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INFORMATION PAPER

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**Eighth Eastern Caribbean Network Technical Group (E/CAR/NTG/8) and
Sixth Eastern Caribbean Radar Data Sharing Ad hoc Group (E/CAR/RD/6)**
Saint George's, Grenada, 3 - 5 September 2018

Agenda Item 4: Surveillance Sharing Activities
4.3 Automatic Dependent Surveillance – Broadcast (ADS-B)/Multilateration (MLAT) Developments

**AUTOMATIC DEPENDENT SURVEILLANCE – BROADCAST (ADS-B) OUT:
ENSURING PREPAREDNESS FOR THE 2020 EQUIPAGE MANDATE**

(Presented by the United States)

EXECUTIVE SUMMARY

In 2010, the United States (U.S.) Federal Aviation Administration (FAA) published a regulatory requirement for all aircraft operating within certain airspace to be equipped with Automatic Dependent Surveillance – Broadcast (ADS-B) Out technology by January 1, 2020, according to Title 14 of the U.S. Code of Federal Regulations (14 CFR) sections 91.225 and 91.227. This requirement will affect all flights in the designated airspace. To prepare the aviation community and prevent any operational disruptions, the FAA is promoting the new mandate to the international community so that foreign aircraft intending to operate within the affected airspace will be equipped with the appropriate ADS-B Out system by the compliance date.

<i>Strategic Objectives:</i>	<ul style="list-style-type: none">• Safety• Air Navigation Capacity and Efficiency
<i>References:</i>	<ul style="list-style-type: none">• Automatic Dependent Surveillance – Broadcast (ADS-B) Out Performance Requirements to Support Air Traffic Control (ATC) Service Final Rule (75 FR 30160, May 28, 2010; Docket No. FAA-2007-29305)• 14 CFR §91.225 and §91.227

1. Introduction

1.1 Automatic Dependent Surveillance – Broadcast (ADS-B) is an important underlying technology in the United States' (U.S.'s) Federal Aviation Administration's (FAA's) plan to transform air traffic control from the current system to the Next Generation Air Transportation System (NextGen). ADS-B is bringing the precision and reliability of satellite-based navigation to surveillance in the U.S. National Airspace System (NAS).

1.2 ADS-B is part of the International Civil Aviation Organization (ICAO) Global Air Navigation Plan (GANP) and was endorsed by the ICAO Member States during the ICAO 38th Assembly in 2013. The U.S. presented a working paper at the ICAO 39th Assembly highlighting the January 1, 2020 mandate to equip all aircraft with ADS-B Out that will use the affected airspace in the U.S. NAS.

1.3 In 2010, the FAA published a regulatory requirement for all aircraft operating within certain airspace to be equipped with a specific version of ADS-B Out technology by January 1, 2020, in accordance with Title 14 of the U.S. Code of Federal Regulations (14 CFR) sections (§) 91.225 and 91.227.

1.4 This requirement will affect all flights within the designated airspace. To prepare the aviation community and prevent any operational disruptions, the FAA is promoting the mandate so that that foreign aircraft intending to operate within the affected airspace will be equipped with the appropriate ADS-B Out technology by the compliance date.

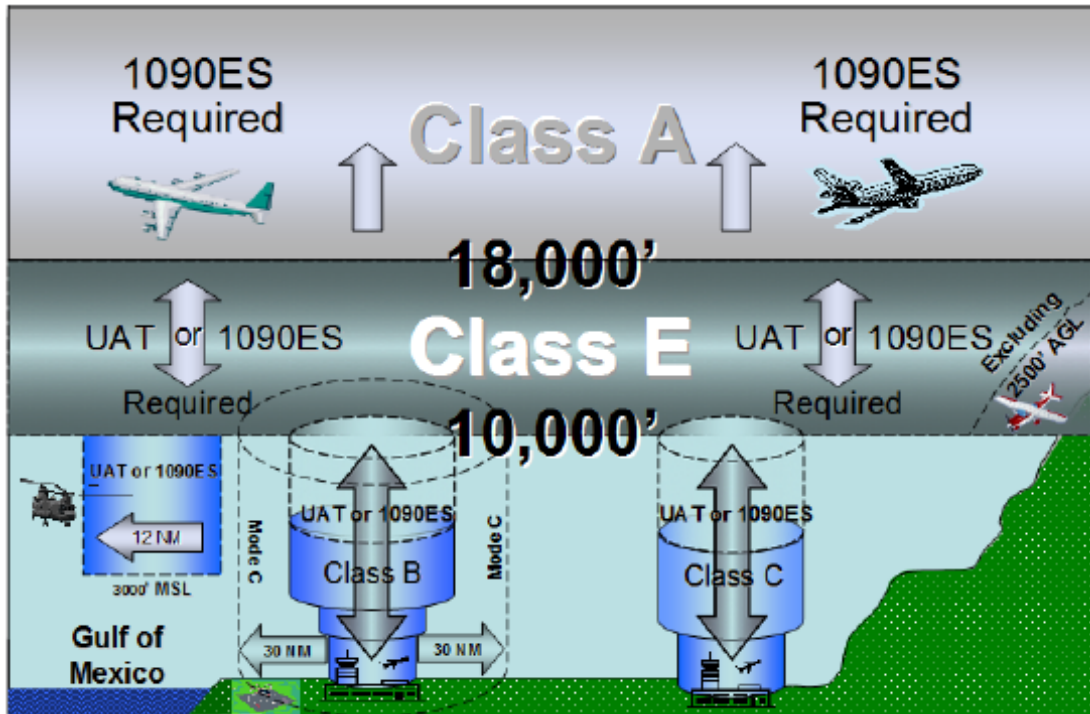
2 Discussion

2.1 ADS-B Out uses Global Navigation Satellite System (GNSS) technology to determine specific aircraft information, which is then broadcast directly to other equipped aircraft and air traffic controllers. Its numerous performance benefits include the ability to provide more frequent position update-rates than radar, deliver more precise location and velocity information for the aircraft, and offer critical in-cockpit traffic information.

2.2 The improved accuracy, integrity, and reliability of ADS-B Out over radar means controllers may be able to safely reduce the mandatory separation between aircraft. ADS-B Out also provides greater surveillance coverage, since ADS-B ground stations are much easier to place than radars. Remote areas without radar coverage, such as the Gulf of Mexico and parts of Alaska, are now covered by ADS-B.

2.3 The FAA published “Automatic Dependent Surveillance – Broadcast (ADS-B) Out Performance Requirements to Support Air Traffic Control (ATC) Service Final Rule” (75 FR 30160, May 28, 2010; Docket No. FAA-2007-29305) 14 CFR §91.225 and §91.227 for ADS-B Out equipage after January 1, 2020. This final rule mandates performance requirements for ADS-B Out avionics that will be required to fly in certain airspace. The final rule does not preclude other position source methods, nor does it mandate ADS-B In equipage. Sections 91.225 and 91.227 do not apply to any aircraft that was not originally certificated with an electrical system or that has not subsequently been certified with such a system installed, including balloons and gliders.

2.4 ADS-B in the U.S. NAS operates on two frequencies (links): 1090 MHz and 978 MHz. Equipment choices include either a Mode S transponder-based 1090 Extended Squitter (ES) or a Universal Access Transceiver (UAT) operating on 978 MHz. Aircraft operating above Flight Level 180 must be equipped with a Mode S-transponder-based ADS-B Out transmitter. Aircraft operating below 18,000 feet and within the U.S. NAS must be equipped with either a Mode S 1090ES transponder or UAT equipment. The graphic below illustrates these requirements.



2.5 The FAA’s service contractor has completed the deployment of ADS-B ground stations, the FAA is using ADS-B information to provide ATC services in all enroute facilities and in over 80% of FAA terminal facilities. The FAA has called on aviation users to equip their aircraft in advance of the January 1, 2020 mandate.

2.6 The FAA is collaboratively working with commercial operators, the avionics industry, and the general aviation community in the U.S. to ensure awareness of this mandate. On October 28, 2014, FAA senior officials met with pilots, operators, manufacturers, and suppliers at an “ADS-B Out Call to Action” meeting to identify and address barriers to equipping with ADS-B Out by January 1, 2020. Formed as a result of the Call to Action, Equip 2020 first met in November 2014 and has met at least quarterly since then. Equip 2020 was given 32 tasks, reflecting barriers to ADS-B Out implementation, to resolve. Approximately 100 representatives from industry and the FAA regularly attend Equip 2020 meetings and Equip 2020 has become a valuable forum for developing and implementing solutions towards meeting the 2020 mandate.

2.7 Compliance with Title 14 of the U.S. Code of Federal Regulations (14 CFR) sections 91.225 and 91.227 requires carriage of equipment that meets the performance requirements of FAA Technical Standard Order (TSO)-C166b, Extended Squitter Automatic Dependent Surveillance-Broadcast (ADS-B) and Traffic Information Service-Broadcast (TIS-B) Equipment Operation on the Radio Frequency of 1090 Megahertz (MHz) or, for aircraft which always fly below FL180 in the U.S., equipment that meets the performance requirements of TSO-C154c. Equipment manufactured under the provisions of TSO-C166b incorporate standards published in RTCA DO-260B/EUROCAE ED-102A. ADS-B equipment manufactured to earlier standards (e.g, RTCA DO-260 or DO-260A) do not comply with 14 CFR §91.225 and §91.227.

3 Conclusion

3.1 The safety and operational benefits of ADS-B Out are significant and the U.S. aviation community is collaboratively working to implement the specific requirements for the U.S. NAS.

3.2 States with operators that intend to operate within the U.S. affected airspace are encouraged to promote awareness of this upcoming requirement. Timely installations will allow the approving authority to ensure that the equipage installations are compliant with the requirements; will allow the operators sufficient preparation to account for the expense and time needed to complete the installation; and will ensure that aircraft can operate in all U.S. airspace on January 1, 2020.

— END —