



ASSEMBLY — 36TH SESSION

TECHNICAL COMMISSION

Agenda Item 34: Support of the ICAO policy on radio frequency spectrum matters

**ICAO COLLABORATION ON FREQUENCY SPECTRUM
REQUIREMENTS FOR UNMANNED AIRCRAFT SYSTEMS (UAS)
OPERATIONS**

(Presented by the United States)

EXECUTIVE SUMMARY

This paper proposes that ICAO lead the global effort to identify and propose a frequency spectrum bandwidth for Unmanned Aircraft Systems (unmanned aircraft vehicles). The next possible opportunity to discuss spectrum requirements for UAS will be 2011.

Action: The Assembly is invited to:

- a) expedite development of an ICAO position with recommendations on UAS spectrum allocation;
- b) lead the effort to establish dedicated UAS frequency spectrum within the protected band; and
- c) Support efforts to establish a UAS frequency spectrum decision as part of the WRC agenda in 2011.

<i>Strategic Objectives:</i>	This working paper relates to Strategic Objective A and D in support of safety, regularity and efficiency of international civil aviation.
<i>Financial implications:</i>	No additional resources required:
<i>References:</i>	

1. INTRODUCTION

1.1 The advent of Unmanned Aircraft Systems (UAS) presents significant challenges for both Air Traffic Service providers and regulators. Unique design elements for UAS include the aircraft,

ground control station (GCS), and a communication link for the pilot to issue command and control instructions to his/her aircraft through the GCS.

1.2 To date, there is no spectrum provided for UAS communications.

2. BACKGROUND

2.1 Frequency spectrum for aviation is approved by the International Telecommunications Union (ITU) World Radio Telecommunications Conference (WRC), which meets every four years. The next WRC is scheduled for October-November 2007, but it will not address UAS issues. With a requirement to establish an agenda three years in advance of the next meeting, the UAS community was not successful in establishing an agenda item for discussion or decision at the 2007 meeting. The UAS community would benefit from increased ICAO support in developing a position for UAS spectrum requirements for consideration at the next possible opportunity, the 2011 WRC.

2.2 While global radio frequency spectrum already was identified long ago for traditional pilot-to-controller communications, there is no approved spectrum for UAS command, control, and communications.

2.3 The Federal Aviation Administration (FAA) has tasked the RTCA Special Committee 203 to develop recommendations for UAS technical standards associated with Detect, Sense, & Avoid (DSA), as well as Command, Control, & Communication (C3). These standards recommendations (anticipated to be completed in the 2012 timeframe) are dependent upon the identification and allocation of protected radio frequency spectrum for UAS operations.

2.4 The RTCA Workgroup tasked with developing C3 standards is now analyzing requirements, issues, and proposed evaluation criteria related to data link capacity, spectrum availability, and operational architectures.

2.5 EUROCAE, at the request of EASA and EUROCONTROL, has established Workgroup 73 to identify the necessary standards for the European integration of UAS. EUROCAE agrees that frequency spectrum is a critical UAS issue but they also have not yet formulated a recommended solution.

3. DISCUSSION

3.1 The UAS Industry global projections are indicating that this area is expected to experience a growth of more than US\$15 billion over the next 8-10 years.

3.2 ICAO has created a UAS Study Group with the United States, other key member States, and EUROCONTROL as participating members. While this is a positive step forward, the United States recommends that ICAO should coordinate, as the global voice for aviation, the allocation of protected radio frequency spectrum for use by UAS. If this opportunity to establish a consensus international position on spectrum allocation for UAS operations in 2011 is lost, the next opportunity to secure spectrum will not come until 2015. Acquisition of frequency spectrum beyond 2011 will significantly

delay this key industry and technology from moving forward. Critical standards development by RTCA and EUROCAE would be severely impacted.

3.3 In order to obtain necessary protected radio frequency spectrum for safe UAS operations, ICAO should lead efforts within the international aviation community to secure and harmonize UAS communications applications on a global scale. Without ICAO leadership to obtain and present a consensus position on UAS spectrum requirements, non-standard spectrum use could complicate UAS development and global interoperability. However, with the technology advancements that UAS will bring to the aviation community, and with that technology potentially migrating to manned aircraft, a reduced accident/incident rate will become more attainable.

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