

## **CHAPTER 10**

### **A10.0 - SPURIOUS EMISSIONS TEST**

## 10.1 TEST SPECIFICATIONS AND PROGRAMME

Following Section A9.0 of RTCM Recommended Standards for 406 MHz Satellite EPIRBs (Version 2.0 Feb 5, 1997) :

- Perform the spurious and harmonic emissions measurements for the 406 MHz and 121.5 MHz signals at the minimum, maximum, and ambient temperatures .
- Control, respectively, that measurements not exceed the limits given in Figure 2-1(406 MHz Spectrum Mask) and Figure 2-5 (121.5 MHz Spectrum Mask)

**Note :** These tests are performed during the COSPAS-SARSAT Type Approval tests (chapter 12)

## 10.2 EQUIPMENT UNDER TEST

Beacon Unit : 1/2  
Name : ACR  
Type : R1B35  
Number : 07

## 10.3 TEST SITE

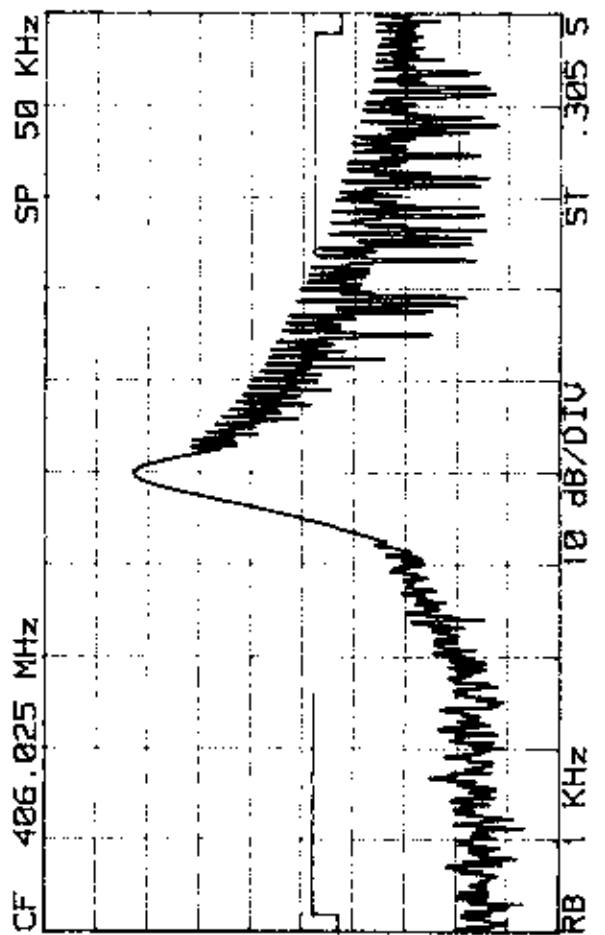
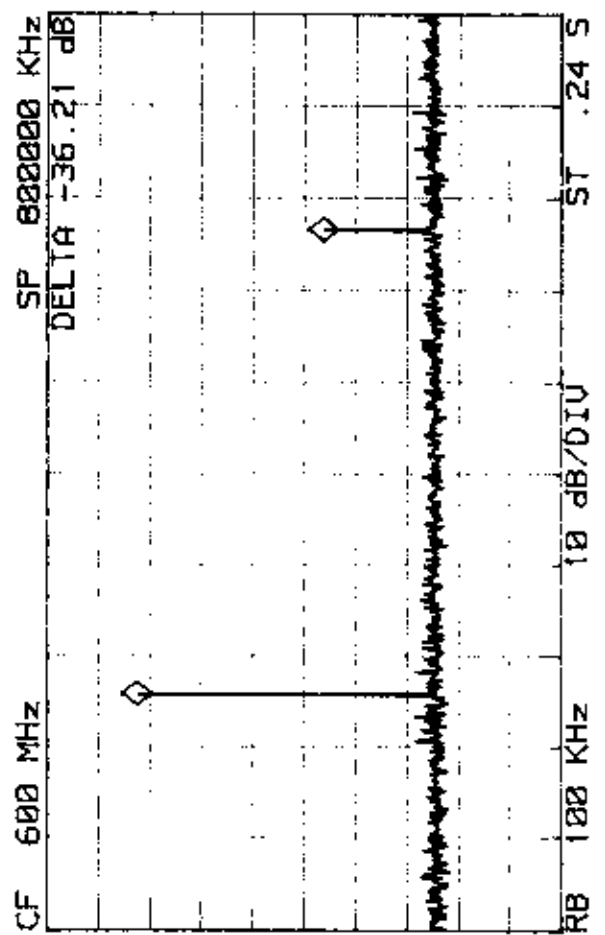
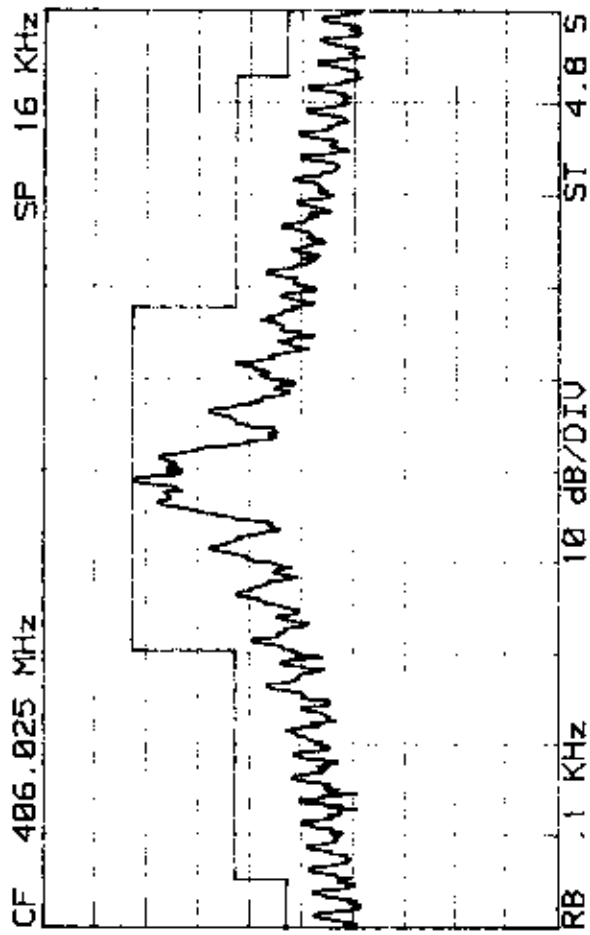
Toulouse Space Center (CS1) - INTESPACE Laboratory.

## 10.4 TEST EQUIPMENT

- Climatic chamber : CLIMATS F.C.I.L. Type: Austral 137H60/1,5E - S/N: 54880.
- Argos - Cospas/Sarsat Test Bench

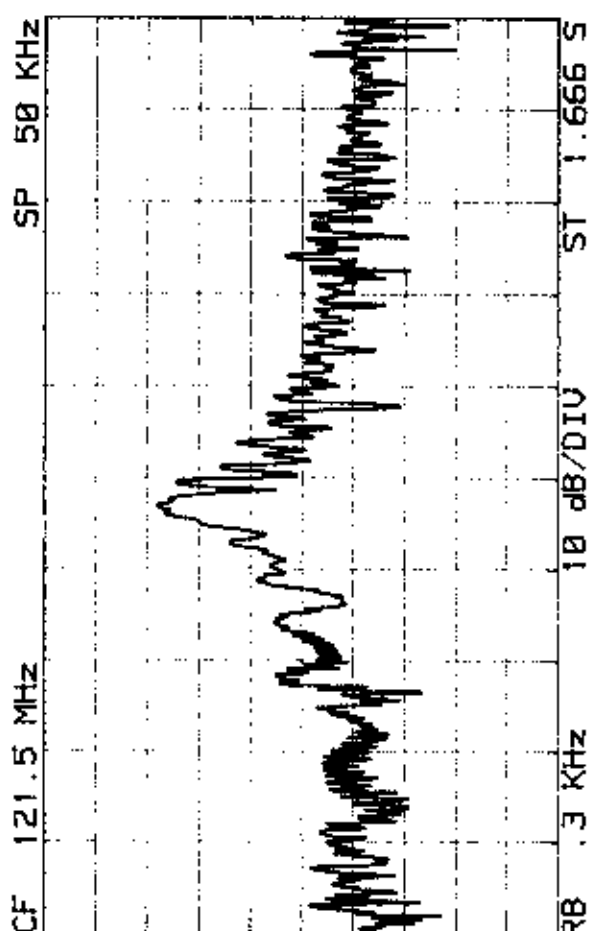
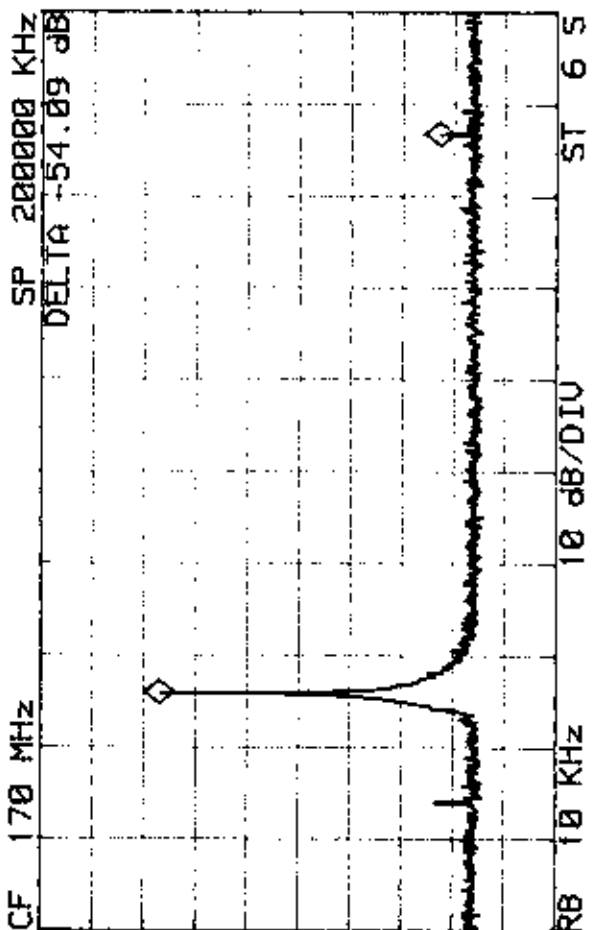
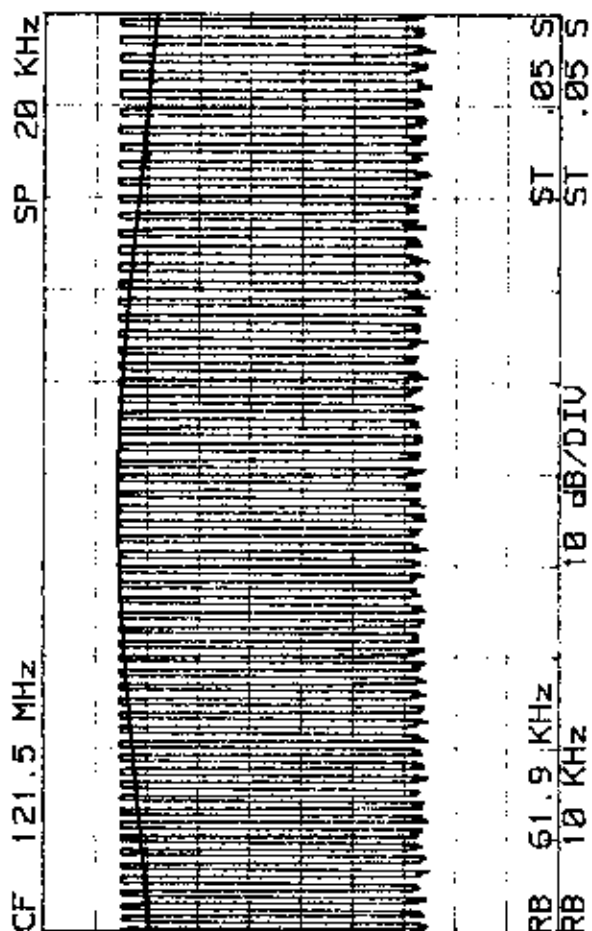
## 10.5. RESULTS

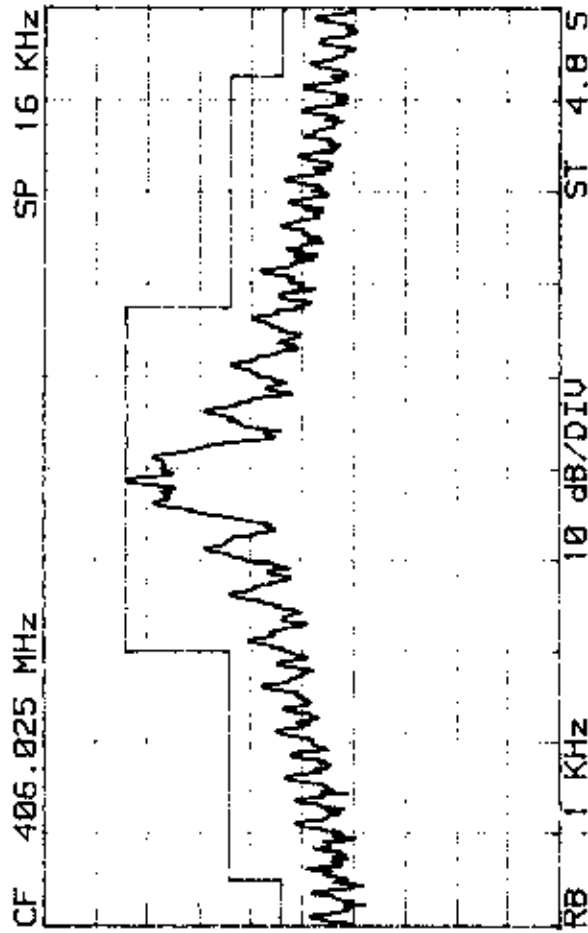
The graphs of spurious and harmonic measurements for the 406 MHz and 121.5 MHz signals are reported next pages :



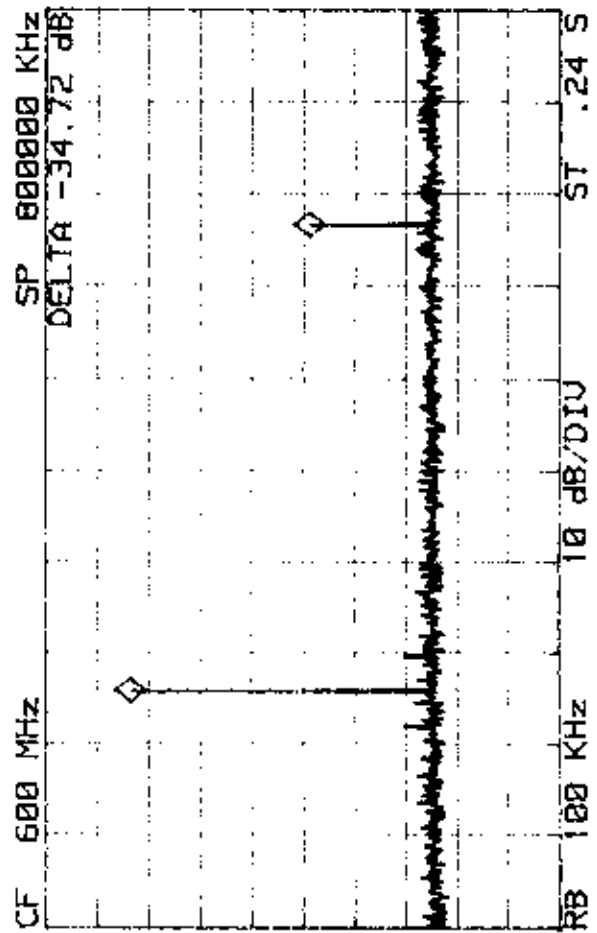
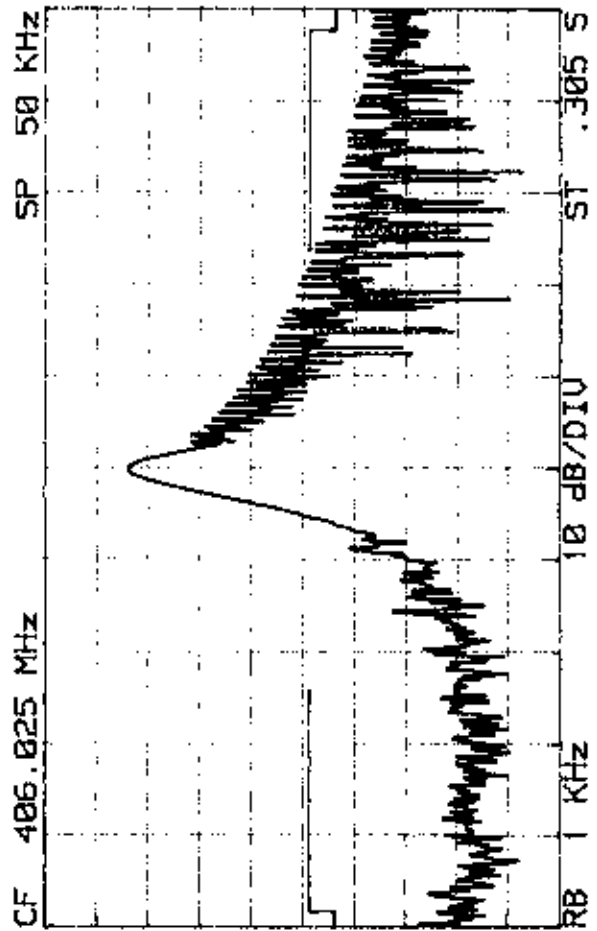
ACR  
RLB35  
07  
25 Apr 2001  
406 MHz  
TEMP : -48°C

ACR  
 RLB35  
 07  
 25 Apr 2001  
 121.5 MHz  
 TEMP : -40°C

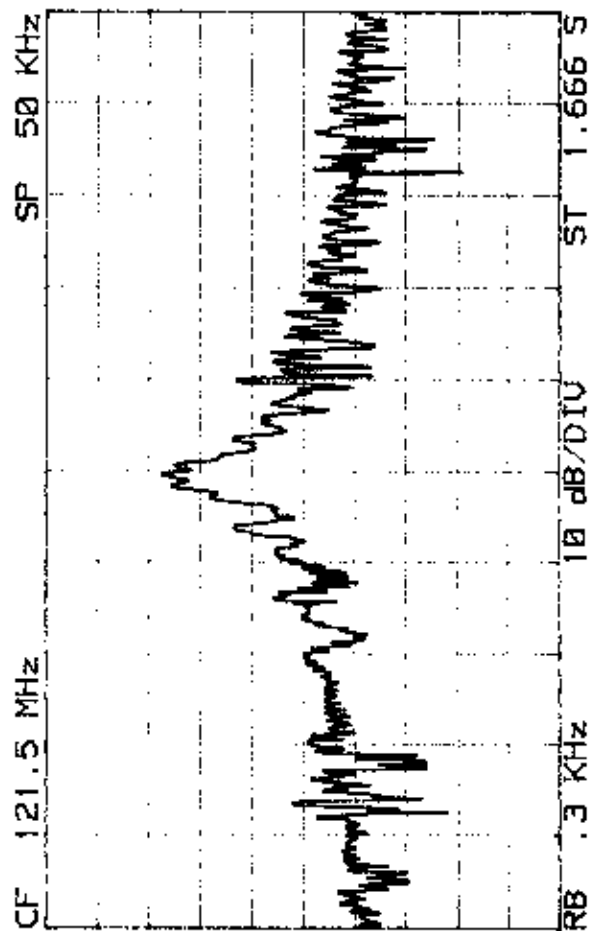
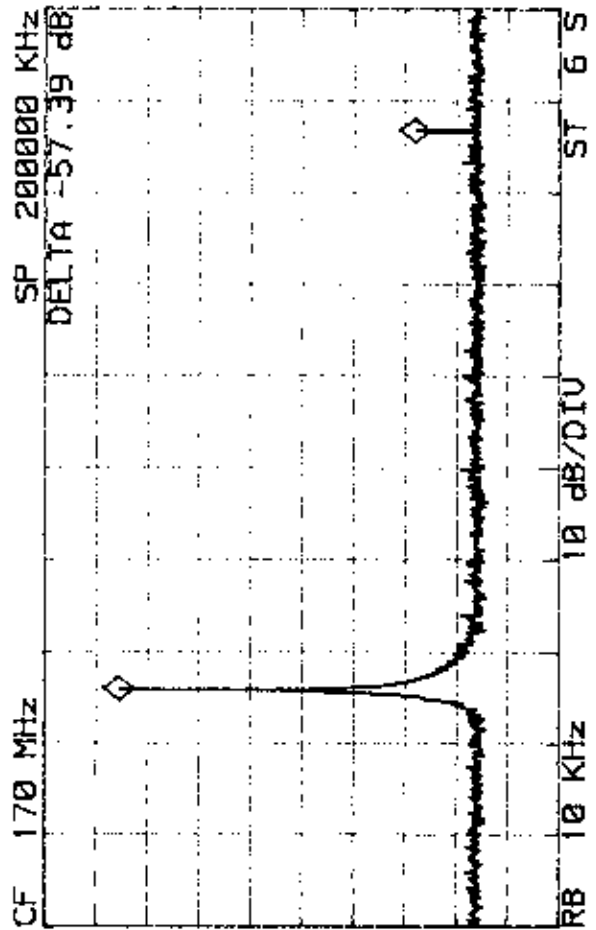
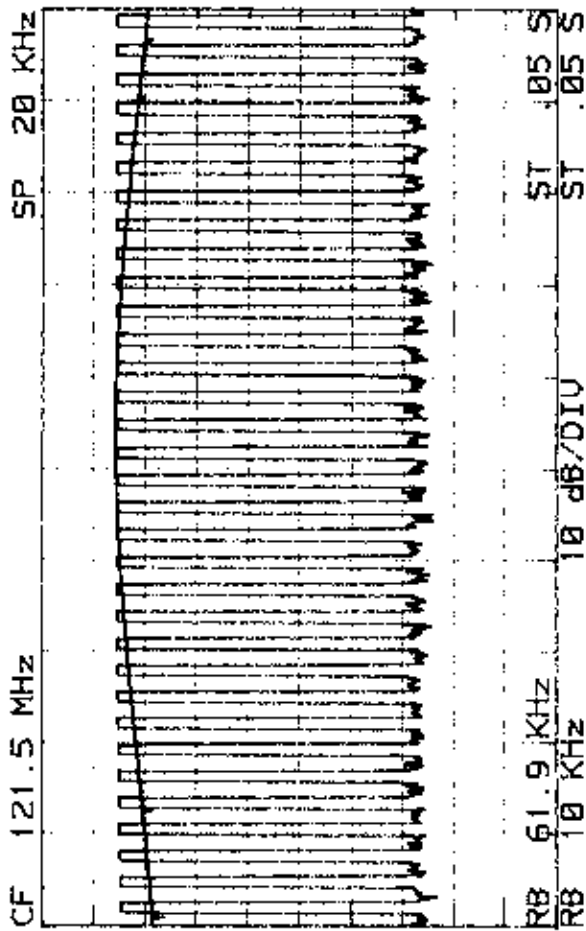




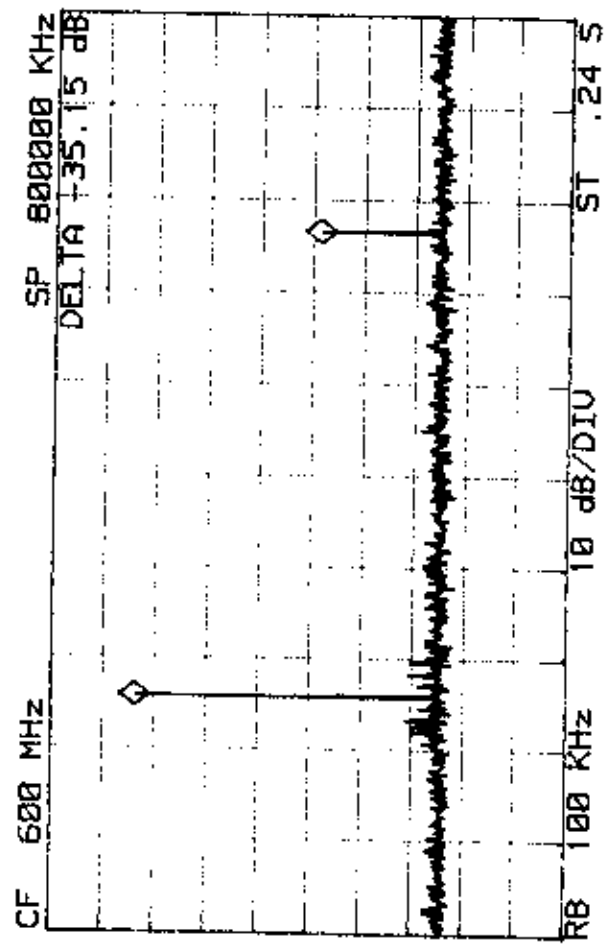
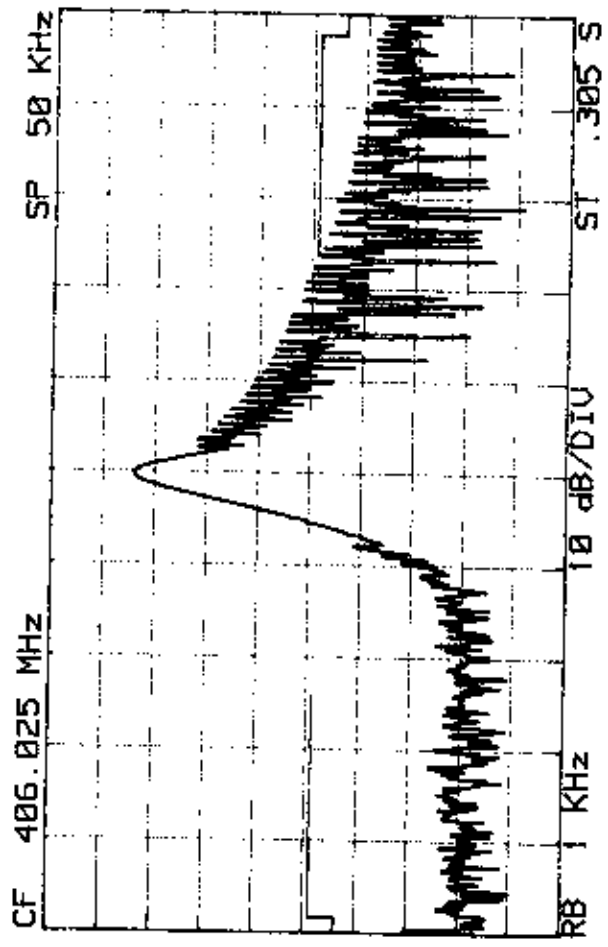
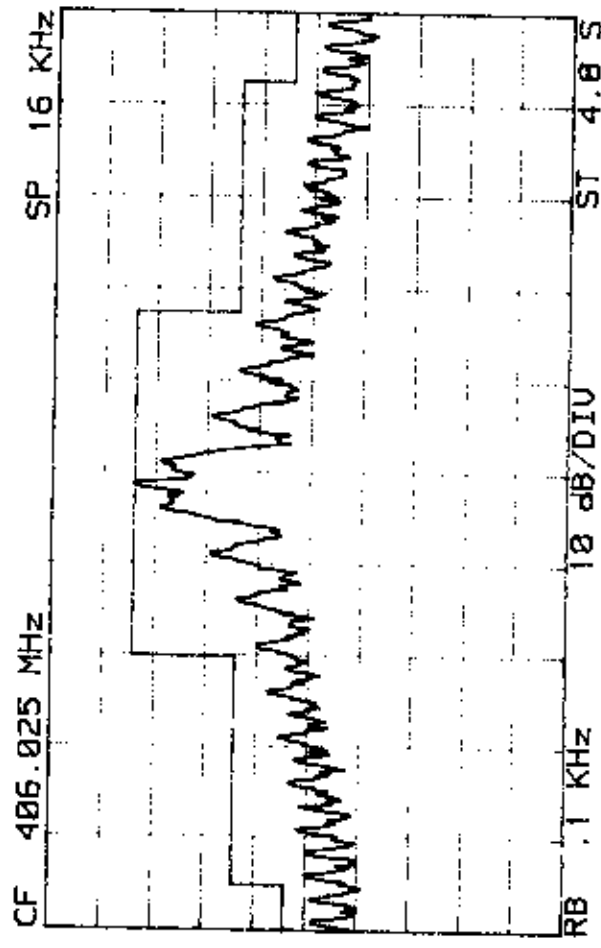
ACR  
RLB35  
07  
18 Apr 2001  
406 MHz  
TEMP : 22°C



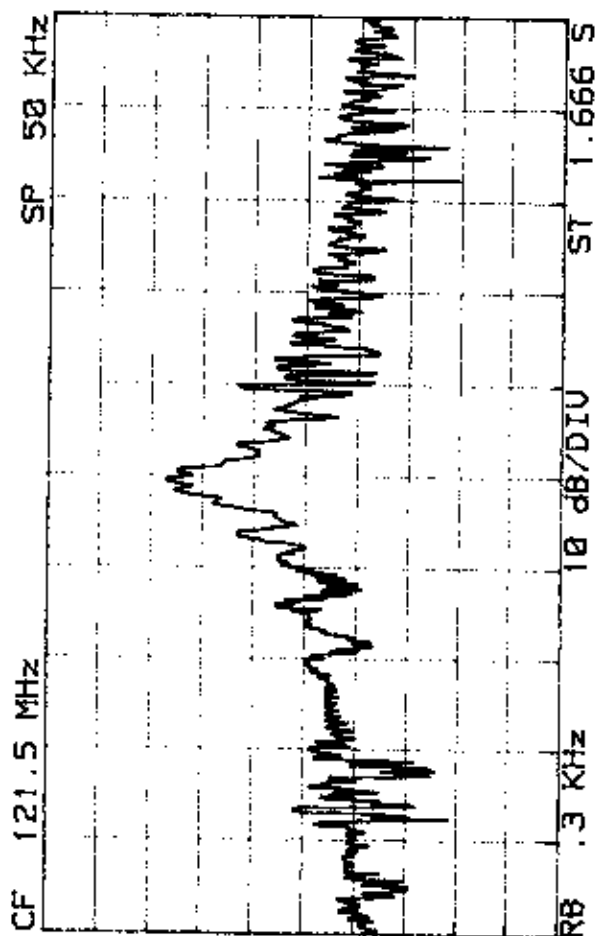
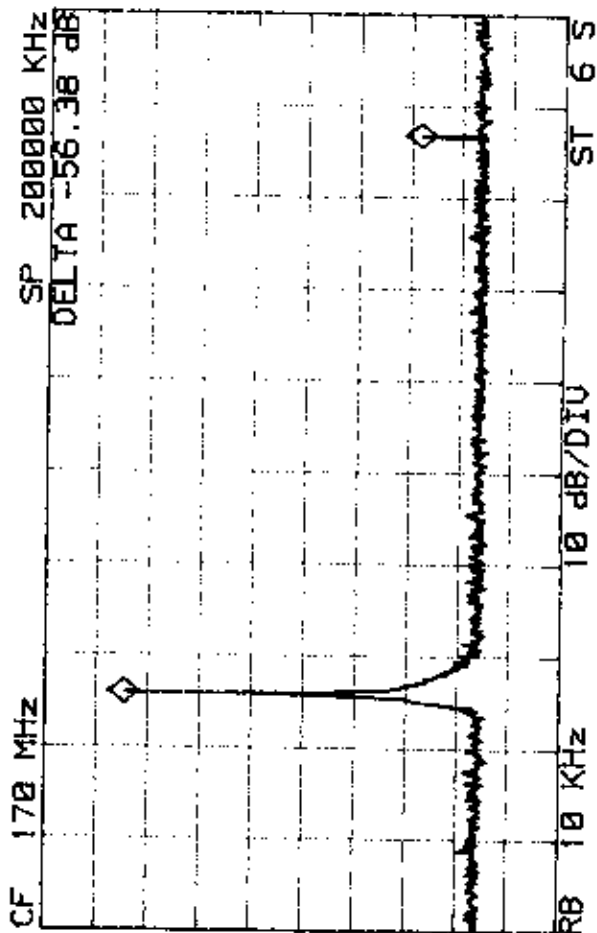
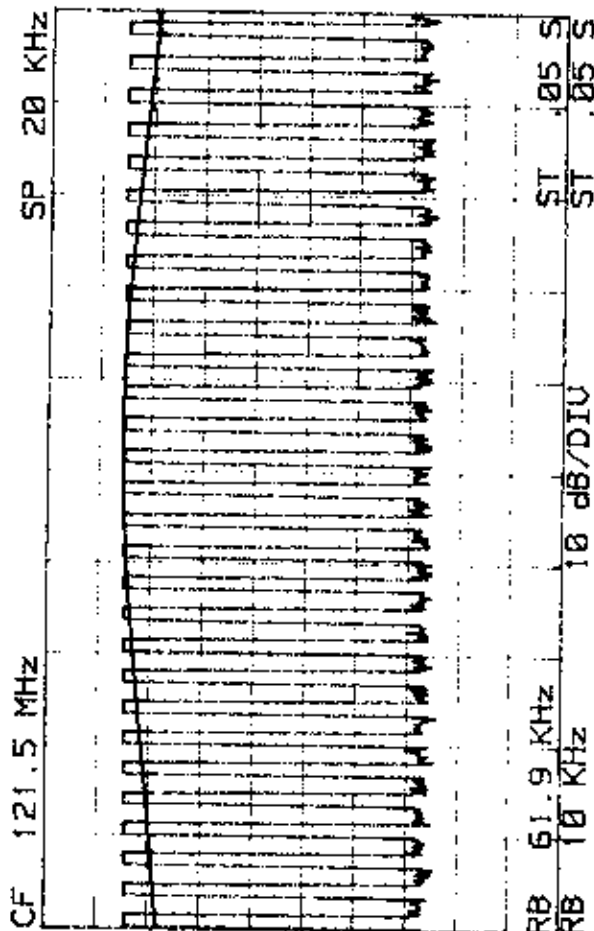
ACR  
 RLB35  
 07  
 18 Apr 2001  
 121.5 MHz  
 TEMP : 22°C



ACR  
RLB35  
07  
19 Apr 2001  
406 MHz  
TEMP : 55°C



ACR  
 RLB35  
 07  
 19 Apr 2001  
 121.5 MHz  
 TEMP : 55 °C





## **CHAPTER 11**

### **A11.0 - THERMAL SHOCK TESTS**

## 11.1 TEST SPECIFICATIONS AND PROGRAMME

### 11.1.1 TEST SPECIFICATIONS

- Following Section A11.0 of RTCM Recommended Standards for 406 MHz Satellite EPIRBs (Version 2.0 Feb 5,1997) :

### 11.1.2 TEST SEQUENCE

#### LOW -TEMPERATURE THERMAL SHOCK

- With the beacon in the ready condition , place it in a temperature-controlled oven at - 30° C for a minimum of three hours.
- Remove the beacon from the oven and immerse it in fresh water at a temperature of 0° C to + 5° C. for 5- 10 seconds .
- Then control if the EUT is normally self activate within 5 minutes floating in water at that temperature .
- Remove the EUT from the water , deactivate it, set it to the ready position and place it in a temperature-controlled oven at - 30° C for a minimum of three hours.
- Immerse the beacon in salt water ( 5 % NaCl ) at a temperature of - 2° C to + 5° C for 10 seconds .
- Then control if the EUT is normally self activate within 5 minutes floating in water at that temperature .
- After 15 minutes floating, the electrical measurements should be nominal.

#### HIGH-TEMPERATURE THERMAL SHOCK

- Proceed as described in § 11.1.2. but with oven temperature at + 70° C ( stowage temperature) and the water maintained between 25° C and 35° C.

## 11.2. EQUIPMENT UNDER TEST

Beacon Unit : 1/2  
Name : ACR  
Type : RLB35  
Number : 07

## 11.3. TEST SITE

Toulouse Space Center (C.S.T./ ITS) - Beacon certification laboratory .

## 11.4. TEST EQUIPMENT

- Climatic chamber : CLIMATS F.C.H. – Type: Austral I37H60/1,5E - S/N: S4880.
- Fresh or salt water container .
- KEITHLEY thermometer/multimeter ,Type : 2000, S/N 0678112 with CU-CT thermocoupler.
- Argos - Cospas/Sarsat Test Bench

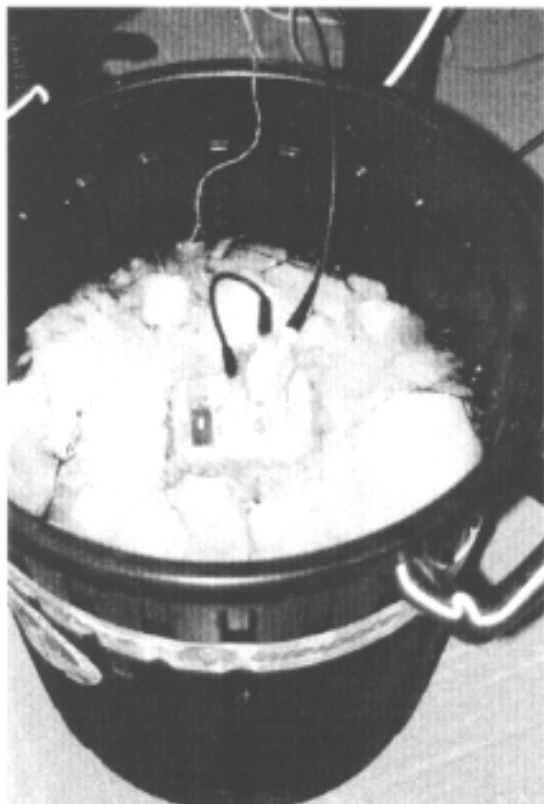
**11.5. TEST RESULTS OF LOW-TEMPERATURE THERMAL SHOCK**
**11.5.1 Test implementation**

Date	Hour	Operations	Results
June 12 <sup>th</sup> ,2001	17:00	The beacon, in the ready condition, is thermally soaked at - 40° C in the temperature-controlled oven .	
June 13 <sup>th</sup> ,2001	9:00	The beacon is immersed in fresh water at 0° C within 10 seconds then floated for 5 minutes .	Self activation : OK
June 13 <sup>th</sup> ,2001	9:30	The beacon, in the ready condition, is thermally soaked at - 40° C in the temperature-controlled oven .	
	15:00	The beacon is immersed in salt water at 0.1 ° C within 10 seconds then floated for 5 minutes .	Self activation : OK
	15:05	Then, the beacon, in float free position and in salt water at 0° C is connected to the test bench and an electrical test are conducted during 2 hours .	The results are nominal after 30 minutes.

**11.5.2 Electrical results of Low-Temperature Thermal Shock Test**

June 13 <sup>th</sup> ,2001	PARAMETERS	RESULTS AFTER 20 MIN.
<b>Low-temperature thermal shock test :</b> - 40° to 0.1° C  See photo, data and graphs next pages	Nominal carrier frequency (406.025 MHz ± 0.002 MHz)	406.0244951 MHz
	RF output power (5 W or 37 dBm ± 2)	36.7 dBm
	Short term frequency stability (< 2 x 10 <sup>-9</sup> /100 ms)	≤ 2 x 10 <sup>-10</sup> /100 ms
	Mean slope (< ± 1 x 10 <sup>-9</sup> /mn)	< 1 x 10 <sup>-9</sup> /mn
	Residual frequency variation (< 3 x 10 <sup>-9</sup> )	≤ 2 x 10 <sup>-9</sup>

**LOW-TEMPERATURE THERMAL SHOCK PHOTO**



*Low. thermal shock*

Pente et Sigma (Mesures)

Mesures du 13 Jun 2001 15:02:11

Constructeur : ACR  
 Type : RLB35  
 Numero : 07  
 Reference INTESPACE : M3223-1  
 Type : SARSAT

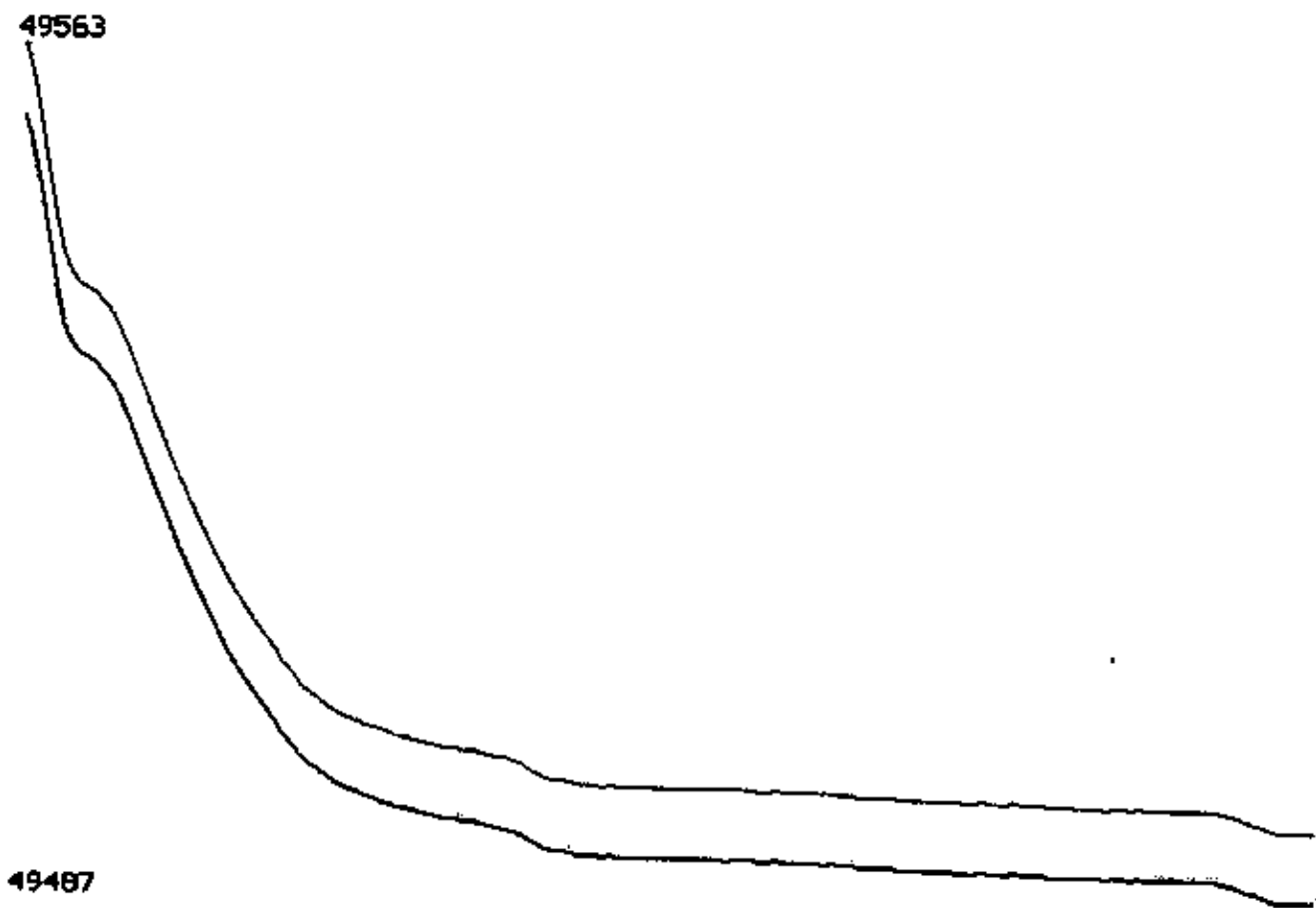
	Freq	Temp.	P406	P121.5
1	49556.25	-1.21	36.21	8.81
2	49554.67	-1.20	36.30	5.80
3	49552.32	-1.23	36.37	0.00
4	49548.67	-0.97	36.43	7.05
5	49544.28	-1.19	36.45	9.48
6	49540.09	-1.20	36.50	4.04
7	49536.87	-1.19	36.58	9.48
8	49535.07	-1.16	36.60	8.02
9	49534.35	-1.17	36.61	7.05
10	49533.90	-1.18	36.63	4.04
11	49533.40	-1.17	36.64	10.06
12	49532.56	-1.16	36.66	7.05
13	49531.46	-1.18	36.67	4.04
14	49530.06	-1.17	36.68	5.80
15	49528.41	-1.16	36.69	4.04
16	49526.57	-1.19	36.70	8.02
17	49524.82	-1.19	36.71	1.03
18	49523.03	-1.15	36.69	8.81

No	Temp	Slope	Sigma	P406	Short term	P121.5
1	-1.1	-5.2E-09	+6.2E-09	36.6	+1.2E-10	8.8
18	-1.1	-3.6E-09	+1.7E-09	36.7	+1.3E-10	4.0
31	-1.2	-1.3E-09	+1.8E-09	36.8	+1.2E-10	5.8
61	-1.0	-3.0E-10	+7.8E-10	37.0	+1.6E-10	5.8
91	-.8	-1.1E-10	+1.5E-10	37.1	+1.5E-10	9.5
121	-.5	-6.2E-11	+1.2E-10	37.2	+1.3E-10	7.1

Nbre d'erreurs de mesure recuperees : 0

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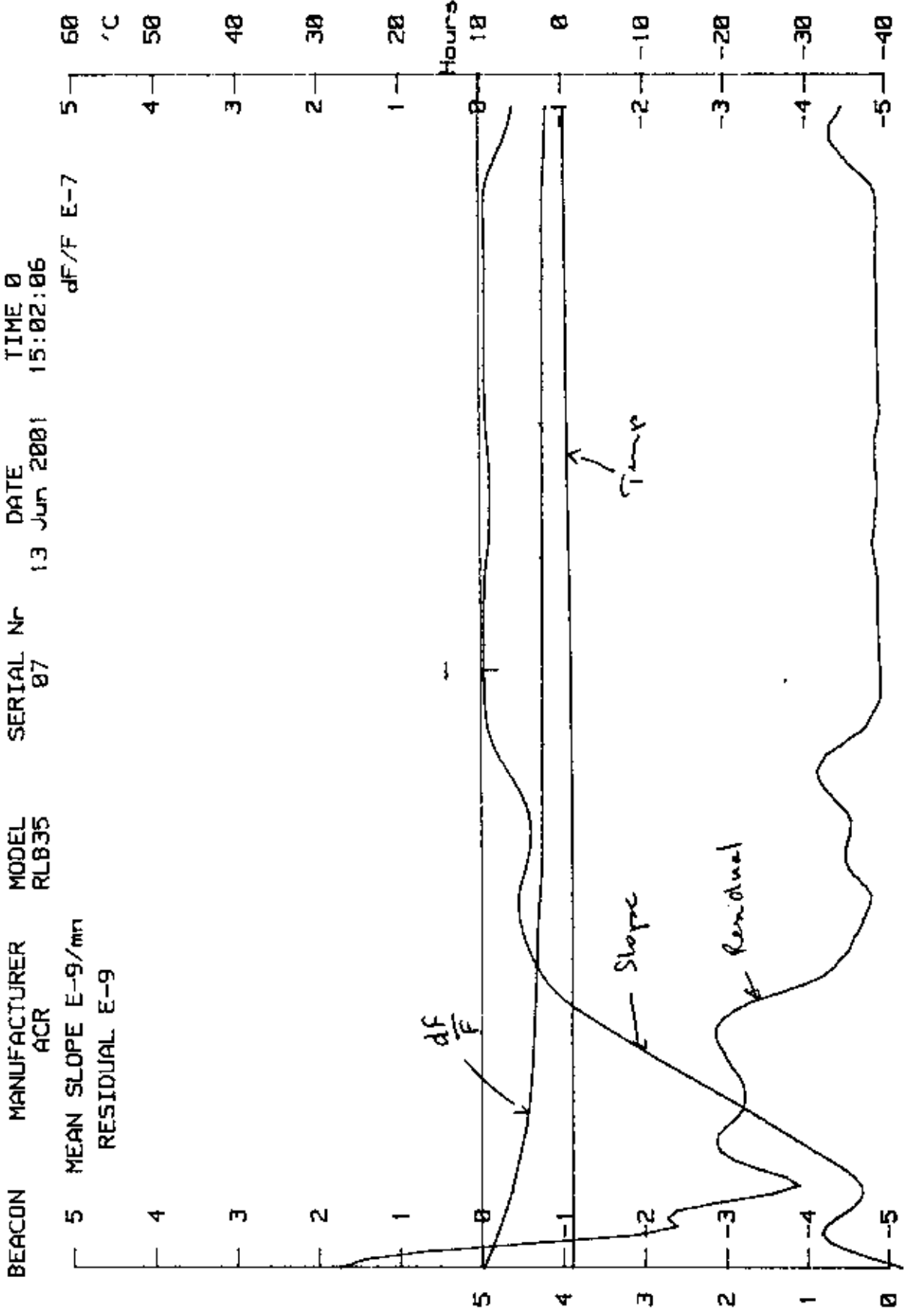


MEDIUM TERM STABILITY

BEACON 5  
MANUFACTURER ACR  
MODEL RLB35  
SERIAL Nr 07  
DATE 13 Jun 2001  
TIME 0  
15:02:06  
dF/F E-7

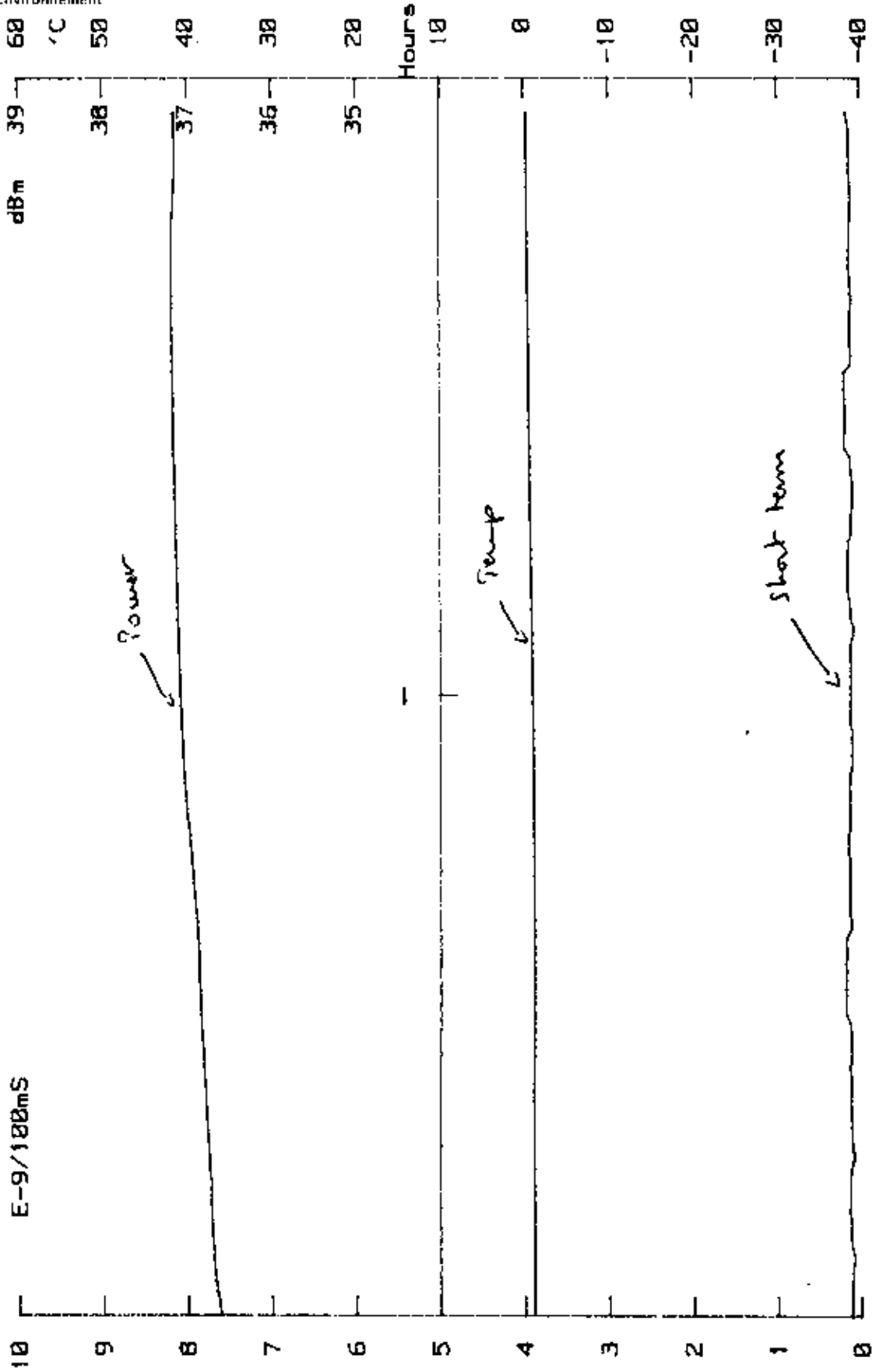
MEAN SLOPE E-9/min  
RESIDUAL E-9

ITS: M3223-RTCM



**OUTPUT POWER and SHORT TERM STABILITY**

BEACON E-9/100mS  
 MANUFACTURER ACR  
 MODEL RLB35  
 SERIAL Nr 07  
 DATE 13 Jun 2001  
 TIME 0 15:02:06





## 11.6. TEST RESULTS OF HIGHT-TEMPERATURE THERMAL SHOCK

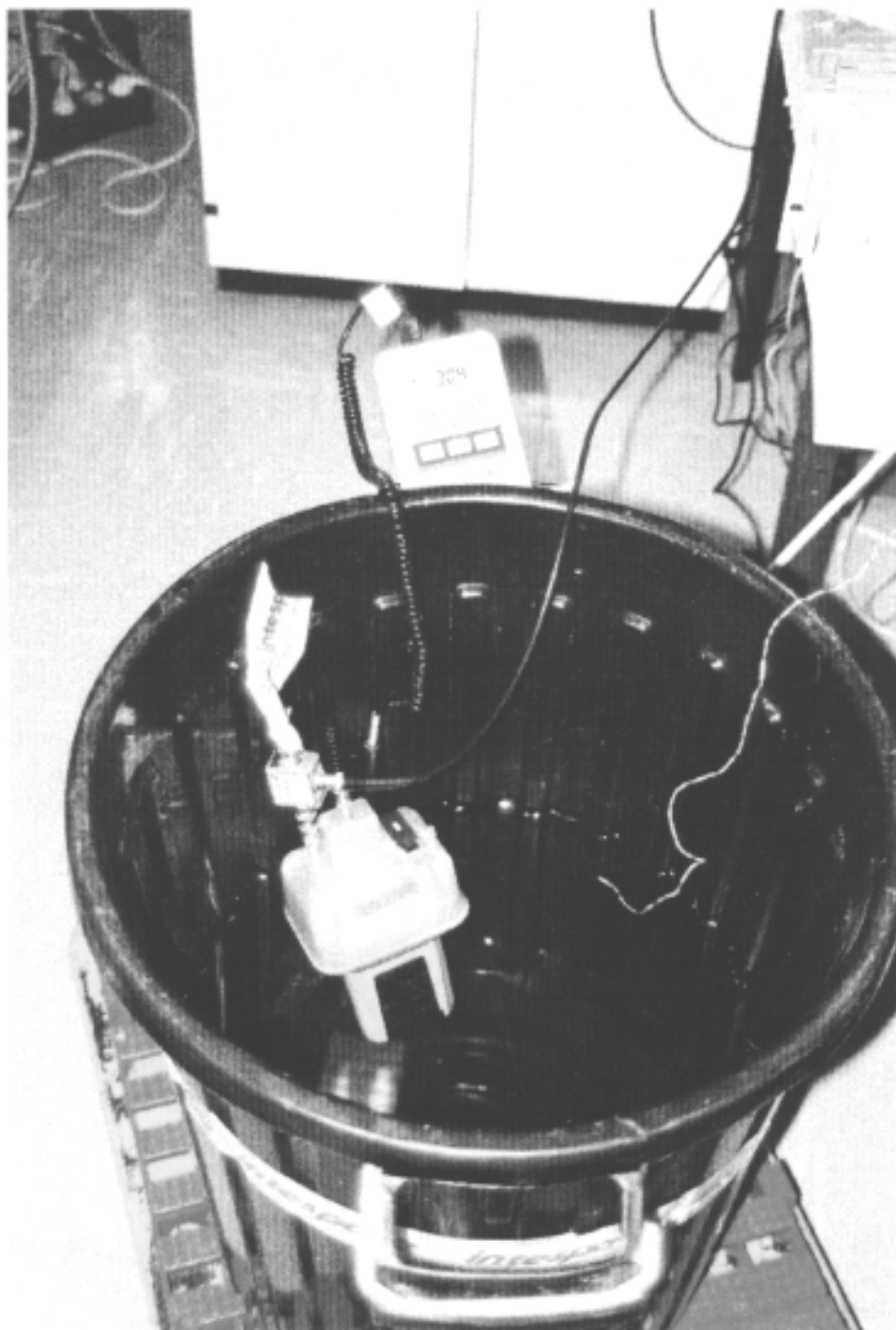
### 11.6.1 Test implementation

Date	Hour	Operations	Results
June 13 <sup>th</sup> ,2001	18:00	The beacon, in the ready condition, is thermally soaked at + 70° C in the temperature-controlled oven .	
June 14 <sup>th</sup> ,2001	9:30	The beacon is immersed in fresh water at 33° C within 10 seconds then floated for 5 minutes .	Self activation : OK
June 14 <sup>th</sup> ,2001	10:00	The beacon, in the ready condition, is thermally soaked at + 70° C in the temperature-controlled oven .	
	17:45	The beacon is immersed in salt water at 31 ° C within 10 seconds then floated for 5 minutes .	Self activation : OK
	17:50	Then, the beacon, in float free position and in salt water at 31° C is connected to the test bench and an electrical test are conducted during 2 hours .	The results are nominal after 20 minutes.

### 11.6.2 Electrical results of Hight-Temperature Thermal Shock Test

June 14 <sup>th</sup> ,2001	PARAMETERS	RESULTS AFTER 20 MIN.
<b>Hight -temperature thermal shock test :</b> +70 ° to + 31° C  See photo, data and graphs next pages	Nominal carrier frequency (406.025 MHz ± 0.002 MHz)	406.0244723 MHz
	RF output power (5 W or 37 dBm ± 2)	37.5 dBm
	Short term frequency stability (< 2 x 10 <sup>-9</sup> /100 ms)	≤ 2 x 10 <sup>-10</sup> /100 ms
	Mean slope (< ± 1 x 10 <sup>-9</sup> /mn)	< 1 x 10 <sup>-9</sup> /mn
	Residual frequency variation (< 3 x 10 <sup>-9</sup> )	≤ 2 x 10 <sup>-9</sup>

**HIGH-TEMPERATURE THERMAL SHOCK PHOTO**



*Choe chand*

**Pente et Sigma (Mesures)**
**Mesures du 14 Jun 2001 17:47:36**

```

Constructeur      : ACR
Type              : RLB35
Numero           : 07
Reference INTESPACE : M3223-3
Type              : SARSAT
    
```

	Freq	Temp.	P406	P121.5
1	49518.80	31.23	37.28	8.02
2	49512.12	31.20	37.38	4.04
3	49501.16	31.24	37.39	4.04
4	49483.72	31.21	37.40	8.02
5	49468.27	31.19	37.41	9.48
6	49461.06	31.17	37.42	9.48
7	49457.22	31.13	37.42	5.80
8	49455.04	31.07	37.44	8.02
9	49454.08	31.05	37.46	4.04
10	49453.79	31.03	37.46	7.05
11	49454.10	31.05	37.46	4.04
12	49454.74	31.04	37.50	1.03
13	49455.48	31.00	37.50	10.57
14	49456.46	31.01	37.49	5.80
15	49457.74	31.04	37.48	12.79
16	49458.75	31.00	37.49	11.44
17	49459.70	31.02	37.48	8.81
18	49460.51	30.98	37.48	8.02

No	Temp	Slope	Sigma	P406	Short term	P121.5
1	31.0	-5.9E-09	+3.2E-08	37.5	+1.4E-10	8.8
18	30.9	+1.5E-09	+1.8E-09	37.5	+1.5E-10	9.5
31	30.6	+4.4E-10	+2.2E-10	37.4	+1.2E-10	5.8
61	30.0	-1.4E-11	+7.3E-11	37.4	+1.2E-10	9.5
91	29.4	-3.1E-11	+1.1E-10	37.3	+1.2E-10	0.0
121	29.0	-4.3E-11	+9.2E-11	37.3	+1.0E-10	0.0

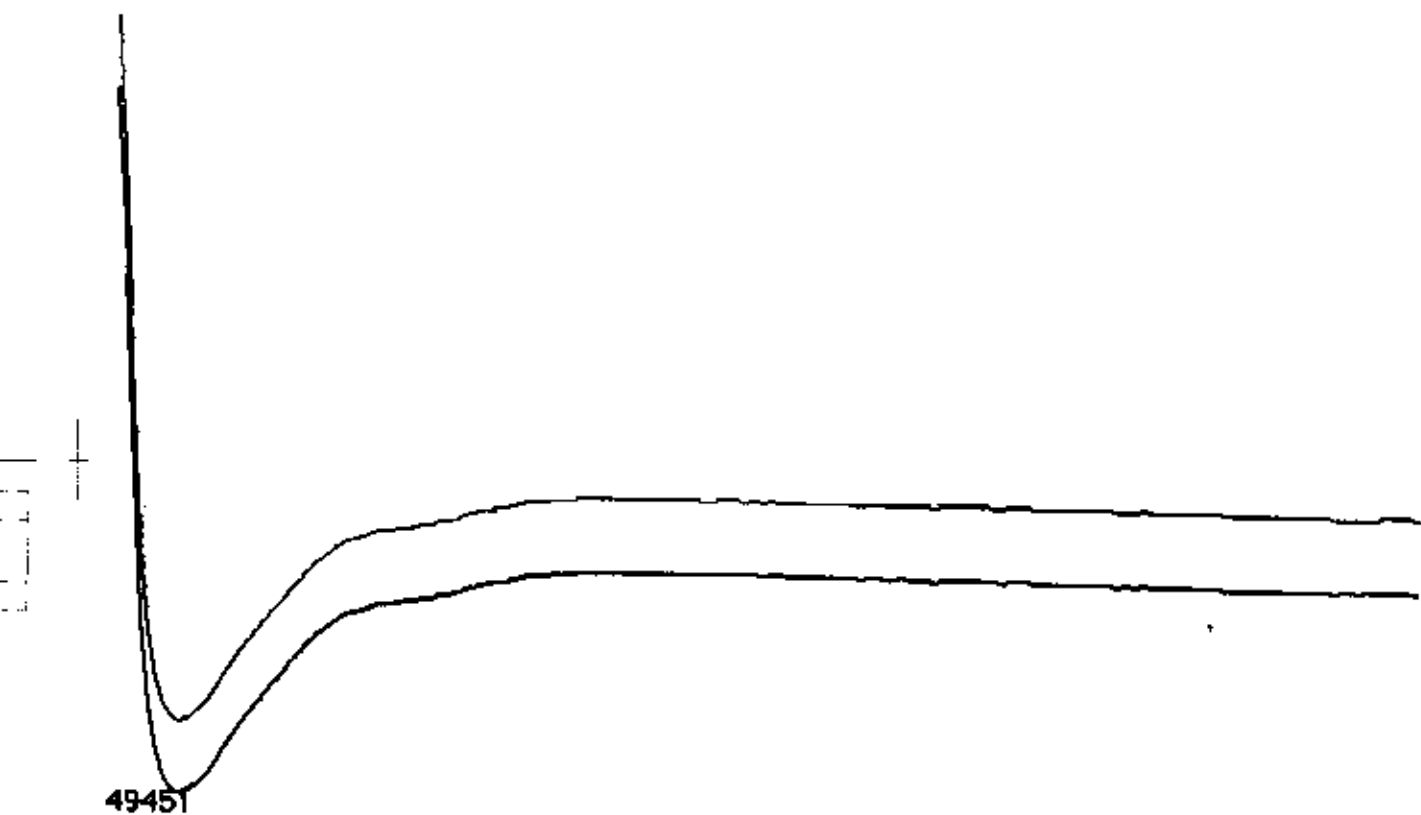
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PRIN

49525

49451



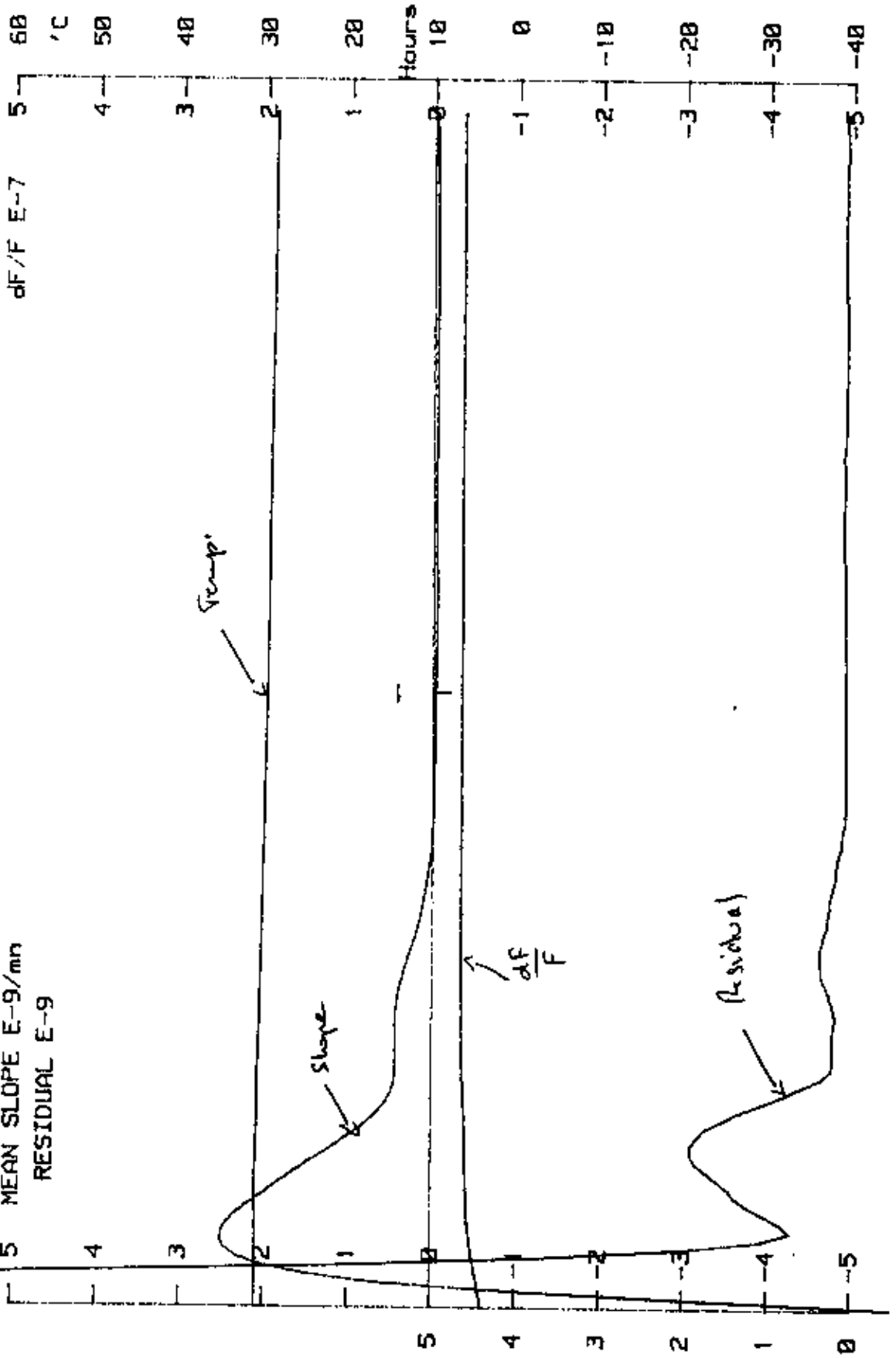
AUKO 06.96

RECORDER NO. 9226

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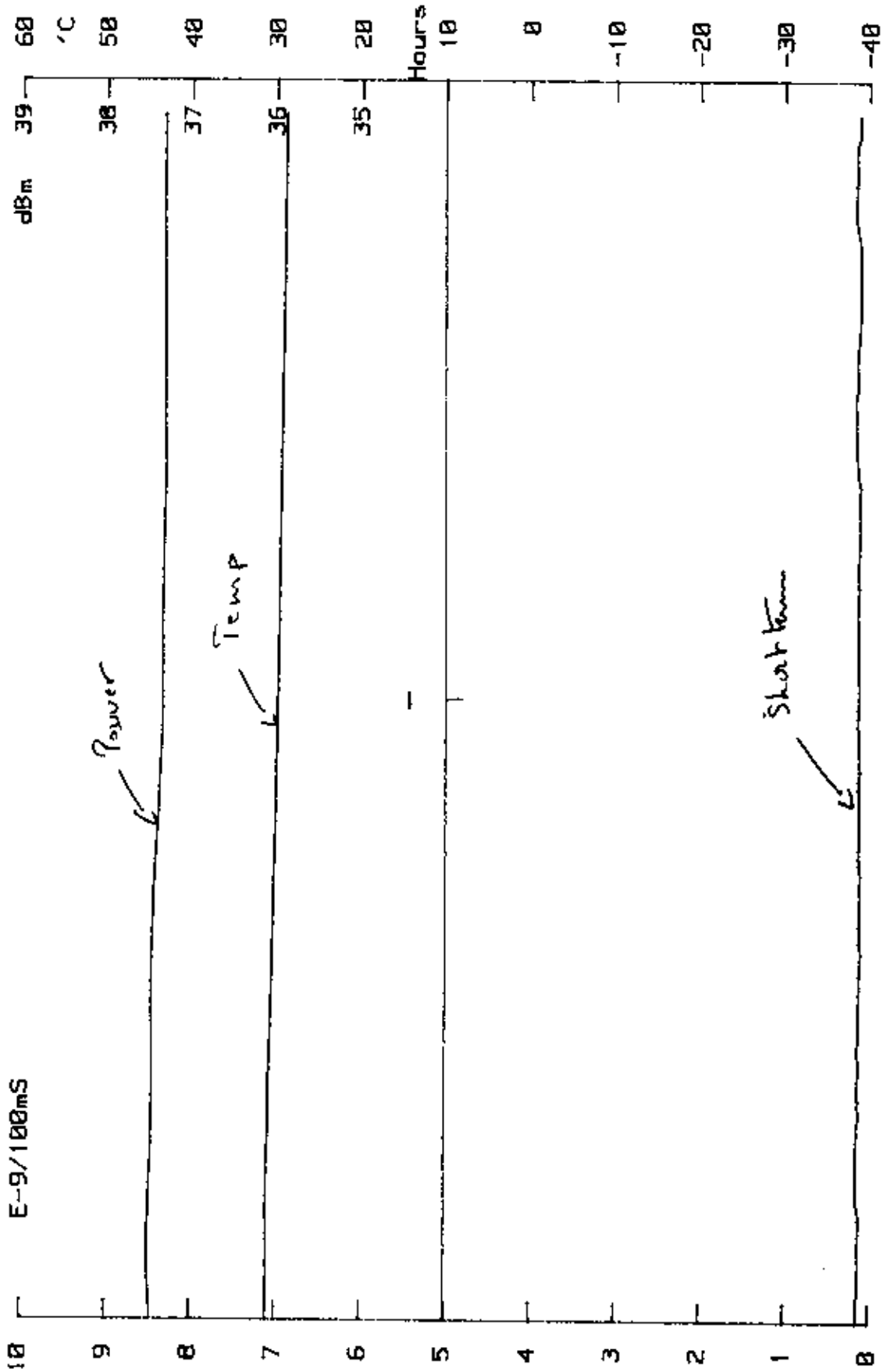
## MEDIUM TERM STABILITY

BEACON MANUFACTURER MODEL SERIAL Nr DATE TIME  $\theta$   
 ACR E-9/mn RLB35 07 14 Jun 2001 17:47:32  
 MEAN SLOPE RESIDUAL E-9  
 RESIDUAL E-9



OUTPUT POWER and SHORT TERM STABILITY

BEACON E-9/100mS  
 MANUFACTURER ACR  
 MODEL RLB35  
 SERIAL Nr 07  
 DATE 14 Jun 2001  
 TIME 0 17:47:32



## CHAPTER 13

<b>A13.0 - OPERATIONAL LIFE, STROBE LIGHT, AND SELF TESTS</b>
---

#### 14.1 TEST SPECIFICATIONS AND PROGRAMME

Following Section A13.0 of RTCM Recommended Standards  
for 406 MHz Satellite EPIRBs (Version 2.0 Feb 5,1997) :

- Using a fresh battery pack, turn ON the EUT (at the ambient temperature) for a period of time equal to the extension interval given by the constructor .
- Place the EUT turned OFF inside climatic chamber stabilized at - 40° C (class I ) for a period of 10 hours
- At the conclusion of this period the EUT is turned ON and continually monitor the following parameters until the end of the battery life :
  - Frequency (nominal carrier, short and medium term stability),
  - RF output power,
  - Homing transmitter peak envelope output power.
  - Strobe light flash rate every 12 hours.

#### 14.2. EQUIPMENT UNDER TEST

##### Beacon

Beacon Unit : 1/2  
Name : ACR  
Type : RLB35  
Number : 07  
Class : 1

##### Beacon Battery Type

Chemistry : Li-SO<sub>2</sub>  
Manufacturer & model n° : SAFT LO26SX  
Size & number of cells : Dx3

#### 14.3. TEST SITE

Toulouse Space Center (C.S.T./ ITS) - Beacon certification laboratory .

#### 14.4. TEST EQUIPMENT

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



## 14.5. RESULTS

These tests have been performed during the COSPAS-SARSAT Type Approval tests (chapter 12)  
 The strobe light test and the self test have been, also, performed with Cospas Sarsat Type Approval tests (chapter 12) at three temperature (-40° C, 22° C and 55° C)

Before these tests we have verified the manufacturer calculation of the loss in battery capacity due to self-testing as well as battery pack self-discharge during the useful lifetime of battery pack (see chapter 12 : C/S Type Approval Test Report § "OPERATING LIFE TEST RESULTS ON RLB35 N° 07 " )

**Total AMP-HOUR burn off battery for -40° C life test : 0.139062 AMP-HOURS**

### 14.5.1 Test implementation

Date	Hour	Operations	Results
June 17 <sup>th</sup> , 2001	17:00	The beacon, in the ready condition, is thermally soaked at - 40° C in the temperature-controlled oven .	
June 18 <sup>th</sup> , 2001	08:00	The beacon in the oven at -40° C and connected into 50 Ohm load Argos Cospas Sarsat Test Bench is manually activated . Simultaneously an Automatic Operational Life Test begin.	OK
June 20 <sup>th</sup> , 2001	10:00	End of Automatic Operational Life Test.	
June 20 <sup>th</sup> , 2001	10:30	Analysis of Operating Life Test Results :	Correct during ≈ 50 hours

### 14.5.2 Electrical results of Operating Life, StrobeLight and Self Tests

Measurement Temperature : -40 °C

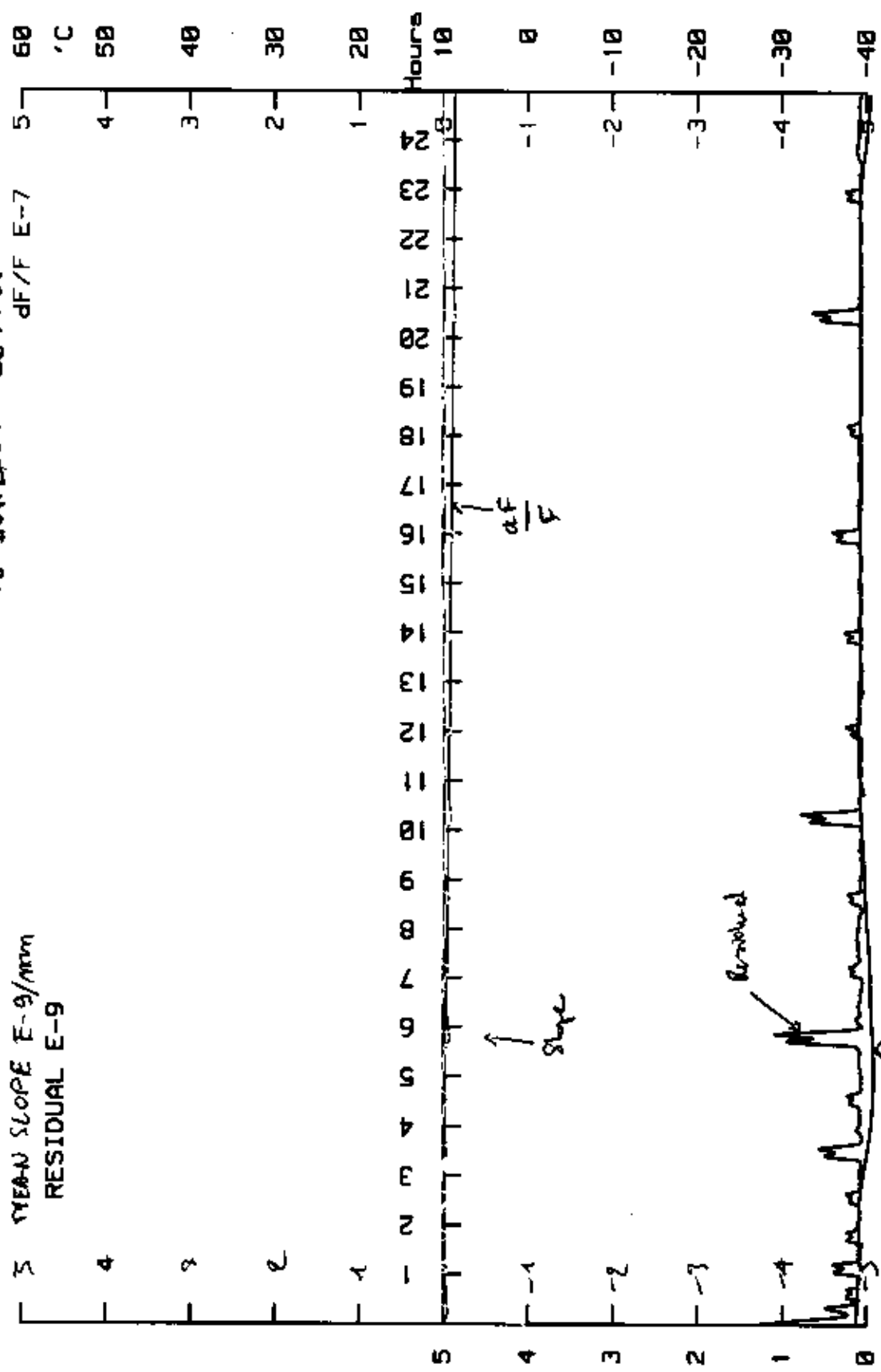
SPECIFICATIONS	12 h	24 h	36 h	48 h	50 h
<b>1 - FREQUENCY (MHz)</b>					
Nominal Carrier 406.025 ± 0.002	406.024546	406.024544	406.024541	406.024539	406.024539
Short term stab. < 2x10 <sup>-9</sup> /100 ms	< 2 x10 <sup>-10</sup>	< 2 x10 <sup>-10</sup>	< 2 x10 <sup>-10</sup>	< 3 x10 <sup>-10</sup>	< 3 x10 <sup>-10</sup>
Slope < 1x10 <sup>-9</sup> /mn	< 1 x10 <sup>-10</sup>	< 1 x10 <sup>-10</sup>	< 1 x10 <sup>-10</sup>	< 1 x10 <sup>-10</sup>	< 1 x10 <sup>-10</sup>
Sigma < 3x10 <sup>-9</sup>	< 8 x10 <sup>-10</sup>	< 6 x10 <sup>-10</sup>	< 6 x10 <sup>-10</sup>	< 2 x10 <sup>-10</sup>	< 2 x10 <sup>-10</sup>
<b>2 - RF OUTPUT</b>					
+ 2.9 5 W (37 dBm ± 2 dBm) - 1.8	36.8	36.9	36.8	36.0	35.4
<b>3 - STROBE LIGHTS</b>					
20 to 30 flashes/min	21	20	21	21	21
Intensity ≥ 0.75 cand.	-	0.90	-	0.85	-
<b>4 - HOMING</b>					
Transmitter : - peak envelope output power (14 dBm + 6 dB - 0 dBm)	18.5	18.5	18.5	18.3	18.1
<b>5 - DIGITAL MESSAGE</b>					
Correct Satellite EPIRB coding	OK	OK	OK	OK	OK

See data and graphs of results on chapter 12 "Cospas-Sarsat Type Approval Tests Report" and graphs next pages.

MEDIUM TERM STABILITY

BEACON 5  
 MANUFACTURER ACR  
 MODEL RLB35  
 SERIAL N° 87  
 DATE 18 JUN 2001  
 TIME 08:03:11  
 dF/F E-7

MEAN SLOPE E-9/mm  
 RESIDUAL E-9



MEDIUM TERM STABILITY

BEACON

MANUFACTURER

MODEL

SERIAL Nr

DATE

TIME 0

5

ACR

RLB35

07

18 Jun 2001

08:03:44

MEAN SLOPE E-9/mm

RESIDUAL E-9

dF/F E-7

60

'C

4

3

2

1

0

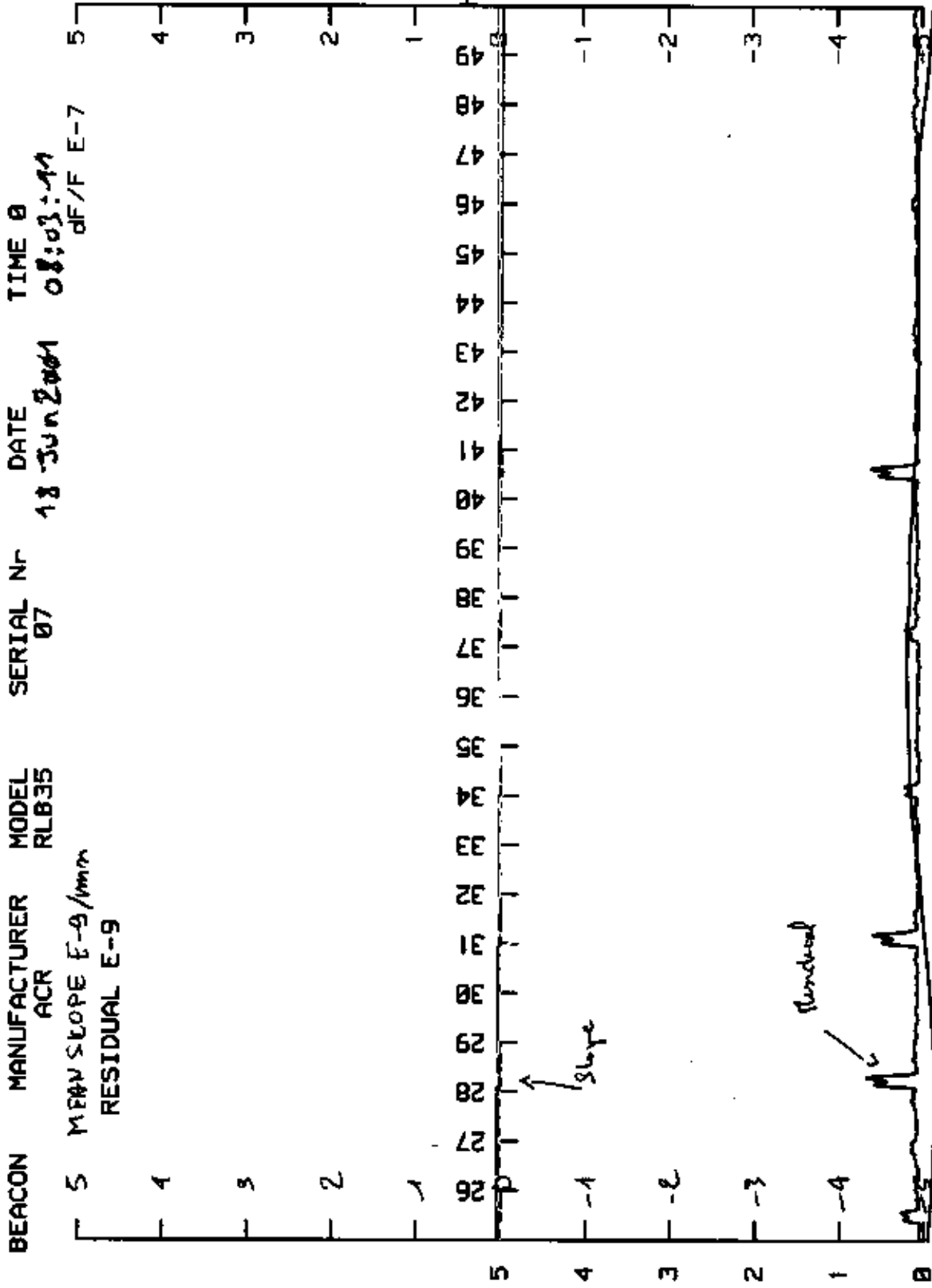
-1

-2

-3

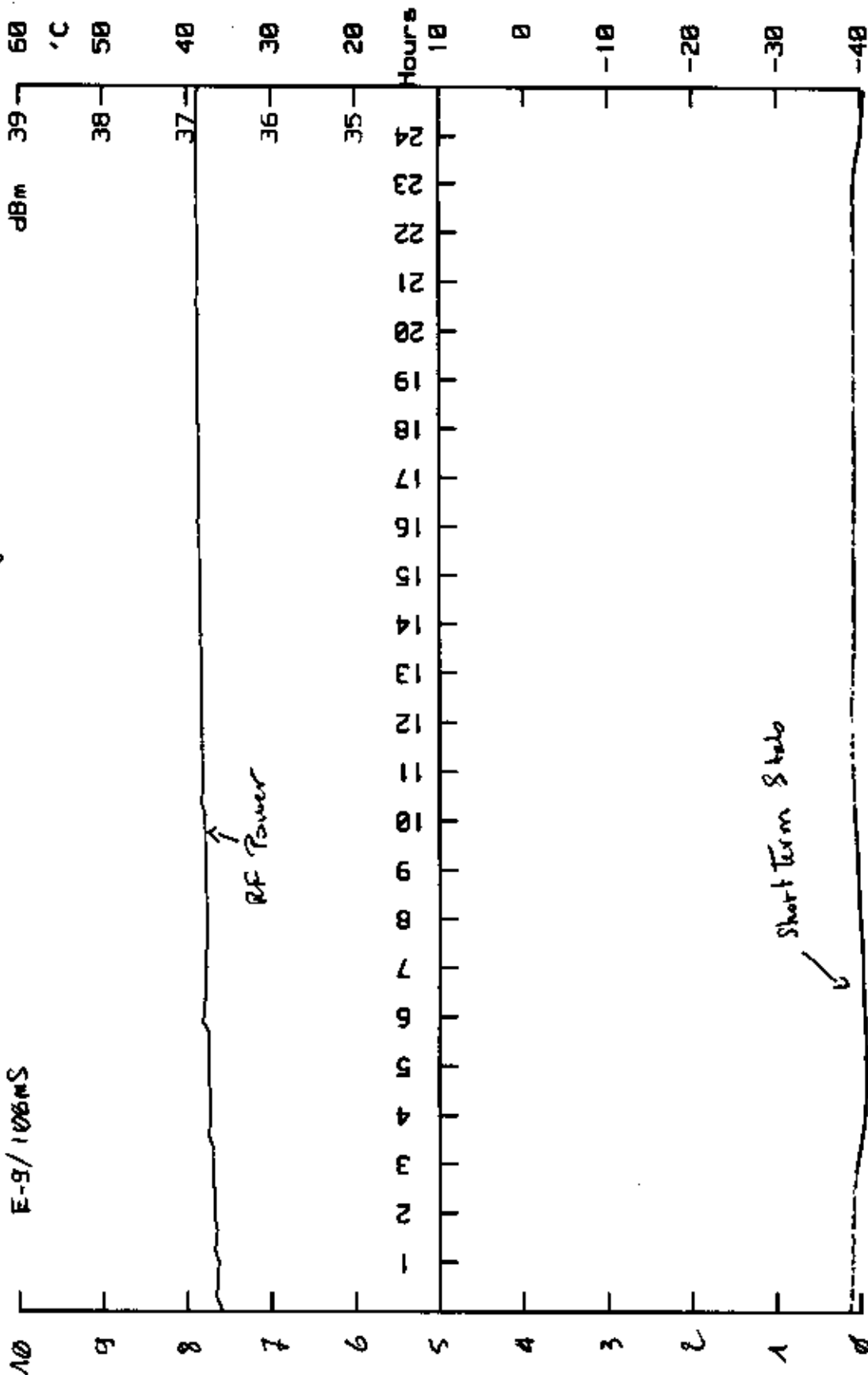
-4

0



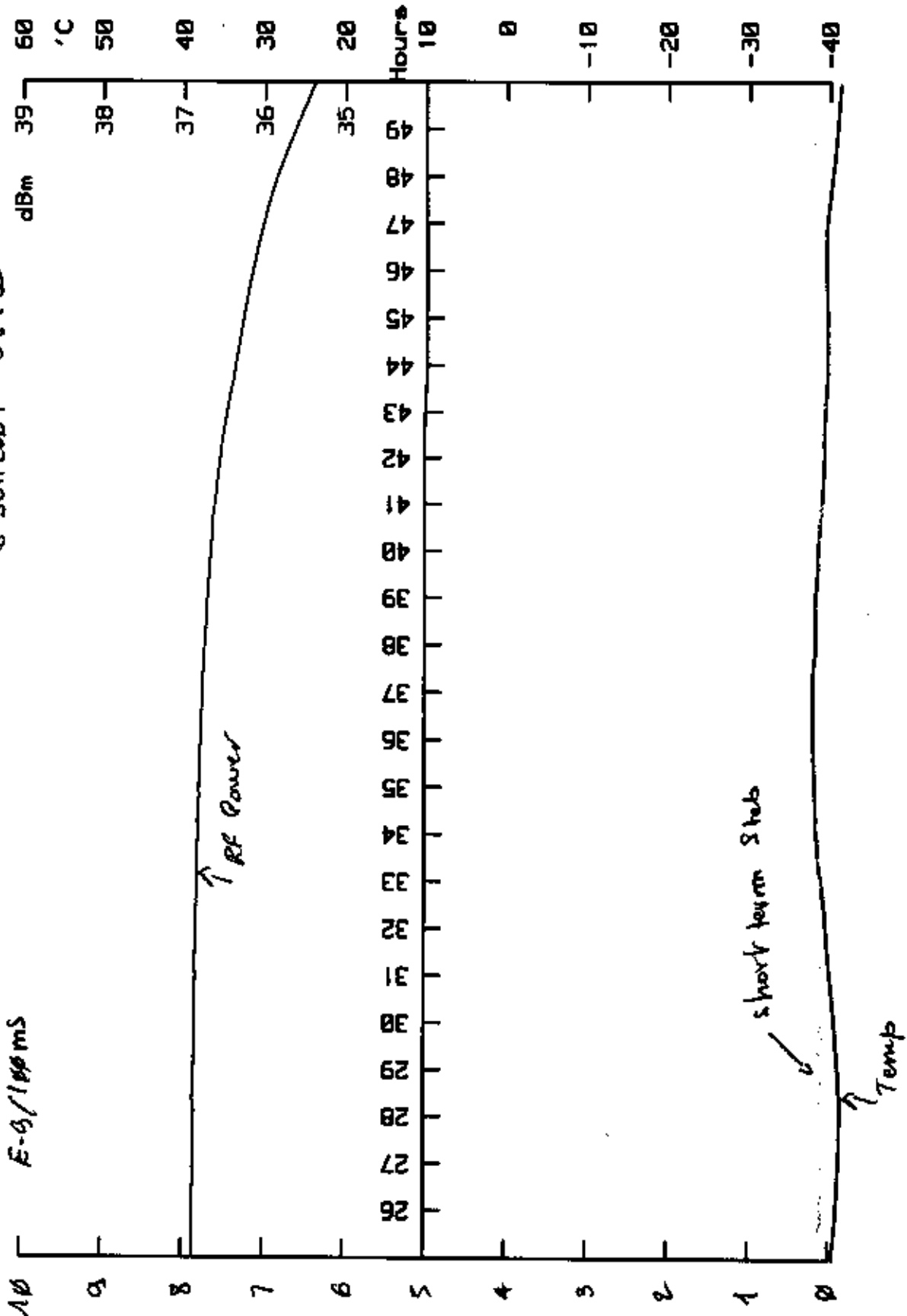
**OUTPUT POWER and SHORT TERM STABILITY**

BEACON E-9/106MS  
 MANUFACTURER ACR  
 MODEL RLB35  
 SERIAL Nr 07  
 DATE 18 Jun 2001  
 TIME 08:03:11



**OUTPUT POWER and SHORT TERM STABILITY**

BEACON MANUFACTURER MODEL SERIAL Nr DATE TIME B  
 E-9/100 mS ACR RLB35 07 08 Jan 2001 08:03:11



## CHAPTER 14

<b>A14.0</b>	<b>AUTOMATIC RELEASE MECHANISM AND AUTOMATIC ACTIVATION TESTS</b>
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## **14-1 TEST SPECIFICATIONS AND PROGRAMME**

The automatic release mechanism and the assembly is mounted on a fixture simulating a deck or a bulkhead as per manufacturer's instructions.

The fixture is then submerged in water as specified in RTCM document " Recommended Standards for 406 MHz Satellite EPIRBs, Version 2.0 Feb 5,1997", appendix A, section A14.0.

The EUT must float free before reaching a depth of 4 meters and must automatically active .

## **14.2. EQUIPMENT UNDER TEST**

Beacon Unit : 1/2  
Name : ACR  
Type : RLB35  
Number : 07

Bracket : ACR Universal Sea Shelter Id 18560

## **14.3. TEST SITE**

Toulouse Fire Station VION - Beacon certification laboratory .

## **14.4. TEST EQUIPMENT**

- Climatic chamber : CLMATS F.C.H. – Type: Austral 137H60/1,5E - S/N: S4880.
- Dive well .
- Cospas/Sarsat Receiver : SERPE-IESM RMD01 S/N 004996
- Argos - Cospas/Sarsat Test Bench









## 14.5 TEST IMPLEMENTATION AND RESULTS

TOULOUSE :Dive well of Fire Station VION

June 7<sup>th</sup>, 2001 from 8:00 to 13:30 EPIRB RLB35 S/N 01 with its bracket into oven at stowage temperature -50° C

June 8<sup>th</sup>, 2001 from 8:00 to 15:00 EPIRB RLB35 S/N 01 with its bracket into oven at stowage temperature 70° C

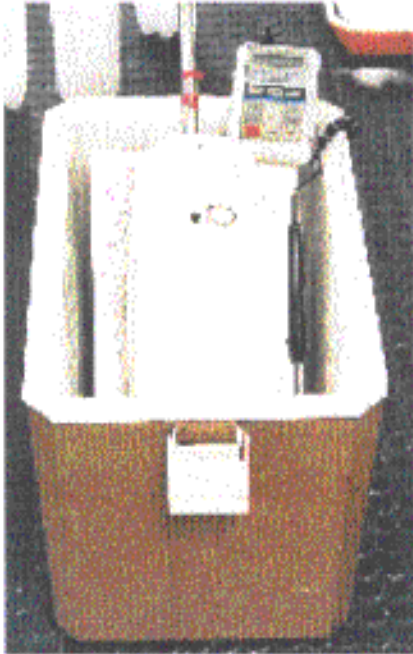
Fresh Water temperature : 20 °C ± 2 °C

	Stowage temp.	Date/Hours	Deep releasing	Mechanical control	Electrical control
CONFIGURATION 1  Normal mounted orientation	1a - 50° C	June 7 <sup>th</sup> ,2001 13:45	4,50 m	OK	OK
	1b + 70° C	June 8 <sup>th</sup> ,2001 14:00	2.50 m	OK	OK
	1c + 22° C	June 7 <sup>th</sup> ,2001 14:00	2.90 m	OK	OK
CONFIGURATION 2  Rolling 90° starboard	+ 22° C	June 7 <sup>th</sup> ,2001 14:15	2.80 m	OK	OK
CONFIGURATION 3  Rolling 90° port	+ 22° C	June 7 <sup>th</sup> ,2001 14:25	3.10 m	OK	OK
CONFIGURATION 4  Pitching 90° bow down	+ 22° C	June 7 <sup>th</sup> ,2001 14:35	3.20 m	OK	OK
CONFIGURATION 5  Pitching 90° stern down	+ 22° C	June 7 <sup>th</sup> ,2001 14:45	3.20 m	OK	OK
CONFIGURATION 6  Upside-down	+ 22° C	June 7 <sup>th</sup> ,2001 15:00	2.90 m	OK	OK

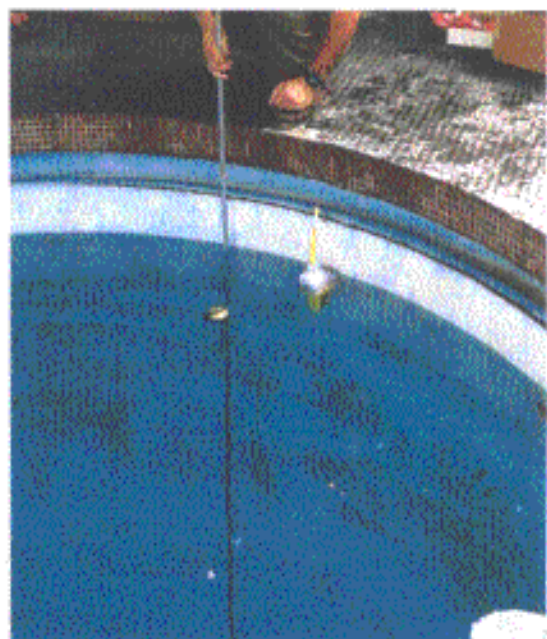
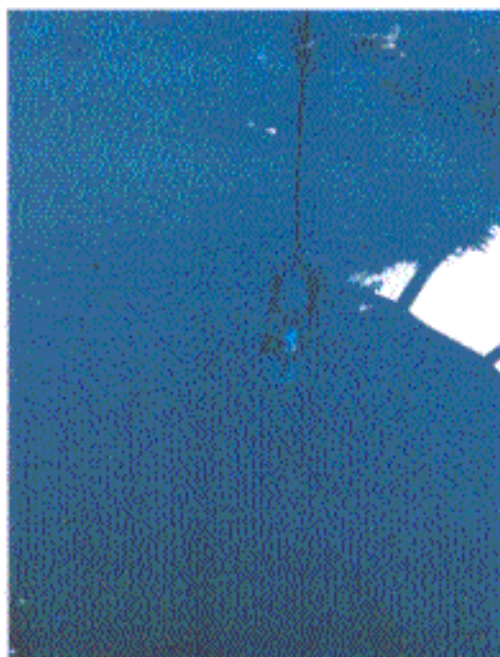
**Note :** At low stowage temperature the deep of the automatic release is just acceptable . We think that the Hammar device is on its working limits .

See photo next pages

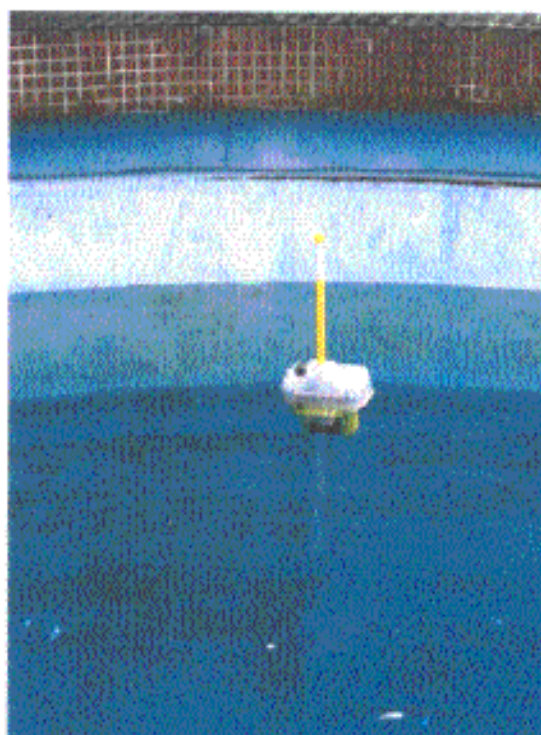
**CONFIGURATION 1 a**  
**Normal mounted orientation at - 50° C**



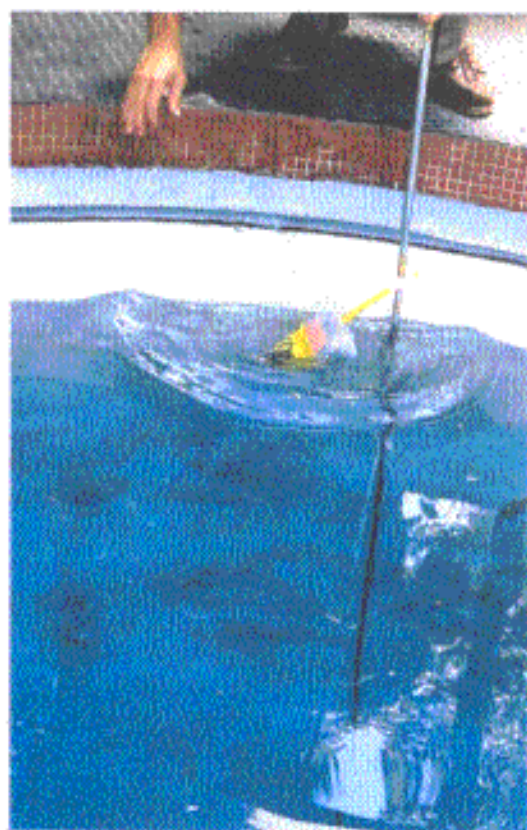
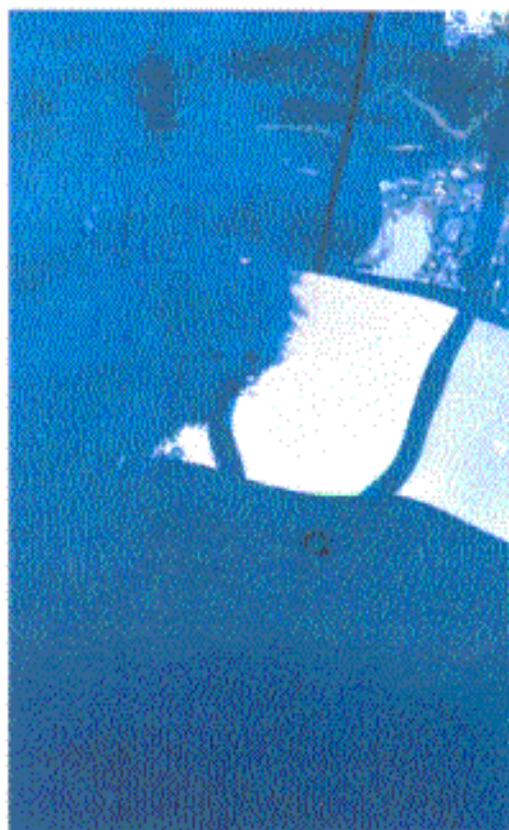
**CONFIGURATION 1 b**  
**Normal mounted orientation at + 70° C**



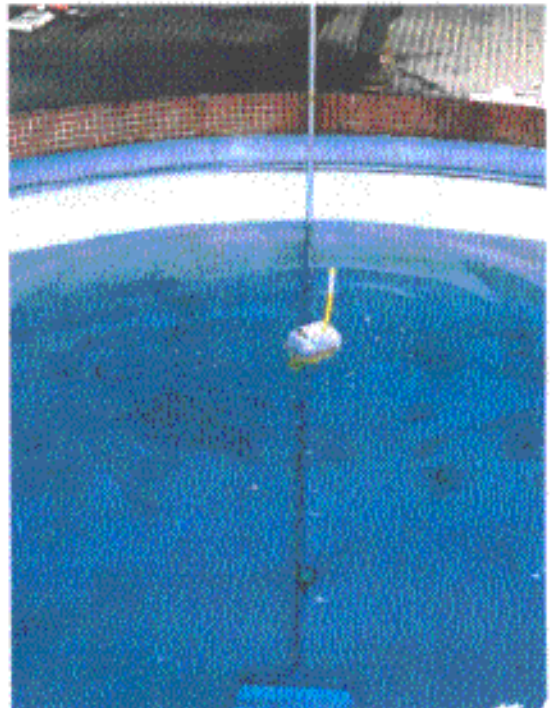
**CONFIGURATION 1 c**  
**Normal mounted orientation at + 25° C**



**CONFIGURATION 2**  
**Rolling 90° starboard at + 22° C**



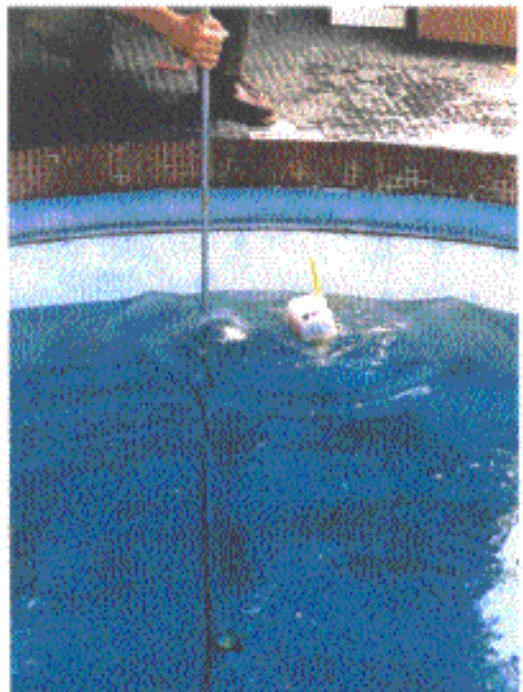
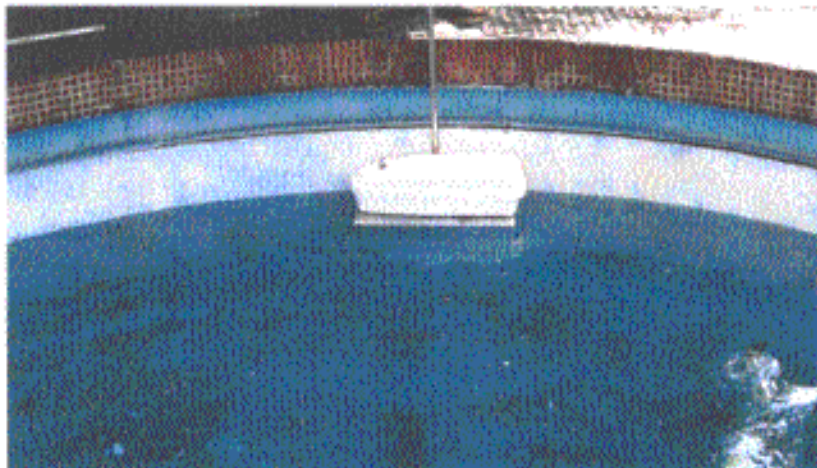
**CONFIGURATION 3**  
**Rolling 90° port at + 22° C**



**CONFIGURATION 4**  
**Pitching 90° bow down + 22° C**

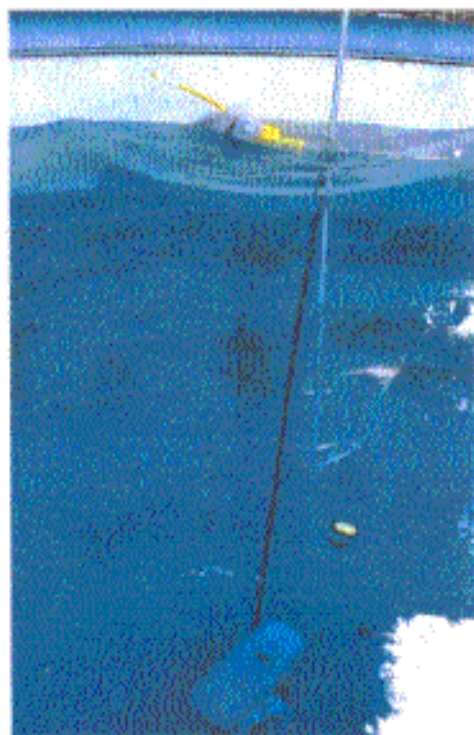
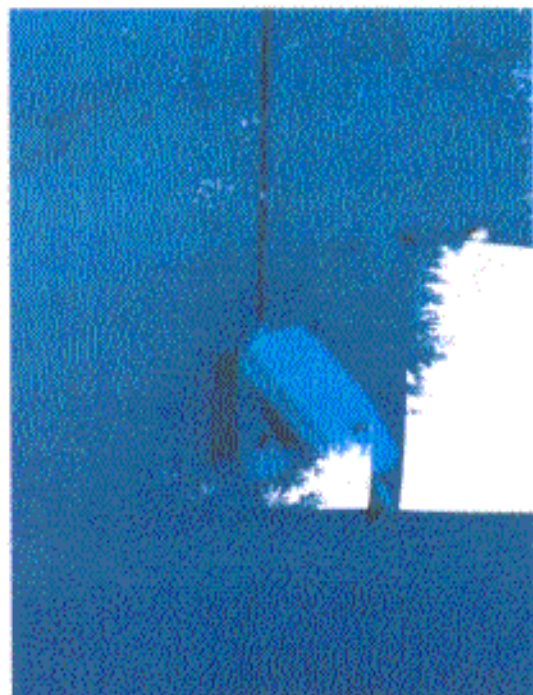


**CONFIGURATION 5**  
**Pitching 90° stern down + 22° C**





**CONFIGURATION 6**  
**Upside down + 22° C**



## CHAPTER 15

<b>A15.0 - STABILITY AND BUOYANCY TESTS</b>
---

### 15.1. TEST SPECIFICATIONS AND SEQUENCE

Following Section A15.0 of RTCM Recommended Standards for 406 MHz Satellite EPIRBs (Version 2.0 Feb 5,1997) :

#### • Stability Test :

The EUT should, when rotated to a horizontal position about any axis, submerged just below the surface, and released, pass through an upright position within 2 seconds .

The satellite EPIRB should float upright in calm fresh water with the base of the antenna a minimum of 40 mm above the waterline

#### • Buoyancy Test :

The reserve buoyancy of the satellite EPIRB should be at least 5% when determined by one of the following procedures :

- 1 . Submerge the complete unit and measure the buoyant force with a scale .  
Divide the measured buoyant force by the weight of the unit . The result should be at least 1.05 .
- 2 . Determine the location of the waterline on the floating satellite EPIRB . Calculate the volume of the unit above the waterline and the volume below the water . Divide the volume above the water by the volume below the water . The result should be at least 1.05 .

### 15.2. EQUIPMENT UNDER TEST

Beacon Unit : 2/2  
Name : ACR  
Type : RLB35  
Number : 01

### 15.3 TEST SITE

Toulouse Space Center (CST) - INTESPACE Metrology.Laboratory

### 15.4. TEST EQUIPMENT

- Fresh water container
- Balance : Sartorius type 3626 001
- Argos - Cospas/Sarsat Test Bench.

## 15.5 TEST IMPLEMENTATION AND RESULTS

Date: June 7<sup>th</sup>, 2001 for the stability test and June 20<sup>th</sup>, 2001 for the buoyancy test

### - Stability test :

In conformance with RTCM A15.0 on four perpendicular axis.

Mean time to return to the upright position : ~1 second.

### - Buoyancy test :

\* Old method of control (Following Section A12.0 of RTCM Paper 166-90/SC 110-X -January 1991):

- Nominal EPIRB weight : 1011 gr

- 5 % reserve buoyancy : 50.55 gr

- With this supplementary weight, 52 gr, the waterline of the EPIRB go up about 40 or 50 mm (see photos next page) .

Height of the base antenna above the water :  $\geq 50$  mm : Result OK

\* Method recommended by RTCM Standards -Version 2.0 Feb 5,1997 :

1 Buoyant Force method :

- Buoyant Force (Fb) = 225 gr  $\pm$  10

- Beacon Weight (W) = 1011 gr  $\pm$  20

- Reserve of buoyancy (Fb/W) = 0.22  $\pm$  0.02

2 Volumetric method :

- Volume of EUT above waterline (Va) = 220 cm<sup>3</sup>  $\pm$  10

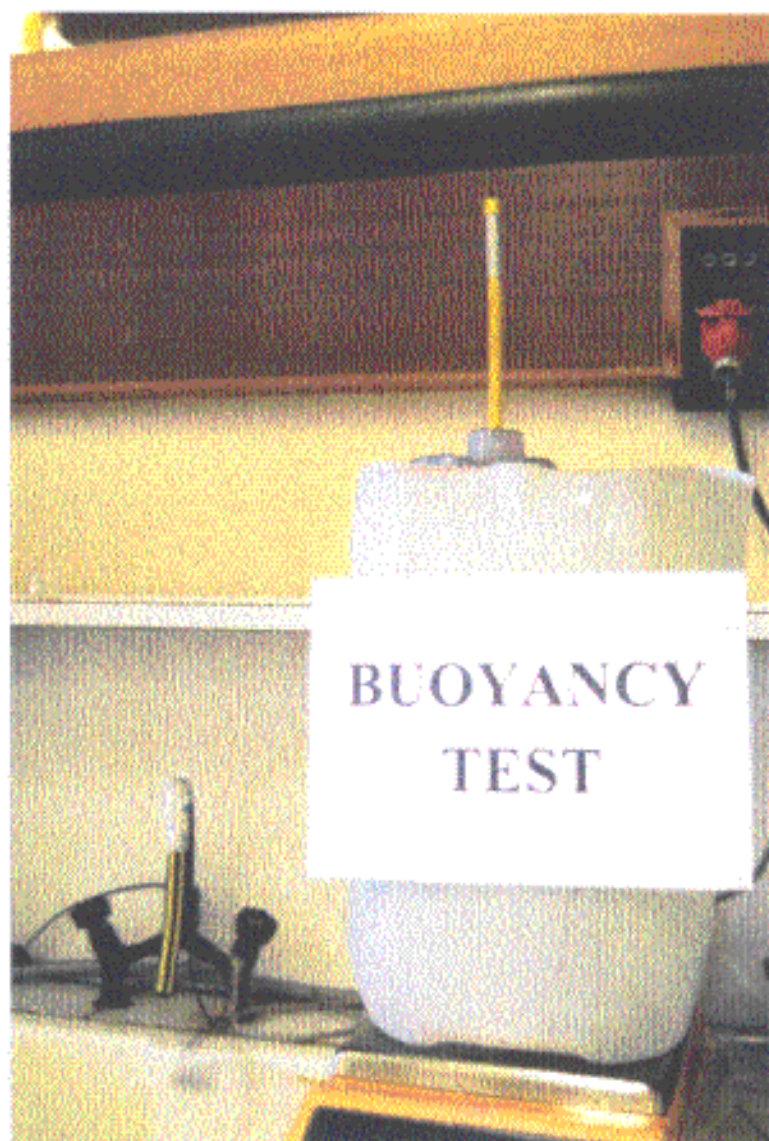
- Volume of EUT below waterline (Vb) = 1235 cm<sup>3</sup>  $\pm$  20

- Reserve of buoyancy (Va/Vb) = 0.18  $\pm$  0.02

Results non conform

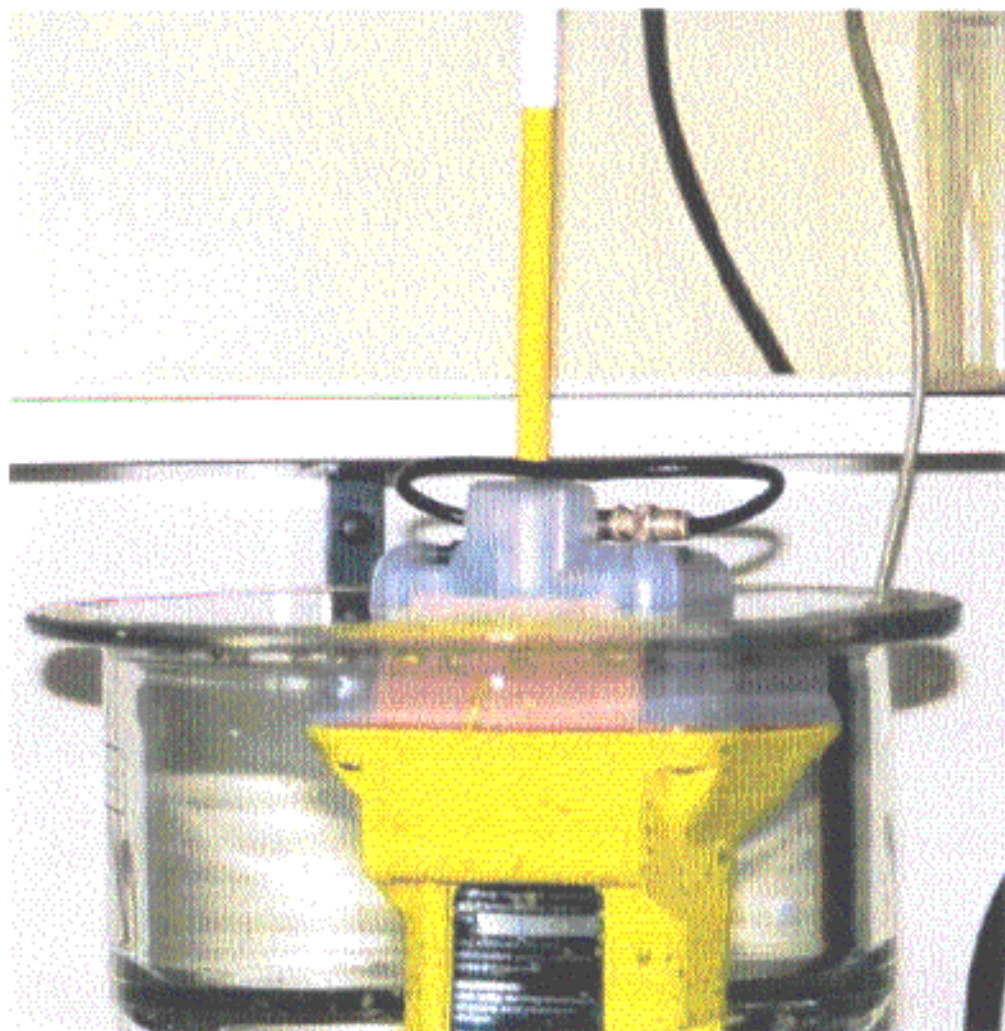
## STABILITY AND BUOYANCY

(Old method, RtcM 1991)



## STABILITY AND BUOYANCY

(Rtcm V. 2.0 Feb 5,1997)



## **CHAPTER 16**

<p><b>A16.0 - INADVERTENT ACTIVATION TEST</b></p>
---

### 16.1. TEST SPECIFICATIONS AND PROGRAMME

- Following Section A16.0 of RTCM Recommended Standards for 406 MHz Satellite EPIRBs (Version 2.0 Feb 5,1997) :
  - Install the unit consisting of satellite EPIRB (on ready position) and its release mechanism in the test bracket .
  - Direct a stream from a hose at the EUT for a period of five minutes :
    - diameter of the nozzle = 63.5 mm,
    - water delivery rate  $\approx$  2300 liters per minute,
    - the end of the nozzle is 3.5 m away from the EUT and 1.5 m above the base of antenna .
  - During the test rotate the EPIRB unit so that water strikes the EUT from all directions over an arc of least 180°.
  - Verify that the EUT don't release from its bracket, nor don't it automatically activate as a result of the water from the hose stream.

### 16.2. EQUIPMENT UNDER TEST

Beacon Unit : 1/2  
Name : ACR  
Type : RLB35  
Number : 07

Bracket : ACR Universal Sea Shelter Id 18560

### 16.3. TEST SITE

Toulouse Space Center (C.S.T./ ITS) - INTESPACE Laboratory.).

### 16.4. TEST EQUIPMENT

- Fire hydrant .
- Debitmeter .
- Mechanical support .
- Cospas/Sarsat Receiver : SERPE-IESM RMD01 S/N 004996
- Argos - Cospas/Sarsat Test Bench

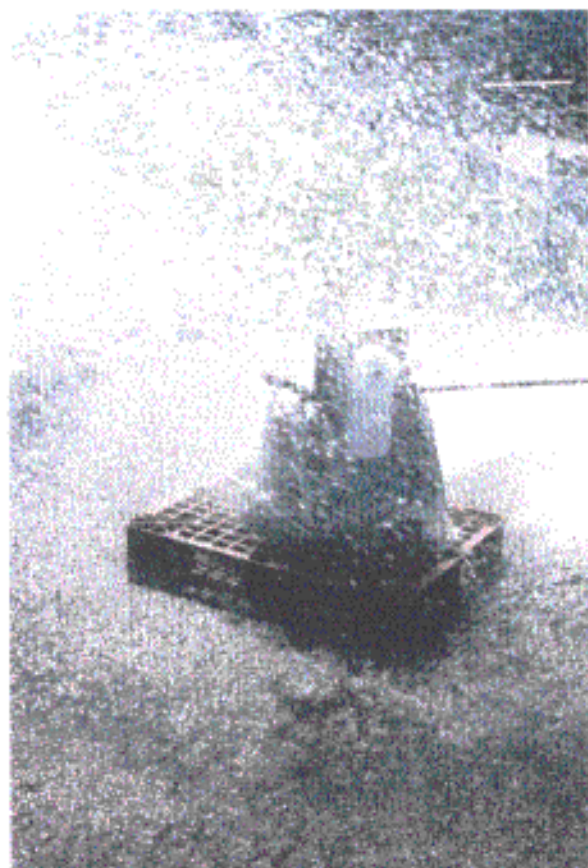


**16.5. TEST IMPLEMENTATION AND RESULTS**

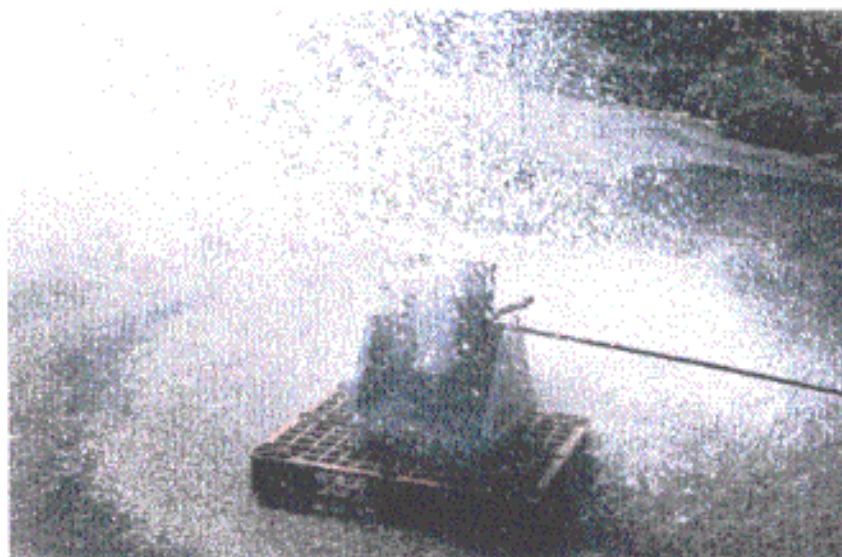
<b>Date</b>	<b>Time</b>	<b>Operations</b>	<b>Comments</b>
June 12 <sup>th</sup> , 2001	16:00	Test preparation	Nothing abnormal to note  No automatic activation  OK
	16:30	Start watering at about 2300 liters of water per minute.  Rotation of satellite EPIRB (180°)	
	16:35	End watering .  Visual inspection :	
	16:45	Beacon with release mechanism cleaned and dried.	

See photos next pages

## INADVERTENT ACTIVATION TEST



## INADVERTENT ACTIVATION TEST Continuation



## CHAPTER 17

<p><b>A17.0 - AUXILIARY RADIO-LOCATING DEVICE TRANSMITTER TEST</b></p>
--

### 17.1.1 TEST SPECIFICATIONS AND PROGRAMME

Following Section 10.3 of ETS 300-066 (Second edition –September 1996 ) :

- 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 12)

### 17.1.2 EQUIPMENT UNDER TEST

Beacon Unit : 1/2  
Name : ACR  
Type : RLB35  
Number : 07

### 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

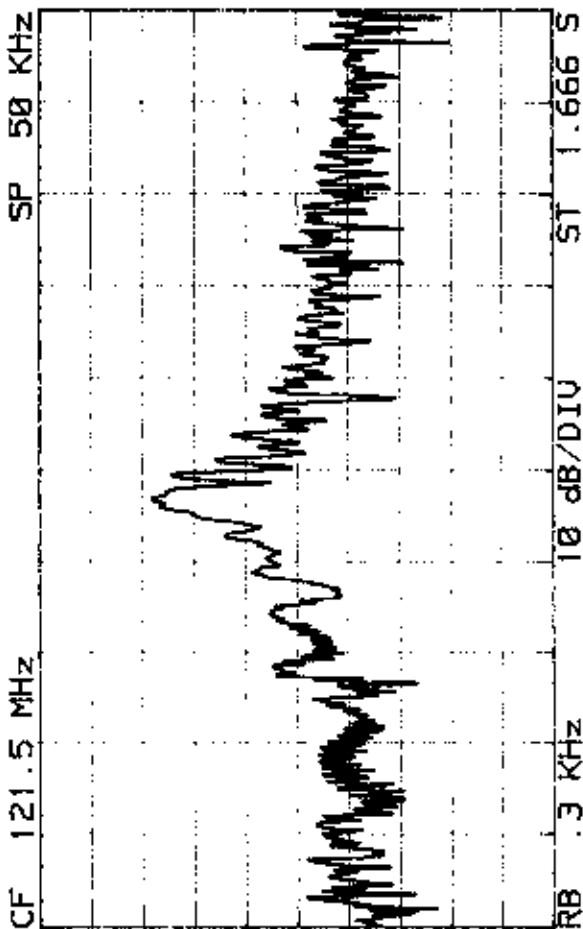
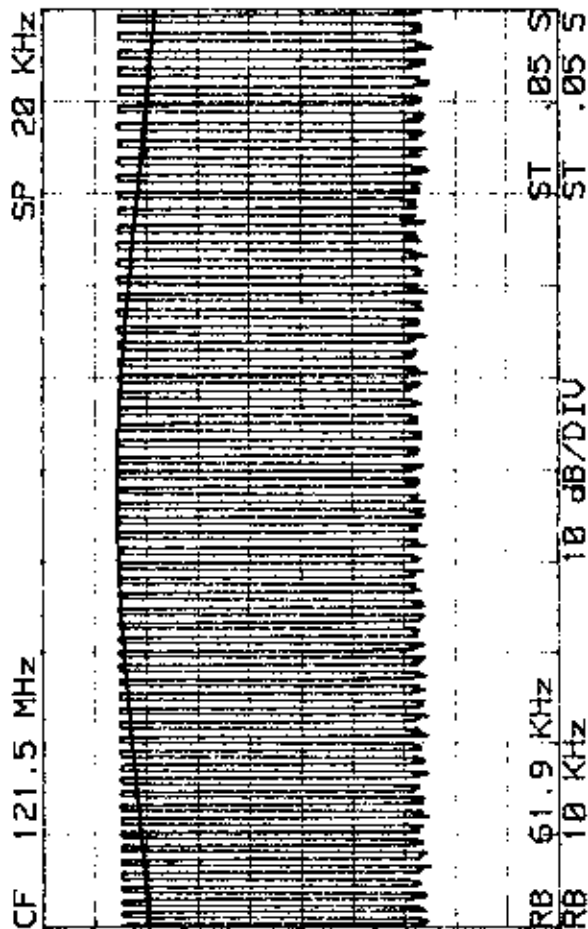
**17.1.5. RESULTS OF HOMING TRANSMITTER TESTS**

Beacon Unit : 1/2  
 Name : ACR  
 Type : RLB35  
 Number : 07

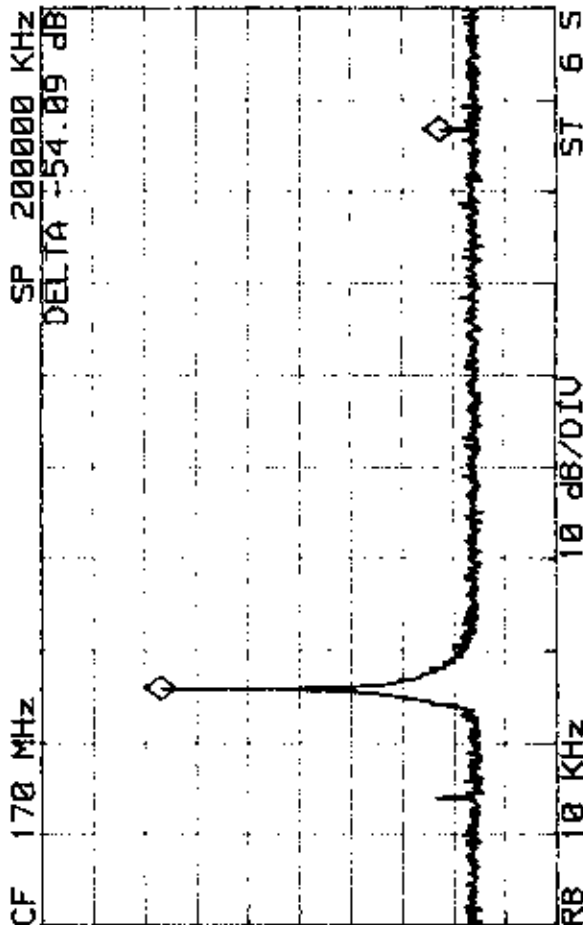
		T min. - 40° C	T amb. 22° C	T max + 55° C
1 - OPERATING LIFETIME AT MINIMUM TEMPERATURE	48H	> 50 h		
2 - CARRIER FREQUENCY *	121500 kHz ± 5 kHz	121.4983	121.4996	121.4996
3 - PEAK ENVELOPE OUTPUT POWER ** ( into 50 Ohms load )	14 dBm + 6/- 2 dBm	18.1 dBm	17.9 dBm	17.6 dBm
4 - TRANSMITTER DUTY CYCLE	continuous	Cont.	Cont.	Cont.
5 - MODULATION FREQUENCY	300 to 1 600 Hz	300 to 1460	290 to 1460	300 to 1460
6 - MODULATION DUTY CYCLE	33 % - 55 %	39 %	41 %	40 %
7 - MODULATION FACTOR	> 0.85	> 0.85	> 0.85	> 0.85
8 - SWEEP REPETITION RATE	2 Hz - 4 Hz	2.56 Hz	2.56 Hz	2.56 Hz
9 - HOMING TRANSMISSION CODING *	Bit 112 = 1	1	1	1

\* See data and graphs of results on chapter 12 " Cospas-Sarsat Type Approval Tests Report "

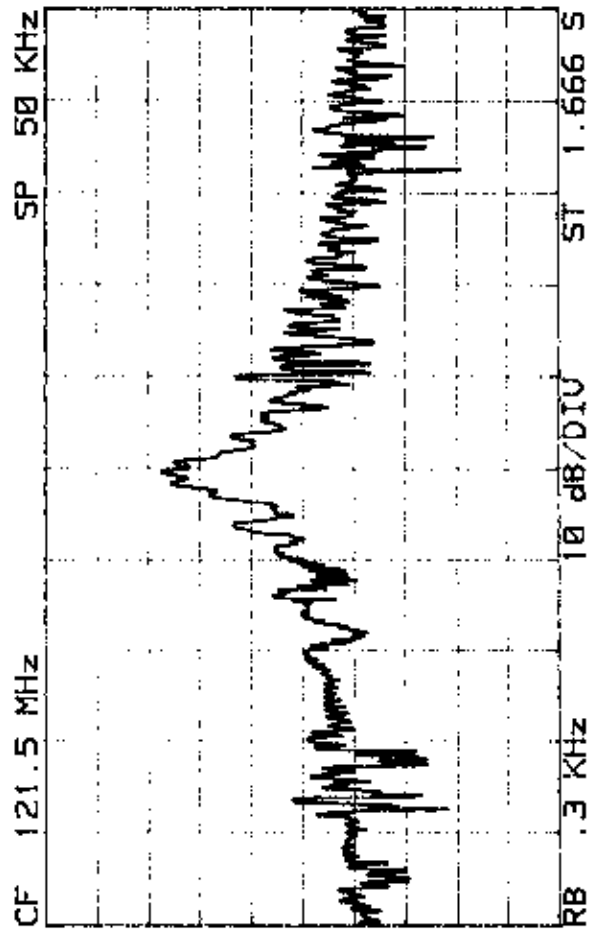
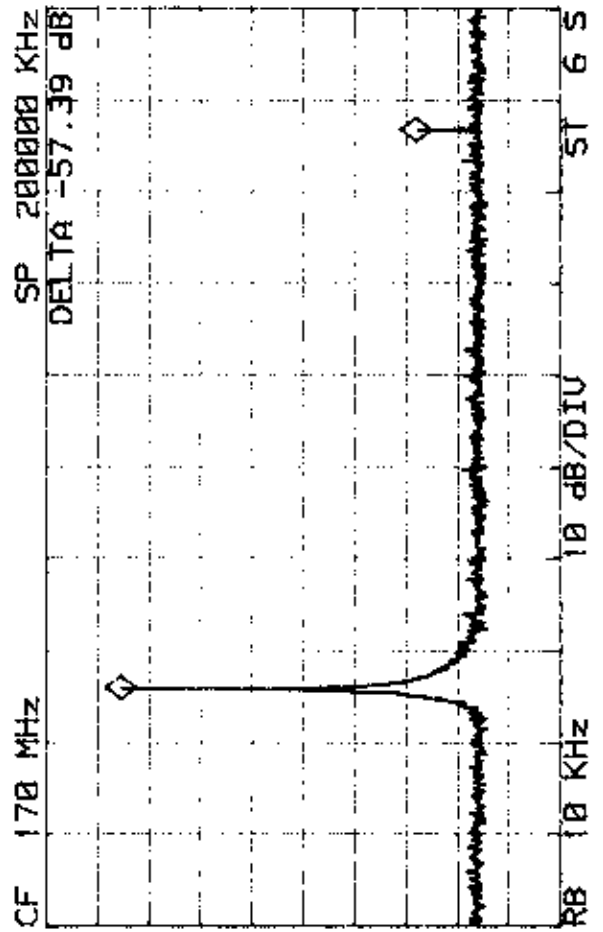
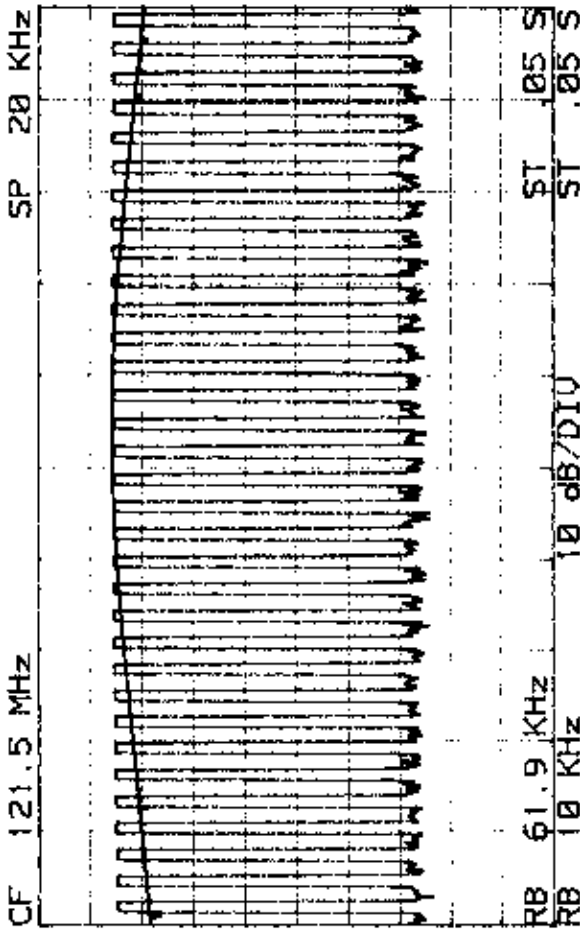
**17.1.6. SPECTRUM MEASUREMENT RESULTS**



ACR  
RLB35  
07  
25 Apr 2001  
121.5 MHz  
TEMP : -40°C

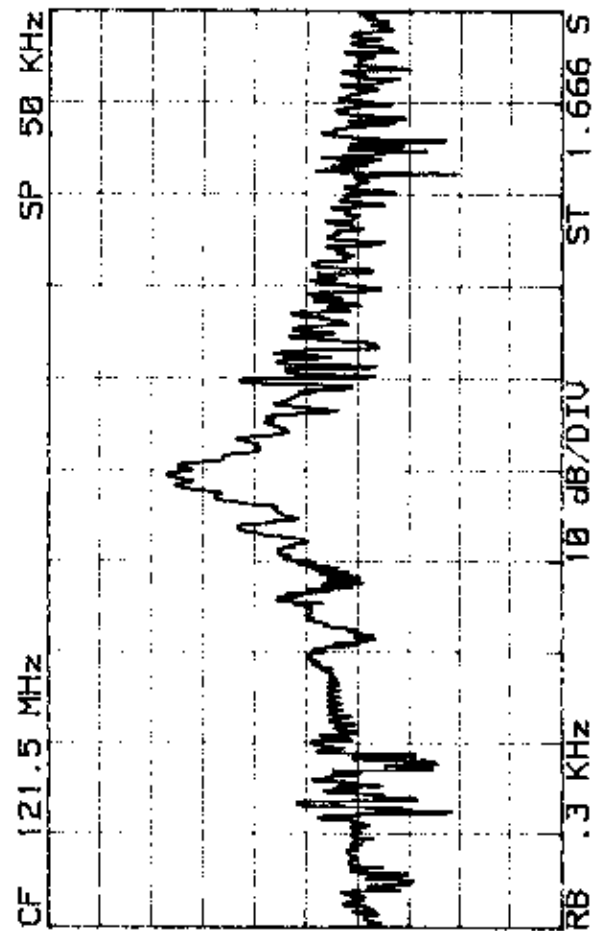
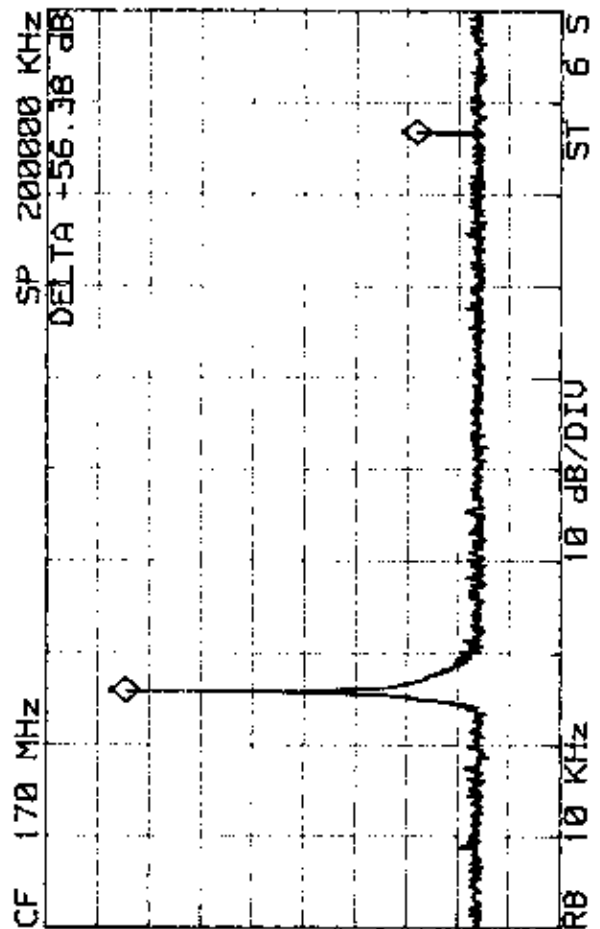
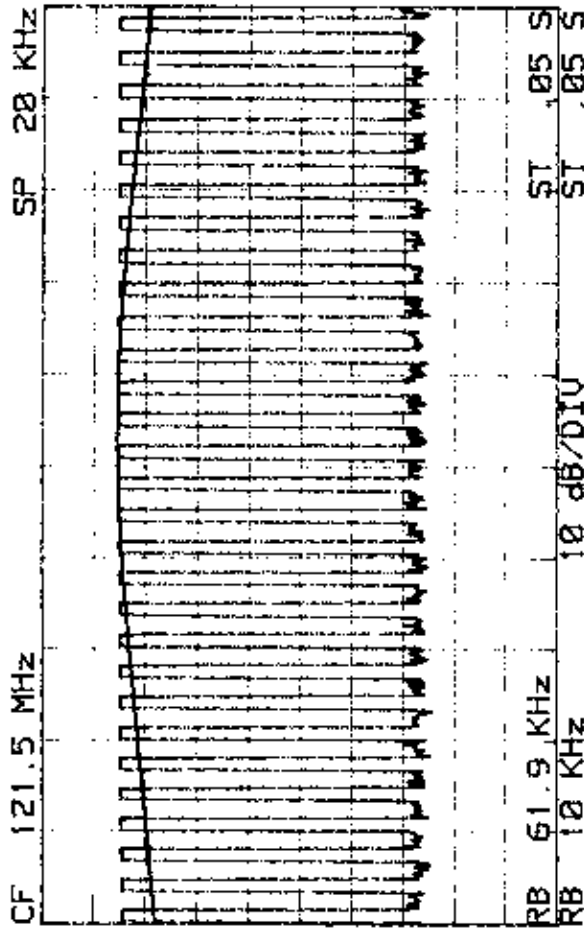


ACR  
RLB35  
Ø7  
18 Apr 2001  
121.5 MHz  
TEMP : 22°C





ACR  
RLB35  
07  
19 Apr 2001  
121.5 MHz  
TEMP : 55°C



**17.2- HOMING RADIATED OUTPUT POWER ON UUT 2/2**

**17.2.1 - ADMINISTRATION**

17.2.1.1	WORK ORDER :	Reference: M3223-ETS/TEC	
17.2.1.2	TEST TEAM :	A. COURTINADE (INTESPACE) J. COMMENGES (INTESPACE)	
17.2.1.3	SCHEDULE :	May 15 <sup>th</sup> , and 16 <sup>th</sup> , 2001	

**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 (Second edition –September 1996 ).

Frequency tested : 121.5 MHz.

**17.2.3 - RADIO BEACON IDENTIFICATIONS**

- Manufacturer : ACR
- Model N° : RLB35
- Serial N° : 01
- Antenna : ACR 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 .

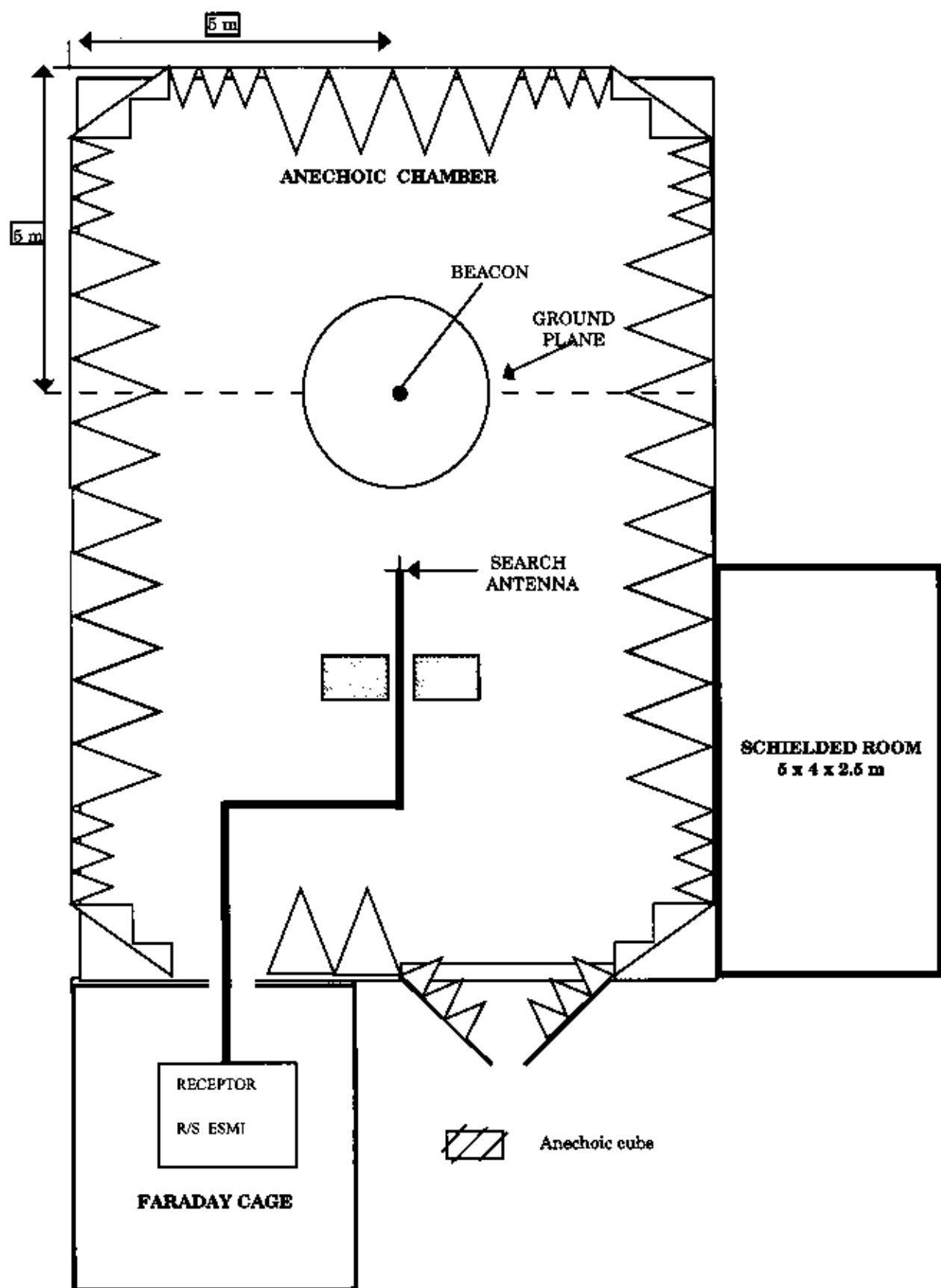
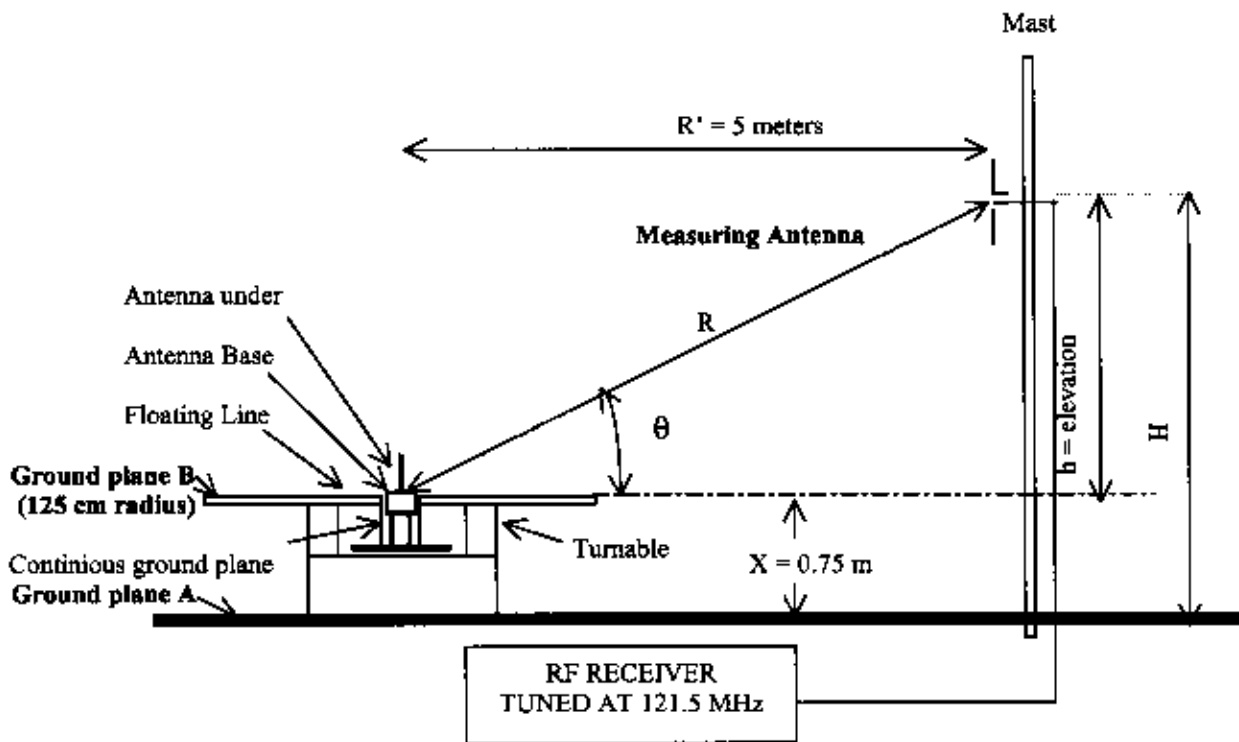


FIGURE 1



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

### 17.2.5 - TEST METHOD

According Section 10.3.5 of ETS 300-066 (Second edition –September 1996 ) following measurements are performed :

- 1/ The elevation angle between  $5^{\circ}$  and  $20^{\circ}$  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  $5^{\circ}$  to  $20^{\circ}$  ) and is remain fixed for the remainder of the test .
- 3/ The remaining 12 measurements of PERP is obtained by rotating the EUT in increments of  $30^{\circ} \pm 3^{\circ}$ . For each measurements the EUT PERP is computed using the following equation :

$$PERP = LOG^{-1} [(P_{REC} - G_{REC} + L_c + L_p)/10] \quad (\text{Equation A})$$

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 PERP is compared to the specified PERP 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

#### **SPECTRUM ANALYSER**

- R/S ESMI

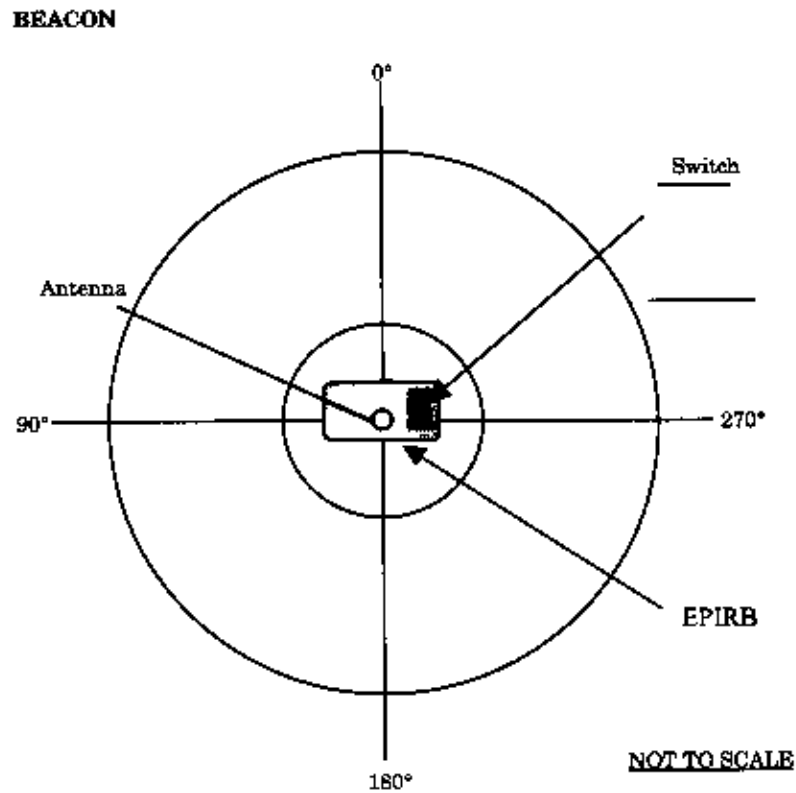
#### **CABLES**

- 20 m cable SUCOFLEX type 100 - cable loss at 121.5 MHz : 1.9 dB

### 17.2.7 - EPIRB MECHANICAL SET UP

EPIRB 0° axisq identified by the antenna position (see figure ) is the rotation center of azimuth angle.

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



### 17.2.8- TESTS OPERATIONS AND RESULTS

- 1 Determination of elevation angle  $\theta$  which produces a maximum gain :

$$\theta = 5^\circ$$

- 2 Determination of Free Space Propagation Loss ( $L_p$ ) :

$$L_p = 20\log(F_0) + 20\log(R) - 27.6 \text{ dB}$$

$$F_0 = 121.5 \text{ MHz}$$

$$R = 5.02 \text{ m (for an elevation angle } \theta = 5^\circ, \text{ figure 2)}$$

$$L_p = 28.1 \text{ dB}$$

- 3 Determination of Search Antenna Gain ( $G_{rec}$ ) :

$$G_{rec} = 20\log(F_0) - (AF - G_m) - 29.8 \text{ dB}$$

$$F_0 = 121.5 \text{ MHz}$$

$$AF = \text{Reference Gain of Search Antenna} = 10 \text{ dB}$$

$$G_m = \text{Directivity gain of the Search Antenna}$$

$$\text{With } \theta = 5^\circ, \quad G_m = 20 \log \frac{\cos(90 \times \sin \theta)}{\cos \theta} = -0.05 \text{ dB}$$

$$29.8 \text{ dB} = \text{Free Space Constant}$$

$$G_{rec} = 1.84 \text{ dB}$$

- 4 Receive System Attenuator and Cable Loss ( $L_c$ ) :

$$L_c = 1.9 \text{ dB}$$



### 18.2.9 MEASUREMENT RESULTS

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

<b>Azimut Angle</b>	<b>P<sub>rec</sub> Measured Power level (dBm)</b>	<b>PERP (dBm)</b>
0	- 8.89	19.27
30	-8.79	19.37
60	-8.79	19.37
90	-8.89	19.27
120	-8.89	19.27
150	-8.99	19.17
180	-9.09	19.07
210	-8.99	19.17
240	-8.99	19.17
270	-8.99	19.17
300	-8.89	19.27
330	-8.89	19.27
<b>Mean value</b>	<b>-8.92</b>	<b>19.25dBm</b>

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

$$\begin{aligned}
 & \mathbf{14\ dBm \leq PERP \leq 20\ dBm} \\
 & \mathbf{and} \\
 & \mathbf{PERP\ Azimuth\ Variation < 3\ dB}
 \end{aligned}$$

## CHAPTER 18

### **A18.0 - HUMIDITY TEST**

### **18.1. TEST SPECIFICATIONS AND PROGRAMME**

Following Section A18.0 of RTCM Recommended Standards for 406 MHz Satellite EPIRBs (Version 2.0 Feb 5, 1997) :

Eject beacon, open the housing and leave inside temperature-controlled RH chamber for 8 hours minimum.

Settings :

- Dry temperature : 40° C
- Damp temperature : 39° C
- Relative humidity (RH) : 95 %

( See photo next page)

At the end of test :

- Within five minutes after opening chamber, at the ambient room conditions, turn on and connect the beacon to the test bench.
- Fifteen minutes after application power, conduct an aliveness test at the ambient temperature

### **18.2. EQUIPMENT UNDER TEST**

Beacon Unit : 1/2  
Name : ACR  
Type : RLB35  
Number : 07

### **18.3. TEST SITE**

Toulouse Space Center (C.S.T./ ITS) - Beacon certification laboratory .

#### 18.4. TEST EQUIPMENT

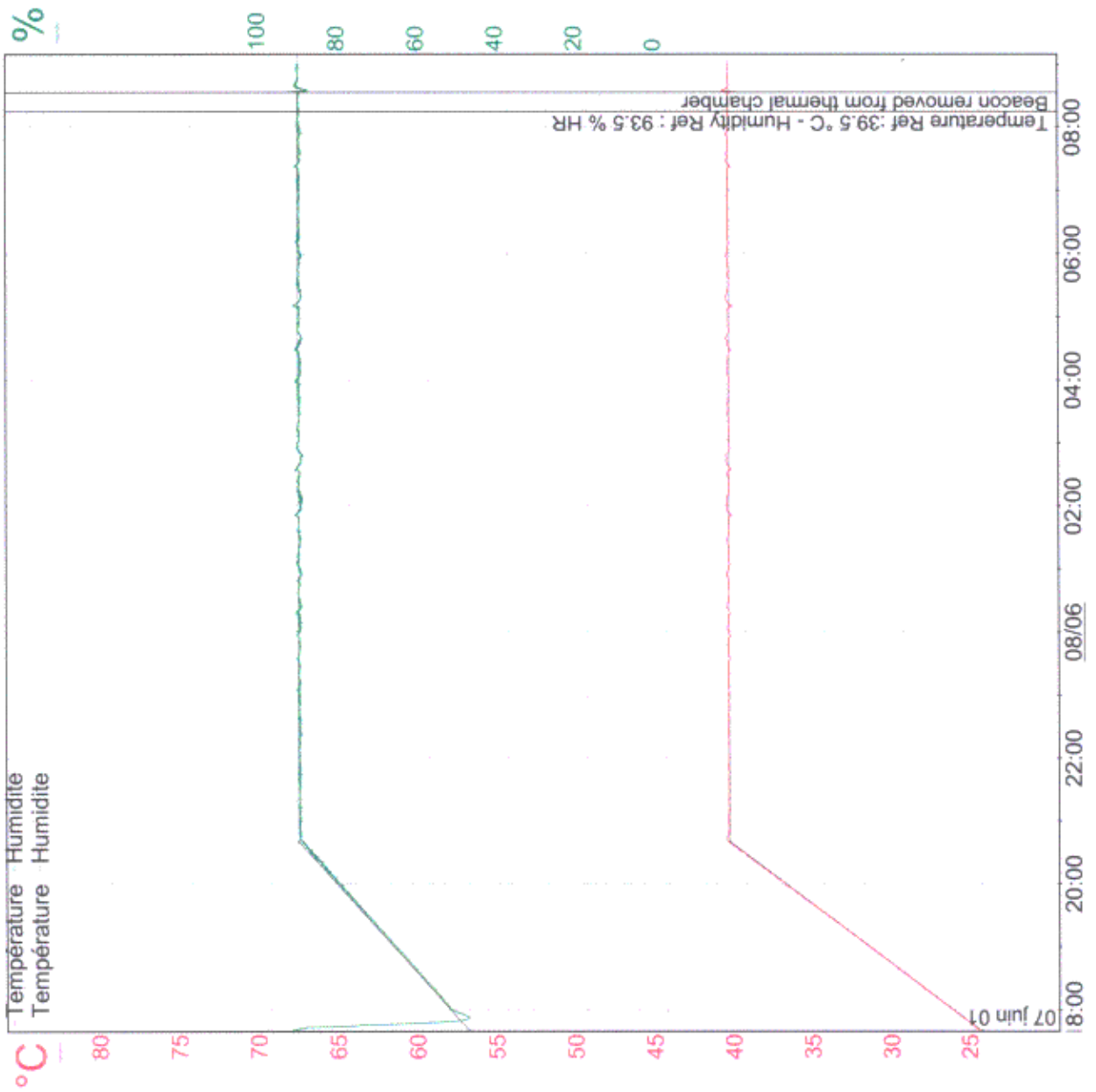
- Climatic chamber : CLIMATS F.C.H. – Type: Austral 137H60/1,5E - S/N: S4880,
- KEITHLEY thermometer/multimeter ,Type : 2000, S/N 0678112 with CU-CT thermocoupler,
- COLE PARMER thermo-hygrometer, Type : TriSense S/N : 37000-00,
- Argos - Cospas/Sarsat Test Bench .

#### 18.5. TEST RESULTS

##### 18.5.1 Test implementation

Date	Hour	Operations	Results
June 7 <sup>th</sup> ,2001	17:30	The beacon, housing opened and in the ready condition, is thermally soaked at + 40° C / 95% RH in the temperature-controlled oven	
June 8 <sup>th</sup> ,2001	9:30	End of Humidity Test . The EUT is removed from the oven .	
	9:35	The EUT, connected to Argos –C/S Test Bench, is turned on.	
	9:40	An aliveness test is conducted	OK See results next pages

##### 18.5.2 Graph test report



## Rapport d'essai

### M3223 - ACR RLB35 07 - 7 June 01

Essai effectué du 07 juin 01 (17h39)  
au 08 juin 01 (11h09)

Durée de l'essai: 17h30,00

PCH60  
N° S4880

Humidity Test (RTCM 110)  
Date d'impression: 27 juil. 01  
1 pages(s)

## Commentaires

Green : Chamber Humidity  
Red : Chamber Temperature

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.....

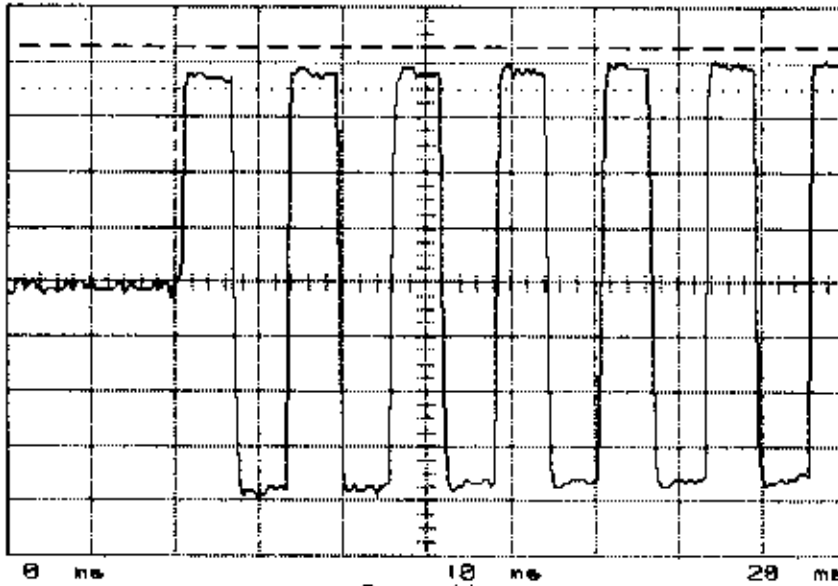
**18.5.3 Aliveness test result after Humidity Test**

 Date : June 8<sup>th</sup>, 2001 09:40

<b>1 – Environmental Temperature ( ° C)</b>		22 ° C
<b>2 – POWER OUTPUT</b>		
- Transmission power	dBm	37 ± 2
- Power risetime	ms	< 5
- Power falltime	ms	< 5
		37.75
		0.85 ms
		-
<b>3 – SPURIOUS OUTPUT</b>		
- In band	*	
- Carrier harmonics	*	
		OK
<b>4 –DIGITAL MESSAGE GENERATOR</b>		
- Repetition rate	*	
- Bit rate	bits/S	400 ± 4
- Transmission time	ms	440 ± 4.4 / 520 ± 5.2
- CW preamble	ms	160 ± 1.6
		OK
		401.30
		519.34
		160.37
<b>5 – DIGITAL MESSAGE</b>		
- Bit and frame sync	bits	1-24
- Format flag	bit	25
- Protocol flag	bit	26
- Country code	bits	27-36
- Protocol	bits	37-40
- Encoded Position Data Source	bits	111
- Homing	bits	112
- BCH 1 code read / calculated	bits	86-106 / 25-85
- BCH 2 code read / calculated	bits	133-144 / 107-132
		FFFE2F
		1
		0
		0366
		1110
		1
		1
		087645 / 087645
		3E8 / 3E8
<b>6 – FREQUENCY</b>		
- Nominal value	KHz	406 025 ± 2
- Short term stability		< 2x10 <sup>-9</sup> /100 ms
		-0.53892
		1.1 x 10 <sup>-10</sup>

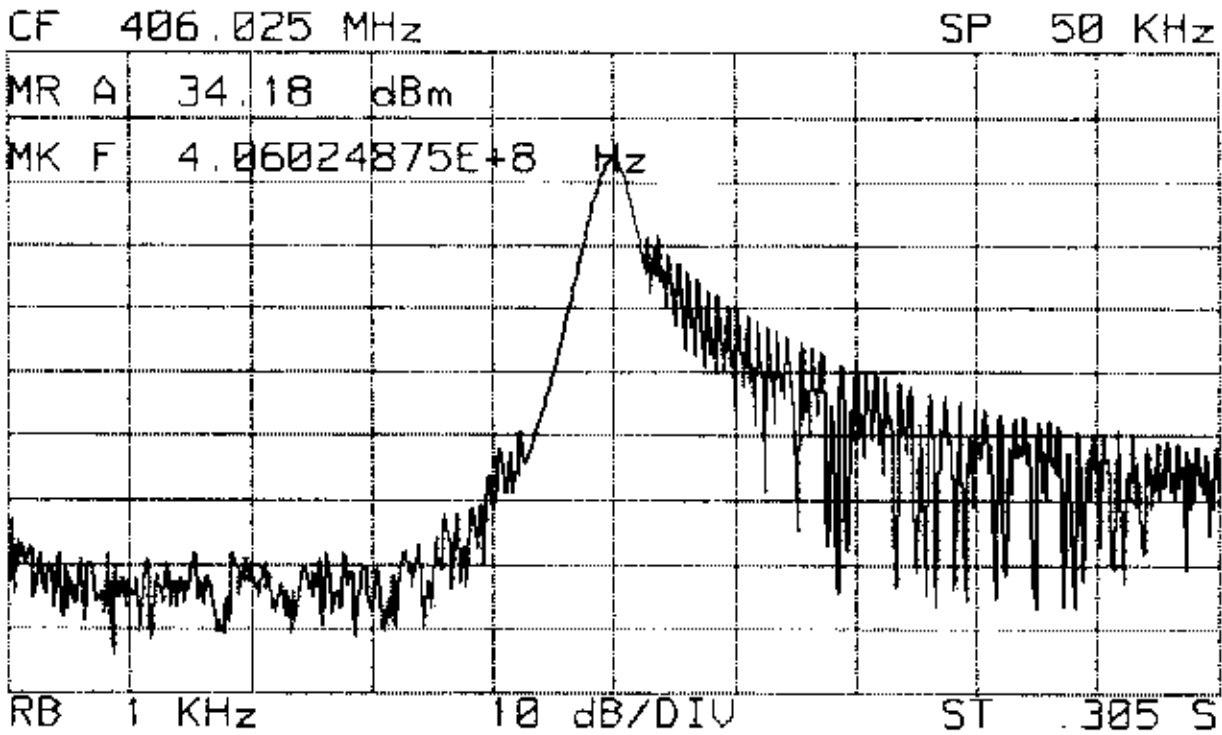
\* See data and graphs next pages





Umarker2(1) 700 mv ==> 1 ns  
 Umarker1(1) 850 mv ==> 1.2 ns

Spectre de frequence





## HUMIDITY TEST



## **CHAPTER 19**

### **A19.0 - ORIENTATION TEST**

### **19.1. TEST SPECIFICATIONS AND SEQUENCE**

Following Section A19.0 of RTCM Recommended Standards for 406 MHz Satellite EPIRBs (Version 2.0 Feb 5,1997) :

- At the ambient temperature :

- In vertically position active the EUT and after 15 minutes perform an alivness test .
- Subsequently place the eut in horizontal position, upside down, and return upright position and perform the alivness test 2 minutes after each position .

### **19.2. EQUIPMENT UNDER TEST**

Beacon Unit : 2/2  
Name : JOTRON  
Type : TRON 40GPS  
Number : 7001

### **19.3 TEST SITE**

Toulouse Space Center (CST) - INTESPACE Metrology.

### **19.4. TEST EQUIPMENT**

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

### **19.5. RESULTS**

The orientation test is performed during the COSPAS-SARSAT certification test at ambient temperature .

See next page the results .

**9.5.1 ALIVENESS TEST RESULTS BEACON - VERTICAL POSITION**

Beacon Unit : 1/2  
 Name : ACR  
 Type : RLB35  
 Number : 07

Date : June 8<sup>th</sup>,2001 09:02

**406 MHZ MEASUREMENTS**

<b>1 - Environmental Temperature ( ° C )</b>			+ 22 ° C
<b>2 - POWER OUTPUT</b>			
- Transmission power	dBm	37 ± 2	37.6
- Power risetime	ms	< 5	0.84 ms
- Power falltime	ms	< 5	-
<b>3 - SPURIOUS OUTPUT</b>			
- In band	*		OK
- Carrier harmonics			
<b>4 - DIGITAL MESSAGE GENERATOR</b>			
- Repetition rate			OK
- Bit rate	bits/S	400 ± 4	401.29
- Transmission time	ms	440 ± 4.4 / 520 ± 5.2	519.35
- CW preamble	ms	160 ± 1.6	160.36
<b>5 - DIGITAL MESSAGE</b>			
- Bit and frame sync	bits	1-24	FFFE2F
- Format flag	bit	25	1
- Protocol flag	bit	26	0
- Country code	bits	27-36	0366
- Protocol	bits	37-40	1110
- Encoded Position Data Source	bits	111	1
- Homing	bits	112	1
- BCH 1 code read / calculated	bits	86-106 / 25-85	1029B4 / 1029B4
- BCH 2 code read / calculated	bits	133-144 / 107-132	66C / 66C
<b>6 - FREQUENCY</b>			
- Nominal value	KHz	406 025 ± 2	-0.54004
- Short term stability		< 2x10 <sup>-9</sup> /100 ms	1.1 x 10 <sup>-10</sup>

\* See data and graphs next pages

Laboratoire de certification  
 Controle balise ARGOS/SARSAT

VERTICAL POSITION

 Constructeur ACR  
 Modele RLB35  
 Numero de serie 07  
 Reference M3223-1  
 Type SARSAT

Date de l'essai 8 Jun 2001 09:02:04

## Message balise

 Message recu (1-144): FFFE2F96EE2EC0017FDFFCOA6D3783E0F66C  
 Format flag (25): 1  
 Protocole flag (26): 0  
 Code pays (27-36): 0366  
 Pays : USA  
 Code protocole (37-40): 1110  
 Protocole utilise : Standard - Test  
 Identification :  
 Numero :  
 BCH 1 lu/calcul (86-106/25-85): 1029B4/1029B4  
 BCH 2 lu/calcul (133-144/107-132): 66C/66C  
 Pos. Data Source (111): Internal  
 121.5 MHz Homing (112): Yes  
 Position GPS de reference : N 43°33'34'' E 1°28'48  
 Position GPS : Yes  
 Position GPS par default : Yes

## Controle message

 Duree de la porteuse pure 160.36ms +- 0.00  
 Duree de l'emission 519.35 ms  
 Frequence de modulation 401.29Hz +- 0.00  
 Stabilite de frequence  
 Frequence moyenne F2 406024459.96 Hz  
 SIGMA2 F2-F1 4.737E-10  
 SIGMA3 F3-F2 1.080E-10

## Mesures d'indice

F	F1	G1
49458.94	233	59
49458.57	233	59

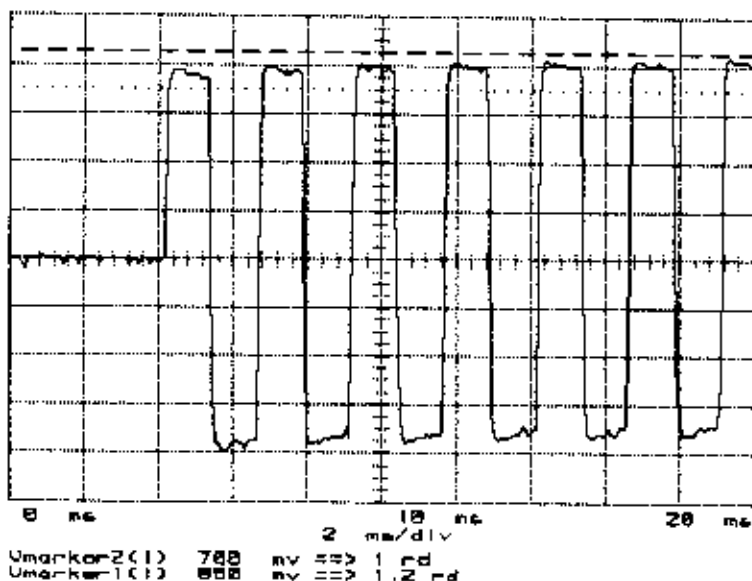
Excursion de phase totale	rd	<= 2.48	2.24
Excursion de phase positive	rd	0.96< <1.24	1.18
Excursion de phase negative	rd	-1.24< <-0.96	-1.06
Symetrie de l'excursion	%	<= 5	-5.09

## Mesures de puissance

Puissance	dBm	37.59
-----------	-----	-------

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Oscillo



Spectre de fréquence

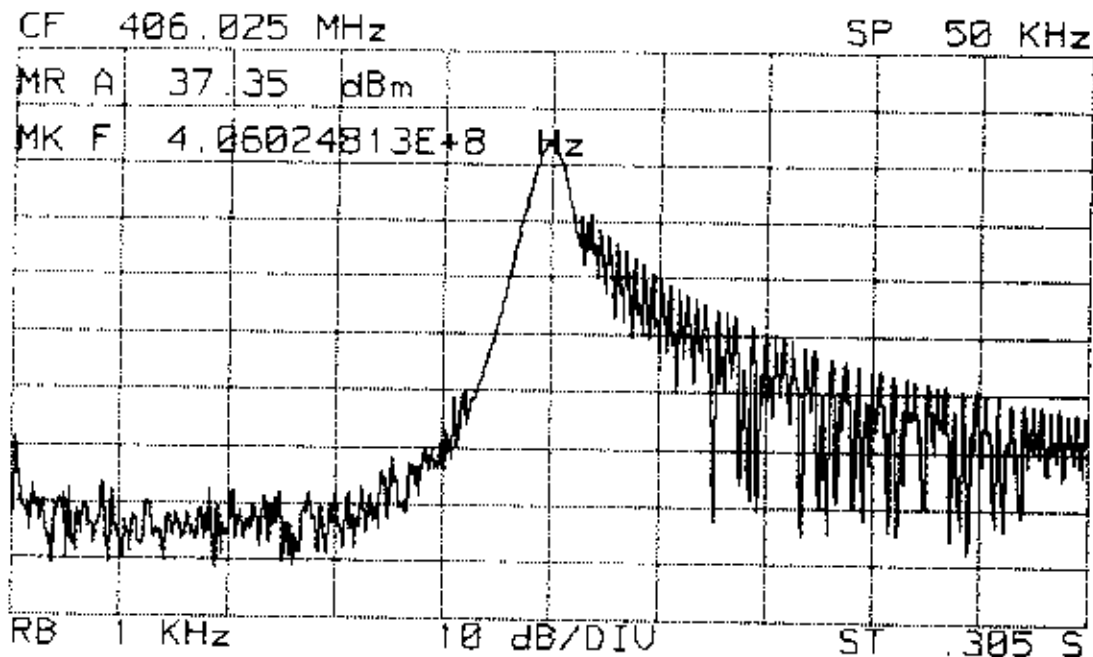


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 HICRIBLÉ NO. 92-81-0  
 AUKO 06 96

**9.5.2 ALIVENESS TEST RESULTS BEACON - HORIZONTAL POSITION**

Beacon Unit : 1/2  
 Name : ACR  
 Type : RLB35  
 Number : 07

Date : June 8<sup>th</sup>, 2001 09 :56

**406 MHZ MEASUREMENTS**

<b>1 - Environmental Temperature ( ° C )</b>			+ 22 ° C
<b>2 - POWER OUTPUT</b>			
- Transmission power	dBm	37 ± 2	37.6
- Power risetime	ms	< 5	0.85 ms
- Power falltime	ms	< 5	-
<b>3 - SPURIOUS OUTPUT</b>			
- In band	*		OK
- Carrier harmonics			
<b>4 - DIGITAL MESSAGE GENERATOR</b>			
- Repetition rate			OK
- Bit rate	bits/S	400 ± 4	401.29
- Transmission time	ms	440 ± 4.4 / 520 ± 5.2	519.35
- CW preamble	ms	160 ± 1.6	160.37
<b>5 - DIGITAL MESSAGE</b>			
- Bit and frame sync	bits	1-24	FFFE2F
- Format flag	bit	25	1
- Protocol flag	bit	26	0
- Country code	bits	27-36	0366
- Protocol	bits	37-40	1110
- Encoded Position Data Source	bits	111	1
- Homing	bits	112	1
- BCH 1 code read / calculated	bits	86-106 / 25-85	087645 / 087645
- BCH 2 code read / calculated	bits	133-144 / 107-132	EC2 / EC2
<b>6 - FREQUENCY</b>			
- Nominal value	KHz	406 025 ± 2	-0.54560
- Short term stability		< 2x10 <sup>-9</sup> /100 ms	1.2 x 10 <sup>-12</sup>

\* See data and graphs next pages

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**HORIZONTAL POSITION**

 Constructeur     ACR  
 Modele            RLB35  
 Numero de serie  07  
 Reference         M3223-1  
 Type              SARSAT

Date de l'essai   8 Jun 2001 09:56:40

**Message balise**

```

Message recu          (1-144): FFFE2F96EE2EC0012C00221D917769BCAEC2
Format flag           (25): 1
Protocole flag        (26): 0
Code pays              (27-36): 0366
Pays                   : USA
Code protocole         (37-40): 1110
Protocole utilise     : Standard - Test
Identification        :
Numero                 :
BCH 1 lu/calculé      (86-106/25-85): 087645/087645
BCH 2 lu/calculé      (133-144/107-132): EC2/EC2
Pos. Data Source      (111): Internal
121.5 MHz Homing      (112): Yes
Position GPS de reference : N 43°33'34'' E 1°28'48
Position GPS          : Yes
Position GPS par default : No
Latitude position     : 43°33'36'' Nord
Longitude position    : 1°28'40'' Est
Delta position        : 0 km
    
```

**Controle message**

```

Duree de la porteuse pure                   160.37ms +- 0.00
Duree de l'emission                         519.35 ms
Frequence de modulation                     401.29Hz +- 0.00
Stabilite de frequence
Frequence moyenne    F2                     406024454.40 Hz
SIGMA2               F2-F1                   2.473E-10
SIGMA3               F3-F2                   1.742E-12
    
```

**Mesures d'indice**

F	F1	G1
49454.38	233	60
49454.34	233	60

Excursion de phase totale	rd	<= 2.48	2.30
Excursion de phase positive	rd	0.96< <1.24	1.19
Excursion de phase negative	rd	-1.24< <-0.96	-1.11
Symetrie de l'excursion	*	<= 5	-3.47

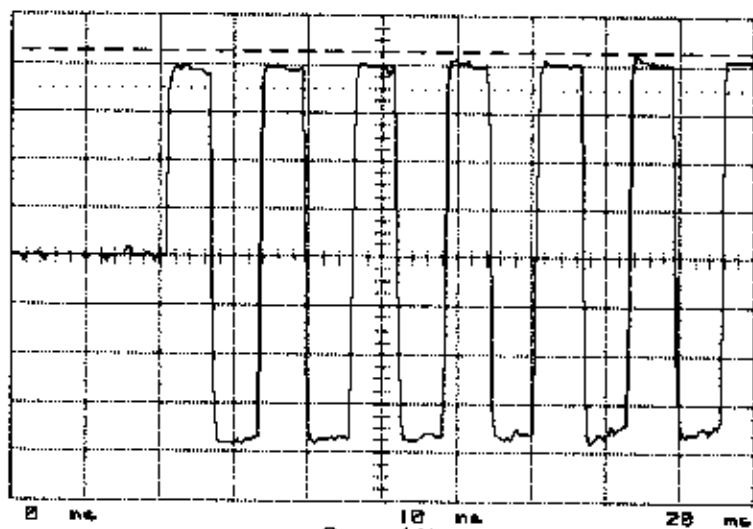
HEWLETT-PACKARD JET414P(1)   RECORDEH --C 92261 K   AUKO 06 96   PHN1 ON THIS SUB-UMELY



Mesures de puissance

Puissance dBm 37.60

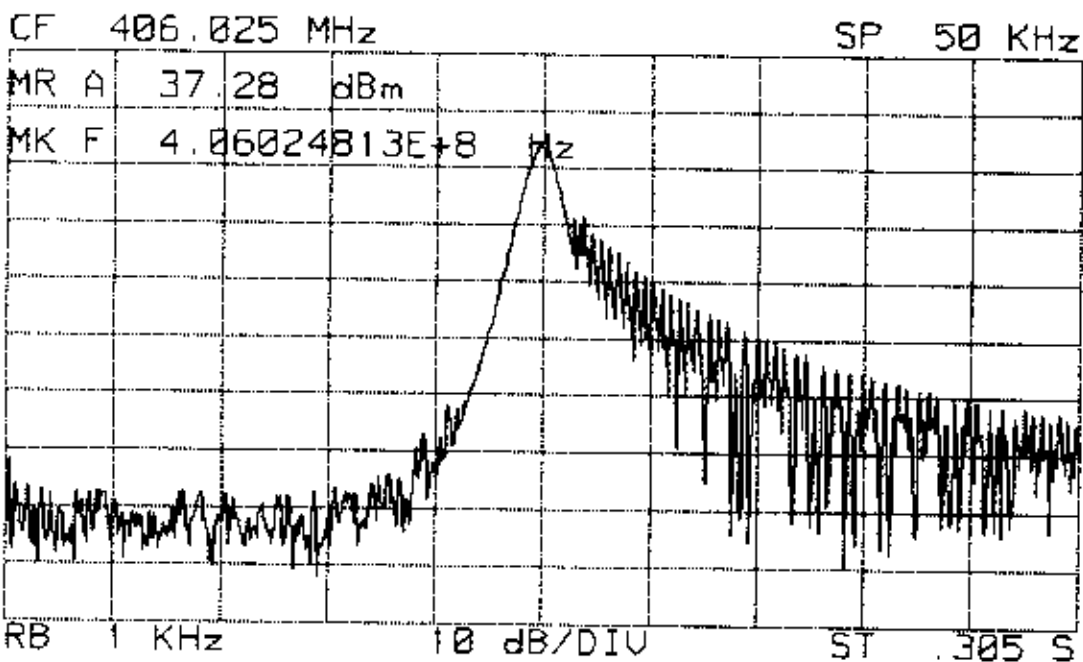
Oscillo



Umarker2(1) 700 mV => 1.00 V

Umarker1(1) 050 mV => 1.25 V

Spectre de fréquence



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**9. 5.3 ALIVENESS TEST RESULTS BEACON - UPSIDE DOWN POSITION**

Beacon Unit : 1/2  
 Name : ACR  
 Type : RLB35  
 Number : 07

Date : June 8<sup>th</sup>,2001 10 :55

**406 MHZ MEASUREMENTS**

<b>1 - Environmental Temperature ( ° C )</b>			+ 22 ° C
<b>2 - POWER OUTPUT</b>			
- Transmission power	dBm	37 ± 2	37.6
- Power risetime	ms	< 5	0.85 ms
- Power falltime	ms	< 5	-
<b>3 - SPURIOUS OUTPUT</b>			
- In band	*		OK
- Carrier harmonics			
<b>4 -DIGITAL MESSAGE GENERATOR</b>			
- Repetition rate			OK
- Bit rate	bits/S	400 ± 4	401.29
- Transmission time	ms	440 ± 4.4 / 520 ± 5.2	519.35
- CW preamble	ms	160 ± 1.6	160.37
<b>5 - DIGITAL MESSAGE</b>			
- Bit and frame sync	bits	1-24	FFFE2F
- Format flag	bit	25	1
- Protocol flag	bit	26	0
- Country code	bits	27-36	0366
- Protocol	bits	37-40	1110
- Encoded Position Data Source	bits	111	1
- Homing	bits	112	1
- BCH 1 code read / calculated	bits	86-106 / 25-85	087645 / 087645
- BCH 2 code read / calculated	bits	133-144 / 107-132	EC2 / EC2
<b>6 - FREQUENCY</b>			
- Nominal value	KHz	406 025 ± 2	-0.54467
- Short term stability		< 2x10 <sup>-9</sup> /100 ms	7.0 x 10 <sup>-11</sup>

\* See data and graphs next pages

Laboratoire de certification  
 Controle balise ARGOS/SARSAT

UPSIDE DOWN POSITION

 Constructeur     ACR  
 Modele            RLB35  
 Numero de serie  07  
 Reference         M3223-1  
 Type               SARSAT

Date de l'essai   8 Jun 2001 10:55:44

## Message balise

 Message reçu                   (1-144): FFFE2F96EE2EC0012C00221D917769BCAEC2  
 Format flag                    (25): 1  
 Protocole flag                 (26): 0  
 Code pays                      (27-36): 0366  
 Pays                            : USA  
 Code protocole                 (37-40): 1110  
 Protocole utilise             : Standard - Test  
 Identification                 :  
 Numero                         :  
 BCH 1 lu/calculé           (86-106/25-85): 087645/087645  
 BCH 2 lu/calculé (133-144/107-132): EC2/EC2  
 Pos. Data Source             (111): Internal  
 121.5 MHz Homing             (112): Yes  
 Position GPS de reference     : N 43°33'34'' E 1°28'40''  
 Position GPS                   : Yes  
 Position GPS par default     : No  
 Latitude position             : 43°33'36'' Nord  
 Longitude position            : 1°28'40'' Est  
 Delta position                 : 0 km

## Controle message

 Duree de la porteuse pure                                   160.37ms +- 0.00  
 Duree de l'emission   519.35 ms

Frequence de modulation                                   401.29Hz +- 0.00

## Stabilite de frequence

Frequence moyenne   F2                                   406024455.33 Hz

 SIGMA2                F2-F1                               4.580E-10  
 SIGMA3                F3-F2                               6.965E-11

## Mesures d'indice

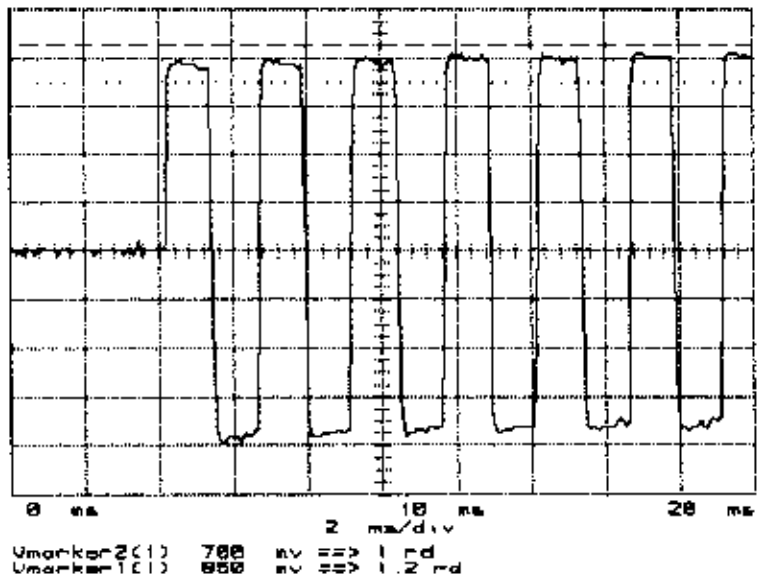
F	F1	G1
49455.11	233	60
49455.02	233	59

Excursion de phase totale	rd	<= 2.48	2.28
Excursion de phase positive	rd	0.96< <1.24	1.08
Excursion de phase negative	rd	-1.24< <-0.96	-1.21
Symetrie de l'excursion	%	<= 5	5.63

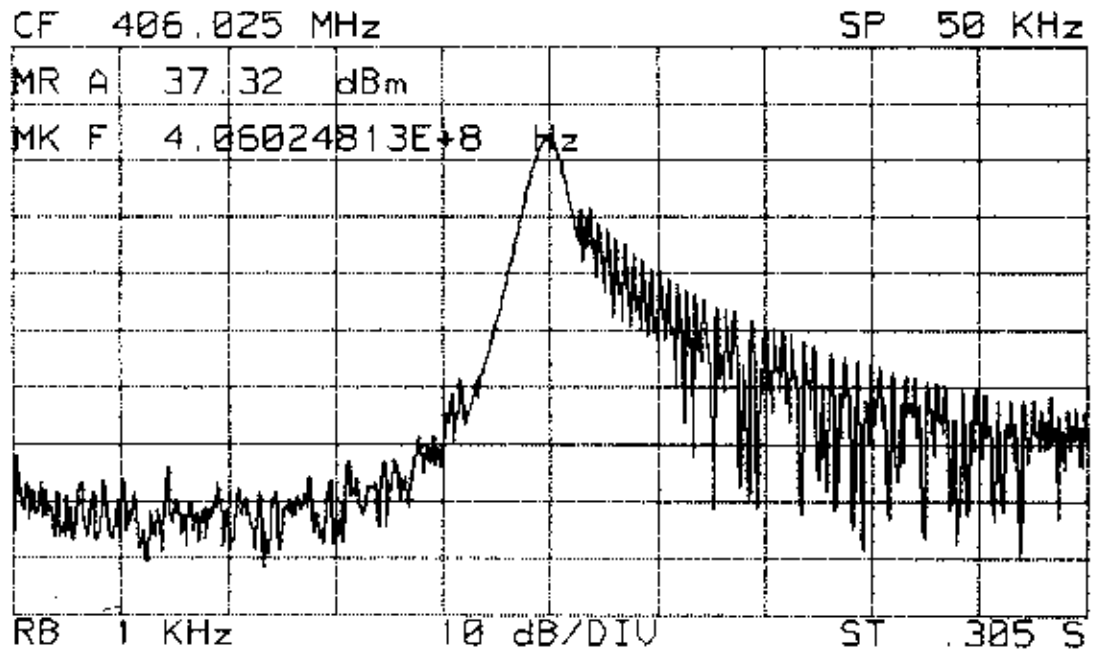
Mesures de puissance

Puissance dBm 37.72

Oscillo



Spectre de frequence



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