

EASA	AIRWORTHINESS DIRECTIVE
	AD No.: 2015-0093 Date: 27 May 2015 Note: This Airworthiness Directive (AD) is issued by EASA, acting in accordance with Regulation (EC) No 216/2008 on behalf of the European Community, its Member States and of the European third countries that participate in the activities of EASA under Article 66 of that Regulation.
This AD is issued in accordance with EU 748/2012, Part 21.A.3B. In accordance with EU 1321/2014 Annex I, Part M.A.301, the continuing airworthiness of an aircraft shall be ensured by accomplishing any applicable ADs. Consequently, no person may operate an aircraft to which an AD applies, except in accordance with the requirements of that AD, unless otherwise specified by the Agency [EU 1321/2014 Annex I, Part M.A.303] or agreed with the Authority of the State of Registry [EC 216/2008, Article 14(4) exemption].	
Design Approval Holder's Name: NORTHROP GRUMMAN LITEF GmbH	Type/Model designation(s): LCR-100 Attitude Heading Reference System
ETSO Authorisation: EASA.210.855 Rev. A	
Foreign AD:	Not applicable
Supersedure:	None
ATA 34	Navigation – Attitude Heading Reference System – Modification / Replacement
Manufacturer(s):	Northrop Grumman LITEF GmbH, formerly LITEF GmbH
Applicability:	Northrop Grumman LITEF GmbH LCR-100 Attitude Heading Reference System (AHRS), Part Number (P/N) 145130-2000, P/N 145130-2001, P/N 145130-7000, P/N 145130-7001 and P/N 145130-7100. These AHRS units are known to be installed on, but not limited to, Pilatus PC-12, Learjet 31A, Cessna 560XL, RUAG (Dornier) 228 series, and PZL Mielec M28 (Sky Truck) aeroplanes; and Bell Helicopter Textron Inc. 412EP, Bell Helicopter Textron Canada 407, and Sikorsky S-76C helicopters.
Reason:	During laboratory tests of LCR-100 AHRS units, it was discovered that when BITE (built-in test) detects failures causing the system to switch into Reset Hold Mode (Silent Mode), system reset was not correctly generated. This reset failure induces frozen analogue output data (Attitude and Heading) without detection or warning to the pilot, while the digital A429 output data is indicated invalid and remains invalid. For aircraft installations using LCR-100 analogue data, there may be misleading analogue output provided by the equipment to the aircraft (pilot and autopilot). The A429 digital Attitude and Heading data is indicated invalid, and is therefore unavailable, but not misleading to the aircraft. Unless a system reset is performed by a switch OFF / switch ON sequence, the unit remains in this failure mode. However, depending on aircraft installation, if there is no automatic comparison of analogue output (e.g. with another equipment output) to detect unit failure, this condition, if not corrected, could lead to undetected attitude and heading errors, possibly resulting in loss of control of the aircraft.

	To address this potential unsafe condition, Northrop Grumman LITEF issued Service Bulletin (SB) 145130-0017-845 (now at issue C), providing instructions for the affected units to be removed and replaced with modified units. For the reasons described above, this AD requires removal from service of the affected LCR-100 AHRS units and replacement with modified (new P/N) units. In addition, as an interim measure pending AHRS unit replacement, for aircraft installations using the analogue output without the means to automatically detect the misleading data, this AD requires a temporary amendment of the applicable Aircraft Flight Manual (AFM).						
Effective Date:	10 June 2015						
Required Action(s) and Compliance Time(s):	Required as indicated, unless accomplished previously: (1) For aircraft installations using the LCR-100 analogue output (see Note 1) without automatic detection of the frozen output data of the AHRS, within 30 days after the effective date of this AD, amend the AFM of the aircraft by inserting a Temporary Revision (TR) to the AFM (Supplement), provided by the design approval (TC) holder of the affected aircraft, or the design change approval (STC) holder of the modification through which the LCR-100 unit was installed, as applicable. The AFM(S) TR must include the following: - information explaining the safety issue, - instructions for the pilot to closely monitor the Attitude and Heading information to detect frozen data, - instructions for the pilot to accomplish after detection (considering possible reset, diversion, etc.), as applicable to the aircraft installation, and - limitations or procedures, as deemed necessary to ensure safe flight. Note 1: Aircraft installations using the LCR-100 analogue output only for non-safety critical functions are not affected by the requirements of paragraph (1) of this AD. (2) Within the compliance time specified in Table 1 of this AD, as applicable, modify the aircraft by replacing each AHRS unit having a P/N specified as 'old' in Table 2 of this AD with a modified unit, having a P/N specified as 'new' in Table 2 of this AD. This modification must be accomplished in accordance with approved aeroplane modification instructions provided by the TC holder of the affected aircraft, or the STC holder of the modification through which the LCR-100 unit was installed. Northrop Grumman LITEF SB 145130-0017-845 contains the necessary instructions how to have a unit modified. Table 1 – Modification <table border="1"> <thead> <tr> <th>Affected aircraft installations</th><th>Compliance Time</th></tr> </thead> <tbody> <tr> <td>Using the LCR-100 analogue output without automatic detection of the frozen output data of the AHRS</td><td>6 months</td></tr> <tr> <td>All other installations, including those defined in Note 1 of this AD</td><td>24 months</td></tr> </tbody> </table>	Affected aircraft installations	Compliance Time	Using the LCR-100 analogue output without automatic detection of the frozen output data of the AHRS	6 months	All other installations, including those defined in Note 1 of this AD	24 months
Affected aircraft installations	Compliance Time						
Using the LCR-100 analogue output without automatic detection of the frozen output data of the AHRS	6 months						
All other installations, including those defined in Note 1 of this AD	24 months						

	Table 2 – LCR-100 AHRS P/N old and new <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>P/N old</th><th>P/N new</th></tr> </thead> <tbody> <tr> <td>145130-2000</td><td>145130-2010</td></tr> <tr> <td>145130-2001</td><td>145130-2011</td></tr> <tr> <td>145130-7000</td><td>145130-7010</td></tr> <tr> <td>145130-7001</td><td>145130-7011</td></tr> <tr> <td>145130-7100</td><td>145130-7110</td></tr> </tbody> </table> (3) Concurrent with modification of an aircraft as required by paragraph (2) of this AD, the AFM change, if required by paragraph (1) of this AD (see Note 1 of this AD), can be removed from that aircraft. (4) Do not install on any aircraft a LCR-100 AHRS unit, having a P/N specified as 'old' in Table 1 of this AD, as required by paragraph (4.1) or (4.2) of this AD, as applicable. (4.1) For an aircraft with LCR-100 AHRS installed, having a P/N specified as 'old' in Table 1 of this AD: After modification as required by paragraph (2) of this AD. (4.2) For an aircraft with LCR-100 AHRS installed, having a P/N listed as 'new' in Table 1 of this AD, or with a AHRS installed with a P/N <u>not</u> listed in Table 1 of this AD: From the effective date of this AD.	P/N old	P/N new	145130-2000	145130-2010	145130-2001	145130-2011	145130-7000	145130-7010	145130-7001	145130-7011	145130-7100	145130-7110
P/N old	P/N new												
145130-2000	145130-2010												
145130-2001	145130-2011												
145130-7000	145130-7010												
145130-7001	145130-7011												
145130-7100	145130-7110												
Ref. Publications:	Northrop Grumman LITEF SB 145130-0017-845, issue C, dated 14 January 2015, or issue D, dated 1 April 2015, which can be downloaded from the NG LITEF GmbH website. The use of later approved revisions of this document is acceptable for compliance with the requirements of this AD.												
Remarks:	- If requested and appropriately substantiated, EASA can approve Alternative Methods of Compliance for this AD. - This AD was posted on 04 March 2015 as PAD 15-020 for consultation until 01 April 2015. The Comment Response Document can be found at http://ad.easa.europa.eu/. - Enquiries regarding this AD should be referred to the Safety Information Section, Certification Directorate, EASA. E-mail: ADs@easa.europa.eu. - For any question concerning the technical content of the requirements in this AD, please contact: Northrop Grumman LITEF GmbH, Customer Service Commercial Avionics, Loerracher Str. 18, 79115 Freiburg, Germany Telephone +49 (761) 4901-142 , Fax +49 (761) 4901-773 Email: ahrs.support@ng-litef.de.												