

Advisory Wire

REFERENCE NO:	AW700-23-0578, Rev 04	INFORMATION TYPE:	Maintenance Operational
ATA:	23-23	EFFECTIVITY:	Global Express / XRS (9002 - 9312, 9314 - 9380, 9384 - 9429) Global 5000 (9127 to 9383, 9389 to 9400, 9404 to 9431 and 9998)
SUBJECT:	FMS CDU 'ACARS DMU FAILED' message observed post Batch 3.3		

1. REFERENCES:

- 1.1. Bombardier Service Bulletin (SB) 700-31-034 / 700-1A11-31-017, Modification – Integrated Avionics Computer (IAC) System – Batch 3.3 Software Upgrade
- 1.2. Bombardier Advisory Wire (AW) 700-31-0563 – Batch 3.3 Software Upgrade – In-Service Observations
- 1.3. ICAO Global Operational Data Link Document (GOLD)
https://www.icao.int/APAC/Documents/edocs/GOLD_2Edition.pdf
- 1.4. Global Express XRS/5000 FANS-1/A+ (CPDLC) Flight Training eLearning
E-learning courses are available at: <https://www.batraining.com/elearning/flightraining/global/>
- 1.5. Bombardier Advisory Wire (AW) 700-31-0647 – Batch 3.4 Software Upgrade – Availability and Updates
- 1.6. Bombardier Service Bulletin (SB) 700-31-039 / 700-1A11-31-021, Modification – Integrated Avionics Computer (IAC) System – Batch 3.4 Software Upgrade

The web link in reference 1.3 and 1.4 are confirmed valid at the time of release of this AW.

References 1.1, 1.2, 1.5 and 1.6 are available on the Bombardier Customer Portal:
my.businessaircraft.bombardier.com > Library > Search by Keyword

2. INTRODUCTION:

Revision 4 of this Advisory Wire (AW) is to inform operators and flight crews of the release of the Bombardier SB 700-31-039 / 700-1A11-31-021 – Batch 3.4 Software Upgrade (Ref. 1.6) as the solution for the condition reported associated with the operation of the Datalink system on aircraft post Batch 3.3 software upgrade (Ref. 1.1). Some operators have reported intermittent occurrences of FMS (Flight Management System) Control Display Unit (CDU) 'ACARS DMU FAILED' scratchpad message. Similar preliminary information was already communicated via AW700-31-0563 (Ref. 1.2).

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3. DESCRIPTION:

The messages can be viewed on two (2) locations:

- 'ACARS DMU FAILED' amber message shows on the FMS CDU DATALINK INDEX page when the IAC (Integrated Avionics Computer) does not receive the correct health status from ADLU (Airborne Data-Link Unit) on the ARINC 429 bus, and
- 'ACARS DMU FAILED' message is displayed on FMS CDU scratchpad as shown in Figure 1 below.



Figure 1 – 'ACARS DMU FAILED' messages displayed on FMS CDU

In the reported cases, the 'ACARS DMU FAILED' FMS CDU scratchpad messages occurred during both FANS (Future Air Navigation System) and non-FANS operations, on ground and in flight at various times. Most occurrences last for a few seconds only and in few others cases the occurrence lasts longer, but in all cases the system recovers on its own. In most cases the crew would only notice the scratchpad message and if the failure condition is no longer present, simply acknowledge and clear the message using the CDU CLEAR key.

During the 'ACARS DMU FAILED' event all Datalink operations are interrupted until the system recovers and any information stored in the datalink RCVD MSGS (i.e. Pre-Departure Clearance (PDC), Oceanic Clearance, text messages...) and FAULT LOG pages may be cleared. Also, the Datalink configuration settings were found to be reverting to default values (e.g. 'DATA' is the VHF Mode default value), which may require re-configuration to the desired setting based on operator preferences with their ground service providers.

In some occurrences, the FANS Automatic Dependent Surveillance – Contract (ADS-C) position report may not be sent to Air Traffic Control (ATC).

If the failure duration is prolonged the system may log off from the FANS. In this case, the contingency procedures and recommended practices indicated in the ICAO (International Civil Aviation Organization) document (Ref. 1.3) should be followed. More specifically, when operating CPDLC (Controller-Pilot Data Link Communications) and the aircraft Datalink system provides an indication of degraded performance resulting from a failure or loss of connectivity, the flight crew should revert to voice communication (e.g. SATCOM voice, VHF voice, HF voice, etc.) and notify the ATC of the failure as soon as practicable.

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The Bombardier FANS training modules (Abnormal Operation section) available online (Ref. 1.4), include procedures for transitioning to voice communication and other contingency procedures related to the operation in the event of abnormal behavior of the data link services.

Among the operators that have reported 'ACARS DMU FAILED' message, the occurrences remain at approximately twenty per cent (20%).

Bombardier had actively investigated this issue with Honeywell and Teledyne. Extensive testing has been conducted on the Honeywell test bench, without been able to reproduce the condition. Additional testing on an affected in-service aircraft allowed data recording during the event. The data was analyzed and showed that during the occurrences, the Datalink unit stops transmitting ARINC 429 data to the IAC which triggers the 'ACARS DMU FAILED' message on the FMS CDU scratchpad. Even though the condition was observed, review of the data exchange between the IAC and the Datalink prior to the occurrence did not identify a triggering source that would cause this Datalink unit behavior.

Additional testing has been performed on Bombardier's test aircraft using a combination of IACs and Datalink units that have exhibited 'ACARS DMU FAILED' events previously. The Datalink system was operated extensively and stressed beyond typical operation. One (1) 'ACARS DMU FAILED' occurrence was recorded and data analyzed.

A condition was identified where there was an issue with an output from the FMS that preceded the Datalink reset. Honeywell has completed the root cause analysis and has determined that this issue was the reason for the failures experienced in the fleet.

Bombardier and Honeywell had developed a plan to correct this condition affecting aircraft post Batch 3.3 (Ref. 1.1) by incorporating the Batch 3.4 software upgrade (Ref. 1.6). Additional fixes to Batch 3.3 (Ref. 1.1) are also included.

Bombardier's recommendation was to continue with the installation of the Batch 3.3 upgrade (Ref. 1.1) as it offers many operational advantages and addresses a number of other concerns. For the operators that may have elected to defer Batch 3.3 upgrade (Ref. 1.1) installation until Batch 3.4 (Ref. 1.6) availability, Batch 3.3 upgrade (Ref. 1.1) will have to be done before, or at the same time as Batch 3.4 upgrade (Ref. 1.6).

4. ACTION:

Operators and flight crew should be familiar with the information contained in this AW.

Batch 3.3 upgrade (Ref. 1.1) is a prerequisite to Batch 3.4 upgrade (Ref. 1.6) and must be done before, or at the same time as Batch 3.4 (Ref. 1.6).

Batch 3.4 software upgrade (Ref. 1.6) is covered by a dedicated schedule therefore advance part scheduling with our In-Service Implementation Team (ISIT) is recommended prior to a maintenance visit. Availability as well as additional information are available in the AW700-31-0647 – Batch 3.4 Software Upgrade – Availability and Updates (Ref. 1.5).

Should a similar event occur while operating FANS/CPDLC and Datalink communication is interrupted causing a log off, it is recommended to revert to voice communication or follow contingency procedures.

It is always a good practice to record or print any relevant information stored in the datalink RCVD MSGS (i.e. Pre-Departure Clearance (PDC), Oceanic Clearance, etc.).

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It is not recommended to replace Datalink unit exhibiting intermittent 'ACARS DMU FAILED' associated with the condition described in this AW and that successfully passes the Aircraft Maintenance Manual (AMM) Operational Test of the Data Link System (TASK 23-23-00-710-801).

Should you have any queries pertaining to this Advisory Wire (AW), please contact your Bombardier Field Service Representative (FSR) or the Customer Response Center (CRC).