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ADS-B UAT MOPS Maintenance

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Proposal to Add a “Receive-Only” Equipment Class

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Summary
This Working Paper addresses the proposal to add a “Receive-Only” Equipment Class and was initiated during Meeting #26 during discussion of the matter by FAA AIR-130.

2.1.11 Equipment Classes

UAT equipment is categorized into aircraft system equipage classes as defined in [Table 3-1](#) of RTCA DO-242A (ADS-B MASPS). For UAT equipment, the installed performance of these equipment classes **shall** be defined by [Table 2-1](#).

The ADS-B MASPS “A1” equipment has been divided into **three** classes, based on the maximum altitude that the aircraft is operated under. For A1 aircraft that always operate below 18,000 feet MSL, the “A1 Low” class and “A1 Single Antenna class are created, and abbreviated throughout this document as “A1L” and “A1S,” respectively. For A1 aircraft that have no altitude operating restrictions, the “A1 High” class is created, and abbreviated throughout this document as “A1H.” The only equipment performance difference between classes A1L and A1H is the Transmitter RF output power, as shown in [Table 2-1](#).

The remainder of the interactive aircraft/vehicle classes (A0, A2, and A3) are as defined in RTCA DO-242A.

For “B” class aircraft that always operate below 18000 feet MSL, the “B0” and “B1S” classes is created. For “B” class aircraft that have no altitude operating restrictions, the “B1” class is available. The ADS-B MASPS “B0” class (broadcast-only aircraft) is defined as having transmitter characteristics and payload capability identical to the UAT A0 interactive aircraft class. The ADS-B MASPS “B1S” class (broadcast-only aircraft) is defined as having transmitter characteristics and payload capability identical to the UAT A1S interactive aircraft class. The ADS-B MASPS “B1” class (broadcast-only aircraft) is defined as having transmitter characteristics and payload capability identical to the UAT A1H interactive aircraft class.

The characteristics of the ADS-B MASPS “B2” class (broadcast-only ground vehicle) are defined in [Table 2-1](#).

The characteristics of the ADS-B MASPS “B3” class (broadcast-only fixed or moveable obstacle) are defined in [Table 2-1](#). The payload capability supports the surface position, height of highest point, and identification (including Emitter Category) of the obstacle, so that both State Vector and Mode Status reports must be supported. Moveable obstacles require a position source. A moveable obstacle is one that can change its position, but only slowly, such that its horizontal velocity may be ignored. See **§Error! Reference source not found.** of this document for the payload characteristics.

Class “R” is a receive-only aircraft/vehicle class also defined in Table 2-1. The subclasses (R1S, R1H, R2 and R3) of receive-only equipment shall meet all of the receive requirements of its corresponding “A” subclass.

Requirements for Class ‘C’ ground-based receive-only equipment are not addressed in this document. See Appendix D for guidance in ground-based receiver performance.

Table 2-1: UAT Installed Equipment Classes

Description	Equipage Class	Tx RF Power Delivered to Antenna System	Intended Antenna Diversity (when Airborne for Classes A & B0-B1)	
			Transmit	Receive
Aircraft	A0	Low Power <i>(Altitude always below 18000 feet)</i>	Single Antenna (see Note 4)	Single Antenna (see Note 4)
	A1L		Alternating every 2 sec.	Alternating every second
	A1S	Medium Power <i>(Altitude always below 18000 feet)</i>	Single Antenna (see Note 4)	Single Antenna (see Note 4)
	A1H	Medium Power	Alternating every 2 sec.	Alternating every second
	A2	Medium Power	Alternating every 2 sec.	Dual Receiver
	A3	High Power	Alternating every 2 sec.	Dual Receiver
	Tx-Only Aircraft / Vehicle	B0	Low Power <i>(Altitude always below 18000 feet)</i>	Single Antenna (see Note 4)
B1S		Medium Power	Single Antenna (see Note 4)	n/a
B1		Medium Power	Alternating every 2 sec.	n/a
Surface Vehicle	B2	+28 to +32 dBm	Single Antenna	n/a
Obstacle	B3	+30 dBm (minimum)	Single Antenna	n/a
<u>Rx-Only Aircraft / Vehicle</u>	<u>R1S</u>	<u>n/a</u>	<u>n/a</u>	<u>Single Antenna (see Note 4)</u>
	<u>R1</u>	<u>n/a</u>	<u>n/a</u>	<u>Alternating every 2 sec.</u>
	<u>R2</u>	<u>n/a</u>	<u>n/a</u>	<u>Dual Receiver</u>
	<u>R3</u>	<u>n/a</u>	<u>n/a</u>	<u>Dual Receiver</u>

Notes:

1. See §**Error! Reference source not found.** for definition of Transmitter RF power levels.
2. Transmitter RF power requirement depends on the aircraft maximum altitude capability. Low-altitude aircraft (< 18,000 feet max altitude) need not support the higher-power transmitter requirements due to line-of-site limitations.

3. *Top antenna is not required if use of a single antenna does not degrade signal propagation. This allows for single antenna installation on radio-transparent airframes.*
4. *For a single-antenna **AIS/BIS** installations, antenna gain pattern performance **will need to** be shown at least equivalent to that of a quarter-wave resonant antenna mounted on the fuselage bottom surface. **For single-antenna A0/B0 installations, such an analysis should be performed.***
5. *See **§Error! Reference source not found.** for definition of payload transmission requirements for each equipment class.*