LEONARDO

HELICOPTERS

AgustaWestland Products

SERVICE BULLETIN

N° **139-718**

DATE: August 30, 2022

REV. : /

TITLE

ATA 93 – OPLS KIT COMPLETION

REVISION LOG

First Issue

1. <u>PLANNING INFORMATION</u>

A. EFFECTIVITY

AW139 helicopter S/N 31970.

B. COMPLIANCE

At Customer's option.

C. CONCURRENT REQUIREMENTS

Compliance with Service Bulletin 139-719 is required before application of this Service Bulletin.

D. REASON

This Service Bulletin is issued in order to provide the necessary instruction on how to perform the installation of the CPU P/N IS00519-B of kit OPLS P/N 4G9360F00211.

E. DESCRIPTION

The provision and the equipment (except the CPU) of the kit OPLS have been already installed on the helicopter. In this Service Bulletin it is described the procedure to perform the installation of the CPU only.

F. APPROVAL

The technical content of this Service Bulletin is approved under the authority of DOA nr. EASA.21.J.005. For helicopters registered under other Aviation Authorities, before applying the Service Bulletin, applicable Aviation Authority approval must be checked within Leonardo Helicopters customer portal.

EASA states mandatory compliance with inspections, modifications or technical directives and related time of compliance by means of relevant Airworthiness Directives. If an aircraft listed in the effectivity embodies a modification or repair not LHD certified and affecting the content of this Service Bulletin, it is responsibility of the Owner/Operator to obtain a formal approval by Aviation Authority having jurisdiction on the aircraft, for any adaptation necessary before incorporation of the present Service Bulletin.

G. MANPOWER

To comply with this Service Bulletin forty-five (45) MMH are deemed necessary.

MMH are based on hands-on time and can change with personnel and facilities available.

H. WEIGHT AND BALANCE

	WEIGHT (Kg)		
			1,9
		ARM (mm)	MOMENT (Kgmm)
LONGITUDINAL BALANCE		6135	11656,5
LATERAL BALANCE		-4	-7,6

I. REFERENCES

1) PUBLICATIONS

Following Data Modules refer to AMP:

DATA MODULE		DESCRIPTION	PART
DM01	39-A-00-20-00-00A-120A-A	Helicopter on ground for a safe maintenance.	-
DM02	39-A-06-41-00-00A-010A-A	Access doors and panels – General data.	-
DM03	39-A-11-00-01-00A-720A-A	Decal - Install procedure.	-

2) ACRONYMS & ABBREVIATIONS

AMP	Aircraft Maintenance Publication
ATP	Acceptance Test Procedure
CPU	Central Processor Unit
DM	Data Module
DOA	Design Organization Approval
EASA	European Aviation Safety Agency
LH	Leonardo Helicopters
MMH	Maintenance Man Hours
OPLS	Obstacle Proximity Lidar System
P/N	Part Number
S/N	Serial Number

3) ANNEX

Annex A   Acceptance Test Procedure

J. PUBLICATIONS AFFECTED

N.A.

K. SOFTWARE ACCOMPLISHMENT SUMMARY

N.A.

2. MATERIAL INFORMATION

A. REQUIRED MATERIALS

1) PARTS

#	P/N	ALTERNATIVE P/N	DESCRIPTION	Q.TY	LVL	NOTE	LOG P/N
1	IS00519-B S/N 2107958		Central Processor Unit	1	.		-
2	NAS1149D0316J		Washer	2	.		-
3	A601A3B10		Bonding cable assy	1	.		-
4	LN65022-0412		Screw	1	.		-
5	MS35207-263		Screw	1	.		-
6	ED300A786		Decal	1	.		-
7	A519A-A000		Gasket	1	.	(1)	-

Refer also to IPD for the spares materials required to comply with the AMP DMs referenced in the accomplishment instructions.

2) CONSUMABLES

Refer to AMDI for the consumable materials required to comply with the AMP DM referenced in the accomplishment instructions.

3) LOGISTIC MATRIX

N.A.

NOTE

(1) Item to be procured only if required after bonding check of the CPU.

B. SPECIAL TOOLS

The following special tools, or equivalent, are necessary to accomplish this Service Bulletin:

#	P/N	DESCRIPTION	Q.TY	NOTE	PART
8	91-199	Target Shaft	1	(B1)	Annex A
9	Commercial	USB keyboard	1	(B2) (B3)	Annex A
10	Commercial	DC Power Bench	1	(B2)	Annex A
11	Commercial	Bondimeter	1	(B2)	Annex A
12	Commercial	Tester, Conductor Pins and Wire Extensions	AR	(B2)	Annex A

Refer also to ITEP for the special tools required to comply with the AMP DM referenced in the accomplishment instructions.

SPECIAL TOOLS NOTE

(B1) Or equivalent item (minimum 4m long, 4 cm wide).

(B2) Item to be procured as local supply.

(B3) Wireless or with 5m long cable.

C. INDUSTRY SUPPORT INFORMATION

Customization.

3. <u>ACCOMPLISHMENT INSTRUCTIONS</u>

<u>GENERAL NOTES</u>

a) Place an identification tag on all components that are re-usable, including the attaching hardware that has been removed to gain access to the modification area and adequately protect them until their later re-use.

b) Shape the cables in order to prevent interference with the structure and the other existing installations, using where necessary suitable lacing cords and plastic cable tiedown.

c) Exercise extreme care during drilling operations to prevent instruments, cables and hoses damage.

d) After drilling, remove all swarf and sharp edges. Apply on bare metal a light film of primer unless the hole is used for ground connection.

e) During the installation of bonding braids or components requiring grounding, clean the surface structure in order to obtain a good ground contact.

f) Let adhesive cure at room temperature for at least 24 hours unless otherwise specified.

g) Exposed thread surface and nut must be protected using a layer of tectyl according to MIL-C-16173 grade I.

h) All lengths are in mm.

1. In accordance with DM 39-A-00-20-00-00A-120A-A, prepare the helicopter on ground for a safe maintenance. Disconnect the battery, all electrical power sources and/or the external power supply.

2. In accordance with DM 39-A-06-41-00-00A-010A-A and with reference to Figure 1, remove all external panels, internal panels and internal liners as required to gain access to the area affected by the installation and perform the installation of the CPU as described in the following procedure:

NOTE

CPU P/N IS00519-B can be installed only if with Serial Number 2107958.

2.1   With reference to Figure 1 View A, install the Central Processor Unit P/N IS00519-B on the support assy P/N 3G5315A07733 by means of n°4 furnished screws. Torque to 1.6 Nm.

2.2   With reference to Figure 1 View A, install the bonding cable assy P/N A601A3B10 on the support assy P/N 3G5315A07733 by means of washer P/N NAS1149D0316J and screw P/N MS35207-263.

2.3   With reference to Figure 1 View A, install the bonding cable assy P/N A601A3B10 on the Central Processor Unit P/N IS00519-B by means of washer P/N NAS1149D0316J and screw P/N LN65022-0412.

2.4   In accordance with AMP DM 39-A-11-00-01-00A-720A-A and with reference to Figure 1 View A, install the decal P/N ED300A786 on the Central Processor Unit P/N IS00519-B.

2.5   With reference to Figure 1 View A, perform the bonding check between the Central Processor Unit P/N IS00519-B and the support assy P/N 3G5315A07733. The resistance measured must not exceeds the value of 2.5 milliohms.

2.6   If the bonding values are out of the acceptable limits, do the operations that follow:

2.6.1   Make sure that bonding surfaces are cleaned.

2.6.2   Repeat the bonding check between the Central Processor Unit P/N IS00519-B and the support assy P/N 3G5315A07733. The resistance measured must not exceeds the value of 2.5 milliohms.

NOTE

Cut the profile of the gasket P/N A519A-A000 to adapt it to the outline of the CPU.

2.6.3   If bonding values are still out of the acceptable limits, remove the Central Processor Unit P/N IS00519-B and reinstall it interposing a conductive gasket P/N A519A-A000 between the Central Processor Unit P/N IS00519-B and the support assy P/N 3G5315A07733.

2.7   With reference to Figure 1 View A and Detail C, remove the existing caps from the electrical connectors A786P1, A786P2, A786P3 and A786P4.

2.8   With reference to Figure 1 View A, connect the electrical connectors A786P1, A786P2, A786P3 and A786P4 to the receptacles of the CPU P/N IS00519-B.

3.   With reference to Figure 1 View B, remove the lock ring P/N AW001YC01RED from the CB panel.

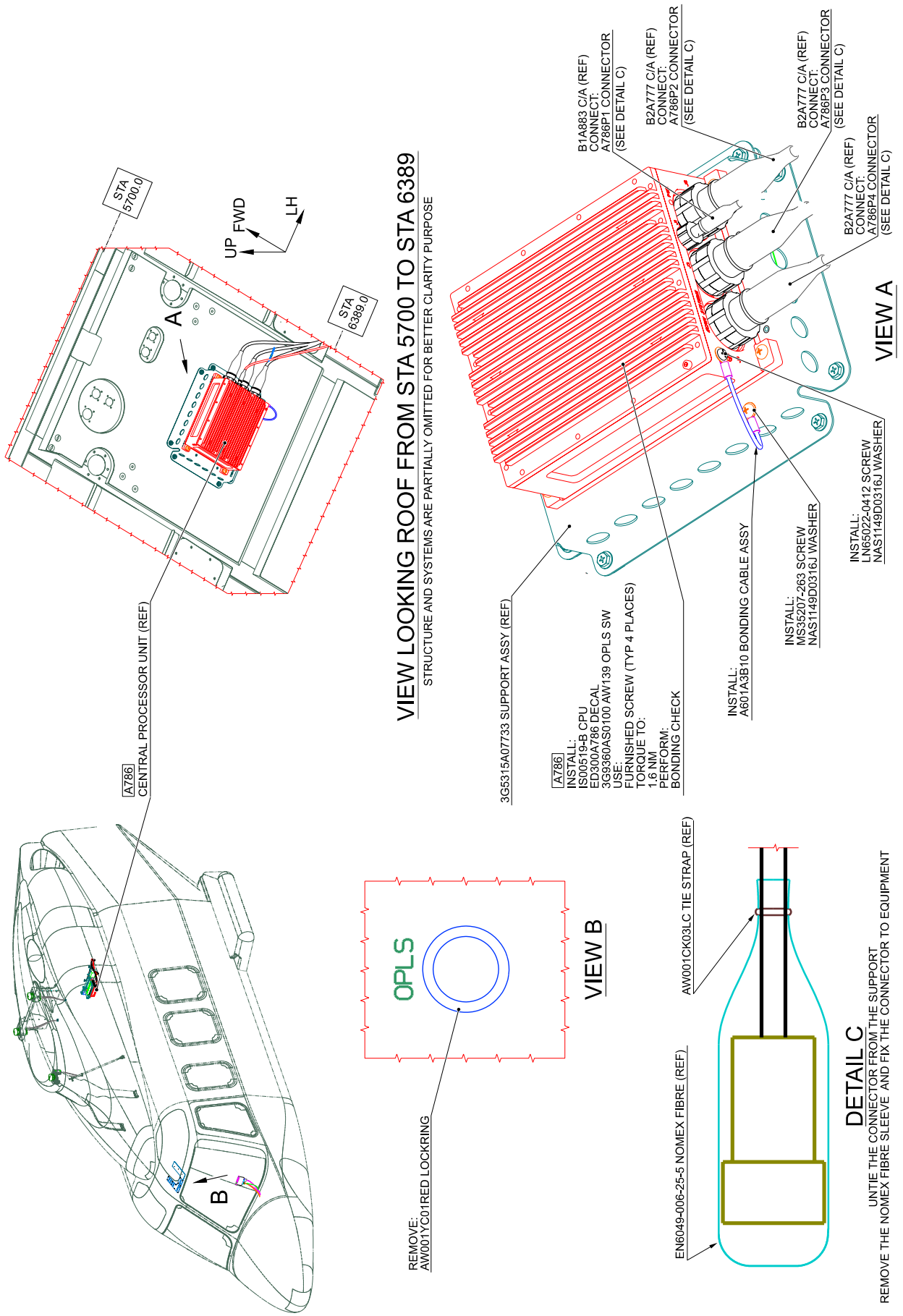4. In accordance with Annex A, perform the OPLS acceptance test procedure.

5. In accordance with weight and balance changes, update the Chart A (see Rotorcraft Flight Manual, Part II, section 6).

6. Return the helicopter to flight configuration and record for compliance with this Service Bulletin on the helicopter logbook.

7. Send the attached compliance form to the following mail box:

<div align="center">

engineering.support.lhd@leonardo.com

</div>

As an alternative, gain access to My Communications section on Leonardo WebPortal and compile the "Service Bulletin Application Communication".

VIEW LOOKING ROOF FROM STA 5700 TO STA 6389
STRUCTURE AND SYSTEMS ARE PARTIALLY OMITTED FOR BETTER CLARITY PURPOSE

STA 5700.0

STA 6389.0

UP FWD
LH

A786
CENTRAL PROCESSOR UNIT (REF)

B

VIEW A

B1A883 C/A (REF)
CONNECT:
A786P1 CONNECTOR
(SEE DETAIL C)

B2A777 C/A (REF)
CONNECT:
A786P2 CONNECTOR
(SEE DETAIL C)

B2A777 C/A (REF)
CONNECT:
A786P3 CONNECTOR
(SEE DETAIL C)

B2A777 C/A (REF)
CONNECT:
A786P4 CONNECTOR
(SEE DETAIL C)

INSTALL:
LN65022-0412 SCREW
NAS1149D0316J WASHER

INSTALL:
A601A3B10 BONDING CABLE ASSY

INSTALL:
MS35207-263 SCREW
NAS1149D0316J WASHER

A786
INSTALL:
IS00519-B CPU
ED300A786 DECAL
3G9360AS0100 AW139 OPLS SW
USE:
FURNISHED SCREW (TYP 4 PLACES)
TORQUE TO:
1,6 NM
PERFORM:
BONDING CHECK

3G5315A07733 SUPPORT ASSY (REF)

VIEW B

OPLS

REMOVE:
AW001YC01RED LOCKRING

DETAIL C
UNTIE THE CONNECTOR FROM THE SUPPORT
REMOVE THE NOMEX FIBRE SLEEVE AND FIX THE CONNECTOR TO EQUIPMENT

AW001CK03LC TIE STRAP (REF)

EN6049-006-25-5 NOMEX FIBRE (REF)

Figure 1

ANNEX A

OPLS
ACCEPTANCE TEST PROCEDURE

1. PRE-REQUISITES AND SYSTEM SETTINGS

1.1   Tester, conductor pins and wire extensions are available for troubleshooting operations.

1.2   A suitable shaft (minimum 4m long, 4 cm wide) is available for obstacle detection verification.

1.3   Verify that all the Electrical Distribution System Circuit Breakers are pushed in except IGN #1/2 and START #1/2. If installed, unplug the connectors from the fire extinguishing bottles and stow them during this ATP. If other Electro-Explosive Devices (EED) are fitted, ensure that they are electrically disconnected.

NOTE

Do not handle plug-receptacle connectors with voltage presence. Performs tests step-by-step to allow the check of each single function.

1.4   Ensure that the External Power Bench is set to the appropriate Voltage (28 VDC) and connected to the A/C External Power Socket.

1.5   Adjust ICS – AV900 Warning Audio #4 level to 95%. As reference, use DM 39-A-23-51-01-00A-27CA-A Number 1 audio panel - Presetting procedure. Instructions can be applied to any of the AV-900 audio panels installed onboard.

1.6   Adjust the audio amplifier RX level "full clockwise".

2. SYSTEM CALIBRATION

2.1   Power up the helicopter via the External Power Bench.

2.2   Connect a USB keyboard to any of the system maintenance ports.
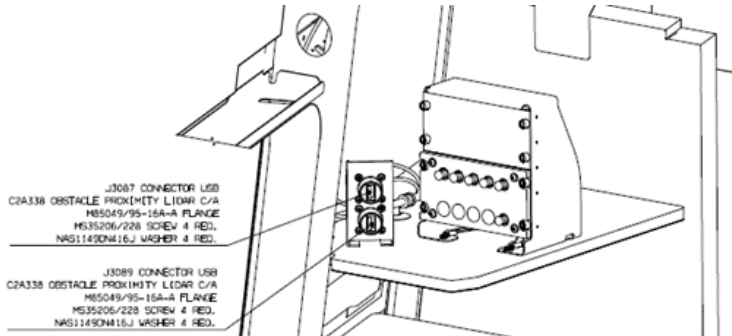
2.3   Verify on the OPLS CP, that the power indicator is OFF (energized).
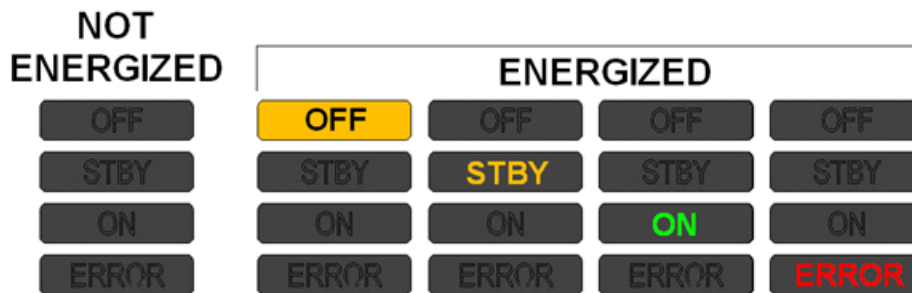
NOTE

Ref. to the Central Display user manual for source selection.

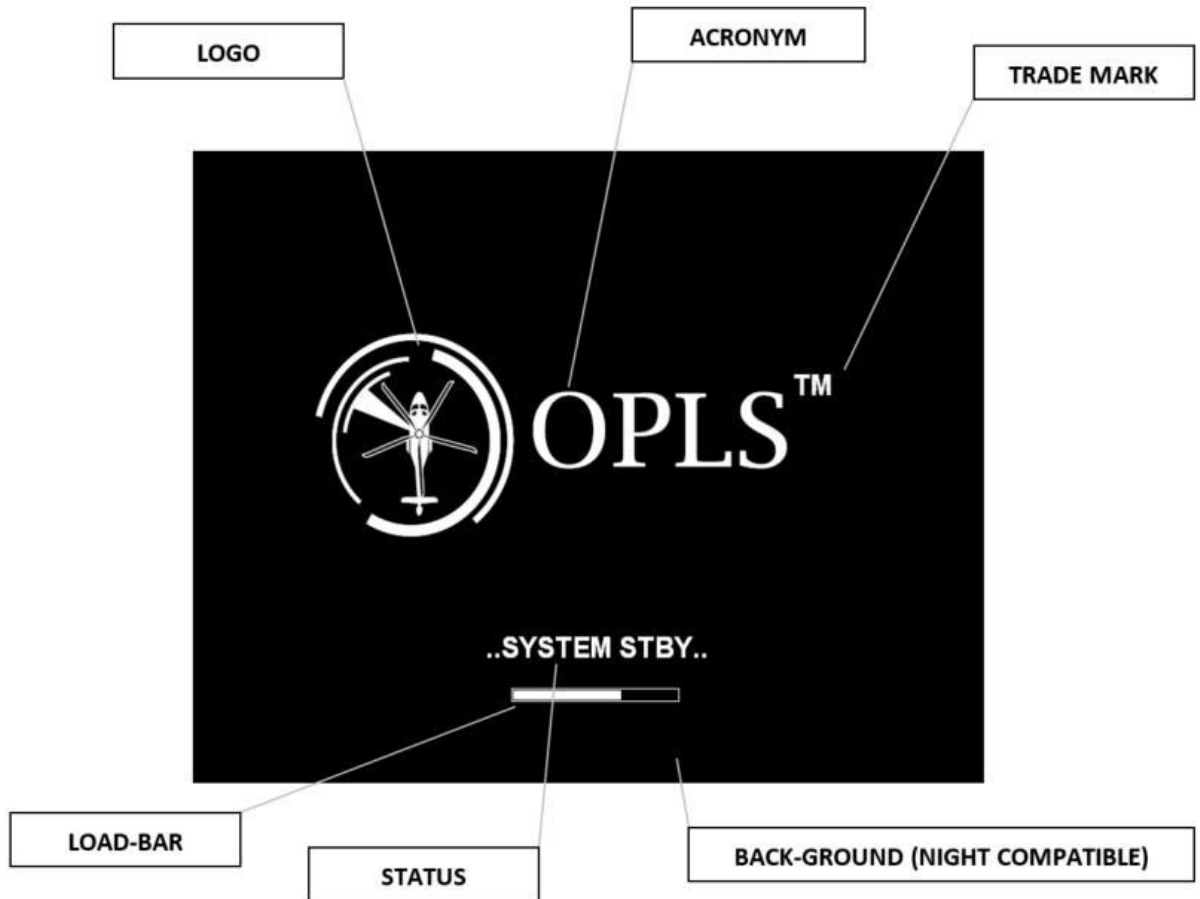2.4   Select the OPLS video page on the Central Display (if integrated).

NOTE

OPLS video page menu path is SYS►GRAPHICS►OPLS.

2.5   Select the OPLS video page on the MFDs via the CCD (if integrated).

2.6   Press the system POWER pushbutton on the OPLS control panel.

2.7   Verify on the OPLS CP, that the power indicator changes to STBY.
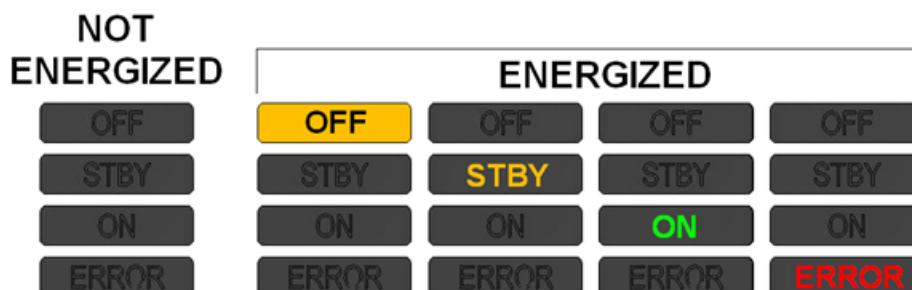
2.8   Verify that the STBY video page is displayed.

2.9   Press and hold the INFO pushbutton for 5s to access the maintenance page. Then release the INFO pushbutton when the password page is in view.

2.10   Input the system maintenance password ("OPLS") in capital letters and then press ENTER.

NOTE

Use the arrow keys to navigate the options. Press the +- keys to modify the settings.

2.11   Verify that the following page is returned:
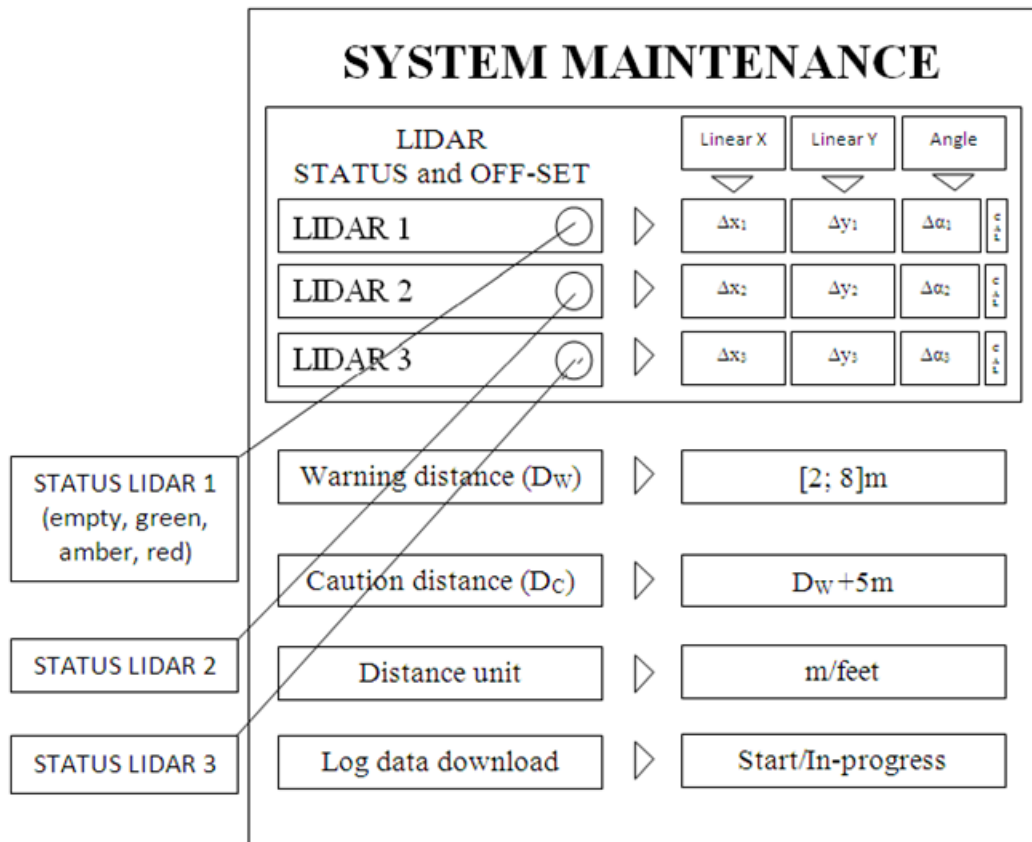
2.12   Verify that every sensor status is green.

2.13   Verify all LINEAR (X & Y) OFF-SET values are set to zero. Otherwise, manually set them to zero.

2.14   Set the Distance unit to "m".

2.15   Set the Warning distance to "+5m".

2.16   Verify that the Caution distance is "+10m".

2.17   Tow the aircraft to a to a clear, flat area of 20x10m.

2.18   Draw on ground a XY reference aligned to the aircraft BL0.

NOTE

Ensure that the maximum alignment error of X-Y axes Vs. A/C BL0 is < 0.5°.

2.19   Mark on-ground four points (I, II, III, IV) along a square-box pattern, at a distance of 1 m beyond the aircraft safety profile as follows:
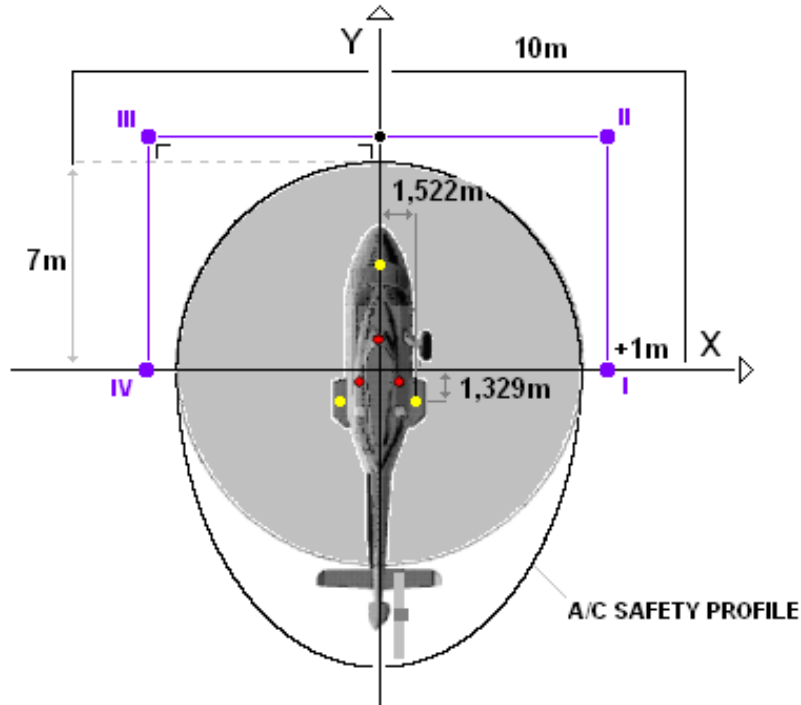
2.20   Launch the automatic CAL procedure for LiDAR 1 by selecting CAL and pressing ENTER.

2.21   Verify that the following page is returned:
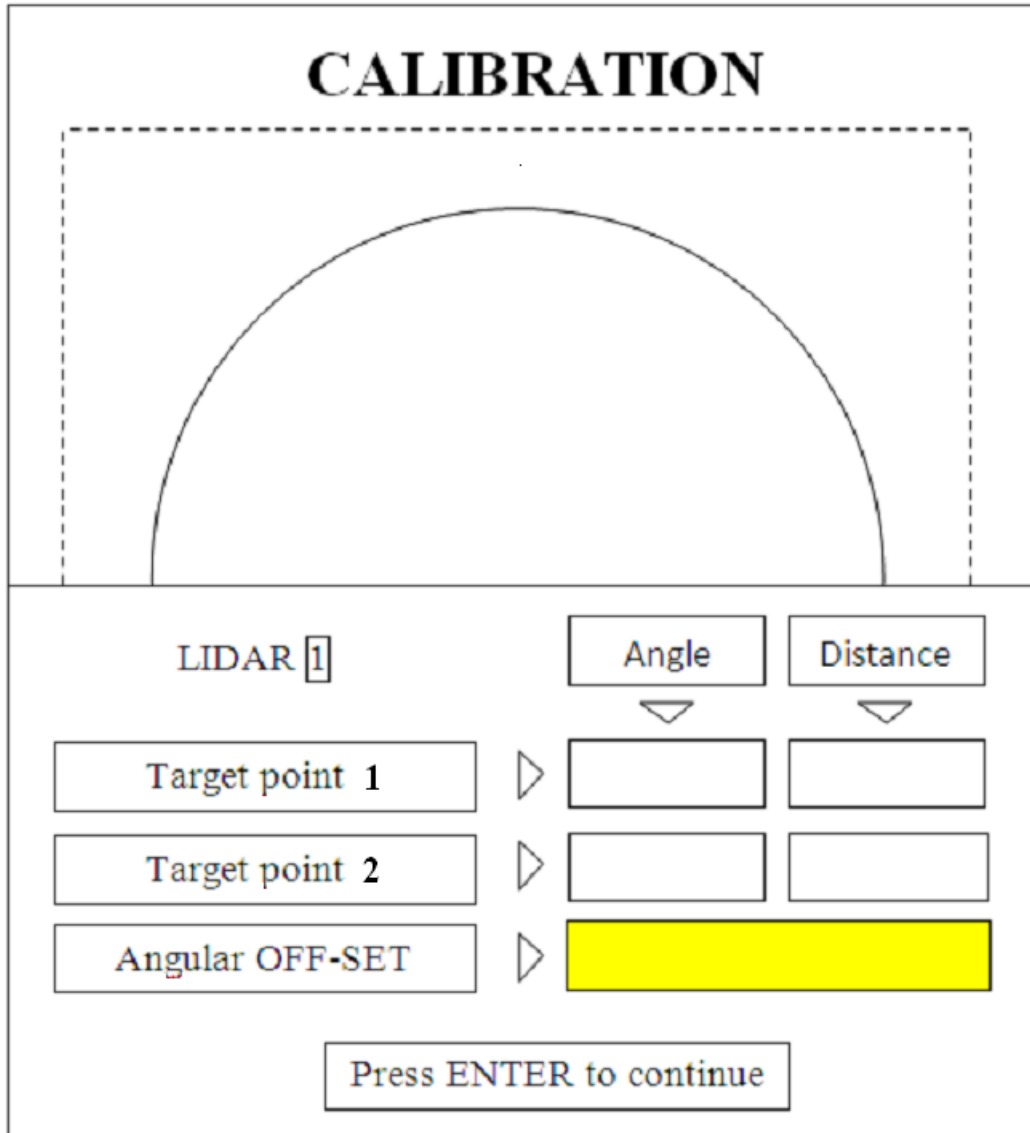
2.22   Place the target shaft at point 1 = II (ref. to step 2.19), perpendicular to ground.

2.23   Verify that the target shaft is reported on the calibration page in the correct position.

2.24   Press enter to acquire the target coordinates.

2.25   Place the target shaft at point 2 = III (ref. to step 2.19), perpendicular to ground.

2.26   Verify that the target shaft is reported on the calibration page in the correct position.

2.27   Press enter to acquire the target coordinates.

2.28   Verify the angular off-set and press enter to confirm it. (Max Offset value = ± 2°).

NOTE

Point 1 = III, point 2 = IV (re. To step 2.19).

2.29   Repeat the calibration procedure (step 2.20 to 2.28) for LiDAR 2.

<u>NOTE</u>

Point 1 = I, point 2 = II (re. To step 2.19).

2.30   Repeat the calibration procedure (step 2.20 to 2.28) for LiDAR 3.

2.31   Press F11 to save the settings in system maintenance page.

2.32   Shutdown the aircraft.

3. **FUNCTIONAL TEST**

3.1   Ensure the external power bench is set to 28V DC and connected to the aircraft socket.

3.2   Verify on the OPLS CP, that the power indicator is de-energized.
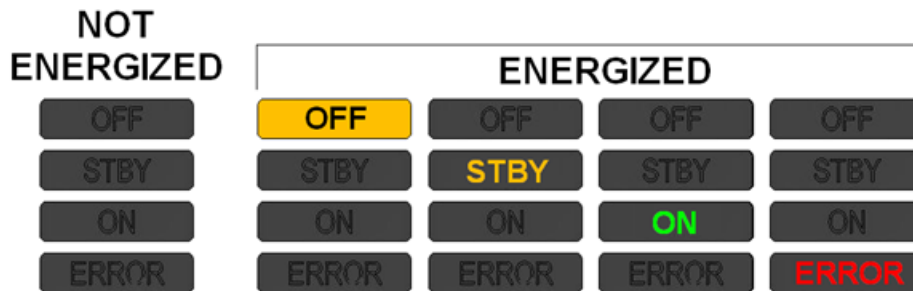
3.3   Turn ON the aircraft via the external power switch.

3.4   Verify on the OPLS CP, that the power indicator is OFF (energized).
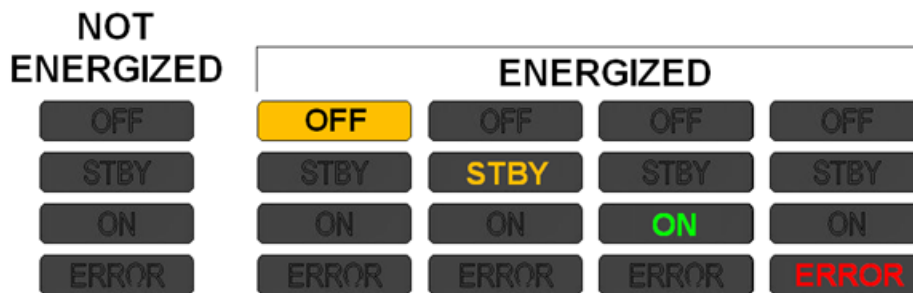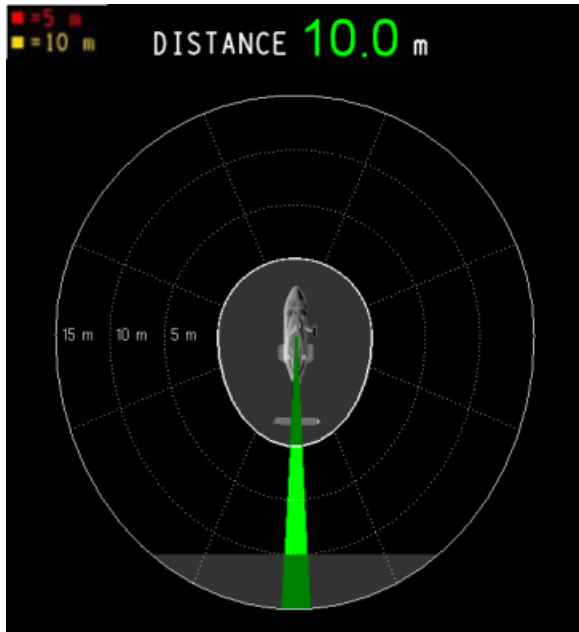

3.5   Turn on the OPLS system.

3.6   Verify on the OPLS CP, that the power indicator is in STBY (energized)
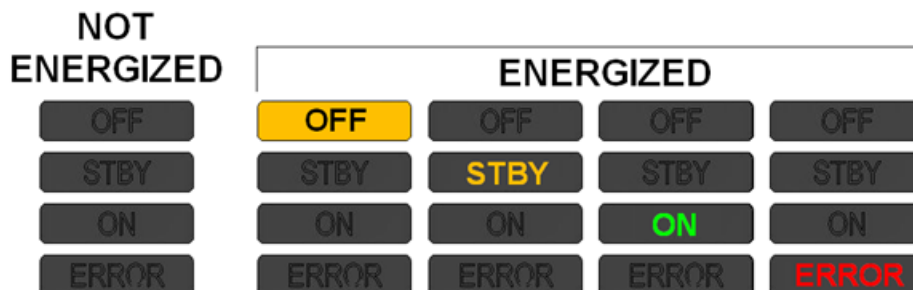
3.7   Wait for 1 minute (about).

3.8   Verify on the OPLS CP, that the power indicator is ON (energized).
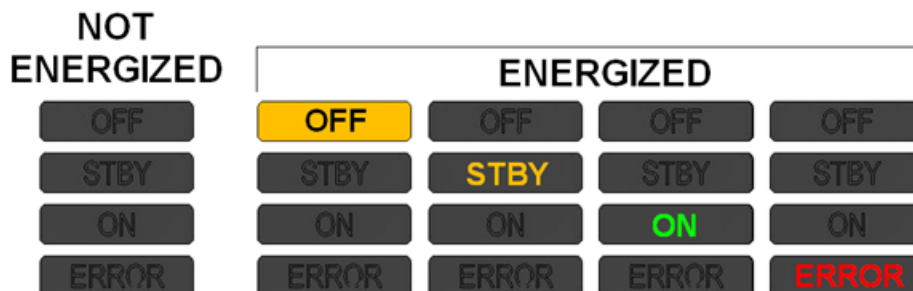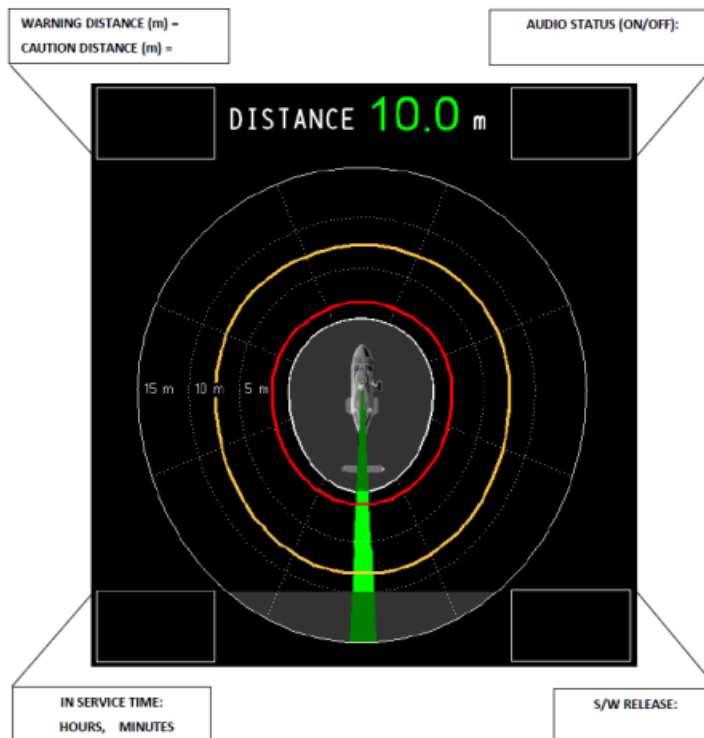
3.9   Verify that the active video page is displayed:

3.10   Press and hold the INFO pushbutton.

3.11   Verify that the embedded LED lights on.

3.12   Verify that the following video page is returned:

3.13   Verify that the warning and caution distances are in compliance with sys setup (see above.

3.14   Release the INFO pushbutton.

3.15   Verify that the standard video page is restored.

3.16   Place the target-shaft in front of the A/C, beyond the caution profile.

3.17   Verify the shaft is properly detected and tracked by the pointer.

3.18   Verify that the pointer and distance indications are green.

3.19   Verify that no audio alarm is audible.

3.20   Move the shaft towards the A/C, inside the caution profile.

3.21   Verify that the pointer and distance indication become amber.

3.22   Verify that the "Approaching" vocal announcement is reproduced once.

3.23   Verify that the audio tone frequency increases as the distance reduces.

3.24   Acknowledge the audio alarm by pressing the dedicated pushbutton on the collective grip.

3.25   Verify the system audio is muted.

3.26   Verify that the dedicated MUTE symbol appears on top of the screen:

3.27   Verify on the OPLS CP, that mute indicator turns ON (Energized).

3.28   Press the system MUTE pushbutton.

3.29   Verify on the OPLS CP, that mute indicator turns OFF (Not Energized).

3.30   Verify the system audio tone is restored.

3.31   Move the shaft inside the warning profile.

3.32   Verify that the pointer and distance indication become red.

3.33   Verify that the "Check Distance" vocal announcement is reproduced once.

3.34   Verify that the audio tone frequency doubles.

3.35   Move the shaft away from the A/C.

3.36   Verify that the pointer keeps tracking the target until it goes out of range.

3.37   Move the shaft towards the A/C, inside the Warning profile.

3.38   Verify that the audio alarm is audible.

3.39   Power off MAU2 (leave MAU1 On) pulling out the relevant circuit breakers.

NOTE

When the MAU2 is turned OFF, the dedicated MUTE symbol appears
on top of the OPLS screen and the OPLS audio alarm is NOT audible.

3.40   Verify that the OPLS audio goes in Mute Mode and the dedicated MUTE symbol
appears on top of the screen (MFDs central display, if install and configured) for
two seconds.

3.41   Power on MAU2 pushing in the relevant circuit breakers and reset the CAS List.
(During MAU recycle MUTE condition could appear).

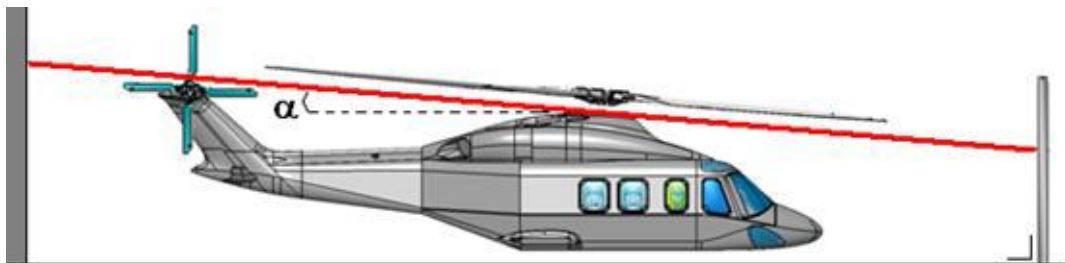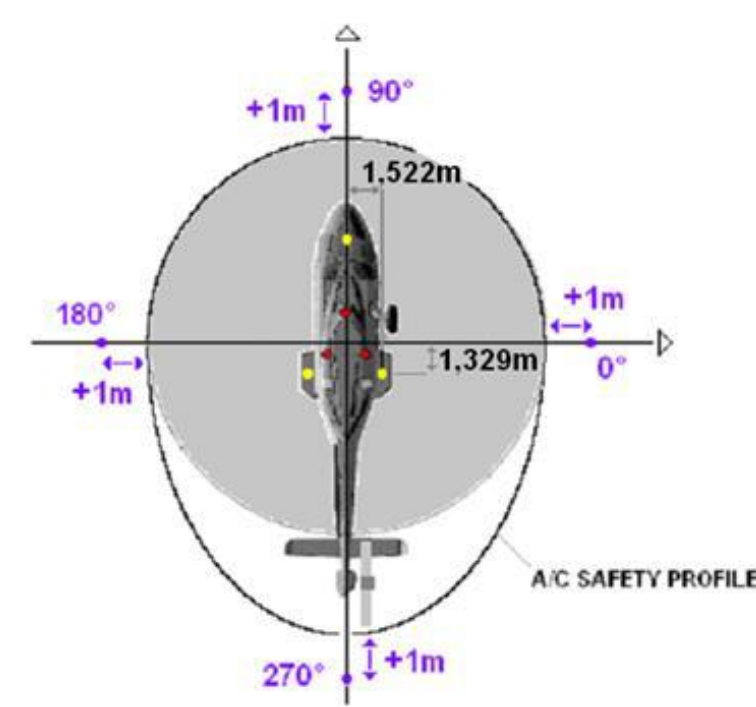3.42   Power off MAU1 (leave MAU2 On) pulling out the relevant circuit breakers.

NOTE

When the MAU1 is turned OFF the OPLS audio alarm is NOT audible.

3.43   Verify that the OPLS audio goes in Mute Mode and the image on MFDs goes in
freeze mode or blank mode.

3.44   Power on MAU1 pushing in the relevant circuit breakers and reset the CAS List.
(During MAU recycle MUTE condition could appear).

3.45   Switch off the system.

4. PRECISION TEST

4.1   Tow the aircraft to a clear, flat area of 20x 20m.

4.2   Place the target shaft perpendicular to ground, along the main cardinal axis.

4.3   Verify the pitch angle (α)<10° and error distance <0.2m, along every axis.

Please send to the following address: **LEONARDO S.p.A.** **CUSTOMER SUPPORT & SERVICES - ITALY** **PRODUCT SUPPORT ENGINEERING & LICENSES DEPT.** Via Giovanni Agusta, 520 21017 Cascina Costa di Samarate (VA) - ITALY Tel.: +39 0331 225036 Fax: +39 0331 225988	**SERVICE BULLETIN COMPLIANCE FORM**	Date:
	Number:	
	Revision:	

Customer Name and Address:	Telephone:
	Fax:
	B.T. Compliance Date:

Helicopter Model	S/N	Total Number	Total Hours	T.S.O.

Remarks:

Information:

We request your cooperation in filling this form, in order to keep out statistical data relevant to aircraft configuration up-to-date. The form should be filled in all its parts and sent to the above address or you can communicate the application also via Technical Bulletin Application Communication Section placed in Leonardo AW Customer Portal - MyCommunications Area. We thank you beforehand for the information given.