

**PUBLIC ENTERPRISE TESTING CENTER «OMEGA»**

**Approved by**

**Director**

**PE TC "OMEGA"**

**Belikov N.I.**



**Report on**

**COSPAS-SARSAT 406 MHz Emergency Beacon Testing  
of the Ocean Signal Ltd.  
Emergency Position Indicating Radio Beacon (EPIRB)  
model EPIRB1  
in accordance with C/S T.007**

**Report Nr. : 14/171**

**Issue : 3**

**Date of Issue : August 06, 2014**

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<b>Accreditations:</b>	COSPAS-SARSAT Secretariat Reference No. CS497/F530 dated 21/09/1994
	National Accreditation Agency of Ukraine Certificate of accreditation for compliance DSTU ISO 17025:2006 No. 2H339 valid until 17.05.2019
	Letter of FCC acceptance #181479 dated July 24, 2014
	IC registration of 3/10m OATS #8780A-1 dated May 29, 2013
	IC registration of 3m alternative test site #8780A-2 dated May 29, 2013
	BABT Certificate of Recognition testing laboratory No.LAB/033 dated 30.06.2013 valid until 30.06.2015
	Letter of USCG Acceptance for testing EPIRBs #16714/161.011/OMEGA dated February 7, 2008
	Accreditation certificate No. AAC.T.00130 dated 28.10.2011 valid until 28.10.2014 issued by AAC "Analitica", Full Member and Signatory to ILAC and APLAC Mutual Recognitions Arrangements ( <a href="http://www.aac-analitica.ru">www.aac-analitica.ru</a> )

**Report on:** Emergency Position Indicating Radio Beacon (EPIRB)  
model EPIRB1

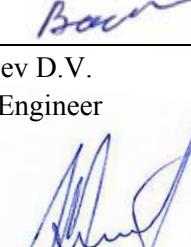
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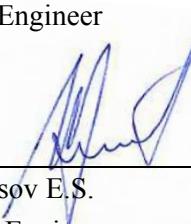
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**Date of Issue:** August 06, 2014  
**Submitted for testing:** February 17, 2014  
**Dates of testing:** Start of tests: February 17, 2014  
End of tests: June 10, 2014

*The results of this report shall be applied only to the tested samples*  
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## History of the Report Issue/revisions

Report Nr – Issue Nr. or Revision Nr.	Date of Issue	Reasons for re-issue
14/171 - Issue 1	May 16, 2014	The initial issue.
14/171 - Issue 2	June 11, 2014	<p>Beacon model changed.</p> <p>Updated beacon manufacturer's documents:</p> <ul style="list-style-type: none"> <li>Application form (Annex G).</li> <li>Quality Assurance Plan (Annex L).</li> <li>Photos of the beacon.</li> <li>List and analysis of operating modes.</li> <li>GNSS Operation description.</li> <li>EPIRB1 Technical Data Sheet.</li> <li>Cell and Battery Data.</li> <li>Beacon Labelling.</li> <li>Technical Data for TCXO.</li> <li>User Manual.</li> <li>Compliance statements.</li> <li>Software compliance statement.</li> <li>Check-list of technical information.</li> </ul> <p>Amended:</p> <ul style="list-style-type: none"> <li>Operating lifetime calculations.</li> </ul> <p>Corrected:</p> <ul style="list-style-type: none"> <li>FTA Table A-1.</li> </ul> <p>Added:</p> <ul style="list-style-type: none"> <li>TCXO data for 12.5 years oscillator ageing.</li> <li>Measurements of the operating currents when the beacon water activated</li> </ul>
14/171 - Issue 3	August 06, 2014	<p>Amended:</p> <ul style="list-style-type: none"> <li>Table F.1, parameter 10.</li> <li>Table F-E.2.</li> <li>Operating lifetime calculations.</li> </ul> <p>Excluded:</p> <ul style="list-style-type: none"> <li>TCXO manufacturer's MTS ageing data for 10 years and 12.5 years.</li> </ul> <p>Updated beacon manufacturer's documents:</p> <ul style="list-style-type: none"> <li>List and analysis of operating modes.</li> <li>Pre-test discharge data and analysis.</li> <li>GNSS Operation description.</li> <li>Brochure.</li> <li>User Manual.</li> <li>Check-list of technical information.</li> </ul>

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## 1. Scope

Test purpose is to confirm compliance of EPIRB model EPIRB1 with the COSPAS-SARSAT 406 MHz Beacon Type Approval Standard C/S T.007 (ref. 2.2) and the Specification for COSPAS-SARSAT 406 MHz Distress Beacons C/S T.001 (ref.2.1) and Interim procedure for the determination of compliance of 406 MHz beacons equipped with a TCXO with COSPAS-SARSAT Type Approval requirements C/S IP TCXO (ref.2.3).

## 2. Reference Documents

- 2.1 Specification for COSPAS-SARSAT 406 MHz Distress Beacons C/S T.001 Issue 3 – Revision 14 October 2013
- 2.2 COSPAS-SARSAT 406 MHz Beacon Type Approval Standard C/S T.007 Issue 4 – Revision 8 October 2013
- 2.3 Interim Procedure for the Determination of Compliance of 406 MHz Beacons Equipped with a TCXO with COSPAS-SARSAT Type Approval Requirements C/S IP (TCXO) – Revision 5 October 2013

## 3. Details of Test Samples

- **Model name:** EPIRB1
- **Serial numbers of test beacons:** 002, 006
- **Hardware P/N:**
  - 900S-01448 Issue 01.00
  - 900S-01528 Issue 01.00 (for AUS/NZ only)
- Note. The difference between Hardware P/Ns described by manufacturer in Annex A, page 234.
- **Firmware/Software P/N:** 500S-01449 Issue 00.04
- **Description of the test beacon and block diagram of equipment under test.**

The Equipment Under Test (EUT) was a Ocean Signal Ltd. EPIRB1 as shown in the photographs below. A full technical description can be found in the manufacturer's documentation.

The EUT was operated using its own power source (internal battery).

One EUT (s/n 002) was configured so that the antenna ports were connected to the 50 Ohms test system using coaxial cables. The test configuration for all tests is identical with the exception of Antenna Characteristics and Satellite Qualitative Test.

The second EUT (s/n 006) was a fully packaged beacon, similar to the proposed production beacons equipped with its proper antenna. This EUT was used to perform Antenna Characteristics and Satellite Qualitative Test. The test configuration for these tests is a function of the beacon type and the operational environments supported by the beacon, as declared by the manufacturer.

- **List of test equipment, provided by beacon manufacturer for TA testing.**

1. Beacon Widget EPIRB software by Ocean Signal Ltd..

This software was used to reprogram the EUT for appropriate protocol and as a method to reset the total GNSS Self Test counter.

- Photos of the EUT subjected to TA-testing



**Figure 3.1 – General view of EPIRB1 s/n 006.**



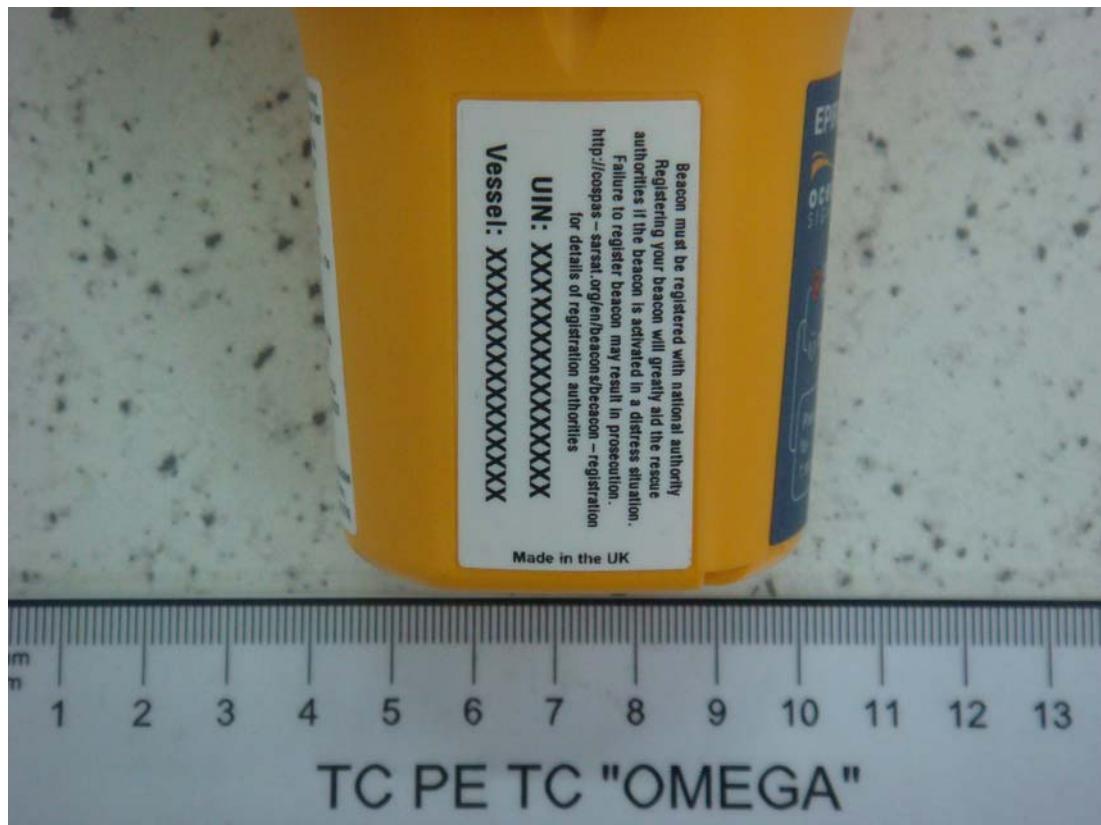
**Figure 3.2 – General view of EPIRB1 s/n 006 with antenna pulled.**



Figure 3.3 – The view of EPIRB1 labels (s/n 006).



**Figure 3.4 – The view of EPIRB1 labels (s/n 006).**



**Figure 3.5 – The view of EPIRB1 labels (s/n 006).**



**Figure 3.7 – The view of EPIRB1 labels (s/n 006).**



Figure 3.8 – General view of EPIRB1 s/n 002.



Figure 3.9 – The view of EPIRB1 labels (s/n 002).

- **Battery Pack details**

A full technical description of battery can be found in the manufacturer's documentation.

Composition: Lithium Manganese Dioxide

Cell type: CR123A

Number of cells: 6

Electrical configuration: 2 x 3 in series

Battery pack P/N: 901S-01393

- Application details:

**APPLICATION FOR A COSPAS-SARSAT 406 MHz BEACON  
TYPE APPROVAL CERTIFICATE<sup>1</sup>**

### G.1 INFORMATION PROVIDED BY THE BEACON MANUFACTURER

#### Beacon Manufacturer and Beacon Model

<b>Beacon Manufacturer</b>	Ocean Signal
<b>Beacon Model</b>	EPIRB1
<b>Other Model Names</b>	

#### Beacon Type and Operational Configurations

<b>Beacon Type</b>	<b>Beacon used while:</b>	<b>Tick where appropriate</b>
<b>EPIRB</b>	Floating in water or on deck or in a safety raft	<input checked="" type="checkbox"/>
<b>PLB</b>	On ground and above ground	<input type="checkbox"/>
	On ground and above ground and floating in water	<input type="checkbox"/>
<b>ELT Survival</b>	On ground and above ground	<input type="checkbox"/>
	On ground and above ground and floating in water	<input type="checkbox"/>
<b>ELT Auto Fixed</b>	Fixed ELT with aircraft external antenna	<input type="checkbox"/>
<b>ELT Auto Portable</b>	In aircraft with an external antenna	<input type="checkbox"/>
	On ground, above ground, or in a safety raft with an integrated antenna	<input type="checkbox"/>
<b>ELT Auto Deployable</b>	Deployable ELT with attached antenna	<input type="checkbox"/>
<b>Other (specify)</b>		<input type="checkbox"/>

#### Beacon Characteristics

<b>Characteristic</b>	<b>Specification</b>
Operating frequency	406.040 MHz
Operating temperature range	Tmin = -20 °C Tmax= 55 °C
Operating lifetime	48 hours
Beacon power supply type (internal, external, combined, other)	Internal

<sup>1</sup> - according to C/S T.007 Iss.4 Rev.8 Oct 2013

Characteristic	Specification
External power supply parameters (AC/DC and nominal voltage)	-
Is external power supply needed to energise the beacon or its ancillary devices in any of operational modes (N/A or Yes or No)	No
Battery chemistry	Lithium Manganese Dioxide
Battery cell model name, size and number of cells in battery pack, and details of the battery pack electrical configuration	CR123A, 34.5mm x 16.8mm dia, 6, 2x3in series
Battery cell manufacturer	Qlite
Battery pack manufacturer and part number	Ocean Signal Ltd, 901S-01393
Beacon manufacturers declared maximum allowed cell shelf-life (from date of cell manufacture to date of battery pack installation in the beacon)	2.5 years
Declared beacon battery replacement period (from date of installation in the beacon to expiry date marked on the beacon)	12.5 years
Oscillator type (e.g. OCXO, MCXO, TCXO)	TCXO
Oscillator manufacturer	Rakon UK Ltd
Oscillator part name and number	E5344LF
Oscillator satisfies long-term frequency stability requirements (Yes or No)	Yes
Antenna type: Integral or Other (e.g. External, Detachable – specify type)	Integral, Manually deployable
Antenna manufacturer	Ocean Signal Ltd.
Antenna part name and number	130S-01404
Navigation device type (Internal, External or None)	Internal
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 not encoded into the beacon message (Yes, No or N/A)	Yes
Navigation device capable of supporting global coverage (Yes, No or N/A)	Yes
Encoded position update capability (Yes, No, N/A) and	Yes

Characteristic	Specification	
Encoded position update interval value (range)	25 min	
For Internal Navigation Devices		
- Geodetic reference system (WGS 84 or GTRF)	WGS84	
- GNSS receiver cold start forced at every beacon activation (Yes or No)	Yes	
- Navigation device manufacturer	Quectel	
- Navigation device model name and part Number	L70	
- Internal navigation device antenna type (integrated, internal, external, passive/active), manufacturer and model	Internal, AEL Crystals Ltd, DAE1575R1820A	
- GNSS system supported (e.g. GPS, GLONASS, Galileo)	GPS	
For External Navigation Devices		
- Data protocol for GNSS receiver to beacon interface	N/A	
- Physical interface for beacon to navigation device	N/A	
- Electrical interface for beacon to navigation device	N/A	
- Part number of the external navigation interface device (if applicable)	N/A	
- Navigation device model and manufacturer (if beacon designed to use specific devices)	N/A	
<b>Self-Test Mode Characteristics:</b>	Self-Test Mode	Optional GNSS Self-Test Mode
- Activated by a separate switch/ separate switch position (Yes or No)	Yes	Yes
- Self-test/GNSS self-test mode switch automatically returns to normal position when released (Yes or No)	Yes	Yes
- Self-test/GNSS self-test activation can cause an operational mode transmission (Yes or No)	No	No
- Results in transmission of a single self-test burst only, regardless of how long the self-test activation mechanism is applied (Yes or No)	Yes	N/A
- Results of self-test/GNSS self-test are indicated by (provide details, e.g. Pass / Fail Indicator light, strobe light, etc.)	Indicator LED/Strobe	Indicator LED/Strobe
- The content of the encoded position data fields of the self-test message has default values	Yes	N/A

Characteristic	Specification	
- 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	N/A
- Self-test results in transmission of a signal other than at 406 MHz (Yes & details or No)	Yes, 121.5MHz for 1 sec	N/A
- Self-test can be activated directly at beacon (Yes or No)	Yes	Yes
- List of Items checked by self-test	406 Power, Synth, 121.5 Power, battery status	GPS
- Self-test/ GNSS self-test 406 MHz burst duration (440 or 520 ms)	520 ms	
- Self-test message length format flag in bit 25, ("0" or "1")	1	
- Maximum duration of self-test mode, sec	16.5secs	315.5secs
- Maximum recommended number of self-tests during battery pack replacement period	150	N/A
- Distinct indication of self-test start (Yes or No)	Yes	Yes
- Indication of self-test results (Yes or No)	Yes	Yes
- Distinct indication of insufficient battery capacity (Yes or No)	Yes	
- Automatic termination of self-test mode immediately after completion of the self-test cycle (Yes or No)	Yes	
- Maximum number of GNSS Self Tests (beacons with internal navigation devices only)	N/A	12
- GNSS Self-test results in transmission of a single burst, irrespectively of the test result (Yes or No)	N/A	No
- Maximum number of self-tests during battery pack replacement period	Unlimited	N/A
- Self-test/ GNSS Self-test can be activated from beacon remote activation points (Yes & details or No)	No	No
- List all methods of Self-test mode and GNSS Self-test modes activation. Provide details on a separate sheet to describe	Test key only	Test key only

<b>Message Coding Protocols:</b>	
	(x) - Tick the boxes below against the intended protocol options
User Protocol (tick where appropriate)	<input type="checkbox"/> Maritime with MMSI <input type="checkbox"/> Maritime with Radio Call Sign <input type="checkbox"/> EPIRB Float Free with Serial Number <input type="checkbox"/> EPIRB Non Float Free with Serial Number <input type="checkbox"/> Radio Call Sign <input type="checkbox"/> Aviation <input type="checkbox"/> ELT with Serial Number <input type="checkbox"/> ELT with Aircraft Operator and Serial Number <input type="checkbox"/> ELT with Aircraft 24-bit Address <input type="checkbox"/> PLB with Serial Number <input type="checkbox"/> National (Short Message Format) <input type="checkbox"/> National (Long Message Format)
Standard Location Protocol (tick where appropriate)	<input checked="" type="checkbox"/> EPIRB with MMSI <input checked="" type="checkbox"/> EPIRB with Serial Number <input type="checkbox"/> ELT with 24-bit Address <input type="checkbox"/> ELT with Aircraft Operator Designator <input type="checkbox"/> ELT with Serial Number <input type="checkbox"/> PLB with Serial Number
National Location Protocol (tick where appropriate)	<input checked="" type="checkbox"/> National Location: EPIRB <input type="checkbox"/> National Location: ELT <input type="checkbox"/> National Location: PLB
RLS Location Protocol (tick where appropriate) <sup>2</sup>	<input type="checkbox"/> EPIRB <input type="checkbox"/> ELT <input type="checkbox"/> PLB
User Location Protocol (tick where appropriate)	<input type="checkbox"/> Maritime with MMSI <input checked="" type="checkbox"/> Maritime with Radio Call Sign <input type="checkbox"/> EPIRB Float Free with Serial Number <input type="checkbox"/> EPIRB Non Float Free with Serial Number <input checked="" type="checkbox"/> Radio Call Sign <input type="checkbox"/> Aviation <input type="checkbox"/> ELT with Serial Number <input type="checkbox"/> ELT with Aircraft Operator and Serial Number <input type="checkbox"/> ELT with Aircraft 24-bit Address <input type="checkbox"/> PLB with Serial Number

<sup>2</sup>

RLS protocols will be effective as of 1 November 2015. The use of RLS-enabled beacons will be regulated by national administrations. Since the RLS functionality might affect the 406 MHz beacon performance, amendments to the type approval procedure for these beacons could be required. Beacon manufacturers should consult the Cospas-Sarsat Secretariat before undertaking the type approval of RLS-enabled beacon models.

Beacon includes a homer transmitter(s) (Yes or No)	Yes
- homer transmitter(s) frequency	121.5 MHz
- homer transmitter(s) power	16 dBm ±2dB
- homer transmitter(s) duty cycle	97 %
- duty cycle of homer swept tone	34 %
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, remote control, external audio and light indicators, external activation device). List details on a separate sheet if insufficient space to describe.	Strobe Light rate 2.5 seconds
Beacon includes automatic activation mechanism (Yes or No) Specify type of automatic beacon activation mechanism	Yes Water Activation
Beacon includes features and functions not listed above, related or non-related to 406 MHz (Yes or No)	No
List features and use a separate sheet if insufficient space	
Beacon model hardware part number (P/N) and version	900S-01448 Issue 01.00 900S-01528 Issue 01.00 (for AUS/NZ only)
Beacon model software/firmware P/N, version, date of issue/releases	500S-01449 Issue 00.04, 7/2/2014
Beacon model printed circuit board P/N and version	101S-01367 Issue 01.00
Beacon Manufacturer Point of Contact (POC) for this Type Approval application:	Name and Job Title: David Sheekey Product and Approvals Manager  Phone: +44 (0) 1843 282930  E-mail: david.sheekey@oceansignal.com

Dated: 06/06/2014.....

Signed:  David Sheekey, Product and Approvals Manager  
(Name, Position and Signature of Beacon Manufacturer Representative)

## 4. Type Approval Testing

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

**Name and Location of Beacon Test Facility:** PUBLIC ENTERPRISE TESTING CENTER «OMEGA», 99053, Sevastopol, ul. Vakulenchuka, 29, Ukraine

**Date of Submission for Testing:** 17 February 2014

#### Applicable C/S Standards:

Document	Issue	Revision
C/S T.001	3	14
C/S T.007	4	8
C/S IP TCXO	-	5

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) and complies Interim procedure for the determination of compliance of 406 MHz beacons equipped with a TCXO with Cospas-Sarsat Type Approval requirements C/S IP (TCXO) as demonstrated in the attached report.

Deviations<sup>1</sup> from the standard test procedures took place:

- soaking period of beacon during Operating Lifetime test was 10 hours at minus 30°C and than 20min at minus 20°C against 2 hours only at minus 20°C as required by T.007.

Dated August 06, 2014 Signed

V. Kovalenko  
Department manager

<sup>1</sup> The deviations were reflected in accordance with Footnote 1 on page G-7 of C/S T.007 Issue 4 – Rev.8

#### 4.1 Modifications of the Test Samples During Type Approval Testing

Modification State (Mod State)	Date of Implementation	Reasons for modification	Description of modification, HW/FW P/Ns, SW version/release after modification
0	17 February 2014	-	-

- Modes of EUT operation during TA testing, message encoding, EUT system configuration,  
Off mode

- No apparent activity

Self-test

- Press TEST button for one second.
- List of items checked as per Customer Supplied Information (Application Form)
- Navigation data applied where stated

GNNS Self-test

- Press and hold TEST button for 10 seconds
- List of items checked as per Customer Supplied Information (Application Form)
- Navigation data applied as applicable (e.g. none applied for timeout, data applied for 'fast acquisition')

Operating

- Remove break off tab, lift the flap up press for 1 second to activate / 1 second to deactivate
- GPS operating in normal duty cycle for the following navigation input conditions
- No navigation data applied, unless otherwise stated

## 5. Test Results

### 5.1 Test Results Summary Table

Parameters to be Measured	Range of Specification	Units	Test Results			Comments
			T <sub>min</sub> (-20 °C)	T <sub>amb</sub> (20 °C)	T <sub>max</sub> (55 °C)	
<b>17-Feb-14 - 19-Feb-14, EPIRB1, S/N 002, Mode State 0</b>						
<b>1. Transmitter Power Output</b>						
– transmitter power output (min and max)	35-39	dBm	36.47 to 36.56	36.83 to 36.86	37.21 to 37.27	Pass Section 5.2
– power output rise time	<5	ms	0.30 to 0.42	0.40 to 0.48	0.40 to 0.47	
– power output 1 ms before burst	<-10 dBm	✓ <sup>1</sup>	✓	✓	✓	
<b>17-Feb-14 - 19-Feb-14, EPIRB1, S/N 002, Mode State 0</b>						
<b>2. Digital Message</b>	<b>Bits number</b>					
– bit sync	1-15	15 bits “1”	✓	✓	✓	✓
– frame sync	16-24	“000101111”	✓	✓	✓	✓
– format flag	25	1 bit	bit value	1	1	1
– protocol flag	26	1 bit	bit value	0	0	0
– Identification / position data	27-85	59 bit	✓	✓	✓	✓
– BCH code	86-106	21 bits	✓	✓	✓	✓
– emerg. code / nation. use / suppl. data	107-112	6 bits	bit value	110111	110111	110111
– additional data / BCH (if applicable)	113-144	32 bits	✓	✓	✓	✓
– position error (if applicable)	<5	km	N/A	N/A	N/A	
<b>17-Feb-14 - 19-Feb-14, EPIRB1, S/N 002, Mode State 0</b>						
<b>3. Digital Message Generator</b>						
– repetition rate T <sub>R</sub> :						
• average T <sub>R</sub>	48.5-51.5	sec	49.61	49.61	49.61	
• min T <sub>R</sub>	47.5≤T <sub>R</sub> ≤48.0	sec	47.81	47.81	47.81	
• max T <sub>R</sub>	52.0≤T <sub>R</sub> ≤52.5	sec	52.50	52.50	52.50	
• standard deviation	0.5-2.0	sec	1.41	1.41	1.41	
– bit rate:						
• min f <sub>b</sub>	≥396	bit/sec	400.01	400.06	400.02	
• max f <sub>b</sub>	≤404	bit/sec	400.14	400.20	400.15	
– total transmission time:						
• short message	435.6-444.4	ms	—	—	—	
• long message	514.8-525.2	ms	518.45 to 518.50	518.35 to 518.45	518.35 to 518.45	
– unmodulated carrier:						
• min T <sub>1</sub>	≥158.4	ms	160.02	160.03	160.03	
• max T <sub>1</sub>	≤161.6	ms	160.04	160.05	160.05	
– first burst delay	≥47.5	sec	53.91 to 54.16	53.91 to 54.88	53.91 to 54.38	

<sup>1</sup>Indicate that testing demonstrated conformance to requirements by placing the ✓ symbol in Table F.1.

Parameters to be Measured	Range of Specification	Units	Test Results			Comments
			T <sub>min</sub> (-20 °C)	T <sub>amb</sub> (20 °C)	T <sub>max</sub> (55 °C)	
<b>17-Feb-14 - 19-Feb-14, EPIRB1, S/N 002, Mode State 0</b>						
<b>4. Modulation</b>						
– biphasic-L		✓	✓	✓	✓	
– rise time (min and max)	50-250	μsec	147.44 to 151.84	144.74 to 154.84	142.17 to 148.29	
– fall time (min and max)	50-250	μsec	158.88 to 163.16	161.44 to 167.43	155.56 to 162.74	
– phase deviation: positive (min and max)	+(1.0 to 1.2)	radians	1.07 to 1.11	1.09 to 1.12	1.07 to 1.13	
– phase deviation: negative (min and max)	-(1.0 to 1.2)	radians	-1.11 to -1.13	-1.08 to -1.11	-1.08 to -1.13	
– symmetry measurement	≤0.05	✓	✓	✓	✓	
<b>17-Feb-14 - 19-Feb-14, EPIRB1, S/N 002, Mode State 0</b>						
<b>5. 406 MHz Transmitted Frequency</b>						
– nominal value	406.039 - 406.041	MHz	406.039998	406.039986	406.039968	
– short-term stability	≤2×10 <sup>-9</sup>	/100 ms	1.46E-10	9.52E-11	9.27E-11	
– medium-term stability slope	(-1 to +1) ×10 <sup>-9</sup>	/min	-5.08E-11	3.56E-11	-2.31E-12	
– medium-term stability residual frequency variation	≤3×10 <sup>-9</sup>		6.84E-10	1.46E-10	3.13E-10	
<b>17-Feb-14 - 19-Feb-14, EPIRB1, S/N 002, Mode State 0</b>						
<b>6. Spurious Emissions into 50 Ohms (406.0 – 406.1 MHz)</b>	C/S T.001 mask	✓	Section 5.2.3	Section 5.2.1	Section 5.2.2	Pass
<b>17-Feb-14 - 19-Feb-14, EPIRB1, S/N 002, Mode State 0</b>						
<b>7. 406 MHz VSWR Check</b>						
– nominal transmitted frequency	406.039 - 406.041	MHz	406.039997	406.039987	406.039969	
– modulation rise time (min and max)	50-250	μsec	146.78 to 150.92	146.39 to 151.05	141.45 to 145.55	
– modulation fall time (min and max)	50-250	μsec	157.83 to 164.43	163.32 to 166.90	156.68 to 160.68	
– phase deviation: positive (min and max)	+(1.0 to 1.2)	radians	1.07 to 1.11	1.09 to 1.12	1.07 to 1.13	
– phase deviation: negative (min and max)	-(1.0 to 1.2)	radians	-1.11 to -1.14	-1.09 to -1.10	-1.07 to -1.12	
– modulation symmetry measurement	≤0.05	✓	✓	✓	✓	
– digital message	Correct	✓	✓	✓	✓	

Parameters to be Measured	Range of Specification	Units	Test Results			Comments
			T <sub>min</sub> (-20 °C)	T <sub>amb</sub> (20 °C)	T <sub>max</sub> (55 °C)	
<b>17-Feb-14 - 19-Feb-14, EPIRB1, S/N 002, Mode State 0</b>						
<b>8 (a). Self-test Mode</b>						
– frame sync	“011010000”	✓	✓	✓	✓	Pass Section 5.2
– format flag	1/0	bit value	1	1	1	
– radiated burst	≤440/520 (±1%)	ms	518.20	518.40	518.05	
– default position data (if applicable)	must be correct	✓	✓	✓	✓	Annex A, page 245
– description provided		✓	✓	✓	✓	
– design data provided on protection against repetitive self-test mode transmissions		✓	✓	✓	✓	Annex A, page 277
– single burst verification	must be one burst	✓	✓	✓	✓	
– provides for 15 Hex ID	must be correct	✓	✓	✓	✓	
– 121.5 MHz RF power (if applicable)	verify that RF power is emitted	✓	✓	✓	✓	
– 406 MHz RF power	verify that RF power is emitted	✓	✓	✓	✓	
– distinct indication of self-test start	must be provided	✓	✓	✓	✓	
– distinct indication of RF-power being emitted	must be provided	✓	✓	✓	✓	
– indication of the self-test result	must be provided	✓	✓	✓	✓	
– distinct indication of insufficient battery capacity <sup>(1)</sup>	must be provided	✓	✓	✓	✓	Annex A, page 245
– maximum duration of self-test mode	shall not exceed maximum duration of self-test	sec	16.41	16.37	16.28	
– automatic termination of the self-test mode upon completion of the self-test and indication of the self-test results	verify automatic termination, irrespectively of the switch position	✓	✓	✓	✓	

<sup>1</sup>only mandatory to new beacon models submitted for type approval testing after 1 November 2015.

Parameters to be Measured	Range of Specification	Units	Test Results			Comments
			T <sub>min</sub> (-20 °C)	T <sub>amb</sub> (20 °C)	T <sub>max</sub> (55 °C)	
<b>17-Feb-14 EPIRB1, S/N 002, Mode State 0</b>						
<b>8 (b). GNSS Self-Test Mode (if applicable)</b>						
– frame sync	“011010000”	✓	-	-	-	
– format flag	1	bit value	-	-	-	
– radiated burst duration	≤ 520 (+1%)	ms	-	-	-	
– position data (if applicable)	must be within 500m (or 5.25km for User Location Protocol) of the actual position	✓	N/A	N/A	N/A	
– design data showing how GNSS Self-Test is limited in number of transmissions and duration	must be provided	✓	✓	✓	✓	
– single burst verification (if applicable)	must be one burst	✓	N/A	N/A	N/A	
– 121.5 MHz RF power (if applicable)	verify that RF power is emitted	✓	N/A	N/A	N/A	
– 406 MHz RF power (if applicable)	verify that RF power is emitted	✓	N/A	N/A	N/A	
– Maximum duration of GNSS Self-Test	Manufacturer to specify value	sec	-	315.50	-	
– Actual duration GNSS of Self-Test with encoded location	Less than maximum duration	sec	-	31- 60	-	
– Maximum number of GNSS Self-Tests (only beacons with internal navigation devices)	Manufacturer to specify number	number	-	12	-	
– Distinct indication to register successful completion or failure of the GNSS selftest	must be provided	✓	—	✓	—	Annex A, page 246
– Distinct indication that a maximum number of GNSS self-tests has been attained after GNSS self-test mode activation and without transmission of a test message or further GNSS receiver current drain	must be provided	✓	—	✓	—	Annex A, page 246

Parameters to be Measured	Range of Specification	Units	Test Results	Comments
<b>18-Feb-14, EPIRB1, S/N 002, Mode State 0</b>				
<b>9. Thermal Shock</b>		°C °C	T <sub>soak</sub> = 55 °C T <sub>meas</sub> = 25 °C	Pass Section 5.3
<ul style="list-style-type: none"> <li>- soak temperature</li> <li>- measurement temperature</li> <li>- the following parameters are to be met within 15 minutes of beacon turn on and maintained for 2 hours:</li> </ul>				
<ul style="list-style-type: none"> <li>- transmit frequency nominal value</li> <li>- transmit frequency short-term stability</li> <li>- transmit frequency medium-term stability slope</li> <li>- transmit frequency medium-term stability residual frequency variation</li> <li>- transmitter power output (min and max)</li> <li>- digital message</li> </ul>	406.039 - 406.041 $\leq 2 \times 10^{-9}$ $(-2 \text{ to } +2) \times 10^{-9}$ $\leq 3 \times 10^{-9}$ 35-39 Correct	MHz /100 ms /min dBm √	406.039980 to 406.039983 5.93E-11 to 1.51E-10 -2.22E-12 to 4.01E-10 1.13E-10 to 5.27E-10 36.48 to 36.72 √	
<b>25-Feb-14 - 28-Feb-14, 10-June-14, EPIRB1, S/N 002, Mode State 0</b>				
<b>10. Operating Lifetime at Minimum Temperature</b>	>48	hrs	59:54:29 at T <sub>min</sub> =-20°C	Pass Section 5.4
<ul style="list-style-type: none"> <li>- actual duration of continuous operation</li> <li>- required equivalent extension</li> <li>- effective demonstrated Operating Lifetime</li> <li>- pre-test battery discharge duration</li> <li>- depleted capacity volume during pre-test battery discharge</li> </ul>	>48	hrs hrs hrs A-hrs	05:48:00 54:06:29 at T <sub>min</sub> =-20°C 5:59:00 0.2895	Deviation from the standard test procedures took place: Soaking period of beacon during Operational Lifetime test was 10 hours at minus 30°C and than 20 minutes at minus 20°C against 2 hours only at minus 20°C as required by T.007
- transmit frequency nominal value	406.039 - 406.041	MHz	406.039997 - 406.040017	
- transmit frequency short-term stability	$\leq 2 \times 10^{-9}$	/100ms	6.08E-11 to 2.17E-10	
- transmit frequency medium-term stability slope	$(-1 \text{ to } +1) \times 10^{-9}$	/min	-2.80E-10 to 1.73E-10	
- transmit frequency medium-term stability residual frequency variation	$\leq 3 \times 10^{-9}$		4.06E-11 to 8.59E-10	
- transmit power output (min and max)	35-39	dBm	35.00 to 36.73	
- Pt <sub>EOL</sub> = minimum transmitter power output observed during lifetime at minimum temperature	35-39	dBm	36.19 minimum observed during first 53 hours 48 minutes 35.00 minimum observed after 53 hours 48 minutes of test	
- digital message	Correct	√	√	
- homer transmitter continuous operation during the lifetime test		Hours	54:06:29	
<ul style="list-style-type: none"> <li>- homer frequency</li> <li>- at the beginning of the test</li> <li>- at the end of the test</li> </ul>		MHz MHz	121.497579 121.497634	
<ul style="list-style-type: none"> <li>- homer peak power level</li> <li>- at the beginning of the test</li> <li>- at the end of the test</li> </ul>		dBm dBm	15.82 17.21	
<ul style="list-style-type: none"> <li>- homer transmitter duty cycle</li> <li>- at the beginning of the test</li> <li>- at the end of the test</li> </ul>		% %	97.43-97.66 97.43-97.66	

Parameters to be Measured	Range of Specification	Units	Test Results	Comments
<b>20-Feb-14 - 22-Feb-14, EPIRB1, S/N 002, Mode State 0</b>				
<b>11. Temperature Gradient (5°C/hr)</b>				Pass Section 5.5
<ul style="list-style-type: none"> <li>– transmit frequency nominal value</li> <li>– transmit frequency short-term stability</li> <li>– transmit frequency medium-term stability:           <ul style="list-style-type: none"> <li>• slope (A to B, C+15 to D and E+15 to F)</li> <li>• slope (B to C+15 and D to E+15)</li> </ul> </li> <li>– residual frequency variation</li> <li>– transmitter power output (min and max)</li> <li>– digital message</li> </ul>	406.039 - 406.041 $\leq 2 \times 10^{-9}$ $(-1 \text{ to } +1) \times 10^{-9}$ $(-2 \text{ to } +2) \times 10^{-9}$ $\leq 3 \times 10^{-9}$ 35-39 Correct	MHz /100ms /min /min dBm √	406.039964 to 406.040000 5.71E-11 to 2.33E-10 -1.77E-10 to 2.19E-10 -4.32E-10 to 4.51E-10 4.91E-11 to 7.93E-10 36.29 to 36.96 √	
<b>24-Feb-14, EPIRB1, S/N 002, Mode State 0</b>				
<b>12. Oscillator Aging</b>	C/S T.001	Hz	from -121 Hz to 24 Hz by 5 years (-0.298 ppm to 0.059 ppm by 5 years) √	Pass Annex A page 285
<ul style="list-style-type: none"> <li>– 5-year carrier nominal frequency variation</li> <li>– MTS analysis (if applicable)</li> </ul>	Must demonstrate compliance	√	√	Pass Section 5.6
<b>EPIRB1, S/N 002, Mode State 0</b>				
<b>13. Protection Against Continuous Transmission description provided</b>	<45	sec	√	Annex A page 276

Parameters to be Measured	Range of Specification	Units	Test Results	Comments
<b>08-May-14 - 13-May-14, EPIRB1, S/N 006, Mode State 0</b>				Pass Section 5.10
<b>14. Satellite Qualitative Test</b> (results provided)	15 Hex ID provided by LUT and position within 5 km 80% of time	√	√ The received digital message corresponds to the encoded radio beacon ID. Received messages with coordinates are determined (successfully located by satellites).	
Configuration 5 “Water” ground plane	15 Hex ID provided by LUT and position within 5 km 80% of time	√	08.05.14 - 7 satellite passes with ratio of successful solutions – 100 % and location error 0.314 .. 0.624 km	Section 5.10.1
Configuration 7 Beacon on ground plane	15 Hex ID provided by LUT and position within 5 km 80% of time	√	12.05.14 - 11 satellite passes with ratio of successful solutions – 100 % and location error 0.131 ... 1.067 km	Section 5.10.2
Configuration 8 Beacon above ground plane	15 Hex ID provided by LUT and position within 5 km 80% of time	√	13.05.14 - 7 satellite passes with ratio of successful solutions – 100 % and location error 0.107 ... 1.821 km	Section 5.10.3
<b>30-April-14, 05-May-14, EPIRB1, S/N 006, Mode State 0</b>				Pass Section 5.7 Section 5.7.1
<b>15.1 Antenna Characteristics</b>				Test configuration 1. (Fig: B.4) “Water” ground plane.
– polarization – VSWR – EIRP <sub>LOSS</sub> – EIRP <sub>maxEOL</sub> – EIRP <sub>minEOL</sub>	linear or RHCP $\leq 1.5$ $\leq 43$ $\geq 32$	dB dBm dBm	linear N/A 0.67 41.90 32.66	
<b>15.2 Antenna Characteristics</b>	linear or RHCP $\leq 1.5$ $\leq 43$ $\geq 30$	dB dBm dBm	linear N/A 0.67 40.96 32.69	Section 5.7.2 Test configuration 4. (Fig: B.5) Beacon above ground plane.

Parameters to be Measured	Range of Specification	Units	Test Results	Comments
<b>16-May-14, EPIRB1, Mode State 0</b>				
<b>16. Beacon Coding Software</b>				
– sample message provided for each coding option of the applicable coding types	correct	✓	✓	Pass Section 5.8 Data provided by manufacturer Per Table F-D.2 Per Table F-D.3
– sample self-test message provided for each coding option of the applicable coding types	correct	✓	✓	Per Table F-D.2 Per Table F-D.3
<b>02-Mar-14 - 06- Mar -14 -, EPIRB1, S/N 002, Mode State 0</b>				
<b>17. Navigation System</b>				
– position data default values	correct	✓	✓	Pass Section 5.9 Test per A.3.8.1
– position acquisition time <sup>3</sup>	<10 (int.nav) < 1 (ext.nav)	min	From 0.93 to 1	Test per A.3.8.2 Results per Results per Table F-C.4
– position accuracy	C/S T.001	m	2228 - ULP 55.6 - SLP 55.6 - NLP	Test per A.3.8.2 Results per Table F-C.4
– encoded position data update interval	>5	min	29.77 - SLP 29.77 - NLP 29.77 - ULP	Test per A.3.8.3
– position clearance after deactivation	correct	✓	✓	Test per A.3.8.4
– position data input update interval	<1.0 min (ELT) <20 min (EPIRB/PLB)	✓	N/A	Test per A.3.8.5
– stored position cleared within interval	1.0-1.5 min (ELT) 20-30 min (EPIRB/PLB)		N/A	
– position data encoding	correct	✓	✓	Test per A.3.8.7 (Data provided by manufacturer)
– retained last valid position after navigation input lost	240(±5)	min	240.60 - SLP 240.62 - NLP 240.60 - ULP	Test per A.3.8.6
– default position data transmitted after 240(±5) minutes without valid position data	correct	✓	✓	
– information provided on protection against erroneous position encoding into the beacon message		✓	✓	Annex A page 278

## 5.2 Electrical and Functional Tests at Constant Temperature

Date of test	17.02.2014 ( $T_{\text{amb}}$ ), 18.02.2014 ( $T_{\text{max}}$ ), 19.02.2014 ( $T_{\text{min}}$ )
Specification	C/S T.007 – section A.2.1
Beacon Model	EPIRB1
Serial number	002
EUT Mod State	0
EUT system configuration, including ancillary devices and modes of their operation	The EUT was operated using its own power source (internal battery). The EUT was configured so that the antenna ports were connected to the 50 Ohms test system using coaxial cables.
EUT operating mode during the test	406 MHz+121.5MHz+Strobe Light
Environmental conditions	Ambient laboratory temperature: 17.4-18.10 °C Relative air humidity: 55-57 %
Beacon environment temperature during test	$T_{\text{amb}} = 20^{\circ}\text{C}$ $T_{\text{max}} = 55^{\circ}\text{C}$ $T_{\text{min}} = - 20^{\circ}\text{C}$
Deviations from standard test procedures	There were no deviations from standard test procedures
Non-compliances noticed	There were not non-compliances

### Test procedure:

The tests were performed after the beacon under test, while turned off, was placed in climatic chamber and stabilized for 2 hours at normal temperature 20°C, at the specified minimum operating temperature minus 20°C and at the maximum operating temperature 55°C correspondingly. Except of testing in the self-test mode (per paragraph A.3.6 T.007), the beacon was allowed to operate for 15 minutes before measurements started.

Active load value used for VSWR test is 17 Ohm.

Matching network was not used.

GNSS signal not available during test.

**The list of parameters**

Parameter tested	Operating temperature		
	20 °C	55 °C	-20 °C
	page No		
<b>Transmitter power output</b>			
Transmitter power output	30	43	54
Maximum and minimum value of output power during operating	29	42	53
Output power rise time	30	43	54
Power output 1 ms before burst	29	42	53
<b>Messages</b>			
Message contents	31	44	55
<b>Digital message generator</b>			
First burst delay	32	45	56
Average repetition rate and standard deviation	32	45	56
Minimal and maximal value of digital message generator parameters	29	42	53
<b>Modulation</b>			
Modulation index	33	46	57
Modulation rise and fall times	33	46	57
View of modulation 3 first bit message	33	46	57
Maximum and minimum value during operating	29	42	53
<b>Transmitted frequency</b>			
Nominal value	29	42	53
Medium /short term frequency stability	29	42	53
Maximum and minimum value during operating	29	42	53
<b>Spurious emissions</b>			
Spurious emissions	35	48	59
<b>VSWR test</b>			
Transmitter nominal frequency	36	49	60
Digital message content	37	50	61
The modulation parameters	36	49	60
<b>Self-test mode</b>			
Duration of the burst	38	51	62
Digital message content (frame synchronization, format flag)	39	52	63
The Output power, frequency of the self- test burst	38	51	62

### 5.2.1 Electrical and Functional Tests at Ambient Temperature

**Table of measured parameters.**

<b>Message</b>					
<b>Contents (full)</b> :FFFE2F 8C9EF9C0637FDFF83D15B 783E0F66C					
Test duration 0:14:53	Bursts received 19	BCH error 0	Self-Test 0		
<b>406 MHz Transmitter Parameters</b>		<b>Limits</b>		<b>Measured</b>	
		min	max	min	current
<b>Frequency, MHz</b>	406.039	406.041	406.039986	406.039986	406.039986
<b>+Phase deviation, rad</b>	1.00	1.20	1.09	1.10	1.12
<b>-Phase deviation, rad</b>	-1.00	-1.20	-1.11	-1.09	-1.08
<b>Phase time rise, us</b>	50.00	250.00	144.74	144.74	154.84
<b>Phase time fall, us</b>	50.00	250.00	161.44	163.77	167.43
<b>Power, dBm</b>	35	39	36.83	36.83	36.86
<b>Power rise, ms</b>	0.00	5.00	0.40	0.45	0.48
<b>Power output 1 ms before burst, dBm</b>		-10		-20.58	
<b>Bit Rate, bps</b>	396.00	404.00	400.06	400.06	400.20
<b>Asymmetry, %</b>	0.00	5.00	0.45	0.58	0.70
<b>CW Preamble, ms</b>	158.40	161.60	160.03	160.03	160.05
<b>Total burst duration, ms</b>	514.80	525.20	518.35	518.40	518.45
<b>Slope</b>	-1.00E-09	1.00E-09	3.56E-11	3.56E-11	3.56E-11
<b>Residual variations</b>	0.00E-09	3.00E-09	1.46E-10	1.46E-10	1.46E-10
<b>Short term variations</b>	0.00E-09	2.00E-09	9.52E-11	9.52E-11	9.52E-11
<b>121.5 MHz Transmitter Parameters</b>					
<b>Carrier Frequency, Hz</b>	121498137	<b>Low Sweep Frequency, Hz</b>			350
<b>Power, dBm<sup>1</sup></b>	18.15	<b>High Sweep Frequency, Hz</b>			1119
<b>Sweep Period, sec</b>	0.33	<b>Sweep Range, Hz</b>			769
<b>Modulation Index, %</b>	100				

<sup>1</sup> Measured power of 121.5 MHz Transmitter complies with maximum power 18 dBm declared by beacon manufacturer in Annex G (see page 15) with applied test facility accuracy 0.5 dB.

**Transmitter Power Output (according to C/S T.007 – section A.3.2.2).**

- **Transmitter Power Output Level (A.3.2.2.1)**

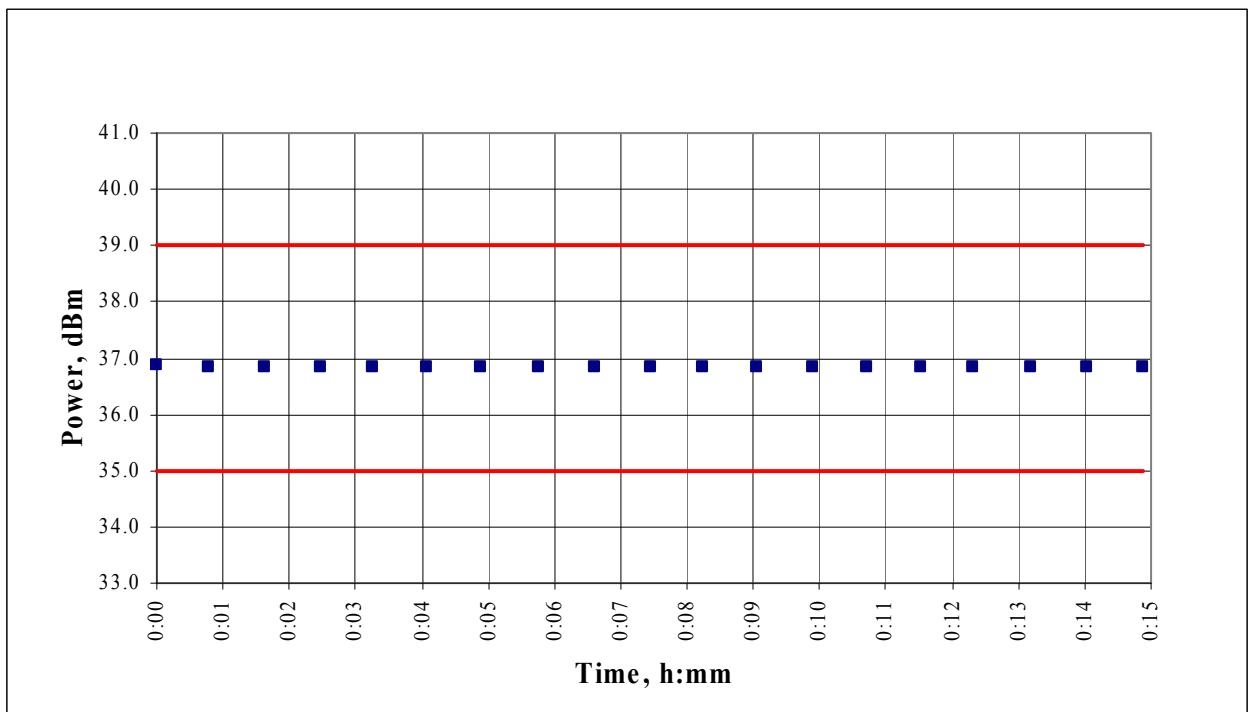


Figure 5.2.1.1 – Transmitter power during test

- **Transmitter Power Output Rise Time (A.3.2.2.2)**

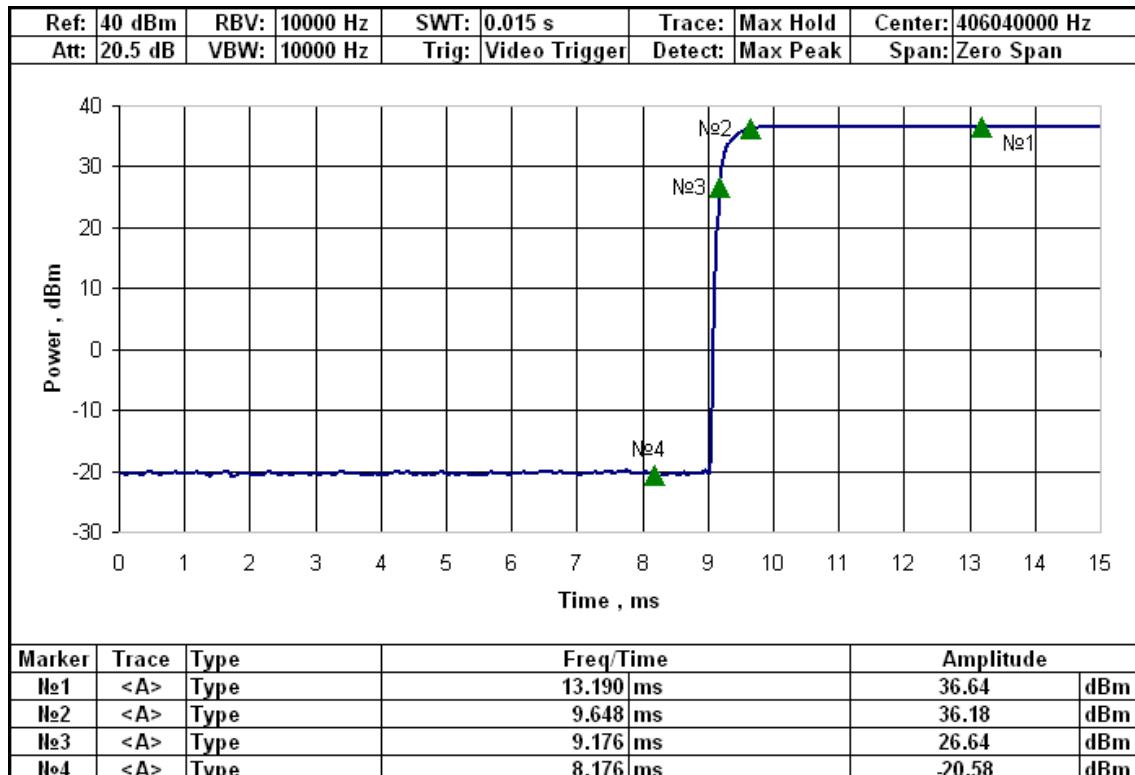


Figure 5.2.1.2 – Transmitter power output rise

**a) Message Coding (according to C/S T.007 - A.3.1.4)**

Bursts received	19
BCH error	0
Self test message	0
Full HEX message	FFFE2F 8C9EF9C0637FDFF83D15B 783E0F66C

Decoding Beacon Message

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - <b>Albania</b>	27-36	0011001001
Type of location protocol: Standard Location - Test	37-40	1110
Test Protocol: Test Protocol (No Decode information in bits 41 to 64)	41-64	111110011100000001100011
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	00000111010001010110
BCH 1 Calculated:	N/A	00000111010001010110
Fixed bits (1101): Pass	107-110	1101
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
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	011001101100
BCH 2 Calculated:	N/A	011001101100
Composite Latitude: default	N/A	Composite Longitude: default
15 Hex ID:	N/A	193DF380C6FFBFF

b) Digital message generator (according to C/S T.007 – section A.3.1)

- Repetition Period (A.3.1.1)

406 MHz Transmitter Parameters	Limits		Measured
	min	max	
Average repetition period, s	48.50	51.50	49.61
Minimum repetition period ,s	47.5	48.0	47.81
Maximum repetition period ,s	52.0	52.5	52.50
Standard deviation	0.5	2.0	1.41
Differences of Rep. period, s	4		4.70

- Measurement of time interval from the moment of beacon activation till the first (operating) burst

	Time interval, sec
	from the moment of beacon activation till the first operation burst
1 <sup>st</sup> measurement	54.88
2 <sup>d</sup> measurement	54.47
3 <sup>d</sup> measurement	53.91
Minimum value	<b>53.91</b>
Maximum value	<b>54.88</b>

c) Data Encoding and Modulation (according to C/S T.007 – section A.3.2.3)

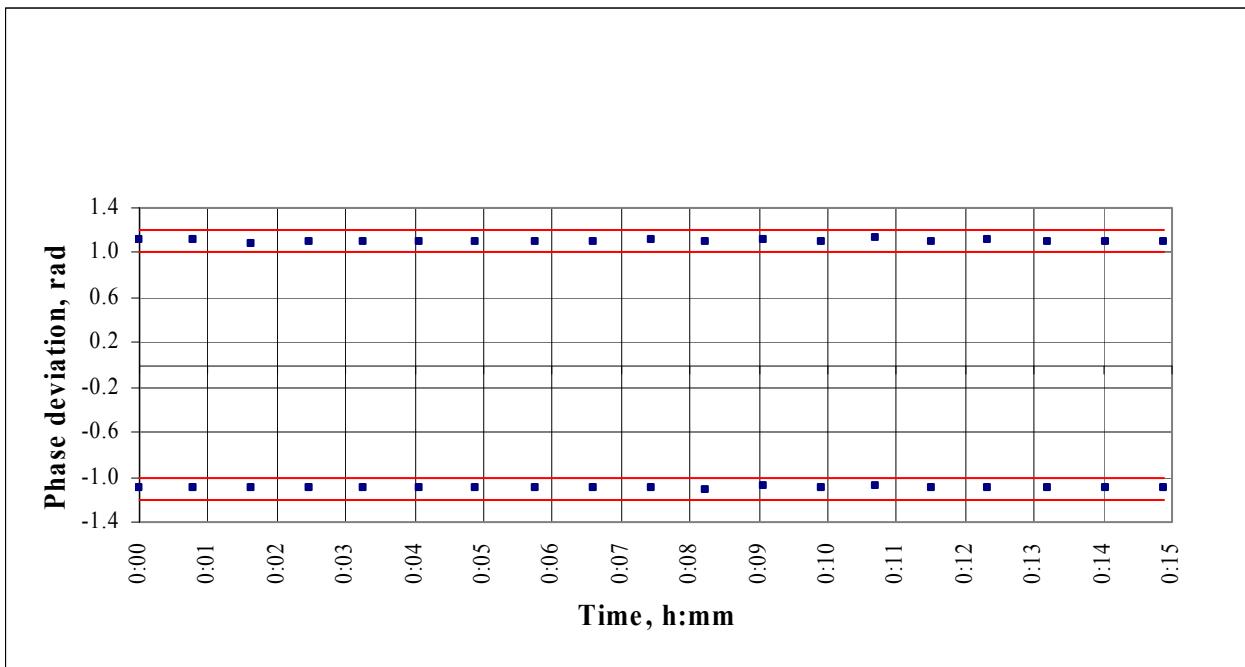


Figure 5.2.1.3 – Modulation index

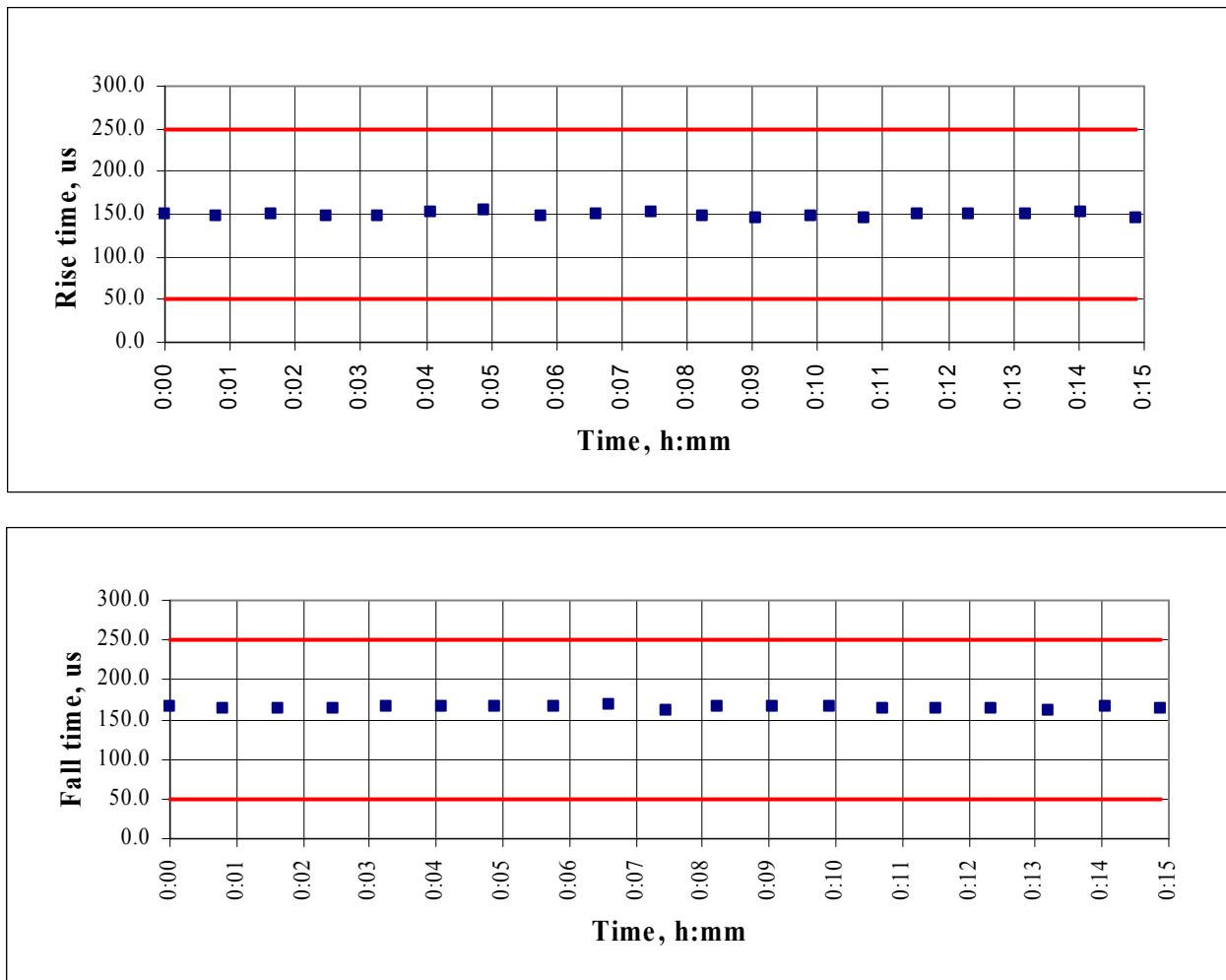


Figure 5.2.1.4 – Modulation rise and fall times

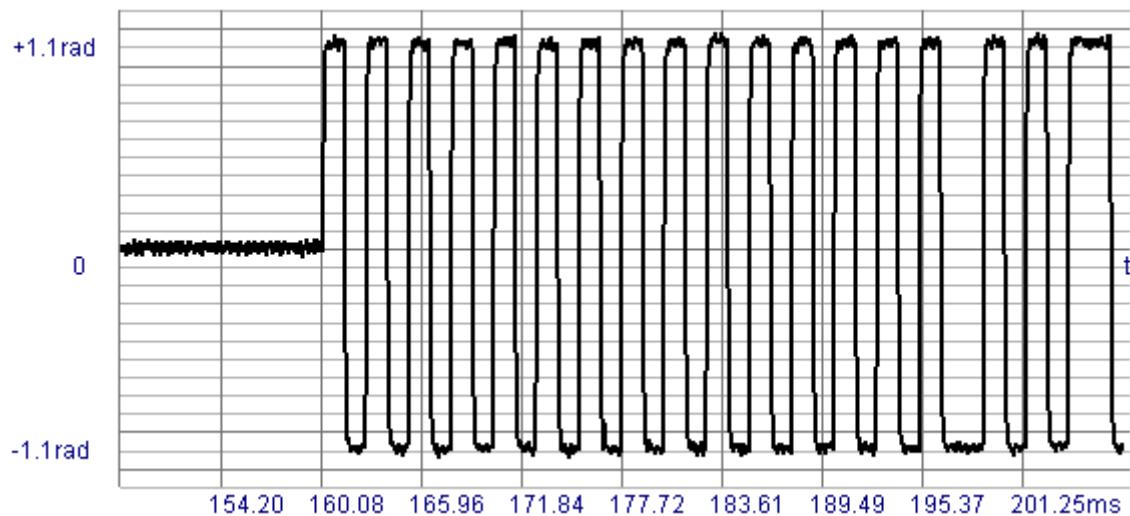


Figure 5.2.1.5 – Modulation symmetry of the bi-phase demodulated signal

d) Spurious output (according to C/S T.007 – section A.3.2.2.4)

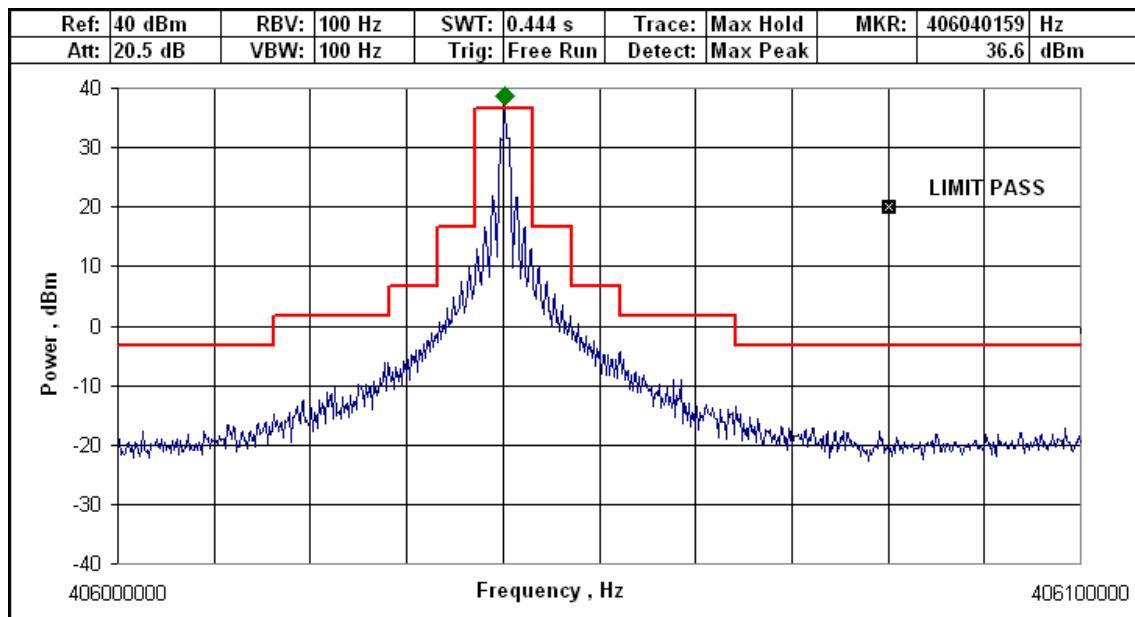


Figure 5.2.1.6 – Spurious output.

e) **Voltage Standing-Wave Ratio (according to C/S T.007 – section A.3.3)**

**Test results.**

The transmitter was operating into an open circuit during 5 minutes and then into a short circuit during 5 minutes. Afterwards, the transmitter was operating into a load having a VSWR of 3:1 (pure resistive 17 Ohm), during which time parameters were measured.

Table of measured parameters.					
Message					
Contents (full)	:FFFE2F 8C9EF9C0637FDFF83D15B 783E0F66C				
Test duration 0:14:53	Bursts received 19	BCH error 0	Self-Test 0		
406 MHz Transmitter Parameters	Limits		Measured		
	min	max	min	current	max
Frequency, MHz	406.039	406.041	406.039987	406.039987	406.039987
+Phase deviation, rad	1.00	1.20	1.09	1.11	1.12
-Phase deviation, rad	-1.00	-1.20	-1.10	-1.10	-1.09
Phase time rise, us	50.00	250.00	146.39	148.43	151.05
Phase time fall, us	50.00	250.00	163.32	164.64	166.90
Asymmetry, %	0.00	5.00	0.49	0.54	0.65

- **The modulation parameters (A.3.2.3)**

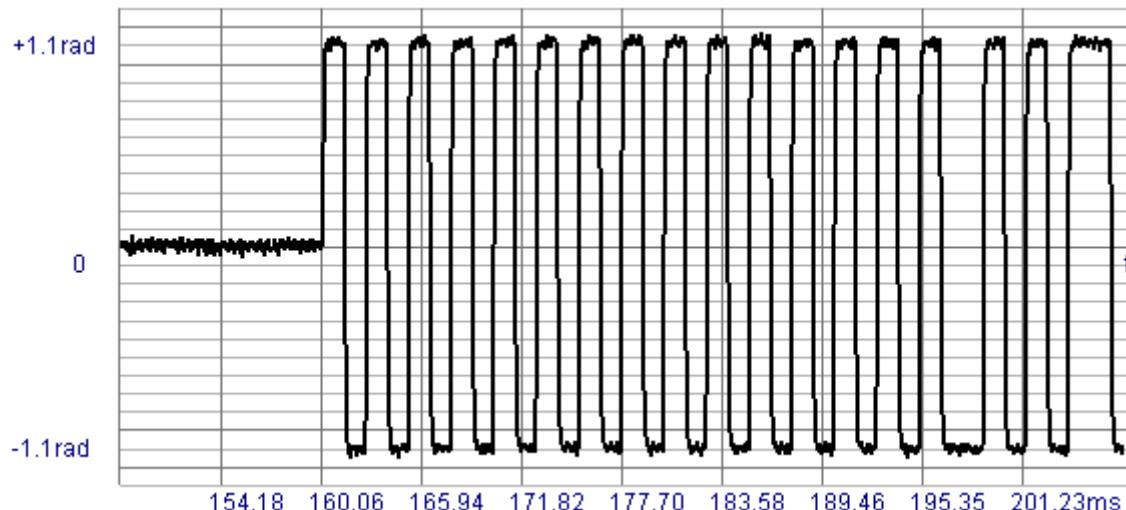


Figure 5.2.1.7 – Modulation symmetry of the bi-phase demodulated signal

- **Message Coding (A.3.1.4)**

Bursts received	19
BCH error	0
Self test message	0
Full HEX message	FFFE2F 8C9EF9C0637FDFF83D15B 783E0F66C

Decoding Beacon Message

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - <b>Albania</b>	27-36	0011001001
Type of location protocol: Standard Location - Test	37-40	1110
Test Protocol: Test Protocol (No Decode information in bits 41 to 64)	41-64	111110011100000001100011
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	00000111010001010110
BCH 1 Calculated:	N/A	00000111010001010110
Fixed bits (1101): Pass	107-110	1101
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
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	011001101100
BCH 2 Calculated:	N/A	011001101100
Composite Latitude: default	N/A	Composite Longitude: default
15 Hex ID:	N/A	193DF380C6FFBFF

**f) Self-test mode (according to C/S T.007 – section A.3.6.)**

**Test result.**

During the self test transmitter emitted only one burst

**Table of measured parameters.**

Message			
Contents (full)	FFFED08C9EF9C0637FDFF83D15B783E0F66C		
Test duration 0 h 0 m	Bursts received 1	BCH error 0	Self-Test 1
<b>406 MHz Transmitter Parameters</b>	<b>Limits</b>		<b>Measured</b>
	<b>min</b>	<b>max</b>	<b>current</b>
Frequency, MHz	406.039	406.041	406.040014
Power, dBm	35	39	36.83
<b>Total burst duration, ms</b>	514.80	525.20	518.40
<b>121.5 MHz Transmitter Parameters</b>			
Carrier Frequency, Hz	121498167		
Power, dBm	18.17		

Parameter	Requirement	Result
Distinct indication of self-test start	must be provided	The red LED will come on to indicate the switch is depressed, followed by the red LED flashing rapidly
Distinct indication of RF-power being emitted	must be provided	Strobe light flashes
Indication of the self-test result	must be provided	The green LED flashes 1 time
Maximum duration of self-test mode	shall not exceed maximum duration of self-test 16.5 sec	16.37 sec
Distinct indication of insufficient battery capacity	must be provided	According to the Self-test mode description (Annex A, page 245) the amber LED test result indicates the battery has been used for over one hour or the allowed number of tests has been exceeded. The EPIRB will still operate normally in distress, but the battery should be replaced to ensure the full operating life when your EPIRB is needed
Automatic termination of the self-test mode upon completion of the self-test and indication of the self-test results	verify automatic termination, irrespectively of the switch position	If the Self-test switch is held in ON position 10 seconds then GNSS self-test starts. GNSS self-test auto terminates when complete

- **Message Coding (A.3.1.4)**

Bursts received	1
BCH error	0
Self test message	1
Full HEX message	FFFED08C9EF9C0637FDFF83D15B783E0F66C

Decoding Beacon Message

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - <b>Albania</b>	27-36	0011001001
Type of location protocol: Standard Location - Test	37-40	1110
Test Protocol: Test Protocol (No Decode information in bits 41 to 64)	41-64	111110011100000001100011
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	00000111010001010110
BCH 1 Calculated:	N/A	00000111010001010110
Fixed bits (1101): Pass	107-110	1101
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
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	011001101100
BCH 2 Calculated:	N/A	011001101100
Composite Latitude: default	N/A	Composite Longitude: default
15 Hex ID:	N/A	193DF380C6FFBFF

**g) GNSS Self-test mode (according to C/S T.007 – section A.3.6.)**

**Test result.**

GNSS Self-test was performed in two conditions: with GNSS signal and without GNSS signal. During GNSS Self-test beacon didn't transmit any burst at 406 MHz and 121.5 MHz.

With GPS signal	
Duration of the self test	31 - 60 sec
Test Result	Strobe flashing and the green LED flashing

Without GPS signal	
Duration of the self test	315.50 sec
Test Result	Strobe flashing and the red LED flashing

GNSS self test counter was checked. GNSS signal was available during the test. See results below.

With GPS signals			
Number of test	Start test time	Duration, sec	Indication after GNSS selftest completion
1.	17.02.2014 19:14	60.00	Strobe flashing and the green LED flashes 11 times <sup>1</sup> then after short pause Strobe flashing and the green LED flashes 11 times
2.	17.02.2014 19:16	37.18	Strobe flashing and the green LED flashes 10 times <sup>1</sup> then after short pause Strobe flashing and the green LED flashes 10 times
3.	17.02.2014 19:18	36.13	Strobe flashing and the green LED flashes 9 times <sup>1</sup> then after short pause Strobe flashing and the green LED flashes 9 times
4.	17.02.2014 19:20	37.02	Strobe flashing and the green LED flashes 8 times <sup>1</sup> then after short pause Strobe flashing and the green LED flashes 8 times
5.	17.02.2014 19:22	37.02	Strobe flashing and the green LED flashes 7 times <sup>1</sup> then after short pause Strobe flashing and the green LED flashes 7 times
6.	17.02.2014 19:24	35.05	Strobe flashing and the green LED flashes 6 times <sup>1</sup> Strobe flashing and the green LED flashes 6 times
7.	17.02.2014 19:26	42.12	Strobe flashing and the green LED flashes 5 times <sup>1</sup> then after short pause Strobe flashing and the green LED flashes 5 times
8.	17.02.2014 19:28	39.02	Strobe flashing and the green LED flashes 4 times <sup>1</sup> then after short pause Strobe flashing and the green LED flashes 4 times
9.	17.02.2014 19:30	56.17	Strobe flashing and the green LED flashes 3 times <sup>1</sup> then after

			short pause Strobe flashing and the green LED flashes 3 times
10.	17.02.2014 19:32	32.02	Strobe flashing and the green LED flashes 2 times <sup>1</sup> then after short pause Strobe flashing and the green LED flashes 2 times
11.	17.02.2014 19:34	31.00	Strobe flashing and the green LED flashes 1 times <sup>1</sup> then after short pause Strobe flashing and the green LED flashes 1 times
12.	17.02.2014 19:36	44.81	Strobe flashing and the green LED flashes continuously without a break until the beacon turns off automatically.
13.	17.02.2014 19:38	GNSS Self-test didn't start	The red LED flashing immediately

Note 1. The number of green flashes indicates the number of GPS tests remaining.

Note 2. For the last GNSS self test Strobe flashing and the green LED flashing are not repeated.

### 5.2.2 Electrical and Functional Tests at Maximum Temperature

**Table of measured parameters.**

Message					
Contents (full)	:FFFE2F 8C9EF9C0637FDFF83D15B 783E0F66C				
Test duration 0:14:53	Bursts received 19	BCH error 0	Self-Test 0		
406 MHz Transmitter Parameters		Limits		Measured	
		min	max	min	current
<b>Frequency, MHz</b>	406.039	406.041	406.039968	406.039968	406.039968
<b>+Phase deviation, rad</b>	1.00	1.20	1.07	1.09	1.13
<b>-Phase deviation, rad</b>	-1.00	-1.20	-1.13	-1.09	-1.08
<b>Phase time rise, us</b>	50.00	250.00	142.17	143.71	148.29
<b>Phase time fall, us</b>	50.00	250.00	155.56	155.60	162.74
<b>Power, dBm</b>	35	39	37.21	37.21	37.27
<b>Power rise, ms</b>	0.00	5.00	0.40	0.40	0.47
<b>Power output 1 ms before burst, dBm</b>		-10		-21.74	
<b>Bit Rate, bps</b>	396.00	404.00	400.02	400.15	400.15
<b>Asymmetry, %</b>	0.00	5.00	0.38	0.56	0.66
<b>CW Preamble, ms</b>	158.40	161.60	160.03	160.05	160.05
<b>Total burst duration, ms</b>	514.80	525.20	518.35	518.40	518.45
<b>Slope</b>	-1.00E-09	1.00E-09	-2.31E-12	-2.31E-12	-2.31E-12
<b>Residual variations</b>	0.00	3.00E-09	3.13E-10	3.13E-10	3.13E-10
<b>Short term variations</b>	0.00	2.00E-09	9.27E-11	9.27E-11	9.27E-11
121.5 MHz Transmitter Parameters					
<b>Carrier Frequency, Hz</b>	121498228	<b>Low Sweep Frequency, Hz</b>			350
<b>Power, dBm<sup>1</sup></b>	18.38	<b>High Sweep Frequency, Hz</b>			1119
<b>Sweep Period, sec</b>	0.33	<b>Sweep Range, Hz</b>			769
<b>Modulation Index, %</b>	100				

<sup>1</sup> Measured power of 121.5 MHz Transmitter complies with maximum power 18 dBm declared by beacon manufacturer in Annex G (see page 15) with applied test facility accuracy 0.5 dB.

**a) Transmitter Power Output (according to C/S T.007 – section A.3.2.2).**

- Transmitter Power Output Level (A.3.2.2.1)**

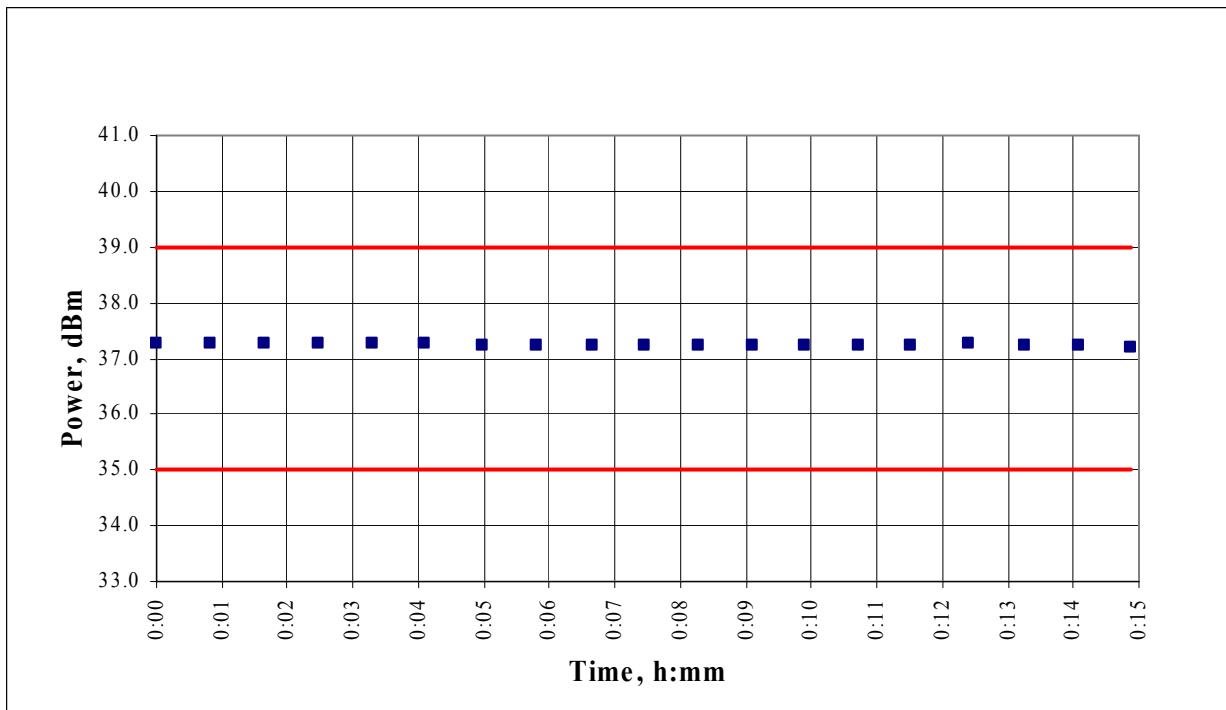


Figure 5.2.2.1 – Transmitter power during test

- Transmitter Power Output Rise Time (A.3.2.2.2)**

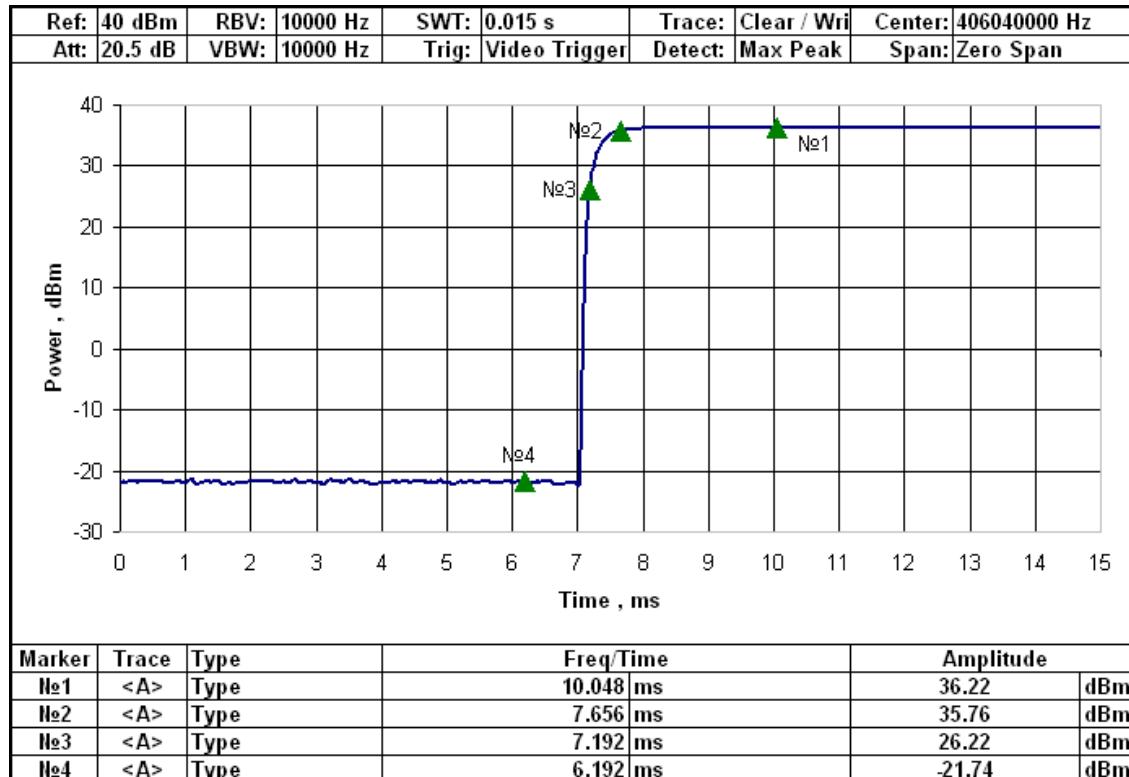


Figure 5.2.2.2 – Transmitter power output rise

**b) Message Coding (according to C/S T.007 - A.3.1.4)**

Bursts received	19
BCH error	0
Self test message	0
Full HEX message	FFFE2F 8C9EF9C0637FDFF83D15B 783E0F66C

Decoding Beacon Message

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - <b>Albania</b>	27-36	0011001001
Type of location protocol: Standard Location - Test	37-40	1110
Test Protocol: Test Protocol (No Decode information in bits 41 to 64)	41-64	111110011100000001100011
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	00000111010001010110
BCH 1 Calculated:	N/A	00000111010001010110
Fixed bits (1101): Pass	107-110	1101
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
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	011001101100
BCH 2 Calculated:	N/A	011001101100
Composite Latitude: default	N/A	Composite Longitude: default
15 Hex ID:	N/A	193DF380C6FFBFF

c) Digital message generator (according to C/S T.007 – section A.3.1)

- Repetition Period (A.3.1.1)

406 MHz Transmitter Parameters	Limits		Measured
	min	max	
Average repetition period, s	48.50	51.50	49.61
Minimum repetition period ,s	47.5	48.0	47.81
Maximum repetition period ,s	52.0	52.5	52.51
Standard deviation	0.5	2.0	1.41
Differences of Rep. period, s	4		4.70

- Measurement of time interval from the moment of beacon activation till the first (operating) burst

	Time interval, sec
	from the moment of beacon activation till the first (operating) burst
1 <sup>st</sup> measurement	54.08
2 <sup>d</sup> measurement	54.38
3 <sup>d</sup> measurement	53.91
Minimum value	<b>53.91</b>
Maximum value	<b>54.38</b>

**d) Data Encoding and Modulation (according to C/S T.007 – section A.3.2.3)**

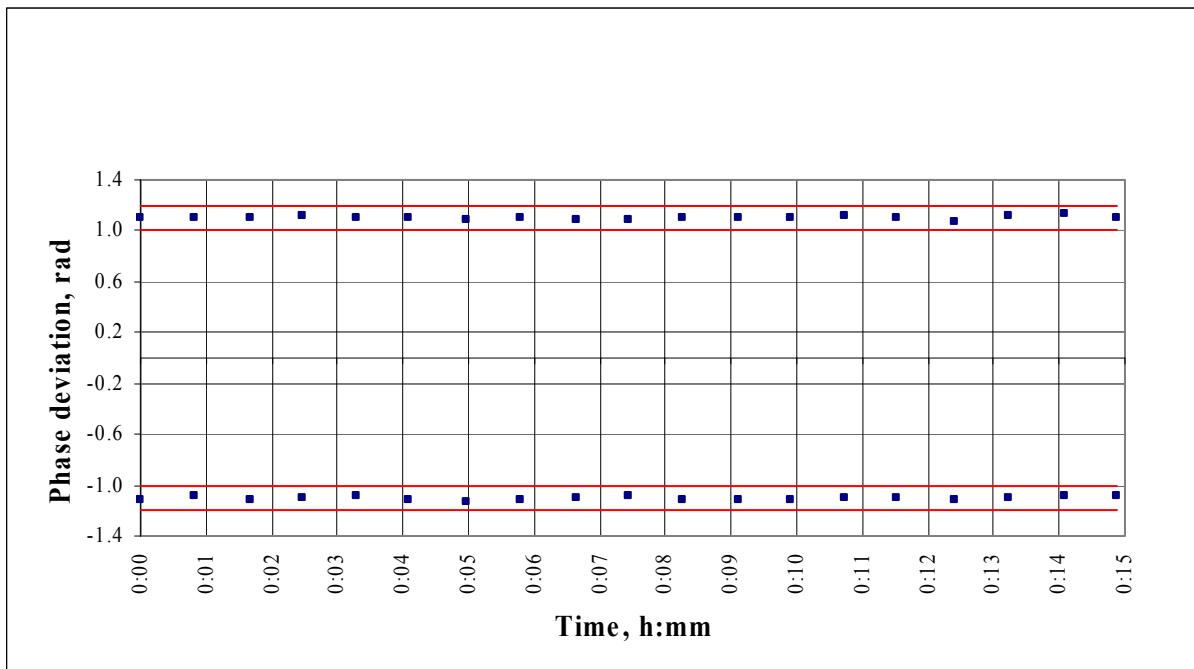


Figure 5.2.2.3 – Modulation index

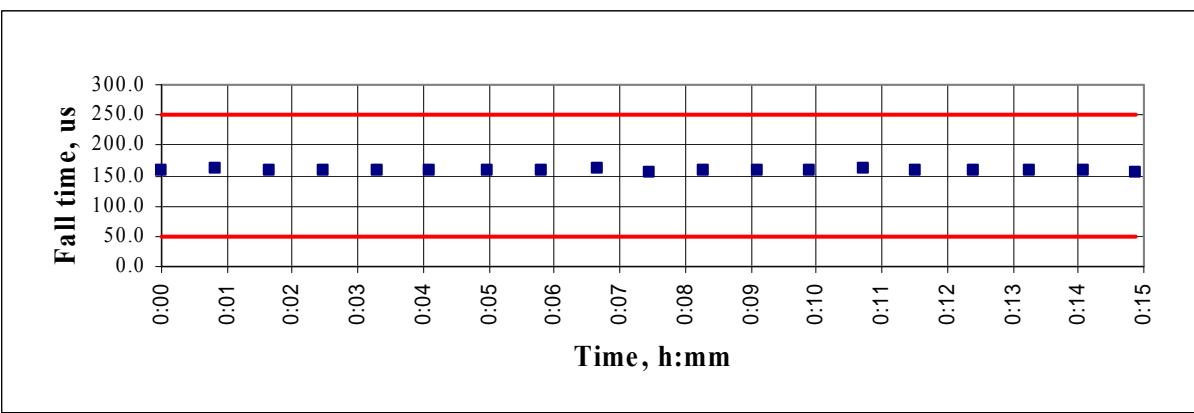
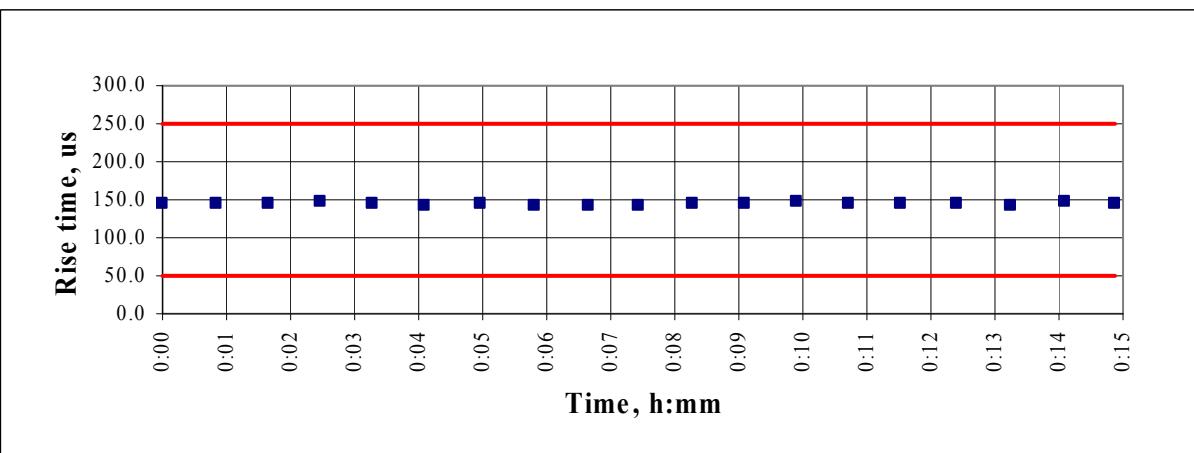


Figure 5.2.2.4 – Modulation rise and fall times

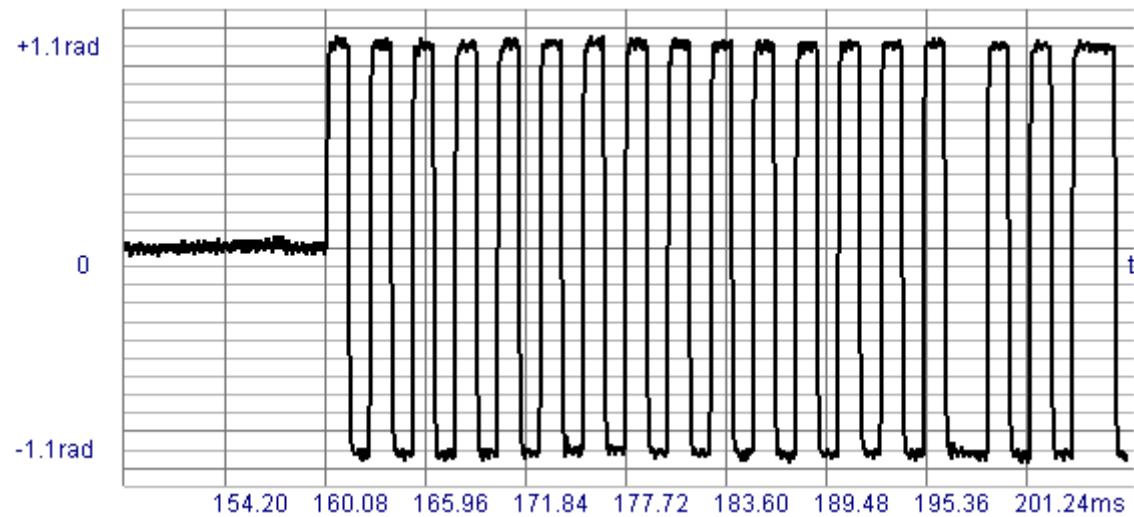


Figure 5.2.2.5 – Modulation symmetry of the bi-phase demodulated signal

e) Spurious output (according to C/S T.007 – section A.3.2.2.4)

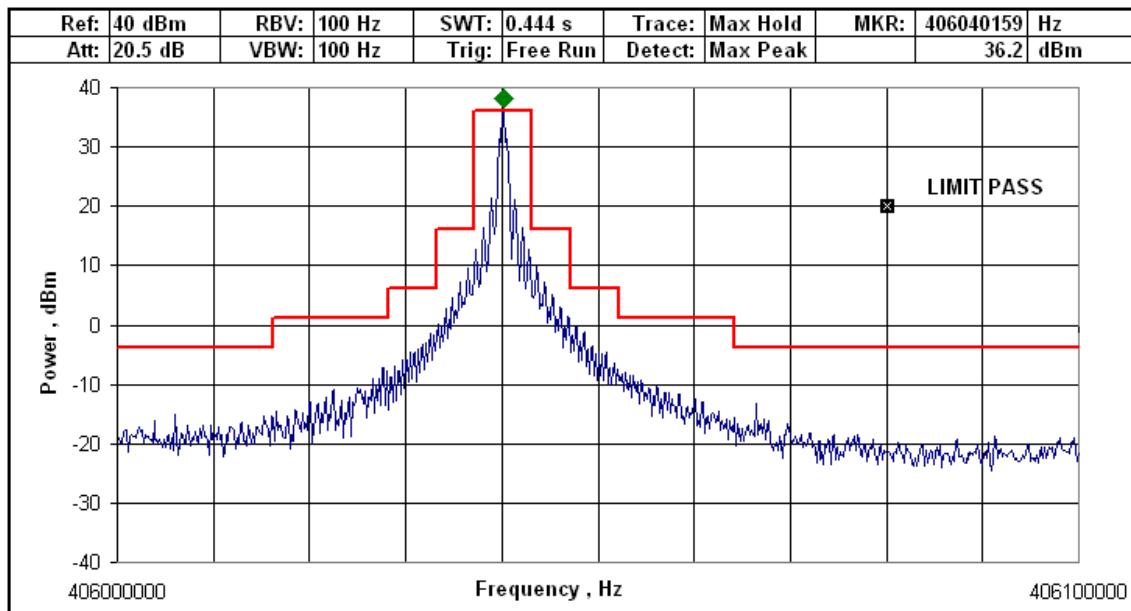


Figure 5.2.2.6 – Spurious output.

**f) Voltage Standing-Wave Ratio (according to C/S T.007 – section A.3.3)**

**Test results.**

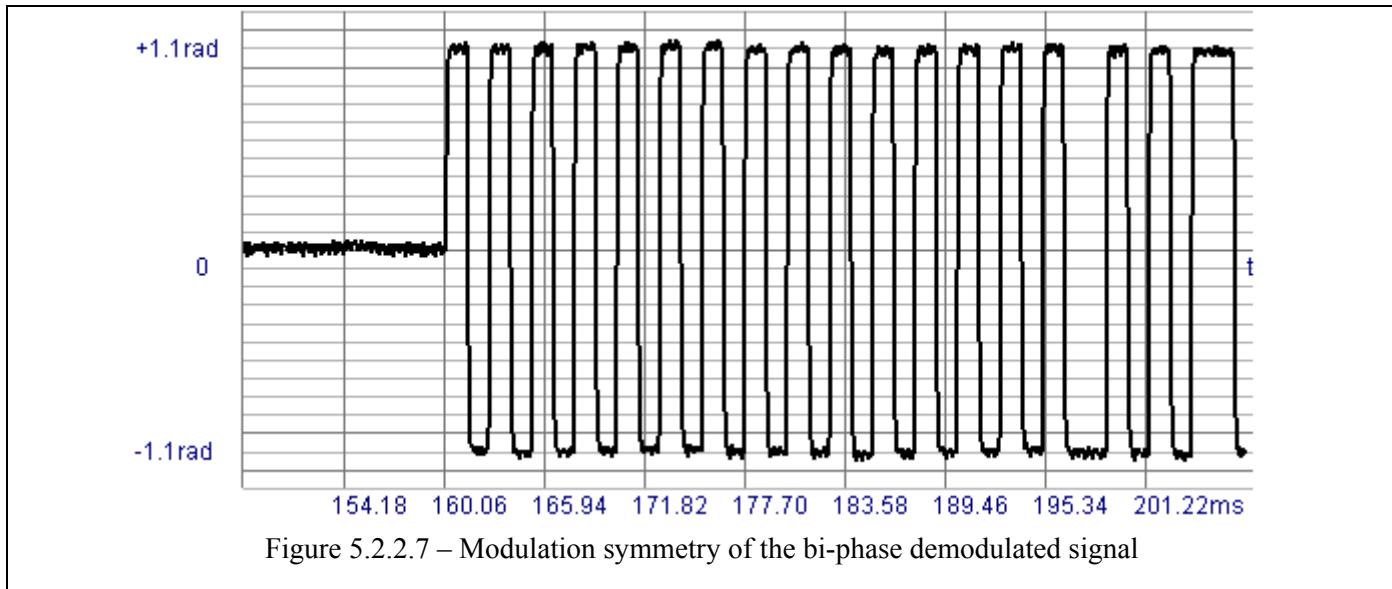
The transmitter was operating into an open circuit during 5 minutes and then into a short circuit during 5 minutes. Afterwards, the transmitter was operating into a load having a VSWR of 3:1 (pure resistive 17 Ohm), during which time parameters were measured.

**Table of measured parameters.**

		Message		
Contents (full)	FFFE2F 8C9EF9C0637FDFF83D15B 783E0F66C			

Test duration 0:14:53	Bursts received 19	BCH error 0	Self-Test 0		
406 MHz Transmitter Parameters	Limits		Measured		
	min	max	min	current	max
<b>Frequency, MHz</b>	406.039	406.041	406.039969	406.039969	406.039969
<b>+Phase deviation, rad</b>	1.00	1.20	1.07	1.10	1.13
<b>-Phase deviation, rad</b>	-1.00	-1.20	-1.12	-1.09	-1.07
<b>Phase time rise, us</b>	50.00	250.00	141.45	143.13	145.55
<b>Phase time fall, us</b>	50.00	250.00	156.68	158.54	160.68
<b>Asymmetry, %</b>	0.00	5.00	0.35	0.59	0.69

- The modulation parameters (A.3.2.3)**



- **Message Coding (A.3.1.4)**

Bursts received	19
BCH error	0
Self test message	0
Full HEX message	FFFE2F 8C9EF9C0637FDFF83D15B 783E0F66C

Decoding Beacon Message

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - <b>Albania</b>	27-36	0011001001
Type of location protocol: Standard Location - Test	37-40	1110
Test Protocol: Test Protocol (No Decode information in bits 41 to 64)	41-64	111110011100000001100011
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	00000111010001010110
BCH 1 Calculated:	N/A	00000111010001010110
Fixed bits (1101): Pass	107-110	1101
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
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	011001101100
BCH 2 Calculated:	N/A	011001101100
Composite Latitude: default	N/A	Composite Longitude: default
15 Hex ID:	N/A	193DF380C6FFBFF

**g) Self-test mode (according to C/S T.007 – section A.3.6.)**

**Test result.**

During the self test transmitter emitted only one burst

**Table of measured parameters.**

Message				
Contents (full)	:FFFED08C9EF9C0637FDFF83D15B783E0F66C			
Test duration 0 h 0 m	Bursts received 1	BCH error 0	Self-Test 1	
<b>406 MHz Transmitter Parameters</b>		<b>Limits</b>		<b>Measured</b>
		min	max	current
Frequency, MHz		406.039	406.041	406.039970
Power, dBm		35	39	36.47
Total burst duration, ms		514.80	525.20	518.05
<b>121.5 MHz Transmitter Parameters</b>				
Carrier Frequency, Hz	121498242			
Power, dBm	18.35			

Parameter	Requirement	Result
Distinct indication of self-test start	must be provided	The red LED will come on to indicate the switch is depressed, followed by the red LED flashing rapidly
Distinct indication of RF-power being emitted	must be provided	Strobe light flashes
Indication of the self-test result	must be provided	The green LED flashes 1 time
Maximum duration of self-test mode	shall not exceed maximum duration of self-test 16.5 sec	16.28 sec
Distinct indication of insufficient battery capacity	must be provided	According to the Self-test mode description (Annex A, page 245) the amber LED test result indicates the battery has been used for over one hour or the allowed number of tests has been exceeded. The EPIRB will still operate normally in distress, but the battery should be replaced to ensure the full operating life when your EPIRB is needed
Automatic termination of the self-test mode upon completion of the self-test and indication of the self-test results	verify automatic termination, irrespectively of the switch position	If the Self-test switch is held in ON position 10 seconds then GNSS self-test starts. GNSS self-test auto terminates when complete

- **Message Coding (A.3.1.4)**

Bursts received	1
BCH error	0
Self test message	1
Full HEX message	FFFED08C9EF9C0637FDFF83D15B783E0F66C

Decoding Beacon Message

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - <b>Albania</b>	27-36	0011001001
Type of location protocol: Standard Location - Test	37-40	1110
Test Protocol: Test Protocol (No Decode information in bits 41 to 64)	41-64	111110011100000001100011
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	00000111010001010110
BCH 1 Calculated:	N/A	00000111010001010110
Fixed bits (1101): Pass	107-110	1101
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
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	011001101100
BCH 2 Calculated:	N/A	011001101100
Composite Latitude: default	N/A	Composite Longitude: default
15 Hex ID:	N/A	193DF380C6FFBFF

### 5.2.3 Electrical and Functional Tests at Minimum Temperature

**Table of measured parameters.**

<b>Message</b>					
<b>Contents (full)</b>	:FFFE2F 8C9EF9C0637FDFF83D15B 783E0F66C				
Test duration 0:14:53	Bursts received 19	BCH error 0	Self-Test 0		
<b>406 MHz Transmitter Parameters</b>		<b>Limits</b>		<b>Measured</b>	
		<b>min</b>	<b>max</b>	<b>min</b>	<b>current</b>
<b>Frequency, MHz</b>		406.039	406.041	406.039998	406.039998
<b>+Phase deviation, rad</b>		1.00	1.20	1.07	1.09
<b>-Phase deviation, rad</b>		-1.00	-1.20	-1.13	-1.11
<b>Phase time rise, us</b>		50.00	250.00	147.44	148.97
<b>Phase time fall, us</b>		50.00	250.00	158.88	161.21
<b>Power, dBm</b>		35	39	36.47	36.47
<b>Power rise, ms</b>		0.00	5.00	0.30	0.30
<b>Power output 1 ms before burst, dBm</b>			-10		-19.48
<b>Bit Rate, bps</b>		396.00	404.00	400.01	400.14
<b>Asymmetry, %</b>		0.00	5.00	0.29	0.41
<b>CW Preamble, ms</b>		158.40	161.60	160.02	160.03
<b>Total burst duration, ms</b>		514.80	525.20	518.45	518.50
<b>Slope</b>		-1.00E-09	1.00E-09	-5.08E-11	-5.08E-11
<b>Residual variations</b>		0.00E-09	3.00E-09	6.84E-10	6.84E-10
<b>Short term variations</b>		0.00E-09	2.00E-09	1.46E-10	1.46E-10
<b>121.5 MHz Transmitter Parameters</b>					
<b>Carrier Frequency, Hz</b>	121497805	<b>Low Sweep Frequency, Hz</b>			350
<b>Power, dBm</b>	16.10	<b>High Sweep Frequency, Hz</b>			1118
<b>Sweep Period, sec</b>	0.33	<b>Sweep Range, Hz</b>			768
<b>Modulation Index, %</b>	100				

a) Transmitter Power Output (according to C/S T.007 – section A.3.2.2).

- Transmitter Power Output Level (A.3.2.2.1)

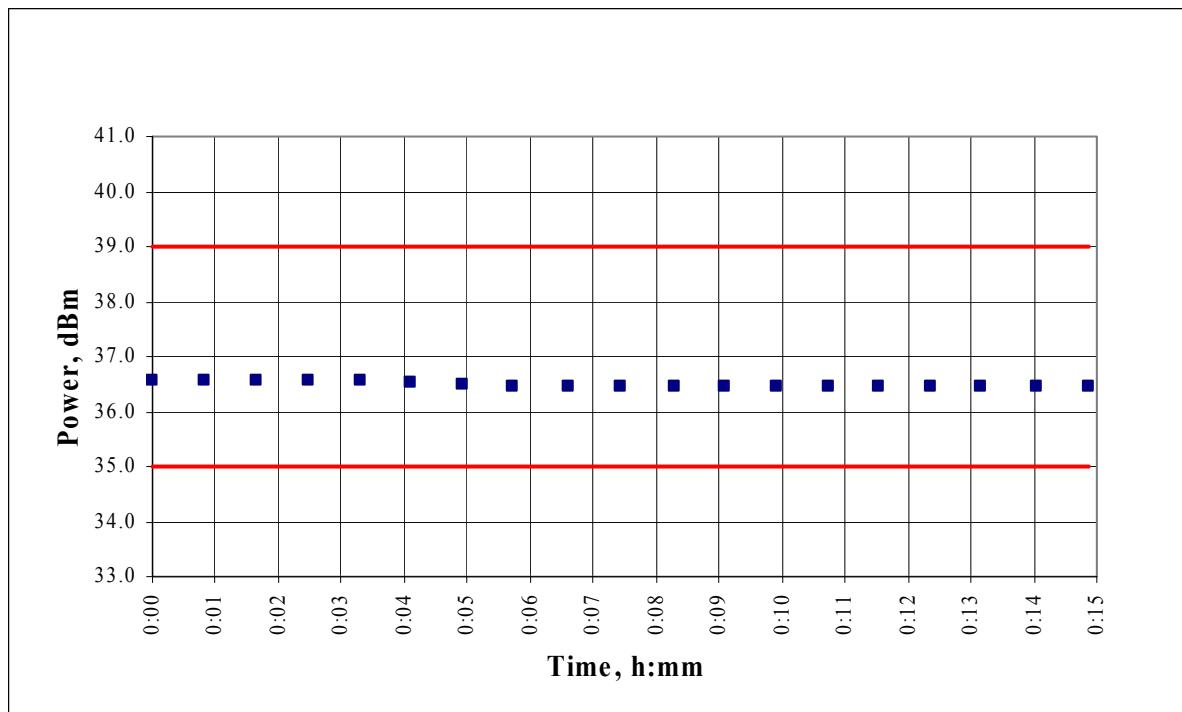


Figure 5.2.3.1 – Transmitter power during test

- Transmitter Power Output Rise Time (A.3.2.2.2)

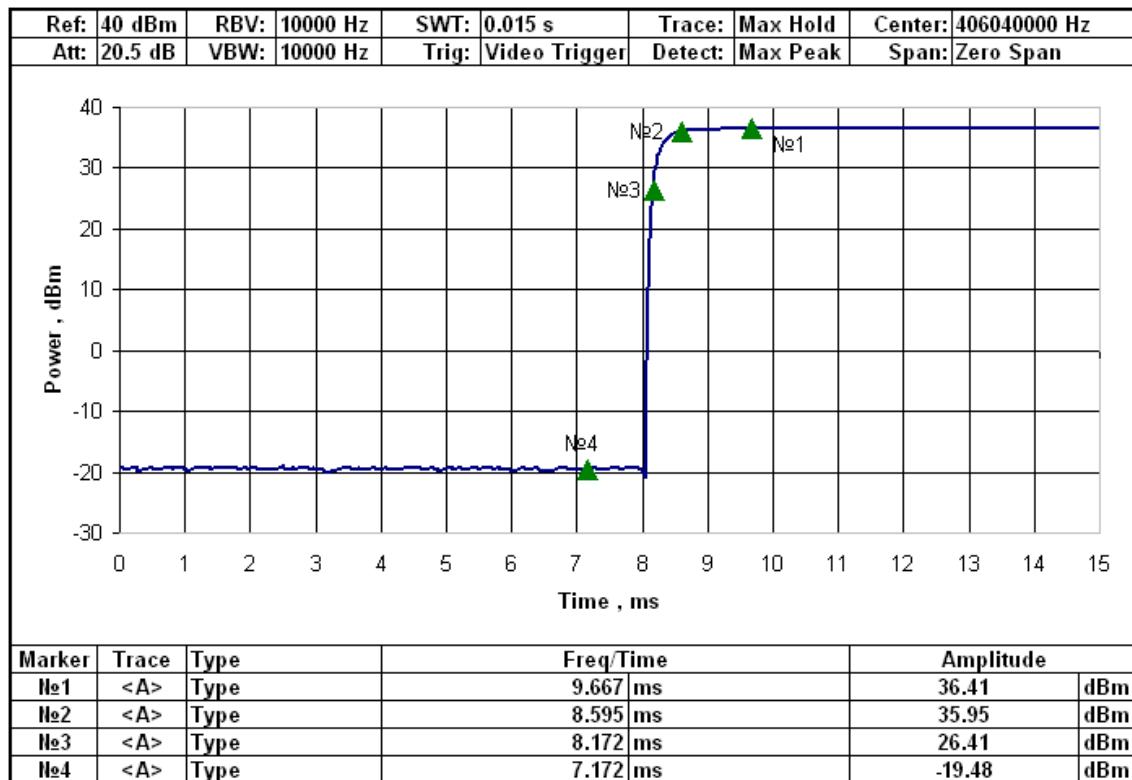


Figure 5.2.3.2 – Transmitter power output rise

**b) Message Coding (according to C/S T.007 - A.3.1.4)**

Bursts received	19
BCH error	0
Self test message	0
Full HEX message	FFFE2F 8C9EF9C0637FDFF83D15B 783E0F66C

Decoding Beacon Message

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - <b>Albania</b>	27-36	0011001001
Type of location protocol: Standard Location - Test	37-40	1110
Test Protocol: Test Protocol (No Decode information in bits 41 to 64)	41-64	111110011100000001100011
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	00000111010001010110
BCH 1 Calculated:	N/A	00000111010001010110
Fixed bits (1101): Pass	107-110	1101
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
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	011001101100
BCH 2 Calculated:	N/A	011001101100
Composite Latitude: default	N/A	Composite Longitude: default
15 Hex ID:	N/A	193DF380C6FFBFF

c) Digital message generator (according to C/S T.007 – section A.3.1)

- Repetition Period (A.3.1.1)

406 MHz Transmitter Parameters	Limits		Measured
	min	max	
Average repetition period, s	48.50	51.50	49.61
Minimum repetition period ,s	47.5	48.0	47.81
Maximum repetition period ,s	52.0	52.5	52.51
Standard deviation	0.5	2.0	1.41
Differences of Rep. period, s	4		4.70

- Measurement of time interval from the moment of beacon activation till the first (operating) burst

	Time interval, sec
	from the moment of beacon activation till the first (operating) burst
1 <sup>st</sup> measurement	54.16
2 <sup>d</sup> measurement	54.08
3 <sup>d</sup> measurement	53.91
Minimum value	<b>53.91</b>
Maximum value	<b>54.16</b>

**d) Data Encoding and Modulation (according to C/S T.007 – section A.3.2.3)**

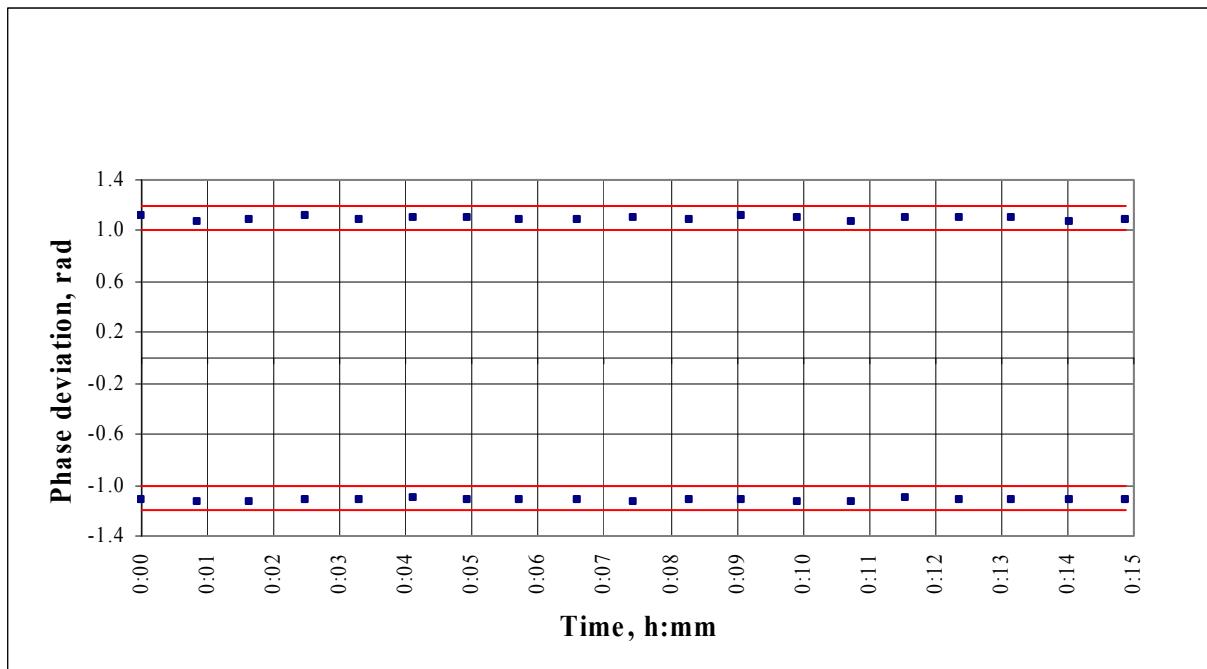


Figure 5.2.3.3 – Modulation index

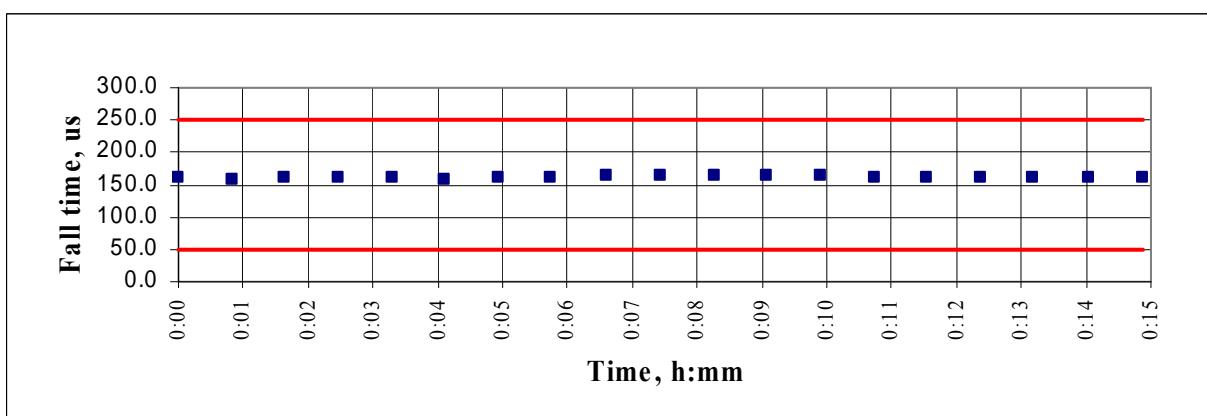
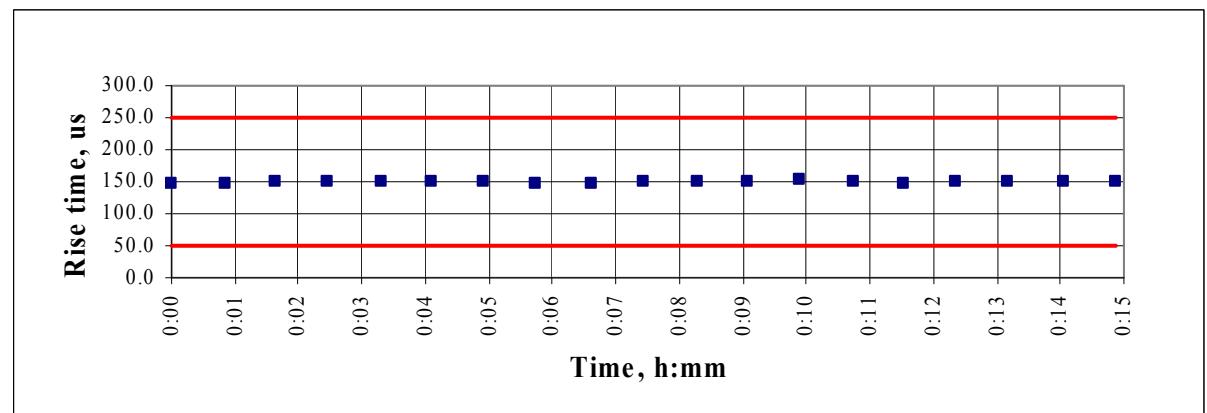


Figure 5.2.3.4 – Modulation rise and fall times

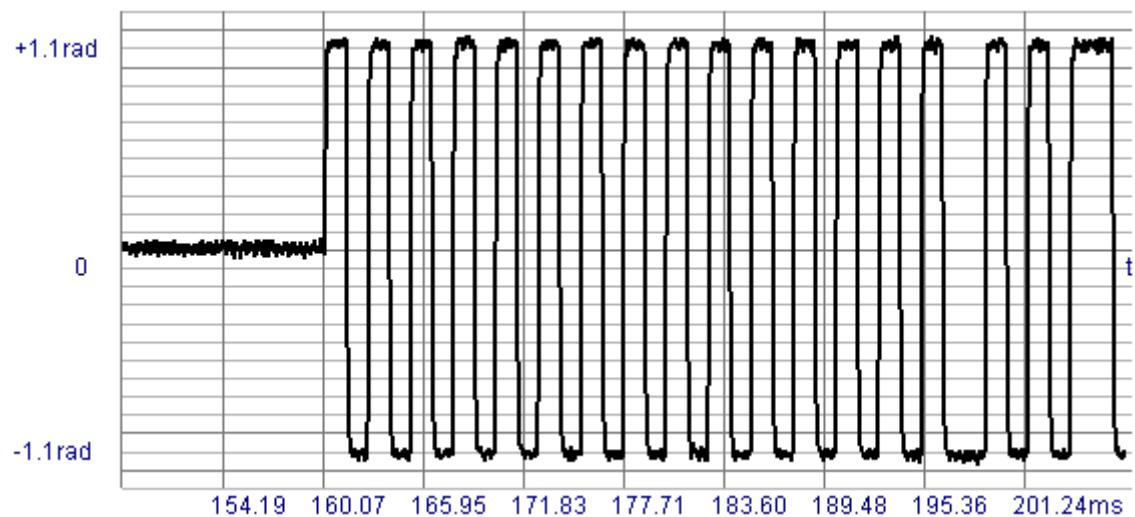


Figure 5.2.3.5– Modulation symmetry of the bi-phase demodulated signal

e) Spurious output (according to C/S T.007 – section A.3.2.2.4)

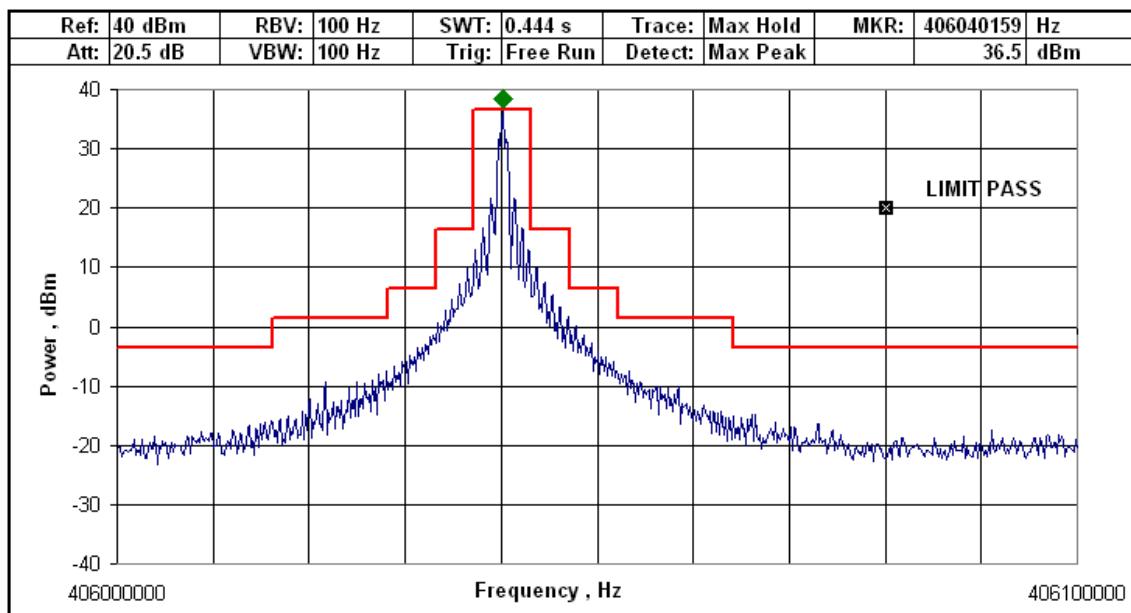


Figure 5.2.3.6 – Spurious output.

**f) Voltage Standing-Wave Ratio (according to C/S T.007 – section A.3.3)**

**Test results.**

The transmitter was operating into an open circuit during 5 minutes and then into a short circuit during 5 minutes. Afterwards, the transmitter was operating into a load having a VSWR of 3:1 (pure resistive 17 Ohm), during which time parameters were measured.

**Table of measured parameters.**

		Message		
Contents (full)	FFFE2F 8C9EF9C0637FDFF83D15B 783E0F66C			

406 MHz Transmitter Parameters	Bursts received	19	BCH error	0	Self-Test	0		
	Limits			Measured				
	min	max		min	current	max		
Frequency, MHz	406.039		406.038	406.039997	406.039997		406.039997	
+Phase deviation, rad	1.00		1.20	1.07	1.07		1.11	
-Phase deviation, rad	-1.00		-1.20	-1.14	-1.13		-1.11	
Phase time rise, us	50.00		250.00	146.78	150.63		150.92	
Phase time fall, us	50.00		250.00	157.83	164.43		164.43	
Asymmetry, %	0.00		5.00	0.32	0.37		0.50	

- The modulation parameters (A.3.2.3)**

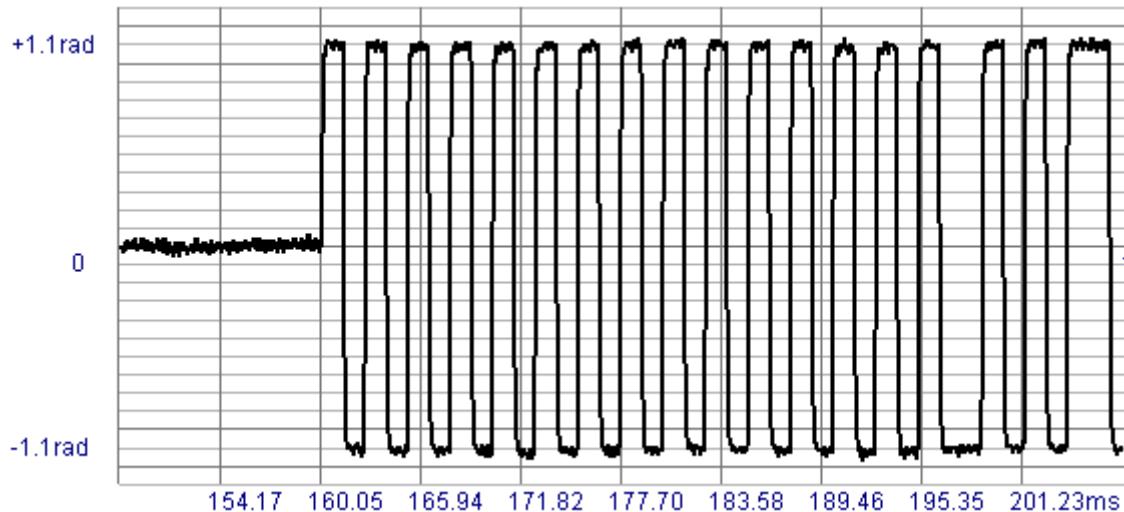


Figure 1.3.7– Modulation symmetry of the bi-phase demodulated signal

- **Message Coding (A.3.1.4)**

Bursts received	19
BCH error	0
Self test message	0
Full HEX message	FFFE2F 8C9EF9C0637FDFF83D15B 783E0F66C

Decoding Beacon Message

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - <b>Albania</b>	27-36	0011001001
Type of location protocol: Standard Location - Test	37-40	1110
Test Protocol: Test Protocol (No Decode information in bits 41 to 64)	41-64	111110011100000001100011
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	00000111010001010110
BCH 1 Calculated:	N/A	00000111010001010110
Fixed bits (1101): Pass	107-110	1101
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
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	011001101100
BCH 2 Calculated:	N/A	011001101100
Composite Latitude: default	N/A	Composite Longitude: default
15 Hex ID:	N/A	193DF380C6FFBFF

**g) Self-test mode (according to C/S T.007 – section A.3.6.)**

**Test result.**

During the self test transmitter emitted only one burst

**Table of measured parameters.**

		Message		
Contents (full)	:FFFED08C9EF9C0637FDFF83D15B783E0F66C	Limits		Measured
		min	max	current
	<b>Frequency, MHz</b>	406.039	406.041	406.040019
	<b>Power, dBm</b>	35	39	36.56
	<b>Total burst duration, ms</b>	514.80	525.20	518.20
<b>121.5 MHz Transmitter Parameters</b>				
<b>Carrier Frequency, Hz</b>	121497746			
<b>Power, dBm</b>	15.96			

Parameter	Requirement	Result
Distinct indication of self-test start	must be provided	The red LED will come on to indicate the switch is depressed, followed by the red LED flashing rapidly
Distinct indication of RF-power being emitted	must be provided	Strobe light flashes
Indication of the self-test result	must be provided	The green LED flashes 1 time
Maximum duration of self-test mode	shall not exceed maximum duration of self-test 16.5 sec	16.41 sec
Distinct indication of insufficient battery capacity	must be provided	According to the Self-test mode description (Annex A, page 245) the amber LED test result indicates the battery has been used for over one hour or the allowed number of tests has been exceeded. The EPIRB will still operate normally in distress, but the battery should be replaced to ensure the full operating life when your EPIRB is needed
Automatic termination of the self-test mode upon completion of the self-test and indication of the self-test results	verify automatic termination, irrespectively of the switch position	If the Self-test switch is held in ON position 10 seconds then GNSS self-test starts. GNSS self-test auto terminates when complete

- **Message Coding (A.3.1.4)**

Bursts received	1
BCH error	0
Self test message	1
Full HEX message	FFFED08C9EF9C0637FDFF83D15B783E0F66C

Decoding Beacon Message

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - <b>Albania</b>	27-36	0011001001
Type of location protocol: Standard Location - Test	37-40	1110
Test Protocol: Test Protocol (No Decode information in bits 41 to 64)	41-64	111110011100000001100011
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	00000111010001010110
BCH 1 Calculated:	N/A	00000111010001010110
Fixed bits (1101): Pass	107-110	1101
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
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	011001101100
BCH 2 Calculated:	N/A	011001101100
Composite Latitude: default	N/A	Composite Longitude: default
15 Hex ID:	N/A	193DF380C6FFBFF

### 5.3 Thermal shock test

Date of test	18.02.2014
Specification	C/S T.007 – section A.2.2
Beacon Model	EPIRB1
Serial number	002
EUT Mod State	0
EUT system configuration, including ancillary devices and modes of their operation	The EUT was operated using its own power source (internal battery). The EUT was configured so that the antenna ports were connected to the 50 Ohms test system using coaxial cables.
EUT operating mode during the test	406 MHz+121.5MHz+Strobe Light
Environmental conditions	Ambient laboratory temperature: 18.0-20.6°C Relative air humidity: 45-55 %
Initial/Offset temperature	55°C / 25°C
Deviations from standard test procedures	There were no deviations from standard test procedures
Non-compliances noticed	There were not non-compliances

#### Test procedure:

The beacon under test, while turned off, is to stabilize during 2 hours at a selected temperature in its operating range. The beacon is then simultaneously placed into an environment held at 30 degrees C offset from the initial temperature and turned on. The beacon is then allowed to operate for 15 minutes before measurements are started.

Matching network was not used.

GNSS signal not available during test.

#### List of test parameters

Measured parameters	page No.
<b>Transmission frequency 406 MHz</b>	
Nominal frequency value	66
Short and average frequency stability	66
Maximum and minimum frequency stability values during test	65
<b>Transmitter power output</b>	
Diagram of power output values during test	68
Maximum and minimum power output values during test	65
<b>Message</b>	
Message contents	69

**Table of measured parameters.**

Message					
Contents (full)	:FFFE2F 8C9EF9C0637FDFF83D15B 783E0F66C				
Test duration 2:00:43	Bursts received 147	BCH error 0	Self-Test 0		
406 MHz Transmitter Parameters	Limits		Measured		
	min	max	min	current	max
<b>Frequency, MHz</b>	406.039	406.041	406.039980	406.039983	406.039983
<b>Power, dBm</b>	35	39	36.48	36.65	36.72
<b>Slope</b>	-2.00E-09	2.00E-09	-2.22E-12	5.21E-13	4.01E-10
<b>Residual variations</b>	0.00E-09	3.00E-09	1.13E-10	1.19E-10	5.27E-10
<b>Short term variations</b>	0.00E-09	2.00E-09	5.93E-11	1.13E-10	1.51E-10
121.5 MHz Transmitter Parameters					
<b>Carrier Frequency, Hz</b>	121498103	<b>Low Sweep Frequency, Hz</b>	350		
<b>Power, dBm<sup>1</sup></b>	18.35	<b>High Sweep Frequency, Hz</b>	1119		
<b>Sweep Period, sec</b>	0.33	<b>Sweep Range, Hz</b>	769		
<b>Modulation Index, %</b>	100				

<sup>1</sup> Measured power of 121.5 MHz Transmitter complies with maximum power 18 dBm declared by beacon manufacture in Annex G (see page 15) with applied test facility accuracy 0.5 dB.

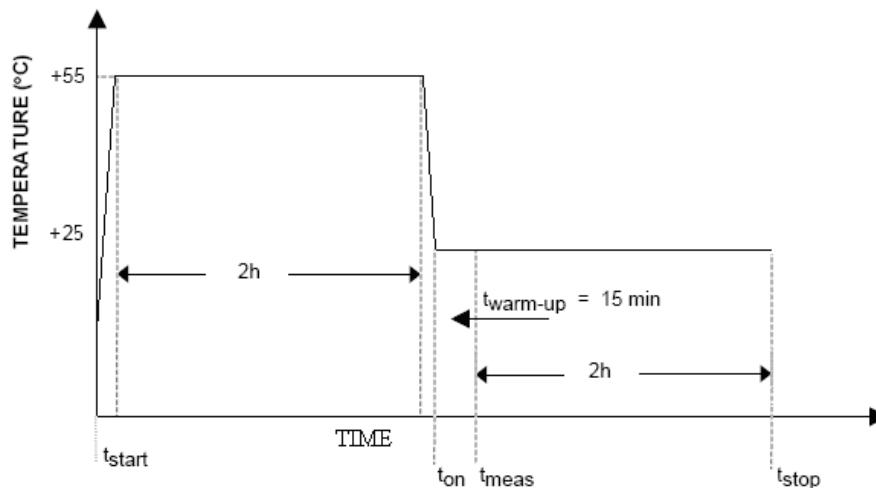


Figure 5.3.1 - Temperature Test Profile

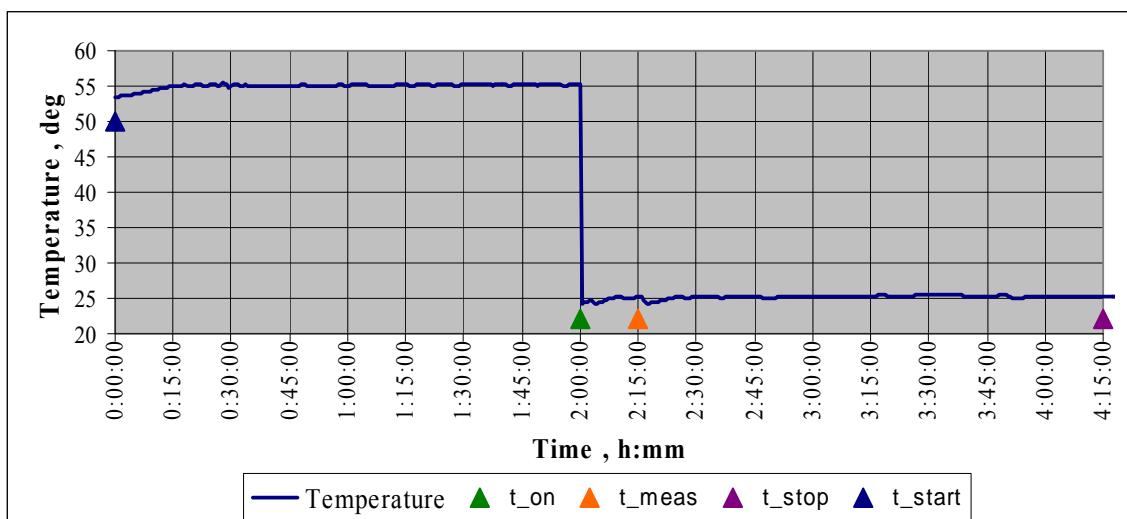


Figure 5.3.2 - Temperature During The Test

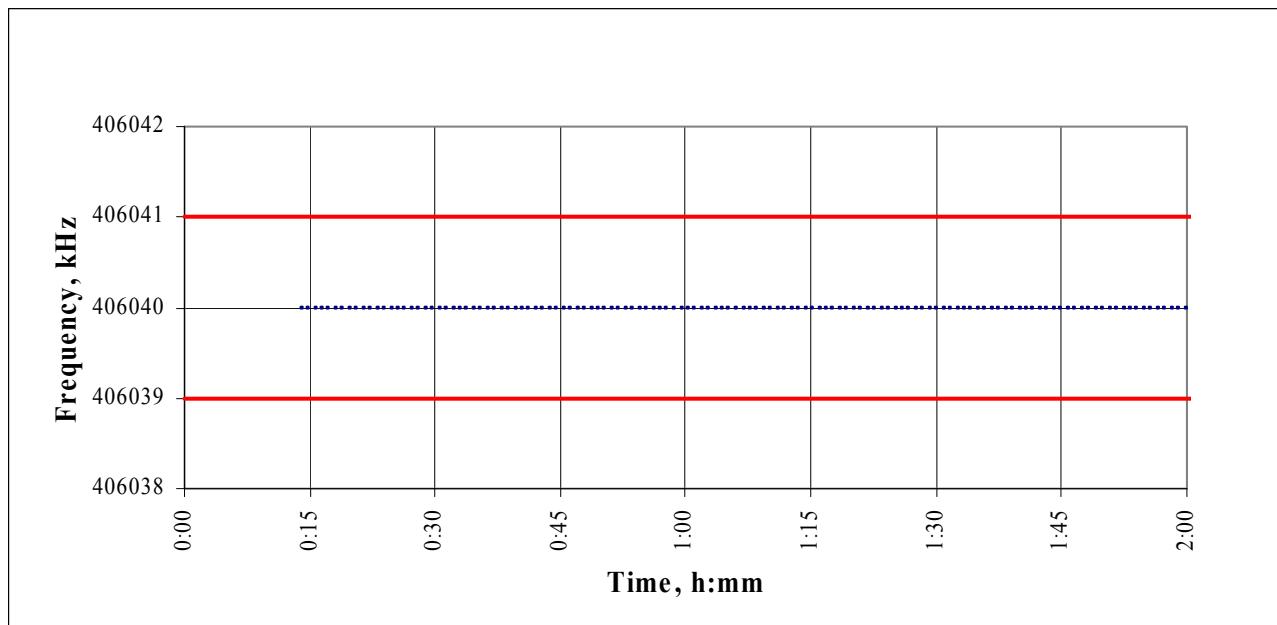
**a) Transmitted Frequency (according to C/S T.007 – section A.3.2.1)****• Nominal Value (A.3.2.1.1)**

Figure 5.3.3 – Nominal Value of frequency

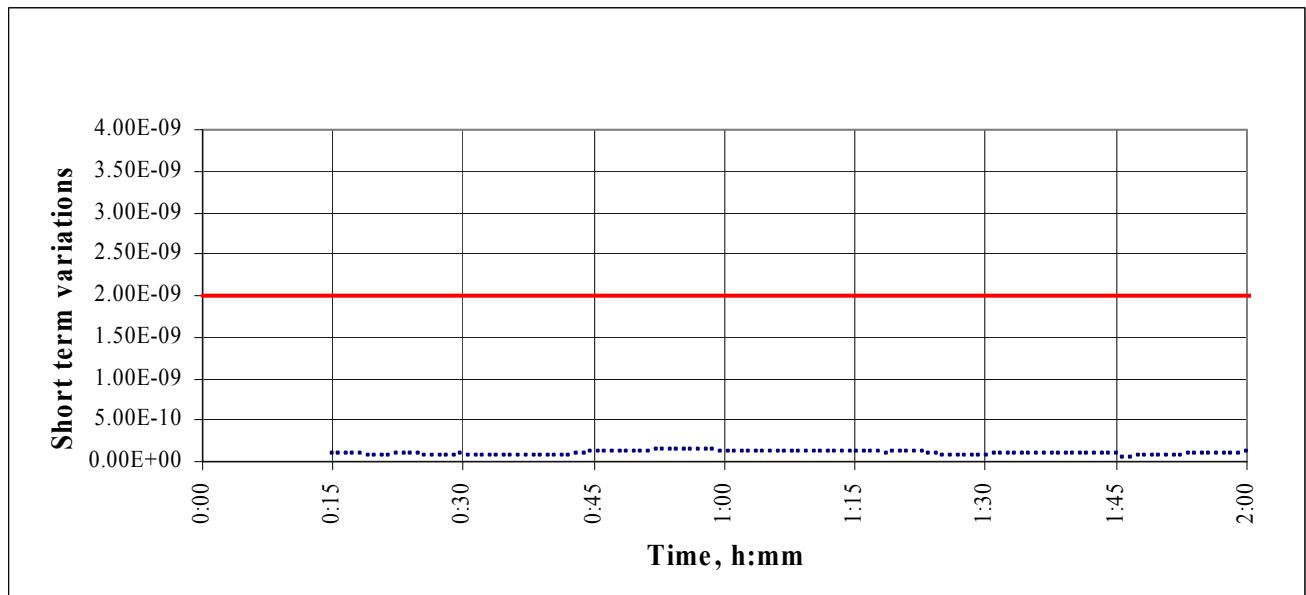
**• Short-Term Stability (A.3.2.1.2)**

Figure 5.3.4 – Short-Term Stability

- Medium-Term Stability (A.3.2.1.3)

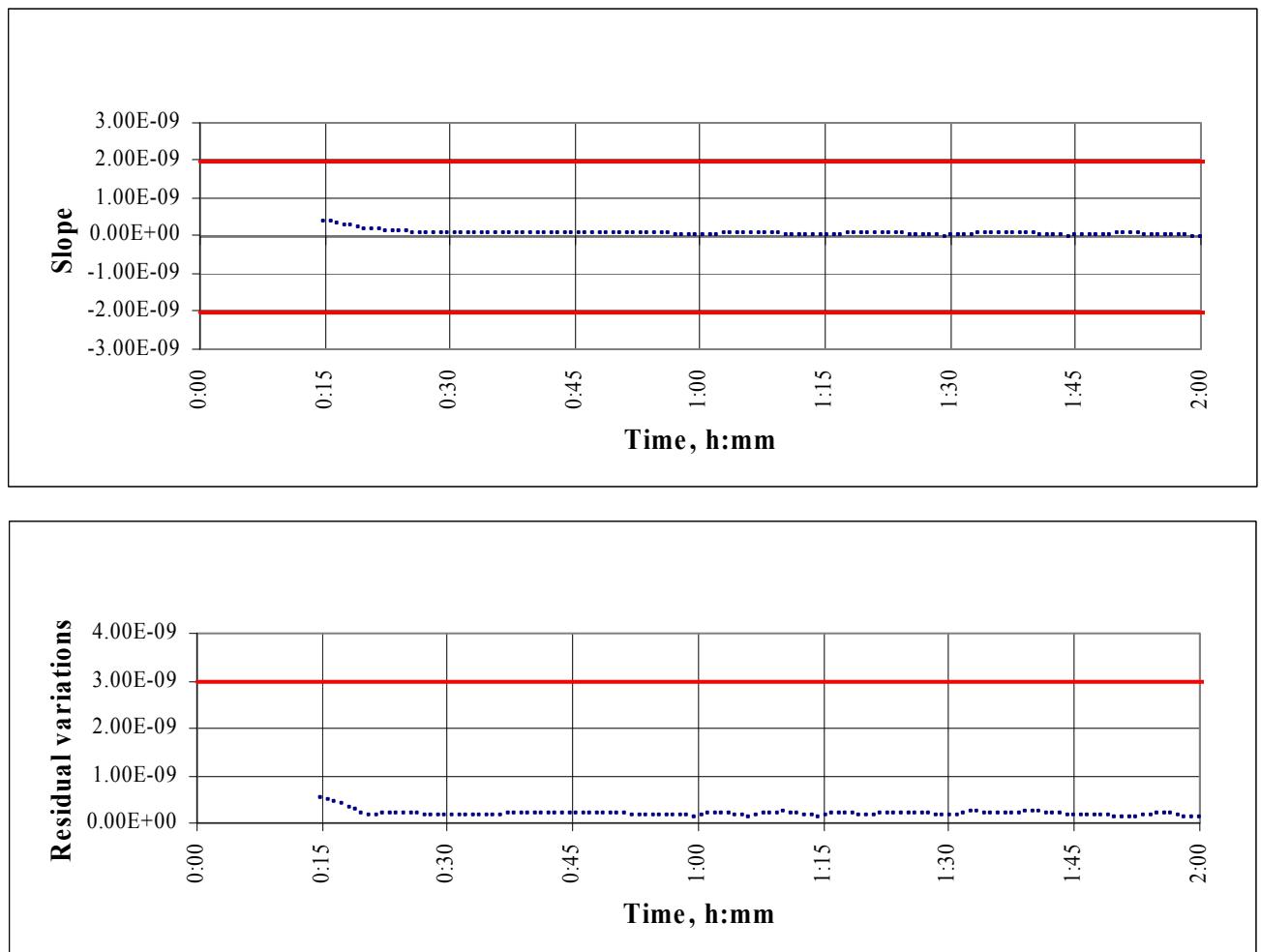


Figure 5.3.5 – Medium-Term Stability

b) Transmitter Power Output (according to C/S T.007 – section A.3.2.2.1).

- Transmitter Power Output Level (A.3.2.2.1)

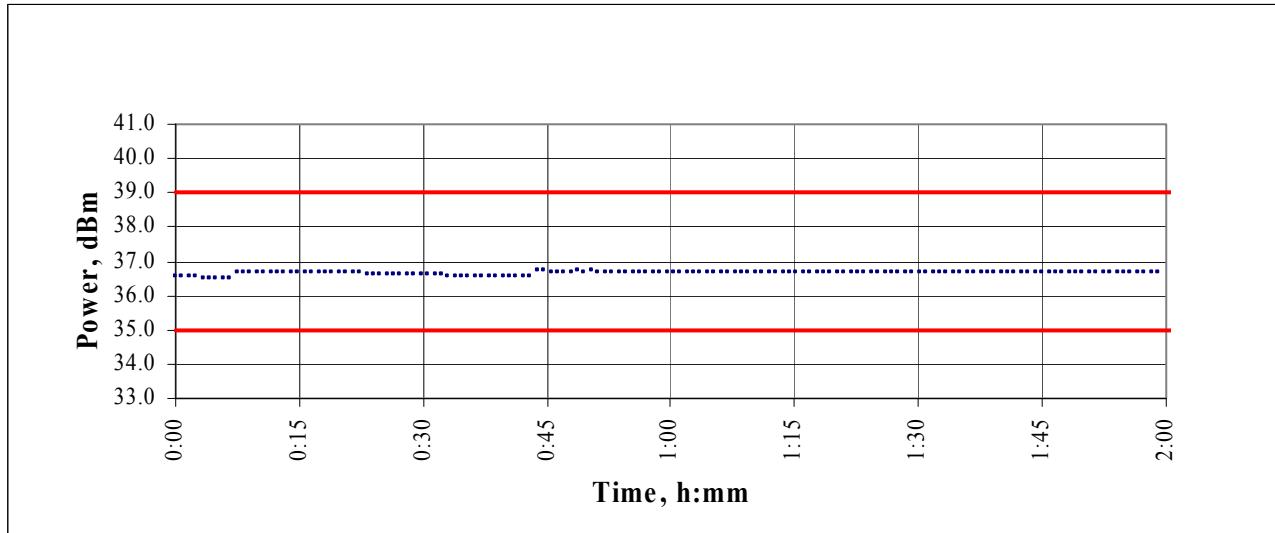


Figure 5.3.6 – Transmitter power during test

c) Message Coding (according to C/S T.007 - A.3.1.4)

Bursts received	147
BCH error	0
Self test message	0
Full HEX message	FFFE2F 8C9EF9C0637FDFF83D15B 783E0F66C

Decoding Beacon Message

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - <b>Albania</b>	27-36	0011001001
Type of location protocol: Standard Location - Test	37-40	1110
Test Protocol: Test Protocol (No Decode information in bits 41 to 64)	41-64	111110011100000001100011
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	00000111010001010110
BCH 1 Calculated:	N/A	00000111010001010110
Fixed bits (1101): Pass	107-110	1101
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
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	011001101100
BCH 2 Calculated:	N/A	011001101100
Composite Latitude: default	N/A	Composite Longitude: default
15 Hex ID:	N/A	193DF380C6FFBFF

## 5.4 Operating Lifetime at Minimum Temperature

Date of test	25.02.2014-28.02.2014 10.06.2014 (measurements of the operating currents when the beacon water activated)
Specification	C/S T.007 – section A.2.3
Beacon Model	EPIRB1
Serial number	002
EUT Mod State	0
EUT system configuration, including ancillary devices and modes of their operation	The EUT was operated using its own power source (internal battery). The EUT was configured so that the antenna ports were connected to the 50 Ohms test system using coaxial cables.
EUT operating mode during the test	406 MHz+121.5MHz+Strobe Light
Environmental conditions	Ambient laboratory temperature: 17.6-18.5°C Relative air humidity: 48-57 %
Test temperature	minus 20°C
Pre-test battery discharge duration	5:58:32 hours
Actual Lifetime test duration	59 hours 54.48 minutes
Required equivalent extension	05 hours 48 minutes
Effective demonstrated Operating Lifetime	54 hours 06.48 minutes
Deviations from standard test procedures	Soaking period of beacon during Operational Lifetime test was 10 hours at minus 30°C and than 20 minutes at minus 20°C against 2 hours only at minus 20°C as required by T.007
Non-compliances noticed	There were not non-compliances

### Test procedure:

- Test was combined with the test IEC 61097-2 Edition 3.0 2008-01 section “5.15.1 Battery capacity and low-temperature test.”
- EPIRB was placed in a chamber at normal room temperature. Then the temperature was reduced to and maintained at minus 30°C for period of 10 hours.
- The chamber was heated to minus 20°C, the heating of the chamber was completed within 20 minutes.
- The equipment has been manually activated in 30 minutes after the end of the period specified in the subclause above and then kept working continuously until power of 406 MHz transmitter was reduced to the minimal acceptable value.
- Parameters were measured immediately after activation of beacon except for the Medium Term Frequency Stability (the mean slope of the frequency and the residual frequency variation about the mean slope), which were computed after 15 minutes according to T.001 section 2.3.1;
- The total duration of the lifetime test was 59 hours 54.48 minutes since activation EUT till the power was reduced to 35 dBm;
- The time of equivalent extension of the operating lifetime test to take into account not full pre- test battery discharge before Lifetime test is 5 hours 48 minutes.
- The operating lifetime test without time of equivalent extension is 54 hours 06.48 minutes;
- Matching network was not used;
- GNSS signal was not available during the test.

### 5.4.1 Operating Current Measurements and Analysis

Beacon manufacturer provided operating currents and pre-test battery discharge calculations (Annex A, page 231).

Operational currents were verified by the testing laboratory with measurement results reported in Table F-E.1 below.

During operating current measurement in modes No. 1 - 7 GNSS signal was not available.

Measured values do not exceed values provided by manufacturer (Annex A, page 233).

**Table F-E.1: Beacon Operating Current**

No.	Beacon Operating Modes	Mode: Manually selectable or Automatic	Measurement interval, sec	Average Current, mA	Peak Current, mA
1	Operating mode switch activated with GPS receiver in search mode (406MHz + Homer + GPS Acquisition + Strobe Light)	Automatic	50	38.10	1034.20
2	Operating mode switch activated (406MHz + Homer + GPS Sleep + Strobe light)	Automatic	50	31.60	1050.00
3	Operating mode water activated with GPS receiver in search mode (406MHz + Homer + GPS Acquisition + Strobe Light)	Automatic	50	38.40	1042.10
4	Operating mode water activated (406MHz + Homer + GPS Sleep + Strobe light)	Automatic	50	31.90	1051.10
5	Self test mode	Manually	16.37	40.74	1081.51
6	GNSS Self Test (GPS Acquisition)	Manually	315.50	11.50	17.30
7	Stand-by mode	Manually / automatically	300	2.00E-05	2.00E-05

Conclusions: The beacon mode: **406MHz + Homer + GPS Acquisition + Strobe Light** when the beacon is water activated is mode at which beacon has the highest current consumption.

Current consumption was measured using circuit shown on Figure 4.4.

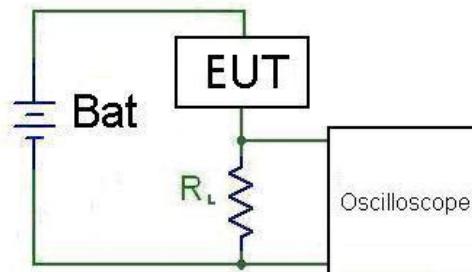


Figure 5.4.1 - The Circuit for Current Consumption Measurement

The value of the current calculated by equation:  $I = \frac{U}{R}$ , where  $I$  is a value of current (A),  $U$  is a value of voltage (V),  $R$  is a value of resistance (Ohm).

Voltage was measured by digital oscilloscope with load R=0.1 Ohm.

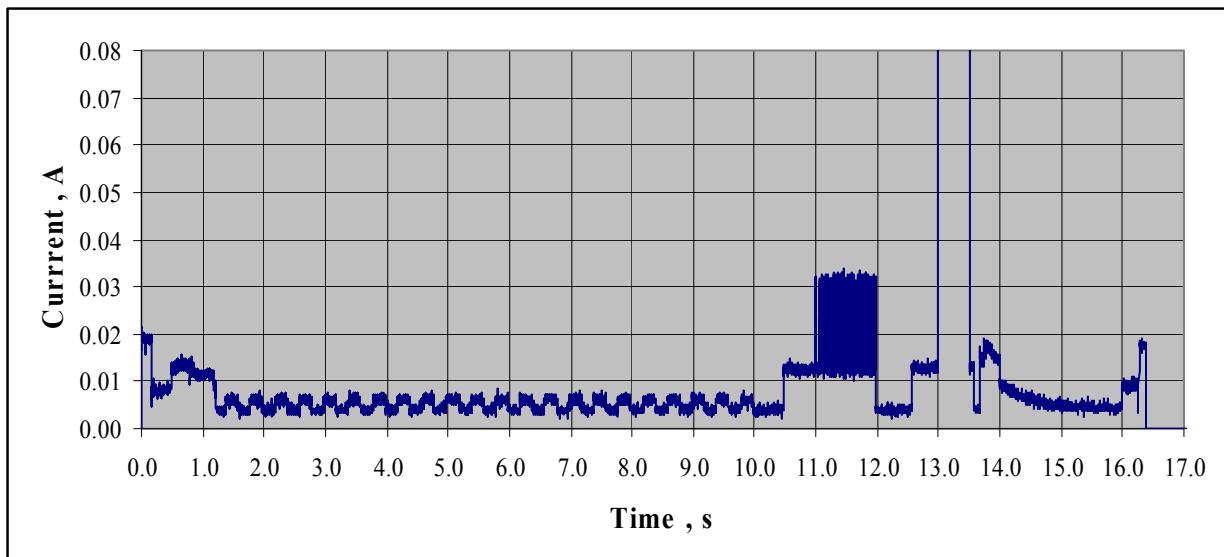


Figure 5.4.2 - Current during self-test

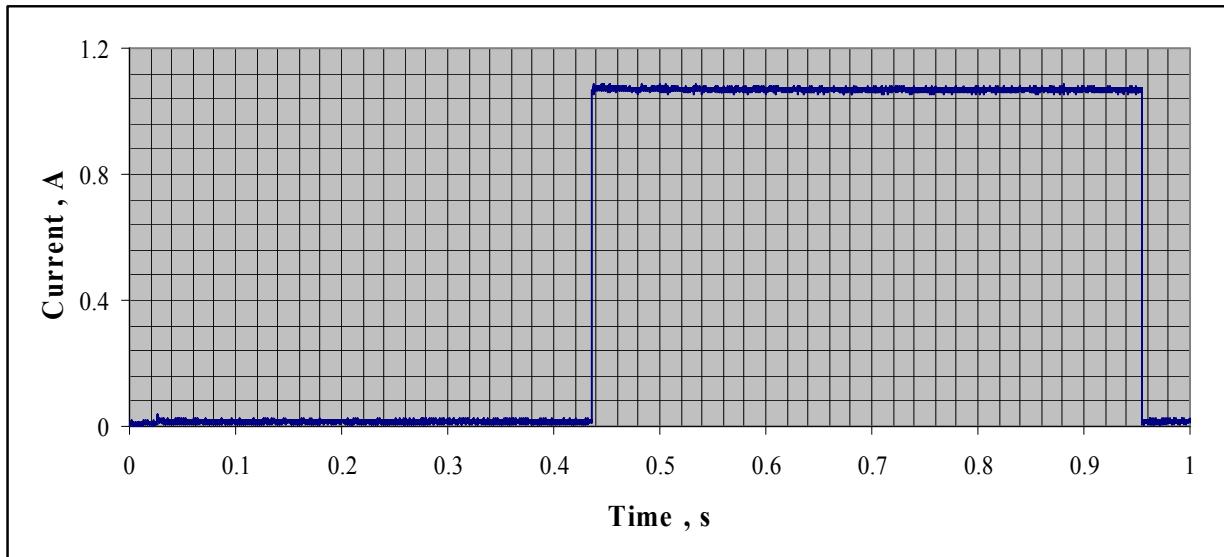


Figure 5.4.3 - Demonstrate maximum current during the 406 burst

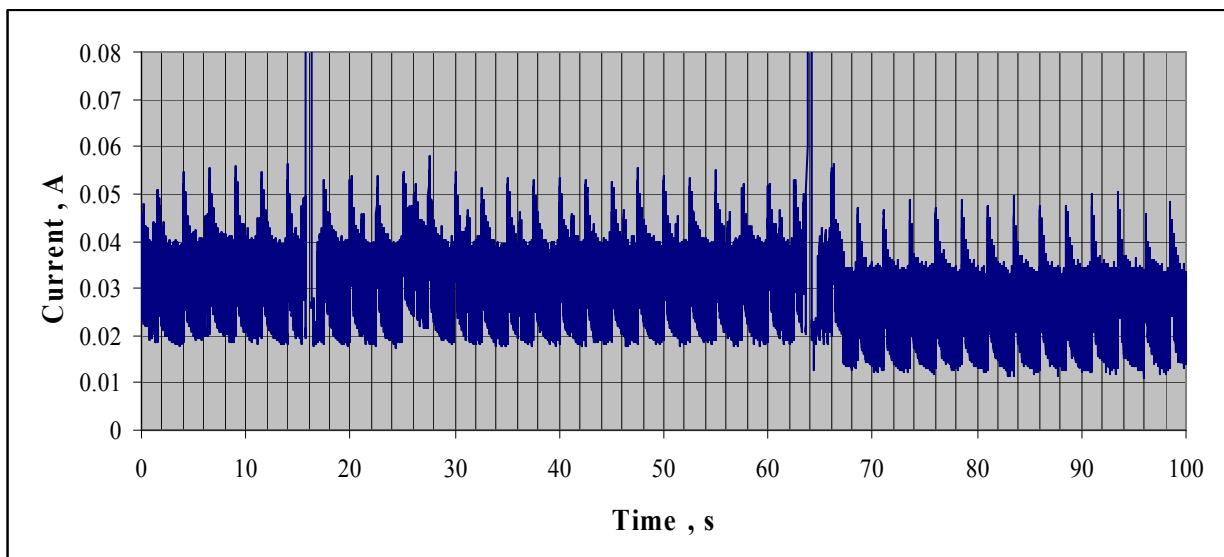


Figure 5.4.4 - GPS receiver is switched from on to off position. Strobe light flashes

### 5.4.2 Pre-test Battery Discharge

**Table F-E.2: Pre-test Battery Discharge Calculations as provided by manufacturer**

Characteristic	Designation	Units	Value	Comments
Beacon manufacturers declared maximum allowed cell shelf-life (from date of cell manufacture to date of battery pack installation in the beacon)	T <sub>CS</sub> or TCS	Years	12.5	
Declared beacon battery replacement period (from date of installation in the beacon to expiry date marked on the beacon)	T <sub>BR</sub> or TBR	Years	2.5	
Battery pack electrical configuration	2 parallel packs each of 3 123 cells in series			
Cell model and cell chemistry	CR123A, Lithium Manganese Dioxide			
Nominal cell capacity		A-hrs	1.7	
Nominal battery pack capacity	C <sub>BN</sub>	A-hrs	3.4	
Annual battery cell capacity loss (self-discharge) due to aging, as specified by cell manufacturer at ambient temperature	L <sub>SDC</sub>	%	0.84	Increase over Cell Manufacturer's data (0.46%) agreed between C/S and Ocean Signal
Calculated battery pack capacity loss due to self-discharge: L <sub>CBN</sub> = C <sub>BN</sub> - [C <sub>BN</sub> * (1 - L <sub>SDC</sub> / 100) <sup>TBR</sup> ]	L <sub>CBN</sub>	mA-hrs	404.10	
Number of self-tests per year	N <sub>ST</sub>		12.00	
Average battery current during a self-test	I <sub>ST</sub>	mA	40.75	
Maximum duration of a self-test	T <sub>ST</sub>	sec	16.50	
Calculated battery pack capacity loss due to self-tests during battery replacement period: L <sub>ST</sub> = I <sub>ST</sub> * T <sub>ST</sub> * T <sub>BR</sub> * N <sub>ST</sub> / 3600	L <sub>ST</sub>	mA-hrs	28.016	
Maximum Number of GNSS self-tests between battery replacements	N <sub>GST</sub>		12.00	
Average battery current during a GNSS self-test of maximum duration	I <sub>GST</sub>	mA	11.50	
Maximum duration of a GNSS self-test	T <sub>GST</sub>	sec	315.5	
Calculated battery pack capacity loss due to GNSS self-tests during battery replacement period: L <sub>GST</sub> = I <sub>GST</sub> * T <sub>GST</sub> * N <sub>GST</sub> / 3600	L <sub>GST</sub>	mA-hrs	12.09	
Average stand-by battery pack current	I <sub>SB</sub>	mA	2.00E-05	
Other Capacity Losses	L <sub>OTH</sub>	mA-hrs	14.4	Note
Battery pack capacity loss due to constant operation of circuitry prior to beacon activation: L <sub>ISB</sub> = I <sub>SB</sub> * T <sub>BR</sub> * 8760	L <sub>ISB</sub>	mA-hrs	2.19	
Calculated value of the battery pack pre-test discharge L <sub>CDC</sub> = L <sub>CBN</sub> + 1.65 * (L <sub>ST</sub> + L <sub>GST</sub> + L <sub>ISB</sub> ) / 1000 + L <sub>OTH</sub> / 1000	L <sub>CDC</sub>	A-hrs	0.48830	

Note. Additional current drawn by the water contacts when activated

The pre- test battery discharge is calculated for the worst case drain / operational current.

Production date of cells installed in the battery: July 2013.

Duration of storage prior to the test: 6 months.

The loss of energy due to the battery ageing:

$$L_{AGEING} = C_{BN} - [C_{BN} * (1 - L_{SDC} / 100)^{6months/12}] = 3.4 \text{ A-hrs} - [3.4 \text{ A-hrs} * (1 - 0.84 / 100)^{6months/12}] = 0.014 \text{ A-hrs.}$$

The final value of the discharge to take into account the cell ageing:

$$L_{CDC} - L_{AGEING\_total} = 0.4883 \text{ A-hrs} - 0.014 \text{ A-hrs} = \mathbf{0.4743 \text{ A-hrs}}$$

The pre-test battery discharge was carried out before Lifetime test at room temperature on the unused battery. Discharge was carried out on resistive load using battery analyzer UBA5 (Vencon Technologies Inc., Canada). The discharge current was 48.39 mA, as current similar to beacon operational current. Discharge current 48.39 mA was confirmed by manufacturer. Duration of preliminary battery discharge with discharge current 48.39 mA was 5 hours 59 minutes. Depleted capacity volume during pre-test battery discharge was **289.5 mA-hrs**.

Lifetime test at minimum temperature minus -20°C with preliminary discharged battery was carried out in 59 hours 54.48 minutes since activation EUT till the power was reduced to 35 dBm.

For the operating lifetime test the beacon was activated manually by switch.

As depleted capacity volume during pre-test battery discharge was 289.5 mA-hrs instead 474.3 mA-hrs the additional extension of operating lifetime was calculated upon operating current values measured by Omega.

The equivalent extension upon measured operating currents is calculated as following:

$$T_{EXT} = (474.3 - 289.5) \text{ mA-hrs} / I_{ARV},$$

where

$T_{EXT}$  time of equivalent extension, hours;

$I_{ARV}$  average operating current of beacon, mA.

Average operate current of beacon should be estimated using values presented in Table F-E.1 above in view of GPS cycle 120 minutes with on/off rate 5 to 115 after 7 hours of operation and thereafter (Annex A, page 292).

$$I_{ARV} = (38.1 * 5 + 31.6 * 115) / 120 = 31.87 \text{ mA}$$

The equivalent extension is

$$T_{EXT} = (474.3 - 289.5) \text{ mA-hrs} / 31.87 \text{ mA} = 5 \text{ hours } 48 \text{ minutes.}$$

In accordance with calculation above 5 hours 48 minutes should be added to 48 hours operation requirements to ensure the beacon will meet the requirement. The minimum operating lifetime duration shall be 53 hours 48 minutes.

During operating lifetime test the beacon operated 59 hours 54.48 minutes. Taking into account the additional extension of operating lifetime 5 hours 48 minutes the excess operation above the requirement is 6 hours 06.48 minutes.

List of parameters measured during operating lifetime test are shown below.

### List of test parameters

Measured parameters	page No.
<b>Transmission frequency 406 MHz:</b>	
Nominal frequency value	77
Short and average frequency stability	78
Maximum and minimum frequency stability values during test	75
<b>Transmitter power output:</b>	
Diagram of power output values during test	81
Maximum and minimum power output values during test	75
<b>Message:</b>	
Message contents	82

**Table of measured parameters.**

Message					
Contents (full)	:FFFE2F 8C9EF9C0637FDFF83D15B 783E0F66C				
Test duration 59:54:29	Bursts received 4347	BCH error 0	Self-Test 0		
406 MHz Transmitter Parameters		Limits		Measured	
		min	max	min	current
Frequency, MHz		406.039	406.041	406.039997	406.039999
Power, dBm		35	39	35.00	35.00
Slope		-1.00E-09	1.00E-09	-2.80E-10	3.40E-12
Residual variations		0.00E-09	3.00E-09	4.06E-11	9.00E-11
Short term variations		0.00E-09	2.00E-09	6.08E-11	1.48E-10
Power, dBm (at 53:48:08)		35	39	36.19	36.24
121.5 MHz Transmitter Parameters at the beginning of the test 00:15:00					
Carrier Frequency, Hz	121497579	Low Sweep Frequency, Hz		350	
Power, dBm	15.82	High Sweep Frequency, Hz		1118	
Sweep Period, sec	0.33	Sweep Range, Hz		768	
Modulation Index, %	100				
121.5 MHz Transmitter Parameters at 53:48:08					
Carrier Frequency, Hz	121497641	Low Sweep Frequency, Hz		350	
Power, dBm	16.54	High Sweep Frequency, Hz		1118	
Sweep Period, sec	0.33	Sweep Range, Hz		768	
Modulation Index, %	100				
121.5 MHz Transmitter Parameters at the end of the test 59:54:29					
Carrier Frequency, Hz	121497634	Low Sweep Frequency, Hz		350	
Power, dBm	17.21	High Sweep Frequency, Hz		1118	
Sweep Period, sec	0.33	Sweep Range, Hz		768	
Modulation Index, %	100				

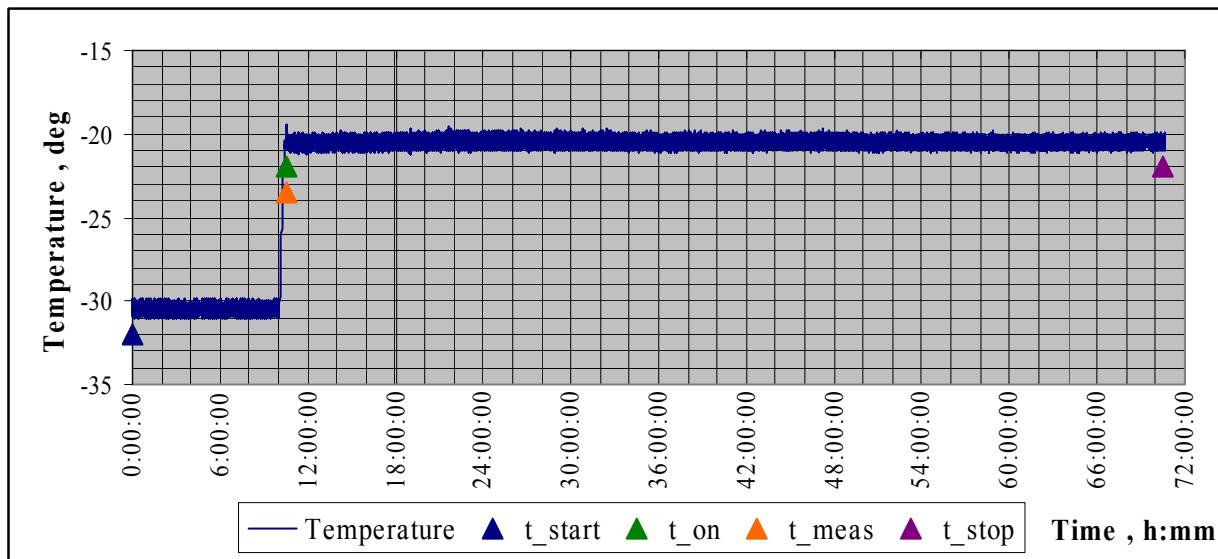


Figure 5.4.5 – Temperature During The Test

**Table of data measured during 30 minutes after activation of EPIRB.**

Time (h:mm:ss)	Rep. period (s)	Power (W)	Frequency (MHz)	Slope	Residual variations	Short term variations	Digital message
0:00:53	0.00	4.16	-	-	-	-	FFFE2F 8C9EF9C0637FDFF83D15B 783E0F66C
0:01:44	50.51	4.39	-	-	-	-	FFFE2F 8C9EF9C0637FDFF83D15B 783E0F66C
0:02:31	47.81	4.33	-	-	-	-	FFFE2F 8C9EF9C0637FDFF83D15B 783E0F66C
0:03:21	49.71	4.49	-	-	-	-	FFFE2F 8C9EF9C0637FDFF83D15B 783E0F66C
0:04:11	50.11	4.43	-	-	-	-	FFFE2F 8C9EF9C0637FDFF83D15B 783E0F66C
0:04:59	47.91	4.41	-	-	-	-	FFFE2F 8C9EF9C0637FDFF83D15B 783E0F66C
0:05:48	49.31	4.38	-	-	-	-	FFFE2F 8C9EF9C0637FDFF83D15B 783E0F66C
0:06:37	48.31	4.34	-	-	-	-	FFFE2F 8C9EF9C0637FDFF83D15B 783E0F66C
0:07:29	52.51	4.32	-	-	-	-	FFFE2F 8C9EF9C0637FDFF83D15B 783E0F66C
0:08:20	50.31	4.30	-	-	-	-	FFFE2F 8C9EF9C0637FDFF83D15B 783E0F66C
0:09:10	50.51	4.44	-	-	-	-	FFFE2F 8C9EF9C0637FDFF83D15B 783E0F66C
0:09:58	47.81	4.42	-	-	-	-	FFFE2F 8C9EF9C0637FDFF83D15B 783E0F66C
0:10:48	49.71	4.42	-	-	-	-	FFFE2F 8C9EF9C0637FDFF83D15B 783E0F66C
0:11:38	50.11	4.41	-	-	-	-	FFFE2F 8C9EF9C0637FDFF83D15B 783E0F66C
0:12:26	47.91	4.40	-	-	-	-	FFFE2F 8C9EF9C0637FDFF83D15B 783E0F66C
0:13:15	49.31	4.39	-	-	-	-	FFFE2F 8C9EF9C0637FDFF83D15B 783E0F66C
0:14:03	48.31	4.38	-	-	-	-	FFFE2F 8C9EF9C0637FDFF83D15B 783E0F66C
0:14:56	52.51	4.37	406.040017	-	-	1.34E-10	FFFE2F 8C9EF9C0637FDFF83D15B 783E0F66C
0:15:46	50.31	4.37	406.040015	-8.85E-09	1.65E-08	1.36E-10	FFFE2F 8C9EF9C0637FDFF83D15B 783E0F66C
0:16:37	50.51	4.36	406.040012	-7.74E-09	1.73E-08	1.37E-10	FFFE2F 8C9EF9C0637FDFF83D15B 783E0F66C
0:17:24	47.81	4.36	406.040010	-6.56E-09	1.75E-08	1.38E-10	FFFE2F 8C9EF9C0637FDFF83D15B 783E0F66C
0:18:14	49.71	4.36	406.040007	-5.34E-09	1.69E-08	1.36E-10	FFFE2F 8C9EF9C0637FDFF83D15B 783E0F66C
0:19:04	50.11	4.35	406.040006	-4.11E-09	1.53E-08	1.35E-10	FFFE2F 8C9EF9C0637FDFF83D15B 783E0F66C
0:19:52	47.91	4.35	406.040004	-2.91E-09	1.28E-08	1.46E-10	FFFE2F 8C9EF9C0637FDFF83D15B 783E0F66C
0:20:41	49.31	4.35	406.040002	-1.81E-09	8.69E-09	1.42E-10	FFFE2F 8C9EF9C0637FDFF83D15B 783E0F66C
0:21:30	48.31	4.35	406.040001	-9.88E-10	4.24E-09	1.41E-10	FFFE2F 8C9EF9C0637FDFF83D15B 783E0F66C
0:22:22	52.51	4.34	406.040001	-5.75E-10	1.22E-09	1.42E-10	FFFE2F 8C9EF9C0637FDFF83D15B 783E0F66C
0:23:13	50.31	4.34	406.040000	-5.07E-10	9.58E-10	1.37E-10	FFFE2F 8C9EF9C0637FDFF83D15B 783E0F66C
0:24:03	50.51	4.35	406.040000	-4.63E-10	8.39E-10	1.31E-10	FFFE2F 8C9EF9C0637FDFF83D15B 783E0F66C
0:24:51	47.81	4.35	406.040000	-4.21E-10	6.74E-10	1.31E-10	FFFE2F 8C9EF9C0637FDFF83D15B 783E0F66C
0:25:41	49.71	4.35	406.040000	-3.79E-10	7.01E-10	1.45E-10	FFFE2F 8C9EF9C0637FDFF83D15B 783E0F66C
0:26:31	50.11	4.35	406.040000	-3.49E-10	7.34E-10	1.45E-10	FFFE2F 8C9EF9C0637FDFF83D15B 783E0F66C
0:27:19	47.91	4.35	406.040000	-3.31E-10	7.67E-10	1.40E-10	FFFE2F 8C9EF9C0637FDFF83D15B 783E0F66C
0:28:08	49.31	4.35	406.039999	-3.09E-10	8.14E-10	1.40E-10	FFFE2F 8C9EF9C0637FDFF83D15B 783E0F66C
0:28:56	48.31	4.35	406.039999	-2.99E-10	8.41E-10	1.39E-10	FFFE2F 8C9EF9C0637FDFF83D15B 783E0F66C
0:29:49	52.51	4.35	406.039999	-2.90E-10	8.64E-10	1.31E-10	FFFE2F 8C9EF9C0637FDFF83D15B 783E0F66C

Note:

Column "Time"	Time from EPIRB activation.		
Column "Rep. Period"	Value of repetition period fixed after first message.		
Column Slope, Residual variations		Medium Term Frequency Stability computed with Frequency measurement immediately after beacon activation and out off C/S specification limit.	

a) Transmitted Frequency (according to C/S T.007 – section A.3.2.1)

• Nominal Value (A.3.2.1.1)

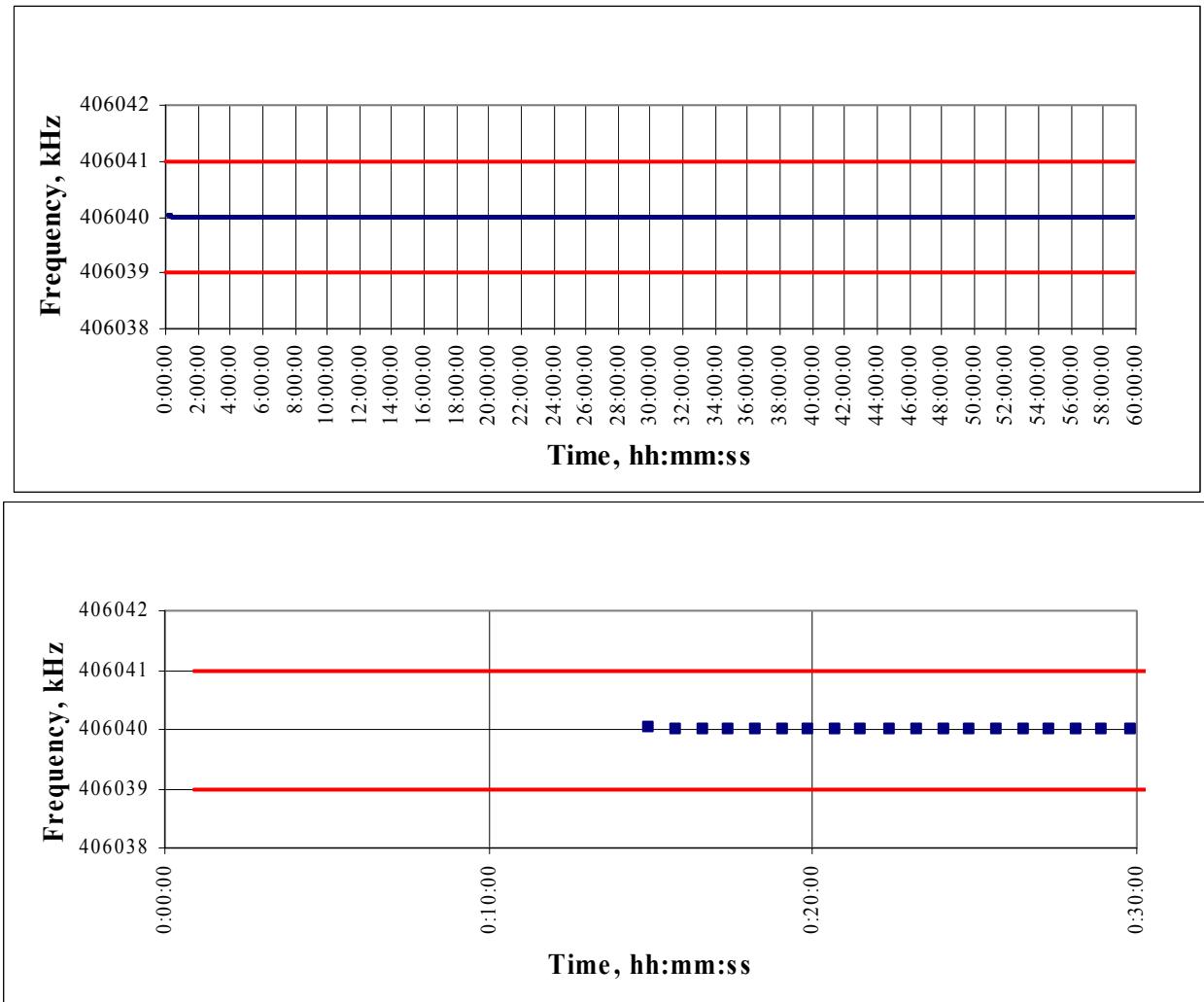


Figure 5.4.6 – Nominal Value of frequency

- **Short-Term Stability (A.3.2.1.2)**

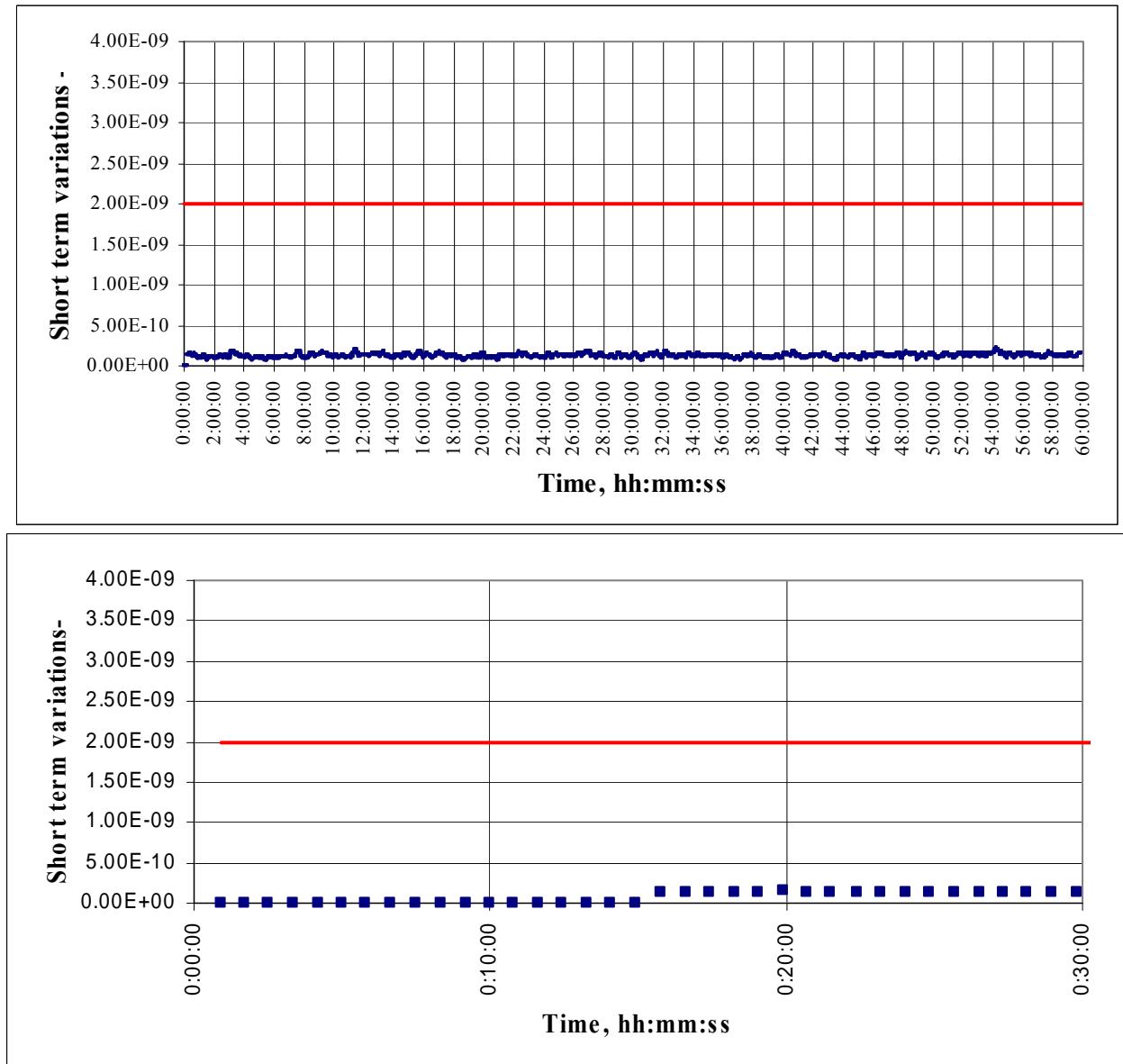
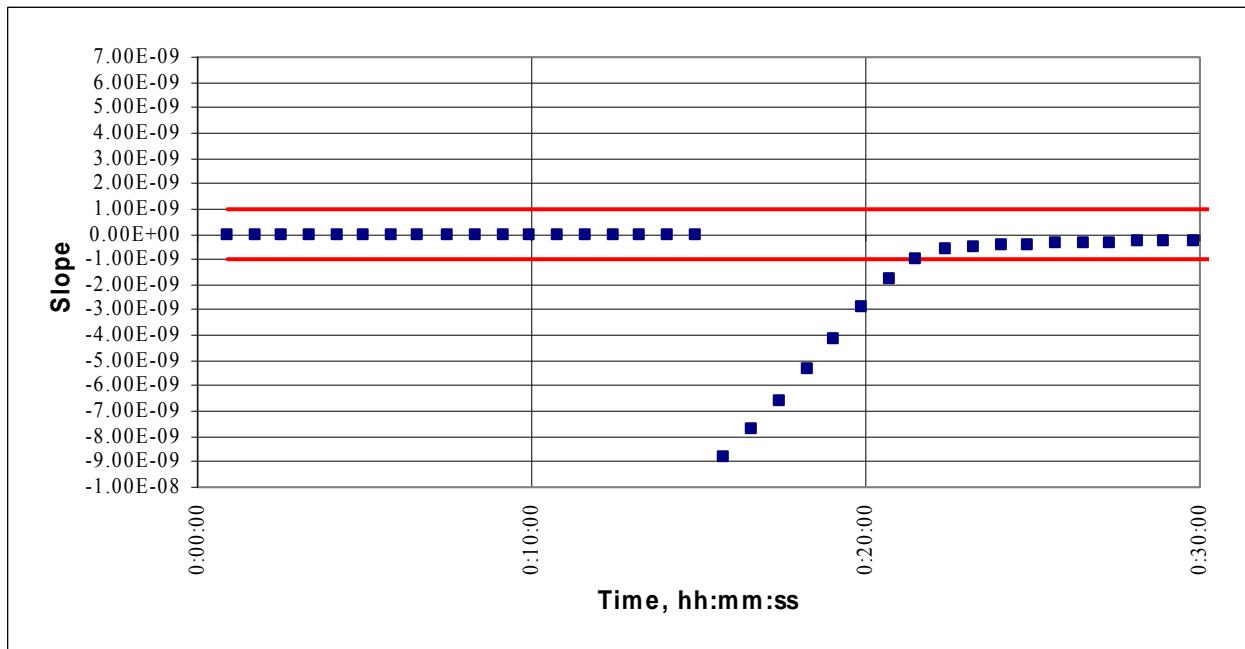
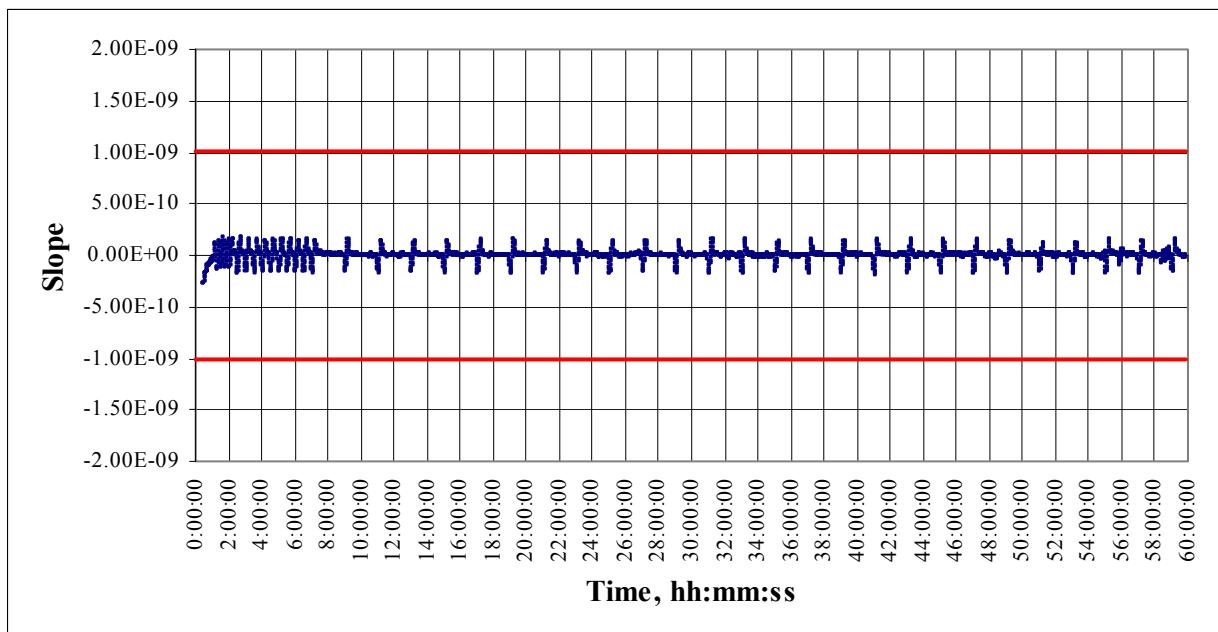


Figure 5.4.7 – Short-Term Stability

- Medium-Term Stability (A.3.2.1.3)



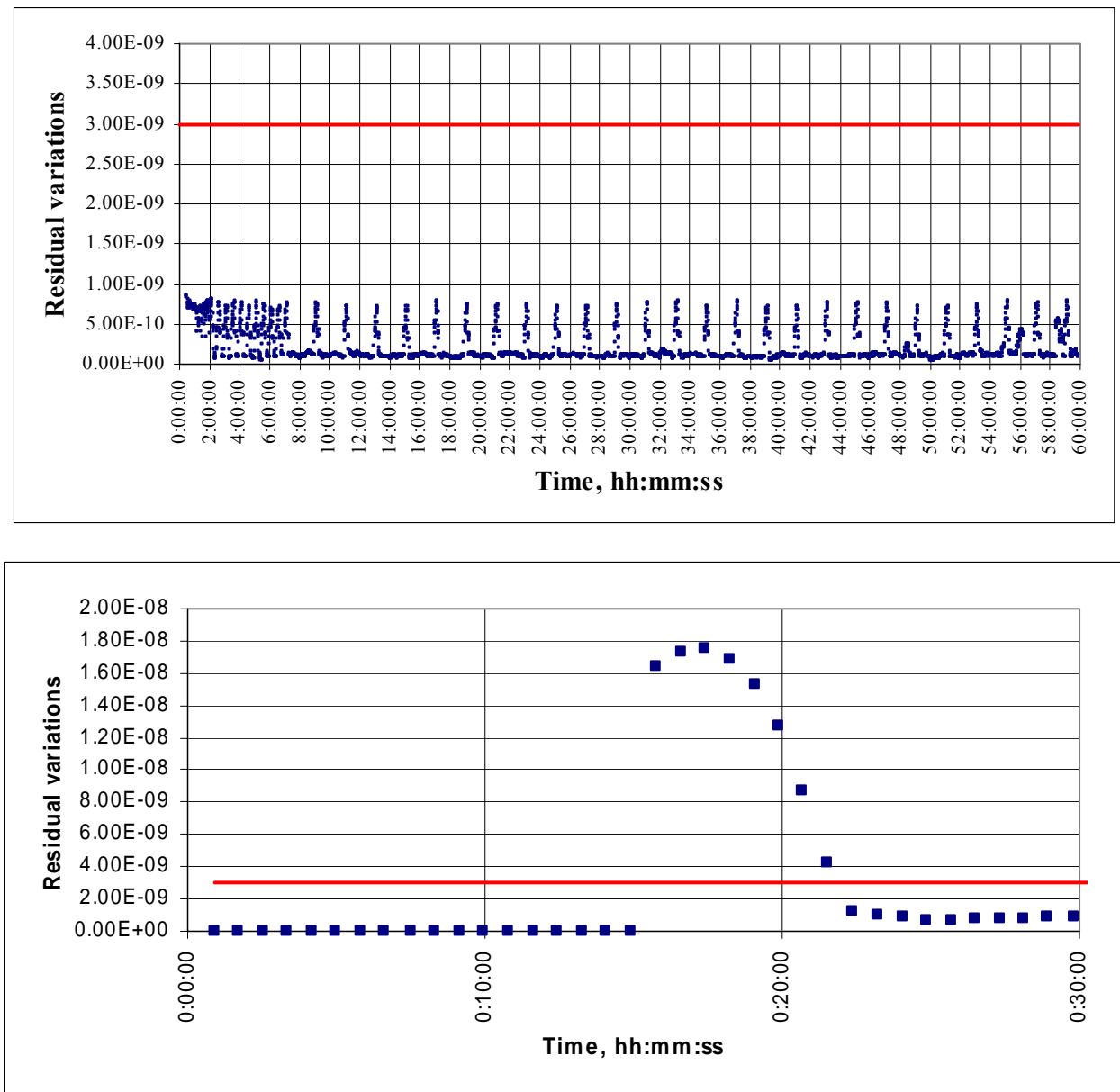


Figure 5.4.8 – Medium-Term Stability

b) Transmitter Power Output (according to C/S T.007 – section A.3.2.2.1).

- Transmitter Power Output Level (A.3.2.2.1)

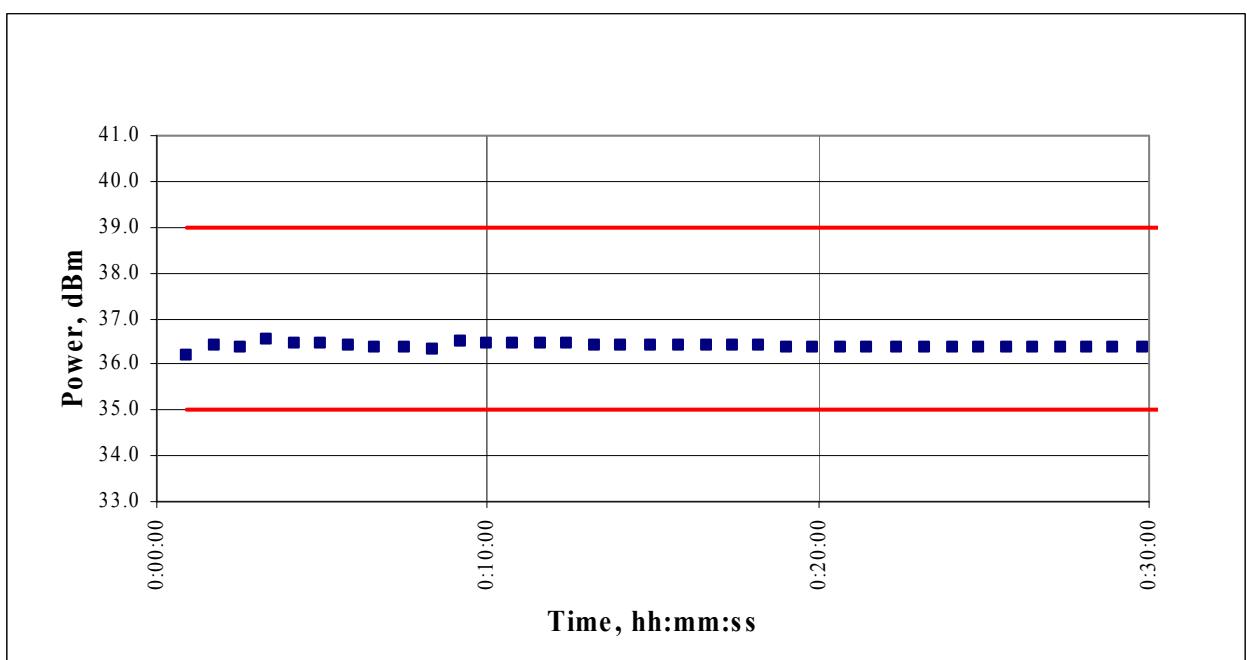
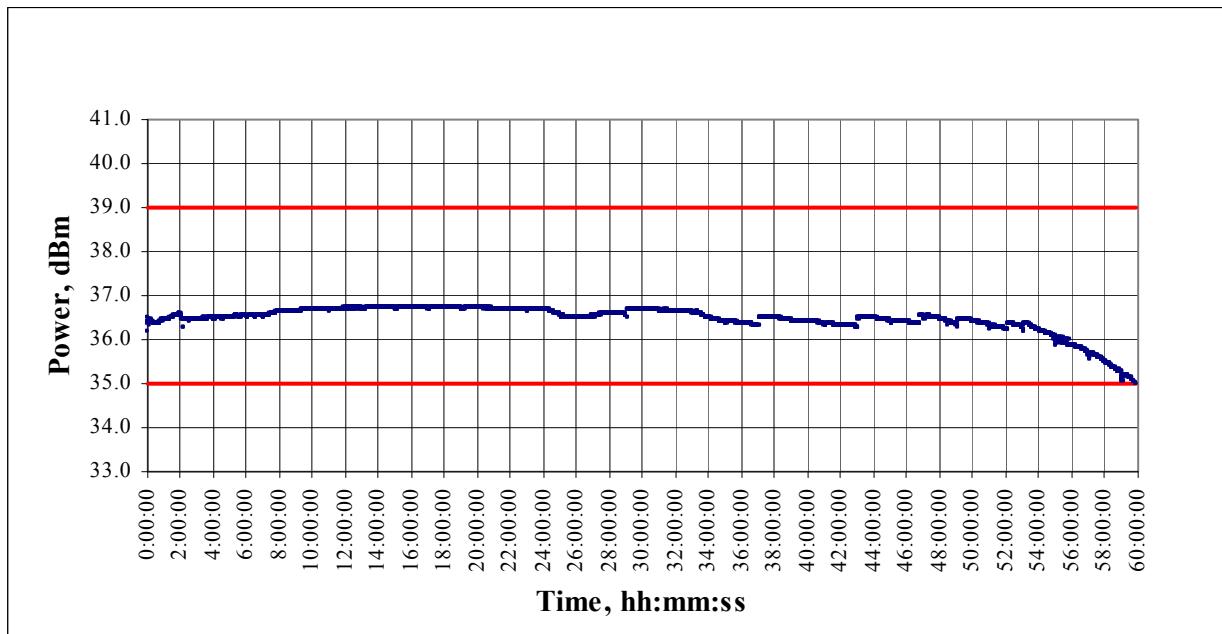


Figure 5.4.9– Transmitter power during test

c) **Message Coding (according to C/S T.007 - A.3.1.4)**

Bursts received	4347
BCH error	0
Self test message	0
Full HEX message	FFFE2F 8C9EF9C0637FDFF83D15B 783E0F66C

Decoding Beacon Message

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - <b>Albania</b>	27-36	0011001001
Type of location protocol: Standard Location - Test	37-40	1110
Test Protocol: Test Protocol (No Decode information in bits 41 to 64)	41-64	111110011100000001100011
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	00000111010001010110
BCH 1 Calculated:	N/A	00000111010001010110
Fixed bits (1101): Pass	107-110	1101
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
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	011001101100
BCH 2 Calculated:	N/A	011001101100
Composite Latitude: default	N/A	Composite Longitude: default
15 Hex ID:	N/A	193DF380C6FFBFF

## 5.5 Frequency Stability Test with Temperature Gradient

Date of test	20.02.2014-22.02.2014
Specification	C/S T.007 – section A.2.4
Beacon Model	EPIRB1
Serial number	002
EUT Mod State	0
EUT system configuration, including ancillary devices and modes of their operation	The EUT was operated using its own power source (internal battery). The EUT was configured so that the antenna ports were connected to the 50 Ohms test system using coaxial cables.
EUT operating mode during the test	406 MHz+121.5MHz+Strobe Light
Environmental conditions	Ambient laboratory temperature: 17.6-18.5°C Relative air humidity: 48-57 %
Temperature range	minus 20°C to 55°C: 5°C/hour and 55°C to minus 20°C: minus 5°C/hour
Deviations from standard test procedures	There were no deviations from standard test procedures
Non-compliances noticed	There were not non-compliances

### Test procedure:

The beacon under test, while turned off, is to stabilize during 2 hours at minus 20°C (Tmin) then turned on. The beacon was allowed to operate for 15 minutes before measurements started. The duration of measurements at Tmin was 1 hour. Then the temperature was increased from Tmin to 55°C (Tmax) with ratio 5°C/hour. Duration of temperature gradient from Tmin to Tmax was 15 hours. During the temperature gradient the parameters were measured. Then the temperature was stabilized at Tmax for 2 hours and the parameters were measured. Then the temperature was decreased from Tmax to Tmin with ratio minus 5°C/hour. Duration of temperature gradient from Tmax to Tmin was 15 hours. During the temperature gradient the parameters were measured. Then the temperature was stabilized at Tmin for 2 hours and the parameters were measured.

Matching network was not used.

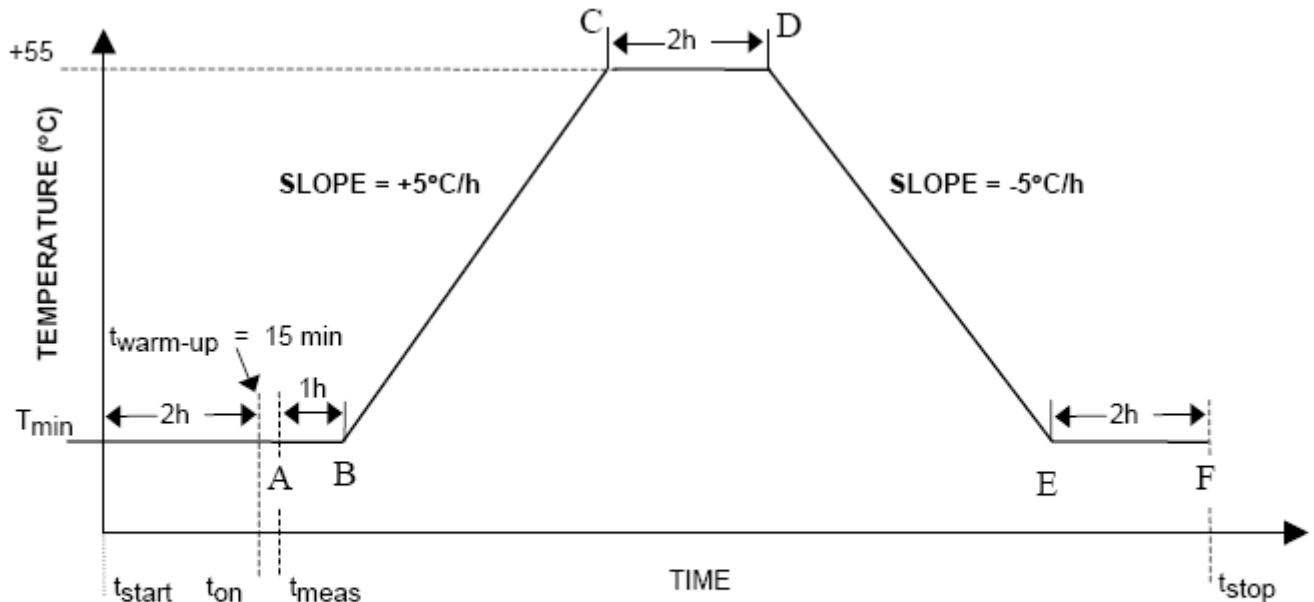
GNSS signal not available during test.

### List of test parameters

Measured parameters	page No.
<b>Transmission frequency 406 MHz</b>	
Nominal frequency value	86
Short and average frequency stability	86
Maximum and minimum frequency stability values during test	84
<b>Transmitter power output</b>	
Diagram of power output values during test	87
Maximum and minimum power output values during test	84
<b>Message</b>	
Message contents	88

**Table of measured parameters.**

Message					
Contents (full)	:FFFE2F 8C9EF9C0637FDFF83D15B 783E0F66C				
Test duration 34:59:28	Bursts received 2540	BCH error 0	Self-Test 0		
406 MHz Transmitter Parameters	Limits		Measured		
	min	max	min	current	max
Frequency, MHz	406.039	406.041	406.039964	406.039999	406.040000
Power, dBm	35	39	36.29	36.53	36.96
slope (A to B C+15 to D and E+15 to F)	-1.00E-09	1.00E-09	-1.77E-10	1.50E-10	2.19E-10
slope (B to C+15 and D to E+15)	-2.00E-09	2.00E-09	-4.32E-10		4.51E-10
Residual variations	0.00E+00	3.00E-09	4.91E-11	4.24E-10	7.93E-10
Short term variations	0.00E+00	2.00E-09	5.71E-11	1.33E-10	2.33E-10
121.5 MHz Transmitter Parameters					
Carrier Frequency, Hz	121497684 121498174	Low Sweep Frequency, Hz		350	
Power, dBm	15.58-18.14	High Sweep Frequency, Hz		1119	
Sweep Period, sec	0.33	Sweep Range, Hz		769	
Modulation Index, %	100				



NOTES:

$T_{\min}$	=	- 40°C (Class 1 beacon)
$T_{\min}$	=	- 20°C (Class 2 beacon)
$t_{on}$	=	beacon turn-on time after 2 hour "cold soak"
$t_{meas}$	=	start time of frequency stability measurement ( $t_{on} + 15$ min)

Figure 5.5.1 – Temperature Gradient Test Profile

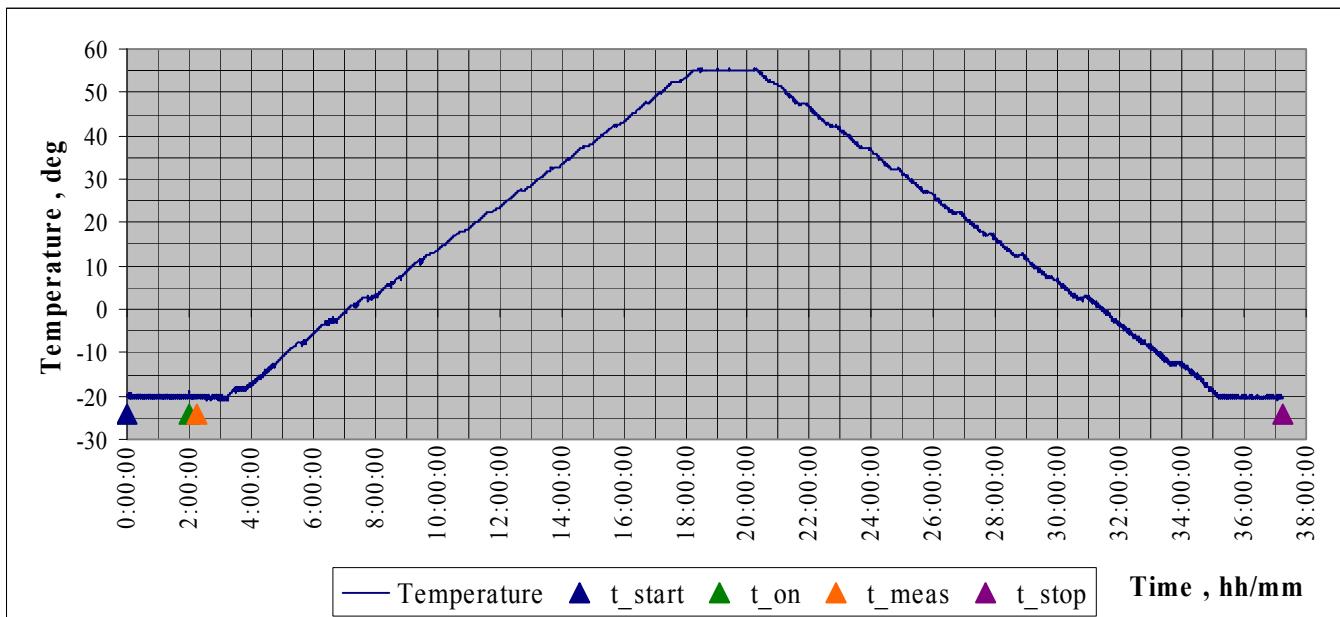


Figure 5.5.2 – Temperature During The Test

**a) Transmitted Frequency (according to C/S T.007 – section A.3.2.1)**

- **Nominal Value (A.3.2.1.1)**

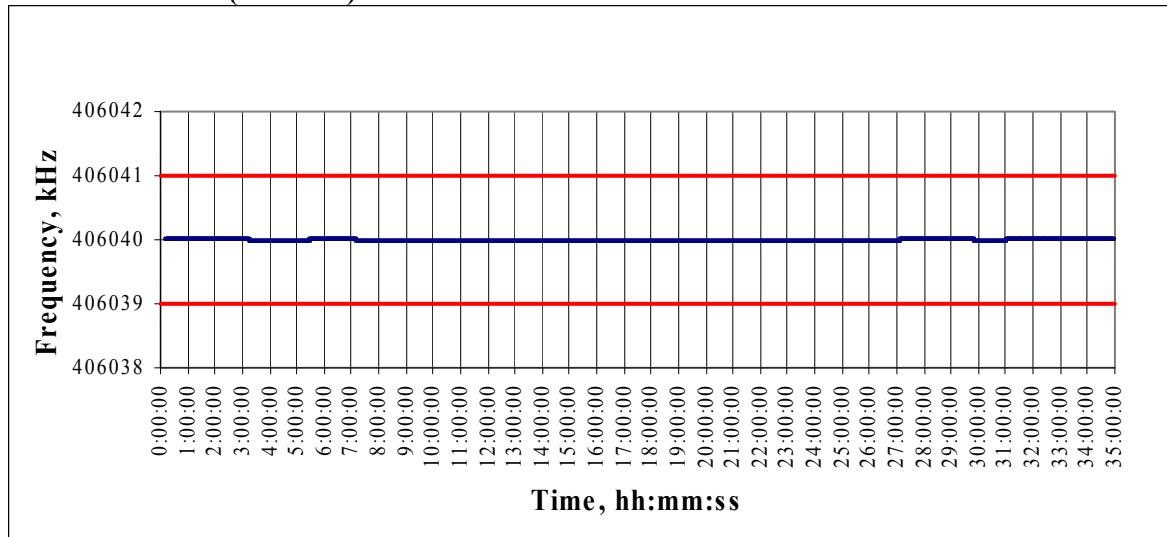


Figure 5.5.3 – Nominal Value of frequency

- **Short-Term Stability (A.3.2.1.2)**

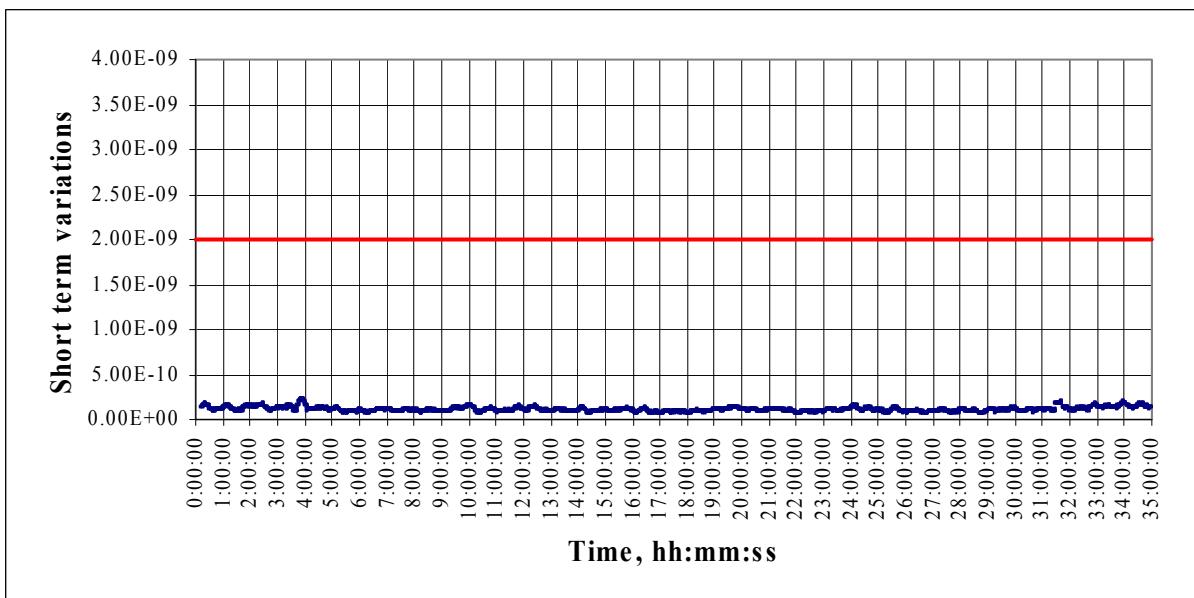


Figure 5.5.4 – Short-Term Stability

- **Medium-Term Stability (A.3.2.1.3)**

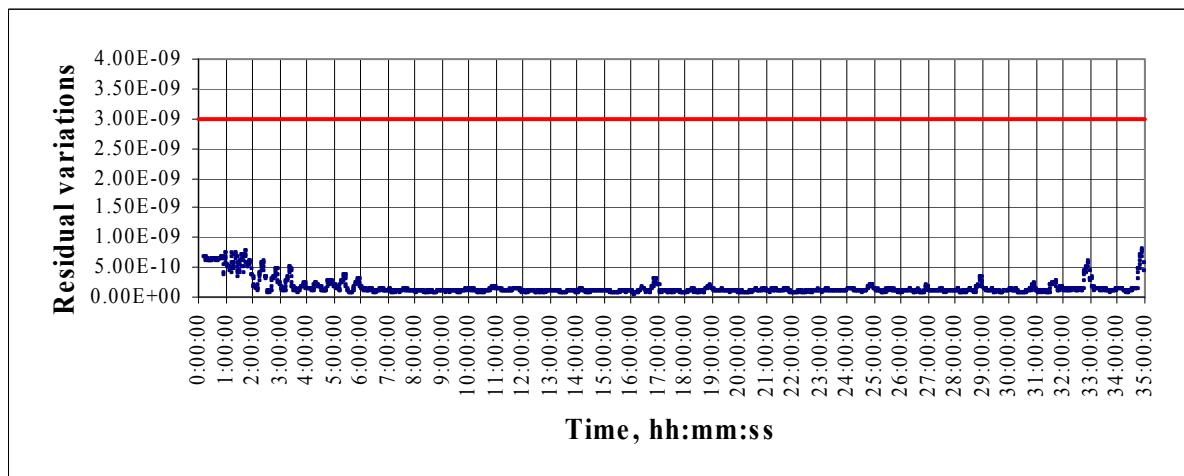
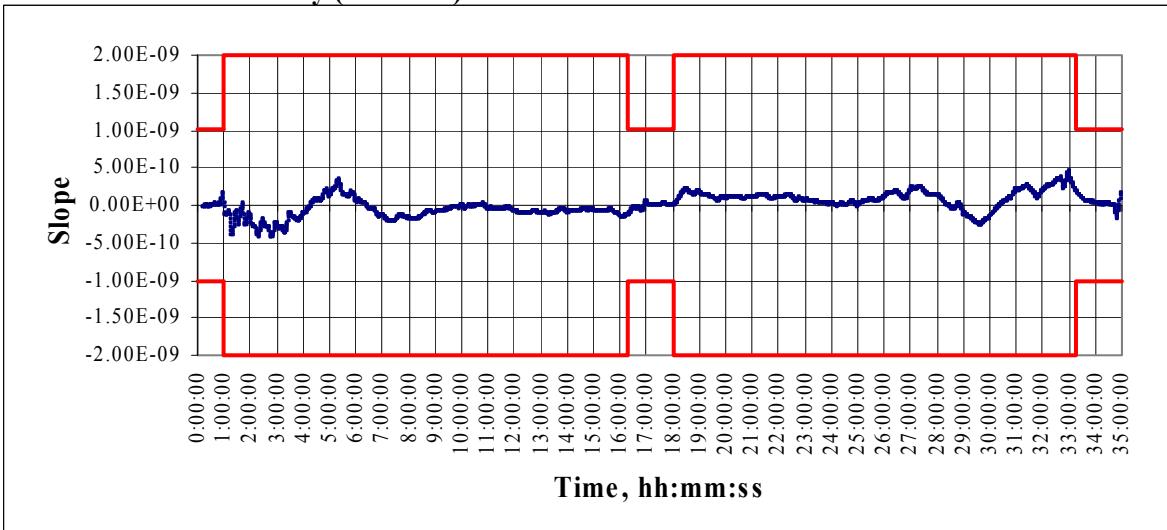


Figure 5.5.5 – Medium-Term Stability

**b) Transmitter Power Output (according to C/S T.007 – section A.3.2.2.1).**

- **Transmitter Power Output Level (A.3.2.2.1)**

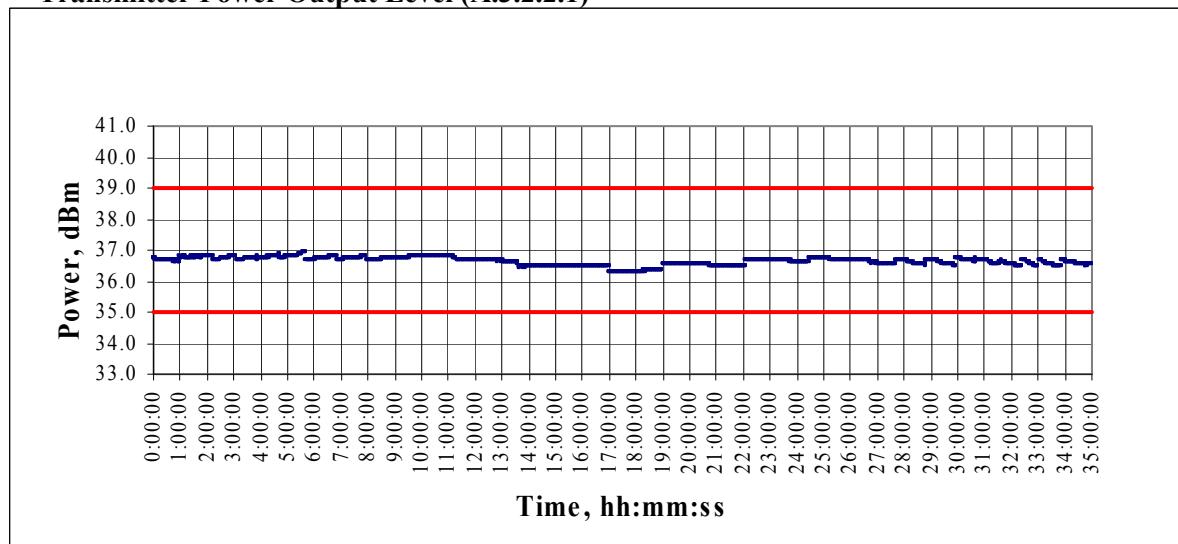


Figure 5.5.6 – Transmitter power during test

c) **Message Coding (according to C/S T.007 - A.3.1.4)**

Bursts received	2540
BCH error	0
Self test message	0
Full HEX message	FFFE2F 8C9EF9C0637FDFF83D15B 783E0F66C

Decoding Beacon Message

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - <b>Albania</b>	27-36	0011001001
Type of location protocol: Standard Location - Test	37-40	1110
Test Protocol: Test Protocol (No Decode information in bits 41 to 64)	41-64	111110011100000001100011
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	00000111010001010110
BCH 1 Calculated:	N/A	00000111010001010110
Fixed bits (1101): Pass	107-110	1101
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
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	011001101100
BCH 2 Calculated:	N/A	011001101100
Composite Latitude: default	N/A	Composite Longitude: default
15 Hex ID:	N/A	193DF380C6FFBFF

## 5.6 Oscillator Ageing

Date of analysis	24.02.2014
Specification	C/S IP (TCXO)
Beacon Model	EPIRB1
EUT Mod State	0
Oscillator Manufacturer and Model (or P/N):	Rakon UK TCXO P/N E5344LF
Oscillator S/N	MI5757
Reference documents	Rakon spread sheet data for MI5757
Environmental conditions:	Ambient laboratory temperature: 19.5°C Relative air humidity: 52 %
Deviations from standard test procedures	There were no deviations from standard test procedures
Non-compliances noticed	There were not non-compliances

### Test description

Fast track approach method according to Interim Procedure (Rev.5 Oct. 2013) was used for the purpose of determining the compliance of beacons equipped with a TCXO with the Cospas-Sarsat requirements concerning the beacon medium-term frequency stability.

The Rakon UK TCXO part number E5344LF, serial number MI5757 is installed in Beacon Model EPIRB1 serial number 002 according to beacon manufacturer's statement (see Annex A, page 269). Technical data for Rakon UK TCXO part number E5344LF, serial number MI5757 and details of calculation are presented in file "OSL\_EPIRB1\_TCXO v1.xls". Result of calculation is showed in table below.

**Table A-1: Fast Track Analysis**

MTS characteristic	tot_max / tot_min	osc_max / osc_min	beacon_wc	MAX-OSC / MIN-OSC	beacon_max/ min	ageing factor	beacon_5 year	C/S spec	Pass/ Fail
Residual, ppb	0.79	0	0.79	2.0	2.15	0.2	2.35	3.0	Pass
Static Positive Mean Slope, ppb/min	0.45	-0.10	0.46	0.7	0.84	0.1	0.94	1.0	Pass
Static Negative Mean Slope, ppb/min	-0.18	0.06	-0.19	-0.7	-0.72	0.1	-0.82	-1.0	Pass
Gradient Positive Mean Slope, ppb/min	0.45	-0.42	0.61	1.70	1.81	0.1	1.91	2.0	Pass
Gradient Negative Mean Slope, ppb/min	-0.43	0.32	-0.54	-1.7	-1.78	0.1	-1.88	-2.0	Pass

**Residual**

Value	Calculation	Result, ppb	Comment
$R_{\text{tot max}}$		0.79	-20.2°C down-ramp
$R_{\text{MAX-OSC}}$		2.00	
$R_{\text{beacon\_max}}$	$\text{SQRT}((R_{\text{tot max}})^2 + (R_{\text{MAX-OSC}})^2)$	2.15	
$R_{\text{beacon\_5\_year}}$	$R_{\text{beacon\_max}} + 0.2 \text{ ppb}$	2.35	<b>Pass with criteria &lt;3.0</b>

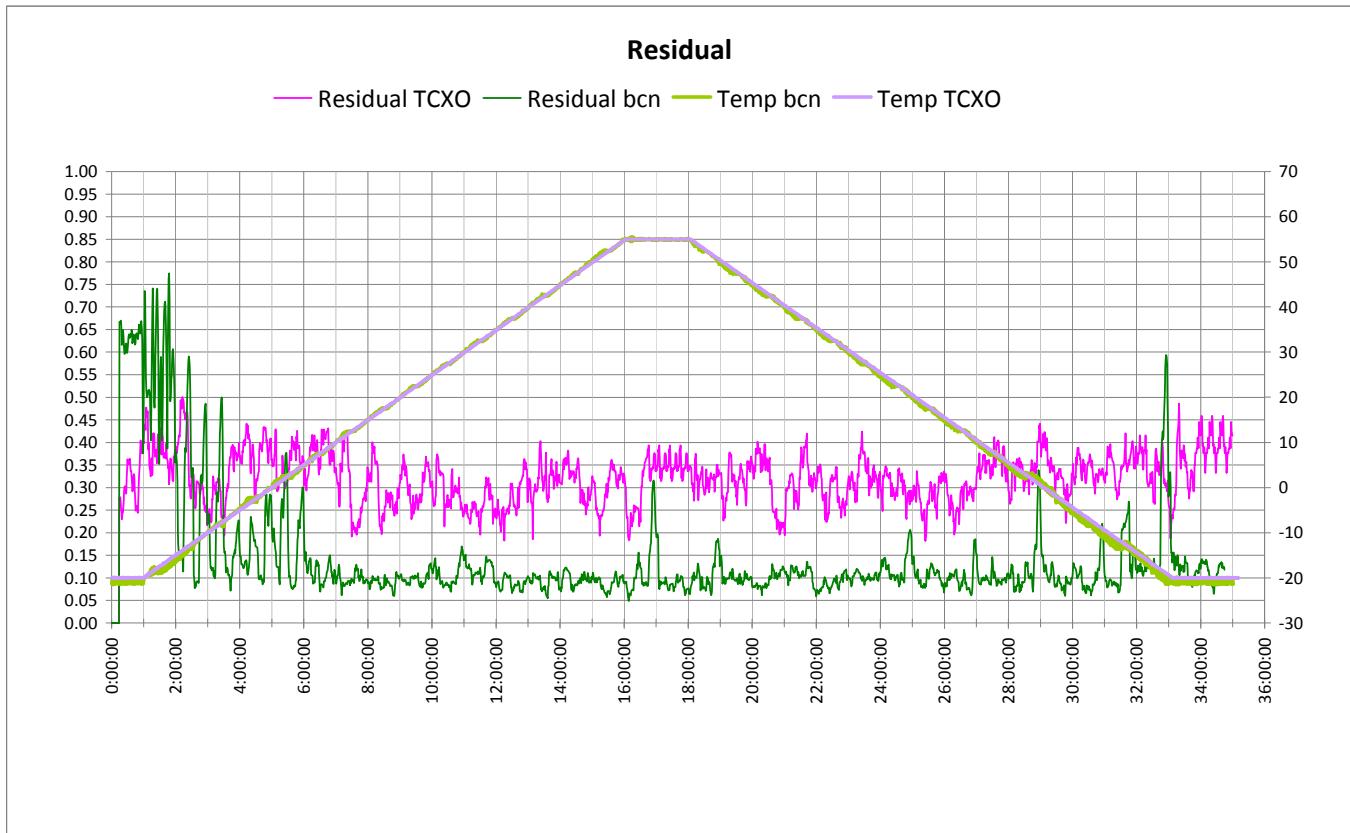


Figure 5.6.1 – Residual during Temperature Gradient Test

**Positive static slope**

Value	Calculation	Result, ppb/min	Comment
SI (+)tot max		0.45	-19.79°C (E+15 to F)
SI (-)osc min		-0.10	-20°C (A to B)
SI (+)beacon wc	SQRT(SI (+)tot max <sup>2</sup> +SI (-)osc min <sup>2</sup> )	0.46	
SI (+)MAX-OSC		0.7	
SI (+)beacon max	SQRT(SI (+)beacon wc <sup>2</sup> +SI (+)MAX-OSC <sup>2</sup> )	0.84	
SI (+)beacon_5 year	SI (+)beacon max + 0.1 ppb/min	<b>0.94</b>	<b>Pass with criteria &lt;1.0</b>

**Positive gradient slope**

Value	Calculation	Result, ppb/min	Comment
SI (+)tot max		0.45	-19.79°C (D to E+15)
SI (-)osc min		-0.42	-17.8°C (B to C+15)
SI (+)beacon wc	SQRT(SI (+)tot max <sup>2</sup> +SI (-)osc min <sup>2</sup> )	0.61	
SI (+)MAX-OSC		1.70	
SI (+)beacon max	SQRT(SI (+)beacon wc <sup>2</sup> +SI (+)MAX-OSC <sup>2</sup> )	1.81	
SI (+)beacon_5 year	SI (+)beacon max + 0.1 ppb/min	<b>1.91</b>	<b>Pass with criteria &lt;2.0</b>

**Negative static slope**

Value	Calculation	Result, ppb/min	Comment
SI (-)tot min		-0.18	-20.1°C (E+15 to F)
SI (+)osc max		0.06	-20°C (E+15 to F)
SI (-)beacon wc	- SQRT(SI (-)tot min <sup>2</sup> +SI (+)osc max <sup>2</sup> )	-0.19	
SI (-)MIN-OSC		-0.7	
SI (-)beacon min	-SQRT(SI (-)beacon wc <sup>2</sup> +SI (-)MIN-OSC <sup>2</sup> )	-0.72	
SI (-)beacon_5 year	SI (-)beacon min - 0.1 ppb/min	<b>-0.82</b>	<b>Pass with criteria &gt; -1.0</b>

**Negative gradient slope**

Value	Calculation	Result, ppb/min	Comment
SI (-)tot min		-0.43	-11.1°C (B to C+15)
SI (+)osc max		0.32	-19°C (D to E+15)
SI (-)beacon wc	- SQRT(SI (-)tot min <sup>2</sup> +SI (+)osc max <sup>2</sup> )	-0.54	
SI (-)MIN-OSC		-1.7	
SI (-)beacon min	-SQRT(SI (-)beacon wc <sup>2</sup> +SI (-)MIN-OSC <sup>2</sup> )	-1.78	
SI (-)beacon_5 year	SI (-)beacon min - 0.1 ppb/min	<b>-1.88</b>	<b>Pass with criteria &gt; -2.0</b>

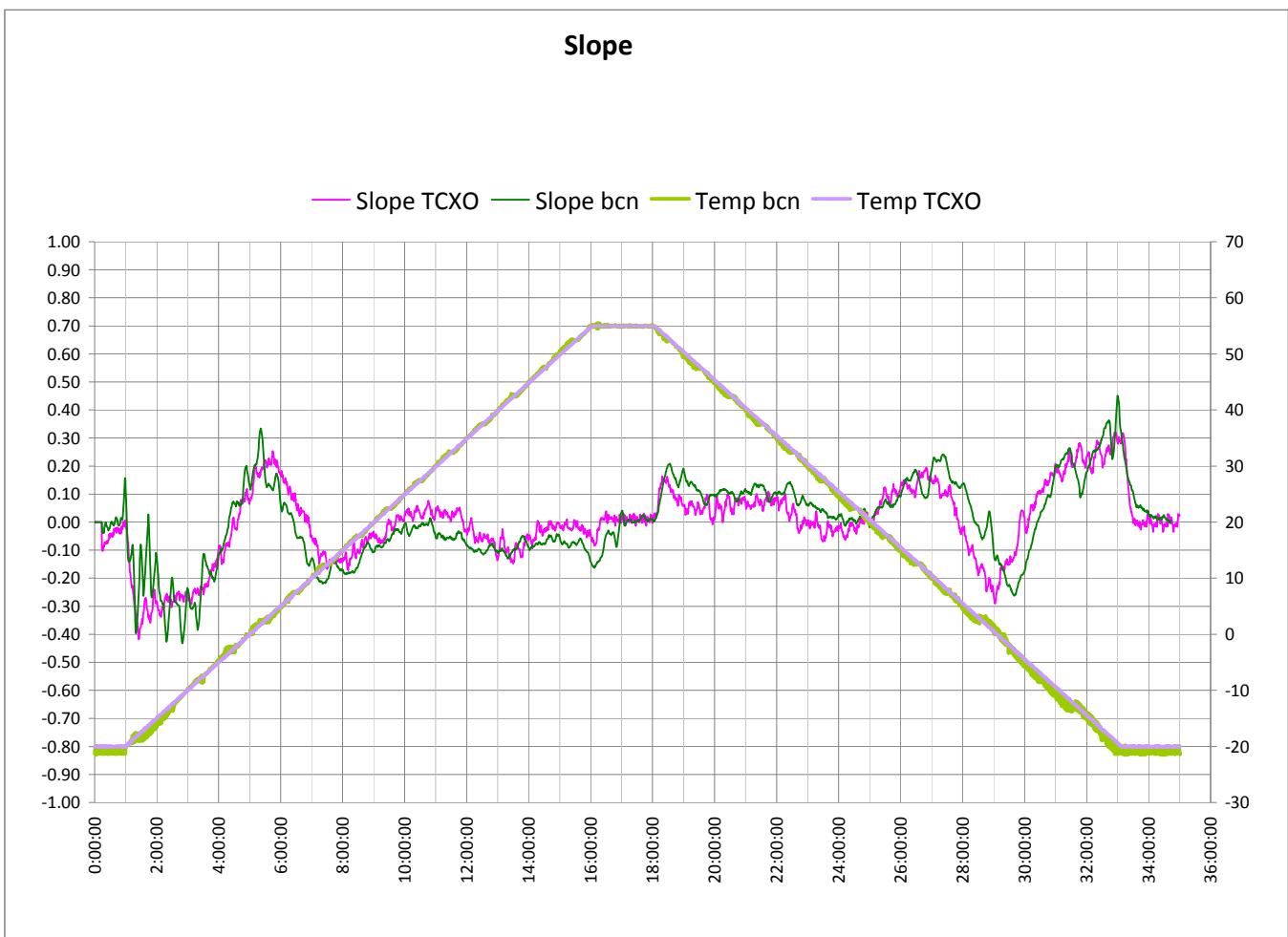


Figure 5.6.2 – Slope during Temperature Gradient Test

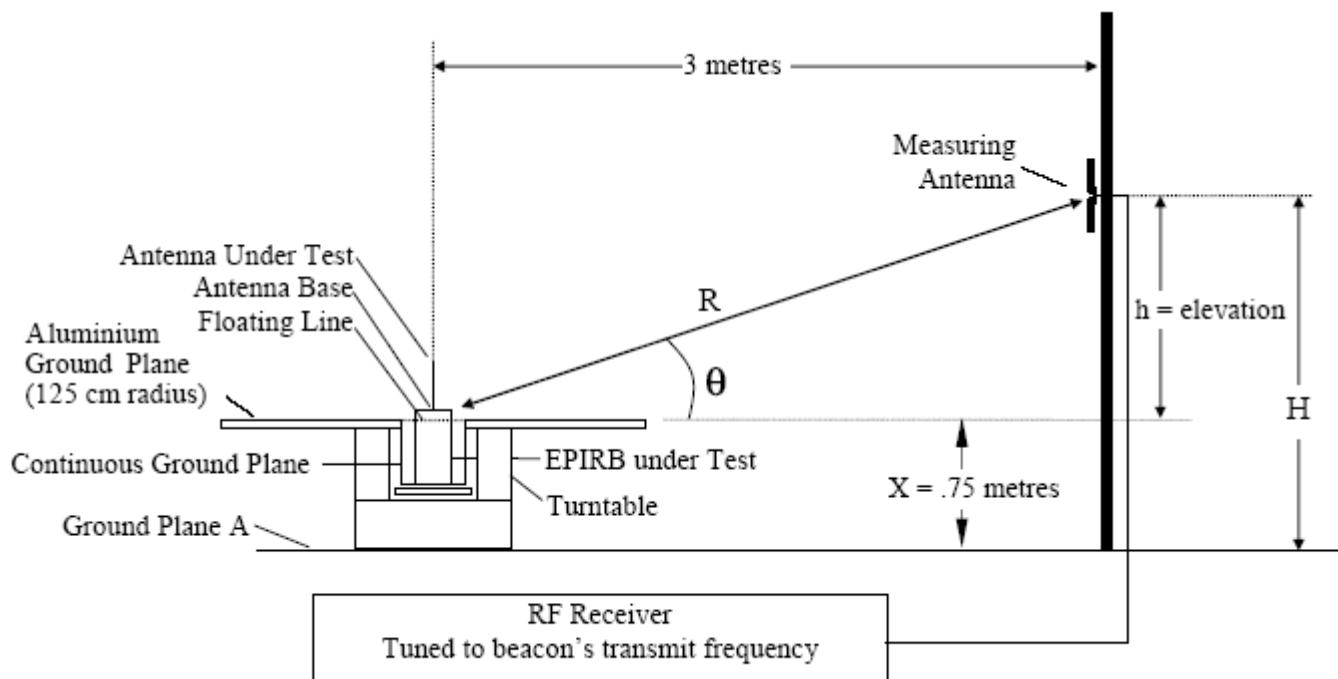
## 5.7 Antenna Characteristics

Date of tests	30.04.2014 (configuration 1) and 05.05.2014(configuration 4)
Specification	C/S T.007 – section A.2.6
Beacon Model	EPIRB1
Serial number	006
EUT Mod State	0
EUT system configuration, including antenna, external ancillary devices and modes of their operation	The EUT was operated using its own power source (internal battery). The EUT was a fully packaged beacon, similar to the proposed production beacons equipped with its proper antenna
Beacon antenna model (P/N)	130S-01404
Measurement antenna type and model	Tuned dipole, FCC-4
Environmental conditions	Open area test site temperature: 17.0-21.2°C Relative air humidity: 44-48 %
Deviations from standard test procedures	There were no deviations from standard test procedures
Non-compliances noticed	There were not non-compliances

### 5.7.1 Test Configuration 1: “Water” Ground Plane (C/S T.007, Figure B.4)

#### Test site:

The measurement was performed in accordance with Figures B.4 and B.8 C/S T.007.



**Table F-B.2: Induced Voltage Measurements Vv / Vh (dBuV)**

Azimuth Angle (degrees)	Elevation Angle (degrees)				
	10	20	30	40	50
<b>0</b>	111.4/88.2	113.0/83.4	111.0/84.0	105.9/77.5	97.3/78.1
<b>30</b>	111.5/85.8	113.0/85.5	110.9/86.5	105.9/83.2	96.8/88.0
<b>60</b>	111.8/82.0	113.1/89.1	111.1/90.6	105.7/87.2	97.5/90.3
<b>90</b>	111.6/79.7	113.0/90.2	111.0/91.5	105.8/91.4	98.0/91.6
<b>120</b>	111.9/80.8	113.1/89.5	111.1/90.7	105.5/88.7	97.6/90.2
<b>150</b>	111.7/83.0	113.1/87.0	111.2/87.7	105.5/90.0	98.3/87.0
<b>180</b>	111.6/86.0	113.1/81.4	111.3/78.4	105.6/78.9	98.4/84.8
<b>210</b>	111.4/87.5	113.1/85.1	111.2/78.8	105.6/81.2	98.1/73.6
<b>240</b>	111.9/89.3	113.1/84.7	111.1/78.4	105.6/86.0	98.0/82.2
<b>270</b>	111.7/90.9	113.0/82.8	111.0/78.7	105.6/88.3	98.1/85.2
<b>300</b>	111.8/87.4	113.1/85.2	111.1/77.0	105.4/83.5	97.4/85.4
<b>330</b>	111.7/90.6	112.9/84.3	111.0/82.9	105.7/83.7	97.7/82.0
<b>Min(Vv-Vh)</b>	20.8	22.8	19.5	14.4	6.4

## 406 MHz BEACON ANTENNA TEST RESULTS

**Table F-B.1: Effective isotropically radiated power (dBm) / antenna gain (dBi)**

Azimuth Angle (degrees)	Elevation Angle (degrees)				
	10	20	30	40	50
<b>0</b>	39.21 / 2.35	41.78 / 4.93	41.48 / 4.62	38.84 / 1.99	33.67 / 3.19
<b>30</b>	39.30 / 2.44	41.79 / 4.93	41.38 / 4.52	38.85 / 1.99	33.33 / 3.53
<b>60</b>	39.59 / 2.74	41.89 / 5.04	41.60 / 4.74	38.67 / 1.81	34.10 / 2.75
<b>90</b>	39.39 / 2.53	41.80 / 4.94	41.50 / 4.65	38.82 / 1.96	34.65 / 2.20
<b>120</b>	39.69 / 2.83	41.90 / 5.04	41.60 / 4.74	38.48 / 1.63	34.19 / 2.66
<b>150</b>	39.49 / 2.64	41.89 / 5.03	41.68 / 4.83	38.50 / 1.64	34.75 / 2.11
<b>180</b>	39.40 / 2.54	41.88 / 5.03	41.77 / 4.92	38.55 / 1.69	34.81 / 2.05
<b>210</b>	39.21 / 2.35	41.89 / 5.03	41.67 / 4.82	38.55 / 1.69	34.46 / 2.40
<b>240</b>	39.71 / 2.85	41.89 / 5.03	41.57 / 4.72	38.56 / 1.71	34.39 / 2.47
<b>270</b>	39.52 / 2.67	41.78 / 4.93	41.47 / 4.62	38.58 / 1.72	34.52 / 2.34
<b>300</b>	39.60 / 2.75	41.89 / 5.03	41.57 / 4.72	38.35 / 1.50	33.84 / 3.02
<b>330</b>	39.52 / 2.66	41.69 / 4.83	41.48 / 4.62	38.65 / 1.80	34.09 / 2.77
	0.51	0.21	0.39	0.50	1.14

$$\text{EIRP}_{\text{LOSS}} = P_{t \text{ ambient}} - P_{t \text{ EOL}} = 36.86 - 36.19 = 0.67 \text{ dB}$$

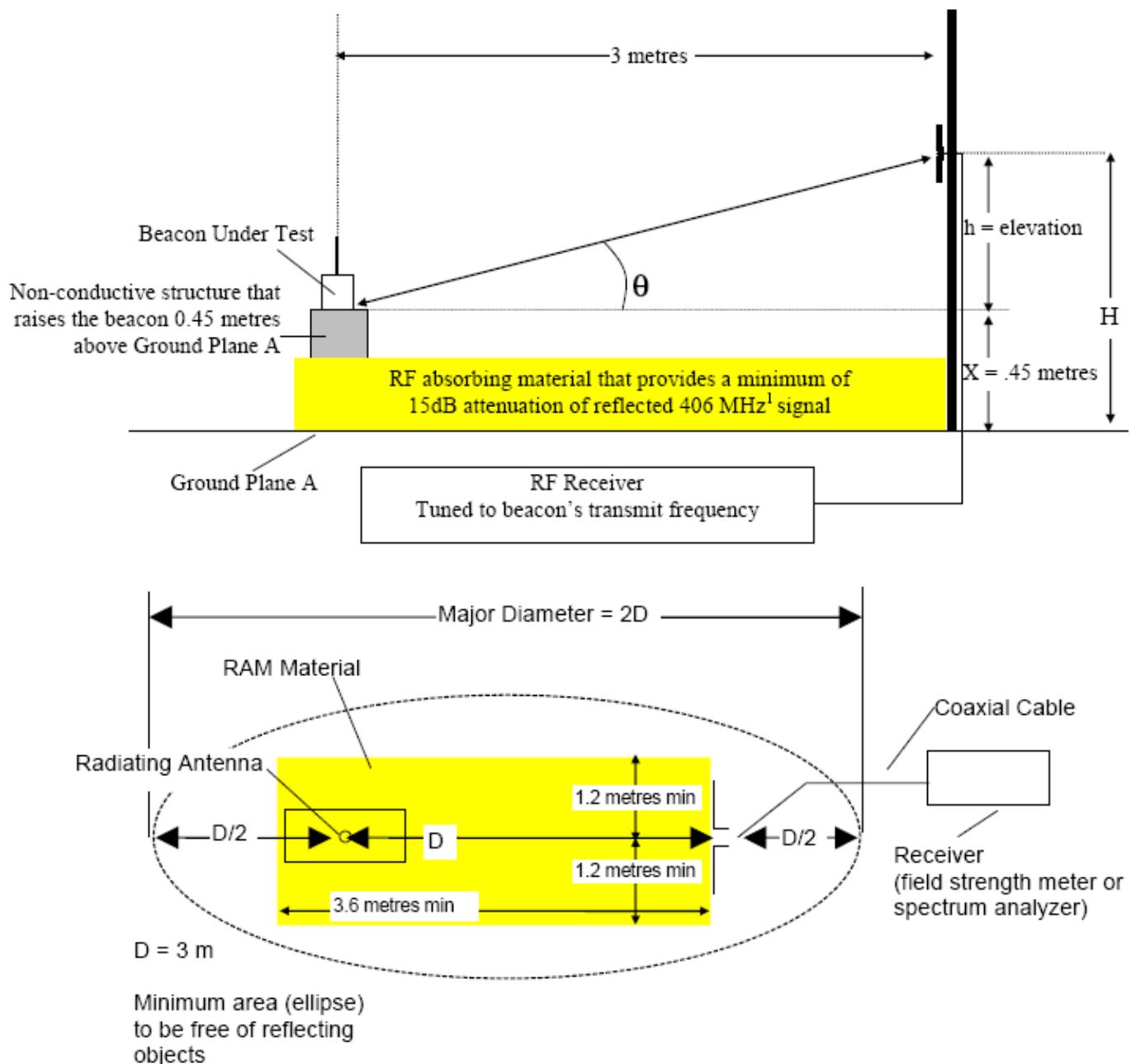
$$\text{EIRP}_{\text{max EOL}} = \text{MAX} [ \text{EIRP}_{\text{max}}, (\text{EIRP}_{\text{max}} - \text{EIRP}_{\text{LOSS}}) ] = \text{MAX} (41.90, 41.23) = 41.90 \text{ dBm} (<= 43 \text{ dBm})$$

$$\text{EIRP}_{\text{min EOL}} = \text{MIN} [ \text{EIRP}_{\text{min}}, (\text{EIRP}_{\text{min}} - \text{EIRP}_{\text{LOSS}}) ] = \text{MIN} (33.33, 32.66) = 32.66 \text{ dBm} (>= 32 \text{ dBm})$$

### 5.7.2 Test Configuration 4: Beacon Above Ground Plane

#### Test site.

The measurement was performed in accordance with Figures B.2 and B.8 C/S T.007.



## 406 MHz BEACON ANTENNA TEST RESULTS

**Table F-B.2: Induced Voltage Measurements Vv / Vh (dBuV)**

Azimuth Angle (degrees)	Elevation Angle (degrees)				
	10	20	30	40	50
0	113.9/80.1	112.2/74.7	107.8/84.4	101.6/80.3	97.3/78.3
90	113.9/89.8	112.1/80.4	107.3/88.3	101.5/87.7	96.9/86.0
180	113.6/84.3	112.0/76.4	107.4/84.1	101.9/84.2	97.0/82.8
270	113.9/85.9	112.1/79.3	107.3/87.7	101.8/80.5	97.4/86.7
Min(Vv-Vh)	15.1	31.7	19.0	13.6	10.7

**Table F-B.3: Equivalent Isotropically Radiated Power (dBm) / Antenna Gain (dBi)**

Azimuth Angle (degrees)	Elevation Angle (degrees)				
	10	20	30	40	50
0	41.50 / 4.64	40.98 / 4.12	38.28 / 1.43	34.56 / -2.30	33.67 / -3.19
90	41.63 / 4.77	40.88 / 4.03	37.81 / 0.95	34.53 / -2.33	33.36 / -3.50
180	41.20 / 4.34	40.78 / 3.92	37.89 / 1.03	34.88 / -1.98	33.40 / -3.45
270	41.50 / 4.64	40.88 / 4.02	37.80 / 0.95	34.76 / -2.10	33.87 / -2.99

$$\text{EIRP}_{\text{LOSS}} = P_{t \text{ ambient}} - P_{t \text{ EOL}} = 36.86 - 36.19 = 0.67 \text{ dB}$$

$$\text{EIRP}_{\text{max EOL}} = \text{MAX} [ \text{EIRP}_{\text{max}}, (\text{EIRP}_{\text{max}} - \text{EIRP}_{\text{LOSS}}) ] = \text{MAX} (41.63, 40.96) = 40.96 \text{ dBm} (<= 43 \text{ dBm})$$

$$\text{EIRP}_{\text{min EOL}} = \text{MIN} [ \text{EIRP}_{\text{min}}, (\text{EIRP}_{\text{min}} - \text{EIRP}_{\text{LOSS}}) ] = \text{MIN} (33.36, 32.69) = 32.69 \text{ dBm} (>= 30 \text{ dBm})$$

## 5.8 Beacon Coding Software

Date of test	16.05.2014
Specification	C/S T.007 – section A.2.1
Beacon Model	EPIRB1
EUT Mod State	0
Performed by	Manufacturer
Verified by	Vasilev D.V.
Measurement Equipment, provided by beacon manufacturer	N/A
Reference documents	C/S T.007 – Annex C
Environmental conditions:	Ambient laboratory temperature: 22.0°C Relative air humidity: 58 %
Deviations from standard test procedures	There were no deviations from standard test procedures
Non-compliances noticed	There were not non-compliances

Beacon coding software test was carried out by beacon manufacturer as it is allowed by CS T.007 and test result provided below.

### Pages of test report of Standard Location and National Location protocols

		Page No.		
Protocol type		Decoded operational message, location A	Decoded operational message, location B	Decoded self-test mode message
1.	Standard Location: EPIRB with MMSI	106	107	108
2.	Standard Location: EPIRB with Serial Number	109	110	111
3.	Standard Location: Test	112	113	114
4.	National Location: EPIRB	115	116	117
5.	National Location: Test	118	119	120

**Pages of test report of User Location protocols**

		Page No.		
Protocol type		Decoded operational message, location A	Decoded operational message, location B	Decoded self-test mode message
1.	User Location: Maritime with Radio Call Sign	121	122	123
2.	User Location: Radio Call Sign	124	125	126
3.	User Location: Test	127	128	129

<b>Document Type</b>		
	<b>Issue</b>	<b>01.02</b>
Approved:	<b>Date Last Amended</b>	<b>15/5/2014</b>
	<b>Last Amended by</b>	<b>S Nolan</b>
<b>Document Title</b>	<b>EPIRB 1 Navigation System, Beacon and Message Coding Test Results</b>	



**Message Coding Protocols**  
**Navigation System Test Results**  
**Beacon Coding Software Results**

**Product EPIRB 1**  
**Software Issue 00:04**  
**Date 15 May 2014**

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	<b>Document Title</b>	<b>EPIRB 1 Navigation System, Beacon and Message Coding Test Results</b>	

<b>Characteristic</b>	<b>Specification</b>
<b>Message Coding Protocols:</b>	(x) Tick the boxes below against the intended protocol options
User Protocol (tick where appropriate)	<input type="checkbox"/> Maritime with MMSI <input type="checkbox"/> Maritime with Radio Call Sign <input type="checkbox"/> EPIRB Float Free with Serial Number <input type="checkbox"/> EPIRB Non Float Free with Serial Number <input type="checkbox"/> Radio Call Sign <input type="checkbox"/> Aviation <input type="checkbox"/> ELT with Serial Number <input type="checkbox"/> ELT with Aircraft Operator and Serial Number <input type="checkbox"/> ELT with Aircraft 24-bit Address <input type="checkbox"/> PLB with Serial Number <input type="checkbox"/> National (Short Message Format) <input type="checkbox"/> National (Long Message Format)
Standard Location Protocol (tick where appropriate)	<input checked="" type="checkbox"/> EPIRB with MMSI <input checked="" type="checkbox"/> EPIRB with Serial Number <input type="checkbox"/> ELT with 24-bit Address <input type="checkbox"/> ELT with Aircraft Operator Designator <input type="checkbox"/> ELT with Serial Number <input type="checkbox"/> PLB with Serial Number
National Location Protocol (tick where appropriate)	<input checked="" type="checkbox"/> National Location: EPIRB <input type="checkbox"/> National Location: ELT <input type="checkbox"/> National Location: PLB
User Location Protocol (tick where appropriate)	<input type="checkbox"/> Maritime with MMSI <input checked="" type="checkbox"/> Maritime with Radio Call Sign <input type="checkbox"/> EPIRB Float Free with Serial Number <input type="checkbox"/> EPIRB Non Float Free with Serial Number <input checked="" type="checkbox"/> Radio Call Sign <input type="checkbox"/> Aviation <input type="checkbox"/> ELT with Serial Number <input type="checkbox"/> ELT with Aircraft Operator and Serial Number <input type="checkbox"/> ELT with Aircraft 24-bit Address <input type="checkbox"/> PLB with Serial Number

<b>Document Type</b>	<b>Issue</b>	01.02	PE TC "Omega" 
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## BEACON CODING SOFTWARE RESULTS

**Table F-D.1 of C/S T.007 (Issue 4 – Rev. 8 October 2013)**

### Examples of User Protocol Beacon Messages

Protocol	Operational Message (in hexadecimal including bit)	Self-Test Message (in hexadecimal including bit)
Maritime User Protocol with MMSI	N/A	N/A
Maritime User Protocol with Radio Call Sign	N/A	N/A
Radio Call Sign User Protocol	N/A	N/A
Serial User: Float-Free EPIRB with Serial Number	N/A	N/A
Serial User: Non Float-Free EPIRB with Serial Number	N/A	N/A
Aviation User Protocol	N/A	N/A
Serial User: ELT with Serial Number	N/A	N/A
Serial User: ELT with Aircraft Operator Designator & Serial Number	N/A	N/A
Serial User: ELT with Aircraft 24-bit Address	N/A	N/A
Serial User: PLB with Serial Number	N/A	N/A
National User (Short)	N/A	N/A
National User (Long)	N/A	N/A
User Test	N/A	N/A

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**Table F-D.2 of C/S T.007 (Issue 4 – Rev. 8 October 2013)**

**Examples of Standard and National Location Protocol Beacon Messages**

Protocol	Operational Message (in hexadecimal including bit and frame synchronisation bits)	Self-Test Message (in hexadecimal including bit and frame synchronisation bits)	GNSS Self Test Message (if applicable, in hexadecimal including bit and frame synchronisation bits)
	Location 'A'	Location 'B'	Location 'A'
Standard Location: EPIRB with MMSI	FFFE2F8C92F42 3F0334032603 9779B469B07	FFFE2F8C92F42 3F03340210CC 8F786A4D7C0	FFFED08C92F423 F07FDFFB2BF037 83EOF66C
Standard Location: EPIRB with Serial Number	FFFE2F8C96F9C 063334030D92 6779B469B07	FFFE2F8C96F9C 063334023B5D 7F786A4D7C0	FFFED08C96F9 C0637FDFF992 EF3783EOF66C
Standard Location: ELT with 24-bit Address	N/A	N/A	N/A
Standard Location: ELT with Aircraft Operator Designator	N/A	N/A	N/A
Standard Location: PLB with Serial Number	N/A	N/A	N/A
Standard Location: Test	FFFE2F8C9EF9C 06333403176D CF79B469B07	FFFE2F8C9EF9C 0633340221A2 D7786A4D7C0	FFFED08C9EF9C 0637FDFF83D15 B783EOF66C
National Location: EPIRB	FFFE2F8C9A001 8CCD601675A6 FF704240E3D	FFFE2F8C9A001 8CCD001148B8 83795340DF8	FFFED08C9A001 8DFC0FF02AD44 779F3C0010
National Location: ELT	N/A	N/A	N/A
National Location: PLB	N/A	N/A	N/A
National Location: Test	FFFE2F8C9F00C 04CD6016385A 0770424F311	FFFE2F8C9F00C 04CD00110544 7B79534F0D4	FFFED08C9F00C 05FC0FF06728BF 783EOF66C
RLS Location: (ELT, EPIRB or PLB)	N/A	N/A	N/A

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**Table F-D.3 of C/S T.007 (Issue 4 – Rev. 8 October 2013)**

**Examples of User-Location Protocol Beacon Messages**

Protocol	Operational Message (in hexadecimal including bit and frame synchronisation bits)	Self-Test Message (in hexadecimal including bit and frame synchronisation bits)	GNSS Self Test Message (if applicable, in hexadecimal including bit and frame synchronisation bits)	
	Location 'A'	Location 'B'		Location 'A'
Maritime Protocol with MMSI	N/A	N/A	N/A	N/A
Maritime Protocol with Radio Call Sign	FFFE2FCC9526F6F06B268F9F32266A01650C	FFFE2FCC9526F6F06B268F9F322668011965	FFFED0CC9526F6F06B268F9F322FE0FF0146	N/A
Radio Call Sign	FFFE2FCC9DBDBC1A55468ED9F6266A01650C	FFFE2FCC9DBDBC1A55468ED9F62668011965	FFFED0CC9DBDBC1A55468ED9F62FE0FF0146	N/A
Serial User-Location: Float-Free EPIRB	N/A	N/A	N/A	N/A
Serial User-Location: Non Float-Free EPIRB	N/A	N/A	N/A	N/A
Aviation	N/A	N/A	N/A	N/A
Serial User-Location: ELT	N/A	N/A	N/A	N/A
Serial User-Location: ELT with Aircraft Operator Designator &	N/A	N/A	N/A	N/A
Serial User-Location: ELT with Aircraft 24-bit address	N/A	N/A	N/A	N/A
Serial User-Location: PLB	N/A	N/A	N/A	N/A
User- Location: Test	FFFE2FCC9E00C05FC0FF010D87666A01650C	FFFE2FCC9E00C05FC0FF010D87668011965	FFFED0CC9E00C05FC0FF010D87783E0F66C	N/A

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## Analysis of Beacon Messages

In all the tests involving a location protocol the following positions were used:

- Location 'A' = **51°21' 51" N, 1° 23' 25" E**
- Location 'B' = **51°16' 38" N, 1° 4' 50" E**
- Distance between locations = **23.6 Km**

The 'Bit Analysis' tables are taken from the '406 MHz Decode Program Version 3.2' available on the Cospas-Sarsat website, and using the '30 Hexadecimal ID' input format for Location.

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## Standard Location EPIRB with MMSI Location A

**Burst-13505.htm**

**Full Hex** FFFE2F8C92F423F03340326039779B469B07

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - Albania	27-36	0011001001
Type of location protocol: Standard Location - EPIRB (MMSI)	37-40	0010
MID: 999999	41-60	11110100001000111111
Specific Beacon: 0	61-64	0000
Latitude Sign: North	65	0
Latitude Degrees: 51	66-72	0110011
Latitude Minutes: 15	73-74	01
Longitude Sign: East	75	0
Longitude Degrees: 1	76-83	00000001
Longitude Minutes: 30	84-85	10
BCH 1 Encoded:	86-106	010011000000011100101
BCH 1 Calculated:	N/A	010011000000011100101
Fixed bits (1101): Pass	107-110	1101
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
Aux Device: 121.5 MHz homer	112	1
Latitude Offset Sign: +	113	1
Latitude Offset Minutes: 6	114-118	00110
Latitude Offset Seconds: 52	119-122	1101
Longitude Offset Sign: -	123	0
Longitude Offset Minutes: 6	124-128	00110
Longitude Offset Seconds: 36	129-132	1001
BCH 2 Encoded:	133-144	101100000111
BCH 2 Calculated:	N/A	101100000111
Composite Latitude: 51.36444444444445 Degrees North	N/A	Composite Longitude: 1.39 Degrees East
15 Hex ID:	N/A	1925E847E0FFBFF

**Lat: 51°21'52" N**

**Long: 1°23'24" E**

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## Standard Location EPIRB with MMSI Location B

Burst-13507.htm

**Full Hex** FFFE2F8C92F423F03340210CC8F786A4D7C0

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - Albania	27-36	0011001001
Type of location protocol: Standard Location - EPIRB (MMSI)	37-40	0010
MID: 999999	41-60	11110100001000111111
Specific Beacon: 0	61-64	0000
Latitude Sign: North	65	0
Latitude Degrees: 51	66-72	0110011
Latitude Minutes: 15	73-74	01
Longitude Sign: East	75	0
Longitude Degrees: 1	76-83	00000001
Longitude Minutes: 0	84-85	00
BCH 1 Encoded:	86-106	001000011001100100011
BCH 1 Calculated:	N/A	001000011001100100011
Fixed bits (1101): Pass	107-110	1101
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
Aux Device: 121.5 MHz homer	112	1
Latitude Offset Sign: +	113	1
Latitude Offset Minutes: 1	114-118	00001
Latitude Offset Seconds: 40	119-122	1010
Longitude Offset Sign: +	123	1
Longitude Offset Minutes: 4	124-128	00100
Longitude Offset Seconds: 52	129-132	1101
BCH 2 Encoded:	133-144	011111000000
BCH 2 Calculated:	N/A	011111000000
Composite Latitude: 51.2777777777778 Degrees North	N/A	Composite Longitude: 1.081111111111111 Degrees East
15 Hex ID:	N/A	1925E847E0FFBFF

**Lat: 51°16'40" N**

**Long: 1°4'52" E**

<b>Document Type</b>	<b>Issue</b>	01.02
	<b>Date Last Amended</b>	15/5/2014
	<b>Last Amended by</b>	S Nolan
<b>Document Title</b>	<b>EPIRB 1 Navigation System, Beacon and Message Coding Test Results</b>	



## Standard Location EPIRB with MMSI Self-Test

### Burst-13508.htm

**Full Hex** FFFED08C92F423F07FDFFB2BF03783EOF66C

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - Albania	27-36	0011001001
Type of location protocol: Standard Location - EPIRB (MMSI)	37-40	0010
MID: 999999	41-60	11110100001000111111
Specific Beacon: 0	61-64	0000
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	011001010111111000000
BCH 1 Calculated:	N/A	011001010111111000000
Fixed bits (1101): Pass	107-110	1101
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
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	011001101100
BCH 2 Calculated:	N/A	011001101100
Composite Latitude: default	N/A	Composite Longitude: default
15 Hex ID:	N/A	1925E847E0FFBFF

**Lat: Default**

**Long: Default**

<b>Document Type</b>	<b>Issue</b>	<b>01.02</b>	PE TC "Omega" 
	<b>Date Last Amended</b>	<b>15/5/2014</b>	
	<b>Last Amended by</b>	<b>S Nolan</b>	
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## Standard Location EPIRB with Serial Number Location A

Burst-13509.htm

**Full Hex** FFFE2F8C96F9C063334030D926779B469B07

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - Albania	27-36	0011001001
Type of location protocol: Standard Location - EPIRB (Serial)	37-40	0110
Cospas-Sarsat #: 999	41-50	1111100111
Serial Number: 99	51-64	00000001100011
Latitude Sign: North	65	0
Latitude Degrees: 51	66-72	0110011
Latitude Minutes: 15	73-74	01
Longitude Sign: East	75	0
Longitude Degrees: 1	76-83	00000001
Longitude Minutes: 30	84-85	10
BCH 1 Encoded:	86-106	000110110010010011001
BCH 1 Calculated:	N/A	000110110010010011001
Fixed bits (1101): Pass	107-110	1101
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
Aux Device: 121.5 MHz homer	112	1
Latitude Offset Sign: +	113	1
Latitude Offset Minutes: 6	114-118	00110
Latitude Offset Seconds: 52	119-122	1101
Longitude Offset Sign: -	123	0
Longitude Offset Minutes: 6	124-128	00110
Longitude Offset Seconds: 36	129-132	1001
BCH 2 Encoded:	133-144	101100000111
BCH 2 Calculated:	N/A	101100000111
Composite Latitude: 51.36444444444445 Degrees North	N/A	Composite Longitude: 1.39 Degrees East
15 Hex ID:	N/A	192DF380C6FFBFF

**Lat: 51°21'52" N**

**Long: 1°23'24" E**

<b>Document Type</b>	<b>Issue</b>	01.02	PE TC "Omega" 
	<b>Date Last Amended</b>	15/5/2014	
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## Standard Location EPIRB with Serial Number Location B

Burst-13510.htm

**Full Hex** FFFE2F8C96F9C063334023B5D7F786A4D7C0

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - Albania	27-36	0011001001
Type of location protocol: Standard Location - EPIRB (Serial)	37-40	0110
Cospas-Sarsat #: 999	41-50	1111100111
Serial Number: 99	51-64	00000001100011
Latitude Sign: North	65	0
Latitude Degrees: 51	66-72	0110011
Latitude Minutes: 15	73-74	01
Longitude Sign: East	75	0
Longitude Degrees: 1	76-83	00000001
Longitude Minutes: 0	84-85	00
BCH 1 Encoded:	86-106	011101101011101011111
BCH 1 Calculated:	N/A	011101101011101011111
Fixed bits (1101): Pass	107-110	1101
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
Aux Device: 121.5 MHz homer	112	1
Latitude Offset Sign: +	113	1
Latitude Offset Minutes: 1	114-118	00001
Latitude Offset Seconds: 40	119-122	1010
Longitude Offset Sign: +	123	1
Longitude Offset Minutes: 4	124-128	00100
Longitude Offset Seconds: 52	129-132	1101
BCH 2 Encoded:	133-144	011111000000
BCH 2 Calculated:	N/A	011111000000
Composite Latitude: 51.2777777777778 Degrees North	N/A	Composite Longitude: 1.081111111111111 Degrees East
15 Hex ID:	N/A	192DF380C6FFBFF

**Lat: 51°16'40" N**

**Long: 1°4'52" E**

<b>Document Type</b>	<b>Issue</b>	<b>01.02</b>
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## Standard Location EPIRB with Serial Number Self Test

### Burst-13516.htm

**Full Hex** FFFED08C96F9C0637FDFF992EF3783EOF66C

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - <b>Albania</b>	27-36	0011001001
Type of location protocol: Standard Location - EPIRB (Serial)	37-40	0110
Cospas-Sarsat #: 999	41-50	1111100111
Serial Number: 99	51-64	00000001100011
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	001100100101110111100
BCH 1 Calculated:	N/A	001100100101110111100
Fixed bits (1101): Pass	107-110	1101
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
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	011001101100
BCH 2 Calculated:	N/A	011001101100
Composite Latitude: default	N/A	Composite Longitude: default
15 Hex ID:	N/A	192DF380C6FFBFF

**Lat: Default**

**Long: Default**

<b>Document Type</b>	<b>Issue</b>	<b>01.02</b>	PE TC "Omega" 
	<b>Date Last Amended</b>	<b>15/5/2014</b>	
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## Standard Location Test EPIRB Location A

### Burst-13513.htm

**Full Hex** FFFE2F8C9EF9C06333403176DCF79B469B07

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - Albania	27-36	0011001001
Type of location protocol: Standard Location - Test	37-40	1110
Test Protocol: Test Protocol (No Decode information in bits 41 to 64)	41-64	11111001110000001100011
Latitude Sign: North	65	0
Latitude Degrees: 51	66-72	0110011
Latitude Minutes: 15	73-74	01
Longitude Sign: East	75	0
Longitude Degrees: 1	76-83	00000001
Longitude Minutes: 30	84-85	10
BCH 1 Encoded:	86-106	001011101101101110011
BCH 1 Calculated:	N/A	001011101101101110011
Fixed bits (1101): Pass	107-110	1101
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
Aux Device: 121.5 MHz homer	112	1
Latitude Offset Sign: +	113	1
Latitude Offset Minutes: 6	114-118	00110
Latitude Offset Seconds: 52	119-122	1101
Longitude Offset Sign: -	123	0
Longitude Offset Minutes: 6	124-128	00110
Longitude Offset Seconds: 36	129-132	1001
BCH 2 Encoded:	133-144	101100000111
BCH 2 Calculated:	N/A	101100000111
Composite Latitude: 51.36444444444445 Degrees North	N/A	Composite Longitude: 1.39 Degrees East
15 Hex ID:	N/A	193DF380C6FFBFF

**Lat: 51°21'52" N**

**Long: 1°23'24" E**

<b>Document Type</b>	<b>Issue</b>	01.02	PE TC "Omega" 
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	<b>Document Title</b>		
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## Standard Location Test EPIRB Location B

### Burst-13514.htm

**Full Hex** FFFE2F8C9EF9C0633340221A2D7786A4D7C0

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - <b>Albania</b>	27-36	0011001001
Type of location protocol: Standard Location - Test	37-40	1110
Test Protocol: Test Protocol (No Decode information in bits 41 to 64)	41-64	11111001110000001100011
Latitude Sign: North	65	0
Latitude Degrees: 51	66-72	0110011
Latitude Minutes: 15	73-74	01
Longitude Sign: East	75	0
Longitude Degrees: 1	76-83	00000001
Longitude Minutes: 0	84-85	00
BCH 1 Encoded:	86-106	010000110100010110101
BCH 1 Calculated:	N/A	010000110100010110101
Fixed bits (1101): Pass	107-110	1101
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
Aux Device: 121.5 MHz homer	112	1
Latitude Offset Sign: +	113	1
Latitude Offset Minutes: 1	114-118	00001
Latitude Offset Seconds: 40	119-122	1010
Longitude Offset Sign: +	123	1
Longitude Offset Minutes: 4	124-128	00100
Longitude Offset Seconds: 52	129-132	1101
BCH 2 Encoded:	133-144	011111000000
BCH 2 Calculated:	N/A	011111000000
Composite Latitude: 51.2777777777778 Degrees North	N/A	Composite Longitude: 1.081111111111111 Degrees East
15 Hex ID:	N/A	193DF380C6FFBFF

**Lat: 51°16'40" N**

**Long: 1°4'52" E**

<b>Document Type</b>	<b>Issue</b>	<b>01.02</b>
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## Standard Location Test EPIRB Self Test

### Burst-13515.htm

**Full Hex** FFFED08C9EF9C0637FDFF83D15B783E0F66C

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - Albania	27-36	0011001001
Type of location protocol: Standard Location - Test	37-40	1110
Test Protocol: Test Protocol (No Decode information in bits 41 to 64)	41-64	11111001110000001100011
Latitude Sign: default	65	0
Latitude Degrees: default	66-72	11111111
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	000001111010001010110
BCH 1 Calculated:	N/A	000001111010001010110
Fixed bits (1101): Pass	107-110	1101
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
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	011001101100
BCH 2 Calculated:	N/A	011001101100
Composite Latitude: default	N/A	Composite Longitude: default
15 Hex ID:	N/A	193DF380C6FFBF

**Lat: Default**

**Long: Default**

<b>Document Type</b>	<b>Issue</b>	<b>01.02</b>
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## National Location EPIRB Location A

Burst-13517.htm

**Full Hex** FFFE2F8C9A0018CCD601675A6FF704240E3D

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - Albania	27-36	0011001001
Type of location protocol: National Location - EPIRB	37-40	1010
Serial Number: 99	41-58	000000000001100011
Latitude Flag: North	59	0
Latitude (Degrees): 51	60-66	0110011
Latitude (Minutes): 22	67-71	01011
Longitude Flag: East	72	0
Longitude (Degrees): 1	73-80	00000001
Longitude (Minutes): 24	81-85	01100
BCH 1 Encoded:	86-106	111010110100110111111
BCH 1 Calculated:	86-106	111010110100110111111
Fixed bits (110): Pass	107-109	110
Bits 113 - 132 provides offset data location	110	1
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
Aux Loc. Device: 121.5 MHz homer	112	1
Latitude Offset Sign: -	113	0
Latitude Offset Minutes: 0	114-115	00
Latitude Offset Seconds: 8	116-119	0010
Longitude Offset Sign: -	120	0
Longitude Offset Minutes: 0	121-122	00
Longitude Offset Seconds: 36	123-126	1001
Additional Id (Nat Use)	127-132	000000
BCH 2 Encoded:	133-144	111000111101
BCH 2 Calculated:	N/A	111000111101
Composite Latitude: 51.36444444444445 Degrees North	N/A	Composite Longitude: 1.39 Degrees East
15 Hex ID:	N/A	19340031BF81FE0

**Lat: 51° 21'52" N**

**Long: 1° 23'24" E**

<b>Document Type</b>	<b>Issue</b>	<b>01.02</b>	PE TC "Omega" 
	<b>Date Last Amended</b>	<b>15/5/2014</b>	
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## National Location EPIRB Location B

Burst-13518.htm

**Full Hex** FFFE2F8C9A0018CCD001148B883795340DF8

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - Albania	27-36	0011001001
Type of location protocol: National Location - EPIRB	37-40	1010
Serial Number: 99	41-58	000000000001100011
Latitude Flag: North	59	0
Latitude (Degrees): 51	60-66	0110011
Latitude (Minutes): 16	67-71	01000
Longitude Flag: East	72	0
Longitude (Degrees): 1	73-80	00000001
Longitude (Minutes): 4	81-85	00010
BCH 1 Encoded:	86-106	100100010111000100000
BCH 1 Calculated:	86-106	100100010111000100000
Fixed bits (110): Pass	107-109	110
Bits 113 - 132 provides offset data location	110	1
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
Aux Loc. Device: 121.5 MHz homer	112	1
Latitude Offset Sign: +	113	1
Latitude Offset Minutes: 0	114-115	00
Latitude Offset Seconds: 40	116-119	1010
Longitude Offset Sign: +	120	1
Longitude Offset Minutes: 0	121-122	00
Longitude Offset Seconds: 52	123-126	1101
Additional Id (Nat Use)	127-132	000000
BCH 2 Encoded:	133-144	110111111000
BCH 2 Calculated:	N/A	110111111000
Composite Latitude: 51.2777777777778 Degrees North	N/A	Composite Longitude: 1.081111111111111 Degrees East
15 Hex ID:	N/A	19340031BF81FE0

**Lat: 51°16'40" N**

**Long: 1°4'52" E**

<b>Document Type</b>	<b>Issue</b>	<b>01.02</b>
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## National Location EPIRB Self Test

Burst-13519.htm

**Full Hex** FFFED08C9A0018DFC0FF02AD44779F3C0010

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - <b>Albania</b>	27-36	0011001001
Type of location protocol: National Location - EPIRB	37-40	1010
Serial Number: 99	41-58	000000000001100011
Latitude Flag: default	59	0
Latitude (Degrees): default	60-66	1111111
Latitude (Minutes): default	67-71	00000
Longitude Flag: default	72	0
Longitude (Degrees): default	73-80	11111111
Longitude (Minutes): default	81-85	00000
BCH 1 Encoded:	86-106	010101011010100010001
BCH 1 Calculated:	86-106	010101011010100010001
Fixed bits (110): Pass	107-109	110
Bits 113 - 132 provides offset data location	110	1
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
Aux Loc. Device: 121.5 MHz horner	112	1
Latitude Offset Sign: default	113	1
Latitude Offset Minutes: default	114-115	00
Latitude Offset Seconds: default	116-119	1111
Longitude Offset Sign: default	120	1
Longitude Offset Minutes: default	121-122	00
Longitude Offset Seconds: default	123-126	1111
Additional Id (Nat Use)	127-132	000000
BCH 2 Encoded:	133-144	000000010000
BCH 2 Calculated:	N/A	000000010000
Composite Latitude: default	N/A	Composite Longitude: default
15 Hex ID:	N/A	19340031BF81FE0

**Lat: Default**

**Long: Default**

<b>Document Type</b>	<b>Issue</b>	<b>01.02</b>
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## National Location Test EPIRB Location A

### Burst-13520.htm

**Full Hex** FFFE2F8C9F00C04CD6016385A0770424F311

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - Albania	27-36	0011001001
Type of location protocol: National Location - Test	37-40	1111
Serial Number: 769	41-58	000000001100000001
Latitude Flag: North	59	0
Latitude (Degrees): 51	60-66	0110011
Latitude (Minutes): 22	67-71	01011
Longitude Flag: East	72	0
Longitude (Degrees): 1	73-80	00000001
Longitude (Minutes): 24	81-85	01100
BCH 1 Encoded:	86-106	011100001011010000001
BCH 1 Calculated:	86-106	011100001011010000001
Fixed bits (110): Pass	107-109	110
Bits 113 - 132 provides offset data location	110	1
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
Aux Loc. Device: 121.5 MHz homer	112	1
Latitude Offset Sign: -	113	0
Latitude Offset Minutes: 0	114-115	00
Latitude Offset Seconds: 8	116-119	0010
Longitude Offset Sign: -	120	0
Longitude Offset Minutes: 0	121-122	00
Longitude Offset Seconds: 36	123-126	1001
Additional Id (Nat Use)	127-132	001111
BCH 2 Encoded:	133-144	001100010001
BCH 2 Calculated:	N/A	001100010001
Composite Latitude: 51.36444444444445 Degrees North	N/A	Composite Longitude: 1.39 Degrees East
15 Hex ID:	N/A	193E0180BF81FE0

**Lat: 51° 21'52" N**

**Long: 1° 23'24" E**

<b>Document Type</b>	<b>Issue</b>	01.02	PE TC "Omega" 
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## National Location Test EPIRB Location B

Burst-13521.htm

**Full Hex** FFFE2F8C9F00C04CD001105447B79534F0D4

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - <b>Albania</b>	27-36	0011001001
Type of location protocol: National Location - Test	37-40	1111
Serial Number: 769	41-58	000000001100000001
Latitude Flag: North	59	0
Latitude (Degrees): 51	60-66	0110011
Latitude (Minutes): 16	67-71	01000
Longitude Flag: East	72	0
Longitude (Degrees): 1	73-80	00000001
Longitude (Minutes): 4	81-85	00010
BCH 1 Encoded:	86-106	000010101000100011110
BCH 1 Calculated:	86-106	000010101000100011110
Fixed bits (110): Pass	107-109	110
Bits 113 - 132 provides offset data location	110	1
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
Aux Loc. Device: 121.5 MHz horner	112	1
Latitude Offset Sign: +	113	1
Latitude Offset Minutes: 0	114-115	00
Latitude Offset Seconds: 40	116-119	1010
Longitude Offset Sign: +	120	1
Longitude Offset Minutes: 0	121-122	00
Longitude Offset Seconds: 52	123-126	1101
Additional Id (Nat Use)	127-132	001111
BCH 2 Encoded:	133-144	000011010100
BCH 2 Calculated:	N/A	000011010100
Composite Latitude: 51.2777777777778 Degrees North	N/A	Composite Longitude: 1.0811111111111111 Degrees East
15 Hex ID:	N/A	193E0180BF81FE0

**Lat: 51° 16'40" N**

**Long: 1° 4'52" E**

<b>Document Type</b>	<b>Issue</b>	<b>01.02</b>
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## National Location Test EPIRB Self Test

### Burst-13522.htm

**Full Hex** FFFED08C9F00C05FC0FF06728BF783EOF66C

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - <b>Albania</b>	27-36	0011001001
Type of location protocol: National Location - Test	37-40	1111
Serial Number: 769	41-58	000000001100000001
Latitude Flag: default	59	0
Latitude (Degrees): default	60-66	1111111
Latitude (Minutes): default	67-71	00000
Longitude Flag: default	72	0
Longitude (Degrees): default	73-80	11111111
Longitude (Minutes): default	81-85	00000
BCH 1 Encoded:	86-106	110011100101000101111
BCH 1 Calculated:	86-106	110011100101000101111
Fixed bits (110): Pass	107-109	110
Bits 113 - 132 provides offset data location	110	1
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
Aux Loc. Device: 121.5 MHz horner	112	1
Latitude Offset Sign: +	113	1
Latitude Offset Minutes: 0	114-115	00
Latitude Offset Seconds: 4	116-119	0001
Longitude Offset Sign: +	120	1
Longitude Offset Minutes: 3	121-122	11
Longitude Offset Seconds: 32	123-126	1000
Additional Id (Nat Use)	127-132	001111
BCH 2 Encoded:	133-144	011001101100
BCH 2 Calculated:	N/A	011001101100
Composite Latitude: default	N/A	Composite Longitude: default
15 Hex ID:	N/A	193E0180BF81FE0

**Lat: Default**

**Long: Default**

<b>Document Type</b>	<b>Issue</b>	01.02	PE TC "Omega" 
	<b>Date Last Amended</b>	15/5/2014	
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## User-Location Maritime Protocol with Radio Call Sign Location A

### Burst-13523.htm

**Hex** FFFE2FCC9526F6F06B268F9F32266A01650C

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: User	26	1
Country code: 201 - Albania	27-36	0011001001
User type: Maritime User	37-39	010
Radio Call Sign (6 digits): XPA02	40-75	1001001101110110111100001101011001
Specific bcn: 0	76-81	001101
Spare	82-83	00
Aux radio device: 121.5 MHz	84-85	01
Encoded BCH 1:	86-106	111100111110011001000
Calculated BCH 1:	N/A	111100111110011001000
Encoded Position Data Source From Internal Navigation Device	107	1
North	108	0
Latitude (degrees): 51	109-115	0110011
Latitude (minutes): 20	116-119	0101
East	120	0
Longitude (degrees): 1	121-128	00000001
Longitude (minutes): 24	129-132	0110
Encoded BCH 2:	133-144	010100001100
Calculated BCH 2:	N/A	010100001100
15 Hex ID:	N/A	992A4DEDE0D64D1

**Lat: 51° 20' N**

**Long: 1° 24' E**

<b>Document Type</b>	<b>Issue</b>	01.02	PE TC "Omega" 
	<b>Date Last Amended</b>	15/5/2014	
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## User-Location Maritime Protocol with Radio Call Sign Location B

### Burst-13524.htm

**Hex** FFFE2FCC9526F6F06B268F9F322668011965

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: User	26	1
Country code: 201 - <b>Albania</b>	27-36	0011001001
User type: Maritime User	37-39	010
Radio Call Sign (6 digits): XPA02	40-75	1001001101110110111100001101011001
Specific bcn: 0	76-81	001101
Spare	82-83	00
Aux radio device: 121.5 MHz	84-85	01
Encoded BCH 1:	86-106	111100111110011001000
Calculated BCH 1:	N/A	111100111110011001000
Encoded Position Data Source From Internal Navigation Device	107	1
North	108	0
Latitude (degrees): 51	109-115	0110011
Latitude (minutes): 16	116-119	0100
East	120	0
Longitude (degrees): 1	121-128	00000001
Longitude (minutes): 4	129-132	0001
Encoded BCH 2:	133-144	100101100101
Calculated BCH 2:	N/A	100101100101
15 Hex ID:	N/A	992A4DEDE0D64D1

**Lat: 51° 16' N**

**Long: 1° 4' E**

<b>Document Type</b>	<b>Issue</b>	01.02	PE TC "Omega" 
	<b>Date Last Amended</b>	15/5/2014	
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	<b>Document Title</b>	<b>EPIRB 1 Navigation System, Beacon and Message Coding Test Results</b>	

## User-Location Maritime Protocol with Radio Call Sign Self Test

### Burst-13525.htm

**Hex** FFFED0CC9526F6F06B268F9F322FE0FF0146

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: User	26	1
Country code: 201 - Albania	27-36	0011001001
User type: Maritime User	37-39	010
Radio Call Sign (6 digits): XPA02	40-75	1001001101110110111100001101011001
Specific bcn: 0	76-81	001101
Spare	82-83	00
Aux radio device: 121.5 MHz	84-85	01
Encoded BCH 1:	86-106	11110011110011001000
Calculated BCH 1:	N/A	11110011110011001000
Encoded Position Data Source From Internal Navigation Device	107	1
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	000101000110
Calculated BCH 2:	N/A	000101000110
15 Hex ID:	N/A	992A4DEDE0D64D1

**Lat: Default**

**Long: Default**

<b>Document Type</b>	<b>Issue</b>	01.02	PE TC "Omega" 
	<b>Date Last Amended</b>	15/5/2014	
	<b>Last Amended by</b>	S Nolan	
	<b>Document Title</b>	<b>EPIRB 1 Navigation System, Beacon and Message Coding Test Results</b>	

## User-Location Protocol with Radio Call Sign Location A

### Burst-13526.htm

**Hex** FFFE2FCC9DBDBC1A55468ED9F6266A01650C

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: User	26	1
Country code: 201 - <b>Albania</b>	27-36	0011001001
User type: Radio Call Sign	37-39	110
Radio Call Sign Identification: XPA02	40-75	11011110110111000011010010101010
Specific bcn: 0	76-81	001101
Spare	82-83	00
Aux radio device: 121.5 MHz	84-85	01
Encoded BCH 1:	86-106	11011011001111011000
Calculated BCH 1:	N/A	11011011001111011000
Encoded Position Data Source From Internal Navigation Device	107	1
North	108	0
Latitude (degrees): 51	109-115	0110011
Latitude (minutes): 20	116-119	0101
East	120	0
Longitude (degrees): 1	121-128	00000001
Longitude (minutes): 24	129-132	0110
Encoded BCH 2:	133-144	010100001100
Calculated BCH 2:	N/A	010100001100
15 Hex ID:	N/A	993B7B7834AA8D1

**Lat: 51° 20' N**

**Long: 1° 24' E**

<b>Document Type</b>	<b>Issue</b>	01.02	PE TC "Omega" 
	<b>Date Last Amended</b>	15/5/2014	
	<b>Last Amended by</b>	S Nolan	
	<b>Document Title</b>	<b>EPIRB 1 Navigation System, Beacon and Message Coding Test Results</b>	

## User-Location Protocol with Radio Call Sign Location B

### Burst-13527.htm

**Hex** FFFE2FCC9DBDBC1A55468ED9F62668011965

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: User	26	1
Country code: 201 - Albania	27-36	0011001001
User type: Radio Call Sign	37-39	110
Radio Call Sign Identification: XPA02	40-75	11011110110111000011010010101010
Specific bcn: 0	76-81	001101
Spare	82-83	00
Aux radio device: 121.5 MHz	84-85	01
Encoded BCH 1:	86-106	11011011001111011000
Calculated BCH 1:	N/A	11011011001111011000
Encoded Position Data Source From Internal Navigation Device	107	1
North	108	0
Latitude (degrees): 51	109-115	0110011
Latitude (minutes): 16	116-119	0100
East	120	0
Longitude (degrees): 1	121-128	00000001
Longitude (minutes): 4	129-132	0001
Encoded BCH 2:	133-144	100101100101
Calculated BCH 2:	N/A	100101100101
15 Hex ID:	N/A	993B7B7834AA8D1

**Lat: 51° 16' N**

**Long: 1° 4' E**

<b>Document Type</b>	<b>Issue</b>	<b>01.02</b>
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## User-Location Protocol with Radio Call Sign Self Test

### Burst-1328.htm

**Hex** FFFED0CC9DBDBC1A55468ED9F62FE0FF0146

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: User	26	1
Country code: 201 - Albania	27-36	0011001001
User type: Radio Call Sign	37-39	110
Radio Call Sign Identification: XPA02	40-75	110111101101111000011010010101010
Specific bcn: 0	76-81	001101
Spare	82-83	00
Aux radio device: 121.5 MHz	84-85	01
Encoded BCH 1:	86-106	1101101100111101100
Calculated BCH 1:	N/A	11011011001111011000
Encoded Position Data Source From Internal Navigation Device	107	1
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	000101000110
Calculated BCH 2:	N/A	000101000110
15 Hex ID:	N/A	993B7B7834AA8D1

**Lat: Default**

**Long: Default**

<b>Document Type</b>	<b>Issue</b>	01.02	PE TC "Omega" 
	<b>Date Last Amended</b>	15/5/2014	
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## User Location Test Location A

### Burst-13529.htm

**Hex** FFFE2FCC9E00C05FC0FF010D87666A01650C

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: User	26	1
Country code: 201 - Albania	27-36	0011001001
User type: Test User	37-39	111
National Use, Hex value: 00602FE07F80	40-85	000000000110000001011111100000111111100000
15 Hex ID:	N/A	993C0180BF81FE0
Encoded BCH 1:	86-106	001000011011000011101
Calculated BCH 1:	N/A	001000011011000011101
Encoded Position Data Source From Internal Navigation Device	107	1
North	108	0
Latitude (degrees): 51	109-115	0110011
Latitude (minutes): 20	116-119	0101
East	120	0
Longitude (degrees): 1	121-128	00000001
Longitude (minutes): 24	129-132	0110
Encoded BCH 2:	133-144	010100001100
Calculated BCH 2:	N/A	010100001100
15 Hex ID:	N/A	993C0180BF81FE0

**Lat: 51° 20' N**

**Long: 1° 24' E**

<b>Document Type</b>	<b>Issue</b>	01.02	PE TC "Omega" 
	<b>Date Last Amended</b>	15/5/2014	
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	<b>Document Title</b>		
<b>EPIRB 1 Navigation System, Beacon and Message Coding Test Results</b>			

## User Location Test Location B

### Burst-13530.htm

**Hex** FFFE2FCC9E00C05FC0FF010D876668011965

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: User	26	1
Country code: 201 - Albania	27-36	0011001001
User type: Test User	37-39	111
National Use, Hex value: 00602FE07F80	40-85	000000000110000001011111100000111111100000
15 Hex ID:	N/A	993C0180BF81FE0
Encoded BCH 1:	86-106	001000011011000011101
Calculated BCH 1:	N/A	001000011011000011101
Encoded Position Data Source From Internal Navigation Device	107	1
North	108	0
Latitude (degrees): 51	109-115	0110011
Latitude (minutes): 16	116-119	0100
East	120	0
Longitude (degrees): 1	121-128	00000001
Longitude (minutes): 4	129-132	0001
Encoded BCH 2:	133-144	100101100101
Calculated BCH 2:	N/A	100101100101
15 Hex ID:	N/A	993C0180BF81FE0

**Lat: 51° 16' N**

**Long: 1° 4' E**

<b>Document Type</b>	<b>Issue</b>	<b>01.02</b>	PE TC "Omega" 
	<b>Date Last Amended</b>	<b>15/5/2014</b>	
	<b>Last Amended by</b>	<b>S Nolan</b>	
	<b>EPIRB 1 Navigation System, Beacon and Message Coding Test Results</b>		

## User Location Test Self Test

### Burst-13531.htm

**Hex** FFFEDOCC9E00C05FC0FF010D877783EOF66C

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: User	26	1
Country code: 201 - Albania	27-36	0011001001
User type: Test User	37-39	111
National Use, Hex value: 00602FE07F80	40-85	000000000110000001011111100000111111100000
15 Hex ID:	N/A	993C0180BF81FE0
Encoded BCH 1:	86-106	001000011011000011101
Calculated BCH 1:	N/A	001000011011000011101
Encoded Position Data Source From Internal Navigation Device	107	1
South	108	1
Latitude (degrees): 60	109-115	0111100
Latitude (minutes): 4	116-119	0001
West	120	1
Longitude (degrees): 224	121-128	11100000
Longitude (minutes): 60	129-132	1111
Encoded BCH 2:	133-144	011001101100
Calculated BCH 2:	N/A	011001101100
15 Hex ID:	N/A	993C0180BF81FE0

**Lat: Default**

**Long: Default**

## 5.9 Navigation System Test

Date of test	02.03.2014 - 06.03.2014
Specification	C/S T.007 – section A.3.8
Beacon Model	EPIRB1
Serial number	002
EUT Mod State	0
EUT system configuration during the test, including antenna, external ancillary devices and modes of their operation	The EUT was operated using its own power source (internal battery). The EUT was configured so that the antenna ports were connected to the 50 Ohms test system using coaxial cables.
Navigation device details (model, interface)	Quectel L70
Measurement Equipment, provided by beacon manufacturer, if any	
Performed by	Vasilev D.V.
Verified by	Yurasov E.S.
Environmental conditions	Ambient laboratory temperature: 10.0 -20.6°C Relative air humidity: 55 -75 %
Deviations from standard test procedures	There were no deviations from standard test procedures
Non-compliances noticed	There were not non-compliances

**5.9.1 Position Data Default Values (A.3.8.1)****Test Date:** 03.03.2014**Test conditions:**

- Ambient laboratory temperature: 17.6 °C
- Relative air humidity: 55 %

**The time stamp of tests.**

Event	Time, UTC	Message	Comment
<b>National Location Protocol, point No 1, 03.03.2014</b>			
Start of test	09:00:00 03.03.2014		BUT is in a shielded room, GNSS signal was not available
Activation EUT	13:19:06 03.03.2014		
Received first message	13:20:00 03.03.2014	FFFE2F 8C9F00C05FC0FF06728BF 79F3C0010	All operation messages have default coordinates
Deactivation	13:50:42 03.03.2014		

Date	<u>03.03.2014</u>	Conditions	<u>Normal temperature</u>
Beacon Model	EPIRB 1	Beacon N	002
Test duration	0 h 30 m	Bursts received	38
<b>Message</b>			
<b>Contents (full)</b>	: FFFE2F 8C9F00C05FC0FF06728BF 79F3C0010		

## Decoding Beacon Message

**Full message:** FFFE2F 8C9F00C05FC0FF06728BF 79F3C0010

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - <b>Albania</b>	27-36	0011001001
Type of location protocol: National Location - Test	37-40	1111
Serial Number: 769	41-58	000000001100000001
Latitude Flag: default	59	0
Latitude (Degrees): default	60-66	1111111
Latitude (Minutes): default	67-71	00000
Longitude Flag: default	72	0
Longitude (Degrees): default	73-80	11111111
Longitude (Minutes): default	81-85	00000
BCH 1 Encoded:	86-106	110011100101000101111
BCH 1 Calculated:	86-106	110011100101000101111
Fixed bits (110): Pass	107-109	110
Bits 113 - 132 provides offset data location	110	1
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
Aux Loc. Device: 121.5 MHz homer	112	1
Latitude Offset Sign: default	113	1
Latitude Offset Minutes: default	114-115	00
Latitude Offset Seconds: default	116-119	1111
Longitude Offset Sign: default	120	1
Longitude Offset Minutes: default	121-122	00
Longitude Offset Seconds: default	123-126	1111
Additional Id (Nat Use)	127-132	000000
BCH 2 Encoded:	133-144	000000010000
BCH 2 Calculated:	N/A	000000010000
Composite Latitude: default	N/A	Composite Longitude: default
15 Hex ID:	N/A	193E0180BF81FE0

**Test Date:** 02.03.2014-03.03.2014

**Test conditions:**

- Ambient laboratory temperature: 18.2 °C
- Relative air humidity: 52 %

**The time stamp of tests.**

Event	Time, UTC	Message	Comment
<b>Standard Location Protocol, point No 1, 02.03.2014-03.03.2014</b>			
Start of test	19:00:00 02.03.2014		BUT is in a shielded room, GNSS signal was not available
Activation EUT	07:54:10 03.03.2014		
Received first message	07:55:04 03.03.2014	FFFE2F 8C9EF9C0637FDFF83D15B 783E0F66C	All operation messages have default coordinates
Deactivation	08:25:41 03.03.2014		

Date	<u>03.03.2014</u>	Conditions	<u>Normal temperature</u>
Beacon Model	EPIRB 1	Beacon N	002
Test duration	0 h 30 m	Bursts received	38
		BCH error	0
<b>Message</b>			
<b>Contents (full)</b>	: FFFE2F 8C9EF9C0637FDFF83D15B 783E0F66C		

## Decoding Beacon Message

**Full message:** FFFE2F 8C9EF9C0637FDFF83D15B 783E0F66C

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - <b>Albania</b>	27-36	0011001001
Type of location protocol: Standard Location - Test	37-40	1110
Test Protocol: Test Protocol (No Decode information in bits 41 to 64)	41-64	111110011100000001100011
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	00000111010001010110
BCH 1 Calculated:	N/A	00000111010001010110
Fixed bits (1101): Pass	107-110	1101
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
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	011001101100
BCH 2 Calculated:	N/A	011001101100
Composite Latitude: default	N/A	Composite Longitude: default
15 Hex ID:	N/A	193DF380C6FFBFF

**Test Date:** 03.03.2014-04.03.2014

**Test conditions:**

- Ambient laboratory temperature: 17.6 °C
- Relative air humidity: 51 %

**The time stamp of tests.**

Event	Time, UTC	Message	Comment
<b>User Location Protocol, point No 1, 03.03.2014-04.03.2014</b>			
Start of test	19:00:00 03.03.2014		BUT is in a shielded room, GNSS signal was not available
Activation EUT	07:28:15 04.03.2014		
Received first message	07:29:09 04.03.2014	FFFE2F CC9E0A000C607CEDF5BA2 FE0FF0146	All operation messages have default coordinates
Deactivation	08:00:20 04.03.2014		

Date	04.03.2014	Conditions	Normal temperature
Beacon Model	EPIRB 1	Beacon N	002
Test duration	0 h 30 m	Bursts received	38
BCH error	0	Self-Test	0
<b>Message</b>			
Contents (full)	: FFFE2F CC9E0A000C607CEDF5BA2 FE0FF0146		

## Decoding Beacon Message

**Full message:** FFFE2F CC9E0A000C607CEDF5BA2 FE0FF0146

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: User	26	1
Country code: 201 - <b>Albania</b>	27-36	0011001001
User type: Test User	37-39	111
National Use, Hex value: 0140018C0F9D	40-85	0000010100000000000000001100011000000111110011101
15 Hex ID:	N/A	993C140018C0F9D
Encoded BCH 1:	86-106	101111101011011101000
Calculated BCH 1:	N/A	101111101011011101000
Encoded Position Data Source From Internal Navigation Device	107	1
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	000101000110
Calculated BCH 2:	N/A	000101000110
15 Hex ID:	N/A	993C140018C0F9D

### 5.9.2 Position Acquisition Time and Position Accuracy (A.3.8.2)

**Test Date:** 04.03.2014, 06.03.2014

Beacon is fitted with the internal GPS receiver.

Check beacon to compliance of requirements of A.3.8.2 C/S T.007 was carried out in the points, having known locations:

- point 1 - N 44°35'15.390", E 33°29'19.666"
- point 2 - N 44°31'10.440", E 33°32'58.740"

**Test conditions:**

- Ambient temperature at open area test site: 10...12 °C.
- Relative air humidity: 73...75 %.
- Homing transmitter 121.5 MHz operated during the test.
- Tests were conducted with the beacon in the next configurations accordance section 4.5 T.007:
  1. Configuration 5 – Water ground plane.
    - The beacon was completely submerged in salt water [composition 5% salt solution by weight].
    - The beacon was maintained at or near the centre of the container for the duration of the test.
    - The container holding the salt water was placed on a flat surface in an area with a good all round view of the sky.
    - The container is made from a non-conductive material (PVC plastic) and there is 30 cm of salt water under the base of the beacon when it is floating in the container and 10 cm of salt water between the beacon and the sides of the container.
  2. Configuration 7 – Beacon on ground plane.
    - The beacon was placed in the centre of a thin 27 cm diameter c aluminum disc which was placed directly on level ground (dirt) in an area with a good all round view of the sky, in the vertical orientation.
  3. Configuration 8 – Beacon above ground plane.
    - The beacon was placed on an electrically insulating support so that its base is 0.45 m above level ground (dirt) in an area with a good all round view of the sky, in the vertical orientation.

**The test time stamp.**

Event	Time	Message	Comment
<b>National Location - Test, point No 1, 06.03.2014</b>			
Activation	12:17:04		configuration 5
Get message with location date	12:17:58	FFFE2F8C9F00C04B24217D7F29B716280201	Page No. 142
Deactivation	12:18:07		
Activation	12:22:05		configuration 7
Get message with location date	12:22:59	FFFE2F8C9F00C04B24217D7F29B716280201	Page No. 143
Deactivation	12:23:08		
Activation	12:19:05		configuration 8
Get message with location date	12:19:59	FFFE2F8C9F00C04B24217D7F29B716280201	Page No. 144
Deactivation	12:20:08		
Change location			
<b>National Location - Test, point No 2, 04.03.2013</b>			
Activation	15:40:04		configuration 5
Get message with location date	15:40:58	FFFE2F8C9F00C04B202180175D3719400A4B	Page No. 145
Deactivation	15:41:07		
Activation	15:38:03		configuration 7
Get message with location date	15:38:57	FFFE2F8C9F00C04B202180175D3719400A4B	Page No. 146
Deactivation	15:39:05		
Activation	15:36:03		configuration 8
Get message with location date	15:36:57	FFFE2F8C9F00C04B202180175D3719400A4B	Page No. 147
Deactivation	15:37:04		

**Performance measurements on accordance requirements item A.3.8.2 T.007 –  
Position Acquisition Time and Position Accuracy**

No	Test Name	C/S T.007 Standard Section	Test procedure description	Obtained results	Comments
1.	Beacon is coded at National Location - Test				
2.	Position Acquisition Time and Position Accuracy at point No 1	A.3.8.2.1	a. EPIRB is placed in the container with salt water (configuration 5). b. Activate the beacon at the location with coordinate: -N 44°35'15.390" -E 33°29'19.666" c. Deactivate the beacon.	Time to Acquire Position: 0 min 54 sec  Encoded location data: - N 44°35'16" - E 33°29'20"  Position accuracy 0.0202 kilometers	Page No 142
3.	Position Acquisition Time and Position Accuracy at point No 1	A.3.8.2.1	a. EPIRB is placed on the aluminum disk (configuration 7). b. Activate the beacon at the location with coordinate: -N 44°35'15.390" -E 33°29'19.666" c. Deactivate the beacon.	Time to Acquire Position: 0 min 54 sec  Encoded location data: - N 44°35'16" - E 33°29'20"  Position accuracy 0.0202 kilometers	Page No 143
4.	Position Acquisition Time and Position Accuracy at point No 1	A.3.8.2.1	a. EPIRB is placed on above ground plane (configuration 8). b. Activate the beacon at the location with coordinate: -N 44°35'15.390" -E 33°29'19.666" c. Deactivate the beacon.	Time to Acquire Position: 0 min 54 sec  Encoded location data: - N 44°35'16" - E 33°29'20"  Position accuracy 0.0202 kilometers	Page No 144
5.	Position Acquisition Time and Position Accuracy at point No 2	A.3.8.2.2	a. Change location to Point 2. The distance between Point 1 and Point 2 is 8.97 km. b. EPIRB is placed in the container with salt water (configuration 5). c. Activate the beacon at the location with coordinate: - N 44°31'10.440" - E 33°32'58.740"	Time to Acquire Position: 0 min 54 sec  Encoded location data: - N 44°31'12" - E 33°33'00"  Position accuracy 0.0556 kilometers	Page No 145

No	Test Name	C/S T.007 Standard Section	Test procedure description	Obtained results	Comments
			d. Deactivate the beacon.		
6.	Position Acquisition Time and Position Accuracy at point No 2	A.3.8.2.2	a. EPIRB is placed on the aluminum disk (configuration 7). b. Activate the beacon at the location with coordinate: - N 44°31'10.440" - E 33°32'58.740" c. Deactivate the beacon.	Time to Acquire Position: 0 min 54 sec  Encoded location data: - N 44°31'12" - E 33°33'00"  Position accuracy 0.0556 kilometers	Page No 146
7.	Position Acquisition Time and Position Accuracy at point No 2	A.3.8.2.2	a. EPIRB is placed on above ground plane (configuration 8). b. Activate the beacon at the location with coordinate: - N 44°31'10.440" - E 33°32'58.740" c. Deactivate the beacon.	Time to Acquire Position: 0 min 54 sec  Encoded location data: - N 44°31'12" - E 33°33'00"  Position accuracy 0.0556 kilometers	Page No 147

**Position Acquisition Time and Position Accuracy (Internal Navigation Devices)**  
**(Table F-C.4 T.007)**

Protocol	Operational Configuration	C/S T.007 Section A.3.8.2.1		C/S T.007 Section A.3.8.2.2	
		Time to Acquire Position (sec)	Location Error in meters	Time to Acquire Position (sec)	Location Error in meters
National Location - Test	Floating in Water - configuration 5	54	20.2	54	55.6
		Page No142		Page No 145	
National Location - Test	Resting on aluminum disk - configuration 7	54	20.2	54	55.6
		Page No 143		Page No 146	
National Location - Test	Placed above ground plane - configuration 8	54	20.2	54	55.6
		Page No 144		Page No 147	

## Decoding Beacon Message

Test site: Configuration 5 – Water ground plane.

Location: Point “1” – N 44°35'15.390", E 33°29'19.666"

**Full message: FFFE2F8C9F00C04B24217D7F29B716280201**

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - <b>Albania</b>	27-36	0011001001
Type of location protocol: National Location - Test	37-40	1111
Serial Number: 769	41-58	000000001100000001
Latitude Flag: North	59	0
Latitude (Degrees): 44	60-66	0101100
Latitude (Minutes): 36	67-71	10010
Longitude Flag: East	72	0
Longitude (Degrees): 33	73-80	00100001
Longitude (Minutes): 30	81-85	01111
BCH 1 Encoded:	86-106	10101111110010100110
BCH 1 Calculated:	86-106	10101111110010100110
Fixed bits (110): Pass	107-109	110
Bits 113 - 132 provides offset data location	110	1
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
Aux Loc. Device: 121.5 MHz homer	112	1
Latitude Offset Sign: -	113	0
Latitude Offset Minutes: 0	114-115	00
Latitude Offset Seconds: 44	116-119	1011
Longitude Offset Sign: -	120	0
Longitude Offset Minutes: 0	121-122	00
Longitude Offset Seconds: 40	123-126	1010
Additional Id (Nat Use)	127-132	000000
BCH 2 Encoded:	133-144	001000000001
BCH 2 Calculated:	N/A	001000000001
Composite Latitude: 44.58777777777778 Degrees North	N/A	Composite Longitude: 33.48888888888889 Degrees East
15 Hex ID:	N/A	193E0180BF81FE0

## Decoding Beacon Message

Test site: Configuration 7 – Resting on aluminum disk

Location: Point “1” – N 44°35'15.390", E 33°29'19.666"

**Full message: FFFE2F8C9F00C04B24217D7F29B716280201**

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - <b>Albania</b>	27-36	0011001001
Type of location protocol: National Location - Test	37-40	1111
Serial Number: 769	41-58	000000001100000001
Latitude Flag: North	59	0
Latitude (Degrees): 44	60-66	0101100
Latitude (Minutes): 36	67-71	10010
Longitude Flag: East	72	0
Longitude (Degrees): 33	73-80	00100001
Longitude (Minutes): 30	81-85	01111
BCH 1 Encoded:	86-106	10101111110010100110
BCH 1 Calculated:	86-106	10101111110010100110
Fixed bits (110): Pass	107-109	110
Bits 113 - 132 provides offset data location	110	1
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
Aux Loc. Device: 121.5 MHz homer	112	1
Latitude Offset Sign: -	113	0
Latitude Offset Minutes: 0	114-115	00
Latitude Offset Seconds: 44	116-119	1011
Longitude Offset Sign: -	120	0
Longitude Offset Minutes: 0	121-122	00
Longitude Offset Seconds: 40	123-126	1010
Additional Id (Nat Use)	127-132	000000
BCH 2 Encoded:	133-144	001000000001
BCH 2 Calculated:	N/A	001000000001
Composite Latitude: 44.58777777777778 Degrees North	N/A	Composite Longitude: 33.48888888888889 Degrees East
15 Hex ID:	N/A	193E0180BF81FE0

## Decoding Beacon Message

Test site: Configuration 8 – Placed above ground plane

Location: Point “1” – N 44°35'15.390", E 33°29'19.666"

**Full message: FFFE2F8C9F00C04B24217D7F29B716280201**

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - <b>Albania</b>	27-36	0011001001
Type of location protocol: National Location - Test	37-40	1111
Serial Number: 769	41-58	000000001100000001
Latitude Flag: North	59	0
Latitude (Degrees): 44	60-66	0101100
Latitude (Minutes): 36	67-71	10010
Longitude Flag: East	72	0
Longitude (Degrees): 33	73-80	00100001
Longitude (Minutes): 30	81-85	01111
BCH 1 Encoded:	86-106	10101111110010100110
BCH 1 Calculated:	86-106	10101111110010100110
Fixed bits (110): Pass	107-109	110
Bits 113 - 132 provides offset data location	110	1
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
Aux Loc. Device: 121.5 MHz homer	112	1
Latitude Offset Sign: -	113	0
Latitude Offset Minutes: 0	114-115	00
Latitude Offset Seconds: 44	116-119	1011
Longitude Offset Sign: -	120	0
Longitude Offset Minutes: 0	121-122	00
Longitude Offset Seconds: 40	123-126	1010
Additional Id (Nat Use)	127-132	000000
BCH 2 Encoded:	133-144	001000000001
BCH 2 Calculated:	N/A	001000000001
Composite Latitude: 44.58777777777778 Degrees North	N/A	Composite Longitude: 33.48888888888889 Degrees East
15 Hex ID:	N/A	193E0180BF81FE0

## Decoding Beacon Message

Test site: Configuration 5 – Water ground plane.

Location: Point “2” – N 44°31'10.440", E 33°32'58.740"

**Full message: FFFE2F 8C9F00C04B202180175D3719400A4B**

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - <b>Albania</b>	27-36	0011001001
Type of location protocol: National Location - Test	37-40	1111
Serial Number: 769	41-58	000000001100000001
Latitude Flag: North	59	0
Latitude (Degrees): 44	60-66	0101100
Latitude (Minutes): 32	67-71	10000
Longitude Flag: East	72	0
Longitude (Degrees): 33	73-80	00100001
Longitude (Minutes): 32	81-85	10000
BCH 1 Encoded:	86-106	000000101110101110100
BCH 1 Calculated:	86-106	000000101110101110100
Fixed bits (110): Pass	107-109	110
Bits 113 - 132 provides offset data location	110	1
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
Aux Loc. Device: 121.5 MHz homer	112	1
Latitude Offset Sign: -	113	0
Latitude Offset Minutes: 0	114-115	00
Latitude Offset Seconds: 48	116-119	1100
Longitude Offset Sign: +	120	1
Longitude Offset Minutes: 1	121-122	01
Longitude Offset Seconds: 0	123-126	0000
Additional Id (Nat Use)	127-132	000000
BCH 2 Encoded:	133-144	101001001011
BCH 2 Calculated:	N/A	101001001011
Composite Latitude: 44.519999999999996 Degrees North	N/A	Composite Longitude: 33.55 Degrees East
15 Hex ID:	N/A	193E0180BF81FE0

## Decoding Beacon Message

Test site: Configuration 7 – Resting on aluminum disk

Location: Point “2” – N 44°31'10.440", E 33°32'58.740"

**Full message: FFFE2F 8C9F00C04B202180175D3719400A4B**

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - <b>Albania</b>	27-36	0011001001
Type of location protocol: National Location - Test	37-40	1111
Serial Number: 769	41-58	000000001100000001
Latitude Flag: North	59	0
Latitude (Degrees): 44	60-66	0101100
Latitude (Minutes): 32	67-71	10000
Longitude Flag: East	72	0
Longitude (Degrees): 33	73-80	00100001
Longitude (Minutes): 32	81-85	10000
BCH 1 Encoded:	86-106	000000101110101110100
BCH 1 Calculated:	86-106	000000101110101110100
Fixed bits (110): Pass	107-109	110
Bits 113 - 132 provides offset data location	110	1
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
Aux Loc. Device: 121.5 MHz homer	112	1
Latitude Offset Sign: -	113	0
Latitude Offset Minutes: 0	114-115	00
Latitude Offset Seconds: 48	116-119	1100
Longitude Offset Sign: +	120	1
Longitude Offset Minutes: 1	121-122	01
Longitude Offset Seconds: 0	123-126	0000
Additional Id (Nat Use)	127-132	000000
BCH 2 Encoded:	133-144	101001001011
BCH 2 Calculated:	N/A	101001001011
Composite Latitude: 44.519999999999996 Degrees North	N/A	Composite Longitude: 33.55 Degrees East
15 Hex ID:	N/A	193E0180BF81FE0

## Decoding Beacon Message

Test site: Configuration 8 – Placed above ground plane

Location: Point “2” – N 44°31'10.440", E 33°32'58.740"

**Full message: FFFE2F 8C9F00C04B202180175D3719400A4B**

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - <b>Albania</b>	27-36	0011001001
Type of location protocol: National Location - Test	37-40	1111
Serial Number: 769	41-58	000000001100000001
Latitude Flag: North	59	0
Latitude (Degrees): 44	60-66	0101100
Latitude (Minutes): 32	67-71	10000
Longitude Flag: East	72	0
Longitude (Degrees): 33	73-80	00100001
Longitude (Minutes): 32	81-85	10000
BCH 1 Encoded:	86-106	000000101110101110100
BCH 1 Calculated:	86-106	000000101110101110100
Fixed bits (110): Pass	107-109	110
Bits 113 - 132 provides offset data location	110	1
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
Aux Loc. Device: 121.5 MHz homer	112	1
Latitude Offset Sign: -	113	0
Latitude Offset Minutes: 0	114-115	00
Latitude Offset Seconds: 48	116-119	1100
Longitude Offset Sign: +	120	1
Longitude Offset Minutes: 1	121-122	01
Longitude Offset Seconds: 0	123-126	0000
Additional Id (Nat Use)	127-132	000000
BCH 2 Encoded:	133-144	101001001011
BCH 2 Calculated:	N/A	101001001011
Composite Latitude: 44.519999999999996 Degrees North	N/A	Composite Longitude: 33.55 Degrees East
15 Hex ID:	N/A	193E0180BF81FE0

**The test time stamp.**

Event	Time	Message	Comment
<b>Standard Location - Test, point No 1, 06.03.2014</b>			
Activation	11:38:04		configuration 5
Get message with location date	11:38:58	FFFE2F8C9EF9C0632C8432D96F379500A39A	Page No. 152
Deactivation	11:39:07		
Activation	11:43:06		configuration 7
Get message with location date	11:44:00	FFFE2F8C9EF9C0632C8432D96F379500A39A	Page No. 153
Deactivation	11:44:09		
Activation	11:41:05		configuration 8
Get message with location date	11:41:59	FFFE2F8C9EF9C0632C8432D96F379500A39A	Page No. 154
Deactivation	11:42:08		
<b>Standard Location - Test , point No 2, 04.03.2014</b>			
Activation	15:29:03		configuration 5
Get message with location date	15:29:57	FFFE2F8C9EF9C0632C8432D96F3784E30E3E	Page No. 155
Deactivation	15:30:04		
Activation	15:27:03		configuration 7
Get message with location date	15:27:57	FFFE2F8C9EF9C0632C8432D96F3784E30E3E	Page No. 156
Deactivation	15:28:04		
Activation	15:25:02		configuration 8
Get message with location date	15:25:56	FFFE2F8C9EF9C0632C8432D96F3784E30E3E	Page No. 157
Deactivation	15:26:03		

**Performance measurements on accordance requirements item A.3.8.2 T.007 –  
Position Acquisition Time and Position Accuracy**

No	Test Name	C/S T.007 Standard Section	Test procedure description	Obtained results	Comments
8.	Beacon is coded at Standard Location - Test				
9.	Position Acquisition Time and Position Accuracy at point No 1	A.3.8.2.1	a. EPIRB is placed in the container with salt water (configuration 5). b. Activate the beacon at the location with coordinate: - N 44°35'15.390" - E 33°29'19.666" c. Deactivate the beacon.	Time to Acquire Position: 0 min 54 sec  Encoded location data: - N 44°35'16" - E 33°29'20"  Position accuracy 0.0202 kilometers	Page No 152
10.	Position Acquisition Time and Position Accuracy at point No 1	A.3.8.2.1	a. EPIRB is placed on the aluminum disk (configuration 7). b. Activate the beacon at the location with coordinate: - N 44°35'15.390" - E 33°29'19.666" c. Deactivate the beacon.	Time to Acquire Position: 0 min 54 sec  Encoded location data: - N 44°35'16" - E 33°29'20"  Position accuracy 0.0202 kilometers	Page No 153
11.	Position Acquisition Time and Position Accuracy at point No 1	A.3.8.2.1	a. EPIRB is placed on above ground plane (configuration 8). b. Activate the beacon at the location with coordinate: - N 44°35'15.390" - E 33°29'19.666" c. Deactivate the beacon.	Time to Acquire Position: 0 min 54 sec  Encoded location data: - N 44°35'16" - E 33°29'20"  Position accuracy 0.0202 kilometers	Page No 154
12.	Position Acquisition Time and Position Accuracy at point No 2	A.3.8.2.2	a. Change location to Point 2. The distance between Point 1 and Point 2 is 8.966 km. b. EPIRB is placed in the container with salt water (configuration 5). c. Activate the beacon at the location with coordinate: - N 44°31'10.440" - E 33°32'58.740"	Time to Acquire Position: 0 min 54 sec  Encoded location data: - N 44°31'12" - E 33°33'00"  Position accuracy 0.0556 kilometers	Page No 155

No	Test Name	C/S T.007 Standard Section	Test procedure description	Obtained results	Comments
			d. Deactivate the beacon.		
13	Position Acquisition Time and Position Accuracy at point No 2	A.3.8.2.2	a. EPIRB is placed on the aluminum disk (configuration 7). b. Activate the beacon at the location with coordinate: - N 44°31'10.440" - E 33°32'58.740" c. Deactivate the beacon.	Time to Acquire Position: 0 min 54 sec  Encoded location data: - N 44°31'12" - E 33°33'00"  Position accuracy 0.0556 kilometers	Page No 156
14	Position Acquisition Time and Position Accuracy at point No 2	A.3.8.2.2	a. EPIRB is placed on above ground plane (configuration 8). b. Activate the beacon at the location with coordinate: - N 44°31'10.440" - E 33°32'58.740" c. Deactivate the beacon.	Time to Acquire Position: 0 min 54 sec  Encoded location data: - N 44°31'12" - E 33°33'00"  Position accuracy 0.0556 kilometers	Page No 157

**Position Acquisition Time and Position Accuracy (Internal Navigation Devices)**  
**(Table F-C.4 T.007)**

Protocol	Operational Configuration	C/S T.007 Section A.3.8.2.1		C/S T.007 Section A.3.8.2.2	
		Time to Acquire Position (sec)	Location Error in meters	Time to Acquire Position (sec)	Location Error in meters
Standard Location - Test	Floating in Water - configuration 5	54	20.2	54	55.6
		Page No152		Page No 155	
Standard Location - Test	Resting on aluminum disk - configuration 7	54	20.2	54	55.6
		Page No 153		Page No 156	
Standard Location - Test	Placed above ground plane - configuration 8	54	20.2	54	55.6
		Page No 154		Page No 157	

## Decoding Beacon Message

Test site: Configuration 5 – Water ground plane.

Location: Point “1” – N 44°35'15.390", E 33°29'19.666"

**Full message: FFFE2F8C9EF9C0632C8432D96F379500A39A**

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - <b>Albania</b>	27-36	0011001001
Type of location protocol: Standard Location - Test	37-40	1110
Test Protocol: Test Protocol (No Decode information in bits 41 to 64)	41-64	111110011100000001100011
Latitude Sign: North	65	0
Latitude Degrees: 44	66-72	0101100
Latitude Minutes: 30	73-74	10
Longitude Sign: East	75	0
Longitude Degrees: 33	76-83	00100001
Longitude Minutes: 30	84-85	10
BCH 1 Encoded:	86-106	010110110010110111100
BCH 1 Calculated:	N/A	010110110010110111100
Fixed bits (1101): Pass	107-110	1101
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
Aux Device: 121.5 MHz homer	112	1
Latitude Offset Sign: +	113	1
Latitude Offset Minutes: 5	114-118	00101
Latitude Offset Seconds: 16	119-122	0100
Longitude Offset Sign: -	123	0
Longitude Offset Minutes: 0	124-128	00000
Longitude Offset Seconds: 40	129-132	1010
BCH 2 Encoded:	133-144	001110011010
BCH 2 Calculated:	N/A	001110011010
Composite Latitude: 44.58777777777778 Degrees North	N/A	Composite Longitude: 33.48888888888889 Degrees East
15 Hex ID:	N/A	193DF380C6FFBFF

## Decoding Beacon Message

Test site: Configuration 7 – Resting on aluminum disk

Location: Point “1” – N 44°35'15.390", E 33°29'19.666"

**Full message: FFFE2F8C9EF9C0632C8432D96F379500A39A**

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - <b>Albania</b>	27-36	0011001001
Type of location protocol: Standard Location - Test	37-40	1110
Test Protocol: Test Protocol (No Decode information in bits 41 to 64)	41-64	111110011100000001100011
Latitude Sign: North	65	0
Latitude Degrees: 44	66-72	0101100
Latitude Minutes: 30	73-74	10
Longitude Sign: East	75	0
Longitude Degrees: 33	76-83	00100001
Longitude Minutes: 30	84-85	10
BCH 1 Encoded:	86-106	010110110010110111100
BCH 1 Calculated:	N/A	010110110010110111100
Fixed bits (1101): Pass	107-110	1101
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
Aux Device: 121.5 MHz homer	112	1
Latitude Offset Sign: +	113	1
Latitude Offset Minutes: 5	114-118	00101
Latitude Offset Seconds: 16	119-122	0100
Longitude Offset Sign: -	123	0
Longitude Offset Minutes: 0	124-128	00000
Longitude Offset Seconds: 40	129-132	1010
BCH 2 Encoded:	133-144	001110011010
BCH 2 Calculated:	N/A	001110011010
Composite Latitude: 44.58777777777778 Degrees North	N/A	Composite Longitude: 33.48888888888889 Degrees East
15 Hex ID:	N/A	193DF380C6FFBFF

## Decoding Beacon Message

Test site: Configuration 8 – Placed above ground plane

Location: Point “1” – N 44°35'15.390", E 33°29'19.666"

**Full message: FFFE2F8C9EF9C0632C8432D96F379500A39A**

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - <b>Albania</b>	27-36	0011001001
Type of location protocol: Standard Location - Test	37-40	1110
Test Protocol: Test Protocol (No Decode information in bits 41 to 64)	41-64	111110011100000001100011
Latitude Sign: North	65	0
Latitude Degrees: 44	66-72	0101100
Latitude Minutes: 30	73-74	10
Longitude Sign: East	75	0
Longitude Degrees: 33	76-83	00100001
Longitude Minutes: 30	84-85	10
BCH 1 Encoded:	86-106	010110110010110111100
BCH 1 Calculated:	N/A	010110110010110111100
Fixed bits (1101): Pass	107-110	1101
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
Aux Device: 121.5 MHz homer	112	1
Latitude Offset Sign: +	113	1
Latitude Offset Minutes: 5	114-118	00101
Latitude Offset Seconds: 16	119-122	0100
Longitude Offset Sign: -	123	0
Longitude Offset Minutes: 0	124-128	00000
Longitude Offset Seconds: 40	129-132	1010
BCH 2 Encoded:	133-144	001110011010
BCH 2 Calculated:	N/A	001110011010
Composite Latitude: 44.58777777777778 Degrees North	N/A	Composite Longitude: 33.48888888888889 Degrees East
15 Hex ID:	N/A	193DF380C6FFBFF

## Decoding Beacon Message

Test site: Configuration 5 – Water ground plane.

Location: Point “2” – N 44°31'10.440", E 33°32'58.740"

**Full message: FFFE2F8C9EF9C0632C8432D96F3784E30E3E**

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - <b>Albania</b>	27-36	0011001001
Type of location protocol: Standard Location - Test	37-40	1110
Test Protocol: Test Protocol (No Decode information in bits 41 to 64)	41-64	111110011100000001100011
Latitude Sign: North	65	0
Latitude Degrees: 44	66-72	0101100
Latitude Minutes: 30	73-74	10
Longitude Sign: East	75	0
Longitude Degrees: 33	76-83	00100001
Longitude Minutes: 30	84-85	10
BCH 1 Encoded:	86-106	010110110010110111100
BCH 1 Calculated:	N/A	010110110010110111100
Fixed bits (1101): Pass	107-110	1101
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
Aux Device: 121.5 MHz homer	112	1
Latitude Offset Sign: +	113	1
Latitude Offset Minutes: 1	114-118	00001
Latitude Offset Seconds: 12	119-122	0011
Longitude Offset Sign: +	123	1
Longitude Offset Minutes: 3	124-128	00011
Longitude Offset Seconds: 0	129-132	0000
BCH 2 Encoded:	133-144	111000111110
BCH 2 Calculated:	N/A	111000111110
Composite Latitude: 44.51999999999996 Degrees North	N/A	Composite Longitude: 33.55 Degrees East
15 Hex ID:	N/A	193DF380C6FFBFF

## Decoding Beacon Message

Test site: Configuration 7 – Resting on aluminum disk

Location: Point “2” – N 44°31'10.440", E 33°32'58.740"

**Full message: FFFE2F8C9EF9C0632C8432D96F3784E30E3E**

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - <b>Albania</b>	27-36	0011001001
Type of location protocol: Standard Location - Test	37-40	1110
Test Protocol: Test Protocol (No Decode information in bits 41 to 64)	41-64	111110011100000001100011
Latitude Sign: North	65	0
Latitude Degrees: 44	66-72	0101100
Latitude Minutes: 30	73-74	10
Longitude Sign: East	75	0
Longitude Degrees: 33	76-83	00100001
Longitude Minutes: 30	84-85	10
BCH 1 Encoded:	86-106	010110110010110111100
BCH 1 Calculated:	N/A	010110110010110111100
Fixed bits (1101): Pass	107-110	1101
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
Aux Device: 121.5 MHz homer	112	1
Latitude Offset Sign: +	113	1
Latitude Offset Minutes: 1	114-118	00001
Latitude Offset Seconds: 12	119-122	0011
Longitude Offset Sign: +	123	1
Longitude Offset Minutes: 3	124-128	00011
Longitude Offset Seconds: 0	129-132	0000
BCH 2 Encoded:	133-144	111000111110
BCH 2 Calculated:	N/A	111000111110
Composite Latitude: 44.51999999999996 Degrees North	N/A	Composite Longitude: 33.55 Degrees East
15 Hex ID:	N/A	193DF380C6FFBFF

## Decoding Beacon Message

Test site: Configuration 8 – Placed above ground plane  
 Location: Point “2” – N 44°31'10.440", E 33°32'58.740"

**Full message: FFFE2F8C9EF9C0632C8432D96F3784E30E3E**

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - <b>Albania</b>	27-36	0011001001
Type of location protocol: Standard Location - Test	37-40	1110
Test Protocol: Test Protocol (No Decode information in bits 41 to 64)	41-64	111110011100000001100011
Latitude Sign: North	65	0
Latitude Degrees: 44	66-72	0101100
Latitude Minutes: 30	73-74	10
Longitude Sign: East	75	0
Longitude Degrees: 33	76-83	00100001
Longitude Minutes: 30	84-85	10
BCH 1 Encoded:	86-106	010110110010110111100
BCH 1 Calculated:	N/A	010110110010110111100
Fixed bits (1101): Pass	107-110	1101
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
Aux Device: 121.5 MHz homer	112	1
Latitude Offset Sign: +	113	1
Latitude Offset Minutes: 1	114-118	00001
Latitude Offset Seconds: 12	119-122	0011
Longitude Offset Sign: +	123	1
Longitude Offset Minutes: 3	124-128	00011
Longitude Offset Seconds: 0	129-132	0000
BCH 2 Encoded:	133-144	111000111110
BCH 2 Calculated:	N/A	111000111110
Composite Latitude: 44.519999999999996 Degrees North	N/A	Composite Longitude: 33.55 Degrees East
15 Hex ID:	N/A	193DF380C6FFBFF

**The test time stamp.**

Event	Time	Message	Comment
<b>Test User, point No 1, 06.03.2014</b>			
Activation	11:02:06		configuration 5
Get message with location date	11:03:00	FFFE2FCC9E0A000C607CEDF5BA259221788C	Page No. 162
Deactivation	11:03:09		
Activation	11:00:05		configuration 7
Get message with location date	11:00:59	FFFE2FCC9E0A000C607CEDF5BA259221788C	Page No. 163
Deactivation	11:01:08		
Activation	10:56:55		configuration 8
Get message with location date	10:57:49	FFFE2FCC9E0A000C607CEDF5BA259221788C	Page No. 164
Deactivation	10:57:58		
<b>Test User, point No 1, 04.03.2014</b>			
Activation	15:16:04		configuration 5
Get message with location date	15:16:58	FFFE2FCC9E0A000C607CEDF5BA259021875F	Page No. 165
Deactivation	15:17:05		
Activation	15:11:06		configuration 7
Get message with location date	15:12:00	FFFE2FCC9E0A000C607CEDF5BA259021875F	Page No. 166
Deactivation	15:12:07		
Activation	15:08:03		configuration 8
Get message with location date	15:08:57	FFFE2FCC9E0A000C607CEDF5BA259021875F	Page No. 167
Deactivation	15:09:04		

**Performance measurements on accordance requirements item A.3.8.2 T.007 –  
Position Acquisition Time and Position Accuracy**

No	Test Name	C/S T.007 Standard Section	Test procedure description	Obtained results	Comments
1.	Beacon is coded at Test User				
2.	Position Acquisition Time and Position Accuracy at point No 1	A.3.8.2.1	a. EPIRB is placed in the container with salt water (configuration 5). b. Activate the beacon at the location with coordinate: - N 44°35'15.390" - E 33°29'19.666" c. Deactivate the beacon.	Time to Acquire Position: 0 min 54 sec  Encoded location data: - N 44°36'00" - E 33°28'00"  Position accuracy 2.228 kilometers	Page No 162
3.	Position Acquisition Time and Position Accuracy at point No 1	A.3.8.2.1	a. EPIRB is placed on the aluminum disk (configuration 7). b. Activate the beacon at the location with coordinate: - N 44°35'15.390" - E 33°29'19.666" c. Deactivate the beacon.	Time to Acquire Position: 0 min 54 sec  Encoded location data: - N 44°36'00" - E 33°28'00"  Position accuracy 2.228 kilometers	Page No 163
4.	Position Acquisition Time and Position Accuracy at point No 1	A.3.8.2.1	a. EPIRB is placed on above ground plane (configuration 8). b. Activate the beacon at the location with coordinate: - N 44°35'15.390" - E 33°29'19.666" c. Deactivate the beacon.	Time to Acquire Position: 0 min 54 sec  Encoded location data: - N 44°36'00" - E 33°28'00"  Position accuracy 2.228 kilometers	Page No 164
5.	Position Acquisition Time and Position Accuracy at point No 2	A.3.8.2.2	a. Change location to Point 2. The distance between Point 1 and Point 2 is 8.966 km. b. EPIRB is placed in the container with salt water (configuration 5). c. Activate the beacon at the location with coordinate: - N 44°31'10.440" - E 33°32'58.740"	Time to Acquire Position: 0 min 54 sec  Encoded location data: - N 44°32'00" - E 33°32'00"  Position accuracy 2.003 kilometers	Page No 165

No	Test Name	C/S T.007 Standard Section	Test procedure description	Obtained results	Comments
			d. Deactivate the beacon.		
6.	Position Acquisition Time and Position Accuracy at point No 2	A.3.8.2.2	a. EPIRB placed on the aluminum disk (configuration 7). b. Activate the beacon at the location with coordinate: - N 44°31'10.440" - E 33°32'58.740" c. Deactivate the beacon.	Time to Acquire Position: 0 min 54 sec  Encoded location data: - N 44°32'00" - E 33°32'00"  Position accuracy 2.003 kilometers	Page No 166
7.	Position Acquisition Time and Position Accuracy at point No 2	A.3.8.2.2	a. EPIRB is placed on above ground plane (configuration 8). b. Activate the beacon at the location with coordinate: - N 44°31'10.440" - E 33°32'58.740" c. Deactivate the beacon.	Time to Acquire Position: 0 min 54 sec  Encoded location data: - N 44°32'00" - E 33°32'00"  Position accuracy 2.003 kilometers	Page No 167

**Position Acquisition Time and Position Accuracy (Internal Navigation Devices)**  
**(Table F-C.4 T.007)**

Protocol	Operational Configuration	C/S T.007 Section A.3.8.2.1		C/S T.007 Section A.3.8.2.2	
		Time to Acquire Position (sec)	Location Error in meters	Time to Acquire Position (sec)	Location Error in meters
Test User	Floating in Water - configuration 5	54	2228	54	2003
		Page No 162		Page No 165	
Test User	Resting on aluminum disk - configuration 7	54	2228	54	2003
		Page No 163		Page No 166	
Test User	Placed above ground plane - configuration 8	54	2228	54	2003
		Page No 164		Page No 167	

## Decoding Beacon Message

Test site: Configuration 5 – Water ground plane.

Location: Point “1” – N 44°35'15.390", E 33°29'19.666"

**Full message: FFFE2FCC9E0A000C607CEDF5BA259221788C**

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: User	26	1
Country code: 201 - <b>Albania</b>	27-36	0011001001
User type: Test User	37-39	111
National Use, Hex value: 0140018C0F9D	40-85	00000101000000000000110001100000111110011101
15 Hex ID:	N/A	993C140018C0F9D
Encoded BCH 1:	86-106	101111101011011101000
Calculated BCH 1:	N/A	101111101011011101000
Encoded Position Data Source From Internal Navigation Device	107	1
North	108	0
Latitude (degrees): 44	109-115	0101100
Latitude (minutes): 36	116-119	1001
East	120	0
Longitude (degrees): 33	121-128	00100001
Longitude (minutes): 28	129-132	0111
Encoded BCH 2:	133-144	100010001100
Calculated BCH 2:	N/A	100010001100
15 Hex ID:	N/A	993C140018C0F9D

## Decoding Beacon Message

Test site: Configuration 7 – Resting on aluminum disk

Location: Point “1” – N 44°35'15.390", E 33°29'19.666"

**Full message: FFFE2FCC9E0A000C607CEDF5BA259221788C**

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: User	26	1
Country code: 201 - <b>Albania</b>	27-36	0011001001
User type: Test User	37-39	111
National Use, Hex value: 0140018C0F9D	40-85	00000101000000000000110001100000111110011101
15 Hex ID:	N/A	993C140018C0F9D
Encoded BCH 1:	86-106	101111101011011101000
Calculated BCH 1:	N/A	101111101011011101000
Encoded Position Data Source From Internal Navigation Device	107	1
North	108	0
Latitude (degrees): 44	109-115	0101100
Latitude (minutes): 36	116-119	1001
East	120	0
Longitude (degrees): 33	121-128	00100001
Longitude (minutes): 28	129-132	0111
Encoded BCH 2:	133-144	100010001100
Calculated BCH 2:	N/A	100010001100
15 Hex ID:	N/A	993C140018C0F9D

## Decoding Beacon Message

Test site: Configuration 8 – Placed above ground plane

Location: Point “1” – N 44°35'15.390", E 33°29'19.666"

**Full message: FFFE2FCC9E0A000C607CEDF5BA259221788C**

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: User	26	1
Country code: 201 - <b>Albania</b>	27-36	0011001001
User type: Test User	37-39	111
National Use, Hex value: 0140018C0F9D	40-85	00000101000000000000110001100000111110011101
15 Hex ID:	N/A	993C140018C0F9D
Encoded BCH 1:	86-106	101111101011011101000
Calculated BCH 1:	N/A	101111101011011101000
Encoded Position Data Source From Internal Navigation Device	107	1
North	108	0
Latitude (degrees): 44	109-115	0101100
Latitude (minutes): 36	116-119	1001
East	120	0
Longitude (degrees): 33	121-128	00100001
Longitude (minutes): 28	129-132	0111
Encoded BCH 2:	133-144	100010001100
Calculated BCH 2:	N/A	100010001100
15 Hex ID:	N/A	993C140018C0F9D

## Decoding Beacon Message

Test site: Configuration 5 – Water ground plane.

Location: Point “2” – N 44°31'10.440", E 33°32'58.740"

**Full message: FFFE2FCC9E0A000C607CEDF5BA259021875F**

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: User	26	1
Country code: 201 - <b>Albania</b>	27-36	0011001001
User type: Test User	37-39	111
National Use, Hex value: 0140018C0F9D	40-85	00000101000000000000110001100000111110011101
15 Hex ID:	N/A	993C140018C0F9D
Encoded BCH 1:	86-106	101111101011011101000
Calculated BCH 1:	N/A	101111101011011101000
Encoded Position Data Source From Internal Navigation Device	107	1
North	108	0
Latitude (degrees): 44	109-115	0101100
Latitude (minutes): 32	116-119	1000
East	120	0
Longitude (degrees): 33	121-128	00100001
Longitude (minutes): 32	129-132	1000
Encoded BCH 2:	133-144	011101011111
Calculated BCH 2:	N/A	011101011111
15 Hex ID:	N/A	993C140018C0F9D

## Decoding Beacon Message

Test site: Configuration 7 – Resting on aluminum disk  
 Location: Point “2” – N 44°31'10.440", E 33°32'58.740"

**Full message: FFFE2FCC9E0A000C607CEDF5BA259021875F**

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: User	26	1
Country code: 201 - <b>Albania</b>	27-36	0011001001
User type: Test User	37-39	111
National Use, Hex value: 0140018C0F9D	40-85	00000101000000000000110001100000111110011101
15 Hex ID:	N/A	993C140018C0F9D
Encoded BCH 1:	86-106	101111101011011101000
Calculated BCH 1:	N/A	101111101011011101000
Encoded Position Data Source From Internal Navigation Device	107	1
North	108	0
Latitude (degrees): 44	109-115	0101100
Latitude (minutes): 32	116-119	1000
East	120	0
Longitude (degrees): 33	121-128	00100001
Longitude (minutes): 32	129-132	1000
Encoded BCH 2:	133-144	011101011111
Calculated BCH 2:	N/A	011101011111
15 Hex ID:	N/A	993C140018C0F9D

## Decoding Beacon Message

Test site: Configuration 8 – Placed above ground plane

Location: Point “2” – N 44°31'10.440", E 33°32'58.740"

**Full message: FFFE2FCC9E0A000C607CEDF5BA259021875F**

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: User	26	1
Country code: 201 - <b>Albania</b>	27-36	0011001001
User type: Test User	37-39	111
National Use, Hex value: 0140018C0F9D	40-85	00000101000000000000110001100000111110011101
15 Hex ID:	N/A	993C140018C0F9D
Encoded BCH 1:	86-106	101111101011011101000
Calculated BCH 1:	N/A	101111101011011101000
Encoded Position Data Source From Internal Navigation Device	107	1
North	108	0
Latitude (degrees): 44	109-115	0101100
Latitude (minutes): 32	116-119	1000
East	120	0
Longitude (degrees): 33	121-128	00100001
Longitude (minutes): 32	129-132	1000
Encoded BCH 2:	133-144	011101011111
Calculated BCH 2:	N/A	011101011111
15 Hex ID:	N/A	993C140018C0F9D

### 5.9.3 Encoded Position Data Update Interval (A.3.8.3)

**Test Date:** 04.03.2014

**The test time stamp.**

Event	Time, UTC	Coordinates	Message	Comment
<b>Test User Protocol</b>				
Start of test	12:31:00			BUT was placed in Location 1
Activation EUT	12:31:03			time of beacon activation in Location 1
Received message	12:31:56	N 44°36'00" E 33°28'00"	FFFE2FCC9E0A000C607CED F5BA259221788C  Page No. 169	time of the first message with position encoded
Change Location	12:32:30			Start of location change from point 1 to point 2
	12:34:10			End of location change from point 1 to point 2
Received message	13:01:42	N 44°32'00" E 33°32'00"	FFFE2FCC9E0A000C607CED F5BA259021875F  Page No. 170	time of first message with updated position after start of location changing
Deactivation	13:02:21			time of beacon deactivation in Location 2

Decoding Beacon Message

Location: Point "1" – N 44°35'5.220", E 33°26'6.840"

**Full message: FFFE2FCC9E0A000C607CEDF5BA259221788C**

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: User	26	1
Country code: 201 - <b>Albania</b>	27-36	0011001001
User type: Test User	37-39	111
National Use, Hex value: 0140018C0F9D	40-85	0000010100000000000000110001100000011110011101
15 Hex ID:	N/A	993C140018C0F9D
Encoded BCH 1:	86-106	101111101011011101000
Calculated BCH 1:	N/A	101111101011011101000
Encoded Position Data Source From Internal Navigation Device	107	1
North	108	0
Latitude (degrees): 44	109-115	0101100
Latitude (minutes): 36	116-119	1001
East	120	0
Longitude (degrees): 33	121-128	00100001
Longitude (minutes): 28	129-132	0111
Encoded BCH 2:	133-144	100010001100
Calculated BCH 2:	N/A	100010001100
15 Hex ID:	N/A	993C140018C0F9D

Decoding Beacon Message

Location: Point "2" – N 44°31'10.440", E 33°32'58.740"

**Full message: FFFE2FCC9E0A000C607CEDF5BA259021875F**

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: User	26	1
Country code: 201 - <b>Albania</b>	27-36	0011001001
User type: Test User	37-39	111
National Use, Hex value: 0140018C0F9D	40-85	0000010100000000000000001100011000000111110011101
15 Hex ID:	N/A	993C140018C0F9D
Encoded BCH 1:	86-106	101111101011011101000
Calculated BCH 1:	N/A	101111101011011101000
Encoded Position Data Source From Internal Navigation Device	107	1
North	108	0
Latitude (degrees): 44	109-115	0101100
Latitude (minutes): 32	116-119	1000
East	120	0
Longitude (degrees): 33	121-128	00100001
Longitude (minutes): 32	129-132	1000
Encoded BCH 2:	133-144	011101011111
Calculated BCH 2:	N/A	011101011111
15 Hex ID:	N/A	993C140018C0F9D

**Protocol:** Standard Test Protocol**Test Date:** 04.03.2014**The test time stamp.**

Event	Time, UTC	Coordinates	Message	Comment
<b>Standard Test Protocol</b>				
Start of test	09:50:00			BUT was placed in Location 1
Activation EUT	09:50:03			time of beacon activation in Location 1
Received message	09:50:57	N 44°35'24" E 33°29'24"	FFFE2F8C9EF9C0632C8432 D96F37958093BC	time of the first message with position encoded
			Page No. 172	
Change Location	09:51:25			Start of location change from point 1 to point 2
	09:54:10			End of location change from point 1 to point 2
Received message	10:20:43	N 44°34'56" E 33°29'36"	FFFE2F8C9EF9C0632C8432 D96F3793806991	time of first message with updated position after start of location changing
			Page No. 173	
Deactivation	10:22:40			time of beacon deactivation in Location 2

## Decoding Beacon Message

Location: Point "1" – N 44°35'26.100", E 33°29'24.300"

**Full message: FFFE2F8C9EF9C0632C8432D96F37958093BC**

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - <b>Albania</b>	27-36	0011001001
Type of location protocol: Standard Location - Test	37-40	1110
Test Protocol: Test Protocol (No Decode information in bits 41 to 64)	41-64	111110011100000001100011
Latitude Sign: North	65	0
Latitude Degrees: 44	66-72	0101100
Latitude Minutes: 30	73-74	10
Longitude Sign: East	75	0
Longitude Degrees: 33	76-83	00100001
Longitude Minutes: 30	84-85	10
BCH 1 Encoded:	86-106	010110110010110111100
BCH 1 Calculated:	N/A	010110110010110111100
Fixed bits (1101): Pass	107-110	1101
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
Aux Device: 121.5 MHz homer	112	1
Latitude Offset Sign: +	113	1
Latitude Offset Minutes: 5	114-118	00101
Latitude Offset Seconds: 24	119-122	0110
Longitude Offset Sign: -	123	0
Longitude Offset Minutes: 0	124-128	00000
Longitude Offset Seconds: 36	129-132	1001
BCH 2 Encoded:	133-144	001110111100
BCH 2 Calculated:	N/A	001110111100
Composite Latitude: 44.59 Degrees North	N/A	Composite Longitude: 33.49 Degrees East
15 Hex ID:	N/A	193DF380C6FFBFF

## Decoding Beacon Message

Location: Point "2" – N 44°34'58.080", E 33°29'31.200"

**Full message: FFFE2F8C9EF9C0632C8432D96F3793806991**

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - <b>Albania</b>	27-36	0011001001
Type of location protocol: Standard Location - Test	37-40	1110
Test Protocol: Test Protocol (No Decode information in bits 41 to 64)	41-64	111110011100000001100011
Latitude Sign: North	65	0
Latitude Degrees: 44	66-72	0101100
Latitude Minutes: 30	73-74	10
Longitude Sign: East	75	0
Longitude Degrees: 33	76-83	00100001
Longitude Minutes: 30	84-85	10
BCH 1 Encoded:	86-106	010110110010110111100
BCH 1 Calculated:	N/A	010110110010110111100
Fixed bits (1101): Pass	107-110	1101
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
Aux Device: 121.5 MHz homer	112	1
Latitude Offset Sign: +	113	1
Latitude Offset Minutes: 4	114-118	00100
Latitude Offset Seconds: 56	119-122	1110
Longitude Offset Sign: -	123	0
Longitude Offset Minutes: 0	124-128	00000
Longitude Offset Seconds: 24	129-132	0110
BCH 2 Encoded:	133-144	100110010001
BCH 2 Calculated:	N/A	100110010001
Composite Latitude: 44.5822222222223 Degrees North	N/A	Composite Longitude: 33.493333333333333 Degrees East
15 Hex ID:	N/A	193DF380C6FFBFF

**Protocol:** National Test Protocol**Test Date:** 04.03.2014**The test time stamp.**

Event	Time, UTC	Coordinates	Message	Comment
<b>National Test Protocol</b>				
Start of test	10:31:00			BUT was placed in Location 1
Activation EUT	10:31:03			time of beacon activation in Location 1
Received message	10:31:57	N 44°35'00" E 33°29'32"	FFFE2F8C9F00C04B22217F1 E6237A01C06D8	time of the first message with position encoded
			Page No. 175	
Change Location	10:32:35			Start of location change from point 1 to point 2
	10:34:50			End of location change from point 1 to point 2
Received message	11:01:43	N 44°35'28" E 33°29'24"	FFFE2F8C9F00C04B24217D7 F29B710240902	time of first message with updated position after start of location changing
			Page No. 176	
Deactivation	11:02:04			time of beacon deactivation in Location 2

## Decoding Beacon Message

Location: Point "1" – N 44°34'58.080", E 33°29'31.200"

**Full message: FFFE2F8C9F00C04B22217F1E6237A01C06D8**

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - <b>Albania</b>	27-36	0011001001
Type of location protocol: National Location - Test	37-40	1111
Serial Number: 769	41-58	000000001100000001
Latitude Flag: North	59	0
Latitude (Degrees): 44	60-66	0101100
Latitude (Minutes): 34	67-71	10001
Longitude Flag: East	72	0
Longitude (Degrees): 33	73-80	00100001
Longitude (Minutes): 30	81-85	01111
BCH 1 Encoded:	86-106	111000111100110001000
BCH 1 Calculated:	86-106	111000111100110001000
Fixed bits (110): Pass	107-109	110
Bits 113 - 132 provides offset data location	110	1
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
Aux Loc. Device: 121.5 MHz homer	112	1
Latitude Offset Sign: +	113	1
Latitude Offset Minutes: 1	114-115	01
Latitude Offset Seconds: 0	116-119	0000
Longitude Offset Sign: -	120	0
Longitude Offset Minutes: 0	121-122	00
Longitude Offset Seconds: 28	123-126	0111
Additional Id (Nat Use)	127-132	000000
BCH 2 Encoded:	133-144	011011011000
BCH 2 Calculated:	N/A	011011011000
Composite Latitude: 44.58333333333336 Degrees North	N/A	Composite Longitude: 33.49222222222225 Degrees East
15 Hex ID:	N/A	193E0180BF81FE0

## Decoding Beacon Message

Location: Point "2" – N 44°35'26.100", E 33°29'24.300"

**Full message: FFFE2F 8C9F00C04B24217D7F29B710240902**

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - <b>Albania</b>	27-36	0011001001
Type of location protocol: National Location - Test	37-40	1111
Serial Number: 769	41-58	000000001100000001
Latitude Flag: North	59	0
Latitude (Degrees): 44	60-66	0101100
Latitude (Minutes): 36	67-71	10010
Longitude Flag: East	72	0
Longitude (Degrees): 33	73-80	00100001
Longitude (Minutes): 30	81-85	01111
BCH 1 Encoded:	86-106	10101111110010100110
BCH 1 Calculated:	86-106	10101111110010100110
Fixed bits (110): Pass	107-109	110
Bits 113 - 132 provides offset data location	110	1
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
Aux Loc. Device: 121.5 MHz homer	112	1
Latitude Offset Sign: -	113	0
Latitude Offset Minutes: 0	114-115	00
Latitude Offset Seconds: 32	116-119	1000
Longitude Offset Sign: -	120	0
Longitude Offset Minutes: 0	121-122	00
Longitude Offset Seconds: 36	123-126	1001
Additional Id (Nat Use)	127-132	000000
BCH 2 Encoded:	133-144	100100000010
BCH 2 Calculated:	N/A	100100000010
Composite Latitude: 44.5911111111111 Degrees North	N/A	Composite Longitude: 33.49 Degrees East
15 Hex ID:	N/A	193E0180BF81FE0

### 5.9.4 Position Clearance after Deactivation (A.3.8.4)

**Protocol:** User Location Protocol

**Test Date:** 04.03.2014

The test time stamp.

Event	Time, UTC	Coordinates	Message	Comment
<b>Test User Protocol</b>				
Start of test	13:02:21			BUT was placed in Location 2
Reactivation EUT	13:02:22			BUT was reactivated after test A.3.8.3, with no navigation signal or navigation data input to the BUT
Received message	13:03:15	Default value	FFFE2FCC9E0A000C607CED F5BA2FE0FF0146	Time of the first operation message
			Page No.178	
Deactivation	13:03:23			Time of beacon deactivation

## Decoding Beacon Message

**Full message: FFFE2FCC9E0A000C607CEDF5BA2FE0FF0146**

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: User	26	1
Country code: 201 - <b>Albania</b>	27-36	0011001001
User type: Test User	37-39	111
National Use, Hex value: 0140018C0F9D	40-85	000001010000000000001100011000000111110011101
15 Hex ID:	N/A	993C140018C0F9D
Encoded BCH 1:	86-106	101111101011011101000
Calculated BCH 1:	N/A	101111101011011101000
Encoded Position Data Source From Internal Navigation Device	107	1
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	000101000110
Calculated BCH 2:	N/A	000101000110
15 Hex ID:	N/A	993C140018C0F9D

**Protocol:** Standard Test Protocol**Test Date:** 04.03.2014**The test time stamp.**

Event	Time, UTC	Coordinates	Message	Comment
<b>Standard Test Protocol</b>				
Start of test	10:22:40			BUT was placed in Location 2
Reactivation EUT	10:22:41			BUT was reactivated after test A.3.8.3, with no navigation signal or navigation data input to the BUT
Received message	12:23:34	Default value	FFFE2F8C9EF9C0637FDFF83D15B 783E0F66C	Time of the first operation message
			Page No. 180	
Deactivation	12:23:45			Time of beacon deactivation

## Decoding Beacon Message

**Full message: FFFE2F8C9EF9C0637FDFF83D15B783E0F66C**

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - <b>Albania</b>	27-36	0011001001
Type of location protocol: Standard Location - Test	37-40	1110
Test Protocol: Test Protocol (No Decode information in bits 41 to 64)	41-64	111110011100000001100011
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	00000111010001010110
BCH 1 Calculated:	N/A	00000111010001010110
Fixed bits (1101): Pass	107-110	1101
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
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	011001101100
BCH 2 Calculated:	N/A	011001101100
Composite Latitude: default	N/A	Composite Longitude: default
15 Hex ID:	N/A	193DF380C6FFBFF

**Protocol:** National Test Protocol**Test Date:** 04.03.2014**The test time stamp.**

Event	Time, UTC	Coordinates	Message	Comment
<b>National Test Protocol</b>				
Start of test	11:02:04			BUT was placed in Location 2
Reactivation EUT	11:02:05			BUT was reactivated after test A.3.8.3, with no navigation signal or navigation data input to the BUT
Received message	11:02:58	Default value	FFFE2F8C9F00C05FC0FF06728BF79F3C0010	Time of the first operation message
			Page No. 182	
Deactivation	11:03:08			Time of beacon deactivation

## Decoding Beacon Message

**Full message: FFFE2F8C9F00C05FC0FF06728BF79F3C0010**

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - <b>Albania</b>	27-36	0011001001
Type of location protocol: National Location - Test	37-40	1111
Serial Number: 769	41-58	000000001100000001
Latitude Flag: default	59	0
Latitude (Degrees): default	60-66	1111111
Latitude (Minutes): default	67-71	00000
Longitude Flag: default	72	0
Longitude (Degrees): default	73-80	11111111
Longitude (Minutes): default	81-85	00000
BCH 1 Encoded:	86-106	110011100101000101111
BCH 1 Calculated:	86-106	110011100101000101111
Fixed bits (110): Pass	107-109	110
Bits 113 - 132 provides offset data location	110	1
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
Aux Loc. Device: 121.5 MHz homer	112	1
Latitude Offset Sign: default	113	1
Latitude Offset Minutes: default	114-115	00
Latitude Offset Seconds: default	116-119	1111
Longitude Offset Sign: default	120	1
Longitude Offset Minutes: default	121-122	00
Longitude Offset Seconds: default	123-126	1111
Additional Id (Nat Use)	127-132	000000
BCH 2 Encoded:	133-144	000000010000
BCH 2 Calculated:	N/A	000000010000
Composite Latitude: default	N/A	Composite Longitude: default
15 Hex ID:	N/A	193E0180BF81FE0

### 5.9.5 Last Valid Position (A.3.8.6)

**Protocol:** User Location Protocol

**Test Date:** 05.03.2014

The test time stamp.

Event	Time, UTC	Coordinates	Message	Comment
<b>User Location Protocol</b>				
Start of test	12:37:00			BUT was placed in Location 1
Activation EUT	12:37:02			time of beacon activation in location 1
Received message	12:37:56	N 44°36'00" E 33°28'00"	FFFE2FCC9E0A000C607CEDF5BA 259221788C  Page No. 184	time of the first message after beacon activation, message encoded with position (location 1)
Navigation input removal	12:38:52			time of navigation input removal
First message after navigation input removal	12:39:34	N 44°36'00" E 33°28'00"	FFFE2FCC9E0A000C607CEDF5BA 259221788C	time of first message after navigation input removal
Received last message with encoded position	16:37:43	N 44°36'00" E 33°28'00"	FFFE2FCC9E0A000C607CEDF5BA 259221788C	time of the last message encoded with encoded position (location 1), before reverting to default
Received first message with default position	16:38:32	Default value	FFFE2FCC9E0A000C607CEDF5BA 2FE0FF0146  Page No. 185	time of the first default message

Time of change coordinates on coordinates by default was 4 hours 00 minutes 36 seconds equal 240 minutes 36 seconds.

## Decoding Beacon Message

**Full message: FFFE2FCC9E0A000C607CEDF5BA259221788C**

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: User	26	1
Country code: 201 - <b>Albania</b>	27-36	0011001001
User type: Test User	37-39	111
National Use, Hex value: 0140018C0F9D	40-85	000001010000000000001100011000000111110011101
15 Hex ID:	N/A	993C140018C0F9D
Encoded BCH 1:	86-106	101111101011011101000
Calculated BCH 1:	N/A	101111101011011101000
Encoded Position Data Source From Internal Navigation Device	107	1
North	108	0
Latitude (degrees): 44	109-115	0101100
Latitude (minutes): 36	116-119	1001
East	120	0
Longitude (degrees): 33	121-128	00100001
Longitude (minutes): 28	129-132	0111
Encoded BCH 2:	133-144	100010001100
Calculated BCH 2:	N/A	100010001100
15 Hex ID:	N/A	993C140018C0F9D

## Decoding Beacon Message

**Full message: FFFE2FCC9E0A000C607CEDF5BA2FE0FF0146**

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: User	26	1
Country code: 201 - <b>Albania</b>	27-36	0011001001
User type: Test User	37-39	111
National Use, Hex value: 0140018C0F9D	40-85	000001010000000000001100011000000111110011101
15 Hex ID:	N/A	993C140018C0F9D
Encoded BCH 1:	86-106	101111101011011101000
Calculated BCH 1:	N/A	101111101011011101000
Encoded Position Data Source From Internal Navigation Device	107	1
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	000101000110
Calculated BCH 2:	N/A	000101000110
15 Hex ID:	N/A	993C140018C0F9D

**Protocol:** Standard Location Protocol**Test Date:** 03.03.2014**The test time stamp.**

Event	Time, UTC	Coordinates	Message	Comment
<b>Standard Location Protocol</b>				
Start of test	08:53:00			BUT was placed in Location 1
Activation EUT	08:53:05			time of beacon activation in location 1
Received message	08:53:58	N 44°35'16" E 33°29'20"	FFFE2F8C9EF9C0632C8432D96F3 79500A39A	time of the first message after beacon activation, message encoded with position (location 1)
			Page No. 187	time of navigation input removal
Navigation input removal	08:54:56			
First message after navigation input removal	08:55:36	N 44°35'16" E 33°29'20"	FFFE2F8C9EF9C0632C8432D96F37 9500A39A	time of first message after navigation input removal
Received last message with encoded position	12:53:45	N 44°35'16" E 33°29'20"	FFFE2F8C9EF9C0632C8432D96F3 79500A39A	time of the last message encoded with encoded position (location 1), before reverting to default
Received first message with default position	12:54:34	Default value	FFFE2F8C9EF9C0637FDFF83D15B 783E0F66C	time of the first default message
			Page No. 188	

Time of change coordinates on coordinates by default was 4 hours 00 minutes 36 seconds equal 240 minutes 36 seconds.

## Decoding Beacon Message

**Full message: FFFE2F8C9EF9C0632C8432D96F379500A39A**

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - <b>Albania</b>	27-36	0011001001
Type of location protocol: Standard Location - Test	37-40	1110
Test Protocol: Test Protocol (No Decode information in bits 41 to 64)	41-64	111110011100000001100011
Latitude Sign: North	65	0
Latitude Degrees: 44	66-72	0101100
Latitude Minutes: 30	73-74	10
Longitude Sign: East	75	0
Longitude Degrees: 33	76-83	00100001
Longitude Minutes: 30	84-85	10
BCH 1 Encoded:	86-106	010110110010110111100
BCH 1 Calculated:	N/A	010110110010110111100
Fixed bits (1101): Pass	107-110	1101
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
Aux Device: 121.5 MHz homer	112	1
Latitude Offset Sign: +	113	1
Latitude Offset Minutes: 5	114-118	00101
Latitude Offset Seconds: 16	119-122	0100
Longitude Offset Sign: -	123	0
Longitude Offset Minutes: 0	124-128	00000
Longitude Offset Seconds: 40	129-132	1010
BCH 2 Encoded:	133-144	001110011010
BCH 2 Calculated:	N/A	001110011010
Composite Latitude: 44.5877777777778 Degrees North	N/A	Composite Longitude: 33.4888888888889 Degrees East
15 Hex ID:	N/A	193DF380C6FFBFF

## Decoding Beacon Message

**Full message: FFFE2F8C9EF9C0637FDFF83D15B783E0F66C**

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - <b>Albania</b>	27-36	0011001001
Type of location protocol: Standard Location - Test	37-40	1110
Test Protocol: Test Protocol (No Decode information in bits 41 to 64)	41-64	111110011100000001100011
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	00000111010001010110
BCH 1 Calculated:	N/A	00000111010001010110
Fixed bits (1101): Pass	107-110	1101
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
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	011001101100
BCH 2 Calculated:	N/A	011001101100
Composite Latitude: default	N/A	Composite Longitude: default
15 Hex ID:	N/A	193DF380C6FFBFF

**Protocol:** National Location Protocol

**Test Date:** 05.03.2014

**The test time stamp.**

Event	Time, UTC	Coordinates	Message	Comment
<b>National Location Protocol</b>				
Start of test	7:11:00			BUT was placed in Location 1
Activation EUT	7:11:02			time of beacon activation in location 1
Received message	7:11:55	N 44°35'16" E 33°29'20"	FFFE2F8C9F00C04B24217D7 F29B716280201	time of the first message after beacon activation, message encoded with position (location 1)
			Page No. 190	
Navigation input removal	7:12:59			time of navigation input removal
First message after navigation input removal	7:13:34	N 44°35'16" E 33°29'20"	FFFE2F8C9F00C04B24217D7 F29B716280201	time of first message after navigation input removal
Received last message with encoded position	11:11:42	N 44°35'16" E 33°29'20"	FFFE2F8C9F00C04B24217D7 F29B716280201	time of the last message encoded with encoded position (location 1), before reverting to default
Received first message with default position	11:12:32	Default value	FFFE2F8C9F00C05FC0FF067 28BF79F3C0010	time of the first default message
			Page No. 191	

Time of change coordinates on coordinates by default was 4 hours 00 minutes 37 seconds equal 240 minutes 37 seconds.

## Decoding Beacon Message

**Full message: FFFE2F8C9F00C04B24217D7F29B716280201**

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - <b>Albania</b>	27-36	0011001001
Type of location protocol: National Location - Test	37-40	1111
Serial Number: 769	41-58	000000001100000001
Latitude Flag: North	59	0
Latitude (Degrees): 44	60-66	0101100
Latitude (Minutes): 36	67-71	10010
Longitude Flag: East	72	0
Longitude (Degrees): 33	73-80	00100001
Longitude (Minutes): 30	81-85	01111
BCH 1 Encoded:	86-106	10101111110010100110
BCH 1 Calculated:	86-106	10101111110010100110
Fixed bits (110): Pass	107-109	110
Bits 113 - 132 provides offset data location	110	1
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
Aux Loc. Device: 121.5 MHz homer	112	1
Latitude Offset Sign: -	113	0
Latitude Offset Minutes: 0	114-115	00
Latitude Offset Seconds: 44	116-119	1011
Longitude Offset Sign: -	120	0
Longitude Offset Minutes: 0	121-122	00
Longitude Offset Seconds: 40	123-126	1010
Additional Id (Nat Use)	127-132	000000
BCH 2 Encoded:	133-144	001000000001
BCH 2 Calculated:	N/A	001000000001
Composite Latitude: 44.58777777777778 Degrees North	N/A	Composite Longitude: 33.48888888888889 Degrees East
15 Hex ID:	N/A	193E0180BF81FE0

## Decoding Beacon Message

**Full message: FFFE2F8C9F00C05FC0FF06728BF79F3C0010**

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - <b>Albania</b>	27-36	0011001001
Type of location protocol: National Location - Test	37-40	1111
Serial Number: 769	41-58	000000001100000001
Latitude Flag: default	59	0
Latitude (Degrees): default	60-66	1111111
Latitude (Minutes): default	67-71	00000
Longitude Flag: default	72	0
Longitude (Degrees): default	73-80	11111111
Longitude (Minutes): default	81-85	00000
BCH 1 Encoded:	86-106	110011100101000101111
BCH 1 Calculated:	86-106	110011100101000101111
Fixed bits (110): Pass	107-109	110
Bits 113 - 132 provides offset data location	110	1
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
Aux Loc. Device: 121.5 MHz homer	112	1
Latitude Offset Sign: default	113	1
Latitude Offset Minutes: default	114-115	00
Latitude Offset Seconds: default	116-119	1111
Longitude Offset Sign: default	120	1
Longitude Offset Minutes: default	121-122	00
Longitude Offset Seconds: default	123-126	1111
Additional Id (Nat Use)	127-132	000000
BCH 2 Encoded:	133-144	000000010000
BCH 2 Calculated:	N/A	000000010000
Composite Latitude: default	N/A	Composite Longitude: default
15 Hex ID:	N/A	193E0180BF81FE0

### ***5.9.6 Position Data Encoding (A.3.8.7)***

This test was conducted by the manufacturer.

The results are provided in the manufacturer's report as per Appendix C to Annex F below.

<b>Document Type</b>	<b>Issue</b>	01.02	PE TC "Omega" 
	<b>Date Last Amended</b>	15/5/2014	
	<b>Last Amended by</b>	S Nolan	
	<b>Document Title</b>		
<b>EPIRB 1 Navigation System, Beacon and Message Coding Test Results</b>			

## NAVIGATION SYSTEM TEST RESULTS

**Table F-C.1 of C/S T.007 (Issue 4 Rev. 8 October 2013)**

**Position Data encoding Results User Location Protocol**

Script Reference (See Table D.2)	Value of Encoded Location Bits Transmitted by Beacon (Hexadecimal)	Confirmation that BCH Correct (✓)
1	Bits 108 – 132 = <b>OFEOFFO</b>	✓
2	Bits 108 – 132 = <b>1001000</b> Number of seconds after providing navigation data that beacon transmitted the above encoded location information: <b>33.8</b>	✓
3	Bits 108 – 132 = <b>0000000</b>	✓
4	Bits 108 – 132 = <b>0006B3C</b>	✓
5	Bits 108 – 132 = <b>1007B3C</b>	✓
6	Bits 108 – 132 = <b>1B28590</b>	✓
7	Bits 108 – 132 = <b>1B29590</b>	✓
8	Bits 108 – 132 = <b>OB41B40</b>	✓
9	Bits 108 – 132 = <b>OB3CB40</b>	✓
10	Bits 108 – 132 = <b>14918A7</b>	✓
<b>Self-Test Navigation Test Scripts (C/S T.007 Issue 4 Rev. 8 October 2013)</b>		
11	Bits 108 – 132 = <b>OFEOFFO</b>	✓
12	Bits 108 – 132 = <b>OFEOFFO</b>	✓

<b>Document Type</b>	<b>Issue</b>	01.02	PE TC "Omega" 
	<b>Date Last Amended</b>	15/5/2014	
	<b>Last Amended by</b>	S Nolan	
<b>Document Title</b>	<b>EPIRB 1 Navigation System, Beacon and Message Coding Test Results</b>		

**Table F-C.2 of C/S T.007 (Issue 4 Rev. 8 October 2013)**

**Position Data encoding Results Standard Location Protocol**

Script Reference (See Table D.2)	Value of Encoded Location Bits Transmitted by Beacon (Hexadecimal)	Confirmation that BCH Correct (✓)
1	Bits 65 – 85 = <b>OFFBFF</b> Bits 113 – 132 = <b>83EOF</b>	✓
2	Bits 65 – 85 = <b>100400</b> Bits 113 – 132 = <b>8420E</b> Number of seconds after providing navigation data that beacon transmitted the above encoded location information: <b>30.08</b>	✓
3	Bits 65 – 85 = <b>000000</b> Bits 113 – 132 = <b>8360D</b>	✓
4	Bits 65 – 85 = <b>000ACF</b> Bits 113 – 132 = <b>0F222</b>	✓
5	Bits 65 – 85 = <b>0012CE</b> Bits 113 – 132 = <b>93A60</b>	✓
6	Bits 65 – 85 = <b>100ECF</b> Bits 113 – 132 = <b>OFA10</b>	✓
7	Bits 65 – 85 = <b>1B2964</b> Bits 113 – 132 = <b>80A00</b>	✓
8	Bits 65 – 85 = <b>1B2D64</b> Bits 113 – 132 = <b>84E00</b>	✓
9	Bits 65 – 85 = <b>0B46D0</b> Bits 113 – 132 = <b>03801</b>	✓
10	Bits 65 – 85 = <b>0B42D0</b> Bits 113 – 132 = <b>08009</b>	✓
11	Bits 65 – 85 = <b>14962A</b> Bits 113 – 132 = <b>80200</b>	✓
<b>Self-Test Navigation Test Scripts (C/S T.007 Issue 4 Rev. 8 October 2013)</b>		
12	Bits 65 – 85 = <b>OFFBFF</b> Bits 113 – 132 = <b>83EOF</b>	✓
13	Bits 65 – 85 = <b>OFFBFF</b> Bits 113 – 132 = <b>83EOF</b>	✓

<b>Document Type</b>	<b>Issue</b>	01.02	PE TC "Omega" 
	<b>Date Last Amended</b>	15/5/2014	
	<b>Last Amended by</b>	S Nolan	
<b>Document Title</b>	<b>EPIRB 1 Navigation System, Beacon and Message Coding Test Results</b>		

**Table F-C.3 of C/S T.007 (Issue 4 Rev. 8 October 2013)**

**Position Data encoding Results National Location Protocol**

Script Reference (See Table D.3)	Value of Encoded Location Bits Transmitted by Beacon (Hexadecimal)	Confirmation that BCH Correct (✓)
1	Bits 59 – 85 = <b>3F81FEO</b> Bits 113 – 126 = <b>27CF</b>	✓
2	Bits 59 – 85 = <b>4002000</b> Bits 113 – 126 = <b>284E</b> Number of seconds after providing navigation data that beacon transmitted the above encoded location information: <b>41.8</b>	✓
3	Bits 59 – 85 = <b>0000000</b> Bits 113 – 126 = <b>26CD</b>	✓
4	Bits 59 – 85 = <b>0019678</b> Bits 113 – 126 = <b>060D</b>	✓
5	Bits 59 – 85 = <b>001567A</b> Bits 113 – 126 = <b>2710</b>	✓
6	Bits 59 – 85 = <b>401B677</b> Bits 113 – 126 = <b>0740</b>	✓
7	Bits 59 – 85 = <b>6CA0B20</b> Bits 113 – 126 = <b>06C0</b>	✓
8	Bits 59 – 85 = <b>6CA2B20</b> Bits 113 – 126 = <b>21C0</b>	✓
9	Bits 59 – 85 = <b>2D03680</b> Bits 113 – 126 = <b>0701</b>	✓
10	Bits 59 – 85 = <b>2CF5680</b> Bits 113 – 126 = <b>2009</b>	✓
11	Bits 59 – 85 = <b>523F14F</b> Bits 113 – 126 = <b>2040</b>	✓
<b>Self-Test Navigation Test Scripts (C/S T.007 Issue 4 Rev. 8 October 2013)</b>		
12	Bits 59 – 85 = <b>3F81FEO</b> Bits 113 – 126 = <b>27CF</b>	✓
13	Bits 59 – 85 = <b>3F81FEO</b> Bits 113 – 126 = <b>27CF</b>	✓

<b>Document Type</b>	<b>Issue</b>	<b>01.02</b>	PE TC "Omega" 
	<b>Date Last Amended</b>	<b>15/5/2014</b>	
	<b>Last Amended by</b>	<b>S Nolan</b>	
	<b>EPIRB 1 Navigation System, Beacon and Message Coding Test Results</b>		

## ANNEX A

### Navigation System Test Script Reference

#### User Location Protocol Test results

Script	Tester File Name	Hex Code
1	Burst-13571.htm	FFFE2FCC94186186186689DE52AFE0FF0146
2 (33.8s)	Burst-13572.htm	FFFE2FCC94186186186689DE52B00100084B
3	Burst-13573.htm	FFFE2FCC94186186186689DE52A000000E27
4	Burst-13574.htm	FFFE2FCC94186186186689DE52A006B3C2F3
5	Burst-13575.htm	FFFE2FCC94186186186689DE52B007B3C49F
6	Burst-13576.htm	FFFE2FCC94186186186689DE52BB28590C48
7	Burst-13577.htm	FFFE2FCC94186186186689DE52BB295907AB
8	Burst-13578.htm	FFFE2FCC94186186186689DE52AB41B400FA
9	Burst-13579.htm	FFFE2FCC94186186186689DE52AB3CB4095C
10	Burst-13580.htm	FFFE2FCC94186186186689DE52B4918A7EF2
11	Burst-13617.htm	FFFED0CC94186186186689DE52AFE0FF0146
12	Burst-13618.htm	FFFED0CC94186186186689DE52AFE0FF0146

#### Standard Location Protocol Test results

Script	Tester File Name	Hex Code
1	Burst-13581.htm	FFFE2F8C96F9C0637FDFF992EF3783EOF66C
2 (30.08s)	Burst-13582.htm	FFFE2F8C96F9C063802000E2FF778420EDF0
3	Burst-13583.htm	FFFE2F8C96F9C063000005DAAE778360D373
4	Burst-13584.htm	FFFE2F8C96F9C06300567C8315770F2220AE
5	Burst-13585.htm	FFFE2F8C96F9C06300967714DAF793A602AA
6	Burst-13586.htm	FFFE2F8C96F9C063807679BB44770FA10C2D
7	Burst-13587.htm	FFFE2F8C96F9C063D94B204CB6B780A00F76
8	Burst-13588.htm	FFFE2F8C96F9C063D96B2467C3B784E007A2
9	Burst-13589.htm	FFFE2F8C96F9C0635A3686FB0977038016F7
10	Burst-13590.htm	FFFE2F8C96F9C0635A1682D07C77080098C0

<b>Document Type</b>	<b>Issue</b>	01.02	PE TC "Omega" 
	<b>Date Last Amended</b>	15/5/2014	
	<b>Last Amended by</b>	S Nolan	
	<b>Document Title</b>	<b>EPIRB 1 Navigation System, Beacon and Message Coding Test Results</b>	

11	Burst-13591.htm	FFFE2F8C96F9C063A4B151B249F78020001B
12	Burst-13592.htm	FFFED08C96F9C0637FDFF992EF3783EOF66C
13	Burst-13593.htm	FFFED08C96F9C0637FDFF992EF3783EOF66C

#### National Location Protocol Test results

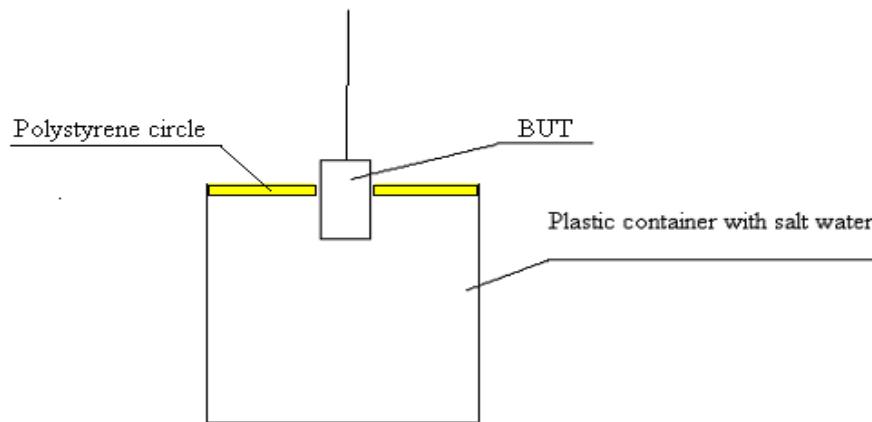
Script	Tester File Name	Hex Code
1	Burst-13604.htm	FFFE2F8C9A0018DFCOFF02AD44779F3C0010
2 (41.8s)	Burst-13605.htm	FFFE2F8C9A0018E00100011ABD37A1380347
3	Burst-13606.htm	FFFE2F8C9A0018C00000065448F79B340105
4	Burst-13607.htm	FFFE2F8C9A0018C00CB3C75F91F718340B28
5	Burst-13608.htm	FFFE2F8C9A0018C00AB3D6522BF79C400767
6	Burst-13609.htm	FFFE2F8C9A0018E00DB3B817B0B71D00029F
7	Burst-13610.htm	FFFE2F8C9A0018F65059066854F71B00059E
8	Burst-13611.htm	FFFE2F8C9A0018F6515901EA1FF787000A6C
9	Burst-13612.htm	FFFE2F8C9A0018D681B400BA34F71C040195
10	Burst-13613.htm	FFFE2F8C9A0018D67AB40067B8F7802408F2
11	Burst-13614.htm	FFFE2F8C9A0018E91F8A7F0960B781000D6D
12	Burst-13615.htm	FFFED08C9A0018DFCOFF02AD44779F3C0010
13	Burst-13616.htm	FFFED08C9A0018DFCOFF02AD44779F3C0010

## 5.10 Satellite Qualitative Test

Date of test	08.05.2014, 12.05.2014 and 13.05.2014
Specification	C/S T.007 – section A.2.5
Beacon Model	EPIRB1
Serial number	006
EUT Mod State	0
EUT system configuration, including ancillary devices and modes of their operation:	The EUT was a fully packaged beacon, similar to the proposed production beacons equipped with its proper antenna
Beacon Antenna	Integral
Environmental conditions	Ambient temperature: 16.2 - 20.5 °C Relative air humidity: 58 - 69 %
Deviations from standard test procedures	There were no deviations from standard test procedures
Non-compliances noticed	There were not non-compliances

**5.10.1 Test Configuration 5 “Water” Ground Plane****Date of the Test:** May 08, 2014**Time of the Test:** 08:50 – 13:30 UTC**Test conditions:**

- Ambient temperature at open testing area: 16.2 – 18.8 °C
- Relative air humidity: 58 - 62 %
- Atmosphere pressure: 758 mm/Hg
- The duration of the satellite test: 04 hours 40 minutes.
- The homing transmitter not operated.
- Actual Location: N 44°35'16"; E 33°29'20".
- Data provided by ITMCC
- Beacon was completely submerged in salt water [composition 5% salt solution by weight, activated while submerged, and floating to the surface under its own buoyancy.
- Beacon was maintained at or near the centre of the container for the duration of the test that was provided by a polystyrene radio transparent circle, floating on the surface of water, the free swimming of beacon in water was provided by the central opening.
- Container holding the salt water was placed in an area with a good all round view of the sky.
- Container by a diameter 58 cm and depth by a 66 cm is made from a non-conductive material (PVC plastic) and there is 50 cm of salt water under the base of the beacon when it is floating in the container and 24 cm of salt water between the beacon and the sides of the container.
- Beacon is submerged in a container with water at floating-line.

**Beacon coding**

- Beacon is coded with Standard Location – Test protocol
- Country code is Italy
- Beacon identification number (15-digit ID): 1EFDF380C6FFBFF.

**APPENDIX A TO ANNEX F**  
**SATELLITE QUALITATIVE TEST SUMMARY REPORT**

**Date of the Test:** May 08, 2014

**Time of the Test:** 08:50 – 13:30 UTC

**Beacon Model:** EPIRB1

**Beacon 15 Hex ID:** 1EFDF380C6FFBFF

**Actual location of the test beacon:** Latitude N 44°35'16"; Longitude: E 33°29'20".

**Beacon test configuration:** floating in water (configuration 5 section 4.5 C/S T.007)

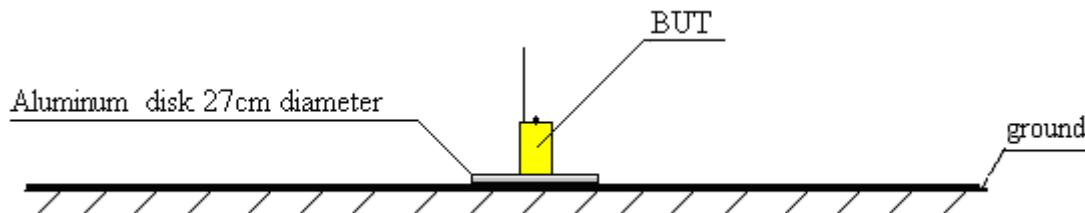
Satellite ID	Satellite Pass Number	Time of Closest Approach (TCA)	Cross Track Angle	15 Hex ID Provided by LUT	Doppler location	Location Error (km)
S8	70249	9:11	13.4	1EFDF380C6FFBFF	44 35.2N / 033 29.0E	0.457
S13	8492	10:00	20.6	1EFDF380C6FFBFF	44 35.2N / 033 29.1E	0.332
S12	27038	10:29	5.2	1EFDF380C6FFBFF	44 35.3N / 033 29.1E	0.314
S10	476196	11:43	14.9	1EFDF380C6FFBFF	44 35.6N / 033 29.4E	0.624
S12	27039	12:10	12.5	1EFDF380C6FFBFF	44 35.2N / 033 28.9E	0.585
S7	83119	12:33	16.8	1EFDF380C6FFBFF	44 35.5N / 033 29.3E	0.434
S10	46197	13:23	1.8	1EFDF380C6FFBFF	44 35.6N / 033 29.4E	0.624

$$\text{Ratio of successful solutions} = \frac{\text{number of Doppler solutions within } 5 \text{ km with } 1^\circ < \text{CTA} < 21^\circ}{\text{number of satellite passes over test duration with } 1^\circ < \text{CTA} < 21^\circ} \times 100 \%$$

$$\text{Ratio of successful solutions} = \frac{7}{7} \times 100\% = 100\%$$

**5.10.2 Test Configuration 7 Beacon on Ground Plane****Date of the Test:** May 12. 2014**Time of the Test:** 05:45 – 13:00 UTC**Test conditions:**

- Ambient temperature at open testing area: 17.3 – 20.1 °C
- Relative air humidity: 64 - 69 %
- Atmosphere pressure: 759 mm/Hg
- The duration of the satellite test: 07 hours 15 minutes.
- The homing transmitter not operated.
- Actual Location: N 44°35'16"; E 33°29'20".
- Data provided by ITMCC
- Beacon was placed in the vertical orientation described in the manufacturer's instruction.
- Beacon was placed in the area with a good all round view of the sky.
- Beacon was placed in the centre of a thin 27 cm diameter aluminum disc which was placed directly on level dry ground (dirt). Configuration 7 Section 4.5 C/S T.007.

**Beacon coding**

- Beacon is coded with Standard Location – Test protocol
- Country code is Italy
- Beacon identification number (15-digit ID): 1EFDF380C6FFBFF.

**APPENDIX A TO ANNEX F**  
**SATELLITE QUALITATIVE TEST SUMMARY REPORT**

**Date of the Test:** May 12, 2014

**Time of the Test:** 05:45 – 13:00 UTC

**Beacon Model:** EPIRB1

**Beacon 15 Hex ID:** 1EFDF380C6FFBFF

**Actual location of the test beacon:** Latitude N 44°35'16"; Longitude: E 33°29'20".

**Beacon test configuration:** beacon operated on ground plane (configuration 7 section 4.5 C/S T.007)

Satellite ID	Satellite Pass Number	Time of Closest Approach (TCA)	Cross Track Angle	15 Hex ID Provided by LUT	Doppler location	Location Error (km)
39231	S11	6:03	18.8	1EFDF380C6FFBFF	44 35.4N / 033 29.3E	0.251
70304	S8	6:42	12.3	1EFDF380C6FFBFF	44 35.2N / 033 29.2E	0.215
8547	S13	6:58	9.5	1EFDF380C6FFBFF	44 35.3N / 033 29.3E	0.076
70305	S8	8:22	5.3	1EFDF380C6FFBFF	44 35.3N / 033 29.1E	0.314
8548	S13	8:38	7.9	1EFDF380C6FFBFF	44 35.4N / 033 29.1E	0.395
39233	S11	9:23	15.6	1EFDF380C6FFBFF	44 35.7N / 033 28.8E	1.067
27094	S12	9:46	12.4	1EFDF380C6FFBFF	44 35.5N / 033 29.0E	0.617
70306	S8	10:02	20.9	1EFDF380C6FFBFF	44 35.5N / 033 28.9E	0.717
27095	S12	11:26	4.6	1EFDF380C6FFBFF	44 35.3N / 033 29.1E	0.314
83176	S7	12:35	16.6	1EFDF380C6FFBFF	44 35.6N / 033 29.0E	0.758
46253	S10	12:38	6.0	1EFDF380C6FFBFF	44 35.2N / 033 29.3E	0.131

$$\text{Ratio of successful solutions} = \frac{\text{number of Doppler solutions within } 5 \text{ km with } 1^\circ < \text{CTA} < 21^\circ}{\text{number of satellite passes over test duration with } 1^\circ < \text{CTA} < 21^\circ} \times 100 \%$$

$$\text{Ratio of successful solutions} = \frac{11}{11} \times 100\% = 100\%$$

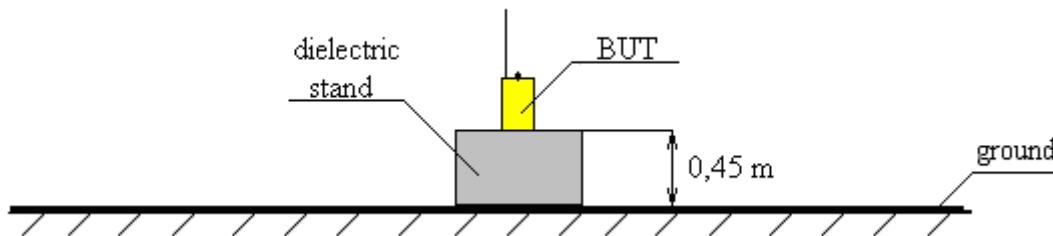
### 5.10.3 Test Configuration 8 Beacon above Ground Plane

Date of the Test: May 13, 2014

Time of the Test: 09:35 - 14:20 UTC

Test conditions:

- Ambient temperature at open testing area: 17.5 – 20.5 °C
- Relative air humidity: 57 - 64 %
- Atmosphere pressure: 754 mm/Hg
- The duration of the satellite test: 04 hours 45 minutes.
- The homing transmitter not operated.
- Actual Location: N 44°35'16"; E 33°29'20".
- Data provided by ITMCC
- Beacon was placed in the vertical orientation described in the manufacturer's instructions.
- Beacon was placed in an area with a good all round view of the sky.
- Beacon was placed on a wooden electrically insulating support so that its base is 0.45m above level dry ground. Configuration 8 Section 4.5 C/S T.007



#### Beacon coding

- Beacon is coded with Standard Location – Test protocol
- Country code is Italy
- Beacon identification number (15-digit ID): 1EFDF380C6FFBFF.

**APPENDIX A TO ANNEX F**  
**SATELLITE QUALITATIVE TEST SUMMARY REPORT**

**Date of the Test:** May 13, 2014

**Time of the Test:** 09:35 - 14:20 UTC

**Beacon Model:** EPIRB1

**Beacon 15 Hex ID:** 1EFDF380C6FFBFF

**Actual location of the test beacon:** Latitude N 44°35'12"; Longitude: E 33°29'17".

**Beacon test configuration:** beacon operated above ground plane (configuration 8 section 4.5 C/S T.007)

Satellite ID	Satellite Pass Number	Time of Closest Approach (TCA)	Cross Track Angle	15 Hex ID Provided by LUT	Doppler location	Location Error (km)
8563	13	9:56	20.20	1EFDF380C6FFBFF	44 34.7N / 033 29.1E	1.094
27109	12	11:15	2.65	1EFDF380C6FFBFF	44 35.0N / 033 29.7E	0.691
83190	7	12:11	20.25	1EFDF380C6FFBFF	44 35.2N / 033 29.3E	0.531
46267	10	12:27	7.97	1EFDF380C6FFBFF	44 35.1N / 033 29.5E	0.379
27110	12	12:57	20.71	1EFDF380C6FFBFF	44 35.2N / 033 29.3E	1.393
83191	7	13:49	4.55	1EFDF380C6FFBFF	44 35.2N / 033 29.3E	0.107
46268	10	14:08	9.53	1EFDF380C6FFBFF	44 35.2N / 033 29.3E	1.821

$$\text{Ratio of successful solutions} = \frac{\text{number of Doppler solutions within } 5 \text{ km with } 1^\circ < \text{CTA} < 21^\circ}{\text{number of satellite passes over test duration with } 1^\circ < \text{CTA} < 21^\circ} \times 100 \%$$

$$\text{Ratio of successful solutions} = \frac{7}{7} \times 100\% = 100 \%$$

## 5.11 Photographs



Fig. 5.11.1 — General view of test site for navigation test, point 2 (Configuration 7 – Beacon on ground plan).



Fig. 5.11.2 — General view of test site for navigation test, point 2 (Configuration 8 - Beacon above ground plane).



Fig. 5.11.3 — General view of test site for navigation test, point 1 (configuration 5 - Beacon floating in water).



Fig. 5.11.4 — General view of test site during satellite qualitative test at configuration 7 (section 4.5 C/S T.007).  
Beacon was raised above building.



Fig 5.11.5— General view of test site during satellite qualitative test at configuration 8 (section 4.5 C/S T.007).  
Beacon was raised above building.



Fig 5.11.6 — General view of satellite qualitative test place at configuration 5 before rise up (section 4.5 C/S T.007),  
i.e. beacon operating while floating in the salt water. Beacon was raised above building



Fig 5.11.8 — General view of antenna test place at configuration 1  
(section 4.5 C/S T.007), i.e. beacon “water” ground plane.



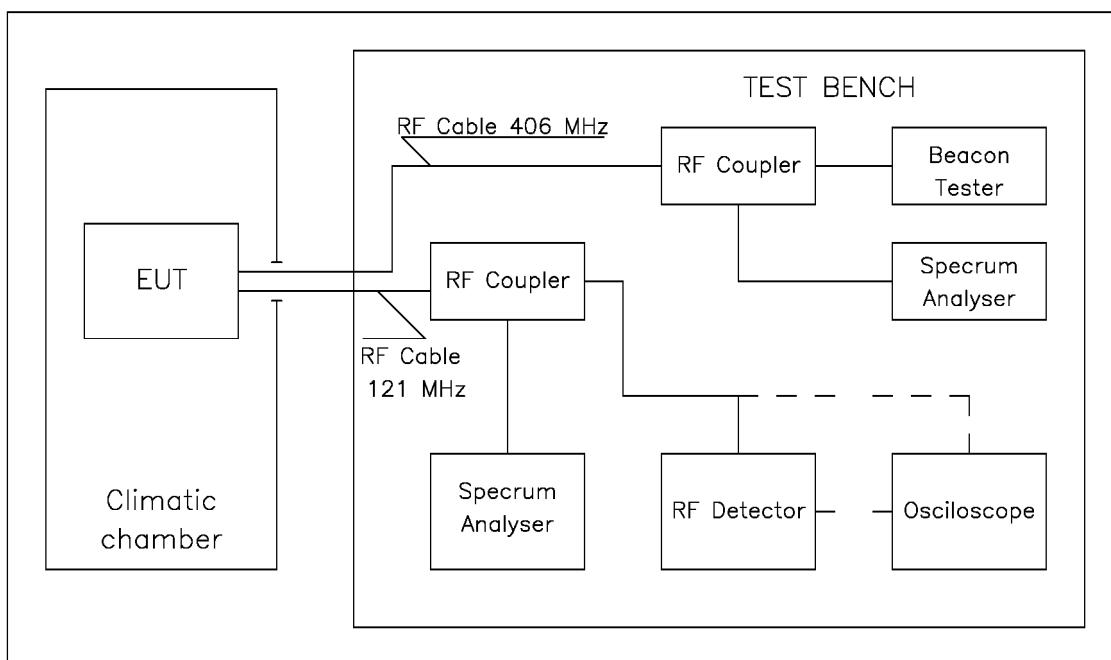
Fig 5.11.9 — General view of antenna test place at configuration 4 (section 4.5 C/S T.007), i.e. beacon operating above ground plane

## 5.12 Test Equipment

- **Test Equipment Used**

No.	Name of test equipment	Type, model	ser. No	Calibration due
1.	Beacon tester	BT-611	1005	06.2014
2.	Spectrum analyzer	FSH8	105763	10.2016
3.	Battery charger and analyser	UBA5	10225	02.2015
4.	Climatic chamber	KPK 400V	15	08.2014
5.	Climatic chamber	KTK-800	308286	10.2014
6.	Antenna	FCC-4	2314	09.2016
7.	Antenna mast	ATR 2	101208	n/a
8.	Ground plane	Ug	102282	n/a
9.	Multimetr	FLUKE -189	89750179	07.2014
10.	Oscilloscope	TDS-3052	B011258	05.2014
11.	Hygrometer	ВИТ-2	B931	03.2015
12.	Thermometer	Gradient-2002	078	02.2015
13.	RFAM	Ternovnik MO	No.1	n/a

- **Block diagramme of test setup for conducted measurements**



- **Test Facility Accuracy**

No.	Parameter	Test facility accuracy
1.	Repetition Time	± 0.01 sec
2.	Total (Transmission Time)	± 1.0 ms
3.	CW Preamble	± 1.0 ms
4.	Bit Rate	± 0.6 bit/sec
5.	Nominal Frequency	± 100 Hz
6.	Frequency Stability	< 1 x 10 <sup>-10</sup>
7.	Transmitted Power	± 0.5 dB
8.	Spurious Power Level	± 2 dB
9.	Carrier Rise Time	± 0.5 ms
10.	Modulation Rise	± 25 µs
11.	Modulation Symmetry	< 0.01
12.	Phase Modulation	± 0.04 rad
13.	Voltage	0.1%
14.	Current value	2%
15.	Ambient temperature (near beacon) various	± 2°C
16.	Antenna Measurement	± 3 dB

**ANNEX A**  
**Technical Data Submitted by Beacon Manufacturer**

## Index

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4.	Pre-test discharge data and analysis, Table F-E.2	5(c)	5(c). Battery Discharge figures Rev 4.pdf	231
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6.	Beacon manuals	5(e)	5e(i) EPIRB1 user manual Rev 5.pdf	235
7.	Beacon technical Data sheet	5(e)	5e(ii) EPIRB1 Technical Data Sheet.pdf	252
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9.	Battery cell technical data sheet	5(g)	5(g) Cell and Battery Data.pdf, data sheet CR123A 4.pdf	262, 335
10.	Electrical diagramme of the battery pack	5(g)	5(g) Cell and Battery Data.pdf	261
11.	Beacon labels and markings	5(h)	5(h) Beacon Labelling.pdf	264
12.	Reference oscillator type and specification	5(i-i)	5i(i) Technical Data for TCXO Rev 3.pdf	270
13.	Long-term frequency stability (LTS)	5(i-ii)	5i(i) Technical Data for TCXO Rev 3.pdf	279
14.	Technical data for TCXO	5(i-iii)	5i(i) Technical Data for TCXO Rev 3.pdf	270
15.	Report on oscillator ageing	5(i-iv)	In 5(j) Compliance statements Rev 4.pdf	279
16.	Serial Number and temperature gradient results	5(i-v)	In 5i(i) Technical Data for TCXO Rev 3.pdf	269, 273
17.	Design: protection against continuous transmission	5(j-i)	5(j) Compliance statements Rev 4.pdf	276
18.	Design: frequency 5-year frequency stability	5(j-ii)	5(j) Compliance statements Rev 4.pdf	276, 279
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22.	Matching network	5(k)	5(k) Antenna Analysis.pdf	286
23.	Beacon quality assurance plan (Annex L)	5(m)	5m Annex L {Quality assurance plan}.pdf	288
24.	GNSS receiver operating cycle and battery current	5(n)	5(n) GNSS operation and Data Sheets Rev 4.pdf	292
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26.	Position Data Encoding: Tables F-C.1, F-C.2, F-C.3	A.2.8	EPIRB 1 NAVIGATION AND BEACON CODING TEST RESULTS V1.02.PDF	298
27.	Beacon Coding Software: Tables F-D.1, F-D.2 and F-D.3	A.3.8.7	EPIRB 1 NAVIGATION AND BEACON CODING TEST RESULTS V1.02.PDF	328
28.	Manufacturer's letter regarding software issue numbering		Software compliance.pdf	333

Note. Column 'Pages' gives the references to the page numbers in the Test Report where the technical information mentioned by the beacon manufacturer in the Check-list is located.

**A complete check-list of technical information provided in support of the  
type-approval**

## APPENDIX F TO ANNEX F

**Table F-F.1: Check-List of Technical Data Provided by Beacon Manufacturer**

<b>Tick (✓) to indicate submission of items</b>	<b>Applicable C/S T.007 requirement</b>	<b>Description of technical information item</b>	<b>File name, title of document, page, section, where the item is located</b>
✓	5(a)	Application Form (Annex G)	5(a) Annex G1 signed.pdf
	6.2	Change Notice Form (Annex H)	N/A
✓	5(m)	Quality Assurance Plan (Annex L)	5m Annex L {Quality assurance plan}.pdf
✓	5(b)	Photos of the beacon in all operational configurations	5(b) Photos of operating modes.pdf
✓	5(c)	Pre-test discharge data and analysis, table F-E.2	5(c). Battery Discharge figures Rev 4.pdf
✓	5(d)	List and analysis of operating modes, Table F-E.1	5(d). Battery Modes Rev 4.pdf
✓	5(e)	Beacon manuals	5(e)(i) EPIRB1 user manual Rev 5.pdf
✓	5(e)	Beacon technical Data sheet	5e(ii) EPIRB1 Technical Data Sheet.pdf
✓	5(f)	Marketing brochure	5(f). Brochure Rev 2.pdf
✓	5(g)	Battery cell technical data sheet	5(g) Cell and Battery Data.pdf
✓	5(g)	Electrical diagramme of the battery pack	As above
✓	5(h)	Beacon labels and markings	5(h) Beacon Labelling.pdf
✓	5(i-i)	Reference oscillator type and specification	5i(i) Technical Data for TCXO Rev 3.pdf
✓	5(i-ii)	Long-term frequency stability (LTS)	As above
✓	5(i-iii)	Technical data for TCXO/MCXOs	As above
✓	5(i-iv)	Report on oscillator ageing	In 5(j) Compliance statements Rev 4.pdf
✓	5(i-v)	Serial Number and temperature gradient results (graph, summary and Excel file)	In 5i(i) Technical Data for TCXO Rev 3.pdf
✓	5(j-i)	Design: protection against continuous transmission	5(j) Compliance statements Rev 4.pdf
✓	5(j-ii)	Design: frequency 5-year frequency stability	As above
✓	5(j-iii)	Design: protection against repetitive self-test	As above
✓	5(j-iv)	Design: self-test default values	As above
✓	5(j-v)	Design: protection against GNSS receiver faulty operation	As above
✓	5(k)	Matching network	5(k) Antenna Analysis.pdf

	5(l)	Antenna cable type and maximum RF-losses	N/A
✓	5(n)	GNSS receiver operating cycle and battery current	5(n) GNSS operation and Data Sheets Rev 4.pdf
✓	5(n)	Internal GNSS receiver and antenna data sheets	As above
	5(o)	Interface with external navigation device	N/A
	5(p-i)	External ancillary devices: technical data sheets	N/A
	5(p-ii)	External ancillary devices: details of electrical connections	N/A
	5(q)	Beacon model variants	N/A
✓	A.3.8.7	Position Data Encoding: Tables F-C.1, F-C.2, F-C.3	EPIRB 1 Navigation and Beacon Coding Test results v1.02.pdf
✓	A.2.8	Beacon Coding Software: Tables F-D.1 , F-D.2 and F-D.3	As Above
✓		Other	Software compliance.pdf data sheet CR123A 4.pdf

06/08/2014 EPIRB1

David Sheekey, Product and  
Approvals Manager,  
david.sheekey@oceansignal.com



(date)

(beacon  
model)

(beacon manufacturers point of  
contact for the type approval: name,  
job title, e-mail address)

(signature)

## **Application Form (Annex G)**

**APPLICATION FOR A COSPAS-SARSAT 406 MHz BEACON  
TYPE APPROVAL CERTIFICATE<sup>1</sup>**

**G.1 INFORMATION PROVIDED BY THE BEACON MANUFACTURER**

**Beacon Manufacturer and Beacon Model**

Beacon Manufacturer	Ocean Signal
Beacon Model	EPIRB1
Other Model Names	

**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	<input checked="" type="checkbox"/>
PLB	On ground and above ground	<input type="checkbox"/>
	On ground and above ground and floating in water	<input type="checkbox"/>
ELT Survival	On ground and above ground	<input type="checkbox"/>
	On ground and above ground and floating in water	<input type="checkbox"/>
ELT Auto Fixed	Fixed ELT with aircraft external antenna	<input type="checkbox"/>
ELT Auto Portable	In aircraft with an external antenna	<input type="checkbox"/>
	On ground, above ground, or in a safety raft with an integrated antenna	<input type="checkbox"/>
ELT Auto Deployable	Deployable ELT with attached antenna	<input type="checkbox"/>
Other (specify)		<input type="checkbox"/>

**Beacon Characteristics**

Characteristic	Specification
Operating frequency	406.040 MHz
Operating temperature range	Tmin = -20 °C    Tmax= 55 °C
Operating lifetime	48 hours
Beacon power supply type (internal, external, combined, other)	Internal

<sup>1</sup> - according to C/S T.007 Iss.4 Rev.8 Oct 2013

Characteristic	Specification
External power supply parameters (AC/DC and nominal voltage)	-
Is external power supply needed to energise the beacon or its ancillary devices in any of operational modes (N/A or Yes or No)	No
Battery chemistry	Lithium Manganese Dioxide
Battery cell model name, size and number of cells in battery pack, and details of the battery pack electrical configuration	CR123A, 34.5mm x 16.8mm dia, 6, 2x3in series
Battery cell manufacturer	Qlite
Battery pack manufacturer and part number	Ocean Signal Ltd, 901S-01393
Beacon manufacturers declared maximum allowed cell shelf-life (from date of cell manufacture to date of battery pack installation in the beacon)	2.5 years
Declared beacon battery replacement period (from date of installation in the beacon to expiry date marked on the beacon)	12.5 years
Oscillator type (e.g. OCXO, MCXO, TCXO)	TCXO
Oscillator manufacturer	Rakon UK Ltd
Oscillator part name and number	E5344LF
Oscillator satisfies long-term frequency stability requirements (Yes or No)	Yes
Antenna type: Integral or Other (e.g. External, Detachable – specify type)	Integral, Manually deployable
Antenna manufacturer	Ocean Signal Ltd.
Antenna part name and number	130S-01404
Navigation device type (Internal, External or None)	Internal
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 not encoded into the beacon message (Yes, No or N/A)	Yes
Navigation device capable of supporting global coverage (Yes, No or N/A)	Yes
Encoded position update capability (Yes, No, N/A) and	Yes