


ENVIRONMENTAL TEST REPORT OF 406 MHz PLB		Number of pages : 232 Appendix : 1
INTESPACE Reference E7555 - RTCM	Client MARTEC	INTESPACE Test Division ES


Test Type(s)				
<input checked="" type="checkbox"/> RTCM	<input type="checkbox"/> ETSI	<input type="checkbox"/> IEC	<input type="checkbox"/> TP4522	<input type="checkbox"/> AS/NZS

Equipment in Test
406 MHz Personal Locator Beacon KANNAD XS3 GPS

	Name	Date	Signature
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Verified by			
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Addresses	Client : Stéphane JINCHELEAU - MARTEC Supply of 1 CD-R INTESPACE : 1 copy		

	Equipment in test PLB : Kannad XS3-GPS	INTESPACE Reference E7555-RTCM
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1 - GENERAL COMMENTS, ADMINISTRATIVE DETAILS AND SUMMARY OF TEST

1.1 GENERAL COMMENTS

This document reports the procedures and results of certification tests on 406-MHz SARSAT beacons. The tests were conducted for approval to United by INTESPACE (ITS).

1.2 ADMINISTRATION

1.2.1 WORK ORDER

Manufacturer: MARTEC
Address: Z.I. des Cinq Chemins 56520 GUIDEL FRANCE
Represented by: Mr. Stephane JINCHELEAU

1.2.2 INTESPACE TEST CENTER

The test operations have been conducted by: Mr. Gerard PEYROU

1.2.3 SCHEDULE

Start of test: 10 September 2007
End of test: 14 December 2007

1.2.4 WORK REFERENCE :

E7555-RTCM

1.2.5 EQUIPEMENT UNDER TEST


The results from this test report concern only the equipment here after referenced:

1.2.5.1 EQUIPEMENT UNDER RTCM TEST

Equipment Under Test (EUT)	Category / Class	Model	Beacon serial number	Commercial designation	GPS fixture	Comments
1	Cat I Class 2	Kannad XS3-GPS	UT1	KANNAD XS3-GPS	Internal	- Beacon normally fitted with 50 Ω RF Output Connector (RTCM & C/S Tests)
2	Cat I Class 2	Kannad XS3-GPS	UT2	KANNAD XS3-GPS	Internal	- Beacon normally fitted (Unit for environmental RTCM Tests)

1.2.5.2 EQUIPEMENT COSPAS/SARSAT TYPE APPROVED (TAC 180)

3 (E7555-CS)	Cat I Class 2	Kannad XS3-GPS	35407-2	KANNAD XS3-GPS	Internal	- Beacon normally fitted with 50 Ω RF Output Connector (C/S T.A. Beacon - TAC no.180)
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	<p align="center">Equipment in test</p> <p align="center">PLB : Kannad XS3-GPS</p>	<p align="center">INTESPACE Reference</p> <p align="center">E7555-RTCM</p>
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1.3 TEST FACILITIES

- ARGOS – COSPAS/SARSAT Certification Test Bench
- INTESPACE Environmental Test Equipments
- Toulouse CNES-FMCC

1.4 STANDARDS AND TEST PROCEDURES APPLICABLES

- COSPAS-SARSAT standards :
 - " C/S T. 001- Issue 3 - Revision 7 - November 2005 "
 - "C/S T. 007- Issue 4 - Revision 1 - October 2006"
- RTCM Recommended Standards for 406 MHz Satellite Personal Locator Beacons (PLBs) - Version 1.1 - June 19, 2002
- INTESPACE Radiobeacon Test Procedures

1.5 TEST SEQUENCE

1.5.1 SERIES OF TESTS RUN IN ORDER: (RTCM item)


- | | |
|---|----------|
| 1 - Initial Aliveness Test | |
| 2 - Vibration Test | (A 3.0) |
| 3 - Bump Test | (A 4.0) |
| 4 - Salt Fog Test | (A 5.0) |
| 5 - Drop Test | (A 6.0) |
| 6 - Leakage and Immersion Test | (A 7.0) |
| 7 Buoyancy and stability | (A.11.0) |
| 8 - Spurious Emission Test (406 MHz) (C/S Tests 8) | (A 8.0) |
| 9 - Cospas-Sarsat C/S T.007 Tests | (A 9.0) |
| 10 - Operational Life, Strobe Light and Self Tests (C/S Tests 8) | (A 10.0) |
| 11 - Auxiliary Radio-Locating Device Transmitter Tests | (A 12.0) |

The three beacons are identical:

- EUT 1 has been used for the complete RTCM and C/S Environmental and Electrical Tests except for the A2.5, A2.6 and A2.7 of C/S Tests. Theses Tests are considered passed with EUT 3 during the previous C/S T.A. test campaign (November 2006 to May 2007).

- EUT 2 is the spare representing the normal beacon fixture (without Ω RF Output Connector). It was used only for the RTCM and C/S Environmental Tests

- EUT 3 has been used for full C/S Tests during the previous C/S T.A. test campaign (November 2006 to May 2007). (T.A.C no. 180)

	<p>Equipment in test</p> <p>PLB : Kannad XS3-GPS</p>	<p>INTESPACE Reference</p> <p>E7555-RTCM</p>
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1.6 RESULTS

According to the following test results, Kannad XS-3 GPS PLB satisfies the standards contained in the COSPAS/SARSAT document COSPAS/SARSAT 406 MHz Distress Beacon Type Approval Standard (C/S T.007) and complies with electrical and environmental RTCM Recommended Standards for 406 MHz Satellite Personal Locator Beacons (PLBs) – Version 1.1 – June 19, 2002.

See following pages the Summary of Test Results and the Chapters of Test Result Reports



Equipment in test
PLB : Kannad XS3-GPS

INTESPACE Reference
E7555-RTCM

PARAMÈTRES TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS			COMMENTS
			T min. (± 3 °C) (__ °C)	T amb. (± 3 °C) (22 °C)	T max. (± 3 °C) (__ °C)	
1. INITIAL FUNCTIONAL TEST * Carrier Frequency * Power Output	406.025 ± 0.002 Or 406.028 ± 0.001 35 - 39	MHz MHz dBm		EUT1 and EUT2 406027789 35.3		CHAPTER 2 11 September 2007
2. VIBRATION TEST (A3.0) • Exterior Mechanical Inspection • Aliveness Test • Activation	No damage Successful self-test No activation during test	√ √ √		EUT1 and EUT2 √ √ √		CHAPTER 3 17 September 2007
3. BUMP TEST (A4.0) • Exterior Mechanical Inspection • Aliveness Test • Activation	No damage Successful self-test No activation during test	√ √ √		EUT1 and EUT2 √ √ √		CHAPTER 4 18 to 20 September 2007



Equipment in test
PLB : Kannad XS3-GPS

INTESPACE Reference
E7555-RTCM

PARAMÈTRES TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS			COMMENTS
			T min. ($\pm 3^{\circ}\text{C}$) (-40°C)	T amb. ($\pm 3^{\circ}\text{C}$) (22°C)	T max. ($\pm 3^{\circ}\text{C}$) ($\text{---}^{\circ}\text{C}$)	
4. SALT FOG TEST (A5.0) <ul style="list-style-type: none"> • Exterior Mechanical Inspection • Aliveness Test 	No damage Successful self-test	√ √		EUT1 and EUT2 √ √		CHAPTER 5 21 to 26 September 2007
5. DROP TEST (A6.0) <ul style="list-style-type: none"> • Exterior Mechanical Inspection • Interior Mechanical Inspection • Aliveness Test • Activation 	No damage No damage Successful self-test No activation during test	√ √ √ √	EUT1 and EUT2 √ √ √			CHAPTER 6 2 October 2007
6. LEAKAGE AND IMMERSION TEST (A7.0) <ul style="list-style-type: none"> • Interior Inspection • Aliveness Test 	No water Successful self-test	√ √		EUT1 and EUT2 √ √		CHAPTER 7 5 to 8 October 2007



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PARAMÈTRES TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS			COMMENTS
			T min. ($\pm 3^{\circ}\text{C}$) (-20°C)	T amb. ($\pm 3^{\circ}\text{C}$) ($+22^{\circ}\text{C}$)	T max. ($\pm 3^{\circ}\text{C}$) ($+55^{\circ}\text{C}$)	
7. SPURIOUS EMISSIONS TEST (A8.0) • 406 MHz • 121.5 MHz	Figure 2-1	√ (attach graphs)	√	√	√	CHAPTER 9 and Chapter 10 (C/S T.A. Tests Results) 11 to 12 October 2007
	Figure 2-5	√ (attach graphs)	√	√	√	
8. COSPAS-SARSAT TYPE APPROVAL TESTS (A9.0)	C-S Certificate (attach test report)	√	EUT 1 & EUT 3			CHAPTER 10 and CHAPTER 13: Appendix A 11 October to 30 November 2007
			√	√	√	



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PARAMÈTRES TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS			COMMENTS
			T min. ($\pm 3^{\circ}\text{C}$) (- 20°C)	T amb. ($\pm 3^{\circ}\text{C}$) (_____ $^{\circ}\text{C}$)	T max. ($\pm 3^{\circ}\text{C}$) (_____ $^{\circ}\text{C}$)	
9. OPERATIONAL LIFE TESTS (A10.1)			EUT 1			CHAPTER 11
Operational Life			28 h			31 October to 5 November 2007
• Frequency						Results after 24 hours
* Nominal Carrier	406.025 \pm 0.002 or 406.028 \pm 0.001	MHz MHz	406.027864 to 406.027921			(C/S Operating Lifetime Test at min Temp. Chapter 10)
* Short-term stability	≤ 0.002	parts/ million in 100 ms	< 0.002			
• Medium term stability :						
* Mean slope	≤ 0.001	parts/ million /min	< 0.0009			
* Residual variation	≤ 0.003	parts/ million	< 0.003			
• RF output power	35-39	dBm	36.5			
• Auxiliary PERP (50 Ω)	14-20	dBm	19.1			



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PARAMÈTRES TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS			COMMENTS
			T min. ($\pm 3^{\circ}\text{C}$) (- 20°C)	T amb. ($\pm 3^{\circ}\text{C}$) (22°C)	T max. ($\pm 3^{\circ}\text{C}$) (55°C)	
10. SELF TEST (A10.2) • RF pulse duration • Frame synchronization pattern • Number of RF bursts - Beacon 15 Hex ID - 121.5 MHz transmission	0.444 sec Or 0.520 sec	√	EUT 1			CHAPTER 11 and CHAPTER 12 (C/S Elec. & Funct. Test at min, amb, and max Temp.) 2 sweeps
	0 1101 0000	√	√	√	√	
	1-burst	√	√	√	√	
	Must be provided by self-test burst	√	√	√	√	
	1 sc /3 sweeps	√	√	√	√	
11. BUOYANCY TEST (Category 1 only) (A11.0) • Buoyancy	Floats	√	EUT 2			9 October 2007 CHAPTER 8
				√		



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INTESPACE Reference
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PARAMÈTRES TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS			COMMENTS
			T min. (± 3 °C) (-20 °C)	T amb. (± 3 °C) (22 °C)	T max. (± 3 °C) (55 °C)	
12. AUXILIARY RADIO-LOCATING DEVICE TRANSMITTER TEST (A12.0)			EUT 1			CHAPTER 12 and Chapter 9 (C/S T.A. Tests Results) 22 November 2007
• Carrier frequency	121.5 ± 0.006	MHz	121.5028	121.5017	121.5008	
• Duty Cycle	Continuous	√	√	√	√	
• Modulation						
* Frequency	≤ 700 Hz within range of 300-1600 Hz	Hz	360 → 1460	360 → 1460	360 → 1460	
* Direction	Upward	√	√	√	√	
* Duty cycle	33-55	%	52	53	53	
* Factor	0.85-1.0	√	> 0.85	> 0.85	> 0.85	
* Sweep repetition rate	2 - 4	Hz	3.1	3.1	3.1	
• PEIRP (Radiated)	14-20	dBm		15		22 November 2007
• Antenna (Radiated)						Non checked (Antenna integrated)
- Pattern	Omni directional	√		√		
- Polarization	Vertical	√		√		
- VSWR	≤ 1.5:1	√		N/A		
13. COSPAS-SARSAT TYPE APPROVAL TESTS	C-S Certificate (attach test report)	√	EUT 3			APPENDIX A
			√ E7555-CS Cospas/Sarsat Type Approval test report (TAC no.180) Date of test campaign: November 2006 to May 2007	√	√	