

Table 2-3: ADS-B CLASS A TRANSMITTER EQUIPMENT TO MESSAGE COVERAGE

Transmitter Class	Minimum Range / Minimum Transmit Power (at Antenna Port)	Operation	MASPS Requirement (RTCA/DO-242)	Minimum Message Capability Required (From Table 2-2)
A ₀ (Minimum)	10 nmi / 70 W	<ul style="list-style-type: none"> • Aid to Visual Acquisition • Conflict Avoidance 	SV MS-P _{VFR}	Airborne Position A/C Identification & Type Airborne Velocity A/C Operational Status <u>Extended Squitter A/C Status</u>
A ₀ (Minimum)	10 nmi / 70 W	<ul style="list-style-type: none"> • Airport Surface 	SV-P MS-P _{VFR}	Surface Position A/C Identification & Type A/C Operational Status
A ₁ (Basic)	20 nmi / 125 W	<ul style="list-style-type: none"> • Aid to Visual Acquisition • Conflict Avoidance • Simultaneous Approaches 	SV MS-P _{IFR}	Airborne Position A/C Identification & Type Airborne Velocity A/C Operational Status Extended Squitter A/C Status
A ₁ (Basic)	20 nmi / 125W	<ul style="list-style-type: none"> • Airport Surface 	SV-P MS-P _{IFR}	Surface Position A/C Identification & Type A/C Operational Status
A ₂ (Enhanced)	40 nmi / 125 W	<ul style="list-style-type: none"> • Aid to Visual Acquisition • Conflict Avoidance • Separation Assurance and Sequencing • Flight Path Deconfliction Planning • Simultaneous Approaches 	SV MS	Airborne Position A/C Identification & Type Airborne Velocity A/C Operational Status Extended Squitter A/C Status A/C Trajectory Intent (TCP) A/C Operational Coordination
A ₂ (Enhanced)	40 nmi / 125 W	<ul style="list-style-type: none"> • Airport Surface 	SV-P MS	Surface Position A/C Identification & Type A/C Operational Status
A ₃ (Extended)	90 nmi / 125 W	<ul style="list-style-type: none"> • Aid to Visual Acquisition • Conflict Avoidance • Separation Assurance and Sequencing • Flight Path Deconfliction Planning • Simultaneous Approaches 	SV MS OC	Airborne Position A/C Identification & Type Airborne Velocity A/C Operational Status Extended Squitter A/C Status A/C Trajectory Intent (TCP) A/C Operational Coordination A/C Trajectory Intent (TCP+1) Event Driven
A ₃ (Extended)	90 nmi / 125 W	<ul style="list-style-type: none"> • Airport Surface 	SV-P MS	Surface Position A/C Identification & Type A/C Operational Status

Table 2-4: ADS-B Class B Transmitter Equipment To Message Coverage

Transmitter Class	Minimum Range / Minimum Transmit Power (at Antenna Port)	Operation	MASPS Requirement (RTCA/DO-242)	Minimum Message Capability Required (From Table 2-2)
B ₁ (Aircraft)	10 nmi / 70 W ¹	<ul style="list-style-type: none"> Aid to Visual Acquisition Conflict Avoidance 	SV _{B1} MS-P _{B1-ARR}	Airborne Position A/C Identification & Type Airborne Velocity A/C Operational Status Extended Squitter A/C Status
B ₁ (Aircraft)	10 nmi / 70 W ¹	<ul style="list-style-type: none"> Airport Surface 	SV _{B1} MS-P _{B1-GND}	Surface Position A/C Identification & Type A/C Operational Status
B ₂ (Ground Vehicle)	10 nmi / 70 W ¹	<ul style="list-style-type: none"> Aid to Visual Acquisition Conflict Avoidance 	SV _{B2} MS-P _{B2}	Surface Position A/C Identification & Type (See Note 14)
B ₂ (Ground Vehicle)	10 nmi / 70 W ¹	<ul style="list-style-type: none"> Airport Surface 	SV _{B2} MS-P _{B2/B3}	Surface Position A/C Identification & Type (See Note 14)
B ₃ (Fixed Obstruction)	10 nmi / 70 W ¹	<ul style="list-style-type: none"> Aid to Visual Acquisition Conflict Avoidance 	SV _{B3} MS-P _{B2/B3}	Airborne Position A/C Identification & Type (See Note 14)
B ₃ (Fixed Obstruction)	10 nmi / 70 W ¹	<ul style="list-style-type: none"> Airport Surface 	SV _{B3} MS-P _{B2/B3}	Airborne Position A/C Identification & Type (See Note 14)

¹ – May be increased based upon application specific needs.

Notes: (Tables 2-3 and 2-4):

- SV = State Vector, SV-P = Partial State Vector, MS = Mode Status, MS-P_{IFR} = Partial Mode Status ~~for IFR Aircraft~~, ~~MS-P_{VFR} = Partial Mode Status for VFR Aircraft~~, OC = On-Condition
- SV elements are as follows:
 - Address (the ICAO 24 Bit Address)
 - Latitude and Longitude
 - Altitude, Geometric
 - Position Component of Navigation Uncertainty Category (NUC_P)
 - Geometric Position Valid (Horizontal/Vertical)
 - N and E Velocity
 - Vertical Rate
 - Velocity Component of Navigation Uncertainty Category (NUC_V)
 - Barometric Pressure Altitude
 - Barometric Pressure Altitude Rate
 - Airspeed (True or Indicated)
 - Ground Speed, Ground Track (True or Magnetic Heading)

- *Turn Indication*
3. *SV-P elements are as follows:*
- *Address (the ICAO 24 Bit Address)*
 - *Latitude*
 - *Longitude*
 - *Position Component of Navigation Uncertainty Category (NUC_P)*
 - *Geometric Position Valid (Horizontal/Vertical)*
 - *N Velocity*
 - *E Velocity*
 - *Velocity Component of Navigation Uncertainty Category (NUC_V)*
 - *Ground Speed, Ground Track (True or Magnetic Heading)*
4. *MS elements are as follows:*
- *Address (the ICAO 24 Bit Address)*
 - *Call Sign (Up to 8 Alpha-numeric Characters)*
 - *Participant Category*
 - *Surveillance Support Code*
 - *Emergency/Priority Status*
 - *Class Codes*
 - *TCP (Trajectory Change Point) Latitude*
 - *TCP (Trajectory Change Point) Longitude*
 - *TCP Altitude (Baro Alt or Flight Level)*
 - *TTG (Time to Go)*
 - *Operational Mode Specific Data*
5. *MS-P_{ERR} elements are as follows:*
- *Address (the ICAO 24 Bit Address)*
 - *Call Sign (Up to 8 Alpha-numeric Characters)*
 - *Participant Category*
 - *Surveillance Support Code*
 - *Emergency/Priority Status*
 - *Class Codes*
- ~~6. *MS-P_{VER} elements are as follows:*~~
- ~~• *Address (the ICAO 24 Bit Address)*~~
 - ~~• *Call Sign (Up to 8 Alpha-numeric Characters)*~~
 - ~~• *Participant Category*~~
 - ~~• *Surveillance Support Code*~~
- ~~7. *OC elements are as follows:*~~
- ~~• *Address (the ICAO 24 Bit Address)*~~
 - ~~• *TCP+1 (Latitude)*~~
 - ~~• *TCP+1 (Longitude)*~~
 - ~~• *TCP+1 Altitude (Barometric or Flight Level)*~~
 - ~~• *TCP+1 TTG*~~
- ~~8. *SV_{BL} elements are as follows:*~~
- ~~• *Address (the ICAO 24 Bit Address)*~~
 - ~~• *Latitude*~~

~~? Longitude~~
~~? Altitude, Geometric~~
~~? Position Component of Navigation Uncertainty Category (NUC_P)~~
~~? Geometric Position Valid (Horizontal/Vertical)~~
~~? N Velocity~~
~~? E Velocity~~
~~? Vertical Rate~~

~~97.~~ SV_{B2} elements are as follows:

- Address (the ICAO 24 Bit Address)
- Latitude
- Longitude
- Position Component of Navigation Uncertainty Category (NUC_P)
- N Velocity
- E Velocity

~~10.~~ ~~$MS-P_{B1-AIR}$ elements are as follows:~~

~~? Address (the ICAO 24 Bit Address)~~
~~? Call Sign (Up to 8 Alpha numeric Characters)~~
~~? Participant Category~~
~~? Surveillance Support Code~~
~~? Class Codes~~

~~11.~~ ~~$MS-P_{B1-GND}$ elements are as follows:~~

~~? Address (the ICAO 24 Bit Address)~~
~~? Participant Category~~
~~? Surveillance Support Code~~
~~? Class Codes~~

~~128.~~ $MS-P_{B2-B3}$ elements are as follows:

- Address (the ICAO 24 Bit Address)
- Participant Category
- Surveillance Support Code

~~139.~~ SV_{B3} elements are as follows:

- Address (the ICAO 24 Bit Address)
- Latitude
- Longitude
- Altitude, Geometric
- Position Component of Navigation Uncertainty Category (NUC_P)
- Geometric Position Valid (Horizontal/Vertical)

~~1410.~~ If the formats for these categories are changed in the future, then they will be required to transmit the message that contains the Version Number.

2.1.11.2 Receiving Subsystem

An ADS-B receiving subsystem is classified by the sensitivity and the set of parameters that it is capable of formatting into reports. Manufacturers should take into consideration the equipment's intended operation when determining the minimum set of reports that the unit will be required to develop (refer to Table 2-5 and Table 2-6).