# CHAPTER 5

# SALT FOG TEST

### 5.1. TEST SPECIFICATIONS AND SEQUENCE

Following section A5.0 of RTCM Recommended Standards for 406 MHz Satellite PLBs (Version 1.1 Feb 4, 2003)

### 5.2. EQUIPMENT UNDER TEST

| | | | |
|---|---|---|---|
| Beacon Unit | : | 1/2 (with 50 ohm output) | 2/2 (normal fitted PLB) |
| Name | : | MARTEC / KANNAD | MARTEC / |
| Type | : | XS3 GPS | XS3 GPS |
| Number | : | UT1 | UT2 |

### 5.3. TEST SITE

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

### 5.4. TEST EQUIPMENT

- Salt fog chamber SAPRATIN S /N : 229 (see photo next page ),
- Salt solution : Mil-Std-810 D (July 19th, 1983), method 509.2,
- METLER TOLEDO Phmeter , Type : check mate 90 S/N : ITS 01 – PH solution in validity ,
- ROTRONIC thermo-hygrometer – Type: HygroPalm 3 - S/N : 21458500 & 31669004 – Validity : 09/2008,
- KEITHLEY thermometer/multimeter ,Type : 2000, S/N 0678112 with CU-CT thermo coupler - Validity : 08/2008
- Argos - Cospas/Sarsat Test Bench.

**Photographs :**

## 5.5. TEST RESULTS

### 5.5.1 Test implementation

Place : INTESPACE Laboratory

| Date | Hour | Events - Observations |
|---|---|---|
| 2007/09/21 | 14h<br>15h<br>18h | Salt bath preparation ; Beacon installation;<br>Warning up of the chamber to 35 °C<br>Salt fog injection (5% of NaCl) at 35 °C ± 2 °C for 48 h |
| 2007/09/23 | 19h | Salt fog injection stopped. Beacon dried during 24 h at 22 °C ± 2 °C |
| 2007/09/24 | 19h | Salt fog injection at 35 °C ± 2 °C ≥ 12 h |
| 2007/09/25<br><br>2007/09/26 | 7h<br>19h<br><br>8h | Salt fog injection stopped. Beacon dried during 12 h at 22 °C ± 2 °C<br>Visual inspection at ≈ 22 °C: **OK**. Nothing abnormal to note .<br>Electrical checks :<br>See results of aliveness after salt fog test next page § 5.5.2 |

### 5.5.2 ALIVENESS TEST RESULTS AFTER RTCM SALT FOG TEST

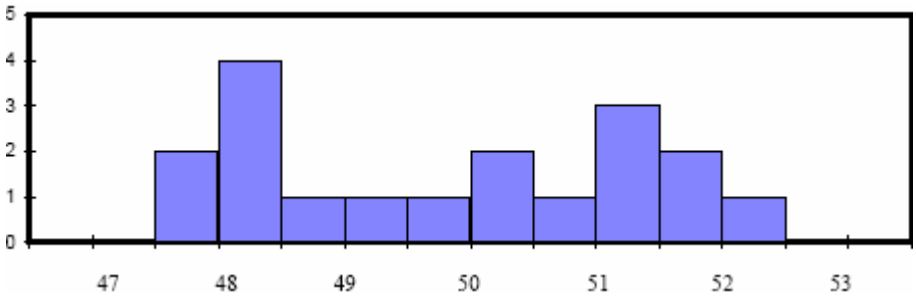
Beacon Unit : 1/2 (with 50 ohm output)
Name : MARTEC / KANNAD
Type : XS3_GPS
Number : UT1

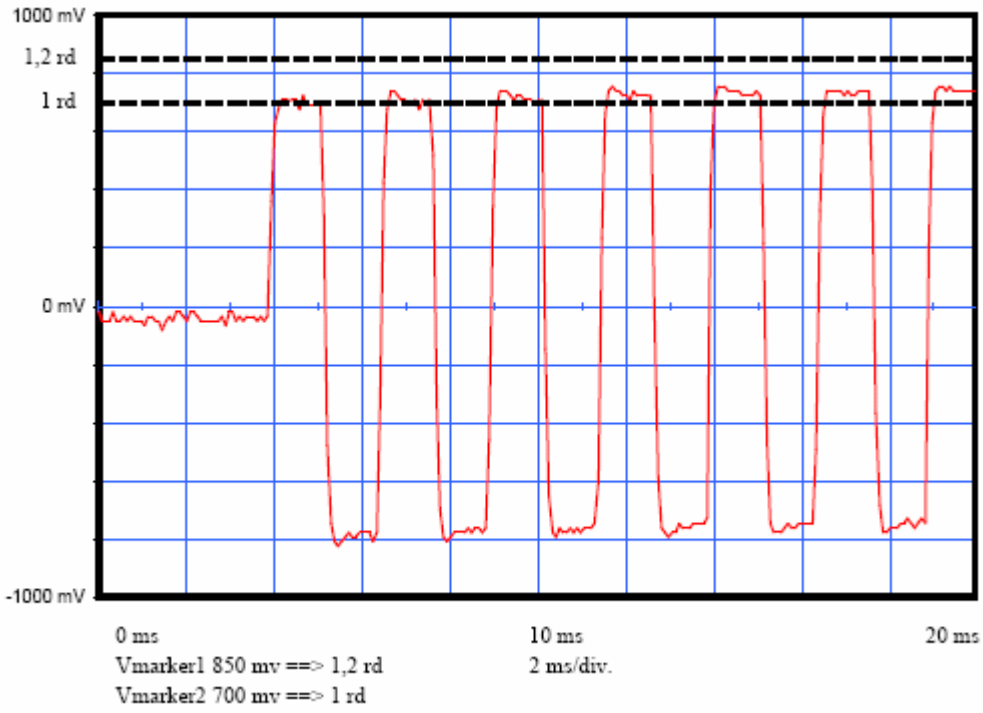
**Message**

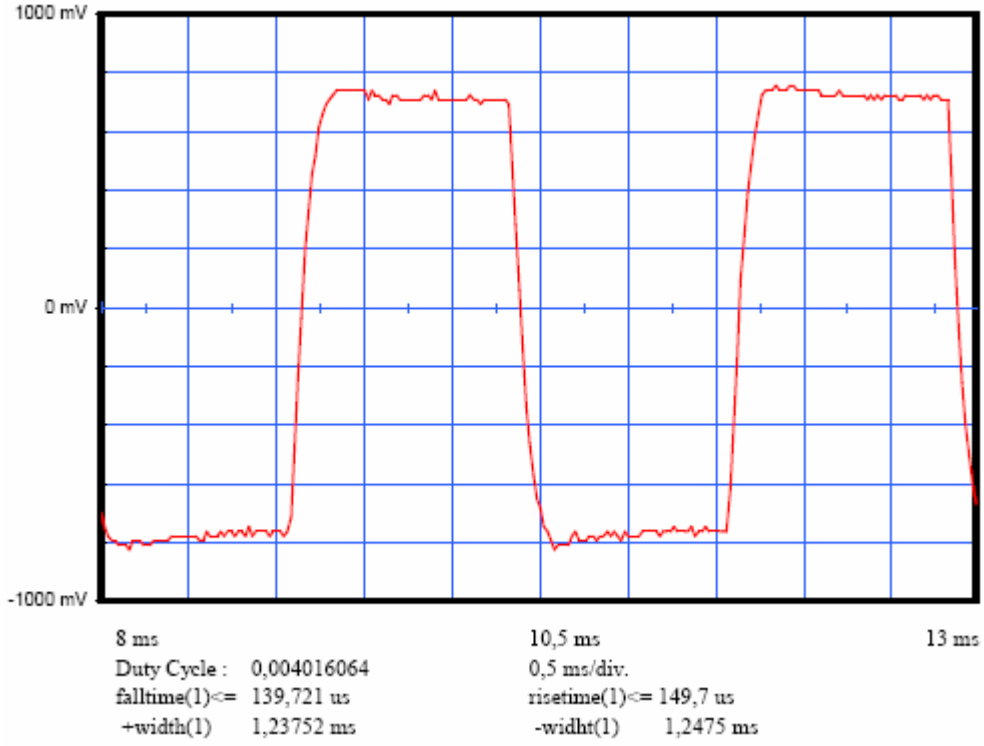
| | | |
|---|---|---|
| Message received | | FFFE2F8E3E2293E02B8036AFFAF78E0159E3 |
| Format Flag | 25 | 1 |
| Protocol flag | 26 | 0 |
| Ident./Position code | 27-85 | |
| Country Code/Country | 27-36 | 227 / FRANCE |
| Protocol Code : U/Std-Nat | 37-39/37-40 | 1110 |
| Protocol Code Used | 37-39/37-40 | Test-Standard Location |
| Identification Data | 40-85/41-64/41-58 | |
| Identification Used | | |
| Calculated BCH1 | 25-85 | 1ABFEB |
| Encoded BCH1 | 86-106 | 1ABFEB |
| Homing | 112 | 1 |
| Em.cod/nat.use/supp.data | 107-112 | 110111 |
| Encod pos data | 111 | 1 Internal |
| Fixed Data "1" | 108 | 1 OK |
| Calculated BCH2 | 107-132 | 9E3 |
| Encoded BCH2 | 133-144 | 9E3 |
| Latitude position | | Nord 43° 33' 32" |
| Longitude position | | Est 1° 28' 40" |
| Delta position | < 5 km | 0,076 km |

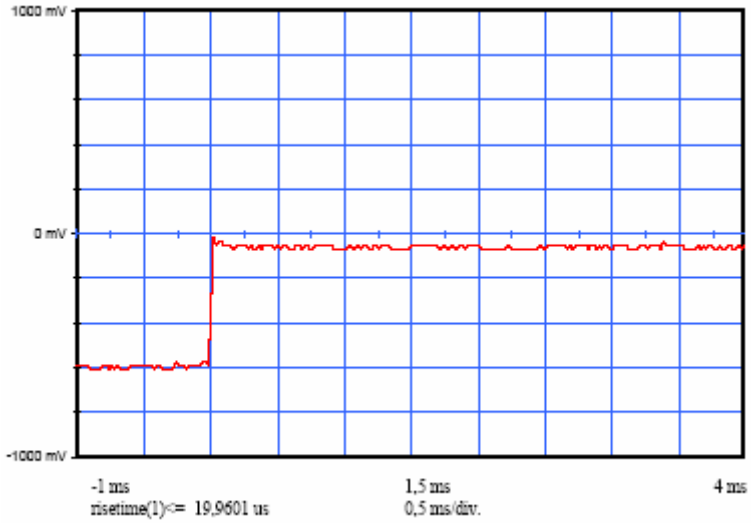
**Electrical and other parameters**

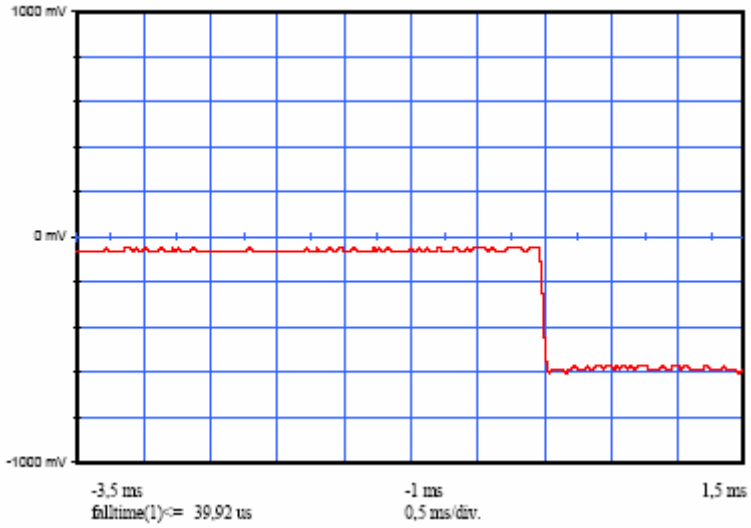
| | | | |
|---|---|---|---|
| CW preamble | ms 158,4 < | < 161,6 | 160,37 |
| Total transmission time | ms 514,8 < | <525,2 | 519,62 |
| Modulation frequency | Hz 396< | < 404 | 401,48 |
| Phase deviation : total | rd | <=2,40 | 2,16 |
| Phase deviation : positive | rd 1,00 < | < 1,20 | 1,08 |
| Phase deviation : negative | rd -1,20 < | < -1,00 | -1,08 |
| Symmetry measurement | % | <=5 % | 0,40 |
| Nominal frequency : F2 | Hz | | 406027834,05 |
| Short term2 | | | 1,59E-10 |
| Short term3 | | | 6,37E-11 |
| Slope | | | -6,26E-11 |
| Residual | | | 2,80E-10 |
| 406 MHz power output | dBm | | 36,8 |
| Homing frequency | MHz | | 121,50 |
| 121,5 MHz power output | dBm | | 18,9 |
| Soak temperature | °C | | 21,1 |
| Extra feature | | | No |
| First Burst Delay | > 47,5 sec | | > 50 sec |



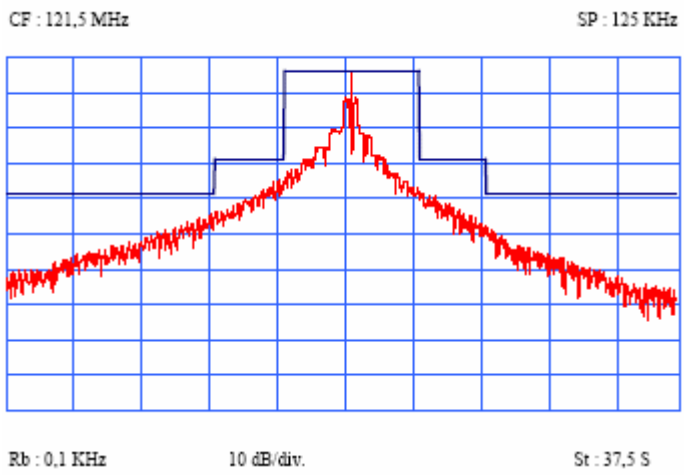

1000 mV
1,2 rd
1 rd
0 mV
-1000 mV
0 ms
10 ms
20 ms
Vmarker1 850 mv ==> 1,2 rd
2 ms/div.
Vmarker2 700 mv ==> 1 rd


1000 mV
0 mV
-1000 mV
8 ms
10,5 ms
13 ms
Duty Cycle : 0,004016064
0,5 ms/div.
falltime(1)<= 139,721 us
risetime(1)<= 149,7 us
+width(1) 1,23752 ms
-widht(1) 1,2475 ms




Spurious 121.5MHz



406 MHZ SPURIOUS EMISSIONS RESULTS

MARTEC / KANNAD
XS3-GPS
UT1 after salt fog
Certification nominale
406 MHz
22 °C