

	<p> Manufacturer : MARTEC. B e a c o n M o d e l : Kannad Auto/Auto GPS/Manual/Manual GPS/Manual+/Manual+ GPS </p>	<p> INTESPACE Reference E6668-RTCM </p>
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CHAPTER 17

121.5 MHz AUXILLARY RADIO-LOCATING DEVICE TRANSMITTER TEST

	<p>Manufacturer : MARTEC. B e a c o n M o d e l : Kannad Auto/Auto GPS/Manual/Manual GPS/Manual+/Manual+ GPS</p>	<p>INTESPACE Reference E6668-RTCM</p>
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<p>17.1 - ELECTRICAL AND FUNCTIONAL TEST OF 121,5 MHZ AT CONSTANT TEMPERATURE</p>
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	<p align="center">Manufacturer : MARTEC. B e a c o n M o d e l : K a n n a d Auto/Auto GPS/Manual/Manual GPS/Manual+/Manual+ GPS</p>	<p align="center">INTESPACE Reference E6668-RTCM</p>
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17.1.1 TEST SPECIFICATIONS AND PROGRAMME

Following

- Section A17.0 of RTCM Recommended Standards for 406 MHz Satellite EPIRBs (Version 2.1 June 20, 2002)
- Section 10.3 of ETSI EN 300 066 V1.3.1(2006-01):

• Perform following measurements.

- Carrier frequency
- Modulation frequency
- Transmitter duty cycle
- Sweep repetition rate
- Modulation duty cycle
- Modulation factor

Note : These tests are performed during the COSPAS-SARSAT Type Approval tests (chapter 13)

17.1.2 EQUIPMENT UNDER TEST


Beacon Unit : UUT 3, UUT4 & UUT7
Name : Martec
Type : KANNAD Auto/Auto GPS/Manual/Manual GPS/Manual+/Manual+ GPS
Number : 54143 (3), 59374 (4) & 38169(7)
Class : II

17.1.3 TEST SITE

Toulouse Space Center (CST) - INTESPACE Laboratory.

17.1.4 TEST EQUIPMENT

- Climatic chamber : CLIMATS F.C.H. – Type: Austral 137H60/1,5E - S/N: S4880.
- Argos - Cospas/Sarsat Test Bench

	Manufacturer : MARTEC. B e a c o n M o d e l : Kannad Auto/Auto GPS/Manual/Manual GPS/Manual+/Manual+ GPS	INTESPACE Reference E6668-RTCM
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17.1.5. RESULTS OF HOMING TRANSMITTER TESTS

Beacon Unit : UUT 3
 Name : Martec
 Type : KANNAD Auto/Auto GPS/Manual/Manual GPS/Manual+/Manual+ GPS
 Number : 54143 (3)
 Class : II

			T min. - 20° C	T amb. 22° C	T max + 55° C
1 - OPERATING LIFETIME AT MINIMUM TEMPERATURE	48H		76 h		
2 - CARRIER FREQUENCY	* 121500 kHz± 5 kHz		121.5042	121.5023	121.5019
3 - PEAK ENVELOPE OUTPUT POWER	** 14 dBm + 6/- 2 dBm (into 50 Ohms load)		19.5 dBm	19.3 dBm	18.9 dBm
4 - TRANSMITTER DUTY CYCLE	continuous		Cont.	Cont.	Cont.
5 - MODULATION FREQUENCY	300 to 1 600 Hz		490 to 1310	480 to 1320	490 to 1320
6 - MODULATION DUTY CYCLE	33 % - 55 %		50 %	50 %	50 %
7 - MODULATION FACTOR	> 0.85		. > 0.85	> 0.85	> 0.85
8 - SWEEP REPETITION RATE	2 Hz - 4 Hz		3.11 Hz	3.1 Hz	3.06 Hz
9 - HOMING TRANSMISSION CODING	* Bit 112 = 1		1	1	1

* See data and graphs of results on chapter 13 “ Cospas-Sarsat Type Approval Tests Report ”

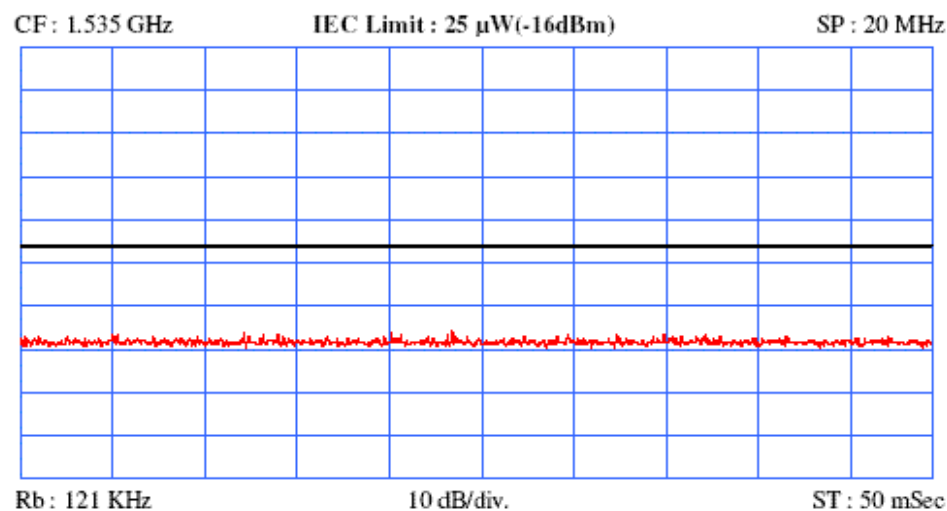
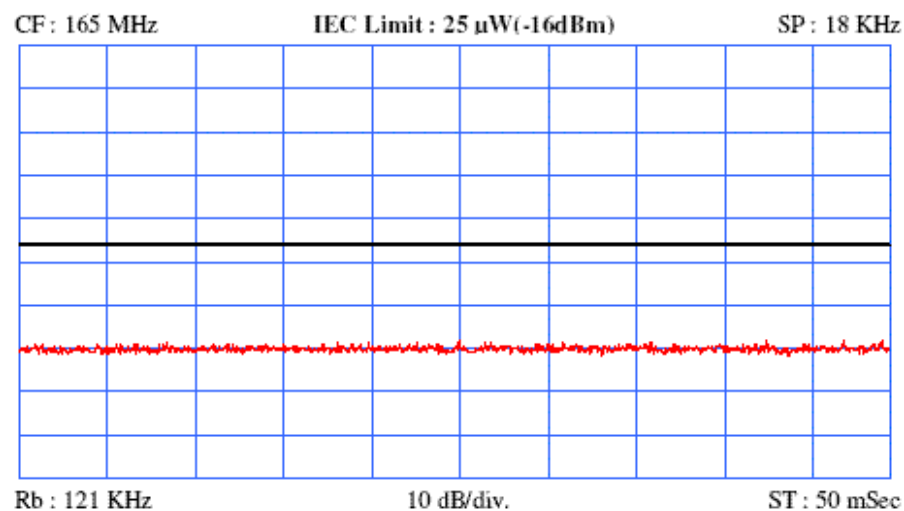
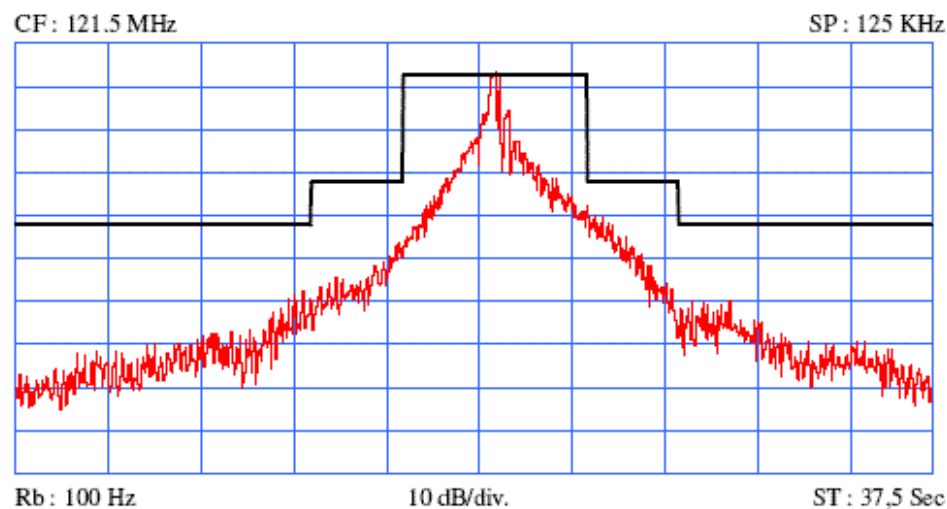
17.1.6. SPECTRUM MEASUREMENT RESULTS



Manufacturer : MARTEC.
Beacon Model : Kannad
Auto/Auto GPS/Manual/Manual
GPS/Manual+/Manual+ GPS

INTESPACE Reference
E6668-RTCM

MARTEC
KANNAD MANUAL+ GPS
38169(UUT7)
Certification nominale
121,5 MHz
-20 °C

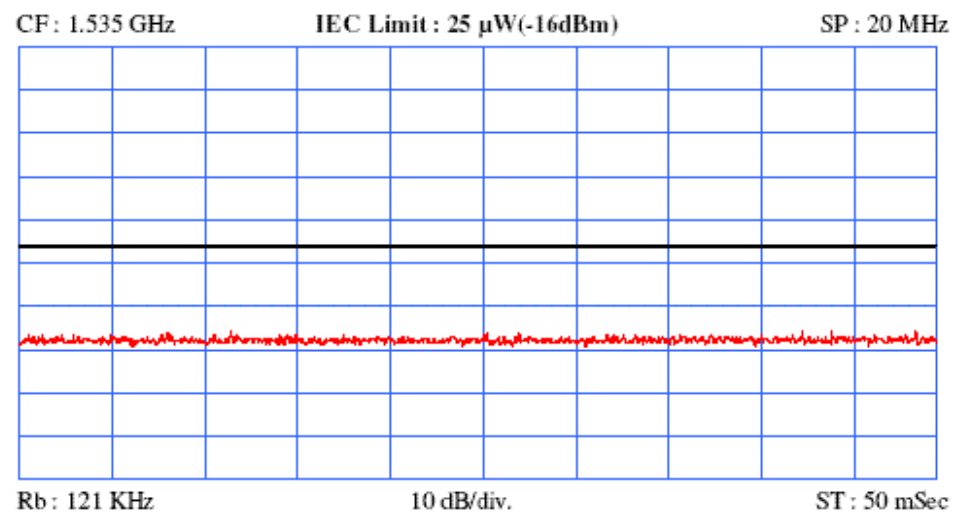
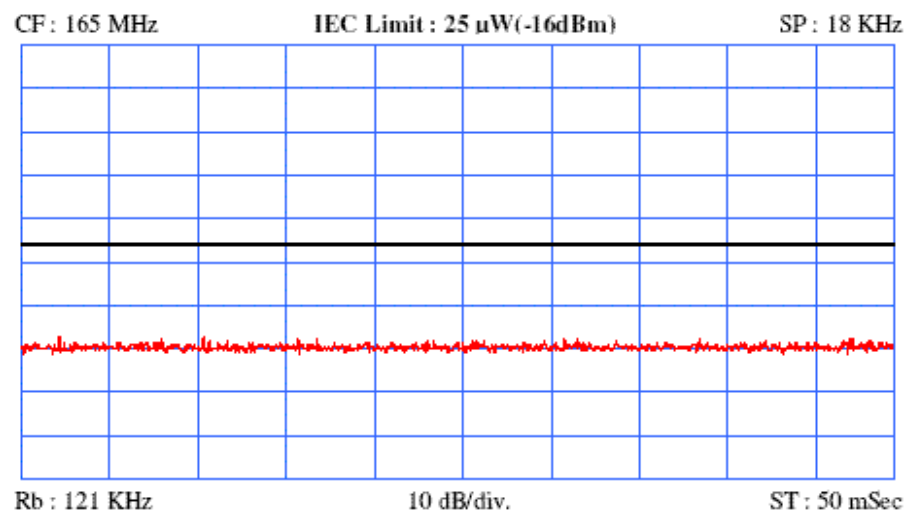
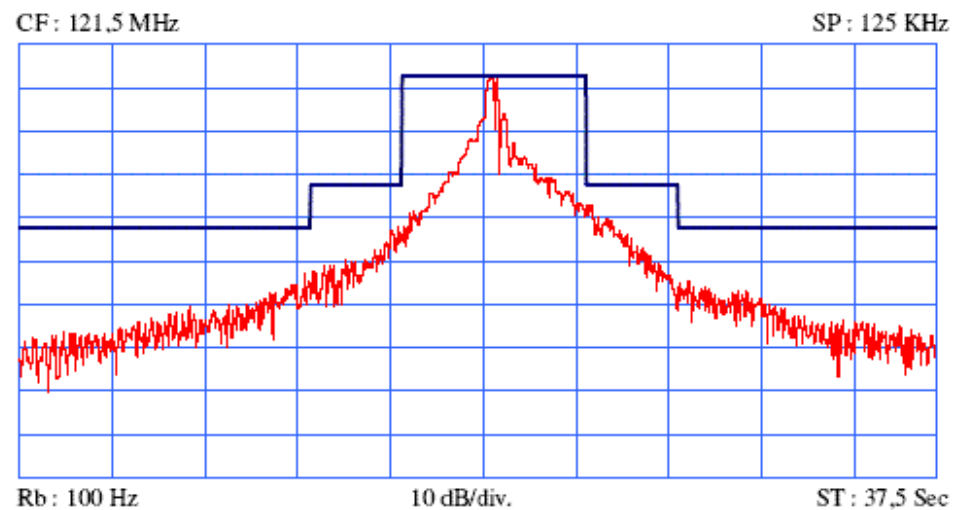




Manufacturer : MARTEC.
Beacon Model : Kannad
Auto/Auto GPS/Manual/Manual
GPS/Manual+/Manual+ GPS

INTESPACE Reference
E6668-RTCM

MARTEC
KANNAD MANUAL+ GPS
38169(UUT7)
Certification nominale
121,5 MHz
22 °C

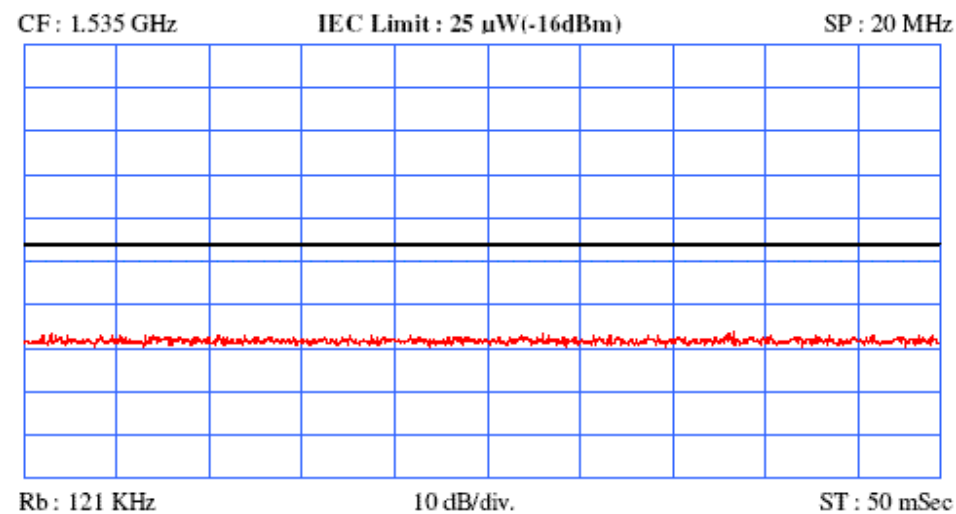
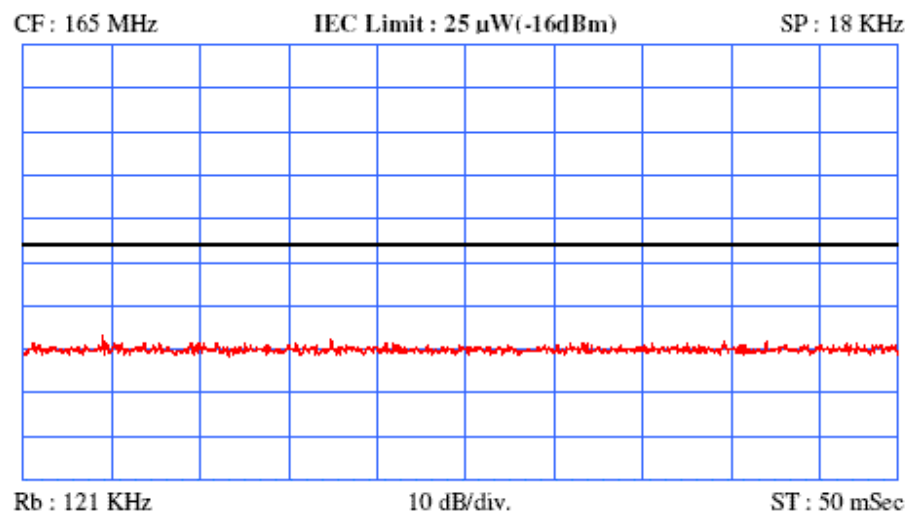
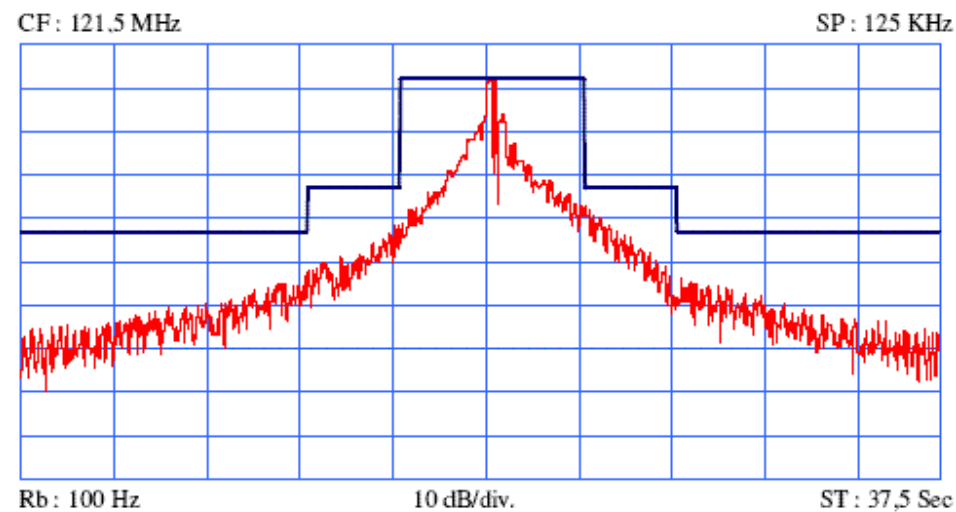





Manufacturer : MARTEC.
Beacon Model : Kannad
Auto/Auto GPS/Manual/Manual
GPS/Manual+/Manual+ GPS


INTESPACE Reference
E6668-RTCM

MARTEC
KANNAD MANUAL+ GPS
38169(UUT7)
Certification nominale
121,5 MHz
55 °C



	<p> Manufacturer : MARTEC. B e a c o n M o d e l : Kannad Auto/Auto GPS/Manual/Manual GPS/Manual+/Manual+ GPS </p>	<p> INTESPACE Reference E6668-RTCM </p>
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17.2- HOMING RADIATED OUTPUT POWER ON UUT 2/2

	<p align="center">Manufacturer : MARTEC. B e a c o n M o d e l : Kannad Auto/Auto GPS/Manual/Manual GPS/Manual+/Manual+ GPS</p>	<p align="center">INTESPACE Reference E6668-RTCM</p>
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17.2.1 - ADMINISTRATION

17.2.1.1	WORK ORDER :	Reference: E6668-ETS/IEC
17.2.1.2	TEST TEAM :	Maël FERRET - Yahia AZZAOU
17.2.1.3	SCHEDULE :	December 12 th , and 13 th , 2005

17.2.2 - PURPOSE

The radiation tests of the dedicated radio beacon are performed in INTESPACE EMC Laboratory in compliance with the test methods described in :

- Section 10.3.5 of ETS 300-066 Standard ETSI EN 300 066 V1.3.1(2006-01) ;
- Annex D, § D4.2 of IEC 61097-2 (Second edition –2002-09) and
- Section A17.0 of RTCM Recommended Standards for 406 MHz Satellite EPIRBs (Version 2.0 Feb 5th, 1997) and

Frequency tested : 121.5 MHz.


17.2.3 - RADIO BEACON IDENTIFICATIONS

Beacon Units : UUT 4
Name : Martec
Type : KANNAD Auto/Auto GPS/Manual/Manual GPS/Manual+/Manual+ GPS
Number : 59374 (4)

Antenna : Martec Antenna

17.2.4 - TEST SITE DESCRIPTION

Tests are performed in an anechoic chamber (size 16 m x 10 m x 11 m) .
Walls, ceiling and doors are lined with EMERSON CUMING foams VHP 36 and VHP 26 type.
The EPIRB is placed as shown on figures n° 1 and n° 2 next pages .

	<p>Manufacturer : MARTEC. Beacon Model : Kannad Auto/Auto GPS/Manual/Manual GPS/Manual+/Manual+ GPS</p>	<p>INTESPACE Reference E6668-RTCM</p>
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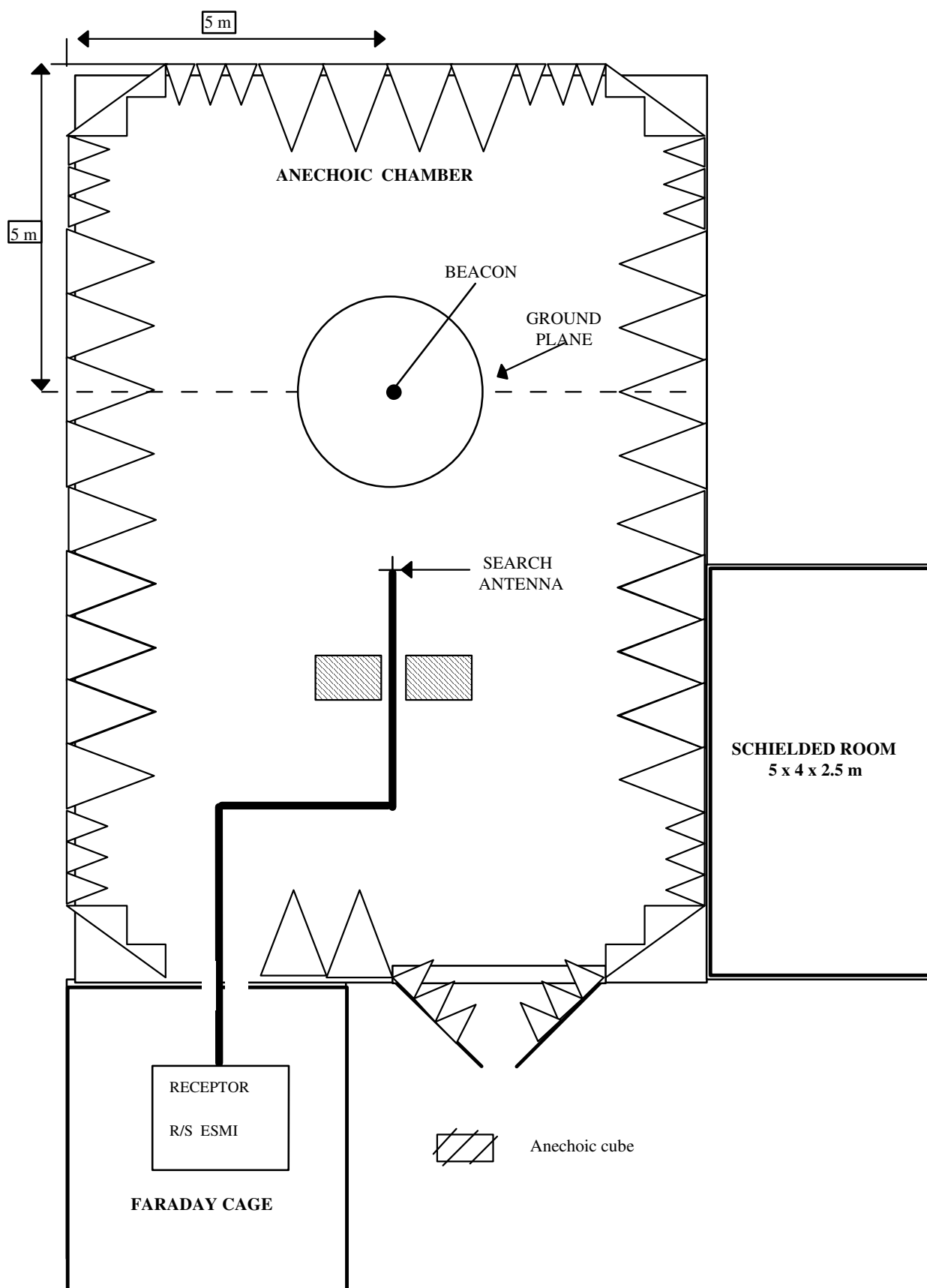



FIGURE 1

	<p>Manufacturer : MARTEC. Beacon Model : Kannad Auto/Auto GPS/Manual/Manual GPS/Manual+/Manual+ GPS</p>	<p>INTESPACE Reference E6668-RTCM</p>
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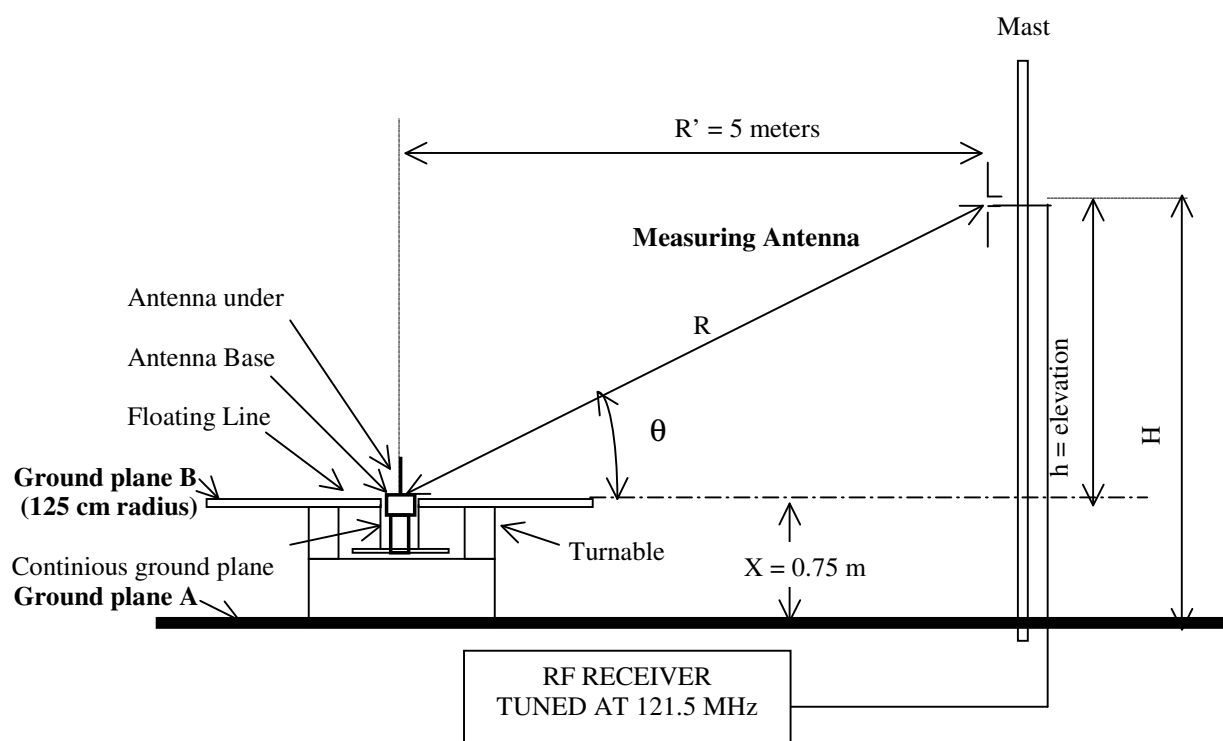



FIGURE 2 : Equipement Test Set Up For BEACON Antenna Test
(For BEACON designed for normal operation in water, ex: EPIRB)

	<p align="center">Manufacturer : MARTEC. B e a c o n M o d e l : Kannad Auto/Auto GPS/Manual/Manual GPS/Manual+/Manual+ GPS</p>	<p align="center">INTESPACE Reference E6668-RTCM</p>
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17.2.5 - TEST METHOD

- 1/ The elevation angle between 5° and 20° which produces a maximum gain is determined with the EUT at an arbitrary azimuth .
- 2/ The PEP is measured and the elevation angle is noted (between 5° to 20°) and is remain fixed for the remainder of the test .
- 3/ The remaining 12 measurements of PEIRP is obtained by rotating the EUT in increments of 30° ± 3°. For each measurements the EUT PEIRP is computed using the following equation :

$$PEIRP = LOG^{-1} [(P_{REC} - G_{REC} + L_C + L_P)/10] \quad (\text{Equation A})$$

Where :

P_{rec} = Measured Power level from spectrum analyzer (dBm)
 G_{rec} = Antenna gain of search antenna (dB)
 L_c = Receive system attenuator and cable loss (dB)
 L_p = Free space propagation loss (dB)

- 4/ The median value of PEIRP is compared to the specified PEIRP to be in the range 25 mW to 100 mW (14 dBm to 20 dBm)

17.2.6 - TEST MEASUREMENT EQUIPMENTS

Search Antenna


- 121.5 MHz test : EMCO Dipole - 3121 C - DB2 - S/N 763
Calibration validity : dec 2005

SPECTRUM ANALYSER

- HP 8566
Calibration validity : oct-06

CABLES

- 10 m cable SUCOFLEX type 100 - cable loss at 121.5 MHz : 1.6 dB

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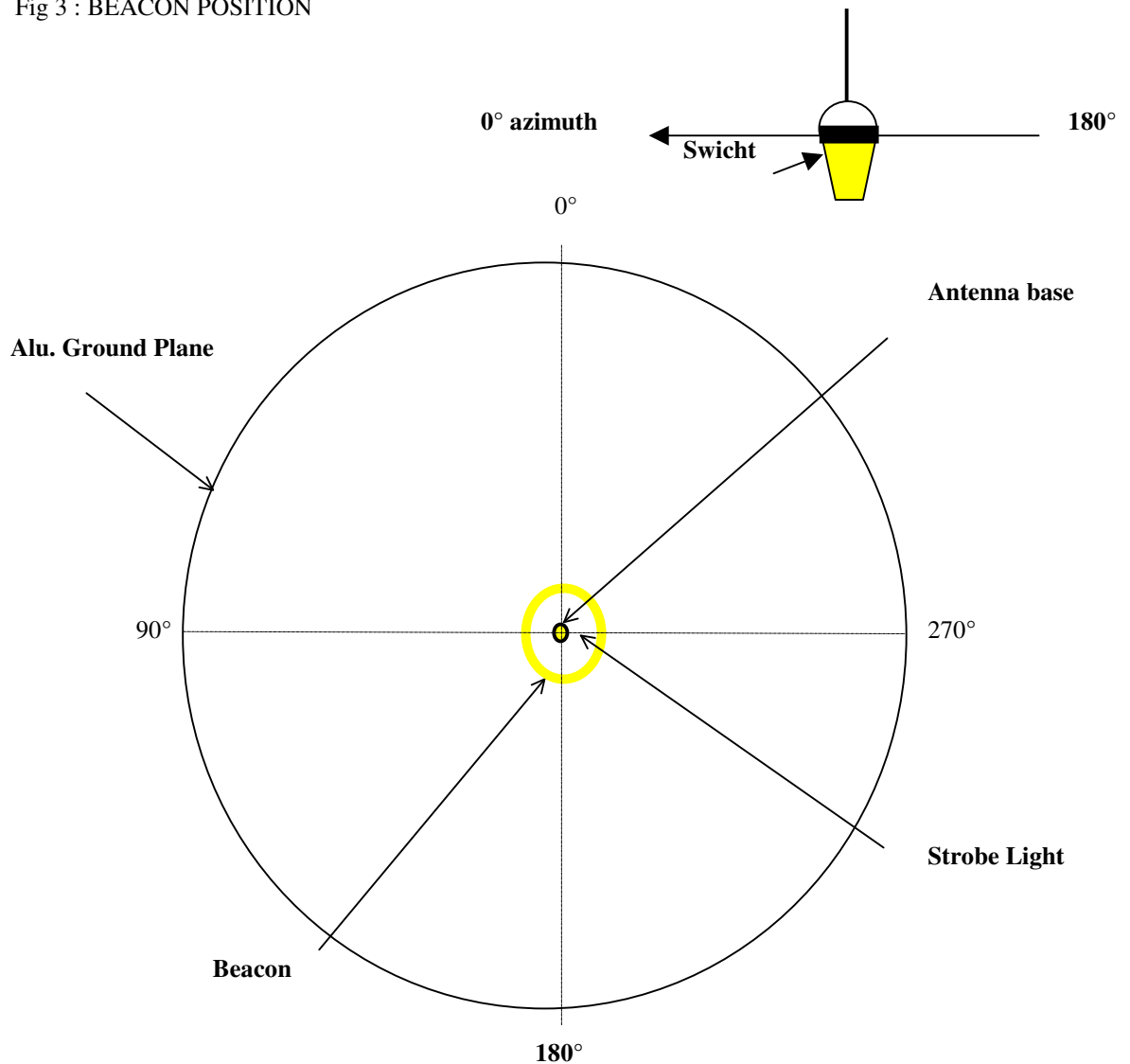
17.2.7 - EPIRB MECHANICAL SET UP


A conductive aluminium paper is used to assure a good conductivity between beacon float level and the ground plane.

Antenna is the centre of rotation of azimuth angle.

0° azimuth turn table direction is identified with the Beacon switch

Fig 3 : BEACON POSITION



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18.2.8 MEASUREMENT RESULTS

Following the Equation (A), 12 value of EUT PEIRP are computed at 5 ° of elevation angle

Azimut Angle	PEIRP (dBm)
0	14,45
30	14,45
60	14,45
90	14,65
120	14,65
150	14,65
180	14,65
210	14,55
240	14,55
270	14,55
300	14,45
330	14,45
Mean value	14,54 dBm

The PEIRP measured and computed are in conformance with specification required :

$$14 \text{ dBm} \leq \text{PEIRP} \leq 20 \text{ dBm}$$

and

$$\text{PEIRP Azimuth Variation} < 3 \text{ dB}$$