CHAPTER 4

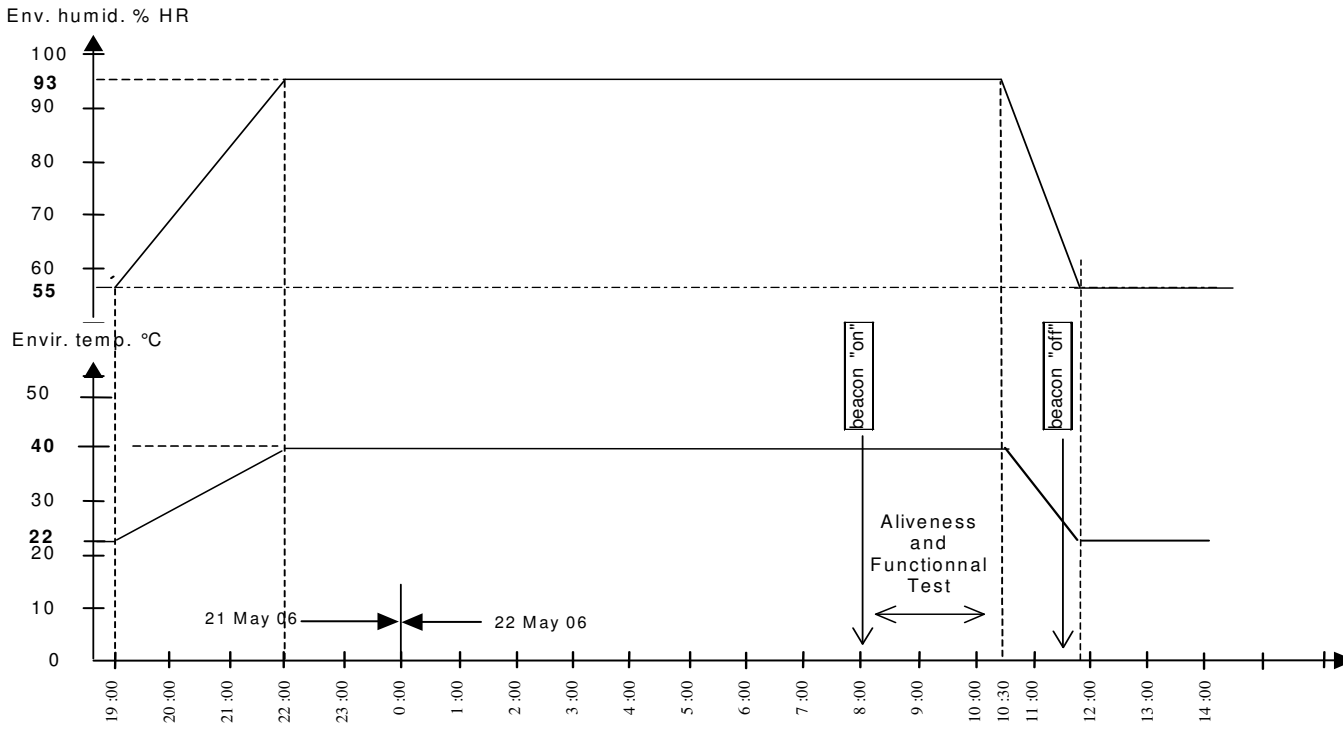
DAMP HEAT TEST

4.1. TEST SPECIFICATIONS AND SEQUENCE

Following :
- Section A2.1 of C/S T. 007 standard ;
- Section A4.0 of RTCM Recommended Standards for 406 MHz Satellite EPIRBs (Version 2.1 June 20, 2002)

We have used also Intespace Radiobeacon Test Procedure N° 554/AP/QA/f : Essai de Chaleur Humide

4.1.1 DRY HEAT CYCLE PROGRAMME



4.1.2 MEASUREMENTS AT 40° C ± 3° C and 93 % ±2 % HR :

- Transmitter power output,
- Digital Message,
- Digital Message Generator,
- Modulation,
- Transmitted frequency ,
- Spurious output,

4.2. EQUIPMENT UNDER TEST

Beacon Unit : UUT 6 and UUT7
Name : MARTEC
Type : KANNAD Auto / Auto GPS
Number : 61592 (06) & 38169 (07)

4.3 TEST SITE

Toulouse Space Center (CST) - INTESPACE - AP/ET.

4.4. 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 thermocouple.
- ROTRONIC thermo-hygrometer, Type : HygroPalm S/N : 21458 500
- Argos - Cospas/Sarsat Test Bench.

4.5. RESULTS

DATA AND GRAPHS OF MEASUREMENTS RESULTS

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Laboratoire de certification
Controle balise ARGOS/SARSAT_____________________________________________

   Constructeur      MARTEC
   Modele            TOPAZE
   Numero de serie   61592 UUT6 (Damp Heat Test)
   Reference         E6668-5
   Type              SARSAT

   Date de l'essai   22 May 2006 08:07:25
   Temperature       39.4 °C


Message balise___________________________________________________________

Message recu                (1-144): FFFE008E3F3C261FC0FF00136776BF3C0672
Format flag                   (25): 1
Protocole flag                (26): 0
Code pays                   (27-36): 0227
Pays                               : FRANCE
Code protocole              (37-40): 1111
Protocole utilise                  : National - Test
Identification                     :
Numero                             : 61592
BCH 1 lu/calcule    (86-106/25-85): 004D9D/004D9D
BCH 2 lu/calcule (133-144/107-132): 672/672
Pos. Data Source              (111): Internal
121.5 MHz Homing              (112): No
Additional Data Pos.          (110): delta Pos.
Position GPS de reference lab      : N 43°33'34'' E 1°28'42
Position GPS                       : Yes
Position GPS par defaut            : Yes


Controle du message______________________________________________________

     160.623178
     160.624184
     160.623894
     160.626296
     160.62585
     160.624714
     160.627892
     160.626322
     160.623044
     160.6248
     160.625246
     160.62609
     160.624418
     160.62457
     160.6263
     160.623774
     160.625692
     160.628034

Duree de la porteuse pure          mS   158.4<  <164.6    160.63 +-  0.00
Duree minimale                                            160.62
Duree maximale                                            160.63
Duree de l'emission                mS   438.6<  <448.4    520.50
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Frequence des bits

400.4526
400.45435
400.45269
400.45419
400.45549
400.44127
400.45755
400.4534
400.44938
400.45126
400.45471
400.44183
400.45475
400.45119
400.44587
400.44716
400.44832
400.44773

Frequence de modulation	Hz	396.0<	<404.0	400.45 +- 0.00

Mesures d'indice

Excursion de phase totale	rd		<= 2.40	2.19
Excursion de phase positive	rd	1.00<	<1.20	1.09
Excursion de phase negative	rd	-1.20<	<-1.00	-1.11
Symetrie de l'excursion	%		<= 5	1.06

Stabilite de frequence

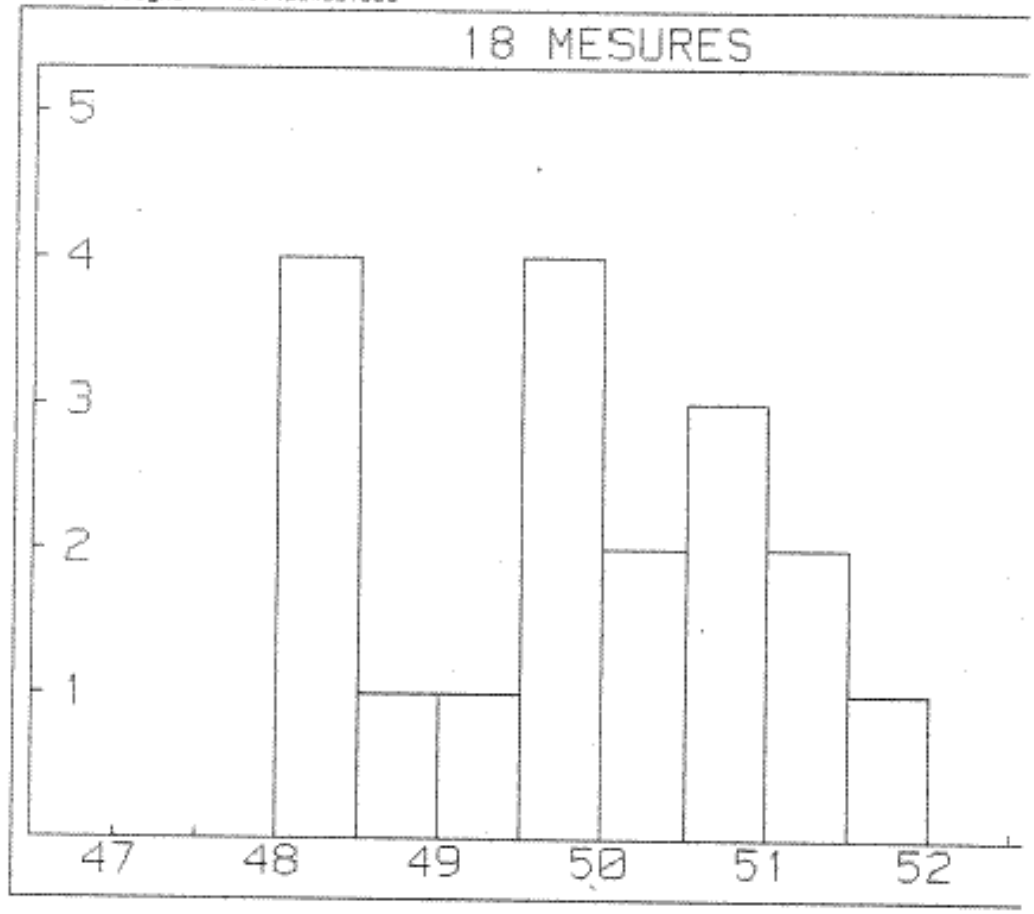
F1	F2	F3
49890.10	49890.09	49890.08
49890.14	49890.18	49890.12
49890.00	49890.07	49890.02
49889.86	49889.92	49890.01
49889.66	49889.74	49889.78
49889.52	49889.46	49889.52
49889.15	49889.20	49889.18
49888.93	49888.92	49888.83
49888.47	49888.57	49888.54
49888.14	49888.14	49888.24
49888.15	49888.09	49888.15
49887.84	49887.86	49887.84
49887.91	49887.88	49887.86
49887.91	49887.91	49887.96
49887.95	49888.05	49887.94
49887.70	49887.72	49887.68
49887.72	49887.65	49887.62
49887.45	49887.51	49887.37

Frequence moyenne	F2	Hz		406027888.72
SIGMA2	F2-F1			9.564E-11
SIGMA3	F3-F2			1.155E-10
Slope		min. -1E-9<	<1E-9	-5.192E-10
Residual frequency variation			<= 3E-9	6.135E-10

Recurrence des emissions

48.3500061035
51.2929992676
49.0010070801
49.8619995117
50.2420043945
48.0289916992
50.5029907227
48.0190124512
49.6610107422
50.7630004883
50.0520019531
49.5909729004
50.9640197754
48.9400024414
51.6239929199
48.2799987793
51.4939880371
49.7210083008

Periode Min : 48.0190124512
Periode Max : 51.6239929199
Periode Moy : 49.7993893094
Periode Sigma : 1.14584561359

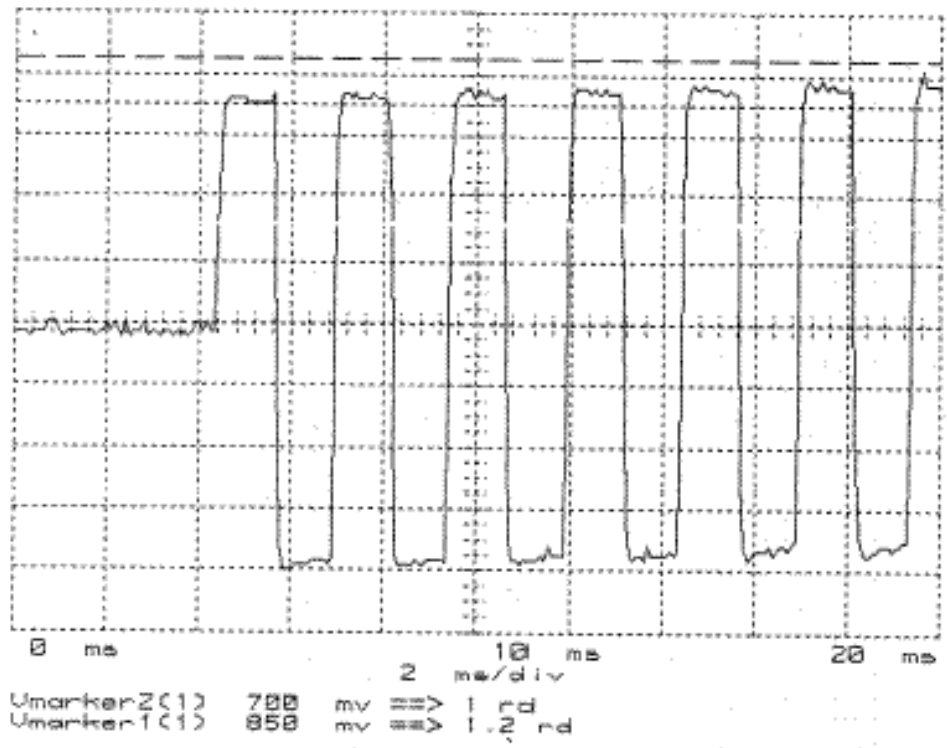


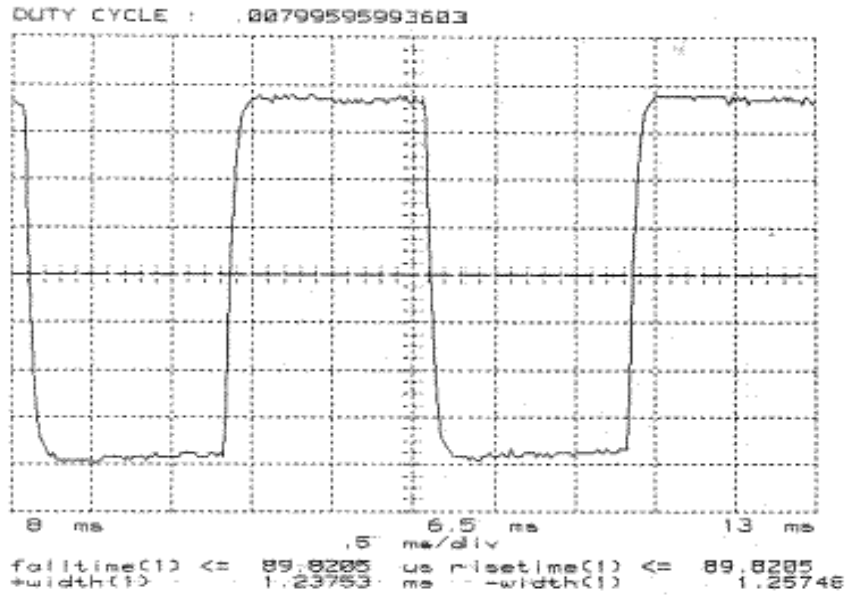
Mesures de puissance

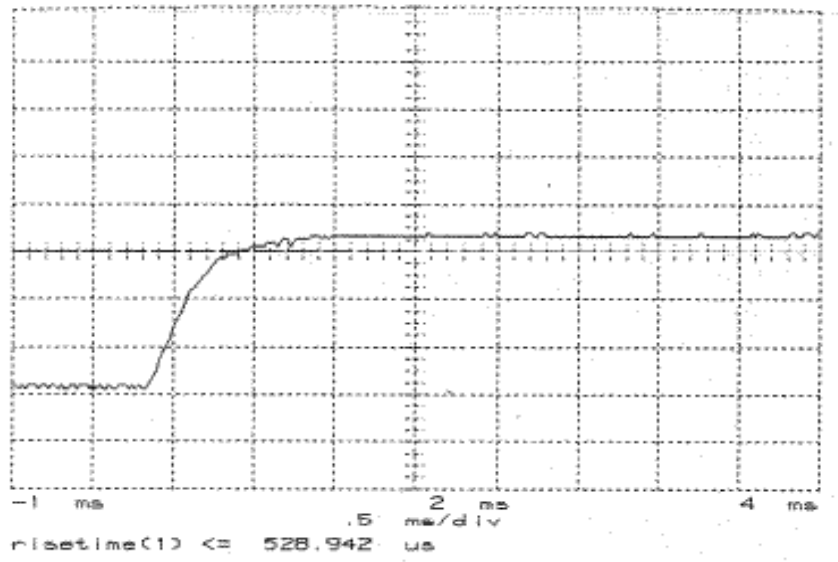
-22.57
-8.67
-5.7
-3.85
-2.75
-2.73
-2.73
-2.73
-2.74
-2.74
-2.74
-3.7
-5.31
-7.92
-15.45

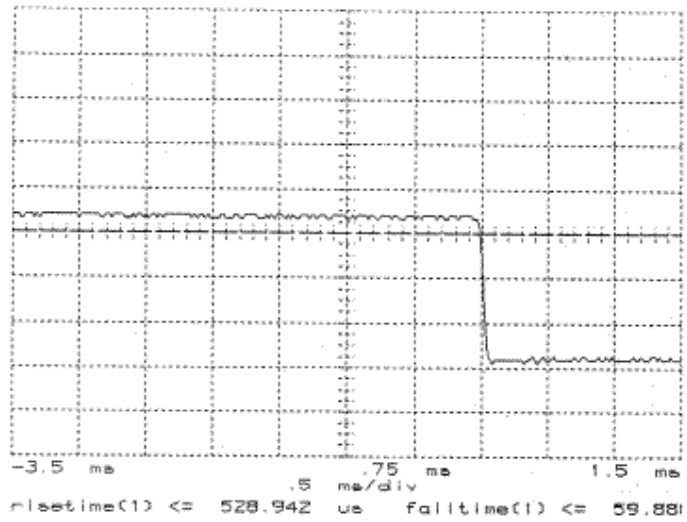
Puissance emission a 406.028 MHz = 38.2 dBm

Oscilloscopes




DUTY CYCLE : .007995959936B3
8 ms
6.5 ms
13 ms
.5 ms/div
falltime(1) <= 89.8205 us risetime(1) <= 89.8205
+width(1) = 1.23753 ms -width(1) = 1.25746


-1 ms
2 ms
4 ms
.5 ms/div
risetime(1) <= 528.942 us



Spurious

MARTEC
TOPAZE
61592 UUT6
22 May 2006
406 MHz
TEMP : 48øC