

2.2.2.1.1.3 Class A2 ADS-B Transponder Based Transmitter Power

The minimum RF peak output power for Class A2 ADS-B Transponder Based equipment shall be 21.0 dBW (125 W).

2.2.2.1.1.4 Class A3 ADS-B Transponder Based Transmitter Power

The minimum RF peak output power for Class A3 ADS-B Transponder Based equipment shall be 21.0 dBW (125 W).

2.2.2.1.1.5 Class B ADS-B Transponder Based Transmitter Power

The minimum RF peak output power for Class B ADS-B Transponder Based equipment shall be 18.5 dBW (70 W).

2.2.2.1.2 RF Peak Output Power (maximum)

The maximum RF peak output power of each pulse of each transmitted message at the terminals of the antenna shall be fixed at 27.0 dBW (500 W) for all classes of Transponder based equipment.

2.2.2.2 Stand Alone Transmitters

Transmitters for Class A0 and Class B equipment may be implemented independent of a Mode S transponder. Such transmitters shall meet the requirements specified in the following subparagraphs.

Note: A 1090 MHz non-transponder device (NTD) is intended to provide the lowest cost implementation of Extended Squitter for low-end General Aviation (GA) users. A NTD implementation does not use the 1090 MHz spectrum as efficiently nor provide all of the system benefits as a transponder implementation. For this reason, its use is restricted to class A0 operation in order to limit the number of such devices. Examples of the spectrum efficiency and system benefit issues related to NTDs are as follows:

- 1. TCAS will not be able to benefit from the ADS-B information from the NTD. TCAS will only monitor ADS-B data reported in DF=17 squitters (as emitted by a Mode S transponder). DF=18 squitters from NTDs are not monitored since TCAS must assume that it cannot interrogate the aircraft (via Mode S) to validate the range and approximate bearing via active interrogations through a process called hybrid surveillance.*
- 2. Mode S interrogators will not be able to benefit from the ADS-B information from the NTD. Mode S interrogators will not be able to read Extended Squitter messages via direct air-ground readout. Such readout requires that the ADS-B data is available in the transponder registers. This will not be the case for a NTD.*
- 3. More interference is generated. An aircraft equipped with a NTD and a Mode A/C transponder will generate more interference than a Mode S transponder implementation of Extended Squitter. Examples are as follows: (a) For a transponder implementation, TCAS will (after validation) maintain an aircraft on passive surveillance unless it becomes a near threat or a*

threat. For the NTD case, the aircraft will emit Extended Squitters and be regularly interrogated by TCAS. (b) A Mode S transponder implementation of Extended Squitter offers a surface surveillance system the possibility of controlling the squitter rate to reduce un-necessary transmissions.

2.2.2.2.1 Transmission Frequency

The carrier frequency of ADS-B message transmissions shall be 1090 ± 1 MHz.

Note: *This requirement is consistent with ICAO Annex 10, Volume IV, second edition, July 1998, section 3.1.2.2.1, and RTCA Document No. DO-181B, section 2.2.3.1 (EUROCAE ED-73A, section 3.3.1).*

2.2.2.2.2 Transmission Spectrum

Spectrum requirements for the ADS-B transmitted message are provided in section 2.2.3.1.3 and Table 2-7 of this document.

Note: *The requirements provided are consistent with requirements of ICAO Annex 10, Volume IV, second edition, July 1998, section 3.1.2.2.2 and Figure 3-5, as well as with the requirements of RTCA Document No. DO-181B (EUROCAE ED-73A).*

2.2.2.2.3 Modulation

The ADS-B transmitted message shall consist of a preamble and a data block. The preamble shall be a 4-pulse sequence and the data block shall be binary pulse-position modulated at a 1 megabit per second data rate.

Note: *This requirement is consistent with ICAO Annex 10, Volume IV, second edition, July 1998, section 3.1.2.2.4. Requirements consistent with RTCA Document No. DO-181B, section 2.2.4.2.1 (EUROCAE ED-73A, sections 3.6.1 and 3.6.2) are provided in section 2.2.3.1.1 of this document.*

2.2.2.2.4 Pulse Shapes

Pulse shape requirements of the ADS-B transmitted message are provided in section 2.2.3.1.3 of this document.

Note: *The requirements provided are consistent with the requirements of ICAO Annex 10, Volume IV, second edition, July 1998, section 3.1.2.2.4.1 and Table 3-2, as well as with the requirements of RTCA Document No. DO-181B, section 2.2.4.2.3 (EUROCAE ED-73A, sections 3.3.2 and 3.6.4).*

2.2.2.2.5 Message Structure

Message structure requirements of the ADS-B transmitted message are provided in section 2.2.3.1 and Figure 2-1 of this document.

Note: *The requirements are consistent with the requirements of ICAO Annex 10, Volume IV, second edition, July 1998, section 3.1.2.2.5 and Figure 3-6, as well*