comment: | | | | |
| | | | | | |
| 2.2.15.2 Impedance and VSWR | | | 3.22.2 Impedance and VSWR | | |
| The VSWR produced by the antenna when terminated in a 50 ohm transmission line shall <<shall0245>> not exceed 1.5:1 over the 1030 to 1090 MHz frequency band. | | | The antenna shall <<shall0743>> have a nominal impedance of 50 ohms. When terminated in a transmission line representative of the aircraft installation, the VSWR at the transponder end shall <<shall0744>> not exceed 1.5:1 over the operating frequency range. | | |

| Comparable | ID=979 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0245 | Page 61 | ED 73C v01 | shall0744 | Page 107 |
| WAT | Comment: 2d ED shall | | | | |
| | | | | | |
| 2.2.15.2 Impedance and VSWR | | | 3.22.2 Impedance and VSWR | | |
| The VSWR produced by the antenna when terminated in a 50 ohm transmission line shall <<shall0245>> not exceed 1.5:1 over the 1030 to 1090 MHz frequency band. | | | The antenna shall <<shall0743>> have a nominal impedance of 50 ohms. When terminated in a transmission line representative of the aircraft installation, the VSWR at the transponder end shall <<shall0744>> not exceed 1.5:1 over the operating frequency range. | | |

| Comparable | ID=980 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0246 | Page 61 | ED 73C v01 | shall0745 | Page 107 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.15.3 Polarization | | | 3.22.3 Polarisation | | |
| The antenna shall <<shall0246>> be vertically polarized. | | | The antenna radiation pattern shall <<shall0745>> be predominantly vertically polarised. | | |

| Comparable | ID=982 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0248 | Page 62 | ED 73C v01 | shall0813 | Page 120 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.16 Power Interruption | | | 3.24 POWER INTERRUPTION. | | |
| The transponder shall <<shall0248>> regain full operational capability to within its operational limits within two seconds after the restoration of power following a momentary power interruption. | | | The transponder shall <<shall0813>> regain full operational capability to within its operational limits within two seconds after the restoration of power following a momentary power interruption. | | |

| Comparable | ID=983 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0249 | Page 62 | ED 73C v01 | shall0347 | Page 61 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.18 Level 1 Mode S Transponder | | | 3.20 THE LEVEL 1 TRANSPONDER | | |
| This transponder supports the ground-based surveillance functions of both ATCRBS and Mode S and also air-to-air surveillance. It shall <<shall0249>> generate replies to valid ATCRBS Mode A and C interrogations. The Mode S formats to be processed and protocol requirements for this transponder are defined in the following paragraphs. | | | The Level 1 Mode-S Transponder supports the ground-based surveillance functions of both Mode A/C and Mode S and also air-to-air surveillance. It shall <<shall0347>> generate replies to valid Mode A/C Mode A and C interrogations. The Mode S formats to be processed and protocol requirements for this transponder are defined in the following paragraphs. | | |

| Comparable | ID=984 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0250 | Page 63 | ED 73C v01 | shall0348 | Page 62 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.18.2.1 Error Protection (Figure 2-9 and Figure 2-10) | | | 3.20.2.1 Error Protection (Figures 3-8 and 3-9) | | |
| On receipt of a Mode S interrogation, the Mode S transponder shall <<shall0250>> perform a parity check, which is an examination of the sequence of demodulated bits to determine whether it is consistent with the code structure. If the bit sequence is consistent, the parity check is passed; otherwise it is failed. In this event the interrogation shall <<shall0251>> not be accepted. | | | On receipt of a Mode S interrogation, the transponder shall <<shall0348>> perform a parity check, which is an examination of the sequence of demodulated bits to determine whether it is consistent with the code structure. If the bit sequence is consistent, the parity check is passed; otherwise it is failed. In this event the interrogation shall <<shall0349>> not be accepted. | | |

| Comparable | ID=985 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0251 | Page 63 | ED 73C v01 | shall0349 | Page 62 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.18.2.1 Error Protection (Figure 2-9 and Figure 2-10) | | | 3.20.2.1 Error Protection (Figures 3-8 and 3-9) | | |
| On receipt of a Mode S interrogation, the Mode S transponder shall <<shall0250>> perform a parity check, which is an examination of the sequence of demodulated bits to determine whether it is consistent with the code structure. If the bit sequence is consistent, the parity check is passed; otherwise it is failed. In this event the interrogation shall <<shall0251>> not be accepted. | | | On receipt of a Mode S interrogation, the transponder shall <<shall0348>> perform a parity check, which is an examination of the sequence of demodulated bits to determine whether it is consistent with the code structure. If the bit sequence is consistent, the parity check is passed; otherwise it is failed. In this event the interrogation shall <<shall0349>> not be accepted. | | |

| Comparable | ID=986 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0252 | Page 63 | ED 73C v01 | shall0350 | Page 62 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.18.2.1 Error Protection (Figure 2-9 and Figure 2-10) | | | 3.20.2.1 Error Protection (Figures 3-8 and 3-9) | | |
| Similarly, the Mode S transponder shall <<shall0252>> encode prior to transmitting a reply or squitter so that these transmissions are consistent with the code structure. | | | Similarly, the Mode S transponder shall <<shall0350>> encode prior to transmitting a reply or squitter so that these transmissions are consistent with the code structure. | | |

| Comparable | ID=988 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0254 | Page 64 | ED 73C v01 | shall0353 | Page 62 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.18.2.1 Error Protection (Figure 2-9 and Figure 2-10) | | | 3.20.2.1 Error Protection (Figures 3-8 and 3-9) | | |
| c. AP or PI Field Generation – The address used for AP field generation is either the discrete address (§2.2.18.2.2.a) or the All-Call address (§2.2.18.2.2.b). The address shall <<shall0254>> be a sequence of 24 bits, (a1, a2 . . . a24) In the discrete address, a1 shall <<shall0255>> be the bit transmitted first in the AA field of an All-Call reply. This address sequence shall <<shall0256>> be used in the downlink Address/Parity field generation, while a modified form of this sequence (b1, b2 . . . b24) shall <<shall0257>> be used for uplink Address/Parity field generation. | | | c. AP or PI Field Generation - The address used for AP field generation is either the aircraft address (3.20.2.2 a), the broadcast address (3.20.2.2 e) or the All-Call address (3.20.2.2 b). The address shall <<shall0353>> be a sequence of 24 bits (a1, a2 . . . a24). In the aircraft address, a1 shall <<shall0354>> be the bit transmitted first in the AA field of an All-Call reply. This address sequence shall <<shall0355>> be used in the downlink Address/Parity field generation, while a modified form of this sequence (b1, b2 . . . b24) shall <<shall0356>> be used for uplink Address/Parity field generation. | | |

| Comparable | ID=989 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0255 | Page 64 | ED 73C v01 | shall0354 | Page 62 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.18.2.1 Error Protection (Figure 2-9 and Figure 2-10) | | | 3.20.2.1 Error Protection (Figures 3-8 and 3-9) | | |
| c. AP or PI Field Generation – The address used for AP field generation is either the discrete address (§2.2.18.2.2.a) or the All-Call address (§2.2.18.2.2.b). The address shall <<shall0254>> be a sequence of 24 bits, (a1, a2 . . . a24) In the discrete address, a1 shall <<shall0255>> be the bit transmitted first in the AA field of an All-Call reply. This address sequence shall <<shall0256>> be used in the downlink Address/Parity field generation, while a modified form of this sequence (b1, b2 . . . b24) shall <<shall0257>> be used for uplink Address/Parity field generation. | | | c. AP or PI Field Generation - The address used for AP field generation is either the aircraft address (3.20.2.2 a), the broadcast address (3.20.2.2 e) or the All-Call address (3.20.2.2 b). The address shall <<shall0353>> be a sequence of 24 bits (a1, a2 . . . a24). In the aircraft address, a1 shall <<shall0354>> be the bit transmitted first in the AA field of an All-Call reply. This address sequence shall <<shall0355>> be used in the downlink Address/Parity field generation, while a modified form of this sequence (b1, b2 . . . b24) shall <<shall0356>> be used for uplink Address/Parity field generation. | | |

| Comparable | ID=990 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0256 | Page 64 | ED 73C v01 | shall0355 | Page 62 |
| WAT | Comment: 0 | | | | |

| 2.2.18.2.1 Error Protection (Figure 2-9 and Figure 2-10) | 3.20.2.1 Error Protection (Figures 3-8 and 3-9) |
|---|---|
| c. AP or PI Field Generation – The address used for AP field generation is either the discrete address (§2.2.18.2.2.a) or the All-Call address (§2.2.18.2.2.b). The address shall <<shall0254>> be a sequence of 24 bits, (a1, a2 . . . a24) In the discrete address, a1 shall <<shall0255>> be the bit transmitted first in the AA field of an All-Call reply. This address sequence shall <<shall0256>> be used in the downlink Address/Parity field generation, while a modified form of this sequence (b1, b2 . . . b24) shall <<shall0257>> be used for uplink Address/Parity field generation. | c. AP or PI Field Generation - The address used for AP field generation is either the aircraft address (3.20.2.2 a), the broadcast address (3.20.2.2 e) or the All-Call address (3.20.2.2 b). The address shall <<shall0353>> be a sequence of 24 bits (a1, a2 . . . a24). In the aircraft address, a1 shall <<shall0354>> be the bit transmitted first in the AA field of an All-Call reply. This address sequence shall <<shall0355>> be used in the downlink Address/Parity field generation, while a modified form of this sequence (b1, b2 . . . b24) shall <<shall0356>> be used for uplink Address/Parity field generation. |

| Comparable | ID=991 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0257 | Page 64 | ED 73C v01 | shall0356 | Page 62 |
| WAT | Comment: 0 | | | | |

| 2.2.18.2.1 Error Protection (Figure 2-9 and Figure 2-10) | 3.20.2.1 Error Protection (Figures 3-8 and 3-9) |
|---|---|
| c. AP or PI Field Generation – The address used for AP field generation is either the discrete address (§2.2.18.2.2.a) or the All-Call address (§2.2.18.2.2.b). The address shall <<shall0254>> be a sequence of 24 bits, (a1, a2 . . . a24) In the discrete address, a1 shall <<shall0255>> be the bit transmitted first in the AA field of an All-Call reply. This address sequence shall <<shall0256>> be used in the downlink Address/Parity field generation, while a modified form of this sequence (b1, b2 . . . b24) shall <<shall0257>> be used for uplink Address/Parity field generation. | c. AP or PI Field Generation - The address used for AP field generation is either the aircraft address (3.20.2.2 a), the broadcast address (3.20.2.2 e) or the All-Call address (3.20.2.2 b). The address shall <<shall0353>> be a sequence of 24 bits (a1, a2 . . . a24). In the aircraft address, a1 shall <<shall0354>> be the bit transmitted first in the AA field of an All-Call reply. This address sequence shall <<shall0355>> be used in the downlink Address/Parity field generation, while a modified form of this sequence (b1, b2 . . . b24) shall <<shall0356>> be used for uplink Address/Parity field generation. |

| Comparable | ID=992 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0258 | Page 67 | ED 73C v01 | shall0359 | Page 64 |
| WAT | Comment: 0 | | | | |

| 2.2.18.2.2 Interrogation Acceptance Protocol (Figure 2-11) | 3.20.2.2 Interrogation Acceptance Protocol (Figure 3-10) |
|---|---|
| Mode S interrogations shall <<shall0258>> be accepted only if the address of the recipient is as defined in “a” or “b” below: | Mode S interrogations shall <<shall0359>> be accepted only if the address of the recipient is as defined in a or b or l below (Annex 10 paragraph 3.1.2.4.1.2.3): |

| Comparable | ID=993 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0259 | Page 67 | ED 73C v01 | shall0360 | Page 64 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.18.2.2 Interrogation Acceptance Protocol (Figure 2-11) | | | 3.20.2.2 Interrogation Acceptance Protocol (Figure 3-10) | | |
| a. Discrete Address – The interrogation shall <<shall0259>> be accepted if the address extracted from the received interrogation is identical to the transponder's address and UF is not equal to 11. | | | a. Aircraft Address - The interrogation shall <<shall0360>> be accepted if the address extracted from the received interrogation is identical to the transponder's address and UF is ( 11. | | |

| Comparable | ID=996 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0262 | Page 67 | ED 73C v01 | shall0363 | Page 64 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.18.2.2 Interrogation Acceptance Protocol (Figure 2-11) | | | 3.20.2.2 Interrogation Acceptance Protocol (Figure 3-10) | | |
| d. ATCRBS-Only All-Call – A Mode S transponder shall <<shall0262>> not accept the ATCRBS-Only All-Call (0.8 microsecond P4). | | | d. Mode A/C-Only All-Call - A Mode S transponder shall <<shall0363>> not accept the Mode A/C-Only All-Call (0.8 (s P4). | | |

| Comparable | ID=997 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0263 | Page 67 | ED 73C v01 | shall0364 | Page 64 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.18.2.2 Interrogation Acceptance Protocol (Figure 2-11) | | | 3.20.2.2 Interrogation Acceptance Protocol (Figure 3-10) | | |
| e. Lack of Reply Capability – The transponder shall <<shall0263>> not accept Mode S interrogations UF=4 or UF=5 if the code in the RR field is larger than 15. | | | e. Lack of Reply Capability - The transponder shall <<shall0364>> not accept Mode S interrogations UF=4 or UF=5 if the code in the RR field is larger than 15. | | |

| Comparable | ID=998 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0264 | Page 68 | ED 73C v01 | shall0365 | Page 64 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.18.2.2 Interrogation Acceptance Protocol (Figure 2-11) | | | 3.20.2.2 Interrogation Acceptance Protocol (Figure 3-10) | | |
| f. Side Lobe Suppression – Suppression as described in §2.2.5.1 shall <<shall0264>> apply to responses to ATCRBS and ATCRBS/Mode S All-Call interrogations. | | | f. Side Lobe Suppression - Suppression as described in paragraph 3.8.2 shall <<shall0365>> apply to responses to Mode A/C and Mode A/C/Mode S All-Call interrogations. | | |

| Comparable | ID=1001 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0267 | Page 68 | ED 73C v01 | shall0368 | Page 64 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.18.2.2 Interrogation Acceptance Protocol (Figure 2-11) | | | 3.20.2.2 Interrogation Acceptance Protocol (Figure 3-10) | | |
| h. Formats for Which Transponder Is Not Equipped – The transponder shall <<shall0267>> not accept a Mode S format for which it is not equipped. | | | h. Formats for Which Transponder Is Not Equiped - The transponder shall <<shall0368>> not accept a Mode S format for which it is not equipped. | | |

| Comparable | ID=1002 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0268 | Page 68 | ED 73C v01 | shall0369 | Page 64 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.18.2.2 Interrogation Acceptance Protocol (Figure 2-11) | | | 3.20.2.2 Interrogation Acceptance Protocol (Figure 3-10) | | |
| i. Stochastic All-Calls – Upon receipt of a Mode S-Only All-Call with a PR (§2.2.14.4.31) code other than 0 or 8, the transponder shall <<shall0268>> execute a random process. If the reply probability indicated by the outcome of the random process is less than or equal to the reply probability indicated by the value of PR and if no lockout condition applies (includes override, §2.2.18.2.4) the transponder shall <<shall0269>> accept the interrogation. | | | i. Stochastic All-Calls - Upon receipt of a Mode S-Only All-Call with a PR (paragraph 3.18.4.28 ) code other than 0 or 8, the transponder shall <<shall0369>> execute a random process. If the reply probability indicated by the outcome of the random process is less than or equal to the reply probability indicated by the value of PR and if no lockout condition applies (includes override, paragraph 3.20.2.4) and the "on the ground" report (VS or FS field) does not indicate the ground condition the transponder shall <<shall0370>> accept the interrogation. | | |

| Comparable | ID=1004 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0270 | Page 68 | ED 73C v01 | shall0371 | Page 65 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.18.2.2 Interrogation Acceptance Protocol (Figure 2-11) | | | 3.20.2.2 Interrogation Acceptance Protocol (Figure 3-10) | | |
| If the value of PR is 5 through 7 or 13 through 15, the interrogation shall <<shall0270>> not be accepted. | | | If the value of PR is 5 through 7 or 13 through 15, the interrogation shall <<shall0371>> not be accepted. | | |

| Comparable | ID=1005 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0271 | Page 68 | ED 73C v01 | shall0372 | Page 65 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.18.2.2 Interrogation Acceptance Protocol (Figure 2-11) | | | 3.20.2.2 Interrogation Acceptance Protocol (Figure 3-10) | | |
| j. Mode S Reply Rate Limiting – Mode S interrogations shall <<shall0271>> not be accepted if the optional Mode S reply rate limit is exceeded. | | | j. Mode S Reply Rate Limiting - Mode S interrogations shall <<shall0372>> not be accepted if the optional Mode S reply rate limit is exceeded. | | |

| Comparable | ID=1006 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0272 | Page 68 | ED 73C v01 | shall0373 | Page 65 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.18.2.2 Interrogation Acceptance Protocol (Figure 2-11) | | | 3.20.2.2 Interrogation Acceptance Protocol (Figure 3-10) | | |
| k. Transaction Cycle – If the transponder is in a transaction cycle, it shall <<shall0272>> not accept interrogations. | | | k. Transaction Cycle - If the transponder is in a transaction cycle, it shall <<shall0373>> not accept interrogations. | | |

| Comparable | ID=1007 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0273 | Page 69 | ED 73C v01 | shall0375 | Page 65 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.18.2.3 Interrogation Reply Coordination | | | 3.20.2.3 Interrogation Reply Coordination | | |
| The transponder shall <<shall0273>> generate replies as follows: | | | The transponder shall <<shall0375>> generate replies as follows: | | |

| Comparable | ID=1008 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0274 | Page 69 | ED 73C v01 | shall0376 | Page 65 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.18.2.3 Interrogation Reply Coordination | | | 3.20.2.3 Interrogation Reply Coordination | | |
| For all Mode S interrogations the reply format number (DF) shall <<shall0274>> be the same as the interrogation format number (UF). | | | For all Mode S interrogations the reply format number (DF) shall <<shall0376>> be the same as the interrogation format number (UF). | | |

| Comparable | ID=1009 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0275 | Page 69 | ED 73C v01 | shall0377 | Page 65 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.18.2.4 Lockout Protocol (Figure 2-12) | | | 3.20.2.4 Lockout Protocol (Figure 3-11) | | |
| Non-Selective All-Call Lockout – On acceptance of an interrogation containing code 1 in the PC field or containing LOS=1 together with IIS=0 in the SD field or both of these code sets, the transponder shall <<shall0275>> start the TD timer. This timer shall <<shall0276>> run for 18 ±1.0 seconds after the last received command. | | | Non-Selective All-Call Lockout - On acceptance of an interrogation containing code 1 in the PC field or containing LOS=1 together with IIS=0 in the SD field or both of these code sets, the transponder shall <<shall0377>> start the TD timer. This timer shall <<shall0378>> run for 18 ±1.0 seconds after the last received command. | | |

| Comparable | ID=1010 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0276 | Page 69 | ED 73C v01 | shall0378 | Page 65 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.18.2.4 Lockout Protocol (Figure 2-12) | | | 3.20.2.4 Lockout Protocol (Figure 3-11) | | |
| Non-Selective All-Call Lockout – On acceptance of an interrogation containing code 1 in the PC field or containing LOS=1 together with IIS=0 in the SD field or both of these code sets, the transponder shall <<shall0275>> start the TD timer. This timer shall <<shall0276>> run for 18 ±1.0 seconds after the last received command. | | | Non-Selective All-Call Lockout - On acceptance of an interrogation containing code 1 in the PC field or containing LOS=1 together with IIS=0 in the SD field or both of these code sets, the transponder shall <<shall0377>> start the TD timer. This timer shall <<shall0378>> run for 18 ±1.0 seconds after the last received command. | | |

| Comparable | ID=1013 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0279 | Page 70 | ED 73C v01 | shall0381 | Page 66 |
| WAT | Comment: DO shall links to 2d ED shall in the sentence | | | | |
| | | | | | |
| 2.2.18.2.5 Multisite Lockout Protocol (Figure 2-12) | | | 3.20.2.5 Multisite Lockout Protocol (Figure 3-11) | | |
| The multisite lockout command shall <<shall0277>> be transmitted in the SD field (§2.2.14.4.36). A lockout command for an II code shall <<shall0278>> be transmitted in an SD with DI=1 or DI=7. An II lockout command shall <<shall0279>> be indicated by LOS equals ONE in the presence of a non-zero interrogator identifier in the IIS subfield of SD. A lockout command for an SI code shall <<shall0280>> be transmitted in an SD with DI=3. An SI lockout shall <<shall0281>> be indicated by LSS (§2.2.19.2.1.1) equals ONE in the presence of a non-zero interrogator identifier in the SIS subfield of SD (§2.2.19.2.1). After a transponder has accepted an interrogation containing a multisite lockout command, that transponder shall <<shall0282>> commence to lock out (i.e., not accept) any Mode S-only All-Call interrogation which includes the identifier of the interrogator that commanded the lockout. The lockout shall <<shall0283>> persist for an interval 18 ±1 seconds after the last acceptance of an interrogation containing the multisite lockout command. Multisite lockout shall <<shall0284>> not prevent acceptance of a Mode S-only All-Call interrogation containing PR codes 8 to 12. If a lockout command (LOS=1) is received together with IIS=0, it shall <<shall0285>> be interpreted as a non-selective all-call lockout | | | Upon receipt of an interrogation with DI=1 or with DI=7, the transponder shall <<shall0380>> examine the LOS subfield (bit 26) and if it is ONE, it shall <<shall0381>> examine the contents of the IIS subfield (bits 17-20) (paragraph 3.21.2.1 a). If an interrogation identifier other than “0” is present in IIS, the transponder has received a multisite lockout command for the interrogator indicated in IIS. | | |

| Comparable | ID=1014 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0280 | Page 70 | ED 73C v01 | shall0382 | Page 66 |
| WAT | Comment: 1st ED shall | | | | |
| | | | | | |

| 2.2.18.2.5 Multisite Lockout Protocol (Figure 2-12) | 3.20.2.5 Multisite Lockout Protocol (Figure 3-11) |
|---|---|
| The multisite lockout command shall <<shall0277>> be transmitted in the SD field (§2.2.14.4.36). A lockout command for an II code shall <<shall0278>> be transmitted in an SD with DI=1 or DI=7. An II lockout command shall <<shall0279>> be indicated by LOS equals ONE in the presence of a non-zero interrogator identifier in the IIS subfield of SD. A lockout command for an SI code shall <<shall0280>> be transmitted in an SD with DI=3. An SI lockout shall <<shall0281>> be indicated by LSS (§2.2.19.2.1.1) equals ONE in the presence of a non-zero interrogator identifier in the SIS subfield of SD (§2.2.19.2.1). After a transponder has accepted an interrogation containing a multisite lockout command, that transponder shall <<shall0282>> commence to lock out (i.e., not accept) any Mode S-only All-Call interrogation which includes the identifier of the interrogator that commanded the lockout. The lockout shall <<shall0283>> persist for an interval 18 ±1 seconds after the last acceptance of an interrogation containing the multisite lockout command. Multisite lockout shall <<shall0284>> not prevent acceptance of a Mode S-only All-Call interrogation containing PR codes 8 to 12. If a lockout command (LOS=1) is received together with IIS=0, it shall <<shall0285>> be interpreted as a non-selective all-call lockout | Upon receipt of an interrogation with DI=3, the transponder shall <<shall0382>> examine the LSS subfield (bit 23) and if it is ONE, it shall <<shall0383>> examine the contents of the SIS subfield (bits 17-22) (paragraph 3.21.2.1 a). If a surveillance identifier other than “0” is present in SIS, the transponder has received a multisite lockout command for the interrogator indicated in SIS. |

| Comparable | ID=1015 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0281 | Page 71 | ED 73C v01 | shall0382 | Page 66 |
| WAT | Comment: DO shall links to 1st ED shall in the sentence | | | | |
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| 2.2.18.2.5 Multisite Lockout Protocol (Figure 2-12) | 3.20.2.5 Multisite Lockout Protocol (Figure 3-11) |
|---|---|
| The multisite lockout command shall <<shall0277>> be transmitted in the SD field (§2.2.14.4.36). A lockout command for an II code shall <<shall0278>> be transmitted in an SD with DI=1 or DI=7. An II lockout command shall <<shall0279>> be indicated by LOS equals ONE in the presence of a non-zero interrogator identifier in the IIS subfield of SD. A lockout command for an SI code shall <<shall0280>> be transmitted in an SD with DI=3. An SI lockout shall <<shall0281>> be indicated by LSS (§2.2.19.2.1.1) equals ONE in the presence of a non-zero interrogator identifier in the SIS subfield of SD (§2.2.19.2.1). After a transponder has accepted an interrogation containing a multisite lockout command, that transponder shall <<shall0282>> commence to lock out (i.e., not accept) any Mode S-only All-Call interrogation which | Upon receipt of an interrogation with DI=3, the transponder shall <<shall0382>> examine the LSS subfield (bit 23) and if it is ONE, it shall <<shall0383>> examine the contents of the SIS subfield (bits 17-22) (paragraph 3.21.2.1 a). If a surveillance identifier other than “0” is present in SIS, the transponder has received a multisite lockout command for the interrogator indicated in SIS. |

| | |
|---|---|
| includes the identifier of the interrogator that commanded the lockout. The lockout shall <<shall0283>> persist for an interval 18 ±1 seconds after the last acceptance of an interrogation containing the multisite lockout command. Multisite lockout shall <<shall0284>> not prevent acceptance of a Mode S-only All-Call interrogation containing PR codes 8 to 12. If a lockout command (LOS=1) is received together with IIS=0, it shall <<shall0285>> be interpreted as a non-selective all-call lockout | |

| | | | | | |
|---|---|---|---|---|---|
| Comparable | ID=1016 | | | | |
| DO 181D v08 | shall0281 | Page 71 | ED 73C v01 | shall0383 | Page 66 |
| WAT | Comment: DO shall links to 2d ED shall in the sentence | | | | |
| | | | | | |

| 2.2.18.2.5 Multisite Lockout Protocol (Figure 2-12) | 3.20.2.5 Multisite Lockout Protocol (Figure 3-11) |
|---|---|
| The multisite lockout command shall <<shall0277>> be transmitted in the SD field (§2.2.14.4.36). A lockout command for an II code shall <<shall0278>> be transmitted in an SD with DI=1 or DI=7. An II lockout command shall <<shall0279>> be indicated by LOS equals ONE in the presence of a non-zero interrogator identifier in the IIS subfield of SD. A lockout command for an SI code shall <<shall0280>> be transmitted in an SD with DI=3. An SI lockout shall <<shall0281>> be indicated by LSS (§2.2.19.2.1.1) equals ONE in the presence of a non-zero interrogator identifier in the SIS subfield of SD (§2.2.19.2.1). After a transponder has accepted an interrogation containing a multisite lockout command, that transponder shall <<shall0282>> commence to lock out (i.e., not accept) any Mode S-only All-Call interrogation which includes the identifier of the interrogator that commanded the lockout. The lockout shall <<shall0283>> persist for an interval 18 ±1 seconds after the last acceptance of an interrogation containing the multisite lockout command. Multisite lockout shall <<shall0284>> not prevent acceptance of a Mode S-only All-Call interrogation containing PR codes 8 to 12. If a lockout command (LOS=1) is received together with IIS=0, it shall <<shall0285>> be interpreted as a non-selective all-call lockout | Upon receipt of an interrogation with DI=3, the transponder shall <<shall0382>> examine the LSS subfield (bit 23) and if it is ONE, it shall <<shall0383>> examine the contents of the SIS subfield (bits 17-22) (paragraph 3.21.2.1 a). If a surveillance identifier other than “0” is present in SIS, the transponder has received a multisite lockout command for the interrogator indicated in SIS. |

| Comparable | ID=1018 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0283 | Page 71 | ED 73C v01 | shall0385 | Page 66 |
| WAT | Comment: 0 | | | | |

| 2.2.18.2.5 Multisite Lockout Protocol (Figure 2-12) | 3.20.2.5 Multisite Lockout Protocol (Figure 3-11) |
|---|---|
| The multisite lockout command shall <<shall0277>> be transmitted in the SD field (§2.2.14.4.36). A lockout command for an II code shall <<shall0278>> be transmitted in an SD with DI=1 or DI=7. An II lockout command shall <<shall0279>> be indicated by LOS equals ONE in the presence of a non-zero interrogator identifier in the IIS subfield of SD. A lockout command for an SI code shall <<shall0280>> be transmitted in an SD with DI=3. An SI lockout shall <<shall0281>> be indicated by LSS (§2.2.19.2.1.1) equals ONE in the presence of a non-zero interrogator identifier in the SIS subfield of SD (§2.2.19.2.1). After a transponder has accepted an interrogation containing a multisite lockout command, that transponder shall <<shall0282>> commence to lock out (i.e., not accept) any Mode S-only All-Call interrogation which includes the identifier of the interrogator that commanded the lockout. The lockout shall <<shall0283>> persist for an interval 18 ±1 seconds after the last acceptance of an interrogation containing the multisite lockout command. Multisite lockout shall <<shall0284>> not prevent acceptance of a Mode S-only All-Call interrogation containing PR codes 8 to 12. If a lockout command (LOS=1) is received together with IIS=0, it shall <<shall0285>> be interpreted as a non-selective all-call lockout | Upon receipt of a multisite lockout command, the transponder shall <<shall0384>> start the TL timer assigned to the IIS or SIS code (See Figures 3.10 and 3.11). The timer shall <<shall0385>> run for 18 + 1.0 seconds after the last acceptance of an interrogation containing the command. |

| Comparable | ID=1021 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0286 | Page 71 | ED 73C v01 | shall0386 | Page 66 |
| WAT | Comment: 0 | | | | |

| 2.2.18.2.6 Acquisition Squitter Protocols | 3.20.2.6 Acquisition Squitter Protocol |
|---|---|
| Mode S transponders shall <<shall0286>> transmit Acquisition squitters to facilitate acquisition. | Mode S transponders shall <<shall0386>> transmit squitters (unsolicited transmissions) to facilitate acquisition of the aircraft. The short (56-bit) acquisition squitter has the format of an All-Call reply. This squitter is used by aircraft equipped with airborne collision avoidance systems to detect the presence and 24-bit address of Mode S equipped aircraft. |

| Comparable | ID=1022 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0287 | Page 71 | ED 73C v01 | shall0389 | Page 66 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.18.2.6 Acquisition Squitter Protocols | | | 3.20.2.6 Acquisition Squitter Protocol | | |
| a. Acquisition Squitter Format – The format used for the acquisition squitter transmissions shall <<shall0287>> be the All-Call reply, DF=11 using II=0 and SI=0 in generating the PI field. | | | a. Acquisition Squitter Format - The format used for the acquisition squitter transmissions shall <<shall0389>> be the All-Call reply, DF=11 using II=0 in generating the PI field. | | |

| Comparable | ID=1024 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0289 | Page 71 | ED 73C v01 | shall0391 | Page 66 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.18.2.6 Acquisition Squitter Protocols | | | 3.20.2.6 Acquisition Squitter Protocol | | |
| (1) The scheduled acquisition squitter shall <<shall0289>> be delayed if a mutual suppression interface is active. | | | (1) The scheduled acquisition squitter shall <<shall0391>> be delayed if a mutual suppression interface is active. | | |

| Comparable | ID=1025 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0290 | Page 71 | ED 73C v01 | shall0392 | Page 66 |
| WAT | Comment: | | | | |
| | | | | | |
| 2.2.18.2.6 Acquisition Squitter Protocols | | | 3.20.2.6 Acquisition Squitter Protocol | | |
| (2) The scheduled acquisition squitter shall <<shall0290>> be delayed if the transponder is in a transaction cycle (see §2.2.18.2.2.k.). | | | (2) The scheduled acquisition squitter shall <<shall0392>> be delayed if the transponder is in a transaction cycle (paragraph 3.20.2.2 k.). | | |

| Comparable | ID=1028 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0293 | Page 72 | ED 73C v01 | shall0393 | Page 66 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.18.2.6 Acquisition Squitter Protocols | | | 3.20.2.6 Acquisition Squitter Protocol | | |
| An acquisition squitter shall <<shall0293>> not be interrupted by link transactions after the squitter transmission has begun. A delayed acquisition squitter shall <<shall0294>> be transmitted as soon as the condition causing the delay no longer exists. | | | An acquisition squitter shall <<shall0393>> not be interrupted after the squitter transmission has begun. A delayed acquisition squitter shall <<shall0394>> be transmitted as soon as the transponder becomes available. | | |

| Comparable | ID=1029 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0294 | Page 72 | ED 73C v01 | shall0394 | Page 66 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.18.2.6 Acquisition Squitter Protocols | | | 3.20.2.6 Acquisition Squitter Protocol | | |
| An acquisition squitter shall <<shall0293>> not be interrupted by link transactions after the squitter transmission has begun. A delayed acquisition squitter shall <<shall0294>> be transmitted as soon as the condition causing the delay no longer exists. | | | An acquisition squitter shall <<shall0393>> not be interrupted after the squitter transmission has begun. A delayed acquisition squitter shall <<shall0394>> be transmitted as soon as the transponder becomes available. | | |

| Comparable | ID=1033 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0298 | Page 73 | ED 73C v01 | shall0395 | Page 67 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.18.2.7 Flight Status and Vertical Status Protocols (Figure 2-13) | | | 3.20.2.7 Flight Status and Vertical Status Protocols (Figure 3-12) | | |
| Mode S-equipped aircraft shall <<shall0298>> report details of their flight status. The source of and the rules for such reports are as follows: | | | Mode S-equipped aircraft shall <<shall0395>> report details of their flight status. The source of and the rules for such reports are as follows: | | |

| Comparable | ID=1034 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0299 | Page 73 | ED 73C v01 | shall0396 | Page 67 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.18.2.7 Flight Status and Vertical Status Protocols (Figure 2-13) | | | 3.20.2.7 Flight Status and Vertical Status Protocols (Figure 3-12) | | |
| a. Alert – The transponder shall <<shall0299>> transmit the 4096 identification code in ATCRBS Mode A replies and in the ID field of downlink format DF=5. This code can be changed by the pilot, and when a change is made an alert condition shall <<shall0300>> be established. If the identification code is changed to 7500, 7600 or 7700, the alert condition shall <<shall0301>> be permanent. If the identification code is changed to any other value, the alert condition shall <<shall0302>> be temporary and self-canceling after 18 ±1 seconds (TC timer). The TC timer shall <<shall0303>> be retriggered and continued for TC seconds after any change has been accepted by the transponder function. The alert condition shall <<shall0304>> be reported in the FS field. The permanent alert condition shall <<shall0305>> be terminated and replaced by a temporary alert condition when the identification code is set to a value other than 7500, 7600 or 7700. | | | a. Alert - The transponder shall <<shall0396>> transmit the 4096 identification code in Mode A replies and in the ID field of downlink format DF=5. This code can be changed by the pilot, and when a change is made an alert condition shall <<shall0397>> be established. If the identification code is changed to 7500, 7600 or 7700, the alert condition shall <<shall0398>> be permanent. If the identification code is changed to any other value, the alert condition shall <<shall0399>> be temporary and self-cancelling after 18 ±1.0 seconds (TC timer). The alert condition shall <<shall0400>> be reported in the FS field. The permanent alert condition shall <<shall0401>> be terminated and replaced by a temporary alert condition when the identification code is set to a value other than 7500, 7600 or 7700. | | |

| Comparable | ID=1035 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0300 | Page 73 | ED 73C v01 | shall0397 | Page 67 |
| WAT | Comment: 0 | | | | |

| 2.2.18.2.7 Flight Status and Vertical Status Protocols (Figure 2-13) | 3.20.2.7 Flight Status and Vertical Status Protocols (Figure 3-12) |
|---|---|
| a. Alert – The transponder shall <<shall0299>> transmit the 4096 identification code in ATCRBS Mode A replies and in the ID field of downlink format DF=5. This code can be changed by the pilot, and when a change is made an alert condition shall <<shall0300>> be established. If the identification code is changed to 7500, 7600 or 7700, the alert condition shall <<shall0301>> be permanent. If the identification code is changed to any other value, the alert condition shall <<shall0302>> be temporary and self-canceling after 18 ±1 seconds (TC timer). The TC timer shall <<shall0303>> be retriggered and continued for TC seconds after any change has been accepted by the transponder function. The alert condition shall <<shall0304>> be reported in the FS field. The permanent alert condition shall <<shall0305>> be terminated and replaced by a temporary alert condition when the identification code is set to a value other than 7500, 7600 or 7700. | a. Alert - The transponder shall <<shall0396>> transmit the 4096 identification code in Mode A replies and in the ID field of downlink format DF=5. This code can be changed by the pilot, and when a change is made an alert condition shall <<shall0397>> be established. If the identification code is changed to 7500, 7600 or 7700, the alert condition shall <<shall0398>> be permanent. If the identification code is changed to any other value, the alert condition shall <<shall0399>> be temporary and self-cancelling after 18 ±1.0 seconds (TC timer). The alert condition shall <<shall0400>> be reported in the FS field. The permanent alert condition shall <<shall0401>> be terminated and replaced by a temporary alert condition when the identification code is set to a value other than 7500, 7600 or 7700. |

| Comparable | ID=1036 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0301 | Page 73 | ED 73C v01 | shall0398 | Page 67 |
| WAT | Comment: 0 | | | | |

| 2.2.18.2.7 Flight Status and Vertical Status Protocols (Figure 2-13) | 3.20.2.7 Flight Status and Vertical Status Protocols (Figure 3-12) |
|---|---|
| a. Alert – The transponder shall <<shall0299>> transmit the 4096 identification code in ATCRBS Mode A replies and in the ID field of downlink format DF=5. This code can be changed by the pilot, and when a change is made an alert condition shall <<shall0300>> be established. If the identification code is changed to 7500, 7600 or 7700, the alert condition shall <<shall0301>> be permanent. If the identification code is changed to any other value, the alert condition shall <<shall0302>> be temporary and self-canceling after 18 ±1 seconds (TC timer). The TC timer shall <<shall0303>> be retriggered and continued for TC seconds after any change has been accepted by the transponder function. The alert condition shall <<shall0304>> be reported in the FS field. The permanent alert condition shall <<shall0305>> be terminated and replaced by a temporary alert condition when the identification code is set to a value other than 7500, 7600 or 7700. | a. Alert - The transponder shall <<shall0396>> transmit the 4096 identification code in Mode A replies and in the ID field of downlink format DF=5. This code can be changed by the pilot, and when a change is made an alert condition shall <<shall0397>> be established. If the identification code is changed to 7500, 7600 or 7700, the alert condition shall <<shall0398>> be permanent. If the identification code is changed to any other value, the alert condition shall <<shall0399>> be temporary and self-cancelling after 18 ±1.0 seconds (TC timer). The alert condition shall <<shall0400>> be reported in the FS field. The permanent alert condition shall <<shall0401>> be terminated and replaced by a temporary alert condition when the identification code is set to a value other than 7500, 7600 or 7700. |

| Comparable | ID=1037 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0302 | Page 73 | ED 73C v01 | shall0399 | Page 67 |
| WAT | Comment: 0 | | | | |

| 2.2.18.2.7 Flight Status and Vertical Status Protocols (Figure 2-13) | 3.20.2.7 Flight Status and Vertical Status Protocols (Figure 3-12) |
|---|---|
| a. Alert – The transponder shall <<shall0299>> transmit the 4096 identification code in ATCRBS Mode A replies and in the ID field of downlink format DF=5. This code can be changed by the pilot, and when a change is made an alert condition shall <<shall0300>> be established. If the identification code is changed to 7500, 7600 or 7700, the alert condition shall <<shall0301>> be permanent. If the identification code is changed to any other value, the alert condition shall <<shall0302>> be temporary and self-canceling after 18 ±1 seconds (TC timer). The TC timer shall <<shall0303>> be retriggered and continued for TC seconds after any change has been accepted by the transponder function. The alert condition shall <<shall0304>> be reported in the FS field. The permanent alert condition shall <<shall0305>> be terminated and replaced by a temporary alert condition when the identification code is set to a value other than 7500, 7600 or 7700. | a. Alert - The transponder shall <<shall0396>> transmit the 4096 identification code in Mode A replies and in the ID field of downlink format DF=5. This code can be changed by the pilot, and when a change is made an alert condition shall <<shall0397>> be established. If the identification code is changed to 7500, 7600 or 7700, the alert condition shall <<shall0398>> be permanent. If the identification code is changed to any other value, the alert condition shall <<shall0399>> be temporary and self-cancelling after 18 ±1.0 seconds (TC timer). The alert condition shall <<shall0400>> be reported in the FS field. The permanent alert condition shall <<shall0401>> be terminated and replaced by a temporary alert condition when the identification code is set to a value other than 7500, 7600 or 7700. |

| Comparable | ID=1039 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0304 | Page 73 | ED 73C v01 | shall0400 | Page 67 |
| WAT | Comment: 0 | | | | |

| 2.2.18.2.7 Flight Status and Vertical Status Protocols (Figure 2-13) | 3.20.2.7 Flight Status and Vertical Status Protocols (Figure 3-12) |
|---|---|
| a. Alert – The transponder shall <<shall0299>> transmit the 4096 identification code in ATCRBS Mode A replies and in the ID field of downlink format DF=5. This code can be changed by the pilot, and when a change is made an alert condition shall <<shall0300>> be established. If the identification code is changed to 7500, 7600 or 7700, the alert condition shall <<shall0301>> be permanent. If the identification code is changed to any other value, the alert condition shall <<shall0302>> be temporary and self-canceling after 18 ±1 seconds (TC timer). The TC timer shall <<shall0303>> be retriggered and continued for TC seconds after any change has been accepted by the transponder function. The alert condition shall <<shall0304>> be reported in the FS field. The permanent alert condition shall <<shall0305>> be terminated and replaced by a temporary alert condition when the identification code is set to a value other than 7500, 7600 or 7700. | a. Alert - The transponder shall <<shall0396>> transmit the 4096 identification code in Mode A replies and in the ID field of downlink format DF=5. This code can be changed by the pilot, and when a change is made an alert condition shall <<shall0397>> be established. If the identification code is changed to 7500, 7600 or 7700, the alert condition shall <<shall0398>> be permanent. If the identification code is changed to any other value, the alert condition shall <<shall0399>> be temporary and self-cancelling after 18 ±1.0 seconds (TC timer). The alert condition shall <<shall0400>> be reported in the FS field. The permanent alert condition shall <<shall0401>> be terminated and replaced by a temporary alert condition when the identification code is set to a value other than 7500, 7600 or 7700. |

| Comparable | ID=1040 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0305 | Page 73 | ED 73C v01 | shall0401 | Page 67 |
| WAT | Comment: 0 | | | | |

| 2.2.18.2.7 Flight Status and Vertical Status Protocols (Figure 2-13) | 3.20.2.7 Flight Status and Vertical Status Protocols (Figure 3-12) |
|---|---|
| a. Alert – The transponder shall <<shall0299>> transmit the 4096 identification code in ATCRBS Mode A replies and in the ID field of downlink format DF=5. This code can be changed by the pilot, and when a change is made an alert condition shall <<shall0300>> be established. If the identification code is changed to 7500, 7600 or 7700, the alert condition shall <<shall0301>> be permanent. If the identification code is changed to any other value, the alert condition shall <<shall0302>> be temporary and self-canceling after 18 ±1 seconds (TC timer). The TC timer shall <<shall0303>> be retriggered and continued for TC seconds after any change has been accepted by the transponder function. The alert condition shall <<shall0304>> be reported in the FS field. The permanent alert condition shall <<shall0305>> be terminated and replaced by a temporary alert condition when the identification code is set to a value other than 7500, 7600 or 7700. | a. Alert - The transponder shall <<shall0396>> transmit the 4096 identification code in Mode A replies and in the ID field of downlink format DF=5. This code can be changed by the pilot, and when a change is made an alert condition shall <<shall0397>> be established. If the identification code is changed to 7500, 7600 or 7700, the alert condition shall <<shall0398>> be permanent. If the identification code is changed to any other value, the alert condition shall <<shall0399>> be temporary and self-cancelling after 18 ±1.0 seconds (TC timer). The alert condition shall <<shall0400>> be reported in the FS field. The permanent alert condition shall <<shall0401>> be terminated and replaced by a temporary alert condition when the identification code is set to a value other than 7500, 7600 or 7700. |

| Comparable | ID=1041 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0306 | Page 73 | ED 73C v01 | shall0402 | Page 67 |
| WAT | Comment: 0 | | | | |

| 2.2.18.2.7 Flight Status and Vertical Status Protocols (Figure 2-13) | 3.20.2.7 Flight Status and Vertical Status Protocols (Figure 3-12) |
|---|---|
| b. On-the-Ground Report – The on-the-ground status of the aircraft shall <<shall0306>> be reported in the FS field and the VS field and the CA field. If a means for automatically indicating the on-the-ground condition (e.g., a weight on wheels or strut switch) is available at the transponder data interface, it shall <<shall0307>> be used as the basis for the reporting of vertical status. If a means for automatically indicating the on-the-ground condition is not available at the transponder data interface, the FS and VS codes shall <<shall0308>> indicate that the aircraft is airborne and the CA field shall <<shall0309>> indicate that the aircraft is either airborne or on the ground (CA=6). | b. On-the-Ground Report – The on-the-ground status of the aircraft shall <<shall0402>> be reported in the FS field and the VS field and the CA field. If a means for automatically indicating the on-the-ground condition (e.g., a weight on wheels or strut switch) is available at the transponder data interface, it shall <<shall0403>> be used as the basis for the reporting of status (FS, VS, for CA codes 4 or 5 for airborne or on-the ground). If a means for automatically indicating the on-the-ground condition is not available at the transponder data interface, the FS and VS codes shall <<shall0404>> indicate that the aircraft is airborne and the CA field shall <<shall0405>> indicate that the aircraft is either airborne or on the ground (CA=6). |

| Comparable | ID=1043 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0308 | Page 74 | ED 73C v01 | shall0404 | Page 67 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.18.2.7 Flight Status and Vertical Status Protocols (Figure 2-13) | | | 3.20.2.7 Flight Status and Vertical Status Protocols (Figure 3-12) | | |
| b. On-the-Ground Report – The on-the-ground status of the aircraft shall <<shall0306>> be reported in the FS field and the VS field and the CA field. If a means for automatically indicating the on-the-ground condition (e.g., a weight on wheels or strut switch) is available at the transponder data interface, it shall <<shall0307>> be used as the basis for the reporting of vertical status. If a means for automatically indicating the on-the-ground condition is not available at the transponder data interface, the FS and VS codes shall <<shall0308>> indicate that the aircraft is airborne and the CA field shall <<shall0309>> indicate that the aircraft is either airborne or on the ground (CA=6). | | | b. On-the-Ground Report – The on-the-ground status of the aircraft shall <<shall0402>> be reported in the FS field and the VS field and the CA field. If a means for automatically indicating the on-the-ground condition (e.g., a weight on wheels or strut switch) is available at the transponder data interface, it shall <<shall0403>> be used as the basis for the reporting of status (FS, VS, for CA codes 4 or 5 for airborne or on-the ground). If a means for automatically indicating the on-the-ground condition is not available at the transponder data interface, the FS and VS codes shall <<shall0404>> indicate that the aircraft is airborne and the CA field shall <<shall0405>> indicate that the aircraft is either airborne or on the ground (CA=6). | | |

| Comparable | ID=1044 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0309 | Page 74 | ED 73C v01 | shall0405 | Page 67 |
| WAT | Comment: 2d shalls for both | | | | |
| | | | | | |
| 2.2.18.2.7 Flight Status and Vertical Status Protocols (Figure 2-13) | | | 3.20.2.7 Flight Status and Vertical Status Protocols (Figure 3-12) | | |
| b. On-the-Ground Report – The on-the-ground status of the aircraft shall <<shall0306>> be reported in the FS field and the VS field and the CA field. If a means for automatically indicating the on-the-ground condition (e.g., a weight on wheels or strut switch) is available at the transponder data interface, it shall <<shall0307>> be used as the basis for the reporting of vertical status. If a means for automatically indicating the on-the-ground condition is not available at the transponder data interface, the FS and VS codes shall <<shall0308>> indicate that the aircraft is airborne and the CA field shall <<shall0309>> indicate that the aircraft is either airborne or on the ground (CA=6). | | | b. On-the-Ground Report – The on-the-ground status of the aircraft shall <<shall0402>> be reported in the FS field and the VS field and the CA field. If a means for automatically indicating the on-the-ground condition (e.g., a weight on wheels or strut switch) is available at the transponder data interface, it shall <<shall0403>> be used as the basis for the reporting of status (FS, VS, for CA codes 4 or 5 for airborne or on-the ground). If a means for automatically indicating the on-the-ground condition is not available at the transponder data interface, the FS and VS codes shall <<shall0404>> indicate that the aircraft is airborne and the CA field shall <<shall0405>> indicate that the aircraft is either airborne or on the ground (CA=6). | | |

| Comparable | ID=1047 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0312 | Page 74 | ED 73C v01 | shall0930 | Page 259 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.18.2.7 Flight Status and Vertical Status Protocols (Figure 2-13) | | | 6.2.13 Validation of declared on-the-ground status | | |
| If the automatically-determined air/ground status is not available or is “airborne”, no validation shall <<shall0311>> be performed. If the automatically-determined air/ground status is available and “on-the-ground” condition is being reported, the air/ground status shall <<shall0312>> be overridden and changed to “airborne” if the conditions given for the vehicle category in the following table are satisfied. | | | If the automatically determined air/ground status is not available or is “airborne”, no validation shall <<shall0929>> be performed. If the automatically determined air/ground status is available and “on-the-ground” condition is being reported, the air/ground status shall <<shall0930>> be overridden and changed to “airborne” if the conditions given for the vehicle category in the table below are satisfied, | | |

| Comparable | ID=1048 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0313 | Page 74 | ED 73C v01 | shall0406 | Page 67 |
| WAT | Comment: DO mentions Extended Squitter, ED does not | | | | |
| | | | | | |
| 2.2.18.2.7 Flight Status and Vertical Status Protocols (Figure 2-13) | | | 3.20.2.7 Flight Status and Vertical Status Protocols (Figure 3-12) | | |
| d. Special Position Identification – When manually selected, the transponder shall <<shall0313>> transmit the equivalent of the ATCRBS SPI in the FS field of surveillance replies DF=4,5 and in the Surveillance Status Subfield (see §2.2.23.1.8) of Extended Squitter transmissions (DF=17) when they contain the airborne position report. This code shall <<shall0314>> be transmitted for 18 ±1 seconds (TI timer) after initiation and can be reinitiated at any time. | | | c. Special Position Identification - When manually selected, the transponder shall <<shall0406>> transmit the equivalent of the SPI in the FS field of surveillance replies DF=4,5. This code shall <<shall0407>> be transmitted for 18 ±1.0 seconds (TI timer) after initiation and can be reinitiated at any time. | | |

| Comparable | ID=1049 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0314 | Page 74 | ED 73C v01 | shall0407 | Page 67 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.18.2.7 Flight Status and Vertical Status Protocols (Figure 2-13) | | | 3.20.2.7 Flight Status and Vertical Status Protocols (Figure 3-12) | | |
| d. Special Position Identification – When manually selected, the transponder shall <<shall0313>> transmit the equivalent of the ATCRBS SPI in the FS field of surveillance replies DF=4,5 and in the Surveillance Status Subfield (see §2.2.23.1.8) of Extended Squitter transmissions (DF=17) when they contain the airborne position report. This code shall <<shall0314>> be transmitted for 18 ±1 seconds (TI timer) after initiation and can be reinitiated at any time. | | | c. Special Position Identification - When manually selected, the transponder shall <<shall0406>> transmit the equivalent of the SPI in the FS field of surveillance replies DF=4,5. This code shall <<shall0407>> be transmitted for 18 ±1.0 seconds (TI timer) after initiation and can be reinitiated at any time. | | |

| Comparable | ID=1050 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0315 | Page 75 | ED 73C v01 | shall0408 | Page 67 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.18.2.8 Capability Reporting | | | 3.20.2.8 Capability Reporting | | |
| The transponder shall <<shall0315>> transmit a "0" value in the three-bit CA (capability) field of an All-Call (DF=11) reply. | | | The transponder shall <<shall0408>> transmit a "0" value in the three-bit CA (capability) field of an All-Call (DF=11) reply. | | |

| Comparable | ID=1051 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0316 | Page 75 | ED 73C v01 | shall0409 | Page 67 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.18.2.9 All-Call Reply Protocol | | | 3.20.2.9 All-Call Reply Protocol | | |
| Upon acceptance of a Mode S-Only All-Call interrogation (UF=11) the transponder shall <<shall0316>> reply by overlaying the received II or SI code on parity according to §2.2.18.2.1, resulting in the PI field which shall <<shall0317>> be used in the reply (DF=11). Upon acceptance of an ATCRBS/Mode S All-Call interrogations the transponder shall <<shall0318>> generate the PI field using II=0. | | | Upon acceptance of a Mode S-Only All-Call interrogation (UF=11) the transponder shall <<shall0409>> reply by overlaying the contents of the received CL and IC fields on parity according to paragraph 3.20.2.1, resulting in the PI field which shall <<shall0410>> be used in the All-Call reply (DF=11). Upon acceptance of a Mode A/C/Mode S All-Call interrogations the transponder shall <<shall0411>> generate the PI field using II=0 or SI=0. | | |

| Comparable | ID=1052 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0317 | Page 75 | ED 73C v01 | shall0410 | Page 67 |
| WAT | Comment: 2d shalls in both | | | | |
| | | | | | |
| 2.2.18.2.9 All-Call Reply Protocol | | | 3.20.2.9 All-Call Reply Protocol | | |
| Upon acceptance of a Mode S-Only All-Call interrogation (UF=11) the transponder shall <<shall0316>> reply by overlaying the received II or SI code on parity according to §2.2.18.2.1, resulting in the PI field which shall <<shall0317>> be used in the reply (DF=11). Upon acceptance of an ATCRBS/Mode S All-Call interrogations the transponder shall <<shall0318>> generate the PI field using II=0. | | | Upon acceptance of a Mode S-Only All-Call interrogation (UF=11) the transponder shall <<shall0409>> reply by overlaying the contents of the received CL and IC fields on parity according to paragraph 3.20.2.1, resulting in the PI field which shall <<shall0410>> be used in the All-Call reply (DF=11). Upon acceptance of a Mode A/C/Mode S All-Call interrogations the transponder shall <<shall0411>> generate the PI field using II=0 or SI=0. | | |

| Comparable | ID=1054 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0319 | Page 75 | ED 73C v01 | shall0412 | Page 67 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.18.2.10 Reply Content (Figure 2-14) | | | 3.20.2.10 Reply Content (Figure 3-13) | | |
| The information content of a Mode S reply shall <<shall0319>> reflect the conditions existing in the transponder after completion of all transponder processing of the interrogation soliciting that reply. | | | The information content of a Mode S reply shall <<shall0412>> reflect the conditions existing in the transponder after completion of all transponder processing of the interrogation soliciting that reply. | | |

| Comparable | ID=1055 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0320 | Page 75 | ED 73C v01 | shall0413 | Page 67 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.18.2.10 Reply Content (Figure 2-14) | | | 3.20.2.10 Reply Content (Figure 3-13) | | |
| In the reply to UF=0, the transponder shall <<shall0320>> insert: | | | In the reply to UF=0, the transponder shall <<shall0413>> insert: | | |

| Comparable | ID=1056 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0321 | Page 75 | ED 73C v01 | shall0414 | Page 68 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.18.2.10 Reply Content (Figure 2-14) | | | 3.20.2.10 Reply Content (Figure 3-13) | | |
| In the reply to UF=4, AC shall <<shall0321>> be in bits 20 to 32. In the reply to UF=5, ID shall <<shall0322>> be in bits 20 to 32. In the reply to UF=11, AA shall <<shall0323>> be in bits 9 to 32. | | | In the reply to UF=4, AC shall <<shall0414>> be in bits 20 to 32. In the reply to UF=5, ID shall <<shall0415>> be in bits 20 to 32. In the reply to UF=11, AA shall <<shall0416>> be in bits 9 to 32. | | |

| Comparable | ID=1057 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0322 | Page 75 | ED 73C v01 | shall0415 | Page 68 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.18.2.10 Reply Content (Figure 2-14) | | | 3.20.2.10 Reply Content (Figure 3-13) | | |
| In the reply to UF=4, AC shall <<shall0321>> be in bits 20 to 32. In the reply to UF=5, ID shall <<shall0322>> be in bits 20 to 32. In the reply to UF=11, AA shall <<shall0323>> be in bits 9 to 32. | | | In the reply to UF=4, AC shall <<shall0414>> be in bits 20 to 32. In the reply to UF=5, ID shall <<shall0415>> be in bits 20 to 32. In the reply to UF=11, AA shall <<shall0416>> be in bits 9 to 32. | | |

| Comparable | ID=1058 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0323 | Page 75 | ED 73C v01 | shall0416 | Page 68 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.18.2.10 Reply Content (Figure 2-14) | | | 3.20.2.10 Reply Content (Figure 3-13) | | |
| In the reply to UF=4, AC shall <<shall0321>> be in bits 20 to 32. In the reply to UF=5, ID shall <<shall0322>> be in bits 20 to 32. In the reply to UF=11, AA shall <<shall0323>> be in bits 9 to 32. | | | In the reply to UF=4, AC shall <<shall0414>> be in bits 20 to 32. In the reply to UF=5, ID shall <<shall0415>> be in bits 20 to 32. In the reply to UF=11, AA shall <<shall0416>> be in bits 9 to 32. | | |

| Comparable | ID=1059 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0324 | Page 75 | ED 73C v01 | shall0417 | Page 68 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.18.2.10 Reply Content (Figure 2-14) | | | 3.20.2.10 Reply Content (Figure 3-13) | | |
| In replies to UF=4 and UF=5, the transponder shall <<shall0324>> insert ZEROs in bits 9 through 13 in the DR field. | | | In replies to UF=4 and UF=5, the transponder shall <<shall0417>> insert ZEROs in bits 9 through 13 in the DR field. | | |

| Comparable | ID=1060 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0325 | Page 75 | ED 73C v01 | shall0418 | Page 69 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.18.2.11 Data Handling and Interfaces | | | 3.20.2.11 Data Handling and Interfaces | | |
| The transponder shall <<shall0325>> have the following data interfaces as described in §2.2.13: | | | The transponder shall <<shall0418>> have the following data interfaces as described in paragraph 3.17: | | |

| Comparable | ID=1061 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0326 | Page 76 | ED 73C v01 | shall0419 | Page 69 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.19 Minimum Level 2 Transponder Description | | | 3.21 DATA LINK TRANSPONDER DESCRIPTION (LEVEL 2 AND HIGHER) | | |
| If peripheral separation as mentioned above is used, interfaces (see §2.2.13) shall <<shall0326>> be part of the transponder design. | | | If peripheral separation as mentioned above is used, interfaces (paragraph 3.17) shall <<shall0419>> be part of the transponder design. | | |

| Comparable | ID=1062 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0327 | Page 79 | ED 73C v01 | shall0421 | Page 70 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.19.1.1 Interrogation Acceptance Protocol (Figure 2-16) | | | 3.21.1.1 Interrogation Acceptance Protocol | | |
| The interrogation acceptance protocol of §2.2.18.2.2 shall <<shall0327>> be used with the following additions: | | | The interrogation acceptance protocol of paragraph 3.20.2.2 shall <<shall0421>> be used with the following additions: | | |

| Comparable | ID=1063 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0328 | Page 79 | ED 73C v01 | shall0422 | Page 70 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.19.1.1 Interrogation Acceptance Protocol (Figure 2-16) | | | 3.21.1.1 Interrogation Acceptance Protocol | | |
| a. An interrogation shall <<shall0328>> not be accepted if the corresponding data buffer (see §2.2.13.3.1) is full. | | | a. An interrogation shall <<shall0422>> not be accepted if the interface data buffer (paragraph 3.17.3 c (4)) is full. | | |

| Comparable | ID=1064 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0329 | Page 79 | ED 73C v01 | shall0423 | Page 70 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.19.1.1 Interrogation Acceptance Protocol (Figure 2-16) | | | 3.21.1.1 Interrogation Acceptance Protocol | | |
| b. An interrogation shall <<shall0329>> be accepted as a “broadcast” if the UF format code is 20, 21 or 16 (if so equipped), and if an ALL ONEs address is decoded. | | | b. An interrogation shall <<shall0423>> be accepted as a "broadcast" if the UF format code is 20 or 21 or 16 (if so equipped) and if an all ONEs address is decoded. | | |

| Comparable | ID=1065 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0330 | Page 79 | ED 73C v01 | shall0424 | Page 70 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.19.1.1 Interrogation Acceptance Protocol (Figure 2-16) | | | 3.21.1.1 Interrogation Acceptance Protocol | | |
| c. Only formats for which the transponder is designed, and to which it can reply, shall <<shall0330>> be accepted. | | | c. Only formats for which the transponder is designed and to which it can reply if a reply is required shall <<shall0424>> be accepted. | | |

| Comparable | ID=1067 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0332 | Page 79 | ED 73C v01 | shall0427 | Page 71 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.19.1.3 Information Transfer | | | 3.21.1.3 Information Transfer | | |
| The minimum Level 2 transponder shall <<shall0332>> be able to transfer information to and from the appropriate data sinks (destinations) and sources (see §2.2.13 and §2.2.19.c and §2.2.19.d). | | | The transponder shall <<shall0427>> be able to transfer information to and from the appropriate data sinks (destinations) and sources (paragraphs 3.17 and 3.21 c and d). | | |

| Comparable | ID=1068 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0333 | Page 79 | ED 73C v01 | shall0428 | Page 71 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.19.1.4 Interrogation-Reply Coordination (Figure 2-17) | | | 3.21.1.4 Interrogation-Reply Coordination (Figure 3-16) | | |
| The transponder shall <<shall0333>> generate replies to interrogations as follows: | | | The transponder shall <<shall0428>> generate replies to accepted interrogations as follows: | | |

| Comparable | ID=1069 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0334 | Page 79 | ED 73C v01 | shall0429 | Page 71 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.19.1.4 Interrogation-Reply Coordination (Figure 2-17) | | | 3.21.1.4 Interrogation-Reply Coordination (Figure 3-16) | | |
| Upon acceptance of an interrogation with UF codes 0 or 16, the transponder shall <<shall0334>> reply with DF=0, if RL=0, and shall <<shall0335>> reply with DF=16, if RL=1. | | | Upon acceptance of an interrogation with UF codes 0 or 16, the transponder shall <<shall0429>> reply with DF=0 if RL=0 and shall <<shall0430>> reply with DF=16 if RL=1. | | |

| Comparable | ID=1070 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0335 | Page 79 | ED 73C v01 | shall0430 | Page 71 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.19.1.4 Interrogation-Reply Coordination (Figure 2-17) | | | 3.21.1.4 Interrogation-Reply Coordination (Figure 3-16) | | |
| Upon acceptance of an interrogation with UF codes 0 or 16, the transponder shall <<shall0334>> reply with DF=0, if RL=0, and shall <<shall0335>> reply with DF=16, if RL=1. | | | Upon acceptance of an interrogation with UF codes 0 or 16, the transponder shall <<shall0429>> reply with DF=0 if RL=0 and shall <<shall0430>> reply with DF=16 if RL=1. | | |

| Comparable | ID=1071 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0336 | Page 79 | ED 73C v01 | shall0431 | Page 71 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.19.1.4 Interrogation-Reply Coordination (Figure 2-17) | | | 3.21.1.4 Interrogation-Reply Coordination (Figure 3-16) | | |
| If the transponder is not equipped with the optional long air-air formats UF=DF=16, it shall <<shall0336>> not accept UF=16 and it shall <<shall0337>> not reply to UF=0 containing RL=1. | | | If the transponder is not equipped with the optional long air-air formats UF=DF=16, it shall <<shall0431>> not accept UF=16 and it shall <<shall0432>> not reply to UF=0 containing RL=1. | | |

| Comparable | ID=1072 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0337 | Page 79 | ED 73C v01 | shall0432 | Page 71 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.19.1.4 Interrogation-Reply Coordination (Figure 2-17) | | | 3.21.1.4 Interrogation-Reply Coordination (Figure 3-16) | | |
| If the transponder is not equipped with the optional long air-air formats UF=DF=16, it shall <<shall0336>> not accept UF=16 and it shall <<shall0337>> not reply to UF=0 containing RL=1. | | | If the transponder is not equipped with the optional long air-air formats UF=DF=16, it shall <<shall0431>> not accept UF=16 and it shall <<shall0432>> not reply to UF=0 containing RL=1. | | |

| Comparable | ID=1073 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0338 | Page 80 | ED 73C v01 | shall0434 | Page 71 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.19.1.4 Interrogation-Reply Coordination (Figure 2-17) | | | 3.21.1.4 Interrogation-Reply Coordination (Figure 3-16) | | |
| Upon acceptance of an interrogation with a UF code of 4, 5, 20 or 21, the transponder shall <<shall0338>> examine the RR code and generate downlink formats as follows: | | | Upon acceptance of an interrogation with a UF code of 4, 5, 20 or 21, the transponder shall <<shall0434>> examine the RR code and generate downlink formats as follows: | | |

| Comparable | ID=1074 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0339 | Page 82 | ED 73C v01 | shall0435 | Page 71 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.19.1.5 Lockout Protocols (Figure 2-12) | | | 3.21.1.5 Lockout Protocols (Figure 3-11) | | |
| Lockout commands shall <<shall0339>> not be accepted if they occur within a broadcast interrogation. | | | Lockout commands shall <<shall0435>> not be accepted if they occur within a broadcast interrogation. | | |

| Comparable | ID=1075 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0340 | Page 82 | ED 73C v01 | shall0436 | Page 72 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.19.1.5 Lockout Protocols (Figure 2-12) | | | 3.21.1.5 Lockout Protocols (Figure 3-11) | | |
| In addition to the rules in §2.2.18.2.4, lockout commands shall <<shall0340>> be accepted if they appear in interrogations UF=20 and UF=21. | | | In addition to the rules in paragraph 3.20.2.4, lockout commands shall <<shall0436>> be accepted if they appear in interrogations UF=20 and UF=21. | | |

| Comparable | ID=1076 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0341 | Page 82 | ED 73C v01 | shall0437 | Page 72 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.19.1.6 Flight and Vertical Status Protocols (Figure 2-13) | | | 3.21.1.6 Flight and Vertical Status Protocols | | |
| The FS report (see §2.2.18.2.7) shall <<shall0341>> also appear in DF=20 and DF=21 and VS shall <<shall0342>> also appear in DF=16. | | | The FS report (paragraph 3.20.2.7) shall <<shall0437>> also appear in DF=20 and DF=21 and VS shall <<shall0438>> also appear in DF=16. | | |

| Comparable | ID=1077 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0342 | Page 82 | ED 73C v01 | shall0438 | Page 72 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.19.1.6 Flight and Vertical Status Protocols (Figure 2-13) | | | 3.21.1.6 Flight and Vertical Status Protocols | | |
| The FS report (see §2.2.18.2.7) shall <<shall0341>> also appear in DF=20 and DF=21 and VS shall <<shall0342>> also appear in DF=16. | | | The FS report (paragraph 3.20.2.7) shall <<shall0437>> also appear in DF=20 and DF=21 and VS shall <<shall0438>> also appear in DF=16. | | |

| Comparable | ID=1079 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0344 | Page 82 | ED 73C v01 | shall0442 | Page 73 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.19.1.8 Reply Content (Figure 2-14) | | | 3.21.1.8 Reply Content | | |
| The reply content summary of §2.2.18.2.10 shall <<shall0344>> apply. Additionally, the rules applying to formats UF=4, UF=5 shall <<shall0345>> also apply to formats UF=20 and UF=21 respectively. | | | The reply content summary of paragraph 3.20.2.10 shall <<shall0442>> apply. Additionally, the rules applying to formats UF=4, UF=5 shall <<shall0443>> also apply to formats UF=20 and UF=21 respectively. | | |

| Comparable | ID=1080 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0345 | Page 82 | ED 73C v01 | shall0443 | Page 73 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.19.1.8 Reply Content (Figure 2-14) | | | 3.21.1.8 Reply Content | | |
| The reply content summary of §2.2.18.2.10 shall <<shall0344>> apply. Additionally, the rules applying to formats UF=4, UF=5 shall <<shall0345>> also apply to formats UF=20 and UF=21 respectively. | | | The reply content summary of paragraph 3.20.2.10 shall <<shall0442>> apply. Additionally, the rules applying to formats UF=4, UF=5 shall <<shall0443>> also apply to formats UF=20 and UF=21 respectively. | | |

| Comparable | ID=1081 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0346 | Page 83 | ED 73C v01 | shall0444 | Page 73 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.19.1.9 UM Protocol (Figure 2-18) | | | 3.21.1.9 UM Protocol (Figure 3-17) | | |
| The UM field shall <<shall0346>> support functions for the multisite protocol. The following paragraphs contain the requirements and descriptions of the protocol. | | | The UM field shall <<shall0444>> support functions for the multisite protocol. The following paragraphs contain the requirements and descriptions of the protocol. | | |

| Comparable | ID=1082 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0347 | Page 84 | ED 73C v01 | shall0445 | Page 73 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.19.1.10 Comm-A Protocol | | | 3.21.1.10 Comm-A Protocol | | |
| The Level 2 transponder shall <<shall0347>> direct the content of received Comm-A formats to the interface (see §2.2.13.2). | | | The transponder shall <<shall0445>> direct the content of received Comm-A formats to the interface (paragraph 3.17.2). | | |

| Comparable | ID=1083 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0348 | Page 84 | ED 73C v01 | shall0446 | Page 73 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.19.1.11 Broadcast Protocol | | | 3.21.1.11 Broadcast Protocol | | |
| If a broadcast interrogation has been accepted (see §2.2.18.2.2), the minimum data link transponder shall <<shall0348>> make that information available at the appropriate interface. | | | If a broadcast interrogation has been accepted (paragraph 3.21.1.1), the transponder shall <<shall0446>> make that information available at the appropriate interface. Other transponder functions shall <<shall0447>> not be affected, and a reply shall <<shall0448>> not be transmitted. | | |

| Comparable | ID=1084 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0349 | Page 84 | ED 73C v01 | shall0447 | Page 73 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.19.1.11 Broadcast Protocol | | | 3.21.1.11 Broadcast Protocol | | |
| Other transponder functions shall <<shall0349>> not be affected, and a reply shall <<shall0350>> not be transmitted. The transponder does not process the control fields of a Comm-A broadcast interrogation, so the 27 bits following the UF field are also available for user data. | | | If a broadcast interrogation has been accepted (paragraph 3.21.1.1), the transponder shall <<shall0446>> make that information available at the appropriate interface. Other transponder functions shall <<shall0447>> not be affected, and a reply shall <<shall0448>> not be transmitted. | | |

| Comparable | ID=1085 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0350 | Page 84 | ED 73C v01 | shall0448 | Page 73 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.19.1.11 Broadcast Protocol | | | 3.21.1.11 Broadcast Protocol | | |
| Other transponder functions shall <<shall0349>> not be affected, and a reply shall <<shall0350>> not be transmitted. The transponder does not process the control fields of a Comm-A broadcast interrogation, so the 27 bits following the UF field are also available for user data. | | | If a broadcast interrogation has been accepted (paragraph 3.21.1.1), the transponder shall <<shall0446>> make that information available at the appropriate interface. Other transponder functions shall <<shall0447>> not be affected, and a reply shall <<shall0448>> not be transmitted. | | |

| Comparable | ID=1087 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0351 | Page 85 | ED 73C v01 | shall0450 | Page 73 |
| WAT | Comment: 2d ED shall | | | | |
| | | | | | |
| 2.2.19.1.12.1 Data Source Designators | | | 3.21.1.12 Comm-B Protocol (Figure 3-18) | | |
| When Comm-B information to be transmitted resides in data sources that are part of the Mode S installation, the data sources shall <<shall0351>> be identified by the BDS code of §2.2.14.4.20.b. The interrogator uses the RR field of surveillance and Comm-A interrogations to designate the BDSl of the data source from which the reply should originate. BDS1 is represented by the last four bits (10-13) of the received RR code (see §2.2.14.4.35). | | | The 8-bit BDS code shall <<shall0449>> determine the register whose contents shall <<shall0450>> be transferred in the MB field of the Comm-B reply. It shall <<shall0451>> be expressed in two groups of 4 bits each, BDS1 (most significant 4 bits) and BDS2 (least significant 4 bits). | | |

| Comparable | ID=1088 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0352 | Page 85 | ED 73C v01 | shall0454 | Page 74 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.19.1.12.1 Data Source Designators | | | 3.21.1.12 Comm-B Protocol (Figure 3-18) | | |
| If the DI code of the Comm-B requesting interrogation is not equal to 7, the BDS2 code of the desired reply source shall <<shall0352>> be "0." | | | The BDS2 code shall <<shall0453>> be as defined in the RRS subfield of the SD field (3.1.2.6.1.4.1) when DI = 7. If no BDS2 code is specified (i.e. DI is not equal to 7) it shall <<shall0454>> signify that BDS2 = 0. | | |

| Comparable | ID=1089 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0353 | Page 86 | ED 73C v01 | shall0455 | Page 74 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.19.1.12.3 Ground-Initiated Comm-B | | | 3.21.1.12 Comm-B Protocol (Figure 3-18) | | |
| To read out data aboard the aircraft, the interrogator will transmit the appropriate data designators and the transponder shall <<shall0353>> insert the data according to §2.2.19.1.12.1 or §2.2.19.1.12.2. | | | To extract data from the aircraft using the ground initiated Comm-B protocol, the interrogator shall <<shall0455>> insert the Comm-B data selector codes according to paragraph 3.21.1.12 a. | | |

| Comparable | ID=1090 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0354 | Page 86 | ED 73C v01 | shall0456 | Page 74 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.19.1.12.4 Air-Initiated Comm-B | | | 3.21.1.12 Comm-B Protocol (Figure 3-18) | | |
| An air-initiated Comm-B sequence shall <<shall0354>> start upon the acceptance of a message intended for delivery to the ground sensor. After receipt of this message, the transponder shall <<shall0355>> insert codes 1 or 3 in the DR field of a surveillance or Comm-B reply, DF=4, 5, 20, 21. On receipt of this announcement, the interrogator transmits code 16 with DI(7 or with DI=7 and RRS=0 in the RR field of a subsequent interrogation. Receipt of this code by the transponder shall <<shall0356>> constitute the authorization to transmit the data. The resulting MB field contains a code identifying the content of the field. This reply, and others following it, shall <<shall0357>> continue to contain codes 1 or 3 in the DR field. After the message has been transmitted at least once in response to an interrogation using non-selective protocols (see §2.2.17.2.3.4) and after closeout is received (Code 4 in the PC field) in UF=4, 5, 20, 21, the transaction shall <<shall0358>> be closed out and the DR code belonging to this message immediately removed. Another message waiting to be transmitted can then set the DR code to 1 or 3 so that the reply can contain the announcement of | | | An air-initiated Comm-B sequence shall <<shall0456>> start upon the receipt of a message intended for delivery to a ground interrogator. After receipt of this message, the transponder shall <<shall0457>> insert codes 1 or 3 as appropriate, in the DR field of a surveillance or Comm-B reply, DF=4, 5, 20, 21. On receipt of this announcement, the interrogator transmits an interrogation with UF = 4, 5, 20 or 21 with RR = 16 and DI ( 7 or with RR = 16 and DI = 7 and RRS=0 in a subsequent interrogation. Receipt of this code by the transponder shall <<shall0458>> constitute the authorization to transmit the data. The resulting MB field contains a code identifying the content of the field. This reply, and others following it, shall <<shall0459>> continue to contain codes 1 or 3 as appropriate in the DR field. After the message has been transmitted at least once in response to an interrogation using non-multisite protocols (paragraph 3.21.2.3 d) and after closeout is received (e.g. Code 4 in the PC field) in UF=4, 5, 20, 21, the transaction shall <<shall0460>> be closed out and the DR code belonging to this message immediately removed. Another message waiting to be transmitted will then set | | |

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| this next message. If RR=16 with DI(7, or with DI=7 and RRS=0, is received while no message is waiting to be transmitted, the reply shall <<shall0359>> contain all ZEROs in the MB field. | the DR code to 1 or 3 as appropriate so that the reply will contain the announcement of this next message. If RR=16 with DI ( 7 or with DI=7 and RRS=0 is received while no message is waiting to be transmitted, the reply shall <<shall0461>> contain all ZEROs in the MB field. This protocol is also used by air-directed Comm-B messages. |

| Comparable | ID=1091 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0355 | Page 86 | ED 73C v01 | shall0457 | Page 74 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.19.1.12.4 Air-Initiated Comm-B | | | 3.21.1.12 Comm-B Protocol (Figure 3-18) | | |
| An air-initiated Comm-B sequence shall <<shall0354>> start upon the acceptance of a message intended for delivery to the ground sensor. After receipt of this message, the transponder shall <<shall0355>> insert codes 1 or 3 in the DR field of a surveillance or Comm-B reply, DF=4, 5, 20, 21. On receipt of this announcement, the interrogator transmits code 16 with DI(7 or with DI=7 and RRS=0 in the RR field of a subsequent interrogation. Receipt of this code by the transponder shall <<shall0356>> constitute the authorization to transmit the data. The resulting MB field contains a code identifying the content of the field. This reply, and others following it, shall <<shall0357>> continue to contain codes 1 or 3 in the DR field. After the message has been transmitted at least once in response to an interrogation using non-selective protocols (see §2.2.17.2.3.4) and after closeout is received (Code 4 in the PC field) in UF=4, 5, 20, 21, the transaction shall <<shall0358>> be closed out and the DR code belonging to this message immediately removed. Another message waiting to be transmitted can then set the DR code to 1 or 3 so that the reply can contain the announcement of this next message. If RR=16 with DI(7, or with DI=7 and RRS=0, is received while no message is waiting to be transmitted, the reply shall <<shall0359>> contain all ZEROs in the MB field. | | | An air-initiated Comm-B sequence shall <<shall0456>> start upon the receipt of a message intended for delivery to a ground interrogator. After receipt of this message, the transponder shall <<shall0457>> insert codes 1 or 3 as appropriate, in the DR field of a surveillance or Comm-B reply, DF=4, 5, 20, 21. On receipt of this announcement, the interrogator transmits an interrogation with UF = 4, 5, 20 or 21 with RR = 16 and DI ( 7 or with RR = 16 and DI = 7 and RRS=0 in a subsequent interrogation. Receipt of this code by the transponder shall <<shall0458>> constitute the authorization to transmit the data. The resulting MB field contains a code identifying the content of the field. This reply, and others following it, shall <<shall0459>> continue to contain codes 1 or 3 as appropriate in the DR field. After the message has been transmitted at least once in response to an interrogation using non-multisite protocols (paragraph 3.21.2.3 d) and after closeout is received (e.g. Code 4 in the PC field) in UF=4, 5, 20, 21, the transaction shall <<shall0460>> be closed out and the DR code belonging to this message immediately removed. Another message waiting to be transmitted will then set the DR code to 1 or 3 as appropriate so that the reply will contain the announcement of this next message. If RR=16 with DI ( 7 or with DI=7 and RRS=0 is received while no message is waiting to be transmitted, the reply shall <<shall0461>> contain all ZEROs in the MB field. This protocol is also used by air-directed Comm-B messages. | | |

| Comparable | ID=1092 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0356 | Page 86 | ED 73C v01 | shall0458 | Page 74 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.19.1.12.4 Air-Initiated Comm-B | | | 3.21.1.12 Comm-B Protocol (Figure 3-18) | | |
| An air-initiated Comm-B sequence shall <<shall0354>> start upon the | | | An air-initiated Comm-B sequence shall <<shall0456>> start upon the receipt | | |

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| acceptance of a message intended for delivery to the ground sensor. After receipt of this message, the transponder shall <<shall0355>> insert codes 1 or 3 in the DR field of a surveillance or Comm-B reply, DF=4, 5, 20, 21. On receipt of this announcement, the interrogator transmits code 16 with DI(7 or with DI=7 and RRS=0 in the RR field of a subsequent interrogation. Receipt of this code by the transponder shall <<shall0356>> constitute the authorization to transmit the data. The resulting MB field contains a code identifying the content of the field. This reply, and others following it, shall <<shall0357>> continue to contain codes 1 or 3 in the DR field. After the message has been transmitted at least once in response to an interrogation using non-selective protocols (see §2.2.17.2.3.4) and after closeout is received (Code 4 in the PC field) in UF=4, 5, 20, 21, the transaction shall <<shall0358>> be closed out and the DR code belonging to this message immediately removed. Another message waiting to be transmitted can then set the DR code to 1 or 3 so that the reply can contain the announcement of this next message. If RR=16 with DI(7, or with DI=7 and RRS=0, is received while no message is waiting to be transmitted, the reply shall <<shall0359>> contain all ZEROs in the MB field. | of a message intended for delivery to a ground interrogator. After receipt of this message, the transponder shall <<shall0457>> insert codes 1 or 3 as appropriate, in the DR field of a surveillance or Comm-B reply, DF=4, 5, 20, 21. On receipt of this announcement, the interrogator transmits an interrogation with UF = 4, 5, 20 or 21 with RR = 16 and DI ( 7 or with RR = 16 and DI = 7 and RRS=0 in a subsequent interrogation. Receipt of this code by the transponder shall <<shall0458>> constitute the authorization to transmit the data. The resulting MB field contains a code identifying the content of the field. This reply, and others following it, shall <<shall0459>> continue to contain codes 1 or 3 as appropriate in the DR field. After the message has been transmitted at least once in response to an interrogation using non-multisite protocols (paragraph 3.21.2.3 d) and after closeout is received (e.g. Code 4 in the PC field) in UF=4, 5, 20, 21, the transaction shall <<shall0460>> be closed out and the DR code belonging to this message immediately removed. Another message waiting to be transmitted will then set the DR code to 1 or 3 as appropriate so that the reply will contain the announcement of this next message. If RR=16 with DI ( 7 or with DI=7 and RRS=0 is received while no message is waiting to be transmitted, the reply shall <<shall0461>> contain all ZEROs in the MB field. This protocol is also used by air-directed Comm-B messages. |

| Comparable | ID=1093 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0357 | Page 86 | ED 73C v01 | shall0459 | Page 74 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.19.1.12.4 Air-Initiated Comm-B | | | 3.21.1.12 Comm-B Protocol (Figure 3-18) | | |
| An air-initiated Comm-B sequence shall <<shall0354>> start upon the acceptance of a message intended for delivery to the ground sensor. After receipt of this message, the transponder shall <<shall0355>> insert codes 1 or 3 in the DR field of a surveillance or Comm-B reply, DF=4, 5, 20, 21. On receipt of this announcement, the interrogator transmits code 16 with DI(7 or with DI=7 and RRS=0 in the RR field of a subsequent interrogation. Receipt of this code by the transponder shall <<shall0356>> constitute the authorization to transmit the data. The resulting MB field contains a code identifying the content of the field. This reply, and others following it, shall <<shall0357>> continue to contain codes 1 or 3 in the DR field. After the message has been transmitted at least once in response to an interrogation using non-selective protocols (see §2.2.17.2.3.4) and after closeout is received (Code 4 in the PC field) in UF=4, 5, 20, 21, the transaction shall <<shall0358>> be closed out and the DR code belonging to this message | | | An air-initiated Comm-B sequence shall <<shall0456>> start upon the receipt of a message intended for delivery to a ground interrogator. After receipt of this message, the transponder shall <<shall0457>> insert codes 1 or 3 as appropriate, in the DR field of a surveillance or Comm-B reply, DF=4, 5, 20, 21. On receipt of this announcement, the interrogator transmits an interrogation with UF = 4, 5, 20 or 21 with RR = 16 and DI ( 7 or with RR = 16 and DI = 7 and RRS=0 in a subsequent interrogation. Receipt of this code by the transponder shall <<shall0458>> constitute the authorization to transmit the data. The resulting MB field contains a code identifying the content of the field. This reply, and others following it, shall <<shall0459>> continue to contain codes 1 or 3 as appropriate in the DR field. After the message has been transmitted at least once in response to an interrogation using non-multisite protocols (paragraph 3.21.2.3 d) and after closeout is received (e.g. Code 4 in the PC field) in UF=4, 5, 20, 21, the transaction shall | | |

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| immediately removed. Another message waiting to be transmitted can then set the DR code to 1 or 3 so that the reply can contain the announcement of this next message. If RR=16 with DI(7, or with DI=7 and RRS=0, is received while no message is waiting to be transmitted, the reply shall <<shall0359>> contain all ZEROs in the MB field. | <<shall0460>> be closed out and the DR code belonging to this message immediately removed. Another message waiting to be transmitted will then set the DR code to 1 or 3 as appropriate so that the reply will contain the announcement of this next message. If RR=16 with DI ( 7 or with DI=7 and RRS=0 is received while no message is waiting to be transmitted, the reply shall <<shall0461>> contain all ZEROs in the MB field. This protocol is also used by air-directed Comm-B messages. |

| Comparable | ID=1094 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0358 | Page 86 | ED 73C v01 | shall0460 | Page 74 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.19.1.12.4 Air-Initiated Comm-B | | | 3.21.1.12 Comm-B Protocol (Figure 3-18) | | |
| An air-initiated Comm-B sequence shall <<shall0354>> start upon the acceptance of a message intended for delivery to the ground sensor. After receipt of this message, the transponder shall <<shall0355>> insert codes 1 or 3 in the DR field of a surveillance or Comm-B reply, DF=4, 5, 20, 21. On receipt of this announcement, the interrogator transmits code 16 with DI(7 or with DI=7 and RRS=0 in the RR field of a subsequent interrogation. Receipt of this code by the transponder shall <<shall0356>> constitute the authorization to transmit the data. The resulting MB field contains a code identifying the content of the field. This reply, and others following it, shall <<shall0357>> continue to contain codes 1 or 3 in the DR field. After the message has been transmitted at least once in response to an interrogation using non-selective protocols (see §2.2.17.2.3.4) and after closeout is received (Code 4 in the PC field) in UF=4, 5, 20, 21, the transaction shall <<shall0358>> be closed out and the DR code belonging to this message immediately removed. Another message waiting to be transmitted can then set the DR code to 1 or 3 so that the reply can contain the announcement of this next message. If RR=16 with DI(7, or with DI=7 and RRS=0, is received while no message is waiting to be transmitted, the reply shall <<shall0359>> contain all ZEROs in the MB field. | | | An air-initiated Comm-B sequence shall <<shall0456>> start upon the receipt of a message intended for delivery to a ground interrogator. After receipt of this message, the transponder shall <<shall0457>> insert codes 1 or 3 as appropriate, in the DR field of a surveillance or Comm-B reply, DF=4, 5, 20, 21. On receipt of this announcement, the interrogator transmits an interrogation with UF = 4, 5, 20 or 21 with RR = 16 and DI ( 7 or with RR = 16 and DI = 7 and RRS=0 in a subsequent interrogation. Receipt of this code by the transponder shall <<shall0458>> constitute the authorization to transmit the data. The resulting MB field contains a code identifying the content of the field. This reply, and others following it, shall <<shall0459>> continue to contain codes 1 or 3 as appropriate in the DR field. After the message has been transmitted at least once in response to an interrogation using non-multisite protocols (paragraph 3.21.2.3 d) and after closeout is received (e.g. Code 4 in the PC field) in UF=4, 5, 20, 21, the transaction shall <<shall0460>> be closed out and the DR code belonging to this message immediately removed. Another message waiting to be transmitted will then set the DR code to 1 or 3 as appropriate so that the reply will contain the announcement of this next message. If RR=16 with DI ( 7 or with DI=7 and RRS=0 is received while no message is waiting to be transmitted, the reply shall <<shall0461>> contain all ZEROs in the MB field. This protocol is also used by air-directed Comm-B messages. | | |

| Comparable | ID=1095 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0359 | Page 86 | ED 73C v01 | shall0461 | Page 74 |
| WAT | Comment: 0 | | | | |

| 2.2.19.1.12.4 Air-Initiated Comm-B | 3.21.1.12 Comm-B Protocol (Figure 3-18) |
|---|---|
| An air-initiated Comm-B sequence shall <<shall0354>> start upon the acceptance of a message intended for delivery to the ground sensor. After receipt of this message, the transponder shall <<shall0355>> insert codes 1 or 3 in the DR field of a surveillance or Comm-B reply, DF=4, 5, 20, 21. On receipt of this announcement, the interrogator transmits code 16 with DI(7 or with DI=7 and RRS=0 in the RR field of a subsequent interrogation. Receipt of this code by the transponder shall <<shall0356>> constitute the authorization to transmit the data. The resulting MB field contains a code identifying the content of the field. This reply, and others following it, shall <<shall0357>> continue to contain codes 1 or 3 in the DR field. After the message has been transmitted at least once in response to an interrogation using non-selective protocols (see §2.2.17.2.3.4) and after closeout is received (Code 4 in the PC field) in UF=4, 5, 20, 21, the transaction shall <<shall0358>> be closed out and the DR code belonging to this message immediately removed. Another message waiting to be transmitted can then set the DR code to 1 or 3 so that the reply can contain the announcement of this next message. If RR=16 with DI(7, or with DI=7 and RRS=0, is received while no message is waiting to be transmitted, the reply shall <<shall0359>> contain all ZEROs in the MB field. | An air-initiated Comm-B sequence shall <<shall0456>> start upon the receipt of a message intended for delivery to a ground interrogator. After receipt of this message, the transponder shall <<shall0457>> insert codes 1 or 3 as appropriate, in the DR field of a surveillance or Comm-B reply, DF=4, 5, 20, 21. On receipt of this announcement, the interrogator transmits an interrogation with UF = 4, 5, 20 or 21 with RR = 16 and DI ( 7 or with RR = 16 and DI = 7 and RRS=0 in a subsequent interrogation. Receipt of this code by the transponder shall <<shall0458>> constitute the authorization to transmit the data. The resulting MB field contains a code identifying the content of the field. This reply, and others following it, shall <<shall0459>> continue to contain codes 1 or 3 as appropriate in the DR field. After the message has been transmitted at least once in response to an interrogation using non-multisite protocols (paragraph 3.21.2.3 d) and after closeout is received (e.g. Code 4 in the PC field) in UF=4, 5, 20, 21, the transaction shall <<shall0460>> be closed out and the DR code belonging to this message immediately removed. Another message waiting to be transmitted will then set the DR code to 1 or 3 as appropriate so that the reply will contain the announcement of this next message. If RR=16 with DI ( 7 or with DI=7 and RRS=0 is received while no message is waiting to be transmitted, the reply shall <<shall0461>> contain all ZEROs in the MB field. This protocol is also used by air-directed Comm-B messages. |

| Comparable | ID=1096 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0361 | Page 87 | ED 73C v01 | shall0468 | Page 75 |
| WAT | Comment: 0 | | | | |

| 2.2.19.1.12.7 Coding of the Data Link Capability Report | 3.21.1.12 Comm-B Protocol (Figure 3-18) |
|---|---|
| SCS: This 1-bit squitter (bit 66) capability subfield shall <<shall0360>> report the capability of the transponder to transmit Extended Squitter position reports. It shall <<shall0361>> be set to ONE if GICB registers 05 and 06 {HEX} have been updated within the last 10 ±1 seconds. Otherwise it shall <<shall0362>> be set to ZERO. The internal insertion of data by the transponder into these registers (altitude and surveillance status) shall <<shall0363>> not qualify as a register update for this purpose. | This 1-bit (34 of the MB field) squitter capability subfield shall <<shall0467>> report the capability of the transponder to transmit extended squitter position reports. It shall <<shall0468>> be set to 1 if GICB registers 05 and 06 {HEX} have been updated within the last ten plus or minus one seconds. Otherwise, it shall <<shall0469>> be set to 0 |

| Comparable | ID=1097 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0362 | Page 87 | ED 73C v01 | shall0469 | Page 75 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.19.1.12.7 Coding of the Data Link Capability Report | | | 3.21.1.12 Comm-B Protocol (Figure 3-18) | | |
| SCS: This 1-bit squitter (bit 66) capability subfield shall <<shall0360>> report the capability of the transponder to transmit Extended Squitter position reports. It shall <<shall0361>> be set to ONE if GICB registers 05 and 06 {HEX} have been updated within the last 10 ±1 seconds. Otherwise it shall <<shall0362>> be set to ZERO. The internal insertion of data by the transponder into these registers (altitude and surveillance status) shall <<shall0363>> not qualify as a register update for this purpose. | | | This 1-bit (34 of the MB field) squitter capability subfield shall <<shall0467>> report the capability of the transponder to transmit extended squitter position reports. It shall <<shall0468>> be set to 1 if GICB registers 05 and 06 {HEX} have been updated within the last ten plus or minus one seconds. Otherwise, it shall <<shall0469>> be set to 0 | | |

| Comparable | ID=1098 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0367 | Page 88 | ED 73C v01 | shall0472 | Page 75 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.19.1.12.8 Updating of the Data Link Capability Report | | | 3.21.1.12 Comm-B Protocol (Figure 3-18) | | |
| The transponder shall <<shall0367>> initiate, generate and transmit the revised basic data link capability report even if the aircraft data link capability is degraded or lost. To support this requirement, the transponder shall <<shall0368>> set the BDS subfield for the basic data link capability report. | | | The transponder shall <<shall0472>> initiate, generate and transmit the revised data link capability report even if the aircraft data link capability is degraded or lost. To support this requirement, the transponder shall <<shall0473>> set the BDS subfield for the data link capability report. | | |

| Comparable | ID=1099 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0368 | Page 88 | ED 73C v01 | shall0473 | Page 76 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.19.1.12.8 Updating of the Data Link Capability Report | | | 3.21.1.12 Comm-B Protocol (Figure 3-18) | | |
| The transponder shall <<shall0367>> initiate, generate and transmit the revised basic data link capability report even if the aircraft data link capability is degraded or lost. To support this requirement, the transponder shall <<shall0368>> set the BDS subfield for the basic data link capability report. | | | The transponder shall <<shall0472>> initiate, generate and transmit the revised data link capability report even if the aircraft data link capability is degraded or lost. To support this requirement, the transponder shall <<shall0473>> set the BDS subfield for the data link capability report. | | |

| Comparable | ID=1102 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0383 | Page 91 | ED 73C v01 | shall0494 | Page 77 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.19.1.17 Data Handling and Interfaces | | | 3.21.1.17 Data Handling and Interfaces | | |
| In addition to the interfaces described in §2.2.18.2.11, the Level 2 transponder shall <<shall0383>> have interfaces for indirect data as specified in §2.2.13.2. | | | In addition to the interfaces described in paragraph 3.20.2.11, the transponder shall <<shall0494>> have interfaces for indirect data as specified in paragraph 3.17.2. | | |

| Comparable | ID=1103 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0384 | Page 91 | ED 73C v01 | shall0495 | Page 78 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.19.1.18 TCAS Crosslink Protocol | | | 3.21.1.18 ACAS Crosslink Protocol. | | |
| In response to a UF=0 with RL=1 (see §2.2.14.4.34) and DS (0 (see §2.2.14.4.9), the transponder shall <<shall0384>> reply with a DF=16 reply in which the MV field shall <<shall0385>> contain the contents of the ground-initiated Comm-B register designated by the DS value. In response to a UF=0 with RL=1 and DS=0, the transponder shall <<shall0386>> reply with a DF=16 with an MV field of all zeroes. Receipt of a UF=0 with DS non-zero but RL=0 shall <<shall0387>> have no associated TCAS crosslink action, and the transponder shall <<shall0388>> reply per §2.2.14.4.34. | | | In response to a UF=0 with RL=1 (3.18.4.31) and DS(0 (3.18.4.11), the transponder shall <<shall0495>> reply with a DF=16 reply in which the MV field shall <<shall0496>> contain the contents of the GICB register designated by the DS value. In response to a UF=0 with RL=1 and DS=0, the transponder shall <<shall0497>> reply with a DF=16 with an MV field of all zeroes. Receipt of a UF=0 with DS(0 but RL=0 shall <<shall0498>> have no associated ACAS crosslink action. | | |

| Comparable | ID=1104 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0385 | Page 91 | ED 73C v01 | shall0496 | Page 78 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.19.1.18 TCAS Crosslink Protocol | | | 3.21.1.18 ACAS Crosslink Protocol. | | |
| In response to a UF=0 with RL=1 (see §2.2.14.4.34) and DS (0 (see §2.2.14.4.9), the transponder shall <<shall0384>> reply with a DF=16 reply in which the MV field shall <<shall0385>> contain the contents of the ground-initiated Comm-B register designated by the DS value. In response to a UF=0 with RL=1 and DS=0, the transponder shall <<shall0386>> reply with a DF=16 with an MV field of all zeroes. Receipt of a UF=0 with DS non-zero but RL=0 shall <<shall0387>> have no associated TCAS crosslink action, and the transponder shall <<shall0388>> reply per §2.2.14.4.34. | | | In response to a UF=0 with RL=1 (3.18.4.31) and DS(0 (3.18.4.11), the transponder shall <<shall0495>> reply with a DF=16 reply in which the MV field shall <<shall0496>> contain the contents of the GICB register designated by the DS value. In response to a UF=0 with RL=1 and DS=0, the transponder shall <<shall0497>> reply with a DF=16 with an MV field of all zeroes. Receipt of a UF=0 with DS(0 but RL=0 shall <<shall0498>> have no associated ACAS crosslink action. | | |

| Comparable | ID=1105 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0386 | Page 91 | ED 73C v01 | shall0497 | Page 78 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.19.1.18 TCAS Crosslink Protocol | | | 3.21.1.18 ACAS Crosslink Protocol. | | |
| In response to a UF=0 with RL=1 (see §2.2.14.4.34) and DS (0 (see §2.2.14.4.9), the transponder shall <<shall0384>> reply with a DF=16 reply in which the MV field shall <<shall0385>> contain the contents of the ground-initiated Comm-B register designated by the DS value. In response to a UF=0 with RL=1 and DS=0, the transponder shall <<shall0386>> reply with a DF=16 with an MV field of all zeroes. Receipt of a UF=0 with DS non-zero but RL=0 shall <<shall0387>> have no associated TCAS crosslink action, and the transponder shall <<shall0388>> reply per §2.2.14.4.34. | | | In response to a UF=0 with RL=1 (3.18.4.31) and DS(0 (3.18.4.11), the transponder shall <<shall0495>> reply with a DF=16 reply in which the MV field shall <<shall0496>> contain the contents of the GICB register designated by the DS value. In response to a UF=0 with RL=1 and DS=0, the transponder shall <<shall0497>> reply with a DF=16 with an MV field of all zeroes. Receipt of a UF=0 with DS(0 but RL=0 shall <<shall0498>> have no associated ACAS crosslink action. | | |

| Comparable | ID=1110 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0398 | Page 94 | ED 73C v01 | shall0512 | Page 82 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.19.2.2.2 Interrogator Identity Report | | | 3.21.2.2 Multisite Common Protocols | | |
| Transponders shall <<shall0398>> insert the interrogator identifier into the UM field of the reply according to the coding of RSS. | | | Transponders shall <<shall0512>> insert the interrogator identifier into the UM field of the reply according to the coding of RSS. | | |

| Comparable | ID=1111 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0399 | Page 95 | ED 73C v01 | shall0513 | Page 82 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.19.2.3 Multisite Comm-B Protocol (Figure 2-19) | | | 3.21.2.3 Multisite Comm-B Protocol (Figure 3-18) | | |
| The multisite Comm-B protocol augments the standard Comm-B protocol and when not in use shall <<shall0399>> not modify the standard process in any way. | | | The multisite Comm-B protocol augments the standard Comm-B protocol and when not in use shall <<shall0513>> not modify the standard process in any way. | | |

| Comparable | ID=1112 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0400 | Page 95 | ED 73C v01 | shall0514 | Page 82 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.19.2.3.1 Multisite Comm-B Reservation | | | 3.21.2.3 Multisite Comm-B Protocol (Figure 3-18) | | |
| A multisite Comm-B reservation is invalid and shall <<shall0400>> not be granted by the transponder unless an air-initiated Comm-B message is waiting to be transmitted and the requesting interrogation contains RR=16, DI=1, MBS=1, IIS is not zero and the B timer is not running. | | | A multisite Comm-B reservation is invalid and shall <<shall0514>> not be granted by the transponder unless: | | |

| Comparable | ID=1113 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0401 | Page 95 | ED 73C v01 | shall0515 | Page 83 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.19.2.3.1 Multisite Comm-B Reservation | | | 3.21.2.3 Multisite Comm-B Protocol (Figure 3-18) | | |
| Transponder protocol procedures shall <<shall0401>> depend upon the state of the B-timer as follows: | | | Transponder protocol procedures shall <<shall0515>> depend upon the state of the B-timer as follows: | | |

| Comparable | ID=1114 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0402 | Page 96 | ED 73C v01 | shall0516 | Page 83 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.19.2.3.2 Multisite Directed Comm-B Transmissions | | | 3.21.2.3 Multisite Comm-B Protocol (Figure 3-18) | | |
| If the airborne data system needs to direct a Comm-B message to a specific interrogator, the air-initiated Comm-B protocol shall <<shall0402>> be used together with the multisite protocol above. When the B-timer is not running, the IIS of the desired destination shall <<shall0403>> be stored and transmitted in bits 14-17, together with IDS=1 in bits 18 and 19 of the UM field unless UM use is preempted by command from the ground. Simultaneously the B-timer shall <<shall0404>> be started and code DR=1 transmitted. | | | If the airborne data system needs to direct a Comm-B message to a specific interrogator, the air-initiated Comm-B protocol shall <<shall0516>> be used together with the multisite protocol above. When the B-timer is not running, the IIS of the desired destination shall <<shall0517>> be stored and transmitted in bits 14-17, together with IDS=1 in bits 18 and 19 of the UM field unless UM use is preempted by command from the ground. Simultaneously the B-timer shall <<shall0518>> be started and code DR=1 transmitted. | | |

| Comparable | ID=1115 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0403 | Page 96 | ED 73C v01 | shall0517 | Page 83 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.19.2.3.2 Multisite Directed Comm-B Transmissions | | | 3.21.2.3 Multisite Comm-B Protocol (Figure 3-18) | | |
| If the airborne data system needs to direct a Comm-B message to a specific interrogator, the air-initiated Comm-B protocol shall <<shall0402>> be used together with the multisite protocol above. When the B-timer is not running, the IIS of the desired destination shall <<shall0403>> be stored and transmitted in bits 14-17, together with IDS=1 in bits 18 and 19 of the UM field unless UM use is preempted by command from the ground. Simultaneously the B-timer shall <<shall0404>> be started and code DR=1 transmitted. | | | If the airborne data system needs to direct a Comm-B message to a specific interrogator, the air-initiated Comm-B protocol shall <<shall0516>> be used together with the multisite protocol above. When the B-timer is not running, the IIS of the desired destination shall <<shall0517>> be stored and transmitted in bits 14-17, together with IDS=1 in bits 18 and 19 of the UM field unless UM use is preempted by command from the ground. Simultaneously the B-timer shall <<shall0518>> be started and code DR=1 transmitted. | | |

| Comparable | ID=1116 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0404 | Page 96 | ED 73C v01 | shall0518 | Page 83 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.19.2.3.2 Multisite Directed Comm-B Transmissions | | | 3.21.2.3 Multisite Comm-B Protocol (Figure 3-18) | | |
| If the airborne data system needs to direct a Comm-B message to a specific interrogator, the air-initiated Comm-B protocol shall <<shall0402>> be used together with the multisite protocol above. When the B-timer is not running, the IIS of the desired destination shall <<shall0403>> be stored and transmitted in bits 14-17, together with IDS=1 in bits 18 and 19 of the UM field unless UM use is preempted by command from the ground. Simultaneously the B-timer shall <<shall0404>> be started and code DR=1 transmitted. | | | If the airborne data system needs to direct a Comm-B message to a specific interrogator, the air-initiated Comm-B protocol shall <<shall0516>> be used together with the multisite protocol above. When the B-timer is not running, the IIS of the desired destination shall <<shall0517>> be stored and transmitted in bits 14-17, together with IDS=1 in bits 18 and 19 of the UM field unless UM use is preempted by command from the ground. Simultaneously the B-timer shall <<shall0518>> be started and code DR=1 transmitted. | | |

| Comparable | ID=1117 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0405 | Page 96 | ED 73C v01 | shall0519 | Page 83 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.19.2.3.2 Multisite Directed Comm-B Transmissions | | | 3.21.2.3 Multisite Comm-B Protocol (Figure 3-18) | | |
| The reservation shall <<shall0405>> not be automatically timed out by the transponder but shall <<shall0406>> continue until either: | | | The reservation shall <<shall0519>> not be automatically timed out by the transponder but shall <<shall0520>> continue until either: | | |

| Comparable | ID=1118 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0406 | Page 96 | ED 73C v01 | shall0520 | Page 83 |
| WAT | Comment: 2d shall | | | | |
| | | | | | |
| 2.2.19.2.3.2 Multisite Directed Comm-B Transmissions | | | 3.21.2.3 Multisite Comm-B Protocol (Figure 3-18) | | |
| The reservation shall <<shall0405>> not be automatically timed out by the transponder but shall <<shall0406>> continue until either: | | | The reservation shall <<shall0519>> not be automatically timed out by the transponder but shall <<shall0520>> continue until either: | | |

| Comparable | ID=1119 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0407 | Page 96 | ED 73C v01 | shall0521 | Page 84 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.19.2.3.3 Multisite Comm-B Closeout | | | 3.21.2.3 Multisite Comm-B Protocol (Figure 3-18) | | |
| If IIS of the interrogation equals the stored Comm-B IIS, the stored Comm-B shall <<shall0407>> be cleared, the B-timer stopped, the DR code 1 for this message reset and the message itself canceled. If the site numbers do not match, the message shall <<shall0408>> not be canceled and the stored Comm-B IIS, B-timer and DR code shall <<shall0409>> remain unchanged. The transponder shall <<shall0410>> not close out a multisite air-initiated Comm-B message unless it has been read out at least once by the reserved site. | | | If the IIS of the interrogation equals the stored Comm-B IIS, the stored Comm-B shall <<shall0521>> be cleared, the B-timer stopped, the DR code 1 for this message reset and the message itself cancelled. If the site numbers do not match, the message shall <<shall0522>> not be cancelled and the stored Comm-B IIS, B-timer and DR code shall <<shall0523>> remain unchanged. The transponder shall <<shall0524>> not close out a multisite air-initiated Comm-B message unless it has been read out at least once by the reserved site. | | |

| Comparable | ID=1120 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0408 | Page 96 | ED 73C v01 | shall0522 | Page 84 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.19.2.3.3 Multisite Comm-B Closeout | | | 3.21.2.3 Multisite Comm-B Protocol (Figure 3-18) | | |
| If IIS of the interrogation equals the stored Comm-B IIS, the stored Comm-B shall <<shall0407>> be cleared, the B-timer stopped, the DR code 1 for this message reset and the message itself canceled. If the site numbers do not match, the message shall <<shall0408>> not be canceled and the stored Comm-B IIS, B-timer and DR code shall <<shall0409>> remain unchanged. The transponder shall <<shall0410>> not close out a multisite air-initiated Comm-B message unless it has been read out at least once by the reserved site. | | | If the IIS of the interrogation equals the stored Comm-B IIS, the stored Comm-B shall <<shall0521>> be cleared, the B-timer stopped, the DR code 1 for this message reset and the message itself cancelled. If the site numbers do not match, the message shall <<shall0522>> not be cancelled and the stored Comm-B IIS, B-timer and DR code shall <<shall0523>> remain unchanged. The transponder shall <<shall0524>> not close out a multisite air-initiated Comm-B message unless it has been read out at least once by the reserved site. | | |

| Comparable | ID=1121 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0409 | Page 96 | ED 73C v01 | shall0523 | Page 84 |
| WAT | Comment: 0 | | | | |
| | | | | | |

| 2.2.19.2.3.3 Multisite Comm-B Closeout | 3.21.2.3 Multisite Comm-B Protocol (Figure 3-18) |
|---|---|
| If IIS of the interrogation equals the stored Comm-B IIS, the stored Comm-B shall <<shall0407>> be cleared, the B-timer stopped, the DR code 1 for this message reset and the message itself canceled. If the site numbers do not match, the message shall <<shall0408>> not be canceled and the stored Comm-B IIS, B-timer and DR code shall <<shall0409>> remain unchanged. The transponder shall <<shall0410>> not close out a multisite air-initiated Comm-B message unless it has been read out at least once by the reserved site. | If the IIS of the interrogation equals the stored Comm-B IIS, the stored Comm-B shall <<shall0521>> be cleared, the B-timer stopped, the DR code 1 for this message reset and the message itself cancelled. If the site numbers do not match, the message shall <<shall0522>> not be cancelled and the stored Comm-B IIS, B-timer and DR code shall <<shall0523>> remain unchanged. The transponder shall <<shall0524>> not close out a multisite air-initiated Comm-B message unless it has been read out at least once by the reserved site. |

| Comparable | ID=1122 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0410 | Page 96 | ED 73C v01 | shall0524 | Page 84 |
| WAT | Comment: 0 | | | | |
| | | | | | |

| 2.2.19.2.3.3 Multisite Comm-B Closeout | 3.21.2.3 Multisite Comm-B Protocol (Figure 3-18) |
|---|---|
| If IIS of the interrogation equals the stored Comm-B IIS, the stored Comm-B shall <<shall0407>> be cleared, the B-timer stopped, the DR code 1 for this message reset and the message itself canceled. If the site numbers do not match, the message shall <<shall0408>> not be canceled and the stored Comm-B IIS, B-timer and DR code shall <<shall0409>> remain unchanged. The transponder shall <<shall0410>> not close out a multisite air-initiated Comm-B message unless it has been read out at least once by the reserved site. | If the IIS of the interrogation equals the stored Comm-B IIS, the stored Comm-B shall <<shall0521>> be cleared, the B-timer stopped, the DR code 1 for this message reset and the message itself cancelled. If the site numbers do not match, the message shall <<shall0522>> not be cancelled and the stored Comm-B IIS, B-timer and DR code shall <<shall0523>> remain unchanged. The transponder shall <<shall0524>> not close out a multisite air-initiated Comm-B message unless it has been read out at least once by the reserved site. |

| Comparable | ID=1123 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0411 | Page 96 | ED 73C v01 | shall0525 | Page 84 |
| WAT | Comment: 0 | | | | |
| | | | | | |

| 2.2.19.2.3.4 Automatic Comm-B Closeout | 3.21.2.3 Multisite Comm-B Protocol (Figure 3-18) |
|---|---|
| If the transponder B-timer runs out before a multisite closeout is accepted, the stored Comm-B IIS shall <<shall0411>> be set to "0" and the T-register shall <<shall0412>> be cleared to enable this message to be read and cleared by another site. | If the transponder B-timer runs out before a multisite closeout is accepted, the stored Comm-B IIS shall <<shall0525>> be set to "0" and the T-register shall <<shall0526>> be cleared to enable this message to be read and cleared by another site. |

| Comparable | ID=1124 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0412 | Page 96 | ED 73C v01 | shall0526 | Page 84 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.19.2.3.4 Automatic Comm-B Closeout | | | 3.21.2.3 Multisite Comm-B Protocol (Figure 3-18) | | |
| If the transponder B-timer runs out before a multisite closeout is accepted, the stored Comm-B IIS shall <<shall0411>> be set to "0" and the T-register shall <<shall0412>> be cleared to enable this message to be read and cleared by another site. | | | If the transponder B-timer runs out before a multisite closeout is accepted, the stored Comm-B IIS shall <<shall0525>> be set to "0" and the T-register shall <<shall0526>> be cleared to enable this message to be read and cleared by another site. | | |

| Comparable | ID=1125 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0413 | Page 97 | ED 73C v01 | shall0527 | Page 84 |
| WAT | Comment: 1st ED shall | | | | |
| | | | | | |
| 2.2.19.2.3.5 Significance of PC Command | | | 3.21.2.3 Multisite Comm-B Protocol (Figure 3-18) | | |
| When the transponder is in the multisite mode, i.e., when the IIS stored for Comm-B is not "0," receipt of a closeout (PC=4) shall <<shall0413>> have no effect on the transaction unless accompanied by IIS equal to the stored Comm-B IIS. | | | When the transponder is in the multisite mode, i.e., when the IIS stored for Comm-B is not "0", receipt of a closeout (PC=4) shall <<shall0527>> have no effect on the transaction unless accompanied by IIS equal to the stored Comm-B IIS in which case the closeout shall <<shall0528>> be effected in accordance with para 3.21.2.3 c. | | |

| Comparable | ID=1126 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0414 | Page 98 | ED 73C v01 | shall0651 | Page 98 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.20.1.1.1.1 Initializing Segment Transfer | | | 3.21.3.1 Comm-C/ELM Protocol (Figures 3-19 and 3-20) | | |
| The ELM transaction for an n-segment message (NCs 0 through n-l) shall <<shall0414>> be initiated upon receipt of a Comm-C transmission containing RC=0. The text transmitted in MC shall <<shall0415>> be stored. This text is the last segment of the message and carries NC=n-l. Upon receipt of NC, the transponder shall <<shall0416>> establish the number of further segments to be received and stored. Receipt of an initializing (RC=0) segment shall <<shall0417>> establish the "setup" in the transponder, which is now prepared to accept further segments. | | | The ELM transaction for an n-segment message (NCs 0 through n-1) shall <<shall0651>> be initiated upon receipt of a Comm-C transmission containing RC=0. The text transmitted in MC shall <<shall0652>> be stored. This text is the last segment of the message and carries NC=n-1. Upon receipt of NC, the transponder shall <<shall0653>> establish the number of further segments to be received and stored. Receipt of an initializing (RC=0) segment shall <<shall0654>> establish the "setup" which includes the clearing of TAS and all segments of all previous ELMs in the transponder, which is now prepared to accept further segments. | | |

| Comparable | ID=1127 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0415 | Page 98 | ED 73C v01 | shall0652 | Page 98 |
| WAT | Comment: 0 | | | | |

| 2.2.20.1.1.1.1 Initializing Segment Transfer | 3.21.3.1 Comm-C/ELM Protocol (Figures 3-19 and 3-20) |
|---|---|
| The ELM transaction for an n-segment message (NCs 0 through n-l) shall <<shall0414>> be initiated upon receipt of a Comm-C transmission containing RC=0. The text transmitted in MC shall <<shall0415>> be stored. This text is the last segment of the message and carries NC=n-l. Upon receipt of NC, the transponder shall <<shall0416>> establish the number of further segments to be received and stored. Receipt of an initializing (RC=0) segment shall <<shall0417>> establish the "setup" in the transponder, which is now prepared to accept further segments. | The ELM transaction for an n-segment message (NCs 0 through n-1) shall <<shall0651>> be initiated upon receipt of a Comm-C transmission containing RC=0. The text transmitted in MC shall <<shall0652>> be stored. This text is the last segment of the message and carries NC=n-1. Upon receipt of NC, the transponder shall <<shall0653>> establish the number of further segments to be received and stored. Receipt of an initializing (RC=0) segment shall <<shall0654>> establish the "setup" which includes the clearing of TAS and all segments of all previous ELMs in the transponder, which is now prepared to accept further segments. |

| Comparable | ID=1128 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0416 | Page 98 | ED 73C v01 | shall0653 | Page 98 |
| WAT | Comment: 0 | | | | |

| 2.2.20.1.1.1.1 Initializing Segment Transfer | 3.21.3.1 Comm-C/ELM Protocol (Figures 3-19 and 3-20) |
|---|---|
| The ELM transaction for an n-segment message (NCs 0 through n-l) shall <<shall0414>> be initiated upon receipt of a Comm-C transmission containing RC=0. The text transmitted in MC shall <<shall0415>> be stored. This text is the last segment of the message and carries NC=n-l. Upon receipt of NC, the transponder shall <<shall0416>> establish the number of further segments to be received and stored. Receipt of an initializing (RC=0) segment shall <<shall0417>> establish the "setup" in the transponder, which is now prepared to accept further segments. | The ELM transaction for an n-segment message (NCs 0 through n-1) shall <<shall0651>> be initiated upon receipt of a Comm-C transmission containing RC=0. The text transmitted in MC shall <<shall0652>> be stored. This text is the last segment of the message and carries NC=n-1. Upon receipt of NC, the transponder shall <<shall0653>> establish the number of further segments to be received and stored. Receipt of an initializing (RC=0) segment shall <<shall0654>> establish the "setup" which includes the clearing of TAS and all segments of all previous ELMs in the transponder, which is now prepared to accept further segments. |

| Comparable | ID=1130 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0418 | Page 98 | ED 73C v01 | shall0655 | Page 98 |
| WAT | Comment: 0 | | | | |

| 2.2.20.1.1.1.1 Initializing Segment Transfer | 3.21.3.1 Comm-C/ELM Protocol (Figures 3-19 and 3-20) |
|---|---|
| Receipt of another initializing segment shall <<shall0418>> result in a new setup within the transponder and cause any previously stored segments to be discarded. | Receipt of another initializing segment shall <<shall0655>> result in a new setup within the transponder and cause any previously stored segments to be discarded. |

| Comparable | ID=1131 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0419 | Page 98 | ED 73C v01 | shall0656 | Page 98 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.20.1.1.1.1 Initializing Segment Transfer | | | 3.21.3.1 Comm-C/ELM Protocol (Figures 3-19 and 3-20) | | |
| A transponder reply shall <<shall0419>> not be generated on receipt of an initializing segment. | | | A transponder reply shall <<shall0656>> not be generated on receipt of an initializing segment. | | |

| Comparable | ID=1132 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0420 | Page 98 | ED 73C v01 | shall0657 | Page 98 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.20.1.1.1.2 Intermediate Segment Transfer | | | 3.21.3.1 Comm-C/ELM Protocol (Figures 3-19 and 3-20) | | |
| Intermediate segments are characterized by RC=1 and shall <<shall0420>> be accepted and stored by the transponder only if the setup of the previous paragraph is in effect and if the received NC is smaller than the value stored at receipt of the initializing segment. | | | Intermediate segments are characterized by RC=1 and shall <<shall0657>> be accepted and stored by the transponder only if the setup of the previous paragraph is in effect and if the received NC is smaller than the value stored at receipt of the initializing segment. | | |

| Comparable | ID=1133 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0421 | Page 98 | ED 73C v01 | shall0658 | Page 99 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.20.1.1.1.2 Intermediate Segment Transfer | | | 3.21.3.1 Comm-C/ELM Protocol (Figures 3-19 and 3-20) | | |
| A reply shall <<shall0421>> not be generated on receipt of the intermediate segment. | | | A reply shall <<shall0658>> not be generated on receipt of the intermediate segment. | | |

| Comparable | ID=1134 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0422 | Page 98 | ED 73C v01 | shall0659 | Page 99 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.20.1.1.1.3 Final Segment Transfer | | | 3.21.3.1 Comm-C/ELM Protocol (Figures 3-19 and 3-20) | | |
| The final segment, characterized by RC=2, shall <<shall0422>> be accepted by the transponder under all circumstances and requires a reply (with the standard 128-microsecond Mode S reply delay). The segment content shall <<shall0423>> be stored if the setup of §2.2.20.1.1.1.1 is in effect and if the received NC is smaller than the value of the initial segment NC. | | | The final segment, characterized by RC=2, shall <<shall0659>> be accepted by the transponder under all circumstances and requires a reply (with the standard 128-(s Mode S reply delay). The segment content shall <<shall0660>> be stored if setup of 3.21.3.1 a is in effect and if the received NC is smaller than the value of the initial segment NC. | | |

| Comparable | ID=1135 |
|---|---|

| DO 181D v08 | shall0423 | Page 98 | ED 73C v01 | shall0660 | Page 99 |
|---|---|---|---|---|---|
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.20.1.1.1.3 Final Segment Transfer | | | 3.21.3.1 Comm-C/ELM Protocol (Figures 3-19 and 3-20) | | |
| The final segment, characterized by RC=2, shall <<shall0422>> be accepted by the transponder under all circumstances and requires a reply (with the standard 128-microsecond Mode S reply delay). The segment content shall <<shall0423>> be stored if the setup of §2.2.20.1.1.1.1 is in effect and if the received NC is smaller than the value of the initial segment NC. | | | The final segment, characterized by RC=2, shall <<shall0659>> be accepted by the transponder under all circumstances and requires a reply (with the standard 128-(s Mode S reply delay). The segment content shall <<shall0660>> be stored if setup of 3.21.3.1 a is in effect and if the received NC is smaller than the value of the initial segment NC. | | |

| Comparable | ID=1136 |
|---|---|

| DO 181D v08 | shall0424 | Page 99 | ED 73C v01 | shall0661 | Page 99 |
|---|---|---|---|---|---|
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.20.1.1.1.4 Completed Message | | | 3.21.3.1 Comm-C/ELM Protocol (Figures 3-19 and 3-20) | | |
| The message is completed if all segments announced by NC in the initializing segment have been received. If the message is completed, the content shall <<shall0424>> be transferred to the ELM interface of §2.2.13.4, and the setup shall <<shall0425>> be deactivated. | | | The message is completed if all segments announced by NC in the initializing segment have been received. If the message is completed, the content shall <<shall0661>> be transferred to the outside, via the ELM interface of paragraph 3.17.4, and cleared. No later arriving segments shall <<shall0662>> be stored. The TAS content shall <<shall0663>> remain unchanged until either a new setup is called for or until closeout. | | |

| Comparable | ID=1137 |
|---|---|

| DO 181D v08 | shall0425 | Page 99 | ED 73C v01 | shall0661 | Page 99 |
|---|---|---|---|---|---|
| WAT | Comment: 2d DO shall | | | | |
| | | | | | |
| 2.2.20.1.1.1.4 Completed Message | | | 3.21.3.1 Comm-C/ELM Protocol (Figures 3-19 and 3-20) | | |
| The message is completed if all segments announced by NC in the initializing segment have been received. If the message is completed, the content shall <<shall0424>> be transferred to the ELM interface of §2.2.13.4, and the setup shall <<shall0425>> be deactivated. | | | The message is completed if all segments announced by NC in the initializing segment have been received. If the message is completed, the content shall <<shall0661>> be transferred to the outside, via the ELM interface of paragraph 3.17.4, and cleared. No later arriving segments shall <<shall0662>> be stored. The TAS content shall <<shall0663>> remain unchanged until either a new setup is called for or until closeout. | | |

| Comparable | ID=1138 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0426 | Page 99 | ED 73C v01 | shall0664 | Page 99 |
| WAT | Comment: 0 | | | | |
| | | | | | |

| 2.2.20.1.1.1.5 Acknowledgment Reply | 3.21.3.1 Comm-C/ELM Protocol (Figures 3-19 and 3-20) |
|---|---|
| The transponder shall <<shall0426>> acknowledge receipt of a final segment by replying with a Comm-D transmission, with KE=1. KE=1 indicates that the MD field contains subfield TAS that reports which segments have been received. This reply shall <<shall0427>> be transmitted 128 microseconds plus or minus 0.25 microsecond following receipt of the sync phase reversal of the interrogation delivering the final segment. | The transponder shall <<shall0664>> acknowledge receipt of a final segment by replying with a Comm-D transmission, with KE=1. KE=1 indicates that the MD field contains subfield TAS that reports which segments have been received. This reply shall <<shall0665>> be transmitted 128 ( 0,25 (s following receipt of the sync phase reversal of the interrogation delivering the final segment. |

| Comparable | ID=1139 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0427 | Page 99 | ED 73C v01 | shall0665 | Page 99 |
| WAT | Comment: 0 | | | | |
| | | | | | |

| 2.2.20.1.1.1.5 Acknowledgment Reply | 3.21.3.1 Comm-C/ELM Protocol (Figures 3-19 and 3-20) |
|---|---|
| The transponder shall <<shall0426>> acknowledge receipt of a final segment by replying with a Comm-D transmission, with KE=1. KE=1 indicates that the MD field contains subfield TAS that reports which segments have been received. This reply shall <<shall0427>> be transmitted 128 microseconds plus or minus 0.25 microsecond following receipt of the sync phase reversal of the interrogation delivering the final segment. | The transponder shall <<shall0664>> acknowledge receipt of a final segment by replying with a Comm-D transmission, with KE=1. KE=1 indicates that the MD field contains subfield TAS that reports which segments have been received. This reply shall <<shall0665>> be transmitted 128 ( 0,25 (s following receipt of the sync phase reversal of the interrogation delivering the final segment. |

| Comparable | ID=1140 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0428 | Page 99 | ED 73C v01 | shall0666 | Page 99 |
| WAT | Comment: 0 | | | | |
| | | | | | |

| 2.2.20.1.1.1.5 Acknowledgment Reply | 3.21.3.1 Comm-C/ELM Protocol (Figures 3-19 and 3-20) |
|---|---|
| The information contained in the TAS subfield shall <<shall0428>> be continually updated while segments are received and shall <<shall0429>> not be cleared until a new initializing segment is received or until closeout occurs. | The information contained in the TAS subfield shall <<shall0666>> be continually updated while segments are received and shall <<shall0667>> not be cleared until a new initializing segment is received or until closeout occurs. |

| Comparable | ID=1141 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0429 | Page 99 | ED 73C v01 | shall0667 | Page 99 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.20.1.1.1.5 Acknowledgment Reply | | | 3.21.3.1 Comm-C/ELM Protocol (Figures 3-19 and 3-20) | | |
| The information contained in the TAS subfield shall <<shall0428>> be continually updated while segments are received and shall <<shall0429>> not be cleared until a new initializing segment is received or until closeout occurs. | | | The information contained in the TAS subfield shall <<shall0666>> be continually updated while segments are received and shall <<shall0667>> not be cleared until a new initializing segment is received or until closeout occurs. | | |

| Comparable | ID=1142 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0430 | Page 99 | ED 73C v01 | shall0668 | Page 99 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.20.1.1.1.6 TAS Transmission Acknowledgment, Subfield in MD | | | 3.21.3.1 Comm-C/ELM Protocol (Figures 3-19 and 3-20) | | |
| This 16-bit (17-32) downlink subfield in MD shall <<shall0430>> report the segments received so far in a Comm-C sequence. Starting with bit 17, which denotes segment number "0," each of the following bits is ONE if the corresponding segment of the sequence has been received. TAS appears in MD if KE=1 in the same reply. | | | This 16-bit (17-32) downlink subfield in MD shall <<shall0668>> report the segments received so far in a Comm-C sequence. Starting with bit 17, which denotes segment number "0", each of the following bits is ONE if the corresponding segment of the sequence has been received. TAS appears in MD if KE=1 in the same reply. | | |

| Comparable | ID=1143 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0431 | Page 99 | ED 73C v01 | shall0669 | Page 99 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.20.1.1.1.7 Closeout | | | 3.21.3.1 Comm-C/ELM Protocol (Figures 3-19 and 3-20) | | |
| A closeout transmission informs the transponder that the TAS has been received and that it shall <<shall0431>> be cleared. This closeout (PC=5) is contained in a surveillance or Comm-A interrogation. | | | A closeout transmission informs the transponder that the TAS has been received and that it shall <<shall0669>> be cleared. This closeout (PC=5) is contained in a surveillance or Comm-A interrogation. | | |

| Comparable | ID=1144 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0432 | Page 99 | ED 73C v01 | shall0670 | Page 99 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.20.1.1.1.7 Closeout | | | 3.21.3.1 Comm-C/ELM Protocol (Figures 3-19 and 3-20) | | |
| An uncompleted message, present when the closeout is received, shall <<shall0432>> be closed out. | | | An uncompleted message, present when the closeout is received, shall <<shall0670>> be closed out. | | |

| Comparable | ID=1145 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0433 | Page 99 | ED 73C v01 | shall0671 | Page 99 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.20.1.1.1.8 Information Transfer | | | 3.21.3.1 Comm-C/ELM Protocol (Figures 3-19 and 3-20) | | |
| Comm-C equipped transponders shall <<shall0433>> be able to transfer received information to the appropriate data sinks (see §2.2.13, §2.2.19.b and §2.2.19.c). | | | Comm-C equipped transponders shall <<shall0671>> be able to transfer received information to the appropriate data sinks (paragraphs 3.17 and 3.21 b and c). | | |

| Comparable | ID=1147 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0446 | Page 103 | ED 73C v01 | shall0315 | Page 52 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.20.1.4 Uplink Interface – Data Rate | | | 3.17.4 ELM Service Interfaces | | |
| A transponder equipped for standard uplink ELM operation shall <<shall0445>> be able to transfer data from at least four complete 16-segment uplink ELMs in any four-second period. A transponder equipped for enhanced uplink ELM operation shall <<shall0446>> be able to transfer data from at least four 16-segment uplink ELMs in any one-second period. In each case, the ELMs shall <<shall0447>> be transferred if they are spaced no closer than 5 milliseconds from the end of one ELM to the beginning of the next. For transponders equipped with the enhanced protocols, this 5 millisecond spacing requirement shall <<shall0448>> also apply to successive 16 segment ELMs bearing the same II code. The content of any uplink ELM shall <<shall0449>> be available for transfer across the output interface no later than ONE (1) second after it has been received. | | | (1) A transponder equipped for uplink ELM operation (Comm-C) shall <<shall0314>> be capable of processing at least 4 complete 16-segment ELMs in any 4-second period (level 3 and 4 transponders). A level 5 transponder shall <<shall0315>> be capable of processing at least 4 complete 16-segment ELMs in any 1 second period. | | |

| Comparable | ID=1148 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0450 | Page 104 | ED 73C v01 | shall0672 | Page 101 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.20.2.1.1 The Comm-D/ELM Protocol (Figure 2-23) | | | 3.21.4.1 The Comm-D/ELM Protocol (Figure 3-21 and 3-22) | | |
| Downlink ELMs shall <<shall0450>> be transmitted only after authorization by the interrogator. The segments to be transmitted are contained in Comm-D replies. | | | Downlink ELMs shall <<shall0672>> be transmitted only after authorization by the interrogator. The segments to be transmitted are contained in Comm-D replies. | | |

| Comparable | ID=1149 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0451 | Page 105 | ED 73C v01 | shall0673 | Page 101 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.20.2.1.1.1 Initialization | | | 3.21.4.1 The Comm-D/ELM Protocol (Figure 3-21 and 3-22) | | |
| To request permission to send n-segments, the transponder shall <<shall0451>> insert the code corresponding to the value 15+n into the DR field of a surveillance or Comm-B reply, DF=4, 5, 20, 21. | | | To request permission to send n-segments, the transponder shall <<shall0673>> insert the code corresponding to the value 15+n into the DR field of a surveillance or Comm-B reply, DF=4, 5, 20, 21. This announcement shall <<shall0674>> remain active until the ELM is closed out. | | |

| Comparable | ID=1150 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0452 | Page 105 | ED 73C v01 | shall0675 | Page 101 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.20.2.1.1.2 Authorization and Transmission | | | 3.21.4.1 The Comm-D/ELM Protocol (Figure 3-21 and 3-22) | | |
| The interrogator requests the transmission of Comm-D segments by a Comm-C interrogation characterized by RC=3. This Comm-C format carries the SRS subfield which is a summary of the segments to be transmitted. On receipt of this authorization the transponder shall <<shall0452>> transmit the first segment with the standard 128-microsecond Mode S reply delay followed by subsequent segments at a rate of one every 136 ±1 microseconds by means of Comm-D formats with KE=0 and ND corresponding to the number of the segment in MD. Segments can be transmitted in any order. The authorization process may be repeated by the interrogator. | | | The interrogator requests the transmission of Comm-D segments by a Comm-C interrogation characterized by RC=3. This Comm-C format carries the SRS subfield which is a summary of the segments to be transmitted. On receipt of this authorization the transponder shall <<shall0675>> transmit the first segment with the standard 128 (s Mode S reply delay followed by subsequent segments at a rate of one every 136 ±1.0 (s by means of Comm-D formats with KE=0 and ND corresponding to the number of the segment in MD. Segments can be transmitted in any order. The authorization process may be repeated by the interrogator. | | |

| Comparable | ID=1151 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0453 | Page 105 | ED 73C v01 | shall0676 | Page 101 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.20.2.1.1.4 Closeout | | | 3.21.4.1 The Comm-D/ELM Protocol (Figure 3-21 and 3-22) | | |
| A closeout transmission is used to inform the transponder that all segments have been received and that the DR field shall <<shall0453>> be reset. This closeout (PC=6) is contained in a surveillance or Comm-A interrogation and shall <<shall0454>> be effective only after a request for transmission has been complied with at least once (see D-Register in Figure 2-22 and Figure 2-23). | | | A closeout transmission is used to inform the transponder that all segments have been received and that the DR field shall <<shall0676>> be reset. This closeout is contained in a surveillance or Comm-A interrogation and shall <<shall0677>> be effective only after a request for transmission has been complied with at least once (see D-Register in Figures 3-21 and 3-22). | | |

| Comparable | ID=1152 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0454 | Page 105 | ED 73C v01 | shall0677 | Page 101 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.20.2.1.1.4 Closeout | | | 3.21.4.1 The Comm-D/ELM Protocol (Figure 3-21 and 3-22) | | |
| A closeout transmission is used to inform the transponder that all segments have been received and that the DR field shall <<shall0453>> be reset. This closeout (PC=6) is contained in a surveillance or Comm-A interrogation and shall <<shall0454>> be effective only after a request for transmission has been complied with at least once (see D-Register in Figure 2-22 and Figure 2-23). | | | A closeout transmission is used to inform the transponder that all segments have been received and that the DR field shall <<shall0676>> be reset. This closeout is contained in a surveillance or Comm-A interrogation and shall <<shall0677>> be effective only after a request for transmission has been complied with at least once (see D-Register in Figures 3-21 and 3-22). | | |

| Comparable | ID=1153 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0455 | Page 106 | ED 73C v01 | shall0678 | Page 101 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.20.2.1.1.5 Information Transfer | | | 3.21.4.1 The Comm-D/ELM Protocol (Figure 3-21 and 3-22) | | |
| The Comm-D/ELM-equipped transponder shall <<shall0455>> have access to the appropriate data sources (see §2.2.13.4, §2.2.19.b and §2.2.19.c). | | | The Comm-D/ELM-equipped transponder shall <<shall0678>> be able to accept data from the appropriate data sources (paragraphs 3.17 and 3.21 b and c). | | |

| Comparable | ID=1154 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0456 | Page 106 | ED 73C v01 | shall0321 | Page 53 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.20.2.2 Downlink Message Cancellation | | | 3.17.5 Downlink Message Cancellation | | |
| If more than one message is stored within the transponder for future transmission, the cancellation procedure shall <<shall0456>> be capable of canceling the stored messages selectively. | | | b. If more than one message is stored within the transponder for future transmission, the cancellation procedure shall <<shall0321>> be capable of cancelling the stored messages selectively. | | |

| Comparable | ID=1155 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0457 | Page 106 | ED 73C v01 | shall0540 | Page 86 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.20.2.3.1 Multisite Comm-D Reservation | | | 3.21.2.5 Multisite Downlink ELM Protocol | | |
| A multisite downlink ELM reservation shall <<shall0457>> not be granted by the transponder unless a downlink ELM is waiting to be transmitted. | | | A multisite downlink ELM reservation shall <<shall0540>> not be granted by the transponder unless a downlink ELM is waiting to be transmitted. | | |

| Comparable | ID=1156 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0458 | Page 106 | ED 73C v01 | shall0541 | Page 86 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.20.2.3.1 Multisite Comm-D Reservation | | | 3.21.2.5 Multisite Downlink ELM Protocol | | |
| Protocol procedure in response to this interrogation shall <<shall0458>> depend upon the state of the D-timer as follows: | | | Protocol procedure in response to this interrogation shall <<shall0541>> depend upon the state of the D-timer as follows: | | |

| Comparable | ID=1157 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0459 | Page 107 | ED 73C v01 | shall0542 | Page 86 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.20.2.3.2 Multisite Directed Comm-D Transmissions | | | 3.21.2.5 Multisite Downlink ELM Protocol | | |
| If the airborne data system needs to direct a Comm-D ELM message to a specific interrogator, a procedure corresponding to the directed Comm-B protocol shall <<shall0459>> be used. | | | If the airborne data system needs to direct a Comm-D ELM message to a specific interrogator, a procedure corresponding to the directed Comm-B protocol shall <<shall0542>> be used. In effect, a "self reservation" is accomplished by storing the IIS of the desired site destination and proceeding with the usual protocol. The stored IIS and IDS=3 shall <<shall0543>> be transmitted in the UM field unless UM use is preempted by command from the ground or there is a Comm-B reservation. | | |

| Comparable | ID=1158 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0460 | Page 107 | ED 73C v01 | shall0543 | Page 86 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.20.2.3.2 Multisite Directed Comm-D Transmissions | | | 3.21.2.5 Multisite Downlink ELM Protocol | | |
| In effect, a “self reservation” is accomplished by storing the IIS of the desired site destination and proceeding with the usual protocol. The stored IIS and IDS=3 shall <<shall0460>> be transmitted in the UM field unless UM use is preempted by command from the ground or there is a Comm-B reservation. | | | If the airborne data system needs to direct a Comm-D ELM message to a specific interrogator, a procedure corresponding to the directed Comm-B protocol shall <<shall0542>> be used. In effect, a "self reservation" is accomplished by storing the IIS of the desired site destination and proceeding with the usual protocol. The stored IIS and IDS=3 shall <<shall0543>> be transmitted in the UM field unless UM use is preempted by command from the ground or there is a Comm-B reservation. | | |

| Comparable | ID=1159 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0461 | Page 107 | ED 73C v01 | shall0544 | Page 86 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.20.2.3.2 Multisite Directed Comm-D Transmissions | | | 3.21.2.5 Multisite Downlink ELM Protocol | | |
| For a multisite directed Comm-D message, the reservation shall <<shall0461>> not be automatically timed out but shall <<shall0462>> continue until either: | | | For a multisite directed Comm-D message, the reservation shall <<shall0544>> not be automatically timed out but shall <<shall0545>> continue until either: | | |

| Comparable | ID=1160 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0462 | Page 107 | ED 73C v01 | shall0545 | Page 86 |
| WAT | Comment: 0 | | | | |
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| 2.2.20.2.3.2 Multisite Directed Comm-D Transmissions | | | 3.21.2.5 Multisite Downlink ELM Protocol | | |
| For a multisite directed Comm-D message, the reservation shall <<shall0461>> not be automatically timed out but shall <<shall0462>> continue until either: | | | For a multisite directed Comm-D message, the reservation shall <<shall0544>> not be automatically timed out but shall <<shall0545>> continue until either: | | |

| Comparable | ID=1161 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0463 | Page 108 | ED 73C v01 | shall0546 | Page 87 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.20.2.3.3 Multisite Comm-D Delivery | | | 3.21.2.5 Multisite Downlink ELM Protocol | | |
| After multisite coordination is accomplished by the surveillance or Comm-A interrogation, downlink ELM delivery shall <<shall0463>> be as described in §2.2.20.2.1.1. | | | After multisite coordination is accomplished by the surveillance or Comm-A interrogation, downlink ELM delivery shall <<shall0546>> be as described in paragraph 3.21.4.1. | | |

| Comparable | ID=1162 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0464 | Page 108 | ED 73C v01 | shall0547 | Page 87 |
| WAT | Comment: 0 | | | | |
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| 2.2.20.2.3.3 Multisite Comm-D Delivery | | | 3.21.2.5 Multisite Downlink ELM Protocol | | |
| In addition, the D-timer shall <<shall0464>> be restarted each time a request for Comm-D segments is received and the stored Comm-D IIS is other than “0.” | | | In addition, the D-timer shall <<shall0547>> be restarted each time a request for Comm-D segments is received and the stored Comm-D IIS is other than "0." | | |

| Comparable | ID=1163 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0465 | Page 108 | ED 73C v01 | shall0548 | Page 87 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.20.2.3.4 Multisite Comm-D Closeout | | | 3.21.2.5 Multisite Downlink ELM Protocol | | |
| If the stored Comm-D IIS equals the IIS of the interrogator, the downlink ELM shall <<shall0465>> be closed out as described in §2.2.20.2.1.1.4. The stored Comm-D IIS shall <<shall0466>> be cleared and the D-timer stopped. If the site numbers do not match, the message is not closed out and the states of the stored Comm-D IIS, the D-timer and the DR code remain unchanged. | | | If the stored Comm-D IIS equals the IIS of the interrogator, the downlink ELM shall <<shall0548>> be closed out as described in paragraph 3.21.4.1 d. The stored Comm-D IIS shall <<shall0549>> be cleared and the D-timer stopped. If the site numbers do not match, the message is not closed out and the states of the stored Comm-D IIS, the D-timer and the DR code remain unchanged. | | |

| Comparable | ID=1164 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0466 | Page 108 | ED 73C v01 | shall0549 | Page 87 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.20.2.3.4 Multisite Comm-D Closeout | | | 3.21.2.5 Multisite Downlink ELM Protocol | | |
| If the stored Comm-D IIS equals the IIS of the interrogator, the downlink ELM shall <<shall0465>> be closed out as described in §2.2.20.2.1.1.4. The stored Comm-D IIS shall <<shall0466>> be cleared and the D-timer stopped. If the site numbers do not match, the message is not closed out and the states of the stored Comm-D IIS, the D-timer and the DR code remain unchanged. | | | If the stored Comm-D IIS equals the IIS of the interrogator, the downlink ELM shall <<shall0548>> be closed out as described in paragraph 3.21.4.1 d. The stored Comm-D IIS shall <<shall0549>> be cleared and the D-timer stopped. If the site numbers do not match, the message is not closed out and the states of the stored Comm-D IIS, the D-timer and the DR code remain unchanged. | | |

| Comparable | ID=1165 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0467 | Page 108 | ED 73C v01 | shall0550 | Page 87 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.20.2.3.5 Automatic Comm-D Closeout | | | 3.21.2.5 Multisite Downlink ELM Protocol | | |
| If the D-timer runs out, the stored Comm-D IIS shall <<shall0467>> be set to "0." The Comm-D message and the DR field shall <<shall0468>> not be cleared. (This makes it possible for another site to read and clear the Comm-D message.) | | | If the D-timer runs out, the stored Comm-D IIS shall <<shall0550>> be set to "0." The Comm-D message and the DR field shall <<shall0551>> not be cleared. (This makes it possible for another site to read and clear the Comm-D message.) | | |

| Comparable | ID=1166 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0468 | Page 108 | ED 73C v01 | shall0551 | Page 87 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.20.2.3.5 Automatic Comm-D Closeout | | | 3.21.2.5 Multisite Downlink ELM Protocol | | |
| If the D-timer runs out, the stored Comm-D IIS shall <<shall0467>> be set to "0." The Comm-D message and the DR field shall <<shall0468>> not be cleared. (This makes it possible for another site to read and clear the Comm-D message.) | | | If the D-timer runs out, the stored Comm-D IIS shall <<shall0550>> be set to "0." The Comm-D message and the DR field shall <<shall0551>> not be cleared. (This makes it possible for another site to read and clear the Comm-D message.) | | |

| Comparable | ID=1169 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0603 | Page 127 | ED 73C v01 | shall0558 | Page 88 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.23.1.1 Extended Squitter Format | | | 3.21.2.6.1 Extended Squitter Format | | |
| The format used for the Extended Squitter shall <<shall0603>> be the 112-bit downlink format DF=17 using II=0 and SI=0 in generating the PI field (§2.2.14.4.30). | | | The format used for the extended squitter shall <<shall0558>> be the 112-bit downlink format DF=17 using II=0 in generating the PI field. | | |

| Comparable | ID=1170 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0604 | Page 127 | ED 73C v01 | shall0560 | Page 88 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.23.1.2 Extended Squitter Types | | | 3.21.2.6.2 Extended Squitter Types | | |
| a. Airborne Position Squitter. The airborne position Extended Squitter shall <<shall0604>> use format DF=17 with the contents of ground-initiated Comm-B register 05 {HEX} inserted in the ME field. | | | b. Surface Position Squitter. The surface position extended squitter type shall <<shall0560>> use format DF=17 with the contents of ground-initiated Comm-B register 06 {HEX} inserted in the ME field. | | |

| Comparable | ID=1171 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0605 | Page 127 | ED 73C v01 | shall0559 | Page 88 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.23.1.2 Extended Squitter Types | | | 3.21.2.6.2 Extended Squitter Types | | |
| b. Surface Position Squitter. The surface position Extended Squitter shall <<shall0605>> use format DF=17 with the contents of ground-initiated Comm-B register 06 {HEX} inserted in the ME field. | | | a. Airborne Position Squitter. The airborne position extended squitter type shall <<shall0559>> use format DF=17 with the contents of ground-initiated Comm-B register 05 {HEX} inserted in the ME field. | | |

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| Comparable | ID=1172 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0606 | Page 127 | ED 73C v01 | shall0561 | Page 88 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.23.1.2 Extended Squitter Types | | | 3.21.2.6.2 Extended Squitter Types | | |
| c. Aircraft Identification Squitter. The aircraft identification Extended Squitter shall <<shall0606>> use format DF=17 with the contents of ground-initiated Comm-B register 08 {HEX} inserted in the ME field. | | | c. Aircraft Identification Squitter. The aircraft identification extended squitter type shall <<shall0561>> use format DF=17 with the contents of ground-initiated Comm-B register 08 {HEX} inserted in the ME field. | | |

| Comparable | ID=1173 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0607 | Page 127 | ED 73C v01 | shall0562 | Page 88 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.23.1.2 Extended Squitter Types | | | 3.21.2.6.2 Extended Squitter Types | | |
| d. Airborne Velocity Squitter. The airborne velocity Extended Squitter shall <<shall0607>> use format DF=17 with the contents of GICB register 09 {HEX} inserted in the ME field. | | | d. Airborne Velocity Squitter. The airborne velocity extended squitter type shall <<shall0562>> use format DF=17 with the contents of GICB register 09 {HEX} inserted in the ME field. | | |

| Comparable | ID=1174 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0608 | Page 128 | ED 73C v01 | shall0563 | Page 88 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.23.1.2 Extended Squitter Types | | | 3.21.2.6.2 Extended Squitter Types | | |
| e. Event-driven Squitter. The event-driven Extended Squitter shall <<shall0608>> use format DF=17 with the contents of GICB register 0A {HEX} inserted in the ME field. | | | e. Event-driven Squitter. The event-driven extended squitter type shall <<shall0563>> use format DF=17 with the contents of GICB register 0A {HEX} inserted in the ME field. | | |

| Comparable | ID=1175 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0609 | Page 128 | ED 73C v01 | shall0568 | Page 89 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.23.1.3 Extended Squitter Rate | | | 3.21.2.6.3 Extended squitter rate | | |
| a. Initialization. At power up initialization, the transponder shall | | | At power up initialization, the transponder shall <<shall0568>> commence | | |

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| <<shall0609>> commence operation in a mode in which it broadcasts only acquisition squitters (see §2.2.18.2.6). The transponder shall <<shall0610>> initiate the broadcast of Extended Squitters for airborne position, surface position, airborne velocity and aircraft identification when data are inserted into GICB registers 05, 06, 09 and 08{HEX} respectively. This determination shall <<shall0611>> be made individually for each squitter type. The insertion of altitude data into register 05 by the transponder (see §2.2.23.1.8) shall <<shall0612>> not satisfy the minimum requirement for broadcast of the airborne position squitter. | operation in a mode in which it broadcasts only acquisition squitters (Paragraph 3.20.2.6). The transponder shall <<shall0569>> initiate the broadcast of extended squitters for airborne position, surface position, airborne velocity and aircraft identification when data are inserted into GICB registers 05, 06, 09 and 08 {HEX} respectively. This determination shall <<shall0570>> be made individually for each squitter type. The insertion of altitude data into register 05 by the transponder (Paragraph 3.21.2.6.8) shall <<shall0571>> not satisfy the minimum requirement for initialisation of broadcast of the airborne position squitter. When extended squitters are broadcast, transmission rates shall <<shall0572>> be as indicated in the following paragraphs. Acquisition squitters shall <<shall0573>> be reported in addition to extended squitters unless the acquisition squitter is inhibited (Paragraph 3.20.2.6). Acquisition squitters shall <<shall0574>> always be reported if extended position or velocity squitters are not reported. |

| Comparable | ID=1176 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0610 | Page 128 | ED 73C v01 | shall0569 | Page 89 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.23.1.3 Extended Squitter Rate | | | 3.21.2.6.3 Extended squitter rate | | |
| a. Initialization. At power up initialization, the transponder shall <<shall0609>> commence operation in a mode in which it broadcasts only acquisition squitters (see §2.2.18.2.6). The transponder shall <<shall0610>> initiate the broadcast of Extended Squitters for airborne position, surface position, airborne velocity and aircraft identification when data are inserted into GICB registers 05, 06, 09 and 08{HEX} respectively. This determination shall <<shall0611>> be made individually for each squitter type. The insertion of altitude data into register 05 by the transponder (see §2.2.23.1.8) shall <<shall0612>> not satisfy the minimum requirement for broadcast of the airborne position squitter. | | | At power up initialization, the transponder shall <<shall0568>> commence operation in a mode in which it broadcasts only acquisition squitters (Paragraph 3.20.2.6). The transponder shall <<shall0569>> initiate the broadcast of extended squitters for airborne position, surface position, airborne velocity and aircraft identification when data are inserted into GICB registers 05, 06, 09 and 08 {HEX} respectively. This determination shall <<shall0570>> be made individually for each squitter type. The insertion of altitude data into register 05 by the transponder (Paragraph 3.21.2.6.8) shall <<shall0571>> not satisfy the minimum requirement for initialisation of broadcast of the airborne position squitter. When extended squitters are broadcast, transmission rates shall <<shall0572>> be as indicated in the following paragraphs. Acquisition squitters shall <<shall0573>> be reported in addition to extended squitters unless the acquisition squitter is inhibited (Paragraph 3.20.2.6). Acquisition squitters shall <<shall0574>> always be reported if extended position or velocity squitters are not reported. | | |

| Comparable | ID=1177 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0611 | Page 128 | ED 73C v01 | shall0570 | Page 89 |

| WAT | Comment: 0 |
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| 2.2.23.1.3 Extended Squitter Rate | 3.21.2.6.3 Extended squitter rate |
|---|---|
| a. Initialization. At power up initialization, the transponder shall <<shall0609>> commence operation in a mode in which it broadcasts only acquisition squitters (see §2.2.18.2.6). The transponder shall <<shall0610>> initiate the broadcast of Extended Squitters for airborne position, surface position, airborne velocity and aircraft identification when data are inserted into GICB registers 05, 06, 09 and 08{HEX} respectively. This determination shall <<shall0611>> be made individually for each squitter type. The insertion of altitude data into register 05 by the transponder (see §2.2.23.1.8) shall <<shall0612>> not satisfy the minimum requirement for broadcast of the airborne position squitter. | At power up initialization, the transponder shall <<shall0568>> commence operation in a mode in which it broadcasts only acquisition squitters (Paragraph 3.20.2.6). The transponder shall <<shall0569>> initiate the broadcast of extended squitters for airborne position, surface position, airborne velocity and aircraft identification when data are inserted into GICB registers 05, 06, 09 and 08 {HEX} respectively. This determination shall <<shall0570>> be made individually for each squitter type. The insertion of altitude data into register 05 by the transponder (Paragraph 3.21.2.6.8) shall <<shall0571>> not satisfy the minimum requirement for initialisation of broadcast of the airborne position squitter. When extended squitters are broadcast, transmission rates shall <<shall0572>> be as indicated in the following paragraphs. Acquisition squitters shall <<shall0573>> be reported in addition to extended squitters unless the acquisition squitter is inhibited (Paragraph 3.20.2.6). Acquisition squitters shall <<shall0574>> always be reported if extended position or velocity squitters are not reported. |

| Comparable | ID=1178 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0612 | Page 128 | ED 73C v01 | shall0571 | Page 89 |

| WAT | Comment: 0 |
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| 2.2.23.1.3 Extended Squitter Rate | 3.21.2.6.3 Extended squitter rate |
|---|---|
| a. Initialization. At power up initialization, the transponder shall <<shall0609>> commence operation in a mode in which it broadcasts only acquisition squitters (see §2.2.18.2.6). The transponder shall <<shall0610>> initiate the broadcast of Extended Squitters for airborne position, surface position, airborne velocity and aircraft identification when data are inserted into GICB registers 05, 06, 09 and 08{HEX} respectively. This determination shall <<shall0611>> be made individually for each squitter type. The insertion of altitude data into register 05 by the transponder (see §2.2.23.1.8) shall <<shall0612>> not satisfy the minimum requirement for broadcast of the airborne position squitter. | At power up initialization, the transponder shall <<shall0568>> commence operation in a mode in which it broadcasts only acquisition squitters (Paragraph 3.20.2.6). The transponder shall <<shall0569>> initiate the broadcast of extended squitters for airborne position, surface position, airborne velocity and aircraft identification when data are inserted into GICB registers 05, 06, 09 and 08 {HEX} respectively. This determination shall <<shall0570>> be made individually for each squitter type. The insertion of altitude data into register 05 by the transponder (Paragraph 3.21.2.6.8) shall <<shall0571>> not satisfy the minimum requirement for initialisation of broadcast of the airborne position squitter. When extended squitters are broadcast, transmission rates shall <<shall0572>> be as indicated in the following paragraphs. Acquisition squitters shall <<shall0573>> be reported in addition to extended squitters unless the acquisition squitter is inhibited (Paragraph 3.20.2.6). Acquisition squitters shall <<shall0574>> always be reported if extended position or velocity squitters are not reported. |

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| Comparable | ID=1179 | | | | |
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| DO 181D v08 | shall0614 | Page 128 | ED 73C v01 | shall0572 | Page 89 |
| WAT | Comment: 0 | | | | |
| | | | | | |

| 2.2.23.1.3 Extended Squitter Rate | 3.21.2.6.3 Extended squitter rate |
|---|---|
| When Extended Squitters are broadcast, transmission rates shall <<shall0614>> be as indicated in the following paragraphs. Acquisition squitters shall <<shall0615>> be reported in addition to Extended Squitters as specified in §2.2.18.2.6.c. Acquisition squitters shall <<shall0616>> always be reported if no Extended Squitters are reported. | At power up initialization, the transponder shall <<shall0568>> commence operation in a mode in which it broadcasts only acquisition squitters (Paragraph 3.20.2.6). The transponder shall <<shall0569>> initiate the broadcast of extended squitters for airborne position, surface position, airborne velocity and aircraft identification when data are inserted into GICB registers 05, 06, 09 and 08 {HEX} respectively. This determination shall <<shall0570>> be made individually for each squitter type. The insertion of altitude data into register 05 by the transponder (Paragraph 3.21.2.6.8) shall <<shall0571>> not satisfy the minimum requirement for initialisation of broadcast of the airborne position squitter. When extended squitters are broadcast, transmission rates shall <<shall0572>> be as indicated in the following paragraphs. Acquisition squitters shall <<shall0573>> be reported in addition to extended squitters unless the acquisition squitter is inhibited (Paragraph 3.20.2.6). Acquisition squitters shall <<shall0574>> always be reported if extended position or velocity squitters are not reported. |

| Comparable | ID=1182 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0617 | Page 128 | ED 73C v01 | shall0576 | Page 89 |
| WAT | Comment: 0 | | | | |
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| 2.2.23.1.3 Extended Squitter Rate | 3.21.2.6.3 Extended squitter rate |
|---|---|
| b. Airborne Position Squitter Rate. Airborne position squitter transmissions shall <<shall0617>> be emitted as specified in §2.2.23.1.5 at random intervals that are uniformly distributed over the range from 0.4 to 0.6 seconds using a time quantization no greater than 15 milliseconds relative to the previous airborne position squitter, with the exceptions as specified in subparagraph g. | a. Airborne Position Squitter Rate. Airborne position squitter transmissions shall <<shall0576>> be emitted when the aircraft is airborne (Paragraph 3.21.2.6.5) at random intervals that are uniformly distributed over the range from 0.4 to 0.6 seconds using a time quantisation of no greater than 15 milliseconds relative to the previous airborne position squitter, with the exceptions as specified in subparagraph f. |

| Comparable | ID=1183 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0618 | Page 128 | ED 73C v01 | shall0577 | Page 89 |

| WAT | Comment: 0 |
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| 2.2.23.1.3 Extended Squitter Rate | 3.21.2.6.3 Extended squitter rate |
|---|---|
| c. Surface Position Squitter Rate. Surface position squitter transmissions shall <<shall0618>> be emitted as specified in §2.2.23.1.5 using one of two rates depending upon whether the high or low squitter rate has been selected (see §2.2.23.1.6). When the high squitter rate has been selected, surface position squitters shall <<shall0619>> be emitted at random intervals that are uniformly distributed over the range from 0.4 to 0.6 seconds using a time quantization no greater than 15 milliseconds relative to the previous surface position squitter (termed the high rate). When the low squitter rate has been selected, surface position squitters shall <<shall0620>> be emitted at random intervals that are uniformly distributed over the range of 4.8 to 5.2 seconds using a time quantization no greater than 15 milliseconds relative to the previous surface position squitter (termed the low rate) Exceptions to this transmission rate are specified in subparagraph g. | b. Surface Position Squitter Rate. Surface position squitters transmissions shall <<shall0577>> be emitted when the aircraft is on the surface (Paragraph 3.21.2.6.5) using one of two rates depending upon whether the high or low squitter rate has been selected (3.21.2.6.6). When the high squitter rate has been selected, surface position squitters shall <<shall0578>> be emitted at random intervals that are uniformly distributed over the range from 0.4 to 0.6 seconds using a time quantisation of no greater than 15 milliseconds relative to the previous surface position squitter (termed the high rate). When the low squitter rate has been selected, surface position squitters shall <<shall0579>> be emitted at random intervals that are uniformly distributed over the range of 4.8 to 5.2 seconds relative to the previous surface position squitter (termed the low rate). Exceptions to this transmission rate are specified in subparagraph f. |

| Comparable | ID=1184 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0619 | Page 128 | ED 73C v01 | shall0578 | Page 89 |

| WAT | Comment: 0 |
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| | |

| 2.2.23.1.3 Extended Squitter Rate | 3.21.2.6.3 Extended squitter rate |
|---|---|
| c. Surface Position Squitter Rate. Surface position squitter transmissions shall <<shall0618>> be emitted as specified in §2.2.23.1.5 using one of two rates depending upon whether the high or low squitter rate has been selected (see §2.2.23.1.6). When the high squitter rate has been selected, surface position squitters shall <<shall0619>> be emitted at random intervals that are uniformly distributed over the range from 0.4 to 0.6 seconds using a time quantization no greater than 15 milliseconds relative to the previous surface position squitter (termed the high rate). When the low squitter rate has been selected, surface position squitters shall <<shall0620>> be emitted at random intervals that are uniformly distributed over the range of 4.8 to 5.2 seconds using a time quantization no greater than 15 milliseconds relative to the previous surface position squitter (termed the low rate) Exceptions to this transmission rate are specified in subparagraph g. | b. Surface Position Squitter Rate. Surface position squitters transmissions shall <<shall0577>> be emitted when the aircraft is on the surface (Paragraph 3.21.2.6.5) using one of two rates depending upon whether the high or low squitter rate has been selected (3.21.2.6.6). When the high squitter rate has been selected, surface position squitters shall <<shall0578>> be emitted at random intervals that are uniformly distributed over the range from 0.4 to 0.6 seconds using a time quantisation of no greater than 15 milliseconds relative to the previous surface position squitter (termed the high rate). When the low squitter rate has been selected, surface position squitters shall <<shall0579>> be emitted at random intervals that are uniformly distributed over the range of 4.8 to 5.2 seconds relative to the previous surface position squitter (termed the low rate). Exceptions to this transmission rate are specified in subparagraph f. |

| Comparable | ID=1185 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0620 | Page 129 | ED 73C v01 | shall0579 | Page 89 |

| WAT | Comment: 0 |
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| | |

| 2.2.23.1.3 Extended Squitter Rate | 3.21.2.6.3 Extended squitter rate |
|---|---|
| c. Surface Position Squitter Rate. Surface position squitter transmissions shall <<shall0618>> be emitted as specified in §2.2.23.1.5 using one of two rates depending upon whether the high or low squitter rate has been selected (see §2.2.23.1.6). When the high squitter rate has been selected, surface position squitters shall <<shall0619>> be emitted at random intervals that are uniformly distributed over the range from 0.4 to 0.6 seconds using a time quantization no greater than 15 milliseconds relative to the previous surface position squitter (termed the high rate). When the low squitter rate has been selected, surface position squitters shall <<shall0620>> be emitted at random intervals that are uniformly distributed over the range of 4.8 to 5.2 seconds using a time quantization no greater than 15 milliseconds relative to the previous surface position squitter (termed the low rate) Exceptions to this transmission rate are specified in subparagraph g. | b. Surface Position Squitter Rate. Surface position squitters transmissions shall <<shall0577>> be emitted when the aircraft is on the surface (Paragraph 3.21.2.6.5) using one of two rates depending upon whether the high or low squitter rate has been selected (3.21.2.6.6). When the high squitter rate has been selected, surface position squitters shall <<shall0578>> be emitted at random intervals that are uniformly distributed over the range from 0.4 to 0.6 seconds using a time quantisation of no greater than 15 milliseconds relative to the previous surface position squitter (termed the high rate). When the low squitter rate has been selected, surface position squitters shall <<shall0579>> be emitted at random intervals that are uniformly distributed over the range of 4.8 to 5.2 seconds relative to the previous surface position squitter (termed the low rate). Exceptions to this transmission rate are specified in subparagraph f. |

| Comparable | ID=1186 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0621 | Page 129 | ED 73C v01 | shall0580 | Page 90 |
| WAT | Comment: 0 | | | | |
| | | | | | |

| 2.2.23.1.3 Extended Squitter Rate | 3.21.2.6.3 Extended squitter rate |
|---|---|
| d. Aircraft Identification Squitter Rate. Aircraft identification squitter transmissions shall <<shall0621>> be emitted at random intervals that are uniformly distributed over the range of 4.8 to 5.2 seconds using a time quantization no greater than 15 milliseconds relative to the previous identification squitter when the aircraft is reporting the airborne position squitter, or when the aircraft is reporting the surface position squitter and the high surface squitter rate has been selected. When the surface position squitter is being reported at the low surface rate, the aircraft identification squitter shall <<shall0622>> be emitted at random intervals that are uniformly distributed over the range of 9.8 to 10.2 seconds using a time quantization no greater than 15 milliseconds relative to the previous identification squitter. Exceptions to these transmission rates are specified in subparagraph g. | c. Aircraft Identification Squitter Rate. Aircraft identification squitter transmissions shall <<shall0580>> be emitted at random intervals that are uniformly distributed over the range of 4.8 to 5.2 seconds using a time quantisation of no greater than 15 milliseconds relative to the previous identification squitter when the aircraft is reporting the airborne position squitter type, or when the aircraft is reporting the surface position squitter type and the high surface squitter rate has been selected. When the surface position squitter type is being reported at the low surface rate, the aircraft identification squitter shall <<shall0581>> be emitted at random intervals that are uniformly distributed over the range of 9.6 to 10.4 seconds relative to the previous identification squitter. Exceptions to these transmission rates are specified in subparagraph f. |

| Comparable | ID=1187 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0622 | Page 129 | ED 73C v01 | shall0581 | Page 90 |
| WAT | Comment: 0 | | | | |

| | |
|---|---|
| 2.2.23.1.3 Extended Squitter Rate | 3.21.2.6.3 Extended squitter rate |
| d. Aircraft Identification Squitter Rate. Aircraft identification squitter transmissions shall <<shall0621>> be emitted at random intervals that are uniformly distributed over the range of 4.8 to 5.2 seconds using a time quantization no greater than 15 milliseconds relative to the previous identification squitter when the aircraft is reporting the airborne position squitter, or when the aircraft is reporting the surface position squitter and the high surface squitter rate has been selected. When the surface position squitter is being reported at the low surface rate, the aircraft identification squitter shall <<shall0622>> be emitted at random intervals that are uniformly distributed over the range of 9.8 to 10.2 seconds using a time quantization no greater than 15 milliseconds relative to the previous identification squitter. Exceptions to these transmission rates are specified in subparagraph g. | c. Aircraft Identification Squitter Rate. Aircraft identification squitter transmissions shall <<shall0580>> be emitted at random intervals that are uniformly distributed over the range of 4.8 to 5.2 seconds using a time quantisation of no greater than 15 milliseconds relative to the previous identification squitter when the aircraft is reporting the airborne position squitter type, or when the aircraft is reporting the surface position squitter type and the high surface squitter rate has been selected. When the surface position squitter type is being reported at the low surface rate, the aircraft identification squitter shall <<shall0581>> be emitted at random intervals that are uniformly distributed over the range of 9.6 to 10.4 seconds relative to the previous identification squitter. Exceptions to these transmission rates are specified in subparagraph f. |

| Comparable | ID=1188 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0623 | Page 129 | ED 73C v01 | shall0582 | Page 90 |
| WAT | Comment: 0 | | | | |

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| 2.2.23.1.3 Extended Squitter Rate | 3.21.2.6.3 Extended squitter rate |
| e. Airborne Velocity Squitter Rate. Airborne velocity squitter transmissions shall <<shall0623>> be emitted as specified in §2.2.23.1.5 at random intervals that are uniformly distributed over the range from 0.4 to 0.6 seconds using a time quantization no greater than 15 milliseconds relative to the previous velocity squitter, with the exceptions as specified in subparagraph g. | d. Airborne Velocity Squitter Rate. Airborne squitter transmissions shall <<shall0582>> be emitted when the aircraft is airborne (Paragraph 3.21.2.6.5) at random intervals that are uniformly distributed over the range from 0.4 to 0.6 seconds using a time quantisation of no greater than 15 milliseconds relative to the previous velocity squitter, with the exceptions as specified in subparagraph f. |

| Comparable | ID=1189 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0624 | Page 129 | ED 73C v01 | shall0583 | Page 90 |
| WAT | Comment: 0 | | | | |

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| 2.2.23.1.3 Extended Squitter Rate | 3.21.2.6.3 Extended squitter rate |
| f. Event-driven Squitter Rate. The event-driven squitter shall <<shall0624>> be transmitted once, each time that GICB register 0A {HEX} is loaded, while observing the delay conditions specified in subparagraph g. The maximum transmission rate for the event-driven squitter shall <<shall0625>> be limited by the transponder to twice per second. If a | e. Event-driven Squitter Rate. The event-driven squitter shall <<shall0583>> be transmitted once, each time that GICB register 0A {HEX} is loaded, while observing the delay conditions specified in subparagraph f. The maximum transmission rate for the event-driven squitter shall <<shall0584>> be limited by the transponder to twice per second. If a |

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| message is inserted in the event-driven register and cannot be transmitted due to rate limiting, it shall <<shall0626>> be held and transmitted when the rate limiting condition has cleared If a new message is received before transmission is permitted, it shall <<shall0627>> overwrite the earlier message. | message is inserted in the event-driven register and cannot be transmitted due to rate limiting, it shall <<shall0585>> be held and transmitted when the rate limiting condition has cleared. If a new message is received before transmission is permitted, it shall <<shall0586>> overwrite the earlier message. |

| Comparable | ID=1190 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0625 | Page 129 | ED 73C v01 | shall0584 | Page 90 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.23.1.3 Extended Squitter Rate | | | 3.21.2.6.3 Extended squitter rate | | |
| f. Event-driven Squitter Rate. The event-driven squitter shall <<shall0624>> be transmitted once, each time that GICB register 0A {HEX} is loaded, while observing the delay conditions specified in subparagraph g. The maximum transmission rate for the event-driven squitter shall <<shall0625>> be limited by the transponder to twice per second. If a message is inserted in the event-driven register and cannot be transmitted due to rate limiting, it shall <<shall0626>> be held and transmitted when the rate limiting condition has cleared If a new message is received before transmission is permitted, it shall <<shall0627>> overwrite the earlier message. | | | e. Event-driven Squitter Rate. The event-driven squitter shall <<shall0583>> be transmitted once, each time that GICB register 0A {HEX} is loaded, while observing the delay conditions specified in subparagraph f. The maximum transmission rate for the event-driven squitter shall <<shall0584>> be limited by the transponder to twice per second. If a message is inserted in the event-driven register and cannot be transmitted due to rate limiting, it shall <<shall0585>> be held and transmitted when the rate limiting condition has cleared. If a new message is received before transmission is permitted, it shall <<shall0586>> overwrite the earlier message. | | |

| Comparable | ID=1192 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0627 | Page 129 | ED 73C v01 | shall0585 | Page 90 |
| WAT | Comment: 2d DO shall | | | | |
| | | | | | |
| 2.2.23.1.3 Extended Squitter Rate | | | 3.21.2.6.3 Extended squitter rate | | |
| f. Event-driven Squitter Rate. The event-driven squitter shall <<shall0624>> be transmitted once, each time that GICB register 0A {HEX} is loaded, while observing the delay conditions specified in subparagraph g. The maximum transmission rate for the event-driven squitter shall <<shall0625>> be limited by the transponder to twice per second. If a message is inserted in the event-driven register and cannot be transmitted due to rate limiting, it shall <<shall0626>> be held and transmitted when the rate limiting condition has cleared If a new message is received before transmission is permitted, it shall <<shall0627>> overwrite the earlier message. | | | e. Event-driven Squitter Rate. The event-driven squitter shall <<shall0583>> be transmitted once, each time that GICB register 0A {HEX} is loaded, while observing the delay conditions specified in subparagraph f. The maximum transmission rate for the event-driven squitter shall <<shall0584>> be limited by the transponder to twice per second. If a message is inserted in the event-driven register and cannot be transmitted due to rate limiting, it shall <<shall0585>> be held and transmitted when the rate limiting condition has cleared. If a new message is received before transmission is permitted, it shall <<shall0586>> overwrite the earlier message. | | |

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| Comparable | ID=1193 | | | | |
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| DO 181D v08 | shall0628 | Page 129 | ED 73C v01 | shall0597 | Page 91 |
| WAT | Comment: 0 | | | | |
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| 2.2.23.1.3 Extended Squitter Rate | | | 3.21.2.6.3 Extended squitter rate | | |
| g. Delayed Transmission. Extended squitter transmission shall <<shall0628>> be delayed in the following circumstances: | | | j. Delayed Transmission. Extended squitter transmission shall <<shall0597>> be delayed in the following circumstances: | | |

| Comparable | ID=1194 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0629 | Page 129 | ED 73C v01 | shall0598 | Page 91 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.23.1.3 Extended Squitter Rate | | | 3.21.2.6.3 Extended squitter rate | | |
| (1) the scheduled Extended Squitter shall <<shall0629>> be delayed if the transponder is in a transaction cycle (see §2.2.18.2.2.k); or | | | (1) the scheduled extended squitter shall <<shall0598>> be delayed if the transponder is in a transaction cycle (3.20.2.2 k); or | | |

| Comparable | ID=1195 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0630 | Page 129 | ED 73C v01 | shall0599 | Page 91 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.23.1.3 Extended Squitter Rate | | | 3.21.2.6.3 Extended squitter rate | | |
| (2) the scheduled Extended Squitter shall <<shall0630>> be delayed if an acquisition or another type of Extended Squitter is in process; or | | | (2) the scheduled extended squitter shall <<shall0599>> be delayed if an acquisition or another type of extended squitter is in process; or | | |

| Comparable | ID=1196 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0631 | Page 130 | ED 73C v01 | shall0600 | Page 91 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.23.1.3 Extended Squitter Rate | | | 3.21.2.6.3 Extended squitter rate | | |
| (3) the scheduled Extended Squitter shall <<shall0631>> be delayed if a mutual suppression interface is active. | | | (3) the scheduled extended squitter shall <<shall0600>> be delayed if a mutual suppression interface is active. | | |

| Comparable | ID=1197 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0632 | Page 130 | ED 73C v01 | shall0601 | Page 92 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.23.1.3 Extended Squitter Rate | | | 3.21.2.6.3 Extended squitter rate | | |
| The delayed squitter shall <<shall0632>> be transmitted as soon as the condition causing the delay no longer exists. | | | The delayed squitter shall <<shall0601>> be transmitted as soon as the transponder becomes available. | | |

| Comparable | ID=1198 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0635 | Page 130 | ED 73C v01 | shall0619 | Page 93 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.23.1.4.2 Register Timeout | | | 3.21.2.6.4 Register Timeout | | |
| The transponder shall <<shall0635>> clear all 56-bits of the airborne position, surface position, squitter status and velocity GICB registers 05, 06, 07 and 09 {HEX} if these registers are not updated within two seconds of the previous update. This timeout shall <<shall0636>> be determined separately for each of these registers. The internal insertion of data by the transponder into these registers (altitude and surveillance status) shall <<shall0637>> not qualify as a register update for the purposes of this timeout condition. | | | The transponder shall <<shall0619>> clear all 56-bits of the airborne position, surface position, squitter status and velocity GICB registers 05, 06, 07 and 09 {HEX} if these registers are not updated with data received external to the transponder within two seconds of the previous update. This timeout shall <<shall0620>> be determined separately for each of these registers. | | |

| Comparable | ID=1199 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0636 | Page 130 | ED 73C v01 | shall0620 | Page 93 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.23.1.4.2 Register Timeout | | | 3.21.2.6.4 Register Timeout | | |
| The transponder shall <<shall0635>> clear all 56-bits of the airborne position, surface position, squitter status and velocity GICB registers 05, 06, 07 and 09 {HEX} if these registers are not updated within two seconds of the previous update. This timeout shall <<shall0636>> be determined separately for each of these registers. The internal insertion of data by the transponder into these registers (altitude and surveillance status) shall <<shall0637>> not qualify as a register update for the purposes of this timeout condition. | | | The transponder shall <<shall0619>> clear all 56-bits of the airborne position, surface position, squitter status and velocity GICB registers 05, 06, 07 and 09 {HEX} if these registers are not updated with data received external to the transponder within two seconds of the previous update. This timeout shall <<shall0620>> be determined separately for each of these registers. | | |

| Comparable | ID=1201 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0640 | Page 131 | ED 73C v01 | shall0622 | Page 93 |

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| WAT | Comment: 0 |

| 2.2.23.1.5.2 Ground Controlled Format Selection | 3.21.2.6.5 Airborne/Surface State Determination |
|---|---|
| Aircraft without such automatic means shall <<shall0640>> report the airborne type messages. Aircraft with or without such automatic on-the-ground determination shall <<shall0641>> use position message types as commanded by control codes in the TCS subfield (see §2.2.23.1.7). After timeout of the TCS commands, control of airborne/ surface formats shall <<shall0642>> revert to the means described above. | Aircraft with an automatic means of determining on-the-ground condition shall <<shall0621>> use this input to select whether to report the airborne or surface message types. Aircraft without such means shall <<shall0622>> report the airborne type messages. Aircraft with or without such automatic on-the-ground determination shall <<shall0623>> use position message types as commanded by control codes in the TCS subfield (Paragraph 3.21.2.6.7). After timeout of the TCS commands, control of airborne/surface determination shall <<shall0624>> revert to the means described above. |

| Comparable | ID=1202 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0641 | Page 131 | ED 73C v01 | shall0623 | Page 93 |
| WAT | Comment: 0 | | | | |

| 2.2.23.1.5.2 Ground Controlled Format Selection | 3.21.2.6.5 Airborne/Surface State Determination |
|---|---|
| Aircraft without such automatic means shall <<shall0640>> report the airborne type messages. Aircraft with or without such automatic on-the-ground determination shall <<shall0641>> use position message types as commanded by control codes in the TCS subfield (see §2.2.23.1.7). After timeout of the TCS commands, control of airborne/ surface formats shall <<shall0642>> revert to the means described above. | Aircraft with an automatic means of determining on-the-ground condition shall <<shall0621>> use this input to select whether to report the airborne or surface message types. Aircraft without such means shall <<shall0622>> report the airborne type messages. Aircraft with or without such automatic on-the-ground determination shall <<shall0623>> use position message types as commanded by control codes in the TCS subfield (Paragraph 3.21.2.6.7). After timeout of the TCS commands, control of airborne/surface determination shall <<shall0624>> revert to the means described above. |

| Comparable | ID=1203 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0642 | Page 131 | ED 73C v01 | shall0624 | Page 94 |
| WAT | Comment: 0 | | | | |

| 2.2.23.1.5.2 Ground Controlled Format Selection | 3.21.2.6.5 Airborne/Surface State Determination |
|---|---|
| Aircraft without such automatic means shall <<shall0640>> report the airborne type messages. Aircraft with or without such automatic on-the-ground determination shall <<shall0641>> use position message types as commanded by control codes in the TCS subfield (see §2.2.23.1.7). After timeout of the TCS commands, control of airborne/ surface formats shall <<shall0642>> revert to the means described above. | Aircraft with an automatic means of determining on-the-ground condition shall <<shall0621>> use this input to select whether to report the airborne or surface message types. Aircraft without such means shall <<shall0622>> report the airborne type messages. Aircraft with or without such automatic on-the-ground determination shall <<shall0623>> use position message types as commanded by control codes in the TCS subfield (Paragraph 3.21.2.6.7). After |

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| | timeout of the TCS commands, control of airborne/surface determination shall <<shall0624>> revert to the means described above. |

| Comparable | ID=1204 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0644 | Page 131 | ED 73C v01 | shall0625 | Page 94 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.23.1.6 Surface Squitter Rate Control | | | 3.21.2.6.6 Surface Squitter Rate Control | | |
| Surface squitter rate shall <<shall0644>> be determined as follows: | | | Surface squitter rate shall <<shall0625>> be determined as follows: | | |

| Comparable | ID=1205 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0645 | Page 131 | ED 73C v01 | shall0626 | Page 94 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.23.1.6 Surface Squitter Rate Control | | | 3.21.2.6.6 Surface Squitter Rate Control | | |
| a. Once per second the contents of the TRS (see §2.2.23.1.9) shall <<shall0645>> be read. If the value of TRS is 0 or 1, the transponder shall <<shall0646>> transmit surface squitters at the high rate. If the value of TRS is 2, the transponder shall <<shall0647>> transmit surface squitters at the low rate. | | | a. Once per second the contents of the TRS (Paragraph 3.21.2.6.9) shall <<shall0626>> be read. If the value of TRS is 0 or 1, the transponder shall <<shall0627>> transmit surface squitters at the high rate. If the value of TRS is 2, the transponder shall <<shall0628>> transmit surface squitters at the low rate. | | |

| Comparable | ID=1206 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0646 | Page 131 | ED 73C v01 | shall0627 | Page 94 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.23.1.6 Surface Squitter Rate Control | | | 3.21.2.6.6 Surface Squitter Rate Control | | |
| a. Once per second the contents of the TRS (see §2.2.23.1.9) shall <<shall0645>> be read. If the value of TRS is 0 or 1, the transponder shall <<shall0646>> transmit surface squitters at the high rate. If the value of TRS is 2, the transponder shall <<shall0647>> transmit surface squitters at the low rate. | | | a. Once per second the contents of the TRS (Paragraph 3.21.2.6.9) shall <<shall0626>> be read. If the value of TRS is 0 or 1, the transponder shall <<shall0627>> transmit surface squitters at the high rate. If the value of TRS is 2, the transponder shall <<shall0628>> transmit surface squitters at the low rate. | | |

| Comparable | ID=1207 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0647 | Page 131 | ED 73C v01 | shall0628 | Page 94 |

| WAT | Comment: 0 |
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| 2.2.23.1.6 Surface Squitter Rate Control | 3.21.2.6.6 Surface Squitter Rate Control |
|---|---|
| a. Once per second the contents of the TRS (see §2.2.23.1.9) shall <<shall0645>> be read. If the value of TRS is 0 or 1, the transponder shall <<shall0646>> transmit surface squitters at the high rate. If the value of TRS is 2, the transponder shall <<shall0647>> transmit surface squitters at the low rate. | a. Once per second the contents of the TRS (Paragraph 3.21.2.6.9) shall <<shall0626>> be read. If the value of TRS is 0 or 1, the transponder shall <<shall0627>> transmit surface squitters at the high rate. If the value of TRS is 2, the transponder shall <<shall0628>> transmit surface squitters at the low rate. |

| Comparable | ID=1208 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0648 | Page 131 | ED 73C v01 | shall0629 | Page 94 |

| WAT | Comment: 0 |
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| | |

| 2.2.23.1.6 Surface Squitter Rate Control | 3.21.2.6.6 Surface Squitter Rate Control |
|---|---|
| b. The squitter rate determined via the TRS subfield shall <<shall0648>> be subject to being overridden by commands received via the RCS subfield (see §2.2.23.1.7). RCS code 1 shall <<shall0649>> cause the transponder to squitter at the high rate for 60 seconds. RCS code 2 shall <<shall0650>> cause the transponder to squitter at the low rate for 60 seconds. These commands shall <<shall0651>> be able to refreshed for a new 60 second period before timeout of the prior period. | b. The squitter rate determined via the TRS subfield shall <<shall0629>> be subject to being overridden by commands received via the RCS subfield (Paragraph 3.21.2.6.7). RCS code 1 shall <<shall0630>> cause the transponder to squitter at the high rate for 60 seconds. RCS code 2 shall <<shall0631>> cause the transponder to squitter at the low rate for 60 seconds. These commands shall <<shall0632>> be able to be refreshed for a new 60 second period before timeout of the prior period. |

| Comparable | ID=1209 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0649 | Page 131 | ED 73C v01 | shall0630 | Page 94 |

| WAT | Comment: 0 |
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| | |

| 2.2.23.1.6 Surface Squitter Rate Control | 3.21.2.6.6 Surface Squitter Rate Control |
|---|---|
| b. The squitter rate determined via the TRS subfield shall <<shall0648>> be subject to being overridden by commands received via the RCS subfield (see §2.2.23.1.7). RCS code 1 shall <<shall0649>> cause the transponder to squitter at the high rate for 60 seconds. RCS code 2 shall <<shall0650>> cause the transponder to squitter at the low rate for 60 seconds. These commands shall <<shall0651>> be able to refreshed for a new 60 second period before timeout of the prior period. | b. The squitter rate determined via the TRS subfield shall <<shall0629>> be subject to being overridden by commands received via the RCS subfield (Paragraph 3.21.2.6.7). RCS code 1 shall <<shall0630>> cause the transponder to squitter at the high rate for 60 seconds. RCS code 2 shall <<shall0631>> cause the transponder to squitter at the low rate for 60 seconds. These commands shall <<shall0632>> be able to be refreshed for a new 60 second period before timeout of the prior period. |

| Comparable | ID=1210 |
|---|---|

| DO 181D v08 | shall0650 | Page 132 | ED 73C v01 | shall0631 | Page 94 |
|---|---|---|---|---|---|
| WAT | Comment: 0 | | | | |
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| 2.2.23.1.6 Surface Squitter Rate Control | 3.21.2.6.6 Surface Squitter Rate Control |
|---|---|
| b. The squitter rate determined via the TRS subfield shall <<shall0648>> be subject to being overridden by commands received via the RCS subfield (see §2.2.23.1.7). RCS code 1 shall <<shall0649>> cause the transponder to squitter at the high rate for 60 seconds. RCS code 2 shall <<shall0650>> cause the transponder to squitter at the low rate for 60 seconds. These commands shall <<shall0651>> be able to refreshed for a new 60 second period before timeout of the prior period. | b. The squitter rate determined via the TRS subfield shall <<shall0629>> be subject to being overridden by commands received via the RCS subfield (Paragraph 3.21.2.6.7). RCS code 1 shall <<shall0630>> cause the transponder to squitter at the high rate for 60 seconds. RCS code 2 shall <<shall0631>> cause the transponder to squitter at the low rate for 60 seconds. These commands shall <<shall0632>> be able to be refreshed for a new 60 second period before timeout of the prior period. |

| Comparable | ID=1211 |
|---|---|

| DO 181D v08 | shall0651 | Page 132 | ED 73C v01 | shall0632 | Page 94 |
|---|---|---|---|---|---|
| WAT | Comment: 0 | | | | |
| | | | | | |

| 2.2.23.1.6 Surface Squitter Rate Control | 3.21.2.6.6 Surface Squitter Rate Control |
|---|---|
| b. The squitter rate determined via the TRS subfield shall <<shall0648>> be subject to being overridden by commands received via the RCS subfield (see §2.2.23.1.7). RCS code 1 shall <<shall0649>> cause the transponder to squitter at the high rate for 60 seconds. RCS code 2 shall <<shall0650>> cause the transponder to squitter at the low rate for 60 seconds. These commands shall <<shall0651>> be able to refreshed for a new 60 second period before timeout of the prior period. | b. The squitter rate determined via the TRS subfield shall <<shall0629>> be subject to being overridden by commands received via the RCS subfield (Paragraph 3.21.2.6.7). RCS code 1 shall <<shall0630>> cause the transponder to squitter at the high rate for 60 seconds. RCS code 2 shall <<shall0631>> cause the transponder to squitter at the low rate for 60 seconds. These commands shall <<shall0632>> be able to be refreshed for a new 60 second period before timeout of the prior period. |

| Comparable | ID=1212 |
|---|---|

| DO 181D v08 | shall0652 | Page 132 | ED 73C v01 | shall0633 | Page 94 |
|---|---|---|---|---|---|
| WAT | Comment: 0 | | | | |
| | | | | | |

| 2.2.23.1.6 Surface Squitter Rate Control | 3.21.2.6.6 Surface Squitter Rate Control |
|---|---|
| c. After timeout and in the absence of RCS codes 1 and 2, control shall <<shall0652>> return to the TRS subfield. | c. After timeout and in the absence of RCS codes 1 and 2, control shall <<shall0633>> return to the TRS subfield. |

| Comparable | ID=1213 |
|---|---|

| DO 181D v08 | shall0653 | Page 132 | ED 73C v01 | shall0635 | Page 94 |
|---|---|---|---|---|---|
| WAT | Comment: 0 | | | | |

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|---|---|
| 2.2.23.1.7 Subfields in SD for Extended Squitter | 3.21.2.6.7 Subfields in SD for Extended Squitter |
| TCS, the 3-bit (21-23) Type Control Subfield in SD shall <<shall0653>> control the position type reported by the transponder. These commands shall <<shall0654>> only affect the format type reported, they shall <<shall0655>> not change the aircraft determination of its on-the-ground condition. The commands for codes 1 and 2 shall <<shall0656>> be able to refreshed for a new period before timeout of the prior period. | RCS, the 3-bit (24-26) Rate Control Subfield in SD shall <<shall0635>> control the squitter rate of the transponder when it is reporting the surface format. This subfield shall <<shall0636>> have no effect on the transponder squitter rate when it is reporting the airborne position type. The following codes have been assigned: |

| Comparable | ID=1214 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0664 | Page 133 | ED 73C v01 | shall0641 | Page 96 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.23.1.8 Subfields in ME for Extended Squitter | | | 3.21.2.6.8 Subfields in ME for Extended Squitter | | |
| Codes 1 and 2 shall <<shall0664>> take precedence over code 3. | | | Codes 1 and 2 shall <<shall0641>> take precedence over code 3. | | |

| Comparable | ID=1215 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0665 | Page 133 | ED 73C v01 | shall0642 | Page 96 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.23.1.8 Subfields in ME for Extended Squitter | | | 3.21.2.6.8 Subfields in ME for Extended Squitter | | |
| ACS, the 12-bit (41-52) Altitude Code Subfield in ME shall <<shall0665>> (under control of the ATS subfield, §2.2.16.2.6.2.9) report the barometric altitude when this field contains an airborne position report. The contents of the ACS subfield shall <<shall0666>> be as specified for the 13-bit AC field (§2.2.14.4.2) except that the M bit (bit 26) shall <<shall0667>> be omitted. When barometric altitude is being reported, the contents of the ACS subfield shall <<shall0668>> be inserted by the transponder from the same source that would be used to provide the altitude field of a reply to a discrete interrogation. Transponder insertion of altitude data in the ACS subfield shall <<shall0669>> take place when the 1-bit ATS subfield has the value of ZERO. Transponder insertion of altitude data in the ACS subfield shall <<shall0670>> be inhibited when the ATS subfield has the value ONE. | | | ACS, the 12-bit (41-52) Altitude Code Subfield in ME shall <<shall0642>> (under control of the ATS subfield, 3.21.2.6.9) report the barometric altitude when ME contains an airborne position report. The contents of the ACS subfield shall <<shall0643>> be as specified for the 13-bit AC field (Paragraph 3.18.4.2) except that the M bit (bit 26) shall <<shall0644>> be omitted. When barometric altitude is being reported, the contents of the ACS subfield shall <<shall0645>> be inserted by the transponder from the same source that would be used to provide the altitude field of a reply to a discrete interrogation. Transponder insertion of altitude data in the ACS subfield shall <<shall0646>> take place when the 1-bit ATS subfield has the value of ZERO. Transponder insertion of altitude data in the ACS subfield shall <<shall0647>> be inhibited when the ATS subfield has the value ONE. | | |

| Comparable | ID=1216 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0666 | Page 133 | ED 73C v01 | shall0643 | Page 96 |

| | |
|---|---|
| WAT | Comment: 0 |

| 2.2.23.1.8 Subfields in ME for Extended Squitter | 3.21.2.6.8 Subfields in ME for Extended Squitter |
|---|---|
| ACS, the 12-bit (41-52) Altitude Code Subfield in ME shall <<shall0665>> (under control of the ATS subfield, §2.2.16.2.6.2.9) report the barometric altitude when this field contains an airborne position report. The contents of the ACS subfield shall <<shall0666>> be as specified for the 13-bit AC field (§2.2.14.4.2) except that the M bit (bit 26) shall <<shall0667>> be omitted. When barometric altitude is being reported, the contents of the ACS subfield shall <<shall0668>> be inserted by the transponder from the same source that would be used to provide the altitude field of a reply to a discrete interrogation. Transponder insertion of altitude data in the ACS subfield shall <<shall0669>> take place when the 1-bit ATS subfield has the value of ZERO. Transponder insertion of altitude data in the ACS subfield shall <<shall0670>> be inhibited when the ATS subfield has the value ONE. | ACS, the 12-bit (41-52) Altitude Code Subfield in ME shall <<shall0642>> (under control of the ATS subfield, 3.21.2.6.9) report the barometric altitude when ME contains an airborne position report. The contents of the ACS subfield shall <<shall0643>> be as specified for the 13-bit AC field (Paragraph 3.18.4.2) except that the M bit (bit 26) shall <<shall0644>> be omitted. When barometric altitude is being reported, the contents of the ACS subfield shall <<shall0645>> be inserted by the transponder from the same source that would be used to provide the altitude field of a reply to a discrete interrogation. Transponder insertion of altitude data in the ACS subfield shall <<shall0646>> take place when the 1-bit ATS subfield has the value of ZERO. Transponder insertion of altitude data in the ACS subfield shall <<shall0647>> be inhibited when the ATS subfield has the value ONE. |

| Comparable | ID=1217 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0667 | Page 133 | ED 73C v01 | shall0644 | Page 96 |
| WAT | Comment: 0 | | | | |

| 2.2.23.1.8 Subfields in ME for Extended Squitter | 3.21.2.6.8 Subfields in ME for Extended Squitter |
|---|---|
| ACS, the 12-bit (41-52) Altitude Code Subfield in ME shall <<shall0665>> (under control of the ATS subfield, §2.2.16.2.6.2.9) report the barometric altitude when this field contains an airborne position report. The contents of the ACS subfield shall <<shall0666>> be as specified for the 13-bit AC field (§2.2.14.4.2) except that the M bit (bit 26) shall <<shall0667>> be omitted. When barometric altitude is being reported, the contents of the ACS subfield shall <<shall0668>> be inserted by the transponder from the same source that would be used to provide the altitude field of a reply to a discrete interrogation. Transponder insertion of altitude data in the ACS subfield shall <<shall0669>> take place when the 1-bit ATS subfield has the value of ZERO. Transponder insertion of altitude data in the ACS subfield shall <<shall0670>> be inhibited when the ATS subfield has the value ONE. | ACS, the 12-bit (41-52) Altitude Code Subfield in ME shall <<shall0642>> (under control of the ATS subfield, 3.21.2.6.9) report the barometric altitude when ME contains an airborne position report. The contents of the ACS subfield shall <<shall0643>> be as specified for the 13-bit AC field (Paragraph 3.18.4.2) except that the M bit (bit 26) shall <<shall0644>> be omitted. When barometric altitude is being reported, the contents of the ACS subfield shall <<shall0645>> be inserted by the transponder from the same source that would be used to provide the altitude field of a reply to a discrete interrogation. Transponder insertion of altitude data in the ACS subfield shall <<shall0646>> take place when the 1-bit ATS subfield has the value of ZERO. Transponder insertion of altitude data in the ACS subfield shall <<shall0647>> be inhibited when the ATS subfield has the value ONE. |

| Comparable | ID=1218 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0668 | Page 134 | ED 73C v01 | shall0645 | Page 96 |
| WAT | Comment: 0 | | | | |

| 2.2.23.1.8 Subfields in ME for Extended Squitter | 3.21.2.6.8 Subfields in ME for Extended Squitter |
|---|---|
| ACS, the 12-bit (41-52) Altitude Code Subfield in ME shall <<shall0665>> (under control of the ATS subfield, §2.2.16.2.6.2.9) report the barometric altitude when this field contains an airborne position report. The contents of the ACS subfield shall <<shall0666>> be as specified for the 13-bit AC field (§2.2.14.4.2) except that the M bit (bit 26) shall <<shall0667>> be omitted. When barometric altitude is being reported, the contents of the ACS subfield shall <<shall0668>> be inserted by the transponder from the same source that would be used to provide the altitude field of a reply to a discrete interrogation. Transponder insertion of altitude data in the ACS subfield shall <<shall0669>> take place when the 1-bit ATS subfield has the value of ZERO. Transponder insertion of altitude data in the ACS subfield shall <<shall0670>> be inhibited when the ATS subfield has the value ONE. | ACS, the 12-bit (41-52) Altitude Code Subfield in ME shall <<shall0642>> (under control of the ATS subfield, 3.21.2.6.9) report the barometric altitude when ME contains an airborne position report. The contents of the ACS subfield shall <<shall0643>> be as specified for the 13-bit AC field (Paragraph 3.18.4.2) except that the M bit (bit 26) shall <<shall0644>> be omitted. When barometric altitude is being reported, the contents of the ACS subfield shall <<shall0645>> be inserted by the transponder from the same source that would be used to provide the altitude field of a reply to a discrete interrogation. Transponder insertion of altitude data in the ACS subfield shall <<shall0646>> take place when the 1-bit ATS subfield has the value of ZERO. Transponder insertion of altitude data in the ACS subfield shall <<shall0647>> be inhibited when the ATS subfield has the value ONE. |

| Comparable | ID=1219 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0669 | Page 134 | ED 73C v01 | shall0646 | Page 96 |
| WAT | Comment: 0 | | | | |
| | | | | | |

| 2.2.23.1.8 Subfields in ME for Extended Squitter | 3.21.2.6.8 Subfields in ME for Extended Squitter |
|---|---|
| ACS, the 12-bit (41-52) Altitude Code Subfield in ME shall <<shall0665>> (under control of the ATS subfield, §2.2.16.2.6.2.9) report the barometric altitude when this field contains an airborne position report. The contents of the ACS subfield shall <<shall0666>> be as specified for the 13-bit AC field (§2.2.14.4.2) except that the M bit (bit 26) shall <<shall0667>> be omitted. When barometric altitude is being reported, the contents of the ACS subfield shall <<shall0668>> be inserted by the transponder from the same source that would be used to provide the altitude field of a reply to a discrete interrogation. Transponder insertion of altitude data in the ACS subfield shall <<shall0669>> take place when the 1-bit ATS subfield has the value of ZERO. Transponder insertion of altitude data in the ACS subfield shall <<shall0670>> be inhibited when the ATS subfield has the value ONE. | ACS, the 12-bit (41-52) Altitude Code Subfield in ME shall <<shall0642>> (under control of the ATS subfield, 3.21.2.6.9) report the barometric altitude when ME contains an airborne position report. The contents of the ACS subfield shall <<shall0643>> be as specified for the 13-bit AC field (Paragraph 3.18.4.2) except that the M bit (bit 26) shall <<shall0644>> be omitted. When barometric altitude is being reported, the contents of the ACS subfield shall <<shall0645>> be inserted by the transponder from the same source that would be used to provide the altitude field of a reply to a discrete interrogation. Transponder insertion of altitude data in the ACS subfield shall <<shall0646>> take place when the 1-bit ATS subfield has the value of ZERO. Transponder insertion of altitude data in the ACS subfield shall <<shall0647>> be inhibited when the ATS subfield has the value ONE. |

| Comparable | ID=1220 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0670 | Page 134 | ED 73C v01 | shall0647 | Page 96 |
| WAT | Comment: 0 | | | | |
| | | | | | |

| 2.2.23.1.8 Subfields in ME for Extended Squitter | 3.21.2.6.8 Subfields in ME for Extended Squitter |
|---|---|

| | |
|---|---|
| ACS, the 12-bit (41-52) Altitude Code Subfield in ME shall <<shall0665>> (under control of the ATS subfield, §2.2.16.2.6.2.9) report the barometric altitude when this field contains an airborne position report. The contents of the ACS subfield shall <<shall0666>> be as specified for the 13-bit AC field (§2.2.14.4.2) except that the M bit (bit 26) shall <<shall0667>> be omitted. When barometric altitude is being reported, the contents of the ACS subfield shall <<shall0668>> be inserted by the transponder from the same source that would be used to provide the altitude field of a reply to a discrete interrogation. Transponder insertion of altitude data in the ACS subfield shall <<shall0669>> take place when the 1-bit ATS subfield has the value of ZERO. Transponder insertion of altitude data in the ACS subfield shall <<shall0670>> be inhibited when the ATS subfield has the value ONE. | ACS, the 12-bit (41-52) Altitude Code Subfield in ME shall <<shall0642>> (under control of the ATS subfield, 3.21.2.6.9) report the barometric altitude when ME contains an airborne position report. The contents of the ACS subfield shall <<shall0643>> be as specified for the 13-bit AC field (Paragraph 3.18.4.2) except that the M bit (bit 26) shall <<shall0644>> be omitted. When barometric altitude is being reported, the contents of the ACS subfield shall <<shall0645>> be inserted by the transponder from the same source that would be used to provide the altitude field of a reply to a discrete interrogation. Transponder insertion of altitude data in the ACS subfield shall <<shall0646>> take place when the 1-bit ATS subfield has the value of ZERO. Transponder insertion of altitude data in the ACS subfield shall <<shall0647>> be inhibited when the ATS subfield has the value ONE. |

| Comparable | ID=1221 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0671 | Page 134 | ED 73C v01 | shall0648 | Page 96 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.23.1.9 Subfields in MB for Extended Squitter | | | 3.21.2.6.9 Subfields in MB for Extended Squitter | | |
| A ground-initiated Comm-B request (§2.2.19.1.12.3) containing RR equals 16 and DI equals 7 and RRS equals 7 shall <<shall0671>> cause the resulting reply to contain the Squitter Capability Report in its MB field. | | | A ground-initiated Comm-B request (Paragraph 3.21.1.12) containing RR equals 16 and DI equals 3 or 7 and RRS equals 7 shall <<shall0648>> cause the resulting reply to contain the squitter status report in its MB field. | | |

| Comparable | ID=1222 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0672 | Page 134 | ED 73C v01 | shall0649 | Page 96 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.23.1.9 Subfields in MB for Extended Squitter | | | 3.21.2.6.9 Subfields in MB for Extended Squitter | | |
| TRS, the 2-bit (33-34) Transmission Rate Subfield in the Squitter Capability Report shall <<shall0672>> report the capability of the aircraft to automatically determine its surface squitter rate and its current squitter rate. | | | TRS, the 2-bit (33-34) Transmission Rate Subfield in MB shall <<shall0649>> report the capability of the aircraft to automatically determine its surface squitter rate and its current squitter rate. | | |

| Comparable | ID=1223 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0673 | Page 134 | ED 73C v01 | shall0650 | Page 98 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.23.1.9 Subfields in MB for Extended Squitter | | | 3.21.2.6.9 Subfields in MB for Extended Squitter | | |

| | |
|---|---|
| ATS, the 1-bit Altitude Type Subfield in the Squitter Capability Report shall <<shall0673>> report the type of altitude being provided in the airborne Extended Squitter in the 1-bit (35) ATS subfield of MB when the reply contains the contents of transponder register 07 {HEX}. | ATS, the 1-bit (35) Altitude Type Subfield in MB shall <<shall0650>> report the type of altitude being provided in the airborne extended squitter when the reply contains the contents of GICB register 07 {HEX}. |

**Summary of Similar Shalls**

| Similar | ID=733 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0012 | Page 12 | ED 73C v01 | shall0017 | Page 13 |
| WAT | Comment: ED includes Hijack Mode - otherwise comparable | | | | |
| | | | | | |
| 2.1.7 Flight Crew Control Functions | | | 2.5 CONTROL AND INDICATION FUNCTIONS | | |
| The following functions shall <<shall0012>> be provided. | | | The following Control and Indication functions shall <<shall0017>> be provided: | | |

| Similar | ID=735 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0014 | Page 13 | ED 73C v01 | shall0021 | Page 14 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.1.7 Flight Crew Control Functions | | | 2.5 CONTROL AND INDICATION FUNCTIONS | | |
| b. Means of selecting the condition in which the transponder is rendered incapable of generating replies to ATCRBS, ATCRBS/Mode S All Call, and Mode S-only All Call interrogations, but continues to generate Mode S squitter transmissions and continues to reply to discretely addressed Mode S interrogations when the aircraft is on the ground. Return to normal operation from this condition shall <<shall0013>> be possible within five seconds. If this condition is enabled automatically when the aircraft is on the ground, a flight crew switch is not necessary. If performed manually, this condition shall <<shall0014>> have no effect on the transmission of Extended Squitters (see §2.2.23.1.2) or on the reporting of on-the-ground state (see §2.2.13.1.2.c, and §2.2.18.2.7.b). Transponders that simulate ATCRBS/Mode S All Call interrogations in self-test/squitter transmission may occasionally open their window of non-acceptance for this purpose coincidental with an actual interrogation, thus generating a reply to the interrogation. Such coincidental acceptance periods may be considered tolerable, but must not exceed one percent of transponder operating time. | | | If this condition is enabled automatically when the aircraft is on the ground, a flight crew switch is not necessary. If performed manually, this condition shall <<shall0021>> have no effect on the transmission of extended squitters (If the extended squitter function is implemented in the transponder) (3.21.2.6.2) or on the reporting of on-the-ground state (3.17.1 b (3), 3.21.2.6.5, 3.20.2.7 b, and 3.20.2.7 c). | | |

| Similar | ID=743 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0022 | Page 19 | ED 73C v01 | shall0098 | Page 26 |
| WAT | Comment: ED details are differed from DO | | | | |
| | | | | | |
| 2.2.2.4 Sensitivity and Dynamic Range | | | 3.2.4 Sensitivity and Dynamic Range | | |

| | |
|---|---|
| a. The MTL for ATCRBS and ATCRBS/Mode S All-Call interrogations shall <<shall0022>> be<br>-73 dBm ±4 dB. | a. The Minimum Triggering Level (MTL) for Mode A/C and Mode A/C/S All-Call interrogations, having equal amplitude P1 and P3 pulses and P2 not detected shall <<shall0098>> be -73 dBm, ±4 dB. |

| Similar | ID=750 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0029 | Page 19 | ED 73C v01 | shall0106 | Page 26 |
| WAT | Comment: Not obviously the same | | | | |
| | | | | | |
| 2.2.3.2 RF Peak Output Power | | | 3.3.3 RF Peak Output Power | | |
| The RF peak output power of each pulse of each reply at the terminals of the antenna shall <<shall0029>> be: | | | The RF peak output power of each pulse of each reply at the terminals of the antenna shall <<shall0106>> be as follows. | | |

| Similar | ID=751 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0030 | Page 20 | ED 73C v01 | shall0107 | Page 27 |
| WAT | Comment: This comparison is for the first half of ED shall0107. The second half of ED shall0107 is in DO shall0031 | | | | |
| | | | | | |
| 2.2.3.3 Unwanted Output Power | | | 3.3.4 Residual Power Output | | |
| When the transponder transmitter is in the inactive state, the RF output power at 1090 ±3 MHz at the terminals of the antenna shall <<shall0030>> not exceed -50 dBm. The inactive state is defined to include the entire period between ATCRBS and/or Mode S transmissions less 10-microsecond transition periods, if necessary, preceding and following the extremes of the transmission. | | | When the transponder transmitter is in the inactive state, the RF output power at 1 090 ±3 MHz, at the terminals of the antenna shall <<shall0107>> not exceed -50 dBm, except in transponders intended for use with ACAS where it shall <<shall0108>> not exceed -70 dBm. (See paragraph 3.23 f). | | |

| Similar | ID=752 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0031 | Page 20 | ED 73C v01 | shall0108 | Page 27 |
| WAT | Comment: NOTE: DO shall 0031 is in a note. This comparison is for the first half of ED shall0107. | | | | |
| | | | | | |
| 2.2.3.3 Unwanted Output Power | | | 3.3.4 Residual Power Output | | |
| 2. If the transponder is used in conjunction with TCAS equipment, the RF power in the inactive state at 1090 MHz at the terminals of the Mode S transponder antenna shall <<shall0031>> not exceed -70 dBm. | | | When the transponder transmitter is in the inactive state, the RF output power at 1 090 ±3 MHz, at the terminals of the antenna shall <<shall0107>> not exceed -50 dBm, except in transponders intended for use with ACAS where it shall <<shall0108>> not exceed -70 dBm. (See paragraph 3.23 f). | | |

| Similar | ID=753 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0032 | Page 20 | ED 73C v01 | shall0109 | Page 27 |
| WAT | Comment: statements similar but following shalls are different | | | | |
| | | | | | |
| 2.2.3.4 Reply Rate Capability | | | 3.4 REPLY RATE CAPABILITY | | |
| The total reply rate over each time interval specified below shall <<shall0032>> be the sum of the individual ATCRBS and Mode S reply rates over this interval. | | | All the reply rates mentioned in this section shall <<shall0109>> be in addition to any squitter transmissions that the transponder is required to make. | | |

| Similar | ID=762 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0040 | Page 21 | ED 73C v01 | shall0115 | Page 27 |
| WAT | Comment: compare parenthetical comment in ED | | | | |
| | | | | | |
| 2.2.3.5 Mode S ELM Peak Reply Rate | | | 3.4.3 Mode S ELM Peak Reply Rate | | |
| At least once every second, a transponder equipped for ELM downlink operation shall <<shall0040>> have the capability of transmitting, in a 25-millisecond interval, 25 percent more segments than have been announced in the initialization. | | | A transponder equipped for ELM downlink operations shall <<shall0115>> have the capability of transmitting, at least once every one second, in a 25-millisecond interval, 25% more segments than have been announced in the initialisation (i.e. at least 20 long replies for transponders capable of handling the maximum of 16 segments). | | |

| Similar | ID=766 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0044 | Page 22 | ED 73C v01 | shall0119 | Page 28 |
| WAT | Comment: ED specifies that the only method is with the IDENT switch. DO indictes that is the method to be used. | | | | |
| | | | | | |
| 2.2.4.1.3 ATCRBS-SPI | | | 3.5.3 Mode A/C Special Position Identification (SPI) Pulse | | |
| In addition to the information pulses provided, an SPI pulse, which may be used with any of the other information pulses upon request, shall <<shall0043>> be provided at a spacing 4.35 microseconds following the last framing pulse. The SPI pulse shall <<shall0044>> be initiated by an IDENT switch. Upon activation of the IDENT switch, the SPI pulse shall <<shall0045>> be transmitted when replying to ATCRBS Mode A interrogations for a period of 18 ±1.0 seconds. The SPI pulse shall <<shall0046>> be transmitted only if the IDENT switch is first activated. The SPI pulse shall <<shall0047>> not be transmitted when replying to Mode C interrogations. | | | b. The SPI pulse shall <<shall0119>> only be initiated by an IDENT switch. | | |

| Similar | ID=768 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0046 | Page 22 | ED 73C v01 | shall0119 | Page 28 |
| WAT | Comment: this DO shall implements the Only part of the ED | | | | |
| | | | | | |
| 2.2.4.1.3 ATCRBS-SPI | | | 3.5.3 Mode A/C Special Position Identification (SPI) Pulse | | |
| In addition to the information pulses provided, an SPI pulse, which may be used with any of the other information pulses upon request, shall <<shall0043>> be provided at a spacing 4.35 microseconds following the last framing pulse. The SPI pulse shall <<shall0044>> be initiated by an IDENT switch. Upon activation of the IDENT switch, the SPI pulse shall <<shall0045>> be transmitted when replying to ATCRBS Mode A interrogations for a period of 18 ±1.0 seconds. The SPI pulse shall <<shall0046>> be transmitted only if the IDENT switch is first activated. The SPI pulse shall <<shall0047>> not be transmitted when replying to Mode C interrogations. | | | b. The SPI pulse shall <<shall0119>> only be initiated by an IDENT switch. | | |

| Similar | ID=787 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0065 | Page 24 | ED 73C v01 | shall0141 | Page 31 |
| WAT | Comment: DO contained in ED list - ED more restrictive | | | | |
| | | | | | |
| 2.2.4.2.3 Mode S Reply Pulse Shape | | | 3.6.4 Mode S Reply Pulse Shape | | |
| b. The pulse rise time shall <<shall0065>> not exceed 0.1 microsecond. | | | a. All Mode S reply pulses shall <<shall0141>> have the following characteristics.<br>Duration: See paragraph **Error! Reference source not found.** c.<br>Rise time: Between 0.05 and 0.1 µs.<br>Decay time: Between 0.05 and 0.2 µs. | | |

| Similar | ID=788 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0066 | Page 24 | ED 73C v01 | shall0141 | Page 31 |
| WAT | Comment: DO contained in ED list - ED more restrictive | | | | |
| | | | | | |
| 2.2.4.2.3 Mode S Reply Pulse Shape | | | 3.6.4 Mode S Reply Pulse Shape | | |
| c. The pulse decay time shall <<shall0066>> not exceed 0.2 microsecond. | | | a. All Mode S reply pulses shall <<shall0141>> have the following characteristics.<br>Duration: See paragraph **Error! Reference source not found.** c. | | |

| | |
|---|---|
| | Rise time: Between 0.05 and 0.1 µs.<br>Decay time: Between 0.05 and 0.2 µs. |
| | |

| Similar | ID=795 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0073 | Page 25 | ED 73C v01 | shall0151 | Page 32 |
| WAT | Comment: DO has +- 0.1 while ED states 0.1 | | | | |
| | | | | | |
| 2.2.4.2.5 Mode S Reply Delay and Jitter | | | 3.7.2 Mode S Reply Delay and Jitter | | |
| b. At all RF input levels from MTL to -21 dBm, the first preamble pulse of the reply shall <<shall0072>> occur 128 ±0.5 microseconds after the P4 pulse of the ATCRBS/Mode S All-Call interrogation. At all RF input levels from MTL +3 dB to -21 dBm, the jitter of the reply delay shall <<shall0073>> not exceed ±0.1 microsecond, peak (99.9 percentile). | | | (2) At all RF input levels from MTL+3dB to -21 dBm, the jitter of the reply delay shall <<shall0151>> not exceed 0.1 µs peak (99.9 percentile). | | |

| Similar | ID=815 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0093 | Page 27 | ED 73C v01 | shall0174 | Page 35 |
| WAT | Comment: DO is 0.2 versus ED with +- | | | | |
| | | | | | |
| 2.2.6.2 Pulse Position Tolerances | | | 3.9.3 Pulse Position Tolerances | | |
| a. The equipment shall <<shall0093>> accept the pulse position of ATCRBS interrogations as valid if the spacing between P1 and P3 is within plus or minus 0.2 microsecond of the nominal spacing. | | | The equipment shall <<shall0174>> accept the pulse interval of Mode A/C interrogations as valid if the spacing between P1 and P3 is within ±0.2 µs of the nominal spacing. | | |

| Similar | ID=816 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0094 | Page 27 | ED 73C v01 | shall0175 | Page 35 |
| WAT | Comment: Same +- difference | | | | |
| | | | | | |
| 2.2.6.2 Pulse Position Tolerances | | | 3.9.3 Pulse Position Tolerances | | |
| The transponder shall <<shall0094>> accept the pulse position of ATCRBS/ Mode S All-Calls as valid if the spacing between F1 and P3 is within plus or minus 0.2 microsecond of the nominal spacing, and if the spacing between P3 and P4 is within plus or minus 0.05 microsecond of nominal. | | | The transponder shall <<shall0175>> accept the pulse intervals of Mode A/C/S All-Call interrogations as valid if the spacing between P1 and P3 is within ±0.2 µs of the nominal interval and if the interval between P3 and P4 is within ±0.05 µs of nominal. | | |

| Similar | ID=838 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0115 | Page 30 | ED 73C v01 | shall0198 | Page 39 |
| WAT | Comment: DO shall 116 links to ED shalls 198-201. It is not clear that the material is comparable. | | | | |
| 2.2.7.2.5 Dead Time | | | 3.10.3 Dead Time | | |
| The time interval beginning at the end of a reply transmission and ending when the receiver has regained its sensitivity to within 3 dB of MTL shall <<shall0115>> not exceed 125 microseconds. | | | After recognition of a valid interrogation, the transponder shall <<shall0198>> not reply to any other interrogation, at least for the duration of the reply pulse train. This dead time shall <<shall0199>> end no later than 125 µs after the transmission of the last reply pulse of the group. | | |

| Similar | ID=845 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0119 | Page 30 | ED 73C v01 | shall0205 | Page 40 |
| WAT | Comment: DO says "apply only to receipt" and ED does not | | | | |
| 2.2.7.3.1 ATCRBS Reply Rate Limiting | | | 3.11 REPLY RATE LIMITING | | |
| A sensitivity-reduction reply rate limit shall <<shall0117>> be incorporated in the transponder for ATCRBS replies. The limit shall <<shall0118>> be capable of being adjusted between 500 continuous ATCRBS Mode A and Mode C replies per second and the maximum continuous rate of which the transponder is capable, or 2000 replies per second, whichever is less, without regard to the number of pulses in each reply. Sensitivity reduction shall <<shall0119>> apply only to the receipt of ATCRBS, ATCRBS/Mode S All-Call, and ATCRBS-Only All-Call interrogations. | | | Sensitivity reduction shall <<shall0205>> apply only to Mode A/C, Mode A/C/S All-Call and Mode A/C-Only All-Call interrogations. | | |

| Similar | ID=848 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0121 | Page 30 | ED 73C v01 | shall0209 | Page 40 |
| WAT | Comment: Different text but may be comparable | | | | |
| 2.2.8.1 Response in the Presence of Low Level Asynchronous Interference | | | 3.12.3 Low Level Asynchronous Interference | | |
| For all received signals levels between -65 and -21 dBm, given an interrogation that requires a reply according to §2.2.17 and if no lockout condition is in effect, the transponder shall <<shall0121>> reply correctly with at least 95 percent reply ratio in the presence of asynchronous interference. | | | b. In the presence of asynchronous interference, the transponder shall <<shall0209>> reply correctly to at least 95% reply of valid Mode S interrogations with received signal levels between -65 and -21 dBm, provided that no lockout condition is in effect. | | |

| Similar | ID=857 |
|---|---|

| | | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0133 | Page 33 | ED 73C v01 | shall0222 | Page 42 |
| WAT | Comment: DO qualifies "in the absence..." | | | | |
| | | | | | |
| 2.2.9.2 Mode S | | | 3.13 UNDESIRED REPLIES | | |
| b. In the presence of non-coherent CW interference at a frequency of 1030 ±0.2 MHz. and at signal levels of -60 dBm or less, and in the absence of valid interrogation signals, Mode S transponders shall <<shall0133>> not generate unwanted Mode S replies more often than once per 10 seconds. | | | Mode S transponders shall <<shall0222>> not generate undesired Mode S replies more often than once per 10 seconds. | | |

| | |
|---|---|
| Similar | ID=869 |

| | | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0143 | Page 34 | ED 73C v01 | shall0232 | Page 42 |
| WAT | Comment: DO references "failure to generate squitters" | | | | |
| | | | | | |
| 2.2.10.4 Failure Annunciation | | | 3.14.3 Failure Indication | | |
| An output shall <<shall0142>> be provided to indicate the validity/non-validity of the transponder. Failure to generate squitters at the nominal rate, a failure detected by self-test or the monitoring function, or failure of Mode S address verification shall <<shall0143>> cause the output to assume the invalid state. Momentary power interrupts shall <<shall0144>> not cause the output to assume the invalid state. The status of the transponder shall <<shall0145>> be annunciated to the flight crew. | | | b Any failure detected by the self-test, squitter monitor or other monitoring function shall <<shall0232>> cause the indication to assume the invalid state. | | |

| | |
|---|---|
| Similar | ID=881 |

| | | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0154 | Page 35 | ED 73C v01 | shall0247 | Page 44 |
| WAT | Comment: ED corresponds to second half of the DO statement | | | | |
| | | | | | |
| 2.2.12.1 Diversity Antenna Selection and Selection Threshold | | | 3.16.2 Diversity Antenna Selection | | |
| The selected antenna shall <<shall0154>> be used to receive the remainder of the interrogation and, if necessary, to transmit the Mode S or ATCRBS reply. | | | d. The selected antenna shall <<shall0247>> be used to receive the remainder of the interrogation and, if necessary, to transmit the reply. | | |

| | |
|---|---|
| Similar | ID=882 |

| | | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0155 | Page 35 | ED 73C v01 | shall0245 | Page 43 |
| WAT | Comment: see also ED shall0251 | | | | |
| | | | | | |
| 2.2.12.1 Diversity Antenna Selection and Selection Threshold | | | 3.16.2 Diversity Antenna Selection | | |
| The transponder shall <<shall0155>> nominally select the antenna connected | | | b. If valid interrogations are not received simultaneously on both | | |

| | |
|---|---|
| to the RF port having the stronger signal. To allow for unbalance in the characteristics of the two channels, a transition zone ±3 dB wide is permitted, in which either antenna may be selected. | channels, the transponder shall <<shall0245>> select one of the antennas as described in paragraph 3.16.4. |

| Similar | ID=883 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0155 | Page 35 | ED 73C v01 | shall0251 | Page 45 |
| WAT | Comment: See ED shall0245 | | | | |
| | | | | | |
| 2.2.12.1 Diversity Antenna Selection and Selection Threshold | | | 3.16.4 Received Signal Delay Threshold | | |
| The transponder shall <<shall0155>> nominally select the antenna connected to the RF port having the stronger signal. To allow for unbalance in the characteristics of the two channels, a transition zone ±3 dB wide is permitted, in which either antenna may be selected. | | | a. If an interrogation is received at either antenna 0.125 µs or less in advance of reception at the other antenna, the selection shall <<shall0251>> be made on the basis of received signal strength. | | |

| Similar | ID=886 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0157 | Page 35 | ED 73C v01 | shall0251 | Page 45 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.12.2 Received Signal Delay Tolerance | | | 3.16.4 Received Signal Delay Threshold | | |
| If an interrogation is received at either antenna 0.125 microsecond or less in advance of reception at the other antenna, the interrogations shall <<shall0157>> be considered simultaneous and the reply antenna selection criteria shall <<shall0158>> be applied. If an interrogation is received at either antenna 0.375 microsecond or more in advance of reception at the other antenna, the antenna selected for the reply shall <<shall0159>> be the one which received the earlier interrogation. If the relative time of receipt is between 0.125 and 0.375 microsecond, the transponder shall <<shall0160>> select the reply antenna based on either the simultaneous interrogation criteria or the earlier time of arrival. | | | a. If an interrogation is received at either antenna 0.125 µs or less in advance of reception at the other antenna, the selection shall <<shall0251>> be made on the basis of received signal strength. | | |

| Similar | ID=898 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0169 | Page 36 | ED 73C v01 | shall0264 | Page 46 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.12.5.2 Extended Squitter | | | 3.16.7.3 Extended Squitter | | |
| b. When broadcasting the surface position format (see §2.2.23.1.2.b), the | | | b. when on the surface, the transponder shall <<shall0264>> transmit | | |

| | |
|---|---|
| transponder shall <<shall0169>> transmit Extended Squitters under control of the SAS subfield (see §2.2.23.1.7). In the absence of any SAS commands, use of the top antenna only shall <<shall0170>> be the default condition. | extended squitters under control of the SAS subfield (paragraph 3.21.2.6.7). In the absence of any SAS commands, use of the top antenna only shall <<shall0265>> be the default condition |

| Similar | ID=938 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0210 | Page 42 | ED 73C v01 | shall0304 | Page 51 |
| WAT | Comment: DO refers to figure 2-16, ED makes no figure reference | | | | |
| | | | | | |
| 2.2.13.3.1 Uplink Interface | | | 3.17.3 Standard Transaction Interfaces | | |
| d. Storage Design, Non-Acceptance – The transponder shall <<shall0210>> not accept a Comm-A interrogation (UF=20, 21) if the data content of that interrogation cannot be processed (see 'UNABLE TO PROCESS,' Figure 2-16). | | | The transponder shall <<shall0304>> not accept a Comm-A interrogation (UF=20, 21) if the data content of that interrogation cannot be processed. | | |

| Similar | ID=943 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0215 | Page 43 | ED 73C v01 | shall0308 | Page 51 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.13.3.2 Downlink Interface | | | 3.17.3 Standard Transaction Interfaces | | |
| c. Storage Design – Buffer Rate – If the interface shifts data into the transponder at a rate slower than the transmission rate, the internal data system shall <<shall0215>> be able to provide the data to support the reply rate specified in §2.2.3.4.2. | | | If the interface shifts data into the transponder at a rate slower than the transmission rate, the internal data storage system shall <<shall0308>> be able to support the reply rate specified in paragraph 3.4. | | |

| Similar | ID=944 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0216 | Page 43 | ED 73C v01 | shall0312 | Page 52 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.13.3.2 Downlink Interface | | | 3.17.3 Standard Transaction Interfaces | | |
| d. Storage Design – Buffer Function – The design shall <<shall0216>> ensure that register content shall <<shall0217>> not be in a state of transition during the insertion of the content in a downlink reply. | | | The design of the storage system shall <<shall0312>> ensure, by double buffering or other means, that storage register content is not in a state of transition during the insertion of the content in a down link reply. | | |

| Similar | ID=945 |
|---|---|

| DO 181D v08 | shall0217 | Page 43 | ED 73C v01 | shall0312 | Page 52 |
|---|---|---|---|---|---|
| WAT | Comment: 2d DO shall | | | | |
| | | | | | |

| 2.2.13.3.2 Downlink Interface | 3.17.3 Standard Transaction Interfaces |
|---|---|
| d. Storage Design – Buffer Function – The design shall <<shall0216>> ensure that register content shall <<shall0217>> not be in a state of transition during the insertion of the content in a downlink reply. | The design of the storage system shall <<shall0312>> ensure, by double buffering or other means, that storage register content is not in a state of transition during the insertion of the content in a down link reply. |

| Similar | ID=1012 |
|---|---|

| DO 181D v08 | shall0278 | Page 70 | ED 73C v01 | shall0380 | Page 66 |
|---|---|---|---|---|---|
| WAT | Comment: 0 | | | | |
| | | | | | |

| 2.2.18.2.5 Multisite Lockout Protocol (Figure 2-12) | 3.20.2.5 Multisite Lockout Protocol (Figure 3-11) |
|---|---|
| The multisite lockout command shall <<shall0277>> be transmitted in the SD field (§2.2.14.4.36). A lockout command for an II code shall <<shall0278>> be transmitted in an SD with DI=1 or DI=7. An II lockout command shall <<shall0279>> be indicated by LOS equals ONE in the presence of a non-zero interrogator identifier in the IIS subfield of SD. A lockout command for an SI code shall <<shall0280>> be transmitted in an SD with DI=3. An SI lockout shall <<shall0281>> be indicated by LSS (§2.2.19.2.1.1) equals ONE in the presence of a non-zero interrogator identifier in the SIS subfield of SD (§2.2.19.2.1). After a transponder has accepted an interrogation containing a multisite lockout command, that transponder shall <<shall0282>> commence to lock out (i.e., not accept) any Mode S-only All-Call interrogation which includes the identifier of the interrogator that commanded the lockout. The lockout shall <<shall0283>> persist for an interval 18 ±1 seconds after the last acceptance of an interrogation containing the multisite lockout command. Multisite lockout shall <<shall0284>> not prevent acceptance of a Mode S-only All-Call interrogation containing PR codes 8 to 12. If a lockout command (LOS=1) is received together with IIS=0, it shall <<shall0285>> be interpreted as a non-selective all-call lockout | Upon receipt of an interrogation with DI=1 or with DI=7, the transponder shall <<shall0380>> examine the LOS subfield (bit 26) and if it is ONE, it shall <<shall0381>> examine the contents of the IIS subfield (bits 17-20) (paragraph 3.21.2.1 a). If an interrogation identifier other than “0” is present in IIS, the transponder has received a multisite lockout command for the interrogator indicated in IIS. |

| Similar | ID=1017 |
|---|---|

| DO 181D v08 | shall0282 | Page 71 | ED 73C v01 | shall0384 | Page 66 |
|---|---|---|---|---|---|
| WAT | Comment: 0 | | | | |
| | | | | | |

| 2.2.18.2.5 Multisite Lockout Protocol (Figure 2-12) | 3.20.2.5 Multisite Lockout Protocol (Figure 3-11) |
|---|---|

| | |
|---|---|
| The multisite lockout command shall <<shall0277>> be transmitted in the SD field (§2.2.14.4.36). A lockout command for an II code shall <<shall0278>> be transmitted in an SD with DI=1 or DI=7. An II lockout command shall <<shall0279>> be indicated by LOS equals ONE in the presence of a non-zero interrogator identifier in the IIS subfield of SD. A lockout command for an SI code shall <<shall0280>> be transmitted in an SD with DI=3. An SI lockout shall <<shall0281>> be indicated by LSS (§2.2.19.2.1.1) equals ONE in the presence of a non-zero interrogator identifier in the SIS subfield of SD (§2.2.19.2.1). After a transponder has accepted an interrogation containing a multisite lockout command, that transponder shall <<shall0282>> commence to lock out (i.e., not accept) any Mode S-only All-Call interrogation which includes the identifier of the interrogator that commanded the lockout. The lockout shall <<shall0283>> persist for an interval 18 ±1 seconds after the last acceptance of an interrogation containing the multisite lockout command. Multisite lockout shall <<shall0284>> not prevent acceptance of a Mode S-only All-Call interrogation containing PR codes 8 to 12. If a lockout command (LOS=1) is received together with IIS=0, it shall <<shall0285>> be interpreted as a non-selective all-call lockout | Upon receipt of a multisite lockout command, the transponder shall <<shall0384>> start the TL timer assigned to the IIS or SIS code (See Figures 3.10 and 3.11). The timer shall <<shall0385>> run for 18 + 1.0 seconds after the last acceptance of an interrogation containing the command. |

| Similar | ID=1023 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0288 | Page 71 | ED 73C v01 | shall0390 | Page 66 |
| WAT | Comment: text the same but the exceptions list not the same | | | | |
| | | | | | |

| 2.2.18.2.6 Acquisition Squitter Protocols | 3.20.2.6 Acquisition Squitter Protocol |
|---|---|
| b. Squitter Rate – Acquisition squitter transmissions shall <<shall0288>> be emitted at random intervals that are uniformly distributed over the range from 0.8 to 1.2 seconds using a time quantization no greater than 15 milliseconds relative to the previous acquisition squitter, with the following exceptions:<br>(1) The scheduled acquisition squitter **shall** be delayed if a mutual suppression interface is active.<br>***Note:*** *A mutual suppression system may be used to connect on-board equipment operating in the same frequency band in order to prevent mutual interference. Squitter action resumes as soon as practical after* | b. Squitter Rate - Acquisition squitter transmissions shall <<shall0390>> be emitted at random intervals that are uniformly distributed over the range from 0.8 to 1.2 seconds using a time quantisation of no greater than 15 milliseconds relative to the previous acquisition squitter, with the following exceptions:<br>(1) The scheduled acquisition squitter shall be delayed if a mutual suppression interface is active.<br>***NOTE:*** *A mutual suppression system may be used to connect on-board equipment operating in the same frequency band in order to prevent mutual interference. Acquisition squitter action resumes as soon as practical after a mutual suppression interval.* |

| | |
|---|---|
| *a mutual suppression interval.*<br>(2) The scheduled acquisition squitter **shall** be delayed if the transponder is in a transaction cycle (see §**Error! Reference source not found.**.k.).<br>(3) The scheduled acquisition squitter **shall** be delayed if an Extended Squitter is in process.<br>(4) Acquisition squitters **shall** only be transmitted when in the on-the-ground state if the transponder is not reporting the surface position type of Mode S Extended Squitter or as specified in subparagraph c. | (2) The scheduled acquisition squitter shall be delayed if the transponder is in a transaction cycle (paragraph **Error! Reference source not found.** k.). |

| Similar | ID=1042 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0307 | Page 73 | ED 73C v01 | shall0403 | Page 67 |
| WAT | Comment: ED mentions FS, VS, and CA | | | | |
| | | | | | |
| 2.2.18.2.7 Flight Status and Vertical Status Protocols (Figure 2-13) | | | 3.20.2.7 Flight Status and Vertical Status Protocols (Figure 3-12) | | |
| b. On-the-Ground Report – The on-the-ground status of the aircraft shall <<shall0306>> be reported in the FS field and the VS field and the CA field. If a means for automatically indicating the on-the-ground condition (e.g., a weight on wheels or strut switch) is available at the transponder data interface, it shall <<shall0307>> be used as the basis for the reporting of vertical status. If a means for automatically indicating the on-the-ground condition is not available at the transponder data interface, the FS and VS codes shall <<shall0308>> indicate that the aircraft is airborne and the CA field shall <<shall0309>> indicate that the aircraft is either airborne or on the ground (CA=6). | | | b. On-the-Ground Report – The on-the-ground status of the aircraft shall <<shall0402>> be reported in the FS field and the VS field and the CA field. If a means for automatically indicating the on-the-ground condition (e.g., a weight on wheels or strut switch) is available at the transponder data interface, it shall <<shall0403>> be used as the basis for the reporting of status (FS, VS, for CA codes 4 or 5 for airborne or on-the ground). If a means for automatically indicating the on-the-ground condition is not available at the transponder data interface, the FS and VS codes shall <<shall0404>> indicate that the aircraft is airborne and the CA field shall <<shall0405>> indicate that the aircraft is either airborne or on the ground (CA=6). | | |

| Similar | ID=1053 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0318 | Page 75 | ED 73C v01 | shall0411 | Page 67 |
| WAT | Comment: ED mentions SI=0 | | | | |
| | | | | | |
| 2.2.18.2.9 All-Call Reply Protocol | | | 3.20.2.9 All-Call Reply Protocol | | |
| Upon acceptance of a Mode S-Only All-Call interrogation (UF=11) the | | | Upon acceptance of a Mode S-Only All-Call interrogation (UF=11) the | | |

| | |
|---|---|
| transponder shall <<shall0316>> reply by overlaying the received II or SI code on parity according to §2.2.18.2.1, resulting in the PI field which shall <<shall0317>> be used in the reply (DF=11). Upon acceptance of an ATCRBS/Mode S All-Call interrogations the transponder shall <<shall0318>> generate the PI field using II=0. | transponder shall <<shall0409>> reply by overlaying the contents of the received CL and IC fields on parity according to paragraph 3.20.2.1, resulting in the PI field which shall <<shall0410>> be used in the All-Call reply (DF=11). Upon acceptance of a Mode A/C/Mode S All-Call interrogations the transponder shall <<shall0411>> generate the PI field using II=0 or SI=0. |

| Similar | ID=1066 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0331 | Page 79 | ED 73C v01 | shall0426 | Page 71 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.19.1.2 Error Protection | | | 3.21.1.2 Error Protection | | |
| The parity algorithm described in §2.2.18.2.1 shall <<shall0331>> be expanded to include 112-bit transmissions. | | | The parity algorithm shall <<shall0426>> be as described in paragraph 3.20.2.1. | | |

| Similar | ID=1086 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0351 | Page 85 | ED 73C v01 | shall0449 | Page 73 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.19.1.12.1 Data Source Designators | | | 3.21.1.12 Comm-B Protocol (Figure 3-18) | | |
| When Comm-B information to be transmitted resides in data sources that are part of the Mode S installation, the data sources shall <<shall0351>> be identified by the BDS code of §2.2.14.4.20.b. The interrogator uses the RR field of surveillance and Comm-A interrogations to designate the BDSl of the data source from which the reply should originate. BDS1 is represented by the last four bits (10-13) of the received RR code (see §2.2.14.4.35). | | | The 8-bit BDS code shall <<shall0449>> determine the register whose contents shall <<shall0450>> be transferred in the MB field of the Comm-B reply. It shall <<shall0451>> be expressed in two groups of 4 bits each, BDS1 (most significant 4 bits) and BDS2 (least significant 4 bits). | | |

| Similar | ID=1101 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0382 | Page 90 | ED 73C v01 | shall0493 | Page 77 |
| WAT | Comment: DO references Level 2 | | | | |
| | | | | | |
| 2.2.19.1.15 Multisite Message Protocol | | | 3.21.1.15 Comm-B Multisite Message Protocol | | |
| The Level 2 transponder shall <<shall0382>> use the multisite message protocol of §2.2.19.2 as it applies to Comm-D operation. | | | The transponder shall <<shall0493>> use the Comm-B multisite message protocol of paragraph 3.21.2. | | |

| Similar | ID=1106 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0387 | Page 91 | ED 73C v01 | shall0498 | Page 78 |
| WAT | Comment: DO makes additional paragraph reference | | | | |

| 2.2.19.1.18 TCAS Crosslink Protocol | 3.21.1.18 ACAS Crosslink Protocol. |
|---|---|
| In response to a UF=0 with RL=1 (see §2.2.14.4.34) and DS (0 (see §2.2.14.4.9), the transponder shall <<shall0384>> reply with a DF=16 reply in which the MV field shall <<shall0385>> contain the contents of the ground-initiated Comm-B register designated by the DS value. In response to a UF=0 with RL=1 and DS=0, the transponder shall <<shall0386>> reply with a DF=16 with an MV field of all zeroes. Receipt of a UF=0 with DS non-zero but RL=0 shall <<shall0387>> have no associated TCAS crosslink action, and the transponder shall <<shall0388>> reply per §2.2.14.4.34. | In response to a UF=0 with RL=1 (3.18.4.31) and DS(0 (3.18.4.11), the transponder shall <<shall0495>> reply with a DF=16 reply in which the MV field shall <<shall0496>> contain the contents of the GICB register designated by the DS value. In response to a UF=0 with RL=1 and DS=0, the transponder shall <<shall0497>> reply with a DF=16 with an MV field of all zeroes. Receipt of a UF=0 with DS(0 but RL=0 shall <<shall0498>> have no associated ACAS crosslink action. |

| Similar | ID=1107 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0388 | Page 91 | ED 73C v01 | shall0498 | Page 78 |
| WAT | Comment: DO 2d shall has no direct parallel in ED | | | | |

| 2.2.19.1.18 TCAS Crosslink Protocol | 3.21.1.18 ACAS Crosslink Protocol. |
|---|---|
| In response to a UF=0 with RL=1 (see §2.2.14.4.34) and DS (0 (see §2.2.14.4.9), the transponder shall <<shall0384>> reply with a DF=16 reply in which the MV field shall <<shall0385>> contain the contents of the ground-initiated Comm-B register designated by the DS value. In response to a UF=0 with RL=1 and DS=0, the transponder shall <<shall0386>> reply with a DF=16 with an MV field of all zeroes. Receipt of a UF=0 with DS non-zero but RL=0 shall <<shall0387>> have no associated TCAS crosslink action, and the transponder shall <<shall0388>> reply per §2.2.14.4.34. | In response to a UF=0 with RL=1 (3.18.4.31) and DS(0 (3.18.4.11), the transponder shall <<shall0495>> reply with a DF=16 reply in which the MV field shall <<shall0496>> contain the contents of the GICB register designated by the DS value. In response to a UF=0 with RL=1 and DS=0, the transponder shall <<shall0497>> reply with a DF=16 with an MV field of all zeroes. Receipt of a UF=0 with DS(0 but RL=0 shall <<shall0498>> have no associated ACAS crosslink action. |

| Similar | ID=1109 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0397 | Page 94 | ED 73C v01 | shall0511 | Page 82 |
| WAT | Comment: 0 | | | | |

| 2.2.19.2.2.1 Multisite Timers | 3.21.2.2 Multisite Common Protocols |
|---|---|
| Each multisite timer shall <<shall0397>> run for 18 ±1 seconds after starting or restarting and is used for automatic closeout of the respective message type. | Each multisite timer (TR) shall <<shall0511>> run for 18 ±1.0 seconds after starting or restarting and is used for automatic closeout of the respective message type. |

| Similar | ID=1129 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0417 | Page 98 | ED 73C v01 | shall0654 | Page 98 |
| WAT | Comment: ED provides additional text | | | | |
| | | | | | |
| 2.2.20.1.1.1.1 Initializing Segment Transfer | | | 3.21.3.1 Comm-C/ELM Protocol (Figures 3-19 and 3-20) | | |
| The ELM transaction for an n-segment message (NCs 0 through n-l) shall <<shall0414>> be initiated upon receipt of a Comm-C transmission containing RC=0. The text transmitted in MC shall <<shall0415>> be stored. This text is the last segment of the message and carries NC=n-l. Upon receipt of NC, the transponder shall <<shall0416>> establish the number of further segments to be received and stored. Receipt of an initializing (RC=0) segment shall <<shall0417>> establish the "setup" in the transponder, which is now prepared to accept further segments. | | | The ELM transaction for an n-segment message (NCs 0 through n-1) shall <<shall0651>> be initiated upon receipt of a Comm-C transmission containing RC=0. The text transmitted in MC shall <<shall0652>> be stored. This text is the last segment of the message and carries NC=n-1. Upon receipt of NC, the transponder shall <<shall0653>> establish the number of further segments to be received and stored. Receipt of an initializing (RC=0) segment shall <<shall0654>> establish the "setup" which includes the clearing of TAS and all segments of all previous ELMs in the transponder, which is now prepared to accept further segments. | | | |

| Similar | ID=1191 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0626 | Page 129 | ED 73C v01 | shall0585 | Page 90 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.23.1.3 Extended Squitter Rate | | | 3.21.2.6.3 Extended squitter rate | | |
| f. Event-driven Squitter Rate. The event-driven squitter shall <<shall0624>> be transmitted once, each time that GICB register 0A {HEX} is loaded, while observing the delay conditions specified in subparagraph g. The maximum transmission rate for the event-driven squitter shall <<shall0625>> be limited by the transponder to twice per second. If a message is inserted in the event-driven register and cannot be transmitted due to rate limiting, it shall <<shall0626>> be held and transmitted when the rate limiting condition has cleared If a new message is received before transmission is permitted, it shall <<shall0627>> overwrite the earlier message. | | | e. Event-driven Squitter Rate. The event-driven squitter shall <<shall0583>> be transmitted once, each time that GICB register 0A {HEX} is loaded, while observing the delay conditions specified in subparagraph f. The maximum transmission rate for the event-driven squitter shall <<shall0584>> be limited by the transponder to twice per second. If a message is inserted in the event-driven register and cannot be transmitted due to rate limiting, it shall <<shall0585>> be held and transmitted when the rate limiting condition has cleared. If a new message is received before transmission is permitted, it shall <<shall0586>> overwrite the earlier message. | | | |

| Similar | ID=1200 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0639 | Page 131 | ED 73C v01 | shall0621 | Page 93 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 2.2.23.1.5.1 Automatic Format Selection | | | 3.21.2.6.5 Airborne/Surface State Determination | | |

| | |
|---|---|
| Aircraft with an automatic means of determining on-the-ground condition shall <<shall0639>> use this input to select whether to report the airborne (airborne position and airborne velocity) or surface (surface position) message types, except airborne format is selected if airborne status is determined when the input indicates on-the-ground condition as specified in §2.2.18.2.7. | Aircraft with an automatic means of determining on-the-ground condition shall <<shall0621>> use this input to select whether to report the airborne or surface message types. Aircraft without such means shall <<shall0622>> report the airborne type messages. Aircraft with or without such automatic on-the-ground determination shall <<shall0623>> use position message types as commanded by control codes in the TCS subfield (Paragraph 3.21.2.6.7). After timeout of the TCS commands, control of airborne/surface determination shall <<shall0624>> revert to the means described above. |

**Summary of Different Shalls**

| Different | ID=684 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0219 | Page 41 |
| WAT | Comment: Related but not the same | | | | |
| | GWF – Match is in DO-181D at 2.2.8.5.a | | | | |
| | | | 3.12.5 Pulse Pair Interference | | |
| No match in DO 181Dv8 | | | d. If a P1-P2 suppression pair and a Mode A or Mode C intermode interrogation are recognised simultaneously the transponder shall <<shall0219>> be suppressed. | | |

| Different | ID=755 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0033 | Page 20 | ED 73C v01 | shall0112 | Page 27 |
| WAT | Comment: WT-mix of Mode A/C and Mode S, RG-It appears that ED 3.4.1 and 3.4.2 cover this | | | | |
| | | | | | |
| 2.2.3.4.1 ATCRBS Reply Rate Capability | | | 3.4.2 Reply Rate Capability - Mode S | | |
| a. The transponder shall <<shall0033>> be able to continuously generate at least 500 ATCRBS 15-pulse replies per second. | | | The total reply rate over each time interval specified below, shall <<shall0112>> be the sum of the individual Mode A/C replies at an average rate of 500 per second and the Mode S reply rate over that interval. | | |

| Different | ID=756 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0034 | Page 20 | ED 73C v01 | shall0110 | Page 27 |
| WAT | Comment: RG- It appears that ED 3.4.1 a covers this material | | | | |
| | | | | | |
| 2.2.3.4.1 ATCRBS Reply Rate Capability | | | 3.4.1 Reply Rate Capability - Mode A/C | | |
| b. If intended for installation in aircraft that operate at altitudes above 15,000 feet, the transponder shall <<shall0034>> be capable of a peak reply rate of 1,200 ATCRBS 15-pulse replies per second for a duration of 100 milliseconds. | | | CLASS 1 equipment shall <<shall0110>> be capable of at least 1 200 Mode A/C replies per second for a 15-pulse coded reply (including 2 framing pulses, 12 information pulses and the SPI pulse). | | |

| Different | ID=757 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0035 | Page 20 | ED 73C v01 | shall0111 | Page 27 |
| WAT | Comment: RG- It appears that ED 3.4.1 b covers this material | | | | |
| | | | | | |

| 2.2.3.4.1 ATCRBS Reply Rate Capability | 3.4.1 Reply Rate Capability - Mode A/C |
|---|---|
| c. If intended for installation in aircraft that operate at altitudes not exceeding 15,000 feet, the transponder shall <<shall0035>> be capable of a peak reply rate of 1,000 ATCRBS 15-pulse replies per second for a duration of 100 milliseconds. | CLASS 2 equipment shall <<shall0111>> be capable of at least 1 000 Mode A/C replies per second for a 15-pulse coded reply (including 2 framing pulses, 12 information pulses and the SPI pulse). |

| Different | ID=769 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0047 | Page 22 | ED 73C v01 | shall0120 | Page 28 |
| WAT | Comment: WT - The DO shall says no Mode C SPI and the ED leaves that question open; RG - ED 3.5.3 a and 3.5.3c state that SPI is added to Mode A reply --this appears to be equivalent to DO | | | | |
| | | | | | |

| 2.2.4.1.3 ATCRBS-SPI | 3.5.3 Mode A/C Special Position Identification (SPI) Pulse |
|---|---|
| In addition to the information pulses provided, an SPI pulse, which may be used with any of the other information pulses upon request, shall <<shall0043>> be provided at a spacing 4.35 microseconds following the last framing pulse. The SPI pulse shall <<shall0044>> be initiated by an IDENT switch. Upon activation of the IDENT switch, the SPI pulse shall <<shall0045>> be transmitted when replying to ATCRBS Mode A interrogations for a period of 18 ±1.0 seconds. The SPI pulse shall <<shall0046>> be transmitted only if the IDENT switch is first activated. The SPI pulse shall <<shall0047>> not be transmitted when replying to Mode C interrogations. | c. Upon activation of the IDENT switch, the SPI pulse shall <<shall0120>> be transmitted when replying to Mode A interrogations for a period of 18 ±1.0 seconds. |

| Different | ID=798 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0076 | Page 25 | ED 73C v01 | shall0161 | Page 32 |
| WAT | Comment: WT -DO references 1% while the ED references 10%; RG - ED 3.8.2 s and DO 2.2.5.1c both refer to 10%; WT - It seems that there is some mix-up in the requirements as 2.2.4.c is a different subject but sounds similar or the same. | | | | |
| | | | | | |

| 2.2.5.1 Side Lobe Suppression, ATCRBS, ATCRBS-Only All-Call, and ATCRBS/Mode S All-Call | 3.8.2 Side Lobe Suppression, Mode A/C, Mode A/C-Only All-Call, and Mode A/C/S All-Call |
|---|---|
| The transponder shall <<shall0076>> reply to no more than one percent of the interrogations under all combinations of the following conditions: | The transponder shall <<shall0161>> reply to no more than 10% of the interrogations if |

| Different | ID=833 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0111 | Page 29 | ED 73C v01 | shall0192 | Page 39 |
| WAT | Comment: ED parenthetically references UF=24 | | | | |

| | |
|---|---|
| 2.2.7.2.1 Recovery From a Mode S Interrogation If No Reply Is Required | 3.10.2 Recovery |
| Following a correctly addressed Mode S interrogation which has been accepted and which requires no reply, a transponder shall <<shall0111>> recover sensitivity to within 3 dB of MTL no later than 45 microseconds after receipt of the sync phase reversal. | Following a correctly addressed Mode S interrogation (other than Comm-C, Uplink Format UF=24) which has been accepted and demands no reply, a transponder shall <<shall0192>> recover sensitivity to within 3 dB of MTL no later than 45 µs after receipt of the sync phase reversal. |

| Different | ID=834 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0111 | Page 29 | ED 73C v01 | shall0193 | Page 39 |
| WAT | Comment: WT - See previous ED entry (shall 192); RG - ED 3.10.2 f matches the content of DO 2.2.7.3.1; WT - it appears to be a mix up in requirement statements. | | | | |

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|---|---|
| 2.2.7.2.1 Recovery From a Mode S Interrogation If No Reply Is Required | 3.10.2 Recovery |
| Following a correctly addressed Mode S interrogation which has been accepted and which requires no reply, a transponder shall <<shall0111>> recover sensitivity to within 3 dB of MTL no later than 45 microseconds after receipt of the sync phase reversal. | Following a Comm-C interrogation for which no reply is required, a transponder with Comm-C capability shall <<shall0193>> recover sensitivity to within 3 dB of MTL no later than 45 µs after the receipt of the sync phase reversal. |

| Different | ID=844 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0118 | Page 30 | ED 73C v01 | shall0204 | Page 39 |
| WAT | Comment: WT - DO mentions "without regard" and ED has different constraints on rates; RG - The "without regard…" material in DO is included in the 3rd paragraph under 3.11 of ED. Are there extra requirements in subsections a and b of ED? | | | | |

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|---|---|
| 2.2.7.3.1 ATCRBS Reply Rate Limiting | 3.11 REPLY RATE LIMITING |
| A sensitivity-reduction reply rate limit shall <<shall0117>> be incorporated in the transponder for ATCRBS replies. The limit shall <<shall0118>> be capable of being adjusted between 500 continuous ATCRBS Mode A and Mode C replies per second and the maximum continuous rate of which the transponder is capable, or 2000 replies per second, whichever is less, without regard to the number of pulses in each reply. Sensitivity reduction shall <<shall0119>> apply only to the receipt of ATCRBS, ATCRBS/Mode S All-Call, and ATCRBS-Only All-Call interrogations. | Without regard to the number of pulses in each reply, the limit control shall <<shall0204>> permit adjustment to any value between 500 continuous Mode A/C replies per second and |

| Different | ID=846 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0120 | Page 30 | ED 73C v01 | shall0206 | Page 40 |
| WAT | Comment: ED additionally refers to "acquisition squitter…" First shall | | | | |

| | |
|---|---|
| 2.2.7.3.2 Mode S Reply Rate Limiting | 3.11 REPLY RATE LIMITING |
| If a reply rate limiting device is provided for Mode S replies, it shall <<shall0120>> permit at least the reply rates required in §2.2.3.4.2. A limiting device may be used to protect the transponder from accidental over-interrogation. | If a reply rate limiting device is provided for Mode S replies, it shall <<shall0206>> permit at least the reply rates specified in paragraph 3.4 and shall <<shall0207>> not prevent acquisition squitter transmission as per 3.20.2.6 and extended squitter as per 3.21.2.6 nor the transmission of a DF=16 (3.21.1.4). |

| | | | | | |
|---|---|---|---|---|---|
| Different | ID=847 | | | | |
| DO 181D v08 | shall0120 | Page 30 | ED 73C v01 | shall0207 | Page 40 |
| WAT | Comment: ED additionally refers to "acquisition squitter…" second shall | | | | |
| | | | | | |
| 2.2.7.3.2 Mode S Reply Rate Limiting | | | 3.11 REPLY RATE LIMITING | | |
| If a reply rate limiting device is provided for Mode S replies, it shall <<shall0120>> permit at least the reply rates required in §2.2.3.4.2. A limiting device may be used to protect the transponder from accidental over-interrogation. | | | If a reply rate limiting device is provided for Mode S replies, it shall <<shall0206>> permit at least the reply rates specified in paragraph 3.4 and shall <<shall0207>> not prevent acquisition squitter transmission as per 3.20.2.6 and extended squitter as per 3.21.2.6 nor the transmission of a DF=16 (3.21.1.4). | | |

| | | | | | |
|---|---|---|---|---|---|
| Different | ID=867 | | | | |
| DO 181D v08 | shall0141 | Page 33 | ED 73C v01 | shall0235 | Page 43 |
| WAT | Comment: 0 | | | | |
| | GWF – SC-209 does not have a failure indication if a change in the 24 bit address is detected. References should be to DO-181D, 2.2.13.1.1 and ED-73C, 3.17.1 | | | | |
| 2.2.10.3 Mode S Address Verification | | | 3.14.3 Failure Indication | | |
| The Mode S transponder shall <<shall0141>> declare a transponder failure in the event that its own Mode S address is all zeros or all ones. | | | Failures related to the 24 bit discrete address shall <<shall0235>> generate a diagnostic error message in order to alert maintenance personnel (if a change in the 24 bit discrete address is detected or if a 24 bit discrete address consisting of all ONEs or all ZEROs is read during the power-on initialisation process). | | |

| | | | | | |
|---|---|---|---|---|---|
| Different | ID=875 | | | | |
| DO 181D v08 | shall0149 | Page 34 | ED 73C v01 | shall0240 | Page 43 |
| WAT | Comment: ED standard identifies max distance of 7.6 m | | | | |
| | GWF – correct reference is DO-181D, 3.1.6.b where reference is made to 7.6 m. | | | | |
| 2.2.12 Diversity Operations | | | 3.16.1 General | | |

| | |
|---|---|
| Diversity Mode S transponders may be implemented for the purpose of improving air-to-air surveillance and communications. Such systems shall <<shall0149>> employ two antennas, one mounted on the top and the other on the bottom of the aircraft. Appropriate switching and signal processing channels to select the best antenna on the basis of the characteristics of the received interrogation signals shall <<shall0150>> also be provided. Such diversity systems, in their installed configuration, shall <<shall0151>> not result in degraded performance relative to that which would have been produced by a single system having a bottom-mounted antenna. | b. Such systems shall <<shall0240>> employ two antennas, one mounted on the top and the other on the bottom of the aircraft, separated by a maximum horizontal distance of 7.6 m. |

| | | | | | |
|---|---|---|---|---|---|
| Different | ID=885 | | | | |
| DO 181D v08 | shall0156 | Page 35 | ED 73C v01 | shall0249 | Page 44 |
| WAT | Comment: The ED shall is in a Note | | | | |
| | GWF – WG-49 will discuss shall inside note. | | | | |
| 2.2.12.1 Diversity Antenna Selection and Selection Threshold | | | 3.16.2 Diversity Antenna Selection | | |
| Additional selection can be made based on the correctness of a received complete Mode S interrogation. In this case, the RF port having the correct signal will be selected. If correctness is observed in both channels, selection shall <<shall0156>> be based on relative signal strength. This additional selection criterion is an optional feature. | | | NOTE 2: Optionally, selection may be based on the correctness of a received complete Mode S interrogation. In this case, the RF port having the correct signal shall <<shall0248>> be selected. If correctness is observed in both channels, selection shall <<shall0249>> be based on relative signal strength. | | |

| | | | | | |
|---|---|---|---|---|---|
| Different | ID=891 | | | | |
| DO 181D v08 | shall0162 | Page 36 | ED 73C v01 | shall0255 | Page 45 |
| WAT | Comment: DO 0.08 vs. ED 0.13 | | | | |
| | GWF – Correct reference in DO-181D is 3.1.6.c. | | | | |
| 2.2.12.4 Reply Delay of Diversity Transponders | | | 3.16.6 Reply Delay of Diversity Transponders | | |
| The total difference in mean reply delay between the two antenna channels (including the transponder-to-antenna cables) shall <<shall0162>> not exceed 0.08 microsecond for interrogations of equal amplitude. This requirement is applicable to interrogation signal strengths between MTL +3 dB, and -21 dBm. | | | The total difference in mean reply delay between the two antenna channels (including the transponder-to-antenna cables) shall <<shall0255>> not exceed 0.13 µs for interrogations of equal amplitude. This requirement is applicable to interrogation signal strengths between MTL +3 dB and -21 dBm. | | |

| | | | | | |
|---|---|---|---|---|---|
| Different | ID=941 | | | | |
| DO 181D v08 | shall0213 | Page 43 | ED 73C v01 | shall0307 | Page 51 |
| WAT | Comment: Perhaps the same results, but clearly different. | | | | |
| | GWF – non-issue | | | | |

| 2.2.13.3.2 Downlink Interface | 3.17.3 Standard Transaction Interfaces |
|---|---|
| a. Information Content – The interface shall <<shall0213>> be able to insert into the downlink transmission any bit not inserted by the transponder. | If the interface is designed to insert bits into the transponder for immediate transmission, such bits shall <<shall0307>> occur at the interface at least one microsecond before actual transmission. |

| Different | ID=966 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0237 | Page 53 | ED 73C v01 | shall0336 | Page 57 |
| WAT | Comment: WT - DO states "multisite… or multisite …" and ED states "in conjunction with …" These may be the same; RG - they may have the same effect. | | | | |
| | GWF – no real differences in the two, even though they probably should not be requirements. Will discuss. | | | | |
| 2.2.14.4.17 II Interrogator Identification | | | 3.18.4.15 Interrogator Identification II | | |
| This 4-bit value shall <<shall0235>> define an interrogator identifier (II) code. These II codes shall <<shall0236>> be assigned to interrogators in the range of 0 to 15. An II code value of ZERO shall <<shall0237>> not be used by interrogators which use the multisite lockout protocols (see §2.2.18.2.5) or multisite communications protocols (see §2.2.19.2). | | | This 4-bit value shall <<shall0334>> define an interrogator identifier (II) code. These II codes shall <<shall0335>> be assigned to interrogators in the range of 0 to 15. An II code value of zero shall <<shall0336>> only be used in conjunction with acquisition based on lockout override. | | |

| Different | ID=981 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0247 | Page 62 | ED 73C v01 | shall0746 | Page 107 |
| WAT | Comment: 0 | | | | |
| | GWF – actually says the same thing but the extraction on ED-73 stopped short of including bullets below text. | | | | |
| 2.2.15.4 Radiation Pattern | | | 3.22.4 Radiation Pattern | | |
| The gain shall <<shall0247>> not be less than the gain of a matched quarter-wave stub minus 3 dB over 90 percent of a coverage volume from 0 to 360 degrees in azimuth and from 5 to 30 degrees above the ground plane when installed at the center of 1.2 meter (4 feet) diameter (or larger) flat circular ground plane. | | | When mounted at the centre of a 1.2 m diameter (or larger) flat, circular ground plane, the antenna gain shall <<shall0746>> not be less than that of a matched quarter-wave stub, minus 3 dB, over 90% of a coverage volume of: | | |

| Different | ID=1078 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0343 | Page 82 | ED 73C v01 | shall0441 | Page 73 |
| WAT | Comment: DO mentions DF=17 | | | | |
| | GWF – ED-73 needs to be updated to add DF=17 | | | | |
| 2.2.19.1.7 Capability Report | | | 3.21.1.7 Capability Report | | |
| The transponder shall <<shall0343>> reply with a non-zero value of CA (see §2.2.14.4.6) in the capability field of DF=11 and DF=17, indicating that further data link information is available in a data link capability report | | | The transponder shall <<shall0441>> reply with a non-zero value of CA (paragraph 3.18.4.5) in the capability field of DF=11, indicating that further data link information is available in a data link capability report (paragraph | | |

| | |
|---|---|
| (§2.2.19.1.12.5). | 3.21.1.12 d). |

| Different | ID=1108 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0389 | Page 91 | ED 73C v01 | shall0501 | Page 78 |
| WAT | Comment: DO only for level 2 transponder | | | | |
| | GWF – DO-181 needs to change to “Level 2” | | | | |
| 2.2.19.2 The Multisite Message Protocol | | | 3.21.2 Multisite Message Protocol | | |
| All multisite protocols are covered in the following paragraphs. However, only the Comm-B protocol shall <<shall0389>> apply to the minimum data link transponder. | | | Comm-B protocol shall <<shall0501>> apply to all Datalink transponders, Comm-C to level 3 and higher, and Comm-D to level 4 and higher. | | |

| Different | ID=1146 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0445 | Page 103 | ED 73C v01 | shall0314 | Page 52 |
| WAT | Comment: WT - ED mentions level 3 and 4 transponders; RG - This appears to be an organizational difference. The separate requirement for different transponder levels is given in DO 2.2.20.1,2.2.20.3 a -f and 2.2.23.1.4 | | | | |
| | GWF – SC-209 agrees with comment from RG. Everything OK. | | | | |
| 2.2.20.1.4 Uplink Interface – Data Rate | | | 3.17.4 ELM Service Interfaces | | |
| A transponder equipped for standard uplink ELM operation shall <<shall0445>> be able to transfer data from at least four complete 16-segment uplink ELMs in any four-second period. A transponder equipped for enhanced uplink ELM operation shall <<shall0446>> be able to transfer data from at least four 16-segment uplink ELMs in any one-second period. In each case, the ELMs shall <<shall0447>> be transferred if they are spaced no closer than 5 milliseconds from the end of one ELM to the beginning of the next. For transponders equipped with the enhanced protocols, this 5 millisecond spacing requirement shall <<shall0448>> also apply to successive 16 segment ELMs bearing the same II code. The content of any uplink ELM shall <<shall0449>> be available for transfer across the output interface no later than ONE (1) second after it has been received. | | | (1) A transponder equipped for uplink ELM operation (Comm-C) shall <<shall0314>> be capable of processing at least 4 complete 16-segment ELMs in any 4-second period (level 3 and 4 transponders). A level 5 transponder shall <<shall0315>> be capable of processing at least 4 complete 16-segment ELMs in any 1 second period. | | |

| Different | ID=1167 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0469 | Page 108 | ED 73C v01 | shall0552 | Page 87 |
| WAT | Comment: ED contains additional information - may be comparable | | | | |
| | GWF – OK as is. | | | | |
| 2.2.20.2.3.6 Significance of PC Command | | | 3.21.2.5 Multisite Downlink ELM Protocol | | |
| When the transponder is in the multisite mode, i.e., when the IIS stored for | | | When the transponder is in the multisite mode, i.e., when the IIS stored for | | |

| | |
|---|---|
| Comm-D is not "0," receipt of a closeout (PC=6) shall <<shall0469>> have no effect on the transaction unless accompanied by IIS equal to the stored Comm-D IIS. | Comm-D is not "0," receipt of a closeout (PC=6) shall <<shall0552>> have no effect on the transaction unless accompanied by IIS equal to the stored Comm-D IIS, in which case the closeout is effected in accordance with 3.21.2.5 d. |

| | | | | | |
|---|---|---|---|---|---|
| Different | ID=1180 | | | | |
| DO 181D v08 | shall0615 | Page 128 | ED 73C v01 | shall0553 | Page 87 |
| WAT | Comment: May be considered comparable | | | | |
| | GWF – seems to be OK. | | | | |
| 2.2.23.1.3 Extended Squitter Rate | | | 3.21.2.6 Extended Squitter Protocols | | |
| When Extended Squitters are broadcast, transmission rates shall <<shall0614>> be as indicated in the following paragraphs. Acquisition squitters shall <<shall0615>> be reported in addition to Extended Squitters as specified in §2.2.18.2.6.c. Acquisition squitters shall <<shall0616>> always be reported if no Extended Squitters are reported. | | | In addition to the aquisition squitters (paragraph 3.20.2.6) Datalink transponders may be capable of transmitting extended squitters. When a transponder has extended squitter capability it shall <<shall0553>> not be possible to inhibit acquisition squitters except as specified in this section (3.21.2.6) | | |

| | | | | | |
|---|---|---|---|---|---|
| Different | ID=1181 | | | | |
| DO 181D v08 | shall0616 | Page 128 | ED 73C v01 | shall0573 | Page 89 |
| WAT | Comment: RG - The additional requirements for Ed 3.21.2.6.33 appear to be in DO 2.2.23.1.3 a-f and 2.2.23.1.4 | | | | |
| | GWF – SC-209 agrees with RG comment. | | | | |
| 2.2.23.1.3 Extended Squitter Rate | | | 3.21.2.6.3 Extended squitter rate | | |
| When Extended Squitters are broadcast, transmission rates shall <<shall0614>> be as indicated in the following paragraphs. Acquisition squitters shall <<shall0615>> be reported in addition to Extended Squitters as specified in §2.2.18.2.6.c. Acquisition squitters shall <<shall0616>> always be reported if no Extended Squitters are reported. | | | At power up initialization, the transponder shall <<shall0568>> commence operation in a mode in which it broadcasts only acquisition squitters (Paragraph 3.20.2.6). The transponder shall <<shall0569>> initiate the broadcast of extended squitters for airborne position, surface position, airborne velocity and aircraft identification when data are inserted into GICB registers 05, 06, 09 and 08 {HEX} respectively. This determination shall <<shall0570>> be made individually for each squitter type. The insertion of altitude data into register 05 by the transponder (Paragraph 3.21.2.6.8) shall <<shall0571>> not satisfy the minimum requirement for initialisation of broadcast of the airborne position squitter. When extended squitters are broadcast, transmission rates shall <<shall0572>> be as indicated in the following paragraphs. Acquisition squitters shall <<shall0573>> be reported in addition to extended squitters unless the acquisition squitter is inhibited (Paragraph 3.20.2.6). Acquisition squitters shall <<shall0574>> always be reported if extended position or velocity squitters are not reported. | | |

## Summary of Uncertain Shalls

| Uncertain | ID=994 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0260 | Page 67 | ED 73C v01 | shall0361 | Page 64 |
| WAT | Comment: ED mentions "VS or FS fields" and DO does not. | | | | |
| | GWF – requirements elsewhere in DO-181D, 2.1.7 | | | | |
| 2.2.18.2.2 Interrogation Acceptance Protocol (Figure 2-11) | | | 3.20.2.2 Interrogation Acceptance Protocol (Figure 3-10) | | |
| b. All-Call Address – If the address extracted from the received interrogation consists of 24 ONEs and UF=11, the transmission is a Mode S-Only All-Call and the received interrogation shall <<shall0260>> be accepted according to i below unless the lockout protocol is in effect. | | | b. All-Call Address - If the address extracted from the received interrogation consists of 24 ONEs and UF=11, the transmission is a Mode S-Only All-Call and the received interrogation shall <<shall0361>> be accepted according to i below unless the lockout protocol is in effect or the "on the ground" report (VS or FS field) indicates the ground condition. | | |

| Uncertain | ID=995 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0261 | Page 67 | ED 73C v01 | shall0362 | Page 64 |
| WAT | Comment: ED mentions VS and FS fields | | | | |
| | GWF – requirements elsewhere in DO-181D, 2.1.7 | | | | |
| 2.2.18.2.2 Interrogation Acceptance Protocol (Figure 2-11) | | | 3.20.2.2 Interrogation Acceptance Protocol (Figure 3-10) | | |
| c. ATCRBS/Mode S All-Call – An ATCRBS/Mode S All-Call interrogation (1.6 microseconds P4) shall <<shall0261>> be accepted unless the TD timer is running or side lobe suppression is in effect. | | | c. Mode A/C/Mode S All-Call - A Mode A/C/Mode S All-Call interrogation (1.6 microseconds P4) shall <<shall0362>> be accepted unless the TD timer is running or side lobe suppression is in effect or the "on the ground" report (VS or FS field) indicates the ground condition. | | |

| Uncertain | ID=999 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0265 | Page 68 | ED 73C v01 | shall0366 | Page 64 |
| WAT | Comment: ED mentions VS and FS fields | | | | |
| | GWF – requirements elsewhere in DO-181D, 2.1.7 | | | | |
| 2.2.18.2.2 Interrogation Acceptance Protocol (Figure 2-11) | | | 3.20.2.2 Interrogation Acceptance Protocol (Figure 3-10) | | |
| g. All-Call Lockout Conditions – On receipt of a Mode S-Only All-Call (UF=11) containing II corresponding to the designator of a running TL timer, the interrogation shall <<shall0265>> not be accepted unless the contained PR code is 8 through 12. Upon receipt of a Mode S-Only All-Call (UF=11) containing II=0, the interrogation shall <<shall0266>> be accepted if the TD timer is not running or if the received PR code is 8 through 12. | | | g. All-Call Lockout Conditions - On receipt of a Mode S-Only All-Call (UF=11) containing II corresponding to the designator of a running TL timer, the interrogation shall <<shall0366>> not be accepted unless the contained PR code is 8 through 12 and the "on the ground" report (VS or FS field) does not indicate the ground condition. Upon receipt of a Mode S-Only All-Call (UF=11) containing II=0, the interrogation shall <<shall0367>> be accepted if the TD timer is not running or if the received PR code is 8 through 12 and the "on the ground" report (VS or FS field) does not indicate the ground condition. | | |

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| Uncertain | ID=1000 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0266 | Page 68 | ED 73C v01 | shall0367 | Page 64 |
| WAT | Comment: ED mentions VS and FS fields | | | | |
| | GWF – requirements elsewhere in DO-181D, 2.1.7 | | | | |
| 2.2.18.2.2 Interrogation Acceptance Protocol (Figure 2-11) | | | 3.20.2.2 Interrogation Acceptance Protocol (Figure 3-10) | | |
| g. All-Call Lockout Conditions – On receipt of a Mode S-Only All-Call (UF=11) containing II corresponding to the designator of a running TL timer, the interrogation shall <<shall0265>> not be accepted unless the contained PR code is 8 through 12. Upon receipt of a Mode S-Only All-Call (UF=11) containing II=0, the interrogation shall <<shall0266>> be accepted if the TD timer is not running or if the received PR code is 8 through 12. | | | g. All-Call Lockout Conditions - On receipt of a Mode S-Only All-Call (UF=11) containing II corresponding to the designator of a running TL timer, the interrogation shall <<shall0366>> not be accepted unless the contained PR code is 8 through 12 and the "on the ground" report (VS or FS field) does not indicate the ground condition. Upon receipt of a Mode S-Only All-Call (UF=11) containing II=0, the interrogation shall <<shall0367>> be accepted if the TD timer is not running or if the received PR code is 8 through 12 and the "on the ground" report (VS or FS field) does not indicate the ground condition. | | |

| Uncertain | ID=1003 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0269 | Page 68 | ED 73C v01 | shall0370 | Page 65 |
| WAT | Comment: ED mentions VS and FS fields | | | | |
| | GWF – requirements elsewhere in DO-181D, 2.1.7 | | | | |
| 2.2.18.2.2 Interrogation Acceptance Protocol (Figure 2-11) | | | 3.20.2.2 Interrogation Acceptance Protocol (Figure 3-10) | | |
| i. Stochastic All-Calls – Upon receipt of a Mode S-Only All-Call with a PR (§2.2.14.4.31) code other than 0 or 8, the transponder shall <<shall0268>> execute a random process. If the reply probability indicated by the outcome of the random process is less than or equal to the reply probability indicated by the value of PR and if no lockout condition applies (includes override, §2.2.18.2.4) the transponder shall <<shall0269>> accept the interrogation. | | | i. Stochastic All-Calls - Upon receipt of a Mode S-Only All-Call with a PR (paragraph 3.18.4.28 ) code other than 0 or 8, the transponder shall <<shall0369>> execute a random process. If the reply probability indicated by the outcome of the random process is less than or equal to the reply probability indicated by the value of PR and if no lockout condition applies (includes override, paragraph 3.20.2.4) and the "on the ground" report (VS or FS field) does not indicate the ground condition the transponder shall <<shall0370>> accept the interrogation. | | |

**Summary of No Link Shalls**

| No Link | ID=669 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0018 | Page 13 |
| WAT | Comment: No comparable text but not a major issue | | | | |
| | | | | | |
| | | | 2.5 CONTROL AND INDICATION FUNCTIONS | | |
| No match in DO 181Dv8 | | | All selected Mode A 4096 Codes shall <<shall0018>> be shown. | | |

| No Link | ID=668 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0019 | Page 13 |
| WAT | Comment: No Hijack mode in DO181 | | | | |
| | | | | | |
| | | | 2.5 CONTROL AND INDICATION FUNCTIONS | | |
| No match in DO 181Dv8 | | | The 7500 Hijack Code shall <<shall0019>> NOT be displayed by the Control Function. | | |

| No Link | ID=670 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0022 | Page 14 |
| WAT | Comment: Hijack not in DO | | | | |
| | | | | | |
| | | | 2.5 CONTROL AND INDICATION FUNCTIONS | | |
| No match in DO 181Dv8 | | | No method shall <<shall0022>> be capable of rendering the transponder incapable of generating replies to Mode A/C, Mode A/C/S All Call, and Mode-S Only All-Call interrogations whenever the transponder is in the Hijack Mode (2.6) whether in the airborne or in the on-ground state (3.17.1 b (3), 3.21.2.6.5, 3.20.2.7 b and 3.20.2.7 c). The transponder shall <<shall0023>> also continue to generate Mode S squitter transmissions and reply to discretely addressed Mode-S interrogations when the aircraft is in the Hijack Mode (2.7). | | |

| No Link | ID=671 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0023 | Page 14 |
| WAT | Comment: Hijack not in DO | | | | |

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| | 2.5 CONTROL AND INDICATION FUNCTIONS |
| No match in DO 181Dv8 | No method shall <<shall0022>> be capable of rendering the transponder incapable of generating replies to Mode A/C, Mode A/C/S All Call, and Mode-S Only All-Call interrogations whenever the transponder is in the Hijack Mode (2.6) whether in the airborne or in the on-ground state (3.17.1 b (3), 3.21.2.6.5, 3.20.2.7 b and 3.20.2.7 c). The transponder shall <<shall0023>> also continue to generate Mode S squitter transmissions and reply to discretely addressed Mode-S interrogations when the aircraft is in the Hijack Mode (2.7). |

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|---|---|---|---|---|---|
| No Link | ID=672 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0025 | Page 14 |
| WAT | Comment: Hijack not in DO | | | | |
| | | | | | |
| | | | 2.5 CONTROL AND INDICATION FUNCTIONS | | |
| No match in DO 181Dv8 | | | No method shall <<shall0025>> be capable of placing the transponder into the Standby Mode once the transponder has entered the Hijack Mode (2.7) except as specified in 2.7.6.2. | | |

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|---|---|---|---|---|---|
| No Link | ID=673 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0026 | Page 15 |
| WAT | Comment: Hijack not in DO | | | | |
| | | | | | |
| | | | 2.5 CONTROL AND INDICATION FUNCTIONS | | |
| No match in DO 181Dv8 | | | No method shall <<shall0026>> be capable of placing the transponder in a mode that inhibits the transmission of altitude information when in the Hijack Mode (2.7) and in the airborne state (3.17.1 b (3), 3.21.2.6.5, 3.20.2.7 b and 3.20.2.7 c) except as specified in 2.7.3.1.1 b. | | |

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|---|---|---|---|---|---|
| No Link | ID=615 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0036 | Page 16 |
| WAT | Comment: No comparable standard was identified. | | | | |
| | | | | | |
| | | | 2.7 MODE S TRANSPONDER HIJACK MODE | | |
| No match in DO 181Dv8 | | | The support of the Hijack Mode is optional in Mode S transponders. When it | | |

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| | is supported the reqirements in this section shall <<shall0036>> apply. |

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| No Link | ID=616 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0037 | Page 17 |
| WAT | Comment: Hijack not in DO 181 | | | | |
| | | | | | |
| | | | 2.7.2.1 Standard “7500” Code Entry | | |
| No match in DO 181Dv8 | | | Upon continuous receipt (or selection) of 4096 Identity Code “7500” (see 2.5 a. and 3.17.1 b (2)) for a minimum period of 10 seconds, transponders shall <<shall0037>> operate depending upon the intended configuration and the initial state of the unit as follows: | | |

| | | | | | |
|---|---|---|---|---|---|
| No Link | ID=617 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0038 | Page 17 |
| WAT | Comment: Hijack not in DO 181 | | | | |
| | | | | | |
| | | | 2.7.2.1.1 Dual Antenna Systems and Dual Diversity Transponder Configuration | | |
| No match in DO 181Dv8 | | | Transponders intended for Dual Antenna Systems and Dual Diversity Transponder configuration (see 2.6 a) shall <<shall0038>> operate as follows: | | |

| | | | | | |
|---|---|---|---|---|---|
| No Link | ID=618 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0039 | Page 17 |
| WAT | Comment: Hijack not in DO 181 | | | | |
| | | | | | |
| | | | 2.7.2.1.1 Dual Antenna Systems and Dual Diversity Transponder Configuration | | |
| No match in DO 181Dv8 | | | a. The Active On transponder shall <<shall0039>> enter the Active Hijack Mode. | | |

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|---|---|---|---|---|---|
| No Link | ID=619 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0040 | Page 17 |
| WAT | Comment: Hijack not in DO 181 | | | | |
| | | | | | |

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| | 2.7.2.1.1 Dual Antenna Systems and Dual Diversity Transponder Configuration |
| No match in DO 181Dv8 | b. The Standby transponder shall <<shall0040>> enter the Standby Hijack Mode |

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|---|---|---|---|---|---|
| No Link | ID=620 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0041 | Page 17 |
| WAT | Comment: Hijack not in DO 181 | | | | |
| | | | | | |
| | | | 2.7.2.1.2 Single Antenna System and Dual Diversity Transponder Configuration | | |
| No match in DO 181Dv8 | | | Transponders intended for Single Antenna System and Dual Diversity Transponder configurations (see 2.6 b) shall <<shall0041>> operate as follows: | | |

| | | | | | |
|---|---|---|---|---|---|
| No Link | ID=621 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0042 | Page 17 |
| WAT | Comment: Hijack not in DO 181 | | | | |
| | | | | | |
| | | | 2.7.2.1.2 Single Antenna System and Dual Diversity Transponder Configuration | | |
| No match in DO 181Dv8 | | | a. The Active On transponder shall <<shall0042>> enter the Active Hijack Mode. | | |

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|---|---|---|---|---|---|
| No Link | ID=622 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0043 | Page 17 |
| WAT | Comment: Hijack not in DO 181 | | | | |
| | | | | | |
| | | | 2.7.2.1.2 Single Antenna System and Dual Diversity Transponder Configuration | | |
| No match in DO 181Dv8 | | | b. The Standby transponder shall <<shall0043>> enter the Active Hijack Mode. | | |

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| No Link | ID=623 |

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|---|---|---|---|---|---|
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0044 | Page 17 |
| WAT | Comment: Hijack not in DO 181 | | | | |
| | | | | | |
| | | | 2.7.2.2 “7500” Code Entry with SPI | | |
| No match in DO 181Dv8 | | | Upon receipt (or selection) of 4096 Identity Code “7500” (see 2.5 a and 3.17.1 b (2)) and activation of the Special Position Identifier (SPI, Ident.) (see 2.5 f and 3.17.1 b (4)) being coincident in any order, transponders shall <<shall0044>> operate depending upon the intended configuration and the initial state of the unit as follows: | | |

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| No Link | ID=624 |

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|---|---|---|---|---|---|
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0045 | Page 17 |
| WAT | Comment: Hijack not in DO 181 | | | | |
| | | | | | |
| | | | 2.7.2.2.1 Dual Antenna Systems and Dual Diversity Transponder Configuration | | |
| No match in DO 181Dv8 | | | Transponders intended for Dual Antenna Systems and Dual Diversity Transponder configurations (see 2.6 a) shall <<shall0045>> operate as follows: | | |

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|---|---|
| No Link | ID=625 |

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|---|---|---|---|---|---|
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0046 | Page 17 |
| WAT | Comment: Hijack not in DO 181 | | | | |
| | | | | | |
| | | | 2.7.2.2.1 Dual Antenna Systems and Dual Diversity Transponder Configuration | | |
| No match in DO 181Dv8 | | | a. The Active On transponder shall <<shall0046>> immediately enter the Active Hijack Mode. | | |

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|---|---|
| No Link | ID=626 |

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|---|---|---|---|---|---|
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0047 | Page 17 |
| WAT | Comment: Hijack not in DO 181 | | | | |
| | | | | | |
| | | | 2.7.2.2.1 Dual Antenna Systems and Dual Diversity Transponder Configuration | | |
| No match in DO 181Dv8 | | | b. The Standby transponder shall <<shall0047>> immediately enter the | | |

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|---|---|
| | Standby Hijack Mode |

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|---|---|---|---|---|---|
| No Link | ID=627 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0048 | Page 18 |
| WAT | Comment: Hijack not in DO 181 | | | | |
| | | | | | |
| | | | 2.7.2.2.2 Single Antenna System and Dual Diversity Transponder Configuration | | |
| No match in DO 181Dv8 | | | Transponders intended for Single Antenna System and Dual Diversity Transponder configurations (see 2.6 b) shall <<shall0048>> operate as follows: | | |

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|---|---|---|---|---|---|
| No Link | ID=628 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0049 | Page 18 |
| WAT | Comment: Hijack not in DO 181 | | | | |
| | | | | | |
| | | | 2.7.2.2.2 Single Antenna System and Dual Diversity Transponder Configuration | | |
| No match in DO 181Dv8 | | | a. The Active On transponder shall <<shall0049>> immediately enter the Active Hijack Mode. | | |

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|---|---|---|---|---|---|
| No Link | ID=629 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0050 | Page 18 |
| WAT | Comment: Hijack not in DO 181 | | | | |
| | | | | | |
| | | | 2.7.2.2.2 Single Antenna System and Dual Diversity Transponder Configuration | | |
| No match in DO 181Dv8 | | | b. The Standby transponder shall <<shall0050>> immediately enter the Active Hijack Mode. | | |

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|---|---|---|---|---|---|
| No Link | ID=630 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0051 | Page 18 |
| WAT | Comment: Hijack not in DO 181 | | | | |
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| | 2.7.2.3 Hijack Mode Discrete Initialization. |
| No match in DO 181Dv8 | a. The transponder shall <<shall0051>> provide for a discrete input to allow Hijack mode activation. |

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|---|---|---|---|---|---|
| No Link | ID=631 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0052 | Page 18 |
| WAT | Comment: Hijack not in DO 181 | | | | |
| | | | | | |
| | | | 2.7.2.3 Hijack Mode Discrete Initialization. | | |
| No match in DO 181Dv8 | | | b. De-bounce time necessary to verify that the discrete was properly activated shall <<shall0052>> NOT exceed 1.0 seconds. | | |

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|---|---|---|---|---|---|
| No Link | ID=632 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0053 | Page 18 |
| WAT | Comment: Hijack not in DO 181 | | | | |
| | | | | | |
| | | | 2.7.2.3 Hijack Mode Discrete Initialization. | | |
| No match in DO 181Dv8 | | | c. Upon detection of the discrete input, transponders shall <<shall0053>> operate depending upon the intended configuration and the initial state of the unit as follows: | | |

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|---|---|---|---|---|---|
| No Link | ID=633 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0054 | Page 18 |
| WAT | Comment: Hijack not in DO 181 | | | | |
| | | | | | |
| | | | 2.7.2.3.1 Dual Antenna Systems and Dual Diversity Transponder Configuration | | |
| No match in DO 181Dv8 | | | Transponders intended for Dual Antenna Systems and Dual Diversity Transponder configurations (see 2.6 a) shall <<shall0054>> operate as follows: | | |

| | | | | | |
|---|---|---|---|---|---|
| No Link | ID=634 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0055 | Page 18 |
| WAT | Comment: Hijack not in DO 181 | | | | |

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| | 2.7.2.3.1 Dual Antenna Systems and Dual Diversity Transponder Configuration |
| No match in DO 181Dv8 | a. The Active On transponder shall <<shall0055>> immediately enter the Active Hijack Mode. |

| No Link | ID=635 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0056 | Page 18 |
| WAT | Comment: Hijack not in DO 181 | | | | |
| | | | | | |
| | | | 2.7.2.3.1 Dual Antenna Systems and Dual Diversity Transponder Configuration | | |
| No match in DO 181Dv8 | | | b. The Standby transponder shall <<shall0056>> immediately enter the Standby Hijack Mode. | | |

| No Link | ID=636 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0057 | Page 18 |
| WAT | Comment: Hijack not in DO 181 | | | | |
| | | | | | |
| | | | 2.7.2.3.2 Single Antenna System and Dual Diversity Transponder Configuration | | |
| No match in DO 181Dv8 | | | Transponders intended for Single Antenna System and Dual Diversity Transponder configurations (see 2.6 b) shall <<shall0057>> operate as follows: | | |

| No Link | ID=637 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0058 | Page 18 |
| WAT | Comment: Hijack not in DO 181 | | | | |
| | | | | | |
| | | | 2.7.2.3.2 Single Antenna System and Dual Diversity Transponder Configuration | | |
| No match in DO 181Dv8 | | | a. The Active On transponder shall <<shall0058>> immediately enter the Active Hijack Mode. | | |

| No Link | ID=638 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0059 | Page 18 |
| WAT | Comment: Hijack not in DO 181 | | | | |
| | | | | | |
| | | | 2.7.2.3.2 Single Antenna System and Dual Diversity Transponder Configuration | | |
| No match in DO 181Dv8 | | | b. The Standby transponder shall <<shall0059>> immediately enter the Active Hijack Mode. | | |

| No Link | ID=639 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0060 | Page 18 |
| WAT | Comment: Hijack not in DO 181 | | | | |
| | | | | | |
| | | | 2.7.3.1 General Requirements (Airborne and On-Ground states) | | |
| No match in DO 181Dv8 | | | Upon entry of the Active Hijack Mode, both an Airborne unit and an On-Ground unit shall <<shall0060>> : | | |

| No Link | ID=640 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0061 | Page 20 |
| WAT | Comment: Hijack not in DO 181 | | | | |
| | | | | | |
| | | | 2.7.3.1.1 Altitude Reporting Requirements | | |
| No match in DO 181Dv8 | | | When in the Active Hijack Mode both an Airborne transponder and an On Ground transponder shall <<shall0061>> continually provide the transmission of valid altitude information (see 2.5 g (2)) in all replies to interrogations required by 2.5 d and 2.5 g regardless of flight crew or other commands that may attempt to inhibit the reporting of altitude data. | | |

| No Link | ID=641 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0062 | Page 20 |
| WAT | Comment: Hijack not in DO 181 | | | | |
| | | | | | |
| | | | 2.7.3.1.1 Altitude Reporting Requirements | | |
| No match in DO 181Dv8 | | | When in the Active Hijack Mode, invalid altitude information shall <<shall0062>> result in both an Airborne transponder and an On Ground | | |

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| | transponder continuing to: |

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|---|---|---|---|---|---|
| No Link | ID=642 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0063 | Page 20 |
| WAT | Comment: Hijack not in DO 181 | | | | |
| | | | | | |
| | | | 2.7.3.1.2 TCAS Communication Requirements (if TCAS equipped) | | |
| No match in DO 181Dv8 | | | When in the Active Hijack mode, the transponder shall <<shall0063>> continue to support all TCAS operations as required with the following exceptions: | | |

| | | | | | |
|---|---|---|---|---|---|
| No Link | ID=643 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0064 | Page 20 |
| WAT | Comment: Hijack not in DO 181 | | | | |
| | | | | | |
| | | | 2.7.3.1.2 TCAS Communication Requirements (if TCAS equipped) | | |
| No match in DO 181Dv8 | | | a. The transponder shall <<shall0064>> set the Sensitivity Level Control sent to the on-board TCAS to a maximum capability of “TA Only” mode. The following constraints shall <<shall0065>> apply: | | |

| | | | | | |
|---|---|---|---|---|---|
| No Link | ID=644 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0065 | Page 20 |
| WAT | Comment: Hijack not in DO 181 | | | | |
| | | | | | |
| | | | 2.7.3.1.2 TCAS Communication Requirements (if TCAS equipped) | | |
| No match in DO 181Dv8 | | | a. The transponder shall <<shall0064>> set the Sensitivity Level Control sent to the on-board TCAS to a maximum capability of “TA Only” mode. The following constraints shall <<shall0065>> apply: | | |

| | | | | | |
|---|---|---|---|---|---|
| No Link | ID=645 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0066 | Page 20 |
| WAT | Comment: Hijack not in DO 181 | | | | |
| | | | | | |
| | | | 2.7.3.1.2 TCAS Communication Requirements (if TCAS equipped) | | |

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| No match in DO 181Dv8 | (1). If the Sensitivity Level Control (SLC) received by the transponder from its associated Control function is set to indicate a mode that is less than the “TA/RA” mode (i.e., SL = 1 or 2) then the same SLC shall <<shall0066>> be provided to the on-board TCAS. |

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|---|---|---|---|---|---|
| No Link | ID=646 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0067 | Page 20 |
| WAT | Comment: Hijack not in DO 181 | | | | |
| | | | | | |
| | | | 2.7.3.1.2 TCAS Communication Requirements (if TCAS equipped) | | |
| No match in DO 181Dv8 | | | (2). If the Sensitivity Level Control received from the Control function is set to TA/RA mode, then it shall <<shall0067>> be changed to TA Only (i.e., SL = 2) prior to the transponder providing it to the on-board TCAS. | | |

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|---|---|---|---|---|---|
| No Link | ID=647 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0068 | Page 21 |
| WAT | Comment: Hijack not in DO 181 | | | | |
| | | | | | |
| | | | 2.7.3.1.2 TCAS Communication Requirements (if TCAS equipped) | | |
| No match in DO 181Dv8 | | | b. The transponder shall <<shall0068>> set the 4096 Identity Code sent to the on-board TCAS to the code of “7500” at all times while in the Active Hijack Mode. | | |

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|---|---|---|---|---|---|
| No Link | ID=648 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0069 | Page 21 |
| WAT | Comment: Hijack not in DO 181 | | | | |
| | | | | | |
| | | | 2.7.3.2 On-Ground State Only | | |
| No match in DO 181Dv8 | | | The transponder shall <<shall0069>> continue to operate in accordance with 2.5 d when in the Active Hijack Mode and in the On-Ground state (3.17.1 b (3), 3.21.2.6.5, 3.20.2.7 b and 3.20.2.7 c). | | |

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|---|---|---|---|---|---|
| No Link | ID=649 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0070 | Page 21 |

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|---|---|---|---|---|---|
| WAT | Comment: Hijack not in DO 181 | | | | |
| | | | | | |
| | | | 2.7.3.3 Loss of Control | | |
| No match in DO 181Dv8 | | | Once in the Active Hijack Mode, the transponder shall <<shall0070>> ensure that it remains in the Active Hijack mode even if all communication is lost with the Control function. Specifically, the transponder shall <<shall0071>> NOT enter the Active On, Standby or Standby Hijack modes upon determining that it is no longer receiving control information. | | |

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|---|---|---|---|---|---|
| No Link | ID=650 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0071 | Page 21 |
| WAT | Comment: Hijack not in DO 181 | | | | |
| | | | | | |
| | | | 2.7.3.3 Loss of Control | | |
| No match in DO 181Dv8 | | | Once in the Active Hijack Mode, the transponder shall <<shall0070>> ensure that it remains in the Active Hijack mode even if all communication is lost with the Control function. Specifically, the transponder shall <<shall0071>> NOT enter the Active On, Standby or Standby Hijack modes upon determining that it is no longer receiving control information. | | |

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|---|---|---|---|---|---|
| No Link | ID=651 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0072 | Page 21 |
| WAT | Comment: Hijack not in DO 181 | | | | |
| | | | | | |
| | | | 2.7.4.1 General Requirements (Airborne and On-Ground states) | | |
| No match in DO 181Dv8 | | | e. Remain in Standby Hijack Mode until the Hijack Mode Exit procedure is performed (see subparagraph 2.7.6 and specifically 2.7.6.2). Specifically, the transponder shall <<shall0072>> NOT be capable of exiting the Standby Hijack Mode and entering the Active Hijack or the Active ON Mode. | | |

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|---|---|---|---|---|---|
| No Link | ID=652 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0073 | Page 21 |
| WAT | Comment: Hijack not in DO 181 | | | | |
| | | | | | |
| | | | 2.7.4.2 TCAS Communication Requirements (if TCAS equipped) | | |

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| No match in DO 181Dv8 | When in the Standby Hijack mode, the transponder shall <<shall0073>> continue to support all TCAS operations as required with the following exceptions: |

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|---|---|---|---|---|---|
| No Link | ID=653 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0074 | Page 21 |
| WAT | Comment: Hijack not in DO 181 | | | | |
| | | | | | |
| | | | 2.7.4.2 TCAS Communication Requirements (if TCAS equipped) | | |
| No match in DO 181Dv8 | | | a. The transponder shall <<shall0074>> set the Sensitivity Level Control sent to the on-board TCAS to a maximum capability of TA Only mode. The following constraints shall <<shall0075>> apply: | | |

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|---|---|---|---|---|---|
| No Link | ID=654 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0075 | Page 21 |
| WAT | Comment: Hijack not in DO 181 | | | | |
| | | | | | |
| | | | 2.7.4.2 TCAS Communication Requirements (if TCAS equipped) | | |
| No match in DO 181Dv8 | | | a. The transponder shall <<shall0074>> set the Sensitivity Level Control sent to the on-board TCAS to a maximum capability of TA Only mode. The following constraints shall <<shall0075>> apply: | | |

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|---|---|---|---|---|---|
| No Link | ID=655 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0076 | Page 22 |
| WAT | Comment: Hijack not in DO 181 | | | | |
| | | | | | |
| | | | 2.7.4.2 TCAS Communication Requirements (if TCAS equipped) | | |
| No match in DO 181Dv8 | | | (1) If the Sensitivity Level Control (SLC) received by the transponder from its associated Control function is set to indicate a mode that is less than the TA/RA mode (i.e., SL = 1 or 2) then the same SLC shall <<shall0076>> be provided to the on-board TCAS. | | |

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| No Link | ID=656 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0077 | Page 22 |

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|---|---|---|---|---|---|
| WAT | Comment: Hijack not in DO 181 | | | | |
| | | | | | |
| | | | 2.7.4.2 TCAS Communication Requirements (if TCAS equipped) | | |
| No match in DO 181Dv8 | | | (2) If the Sensitivity Level Control received from the Control function is set to TA/RA mode, then it shall <<shall0077>> be changed to TA Only (i.e., SL = 2) prior to the transponder providing it to the on-board TCAS. | | |

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|---|---|---|---|---|---|
| No Link | ID=657 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0078 | Page 22 |
| WAT | Comment: Hijack not in DO 181 | | | | |
| | | | | | |
| | | | 2.7.4.2 TCAS Communication Requirements (if TCAS equipped) | | |
| No match in DO 181Dv8 | | | b. The transponder shall <<shall0078>> set the 4096 Identity Code sent to the on-board TCAS to the code of “7500” at all times while in the Standby Hijack Mode. | | |

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|---|---|---|---|---|---|
| No Link | ID=658 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0079 | Page 22 |
| WAT | Comment: Hijack not in DO 181 | | | | |
| | | | | | |
| | | | 2.7.4.3 Loss of Control | | |
| No match in DO 181Dv8 | | | Once in the Standby Hijack Mode, the transponder shall <<shall0079>> ensure that it remains in the Standby Hijack mode even if all communication is lost with the Control function. Specifically, the transponder shall <<shall0080>> NOT enter the Standby, Active On, or Active Hijack modes upon determining that it is no longer receiving control information. | | |

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| No Link | ID=659 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0080 | Page 22 |
| WAT | Comment: Hijack not in DO 181 | | | | |
| | | | | | |
| | | | 2.7.4.3 Loss of Control | | |
| No match in DO 181Dv8 | | | Once in the Standby Hijack Mode, the transponder shall <<shall0079>> ensure that it remains in the Standby Hijack mode even if all communication is lost with the Control function. Specifically, the transponder shall <<shall0080>> NOT enter the Standby, Active On, or Active Hijack modes | | |

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| | upon determining that it is no longer receiving control information. |

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|---|---|---|---|---|---|
| No Link | ID=660 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0081 | Page 22 |
| WAT | Comment: Hijack not in DO 181 | | | | |
| | | | | | |
| | | | 2.7.5 Hijack Mode Indication | | |
| No match in DO 181Dv8 | | | a. A means shall <<shall0081>> be provided to indicate that the transponder is in the Active Hijack Mode. | | |

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|---|---|---|---|---|---|
| No Link | ID=661 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0082 | Page 22 |
| WAT | Comment: Hijack not in DO 181 | | | | |
| | | | | | |
| | | | 2.7.5 Hijack Mode Indication | | |
| No match in DO 181Dv8 | | | b. A means shall <<shall0082>> be provided to indicate that the transponder is in the Standby Hijack Mode for transponders intended for installation in the Dual Antenna Systems and Dual Diversity Transponder configuration. | | |

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|---|---|---|---|---|---|
| No Link | ID=662 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0083 | Page 23 |
| WAT | Comment: Hijack not in DO 181 | | | | |
| | | | | | |
| | | | 2.7.5 Hijack Mode Indication | | |
| No match in DO 181Dv8 | | | c. Momentary power interrupts shall <<shall0083>> NOT cause the indication described in subparagraph 2.7.5 a. to give a false indication that the Active Hijack Mode is active. | | |

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|---|---|---|---|---|---|
| No Link | ID=663 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0084 | Page 23 |
| WAT | Comment: Hijack not in DO 181 | | | | |
| | | | | | |
| | | | 2.7.5 Hijack Mode Indication | | |

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| No match in DO 181Dv8 | d. Momentary power interrupts shall <<shall0084>> NOT cause the indication described in subparagraph 2.7.5 b. to give a false indication that the Standby Hijack Mode is active. |

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|---|---|---|---|---|---|
| No Link | ID=664 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0085 | Page 23 |
| WAT | Comment: Hijack not in DO 181 | | | | |
| | | | | | |
| | | | 2.7.6.1 Airborne State | | |
| No match in DO 181Dv8 | | | Performance of Hijack Mode Exit Procedures (2.7.6) while in the airborne state shall <<shall0085>> result in the transponder NOT exiting the Active Hijack Mode nor the Standby Hijack Mode. | | |

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|---|---|---|---|---|---|
| No Link | ID=665 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0086 | Page 23 |
| WAT | Comment: Hijack not in DO 181 | | | | |
| | | | | | |
| | | | 2.7.6.2 On-Ground State | | |
| No match in DO 181Dv8 | | | While in the On-Ground State, a means shall <<shall0086>> be provided that shall <<shall0087>> result in: | | |

| | | | | | |
|---|---|---|---|---|---|
| No Link | ID=666 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0087 | Page 23 |
| WAT | Comment: Hijack not in DO 181 | | | | |
| | | | | | |
| | | | 2.7.6.2 On-Ground State | | |
| No match in DO 181Dv8 | | | While in the On-Ground State, a means shall <<shall0086>> be provided that shall <<shall0087>> result in: | | |

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|---|---|---|---|---|---|
| No Link | ID=667 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0088 | Page 23 |
| WAT | Comment: Hijack not in DO 181 | | | | |
| | | | | | |
| | | | 2.7.7 Power Interrupt Conditions | | |

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| No match in DO 181Dv8 | If the Hijack Mode Exit procedure has not been performed as per 2.7.6.2, transponders that have the capability to retain last known state information prior to a Power Off condition (e.g., Non-Volatile Memory, etc.) shall <<shall0088>> provide the capability for the transponder to return to the Active Hijack Mode or Standby Hijack Mode upon restoration of power. |

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|---|---|---|---|---|---|
| No Link | ID=674 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0116 | Page 28 |
| WAT | Comment: this ED entry is in a note and corresponds to the note in the DO document following shall0040 | | | | |
| | | | | | |
| | | | 3.4.3 Mode S ELM Peak Reply Rate | | |
| No match in DO 181Dv8 | | | NOTE 2: Transponders may exist which have a declared capability of transmitting less than the maximum number of Comm-D segments in one burst. These shall <<shall0116>> also have a surplus transmitting capacity of 25%. | | |

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|---|---|---|---|---|---|
| No Link | ID=676 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0157 | Page 32 |
| WAT | Comment: Comparable standard not found. | | | | |
| | | | | | |
| | | | 3.8.1 General | | |
| No match in DO 181Dv8 | | | f. A transponder in suppression shall <<shall0157>> not recognise Mode A, Mode C or intermode interrogations if either the P1 pulse alone or both the P1 and P3 pulses of the interrogation are received during the suppression interval. Suppression shall <<shall0158>> not affect the recognition of, acceptance of, or replies to Mode S interrogations. | | |

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| No Link | ID=677 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0158 | Page 32 |
| WAT | Comment: Comparable standard not found. | | | | |
| | | | | | |
| | | | 3.8.1 General | | |
| No match in DO 181Dv8 | | | f. A transponder in suppression shall <<shall0157>> not recognise Mode A, Mode C or intermode interrogations if either the P1 pulse alone or both the P1 and P3 pulses of the interrogation are received during the suppression interval. Suppression shall <<shall0158>> not affect the | | |

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| | recognition of, acceptance of, or replies to Mode S interrogations. |

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|---|---|---|---|---|---|
| No Link | ID=675 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0166 | Page 34 |
| WAT | Comment: Comparable standard not found. | | | | |
| | | | | | |
| | | | 3.8.2 Side Lobe Suppression, Mode A/C, Mode A/C-Only All-Call, and Mode A/C/S All-Call | | |
| No match in DO 181Dv8 | | | If a P1-P2 suppression pair and a Mode A or Mode C interrogation are recognised simultaneously, the transponder shall <<shall0166>> be suppressed. | | |

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|---|---|---|---|---|---|
| No Link | ID=678 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0196 | Page 39 |
| WAT | Comment: Could not directly link with DO standard | | | | |
| | | | | | |
| | | | 3.10.2 Recovery | | |
| No match in DO 181Dv8 | | | A transponder with Comm-C capability shall <<shall0196>> recover sensitivity to within 3dB of MTL no later than 45 (s after receipt of the sync phase reversal. | | |

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| No Link | ID=679 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0208 | Page 40 |
| WAT | Comment: Could not find comparable standard | | | | |
| | | | | | |
| | | | 3.12.1 Mode A and Mode C with Random Interfering Pulse | | |
| No match in DO 181Dv8 | | | The transponder shall <<shall0208>> reply to at least 90% of the interrogations when random pulses are received 10 dB below the proper interrogation and are not recognised as P1, P2 or P3. | | |

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|---|---|---|---|---|---|
| No Link | ID=680 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0210 | Page 41 |
| WAT | Comment: In Note 1 No comparable standard was identified. | | | | |
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| | 3.12.3 Low Level Asynchronous Interference |
| No match in DO 181Dv8 | NOTE 1: Such pulses may combine with P1 and P2 pulses of the Mode S waveform to form a valid Mode A/C-Only All-Call waveform. The Mode S transponder shall <<shall0210>> not respond to Mode A/C-Only All-Calls but shall <<shall0211>> respond to the Mode S interrogation. |

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| No Link | ID=681 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0211 | Page 41 |
| WAT | Comment: In Note 1 No comparable standard was identified. | | | | |
| | | | | | |
| | | | 3.12.3 Low Level Asynchronous Interference | | |
| No match in DO 181Dv8 | | | NOTE 1: Such pulses may combine with P1 and P2 pulses of the Mode S waveform to form a valid Mode A/C-Only All-Call waveform. The Mode S transponder shall <<shall0210>> not respond to Mode A/C-Only All-Calls but shall <<shall0211>> respond to the Mode S interrogation. | | |

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|---|---|---|---|---|---|
| No Link | ID=682 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0212 | Page 41 |
| WAT | Comment: In Note 2 No comparable standard was identified. | | | | |
| | | | | | |
| | | | 3.12.3 Low Level Asynchronous Interference | | |
| No match in DO 181Dv8 | | | NOTE 2: A preceding pulse may also combine with the P2 of the Mode S waveform to form a valid Mode A or Mode C interrogation. Under such conditions, the P1-P2 pair of the Mode S preamble shall <<shall0212>> take precedence. | | |

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| No Link | ID=685 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0237 | Page 43 |
| WAT | Comment: No comparable standard was identified. | | | | |
| | | | | | |
| | | | 3.15.2 Mutual Suppression Interface | | |
| No match in DO 181Dv8 | | | Where applicable equipment shall <<shall0237>> have the capability of interfacing with an aircraft mutual suppression bus and shall <<shall0238>> generate and respond to mutual suppression pulses (See paragraph 1.4.2.3). | | |

| No Link | ID=686 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0238 | Page 43 |
| WAT | Comment: No comparable standard was identified. | | | | |
| | | | | | |
| | | | 3.15.2 Mutual Suppression Interface | | |
| No match in DO 181Dv8 | | | Where applicable equipment shall <<shall0237>> have the capability of interfacing with an aircraft mutual suppression bus and shall <<shall0238>> generate and respond to mutual suppression pulses (See paragraph 1.4.2.3). | | |

| No Link | ID=687 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0239 | Page 43 |
| WAT | Comment: Corresponds to first sentence of DO in 2.2.12 which does not have a shall. No comparable standard was identified. | | | | |
| | | | | | |
| | | | 3.16.1 General | | |
| No match in DO 181Dv8 | | | a. Where applicable Mode S transponders (see paragraph 1.4.2.5) shall <<shall0239>> be designed to operate with antenna diversity. | | |

| No Link | ID=688 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0242 | Page 43 |
| WAT | Comment: Second ED shall is not in DO No comparable standard was identified. | | | | |
| | | | | | |
| | | | 3.16.1 General | | |
| No match in DO 181Dv8 | | | c. Appropriate switching and signal processing channels to select the best antenna on the basis of the characteristics of the received interrogation signals shall <<shall0241>> also be provided; replies shall <<shall0242>> only be transmitted from the selected antenna. | | |

| No Link | ID=690 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0246 | Page 44 |
| WAT | Comment: No comparable standard was identified. | | | | |
| | | | | | |
| | | | 3.16.2 Diversity Antenna Selection | | |
| No match in DO 181Dv8 | | | c. If only one channel receives or accepts a valid interrogation, then that channel shall <<shall0246>> be automatically selected regardless of received signal strength. | | |

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| No Link | ID=689 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0248 | Page 44 |
| WAT | Comment: in a note No comparable standard was identified. | | | | |
| | | | | | |
| | | | 3.16.2 Diversity Antenna Selection | | |
| No match in DO 181Dv8 | | | NOTE 2: Optionally, selection may be based on the correctness of a received complete Mode S interrogation. In this case, the RF port having the correct signal shall <<shall0248>> be selected. If correctness is observed in both channels, selection shall <<shall0249>> be based on relative signal strength. | | |

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|---|---|---|---|---|---|
| No Link | ID=692 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0256 | Page 45 |
| WAT | Comment: No comparable standard was identified. | | | | |
| | | | | | |
| | | | 3.16.7.1 Non-Diversity Installation | | |
| No match in DO 181Dv8 | | | In a non-diversity installation operating with one bottom antenna only, all squitter transmissions shall <<shall0256>> be directed to that antenna. | | |

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| No Link | ID=691 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0261 | Page 45 |
| WAT | Comment: In a Note No comparable standard was identified. | | | | |
| | | | | | |
| | | | 3.16.7.2 Acquisition Squitter | | |
| No match in DO 181Dv8 | | | NOTE: Acquisition squitters shall <<shall0261>> only be transmitted on the surface if the transponder is not reporting the surface position. | | |

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| No Link | ID=694 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0298 | Page 50 |
| WAT | Comment: corresponds to first part of DO 2.2.13.2 and 2.2.13.2.1 which do not contain shalls No comparable standard was identified. | | | | |
| | | | | | |
| | | | 3.17.2 Indirect Data | | |
| No match in DO 181Dv8 | | | b. If the transponder is designed to function with data link devices | | |

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| | outside the transponder equipment, the input and output interfaces shall <<shall0298>> satisfy the following specification: |

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| No Link | ID=695 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0337 | Page 57 |
| WAT | Comment: DO paragraph 2.2.14.4.20 does not contain a shall No comparable standard was identified. | | | | |
| | | | | | |
| | | | 3.18.4.18 Message, Comm-B, MB | | |
| No match in DO 181Dv8 | | | b. For messages that use the data source designator code (BDS) to define the content of the MB message field of which it is part, the BDS code shall <<shall0337>> comprise two group of 4 bits each, BDS1 (33-36) and BDS2 (37-40) which correspond to the BDS1 and BDS2 data source designator codes as described in paragraph 3.21.1.12 a. | | | |

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|---|---|---|---|---|---|
| No Link | ID=696 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0339 | Page 57 |
| WAT | Comment: DO paragraph 2.2.14.4.22 contains no shall No comparable standard was identified. | | | | |
| | | | | | |
| | | | 3.18.4.20 Message, Comm-D MD | | |
| No match in DO 181Dv8 | | | This 80-bit (9-88) downlink field shall <<shall0339>> contain: | | |

| | | | | | |
|---|---|---|---|---|---|
| No Link | ID=697 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0340 | Page 58 |
| WAT | Comment: DO paragraphs 2.2.14.4.26 contains no shall No comparable standard was identified. | | | | |
| | | | | | |
| | | | 3.18.4.23 Message, Comm-V MV | | |
| No match in DO 181Dv8 | | | This 56-bit (33-88) downlink field contains information used in air-to-air exchanges and is part of the long air-air surveillance reply DF=16. This downlink field shall <<shall0340>> contain GICB information as requested in the DS field of the UF=0 interrogation that elicited the reply. | | |

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| No Link | ID=700 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0351 | Page 62 |
| WAT | Comment: Comparable to beginning of 2.2.18.2.1.b in DO but DO does not have a shall No comparable standard was identified. | | | | |

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| | 3.20.2.1 Error Protection (Figures 3-8 and 3-9) |
| No match in DO 181Dv8 | b. Parity Check Sequence Generation - The sequence of 24 parity bits (P1, P2 ..... P24) shall <<shall0351>> be generated from the sequence of information bits (m1, m2 .... mk) where k is 32 or 88 for short or long transmissions respectively. This shall <<shall0352>> be done by means of a code generated by the polynomial : |

| | | | | | |
|---|---|---|---|---|---|
| No Link | ID=701 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0352 | Page 62 |
| WAT | Comment: Comparable to beginning of 2.2.18.2.1.b in DO but DO does not have a shall No comparable standard was identified. | | | | |
| | | | | | |
| | | | 3.20.2.1 Error Protection (Figures 3-8 and 3-9) | | |
| No match in DO 181Dv8 | | | b. Parity Check Sequence Generation - The sequence of 24 parity bits (P1, P2 ..... P24) shall <<shall0351>> be generated from the sequence of information bits (m1, m2 .... mk) where k is 32 or 88 for short or long transmissions respectively. This shall <<shall0352>> be done by means of a code generated by the polynomial : | | |

| | | | | | |
|---|---|---|---|---|---|
| No Link | ID=702 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0357 | Page 62 |
| WAT | Comment: DO paragraph 2.2.18.2.1 does not have a shall but is comparable No comparable standard was identified. | | | | |
| | | | | | |
| | | | 3.20.2.1 Error Protection (Figures 3-8 and 3-9) | | |
| No match in DO 181Dv8 | | | The code used in downlink PI field generation shall <<shall0357>> be formed by a sequence of 24 bits (a1, a2, . . . a24) where the first 17 bits are ZEROs, the next three bits are a replica of the code label (CL) field (3.18.4.7) and the last four bits are a replica of the interrogator code (IC) field (3.18.4.13) | | |

| | | | | | |
|---|---|---|---|---|---|
| No Link | ID=703 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0379 | Page 65 |
| WAT | Comment: no exact match but in this section No comparable standard was identified. | | | | |
| | | | | | |
| | | | 3.20.2.5 Multisite Lockout Protocol (Figure 3-11) | | |
| No match in DO 181Dv8 | | | To prevent transponder acquisition from being denied to one interrogator by lockout commands originating from another interrogator, the following | | |

| | |
|---|---|
| | multisite lockout protocol shall <<shall0379>> be used. |

| | | | | | |
|---|---|---|---|---|---|
| No Link | ID=704 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0387 | Page 66 |
| WAT | Comment: ED replication of similar statement at beginning of 3.20.2.6 No comparable standard was identified. | | | | |
| | | | | | |
| | | | 3.20.2.6 Acquisition Squitter Protocol | | |
| No match in DO 181Dv8 | | | Mode S transponders shall <<shall0387>> transmit Acquisition squitters to facilitate acquisition. It shall <<shall0388>> not be possible to inhibit acquisition squitters except as specified in this section (3.20.2.6) and in section (3.21.2.6). | | |

| | | | | | |
|---|---|---|---|---|---|
| No Link | ID=705 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0388 | Page 66 |
| WAT | Comment: In DO Table 2.2.16-1 No comparable standard was identified. | | | | |
| | | | | | |
| | | | 3.20.2.6 Acquisition Squitter Protocol | | |
| No match in DO 181Dv8 | | | Mode S transponders shall <<shall0387>> transmit Acquisition squitters to facilitate acquisition. It shall <<shall0388>> not be possible to inhibit acquisition squitters except as specified in this section (3.20.2.6) and in section (3.21.2.6). | | |

| | | | | | |
|---|---|---|---|---|---|
| No Link | ID=706 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0433 | Page 71 |
| WAT | Comment: Did not find in DO No comparable standard was identified. | | | | |
| | | | | | |
| | | | 3.21.1.4 Interrogation-Reply Coordination (Figure 3-16) | | |
| No match in DO 181Dv8 | | | If the transponder is equipped with the optional long air formats UF=DF=16, reply rate limiting (3.11) shall <<shall0433>> not prevent the transmission of DF=16. | | |

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|---|---|---|---|---|---|
| No Link | ID=707 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0440 | Page 73 |
| WAT | Comment: did not find in DO in same context No comparable standard was identified. | | | | |

| | |
|---|---|
| | 3.21.1.6 Flight and Vertical Status Protocols |
| No match in DO 181Dv8 | When manually selected, the transponder shall <<shall0439>> indicate the equivalent of the SPI condition in the FS field of surveillance replies DF=4,5 and in the Surveillance Status Subfield of extended squitter transmissions (DF=17) when they contain the airborne position report. This code shall <<shall0440>> be transmitted for 18 ±1.0 seconds (TI timer) after initiation and can be reinitiated at any time. |

| | | | | | |
|---|---|---|---|---|---|
| No Link | ID=708 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0451 | Page 73 |
| WAT | Comment: Refer to DO 2.2.19.1.12.1 - comparable but no shall | | No comparable standard was identified. | | |
| | | | | | |
| | | | 3.21.1.12 Comm-B Protocol (Figure 3-18) | | |
| No match in DO 181Dv8 | | | The 8-bit BDS code shall <<shall0449>> determine the register whose contents shall <<shall0450>> be transferred in the MB field of the Comm-B reply. It shall <<shall0451>> be expressed in two groups of 4 bits each, BDS1 (most significant 4 bits) and BDS2 (least significant 4 bits). | | |

| | | | | | |
|---|---|---|---|---|---|
| No Link | ID=709 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0452 | Page 74 |
| WAT | Comment: Refer to DO 2.2.19.1.12.1 - comparable but no shall | | No comparable standard was identified. | | |
| | | | | | |
| | | | 3.21.1.12 Comm-B Protocol (Figure 3-18) | | |
| No match in DO 181Dv8 | | | The BDS1 Code shall <<shall0452>> be as defined in the RR field of a surveillance or Comm-A interrogation. | | |

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|---|---|---|---|---|---|
| No Link | ID=710 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0453 | Page 74 |
| WAT | Comment: Refer to DO 2.2.19.1.12.1 - comparable but no shall | | No comparable standard was identified. | | |
| | | | | | |
| | | | 3.21.1.12 Comm-B Protocol (Figure 3-18) | | |
| No match in DO 181Dv8 | | | The BDS2 code shall <<shall0453>> be as defined in the RRS subfield of the SD field (3.1.2.6.1.4.1) when DI = 7. If no BDS2 code is specified (i.e. DI is not equal to 7) it shall <<shall0454>> signify that BDS2 = 0. | | |

| No Link | ID=711 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0455 | Page 74 |
| WAT | Comment: | | | | |
| | | | | | |
| | | | 3.21.1.12 Comm-B Protocol (Figure 3-18) | | |
| No match in DO 181Dv8 | | | To extract data from the aircraft using the ground initiated Comm-B protocol, the interrogator shall <<shall0455>> insert the Comm-B data selector codes according to paragraph 3.21.1.12 a. | | |

| No Link | ID=712 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0462 | Page 75 |
| WAT | Comment: Comparable to first sentence of DO para 2.2.19.1.12.5 (no shall in DO) No comparable standard was identified. | | | | |
| | | | | | |
| | | | 3.21.1.12 Comm-B Protocol (Figure 3-18) | | |
| No match in DO 181Dv8 | | | The data link capability report shall <<shall0462>> provide the interrogator with a description of the data link capability of the Mode S installation. The report shall <<shall0463>> be obtained by a ground-initiated Comm-B reply in response to an interrogation containing RR equals 17 and DI is not equal to 7 or Dl equals 7 and RRS equals zero (paragraph 3.21.1.12). | | |

| No Link | ID=713 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0463 | Page 75 |
| WAT | Comment: Comparable to 2d and 3d sentences of DO para 2.2.19.1.12.5 (no shall in DO) No comparable standard was identified. No comparable standard was identified. | | | | |
| | | | | | |
| | | | 3.21.1.12 Comm-B Protocol (Figure 3-18) | | |
| No match in DO 181Dv8 | | | The data link capability report shall <<shall0462>> provide the interrogator with a description of the data link capability of the Mode S installation. The report shall <<shall0463>> be obtained by a ground-initiated Comm-B reply in response to an interrogation containing RR equals 17 and DI is not equal to 7 or Dl equals 7 and RRS equals zero (paragraph 3.21.1.12). | | |

| No Link | ID=714 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0464 | Page 75 |
| WAT | Comment: No comparable standard was identified. | | | | |

| | |
|---|---|
| | 3.21.1.12 Comm-B Protocol (Figure 3-18) |
| No match in DO 181Dv8 | The subfields within the MB field of all data link capability reports shall <<shall0464>> be: |

| | | | | | |
|---|---|---|---|---|---|
| No Link | ID=715 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0465 | Page 75 |
| WAT | Comment: Check the app B No comparable standard was identified. | | | | |
| | | | | | |
| | | | 3.21.1.12 Comm-B Protocol (Figure 3-18) | | |
| No match in DO 181Dv8 | | | A value of 1 shall <<shall0465>> be inserted in this 4-bit subfield (1-4 of the MB field) as a first part of Comm-B data selector (BDS) code. | | |

| | | | | | |
|---|---|---|---|---|---|
| No Link | ID=716 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0466 | Page 75 |
| WAT | Comment: Check the app B No comparable standard was identified. | | | | |
| | | | | | |
| | | | 3.21.1.12 Comm-B Protocol (Figure 3-18) | | |
| No match in DO 181Dv8 | | | A value of 0 shall <<shall0466>> be inserted in this 4-bit subfield (5-8 of the MB field) as a second part of Comm-B data selector (BDS) code. | | |

| | | | | | |
|---|---|---|---|---|---|
| No Link | ID=717 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0467 | Page 75 |
| WAT | Comment: Check the app B No comparable standard was identified. | | | | |
| | | | | | |
| | | | 3.21.1.12 Comm-B Protocol (Figure 3-18) | | |
| No match in DO 181Dv8 | | | This 1-bit (34 of the MB field) squitter capability subfield shall <<shall0467>> report the capability of the transponder to transmit extended squitter position reports. It shall <<shall0468>> be set to 1 if GICB registers 05 and 06 {HEX} have been updated within the last ten plus or minus one seconds. Otherwise, it shall <<shall0469>> be set to 0 | | |

| | | | | | |
|---|---|---|---|---|---|
| No Link | ID=718 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0528 | Page 84 |

| | | | | | |
|---|---|---|---|---|---|
| WAT | Comment: 2d ED shall No comparable standard was identified. | | | | |
| | | | | | |
| | | | 3.21.2.3 Multisite Comm-B Protocol (Figure 3-18) | | |
| No match in DO 181Dv8 | | | When the transponder is in the multisite mode, i.e., when the IIS stored for Comm-B is not "0", receipt of a closeout (PC=4) shall <<shall0527>> have no effect on the transaction unless accompanied by IIS equal to the stored Comm-B IIS in which case the closeout shall <<shall0528>> be effected in accordance with para 3.21.2.3 c. | | |

| | | | | | |
|---|---|---|---|---|---|
| No Link | ID=698 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0814 | Page 123 |
| WAT | Comment: in a note No comparable standard was identified. | | | | |
| | | | | | |
| | | | 3.24 POWER INTERRUPTION. | | |
| No match in DO 181Dv8 | | | denotes unassigned coding space with N available bits. These shall <<shall0814>> be coded as ZEROs for transmission | | |

| | | | | | |
|---|---|---|---|---|---|
| No Link | ID=699 | | | | |
| DO 181D v08 | shall0000 | Page 0 | ED 73C v01 | shall0815 | Page 124 |
| WAT | Comment: in a note No comparable standard was identified. | | | | |
| | | | | | |
| | | | 3.24 POWER INTERRUPTION. | | |
| No match in DO 181Dv8 | | | denotes unassigned coding space with N available bits. These shall <<shall0815>> be coded as ZEROs for transmission | | |

| | | | | | |
|---|---|---|---|---|---|
| No Link | ID=722 | | | | |
| DO 181D v08 | shall0001 | Page 6 | ED 73C v01 | shall0000 | Page 0 |
| WAT | Comment: 0 | | | | |
| | | | | | |
| 1.4.3.1 Level 1 Transponders | | | | | |
| Level 1 Transponders <<shall0001>> have the capabilities presecribed for: | | | No match in ED 73Cv2 | | |

| | | | | | |
|---|---|---|---|---|---|
| No Link | ID=723 | | | | |
| DO 181D v08 | shall0002 | Page 7 | ED 73C v01 | shall0000 | Page 0 |

| | | | | | |
|---|---|---|---|---|---|
| WAT | Comment: Questionable use of Shall - nothing for Level 2 | | | | |
| | | | | | |
| 1.4.3.3 Level 3 Transponders (Uplink ELM Capability) | | | | | |
| Level 3 Transponders shall <<shall0002>> have the capabilities of §1.4.3.2 and also those prescribed for ground-to-air extended length message (ELM) communications. | | | No match in ED 73Cv2 | | |

| | | | | | |
|---|---|---|---|---|---|
| No Link | ID=724 | | | | |
| DO 181D v08 | shall0003 | Page 7 | ED 73C v01 | shall0000 | Page 0 |
| WAT | Comment: Questionable use of Shall - nothing for Level 2 | | | | |
| | | | | | |
| 1.4.3.4 Level 4 Transponders (Full ELM Capability) | | | | | |
| Level 4 transponders shall <<shall0003>> have the capabilities of §1.4.3.3 and also those prescribed for air-to-ground extended length message (ELM) communications. | | | No match in ED 73Cv2 | | |

| | | | | | |
|---|---|---|---|---|---|
| No Link | ID=725 | | | | |
| DO 181D v08 | shall0004 | Page 7 | ED 73C v01 | shall0000 | Page 0 |
| WAT | Comment: Questionable use of Shall - nothing for Level 2 | | | | |
| | | | | | |
| 1.4.3.5 Level 5 Transponders (Enhanced Data Link Protocol Capability) | | | | | |
| Level 5 transponders shall <<shall0004>> have the capabilities of §1.4.3.4 and also those prescribed for enhanced Comm-B and extended length message (ELM) communications. | | | No match in ED 73Cv2 | | |

| | | | | | |
|---|---|---|---|---|---|
| No Link | ID=727 | | | | |
| DO 181D v08 | shall0006 | Page 12 | ED 73C v01 | shall0000 | Page 0 |
| WAT | Comment: did not find comparable requirement in ED | | | | |
| | | | | | |
| 2.1.2 General Performance | | | | | |
| The equipment shall <<shall0006>> perform its intended function as defined by the manufacturer, and its proper use shall <<shall0007>> not create a hazard to users of the National Airspace System (NAS). | | | No match in ED 73Cv2 | | |

| No Link | ID=728 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0007 | Page 12 | ED 73C v01 | shall0000 | Page 0 |
| WAT | Comment: did not find comparable requirement in ED | | | | |
| | | | | | |
| 2.1.2 General Performance | | | | | |
| The equipment shall <<shall0006>> perform its intended function as defined by the manufacturer, and its proper use shall <<shall0007>> not create a hazard to users of the National Airspace System (NAS). | | | No match in ED 73Cv2 | | |

| No Link | ID=729 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0008 | Page 12 | ED 73C v01 | shall0013 | Page 13 |
| WAT | Comment: 2d ED shall No comparable standard was identified. | | | | |
| | | | | | |
| 2.1.3 Federal Communications Commission Rules | | | 2.2 INTERNATIONAL TELECOMMUNICATIONS UNION | | |
| The equipment shall <<shall0008>> comply with all applicable rules of the Federal Communications Commission. | | | The equipment shall <<shall0013>> comply with the relevant International Telecommunications Union Radio Regulations. | | |

| No Link | ID=760 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0038 | Page 21 | ED 73C v01 | shall0000 | Page 0 |
| WAT | Comment: ED does identify requirements for enhanced data link protocol. Only reference in ED is at 3.21.5 and is not related to this. | | | | |
| | | | | | |
| 2.2.3.4.2 Mode S Reply Rate Capability | | | | | |
| c. A transponder equipped with the enhanced data link protocols (see §2.2.21) shall <<shall0038>> be able to transmit as long replies: | | | No match in ED 73Cv2 | | |

| No Link | ID=764 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0042 | Page 22 | ED 73C v01 | shall0000 | Page 0 |
| WAT | Comment: corresponds to ED 3.5.2 which does not have a shall | | | | |
| | | | | | |
| 2.2.4.1.2 Information Pulses | | | | | |
| The designators of the information pulses and their positions from the first framing pulse shall <<shall0042>> be: | | | No match in ED 73Cv2 | | |

| No Link | ID=858 |
|---|---|

| | | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0133 | Page 33 | ED 73C v01 | shall0000 | Page 0 |
| WAT | Comment: No comparable standard was identified. | | | | |
| | | | | | |
| 2.2.9.2 Mode S | | | | | |
| b. In the presence of non-coherent CW interference at a frequency of 1030 ±0.2 MHz. and at signal levels of -60 dBm or less, and in the absence of valid interrogation signals, Mode S transponders shall <<shall0133>> not generate unwanted Mode S replies more often than once per 10 seconds. | | | No match in ED 73Cv2 | | |

| | |
|---|---|
| No Link | ID=874 |

| | | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0148 | Page 34 | ED 73C v01 | shall0000 | Page 0 |
| WAT | Comment: No comparable standard was identified. | | | | |
| | | | | | |
| 2.2.11 Response to Mutual Suppression Pulses | | | | | |
| b. The suppression output signal shall <<shall0148>> precede the transponder RF transmission by no more than 10 microsoeconds and return to the inactive state in less than 10 microseconds. | | | No match in ED 73Cv2 | | |

| | |
|---|---|
| No Link | ID=878 |

| | | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0152 | Page 34 | ED 73C v01 | shall0000 | Page 0 |
| WAT | Comment: No comparable standard was identified. | | | | |
| | | | | | |
| 2.2.12.1 Diversity Antenna Selection and Selection Threshold | | | | | |
| Antenna selection shall <<shall0152>> be automatic. The transponder shall <<shall0153>> select one of the two antennas on the basis of the relative strengths of the detected interrogation signals, provided that both channels simultaneously receive a valid identical interrogation or pulse pair. Antenna selection and switching may occur after the receipt of one of the following. | | | No match in ED 73Cv2 | | |

| | |
|---|---|
| No Link | ID=880 |

| | | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0153 | Page 34 | ED 73C v01 | shall0000 | Page 0 |
| WAT | Comment: DO material in the sentence following the Shall ("Antenna selection and switching may…") is not found in ED. No comparable standard was identified. | | | | |
| | | | | | |
| 2.2.12.1 Diversity Antenna Selection and Selection Threshold | | | | | |
| Antenna selection shall <<shall0152>> be automatic. The transponder shall | | | No match in ED 73Cv2 | | |

| | |
|---|---|
| <<shall0153>> select one of the two antennas on the basis of the relative strengths of the detected interrogation signals, provided that both channels simultaneously receive a valid identical interrogation or pulse pair. Antenna selection and switching may occur after the receipt of one of the following. | |

| No Link | ID=884 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0155 | Page 35 | ED 73C v01 | shall0000 | Page 0 |
| WAT | Comment: RG-the DO material matches the content of ED 3.16.3 b; WT-There is no shall in ED 3.16.3.b | | | | |
| | | | | | |
| 2.2.12.1 Diversity Antenna Selection and Selection Threshold | | | | | |
| The transponder shall <<shall0155>> nominally select the antenna connected to the RF port having the stronger signal. To allow for unbalance in the characteristics of the two channels, a transition zone ±3 dB wide is permitted, in which either antenna may be selected. | | | No match in ED 73Cv2 | | |

| No Link | ID=906 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0177 | Page 38 | ED 73C v01 | shall0000 | Page 0 |
| WAT | Comment: No comparable standard was identified. | | | | |
| | | | | | |
| 2.2.13.1.1 Fixed Direct Data | | | | | |
| (2) Mode S-Only All-Call Replies – In response to a Mode S-Only All-Call interrogation, the transponder shall <<shall0177>> place its 24-bit discrete address in the "AA" field (see §2.2.14.4.1), bits 9-32 of the All-Call reply. | | | No match in ED 73Cv2 | | |

| No Link | ID=907 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0178 | Page 38 | ED 73C v01 | shall0000 | Page 0 |
| WAT | Comment: No comparable standard was identified. | | | | |
| | | | | | |
| 2.2.13.1.1 Fixed Direct Data | | | | | |
| (3) All Other Mode S Transmissions – In each response to any Mode S interrogation except Mode S-Only All-Call, the transponder shall <<shall0178>> place its 24-bit address, overlaid on parity, in the "AP" field, bits 33-56 of short formats and bits 89-112 of long formats (see §2.2.14.4.4). | | | No match in ED 73Cv2 | | |

| No Link | ID=948 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0220 | Page 45 | ED 73C v01 | shall0000 | Page 0 |
| WAT | Comment: In a Note No comparable standard was identified. | | | | |
| | | | | | |
| 2.2.14.1 Format Structure, Interrogation and Reply | | | | | |
| 2. [- N -] denotes free coding space with N available bits. These shall <<shall0220>> be coded as ZEROs for transmission. | | | No match in ED 73Cv2 | | |

| No Link | ID=949 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0221 | Page 46 | ED 73C v01 | shall0000 | Page 0 |
| WAT | Comment: in a note No comparable standard was identified. | | | | |
| | | | | | |
| 2.2.14.1 Format Structure, Interrogation and Reply | | | | | |
| 2. [- N -] denotes free coding space with N available bits. These shall <<shall0221>> be coded as ZEROs for transmission. | | | No match in ED 73Cv2 | | |

| No Link | ID=950 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0222 | Page 50 | ED 73C v01 | shall0000 | Page 0 |
| WAT | Comment: not found No comparable standard was identified. | | | | |
| | | | | | |
| 2.2.14.4.3 AF Application Field | | | | | |
| This 3-bit (6-8) downlink field in DF=19 shall <<shall0222>> be used to define the format of the 112-bit transmission. | | | No match in ED 73Cv2 | | |

| No Link | ID=955 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0227 | Page 51 | ED 73C v01 | shall0000 | Page 0 |
| WAT | Comment: not found No comparable standard was identified. | | | | |
| | | | | | |
| 2.2.14.4.8 CF Control Field | | | | | |
| This 3-bit (6-8) downlink field in DF=18 shall <<shall0227>> be used to define the format of the 112-bit transmission. | | | No match in ED 73Cv2 | | |

| No Link | ID=962 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0233 | Page 53 | ED 73C v01 | shall0000 | Page 0 |

| | |
|---|---|
| WAT | Comment: ED 3.18.4.12 is flight status but contains no shall No comparable standard was identified. |
| | |
| 2.2.14.4.14 FS Flight Status | |
| This 3-bit (6-8) downlink field reports the flight status of the aircraft and is used in formats DF=4, 5, 20 and 21. Aircraft without the means of automatically determining the on-the-ground condition shall <<shall0233>> always report airborne state. The codes are: | No match in ED 73Cv2 |

| | | | | | |
|---|---|---|---|---|---|
| No Link | ID=969 | | | | |
| DO 181D v08 | shall0240 | Page 56 | ED 73C v01 | shall0000 | Page 0 |
| WAT | Comment: 3.18.4.27 of ED is PI but no shall No comparable standard was identified. | | | | |
| | | | | | |
| 2.2.14.4.30 PI Parity/Interrogator Identity | | | | | |
| The code used in downlink PI field generation shall <<shall0240>> be formed by a sequence of 24 bits (a1, a2, . . . a24) where the first 17 bits are ZEROs, the next three bits are a replica of the code label (CL) field (see §2.2.14.4.9) and the last four bits are a replica of the interrogator code (IC) field (§2.2.14.4.15). | | | No match in ED 73Cv2 | | |

| | | | | | |
|---|---|---|---|---|---|
| No Link | ID=970 | | | | |
| DO 181D v08 | shall0241 | Page 56 | ED 73C v01 | shall0000 | Page 0 |
| WAT | Comment: 3.18.4.27 of ED is PI but no shall No comparable standard was identified. | | | | |
| | | | | | |
| 2.2.14.4.30 PI Parity/Interrogator Identity | | | | | |
| If the reply is made in response to a Mode A/C/S All-Call, a Mode S-only All-Call with CL field and IC field equal to ZERO, or is an acquisition or Extended Squitter, the II (see §2.2.14.4.17) and the SI (see §2.2.14.4.37) codes shall <<shall0241>> be set to ZERO. | | | No match in ED 73Cv2 | | |

| | | | | | |
|---|---|---|---|---|---|
| No Link | ID=976 | | | | |
| DO 181D v08 | shall0243 | Page 61 | ED 73C v01 | shall0000 | Page 0 |
| WAT | Comment: ED paragraph 3.18.4.38 contains no shall No comparable standard was identified. | | | | |
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| 2.2.14.4.42 VS Vertical Status | | | | | |
| This 1-bit (6) downlink field in DF=0, 16 indicates, when ZERO, that the aircraft is airborne and, when ONE, that the aircraft is on the ground. Aircraft | | | No match in ED 73Cv2 | | |

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| without the means of automatically determining the on-the-ground condition shall <<shall0243>> always report airborne state. | |

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| No Link | ID=987 | | | | |
| DO 181D v08 | shall0253 | Page 64 | ED 73C v01 | shall0000 | Page 0 |
| WAT | Comment: comparable to sentence in ED 3.20.2.1 b before the note No comparable standard was identified. | | | | |
| | | | | | |
| 2.2.18.2.1 Error Protection (Figure 2-9 and Figure 2-10) | | | | | |
| the result is a quotient and a remainder R(x) of degree <24. The bit sequence formed by this remainder shall <<shall0253>> be the parity check sequence. Parity bit pi for any i from 1 to 24, is the coefficient of x24-iin R(x). | | | No match in ED 73Cv2 | | |

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|---|---|---|---|---|---|
| No Link | ID=1011 | | | | |
| DO 181D v08 | shall0277 | Page 70 | ED 73C v01 | shall0000 | Page 0 |
| WAT | Comment: no exact match but the correct paragraph - ED 3.20.2.5 No comparable standard was identified. | | | | |
| | | | | | |
| 2.2.18.2.5 Multisite Lockout Protocol (Figure 2-12) | | | | | |
| The multisite lockout command shall <<shall0277>> be transmitted in the SD field (§2.2.14.4.36). A lockout command for an II code shall <<shall0278>> be transmitted in an SD with DI=1 or DI=7. An II lockout command shall <<shall0279>> be indicated by LOS equals ONE in the presence of a non-zero interrogator identifier in the IIS subfield of SD. A lockout command for an SI code shall <<shall0280>> be transmitted in an SD with DI=3. An SI lockout shall <<shall0281>> be indicated by LSS (§2.2.19.2.1.1) equals ONE in the presence of a non-zero interrogator identifier in the SIS subfield of SD (§2.2.19.2.1). After a transponder has accepted an interrogation containing a multisite lockout command, that transponder shall <<shall0282>> commence to lock out (i.e., not accept) any Mode S-only All-Call interrogation which includes the identifier of the interrogator that commanded the lockout. The lockout shall <<shall0283>> persist for an interval 18 ±1 seconds after the last acceptance of an interrogation containing the multisite lockout command. Multisite lockout shall <<shall0284>> not prevent acceptance of a Mode S-only All-Call interrogation containing PR codes 8 to 12. If a lockout command (LOS=1) is received together with IIS=0, it shall <<shall0285>> be interpreted as a non-selective all-call lockout | | | No match in ED 73Cv2 | | |

| No Link | ID=1019 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0284 | Page 71 | ED 73C v01 | shall0000 | Page 0 |
| WAT | Comment: ED standard is in note 2 in 3.20.2.5 No comparable standard was identified. | | | | |

| 2.2.18.2.5 Multisite Lockout Protocol (Figure 2-12) | |
|---|---|
| The multisite lockout command shall <<shall0277>> be transmitted in the SD field (§2.2.14.4.36). A lockout command for an II code shall <<shall0278>> be transmitted in an SD with DI=1 or DI=7. An II lockout command shall <<shall0279>> be indicated by LOS equals ONE in the presence of a non-zero interrogator identifier in the IIS subfield of SD. A lockout command for an SI code shall <<shall0280>> be transmitted in an SD with DI=3. An SI lockout shall <<shall0281>> be indicated by LSS (§2.2.19.2.1.1) equals ONE in the presence of a non-zero interrogator identifier in the SIS subfield of SD (§2.2.19.2.1). After a transponder has accepted an interrogation containing a multisite lockout command, that transponder shall <<shall0282>> commence to lock out (i.e., not accept) any Mode S-only All-Call interrogation which includes the identifier of the interrogator that commanded the lockout. The lockout shall <<shall0283>> persist for an interval 18 ±1 seconds after the last acceptance of an interrogation containing the multisite lockout command. Multisite lockout shall <<shall0284>> not prevent acceptance of a Mode S-only All-Call interrogation containing PR codes 8 to 12. If a lockout command (LOS=1) is received together with IIS=0, it shall <<shall0285>> be interpreted as a non-selective all-call lockout | No match in ED 73Cv2 |

| No Link | ID=1020 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0285 | Page 71 | ED 73C v01 | shall0000 | Page 0 |
| WAT | Comment: ED sentence following Shall 381 is comparable No comparable standard was identified. | | | | |

| 2.2.18.2.5 Multisite Lockout Protocol (Figure 2-12) | |
|---|---|
| The multisite lockout command shall <<shall0277>> be transmitted in the SD field (§2.2.14.4.36). A lockout command for an II code shall <<shall0278>> be transmitted in an SD with DI=1 or DI=7. An II lockout command shall <<shall0279>> be indicated by LOS equals ONE in the presence of a non-zero interrogator identifier in the IIS subfield of SD. A lockout command for an SI code shall <<shall0280>> be transmitted in an SD with DI=3. An SI lockout shall <<shall0281>> be indicated by LSS (§2.2.19.2.1.1) equals ONE in the presence of a non-zero interrogator identifier in the SIS subfield of SD (§2.2.19.2.1). After a transponder has accepted an interrogation containing a multisite lockout command, that transponder shall <<shall0282>> commence | No match in ED 73Cv2 |

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| to lock out (i.e., not accept) any Mode S-only All-Call interrogation which includes the identifier of the interrogator that commanded the lockout. The lockout shall <<shall0283>> persist for an interval 18 ±1 seconds after the last acceptance of an interrogation containing the multisite lockout command. Multisite lockout shall <<shall0284>> not prevent acceptance of a Mode S-only All-Call interrogation containing PR codes 8 to 12. If a lockout command (LOS=1) is received together with IIS=0, it shall <<shall0285>> be interpreted as a non-selective all-call lockout | |

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| No Link | ID=1026 | | | | |
| DO 181D v08 | shall0291 | Page 71 | ED 73C v01 | shall0000 | Page 0 |
| WAT | Comment: Did not find in ED No comparable standard was identified. | | | | |
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| 2.2.18.2.6 Acquisition Squitter Protocols | | | | | |
| (3) The scheduled acquisition squitter shall <<shall0291>> be delayed if an Extended Squitter is in process. | | | No match in ED 73Cv2 | | |

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| No Link | ID=1027 | | | | |
| DO 181D v08 | shall0292 | Page 71 | ED 73C v01 | shall0000 | Page 0 |
| WAT | Comment: Did not find in ED No comparable standard was identified. | | | | |
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| 2.2.18.2.6 Acquisition Squitter Protocols | | | | | |
| (4) Acquisition squitters shall <<shall0292>> only be transmitted when in the on-the-ground state if the transponder is not reporting the surface position type of Mode S Extended Squitter or as specified in subparagraph c. | | | No match in ED 73Cv2 | | |

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| No Link | ID=1030 | | | | |
| DO 181D v08 | shall0295 | Page 72 | ED 73C v01 | shall0000 | Page 0 |
| WAT | Comment: did not find No comparable standard was identified. | | | | |
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| 2.2.18.2.6 Acquisition Squitter Protocols | | | | | |
| c. Conditions for Acquisition Squitter Transmission –When commanded to report the surface position format by TCS commands (see §2.2.23.1.7), aircraft without automatic means of determining the on-the-ground condition, and aircraft with such means that are reporting airborne state, shall <<shall0295>> transmit acquisition squitters in addition to the surface | | | No match in ED 73Cv2 | | |

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| position Extended Squitters unless acquisition squitter transmission has been inhibited (subparagraph d.) | |

| No Link | ID=1031 | | | | |
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| DO 181D v08 | shall0296 | Page 72 | ED 73C v01 | shall0000 | Page 0 |
| WAT | Comment: did not find in comparable area in ED No comparable standard was identified. | | | | |
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| 2.2.18.2.6 Acquisition Squitter Protocols | | | | | |
| If aircraft are commanded to stop emitting surface position Extended Squitters by RCS command equal to 3 or 4 (see §2.2.23.1.7), these aircraft shall <<shall0296>> begin to emit the acquisition squitter (if not already doing so). | | | No match in ED 73Cv2 | | |

| No Link | ID=1032 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0297 | Page 73 | ED 73C v01 | shall0000 | Page 0 |
| WAT | Comment: Did not find in a comparable are in ED No comparable standard was identified. | | | | |
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| 2.2.18.2.6 Acquisition Squitter Protocols | | | | | |
| d. Future Suppression of Regular Transmission of Acquisition Squitter Transponders equipped for Extended Squitter operation should have a means to disable acquisition squitters when Extended Squitters are being emitted. After regular acquisition squitter suppression has been implemented, the acquisition squitter shall <<shall0297>> continue to be broadcast by transponders if they are not emitting any Extended Squitters. | | | No match in ED 73Cv2 | | |

| No Link | ID=1038 | | | | |
|---|---|---|---|---|---|
| DO 181D v08 | shall0303 | Page 73 | ED 73C v01 | shall0000 | Page 0 |
| WAT | Comment: No comparable standard was identified. | | | | |
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| 2.2.18.2.7 Flight Status and Vertical Status Protocols (Figure 2-13) | | | | | |
| a. Alert – The transponder shall <<shall0299>> transmit the 4096 identification code in ATCRBS Mode A replies and in the ID field of downlink format DF=5. This code can be changed by the pilot, and when a change is made an alert condition shall <<shall0300>> be established. If the identification code is changed to 7500, 7600 or 7700, the alert condition shall <<shall0301>> be permanent. If the identification code is changed to any other value, the alert condition shall <<shall0302>> be temporary and self- | | | No match in ED 73Cv2 | | |

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| canceling after 18 ±1 seconds (TC timer). The TC timer shall <<shall0303>> be retriggered and continued for TC seconds after any change has been accepted by the transponder function. The alert condition shall <<shall0304>> be reported in the FS field. The permanent alert condition shall <<shall0305>> be terminated and replaced by a temporary alert condition when the identification code is set to a value other than 7500, 7600 or 7700. | |

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| No Link | ID=1045 | | | | |
| DO 181D v08 | shall0310 | Page 74 | ED 73C v01 | shall0000 | Page 0 |
| WAT | Comment: Apparently missing material No comparable standard was identified. | | | | |
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| 2.2.18.2.7 Flight Status and Vertical Status Protocols (Figure 2-13) | | | | | |
| Aircraft with an automatic means for determining the on-the-ground condition that are equipped to format Extended Squitter messages shall <<shall0310>> perform the following validation check: | | | No match in ED 73Cv2 | | |

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| No Link | ID=1100 | | | | |
| DO 181D v08 | shall0371 | Page 88 | ED 73C v01 | shall0000 | Page 0 |
| WAT | Comment: IN a NOTE No comparable standard was identified. | | | | |
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| 2.2.19.1.13 Aircraft Identification Reporting and AIS Aircraft Identification Subfield in MB | | | | | |
| Note: There are indications that a firm requirement may exist for the AIS feature in European Airspace. In such usage, the identification number entered in field 7 of the ICAO flight plan format shall <<shall0371>> be transmitted in the AIS subfield. | | | No match in ED 73Cv2 | | |

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| No Link | ID=1168 | | | | |
| DO 181D v08 | shall0602 | Page 127 | ED 73C v01 | shall0000 | Page 0 |
| WAT | Comment: DO standard is that the xpdr shall have ES capability No comparable standard was identified. | | | | |
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| 2.2.23.1 ADS-B Extended Squitter | | | | | |
| Mode S transponders shall <<shall0602>> have the capability to transmit Extended Squitters to support the broadcast of aircraft-derived position, identification and state information. | | | No match in ED 73Cv2 | | |

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| No Link | ID=1224 | | | | |
| DO 181D v08 | shall0676 | Page 135 | ED 73C v01 | shall0000 | Page 0 |
| WAT | Comment: | No comparable standard was identified. | | | |
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| 2.2.23.3.2 ES/NT Squitter Types | | | | | |
| Airborne Position Squitter. The airborne position type ES/NT shall <<shall0676>> use format DF=18 with the format for register 05 {HEX} inserted in the ME field. | | | No match in ED 73Cv2 | | |

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| No Link | ID=1225 | | | | |
| DO 181D v08 | shall0677 | Page 135 | ED 73C v01 | shall0000 | Page 0 |
| WAT | Comment: | No comparable standard was identified. | | | |
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| 2.2.23.3.2 ES/NT Squitter Types | | | | | |
| Surface Position Squitter. The surface position type ES/NT type shall <<shall0677>> use format DF=18 with the format for register 06 {HEX} inserted in the ME field. | | | No match in ED 73Cv2 | | |

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| No Link | ID=1226 | | | | |
| DO 181D v08 | shall0678 | Page 135 | ED 73C v01 | shall0000 | Page 0 |
| WAT | Comment: | No comparable standard was identified. | | | |
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| 2.2.23.3.2 ES/NT Squitter Types | | | | | |
| Aircraft Identification Squitter. The aircraft identification type ES/NT shall <<shall0678>> use format DF=18 with the format for register 08 {HEX} inserted in the ME field. | | | No match in ED 73Cv2 | | |

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| No Link | ID=1227 | | | | |
| DO 181D v08 | shall0679 | Page 135 | ED 73C v01 | shall0000 | Page 0 |
| WAT | Comment: | No comparable standard was identified. | | | |
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| 2.2.23.3.2 ES/NT Squitter Types | | | | | |
| Airborne Velocity Squitter. The airborne velocity type ES/NT shall | | | No match in ED 73Cv2 | | |

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| <<shall0679>> use format DF=18 with the format for register 09 {HEX} inserted in the ME field | |

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| No Link | ID=1228 | | | | |
| DO 181D v08 | shall0680 | Page 135 | ED 73C v01 | shall0000 | Page 0 |
| WAT | Comment: No comparable standard was identified. | | | | |
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| 2.2.23.3.2 ES/NT Squitter Types | |
| Event-Driven Squitter. The event-driven type ES/NT shall <<shall0680>> use format DF=18 with the format for register 0A {HEX} inserted in the ME field. | No match in ED 73Cv2 |