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| **World Radiocommunication Conference (WRC‑15)Geneva, 2‑27 November 2015** |  |
| **INTERNATIONAL TELECOMMUNICATION UNION** |  |
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| **PLENARY MEETING** | **Document 5‑E** |
| **20 July 2015** |
| **Original: English** |
| Director, Radiocommunication Bureau |
| report of the director of the radiocommunication bureau on GLOBAL FLIGHT TRACKING FOR CIVIL AVIATION |
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# 1 Background

Recent events spurred worldwide discussions on global flight tracking and the need for ITU and other relevant organizations to coordinate action within the scope of their respective mandates. In response, the ITU Plenipotentiary Conference 2014 approved Resolution 185 (Busan, 2014) “Global flight tracking for civil aviation”. The Resolution resolves to instruct WRC‑15, pursuant to No. 119 of the ITU Convention, to include in its agenda, as a matter of urgency, the consideration of global flight tracking, including, if appropriate, and consistent with ITU practices, various aspects of the matter, taking into account ITU‑R studies. In addition, Resolution 185 (Busan, 2014) instructs the Director of the Radiocommunication Bureauto prepare a specific report on the matter for consideration by WRC‑15. As instructed, the report has been prepared and is provided below.

Global flight tracking for civil aviation is understood to be the ability to provide or obtain the position and identification of an aircraft anywhere in the world, i.e. over the ocean, poles, dense landmass, and remote areas where civil aircraft may operate. Flight tracking is provided in many locations today by various terrestrial and satellite technologies.

Two ITU‑R Working Parties (WPs) are currently studying aspects related to this issue: WP 5B (maritime mobile service including the Global Maritime Distress and Safety System (GMDSS); aeronautical mobile service and radiodetermination service) and WP 4C (Efficient orbit/spectrum utilization for MSS and RDSS).

Immediately after the approval of Resolution 185 (Busan, 2014), the Director, BR, sent a note to WPs 5B and 4C (see Documents 4C/380 and 5B/758), inviting them to complete, as a matter of urgency, the corresponding studies, including any guidance on possible courses of action to be taken by WRC‑15. He also presented a report with the preliminary results of ITU‑R studies to CPM15‑2 (see Document [CPM15‑2/7](http://www.itu.int/md/R12-CPM15.02-C-0007/en)).

# 2 Summary of technical and operational studies in ITU‑R

Over the last two years, ITU‑R WPs 4C and 5B have been studying the issues relating to aircraft tracking. The following texts have been developed regarding the technical and operational aspects of aircraft flight tracking and illustrate the current status of the ITU‑R studies on this matter:

• Preliminary draft new Report ITU‑R M.[ADS‑MSS] – Use of existing mobile‑satellite service systems for aircraft tracking (see Annex 1 of Document [4C/435](http://www.itu.int/md/R12-WP4C-C-0435/en))

• Working document towards a preliminary draft new Report ITU‑R M.[FLIGHT TRACKING] – Global flight tracking for civil aviation (see Annex 11 of Document [5B/883](http://www.itu.int/md/R12-WP5B-C-0883/en))

• Working document towards a preliminary draft new Report ITU‑R M.[ADS‑B] – Reception of automatic dependent surveillance broadcast via satellite and compatibility studies with incumbent systems in the frequency band 1 087.7‑1 092.3 MHz (see Annex 12 of Document [5B/883](http://www.itu.int/md/R12-WP5B-C-0883/en)).

In response to the BR Director’s request, ITU‑R WPs 4C and 5B provided to him the following advice about the status of these studies and guidance on possible courses of action to be taken by WRC‑15:

• Note from WP 4C to the Director, BR (see Attachment 2)

• Note from WP 5B to the Director, BR (see Attachment 3).

# 3 Conclusions

In response to ITU Plenipotentiary Conference Resolution 185 (Busan, 2014) and given the status of the ITU‑R studies that have been carried out at this stage, the Director of the Radiocommunication Bureau would like to bring the following elements to the attention of WRC‑15:

a) To be responsive to the requirements of the global civil aviation community, the conference may wish to consider modifications to the Radio Regulations that could facilitate the provision of global flight tracking on a worldwide basis, irrespective of the systems used.

b) There is a range of systems already operating in accordance with the provisions of Article 5 of the Radio Regulations and contributing to global flight tracking (GFT).

c) Two of these systems (ADC‑C and ADS‑B MSS retransmission) can be provided by satellite systems in the mobile‑satellite service, without amending the Radio Regulations. A third one, ADS‑B, currently provides a service limited to the range of terrestrial stations.

d) Along with these terrestrial and satellite systems, satellite reception of ADS‑B can further contribute to GFT, considered as one component of the global aviation distress and safety system (GADSS), which is being developed by ICAO. Since there is no allocation to this effect in Article 5 of the Radio Regulations, satellite reception of ADS‑B would, however, require modifications to the Radio Regulations in order to provide full global coverage.

In view of the above, and given that ITU‑R studies in this regard have not been completed at this stage, in addressing the issue of global flight tracking along the lines requested by Resolution 185 (Busan, 2014), the following options may be considered by WRC‑15, noting that some of them could not support safety and regularity of flight and that no consensus was reached on any of them:

Option 1

• To make no change to the Radio Regulations (NOC).

Option 2

• To make a primary allocation in the band 1 087.7‑1 092.3 MHz to the aeronautical mobile-satellite (Route) service (AMS(R)S) (Earth‑to‑space), limited to the satellite reception of ADS‑B in the Earth‑to‑space direction.

Option 3

• To make a primary allocation in the band 1 087.7‑1 092.3 MHz to the aeronautical mobile‑satellite (Route) service (AMS(R)S) (Earth‑to‑space), limited to the satellite reception of ADS‑B in the Earth‑to‑space direction, and subject to not claiming protection from systems operating in the aeronautical radionavigation service (ARNS) and aeronautical mobile (Route) service in the frequency range 960‑1 164 MHz.

Option 4

• To make a secondary allocation in the band 1 087.7‑1 092.3 MHz to the mobile‑satellite service (MSS) (Earth‑to‑space), limited to the satellite reception of ADS‑B in the Earth‑to‑space direction.

Notwithstanding the WRC‑15 outcome on global flight tracking, a holistic approach to address the issue of GFT/GADSS may require further study by ITU‑R study groups for consideration by a future competent WRC.

**Attachments**: 3

ATTACHMENT 1

RESOLUTION 185 (BUSAN, 2014)

Global flight tracking for civil aviation

The Plenipotentiary Conference of the International Telecommunication Union (Busan, 2014),

recalling

the relevant provisionsof Article 1 of the ITU Constitution, in particular No. 17, which stipulates that the Union is to promote the adoption of measures for ensuring the safety of life through the cooperation of telecommunication services,

considering

*a)* that the loss of Flight MH370 spurred worldwide discussions on global flight tracking and the need for coordinated action by ITU and other relevant organizations, within the scope of their respective mandates;

*b)* that determination of the position of aircraft and reporting this information to air traffic control centres represents an important element of aviation safety and security;

*c)* that the International Civil Aviation Organization (ICAO) has developed Standards and Recommended Practices (SARPs) for systems enabling position determination and tracking of aircraft for air traffic control;

*d)* that the current agenda of the 2015 World Radiocommunication Conference (WRC-15), as contained in ITU Council Resolution 1343 (Council-12), does not directly address the issue of global flight tracking;

*e)* that flight tracking for civil aviation is currently available across the globe, apart from some parts of the polar regions;

*f)* that ICAO, in its special meeting onglobal flight tracking**,** Montreal, 12‑13 May 2014, encouraged ITU to take action, at the earliest opportunity, to provide the necessary spectrum allocations for satellite when emerging aviation needs are identified,

considering further

*a)* that studies relating to global flight tracking are ongoing in the ITU Radiocommunication Sector (ITU-R);

*b)* that ITU and ICAO signed a memorandum of understanding in 2012 to establish a framework for enhanced cooperation between the two parties,

noting

that identifying and tracking of civil aircraft flights contributes indirectly to aviation safety,

resolves

to instruct WRC-15, pursuant to No. 119 of the ITU Convention, to include in its agenda, as a matter of urgency, the consideration of global flight tracking, including, if appropriate, and consistent with ITU practices, various aspects of the matter, taking into account ITU-R studies,

instructs the Secretary-General

to bring this resolution to the attention of WRC-15 and ICAO,

instructs the Director of the Radiocommunication Bureau

to prepare a specific report on the matter as referred to in *resolves* above for consideration by WRC‑15.

ATTACHMENT 2

NOTE FROM WP 4C TO THE DIRECTOR, RADIOCOMMUNICATION BUREAU

Global flight tracking for civil aviation

In response to Document [4C/380](http://www.itu.int/md/R12-WP4C-C-0380/en), Working Party 4C would like to provide the following elements, falling within its mandate, for consideration by the Director in the development of his ‘specific report’ to be submitted to WRC‑15 in response to Resolution 185 (Busan, 2014) relating to global flight tracking for civil aviation.

Background

Global flight tracking (GFT) for civil aviation is understood to be the ability to provide or obtain the position and identification of an aircraft anywhere in the world i.e. over the ocean, poles, dense landmass, and remote areas where civil aircraft may operate.

Flight tracking is provided in many locations today by various terrestrial and satellite technologies.

Most technologies used to support flight tracking functions fall under the mandate of Working Party 5B as aeronautical services. Working Party 4C is currently developing a report on the use of the mobile‑satellite service (MSS) to provide Automatic Dependent Surveillance‑Contract (ADS‑C) and the MSS satellite retransmission of Automatic Dependent Surveillance‑Broadcast (ADS‑B) messages.

ITU‑R studies under consideration

Preliminary draft new Report ITU‑R M.[ADS‑MSS] – Use of existing mobile‑satellite service systems for aircraft tracking (see Annex 1 of Document [4C/435](http://www.itu.int/md/R12-WP4C-C-0435/en)).

Possible WRC‑15 courses of action

The flight tracking applications and systems described in the preliminary draft new Report ITU‑R M.[ADS‑MSS] operate or are planning to operate using MSS systems with access to spectrum allocated to the aeronautical mobile‑satellite (Route) service. No regulatory actions are required by the above‑mentioned studies.

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Note From WP 5B to the Director, Radiocommunication Bureau

Global flight tracking for civil aviation

Scope

Working Party 5B, in response to the request of the Director – Radiocommunication Bureau, would like to provide the following elements, relating to Global flight tracking for civil aviation, falling within its mandate, for consideration by the Director in response to Resolution 185 (Busan, 2014).

Background

Global flight tracking (GFT) for civil aviation is understood to be the ability to provide or obtain the position and aircraft identification anywhere in the world i.e. over the ocean, poles, dense landmass, and remote areas where civil aircraft may operate.

Flight tracking is currently provided in many locations today by various terrestrial and satellite technologies.

ITU‑R studies under consideration:

Working Party 5B has developed two reports that are relevant to the issue of GFT:

*– Working document towards a preliminary draft new Report ITU‑R M.[FLIGHT TRACKING] ‑ Global flight tracking for civil aviation* was initiated during the extraordinary meeting of WP 5B in May 2015 which identifies existing technologies and some currently under development that can contribute to global flight tracking. (See Annex 11 of Document [5B/883](http://www.itu.int/md/R12-WP5B-C-0883/en)).

*– Working document towards a preliminary draft new Report ITU‑R M.[ADS‑B] ‑ Reception of automatic dependent surveillance broadcast via satellite and compatibility studies with incumbent systems in the frequency band 1 087.7-1 092.3 MHz* (see Annex 12 of Document [5B/883](http://www.itu.int/md/R12-WP5B-C-0883/en)) has been developed over the past two years to characterize and investigate the sharing environment of the satellite reception of existing aircraft transmissions known as ADS‑B assessing the potential impact of ICAO and non‑ICAO systems that may also be operating on and around the frequency 1 090 MHz.

Possible courses of action

Working Party 5B received contributions relating to global flight tracking. In some of these contributions, suggestions were made by certain membership to modify Article 5 of the Radio Regulations to enable certain technology to expand their operation using space‑based reception to contribute towards global flight tracking.

As detailed in the abovementioned ITU‑R Reports, there are a range of systems already operating in accordance with the provisions in Article 5 of the Radio Regulations that contribute to Global Flight Tracking (GFT). Along with these terrestrial and satellite technologies, satellite reception of ADS‑B can further contribute to GFT, considered as one component of the global aviation distress and safety system (GADSS), which is being developed by ICAO.

Notwithstanding the WRC‑15 outcome on global flight tracking, a holistic approach to address the issue of global flight tracking/GADSS, may require further study by ITU‑R study groups for consideration by a future competent WRC.

The following views were expressed with regard to the treatment of global flight tracking by WP 5B:

*View 1:*

One candidate GFT solution is the satellite reception of ADS‑B signals, however there is no current allocation in Article 5 to support this.

Noting the requirement for urgency on this matter, WP 5B is of the view that consideration of possible regulatory action at WRC‑15 to support satellite reception of ADS‑B will be a necessary component to address this issue. WP 5B has identified a non‑exhaustive range of actions that could be considered, with the caveat that the viability of these options are based on the outcomes of studies in WP 5B.

Without prejudice of the results of the technical studies and regulatory actions, these options include a range of potential service allocations in the frequency range 1 087.7‑1 092.3 MHz limited to the satellite reception of ADS‑B in the Earth‑to‑space direction, including but not limited to:

– a primary allocation to the Aeronautical Mobile Satellite (Route) Service (AMS(R)S) (Earth‑to‑space); or

– a primary allocation to Aeronautical Mobile Satellite (Route) Service (AMS(R)S) (Earth‑to‑space) that cannot claim protection from ICAO and non‑ICAO systems operating in the aeronautical radionavigation service (ARNS) and Aeronautical Mobile (Route) Service in the frequency range 960‑1 164 MHz; or

– a secondary allocation to the mobile satellite service (mss) (Earth‑to‑space); or

– no change.

Some of these options could not support safety and regularity of flight.

Some of these options could potentially be accompanied by a follow up action at a future competent WRC.

*View 2:*

The modification of the Table of Allocations is a policy issue and falls under the responsibility of ITU Member States and thus outside of the mandate of the terms of reference of ITU‑R study groups.

*View 3:*

Until the studies are completed there is no need to express any views.

No consensus was reached on these views.

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