

# STATEMENT of COMPLIANCE

with

**DO160E**

**For the AHV1600  
Low Range Radio Altimeter**

Prepared by:  
THALES COMMUNICATIONS  
160 Boulevard de Valmy B.P. 82 92704 COLOMBES Cedex FRANCE

Approved by M.KWARTNIK

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## CHANGES

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- B	
- C	
- D	
- E	

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Written by		Daniel DOS SANTOS					
Checked by		Jean-Jacques ANDRE					
Approved by		Christian MICHEL					
Approved by		Xavier GOMBERT					
Approved by		Marian KWARTNIK					

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# 1. SCOPE

## 1.1 GENERALITY

This document permits TCF to state the compliance status of the Radio Altimeter AHV1600 P/N AHV1600-01-01 XX X to each requirements of the of DO160E [1] document.

A compliance matrix is given in paragraph 4 and is providing the list of documentary evidences related to every DO160E [1] requirement and the performance declaration.

## 1.2 ABBREVIATION AND ACRONYMS

AC	:	Alternating Current
CW	:	Continuous Wave
EQTR	:	Environmental Qualification Test Report
EUROCAE	:	European Organization for Civil Aviation Equipments
N-A	:	Not Applicable
PM	:	Pulse Modulation
RMS	:	Root Mean Square
SW	:	Square Wave
TCF	:	THALES Communications France

## 2. APPLICABLE DOCUMENTS

<i>Document Identifier</i>	<i>Document Title</i>
[1] RTCA DO160E	Environmental Conditions and Test Procedures for Airborne Equipment
[2]	
[3]	
[4]	
[5]	
[6]	
[7]	
[8]	
[9]	

### 3. REFERENCED DOCUMENTS

<i>Document Identifier</i>	<i>Document Title</i>
[10]	
[11] EQTR n° 61 816 441 - 279 issue -A dated 16/06/2009	Environmental Qualification Test Report for the AHV1600 Transceiver
[12]	
[13]	
[14]	
[15]	
[16]	
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## 4. COMPLIANCE MATRIX WITH DO160E

TCF declares that the AHV1600 Transceiver is identified with the following necessary information regarding the appropriate category of each environmental test:

- Cat. [(B4)X]BBB[RG]XWFD FSZZAZ[ZC][HF]M[(A4G33)(A3J33)]XXAX

<i>DO-160E [1] requirement</i>		<i>Compliance</i>	<i>Documentary evidences or comments</i>
<i>Section</i>	<i>Environmental conditions</i>	<i>OK / NOK / N-A</i>	
4	<u>Temperature and altitude</u>		EQTR document [11] Environmental Test Report 1, 2, 3, 4 & 5.
	§4.5.1 Ground Survival Low Temperature Test and Short-Time Operating Low Temperature Test	<b>OK</b>	Equipment tested to category B4. <u>Note:</u> As the short time operating low temperature and the operating low temperature are the same, the short time operating low temperature test has not been performed (see RTCA DO160E §4.5.1 note 2)
	§4.5.2 Operating Low Temperature Test	<b>OK</b>	Equipment tested to category B4. TCF declares that the AHV1600 is intended for use with full performances at temperature up to -40°C.
	§4.5.3 Ground Survival High Temperature Test and Short-time Operating High Temperature Test	<b>OK</b>	Equipment tested to category B4. <u>Note:</u> As the short time operating high temperature and the operating high temperature are the same, the short time operating high temperature test has not been performed (see RTCA DO160E §4.5.3 note 2)
	§4.5.4 Operating High Temperature	<b>OK</b>	Equipment tested to category B4. TCF declares that the AHV1600 Transceiver is intended for use with full performances at temperature up to +70°C.
	§4.5.5 In-Flight Loss of Cooling Test	<b>N-A</b>	Equipment identified as Category X, no test performed. TCF declares that the AHV1600 Transceiver is intended for use with no cooling.
	§4.6.1 Altitude Test	<b>OK</b>	Equipment tested to Category B4.

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<b>D0-160E [1] requirement</b>		<b>Compliance</b>	<b>Documentary evidences or comments</b>
<b>Section</b>	<b>Environmental conditions</b>	<b>OK / NOK / N-A</b>	
	§4.6.2 Decompression Test	<b>N-A</b>	Test not applicable according to the selected category
	§4.6.3 Overpressure Test	<b>N-A</b>	Test not applicable according to the selected category
5	<u>Temperature variation</u>	<b>OK</b>	EQTR document [11] Environmental Test Result 6. Equipment tested to Category B. TCF declares that the AHV1600 Transceiver is intended for use with full performances at temperature variations between -40°C and +70°C operating temperature extremes.
6	<u>Humidity</u>	<b>OK</b>	EQTR document [11] Environmental Test Result 7. Equipment tested to Category B.
7	<u>Operational shocks and crash safety</u>		EQTR document [11] Environmental Test Result 9, 10 & 11.
	§7.2 Operational shocks	<b>OK</b>	Equipment tested to Category B.
	§7.3.1 Crash safety (impulse test)	<b>OK</b>	Equipment tested to Category B.
	§7.3.1 Crash safety (sustained test)	<b>OK</b>	Equipment tested to Category B.
8	<u>Vibration</u>		EQTR document [11] environmental Test Result 13.
	§8.5 Standard vibration test procedure fixed wing aircraft	<b>N-A</b>	No test performed
	§8.6 High level short duration vibration test procedure	<b>N-A</b>	No test performed
	§8.7 Robust vibration Test procedure fixed wing aircraft	<b>N-A</b>	No test performed
	§8.8 Vibration test for helicopters	<b>OK</b>	Equipment tested to Category R, zone2, Curve G (Helicopters frequencies at f1=20.5 Hz, f2=41.5 Hz, f3=f4=0Hz)
9	<u>Explosive atmosphere</u>	<b>N-A</b>	Equipment identified as Category X, no test performed.
10	<u>Waterproofness</u>	<b>OK</b>	EQTR document [11] Environmental Test Result 8.
	§10.3.1 Condensing Water Proof Test	<b>N-A</b>	Test not applicable according to the selected category
	§10.3.2 Drip proof Test	<b>OK</b>	Equipment tested to Category W.
	§10.3.3 Spray proof Test	<b>N-A</b>	Test not applicable according to the selected category.
	§10.3.3 Continuous stream proof Test	<b>N-A</b>	Test not applicable according to the selected category.



<b>D0-160E [1] requirement</b>		<b>Compliance</b>	<b>Documentary evidences or comments</b>
<b>Section</b>	<b>Environmental conditions</b>	<b>OK / NOK / N-A</b>	
11	<u>Fluids susceptibility</u>	<b>OK</b>	EQTR document [11] Environmental Test Result 46.
	§11.4.1 Spray Test		Equipment compliant by similarity to Category F  The compliance of the AHV1600 Transceiver with the spray test is demonstrated by similarity with the MIL-STD-810F method 504 for fluids.  List of fluid contaminant used: Aviation turbine fuel JP-4, JP-5, JP-8, Mineral oil based, Phosphate ester based, lubricating oils (mineral based, ester based synthetic), solvents and cleaning fluid (isopropyl Alcohol, denatured Alcohol, cleaning compound for aircraft surfaces), DE-Icing fluid (ethylene Glycol), insecticides (dichloros), fire extinguishants (protein and fluoroprotein).
	§11.4.2 ImmersionTest		<b>N-A</b>
12	<u>Sand and dust</u>	<b>OK</b>	EQTR document [11] Environmental Test Result 47.
	§12.4 Dust test procedure		Equipment tested to Category D.
	§12.5 Sand test procedure		<b>N-A</b>
13	<u>Fungus resistance</u>	<b>OK</b>	EQTR document [11] Environmental Test Result 48.  Equipment compliant by similarity to Category F.
14	<u>Salt Fog</u>	<b>OK</b>	EQTR document [11] Environmental Test Result 49.  Equipment compliant by similarity to Category S.
15	<u>Magnetic effect</u>	<b>OK</b>	EQTR document [11] Environmental Test Result 22.  Equipment tested to Category Z.
16	<u>Power input</u>	<b>OK</b>	EQTR document [11] Environmental Test Result 37 to 43 and 45.  TCF declares that the AHV1600 Transceiver is intended for use with a standard electrical 28VDC power input
	§16.6.1.1 Normal operating conditions (dc): voltage (Average Value)		Equipment tested to Category Z.

<b>DO-160E [1] requirement</b>		<b>Compliance</b>	<b>Documentary evidences or comments</b>
<b>Section</b>	<b>Environmental conditions</b>	<b>OK / NOK / N-A</b>	
	§16.6.1.2 Normal operating conditions (dc): Ripple Voltage	<b>OK</b>	Equipment compliant to Category Z. <u>Note:</u> As the Ripple Voltage requirement is addressed by §18.3.1 Audio Frequency Conducted Susceptibility, the ripple voltage test has not been performed (see RTCA DO160E §16.6.1.2.b note)
	§16.6.1.3 Normal operating conditions (dc): Momentary Power Interruptions		Equipment tested to Category Z. TCF declares that the AHV1600 Transceiver is able to withstand momentary power interruption up to 2ms (Test condition 1 of table 16-3).
	§16.6.1.4 Normal operating condition (dc): Normal Surge Voltage	<b>OK</b>	Equipment tested to Category Z.
	§16.6.1.5 Normal operating condition (dc): Engine Starting Under Voltage Operation	<b>OK</b>	Equipment tested to Category Z.
	§16.6.2.1 Abnormal Operating Conditions (dc): Voltage Steady State	<b>OK</b>	Equipment tested to Category Z.
	§16.6.2.2 Abnormal Operating Conditions (dc): Low Voltage Conditions	<b>N-A</b>	Test not applicable according to the selected category.
	§16.6.2.3 Abnormal Operating Conditions (dc): Momentary Undervoltage Operation	<b>OK</b>	Equipment tested to Category Z.
	§16.6.2.4 Abnormal Operating Conditions (dc): Abnormal Surge Voltage	<b>OK</b>	Equipment tested to Category Z.
17	<u>Voltage spike</u>	<b>OK</b>	EQTR document [11] Environmental Test Result 44. Equipment tested to Category A.
18	<u>Audio frequency conducted susceptibility – power inputs</u>		EQTR document [11] Environmental Test Result 45.
	§18.3.1 DC Inputs Power Leads	<b>OK</b>	Equipment tested to Category Z.
	§18.3.2 AC Inputs Power Leads	<b>N-A</b>	Test not applicable according to the selected category.
19	<u>Induced signal susceptibility</u>		EQTR document [11] Environmental Test Result 14 to 17.
	§19.3.1 Magnetic fields induced into the equipment	<b>OK</b>	Equipment tested to Category ZC.

<b>D0-160E [1] requirement</b>		<b>Compliance</b>	<b>Documentary evidences or comments</b>
<b>Section</b>	<b>Environmental conditions</b>	<b>OK / NOK / N-A</b>	
	§19.3.2 Magnetic field induced into interconnecting cables	<b>OK</b>	Equipment tested to Category ZC.
	§19.3.3 Electric field induced into interconnecting cables	<b>OK</b>	Equipment tested to Category ZC.
	§19.3.4 Spikes induced into interconnecting cables	<b>OK</b>	Equipment tested to Category ZC.
20	<u>Radio frequency susceptibility (radiated and conducted)</u>		EQTR document [11] Environmental Test Result 18 to 20
	§20.4 Conducted Susceptibility (CS) test	<b>OK</b>	Equipment tested to Category H.
	§20.5 Radiated Susceptibility (RS) test	<b>OK</b>	Equipment tested to Category F for SW and CW modulation.
	§20.6 Radiated Susceptibility (RS) test – alternate procedure reverberation chamber	<b>OK</b>	Equipment tested to Category F for PM modulation.  According to DO160E §20.3 d, TCF declares the following frequency exclusion bandwidths:  - from 1.89GHz to 2.42GHz - from 3.78GHz to 4.84GHz - from 7.56GHz to 9.68GHz  The required level to test these frequency bands is the level of category S (1V/m). Due to the test means used, the equipment has been subjected to 100V/m in these frequency bands with its full performances.
21	<u>Emission of radio frequency energy</u>		EQTR document [11] Environmental Test Result 23 to 25.
	§21.3 Conducted RF emission	<b>OK</b>	Equipment tested to Category M.
	§21.4 Radiated RF emission	<b>OK</b>	Equipment tested to Category M.
22	<u>Lightning induced transient susceptibility</u>		EQTR document [11] Environmental Test Result 26 to 35.
	§22.5.1 Pin Injection Tests	<b>OK</b>	Equipment tested to Category (A4) for power lines and (A3) for interconnecting lines.
	§22.5.2 Cable Bundle Tests (cable induction and ground injection)	<b>OK</b>	Equipment tested to Category (G33) for power lines and (J33) for interconnecting lines.
23	<u>Lightning direct effects</u>	<b>N-A</b>	Equipment identified as Category X, no test performed.

<b>D0-160E [1] requirement</b>		<b>Compliance OK / NOK / N-A</b>	<b>Documentary evidences or comments</b>
<b>Section</b>	<b>Environmental conditions</b>		
24	<u>Icing</u>	<b>N-A</b>	Equipment identified as Category X, no test performed.
25	<u>Electrostatic discharge</u>	<b>OK</b>	EQTR document [11] Environmental Test Result 36. Equipment tested to Category A.
26	<u>Fire, Flammability</u>	<b>N-A</b>	Equipment identified as Category X, no test performed.

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