



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

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ISO 9001 / EN 9100

Certifié par





Equipment in test

PLB : Kannad XS3-GPS

INTESPACE Reference

E7555-RTCM

CHAPTER	Contents	Number of pages
1 ADMINISTRATIVE DETAILS, GENERAL COMMENTS AND SUMMARY OF TESTS		11
2 INITIAL ALIVENESS TEST		9
3 VIBRATION TEST		27
4 BUMP TEST		42
5 SALT FOG TEST		8
6 DROP TEST		11
7 LEAKAGE AND IMMERSION TEST		9
8 BUOYANCY AND STABILITY TEST		3
9 SPURIOUS EMISSION TEST		8
10 COSPAS/SARSAT T.007 TESTS		80
11 OPERATIONAL LIFE AND SELF TESTS		9
12 121.5 MHZ AUXILIARY RADIO-LOCATING DEVICE TRANSMITTER TESTS		11
13 APPENDIX A : E7555-CS Cospas/Sarsat Type Approval test report (TAC no.180)		197

	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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	Equipment in test PLB : Kannad XS3-GPS	INTESPACE Reference E7555-RTCM
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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)

	Equipment in test PLB : Kannad XS3-GPS	INTESPACE Reference E7555-RTCM
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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				EUT1 and EUT2		CHAPTER 2
* Carrier Frequency	406.025 \pm 0.002 Or 406.028 \pm 0.001	MHz MHz dBm		406027789		11 September 2007
* Power Output	35 - 39			35.3		
2. VIBRATION TEST (A3.0)				EUT1 and EUT2		CHAPTER 3
• Exterior Mechanical Inspection	No damage	√		√		17 September 2007
• Aliveness Test	Successful self-test	√		√		
• Activation	No activation during test	√		√		
3. BUMP TEST (A4.0)				EUT1 and EUT2		CHAPTER 4
• Exterior Mechanical Inspection	No damage	√		√		18 to 20 September 2007
• Aliveness Test	Successful self-test	√		√		
• Activation	No activation during test	√		√		

**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) (-40 °C)	T amb. (± 3 °C) (22°C)	T max. (± 3 °C) (____ °C)	
4. SALT FOG TEST (A5.0)				EUT1 and EUT2		CHAPTER 5
• Exterior Mechanical Inspection	No damage	√		√		21 to 26 September 2007
• Aliveness Test	Successful self-test	√		√		
5. DROP TEST (A6.0)			EUT1 and EUT2			CHAPTER 6
• Exterior Mechanical Inspection	No damage	√	√			2 October 2007
• Interior Mechanical Inspection	No damage	√	√			
• Aliveness Test	Successful self-test	√	√			
• Activation	No activation during test	√	√			
6. LEAKAGE AND IMMERSION TEST (A7.0)				EUT1 and EUT2		CHAPTER 7
• Interior Inspection	No water	√		√		5 to 8 October 2007
• Aliveness Test	Successful self-test	√		√		

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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)	
EUT 1 & EUT 3						
7. SPURIOUS EMISSIONS TEST (A8.0)	Figure 2-1	<input checked="" type="checkbox"/> (attach graphs)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	CHAPTER 9 and Chapter 10 (C/S T.A. Tests Results) 11 to 12 October 2007
			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
EUT 1 & EUT 3						
8. COSPAS-SARSAT TYPE APPROVAL TESTS (A9.0)	C-S Certificate (attach test report)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	CHAPTER 10 and CHAPTER 13: Appendix A 11 October to 30 November 2007

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

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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)	
EUT 1						
10. SELF TEST (A10.2)						
• RF pulse duration	0.444 sec Or 0.520 sec	√	√	√	√	CHAPTER 11 and CHAPTER 12 (C/S Elec. & Funct. Test at min, amb, and max Temp.)
• Frame synchronization pattern	0 1101 0000	√	√	√	√	
• Number of RF bursts	1-burst	√	√	√	√	
- Beacon 15 Hex ID	Must be provided by self-test burst	√	√	√	√	
- 121.5 MHz transmission	1 sc /3 sweeps	√	√	√	√	2 sweeps
EUT 2						
11. BUOYANCY TEST (Category 1 only) (A11.0)						9 October 2007
• Buoyancy	Floats	√		√		CHAPTER 8



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. ($\pm 3^{\circ}\text{C}$) (-20 °C)	T amb. ($\pm 3^{\circ}\text{C}$) (22 °C)	T max. ($\pm 3^{\circ}\text{C}$) (55 °C)	
12. AUXILIARY RADIO-LOCATING DEVICE TRANSMITTER TEST (A12.0) <ul style="list-style-type: none">• Carrier frequency• Duty Cycle• Modulation<ul style="list-style-type: none">* Frequency* Direction* Duty cycle* Factor* Sweep repetition rate• PEIRP (Radiated)• Antenna (Radiated)<ul style="list-style-type: none">- Pattern- Polarization- VSWR	121.5 \pm 0.006 ≤ 700 Hz within range of 300-1600 Hz	MHz Hz	121.5028 360 → 1460	121.5017 360 → 1460	121.5008 360 → 1460	EUT 1 CHAPTER 12 and Chapter 9 (C/S T.A. Tests Results) 22 November 2007
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