



# FIT PR Review

# PR issues

- 1. ADS-C with INVALID data (1116, 1084, 959)**
2. ETG erroneous in ADS-C (634A, 928, 868, 940, 1079, 1114, 1116)
3. PR to be closed (695, 711, 720, 746, 748, 752, 754, 758, 759, 766, 770, 811, 930, 998, 999, 1059)
4. PR still open (694, 761, 879, 939, 1117)

# 1. ADS-C with INVALID data

- PR 1116: A330, ADS-C with invalid Alt (n+1) for 3 consecutive reports
- PR 1084: A380, ADS-C with invalid Alt (n), ETG (n), Alt (n+1) for most of the reports
- PR 959: ADS-C with INVALID data with both Thales FMS and HNW FMS, 1 300 ADS-C reports with invalid data over the past 15 days

## CMU/ATSU default values:

Predicted Route:

Lat. (n) = 36.07

Long. (n) = -50.01

**Alt. (n) = (D) -131072 ft**

**ETG = (D) 04h33:03 (16383 sec)**

Lat. (n+1) = 34.06

Long. (n+1) = -60.11

**Alt. (n+1) = (D) -131072 ft**



## ATC interpretation:

Predicted Route:

Pos = 360000N0500000W

**Alt = INVALID**

**ETA = INVALID**

Pos = 340000N0600000W

**Alt = INVALID**

*Airbus to perform test with Thales FMS for these listed A/C*

# 1. ADS-C with INVALID data

Several cases of invalid data have been reproduced with FMS Honeywell P3 standard:

- Depending on operational F-PLN modifications or upon different scenarios, the FMS times to re-compute predictions and data may vary quite significantly, thus causing INVALID data to be sent to FANS systems and to ADS-C more particularly.

Nota: The new Thales FMS T4 standard seems to offer a better behaviour.

Issue reproduced with HNW FMS  
Issue still in investigation for Thales FMS

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## 2. ETG erroneous in ADS-C

- PR 634A: Erroneous predicted estimate transmitted in Waypoint Change Report
  - ⇒ No traces, no investigation performed
  
- PR 928: A330, more than 5 minutes of ADS-C with erroneous estimated time, change of date
  - ⇒ Not reproduced in Airbus simulator, no identified clue
  
- PR 868: A320, 16 minutes difference in the estimate for the NEXT position after an amended route, change of date
  - ⇒ No recovered traces, no investigation performed
  
- PR 940: A330, grossly inaccurate estimated time, change of date
  - ⇒ No specific clue
  
- PR 1079: A380, weather deviation and offset, ADS-C with erroneous estimated time, ADS-C accurate after offset removed
  - ⇒ Not reproduced by HNW, not a systematic failure

## 2. ETG erroneous in ADS-C

- PR 1114: A320, ADS-C report with erroneous estimated time following the re-route based on 'nil wind'
  - ⇒ Airbus investigation in progress
- PR 1116: A330, one ADS-C report with erroneous ETG just after a CPDLC request sent to fly at FL 370
  - ⇒ Airbus investigation in progress

Investigation on A340/330 A/C is difficult as FMS traces are not detailed enough. A380 FMS detailed traces are expected for further investigation of the rootcause

Airbus needs to collect data to allow representativeness of Airbus tests (FMS traces on A380)

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# PR694: A380 Pilot Defined Waypoints Limited to 20

Issue: Limited number of Pilot Defined Waypoints in the FMS

Corrections: The number has been increased to:

50 Pilot Defined Wpt on FMS L2 for A380

99 on FMS R1A P4 for Honeywell (certification ongoing)

99 on FMS R1A S8/T6 for Thales (certification planned 2014)

To be closed

# PR695: A330 Could not establish ADS

Issue: Logon was received prior to MEPAB. CPDLC Connection was established OK, but ADS-C could not be established.

The pilot response to a free text query concerning whether ADS was armed was:

“ADS ARMED. HAD TROUBLES WITH IT ALL WAY ACROSS PACIFIC”

Analysis: This issue is characterized by a CPDLC auto-reset which leads to a normal behaviour on CPDLC side and an inactive behaviour on ADS side. ADS remains inoperative until the next ATSU box manual reset recommended upon exhibition of the message "INVALID DATA" on the DCDU per the QRH instructions. This could explain why crew confirmed that ADS was ARMED.

Corrected in FANS A+  
TO BE CLOSED

# PR711: A380 Uplink Routing via HFDL

Issue: 49% of the uplinks were sent via HFDL

Analysis: ARINC's issue: "ARINC's routing configuration in our ATC Gateway that handles ATS internetworking. We have made a change to the configuration that should correct this problem". The change has been implemented.

TO BE CLOSED

# PR720: Unusual losses of CPDLC connection

Issue: CPDLC and ADS-C were functioning OK. The uplink of the NDA message appeared to cause a CPDLC disconnect to be generated. (It is not known if any uplink would have also caused this disconnect to occur)

Analysis: Too late to require traces. No possibility to investigate.

No investigation possible.  
TO BE CLOSED

# PR746: ACNZ 2009-13 Delayed ADS reports A345

Issue: Normal latency for ADS reports generated by aircraft between 0617 and 0700 on departure Auckland and for initial Tasman transit. However, four reports generated between 0721 - 0727 as aircraft approached and passed 163E were delayed between 28-33 minutes.

Analysis: Too Late to require traces. No possibility to investigate from Airbus

No investigation possible.  
TO BE CLOSED

# PR748: Unable to establish CPDLC and/or ADS-C

Issue: Data analysis indicates that YBBB has been unable to establish CPDLC and/or ADS-C with GIA a/c since logons started being received.

Analysis: Too Late to require traces. No possibility to investigate from Airbus

No investigation possible.  
TO BE CLOSED

# PR752: HFDDL used for uplinks to A380

Issue: HFDDL is being incorrectly used for uplinks to VH-OQD.

Analysis: ARINC made routing change in ATC Gateway 2010 March 18 1856UTC to route Qantas A388 aircraft by tail

“Data review for May-July 2010 indicates issue is fixed. Recommend this PR is closed”. P Radford.

TO BE CLOSED

# PR754: Delay in receipt of DR1

Issue: A delay of 7-10 minute was experienced in receipt of a DR1

Analysis: This event suggests the aircraft was having a SATCOM connection problem. Attempts were made on VHF and SATCOM prior to delivering the disconnect on HF DL. SATCOM was lost at 2351utc. Data3 problem is not indicated in this event.

This delay could be linked with data 3/2 priorities management on ground.  
No possibility for further investigation.

TO BE CLOSED



# PR758: 20 minutes between CR1 & CC1

Issue: A logon was received from QFA11 at 0456, and a CPDLC Connection Request (CR1) was uplinked.

The CPDLC Connection Confirm (CC1) was not received until 0516, 20 minutes later. The aircraft should have been well within VHF data link coverage at the time.

Analysis: Too late for traces recovery. No possibility for further investigation.

No investigation possible.  
TO BE CLOSED

# PR759: Loss of CPDLC & ADS-C with UAE406

Issue: A logon had been received from UAE406 – CPDLC and ADS-C had been established. Shortly after crossing GEMAC it became apparent that CPDLC was not working. ADS-C was lost shortly afterwards.

The aircraft was operating in moderate to severe turbulence, and voice comms were poor. The loss of CPDLC caused a substantial workload increase. CPDLC and ADS-C functionality were re-established at approximately 2240.

Analysis: ADS and CPDLC problems seem to be linked to a communication performance issue (some datalink messages transmissions last for more than 14 minutes to reach the ground).

However, Airbus FANS product improvement has been logged (CDA and NDA purged next to a disconnect request).

TO BE CLOSED

# PR761: Invalid ADS-C time intervals from KAL138

Issue: KAL138 passed BULRO (054247S1700000E) at 2319, next waypoint NI (003238S1665515E). Shortly afterwards, KAL138 was re-cleared direct to FENSE (033000N1621542E). Subsequent ADS-C reports did not contain valid Predicted Route Group information (initial investigations indicate that the time interval to the Next waypoint was zero). In addition, data link functionality (ADS-C and CPDLC) was lost at approximately 0000. It is not known if this is related to the problem described above.

Analysis: This issue is caused by a FMS 2 Thales / GE (T2 standard) misbehavior which sets to zero the time interval to the next waypoint, when the report sent before midnight contains a next waypoint which will be reached after midnight.

Correction implemented in FMS T3 / T4 standard (certified)

Proposed to be closed

# PR766: QFA12 unable to load CPDLC route clearance(s)

Issue: QFA12 was unable to load several CPDLC route clearances (UM79). Can the destination be included in UM79 uplinks?

Analysis: Load of the FMS “UM79” : « CLEARED TO [position] VIA [route clearance]».

If [position] is not an airport while [route clearance] contains an arrival airport, an arrival runway, an approach procedure, an approach transition, an arrival procedure or an arrival transition, each of these elements shall be discarded with the following rejection codes: error type code 008 and error data code respectively 060, 097, 095, 096, 093, 094. The message # 62 set to unexpected data is transmitted to the ATC device.

Partial load in the FMS due to insertion of a a destination in the [ROUTE CLEARANCE] while the [position] is not an airport.

TO BE CLOSED

# PR770: Loss of CPDLC - CPA171

Issue: No CPDLC downlinks were received from CPA171.

Analysis: Too late for traces recovery. No possibility for further investigation

No investigation possible.  
TO BE CLOSED

# PR811: Unexpected error message from ACI701

Issue: In response to an uplink clearance an error message "Unrecognised message Reference number" was received.

Analysis: The issue is seen when a CPDLC request is sent by the pilot, when no definitive answer was supplied by the Ground in 5 minutes. Then, when a definitive answer is afterward supplied, this answer is refused and an ERROR message with "Unrecognized MRN" error information is sent to the ground.

Issue present only on A320/330/340 FANS A/A+.

Answer: See attached paper



Microsoft Office  
Word Document

Corrected on next standard FANS A+C  
TO BE CLOSED

# PR930: Conditional Clearance Executed After New Clearance Received

Issue: This incident may have highlighted **a major technical issue.** When the Controller sends a CPDLC message containing a reminder (in this case a time marker at 1836), the reminder is memorized by the aircraft FMS and comes back automatically when appropriate. Apparently in our case, the reminder was not deleted by the next clearance. Therefore, it reappeared at the memorized time and misled the crew to start descent, against the fact that they had previously been told not to.

Analysis: To be corrected on next FANS standards



PR930 - NAT  
answer

Corrected on next standards  
**TO BE CLOSED**

# PR998: A388 D-AIMF not able to log on to Gander Oceanic CZQX

Issue: Flight sent AFN notification to CZQX but log on was not successful. Logon to BIRD/EGGX later on worked fine.

Analysis: The traces analysis does not show any airborne misbehaviour (no reset and both ADS and CPDLC applications behaved correctly during all the flight).

This issue seems linked to both ground misbehaviour (sometime the answer to the A/C notification is missing and no CPDLC Connection Request is sent after each A/C notification) and to a crew training issue (the establishment of the CPDLC connection is not directly linked to a notification process).

No Ground answer  
TO BE CLOSED



# PR999: A388 delayed ADS-C downlinks via HF DL and SATCOM

Issue: Significant delays via SATCOM INMARSAT I4 APK1 and HF DL Stations H02 and H16. Aircraft is southbound to YSSY at handover point between KZAK and NZZO. Boundary waypoint change received via HF DL H02 sent at 1345 latency 2242", next periodic received via SATCOM APK1 sent at 1411 latency 1688", next received via HF DL H16 sent at 1416 latency 1444". NZZO downlinks attached.

Analysis: Feedback from Inmarsat. The SBB SIMS are not active – they were deactivated on 2010-09-07. The ORT is not configured appropriately for non activated SIMs. The SDU tries to obtain SBB and Classic – by using the I4s This combination fails since SBB fails as the aircraft has not been activated in the network. So the aircraft then tries to get Swift 64 and Classic which it does on I3s. There is a timer – may be 20 mins? – after which the SDU tries the I4s again (and fails)The whole process repeats ad infinitum and the aircraft is bouncing between I4s and I3s. This bouncing will impact some FANS messages. The fix is either to get SBB activated or change the ORT settings which will change the SDU behaviour to either use I3s or I4s.

A380 QFA is ongoing to be retrofitted with SBB before end of Feb-12  
(6 A/Cs) and end of June-12 (6 A/Cs more)  
TO BE CLOSED

# PR1059: Delayed ADS-C Reports Across 163E

Issue: Significantly delayed ADS-C reports around 163E FIR boundary between NZZO and YBBB for this tail on 16 August

Analysis: The ADS messages delays can be explained by an aircraft SATCOM antenna issue. Airbus is working with the airline in order to fix this issue which degrades the SATCOM communication.

Satcom Antenna root-cause  
TO BE CLOSED

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- 4. PR still open ( 879, 939,1117)**

# PR 879: Thales FMC includes latitude and longitude in DM24

Issue: It seems that when a Thales equipped aircraft sends a DM24, the latitude and longitude, along with the actual name of the fix, is being included in the route information. For example, an aircraft will file 42N055W DCT SOORY DCT JIMAC M327 SAVON DCT GALVN DCT SUMRS. When a DM24 is sent, the aircraft will send this route but also include the latitude and longitude of the fixes. In some instances, airways will also be stripped out. See the two attached examples for details.

Analyse: The insertion of Lat Long data in Route information is compliant with applicable standard ED100A/DO258A (Lat Long information is optional and can be provided in the downlink). This design is based on the choice to activate systematically the option i.e. to send systematically the (lat, long) for a fix. The ATC centers should be robust to this optional field i.e. to the lat/long, since it is specified in applicable standard. It is not a separated fix in the route, it is only additional data related with fix, which may or may not be used by ground systems.

Moreover, this design permits to resolve potential issues of duplicate fixes in ground ATC Data Base (and also in ground AOC Data base since the design is the same for AOC downlinks).

Uses the single character identifier for the approach type (e.g. I25L instead of ILS25L). Yes, until REV2+ only. From RELEASE 1A, the complete name format is used.

c/ are identified limitations that will be fixed in next releases. Do not put the intersection waypoints between airways in the [routeinformation]. Yes, until RELEASE 1A T3 only. From RELEASE 1A T4, the intersection waypoints between airways are sent. [EPR 81829].

To be corrected on next standard  
OPEN

# PR939: ADS disconnection

Issue: Aircraft was westbound coming from the Santa Maria CTA into the New York CTA. AFN LOGON process for KZWY began at 2131Z. CPDLC connection completed at 2132Z. Flight was never able to connect via ADS-C. Whenever the ATC ground system at ZNY attempted to connect the response back from the aircraft was 'ADS Disconnect: Reason not specified'. Connection attempts were made 7 times over a two hour period with the same result.

Analyse: Each time NYCODYA wanted to establish an ADS contract whereas 5 ground ADS connections are already established on board. Same behaviour was seen twice for SMACAYA ATC centre. Per specification, when the airborne ADS application receives an ADS request from a non connected center while five ADS Ground connections are established, the airborne ADS application shall deny service, by sending a **Disconnect Request reason code 1 (= congestion)**.

To indicate the Disconnect Request  
in the rejected message: under analysis  
Open

# PR1117: A333 receives CPDLC messages via SATCOM but responses are lost

Issue: at 15:01 a clearance was sent, a MAS/S received but no operational response followed (no ack). The clearance was repeated at 15:29 with the same result. When the clearance was delivered via voice shortly afterwards it turned out that the crew were already at the cleared level, having received the CPDLC message(s). The crew advised of "intermittent contact" via data link.

Analyse: In investigation

OPEN



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