International Civil Aviation Organization

MIDANPIRG/19 & RASG-MID/9 Meetings

(Saudi Arabia, 14-17 February 2022)

Agenda Item 5.8 CNS

Automatic Dependent Surveillance-Broadcast Privacy – Possible solutions

(Presented by Saudi Arabia)

SUMMARY

This paper provides information on the concerns raised by aircraft operators and owners on the privacy of flights broadcasting ADS-B data. This data is used by internet-based flight tracker platforms and websites to provide real-time tracking of aircraft including private and sensitive flights. The paper also reviews potential solutions that may be considered to control and limit the access to ADS-B data publicly.

Action by the meeting is in paragraph 4.

REFERENCE(S)

ICAO Annex 10 Volume, III & IV.

Doc 9750, Global Air navigation Plan

Doc 9924, Aeronautical Surveillance Manual.

Circular 326 - Assessment of ADS-B and Multilateration Surveillance to Support Air Traffic Services and Guidelines for Implementation

1. INTRODUCTION

1.1 The Automatic Dependent Surveillance–Broadcast (ADS-B) makes frequent and automatic broadcast transmissions of an aircraft's identification, position, altitude, velocity, and other information to any receiver (airborne or ground) within range. The broadcasted aircraft position/velocity is normally based on the global navigation satellite system (GNSS) and transmitted at least once per second. The ADS-B data is broadcasted in an unencrypted and structured format allowing the ground ATM systems and the Air Navigation Service Providers (ANSPs) to use it for ATS surveillance purpose and to provide the required ATC separation between aircraft.

1.2 However, the ADS-B data can be easily received and processed using cheap and basic receivers that are widely used by companies and the public. Consequently, the flights providing ADS-B data in support of surveillance services, are visible to the public and commercial companies equipped with appropriate receivers and shared through the Internet using specialized flight tracker platforms and websites.

1.3 The number of internet-based flight tracker platforms and websites is increasing offering free access and commercial services with specific details on flights. The companies managing these platforms and websites obtain the flights' data from their ground network of ADS-B receivers including ADS-B Ground Stations deployed by ANSPs. This latter is usually subject of specific arrangements between the company and the ANSP.

1.4 Recently, the available sources of ADS-B data are being complemented with the data obtained from satellite-based ADS-B receivers allowing the internet-based flight tracker platforms and websites to access the data independently from the ground infrastructure.

1.5 In general, the ADS-B data is also supplemented by:

a) information on the airport of departure & arrival, and flight routing by matching the Aircraft Identification (ACID) or call sign/flight ID of the flight to databases of flight plans (FPLs) and airline and airport arrival and departure schedules.

b) additional information, such as pictures of the aircraft type, and/or registration assigned to the aircraft using the 24-bit address.

2. DISCUSSION

2.1 The privacy concern, started by the availability of flight information and data on public internet. The open access to ADS-B data on the internet raises concerns regarding real-time tracking of sensitive flights or aircraft including VVIP, VIP, State, and private flights. These concerns have been expressed by aircraft owners and operators. They consider that the publication and tracking of their flight on the internet is unacceptable and measures must be taken to protect the right of privacy and enforce restriction on the access to ADS-B data and flight data information.

2.2 To limit the extent to which the aircraft/flight can be quickly and easily identified and displayed with real-time position and identification information, aircraft operators including State flights, may, when possible, switch off or disable Mode S/ADS-B and revert to Mode 3/A/C for specific, sensitive, and training flights to restrict tracking and recording of flight maneuvers, performance, and capabilities. However, this operation is not always possible as ADS-B transmitting equipment may not has a cockpit control that enables the pilot to turn the ADS-B transmissions on and off. In addition, the ADS-B equipment may be coupled with transponder and Traffic Alert and Collision Avoidance System (TCAS) system and disabling ADS-B may also disable the transponder and TCAS functions. This will lead to the loss of ATS surveillance and inability of ANSP to provide safe ATC services.

2.3 When exploring possible privacy schemes and practices related to ATM data distribution and/or dissemination related to aircraft and flights broadcasting ADS-B data, the following potential solutions should be considered:

- **Filtering of flight data by ANSPs and the platform/web-based providers:** The filtering of ADS-B data items is considered one of potential solution that may mask the identify of a flight or aircraft. Two type of agreement can be considered: 1/ Agreement between adjacent ANSPs to avoid sharing of the ADS-B data for all flights that are not within their Area of responsibility (AoR); and 2/ Agreement with the platform/web-based providers to remove the flight and aircraft data from the real-time tracking. The filtering can be based on 24-bit address or aircraft/flight identification (ACID). However, the filtering may be a partial solution as it is subject of platform/web-based platforms, and it is limited to specific operators and data only. Further, the filtering does not prevent individuals with the appropriate equipment from receiving the ADS-B data.

- **Restrict access to the flight data and flight plans:** The internet-based flight tracker platforms receive ADS-B data and/or flight plan data from multiple sources. In general, the flight plan data is often provided through companies serving airlines. They have access to flight plan data, including all data items (Departure and Destination Aerodrome and times, aircraft type etc..). These companies may share the flight data with the platform/web-based providers. To restrict access to the flight plan data, the management of flight plans should be reviewed to limit the access to parties directly concerned by the flight. In addition, the Stakeholders providing flight data and flight plans should established agreements with the parties to limit the use of the data for intended purpose only and with restrictions regarding its sharing publicly and with platform/web-based providers. The FAA is using the Limiting Aircraft Data Display (LADD) service which limits the available of the data from the FAA systems, either completely or through data sharing agreements with restrictions regarding its sharing publicly. LADD also provides greater enforcement capabilities against third parties that may violate those protections, including possible suspension or termination from receiving FAA flight tracking data for any parties that may inadvertently or knowingly share such information. The details on FAA LADD can be found using the following link:

https://ladd.faa.gov/.

- **De-identification of aircraft and flight:** The ICAO 24-bit aircraft address is allocated to States to identify aircraft. ICAO Annex 10, Aeronautical Telecommunications Vol III, Appendix to Chapter 9 describes the worldwide scheme for the allocation, assignment and application of aircraft addresses. As the 24-bit address is static and it is included in every ADS-B message sent by the aircraft, it can easily be used to identify the aircraft. In order to ensure the privacy of any flight, the static assignment of the 24-bit address needs to be reviewed with introduction of dynamic 24-bit address scheme. With this scheme, there is a need to allocate generic or anonymous Aircraft Identification (ACID) to ensure complete de-identification of the flight and prevent correlation to other data. The identification of aircraft and flight must be subject of safety risk assessment to assess the impact on ATS and ATM systems and on other systems such (ELT). The dynamic allocation of 24-bit address is today enabled by the FAA under the **Privacy ICAO aircraft address program (PIA)**, available to US registered aircraft operating in domestic US airspace and equipped with 1090 Mhz ADS-B. This program is set to address the concerns raised by aircraft operators operating in ADS-B environment. It limits the extent to which the aircraft can be quickly and easily identified by non-U.S. government entities, while ensuring there is no adverse effect on ATC services. The details on FAA PIA can be found using the following link: https://www.faa.gov/nextgen/equipadsb/privacy/.

- **Encryption of ADS-B data:** The encryption of data that's used for military surveillance. It might be used to restrict the processing of the data to authorized parties. The encryption of ADS-B data may include the management and distribution of the encryption keys to all concerned parties and use of a new encrypted protocol combined with a number of bits in the ADS-B downlink format defined under ICAO Annex 10, Vol. IV. Chapter 3.

3. CONCLUSION

3.1 The introduction of ADS-B for automatic position reporting by aircraft raises concerns on the privacy and the real-time tracking of private and sensitive flights including VVIP, VIP, and State. The flights data are available on internet-based flight tracker platforms and websites is increasing offering free access and commercial services with details on flights.

3.2 Currently, there is no regional and global solutions to control and limit the access to the ADS-B data for private and sensitive flights. and ICAO is invited to consider setting of provision to introduce restrictions regarding sharing of ADS-B and ATS surveillance data publicly. The meeting is invited to consider the following conclusion and decision:

DRAFT MIDANPIRG CONCLUSION 19/XX: Restrictions on sharing of ADS-B data publicly

That:

a) MID States share information on practices to protect and restrict sharing of the ADS-B data publicly.

b) MID States support ICAO MID office in the development of guidance material on potential solutions for the privacy of flights broadcasting ADS-B data.

c) ICAO considers the amendment of Annex 10 to introduce provisions to protect and restrict sharing of the ADS-B data publicly and to update ICAO document (restricted) related to threats and risks to civil aviation to describe how ADS-B data available publicly may be source of safety and security concerns.

DRAFT MIDANPIRG DECISION 19/XX: Development of Guidance on the privacy for flights broadcasting ADS-B data

That CNS SG develops guidance material on potential solutions allowing to protect the privacy of flights broadcasting ADS-B data.

4. ACTION BY THE MEETING

4.1 The meeting is invited to:

a) note the information provided in this paper;
b) discuss and adopt the proposal for conclusion and decision provided under paragraph 3.2 of this paper.

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