Document No.
QTR-451-PLB

QUALIFICATION TEST REPORT

FOR

MODEL AK-451-PLB

PLB Personal Locator Beacon

AMERI - KING CORPORATION

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PREPARED BY: _____ DATE: ___10/11/07_____
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APPROVED BY: _____DATE: ___10/12/07_____
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REVISION TABLE

REVISION	DESCRIPTION	APPROVED BY	DATE
NC 1	First Release	K. V.	10/12/07

TABLE OF CONTENT

ADMINISTRATIVE DATA

PURPOSE OF REPORT:	To describe the test report for qualification tests in accordance with FCC Title 47 Part 95 Requirements and RTCM Paper 76-2002/SC110-STD. RTCM Recommended Standards For 406 MHz Satellite Personal Locator Beacons (PLBS). Version 1.1, developed By RTCM Special Committee No.110. June 19, 2002 with ADDENDUM RTCM Paper 23-2003/SC110-274, February 4, 2003
TEST ITEMS:	PLB Personal Locator Beacon Emergency Locator Transmitter Ameri-King Corporation Model No. AK-451 Serial No.: CS-09 and CS-19
TEST SPECIFICATIONS:	RTCM Paper 76-2002/SC110-STD. RTCM Recommended Standards For 406 MHz Satellite Personal Locator Beacons (PLBS). Version 1.1 developed By RTCM Special Committee No.110. June 19, 2002 with Addendum RTCM Paper 23-2003/SC110-274, February 4, 2003 FCC Code of Federal Regulations, Telecommunication, Title 47, Subpart K, Part 95, dated 06/02/2003.

PREPARED BY Quang Phan DATE: 10/11/07	**Ameri-King Corporation**		
CHECKED BY Keith Van DATE: 10/12/07	Subject **QUALIFICATION TEST REPORT**	REPORT NO. QTR-451-PLB	REV NC

SUBMITTED BY:

AMERI-KING CORPORATION
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FCC TITLE 47 PART 95 COMPLIANCE CROSS REFERENCE

REQUIREMENTS, FCC PART 95 Paragraph	COMPLIANCE STATEMENT	
95.1400 **Basis and purpose.** The rules in this subpart are intended to provide individuals in remote areas a means to alert others of an emergency situation and to aid search and rescue personnel locate those in distress. The effective date for the rules in this subpart will be July 1, 2003.	Document IM-451 Volume 2, Operation Manual for AK-451-PLB, paragraph 2.1, Responsible Use	
95.1401 **Frequency.** The frequency band 406.0-406.1 MHz is an emergency and distress frequency band available for use by Personal Locator Beacons (PLBs). Personal Locator Beacons that transmit on the frequency band 406.0-406.1 MHz must use G1D emission. Use of these frequencies must be limited to transmission of distress and safety communications.	Document IM-451 Volume 2, Operation Manual for AK-451-PLB, paragraph 8.2 Specifications	
95.1402 **Special requirements for 406 MHz PLBs.** **(a)** All 406 MHz PLBs must meet all the technical and performance standards contained in the Radio Technical Commission for Maritime (RTCM) Service document ‘‘RTCM Recommended Standards for 406 MHz Satellite Personal Locator Beacons (PLBs),’’ Version 1.1, RTCM Paper 76-2002/SC110-STD, dated June 19, 2002. This RTCM document is incorporated by reference in accordance with 5 U.S.C. 552(a), and 1 CFR part 51. Copies of the document are available and may be obtained from the Radio Technical Commission for Maritime Services, 1800 Diagonal Road, Suite 600, Alexandria,	Document IM-451 Volume 2, Operation Manual for AK-451-PLB, paragraph 8.2, Specifications	

Virginia 22314-2840. The document is available for inspection at Commission headquarters at 445 12th Street SW., Washington, DC 20554. Copies may also be inspected at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030, or go to: http://www.archives.gov/federallregister/codeloflfederallregulations/ibrllocations.html.		
(b) The 406 MHz PLB must contain, as an integral part, a homing beacon operating only on 121.500 MHz and meeting all requirements described in the RTCM Recommended Standards document described in paragraph (a) of this section. The 121.500 MHz homing beacon must have a continuous duty cycle that can be interrupted only during the transmission of the 406 MHz signal. The 406 MHz PLB shall transmit a unique identifier (Morse code ‘‘P’’) on the 121.500 MHz signals.	Document IM-451 Volume 2, Operation Manual for AK-451-PLB, paragraph 8.2, Specifications	
(c) Before a 406 MHz PLB certification application is submitted to the Commission, the applicant must have obtained certification from a test facility, recognized by one of the COSPAS/ SARSAT Partners that the PLB satisfies the standards contained in the COSPAS/SARSAT document COSPAS/ SARSAT 406 MHz Distress Beacon Type Approval Standard (C/S T.007). Additionally, an independent test facility must certify that the PLB complies with the electrical and environmental standards associated with the RTCM Recommended Standards.	Cospas-Sarsat Type Approved Certificate No. 179 Document No. E6557-CS dated 01/25/07and 07/04/07 Intespace Laboratory All tests were conducted at an independent laboratory, Environment Associates Inc., Chatsworth, California Document No. 28061-0216905 dated 07/20/07 Test Report For Environmental Test Of the 406 MHz Satellite Personal Locator Beacons (PLB), Environment Associates Inc.	
(d) The procedures of Notification by the equipment manufacturer and Certification from either the Commission or designated Telecommunications Certification Body are contained in subpart J of part 2 of this chapter.	FCC type certification from a designated Telecommunications Certification Body	
(e) An identification code, issued by the National Oceanic and Atmospheric Administration (NOAA), the United States Program Manager for the 406 MHz COSPAS/SARSAT satellite system, must be programmed in each PLB unit to establish a unique identification for each PLB station. With each marketable PLB unit, the manufacturer or grantee must include a	Document IM-451 Volume 2, Operation Manual for AK-451-PLB, paragraph 1.3, Registration in the United States Document IM-451 Volume 2, Operation Manual for AK-451-PLB, paragraph 1.1, Registration Importance	

postage pre-paid registration card printed with the PLB identification code addressed to: SARSAT Beacon Registration, NOAA, NESDIS, E/SP3, Room 3320, FB-4, 5200 Auth Road, Suitland, Maryland 20746-4303. The registration card must request the owner's name, address, telephone number, alternate emergency contact and include the following statement: ''WARNING'' failure to register this PLB with NOAA could result in a monetary forfeiture order being issued to the owner.''		
(f) To enhance protection of life and property, it is mandatory that each 406 MHz PLB be registered with NOAA and that information be kept up-to-date. In addition to the identification plate or label requirements contained in §§ 2.925 and 2.926 of this chapter, each 406 MHz PLB must be provided on the outside with a clearly discernable permanent plate or label containing the following statement: ''The owner of this 406 MHz PLB must register the NOAA identification code contained on this label with the National Oceanic and Atmospheric Administration (NOAA) whose address is: SARSAT Beacon Registration, NOAA, NESDIS, E/SP3, Room 3320, FB-4, 5200 Auth Road, Suitland, Maryland 20746-4303.'' Owners shall advise NOAA in writing upon change of PLB ownership, or any other change in registration information. NOAA will provide registrants with proof of registration and change of registration postcards.	Document IM-451 Volume 2, Operation Manual for AK-451-PLB, paragraph 1.3, Registration in the United States Document IM-451 Volume 2, Operation Manual for AK-451-PLB, paragraph 4.3, Front label, back label, and name plate. Document IM-451 Volume 2, Operation Manual for AK-451-PLB, paragraph 1.5, Change of ownership or contact information.	
(g) For 406 MHz PLBs with identification codes that can be changed after manufacture, the identification code shown on the plate or label must be easily replaceable using commonly available tools.	Document IM-451 Volume 2, Operation Manual for AK-451-PLB, paragraph 4.1, Reprogramming at a service center. Document IM-451 Volume 2, Operation Manual for AK-451-PLB, paragraph 4.3.2	

RTCM PAPER 76-2002/SC110-STD COMPLIANCE CROSS REFERENCE.

REQUIREMENTS	COMPLIANCE STATEMENTS		
RTCM Paper 76-2002/SC110-STD Paragraph	**Document No. QTR-451-PLB Paragraph**	**Document No. 28061-0216905, dated 07/20/07 Environment Associates Inc. Paragraph**	**Document No. E6557-CS dated 01/25/07 and 07/04/07 Intespace Laboratory Paragraph**
A2.0 Sequence Of Tests	1.2		
A3.0 Vibration Test	2.2 and 3.2	2.0, 2.1, 2.2, 2.3	
A4.0 Bump Test	2.3 and 3.3	3.0, 3.1, 3.2, 3.3	
A5.0 Salt Fog Test	2.4 and 3.4	4.0, 4.1, 4.2, 4.3	
A6.0 Drop Test	2.5 and 3.5	5.0, 5.1, 5.2, 5.3	
A7.0 Leakage And Immersion Test	2.6 and 3.6	6.0, 6.1, 6.2, 6.3	
A8.0 Spurious Emissions Test	2.7 and 3.7	7.0, 7.1, 7.2, 7.3	
A9.0 Cospas-Sarsat Type Approval Test.	2.8 and 3.8		**Cospas-Sarsat** Type Approval Certificate No. 179, dated 9/24/07. Document No. E6557-CS dated 01/25/07 and 07/04/07 **Intespace Laboratory** Paragraph 4 Results

REQUIREMENTS	COMPLIANCE STATEMENTS		
RTCM Paper 76-2002/SC110-STD Paragraph	**Document No. QTR-451-PLB Paragraph**	**Document No. 28061-0216905, dated 07/20/07 Environment Associates Inc. Paragraph**	**Document No. E6557-CS dated 01/25/07 and 07/04/07 Intespace Laboratory Paragraph**
A10.1 Operational Life Tests	2.9 and 3.9		24 hours for 406 MHz and around 77 hours for 121.5 MHz Document No. E6557-CS dated 01/25/07 and 07/04/07 **Intespace Laboratory** ,Table C2-1,Paragraph 10
A10.2 Self Test	2.10 and 3.10		Document No. E6557-CS dated 01/25/07 and 07/04/07 **Intespace Laboratory** ,Table C2-1,Paragraph 8
A11.0 Buoyancy Test	2.11 and 3.11		
A12.0 Auxiliary Radio-Locating Device Transmitter Test	2.12 and 3.12		In addition, The AK-451 has been qualification tested per FAA TSO C126 & FAA TSO C91a and FCC Part 87 & FCC Part 2 Requirements. See Document No.C70223J2 dated 03/01/07, **Compatible Electronics Inc.** See Document No. C61222M1 dated 03/01/07, **Compatible Electronics Inc.**

1.0 GENERAL

1.1 PURPOSE AND APPLICABILITY:

The purpose of this document is to describe the test results and data for qualifying the PLB (Personal Locator Beacon), Model AK-451-PLB, per FCC Title 47 Part 95 Requirements and RTCM Paper 76-2002/SC110-STD. RTCM Recommended Standards For 406 MHz Satellite Personal Locator Beacons (PLBS). Version 1.1. developed By RTCM Special Committee No.110. June 19, 2002 with Addendum RTCM Paper 23-2003/SC110-274, February 4, 2003

The tests enumerated herein were performed on Personal Locator Beacon, Model AK-451, Serial No. CS-09 and CS-19.

This document consists of a description of the Qualification tests conducted, followed by Test Result Data Sheets showing the results of the testing performed during/after such procedure.

The test data log sheets (detail times for tests conducted), test Equipments (list all applicable Test Instruments used) and test Photographs are shown in the following Test Reports:

- Document No. 28061-0216905, dated 07/20/07, Test Report For Environmental Test Of the 406 MHz Satellite Personal Locator Beacons (PLB), Environment Associates Inc.

- Document No. E6557-CS, dated 01/25/07 and 07/04/07 Intespace Laboratory, a Cospas-Sartsat approved laboratory.

The review of the test results presented in this report indicates that the PLB (Personal Locator Beacon), Model AK-451 is capable of performance in accordance with the requirements of RTCM Paper 76-2002/SC110-STD. RTCM Recommended Standards For 406 MHz Satellite Personal Locator Beacons (PLBS). Version 1.1. developed By RTCM Special Committee No.110. June 19, 2002 with Addendum RTCM Paper 23-2003/SC110-274, February 4, 2003

1.2 TEST SEQUENCES

All Qualification tests were conducted in sequence and performed on the same test units, as follows:

1. Initial Functional Test
2. Vibration Test (A3.0)
3. Bump Test (A4.0)
4. Salt Fog Test (A5.0)
5. Drop Test (A6.0)
6. Leakage And Immersion Test (A7.0)
7. Spurious Emissions Test (A8.0)
8. Cospas-Sarsat Type Approval Test (A9.0)
9. Operational Life Tests (A10.0)
10. Self Test (A10.2)
11. Buoyancy Test (A11.0)
12. Auxiliary Radio-Locating Device Transmitter Test (A12.0)

1.3 INDEPENDENT TEST CERTIFICATIONS:

Test Certifications From Independent Test Laboratories are included.

Environment Associates Inc.
9604 Variel Avenue
Chatsworth, CA 91311 USA
Tel: (818) 709-0568

Intespace Laboratory,
A COSPAS SARSAT approved Test Laboratory
2 Rond Point Pierre Guillaumat - BP 64356
31029 Toulouse Cedex 4 – France
Tel: +33 (0) 561 28 11 11

2.0 SUMMARY OF TEST RESULTS
Model AK-451-(PLB) S/N C/S 09

References:

(1) See page 28, Test 1 Result: Initial functional test

(7) See page 37, Test 7 Result: Spurious emission test

(8) See page 65, Document Number: E6557-CS, dated 01/25/07 and 07/12/07, C/S T.A. Test Report of 406 Mhz Distress Beacon, Intespace Laboratory, a Cospas-Sarsat approved Laboratory.

(12) See page 499, Para. 4.8, Test 12 Result, Aux Radio Locating Device Transmitter Test, PEIRP (radiated)

(13) Document No. 28061-0216905, dated 7/20/07, Test report for Environmental Test of the Model AK-451-PLB, Environment Associates, Inc.

PARAMETER TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS			COMMENTS
			$T_{min.}$ (-20°C)	$T_{amb.}$ (+25°C)	$T_{max.}$ (+55°C)	
2.1 INITIAL FUNCTIONAL TEST						
• Carrier Frequency	406.028 ± 0.001	MHz		406.027790 (PASS)		See Page 28 Reference (1)
• Power Output	35 - 39	dBm		36.1dBm (PASS)		
2.2 VIBRATION TEST (A3.0)						
• Exterior Mechanical Inspection	No damage	√		PASS		See Reference (13)
• Aliveness Test:	Successful self-test	√		PASS		
• Activation	No activation during test	√		PASS		
2.3 BUMP TEST (A4.0)						
• Exterior Mechanical Inspection	No damage	√		PASS		See Reference (13)
• Aliveness Test	Successful self-test	√		PASS		
• Activation	No activation during test	√		PASS		

PARAMETER TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS			COMMENTS
			$T_{min.}$ (-20°C)	$T_{amb.}$ (+25°C)	$T_{max.}$ (+55°C)	
2.4 SALT FOG TEST (A5.0)						
• Exterior Mechanical Inspection	No damage	√		PASS		See Reference (13)
• Aliveness Test	Successful self-test	√		PASS		
2.5 DROP TEST (A6.0)						
• Exterior Mechanical Inspection	No damage	√	PASS			See Reference (13)
• Interior Mechanical Inspection	No damage	√	PASS			
• Aliveness Test	Successful self-test	√	PASS			
• Activation	No Activation during test	√	PASS			
2.6 LEAKAGE AND IMMERSION TEST (A7.0)						
Leakage & Immersion						
• Interior Inspection	No water	√		PASS		See Reference (13)
• Aliveness Test	Successful self-test	√		PASS		

PARAMETER TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS			COMMENTS
			$T_{min.}$ (-20°C)	$T_{amb.}$ (+25°C)	$T_{max.}$ (+55°C)	
2.7 SPURIOUS EMISSIONS TEST (A8.0)						
• 406 MHz	Figure 2-1 RTCM PAPER 23-2003 / SC110-274	√ (attach graphs)	PASS	PASS	PASS	See Page 37 Reference (7) Test 7 result
• 121.5 MHz	Figure 2-5 RTCM PAPER 23-2003 / SC110-274	√ (attach Graphs)	PASS	PASS	PASS	See Page 37, page 43 Reference (7) Test 7 result
2.8 COSPAS-SARSAT TYPE APPROVAL TESTS (A9.0)	C-S Certificate (attach test report)	√	PASS	PASS	PASS	See Page 52 Reference (8)

PARAMETER TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS			COMMENTS
			$T_{min.}$ (-20°C)	$T_{amb.}$ (+25°C)	$T_{max.}$ (+55°C)	
2.9 OPERTIONAL LIFE TESTS (A10.0)*						
Operational Life						
• Frequency - Nominal Carrier	406.028 ± 0.001	MHz	406.027779 (PASS)			See Page 65 Reference (8) page 79
- Short-term stability	≤ 0.002	parts/ million in 100ms	< 4.5E-10 (PASS)			See Page 65 Reference (8) page 79
• Medium-term stability - Mean slope	≤ 0.001	parts/ million/ minute	< 8E-11 (PASS)			See Page 65 Reference (8) page 79
- Residual variation	≤ 0.003	parts/ million	< 1.5 E-9 (PASS)			See Page 65 Reference (8) page 79
• RF output power	35 – 39	dBm	36.3 dBm (PASS)			See Page 65 Reference (8) page 79
• Auxiliary PEIRP	14 - 20	dBm	19.5 dBm (PASS)			See Page 499 Reference (12) Page 500

PARAMETER TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS			COMMENTS
			$T_{min.}$ (-20°C)	$T_{amb.}$ (+25°C)	$T_{max.}$ (+55°C)	
2.10 SELF TEST (A10.2)						
• RF pulse duration	≤ 0.525 sec	√	PASS	PASS	PASS	See Page 65 Reference (8) page 79
• Frame synchronization pattern	0 1101 0000	√	PASS	PASS	PASS	See Page 65 Reference (8) page 79
• Number of RF bursts	1-burst	√	PASS	PASS	PASS	See Page 65 Reference (8) page 79
- Beacon 15 Hex ID	must be provided by self-test burst	√	PASS	PASS	PASS	See Page 65 Reference (8) page 79
- 121.5 MHz transmission	≤ 1 sec / 3 sweeps	√	PASS	PASS	PASS	See Page 65 Reference (8) page 79
2.11 BUOYANCY TEST (A11.0)						
• Buoyancy	Floats	√		PASS		If floating collar is attached.

PARAMETER TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS			COMMENTS
			$T_{min.}$ (-20°C)	$T_{amb.}$ (+25°C)	$T_{max.}$ (+55°C)	
2.12 AUXILIARY RADIO- LOCATING DEVICE TRANSMITTER TEST *						
• Carrier Frequency	121.5 ± 0.006	MHz				
• Transmitter Duty Cycle	Continuous	√	PASS		PASS	See Page 37 Reference (7)
• Modulation						
- Frequency	≥ 700 Hz within 300-1600 Hz	Hz	812 Hz (PASS)		PASS	See Page 37 Reference (7)
- Duty Cycle	33 – 55	%	40% (PASS)		PASS	See Page 37 Reference (7)
- Factor	0.85 – 1.0	√	0.98 (PASS)		PASS	See Page 37 Reference (7)
- Sweep repetition rate	2 – 4	Hz	3Hz (PASS)		PASS	See Page 35 Reference (7)
- Frequency Coherence	√	√	PASS		PASS	See Page 37 Reference (7)
• PEIRP (Radiated)	14 – 20	dBm		19.5 dBm (PASS)		See Page 499, Test 12 Result, PEIRP (radiated)
• Antenna (Radiated)						
- Pattern	Omnidirectional	√		Omnidirectional (PASS)		See Page 65 Reference (8)Pg 80
- Polarization	Vertical	√		Vertical (PASS)		See Page 65 Reference (8)Pg 80
- VSWR	≤ 1.5:1	√		1.29 (PASS)		See Page 65 Reference (8)Pg 80

3.0 SUMMARY OF TEST RESULTS
Model AK-451-(PLB) S/N C/S 19

References:

(1) See Page 33, Test 1 Result: Initial functional test

(7) See Page 41, Test 7 Result: Spurious emission test

(8) See page 65, Document Number: E6557-CS, dated 01/25/07 and 07/12/07, C/S T.A. Test Report of 406 Mhz Distress Beacon, Intespace Laboratory, a Cospas-Sarsat approved Laboratory.

(12) See page 499, Para. 4.8, Test 12 Result: Aux Radio Locating Device Transmitter Test, PEIRP (radiated)

(13) Document No. 28061-0216905, dated 7/20/07, Test report for Environmental Test of the Model AK-451-PLB, Environment Associates, Inc.

PARAMETER TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS			COMMENTS
			$T_{min.}$ (-20°C)	$T_{amb.}$ (+25°C)	$T_{max.}$ (+55°C)	
3.1 INITIAL FUNCTIONALTEST						
• Carrier Frequency	406.028 ± 0.001	MHz		406.027564 (PASS)		See page 33 Reference (1)
• Power Output	35 - 39	dBm		36.3dBm (PASS)		
3.2 VIBRATION TEST (A3.0)						
• Exterior Mechanical Inspection	No damage	√		PASS		
• Aliveness Test:	Successful self-test	√		PASS		See Reference (13)
• Activation	No activation during test	√		PASS		
3.3 BUMP TEST (A4.0)						
• Exterior Mechanical Inspection	No damage	√		PASS		
• Aliveness Test	Successful self-test	√		PASS		See Reference (13)
• Activation	No activation during test	√		PASS		

PARAMETER TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS			COMMENTS
			$T_{min.}$ (-20°C)	$T_{amb.}$ (+25°C)	$T_{max.}$ (+55°C)	
3.4 SALT FOG TEST (A5.0)						
• Exterior Mechanical Inspection	No damage	√		PASS		See Reference (13)
• Aliveness Test	Successful self-test	√		PASS		
3.5 DROP TEST (A6.0)						
• Exterior Mechanical Inspection	No damage	√	PASS			See Reference (13)
• Interior Mechanical Inspection	No damage	√	PASS			
• Aliveness Test	Successful self-test	√	PASS			
• Activation	No Activation during test	√	PASS			
3.6 LEAKAGE AND IMMERSION TEST (A7.0)						
Leakage & Immersion						
• Interior Inspection	No water	√		PASS		See Reference (13)
• Aliveness Test	Successful self-test	√		PASS		

PARAMETER TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS			COMMENTS
			$T_{min.}$ (-20°C)	$T_{amb.}$ (+25°C)	$T_{max.}$ (+55°C)	
3.7 SPURIOUS EMISSIONS TES (A8.0)*						
• 406 MHz	Figure 2-1 RTCM PAPER 23-2003 / SC110-274	√ (attach graphs)	PASS	PASS	PASS	See page 41 Reference (7) Test 7 result
• 121.5 MHz	Figure 2-5 RTCM PAPER 23-2003 / SC110-274	√ (attach Graphs)	PASS	PASS	PASS	See page 41 & 45 Reference (7) Test 7 result
3.8 COSPAS-SARSAT TYPE APPROVAL TESTS (A9.0)	C-S Certificate (attach test report)	√	PASS	PASS	PASS	See page 52 Reference (8)

PARAMETER TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS			COMMENTS
			$T_{min.}$ (-20°C)	$T_{amb.}$ (+25°C)	$T_{max.}$ (+55°C)	
3.9 OPERTIONAL LIFE TESTS (A10.0)*						
Operational Life						
• Frequency - Nominal Carrier	406.028 ± 0.001	MHz	406.027779 (PASS)			See page 65 Reference (8)
- Short-term stability	≤ 0.002	parts/ million in 100ms	< 4.5E-10 (PASS)			See page 65 Reference (8)
• Medium-term stability - Mean slope	≤ 0.001	parts/ million/ minute	< 8E-11 (PASS)			See page 65 Reference (8)
- Residual variation	≤ 0.003	parts/ million	< 1.5 E-9 (PASS)			See page 65 Reference (8)
• RF output power	35 – 39	dBm	36.3 dBm (PASS)			See page 65 Reference (8)
• Auxiliary PEIRP	14 - 20	dBm	19.5 dBm (PASS)			See page 499 Reference (12) page 500

PARAMETER TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS			COMMENTS
			$T_{min.}$ (-20°C)	$T_{amb.}$ (+25°C)	$T_{max.}$ (+55°C)	
3.10 SELF TEST (A10.2)						
• RF pulse duration	≤ 0.525 sec	√	PASS	PASS	PASS	See page 65 Reference (8)
• Frame synchronization pattern	0 1101 0000	√	PASS	PASS	PASS	See page 65 Reference (8)
• Number of RF bursts	1-burst	√	PASS	PASS	PASS	See page 65 Reference (8)
- Beacon 15 Hex ID	must be provided by self-test burst	√	PASS	PASS	PASS	See page 65 Reference (8)
- 121.5 MHz transmission	≤ 1 sec / 3 sweeps	√	PASS	PASS	PASS	See page 65 Reference (8)
3.11 BUOYANCY TEST (A11.0)						
• Buoyancy	Floats	√		PASS		If floating collar is attached.

PARAMETER TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS			COMMENTS
			$T_{min.}$ (-20°C)	$T_{amb.}$ (+25°C)	$T_{max.}$ (+55°C)	
3.12 AUXILIARY RADIO-LOCATING DEVICE TRANSMITTER TEST *						
• Carrier Frequency • Transmitter Duty Cycle • Modulation	121.5 ± 0.006 Continuous	MHz √	PASS		PASS	See page 41 Reference (7)
- Frequency	≥ 700 Hz within 300-1600 Hz	Hz	871 Hz (PASS)		PASS	See page 41 Reference (7)
- Duty Cycle	33 – 55	%	40% (PASS)		PASS	See page 41 Reference (7)
- Factor	0.85 – 1.0	√	0.98 (PASS)		PASS	See page 41 Reference (7)
- Sweep repetition rate	2 – 4	Hz	3Hz (PASS)		PASS	See page 41 Reference (7)
- Frequency Coherence	√	√	PASS		PASS	See page 41 Reference (7)
• PEIRP (Radiated)	14 – 20	dBm		19.5 dBm (PASS)		See page 499, Test 12 result, PEIRP (radiated)
• Antenna (Radiated)						
- Pattern	Omnidirectional	√		Omnidirectional (PASS)		See page 65 Reference (8)
- Polarization	Vertical	√		Vertical (PASS)		See page 65 Reference (8)
- VSWR	≤ 1.5:1	√		1.29 (PASS)		See page 65 Reference (8)

4.0 TEST RESULTS

4.1 TEST 1 RESULT
INITIAL FUNCTIONAL TEST

S/N CS 09

Test Equipment used: Beacon Tester, W.S. Technology Inc. Model No. BT100AVS, S/N 2228. Calibration due 01/16/08.

Beacon Test Report
992C40018C00F9D

Organization: Ameri-King
Tested By: Quang Phan
Date: 09-July-07 (Start Date)
Tester Model/Serial No./File Name: BT100AVS/2228/AK-451_SN CS-09 (Ambient)
Tester Cal Due Date: Jan 16, 2008
Tester Temperature: 26°C

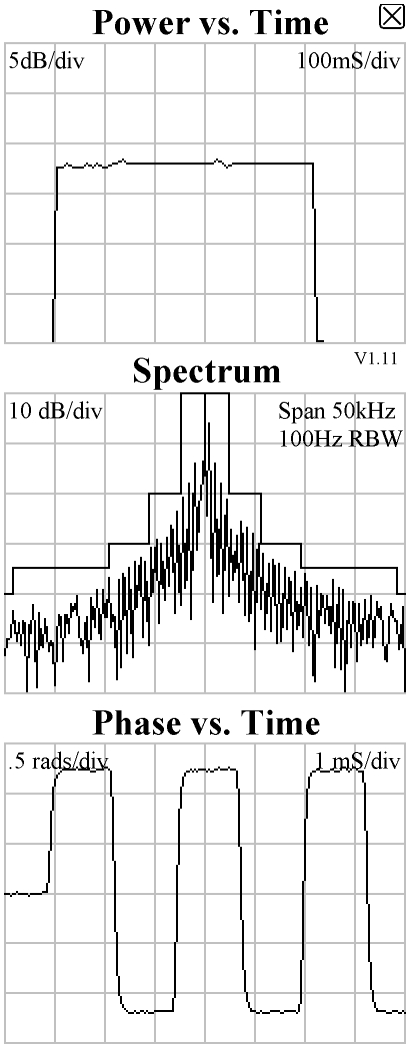
☐ **PASS** ☐ **FAIL** **INITIALS:_____**

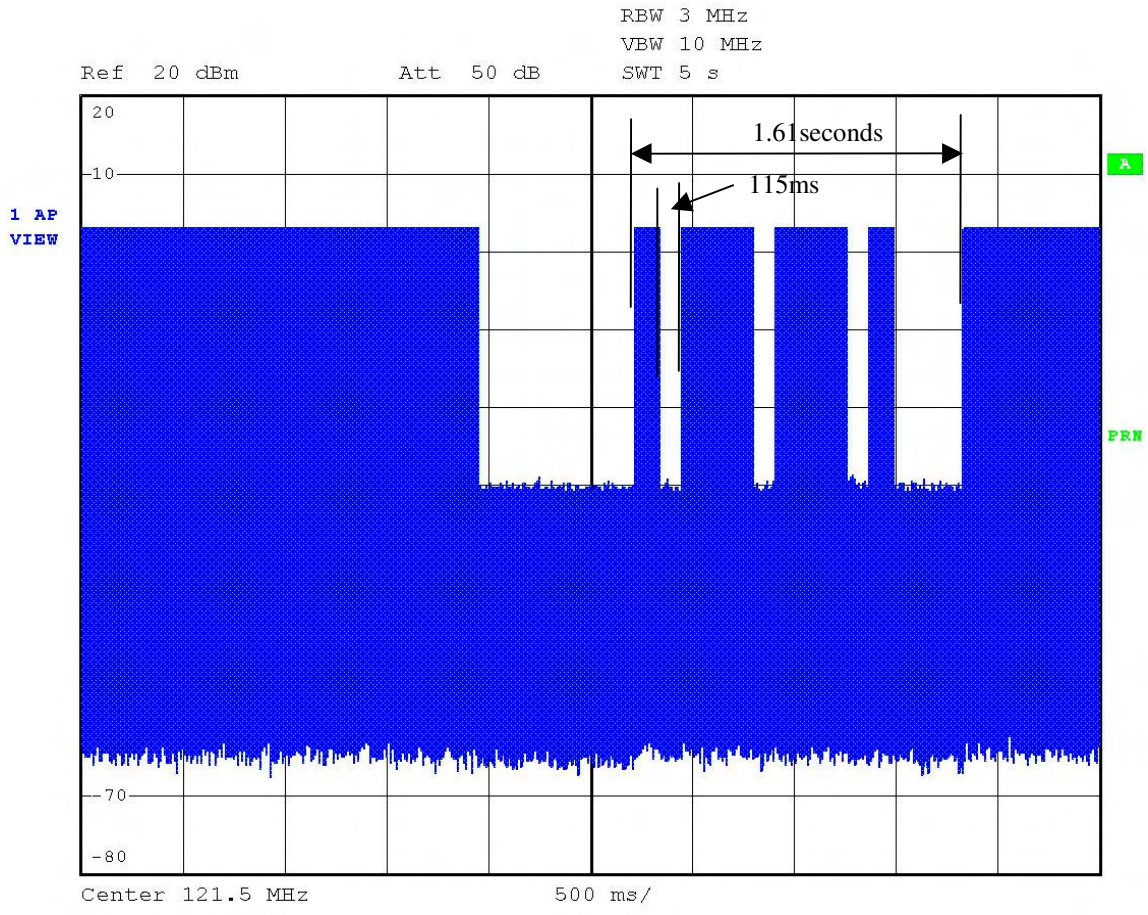
Notes: Add text comments here.

15 Hex ID: 992C40018C00F9D
Full Hex: FFFE2FCC962000C6007CEDFCEC4FE0FF0F61
Burst Mode: Normal Mode (Long)
Protocol: Serial ELT Protocol
Country 201: Albania
National use: Not Used
C/S Approval #: 999
Serial Number: 99
Auxiliary Radio: 121.5 MHz
Position Source: External GPS
Latitude: ***°**.**
Longitude: ***°**.**

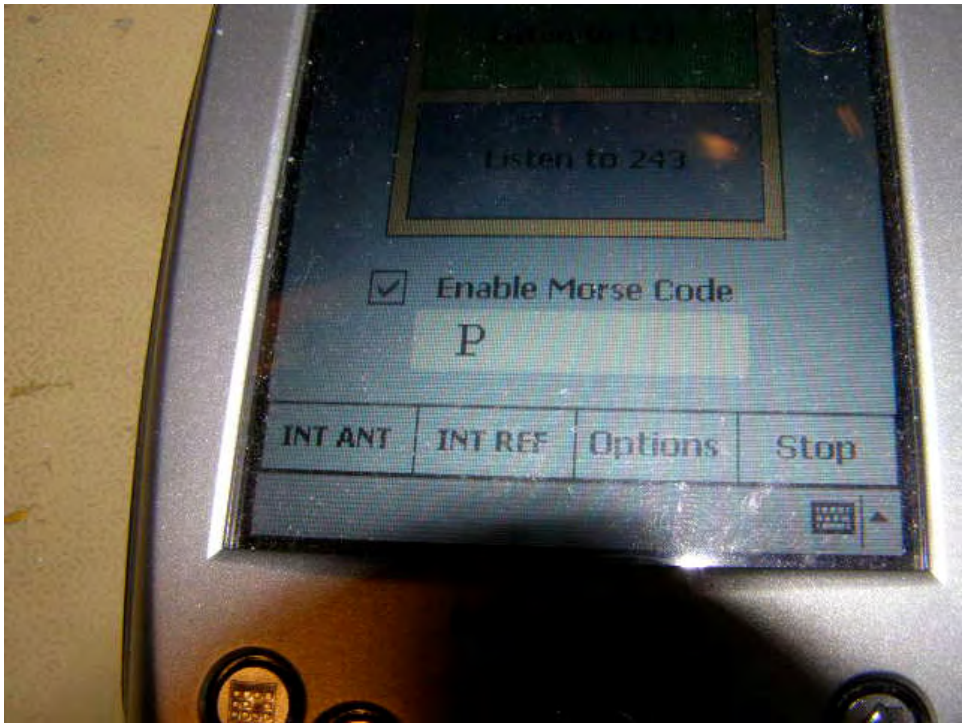
406 MHz Measurements
406 Frequency (INT REF): 406.027746 MHz
406 Power (5 Watt): 36.1 dBm
Power Rise Time: < 5 ms
Phase Deviation: -1.18 +1.16 radians
Modulation Rise Time: 143 uS
Modulation Fall Time: 145 uS
Modulation Symmetry: 0.8%
Modulation Bit Rate: 399.5 bps
CW Preamble: 159.9 ms
Stability Measure @ 18 Bursts
Nominal Frequency: 406027945.894 Hz
Short Term: 1.72E-10/100ms
Mean Slope: 0.61E-10/minute
Residual: 0.82E-09

121/243 MHz Measurements
121 Frequency (INT REF): 121.4986 MHz
121 Power (5 Watt): 22.1 dBm
243 Frequency (INT REF): 242.9972 MHz
243 Power (5 Watt): 21.9 dBm
Sweep Direction: Downwards
Audio Frequency: 375 Hz to 1187 Hz
Sweep Range: 812 Hz
Sweep Rep Rate: 3 Hz
Modulation Factor: 98 %
Duty Cycle: 40 %





Date: 25.SEP.2007 11:03:50



[French] [Russian]

International Satellite System For Search and Rescue

COSPAS SARSAT

Home Description Status Beacons Documentation Management

406 MHz Decode Program (Version 3.1)

CC962000C6007CEDFCEC4FE0FF0F61 ○ 15 Hexadecimal ID ○ 22 Hexadecimal ○ 30 Hexadecimal process

Click here for the ITU List of MID Country Code Numbers.

ITEM	BITS	VALUE
Message format: long format	**25**	**1**
Protocol: User	**26**	**1**
Country code: 201	**27-36**	**0011001001**
User type: Serial User	**37-39**	**011**
Serial Type: ELT with Serial Identification	**40-42**	**000**
Cospas-Sarsat Certificate Number in bits 74-83: Yes	**43**	**1**
Serial Number: 99	**44-63**	**00000000000001100011**
All 0s or National Use	**64-73**	**0000000000**
C/S Number or National Use (bit 43 refers): 999	**74-83**	**1111100111**
Aux radio device: 121.5 MHz	**84-85**	**01**
Encoded BCH 1:	**86-106**	**10111111001110110001**
Calculated BCH 1:	**N/A**	**10111111001110110001**
Encoded Position Data Source From External Navigation Device	**107**	**0**
default	**108**	**0**
Latitude (degrees): default	**109-115**	**1111111**
Latitude (minutes): default	**116-119**	**0000**
default	**120**	**0**
Longitude (degrees): default	**121-128**	**11111111**
Longitude (minutes): default	**129-132**	**0000**
Encoded BCH 2:	**133-144**	**111101100001**
Calculated BCH 2:	**N/A**	**111101100001**
15 Hex ID:	**N/A**	**992C40018C00F9D**

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700 de la Gauchetière West, Suite 2450, Montreal (Quebec) H3B 5M2
Canada
Email: mail@cospas-sarsat.int Tel: +1 514 954 6761

4.2 TEST 1 RESULT
INITIAL FUNCTIONAL TEST

S/N CS 19

Test Equipment used: Beacon Tester, W.S. Technology Inc. Model No. BT100AVS, S/N 2228. Calibration due 01/16/08.

Beacon Test Report
192E008002FFBFF

Organization: Ameri-King
Tested By: Quang Phan
Date: 29-June-07 (Start Date)
Tester Model/Serial No./File Name: BT100AVS/2228/AK-451_SN CS-19 (Ambient)
Tester Cal Due Date: Jan 16, 2008
Tester Temperature: 26°C

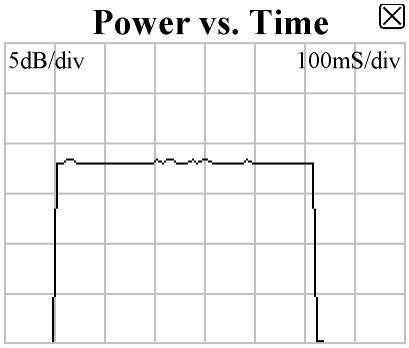
☐ **PASS** ☐ **FAIL** **INITIALS:_____**

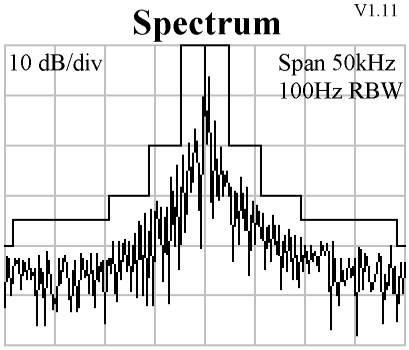
Notes: Add text comments here.

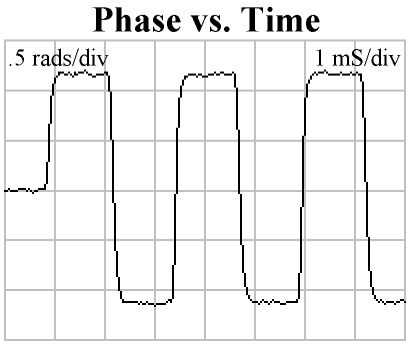
15 Hex ID: 192E008002FFBFF
Full Hex: FFFE2F8C970040017FDFFE13043583E0FAA8
Burst Mode: Normal Mode (Long)
Protocol: Serial PLB Protocol
Country 201: Albania
National use: Not Used
C/S Approval #: 999
Serial Number: 99
Auxiliary Radio: 121.5 MHz
Position Source: External GPS
Latitude: ***°**.**
Longitude: ***°**.**

406 MHz Measurements
406 Frequency (INT REF): 406.027564 MHz
406 Power (5 Watt): 36.3 dBm
Power Rise Time: < 5 ms
Phase Deviation: -1.13 +1.15 radians
Modulation Rise Time: 142 uS
Modulation Fall Time: 165 uS
Modulation Symmetry: 0.8%
Modulation Bit Rate: 399.5 bps
CW Preamble: 159.8 ms
Stability Measure @ 18 Bursts
Nominal Frequency: 406027945.894 Hz
Short Term: 1.72E-10/100ms
Mean Slope: 0.61E-10/minute
Residual: 0.82E-09

121/243 MHz Measurements
121 Frequency (INT REF): 121.4975 MHz
121 Power (5 Watt): 19.6 dBm
243 Frequency (INT REF): 242.9950 MHz
243 Power (5 Watt): 19.4 dBm
Sweep Direction: Downwards
Audio Frequency: 375 Hz to 1187 Hz
Sweep Range: 871 Hz
Sweep Rep Rate: 3 Hz
Modulation Factor: 98 %
Duty Cycle: 40 %







[French] [Russian]

International Satellite System For Search and Rescue

COSPAS SARSAT

Home Description Status Beacons Documentation Management

406 MHz Decode Program (Version 3.1)

8C970040017FDFFE13043583E0FAA8 ○ 15 Hexadecimal ID ○ 22 Hexadecimal ○ 30 Hexadecimal process

Click here for the ITU List of MID Country Code Numbers.

ITEM	BITS	VALUE
Message format: long format	**25**	**1**
Protocol: Location Protocol	**26**	**0**
Country code: 201	**27-36**	**0011001001**
Type of location protocol: Standard Location - PLB (Serial)	**37-40**	**0111**
Cospas-Sarsat #: 1	**41-50**	**0000000001**
Serial Number: 1	**51-64**	**00000000000001**
Latitude Sign: default	**65**	**0**
Latitude Degrees: default	**66-72**	**1111111**
Latitude Minutes: default	**73-74**	**11**
Longitude Sign: default	**75**	**0**
Longitude Degrees: default	**76-83**	**11111111**
Longitude Minutes: default	**84-85**	**11**
BCH 1 Encoded:	**86-106**	**11000010011000010000**
BCH 1 Calculated:	**N/A**	**11000010011000010000**
Fixed bits (1101): Pass	**107-110**	**1101**
Position Data: Encoded Position Data Source From External Navigation Device	**111**	**0**
Aux Device: 121.5 MHz homer	**112**	**1**
Latitude Offset Sign: default	**113**	**1**
Latitude Offset Minutes: default	**114-118**	**00000**
Latitude Offset Seconds: default	**119-122**	**1111**
Longitude Offset Sign: default	**123**	**1**
Longitude Offset Minutes: default	**124-128**	**00000**
Longitude Offset Seconds: default	**129-132**	**1111**
BCH 2 Encoded:	**133-144**	**101010101000**
BCH 2 Calculated:	**N/A**	**101010101000**
Composite Latitude: default	**N/A**	**Composite Longitude: default**
15 Hex ID:	**N/A**	**192E008002FFBFF**

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700 de la Gauchetière West, Suite 2450, Montreal (Quebec) H3B 5M2
Canada
Email: mail@cospas-sarsat.int Tel: +1 514 954 6761

4.3 TEST 7 RESULT
SPURIOUS EMISSION TEST
406 MHz

S/N CS 09

Beacon Test Report
992C40018C00F9D

Organization: Ameri-King
Tested By: Quang Phan
Date: 09-July-07 (Start Date)
Tester Model/Serial No./File Name: BT100AVS/2228/AK-451_SN CS-09 (Ambient)
Tester Cal Due Date: Jan 16, 2008
Tester Temperature: 26°C

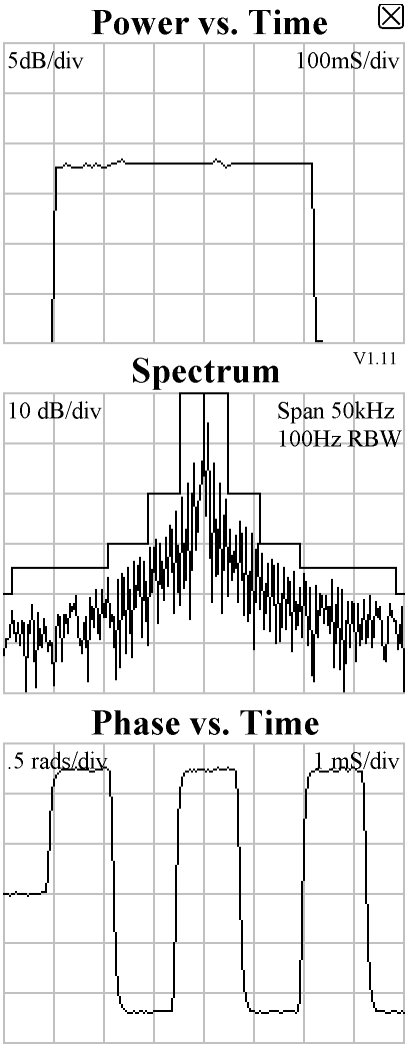
☐ **PASS** ☐ **FAIL** **INITIALS:_____**

Notes: Add text comments here.

15 Hex ID: 992C40018C00F9D
Full Hex: FFFE2FCC962000C6007CEDFCEC4FE0FF0F61
Burst Mode: Normal Mode (Long)
Protocol: Serial ELT Protocol
Country 201: Albania
National use: Not Used
C/S Approval #: 999
Serial Number: 99
Auxiliary Radio: 121.5 MHz
Position Source: External GPS
Latitude: ***°**.**
Longitude: ***°**.**

406 MHz Measurements
406 Frequency (INT REF): 406.027746 MHz
406 Power (5 Watt): 36.1 dBm
Power Rise Time: < 5 ms
Phase Deviation: -1.18 +1.16 radians
Modulation Rise Time: 143 uS
Modulation Fall Time: 145 uS
Modulation Symmetry: 0.8%
Modulation Bit Rate: 399.5 bps
CW Preamble: 159.9 ms
Stability Measure @ 18 Bursts
Nominal Frequency: 406027945.894 Hz
Short Term: 1.72E-10/100ms
Mean Slope: 0.61E-10/minute
Residual: 0.82E-09

121/243 MHz Measurements
121 Frequency (INT REF): 121.4986 MHz
121 Power (5 Watt): 22.1 dBm
243 Frequency (INT REF): 242.9972 MHz
243 Power (5 Watt): 21.9 dBm
Sweep Direction: Downwards
Audio Frequency: 375 Hz to 1187 Hz
Sweep Range: 812 Hz
Sweep Rep Rate: 3 Hz
Modulation Factor: 98 %
Duty Cycle: 40 %



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Beacon Test Report
992C40018C00F9D

Organization: Ameri-King
Tested By: Quang Phan
Date: 9-July-07 (Start Date)
Tester Model/Serial No./File Name: BT100AVS/2228/AK-451_SN CS-09 (-20C)
Tester Cal Due Date: Jan 16, 2008
Tester Temperature: 26°C

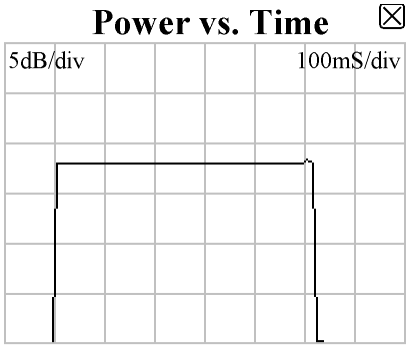
☐ **PASS** ☐ **FAIL** **INITIALS:_____**

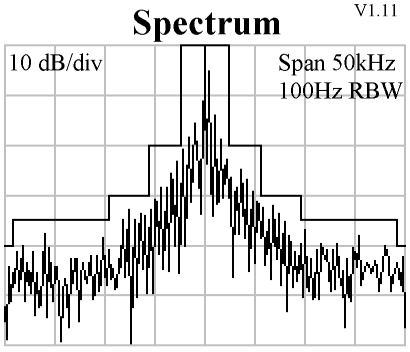
Notes: Add text comments here.

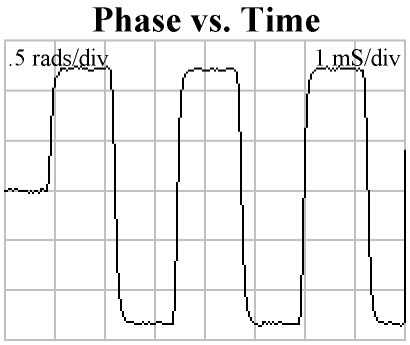
15 Hex ID: 992C40018C00F9D
Full Hex: FFFE2FCC962000C6007CEDFCEC4FE0FF0F61
Burst Mode: Normal Mode (Long)
Protocol: Serial ELT Protocol
Country 201: Albania
National use: Not Used
C/S Approval #: 999
Serial Number: 99
Auxiliary Radio: 121.5 MHz
Position Source: External GPS
Latitude: ***°**.**
Longitude: ***°**.**

406 MHz Measurements
406 Frequency (INT REF): 406.027790 MHz
406 Power (5 Watt): 36.3 dBm
Power Rise Time: < 5 ms
Phase Deviation: -1.33 +1.2 radians
Modulation Rise Time: 135 uS
Modulation Fall Time: 153 uS
Modulation Symmetry: 1.5%
Modulation Bit Rate: 399.5 bps
CW Preamble: 159.7 ms
Stability Measure @ 18 Bursts
Nominal Frequency: 406027945.894 Hz
Short Term: 1.72E-10/100ms
Mean Slope: 0.61E-10/minute
Residual: 0.82E-09

121/243 MHz Measurements
121 Frequency (INT REF): 121.4987 MHz
121 Power (5 Watt): 21.9 dBm
243 Frequency (INT REF): 242.9974 MHz
243 Power (5 Watt): 21.8 dBm
Sweep Direction: Downwards
Audio Frequency: 375 Hz to 1187 Hz
Sweep Range: 812 Hz
Sweep Rep Rate: 3 Hz
Modulation Factor: 98 %
Duty Cycle: 40 %







Beacon Test Report
992C40018C00F9D

Organization: Ameri-King
Tested By: Quang Phan
Date: 09-July-07 (Start Date)
Tester Model/Serial No./File Name: BT100AVS/2228/AK-451_SN CS-09 (+55C)
Tester Cal Due Date: Jan 16, 2008
Tester Temperature: 26°C

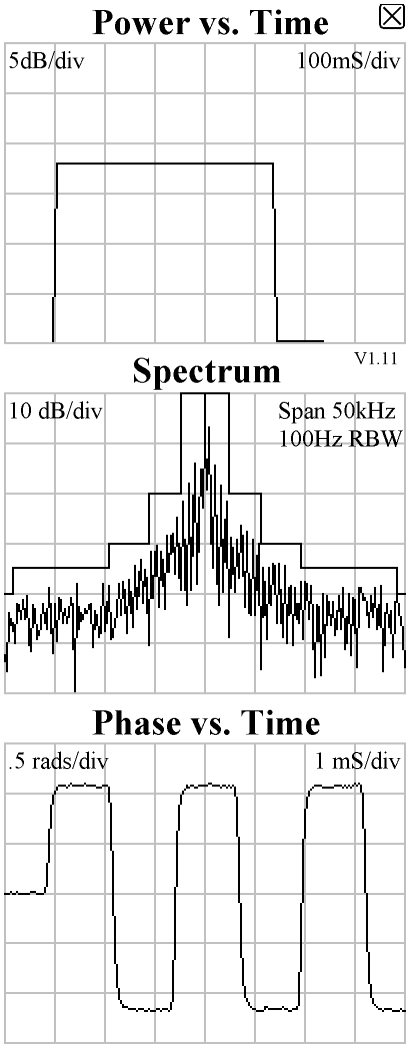
☐ **PASS** ☐ **FAIL** **INITIALS:_____**

Notes: Add text comments here.

15 Hex ID: 992C40018C00F9D
Full Hex: FFFE2FCC962000C6007CEDFCEC4FE0FF0F61
Burst Mode: Normal Mode (Long)
Protocol: Serial ELT Protocol
Country 201: Albania
National use: Not Used
C/S Approval #: 999
Serial Number: 99
Auxiliary Radio: 121.5 MHz
Position Source: External GPS
Latitude: ***°**.**
Longitude: ***°**.**

406 MHz Measurements
406 Frequency (INT REF): 406.027701 MHz
406 Power (5 Watt): 35.7 dBm
Power Rise Time: < 5 ms
Phase Deviation: -1.18 +1.17 radians
Modulation Rise Time: 117 uS
Modulation Fall Time: 177 uS
Modulation Symmetry: 1.1%
Modulation Bit Rate: 399.5 bps
CW Preamble: 160.1 ms
Stability Measure @ 18 Bursts
Nominal Frequency: 406027945.894 Hz
Short Term: 1.72E-10/100ms
Mean Slope: 0.61E-10/minute
Residual: 0.82E-09

121/243 MHz Measurements
121 Frequency (INT REF): 121.4985 MHz
121 Power (5 Watt): 22.2 dBm
243 Frequency (INT REF): 242.9970 MHz
243 Power (5 Watt): 22.1 dBm
Sweep Direction: Downwards
Audio Frequency: 375 Hz to 1187 Hz
Sweep Range: 812 Hz
Sweep Rep Rate: 3 Hz
Modulation Factor: 98 %
Duty Cycle: 40 %



4.4 TEST 7 RESULT
SPURIOUS EMISSION TEST
406 MHz

S/N CS 19

Beacon Test Report
192E008002FFBFF

Organization: Ameri-King
Tested By: Quang Phan
Date: 09-July-07 (Start Date)
Tester Model/Serial No./File Name: BT100AVS/2228/AK-451_SN CS-19 (Ambient)
Tester Cal Due Date: Jan 16, 2008
Tester Temperature: 26°C

☐ **PASS** ☐ **FAIL** **INITIALS:_____**

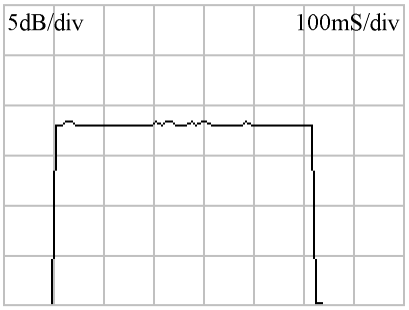
Notes: Add text comments here.

15 Hex ID: 192E008002FFBFF
Full Hex: FFFE2F8C970040017FDFFE13043583E0FAA8
Burst Mode: Normal Mode (Long)
Protocol: Serial PLB Protocol
Country 201: Albania
National use: Not Used
C/S Approval #: 999
Serial Number: 99
Auxiliary Radio: 121.5 MHz
Position Source: External GPS
Latitude: ***°**.**
Longitude: ***°**.**

406 MHz Measurements
406 Frequency (INT REF): 406.027564 MHz
406 Power (5 Watt): 36.3 dBm
Power Rise Time: < 5 ms
Phase Deviation: -1.13 +1.15 radians
Modulation Rise Time: 142 uS
Modulation Fall Time: 165 uS
Modulation Symmetry: 0.8%
Modulation Bit Rate: 399.5 bps
CW Preamble: 159.8 ms
Stability Measure @ 18 Bursts
Nominal Frequency: 406027945.894 Hz
Short Term: 1.72E-10/100ms
Mean Slope: 0.61E-10/minute
Residual: 0.82E-09

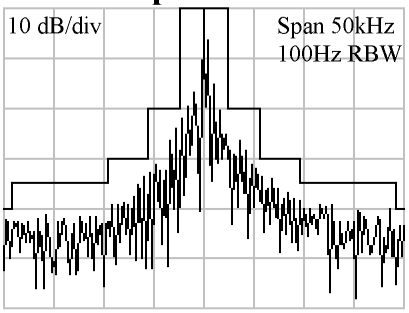
121/243 MHz Measurements
121 Frequency (INT REF): 121.4975 MHz
121 Power (5 Watt): 19.6 dBm
243 Frequency (INT REF): 242.9950 MHz
243 Power (5 Watt): 19.4 dBm
Sweep Direction: Downwards
Audio Frequency: 375 Hz to 1187 Hz
Sweep Range: 871 Hz
Sweep Rep Rate: 3 Hz
Modulation Factor: 98 %
Duty Cycle: 40 %

Power vs. Time ☒

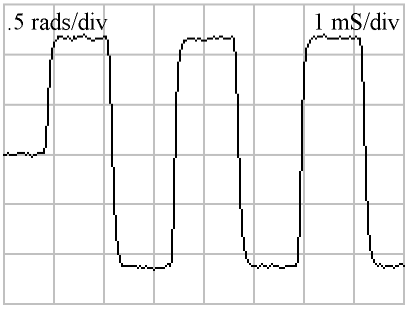


V1.11

Spectrum



Phase vs. Time



Beacon Test Report
192E008002FFBFF

Organization: Ameri-King
Tested By: Quang Phan
Date: 09-July-07 (Start Date)
Tester Model/Serial No./File Name: BT100AVS/2228/AK-451_SN CS-19 (-20C)
Tester Cal Due Date: Jan 16, 2008
Tester Temperature: 26°C

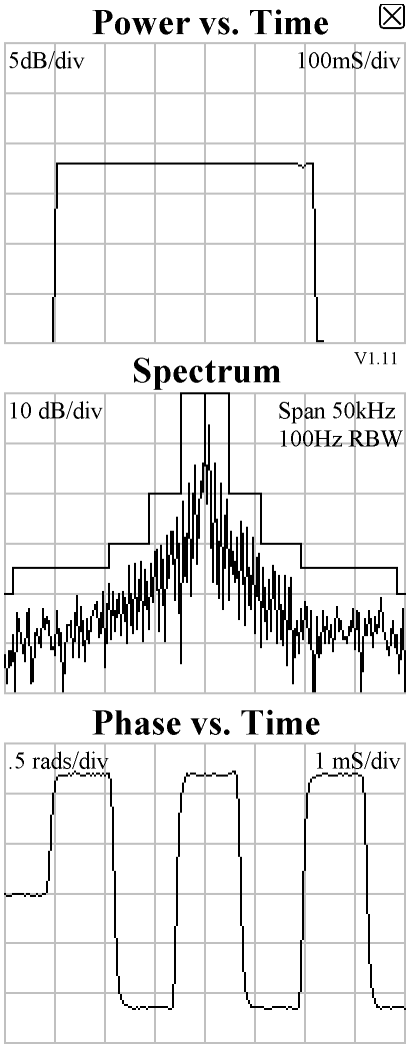
☐ **PASS** ☐ **FAIL** **INITIALS:_____**

Notes: Add text comments here.

15 Hex ID: 192E008002FFBFF
Full Hex: FFFE2F8C970040017FDFFE13043583E0FAA8
Burst Mode: Normal Mode (Long)
Protocol: Serial PLB Protocol
Country 201: Albania
National use: Not Used
C/S Approval #: 999
Serial Number: 99
Auxiliary Radio: 121.5 MHz
Position Source: External GPS
Latitude: ***°**.**
Longitude: ***°**.**

406 MHz Measurements
406 Frequency (INT REF): 406.027599 MHz
406 Power (5 Watt): 36.5 dBm
Power Rise Time: < 5 ms
Phase Deviation: -1.33 +1.2 radians
Modulation Rise Time: 130 uS
Modulation Fall Time: 153 uS
Modulation Symmetry: 1.5%
Modulation Bit Rate: 399.5 bps
CW Preamble: 159.7 ms
Stability Measure @ 18 Bursts
Nominal Frequency: 406027945.894 Hz
Short Term: 1.72E-10/100ms
Mean Slope: 0.61E-10/minute
Residual: 0.82E-09

121/243 MHz Measurements
121 Frequency (INT REF): 121.4976 MHz
121 Power (5 Watt): 19.4 dBm
243 Frequency (INT REF): 242.9952 MHz
243 Power (5 Watt): 19.2 dBm
Sweep Direction: Downwards
Audio Frequency: 375 Hz to 1187 Hz
Sweep Range: 871 Hz
Sweep Rep Rate: 3 Hz
Modulation Factor: 98 %
Duty Cycle: 40 %



Beacon Test Report
192E008002FFBFF

Organization: Ameri-King
Tested By: Quang Phan
Date: 09-July-07 (Start Date)
Tester Model/Serial No./File Name: BT100AVS/2228/AK-451_SN CS-19 (+55C)
Tester Cal Due Date: Jan 16, 2008
Tester Temperature: 26°C

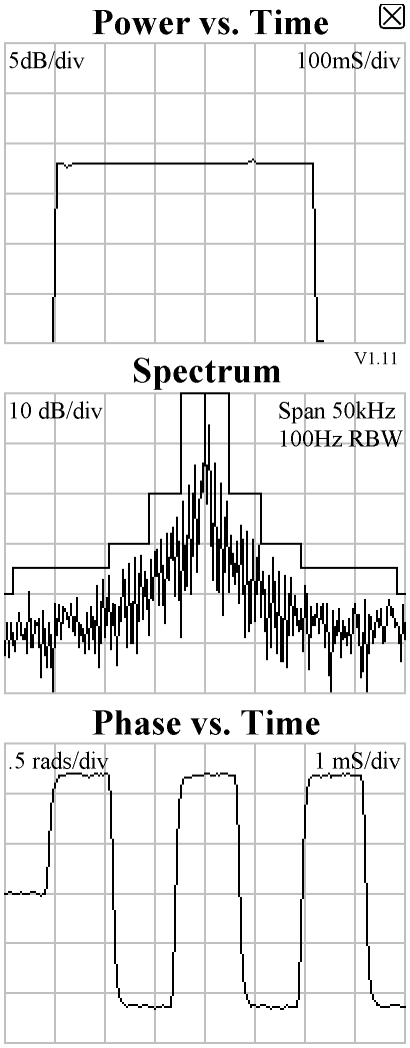
☐ **PASS** ☐ **FAIL** **INITIALS:_____**

Notes: Add text comments here.

15 Hex ID: 192E008002FFBFF
Full Hex: FFFE2F8C970040017FDFFE13043583E0FAA8
Burst Mode: Normal Mode (Long)
Protocol: Serial PLB Protocol
Country 201: Albania
National use: Not Used
C/S Approval #: 999
Serial Number: 99
Auxiliary Radio: 121.5 MHz
Position Source: External GPS
Latitude: ***°**.**
Longitude: ***°**.**

406 MHz Measurements
406 Frequency (INT REF): 406.027531 MHz
406 Power (5 Watt): 35.9 dBm
Power Rise Time: < 5 ms
Phase Deviation: -1.18 +1.17 radians
Modulation Rise Time: 117 uS
Modulation Fall Time: 177 uS
Modulation Symmetry: 1.1%
Modulation Bit Rate: 399.5 bps
CW Preamble: 160.1 ms
Stability Measure @ 18 Bursts
Nominal Frequency: 406027945.894 Hz
Short Term: 1.72E-10/100ms
Mean Slope: 0.61E-10/minute
Residual: 0.82E-09

121/243 MHz Measurements
121 Frequency (INT REF): 121.4974 MHz
121 Power (5 Watt): 19.7 dBm
243 Frequency (INT REF): 242.9948 MHz
243 Power (5 Watt): 19,5 dBm
Sweep Direction: Downwards
Audio Frequency: 375 Hz to 1187 Hz
Sweep Range: 871 Hz
Sweep Rep Rate: 3 Hz
Modulation Factor: 98 %
Duty Cycle: 40 %



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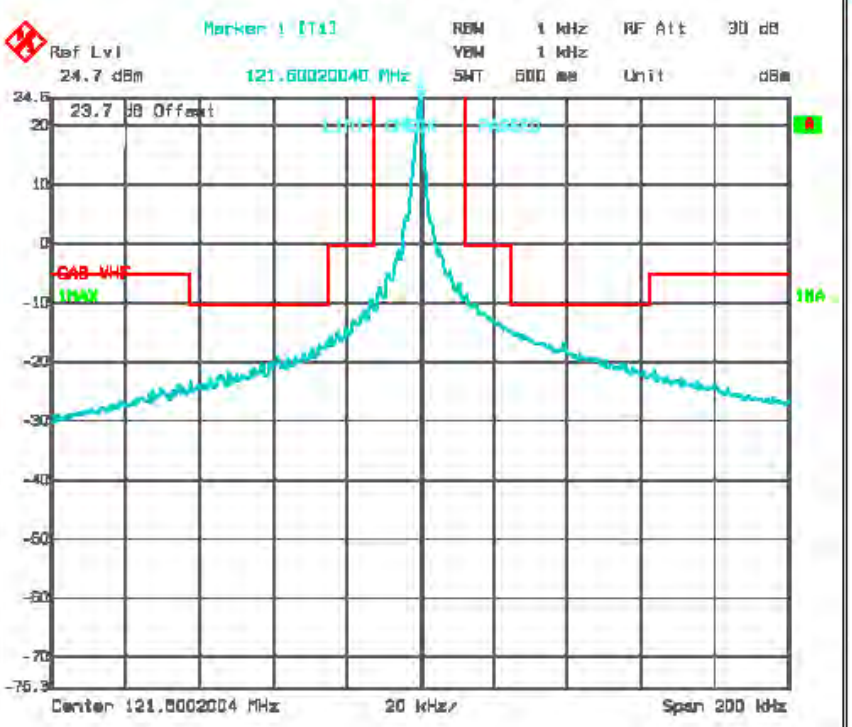
4.5 TEST 7 RESULT:
SPURIOUS EMISSIONS TEST
121.5 MHz

S/N CS 09 & CS 19

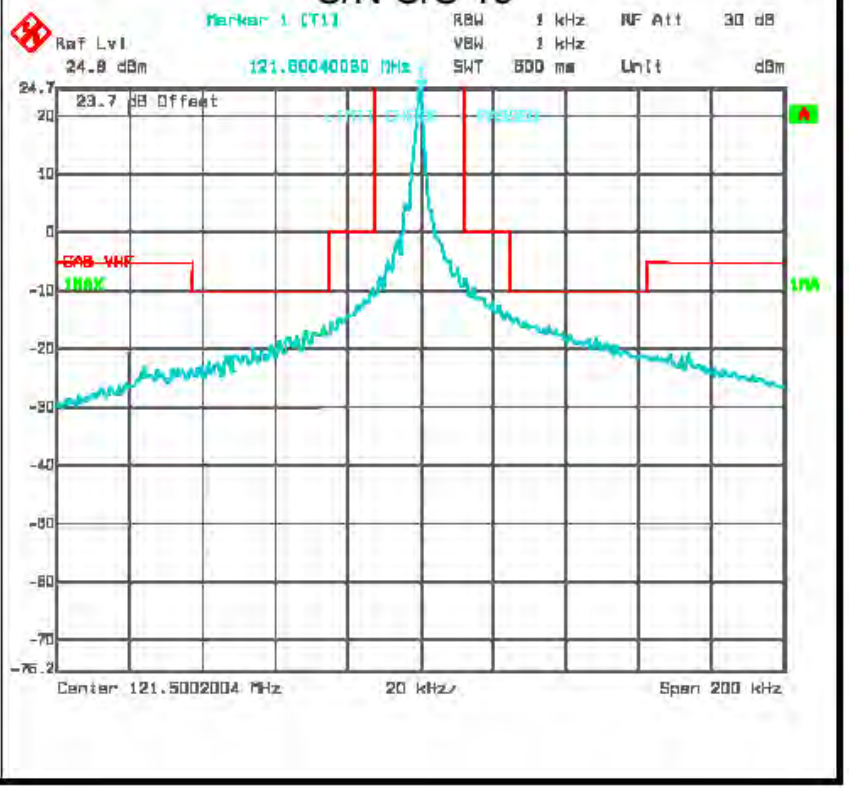
Test Equipment used: Spectrum Analyzer, Rohde & Schwarz FSEB20,
Calibration due 9/12/08

SPURIOUS EMISSION TEST RESULT @ 25 DEG C

S/N C/S 09

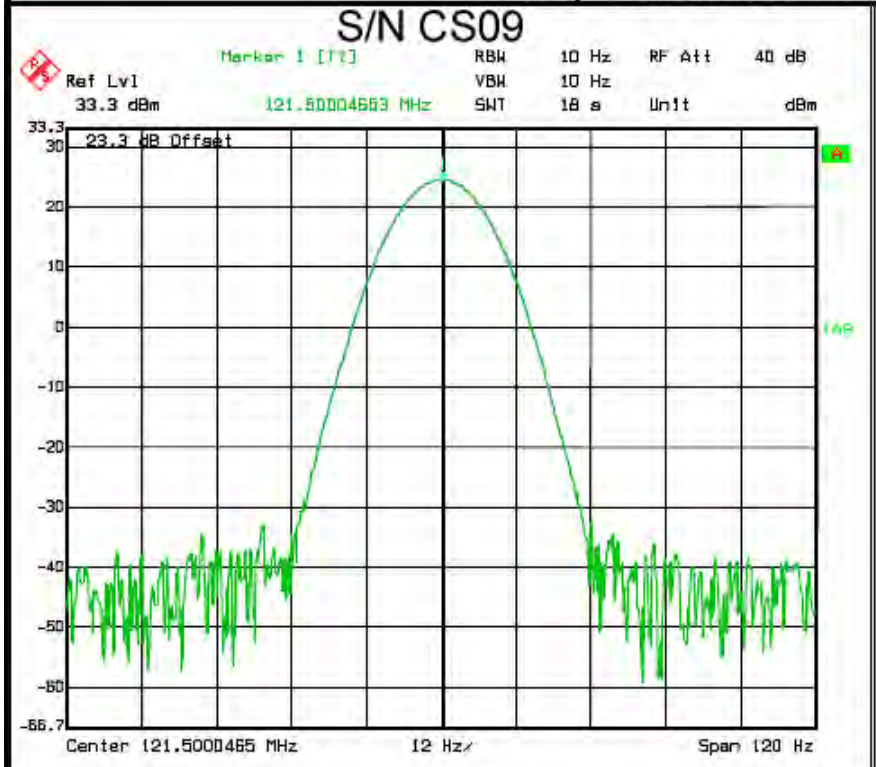


S/N C/S 19

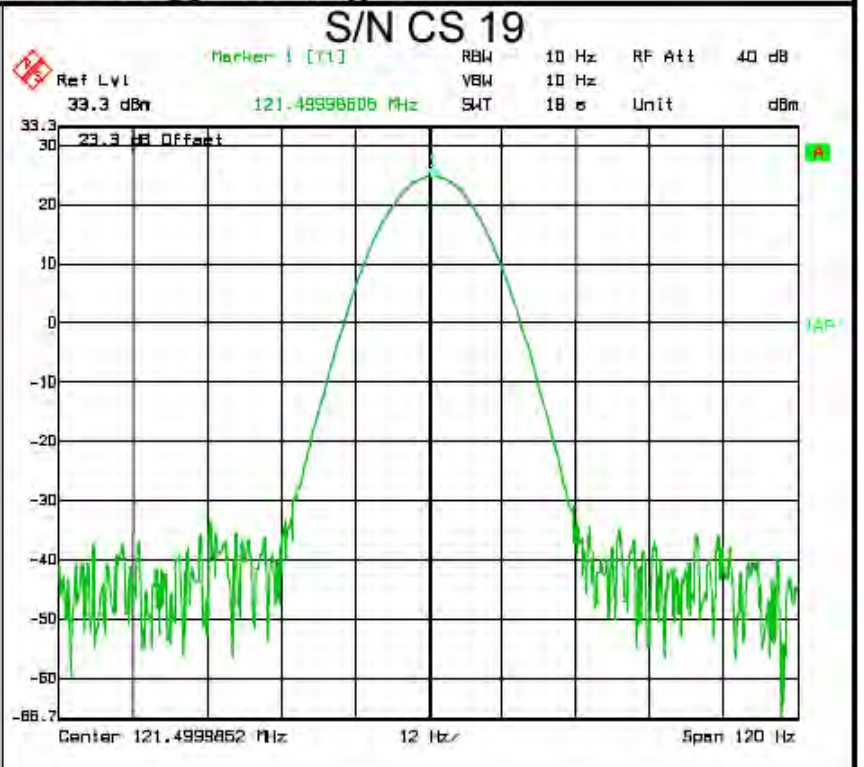


Freq Coherence Test Result @ +25 deg C

S/N CS09

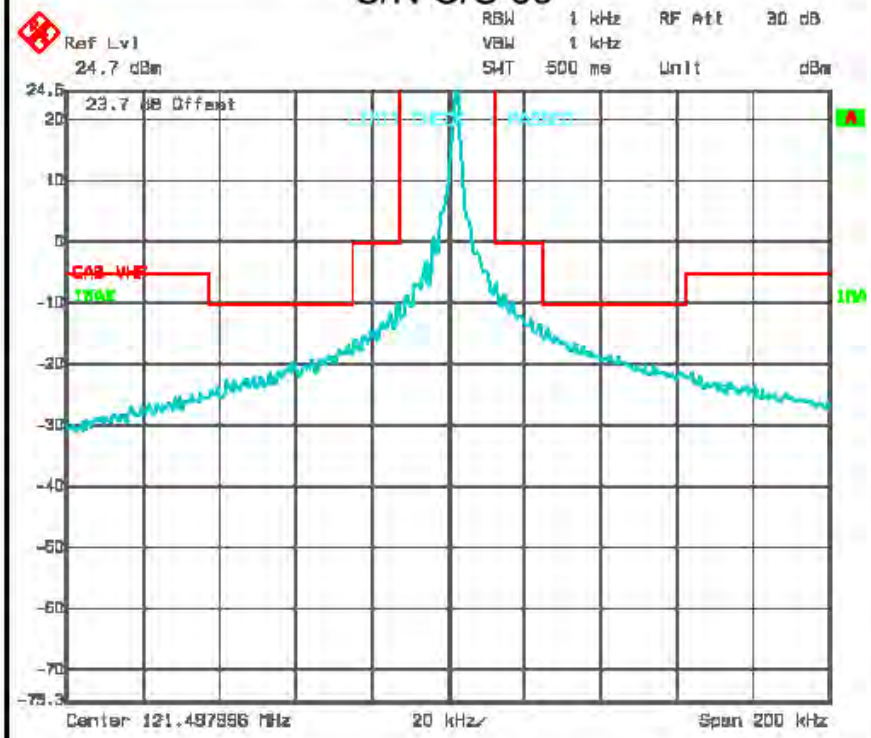


S/N CS 19

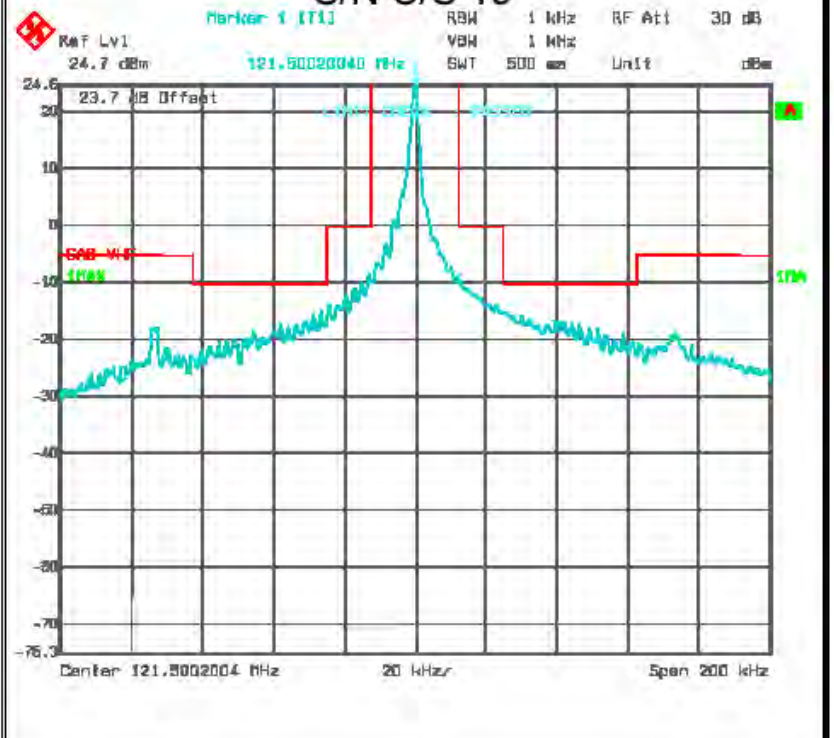


SPURIOUS EMISSION TEST RESULT @ -20 DEG C

S/N C/S 09

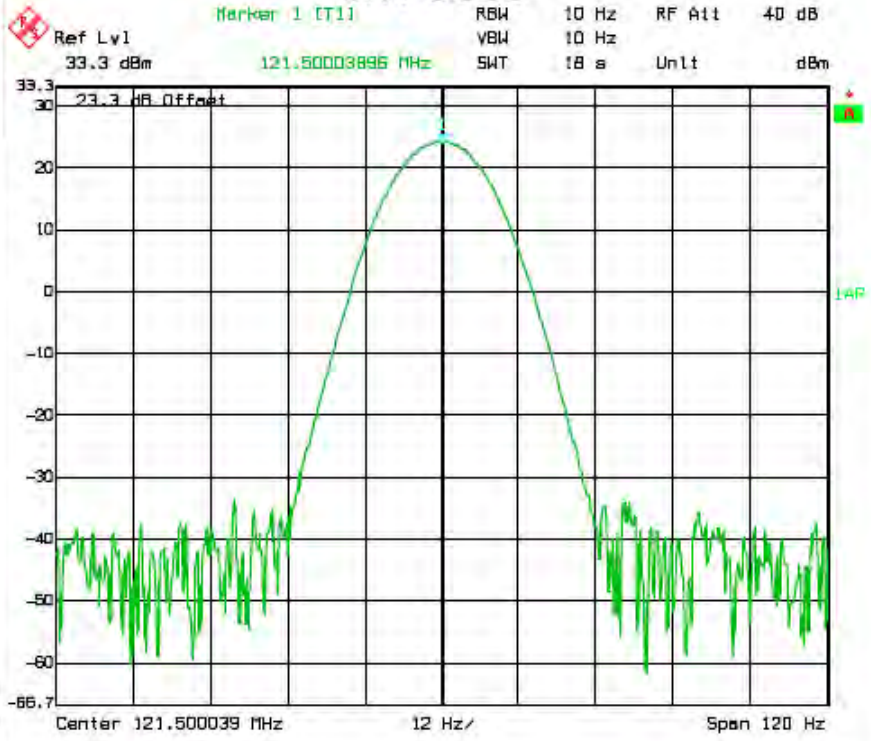


S/N C/S 19

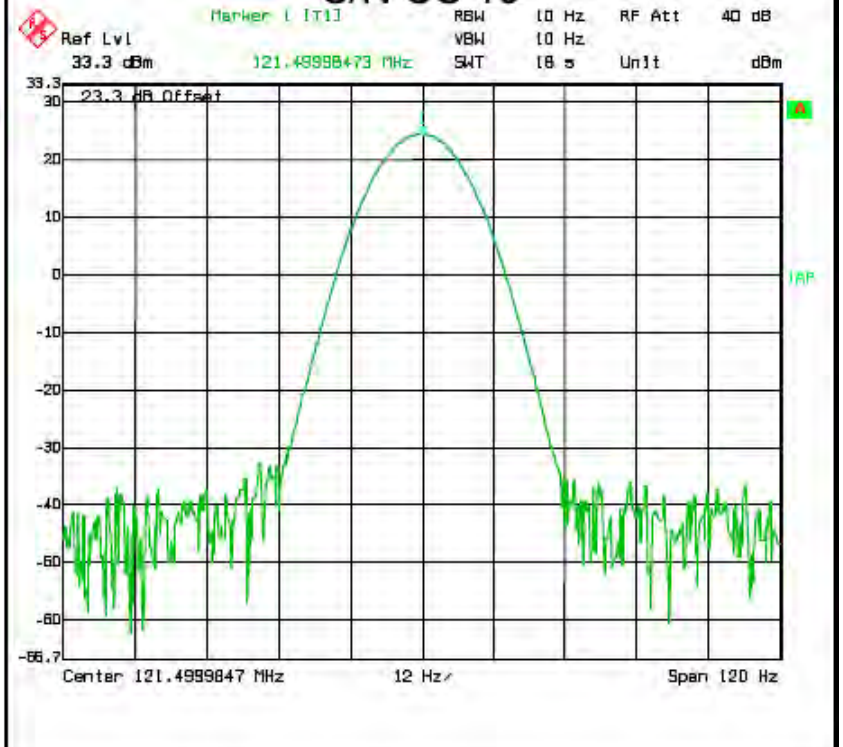


Freq Coherence Test Result @ -20 deg C

S/N CS09

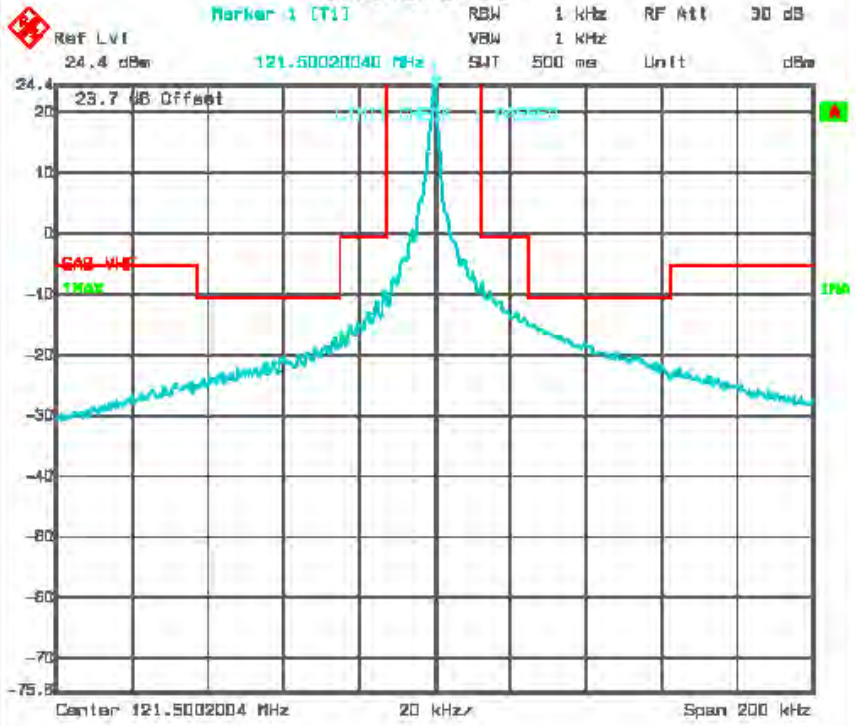


S/N CS 19

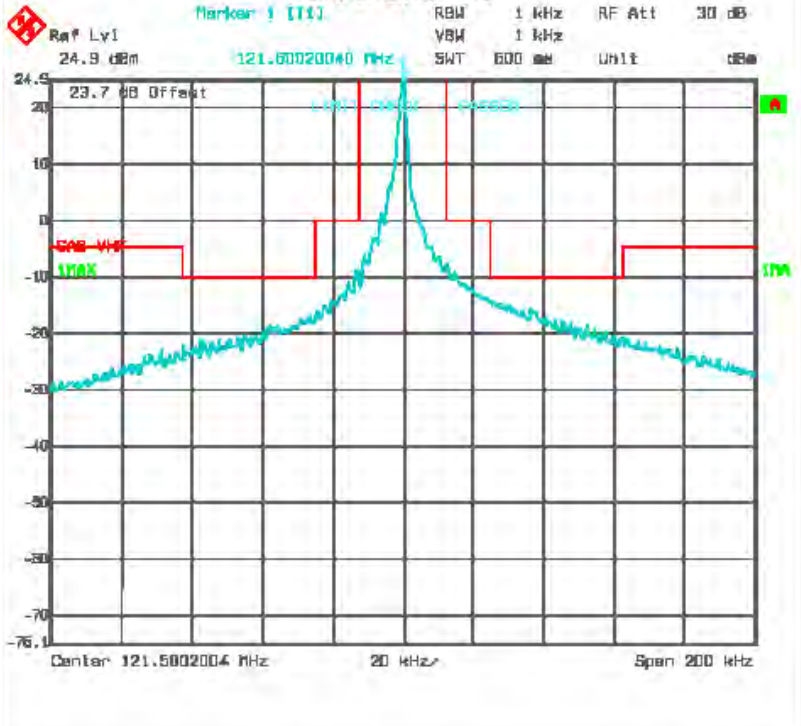


SPURIOUS EMISSION TEST RESULT @ +55 DEG C

S/N C/S 09

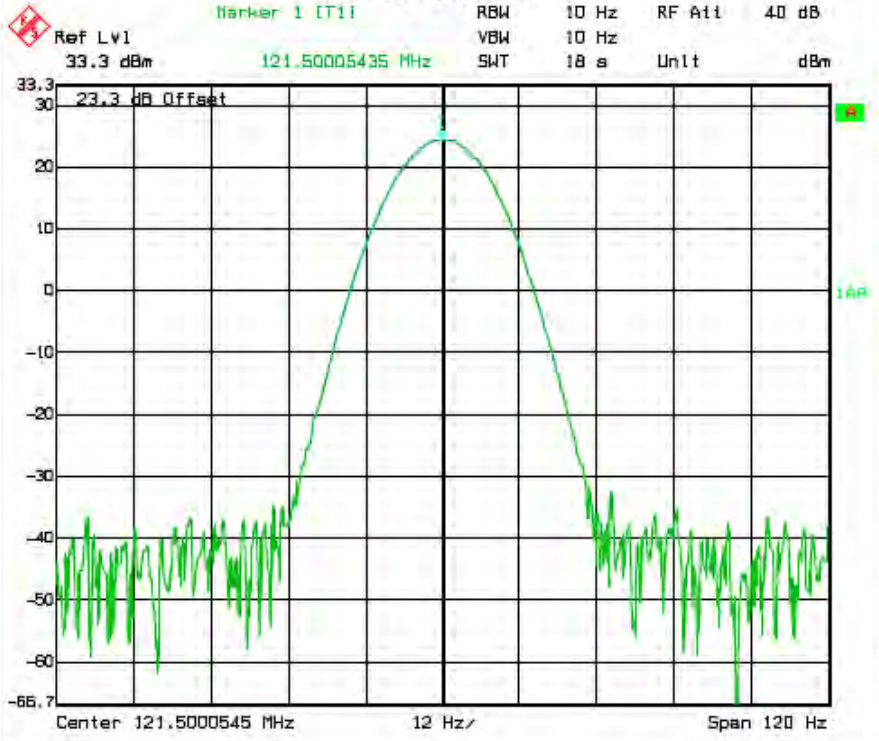


S/N C/S 19

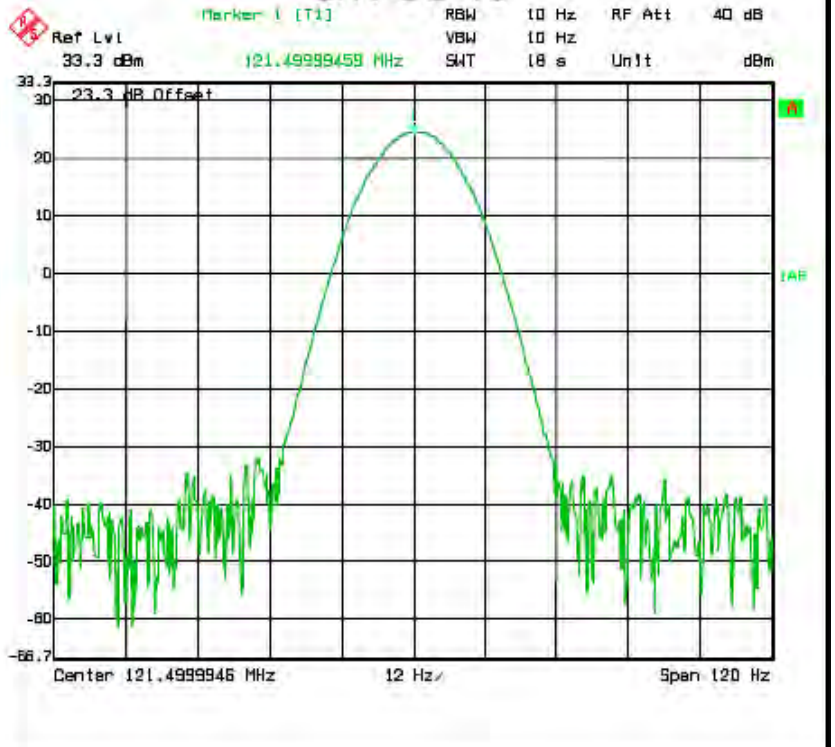


Freq Coherence Test Result @ +55 deg C

S/N CS09



S/N CS 19



4.6 TEST 8 RESULT
COSPAS-SARSAT TYPE APPROVAL TEST (A9.0)
TAC No. 179

TYPE APPROVAL CERTIFICATE

For a 406 Megahertz Distress Beacon for use with the Cospas-Sarsat Satellite System

Certificate Number: 179

Manufacturer: Ameri-King Corporation, USA

Beacon Type: ELT (AF)/(AP)/(S) and PLB

Beacon Model(s): AK-451(AF), AK-451(AP), AK-451(S), AK-451-PLB

Test Laboratory: Intespace, Toulouse, France

Dates of Test: June – October 2006, June – July 2007

Details of the beacon features and battery type are provided overleaf.

The Cospas-Sarsat Council hereby certifies that the 406 MHz Distress Beacon Model identified above is compati with the Cospas-Sarsat System as defined in documents:

C/S T.001 Specification for Cospas-Sarsat 406 MHz Distress Beacon
Issue 4 – Rev. 7, November 2005

C/S T.007 Cospas-Sarsat 406 MHz Distress Beacon Type Approval Standard
Issue 4, November

Date Originally Issued: 24 September 2007

_____

D. Levesque
Head of Cospas-Sarsat Secretariat

NOTE, HOWEVER:

1. This certificate does not authorize the operation or sale of any 406 MHz distress beacon. Such authorization may require type acceptance by national administrations in countries where the beacon will be distributed, and may also be subject to national licensing requirements.

2. This certificate is intended only as a formal notification to the above identified manufacturer that the Cospas-Sarsat Council has determined, on the basis of test data of a beacon submitted by the manufacturer, that 406 MHz distress beacons of the type identified herein meet the standards for use with the Cospas-Sarsat System.

3. Although the manufacturer has formally stated that all beacons identified with the above model name(s) will meet the Cospas-Sarsat specification referenced above, this certificate is not a warranty and Cospas-Sarsat hereby expressly disclaims any and all liability arising out of or in connection with the issuance, use or misuse of the certificate.

4. This certificate is subject to revocation by the Cospas-Sarsat Council should the beacon type for which it is issued cease to meet the Cospas-Sarsat specification. A new certificate may be issued after satisfactory corrective action has been taken and correct performance demonstrated in accordance with the Cospas-Sarsat Type Approval Standard.

5. Cospas-Sarsat type approval testing requirements only address the electrical performance of the beacon at 406 MHz. Conformance of the beacon to operational and environmental requirements is the responsibility of national administrations.

Operating temperature range: -20℃ to +55℃

Operating lifetime: 24 hours

Transmit frequency: 406.028 MHz

Battery details: battery pack of 4 (four) D-type cells:
- Lithium Sulphur Dioxide, SAFT LO26SXC or
- Lithium Manganese Dioxide, SAFT LM33600; or
- Lithium Manganese Dioxide, Ultralife U10014.

Beacon model features:

- 121.5/243 MHz auxiliary radio locating device (100 mW, homer duty cycle 40 %);
- Interface to external navigation device;
- Automatic activation via G-switch [(1)];
- Self-test mode (one burst 520 ms or 440 ms, subject to format flag);
- ELT Remote Unit (P/N 450004) and Remote Audio Buzzer Monitor (P/N 451018) [(1)];
- Approved for use with external aircraft antennae: blade (AK 451.017-3A), rod (AK 451.017-2A) and whip (AK 451.017-1B) [(1)];
- Approved for use with detachable portable whip antenna, AK 451.017-4(S) [(2)].

Approved Beacon Message Protocols: Beacon is approved for encoding with the message protocols indicated with "Yes" and black text below:

USER PROTOCOLS		USER-LOCATION PROTOCOLS		LOCATION PROTOCOLS	
No	Maritime with MMSI	No	Maritime with MMSI	No	Standard Location: EPIRB with MMSI
No	Maritime with Radio Call Sign	No	Maritime with Radio Call Sign	No	Standard Location: EPIRB with Serial Number
No	EPIRB Float Free with Serial Number	No	EPIRB Float Free with Serial Number	**Yes**	**Standard Location: ELT with 24-bit Address**
No	EPIRB Non Float Free with Serial Number	No	EPIRB Non Float Free with Serial Number	**Yes**	**Standard Location: ELT with Aircraft Operator Designator**
No	Radio Call Sign	No	Radio Call Sign	**Yes**	**Standard Location: ELT with Serial Number**
Yes	**Aviation**	**Yes**	**Aviation**	**Yes**	**Standard Location: PLB with Serial Number** [(3)]
Yes	**ELT with Serial Number**	**Yes**	**ELT with Serial Number**	No	National Location: EPIRB
Yes	**ELT with Aircraft Operator and Serial Number**	**Yes**	**ELT with Aircraft Operator and Serial Number**	**Yes**	**National Location: ELT**
Yes	**ELT with Aircraft 24-bit Address**	**Yes**	**ELT with Aircraft 24-bit Address**	**Yes**	**National Location: PLB** [(3)]
Yes	**PLB with Serial Number** [(3)]	**Yes**	**PLB with Serial Number** [(3)]		
Yes	**National (Short Format Message)**				
Yes	**National (Long Format Message)**				

NOTES:
[(1)] applicable only to models AK-451(AF) and AK-451(AP);
[(2)] applicable only to models AK-451(S) and AK-451-PLB;
[(3)] applicable only to model AK-451-PLB.

Database ID: 179-1

TAC Number: 179 **TAC Date:** 24-Sep-07 **TAC Rev Date:**

Beacon Model Name: AK-451

Additional Names: AK-451(AF), AK-451(AP), AK-451(S), AK-451-PLB

Manufacturer: Ameri-King Corporation

Tx Frequencies: 406.028 MHz **In Production:** Yes **Class:** 2

Type:
FF=Float Free ELT(Auto)/ELT(Portable)/ELT(Survival)/PLB **Tested Life: (24 / 48 hrs)** 24

Battery:
Manufacturer (Model, No of Cells) Ultralife U10014 or SAFT LO26SXC or SAFT LM33600, 4 x D-size cells

Protocols Tested: U, UL, NL, SL

Protocol Notes: U=User; UL=User Location; SL=Standard Location; NL=National Location

Self Test: Yes

Self Test RF: Yes **Self Test RF (Short/Long):** Both

Self Test Format Flag: Corresponds to nominal flag **Self Test Consistent with 15 Hex ID:** Yes

Homer Freq: 121.5/243 MHz **Homer Duty Cycle:** 40 %

Homer Power: 100mW

Strobe Light: No **Strobe Brightness:** N/A

Strobe Duty Cycle: N/A

Nav Device: Ext

Nav Device Model: Data protocol for interface to external navigation device: serial 3-wires RS232

Separable Antenna: Yes

Antenna Model: Whip (AK 451.017-1B), Rod (AK 451.017-2A) and Blade (AK 451.017-3A) for use with AK-451(AF) and AK-451(AP); Portable Whip (AK 451.017-4(S) for use with AK-451(S) and AK-451-PLB

Additional Functions: 'G-switch' in AK-451(AF) and AK-451(AP) ; optional ELT Remote Unit (P/N 450004) and optional Remote Audio Buzzer Monitor (P/N 451018) with AK-451(AF) and AK-451(AP)

Comments General: Approved for encoding with National User (long) and National User (short) protocols and all applicable to ELTs and PLBs variants of User, User-Location, Standard Location and National Location protocols

TAC Rev History:

Database ID: 179-1

Cospas-Sarsat 406 MHz Beacon Models Listed by Type Approval Number

Notes:

- For additional information on a specific beacon model select the report hyperlink associated with that model. Multiple reports are provided in cases where the manufacturer produces more than one variant of the same beacon but with different features.
- A particular beacon model may be sold under several different names. All alternative beacon model names provided to the Cospas-Sarsat Secretariat by the beacon manufacturer are listed in the detailed report.
- Some manufacturers use the same beacon model names for beacons with different type approval numbers.
- Cospas-Sarsat Numbers (No.) starting at 700 identify special use beacons. These beacon models are compatible with the Cospas-Sarsat System; however, they do not satisfy all Cospas-Sarsat technical and testing requirements as detailed in Cospas-Sarsat documents C/S T.001 (406 MHz beacon specification) and T.007 (406 MHz beacon type approval standard). Therefore, they have not received a Cospas-Sarsat Type Approval Certificate.
- In the maritime domain, EPIRBs are designated as either float free (FF) or non-float free (Non FF). FF EPIRBs are designed to float away from a sinking vessel and activate automatically, whereas Non FF EPIRBs can only be activated manually.
- In the aviation domain, beacons are designated as either automatic or manual ELTs. Automatic ELTs are designed to be activated automatically using a crash sensor or G-switch, whereas manual ELTs can only be activated by the ELT operator.

Click here for the list of beacon models by manufacturer.

Full Report	C/S No	Beacon Model	Manufacturer	Application
Report	001	Tron 30S	Jotron Electronics A.S.	FF / Non FF EPIRB
Report	002	RT 160M (McMurdo RB406)	McMurdo Ltd.	FF EPIRB
Report	003	BSU 85	ELTA SA	Non FF EPIRB
Report	004	SDT 460 M	Sextant	Non FF EPIRB
Report	005	Kannad 406	SERPE-IESM	Non FF EPIRB
Report	006	SDT 406 A	Sextant	ELT (Auto)
Report	007	Kannad 406 F	SERPE-IESM	FF EPIRB
Report	008	CPT-600M	Caledonian Airborne Systems Ltd.	FF EPIRB
Report	009	BSP 86	ELTA SA	FF EPIRB
Full Report	C/S No	Beacon Model	Manufacturer	Application
Report	010	406 P	Lokata Ltd.	Non FF EPIRB
Report	011	406 M	Lokata Ltd.	Non FF EPIRB
Report	012	406 H	Lokata Ltd.	FF EPIRB
Report	013	Kannad 406 S	SERPE-IESM	Non FF EPIRB
Report	013	Kannad 406 S	SERPE-IESM	Non FF EPIRB

Report	014	Kannad 406 F (Kannad 406 P)	SERPE-IESM	FF EPIRB
Report	014	Kannad 406 F (Kannad 406 P)	SERPE-IESM	FF EPIRB
Report	015	JQE-2A	Japan Radio Co. Ltd.	FF EPIRB
Report	016	M 02	ELTA SA	FF EPIRB
Report	017	RLB-23	ACR Electronics Inc.	FF EPIRB
Report	018	RLB-24	ACR Electronics Inc.	Non FF EPIRB
Report	019	948	The Guest Company Inc.	FF EPIRB
Full Report	**C/S No**	**Beacon Model**	**Manufacturer**	**Application**
Report	020	A06	ELTA SA	ELT (Auto)
Report	020	S06	ELTA SA	ELT (Man)
Report	021	JQE-2A	Japan Radio Co. Ltd.	FF EPIRB
Report	022	Kannad 406 S	SERPE-IESM	Non FF EPIRB
Report	023	Kannad 406 F (Kannad 406 P)	SERPE-IESM	FF EPIRB
Report	024	M 04	ELTA SA	FF EPIRB
Report	025	406 P(Y)	Lokata Ltd.	Non FF EPIRB
Report	026	406 M(Y)	Lokata Ltd.	Non FF EPIRB
Report	027	406 H(Y)	Lokata Ltd.	FF EPIRB
Report	028	RT 161M	McMurdo Ltd.	FF EPIRB
Report	029	948	The Guest Company Inc.	Non FF EPIRB
Full Report	**C/S No**	**Beacon Model**	**Manufacturer**	**Application**
Report	030	JQE-2A	Japan Radio Co. Ltd.	FF EPIRB
Report	031	RT 160	McMurdo Ltd.	Non FF EPIRB
Report	032	RT 161	McMurdo Ltd.	Non FF EPIRB
Report	033	CPT 600N	Caledonian Airborne Systems Ltd.	FF EPIRB
Report	034	MT06	ELTA SA	Non FF EPIRB
Report	035	Kannad 406 FH (Kannad 406 PH)	SERPE-IESM	FF EPIRB
Report	036	ARB-MK	Musson-Exim	FF EPIRB
Report	037	C-2277 (Furuno FSO-400)	Toyo Communication Equipment Co. Ltd.	FF EPIRB
Report	038	L-1000	Nothern Airborne Technology	PLB
Report	039	Kannad 406 S (Kannad 406 SW, Rescuer 406 S)	SERPE-IESM	Non FF EPIRB
Full Report	**C/S No**	**Beacon Model**	**Manufacturer**	**Application**
Report	040	Kannad 406 F (Kannad 406 P, Kannad 406 FW, Kannad 406 PW)	SERPE-IESM	FF EPIRB
Report	041	Kannad 406 FH (Kannad 406 PH or WH, Rescuer 406 P or PW)	SERPE-IESM	FF EPIRB
Report	042	Kannad 406 ATP	SERPE-IESM	ELT (Auto)
Report	043	SATFIND-406 M	Nothern Airborne Technology	FF / Non FF EPIRB
Report	044	H-06	ELTA SA	ELT (Auto)
Report	045	SEVT-406	Bitova Electronic Co.	FF EPIRB
Report	046	ARB-PK	Yaroslavsky Radio Engineering Works	PLB
Report	047	ARB-PK1	Yaroslavsky Radio Engineering Works	PLB
Report	048	ARB-PK10	Yaroslavsky Radio Engineering Works	PLB

Report	049	JQE-2A	Japan Radio Co. Ltd.	FF EPIRB
Full Report	**C/S No**	**Beacon Model**	**Manufacturer**	**Application**
Report	050	Tron 30 S mkII	Jotron Electronics A.S.	FF EPIRB
Report	051	P-07	ELTA SA	PLB
Report	052	ARB-PC	Musson-Exim	PLB
Report	053	LDT 61	McMurdo Ltd.	FF EPIRB
Report	053	LDT 62	McMurdo Ltd.	Non FF EPIRB
Report	054	406 PF(Y)	Lokata Ltd.	Non FF EPIRB
Report	055	Honeywell ECB	Lokata Ltd.	Non FF EPIRB
Report	056	REB-22 (Anristu RJ301A, ZENICAL EP)	Taiyo Musen Co. Ltd.	FF EPIRB
Report	057	952-02	The Guest Company Inc.	Non FF EPIRB
Report	058	Avmar M1-406	Aviation and Marine	FF EPIRB
Report	059	ARB-MKS Afalina	Yaroslavsky Radio Engineering Works	FF EPIRB
Full Report	**C/S No**	**Beacon Model**	**Manufacturer**	**Application**
Report	060	ARB-PKE Excom	Yaroslavsky Radio Engineering Works	PLB
Report	061	ARB-M	Musson-Exim	FF EPIRB
Report	062	Musson-501	Musson-Exim	FF EPIRB
Report	062	Musson-501	Musson-Exim	FF EPIRB
Report	063	406 MH(Y)	Lokata Ltd.	FF EPIRB
Report	064	406 M(Y)E	Lokata Ltd.	Non FF EPIRB
Report	065	406 MH(Y)E	Lokata Ltd.	FF EPIRB
Report	066	Tron 30 S mkII	Jotron Electronics A.S.	FF EPIRB
Report	067	ELT 110-406 (ELT B406-1)	Artex Inc.	ELT (Auto)
Report	068	COSPAS-ARB-MK1	Musson-Exim	FF EPIRB
Report	069	M-05 Sealife	ELTA SA	FF EPIRB
Report	069	M-05 Sealife	ELTA SA	FF EPIRB
Full Report	**C/S No**	**Beacon Model**	**Manufacturer**	**Application**
Report	070	RT 260M (Newcom NC-270, Tellumat PT 280A, McMurdo MCM 406A)	McMurdo Ltd.	FF EPIRB
Report	071	SATFIND-406 Pocket PLB	Northern Airborne Technology Ltd.	PLB
Report	072	RT260 (Newcom NC-270A, Tellumat PT 280-M, McMurdo MCM 406M)	McMurdo Ltd.	Non FF EPIRB
Report	073	952-01	The Guest Company Inc.	FF EPIRB
Report	074	ELT 96	Air Precision	ELT (Auto)
Report	074	ELT 96 S	Air Precision	ELT (Man)
Report	074	ELT 97	Air Precision	ELT (Auto)
Report	075	406-2A (406-2AH)	Lokata Ltd.	FF EPIRB
Report	075	406-2M	Lokata Ltd.	Non FF EPIRB
Report	076	952-21 (952-25)	Litton Special Devices	ELT (Auto)
Report	076	952-23	Litton Special Devices	ELT (Man)
Report	077	TP 2	Skanti	FF EPIRB
Report	077	TP 2	Skanti	FF EPIRB
Report	078	SATFIND-406 Survival EPIRB	Northern Airborne Technology Ltd.	FF / Non FF EPIRB

Report	079	MO56	ELTA SA	FF EPIRB
Full Report	**C/S No**	**Beacon Model**	**Manufacturer**	**Application**
Report	080	JQE-3A	Japan Radio Co. Ltd.	FF EPIRB
Report	080	JQE-3A-J	Japan Radio Co. Ltd.	FF EPIRB
Report	081	ENASAT-406 A	ENA Telecomunicaciones S.A.	FF EPIRB
Report	081	ENASAT-406 M	ENA Telecomunicaciones S.A.	Non FF EPIRB
Report	082	RLB 23E1	ACR Electronics Inc.	FF EPIRB
Report	083	RLB-27 (Satellite 406)	ACR Electronics Inc.	FF EPIRB
Report	083	RLB-27 (Satellite 406)	ACR Electronics Inc.	FF EPIRB
Report	084	RLB-28 (Satellite 406)	ACR Electronics Inc.	Non FF EPIRB
Report	084	RLB-28 (Satellite 406)	ACR Electronics Inc.	Non FF EPIRB
Report	085	Locat LDT61A	McMurdo Ltd.	FF EPIRB
Report	085	Locat LDT62A	McMurdo Ltd.	Non FF EPIRB
Report	086	REB-23-01 (Anritsu RJ302A, ZENICALL-F)	Taiyo Musen Co Ltd	FF EPIRB
Report	086	REB-23-02	Taiyo Musen Co Ltd	Non FF EPIRB
Report	087	REB-24	Taiyo Musen Co Ltd	Non FF EPIRB
Report	088	RESCU 406	Honeywell Aerospace Canada	ELT (Man)
Report	089	P076	ELTA SA	PLB
Full Report	**C/S No**	**Beacon Model**	**Manufacturer**	**Application**
Report	090	ADELT CPT 609	Caledonian Airborne Systems Ltd.	ELT (Auto)
Report	091	Kannad 406 ATP	SERPE-IESM	ELT (Auto)
Report	091	Kannad 406 ATP-M	SERPE-IESM	ELT (Auto)
Report	092	Kannad 406 m	SERPE-IESM	PLB / Non FF EPIRB
Report	092	Kannad 406 m	SERPE-IESM	PLB / Non FF EPIRB
Report	093	SATFIND-406 ELT Model A-1000	Northern Airborne Technology Ltd.	ELT (Auto)
Report	094	EB-10	Saracom Co. Ltd.	FF EPIRB
Report	095	TRON 40S	Jotron Electronics A.S.	FF EPIRB
Report	096	SM-511	State Designer's Bureau of Radio-communication	FF EPIRB
Report	097	ELT503-1	Techtest Limited	ELT (Auto)
Report	097	ELT503-3 (ELT503-11)	Techtest Limited	ELT (Auto)
Report	098	TRON 45 SX	Jotron Electronics A.S.	Non FF EPIRB
Report	099	TRON 45 S	Jotron Electronics A.S.	Non FF EPIRB
Full Report	**C/S No**	**Beacon Model**	**Manufacturer**	**Application**
Report	100	639 SIU	BAE Systems Integrated System Technologies	FF EPIRB
Report	101	Kannad 406 XS	SERPE-IESM	Non FF EPIRB / ELT (Man) / PLB
Report	102	SATFIND-406 GPIRB	Northern Airborne Technology Ltd	FF EPIRB
Report	103	ELT503-12	Techtest Limited	ELT (Man)
Report	103	ELT503-2 (ELT503-8)	Techtest Limited	ELT (Auto)
Report	103	PLB500-4 (PLB500-20)	Techtest Limited	PLB
Report	104	ELT 110-406 NAV (110-406 HM NAV , B406-2NAV, 110-406ED NAV)	Artex Inc.	ELT (Auto)
Report	105	Kannad 406 AP (Kannad 406 AF, Kannad 406 AF-H)	SERPE-IESM	ELT (Auto)

Report	105	Kannad 406 AS (Kannad 406 Survival)	SERPE-IESM	ELT (Man)
Report	105	Kannad 406 AP (Amdt G or higher), Kannad 406 AF (Amdt G or higher), Kannad 406 AF-H (Amdt G or higher), Kannad 406 AP-H (Amdt A or higher)	Martec Serpe-Iesm	ELT (Auto)
Report	105	Kannad 406 AS (Amdt F or higher), Kannad 406 Survival (Amdt B or higher)	Martec Serpe-Iesm	ELT (Man)
Report	105	Kannad 406 $ATP_{TAC\ 105}$	Martec Serpe-Iesm	ELT(Auto)/ELT(Portable)
Report	106	E3a (SOS Rescue 406a, Sea 406a, Sailor 406a)	McMurdo Ltd.	FF EPIRB
Report	106	E3c (SOS Rescue 406c, Sea 406c, Sailor 406c)	McMurdo Ltd.	Non FF EPIRB
Report	106	E3m (SOS Rescue 406m, Sea 406m, Sailor 406m)	McMurdo Ltd.	Non FF EPIRB
Report	107	RLB-32 (Satellite 2)	ACR Electronics Inc.	FF EPIRB
Report	108	RLB-33 (RapidFix)	ACR Electronics Inc.	FF EPIRB
Report	109	PLB-100 (GyPSI 406)	ACR Electronics Inc.	PLB
Report	109	RLB-100	ACR Electronics Inc.	Non FF EPIRB
Full Report	**C/S No**	**Beacon Model**	**Manufacturer**	**Application**
Report	110	MBT-040600	Microwave Monolithics Inc.	PLB
Report	110	MBT-040600D	Microwave Monolithics Inc.	PLB
Report	110	MBT-040600-48	Microwave Monolithics Inc.	PLB
Report	110	MBT-040600D-48	Microwave Monolithics Inc.	PLB
Report	111	500-12	Techtest Limited	ELT (Auto) / PLB
Report	111	500-27	Techtest Limited	ELT (Man) / PLB
Report	111	500-27PELS	Techtest Limited	ELT (Man) / PLB
Report	112	C406-1 (C406-1HM)	Artex Inc.	ELT (Auto)
Report	112	C406-2 (C406-2HM)	Artex Inc.	ELT (Auto)
Report	112	B406-4	Artex Inc.	ELT (Auto)
Report	112	G406-4	Artex Inc.	ELT (Auto)
Report	113	MBT-040600A	Microwave Monolithics Inc.	PLB
Report	113	MBT-040600A-48	Microwave Monolithics Inc.	PLB
Report	114	MBT-040600B	Microwave Monolithics Inc.	PLB
Report	114	MBT-040600E	Microwave Monolithics Inc.	PLB
Report	114	MBT-040600B-48	Microwave Monolithics Inc.	PLB
Report	114	MBT-040600E-48	Microwave Monolithics Inc.	PLB
Report	115	MBT-040600C	Microwave Monolithics Inc.	PLB
Report	115	MBT-040600C-48	Microwave Monolithics Inc.	PLB
Report	116	T-1630/SRT Buoy Tx SEPIRB	Ultra Electronics Ocean Systems	Non FF EPIRB
Report	117	SEP-406	Samyung Electronic Company Ltd.	FF EPIRB
Report	118	SERB MkII	ADI Limited	Non FF EPIRB

Report	119	G4a (SOS Precision 406a, Sailor GPS 406a)	McMurdo Ltd.	FF EPIRB
Report	119	G4c (SOS Precision 406c, Sailor GPS 406c)	McMurdo Ltd.	Non FF EPIRB
Report	119	G4m (SOS Precision 406m, Sailor GPS 406m)	McMurdo Ltd.	Non FF EPIRB
Full Report	**C/S No**	**Beacon Model**	**Manufacturer**	**Application**
Report	120	A 1500 SATFIND-406 ELT	Northern Airborne Technology Ltd.	ELT
Report	121	BAU-35	DRS Data and Imaging Systems	ELT (Auto)
Report	121	BAU-35A	DRS Data and Imaging Systems	ELT (Auto)
Report	122	TRON 40 GPS	Jotron Electronics A.S.	FF EPIRB
Report	123	PROFIND 406 (Satfind 406 PRO)	Seimac Limited	FF EPIRB
Report	124	RESCU 406AF	Honeywell Aerospace Canada	ELT (Auto)
Report	125	ARM-406 AC1	FUSE ISDE	ELT (Man)
Report	126	G406-1	Artex Inc.	ELT (Auto)
Report	126	G406-2	Artex Inc.	ELT (Auto)
Report	127	RLB35	ACR Electronics Inc.	FF EPIRB
Report	128	SARBE10-I286	Signature Industries Limited	Non FF EPIRB
Report	129	Fastfind Plus	McMurdo Ltd.	PLB
Report	129	Fastfind Plus	McMurdo Ltd.	PLB / Non FF EPIRB
Report	129	Fastfind	McMurdo Ltd.	PLB
Report	129	Fastfind	McMurdo Ltd.	PLB/Non FF EPIRB
Full Report	**C/S No**	**Beacon Model**	**Manufacturer**	**Application**
Report	130	ARM-406 P	FUSE ISDE	ELT (Auto)
Report	130	ARM-406 P1	FUSE ISDE	ELT (Auto)
Report	131	ADT406 AF/AP	ELTA SA	ELT (Auto)
Report	131	ADT 406² AF/AP	ELTA SA	ELT (Auto)
Report	132	MR 509/1	Becker Flugfunkwerk GmbH	PLB
Report	133	SRB-406	DME Corporation	ELT (Auto)
Report	134	EMS 406-1	EMS Technologies Canada	ELT (Auto)
Report	135	C406-N	Artex Inc.	ELT (Auto)
Report	135	C406-N HM	Artex Inc.	ELT (Auto)
Report	136	RLB35	ACR Electronics Inc.	FF EPIRB
Report	136	RLB35MC	ACR Electronics Inc.	FF EPIRB
Report	137	SEEPIRB 406	Thales Underwater Systems Limited	Non FF EPIRB
Report	138	Kannad 406 XS-2 GPS	SERPE-IESM	PLB
Report	138	Kannad 406 XS-2	SERPE-IESM	PLB
Report	139	MT400	STANDARD COMMUNICATIONS PTY LTD	Non FF EPIRB
Report	139	MT401	STANDARD COMMUNICATIONS PTY LTD	Non FF EPIRB
Report	139	MT401 FF	STANDARD COMMUNICATIONS PTY LTD	FF EPIRB
Full Report	**C/S No**	**Beacon Model**	**Manufacturer**	**Application**
Report	140	MP-406	Musson-Morsviaz-Servis	FF EPIRB
Report	141	RLB-33S	ACR	SSAS
Report	142	BE369/406	Signature Industries	Non FF EPIRB
Report	143	PLB 200	ACR	PLB
Report	144	PLB 201	ACR	PLB

Report	145	ARB M-406	Yaroslavsky Radio Engineering Works	FF EPIRB
Report	146	EMS SSAS	EMS Technologies Canada	SSAS
Report	147	Fernau 2100	Fernau Avionics Ltd.	PLB
Report	147	Fernau 2200	Fernau Avionics Ltd.	PLB
Report	147	Fernau 2100B	Fernau Avionics Ltd.	PLB
Report	147	Fernau 2200B	Fernau Avionics Ltd.	PLB
Report	148	SLB-1000	Seimac Limited	ELT(s)/PLB
Report	148	SLB-1000-200	Seimac Limited	ELT(s)/PLB
Report	148	SLB-1000-210 (SLB 406)	Seimac Limited	ELT(s)/PLB
Report	149	Kannad 406 GPS PRO	SERPE-IESM	FF EPIRB
Report	149	Kannad 406 SVW GPS	SERPE-IESM	Non FF EPIRB
Report	149	Kannad 406 SV GPS	SERPE-IESM	Non FF EPIRB
Full Report	**C/S No**	**Beacon Model**	**Manufacturer**	**Application**
Report	150	RB6	Kinetic Technologies International Pty Ltd.	Non FF EPIRB
Report	151	Kannad 406 PRO	SERPE-IESM	FF EPIRB
Report	151	Kannad 406 SVW	SERPE-IESM	Non FF EPIRB
Report	151	Kannad 406 SV	SERPE-IESM	Non FF EPIRB
Report	152	ME406	Artex Inc.	ELT (Auto)
Report	152	ME406 HM	Artex Inc.	ELT (Auto)
Report	152	ME406P	Artex Inc.	ELT (Auto) ELT (Portable)
Report	153	ADT 406 S	ELTA SA	ELT (Survival)
Report	154	CPT-900	Caledonian Airborne System	ELT (Auto)
Report	155	Tron S-VDR Capsule	Jotron A.S.	FF EPIRB
Report	155	L-3 FFSVR	Jotron A.S.	FF EPIRB
Report	156	PLB 200	ACR Electronics Inc.	PLB
Report	157	PLB 201	ACR Electronics Inc.	PLB
Report	158	AVMM ELT S-406	Musson Marine Ltd.	ELT (Man) - Survival
Report	159	SARBE G2R ELT (SARBE 8 ELT CSAR +406)	Signature Industries Ltd.	ELT
Full Report	**C/S No**	**Beacon Model**	**Manufacturer**	**Application**
Report	160	navtec global-C plus	Navtec GmbH	FF EPIRB
Report	161	Marlin-406 (Marlin-406 A2)	Kolgrim-Don Ltd.	FF EPIRB
Report	162	Kannad Auto GPS	Martec Serpe-Iesm	FF EPIRB
Report	162	Kannad Auto	Martec Serpe-Iesm	FF EPIRB
Report	162	Kannad Manual + GPS	Martec Serpe-Iesm	Non FF EPIRB
Report	162	Kannad Manual +	Martec Serpe-Iesm	Non FF EPIRB
Report	162	Kannad Manual GPS	Martec Serpe-Iesm	Non FF EPIRB
Report	162	Kannad Manual	Martec Serpe-Iesm	Non FF EPIRB
Report	163	G5 Smartfind Plus (a) & (m) (SGE406-II (a) & (m), EG50:AUTO & EG50: MAN)	McMurdo Ltd.	FF/Non FF EPIRB
Report	163	E5 Smartfind (a) & (m) (SE406-II (a) & (m), EP50:AUTO & EP50: MAN)	McMurdo Ltd.	FF/Non FF EPIRB

Report	164	TEB-700 (JQE-103, ZENICALL G)	Taiyo Musen Co. Ltd.	FF EPIRB
Report	164	TEB-720	Taiyo Musen Co. Ltd.	Non FF EPIRB
Report	165	C1 S-VDR Float Free Capsule (VR-3000S Float Free DRU, Model VR-3030 ; VDR-A16 Float Free CSM, Model VDR-A16)	McMurdo Ltd.	FF EPIRB
Report	166	MR 109	Becker Electronics Taiwan Ltd.	PLB
Report	167	Kannad 406 AF-Compact	Martec Serpe-Iesm	ELT (Auto)
Report	168	EBC-406	Emergency Beacon Corp. (EBC)	ELT(Auto) / ELT(Portable)
Report	168	EBC-406H	Emergency Beacon Corp. (EBC)	ELT(Auto) / ELT(Portable)
Report	169	PLB 300	ACR Electronics Inc.	PLB
Report	170	C406-1 (C406-1HM)	Artex Inc.	ELT (Auto)
Report	170	C406-2/B406-4/G406-4 (C406-2HM)	Artex Inc.	ELT (Auto)
Report	171	RESCU 406 AFN	Honeywell ASCa Inc.	ELT (Auto)
Report	172	PRO-5	URANIS Ltd	FF EPIRB
Report	173	RLB35	ACR Electronics Inc.	FF EPIRB
Report	173	RLB35MC	ACR Electronics Inc.	FF EPIRB
Report	174	PLB200	ACR Electronics Inc.	PLB
Report	175	SARBE 7-406	Signature Industries Limited	PLB
Report	175	SARBE 7-406G	Signature Industries Limited	PLB
Report	176	MT410	STANDARD COMMUNICATIONS PTY LTD	PLB
Report	176	MT410G	STANDARD COMMUNICATIONS PTY LTD	PLB
Report	177	PARM-406	FUSE ISDE	PLB
Report	178	MRB 406	SALCOM	Non FF EPIRB
Report	179	AK-451 (AK-451(AF), AK-451(AP), AK-451 (S), AK-451-PLB)	Ameri-King Corporation	ELT(Auto)/ELT(Portable)/ ELT(Survival)/PLB

Special Use Beacons

Full Report	C/S No	Beacon Model	Manufacturer	Application
Report	701	MR 509	Becker Flugfunkwerk GmbH	PLB
Report	702	AF/PRC-807 Warrendi	BAE Systems Australia Ltd.	PLB
Report	703	AN-PRC-149	Tadiran Spectralink Ltd.	PLB
Report	704	Warrendi Model AF/ PRC-807A	BAE Systems Australia Ltd.	PLB
Report	705	AN/URT-140	Tadiran Spectralink Ltd.	ELT(Auto)/PLB
Report	706	SARBE G2R	Signature Industries	PLB
Report	707	NH90 RBA	EADS Deutschland GmbH	ELT (Auto)
Report	708	AN/PRC-112G	General Dynamics C4 Systems	PLB
Report	709	SARBE 6-406G (SARBE 7-V406G)	Signature Industries	PLB
Report	709	SARBE 6-406 (SARBE 7-V406)	Signature Industries Limited	PLB

[Contact Us | Related Sites | Location]

700 de la Gauchetière West, Suite 2450, Montreal (Quebec) H3B 5M2
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4.7 TEST 8 RESULT
COSPAS-SARSAT TYPE APPROVAL TEST REPORT

Intespace C/S Test Report of 406 MHz Distress Beacon

Document No. Ref: E6557-CS

Toulouse, 25 january 2007

INTESPACE reference : E6557-CS

C/S T.A. TEST REPORT OF 406 MHz DISTRESS BEACON

MANUFACTURER :	Ameri-King Corp.
BEACON MODEL :	AK-451 ()Series ELT (AF)(AP)(S) & PLB

Written : 25 January 2007
By : Gerard PEYROU
Visa :

Approved :
By : Paul Eric DUPUIS
Visa :

Quality Control :
By : André LOUIT
Visa :

Distribution :

- Mr	Keith VAN	Ameri-King Corp.	(1 copy)
- Mr	Dany St PIERRE	COSPAS/SARSAT Sec	(1 copy)
- INTESPACE		ITS/EQ (RLS)	(1 copy)

1 - ADMINISTRATION

1.1. WORK ORDER

Manufacturer : Ameri-King Corp.
Address : 17881 Sampson Ln. Huntington Beach,
CA 92647, USA

Represented by : Mr Keith VAN

1.2. INTESPACE TEST CENTER

The test operations have been conducted by :
Gerard PEYROU

1.3. SCHEDULE

Start of test: 19 juin 2006
End of test : 25 octobre 2006

1.4. WORK REFERENCE : **E6557-CS**

1.5. EQUIPMENT UNDER TEST

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

- Commercial designation AK-451() Series
- Model : ELT (AF)(AP)(S) & PLB
- Sérial number:

	C/S Test Type
- BUT1 : C/S 09	Main Electrical & Temperature
- BUT2 : C/S 07	Additional Electrical and Satellite
- BUT3 : C/S 08	Antenna Tests

- Batteries:

- AK 450 0010-1A: Ulrtalife U10014 (LiMnO	Main Electrical & Temperature
- AK 450 0010-2A: Saft L0263XC ($LiSO_{2)}$	Additional Battery Tests
- AK 450 0010-3A: Saft LM33600 ($LiMnO_{2)}$	Additional Battery Tests

- Antennas:

Ameri-King Ref	AUT
- AK 450 0017-1	Whip (AP)
- AK 450 0017-2	Rod (AF)
- AK 450 0017-3	Blade (AF)
- AK 450 0017-4	Whip (S) (PLB)

2 - TEST FACILITIES

- ARGOS - COSPAS/SARSAT Certification Test Bench.
- Anechoic chamber for antenna test .
- Toulouse CNES MCC .

3 - STANDARDS AND TEST PROCEDURES APPLICABLE

COSPAS-SARSAT standards :

- "C/S T. 001- Issue 4 - Revision 7 - November 2005 "
- "C/S T. 007- Issue 4 - November 2005"

INTESPACE Radio Beacon Test Procédures :

- " COSPAS-SARSAT Certification Test"	Réf. ITS : 572 AP/QA
- " 406 MHz Caracteristic Antenna Test "	Réf. ITS : 566 AP/QA
- " Radio Beacon Test Report "	Réf. ITS : 579 AP/QA-f

Note: For the Operating Life Test at the minimum temperature we have used directly fresh battery packs. The manufacturer equivalent runtime calculation of the battery packs capacity depletion during the beacon ra has been removed from the total beacon operating lifetime test result.

4 - RESULTS

See the following pages :

- ANNEX G : Application form for a COSPAS-SARSAT 406 MHz beacon Type Approval Certificate,
- Table C2-1 Summary of 406 MHz beacon test results (Main Program Tests - Ultralife U10014 $LiMO_2$ Battery pack)
- Table C2-2 Summary of 406 MHz beacon test results (Alternative Battery Tests - Saft LO263XC $LiSO_2$ Battery pack)
- Table C2-3 Summary of 406 MHz beacon test results (Alternative Battery Tests - Saft LM33600 ($LiMnO_2$) Battery pa
- Test results : data and graphs
- Annex A : Antenna Test Report
- Annex B : Satellite Qualitative Test Report
- Annex C : Saft LO263XC ($LiSO_2$) Alternative Battery Test Report
- Annex D : Saft LM33600 ($LiMnO_2$) Alternative Battery Test Report
- Annex E : Tables F-C & F-D ~ Navigation System Test Results & Beacon Coding Software Test Results
- Annex F : Manufacturer documentation and technical data

ANNEX G

APPLICATION FOR A COSPAS - SARSAT 406 MHz BEACON TYPE APPROVAL CERTIFICATE

G.1 INFORMATION PROVIDED BY THE BEACON MANUFACTUREUR

Beacon Manufacturer and Beacon Model

Beacon Manufacturer	AMERI-KING CORPORATION
Beacon Model	AK-451-( ) SERIES

Beacon Type and Operational Configurations

Beacon Type	Beacon used while:	Tick where appropriate
EPIRB	Floating in water or on deck or in a safety raft	
PLB	On ground and above ground	√
	On ground and above ground and floating in water	
ELT Survival	On ground and above ground	√
	On ground and above ground and floating in water	
ELT Auto Fixed	Fixed ELT with aircraft external antenna	√
ELT Auto Portable	In aircraft with an external antenna	√
	On ground, above ground, or in a safety raft with an integrated antenna	
ELT Auto Deployable	Deployable ELT with attached antenna	
Other (specify)		

Beacon Characteristics

Characteristic	Specification
Operating temperature range	Tmin = ____-20 C_____ Tmax= _____+55 C_____
Operating lifetime	_____50_____hours
Battery chemistry	Li-Mn_2 , $LiS0_2$
Battery cell size and number of cells	D-size, 4 cells
Battery manufacturer	UltraLife, SAFT
Battery pack manufacturer and part number	Ultra Life U10014, Saft L026SXC, Saft LM33600
Oscillator type (e.g. OCXO, MCXO, TCXO)	OCXO
Oscillator manufacturer	TES ELECTRONIC SOLUTIONS
Oscillator part name and number	EWOS 2520
Oscillator satisfies long-term frequency stability requirements (Yes or No)	YES
Antenna type (Integrated or External)	EXTERNAL
Antenna manufacturer	AMERI-KING CORPORATION
Antenna part name and number	WHIP ANT 451017-1 / ROD ANT 451017-2 BLADE ANT 451017-3 / PORTABLE ANT 451017-4
Navigation device type (Internal, External or None)	EXTERNAL
Features in beacon that prevent degradation to 406 MHz signal or beacon lifetime resulting from a failure of navigation device or failure to acquire position data (Yes, No, or N/A)	YES
Features in beacon that ensures erroneous position data is encoded into the beacon message (Yes, No or N/A)	YES
Navigation device capable of supporting global coverage (Yes, No or N/A)	YES

Characteristic	Specification
For Internal Navigation Devices	
• Geodetic reference system (WGS 84 or GTRF)	
• GNSS receiver cold start forced at every beacon activation (Yes or No)	
• Navigation device manufacturer	
• Navigation device model name and part Number	
• GNSS system supported (e.g. GPS, GLONASS, Galileo)	
For External Navigation Devices	
• Data protocol for GNSS receiver to beacon interface	RS232 SERIAL DATA
• Physical interface for beacon to navigation device	SERIAL 3 WIRES RS232
• Electrical interface for beacon to navigation device	+/- 12 VOLT
• Navigation device model and manufacturer (if beacon designed to use specific devices)	GARMIN, HONEYWELL, TRIMBLE, IIMORROW, ARNAV, ETC.
Self-Test Mode Characteristics	
• Self-test has separate switch position (Yes or No)	YES
• Self-test switch automatically returns to normal position when released (Yes or No)	YES
• Self-test activation can cause an operational mode transmission (Yes or No)	NO
• Self-test causes a single beacon self-test message burst only regardless of how long the self-test activation mechanism applied (Yes or No)	YES
• Results of self-test indicated by (e.g. Pass / Fail Indicator Light, Strobe Light, etc.)	LED LIGHT EXTINGUISHED : PASS LED LIGHT FLASHES : FAIL
• Self-test can be activated from beacon remote activation points (Yes or No)	NO

Characteristic	Specification
• Self-test performs an internal check and indicates that RF power emitted at 406 MHz and 121.5 MHz if beacon includes a 121.5 MHz homer (Yes or No)	YES
• Self-test transmits a signal(s) other than at 406 MHz (Yes & details or No)	NO
• Self-test can be activated directly at beacon (Yes or No)	YES
• List of Items checked by self-test	
• Self-test transmission burst duration (440 or 520 ms)	440 / 520 ms
• Self-test format bit ("0" or "1")	0
Beacon includes a homer transmitter (if yes identify frequency of transmission)	121.5 MHz
• -Homer Transmit Power	23 dBm
• -Homer Duty Cycle %	40%
• -Duty Cycle of Homer Swept Tone	33-55%
Beacon includes a strobe light (Yes or No)	NO
• Strobe light intensity	
• Strobe light flash rate	
Beacon transmission repetition period satisfies C/S T.001 requirement that two beacon's repetition periods are not synchronised closer than a few seconds over 5 minute period, and the time intervals between transmissions are randomly distributed on the interval 47.5 to 52.5 seconds (Yes or No)	YES
Other ancillary devices (e.g. voice transceiver). List details on a separate sheet if insufficient space to describe.	NO
Beacon includes automatic activation mechanism (Yes or No)	YES

Dated: 07/07/06

Signed: KEITH VAN, ENGINEERING MANAGER, AMERI-KING CORP

(Name, Position and Signature of Beacon Manufacturer Representative)

G.2 INFORMATION PROVIDED BY THE COSPAS-SARSAT ACEPTED TEST FACILITY

Name and Location of Beacon Test Facilit INTESPACE LABORATORY, TOULOUSE, FRANCE

Date of submission for Testing: 19 June 2006

Applicable C/S Standards:

Document	Issue	Revision
C/S T.001	3	7
C/S T.007	4	

I hereby confirm that the 406 MHz beacon described above has been successfully tested in accordance with the COSPAS-SARSAT 406 MHz Beacon Type Approval Standard (C/S T.007) and complies with the Specification for Cospas-Sarsat 406 MHz Distress Beacons (C/S T.001) as demonstrated in the attached report.

Dated : 25 january 2007 Signed :

Gérard PEYROU
Intespace Distress Beacon Test Responsible

PARAMÈTRES TO BE MEASURED DURING TESTS		RANGE OF SPECIFICATION	UNITS	TEST RESULTS			COMMENTS
				$T_{min.}$ -20°C (±3)	$T_{amb.}$ 22°C (±3)	$T_{max.}$ 55°C (±3)	
1 - POWER OUTPUT							
o transmitter power output		35 - 39	dBm	36,3	36,1	35,7	
o Power output rise time		< 5	ms	0,08	0,07	0,07	Graphs p, 34, 37 and 40
o power output 1 ms before burst		< -10 dBm	√ *	√	√	√	Graphs pages 28 to 30
2 - DIGITAL MESSAGE	Bits number						Data and graphs pages 31 to 40
o bit sync	1-15	15 bits "1"	√	√	√	√	
o frame sync	16-24	9 bits (000101111)	√	√	√	√	
o format flag	25	1 bit	√	1	1	1	
o protocol flag	26	1 bit	√	1	1	1	
o identification/position code	27-85	59 bits	√	√	√	√	
o BCH code	86-106	21 bits	√	√	√	√	
o emerg. code/nat. use/supplem. data	107-112	6 bits	data bits	000101	000101	000101	
o additional data/BCH (if applicable)	113-144	32 bits	√	√	√	√	
o position error (if applicable)		< 5	km	3,055 km	3,055 km	3,055 km	

PARAMÈTRES TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS			COMMENTS
			$T_{min.}$ -20°C (±3)	$T_{amb.}$ 22°C (±3)	$T_{max.}$ 55°C (±3)	
3 - DIGITAL MESSAGE GENERATOR						Data and graphs pages 31 to 40
o repetition rate T_R :						
average T_R =	48,5 - 51,5	seconds	50,22	50,22	50,22	
minimum T_R =	$47,5 \leq T_R \leq 48,0$	seconds	48,00	48,00	48,00	
maximum T_R =	$52,0 \leq T_R \leq 52,5$	seconds	52,00	52,00	52,01	
standard deviation =	0,5 - 2,0		1,31	1,31	1,32	
o bit rate						
minimum f_b =	396	bits/sec.	399,75	399,78	399,75	
maximum f_b =	404	bits/sec.	399,85	399,82	399,81	
o total transmission time :						
short message =	435.6 - 444.4	ms				
long message =	514.8 - 525.2	ms	520,39	520,36	520,34	
o unmodulated carrier						
minimum T_1 =	158,4	ms	159,85	159,83	159,79	
maximum T_1 =	161,6	ms	159,87	159,85	159,82	
o first burst delay	> 47,5	seconds	≥ 50	≥ 50	≥ 50	