



International Civil Aviation Organization

**THE FOURTH MEETING OF ADS-B STUDY AND
IMPLEMENTATION TASK FORCE (ADS-B SITF/4)**

Nadi, Fiji, 26-28 October 2005

Agenda Item 8: Review items from ADS-B Problem report database.

PROBLEM REPORTING DATABASE UPDATE

(Prepared and presented by Greg Dunstone, Airservices Australia)

SUMMARY

This paper outlines the problem reporting process and then attaches the current database printout.

1. INTRODUCTION

1.1 A previous APANPIRG ADS-B Task Force meeting requested that an ADS-B problem and Issue reporting database be established. A database has been established on the Airservices Australia website.

At the Singapore meeting, the Task Force decided :

That, Members of the ADS-B Task Force provide comments to Australia on the web based ADS-B Problem Report System.

(Decision 1/2 - Comments on ADS-B Problem Reporting System)

2. THE DATABASE

2.1 ADS-B problems and issues may be submitted online using a data entry form on the Airservices Australia website at www.airservicesaustralia.com/adsb/issues .

2.2 The data from the entry form will then be incorporated into an Access database – and a report made available on the same website regularly.

Problem / Issue Report Form - Microsoft Internet Explorer provided by Airservices Australia

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites History Print W

Address <http://www.airservicesaustralia.com/adsb/issues/> Go

Automatic Dependent Surveillance Broadcast
Problem / Issue Report Form

Please use this form to create an ADS-B problem or issues report. The form may also be used to submit additional information or make comments on an existing problem or issue. When commenting on an existing problem or issue, check the comment category box and enter the associated problem or issue reference number.

[Form Instructions](#)

Name:

Organisation:

Daytime Phone Number:

Email Address:

Date/Time (UTC) Year Month Day
Hour Minutes

Short Description

Category

☐ Avionics

☐ Ground System

☐ Procedure

☐ Comment on Existing problem / Issue (Ref. Num)

☐ Other:

Done Local intranet

Start C:\ ADS... Pro... 5:29 PM

3. HOW TO ACCESS THE DATABASE

3.1 Access the ADS-B Problem and Issues website at
www.airservicesaustralia.com/adsb/issues

3.2 There is no longer any need to enter a password. The password has been removed because the ABIT papers published on the web included the password. Ie: They were “public” anyway.

3.3 There are links on the page to detailed data entry form instructions and to the latest report from the Problem and Issues database.

3.4 Use the form to create a new problem or issue or to make comments relating to an existing issue or problem.

4. CONFIDENTIALITY

4.1 Problem reports may contain information of an operational or commercially sensitive nature and therefore may not be released to parties outside the Task Force.

4.2 However, it is important that information that may have an impact on other parties be distributed to all users as soon as possible. In this way, each party is made aware of problems already encountered by others, and may be able to contribute further information to aid in the solution of these problems.

4.3 Before dissemination of information to third parties, all references that could identify particular parties must be removed.

5. REPORTED PROBLEMS

5.1 Currently the database contains only 8 problem reports. These have been provided by Australia. The database report is attached.

6. RECOMMENDATION

6.1 Members of the Task Force are requested to note the establishment of the interim reporting mechanism and are asked to use the website to identify problems and issues related to the implementation and use ADS-B technology.

6.2 Members are asked to note the reported problems and are invited to provide comment or support to resolve the issues.

ADSB Problem/Issue Report

Reference Number**1****Short Description**

Occassional transitory NUC=0 transmitted (Minor)

Name

Greg Dunstone

Organization

Airservices Australia

Date / Time (UTC)**Category:**Avionics ☒Ground System ☐Procedure ☐Comment On Existing Issue ☐Other Category ☐

Ref No of Existing Issue

Other Category Text

Description

Occasionally, a single message report from Airbus and Boeing aircraft is received with a NUC=0. This data will be ignored by the ATC system. Typically this will occur for 0.5 seconds once every few minutes. It has minimal operational consequence. Its cause is not yet understood. Investigations continue

The problem appears to be worse on Airbus aircraft. Airbus has been advised and investigations are continuing.

ADSB Problem/Issue Report

Reference Number

2

Short Description

Occasional incorrect position data (Severity : Low)

Name

Greg Dunstone

Organization

Airservices Australia

Date / Time (UTC)

Category:

Avionics ☒

Ground System ☐

Procedure ☐

Comment On Existing Issue ☐

Other Category ☐

Ref No of Existing Issue

N/A

Other Category Text

N/A

Description

It was observed that occasionally, an A320 aircraft, using a Honeywell transponder, output a single positional data message at the incorrect position "along" the track of the aircraft. The position error is very transitory (ie: a single position report) and is slightly incorrect (a few tens of a nautical mile).

The symptom appears to be consistent with an extrapolation of position backwards, rather than forwards from GPS position determination till transmit time.

Airbus and Jetstar have been advised and investigations are continuing.

The symptom appears to be consistent with an extrapolation of position backwards, rather than forwards from GPS position determination till transmit time. Airbus and Jetstar have been advised and investigations are continuing.

ADSB Problem/Issue Report

Reference Number**3****Short Description**

Incorrect data from Rockwell Collins TDR-94 transponder (Severity : Medium-High)

Name

Greg Dunstone

Organization

Airservices Australia

Date / Time (UTC)**Category:**Avionics ☒Ground System ☐Procedure ☐Comment On Existing Issue ☐Other Category ☐

Ref No of Existing Issue

Other Category Text

Description

A transponder fitted to a Challenger business aircraft was found to be transmitting incorrect data.

The manufacturer advises that :

All should be advised that the model xxx Mode-S Transponders are not qualified to either RTCA DO-260 or DO-260A. Rather, the Extended Squitter formats are those established prior to either of those specs. The formats were consistent with ICAO Document No. 9688, Manual of Mode-S Specific Services at that time. Essentially, those formats were used to demonstrate feasibility during early ADS-B trials. As such, there should be no units enabled for extended squitter in the current air space. The extended squitter function can be disabled by grounding the Extended Squitter Disable discrete input at the unit interface. For those wanting extended squitter in the near future, we remain on track to release the xxx in February, 2005, and this unit will be compliant with RTCA DO-260B and FAA TSO-C166.

It seems that the airframe OEM has installed with the pin incorrectly wired. Work is underway to attempt to ensure that these aircraft are identified and corrected.

ADSB Problem/Issue Report

Reference Number

4

Short Description

Boeing 747 NUC variation with altitude (Severity : Low)

Name

Greg Dunstone

Organization

Airservices Australia

Date / Time (UTC)

Category:

Avionics ☒

Ground System ☐

Procedure ☐

Comment On Existing Issue ☐

Other Category ☐

Ref No of Existing Issue

N/A

Other Category Text

N/A

Description

A number of B747 aircraft have transmitted a NUC=1 when in flight, which seems to change to NUC=2 when the aircraft is below 2500 feet.

The problem has not been observed for some time. Boeing has been informed. The issue is no risk because the data from these aircraft would not be used. It is presumed to be a wiring error. The situation will be monitored.

ADSB Problem/Issue Report

Reference Number

5

Short Description

Airbus NUC=0 when non ADS-B capable (not a problem)

Name

Greg Dunstone

Organization

Airservices Australia

Date / Time (UTC)

Category:

Avionics ☒

Ground System ☐

Procedure ☐

Comment On Existing Issue ☐

Other Category ☐

Ref No of Existing Issue

N/A

Other Category Text

N/A

Description

This occurs for aircraft without the wiring between MMR and transponder. Ie: Not really ADS-B capable

ADSB Problem/Issue Report

Reference Number

6

Short Description

B744 transmit NuC=1 when non ADS-B capable (not a problem)

Name

Greg Dunstone

Organization

Airservices Australia

Date / Time (UTC)

Category:

Avionics ☒

Ground System ☐

Procedure ☐

Comment On Existing Issue ☐

Other Category ☐

Ref No of Existing Issue

N/A

Other Category Text

N/A

Description

1. Airservices Australia's ADS-B ground station has detected two commercial B744 aircraft squittering ADS-B.

One aircraft was xxx Airways flight xxx of 8 January 2004 squittering ModeS address : xxxx. The reg was probably xxxxx.

Another was yyyy Airways yyyyyy B744ERF (reg yyyyy) We are advised by xxxx Airways that this aircraft was equipped with ADS-B by Boeing using an zzzzz transponder. Our data shows that both aircraft are transmitting good positional data, but the transmitted NUC (declared navigational uncertainty) was always a low value (value =1). It is presumed that the wiring of the MMR/GPS data to the transponder is not in place.

ADSB Problem/Issue Report

Reference Number**7****Short Description**

Aircraft with 000000 24 bit code (not an ADS-B specific problem) - recommendation below:

Name

Greg Dunstone

Organization

Airservices Australia

Date / Time (UTC)**Category:**Avionics ☒Ground System ☐Procedure ☐Comment On Existing Issue ☐Other Category ☐

Ref No of Existing Issue

Other Category Text

Description

This problem exists for both TCAS, Mode S and ADS-B. A code 000000 and ffffff are prohibited by ICAO. Therefore this is not an ADS-B problem per se. Installation instructions and maintenance instructions should stress the importance of ModeS addresses being correct. ATC systems should prohibit address =000000 and ffffff.

ADSB Problem/Issue Report

Reference Number

8

Short Description

Aircraft on surface being pushed back - ground track is 180 degrees wrong.
(Minor at this time - more important for Surface application)

Name

Greg Dunstone

Organization

Airservices Australia

Date / Time (UTC)

Category:

Avionics ☒

Ground System ☐

Procedure ☐

Comment On Existing Issue ☐

Other Category ☐

Ref No of Existing Issue

N/A

Other Category Text

N/A

Description

Aircraft on surface being pushed back - ground track is 180 degrees wrong. Whilst aircraft is moving forward track remains correct. It seems that heading is used instead of track.

More work required to better identify problem to transponder or GNSS receiver.

ADSB Problem/Issue Report

Reference Number**9****Short Description**

Short circuit on air-ground discrete input resulted in transmission of Surface Squitter whilst airborne --> and displayed in wrong position due to Ground station decoding (incorrectly) as per MOPS. (Medium)

Name

Greg Dunstone

Organization

Airservices Australia

Date / Time (UTC)**Category:**Avionics ☒Ground System ☐Procedure ☐Comment On Existing Issue ☐Other Category ☐

Ref No of Existing Issue

N/A

Other Category Text

N/A

Description

The problem was caused by a short circuit on one of the air-ground discrete inputs providing a false on-ground indication to the transponder.

A) The transponder did not have on-ground validation, as required by Annex 10, and hence the on-ground indication was not over-ridden on the basis of speed and radio altitude. Our avionics survey indicates none of the major manufacturers have implemented on-ground validation. Airbus has indicated that other cases on this problem have been reported.

Next round of avionics needs to consider the issue more closely.

B) Aircraft was presented in the wrong position because the aircraft was more than 45 Nm away from the Ground station and the Ground station did not use unambiguous decoding. [The RTCA MOPS do not describe decoding of surface squits - a paper has been prepared by Kojo Owusu and Dr. William Harman describing how the decode should be done.

ADSB Problem/Issue Report

Reference Number

10

Short Description

Large position jumps observed on one aircraft (Fixed SW bug)

Name

Greg Dunstone

Organization

Airservices Australia

Date / Time (UTC)

Category:

Avionics ☐

Ground System ☒

Procedure ☐

Comment On Existing Issue ☐

Other Category ☐

Ref No of Existing Issue

N/A

Other Category Text

N/A

Description

The jumps observed in ML were due to a GS software problem (subsequently rectified) associated with the change to implement local decoding based on the last known aircraft position.

Care is needed in impementation of CPR decoding and the switching between ambiguous and unambiguous decoding.