

CHAPTER 7

LEAKAGE AND IMMERSION TEST

7.1. TEST SPECIFICATIONS AND SEQUENCE

Following Section A7.0 of RTCM Recommended Standards for 406 MHz Satellite PLBs
(Version 1.1 Feb 4, 2003) :

- Leave beacon in off position throughout test .
- Place the beacon in an atmosphere of $+ 65 \pm 3^{\circ}\text{C}$ for one hour.
- Fully immerse beacon in water at $+ 20 \pm 3^{\circ}\text{C}$ to a depth of 100 ± 5 mm msasured from it highest point to the surface of water for a period of 48 hours (Test equipment : Pressure Chamber).
- Set chamber to 1 kg/cm^2 to simulate a 10 meter head of water .
- Leave pressure on for one hour .
- Remove beacon from chamber, wipe it dry and perform an alivness test
- Open the EUT and then inspect for damage and visible ingress of water .

7.2. EQUIPMENT UNDER TEST

Beacon Unit : 1/3
Name : ACR / TeraFixTM 406GPS I/O PLB
Type : PLB200
Number : 07

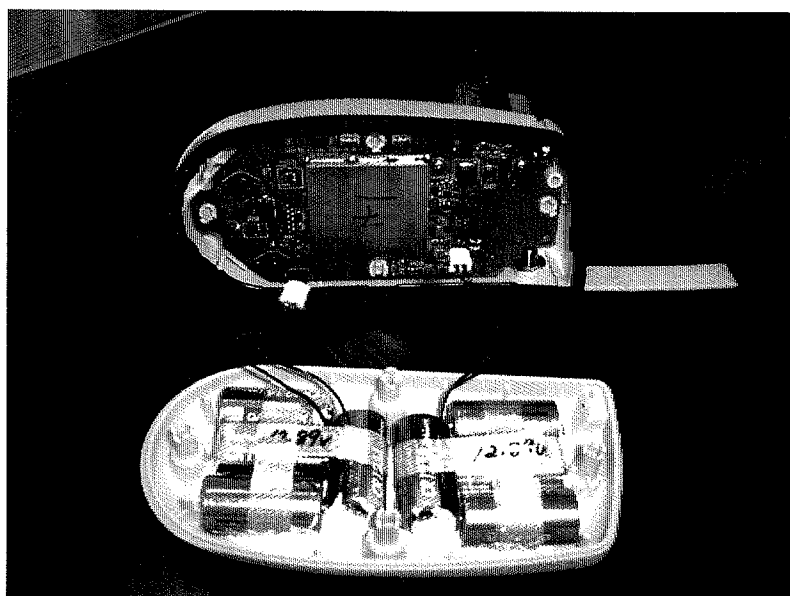
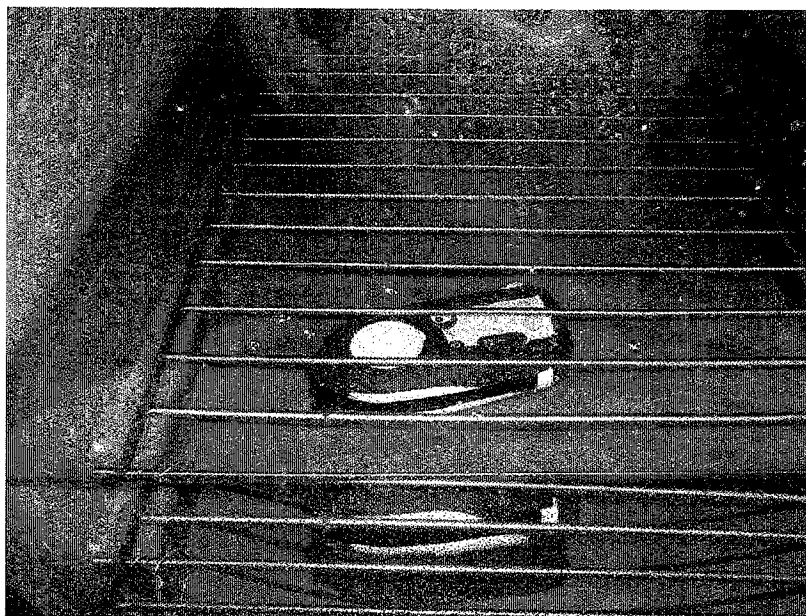
7.3 TEST SITE

Toulouse Space Center (CST) - INTESPACE Metrology.

7.4. TEST EQUIPMENT

- Pressure chamber : Intespace 100 liters Pressure Chamber (see photo next page),
- Pressure sensor : BARFLEX BOURDON Electronique Type 0-2000 hPa
- Pressure reducer.
- Nitrogen cylinder.
- Argos - Cospas/Sarsat Test Bench.

LEAKAGE AND IMMERSION TEST



7.5. TEST RESULTS

7.5.1 Test implementation

Place : INTESPACE Laboratory

Date	Hour	Events - Observations
07 july 2004	14:00	Beacon (turned Off) leaved in thermal chamber at + 65 °C for one hour minimum
	16:00	Beacon submerged under 100 mm of water for 48 hours minimum in pressure chamber
09 july 2004	21:00	Beacon submerged and chamber pressurized to 10^5 Pascal for one hour
09 july 2004	22:00	Chamber depressurized and then beacon removed, wiped and dried .
10 july 2004	00:50	Electrical checks : See results of aliveness test next pages
	11:00	Beacon opened for visual inspection at ≈ 22 °C: OK. Nothing abnormal to note .(see photos)

7.5.2 ALIVENESS TEST RESULTS AFTER SALT FOG TEST

Beacon Unit : 1/3
 Name : ACR / TeraFixTM 406GPS I/O PLB
 Type : PLB200
 Number : 07
 Date : 10 july 2004

406 MHZ MEASUREMENTS

1 - Environmental Temperature (° C)			+ 22° C
2 - POWER OUTPUT			
- Transmission power	dBm	37 ± 2	37.2
- Power risetime	ms	< 5	0.90 ms
- Power falltime	ms	< 5	-
3 - SPURIOUS OUTPUT			
- In band	*		OK
- Carrier harmonics			
4 -DIGITAL MESSAGE GENERATOR			
- Repetition rate			OK
- Bit rate	bits/S	400 ± 4	398.33
- Transmission time	ms	440 ± 4.4 / 520 ± 5.2	522.42
- CW preamble	ms	160 ± 1.6	160.7
5 - DIGITAL MESSAGE			
- 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	00B717 / 00B717
- BCH 2 code read / calculated	bits	133-144 / 107-132	9E3 / 9E3
6 - FREQUENCY			
- Nominal value	KHz	406 025 ± 2 or 406 028 ± 1	406 027.862
- Short term stability		< 210 ⁻⁹ /100 ms	2.5 x 10 ⁻¹⁰

* See data and graphs next pages

Laboratoire de certification
Contrôle balise ARGOS/SARSAT

Aliveness test after immersion & Leakage test

Constructeur ACR
Modele PLB 200
Numero de serie 7
Reference E550307B
Type SARSAT

Date de l'essai 10 Jul 2004 00:51:21
Température -90 °C

Message balise

Message reçu (1-144): FFFE2F96EE3240072B80302DC5F78E0159E3
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): 00B717/00B717
BCH 2 lu/calculé (133-144/107-132): 9E3/9E3
Pos. Data Source (111): Internal
121.5 MHz Homing (112): Yes
Position GPS de reference lab : N 43°33'34'' E 1°28'48
Position GPS : Yes
Position GPS par défaut : No
Latitude position : 43.5°3'32'' Nord
Longitude position : 5°58'40'' Est
Delta position : 254984532731 km

Contrôle message

Durée de la porteuse pure 160.70ms +- 0.00
Durée de l'émission 522.42 ms
Fréquence de modulation 398.33Hz +- 0.00
Stabilité de fréquence
Fréquence moyenne F2 406027861.86 Hz
SIGMA2 F2-F1 1.742E-12
SIGMA3 F3-F2 2.543E-10

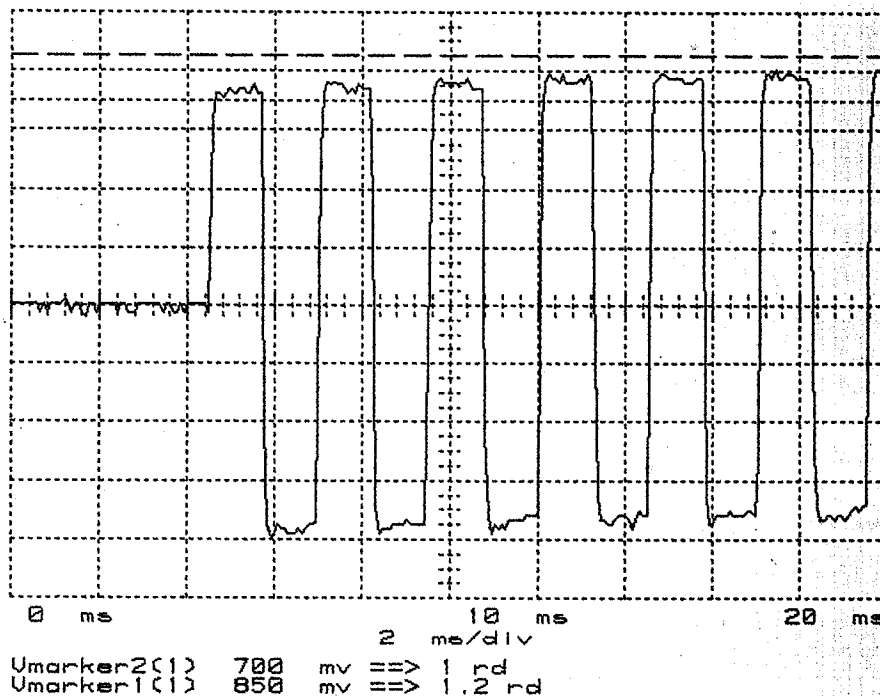
Mesures d'indice

F	F1	G1
49862.82	250	61
49864.15	249	61

	rd	<=		
Excursion de phase totale	rd	<= 2.48		2.19
Excursion de phase positive	rd	0.96<	<1.24	1.09
Excursion de phase negative	rd	-1.24<	<-0.96	-1.10
Symétrie de l'excursion	%	<= 5		.37

Mesures de puissance

Puissance dBm 37.20
Oscillo



Spectre de fréquence

