

DRAFT

Differences between
RTCA DO 181D version 1-6
And
EUROCAE ED 73B version h

Prepared by:
Wm. A. Thedford, Ph. D.
AACAS – LLC
April 16, 2008

| | | | | | | | |
|---|--|----------|--------------|--|--------------------------------------|----------|-----|
| Different | S0041 | Page: 22 | DO 181D v1-6 | ED 73B v h | S0051 | Page: 22 | 511 |
| Comment: | Perhaps acceptable | | | | | | |
| Section: | 2.2.3.4.1 ATCRBS Reply Rate Capability | | | Section: | 3.4.2 Reply Rate Capability - Mode S | | |
| The transponder shall 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 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 | S0042 | Page: 22 | DO 181D v1-6 | ED 73B v h | S0049 | Page: 22 | 509 |
| Comment: | DO limits to 100 milliseconds. | | | | | | |
| Section: | 2.2.3.4.1 ATCRBS Reply Rate Capability | | | Section: | 3.4.1 Reply Rate Capability - Mode A/C | | |
| If intended for installation in aircraft that operate at altitudes above 15,000 feet, the transponder shall 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 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 | S0123 | Page: 32 | DO 181D v1-6 | ED 73B v h | S0141 | Page: 32 | 157 |
| Comment: | | | | | | | |
| Section: | 2.2.7.2.1 Recovery From a Mode S Interrogation If No Reply Is Required | | | Section: | 3.10.2 Recovery | | |
| Following a correctly addressed Mode S interrogation which has been accepted and which requires no reply, a transponder shall 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 recover sensitivity to within 3 dB of MTL no later than 45 μs after receipt of the sync phase reversal. | | | |

| | | | | | | | |
|--|--------------------------------------|----------|--------------|--|--------------------------|----------|-----|
| Different | S0130 | Page: 33 | DO 181D v1-6 | ED 73B v h | S0153 | Page: 33 | 168 |
| Comment: | | | | | | | |
| Section: | 2.2.7.3.1 ATCRBS Reply Rate Limiting | | | Section: | 3.11 REPLY RATE LIMITING | | |
| <p>The limit shall 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.</p> | | | | <p>Without regard to the number of pulses in each reply, the limit control shall permit adjustment to any value between 500 continuous Mode A/C replies per second and</p> <ul style="list-style-type: none"> a. 2 000 continuous replies per second, or b. the maximum continuous reply rate capability, if less than 2 000 replies per second. | | | |

| | | | | | | | |
|---|--------------------------------------|----------|--------------|---|--------------------------|----------|-----|
| Different | S0132 | Page: 33 | DO 181D v1-6 | ED 73B v h | S0155 | Page: 33 | 170 |
| Comment: | | | | | | | |
| Section: | 2.2.7.3.2 Mode S Reply Rate Limiting | | | Section: | 3.11 REPLY RATE LIMITING | | |
| <p>If a reply rate limiting device is provided for Mode S replies, it shall permit at least the reply rates required in §2.2.3.4.2.</p> | | | | <p>If a reply rate limiting device is provided for Mode S replies, it shall permit at least the reply rates specified in paragraph 3.4 and shall not prevent acquisition squitter transmission as per 3.22.2.6 and extended squitter as per 3.2 nor the transmission of a DF=16 (3.23.1.4).</p> | | | |

| | | | | | | | |
|--|--------------------------------------|----------|--------------|---|---------------------------|----------|-----|
| Different | S0154 | Page: 36 | DO 181D v1-6 | ED 73B v h | S0187 | Page: 36 | 243 |
| Comment: | | | | | | | |
| Section: | 2.2.10.3 Mode S Address Verification | | | Section: | 3.14.3 Failure Indication | | |
| <p>The Mode S transponder shall declare a transponder failure in the event that its own Mode S address is ALL ZEROs or ALL ONEs.</p> | | | | <p>Failures related to the 24 bit discrete address shall 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).</p> | | | |

| | | | | | | | |
|---|-----------------------------|----------|--------------|--|----------------|----------|-----|
| Different | S0161 | Page: 37 | DO 181D v1-6 | ED 73B v h | S0193 | Page: 37 | 245 |
| Comment: | | | | | | | |
| Section: | 2.2.12 Diversity Operations | | | Section: | 3.16.1 General | | |
| Such systems shall employ two antennas, one mounted on the top and the other on the bottom of the aircraft. | | | | Such systems shall 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 | S0174 | Page: 39 | DO 181D v1-6 | ED 73B v h | S0208 | Page: 39 | 258 |
| Comment: | DO wrong? | | | | | | |
| Section: | 2.2.12.4 Reply Delay of Diversity Transponders | | | Section: | 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 not exceed 0.08 microsecond for interrogations of equal amplitude. | | | | The total difference in mean reply delay between the two antenna channels (including the transponder-to-antenna cables) shall not exceed 0.13 μ s for interrogations of equal amplitude. | | | |

| | | | | | | | |
|--|--|----------|--------------|--|--|----------|-----|
| Different | S0248 | Page: 55 | DO 181D v1-6 | ED 73B v h | S0290 | Page: 55 | 356 |
| Comment: | | | | | | | |
| Section: | 2.2.14.4.17 II Interrogator Identification | | | Section: | 3.18.4.15 Interrogator Identification II | | |
| An II code value of ZERO shall 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). | | | | An II code value of zero shall only be used in conjunction with acquisition based on lockout override. | | | |

| | | | | | | | |
|--|--|----------|--------------|---|--|----------|-----|
| Different | S0325 | Page: 75 | DO 181D v1-6 | ED 73B v h | S0376 | Page: 75 | 685 |
| Comment: | | | | | | | |
| Section: | 2.2.18.2.7 Flight Status and Vertical Status Protocols (Figure 2-13) | | | Section: | 3.22.2.7 Flight Status and Vertical Status Protocols (Figure 3-12) | | |
| Special Position Identification – When manually selected, the transponder shall transmit the equivalent of the ATRCBS SPI in the FS field of surveillance replies DF=4, 5, 20, 21 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. | | | | Special Position Identification -When manually selected, the transponder shall transmit the equivalent of the SPI in the FS field of surveillance replies DF=4,5. | | | |

| | | | | | | | |
|--|---|----------|--------------|---|-----------------------------------|----------|----|
| Different | S0401 | Page: 90 | DO 181D v1-6 | ED 73B v h | S0471 | Page: 90 | 10 |
| Comment: | | | | | | | |
| Section: | 2.2.19.2 The Multisite Message Protocol | | | Section: | 3.23.2 Multisite Message Protocol | | |
| However, only the Comm-B protocol shall apply to the Level 2 transponders. | | | | Comm-B protocol shall apply to all Datalink transponders, Comm-C to level 3 and higher, and Comm-D to level 4 and higher. | | | |

| | | | | | | | |
|---|---|-----------|--------------|--|-------------------------------|-----------|-----|
| Different | S0458 | Page: 103 | DO 181D v1-6 | ED 73B v h | S0266 | Page: 103 | 434 |
| Comment: | Not an issue? | | | | | | |
| Section: | 2.2.20.1.4 Uplink Interface – Data Rate | | | Section: | 3.17.4 ELM Service Interfaces | | |
| A transponder equipped for standard uplink ELM operation shall be able to transfer data from at least four complete 16-segment uplink ELMs in any four-second period. | | | | (1) A transponder equipped for uplink ELM operation (Comm-C) shall be capable of processing at least 4 complete 16-segment ELMs in any 4-second period (level 3 and 4 transponders). | | | |

| | | | | | | | |
|--|---|-----------|--------------|---|--|-----------|----|
| Different | S0484 | Page: 108 | DO 181D v1-6 | ED 73B v h | S0552 | Page: 108 | 83 |
| Comment: | ED added material | | | | | | |
| Section: | 2.2.20.2.3.6 Significance of PC Command | | | Section: | 3.25.2 Multisite Downlink ELM Protocol | | |
| , when the IIS stored for Comm-D is not ZERO (0), receipt of a closeout (PC=6) shall have no effect on the transaction unless accompanied by IIS equal to the stored Comm-D IIS. | | | | , when the IIS stored for Comm-D is not "0," receipt of a closeout (PC=6) shall 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 3.25.2 d. | | | |

| | | | | | | | |
|--|-----------------------------------|-----------|--------------|--|----------------------------------|-----------|-----|
| Different | S0629 | Page: 133 | DO 181D v1-6 | ED 73B v h | S0680 | Page: 133 | 584 |
| Comment: | | | | | | | |
| Section: | 2.2.23.1.3 Extended Squitter Rate | | | Section: | 3.28 EXTENDED SQUITTER PROTOCOLS | | |
| Acquisition squitters shall be reported in addition to Extended Squitters as specified in §2.2.18.2.6.c. | | | | When a transponder has extended squitter capability it shall not be possible to inhibit acquisition squitters except as specified in this section (3.28) | | | |

| | | | | | | | |
|---|-----------------------------------|-----------|--------------|---|-------------------------------|-----------|-----|
| Different | S0630 | Page: 133 | DO 181D v1-6 | ED 73B v h | S0701 | Page: 133 | 597 |
| Comment: | | | | | | | |
| Section: | 2.2.23.1.3 Extended Squitter Rate | | | Section: | 3.28.3 Extended squitter rate | | |
| Acquisition squitters shall always be reported if no Extended Squitters are reported. | | | | Acquisition squitters shall always be reported if extended position or velocity squitters are not reported. | | | |

| | | | | | | | |
|---|-----------------------------------|-----------|--------------|--|-------------------------------|-----------|-----|
| Different | S0630 | Page: 133 | DO 181D v1-6 | ED 73B v h | S0700 | Page: 133 | 596 |
| Comment: | | | | | | | |
| Section: | 2.2.23.1.3 Extended Squitter Rate | | | Section: | 3.28.3 Extended squitter rate | | |
| Acquisition squitters shall always be reported if no Extended Squitters are reported. | | | | Acquisition squitters shall be reported in addition to extended squitters unless the acquisition squitter is inhibited (Paragraph 3.22.2.6). | | | |