

Toulouse 8 April 1999

INTESPACE reference : M1469

**TEST REPORT OF  
406 MHz DISTRESS BEACON**

**MANUFACTURER :** ACR Electronics, Inc.

**BEACON MODEL :** RLB32 and RLB 33

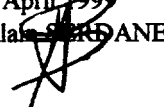
Written : 8 April 1999

By : G. PEYROU

Visa : 

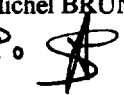
Approved : 8 April 1999

By : Alain ~~PEYROU~~ BRUNEL

Visa : 

Quality Control : 8 April 1999

By : Michel BRUNEL

Visa : P. 

**Distribution :**

|             |             |                       |          |
|-------------|-------------|-----------------------|----------|
| - Mr        | Cal. HAVENS | ACR Electronics, Inc. | (1 copy) |
| - Mr        | S. MIKAILOV | COSPAS/SARSAT Sec.    | (1 copy) |
| - Mr        | L. FOURCADE | CNES - CT/RC/AD/LM    | (1 copy) |
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Accréditation  
N° 1-0743  
Scope  
given  
on request

## 1 - ADMINISTRATION

### 1.1. WORK ORDER

Manufacturer : ACR Electronics, Inc.  
Address : 5757 Ravenswood Road - Fort LAUDERDALE FL 33312 USA

Represented by : Mr Cal. HAVENS

### 1.2. INTESPACE TEST CENTER

The test operations was conducted by : Mr G. PEYROU

### 1.3. SCHEDULE

Start of test: 15 March 1999  
End of test : 06 April 1999

### 1.4. WORK REFERENCE : M1469

### 1.5. EQUIPMENT UNDER TEST

The results from this test report concern only the equipment here after referenced :

- Commercial designation :
- Models : RLB 32 / RLB 33
- Sérial numbers: 2 / 1

## 2 - TEST FACILITIES

- ARGOS - COSPAS/SARSAT Certification Bench.
- Anechoic chamber for antenna test .
- Toulouse CNES MCC .

### **3 - STANDARDS AND TEST PROCEDURES APPLICABLE**

COSPAS-SARSAT standards :

- "C/S T. 001- Issue 3 - Revision 2 - October 1998 "
- "C/S T. 007- Issue 3 - Revision 5 - October 1998" and C/S draft :  
"Specific Test Procedure for C/S Type Approval Testing of ACR PLB-100  
and RLB-33 beacons" - January 1999 ( See copy of this next page )

INTESPACE Radio Beacon Test Procédures :

- |                                           |                        |
|-------------------------------------------|------------------------|
| - " COSPAS-SARSAT Certification Test"     | Réf. ITS : 572 AP/QA   |
| - " 406 MHz Characteristic Antenna Test " | Réf. ITS : 566 AP/QA   |
| - " Radio Beacon Test Report "            | Réf. ITS : 579 AP/QA-f |

### **4 - RESULTS**

See the following pages :

- application forms for a COSPAS-SARSAT 406 MHz beacon Type Approval Certificate,
  - summaries of 406 MHz beacon test results
  - test results : data and graphs
  - and manufacturer technical data
- for RLB33 and RLB32 ACR beacon models

## **Specific Test Procedure for C/S Type Approval Testing of ACR PLB-100 and RLB-33 beacons**

All the procedures and measurement conditions as specified in C/S T.007 Issue 3 - Revision 5, October 1998, should be used. However, the Operational lifetime at Minimum Temperature should be tested in accordance with para. A2.3 provided below. Also, in addition to para. A3.8 of C/S T.007 (applicable to the testing of the beacon in active state) the tests described in para. A3.9 provided below should be performed.

### **A2.3 Operating Lifetime at Minimum Temperature (test no. 10 in Annex C)** ( Use instead of A2.3 of T.007)

The operational lifetime test is intended to establish, with reasonable confidence, that the satellite beacon will function at its minimum operating temperature for its rated life using a battery that has reached its expiration date. To accomplish this, the life test should be performed with a fresh battery pack which has been discharged to take into account:

- a) the average current drain resulting from constant operation of the GPS interface and memory over the rated life of the battery pack (see A3.9.5).
- b) the number of self tests, as recommended by the beacon manufacturer over the rated life of the battery pack (the beacon manufacturer should substantiate the method used to determine the corresponding current drain).
- c) a correction coefficient of 1.65 [applied to a) + b)] to account for differences between battery to battery, beacon to beacon and the possibility of exceeding the battery replacement time.

After the battery pack has been appropriately discharged, the beacon under test is operated at its minimum operating temperature for its rated life. During this period, the following parameters are measured on each transmission:

- transmitted frequency, per para A3.2.1
- transmitter power output, per para A3.2.2.1
- digital message, per para. A3.1.4

The 18-sample analysis window of the stability calculations is advanced in time through the period such that each succeeding data set includes the latest frequency sample and drops the earliest one.

If beacon is intended to be encoded with short or long format messages this test should be performed with a long format message.

### **A3.9 External Navigation System Operating Prior Beacon activation**

The following navigation signal or data input configurations should be verified:

A3.9.1 If appropriate navigation signals or data input are present, the test beacon should store data within 30 minutes to allow for the test beacon to produce a digital message with properly encoded position data and BCH code(s) according to document C/S T.001, when and if the beacon is activated. To test this, allow appropriate time for initial position acquisition to be stored in the test beacon by the navigation device. Verify after the test beacon is activated for fifteen minutes that a correct digital message is transmitted, including valid position data encoding, positive or negative direction delta offset and correctly calculated BCH code(s).

A3.9.2 Since the beacon must be capable of updating the stored encoded position data when the beacon is not activated, move the non active beacon with its external navigation device to a new location or input different navigation data with the opposite polarity direction delta offset of that used in A3.9.1 and repeat A3.9.1

A3.9.3 If no navigation signals or data input has ever been stored in the test beacon or the beacon has been activated and then turned off, subsequent activation of the beacon with no navigation signals or data input having been present, should transmit a message which contains default values for position data bits as specified in C/S T.001. To test this, with the test beacon not activated and navigation signals or data input recently stored in the beacon, disconnect the navigation signals or data input and turn the beacon ON and then OFF. Then, activate and operate the test beacon at ambient temperatures for 30 minutes. Verify that after the test beacon has been activated for 15 minutes, the default values for position data are present in the digital message and the BCH code(s) is correct for the remainder of this 30 minute period.

A3.9.4 If navigation signals or data input has been stored in the test beacon, the last valid position data stored in the test beacon shall be retained. Once the beacon is activated, this position data shall be encoded into the message and transmitted for as long as the beacon is active. To test this, with the test beacon not activated and valid navigation data recently stored in the test beacon, disconnect the navigation signals or input data and wait for 25 hours to go by. After 25 hours, activate and operate the test beacon for 30 minutes. Verify that after being activated for 15 minutes, valid position data are present in the digital message and check for correct BCH code(s) for the remainder of this 30 minute period.

A3.9.5 Since this type of external GPS involves circuits active prior to beacon activation, the Operating Lifetime at Minimum Temperature test (A2.3), must involve testing beacon life time at the battery replacement time. Therefore, the beacon manufacturer should provide the data necessary to discharge a fresh battery pack at room temperature to account for GPS current drain over the battery pack rated 5 year life time. The external GPS battery discharge figures provided by the beacon manufacturer should be verified by the testing laboratory, using an integrating charge meter which will measure the total charge delivered to the inactivated test beacon in conjunction with an active GPS interface, over a sufficient period of time. This total measured charge, divided by the time recorded for the charge measurement, is the average current drain on the battery over the measurement time period which should be prorated to the rated 5 year life of the battery pack. The duration of the GPS average current drain measurement should be defined by the testing laboratory.

**APPLICATION FOR A COSPAS - SARSAT 406 MHz  
 BEACON TYPE APPROVAL CERTIFICATE**

**Beacon Manufacturer :** ACR Electronics, Inc.

**Beacon model :** RLB 33

**Beacon Number :** 1

**Name and Location of Beacon Test Facility :** INTESPACE / CNES Toulouse

**Beacon Type :** Aviation : ☐ Land : ☐ Maritime : ☒

**Antenna Model :** ACR A3-06-1791-1

**Specified Operating Temperature Range** -40 °C to 55 °C

**Specified Operating Lifetime :** 24 hr ☐ 48 hr ☒ Other ☐ Specify :

**Beacon Battery Type(s)**

Chemistry : Li SO<sub>2</sub>  
 Manufacturer & model n° : SAFT LO26SX  
 Size & number of cells : 3 cells, D size

**Extra Features in Beacon**

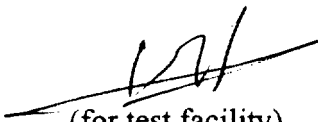
No Yes

**Details**

- |                                      |                          |                                     |                                                             |
|--------------------------------------|--------------------------|-------------------------------------|-------------------------------------------------------------|
| a) Auxiliary Radio-Locating Device : | <input type="checkbox"/> | <input checked="" type="checkbox"/> | Frequency : 121.5<br>Power : 17 dBm<br>Tx. Duty Cycle : 37% |
| b) Transmits Encoded Position Data   | <input type="checkbox"/> | <input checked="" type="checkbox"/> | External Nav. Device<br>Type : GPS                          |
| c) Transmits Long Message (144 bits) | <input type="checkbox"/> | <input checked="" type="checkbox"/> |                                                             |
| c) Automatic Activation :            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |                                                             |
| d) Built-in Strobe light :           | <input type="checkbox"/> | <input checked="" type="checkbox"/> | Intensity : >= 0.75 cd<br>Flash rate : 20                   |
| e) Self-test mode                    | <input type="checkbox"/> | <input checked="" type="checkbox"/> |                                                             |
| f) Other                             | <input type="checkbox"/> | <input type="checkbox"/>            | Specify :                                                   |

I hereby confirm that the 406 MHz beacon described above has been successfully tested in accordance with the COSPAS-SARSAT Type Approval Standard (C/S T.007) and complies with the COSPAS-SARSAT Specification (C/ST T.001) as demonstrated in the attached report.

Dated : 2 April 1999

Signed :   
 (for test facility)

**APPLICATION FOR A COSPAS - SARSAT 406 MHz  
 BEACON TYPE APPROVAL CERTIFICATE**

**Beacon Manufacturer :** ACR Electronics, Inc.

**Beacon model :** RLB 32

**Beacon Number :** 2

**Name and Location of Beacon Test Facility :** INTESPACE / CNES Toulouse

**Beacon Type :** Aviation : ☐ Land : ☐ Maritime : ☒

**Antenna Model :** ACR A3-06-1791-1

**Specified Operating Temperature Range** -40 °C to 55 °C

**Specified Operating Lifetime :** 24 hr ☐ 48 hr ☒ Other ☐ Specify :

**Beacon Battery Type(s)**

Chemistry : Li SO2

Manufacturer & model n° : SAFT LO26SX

Size & number of cells : 3 cells, D size

**Extra Features in Beacon**

No Yes

**Details**

a) Auxiliary Radio-Locating Device :

☐

☒

Frequency : 121.5

Power : 16.5 dBm

Tx. Duty Cycle : 37%

b) Transmits Encoded Position Data

☒

☐

Nav. Device (Internal or External)

Type(GPS, GLONASS, etc.)

c) Transmits Long Message (144 bits)

☒

☐

c) Automatic Activation :

☐

☒

d) Built-in Strobe light :

☐

☒

Intensity :  $\geq 0.75$  cd

Flash rate : 21

e) Self-test mode

☐

☒

f) Other

☐

☐

Specify :

I hereby confirm that the 406 MHz beacon described above has been successfully tested in accordance with the COSPAS-SARSAT Type Approval Standard (C/S T.007) and complies with the COSPAS-SARSAT Specification (C/ST T.001) as demonstrated in the attached report.

Dated :

8 April 1999

Signed :

  
 (for test facility)

Table C2 : SUMMARY OF 406 MHz BEACON TEST RESULTS (RLB33)

Ref: M1469

| PARAMÈTRES TO BE MEASURED<br>DURING TESTS | RANGE OF<br>SPECIFICATION | UNITS     | TEST RESULTS                    |                                |                                | COMMENTS                                                 |
|-------------------------------------------|---------------------------|-----------|---------------------------------|--------------------------------|--------------------------------|----------------------------------------------------------|
|                                           |                           |           | T <sub>min.</sub><br>-40°C (±3) | T <sub>amb.</sub><br>20°C (±3) | T <sub>max.</sub><br>55°C (±3) |                                                          |
| <b>1 - POWER OUTPUT</b>                   |                           |           |                                 |                                |                                |                                                          |
| o transmitter power output                | 35 - 39                   | dBm       | 37,7                            | 38,3                           | 38,4                           | Graphs p, 28, 31 and 34<br>Graphs pages 21, 22<br>and 23 |
| o Power output rise time                  | < 5                       | ms        | 0,72                            | 0,75                           | 0,79                           |                                                          |
| o power output 1 ms before burst          | must be < -10 dBm         | √ *       | √                               | √                              | √                              |                                                          |
| <b>2 - DIGITAL MESSAGE</b>                |                           |           |                                 |                                |                                | Graphs pages 26, 29<br>and 32                            |
| o bit sync                                | Bits number<br>1-15       | √         | √                               | √                              | √                              |                                                          |
| o frame sync                              | 16-24                     | √         | √                               | √                              | √                              |                                                          |
| o format flag                             | 25                        | √         | 1                               | 1                              | 1                              |                                                          |
| o protocol flag                           | 26                        | √         | 0                               | 0                              | 0                              |                                                          |
| o identification/position data            | 27-85                     | √         | √                               | √                              | √                              |                                                          |
| o BCH code                                | 86-106                    | √         | √                               | √                              | √                              |                                                          |
| o emerg. code/nat. use/supplem. data      | 107-112                   | data bits | 110101                          | 110101                         | 110101                         |                                                          |
| o additional data/BCH (if applicable)     | 113-144                   | √         | √                               | √                              | √                              |                                                          |
| o position error (if applicable)          | < 5                       | km        | 0,07                            | 0,07                           | 0,07                           |                                                          |

Table C2 : SUMMARY OF 406 MHz BEACON TEST RESULTS (RLB 33)

Ref. M1469

| PARAMÈTRES TO BE MEASURED<br>DURING TESTS | RANGE OF<br>SPECIFICATION | UNITS         | TEST RESULTS                    |                                |                                | COMMENTS                          |
|-------------------------------------------|---------------------------|---------------|---------------------------------|--------------------------------|--------------------------------|-----------------------------------|
|                                           |                           |               | T <sub>min.</sub><br>-40°C (±3) | T <sub>amb.</sub><br>20°C (±3) | T <sub>max.</sub><br>55°C (±3) |                                   |
| 3 - DIGITAL MESSAGE GENERATOR             |                           |               |                                 |                                |                                |                                   |
| o repetition rate ** :                    |                           |               |                                 |                                |                                | Data and graphs<br>pages 26 to 34 |
|                                           | minimum T <sub>R</sub> =  | 47,5          | seconds                         | 48,5                           | 48,5                           |                                   |
| maximum T <sub>R</sub> =                  | 52,5                      | seconds       | 52,5                            | 52,5                           |                                |                                   |
| o bit rate                                |                           |               |                                 |                                |                                |                                   |
|                                           | minimum f <sub>b</sub> =  | 396           | bits/sec.                       | 398,83                         | 398,83                         |                                   |
| maximum f <sub>b</sub> =                  | 404                       | bits/sec.     | 398,85                          | 398,86                         |                                |                                   |
| o total transmission time :               |                           |               |                                 |                                |                                |                                   |
|                                           | short message =           | 435.6 - 444.4 | ms                              |                                |                                |                                   |
| long message (optional) =                 | 514.8 - 525.2             | ms            | 522,05                          | 522,05                         | 522,04                         |                                   |
| o CW preamble                             |                           |               |                                 |                                |                                |                                   |
|                                           | minimum T <sub>I</sub> =  | 158,4         | ms                              | 160,90                         | 160,93                         |                                   |
| maximum T <sub>I</sub> =                  | 161,6                     | ms            | 160,92                          | 160,94                         | 160,93                         |                                   |
| o first burst delay                       | > 47,5                    | seconds       | 51,50                           | 49,50                          | 50,00                          |                                   |

Table C2 : SUMMARY OF 406 MHz BEACON TEST RESULTS (RLB 33 )

Ref: M1469

| PARAMÈTRES TO BE MEASURED<br>DURING TESTS                                                                                                                     | RANGE OF<br>SPECIFICATION                                              | UNITS     | TEST RESULTS         |                     |                     | COMMENTS                                          |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|-----------|----------------------|---------------------|---------------------|---------------------------------------------------|
|                                                                                                                                                               |                                                                        |           | T min.<br>-40°C (±3) | T amb.<br>20°C (±3) | T max.<br>55°C (±3) |                                                   |
| <b>4 - MODULATION</b><br>o biphas-L<br>o rise time<br>o fall time<br>o phase deviation : positive<br>o phase deviation : negative<br>o symmetry measurement   | √                                                                      | √         | √                    | √                   | √                   | Data and graphs<br>pages 26 to 34                 |
|                                                                                                                                                               | 50 - 250                                                               | microsec. | 80                   | 90                  | 90                  |                                                   |
|                                                                                                                                                               | 50 - 250                                                               | microsec. | 100                  | 90                  | 90                  |                                                   |
|                                                                                                                                                               | + (1.0 to 1.2)                                                         | radians   | + 1,15               | + 1,13              | + 1,15              |                                                   |
|                                                                                                                                                               | - (1.0 to 1.2)                                                         | radians   | - 1,12               | - 1,08              | - 1,12              |                                                   |
|                                                                                                                                                               | ≤ 0.05                                                                 |           | + 0,0040             | + 0,0040            | + 0,000004          |                                                   |
| <b>5 - 406 MHz TRANSMITTED FREQUENCY</b><br>o nominal value<br>o short term stability<br>o medium term stability<br>o slope<br>o residual frequency variation | 406.023 - 406.027 or<br>406.027 - 406.029***<br>≤ 2 x 10 <sup>-9</sup> | MHz       | 406,025225           | 406,025214          | 406,025204          | Data pages 26, 29<br>and 32                       |
|                                                                                                                                                               | /100 ms                                                                | /100 ms   | 5,4E-11              | 8,7E-11             | 7,7E-11             |                                                   |
|                                                                                                                                                               | (-1 to +1) x 10 <sup>-9</sup>                                          | /minute   | -4,2E-11             | -7,9E-11            | -2,51E-10           |                                                   |
|                                                                                                                                                               | ≤ 3 x 10 <sup>-9</sup>                                                 |           | 1,06E-10             | 8,9E-11             | 1,78E-10            |                                                   |
| <b>6 - SPURIOUS EMISSION ****</b><br>(into 50 ohms)<br>o in-band (406.00 to 406.1 MHz)                                                                        | see spurious<br>emission mask in<br>C/S T.001                          | √         | √                    | √                   | √                   | See graphs pages<br>39 to 41<br>Just on the limit |

Table C2 : SUMMARY OF 406 MHz BEACON TEST RESULTS (RLB 33)

Ref: M1469

| PARAMÈTRES TO BE MEASURED<br>DURING TESTS                                                                                                                                                                                                                                                                | RANGE OF<br>SPECIFICATION                    | UNITS     | TEST RESULTS                    |                                |                                | COMMENTS                        |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-----------|---------------------------------|--------------------------------|--------------------------------|---------------------------------|
|                                                                                                                                                                                                                                                                                                          |                                              |           | T <sub>min.</sub><br>-40°C (±3) | T <sub>amb.</sub><br>20°C (±3) | T <sub>max.</sub><br>55°C (±3) |                                 |
| <b>7 - 406 MHz VSWR CHECK</b><br>after open circuit, short circuit, then while<br>VSWR is 3:1, measure :<br>o nominal transmitted frequency<br>Modulation :<br>o rise time<br>o fall time<br>o phase deviation : positive<br>o phase deviation : negative<br>o symmetry measurement<br>o digital message | 406.023 - 406.027 or<br>406.027 - 406.029*** | MHz       | 406,0252193                     | 406,0252156                    | 406,0251950                    | See data and graphs<br>32 to 45 |
|                                                                                                                                                                                                                                                                                                          | 50 - 250                                     | microsec. | 89,8                            | 89,8                           | 89,8                           |                                 |
|                                                                                                                                                                                                                                                                                                          | 50 - 250                                     | microsec. | 79,8                            | 99,8                           | 89,8                           |                                 |
|                                                                                                                                                                                                                                                                                                          | + (1.0 to 1.2)                               | radians   | 1,13                            | 1,14                           | 1,16                           |                                 |
|                                                                                                                                                                                                                                                                                                          | - (1.0 to 1.2)                               | radians   | -1,12                           | -1,07                          | -1,11                          |                                 |
|                                                                                                                                                                                                                                                                                                          | ≤ 0.05                                       | ✓         | ✓                               | ✓                              | ✓                              |                                 |
|                                                                                                                                                                                                                                                                                                          | must be correct                              | ✓         | ✓                               | ✓                              | ✓                              |                                 |
| <b>8 - SELF-TEST MODE (if applicable)</b><br>o frame sync<br>o format flag<br>o single radiated burst<br>o default position data (if applicable)<br>o description provided                                                                                                                               | 9 bits (011010000)                           | ✓         | ✓                               | ✓                              | ✓                              | Data pages 57 to 59             |
|                                                                                                                                                                                                                                                                                                          | 1/0                                          | bit       | 1                               | 1                              | 1                              |                                 |
|                                                                                                                                                                                                                                                                                                          | ≤ 440 / 520 (+1%)                            | ms        | 441,78                          | 441,79                         | 441,77                         |                                 |
|                                                                                                                                                                                                                                                                                                          | must be correct                              | ✓         | ✓                               | ✓                              | ✓                              |                                 |
|                                                                                                                                                                                                                                                                                                          |                                              | ✓         |                                 |                                |                                |                                 |
|                                                                                                                                                                                                                                                                                                          |                                              |           |                                 |                                |                                | Manufacturer doc.<br>Annex A    |

Table C2 : SUMMARY OF 406 MHz BEACON TEST RESULTS (RLB 33)

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| PARAMÈTRES TO BE MEASURED<br>DURING TESTS                                                           | RANGE OF<br>SPECIFICATION                    | UNITS   | TEST RESULTS              | COMMENTS                          |
|-----------------------------------------------------------------------------------------------------|----------------------------------------------|---------|---------------------------|-----------------------------------|
| 9 - THERMAL SHOCK ****(30° C change)                                                                |                                              |         |                           | Data and graphs<br>pages 60 to 64 |
| o Soak temperature (5)                                                                              |                                              | °C      | Tsoak = 20                |                                   |
| o Measurement temperature                                                                           |                                              | °C      | TMeas = -10               |                                   |
| the following parameters are to be met within<br>15 minutes of beacon and maintained for 2<br>hours |                                              |         |                           |                                   |
| o Transmitted frequency :                                                                           |                                              |         |                           |                                   |
| - nominal value                                                                                     | 406.023 - 406.027 or<br>406.027 - 406.029*** | MHz     | 406,025214 / 406,025216   |                                   |
| - short term stability                                                                              | $\leq 2 \times 10^{-9}$                      | /100 ms | 4,6E-10                   |                                   |
| - medium term stability                                                                             | $(-1 \text{ to } +1) \times 10^{-9}$         | /minute | -2E-10 / 8E-11<br>9,3E-11 |                                   |
| - residual frequency variation                                                                      | $\leq 3 \times 10^{-9}$                      |         |                           |                                   |
| o Transmitted power output                                                                          | 35 - 39                                      | dBm     | 38,2 / 38,4               |                                   |
| o Digital message                                                                                   | must be correct                              | ✓       | ✓                         |                                   |

Table C2 : SUMMARY OF 406 MHz BEACON TEST RESULTS (RLB 33)

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| PARAMÈTRES TO BE MEASURED<br>DURING TESTS                                                                                                                                                                                                                                                                                                    | RANGE OF<br>SPECIFICATION                                                                                                                                                                        | UNITS                                                      | TEST RESULTS                                                                                                                                      | COMMENTS                                                                                                                                                                                                                                                     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>10 - OPERATING LIFETIME AT MINIMUM<br/>TEMPERATURE ****</b><br>o Current drain over the battery rated 5 year life time<br>o Duration<br>o Transmitted frequency :<br>- nominal value<br>- short term stability<br>- medium term stability<br>- slope<br>- residual frequency variation<br>o Transmitted power output<br>o Digital message | > 24<br><br>406.023 - 406.027 or<br>406.027 - 406.029***<br><br>$\leq 2 \times 10^{-9}$<br><br>$(-1 \text{ to } +1) \times 10^{-9}$<br>$\leq 3 \times 10^{-9}$<br><br>35 - 39<br>must be correct | Amp-hour<br>hours<br>MHz<br>/100 ms<br>/minute<br>dBm<br>√ | 1,00207<br><br>56 hours at Tmin = -40 °C<br><br>406,025228 / 406,025235<br><br>5,85E-10<br><br>-5E-10 / 8E-11<br>5E-10<br><br>35,0/ 37,8<br><br>√ | This test was performed<br>with battery pack that<br>have the charge adapted<br>for to take account of<br>the external GPS and Self<br>Test current drain during<br>5 years life time<br><br>See technical explanations<br>data and graphs<br>pages 65 to 83 |
| <b>11 - TEMPERATURE GRADIENT ****<br/>(5° C/hr)</b><br>o Transmitted frequency :<br>- nominal value<br>- short term stability<br>- medium term stability<br>- slope<br>- residual frequency variation<br>o Transmitted power output<br>o Digital message                                                                                     | 406.023 - 406.027 or<br>406.027 - 406.029***<br><br>$\leq 2 \times 10^{-9}$<br><br>$(-1 \text{ to } +1) \times 10^{-9}$<br>$\leq 3 \times 10^{-9}$<br><br>35 - 39<br>must be correct             | MHz<br>/100 ms<br>/minute<br>dBm<br>√                      | 406,025200 / 406,025234<br><br>1,3E-10<br><br>-3E-10 / 2E-10<br>4,1E-10<br><br>37,3 / 38,6<br><br>√                                               | Data and graphs<br>pages 84 to 93                                                                                                                                                                                                                            |

Table C2 : SUMMARY OF 406 MHz BEACON TEST RESULTS (RLB 33)

Ref: M1469

| PARAMÈTRES TO BE MEASURED DURING TESTS                                                                                                                                                                                      | RANGE OF SPECIFICATION                                                             | UNITS                               | TEST RESULTS                       | COMMENTS                                |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------|------------------------------------|-----------------------------------------|
| <b>12 - LONG TERM FREQUENCY STABILITY</b><br>o Data provided                                                                                                                                                                | 406.023 - 406.027 or<br>406.027 - 406.029***                                       | MHz<br>✓                            | ✓                                  | Constructor explanations in Annex A     |
| <b>13 - PROTECTION AGAINST CONTINUOUS TRANSMISSION</b><br>o Description provided                                                                                                                                            | ≤ 45                                                                               | seconds<br>✓                        | ✓                                  | Constructor explanations in Annex A     |
| <b>14 - SATELLITE QUALITATIVE TESTS ****</b><br>o Results provided                                                                                                                                                          | successfully located<br>by satellites / LUT                                        | ✓                                   | ✓                                  | Data and graphs<br>pages 94 to 100      |
| <b>15 - ANTENNA CHARACTERISTICS</b><br>o Polarization<br><br>o VSWR<br>o ERP <sup>max</sup> EOL<br>o ERP <sup>min</sup> EOL<br>o azimuth gain variation at 40° elevation angle                                              | linear<br>or<br>RHCP<br><br>≤ 1.5<br>≤ 20<br>≥ 1.6<br>≤ 3                          | ✓<br>✓<br>-<br>Watts<br>Watts<br>dB | ✓<br><br>N/A<br>17,9<br>3,0<br>0,3 | Antenna test report<br>pages 111 to 121 |
| <b>16 - BEACON CODING SOFTWARE</b><br>o sample message provided for each coding option of the applicable coding protocol types<br><br>o sample messages provided, if applicable, with encoded positions at least 5 km apart | must be correct<br>(attach to report)<br><br>must be correct<br>(attach to report) | ✓<br><br>✓                          | ✓<br><br>✓                         | See manufacturer doc.<br>Annex A        |

Table C2 : SUMMARY OF 406 MHz BEACON TEST RESULTS (RLB 33)

Ref : M1469

| PARAMÈTRES TO BE MEASURED<br>DURING TESTS                                                                                                  | RANGE OF<br>SPECIFICATION | UNITS   | TEST RESULTS       | COMMENTS                  |
|--------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|---------|--------------------|---------------------------|
| <b>17 - NAVIGATION SYSTEM****</b><br>(as applicable)                                                                                       |                           |         |                    | See data pages 107 to 110 |
| o position data default values                                                                                                             | must be correct           | ✓       | ✓                  |                           |
| o position acquisition time                                                                                                                | < 30                      | minutes | at the first burst |                           |
| o position data update interval                                                                                                            | > 20                      | minutes | N/A                |                           |
| o delta offset :                                                                                                                           |                           |         |                    |                           |
| - positive direction                                                                                                                       | must be correct           | ✓       | ✓                  |                           |
| - negative direction                                                                                                                       | must be correct           | ✓       | ✓                  |                           |
| - overrange to 2 times coarse res.                                                                                                         | must be correct           | ✓       | ✓                  |                           |
| o last valid position :                                                                                                                    |                           |         |                    |                           |
| - retained after 25 hours nav signal lost                                                                                                  | must be correct           | ✓       | ✓                  |                           |
| - cleared when beacon reactivated                                                                                                          | must be correct           | ✓       | ✓                  |                           |
| o design data provided on protection against<br>beacon degradation due to navigation device,<br>interface or signal failure or malfunction | no degradation            | ✓       | ✓                  |                           |

\* The ticks mark ✓ can be used where indicated to record that the requirement is met (no value needs to be shown).

\*\* If  $(T_{R_{max}} - T_{R_{min}}) \leq 1$  second, the manufacturer must provide a technical explanation, as describes in section A3.1.1.

\*\*\* From 1 January 2000 new 406MHz beacon models submitted for type approval can be set to transmit at 406.028 Mhz  $\pm$  1 kHz. The transmitted frequency shall not vary more than + 2 kHz / - 5 kHz from 406.028 MHz in 5 years. It shall not vary more than 2 parts in 10<sup>6</sup> in 100 ms. After 1 January 2002, all new beacon models submitted for the type approval must be set at the frequency 406.028 MHz  $\pm$  1 kHz and satisfy the above stability requirements.

\*\*\*\* attach graphs of test results for test number 6, 9, 10 and 11 and a summary table of results for test number 14, and, if applicable, test number 17.

Table C2 : SUMMARY OF 406 MHz BEACON TEST RESULTS (RLB 32)

Ref : M1469

| PARAMÈTRES TO BE MEASURED<br>DURING TESTS | RANGE OF<br>SPECIFICATION | UNITS     | TEST RESULTS                    |                                |                                | COMMENTS       |
|-------------------------------------------|---------------------------|-----------|---------------------------------|--------------------------------|--------------------------------|----------------|
|                                           |                           |           | T <sub>min.</sub><br>-40°C (±3) | T <sub>amb.</sub><br>20°C (±3) | T <sub>max.</sub><br>55°C (±3) |                |
| <b>1 - POWER OUTPUT</b>                   |                           |           |                                 |                                |                                |                |
| o transmitter power output                | 35 - 39                   | dBm       |                                 | 38,4                           |                                | Graph page 28  |
| o Power output rise time                  | < 5                       | ms        |                                 | 0,82                           |                                | Graph page 24  |
| o power output 1 ms before burst          | must be < -10 dBm         | √ *       |                                 | √                              |                                |                |
| <b>2 - DIGITAL MESSAGE</b>                |                           |           |                                 |                                |                                |                |
| o bit sync                                | 15 bits "1"               | √         |                                 | √                              |                                | Graph page 35  |
| o frame sync                              | 9 bits (000101111)        | √         |                                 | √                              |                                |                |
| o format flag                             | 1 bit                     | √         |                                 | 0                              |                                |                |
| o protocol flag                           | 1 bit                     | √         |                                 | 1                              |                                |                |
| o identification/position code            | 59 bits                   | √         |                                 | √                              |                                |                |
| o BCH code                                | 21 bits                   | √         |                                 | √                              |                                |                |
| o emerg. code/nat. use/supplem. data      | 6 bits                    | data bits |                                 | 010000                         |                                |                |
| o additional data/BCH (if applicable)     | 32 bits                   | √         |                                 | N/A                            |                                | Not applicable |
| o position error (if applicable)          | < 5                       | km        |                                 | N/A                            |                                |                |

Table C.2 : SUMMARY OF 406 MHz BEACON TEST RESULTS (RLB 32)

Ref: M1469

| PARAMÈTRES TO BE MEASURED<br>DURING TESTS | RANGE OF<br>SPECIFICATION | UNITS     | TEST RESULTS                    |                                |                                | COMMENTS                   |
|-------------------------------------------|---------------------------|-----------|---------------------------------|--------------------------------|--------------------------------|----------------------------|
|                                           |                           |           | T <sub>min.</sub><br>-40°C (±3) | T <sub>amb.</sub><br>20°C (±3) | T <sub>max.</sub><br>55°C (±3) |                            |
| 3 - DIGITAL MESSAGE GENERATOR             |                           |           |                                 |                                |                                |                            |
| o repetition rate *** :                   |                           |           |                                 |                                |                                | Data and graphs<br>page 35 |
| minimum T <sub>R</sub> =                  | 47,5                      | seconds   |                                 | 49,5                           |                                |                            |
| maximum T <sub>R</sub> =                  | 52,5                      | seconds   |                                 | 52,5                           |                                |                            |
| o bit rate                                |                           |           |                                 |                                |                                |                            |
| minimum f <sub>b</sub> =                  | 396                       | bits/sec. |                                 | 398,84                         |                                |                            |
| maximum f <sub>b</sub> =                  | 404                       | bits/sec. |                                 | 398,86                         |                                |                            |
| o total transmission time :               |                           |           |                                 |                                |                                |                            |
| short message =                           | 435.6 - 444.4             | ms        |                                 | 441,79                         |                                |                            |
| long message (optional) =                 | 514.8 - 525.2             | ms        |                                 |                                |                                |                            |
| o CW preamble                             |                           |           |                                 |                                |                                |                            |
| minimum T <sub>1</sub> =                  | 158,4                     | ms        |                                 | 160,91                         |                                |                            |
| maximum T <sub>1</sub> =                  | 161,6                     | ms        |                                 | 160,91                         |                                |                            |
| o first burst delay                       | > 47,5                    | seconds   |                                 | 50                             |                                |                            |

Table C2 : SUMMARY OF 406 MHz BEACON TEST RESULTS (RLB 32)

Ref. M1469

| PARAMÈTRES TO BE MEASURED<br>DURING TESTS           | RANGE OF<br>SPECIFICATION                     | UNITS     | TEST RESULTS                    |                                |                                | COMMENTS                               |
|-----------------------------------------------------|-----------------------------------------------|-----------|---------------------------------|--------------------------------|--------------------------------|----------------------------------------|
|                                                     |                                               |           | T <sub>min.</sub><br>-40°C (±3) | T <sub>amb.</sub><br>20°C (±3) | T <sub>max.</sub><br>55°C (±3) |                                        |
| <b>4 - MODULATION</b>                               |                                               |           |                                 |                                |                                |                                        |
| o biphase-L                                         |                                               | ✓         |                                 | ✓                              |                                | Data and graphs<br>pages 35 and 36     |
| o rise time                                         | 50 - 250                                      | microsec. |                                 | 90                             |                                |                                        |
| o fall time                                         | 50 - 250                                      | microsec. |                                 | 100                            |                                |                                        |
| o phase deviation : positive                        | + (1.0 to 1.2)                                | radians   |                                 | + 1,14                         |                                |                                        |
| o phase deviation : negative                        | - (1.0 to 1.2)                                | radians   |                                 | - 1,11                         |                                |                                        |
| o symmetry measurement                              | ≤ 0.05                                        |           |                                 | + 0,0000                       |                                |                                        |
| <b>5 - 406 MHz TRANSMITTED FREQUENCY</b>            |                                               |           |                                 |                                |                                |                                        |
| o nominal value                                     | 406.023 - 406.027 or<br>406.027 - 406.029***  | MHz       |                                 | 406,024674                     |                                | Data page 35                           |
| o short term stability                              | ≤ 2 x 10 <sup>-9</sup>                        | /100 ms   |                                 | 5,26E-11                       |                                |                                        |
| o medium term stability<br>. slope                  | (-1 to +1) x 10 <sup>-9</sup>                 | /minute   |                                 | -4,99E-11                      |                                |                                        |
| . residual frequency variation                      | ≤ 3 x 10 <sup>-9</sup>                        |           |                                 | 5,47E-11                       |                                |                                        |
| <b>6 - SPURIOUS EMISSION ****</b><br>(into 50 ohms) |                                               |           |                                 |                                |                                |                                        |
| o in-band (406.00 406.1 MHz)                        | see spurious<br>emission mask in<br>C/S T.001 | ✓         |                                 | ✓                              |                                | See graph page 42<br>Just on the limit |

Table C2 : SUMMARY OF 406 MHz BEACON TEST RESULTS (RLB 32 )

Ref: M1469

| PARAMÈTRES TO BE MEASURED<br>DURING TESTS                                                                                                                                  | RANGE OF<br>SPECIFICATION                                         | UNITS                    | TEST RESULTS                    |                                |                                | COMMENTS                                                                              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|--------------------------|---------------------------------|--------------------------------|--------------------------------|---------------------------------------------------------------------------------------|
|                                                                                                                                                                            |                                                                   |                          | T <sub>min.</sub><br>-40°C (±3) | T <sub>amb.</sub><br>20°C (±3) | T <sub>max.</sub><br>55°C (±3) |                                                                                       |
| <b>8 - SELF-TEST MODE (if applicable)</b><br>o frame sync<br>o format flag<br>o single radiated burst<br>o default position data (if applicable)<br>o description provided | 9 bits (011010000)<br>1/0<br>≤ 440 / 520 (+1%)<br>must be correct | ✓<br>bit<br>ms<br>✓<br>✓ |                                 | ✓<br>0<br>441,79<br>N/A<br>✓   |                                | Data pages 57 to 59<br><br><br><br><br>Not applicable<br>Manufacturer doc.<br>Annex A |
| <b>14 - SATELLITE QUALITATIVE TESTS ****</b><br>o Results provided                                                                                                         | successfully located by satellites / LUT                          | ✓                        |                                 | ✓                              |                                | Data and graphs pages 101 to 106                                                      |

\* The ticks mark ✓ can be used where indicated to record that the requirement is met (no value needs to be shown).

\*\* If  $(T_{R_{max}} - T_{R_{min}}) \leq 1$  second, the manufacturer must provide a technical explanation, as describes in section A3.1.1.1.

\*\*\* From 1 January 2000 new 406MHz beacon models submitted for type approval can be set to transmit at 406.028 MHz ± 1 kHz. The transmitted frequency shall not vary more than + 2 kHz / - 5 kHz from 406.028 MHz in 5 years. It shall not vary more than 2 parts in 10<sup>9</sup> in 100 ms. After 1 January 2002, all new beacon models submitted for the type approval must be set at the frequency 406.028 MHz ± 1 kHz and satisfy the above stability requirements.

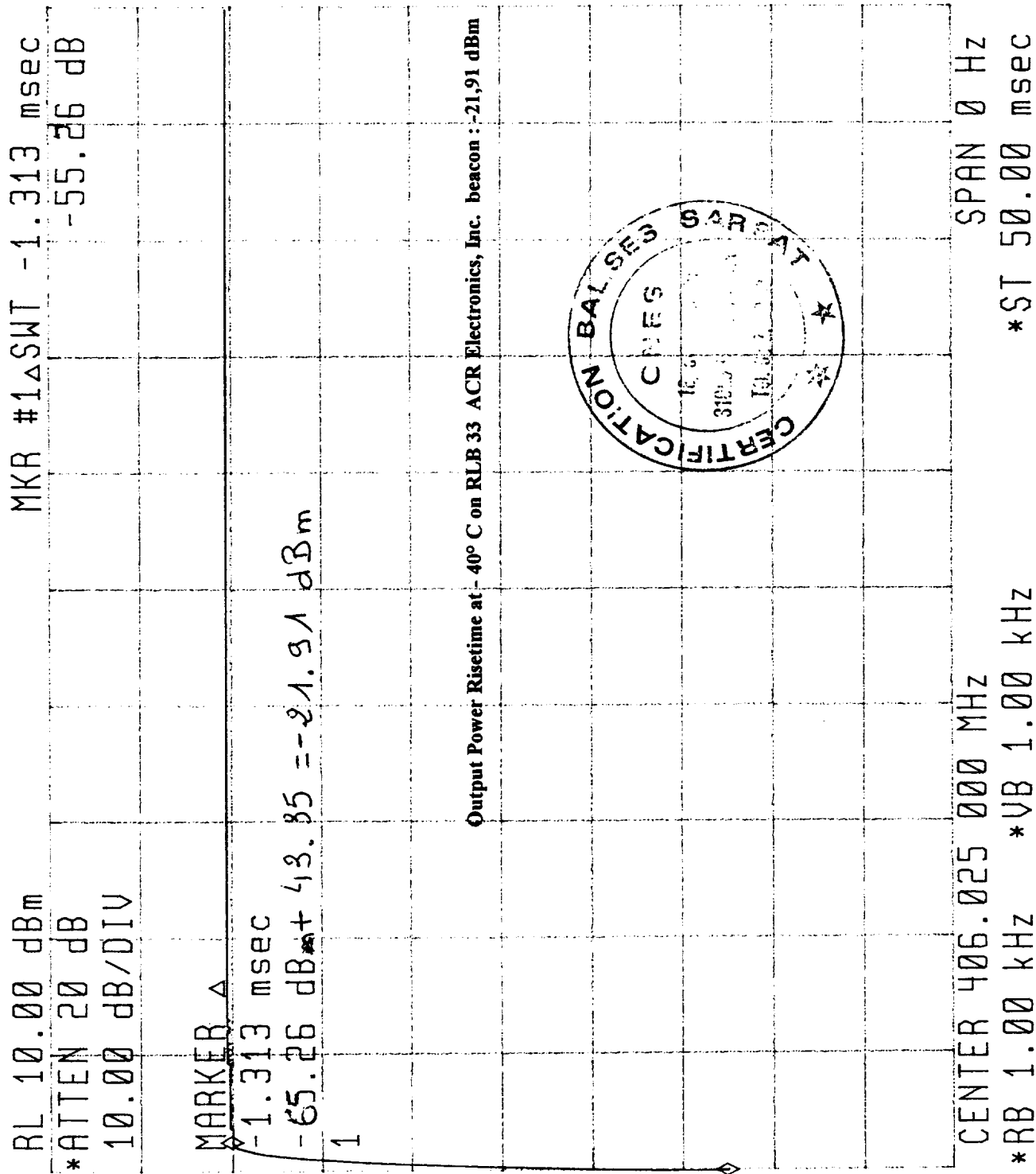
\*\*\*\* attach graphs of test results for test number 6, 9, 10 and 11 and a summary table of results for test number 14, and, if applicable, test number 17.

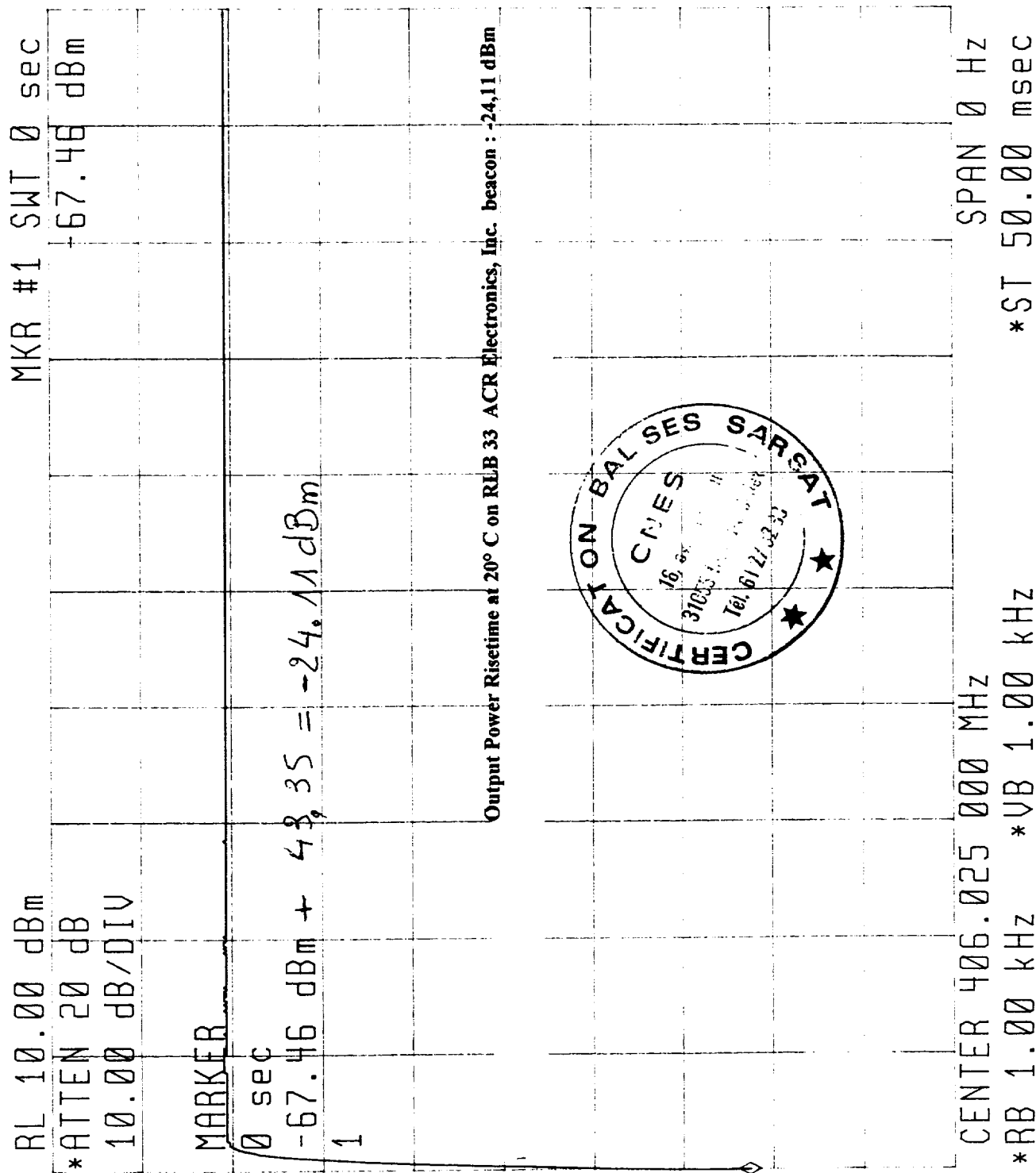
**TRANSMITTER OUTPUT POWER RISE TIME TEST RESULT ON**

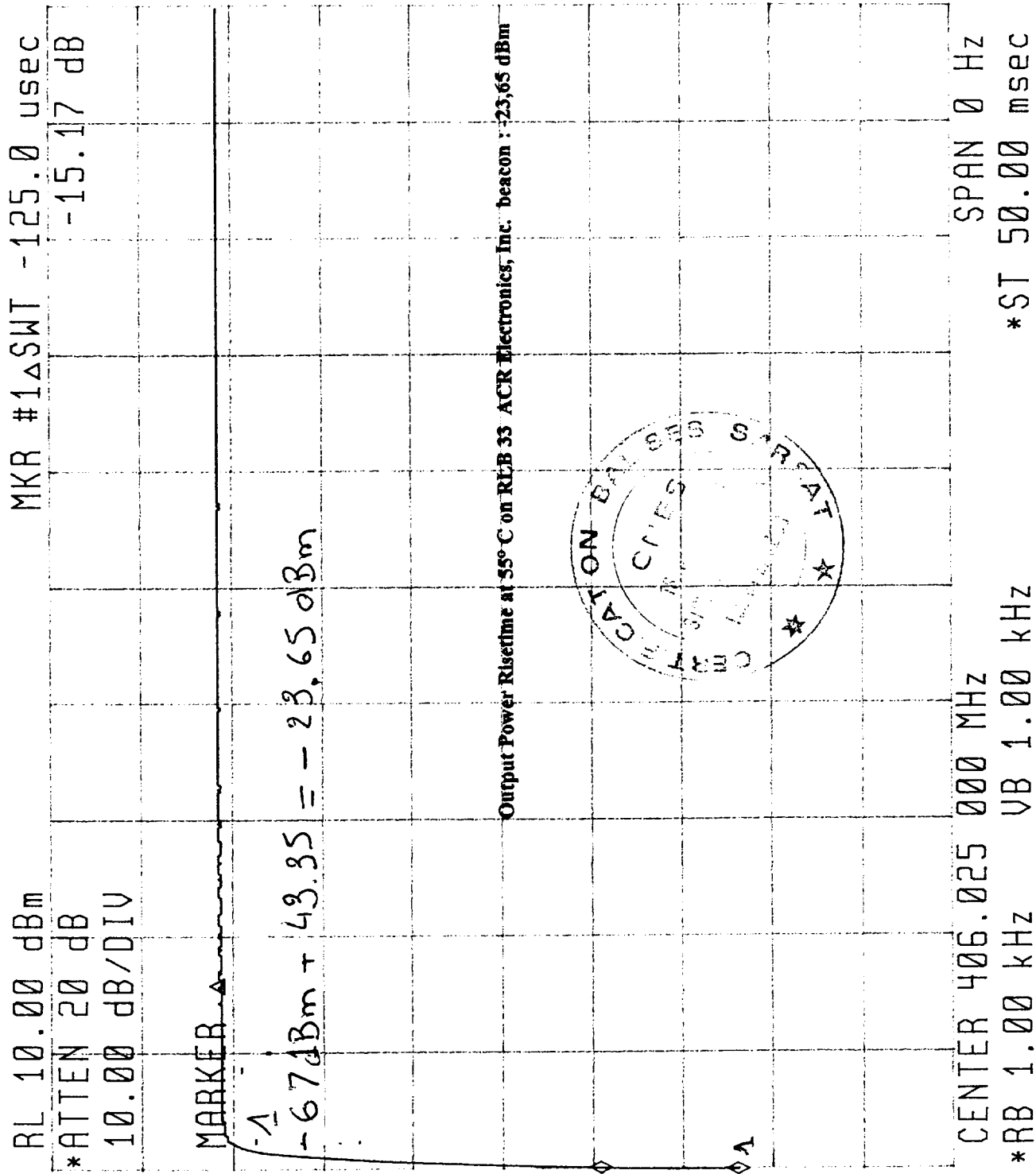
**- N° 1 RLB 33 ACR Electronics, Inc. beacon  
at -40° C, 20° C and 55° C**

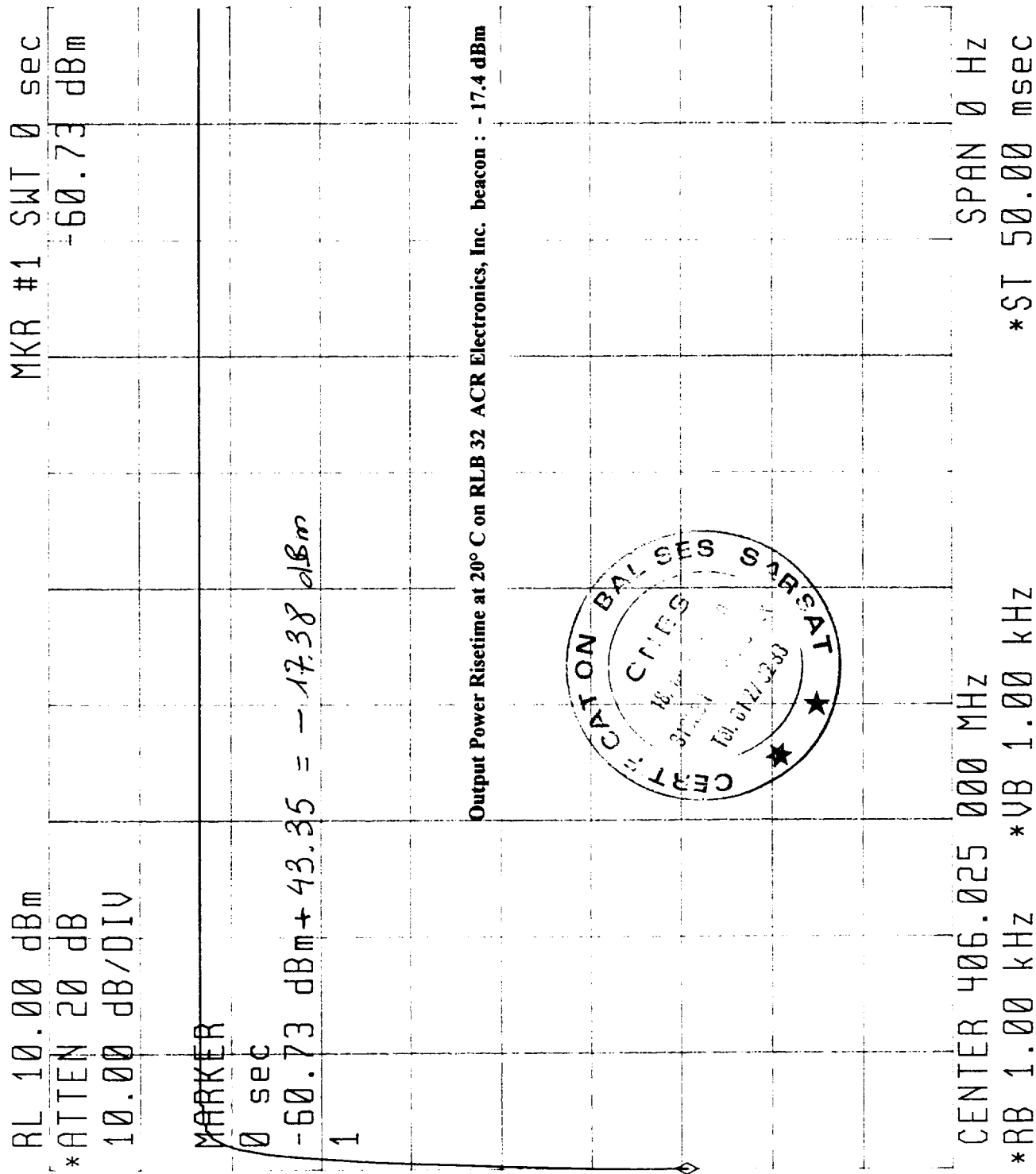
**- N° 2 RLB 32 ACR Electronics, Inc. beacon  
at 20° C**

**(1 ms before 10 % of the burst)**









**CERTIFICATION TEST RESULTS ON**

**- N° 1 RLB 33 ACR Electronics, Inc. Beacon  
at -40° C, 20° C and 55° C and**

**- N° 2 RLB 32 ACR Electronics, Inc. Beacon  
at 20° C**

**Certification Test at -40°C**

Manufacturer : ACR

Beacon Type : RLB 33

Number : 1

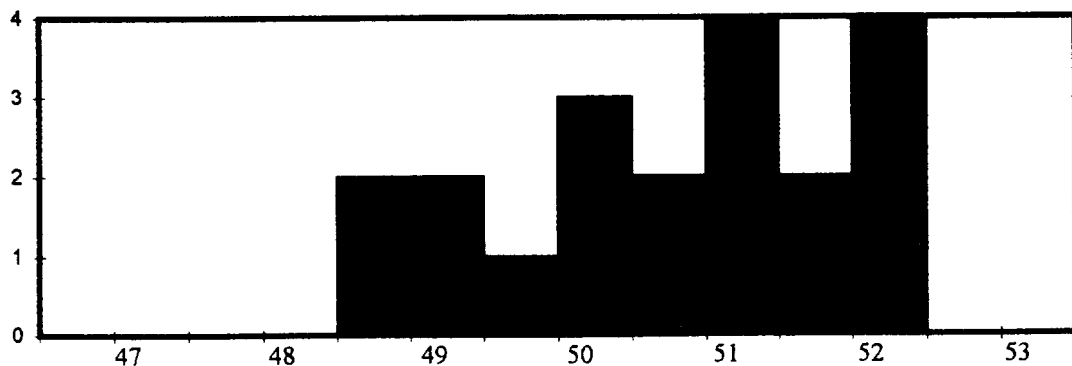
Date of test : 16-mar-99

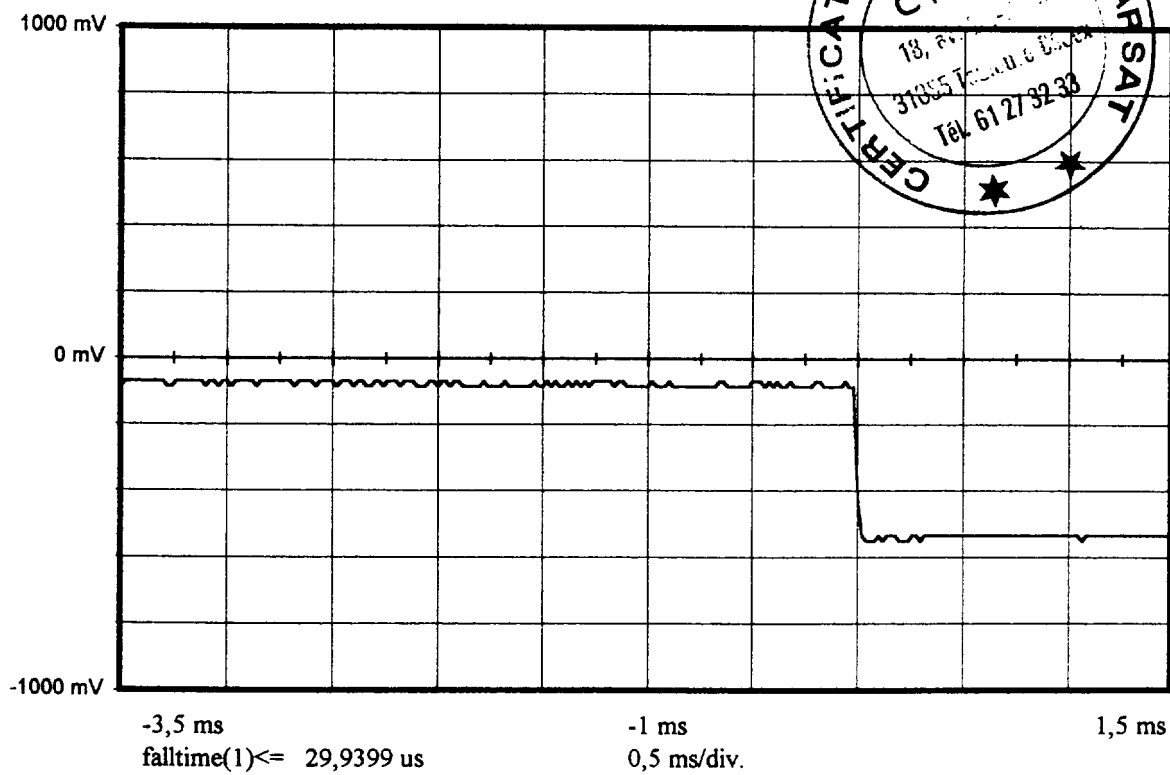
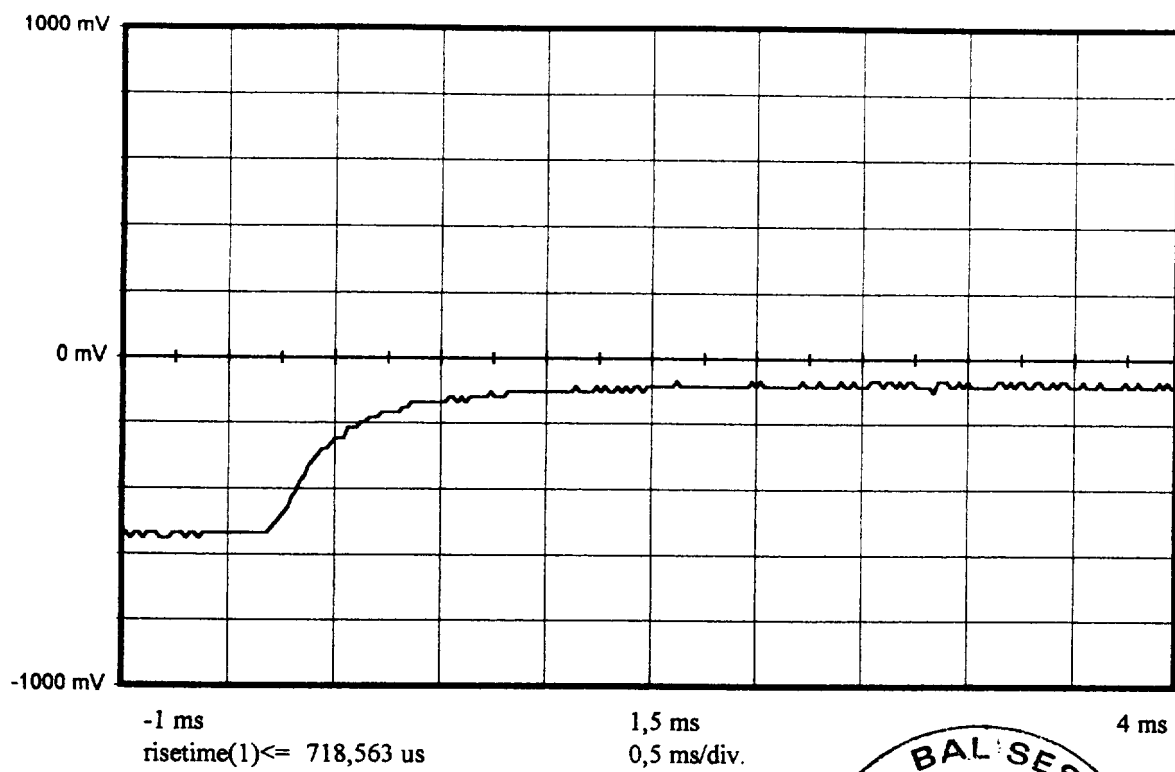
**Message**

|                           |             |                                      |
|---------------------------|-------------|--------------------------------------|
| Message received          |             | FFFE2F96EE2EC0012B0027FE91F5DAED3A63 |
| Format Flag               | 25          | 1                                    |
| Protocol flag             | 26          | 0                                    |
| Country Code/Country      | 27-36       | 366 / USA                            |
| Protocol Code : U/Std-Nat | 37-39/37-40 | 1110                                 |
| Ident./Position code      | 27-85       |                                      |
| Calculated BCH1           | 25-85       | 1FFA47                               |
| Readed BCH1               | 86-106      | 1FFA47                               |
| Identification            |             |                                      |
| Protocol                  |             | Test-Standard Location               |
| Number                    |             |                                      |
| Homing                    | 112         | 1                                    |
| Encod pos data            | 111         | 0                                    |
| Fixed Data "1"            | 108         | 1 OK                                 |
| Calculated BCH2           | 107-132     | A63                                  |
| Readed BCH2               | 133-144     | A63                                  |
| Latitude position         |             | Nord 43° 22' 44"                     |
| Longitude position        |             | Est 1° 13' 12"                       |
| Delta position            |             | 0,07 Km                              |

**Electrical and other parameters**

|                            |     |                 |              |
|----------------------------|-----|-----------------|--------------|
| CW preamble                | ms  | 158,4 < < 162,6 | 160,91       |
| Total transmission time    | ms  | 513,8 < < 526,2 | 522,05       |
| Modulation frequency       | Hz  | 395,4 < < 404,6 | 398,84       |
| Phase deviation : total    | rd  | <=2,40          | 2,27         |
| Phase deviation : positive | rd  | 1,00 < < 1,20   | 1,15         |
| Phase deviation : negative | rd  | -1,20 < < -1,00 | -1,12        |
| Symmetry measurement       | %   | <=5 %           | 0,40         |
| Nominal frequency : F2     | Hz  |                 | 406025224,73 |
| SIGMA2                     |     |                 | 2,47E-10     |
| SIGMA3                     |     |                 | 5,44E-11     |
| Slope                      |     |                 | -4,23E-11    |
| Residual                   |     |                 | 1,06E-10     |
| 406 MHz power output       | dBm |                 | 37,7         |
| Homing frequency           | MHz |                 | 121,50       |
| 121,5 MHz power output     | dBm |                 | 16,9         |
| Soak temperature           | °C  |                 | -39,3        |
| Extra feature              |     |                 | No           |





**Certification Test at 20°C**

Manufacturer : ACR

Beacon Type : RLB 33

Number : 1

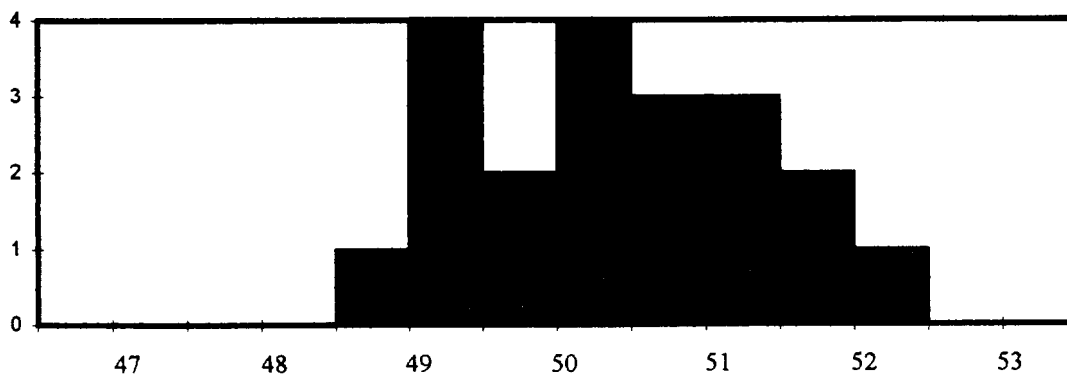
Date of test : 15-mar-1999

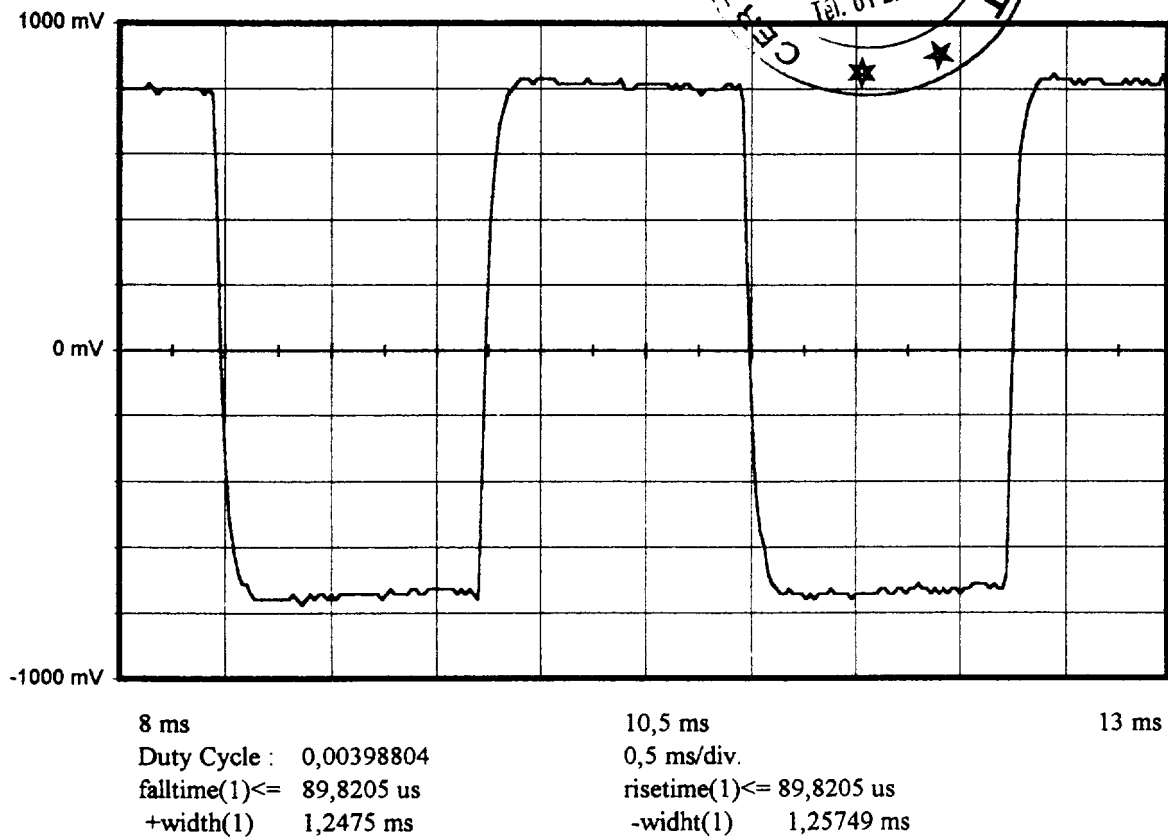
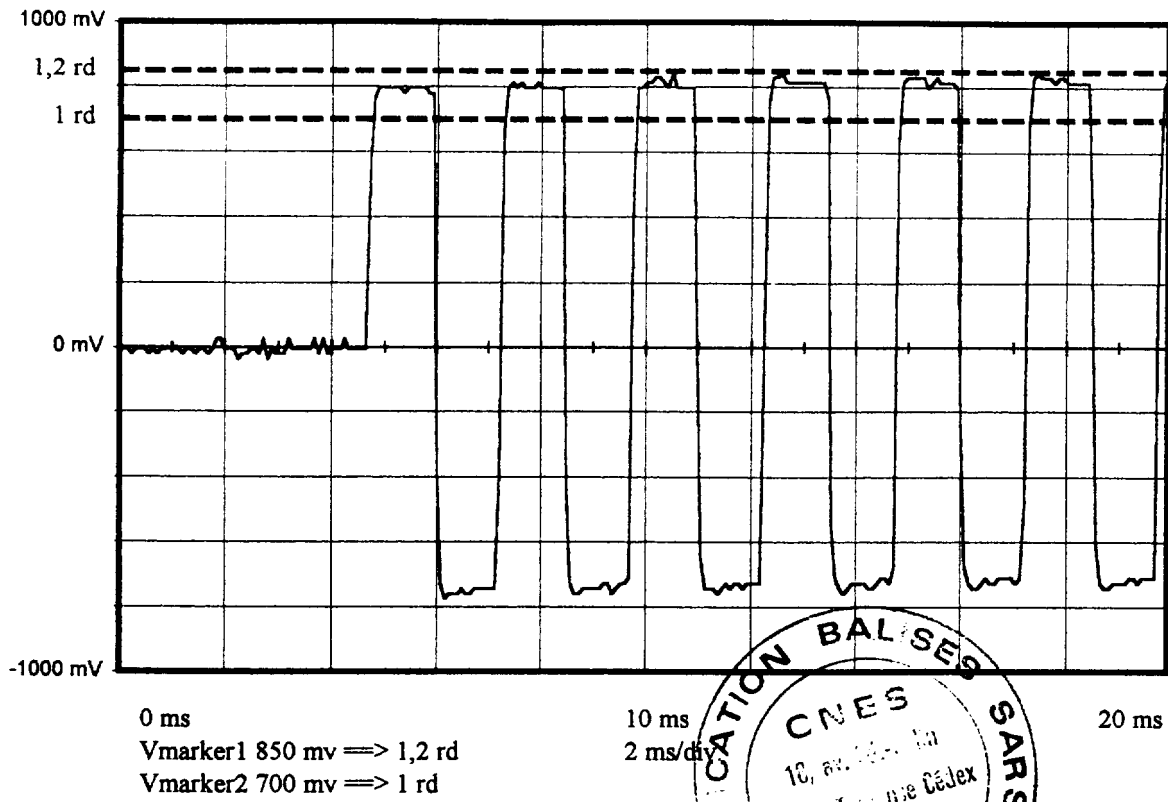
**Message**

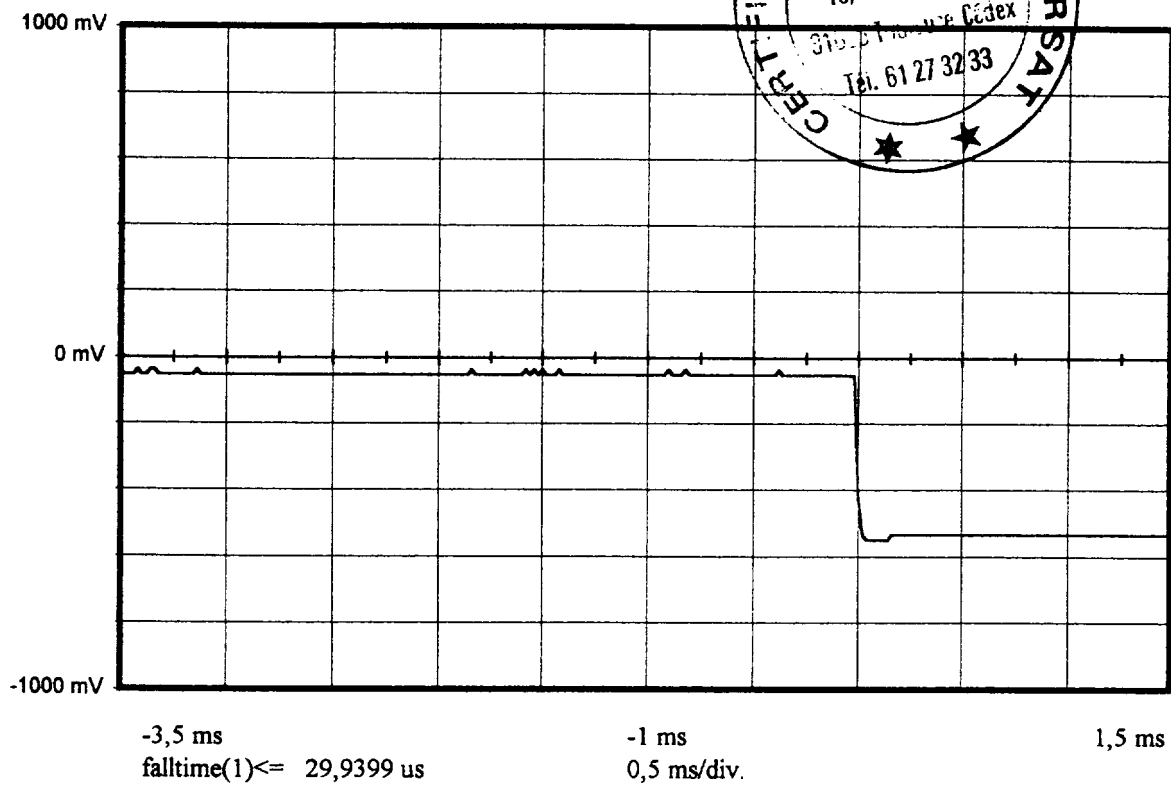
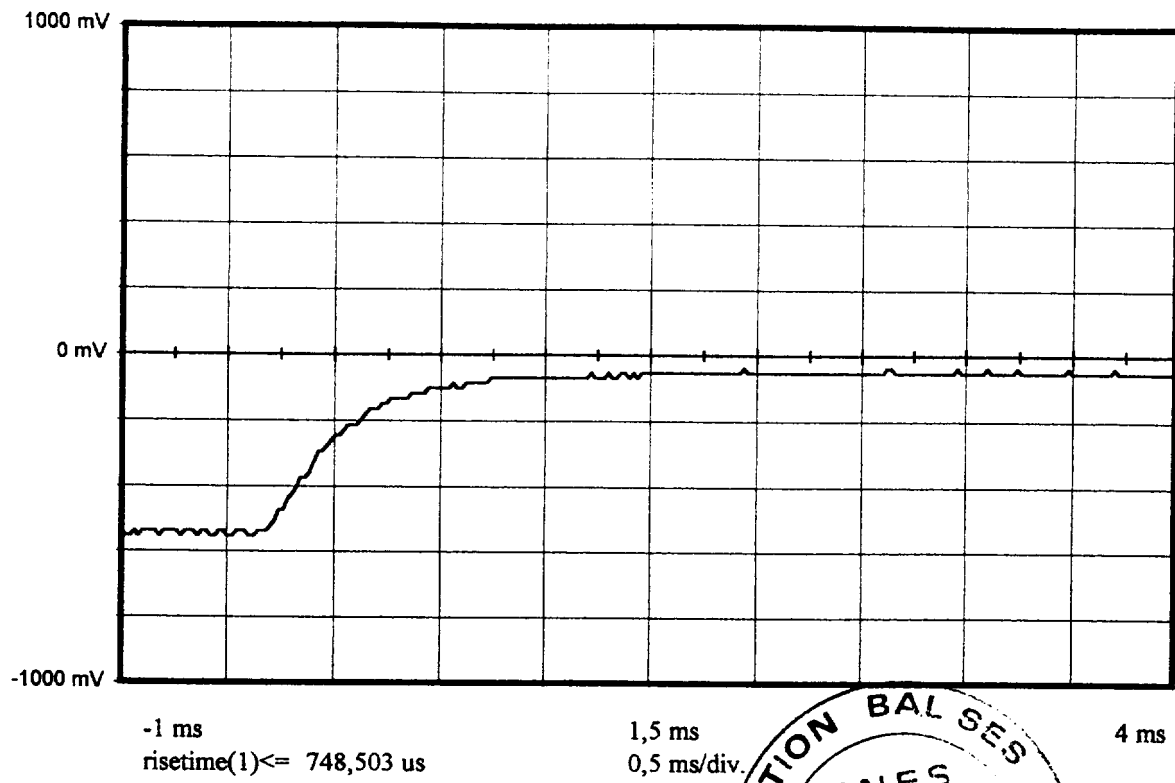
|                           |             |                                      |
|---------------------------|-------------|--------------------------------------|
| Message received          |             | FFFE2F96EE2EC0012B0027FE91F5DAED3A63 |
| Format Flag               | 25          | 1                                    |
| Protocol flag             | 26          | 0                                    |
| Country Code/Country      | 27-36       | 366 / USA                            |
| Protocol Code : U/Std-Nat | 37-39/37-40 | 1110                                 |
| Ident./Position code      | 27-85       |                                      |
| Calculated BCH1           | 25-85       | 1FFA47                               |
| Readed BCH1               | 86-106      | 1FFA47                               |
| Identification            |             |                                      |
| Protocol                  |             | Test-Standard Location               |
| Number                    |             |                                      |
| Homing                    | 112         | 1                                    |
| Encod pos data            | 111         | 0                                    |
| Fixed Data "1"            | 108         | 1                                    |
| Calculated BCH2           | 107-132     | A63                                  |
| Readed BCH2               | 133-144     | A63                                  |
| Latitude position         |             | Nord 43° 22' 44"                     |
| Longitude position        |             | Est 1° 13' 12"                       |
| Delta position            |             | 0.07 Km                              |

**Electrical and other parameters**

|                            |     |                 |              |
|----------------------------|-----|-----------------|--------------|
| CW preamble                | ms  | 158,4 < < 162,6 | 160,93       |
| Total transmission time    | ms  | 434,6 < < 445,4 | 522,05       |
| Modulation frequency       | Hz  | 395,4 < < 404,6 | 398,85       |
| Phase deviation : total    | rd  | <=2,40          | 2,21         |
| Phase deviation : positive | rd  | 1,00 < < 1,20   | 1,13         |
| Phase deviation : negative | rd  | -1,20 < < -1,00 | -1,08        |
| Symmetry measurement       | %   | <=5 %           | 0,40         |
| Nominal frequency : F2     | Hz  |                 | 406025214,22 |
| SIGMA2                     |     |                 | 1,25E-10     |
| SIGMA3                     |     |                 | 8,74E-11     |
| Slope                      |     |                 | -7,86E-11    |
| Residual                   |     |                 | 8,88E-11     |
| 406 MHz power output       | dBm |                 | 38,3         |
| Homing frequency           | MHz |                 | 121,50       |
| 121,5 MHz power output     | dBm |                 | 16,6         |
| Soak temperature           | °C  |                 | 20,1         |
| Extra feature              |     |                 | No           |







**Certification Test at 55°C**

Manufacturer : ACR

Beacon Type : RLB 33

Number : 1

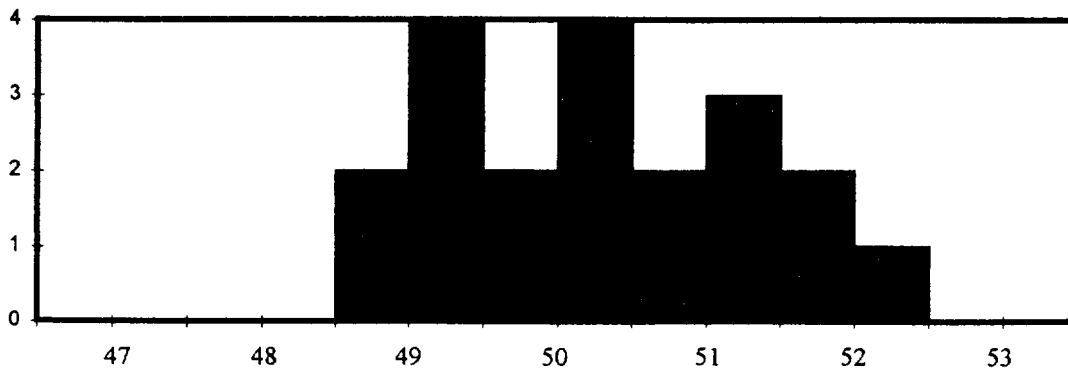
Date of test : 16-mar-1999

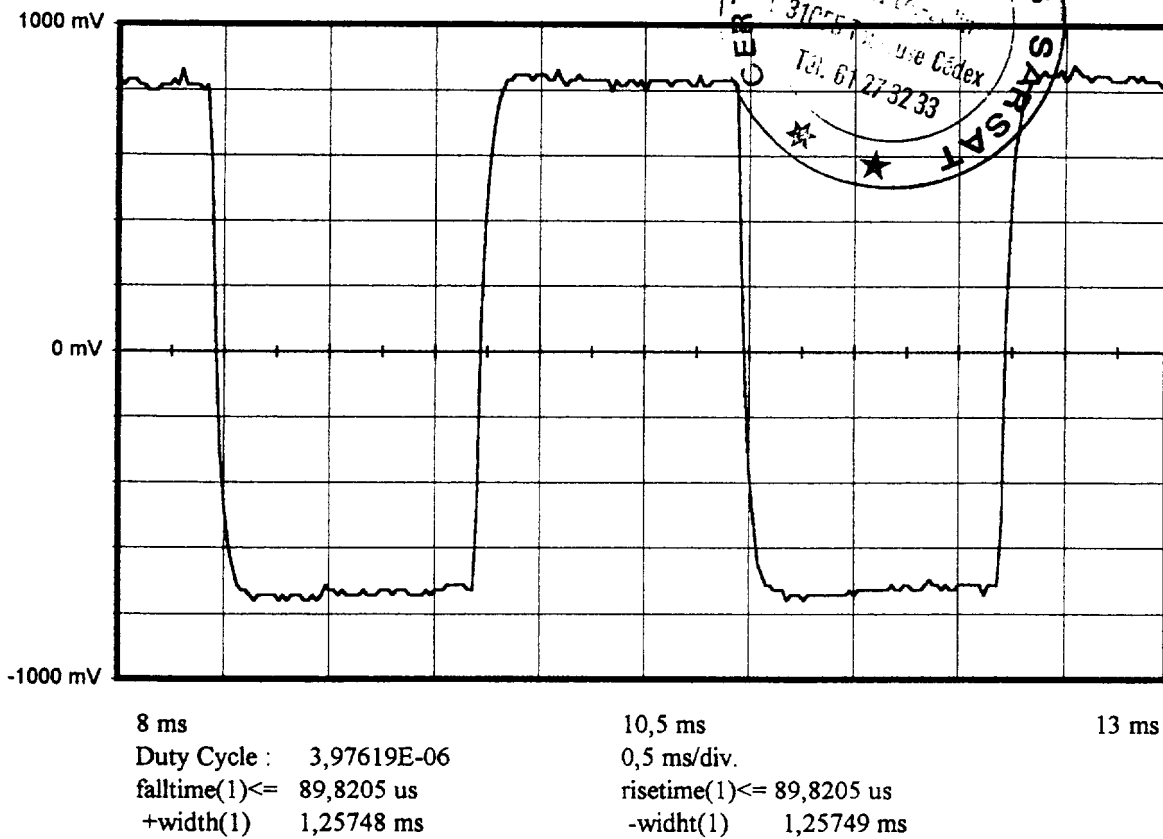
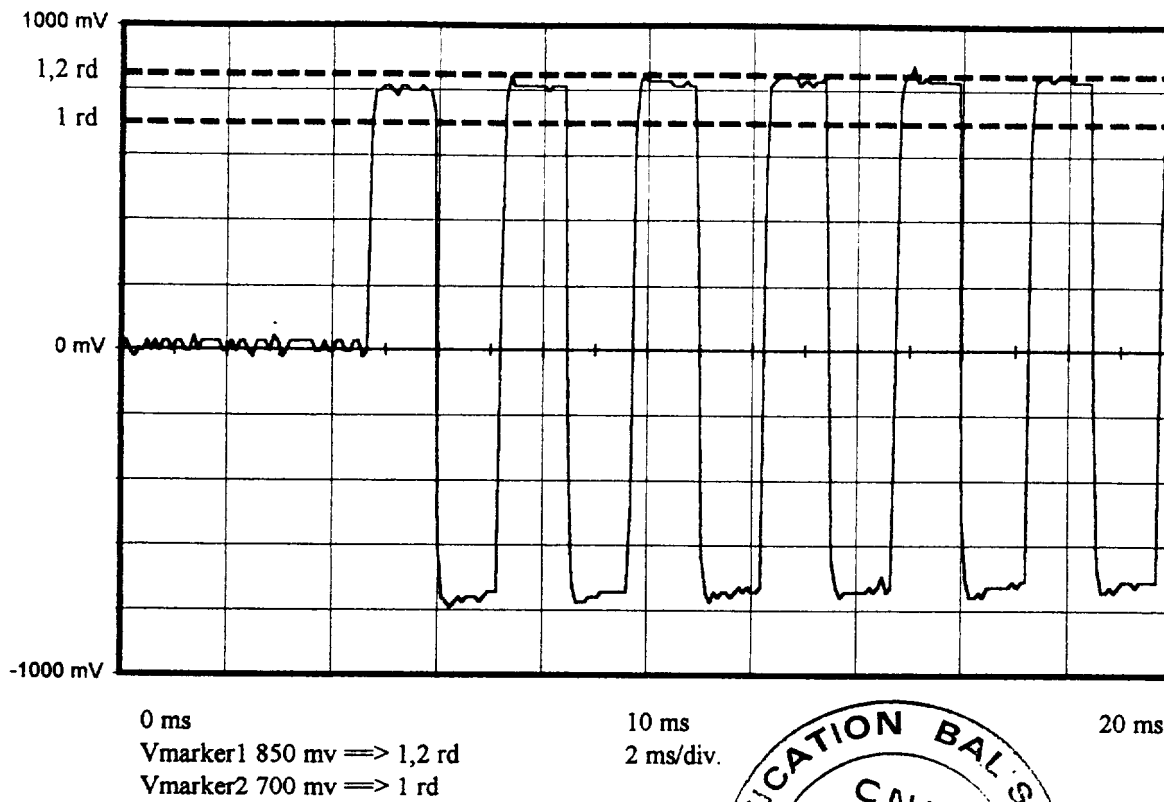
**Message**

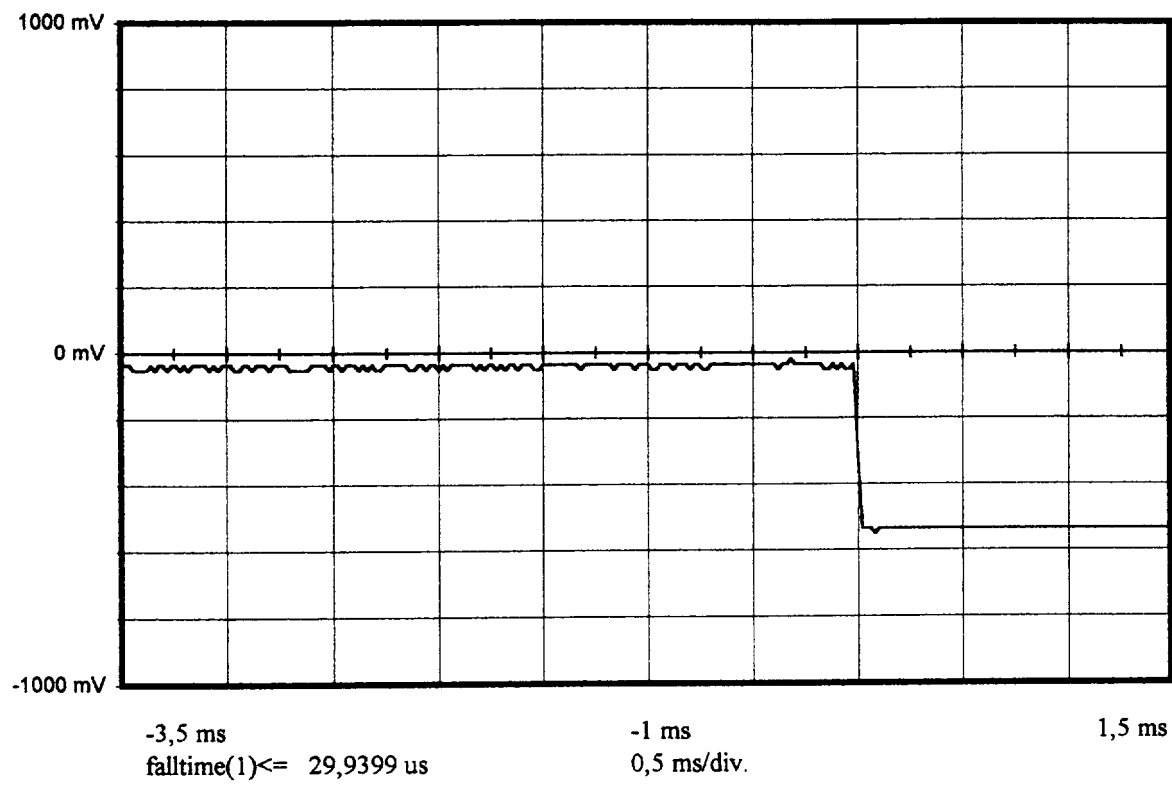
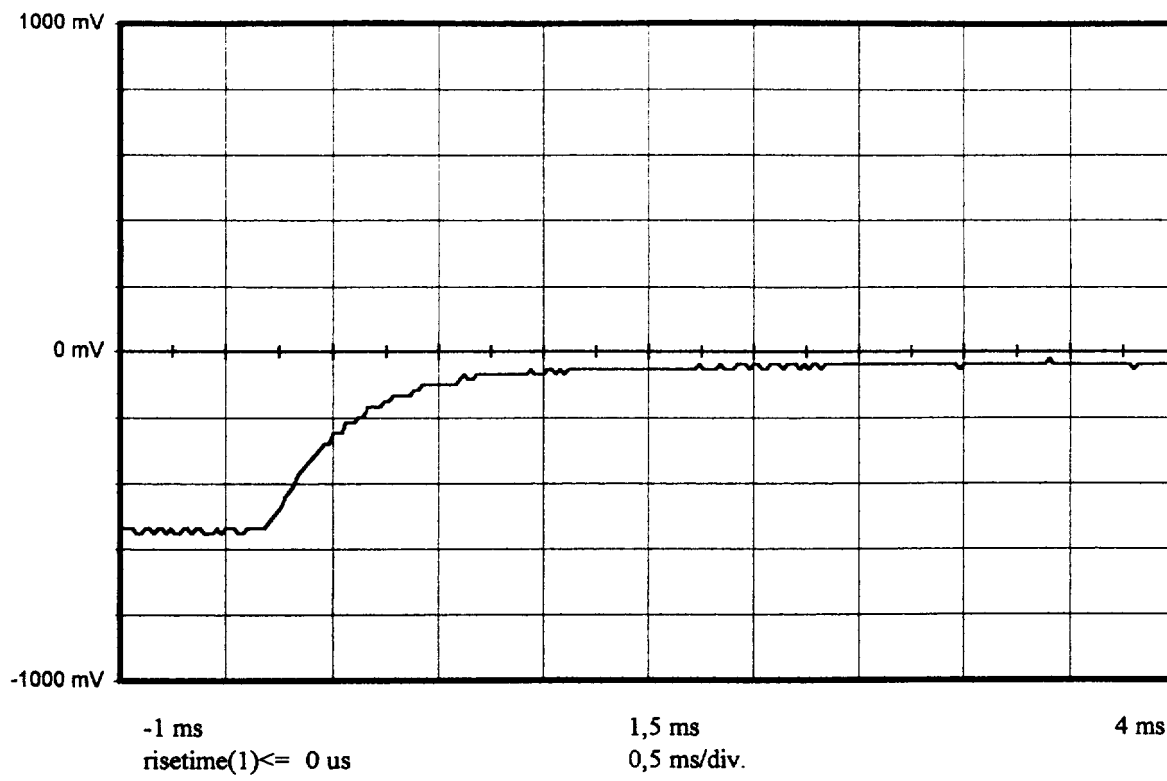
|                           |             |                                      |
|---------------------------|-------------|--------------------------------------|
| Message received          |             | FFFE2F96EE2EC0012B0027FE91F5DAED3A63 |
| Format Flag               | 25          | 1                                    |
| Protocol flag             | 26          | 0                                    |
| Country Code/Country      | 27-36       | 366 / USA                            |
| Protocol Code : U/Std-Nat | 37-39/37-40 | 1110                                 |
| Ident./Position code      | 27-85       |                                      |
| Calculated BCH1           | 25-85       | 1FFA47                               |
| Readed BCH1               | 86-106      | 1FFA47                               |
| Identification            |             |                                      |
| Protocol                  |             | Test-Standard Location               |
| Number                    |             |                                      |
| Homing                    | 112         | 1                                    |
| Encod pos data            | 111         | 0                                    |
| Fixed Data "1"            | 108         | 1                                    |
| Calculated BCH2           | 107-132     | A63                                  |
| Readed BCH2               | 133-144     | A63                                  |
| Latitude position         |             | Nord 43° 22' 44"                     |
| Longitude position        |             | Est 1° 13' 12"                       |
| Delta position            |             | 0.07 Km                              |

**Electrical and other parameters**

|                            |     |                 |              |
|----------------------------|-----|-----------------|--------------|
| CW preamble                | ms  | 158,4 < < 162,6 | 160,93       |
| Total transmission time    | ms  | 434,6 < < 445,4 | 522,04       |
| Modulation frequency       | Hz  | 395,4 < < 404,6 | 398,85       |
| Phase deviation : total    | rd  | <=2,40          | 2,26         |
| Phase deviation : positive | rd  | 1,00 < < 1,20   | 1,15         |
| Phase deviation : negative | rd  | -1,20 < < -1,00 | -1,12        |
| Symmetry measurement       | %   | <=5 %           | 0,00         |
| Nominal frequency : F2     | Hz  |                 | 406025203,88 |
| SIGMA2                     |     |                 | 9,42E-11     |
| SIGMA3                     |     |                 | 7,65E-11     |
| Slope                      |     |                 | -2,51E-10    |
| Residual                   |     |                 | 1,78E-10     |
| 406 MHz power output       | dBm |                 | 38,4         |
| Homing frequency           | MHz |                 | 121,50       |
| 121,5 MHz power output     | dBm |                 | 16,1         |
| Soak temperature           | °C  |                 | 53,2         |
| Extra feature              |     |                 | No           |







**Certification Test at 20°C**

Manufacturer : ACR

Beacon Type : RLB 32

Number : 2

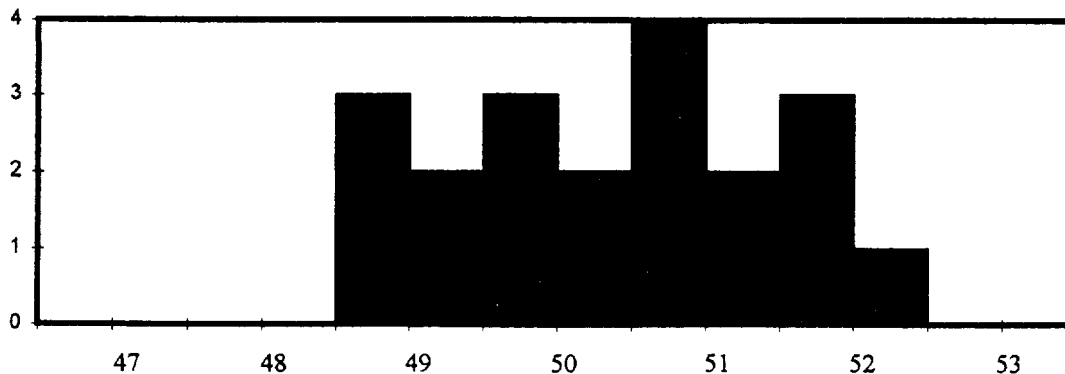
Date of test : 18 Feb 1999

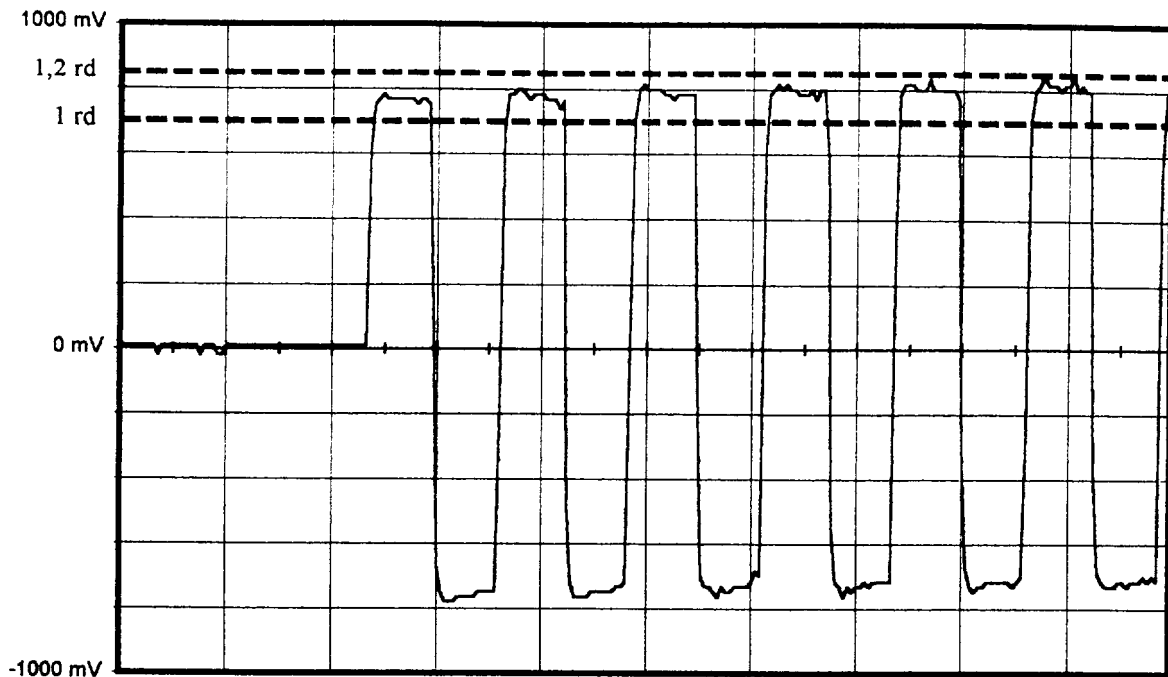
**Message**

|                           |             |                              |
|---------------------------|-------------|------------------------------|
| Message received          |             | FFFE2F56EE810004A020085A5890 |
| Format Flag               | 25          | 0                            |
| Protocol flag             | 26          | 1                            |
| Country Code/Country      | 27-36       | 366 / USA                    |
| Protocol Code : U/Std-Nat | 37-39/37-40 | 111                          |
| Ident./Position code      | 27-85       | ADDD02000940401              |
| Calculated BCH1           | 25-85       | 16962                        |
| Readed BCH1               | 86-106      | 16962                        |
| Identification            |             | 8                            |
| Protocol                  |             | Test                         |
| Number                    |             | 3:4:5:                       |
| Homing                    | 84-85       | 01                           |
| Emer cod / Encod pos data | 107         | 0                            |
| Activation type           | 108         | 1                            |
| Calculated BCH2           | 107-132     |                              |
| Readed BCH2               | 133-144     |                              |
| Latitude position         |             |                              |
| Longitude position        |             |                              |
| Delta position            |             |                              |

**Electrical and other parameters**

|                            |     |                 |              |
|----------------------------|-----|-----------------|--------------|
| CW preamble                | ms  | 158,4 < < 162,6 | 160,91       |
| Total transmission time    | ms  | 434,6 < < 445,4 | 441,79       |
| Modulation frequency       | Hz  | 395,4 < < 404,6 | 398,85       |
| Phase deviation : total    | rd  | <=2,40          | 2,25         |
| Phase deviation : positive | rd  | 1,00 < < 1,20   | 1,14         |
| Phase deviation : negative | rd  | -1,20 < < -1,00 | -1,11        |
| Symmetry measurement       | %   | <=5 %           | 0,0004       |
| Nominal frequency : F2     | Hz  |                 | 406024674,26 |
| SIGMA2                     |     |                 | 7,51E-11     |
| SIGMA3                     |     |                 | 5,26E-11     |
| Slope                      |     |                 | -4,99E-11    |
| Residual                   |     |                 | 5,47E-11     |
| 406 MHz power output       | dBm |                 | 38,4         |
| Homing frequency           | MHz |                 | 121,50       |
| 121,5 MHz power output     | dBm |                 | 16,4         |
| Soak temperature           | °C  |                 | 19,9         |
| Extra feature              |     |                 | No           |

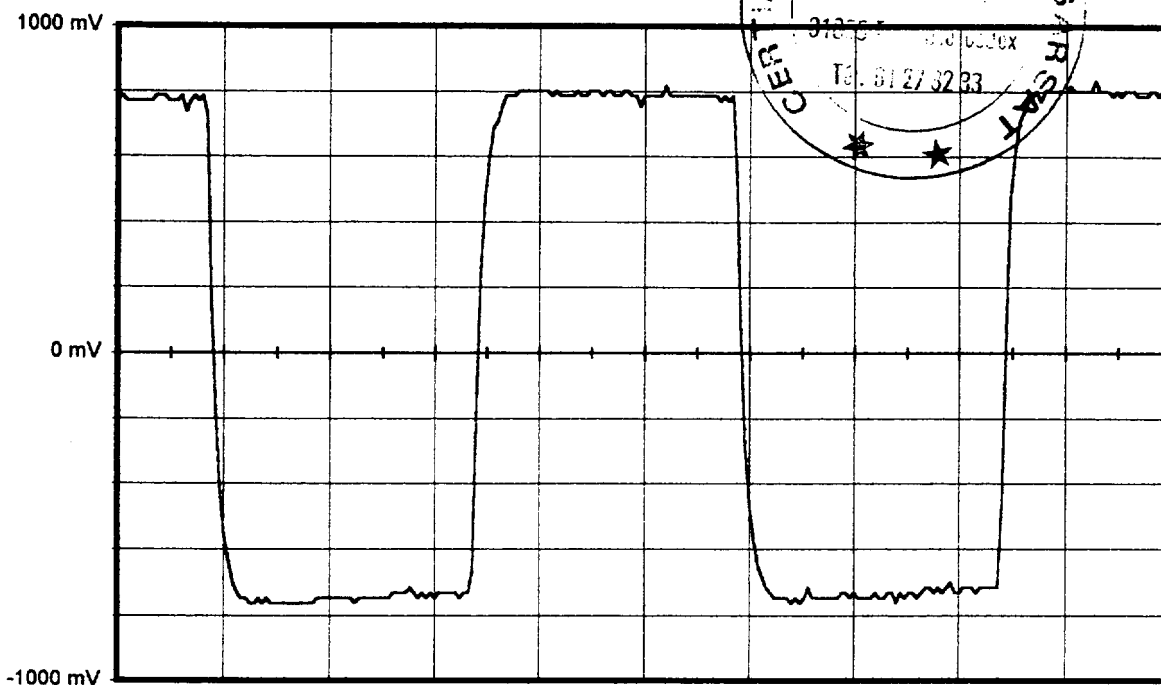
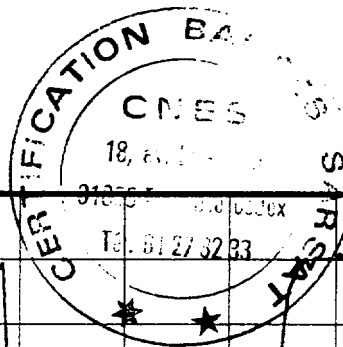




0 ms  
 Vmarker1 850 mv  $\Rightarrow$  1,2 rd  
 Vmarker2 700 mv  $\Rightarrow$  1 rd

10 ms  
 2 ms/div.

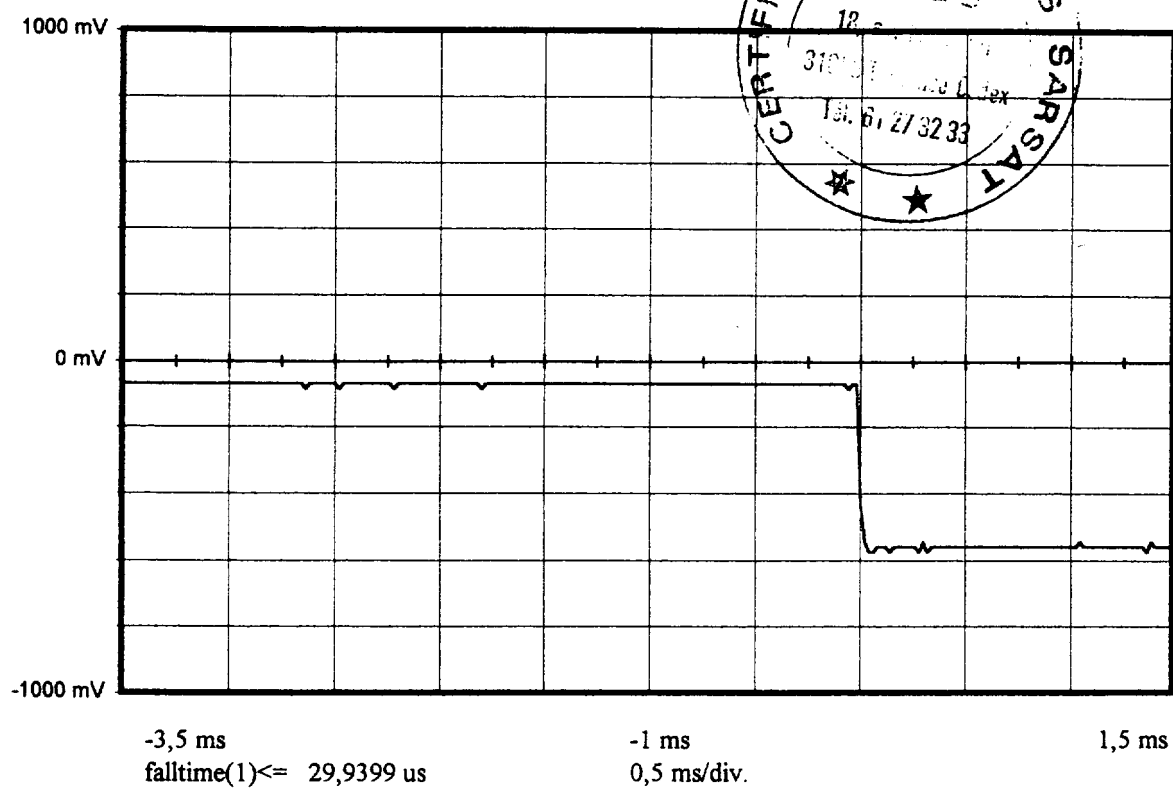
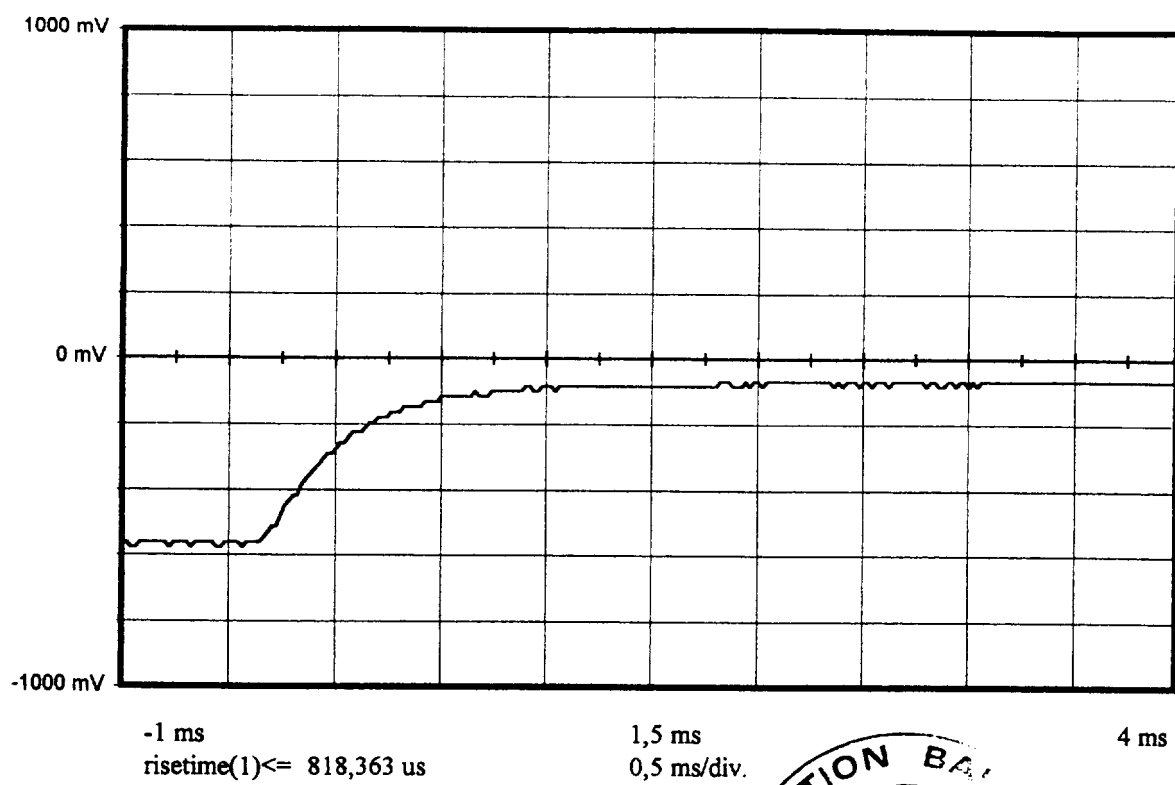
20 ms



8 ms  
 Duty Cycle : 3,98E-06  
 falltime(1)  $\leq$  99,8005 us  
 +width(1) 1,25748 ms

10,5 ms  
 0,5 ms/div.  
 risetime(1)  $\leq$  89,8205 us  
 -width(1) 1,25749 ms

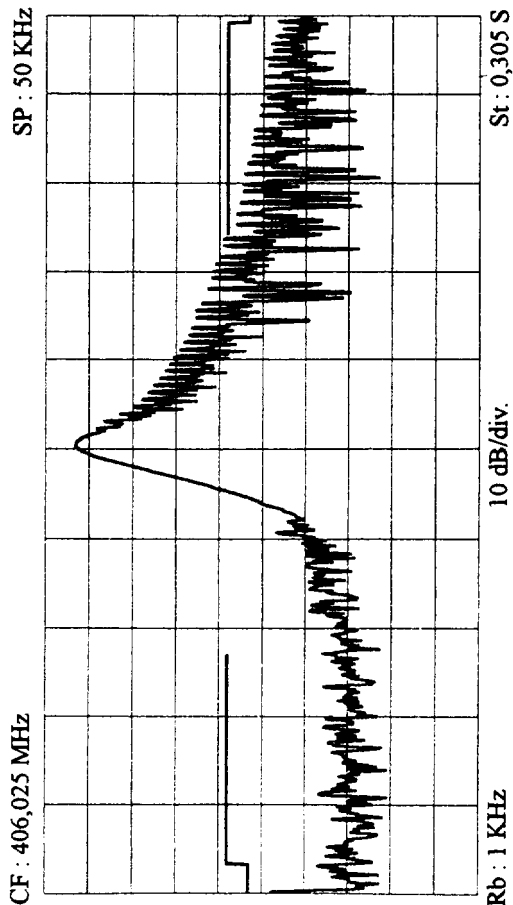
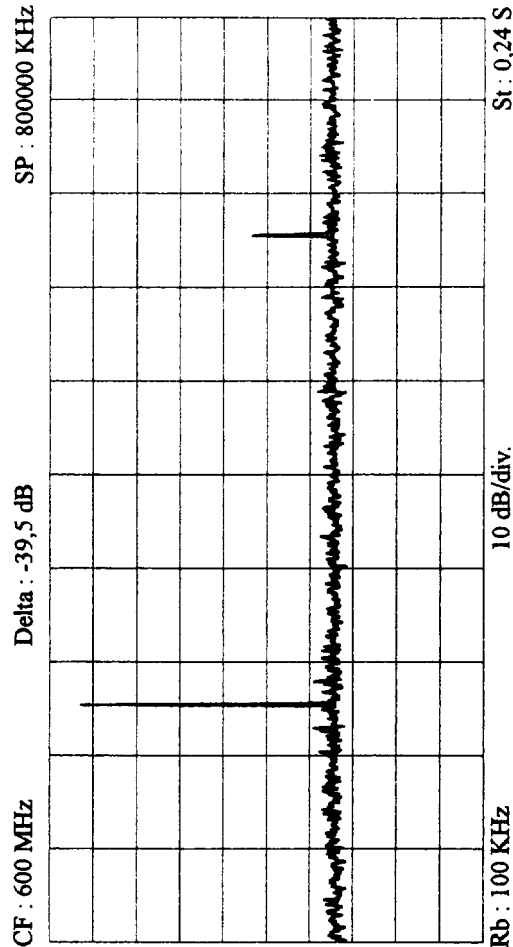
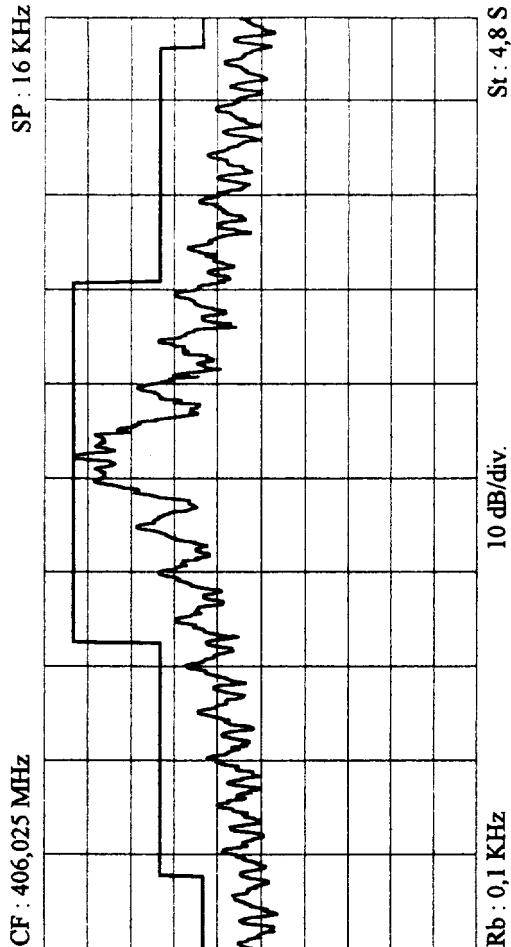
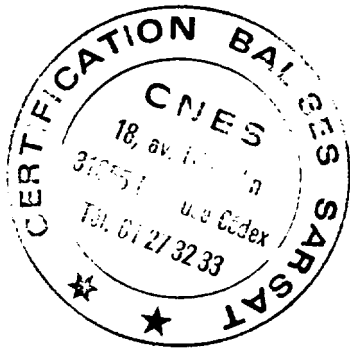
13 ms



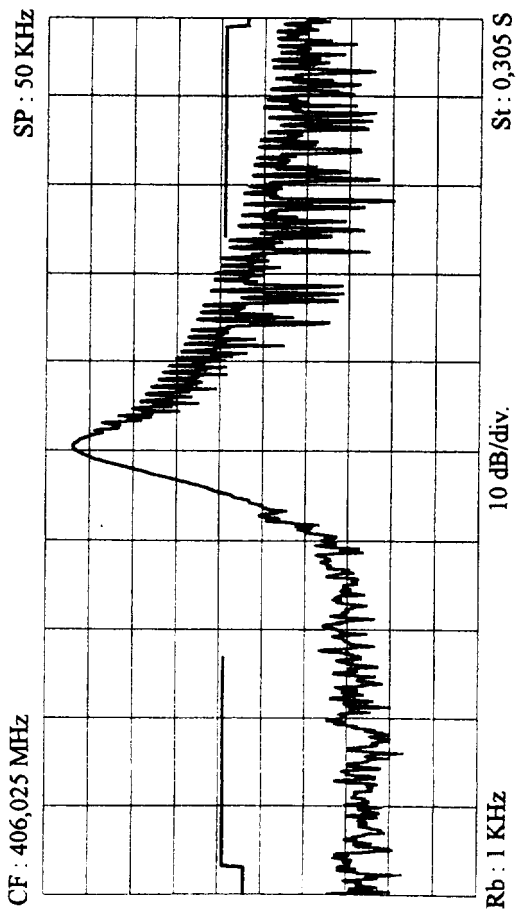
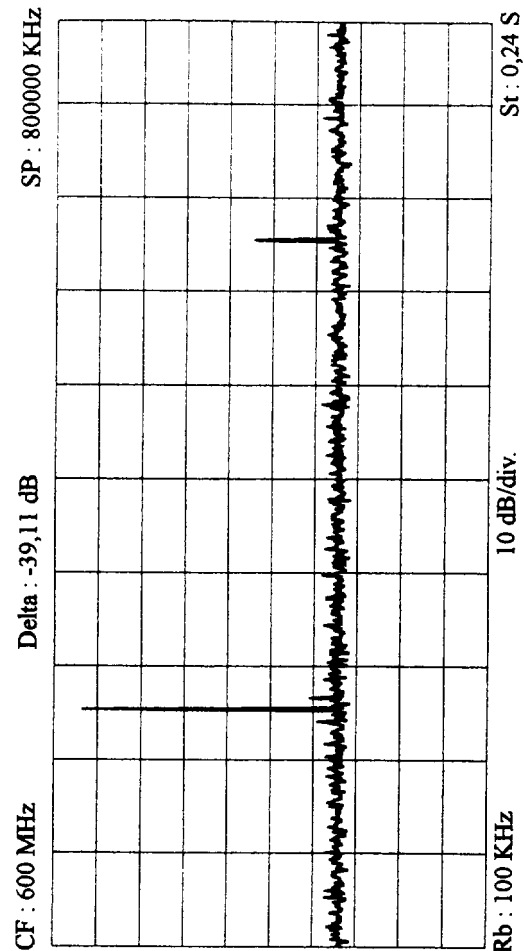
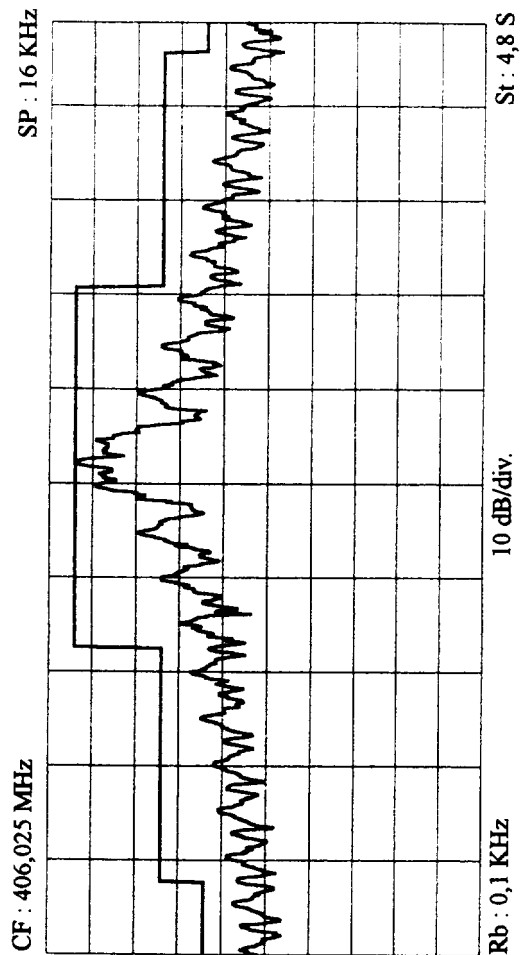
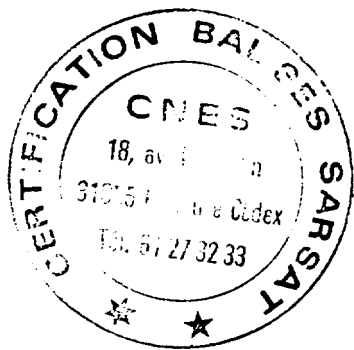
**SPURIOUS EMISSIONS TEST RESULTS ON**

- N° 1 RLB 33 ACR Electronics, Inc. Beacon  
at -40° C, 20° C and 55° C and
- N° 2 RLB 32 ACR Electronics, Inc. Beacon  
at 20° C

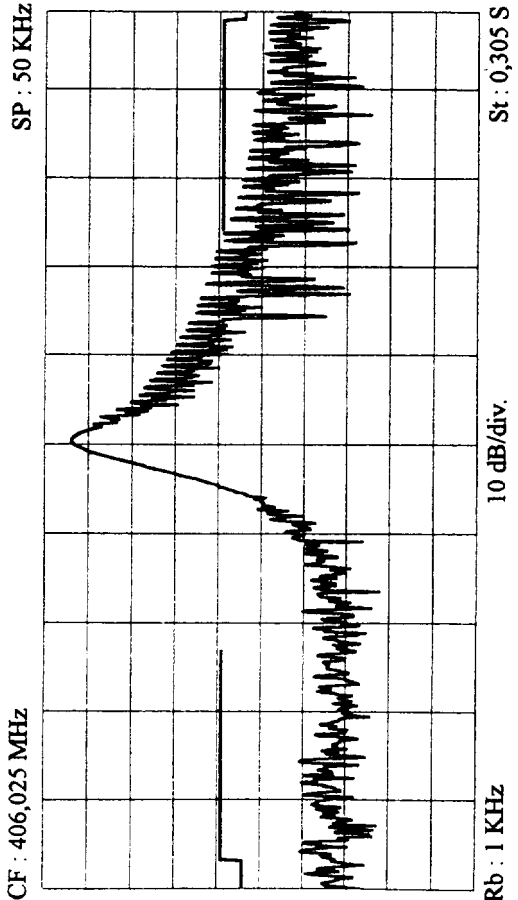
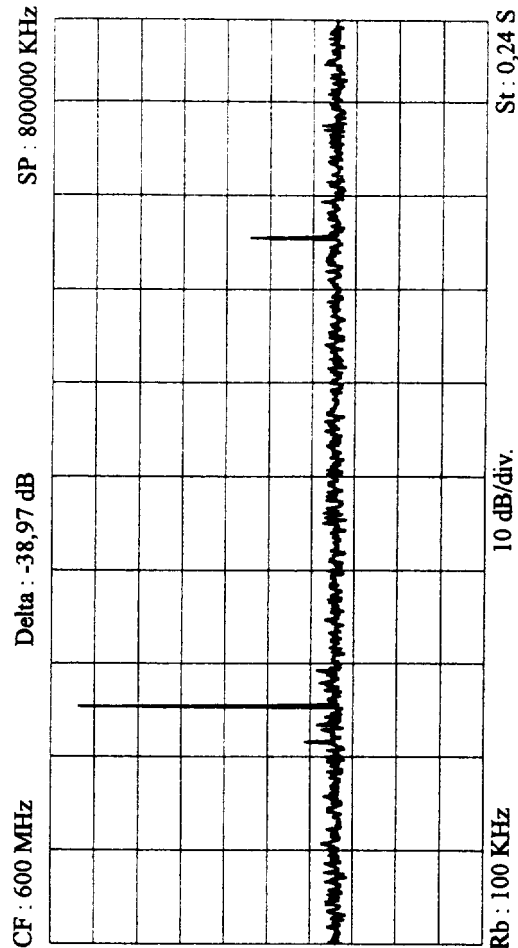
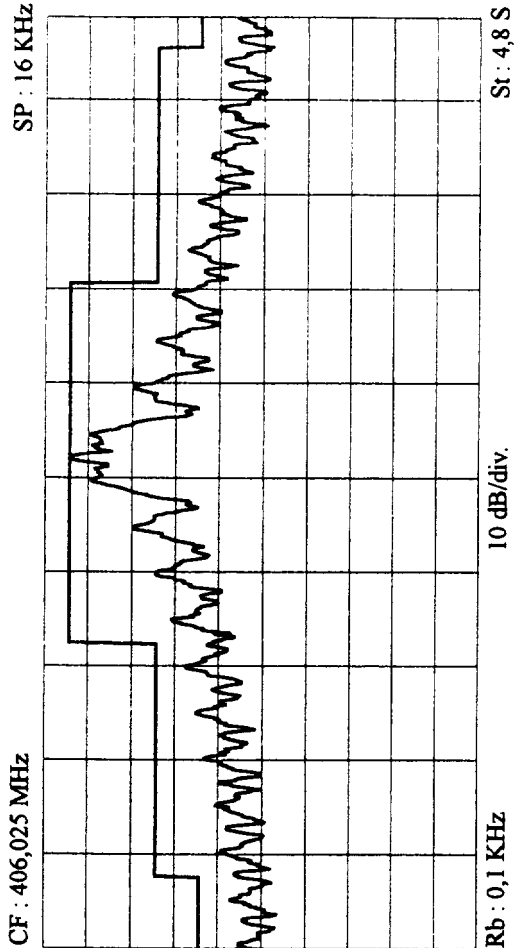
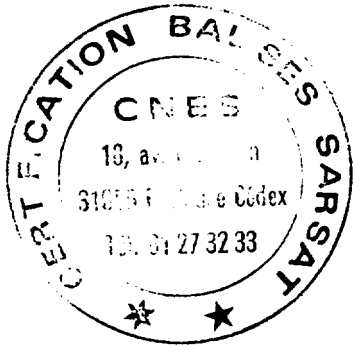
ACR Electronics, Inc.  
RLB 33  
1  
Certification nominale  
406 MHz  
-40 °C



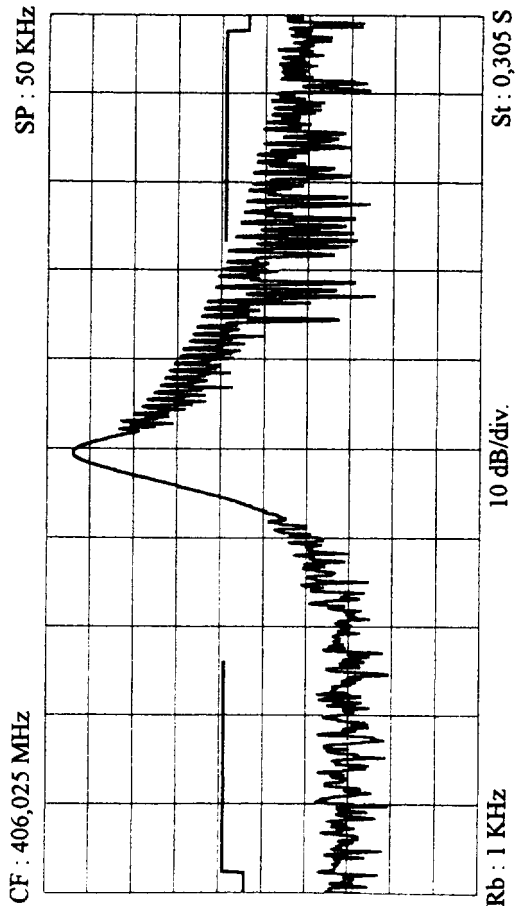
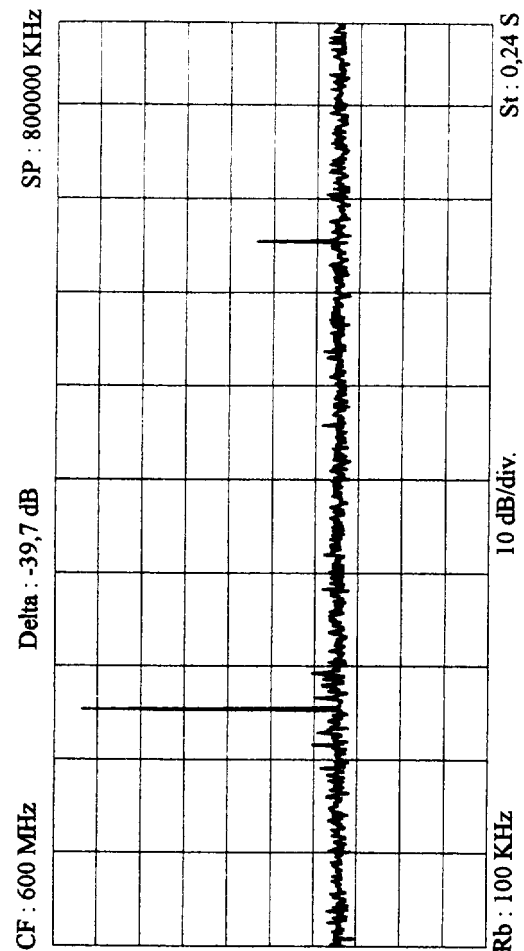
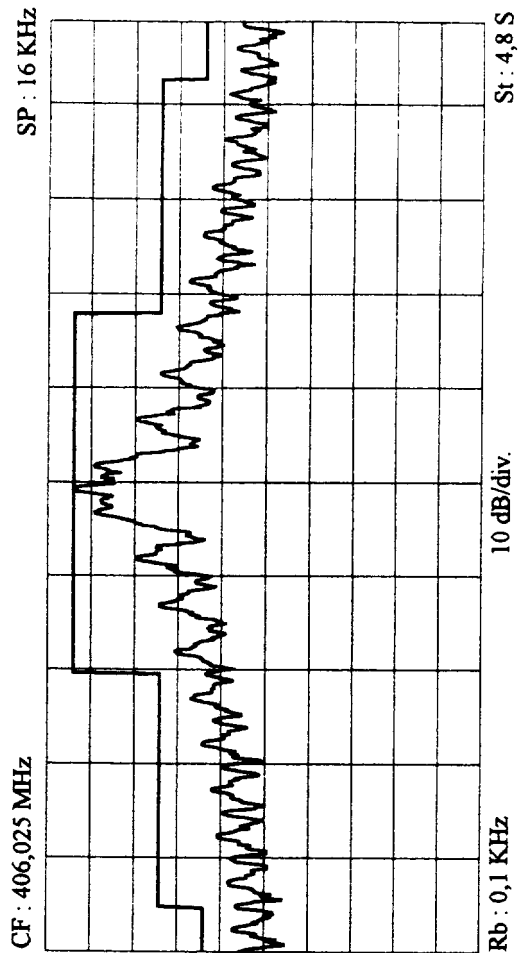
ACR Electronics, Inc.  
 RLB 33  
 1  
 Certification nominale  
 406 MHz  
 20 °C



ACR Electronics, Inc.  
RLB 33  
1  
Certification nominale  
406 MHz  
55 °C



ACR Electronics, Inc.  
RLB 32  
2  
Certification nominale  
406 MHz  
20 °C



**406 MHz VSWR 3:1 TEST RESULTS ON**  
**RLB 33 ACR Electronics, Inc.**  
**N° 1**  
**at -40° C, 20° C and 55° C**

**Certification Test VSWR at -40°C**

Manufacturer : ACR

Beacon Type : RLB 33

Number : 1

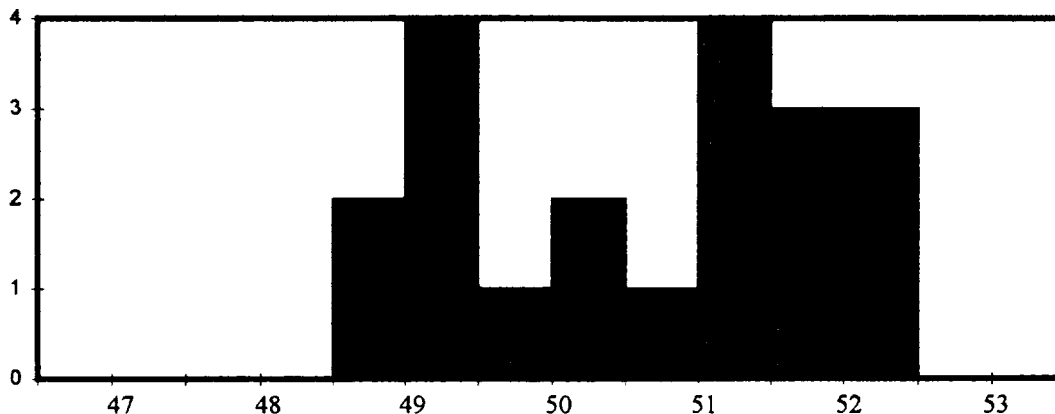
Date of test : 17-mar-99

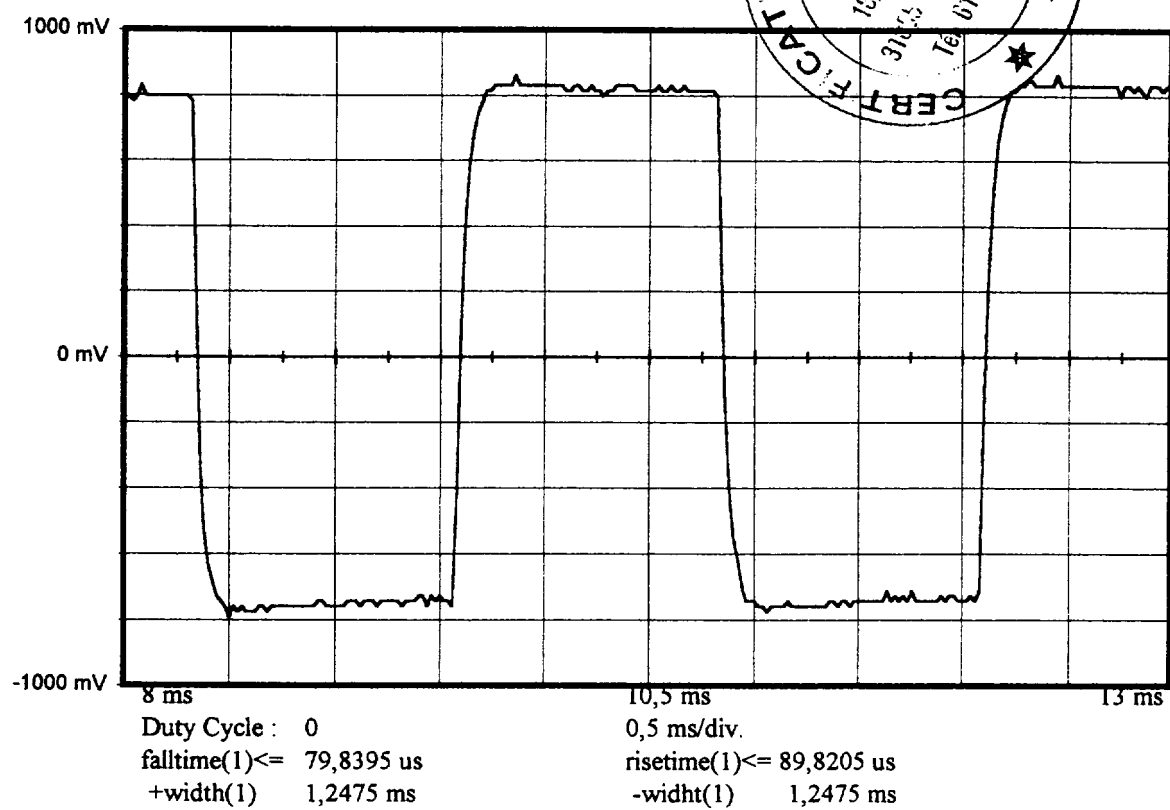
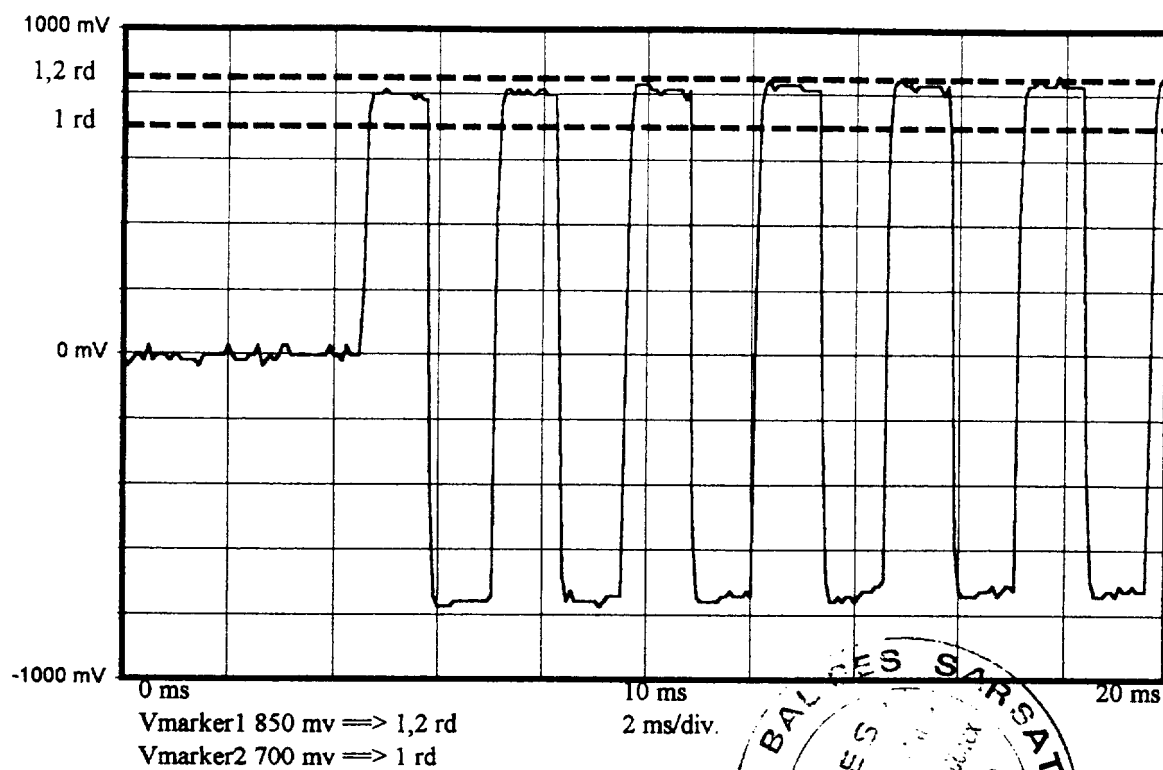
**Message**

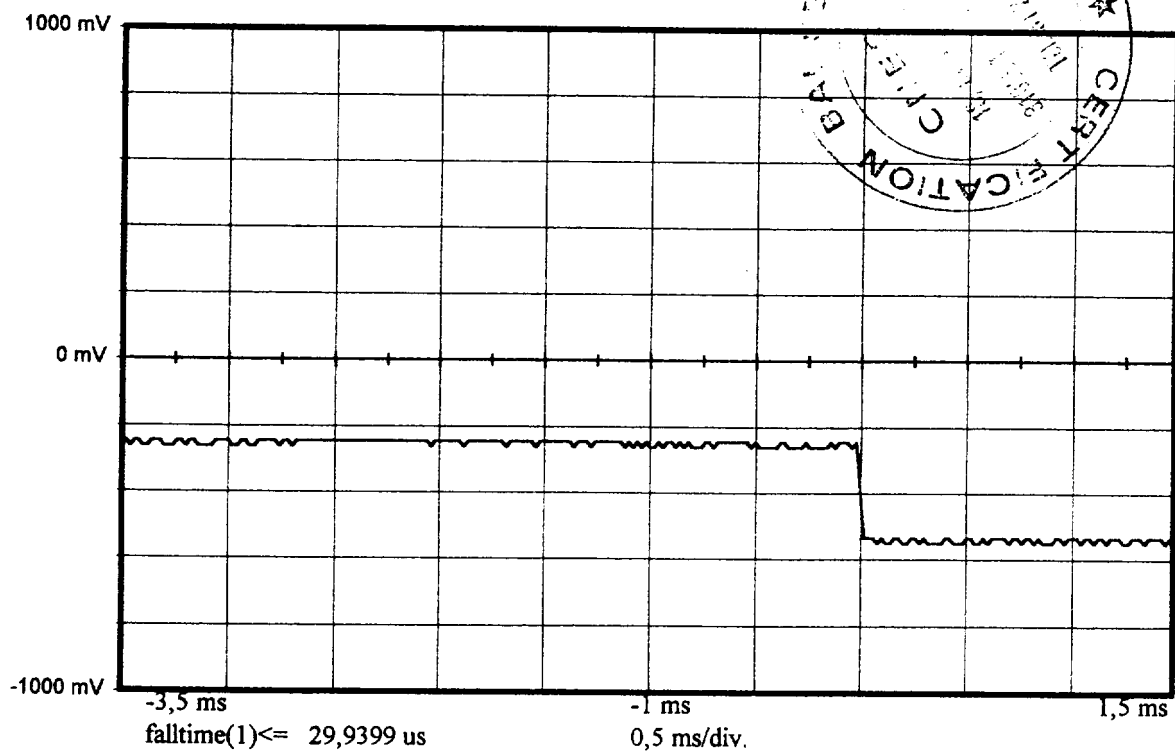
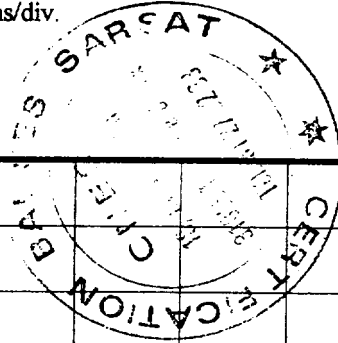
|                           |             |                                      |
|---------------------------|-------------|--------------------------------------|
| Message received          |             | FFFE2F96EE2EC0012B0027FE91F5DAED3A63 |
| Format Flag               | 25          | 1                                    |
| Protocol flag             | 26          | 0                                    |
| Country Code/Country      | 27-36       | 366 / USA                            |
| Protocol Code : U/Std-Nat | 37-39/37-40 | 1110                                 |
| Ident./Position code      | 27-85       |                                      |
| Calculated BCH1           | 25-85       | 1FFA47                               |
| Readed BCH1               | 86-106      | 1FFA47                               |
| Identification            |             |                                      |
| Protocol                  |             | Test-Standard Location               |
| Number                    |             |                                      |
| Homing                    | 112         | 1                                    |
| Encod pos data            | 111         | 0                                    |
| Fixed Data "I"            | 108         | 1                                    |
| Calculated BCH2           | 107-132     | A63                                  |
| Readed BCH2               | 147-144     | A63                                  |
| Latitude position         |             | Nord 43° 22' 44"                     |
| Longitude position        |             | Est 1° 13' 12"                       |
| Delta position            |             | 0,07 Km                              |

**Electrical and other parameters**

|                            |                    |              |
|----------------------------|--------------------|--------------|
| Rise time Modulation       | ms                 | 0,0898       |
| Fall time Modulation       | ms                 | 0,0798       |
| Phase deviation : positive | rd 1,00 < < 1,20   | 1,13         |
| Phase deviation : negative | rd -1,20 < < -1,00 | -1,12        |
| Symmetry measurement       | %                  | 0,00         |
| Nominal frequency : F2     | Hz                 | 406025219,32 |







**Certification Test VSWR at 20°C**

Manufacturer : ACR  
 Beacon Type : RLB 33  
 Number : 1

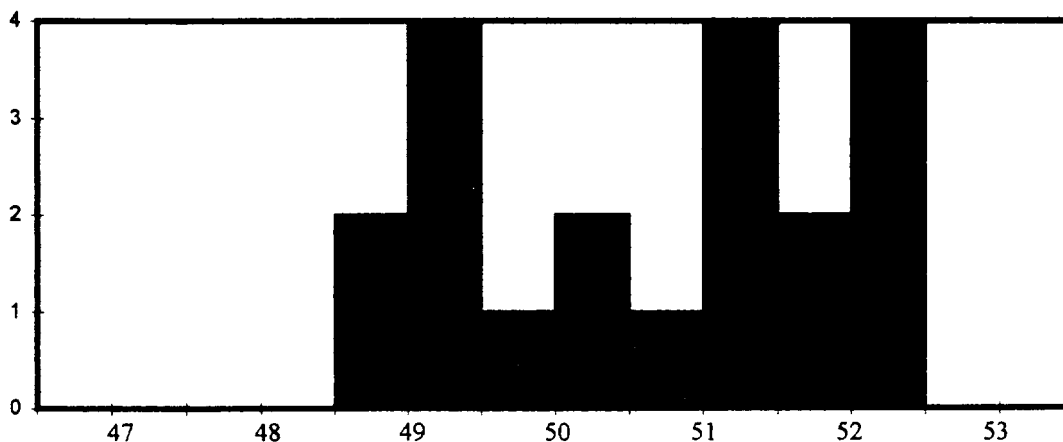
Date of test : 16 mar 1999

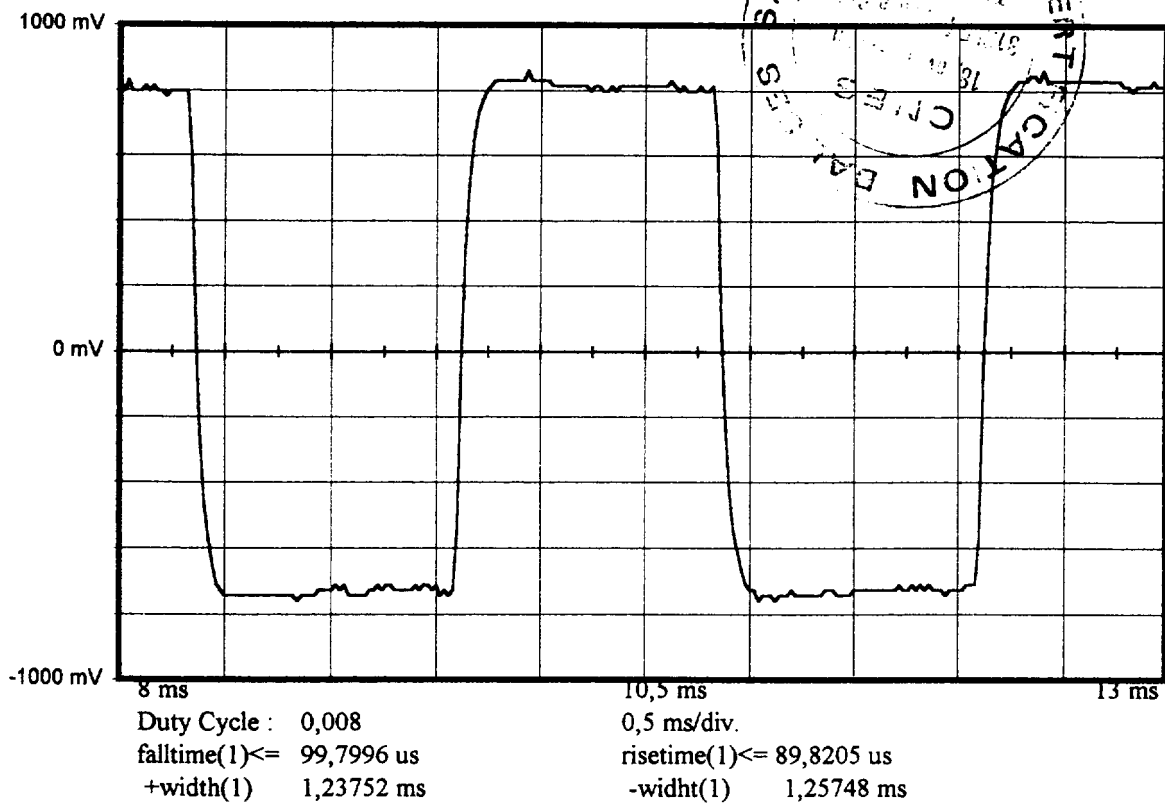
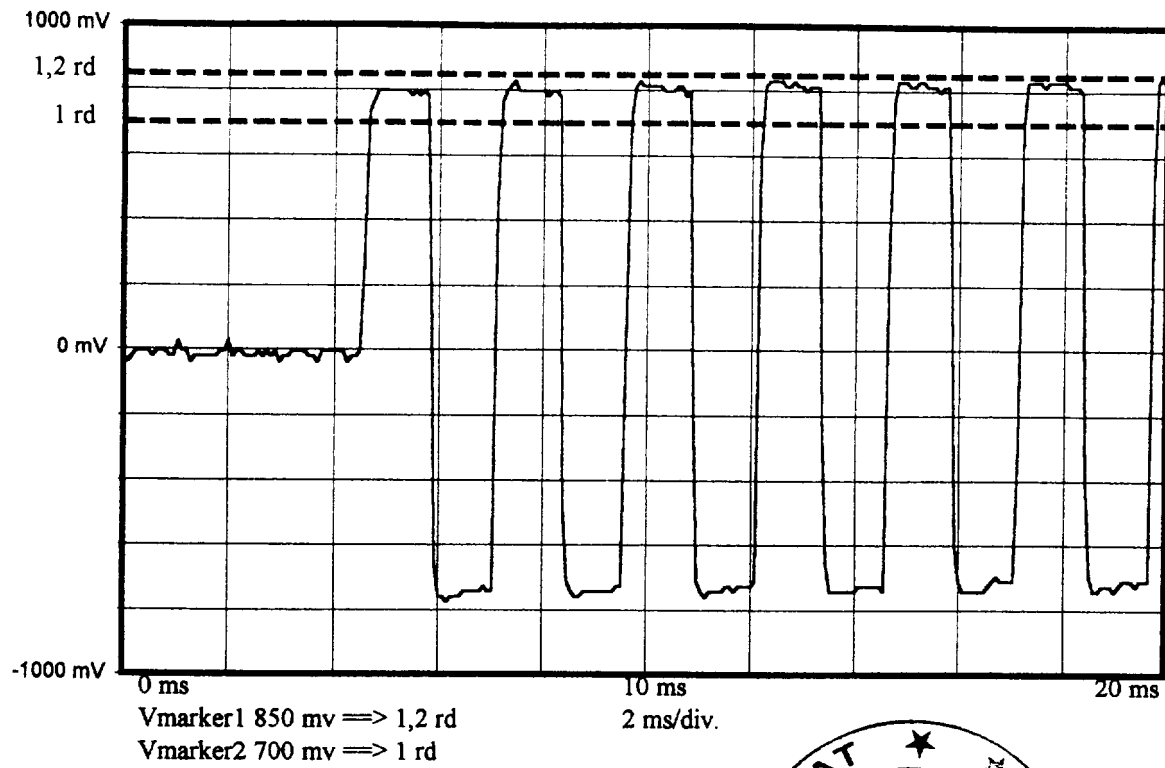
**Message**

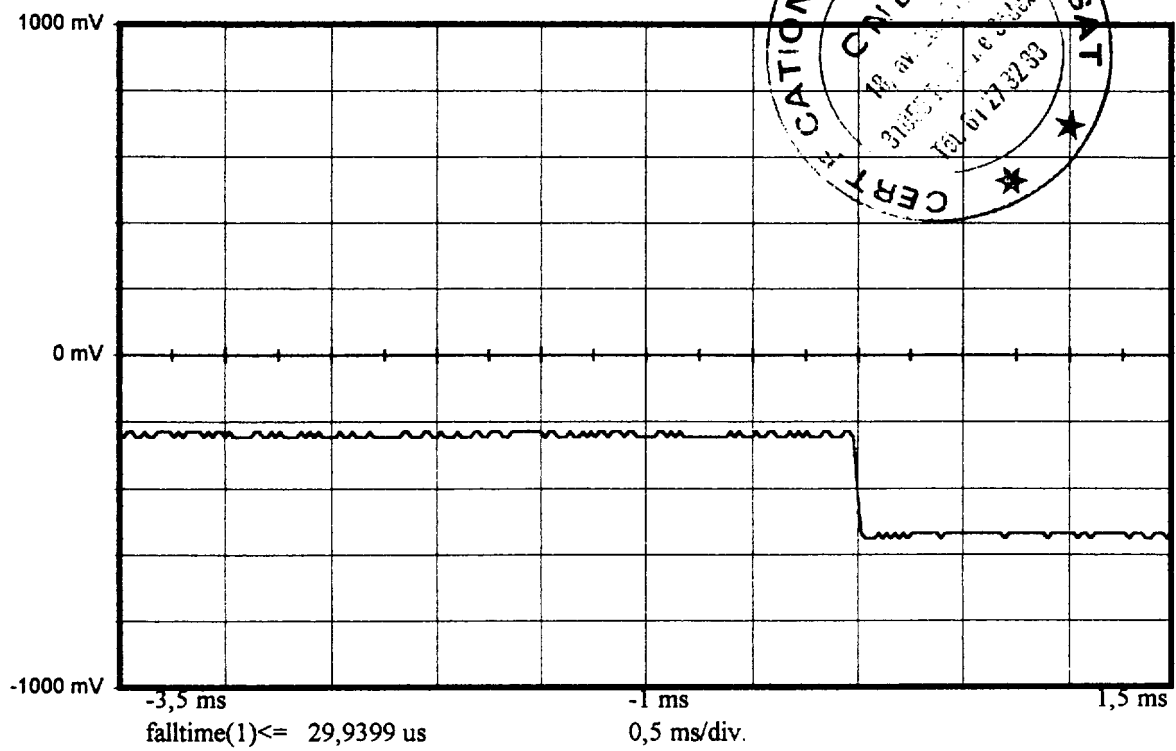
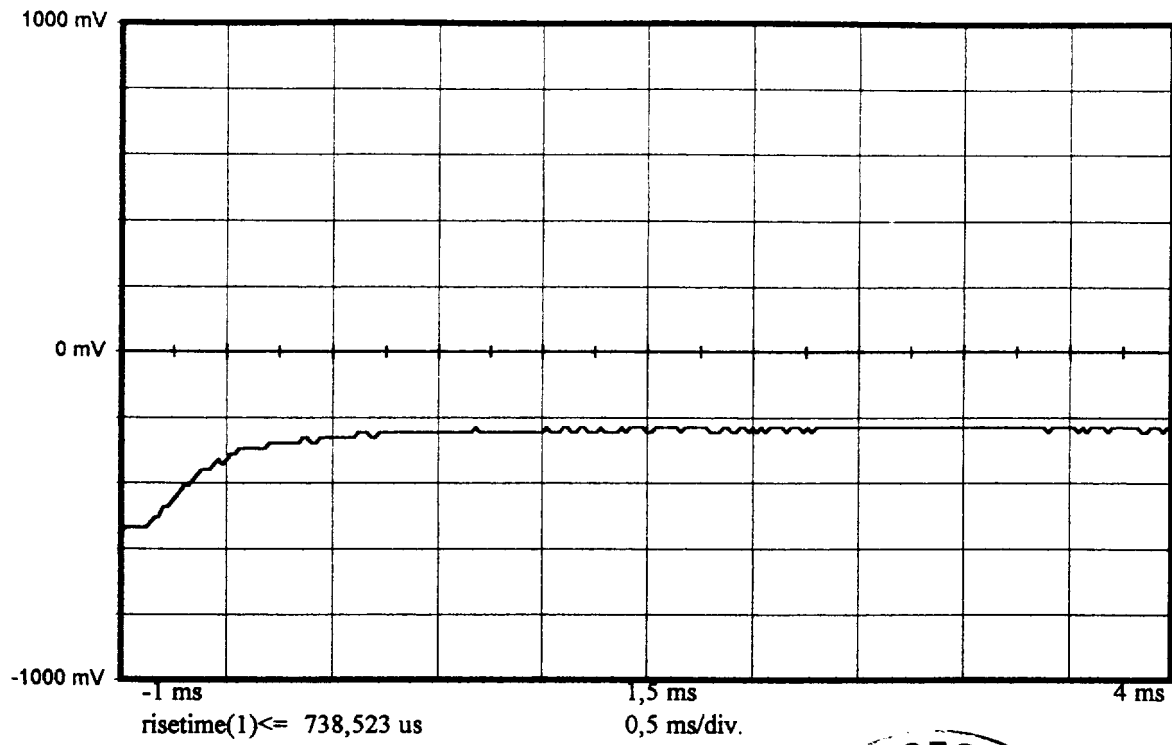
|                           |             |                                      |
|---------------------------|-------------|--------------------------------------|
| Message received          |             | FFFE2F96EE2EC0012B0027FE91F5DAED3A63 |
| Format Flag               | 25          | 1                                    |
| Protocol flag             | 26          | 0                                    |
| Country Code/Country      | 27-36       | 366 / USA                            |
| Protocol Code : U/Std-Nat | 37-39/37-40 | 1110                                 |
| Ident./Position code      | 27-85       | 0                                    |
| Calculated BCH1           | 25-85       | 1FFA47                               |
| Readed BCH1               | 86-106      | 1FFA47                               |
| Identification            |             |                                      |
| Protocol                  |             | Test-Standard Location               |
| Number                    |             | 0                                    |
| Homing                    | 112         | 1                                    |
| Encod pos data            | 111         | 0                                    |
| Fixed Data "1"            | 108         | 1                                    |
| Calculated BCH2           | 107-132     | A63                                  |
| Readed BCH2               | 147-144     | A63                                  |
| Latitude position         |             | Nord 43° 22' 44"                     |
| Longitude position        |             | Est 1° 13' 12"                       |
| Delta position            |             | 0,07 Km                              |

**Electrical and other parameters**

|                            |                    |              |
|----------------------------|--------------------|--------------|
| Rise time Modulation       | ms                 | 0,0898       |
| Fall time Modulation       | ms                 | 0,0998       |
| Phase deviation : positive | rd 1,00 < < 1,20   | 1,14         |
| Phase deviation : negative | rd -1,20 < < -1,00 | -1,07        |
| Symmetry measurement       | %                  | 0,80         |
| Nominal frequency : F2     | Hz                 | 406025215,56 |







**Certification Test VSWR at 55°C**

Manufacturer : ACR

Beacon Type : RLB 33

Number : 1

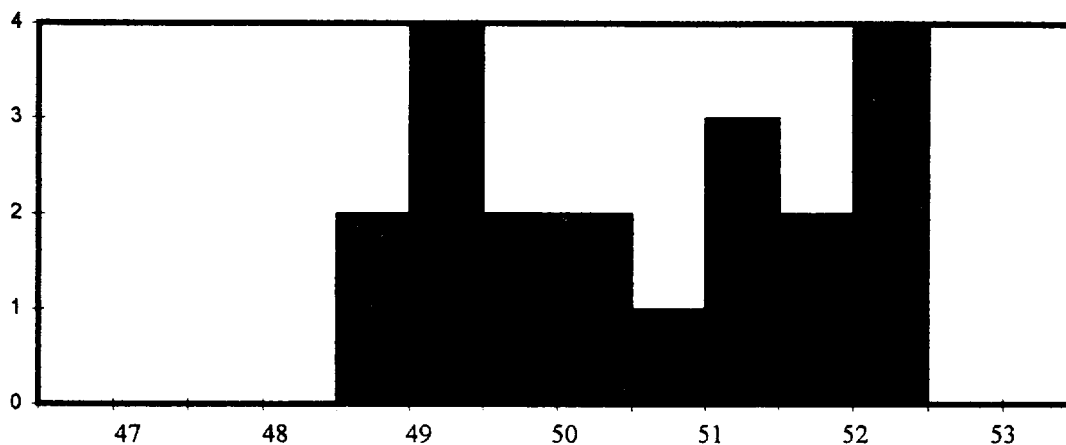
Date of test : 16 mar 1999

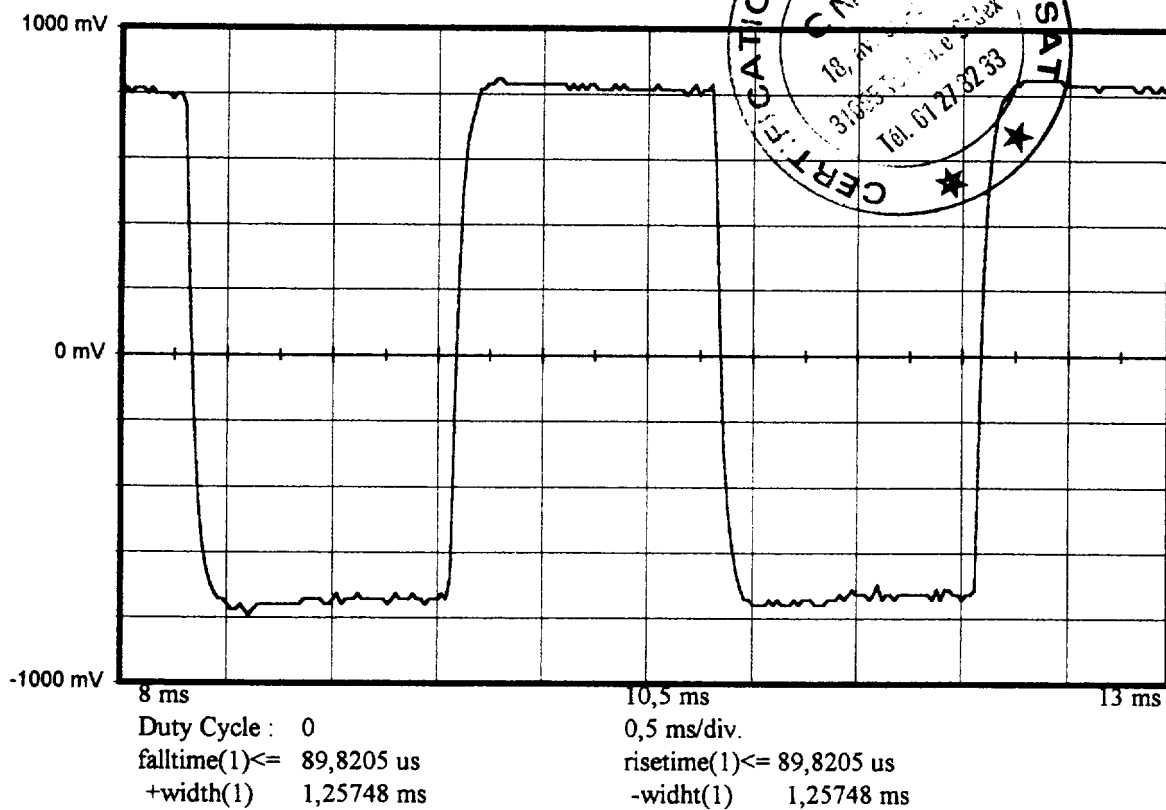
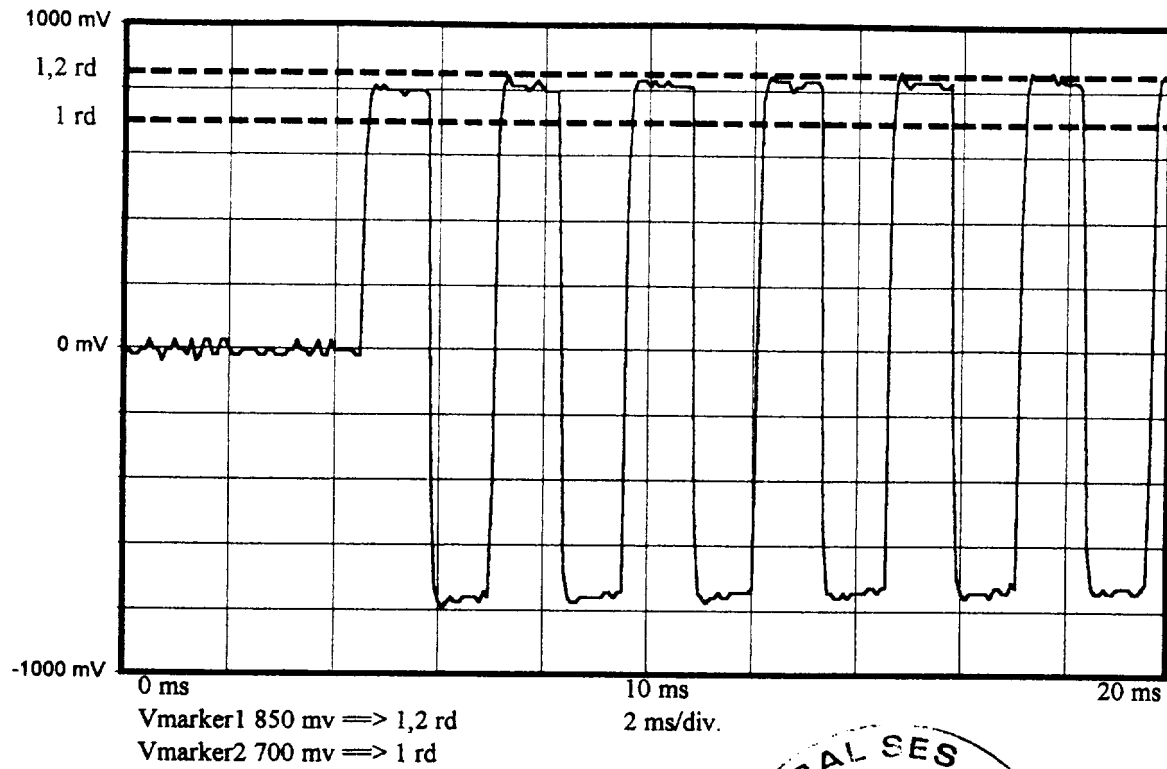
**Message**

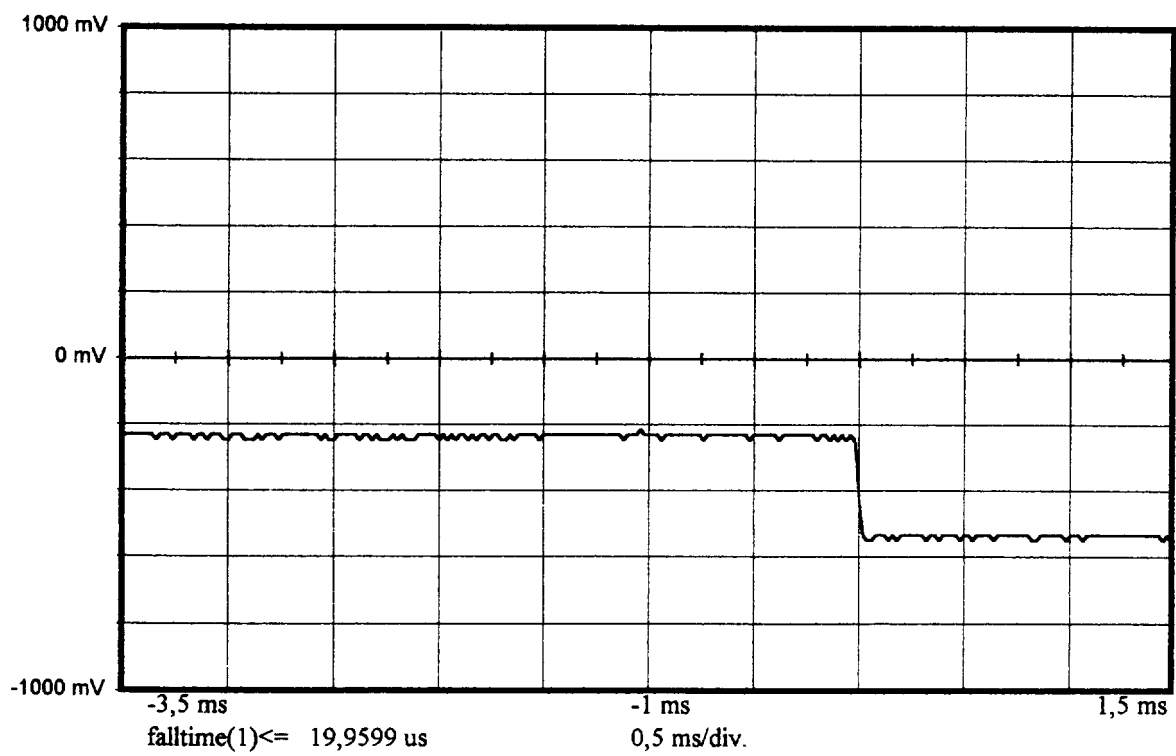
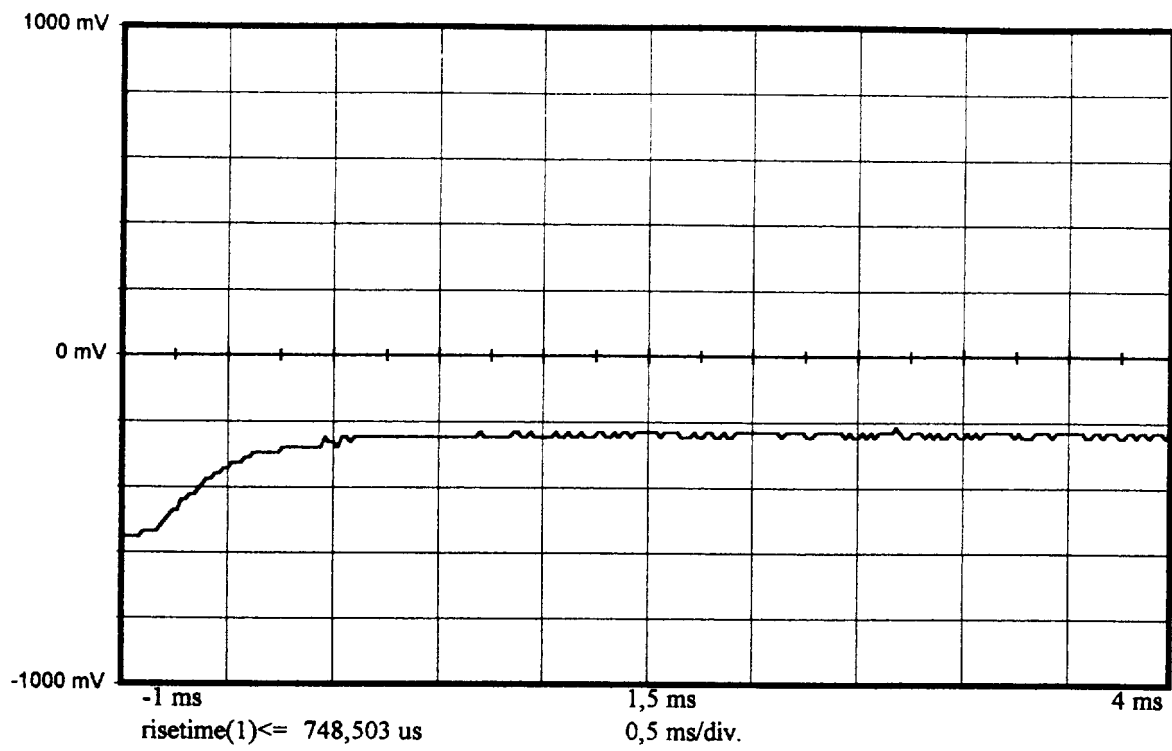
|                           |             |                                      |
|---------------------------|-------------|--------------------------------------|
| Message received          |             | FFFE2F96EE2EC0012B0027FE91F5DAED3A63 |
| Format Flag               | 25          | 1                                    |
| Protocol flag             | 26          | 0                                    |
| Country Code/Country      | 27-36       | 366 / USA                            |
| Protocol Code : U/Std-Nat | 37-39/37-40 | 1110                                 |
| Ident./Position code      | 27-85       |                                      |
| Calculated BCH1           | 25-85       | 1FFA47                               |
| Readed BCH1               | 86-106      | 1FFA47                               |
| Identification            |             |                                      |
| Protocol                  |             | Test-Standard Location               |
| Number                    |             |                                      |
| Homing                    | 112         | 1                                    |
| Encod pos data            | 111         | 0                                    |
| Fixed Data "1"            | 108         | 1                                    |
| Calculated BCH2           | 107-132     | A63                                  |
| Readed BCH2               | 147-144     | A63                                  |
| Latitude position         |             | Nord 43° 22' 44"                     |
| Longitude position        |             | Est 1° 13' 12"                       |
| Delta position            |             | 0,07 Km                              |

**Electrical and other parameters**

|                            |                    |              |
|----------------------------|--------------------|--------------|
| Rise time Modulation       | ms                 | 0,0898       |
| Fall time Modulation       | ms                 | 0,0898       |
| Phase deviation : positive | rd 1,00 < < 1,20   | 1,16         |
| Phase deviation : negative | rd -1,20 < < -1,00 | -1,11        |
| Symmetry measurement       | % <=5 %            | 0,00         |
| Nominal frequency : F2     | Hz                 | 406025194,98 |







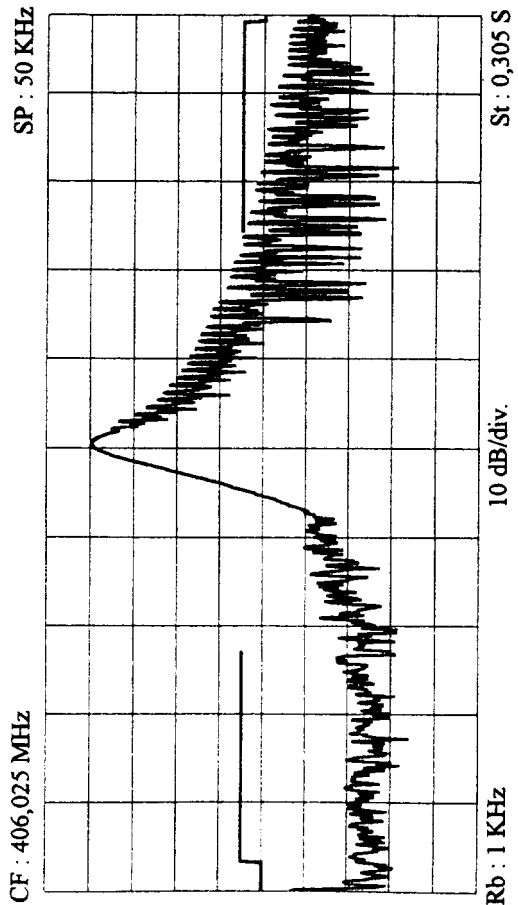
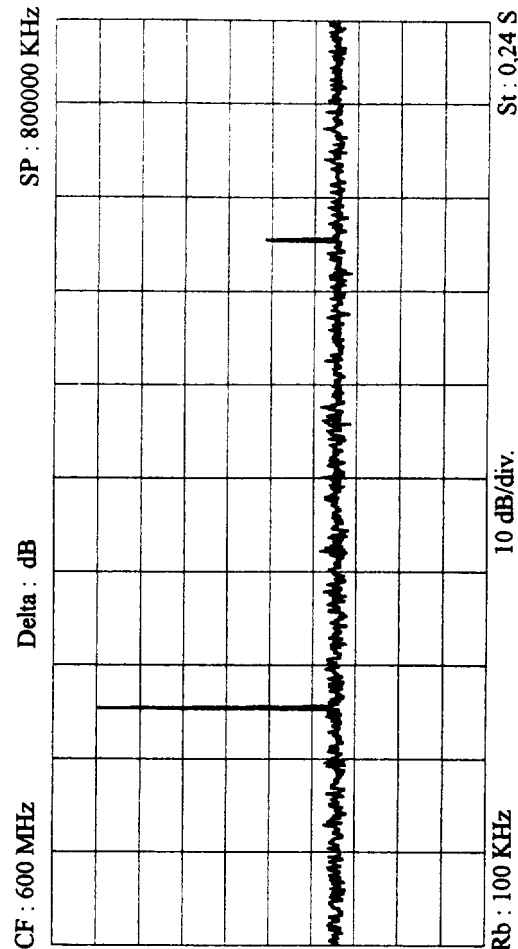
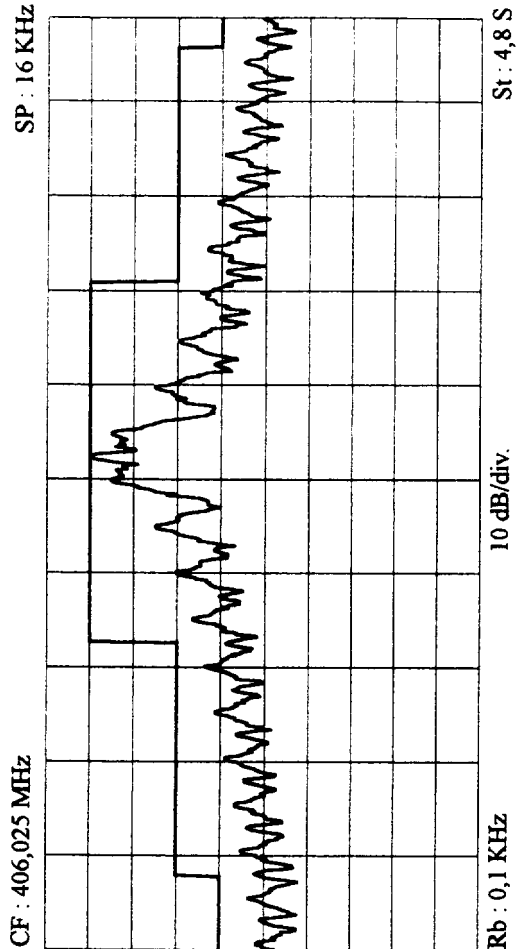
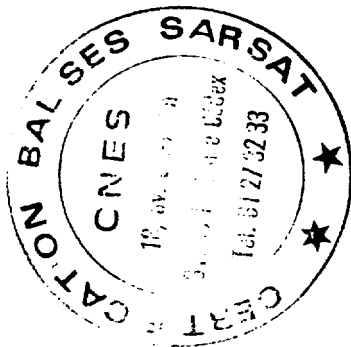
**VSWR SPURIOUS EMISSIONS RESULTS**

**RLB 33 ACR Electronics, Inc.**

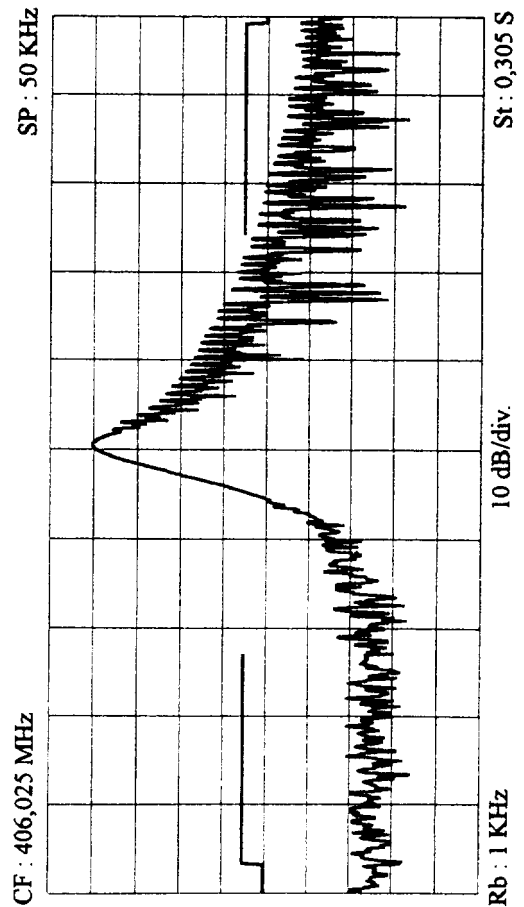
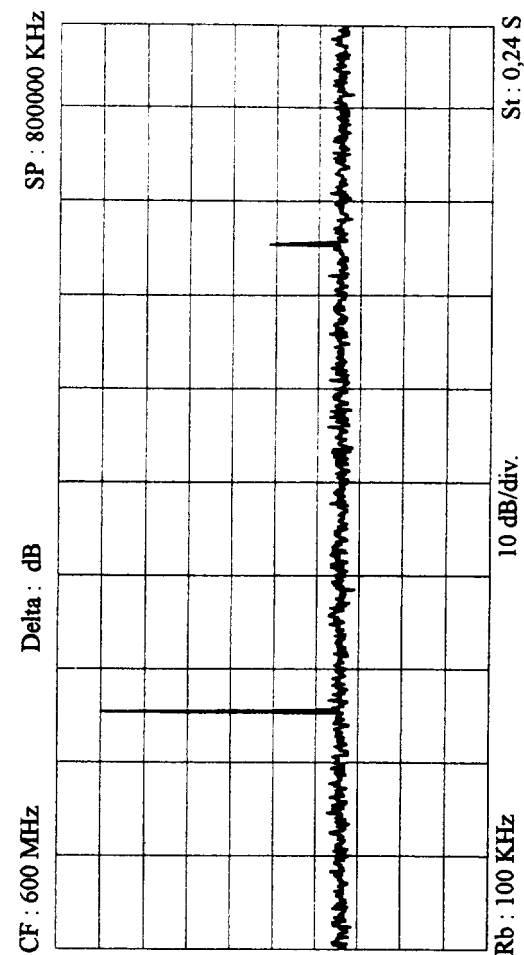
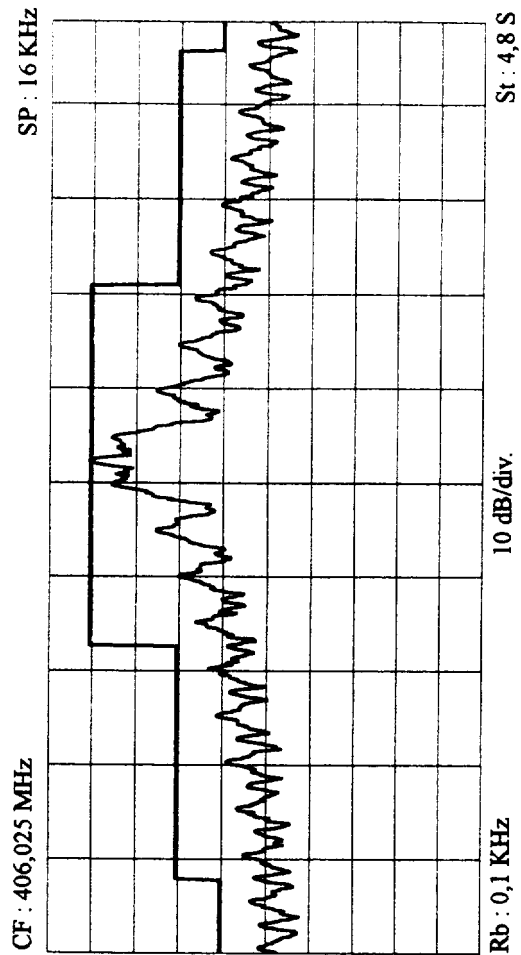
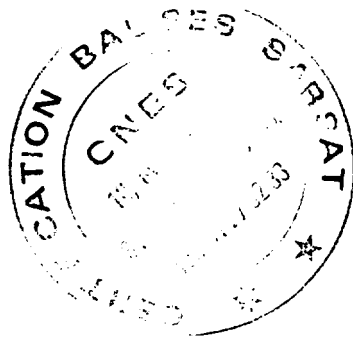
**N° 1**

**at -40° C, 20° C and 55° C**

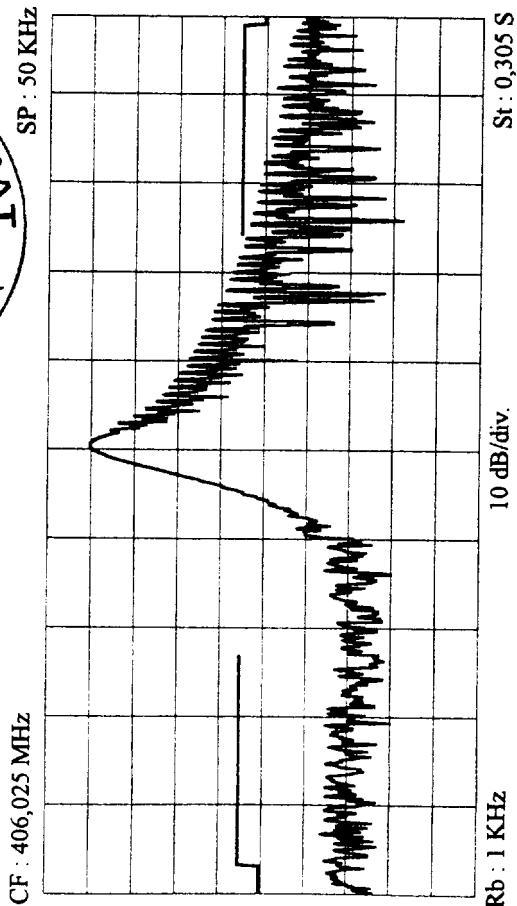
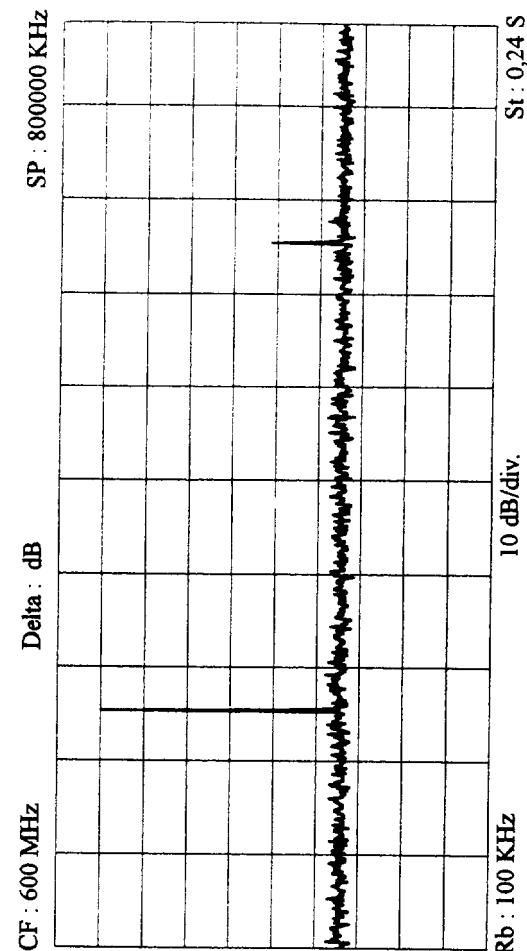
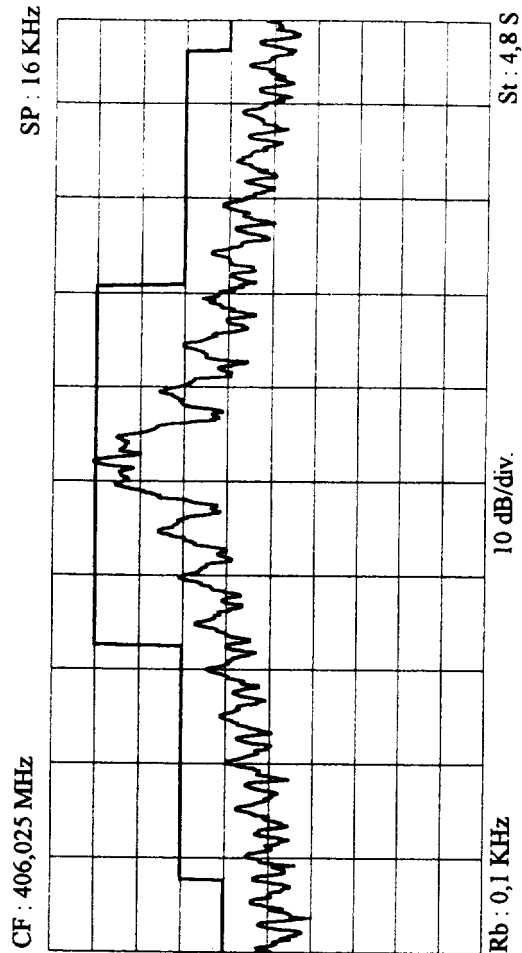
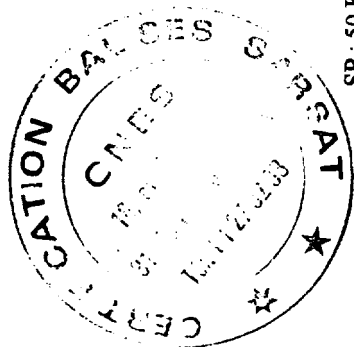
ACR Electronics, Inc.  
RLB 33  
1  
Certification VSWR  
406 MHz  
-40 °C



ACR Electronics, Inc.  
 RLB 33  
 1  
 Certification VSWR  
 406 MHz  
 20 °C



ACR Electronics, Inc.  
RLB 33  
1  
Certification VSWR  
406 MHz  
55 °C



**SELF-TEST MODE CONTROL ON**

**N° 1 RLB 33 ACR Electronics, Inc.  
at -40° C, 20° C and 55° C**

**N° 2 RLB 32 ACR Electronics, Inc.  
at 20° C**

**Message at -40°C**

|                        |                              |
|------------------------|------------------------------|
| Manufacturer           | ACR                          |
| Beacon model           | RLB 33                       |
| Serial number          | 1                            |
| Date of test           | 16-mar-99                    |
| Temperature            | -22,8                        |
| Message received       | FFFED096EE2EC0017FDFFC0A6D35 |
| Frame synchro. pattern | 011010000                    |

|                         |                  |        |
|-------------------------|------------------|--------|
| Total transmission time | ms 434.6< <445.4 | 441,78 |
|-------------------------|------------------|--------|

**Message at 20°C**

|                        |                              |
|------------------------|------------------------------|
| Manufacturer           | ACR                          |
| Beacon model           | RLB 33                       |
| Serial number          | 1                            |
| Date of test           | 15-mar-99                    |
| Temperature            | 20,1                         |
| Message received       | FFFED096EE2EC0017FDFFC0A6D35 |
| Frame synchro. pattern | 011010000                    |

|                         |                  |        |
|-------------------------|------------------|--------|
| Total transmission time | ms 434.6< <445.4 | 441,79 |
|-------------------------|------------------|--------|

**Message at 55 °C**

|                        |                              |
|------------------------|------------------------------|
| Manufacturer           | ACR                          |
| Beacon model           | RLB 33                       |
| Serial number          | 1                            |
| Date of test           | 16-mar-99                    |
| Temperature            | 53,2                         |
| Message received       | FFFED096EE2EC0017FDFFC0A6D35 |
| Frame synchro. pattern | 011010000                    |

|                         |                  |        |
|-------------------------|------------------|--------|
| Total transmission time | ms 434.6< <445.4 | 441,77 |
|-------------------------|------------------|--------|

**Message at 20°C**

|                        |                              |
|------------------------|------------------------------|
| Manufacturer           | ACR                          |
| Beacon model           | RLB 32                       |
| Serial number          | 2                            |
| Date of test           | 15-mar-99                    |
| Temperature            | 20,3                         |
| Message received       | FFFED056EE810004A020085A5890 |
| Frame synchro. pattern | 011010000                    |

|                         |                  |        |
|-------------------------|------------------|--------|
| Total transmission time | ms 434.6< <445.4 | 441,79 |
|-------------------------|------------------|--------|

## 406 MHz BEACON SELF-TEST CHARACTERISTICS

406 MHz beacon Model(s) : RLB 33 and RLB-32

|                                                                                                                                                  | Answer (X)                          |                                     |
|--------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------------------------------------|
|                                                                                                                                                  | Yes                                 | No                                  |
| <b>1. Does beacon have a self-test mode ?</b>                                                                                                    | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| If yes :                                                                                                                                         |                                     |                                     |
| ♦ does self-test have a separate switch position ?                                                                                               | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| ♦ does self-test switch automatically return to normal position when released ? if not, how long until the first "distress" message is emitted : | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| ♦ does self-test transmit a 406 MHz signal ?                                                                                                     | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| if yes :                                                                                                                                         |                                     |                                     |
| - unmodulated signal only                                                                                                                        | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| - normal data, but with inverted frame synchronization pattern                                                                                   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| - 1 burst only                                                                                                                                   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| - 2 bursts only                                                                                                                                  | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| - 3 or more bursts                                                                                                                               | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| ♦ does self-test transmit a 121.5 MHz signal ?                                                                                                   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| if yes :                                                                                                                                         |                                     |                                     |
| - for less than 1 second                                                                                                                         | <input type="checkbox"/>            | <input type="checkbox"/>            |
| - continually while self-test switch is activated                                                                                                | <input type="checkbox"/>            | <input type="checkbox"/>            |
| - other (please specify) :                                                                                                                       | <input type="checkbox"/>            |                                     |
| ♦ does self-test transmit any other frequency (e.g. 243 MHz) ?                                                                                   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| <b>2. Result of self-test is indicated by :</b>                                                                                                  |                                     |                                     |
| ♦ pass/fail display indicator light                                                                                                              | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| ♦ strobe light flash                                                                                                                             | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| ♦ other (please specify) : 3 beeps after initial beep indicates pass                                                                             | <input checked="" type="checkbox"/> |                                     |
| <b>3. Can the self-test be performed without removing the beacon from its mounting bracket ?</b>                                                 | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| <b>4. What parameters are internally tested by the self-test ?</b>                                                                               |                                     |                                     |
| ♦ battery voltage                                                                                                                                | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| ♦ RF power                                                                                                                                       | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| ♦ approximate RF frequency                                                                                                                       | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| ♦ phase locked loop                                                                                                                              | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| ♦ other (please specify) : Successful retrieval of message data                                                                                  | <input checked="" type="checkbox"/> |                                     |
| <b>5. Do the above characteristics apply to this beacon model :</b>                                                                              |                                     |                                     |
| ♦ for all countries where beacon is sold ,                                                                                                       | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| if no, please specify :                                                                                                                          |                                     |                                     |
| ♦ for all production serial numbers ?                                                                                                            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| if no, specify :                                                                                                                                 |                                     |                                     |
| <b>6. Comments</b>                                                                                                                               |                                     |                                     |

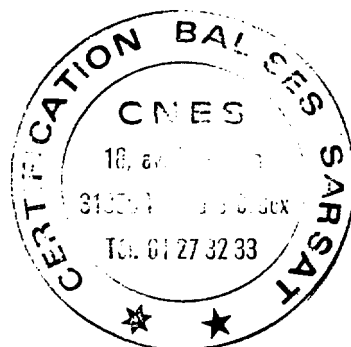
**THERMAL SHOCK TEST RESULT ON**  
**RLB 33 ACR Electronics, Inc.**  
**N° 1**

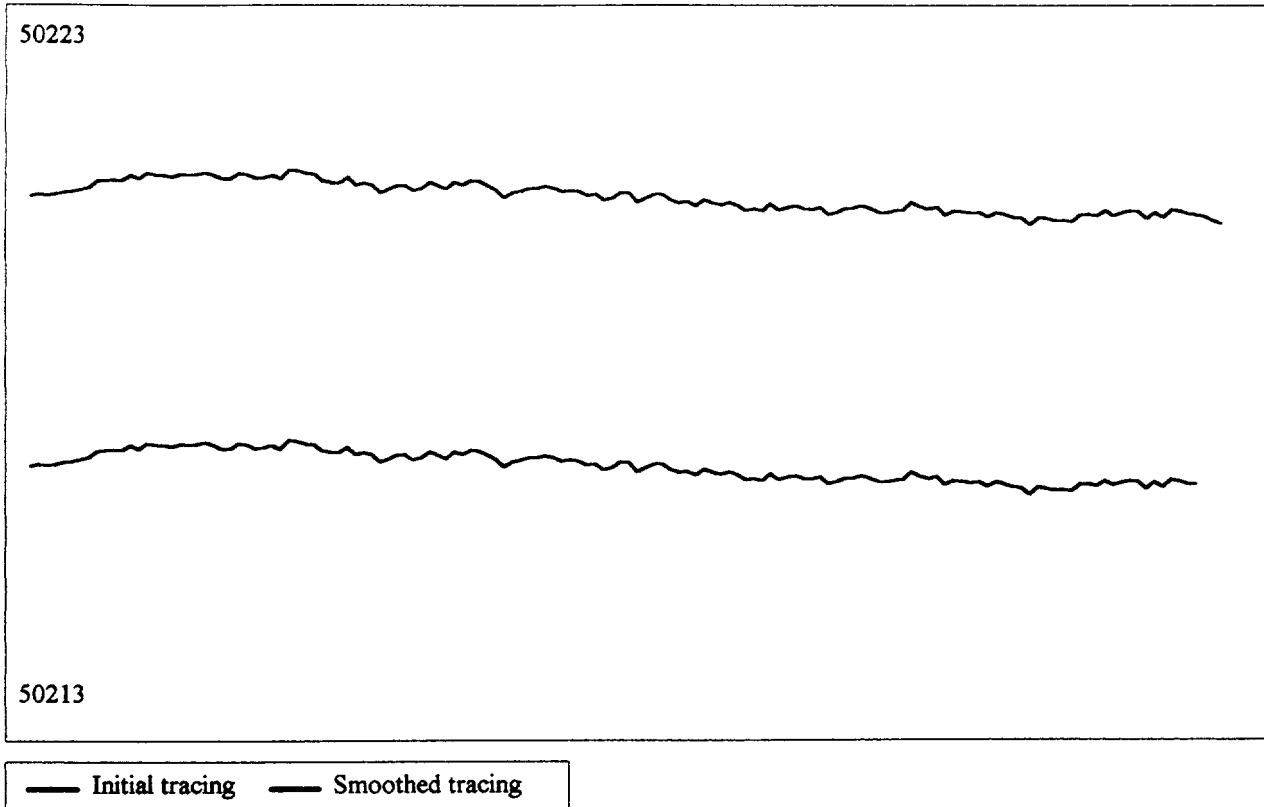
**20°C to -10°C**

Temperature Soak : 20°C  
 Temperature Measure : -10°C

| No | Frequency | Temp. | P406 | P121.5 |
|----|-----------|-------|------|--------|
| 1  | 50214,11  | -7,2  | 38,1 | 16,5   |
| 2  | 50216,48  | -8,9  | 38,2 | 16,6   |
| 3  | 50216,50  | -8,7  | 38,3 | 16,6   |
| 4  | 50216,24  | -8,9  | 38,3 | 16,6   |
| 5  | 50216,06  | -9,0  | 38,3 | 16,7   |
| 6  | 50215,91  | -9,1  | 38,3 | 16,7   |
| 7  | 50215,86  | -9,1  | 38,4 | 16,7   |
| 8  | 50215,74  | -9,4  | 38,4 | 16,7   |
| 9  | 50215,69  | -9,2  | 38,4 | 16,7   |
| 10 | 50215,59  | -9,3  | 38,4 | 16,8   |
| 11 | 50215,53  | -9,4  | 38,4 | 16,8   |
| 12 | 50215,55  | -9,2  | 38,4 | 16,8   |
| 13 | 50215,47  | -9,7  | 38,4 | 16,8   |
| 14 | 50215,45  | -9,4  | 38,4 | 16,8   |
| 15 | 50215,46  | -9,2  | 38,4 | 16,8   |
| 16 | 50215,49  | -9,6  | 38,4 | 16,8   |
| 17 | 50215,68  | -9,5  | 38,4 | 16,8   |
| 18 | 50215,56  | -9,4  | 38,4 | 16,9   |

| No  | Temp. | Slope    | Sigma   | P406 | Short term | P121.5 |
|-----|-------|----------|---------|------|------------|--------|
| 1   | -9,3  | -1,6E-10 | 4,6E-10 | 38,4 | 9,3E-11    | 16,8   |
| 31  | -10,0 | -4,8E-12 | 7,0E-11 | 38,4 | 4,7E-11    | 16,9   |
| 61  | -9,8  | -1,1E-11 | 1,5E-10 | 38,3 | 5,3E-11    | 16,9   |
| 91  | -10,1 | -3,3E-11 | 1,1E-10 | 38,3 | 7,6E-11    | 16,9   |
| 121 | -10,2 | -3,1E-11 | 1,2E-10 | 38,2 | 7,3E-11    | 16,9   |

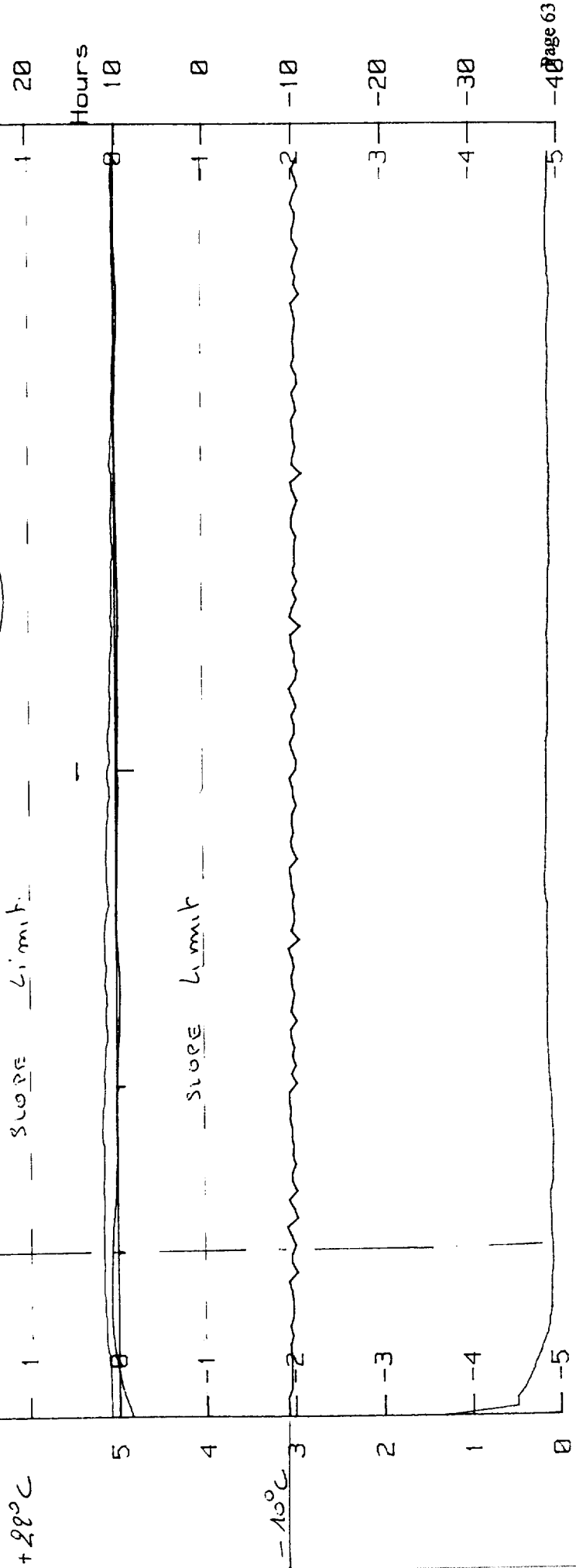
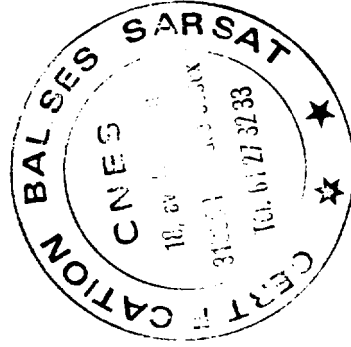


**Frequency variation**

MEDIUM TERM STABILITY

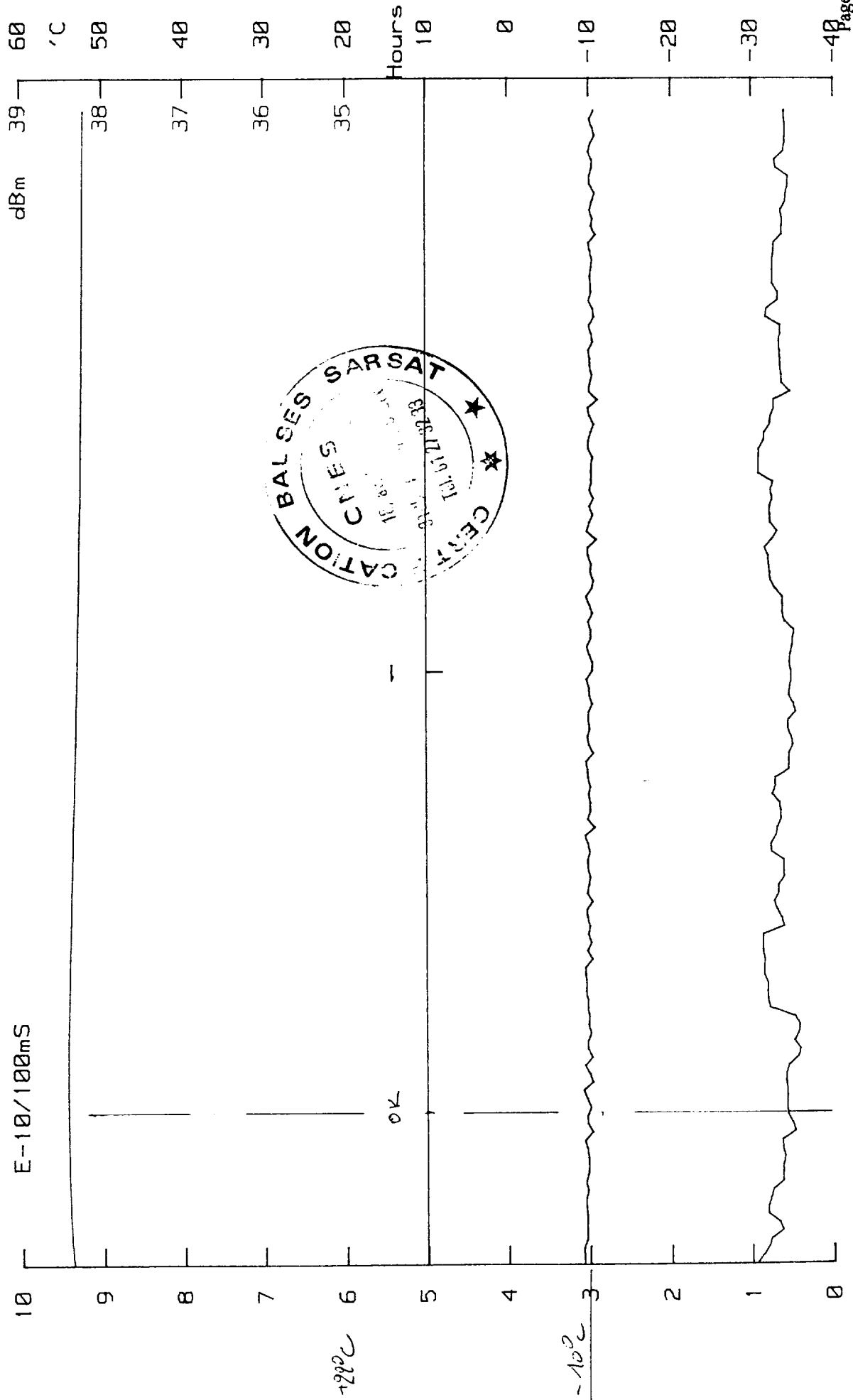
BEACON MANUFACTURER MODEL SERIAL N° DATE TIME Ø  
ACR RLB 33 1

5 MEAN SLOPE E-9/mn  
RESIDUAL E-9



# OUTPUT POWER and SHORT TERM STABILITY

BEACON MANUFACTURER ACR MODEL RLB 33 SERIAL N° 1 DATE TIME Ø



**OPERATING LIFE TEST RESULTS ON**  
**RLB 33 ACR Electronics, Inc.**  
**N° 1**

**-40 °C**

### Average Current Drain Calculation

Prior to Life Test, we have applicate the C/S specific ( § A3,9,5 ) to measure the GPS and Self Test current drain over the battery pack rated 5 year life time .

We have used an ACR Integrating Charge Meter with 5323A HP Counter and we have controled the ACR method and calculation following their procedure. We can see ACR description and calculation exemple in Annex A

#### 1 Test results of GPS current drain (GPS plug attached )

Date : 16 March 1999

$$Q_t = C_0(U_r.N_p + U_0)$$

$C_0$  = 62,1E-06 Farad ( measured with Intespace capacimeter )

$U_r$  = 2,5 Volts, Standard

$U_0$  = 0 V (test start after a reset and finish just at the new pulse)

$N_p$  = Number of pulse (Intespace Pulse Counter , 5323A HP )

|    | Time<br>(HH:MM) | T Delay<br>(sec) | Total Pulse<br>$N_p$ | Total Charge<br>$Q_t$ (Amp-Sec) | Current aver.<br>(Amp) |
|----|-----------------|------------------|----------------------|---------------------------------|------------------------|
| T0 | 09:57           | 0                | 0                    | 0                               |                        |
| T1 | 10:07           | 607              | 49                   | 0,007607                        | 12,533E-06             |
| T2 | 10:18           | 1262             | 110                  | 0,017078                        | 13,532E-06             |
| T3 | 10:28           | 1930             | 164                  | 0,025461                        | 13,192E-06             |
| T4 | 10:35           | 2339             | 201                  | 0,031205                        | 13,341E-06             |
| T5 | 10:43           | 2896             | 246                  | 0,038192                        | 13,188E-06             |
| T6 | 10:55           | 3499             | 300                  | 0,046575                        | 13,311E-06             |
| T7 | 10:55           | 3515             | 301                  | 0,046730                        | 13,295E-06             |

|                                    |
|------------------------------------|
| Max Current average 13,532E-06 Amp |
|------------------------------------|

|                                                            |
|------------------------------------------------------------|
| GPS INTERFACE AMP-HOURS IN 5 YEARS = 0,592705626 AMP-HOURS |
|------------------------------------------------------------|

1,66794E-08      0,000730556      1,4611E-02      6,0732E-01

## 2-Self-test current drain following ACR calculation

|                                            |   |                   |
|--------------------------------------------|---|-------------------|
| Four self tests per year for 5 years =     |   | 20 tests          |
| Background current                         | = | 0,25 Amps         |
| Duration                                   | = | 7 Seconds         |
| Burst current                              | = | 2 Amps            |
| Duration                                   | = | 0,44 Seconds      |
| Total self-test-battery drain in 5 years = |   | 52,6 Coulombs     |
| Total seconds in 5 years                   | = | 157680000 Seconds |
| Average self-test battery drain            | = | 3,33587E-07 Amps  |

|                                  |                       |
|----------------------------------|-----------------------|
| SELF-TEST AMP-HOURS IN 5 YEARS = | 0,014611111 AMP-HOURS |
|----------------------------------|-----------------------|

## 3-Total Self-test and GPS Interface amp-hours in 5 years

|                                                          |   |                       |
|----------------------------------------------------------|---|-----------------------|
| Total calculation                                        | = | 0,60731674 Amp-hours  |
| COSPAS/SARSAT Test Factor =                              |   | 1,65                  |
| Total AMP-Hour burn off<br>battery for - 40° C life test | = | 1,002072616 Amp-hours |

**4-Discharging a new battery pack before the life test**

Resistor used = 221,65 Ohms ( Intespace measure.)

Discharge duration :

- battery voltage at the beginning = 8,42 Volts ( Intespace measure.)

- first discharge duration = 26,38 Hours

= 26 h 22,8 mn

We have started the battery pack discharge on 16/03/1999 15:50

The previously Stop Battery Discharge was on 17/03/1999 18:13

During the battery pack discharge

the battery voltage increase to = 8,635 Volts

- second discharge duration = 25,72 Hours

= 25 h 43,2 mn

|                                                                 |
|-----------------------------------------------------------------|
| The definitive Stop Battery Discharge was on = 17/03/1999 17:33 |
|-----------------------------------------------------------------|

| No | Frequency | Temp. | P406 | P121.5 |
|----|-----------|-------|------|--------|
| 1  | 50237,98  | -40,3 | 37,0 | 16,4   |
| 2  | 50237,80  | -40,1 | 37,1 | 16,6   |
| 3  | 50237,49  | -41,1 | 37,1 | 16,6   |
| 4  | 50237,13  | -40,9 | 37,1 | 16,5   |
| 5  | 50237,06  | -41,0 | 37,2 | 16,6   |
| 6  | 50236,57  | -40,6 | 37,2 | 16,5   |
| 7  | 50236,38  | -40,9 | 37,2 | 16,6   |
| 8  | 50236,22  | -40,4 | 37,2 | 16,6   |
| 9  | 50236,02  | -41,0 | 37,2 | 16,5   |
| 10 | 50236,02  | -40,8 | 37,2 | 16,6   |
| 11 | 50235,73  | -40,9 | 37,3 | 16,6   |
| 12 | 50235,68  | -40,9 | 37,3 | 16,7   |
| 13 | 50235,49  | -40,7 | 37,3 | 16,7   |
| 14 | 50235,51  | -40,3 | 37,3 | 16,6   |
| 15 | 50235,27  | -40,5 | 37,3 | 16,6   |
| 16 | 50235,13  | -40,3 | 37,3 | 16,6   |
| 17 | 50235,11  | -40,5 | 37,3 | 16,6   |
| 18 | 50235,10  | -40,5 | 37,3 | 16,6   |

| No  | Temp. | Slope    | Sigma   | P406 | Short term | P121.5 |
|-----|-------|----------|---------|------|------------|--------|
| 1   | -41,0 | -4,7E-10 | 4,9E-10 | 37,2 | 7,1E-11    | 16,7   |
| 18  | -40,8 | -7,7E-11 | 2,7E-10 | 37,4 | 1,1E-10    | 16,6   |
| 31  | -41,1 | -1,4E-10 | 3,1E-10 | 37,4 | 7,7E-11    | 16,8   |
| 61  | -41,7 | -3,2E-11 | 3,4E-10 | 37,4 | 7,1E-11    | 16,8   |
| 91  | -42,2 | -7,1E-11 | 1,5E-10 | 37,4 | 4,9E-11    | 16,8   |
| 121 | -42,1 | -2,4E-11 | 3,4E-10 | 37,5 | 4,7E-11    | 16,8   |
| 151 | -42,1 | -5,4E-11 | 1,7E-10 | 37,5 | 5,7E-11    | 16,7   |
| 181 | -41,8 | -2,8E-11 | 1,3E-10 | 37,5 | 6,8E-11    | 16,7   |
| 211 | -41,2 | -1,0E-10 | 2,1E-10 | 37,5 | 6,2E-11    | 16,8   |
| 241 | -40,5 | -5,9E-11 | 2,5E-10 | 37,5 | 7,2E-11    | 16,8   |
| 271 | -40,3 | -1,6E-11 | 2,7E-10 | 37,5 | 9,0E-11    | 16,9   |
| 301 | -40,4 | -4,9E-12 | 3,2E-10 | 37,6 | 7,9E-11    | 16,8   |
| 331 | -40,4 | -1,2E-11 | 1,6E-10 | 37,6 | 6,6E-11    | 16,8   |
| 361 | -40,3 | -3,0E-11 | 2,8E-10 | 37,6 | 6,3E-11    | 16,9   |
| 391 | -40,1 | -1,2E-12 | 1,5E-10 | 37,6 | 7,0E-11    | 16,9   |
| 421 | -40,2 | 2,4E-12  | 1,2E-10 | 37,6 | 1,0E-10    | 16,8   |
| 451 | -39,9 | -4,1E-11 | 1,2E-10 | 37,6 | 7,8E-11    | 16,9   |
| 481 | -40,0 | -3,1E-11 | 1,3E-10 | 37,6 | 6,2E-11    | 16,9   |
| 511 | -40,1 | -4,3E-12 | 1,2E-10 | 37,6 | 6,3E-11    | 16,8   |
| 541 | -39,8 | -1,1E-11 | 1,4E-10 | 37,6 | 8,1E-11    | 16,8   |
| 571 | -39,9 | -6,0E-12 | 1,2E-10 | 37,6 | 6,3E-11    | 16,8   |
| 601 | -40,0 | -2,6E-11 | 1,2E-10 | 37,6 | 9,1E-11    | 16,8   |
| 631 | -40,1 | -1,7E-11 | 1,2E-10 | 37,6 | 5,5E-11    | 16,9   |
| 661 | -40,1 | -4,2E-11 | 1,7E-10 | 37,6 | 5,7E-11    | 16,9   |
| 691 | -40,0 | 5,4E-12  | 2,4E-10 | 37,6 | 5,7E-11    | 16,8   |
| 721 | -39,9 | 2,2E-11  | 1,5E-10 | 37,7 | 6,8E-11    | 16,8   |
| 751 | -40,3 | 2,5E-11  | 1,8E-10 | 37,7 | 8,6E-11    | 16,8   |
| 781 | -39,9 | -7,4E-12 | 2,5E-10 | 37,7 | 7,9E-11    | 16,8   |
| 811 | -40,0 | 1,4E-11  | 2,2E-10 | 37,7 | 4,5E-11    | 16,9   |
| 841 | -39,8 | 1,8E-11  | 1,3E-10 | 37,7 | 7,2E-11    | 16,9   |

| No   | Temp. | Slope    | Sigma   | P406 | Short term | P121.5 |
|------|-------|----------|---------|------|------------|--------|
| 871  | -39,7 | -1,5E-11 | 1,7E-10 | 37,7 | 6,9E-11    | 16,9   |
| 901  | -40,0 | 8,3E-11  | 2,1E-10 | 37,7 | 7,4E-11    | 16,9   |
| 931  | -40,0 | 3,4E-12  | 1,1E-10 | 37,7 | 6,1E-11    | 16,9   |
| 961  | -40,0 | 5,4E-11  | 2,5E-10 | 37,7 | 6,8E-11    | 16,9   |
| 991  | -40,3 | 6,1E-11  | 2,0E-10 | 37,7 | 5,6E-11    | 16,9   |
| 1021 | -40,1 | -7,0E-13 | 1,1E-10 | 37,7 | 9,2E-11    | 16,9   |
| 1051 | -40,2 | -7,7E-12 | 1,8E-10 | 37,7 | 5,2E-11    | 16,9   |
| 1081 | -39,9 | -1,8E-11 | 1,3E-10 | 37,7 | 8,3E-11    | 16,9   |
| 1111 | -39,9 | -2,0E-11 | 1,9E-10 | 37,7 | 5,8E-11    | 16,8   |
| 1141 | -40,0 | -5,2E-11 | 3,0E-10 | 37,7 | 6,1E-11    | 16,9   |
| 1171 | -39,8 | -3,6E-11 | 2,6E-10 | 37,7 | 7,7E-11    | 16,9   |
| 1201 | -39,9 | -2,3E-11 | 1,7E-10 | 37,7 | 6,7E-11    | 16,9   |
| 1231 | -39,8 | 7,0E-12  | 1,5E-10 | 37,7 | 5,0E-11    | 16,9   |
| 1261 | -40,0 | 2,7E-11  | 1,6E-10 | 37,8 | 6,2E-11    | 16,9   |
| 1291 | -39,8 | -1,9E-11 | 1,4E-10 | 37,8 | 4,7E-11    | 16,9   |
| 1321 | -39,8 | -1,3E-11 | 8,4E-11 | 37,8 | 4,4E-11    | 16,9   |
| 1351 | -39,6 | -1,1E-11 | 1,7E-10 | 37,8 | 4,3E-11    | 16,9   |
| 1381 | -39,9 | 1,4E-11  | 1,4E-10 | 37,8 | 8,6E-11    | 16,9   |
| 1411 | -39,9 | -9,8E-12 | 2,0E-10 | 37,8 | 7,1E-11    | 16,9   |
| 1441 | -39,8 | 1,4E-11  | 1,2E-10 | 37,8 | 4,0E-11    | 16,9   |
| 1471 | -40,0 | -2,2E-11 | 1,3E-10 | 37,8 | 7,0E-11    | 16,9   |
| 1501 | -40,0 | 1,2E-11  | 1,4E-10 | 37,8 | 4,7E-11    | 16,9   |
| 1531 | -39,9 | -2,2E-12 | 1,1E-10 | 37,8 | 6,0E-11    | 16,9   |
| 1561 | -39,7 | -7,0E-12 | 1,5E-10 | 37,8 | 7,0E-11    | 16,9   |
| 1591 | -39,9 | -1,4E-11 | 1,8E-10 | 37,8 | 8,1E-11    | 16,9   |
| 1621 | -39,7 | -1,0E-11 | 2,0E-10 | 37,8 | 7,1E-11    | 16,9   |
| 1651 | -39,8 | -2,9E-11 | 2,1E-10 | 37,8 | 5,7E-11    | 16,9   |
| 1681 | -39,6 | -3,4E-11 | 9,3E-11 | 37,8 | 6,0E-11    | 16,9   |
| 1711 | -39,8 | 1,7E-11  | 1,3E-10 | 37,8 | 6,2E-11    | 16,9   |
| 1741 | -39,6 | 1,4E-11  | 1,3E-10 | 37,8 | 5,0E-11    | 16,9   |
| 1771 | -39,7 | 5,2E-13  | 8,3E-11 | 37,8 | 6,0E-11    | 17,0   |
| 1801 | -39,6 | -6,1E-12 | 1,8E-10 | 37,8 | 5,0E-11    | 17,0   |
| 1831 | -39,7 | 1,1E-11  | 1,3E-10 | 37,8 | 7,2E-11    | 16,9   |
| 1861 | -39,7 | -1,4E-11 | 1,3E-10 | 37,8 | 9,4E-11    | 16,9   |
| 1891 | -39,7 | 4,0E-13  | 7,5E-11 | 37,8 | 6,6E-11    | 16,9   |
| 1921 | -39,7 | 4,0E-13  | 1,2E-10 | 37,8 | 7,0E-11    | 17,0   |
| 1951 | -39,6 | -1,4E-12 | 1,2E-10 | 37,8 | 7,0E-11    | 16,9   |
| 1981 | -39,8 | 4,3E-12  | 1,6E-10 | 37,8 | 7,8E-11    | 16,9   |
| 2011 | -39,6 | 2,3E-12  | 1,3E-10 | 37,8 | 7,1E-11    | 16,9   |
| 2041 | -39,5 | -4,7E-12 | 1,4E-10 | 37,8 | 8,1E-11    | 17,0   |
| 2071 | -39,6 | -5,1E-12 | 2,2E-10 | 37,8 | 5,3E-11    | 16,9   |
| 2101 | -39,5 | 4,4E-11  | 1,3E-10 | 37,8 | 5,5E-11    | 16,9   |
| 2131 | -39,5 | -7,9E-13 | 1,7E-10 | 37,8 | 7,9E-11    | 16,9   |
| 2161 | -39,6 | 1,6E-12  | 2,1E-10 | 37,8 | 5,5E-11    | 16,9   |
| 2191 | -39,6 | -6,6E-12 | 1,7E-10 | 37,8 | 6,2E-11    | 16,9   |
| 2221 | -39,5 | 6,6E-12  | 1,6E-10 | 37,8 | 7,1E-11    | 16,9   |
| 2251 | -39,4 | -3,3E-12 | 1,0E-10 | 37,7 | 3,5E-11    | 16,9   |
| 2281 | -39,5 | -1,6E-11 | 1,2E-10 | 37,7 | 8,5E-11    | 16,9   |
| 2311 | -39,3 | -2,1E-12 | 1,3E-10 | 37,7 | 8,1E-11    | 16,9   |
| 2341 | -39,3 | 1,5E-11  | 1,2E-10 | 37,7 | 6,0E-11    | 16,9   |
| 2371 | -38,6 | 6,9E-12  | 1,1E-10 | 37,7 | 4,5E-11    | 16,9   |

24h

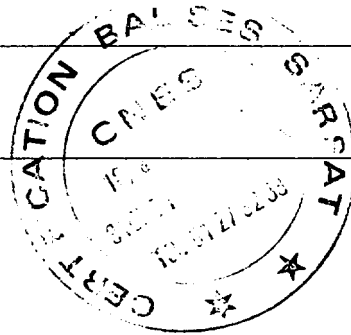
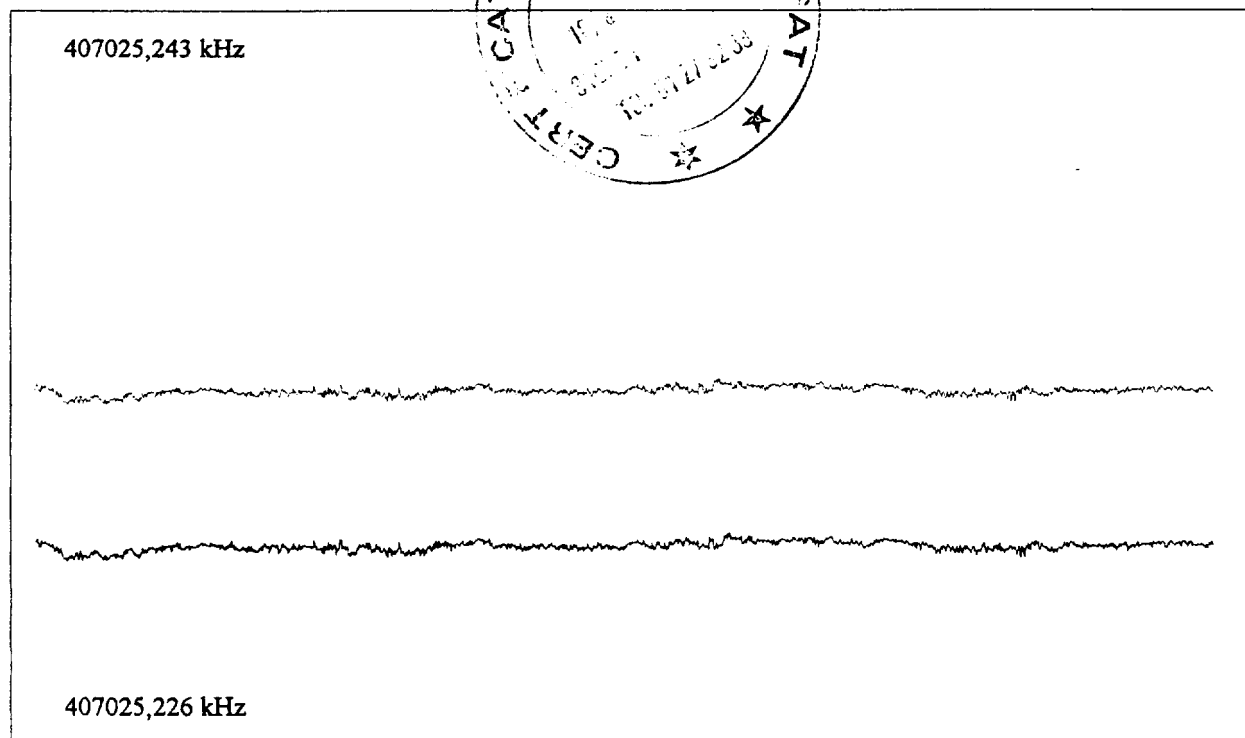
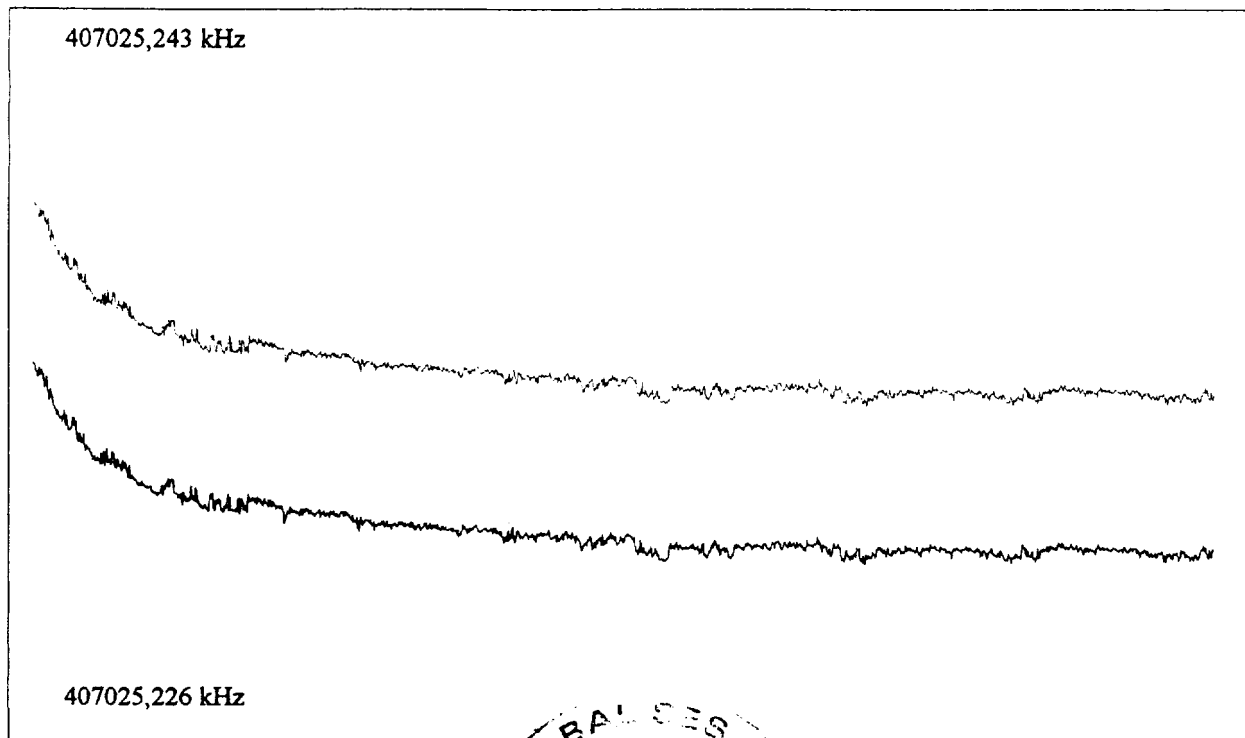
| No   | Temp. | Slope    | Sigma   | P406 | Short term | P121.5 |
|------|-------|----------|---------|------|------------|--------|
| 2401 | -38,6 | -5,2E-13 | 1,5E-10 | 37,7 | 4,3E-11    | 17,0   |
| 2431 | -38,8 | 3,5E-12  | 1,5E-10 | 37,7 | 7,3E-11    | 16,9   |
| 2461 | -38,9 | -1,4E-11 | 1,0E-10 | 37,7 | 7,1E-11    | 16,9   |
| 2491 | -39,0 | 1,5E-12  | 7,9E-11 | 37,7 | 3,7E-11    | 16,9   |
| 2521 | -38,9 | 2,7E-11  | 1,5E-10 | 37,7 | 5,9E-11    | 16,9   |
| 2551 | -39,0 | -3,8E-12 | 1,6E-10 | 37,7 | 8,1E-11    | 17,0   |
| 2581 | -38,9 | 9,9E-12  | 2,4E-10 | 37,7 | 4,8E-11    | 16,9   |
| 2611 | -38,9 | -1,6E-11 | 1,1E-10 | 37,7 | 6,6E-11    | 16,9   |
| 2641 | -38,9 | -1,5E-11 | 1,6E-10 | 37,7 | 7,8E-11    | 16,9   |
| 2671 | -39,0 | 7,6E-12  | 1,3E-10 | 37,6 | 6,6E-11    | 16,9   |
| 2701 | -38,8 | -3,5E-12 | 8,5E-11 | 37,6 | 6,6E-11    | 16,9   |
| 2731 | -38,6 | -2,1E-13 | 1,4E-10 | 37,6 | 4,9E-11    | 16,9   |
| 2761 | -38,7 | -2,8E-12 | 8,9E-11 | 37,6 | 8,6E-11    | 16,9   |
| 2791 | -38,4 | -2,1E-11 | 1,1E-10 | 37,6 | 6,9E-11    | 16,9   |
| 2821 | -38,8 | 1,1E-11  | 8,0E-11 | 37,6 | 7,8E-11    | 16,9   |
| 2851 | -38,5 | -1,5E-11 | 7,9E-11 | 37,6 | 8,4E-11    | 16,9   |
| 2881 | -38,3 | -2,6E-12 | 1,3E-10 | 37,5 | 4,9E-11    | 16,9   |
| 2911 | -38,3 | -3,3E-12 | 1,4E-10 | 37,5 | 7,2E-11    | 16,9   |
| 2941 | -38,3 | -5,5E-12 | 1,2E-10 | 37,5 | 8,1E-11    | 16,9   |
| 2971 | -38,3 | 1,4E-11  | 1,3E-10 | 37,5 | 4,6E-11    | 16,9   |
| 3001 | -38,2 | -7,3E-12 | 1,5E-10 | 37,5 | 5,9E-11    | 16,9   |
| 3031 | -38,1 | -4,1E-12 | 2,0E-10 | 37,4 | 6,5E-11    | 16,9   |
| 3061 | -38,3 | 1,0E-11  | 9,7E-11 | 37,4 | 7,4E-11    | 16,8   |
| 3091 | -38,3 | -7,8E-12 | 1,2E-10 | 37,4 | 8,2E-11    | 16,9   |
| 3121 | -38,2 | -1,3E-12 | 8,9E-11 | 37,3 | 6,9E-11    | 16,8   |
| 3151 | -38,4 | 9,2E-12  | 1,5E-10 | 37,3 | 6,0E-11    | 16,9   |
| 3181 | -38,2 | 2,3E-12  | 7,9E-11 | 37,3 | 5,2E-11    | 16,9   |
| 3211 | -38,4 | 3,2E-12  | 1,4E-10 | 37,2 | 3,3E-11    | 16,9   |
| 3241 | -38,0 | -2,5E-12 | 1,3E-10 | 37,2 | 8,4E-11    | 16,9   |
| 3271 | -38,2 | 1,0E-11  | 1,0E-10 | 37,2 | 7,4E-11    | 16,8   |
| 3301 | -38,2 | 1,1E-11  | 1,1E-10 | 37,1 | 7,9E-11    | 16,8   |
| 3331 | -38,2 | 1,3E-11  | 1,1E-10 | 37,1 | 4,5E-11    | 16,9   |
| 3361 | -38,1 | 1,5E-11  | 1,1E-10 | 37,0 | 7,0E-11    | 16,8   |
| 3391 | -38,1 | -7,4E-12 | 1,1E-10 | 37,0 | 6,2E-11    | 16,9   |
| 3421 | -38,3 | 1,8E-11  | 1,2E-10 | 36,9 | 8,1E-11    | 16,9   |
| 3451 | -38,1 | 8,4E-12  | 8,5E-11 | 36,9 | 9,0E-11    | 16,8   |
| 3481 | -38,2 | -9,7E-12 | 1,0E-10 | 36,8 | 4,8E-11    | 16,9   |
| 3511 | -38,1 | 1,0E-11  | 1,1E-10 | 36,8 | 6,0E-11    | 16,8   |
| 3541 | -37,9 | 7,0E-12  | 9,9E-11 | 36,7 | 6,6E-11    | 16,8   |
| 3571 | -38,4 | -1,3E-11 | 8,6E-11 | 36,6 | 4,5E-11    | 16,8   |
| 3601 | -38,0 | 9,2E-12  | 1,4E-10 | 36,5 | 6,8E-11    | 16,9   |
| 3631 | -38,1 | -2,0E-12 | 1,2E-10 | 36,4 | 3,8E-11    | 16,8   |
| 3661 | -38,2 | 7,1E-12  | 1,1E-10 | 36,3 | 5,5E-11    | 16,8   |
| 3691 | -38,0 | -1,0E-11 | 9,7E-11 | 36,2 | 5,7E-11    | 16,8   |
| 3721 | -38,1 | -7,7E-12 | 9,0E-11 | 36,1 | 5,4E-11    | 16,7   |
| 3751 | -38,0 | -9,5E-12 | 9,7E-11 | 36,0 | 6,6E-11    | 16,7   |
| 3781 | -38,0 | -3,7E-12 | 1,1E-10 | 35,9 | 4,9E-11    | 16,7   |
| 3811 | -37,9 | -1,3E-12 | 1,0E-10 | 35,8 | 8,1E-11    | 16,7   |
| 3841 | -37,9 | -1,3E-12 | 9,5E-11 | 35,7 | 5,9E-11    | 16,8   |
| 3871 | -38,0 | -1,9E-11 | 9,9E-11 | 35,6 | 7,2E-11    | 16,8   |
| 3901 | -38,0 | -1,2E-11 | 8,9E-11 | 35,5 | 1,3E-10    | 16,8   |

48h

| No   | Temp. | Slope    | Sigma   | P406 | Short term | P121.5 |
|------|-------|----------|---------|------|------------|--------|
| 3931 | -37,8 | -3,1E-11 | 1,6E-10 | 35,3 | 3,3E-10    | 16,8   |
| 3961 | -38,0 | -3,8E-11 | 2,1E-10 | 35,2 | 4,1E-10    | 16,7   |
| 3991 | -37,7 | -1,1E-11 | 2,4E-10 | 35,1 | 5,2E-10    | 16,7   |
| 4021 | -37,9 | -3,4E-11 | 2,6E-10 | 35,0 | 5,7E-10    | 16,8   |
| 4051 | -37,9 | -5,1E-11 | 2,5E-10 | 34,9 | 6,6E-10    | 16,7   |
| 4081 | -37,6 | -4,6E-11 | 2,2E-10 | 34,8 | 7,8E-10    | 16,7   |
| 4111 | -37,7 | -3,9E-11 | 2,2E-10 | 34,7 | 9,0E-10    | 16,7   |
| 4141 | -37,6 | -5,2E-11 | 2,1E-10 | 34,5 | 9,7E-10    | 16,6   |
| 4171 | -37,6 | -2,3E-11 | 1,7E-10 | 34,4 | 1,1E-9     | 16,7   |
| 4201 | -37,7 | -3,4E-12 | 1,6E-10 | 34,3 | 1,2E-9     | 16,7   |
| 4231 | -37,7 | -2,5E-11 | 1,1E-10 | 34,1 | 1,3E-9     | 16,6   |
| 4261 | -37,6 | -1,4E-11 | 1,0E-10 | 34,0 | 1,4E-9     | 16,7   |
| 4291 | -37,7 | -7,9E-12 | 9,2E-11 | 33,9 | 1,5E-9     | 16,7   |
| 4321 | -37,5 | 1,2E-11  | 9,4E-11 | 33,7 | 1,6E-9     | 16,6   |
| 4351 | -37,4 | 2,7E-11  | 9,6E-11 | 33,5 | 2,1E-9     | 16,7   |
| 4381 | -37,4 | -4,2E-11 | 2,4E-10 | 33,4 | 1,9E-9     | 16,7   |
| 4411 | -37,5 | -3,3E-11 | 1,0E-10 | 33,2 | 2,0E-9     | 16,5   |
| 4441 | -37,4 | -2,0E-11 | 7,9E-11 | 32,9 | 2,1E-9     | 16,7   |
| 4471 | -37,5 | -2,3E-12 | 1,2E-10 | 32,7 | 2,1E-9     | 16,6   |
| 4501 | -37,5 | -2,6E-11 | 8,9E-11 | 32,6 | 2,2E-9     | 16,6   |
| 4531 | -37,7 | -9,8E-13 | 7,6E-11 | 32,4 | 2,2E-9     | 16,6   |
| 4561 | -37,7 | 2,1E-12  | 7,5E-11 | 32,1 | 2,3E-9     | 16,5   |
| 4591 | -37,4 | -7,1E-12 | 9,9E-11 | 31,9 | 2,4E-9     | 16,4   |
| 4621 | -37,3 | 1,0E-11  | 1,2E-10 | 31,6 | 2,4E-9     | 16,6   |
| 4651 | -37,5 | 9,5E-12  | 1,3E-10 | 31,2 | 2,6E-9     | 16,4   |
| 4681 | -37,3 | 8,9E-12  | 1,3E-10 | 30,8 | 4,0E-9     | 16,5   |
| 4711 | -37,2 | -5,0E-11 | 1,9E-09 | 30,0 | 3,7E-10    | 16,3   |
| 4741 | -37,4 | -5,8E-10 | 7,9E-10 | 29,0 | 7,0E-10    | 16,3   |
| 4771 |       |          |         |      |            |        |
| 4801 |       |          |         |      |            |        |
| 4831 |       |          |         |      |            |        |
| 4861 |       |          |         |      |            |        |
| 4891 |       |          |         |      |            |        |
| 4921 |       |          |         |      |            |        |
| 4951 |       |          |         |      |            |        |
| 4981 |       |          |         |      |            |        |
| 5011 |       |          |         |      |            |        |
| 5041 |       |          |         |      |            |        |
| 5071 |       |          |         |      |            |        |
| 5101 |       |          |         |      |            |        |
| 5131 |       |          |         |      |            |        |
| 5161 |       |          |         |      |            |        |
| 5191 |       |          |         |      |            |        |
| 5221 |       |          |         |      |            |        |
| 5251 |       |          |         |      |            |        |
| 5281 |       |          |         |      |            |        |
| 5311 |       |          |         |      |            |        |
| 5341 |       |          |         |      |            |        |
| 5371 |       |          |         |      |            |        |
| 5401 |       |          |         |      |            |        |
| 5431 |       |          |         |      |            |        |

56h

OK

**Frequency variation**

— Initial tracing      — Smoothed tracing

LIFE TEST AT -20 °C

Manufacturer : ACR Electronics, Inc.

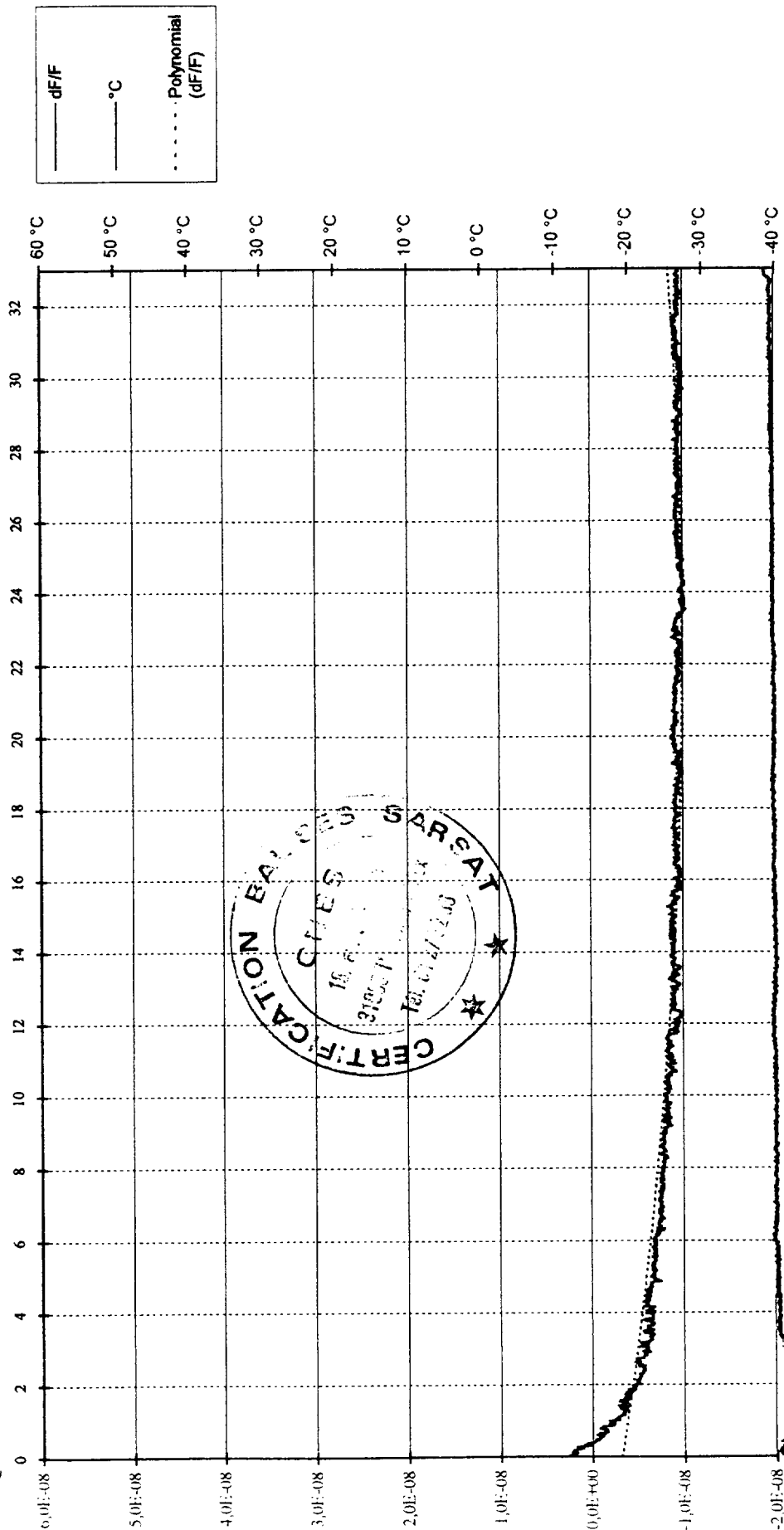
Model : RLB 33

Number : 1

Date : 19/03/1999

Time : 00:10:50

FREQUENCY VARIATION



LIFE TEST AT -20 °C

Manufacturer : ACR Electronics, Inc.

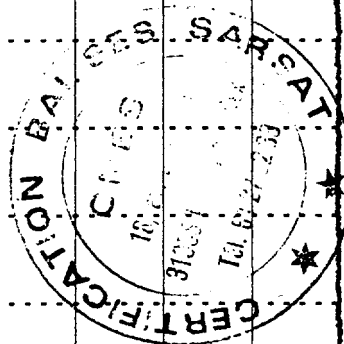
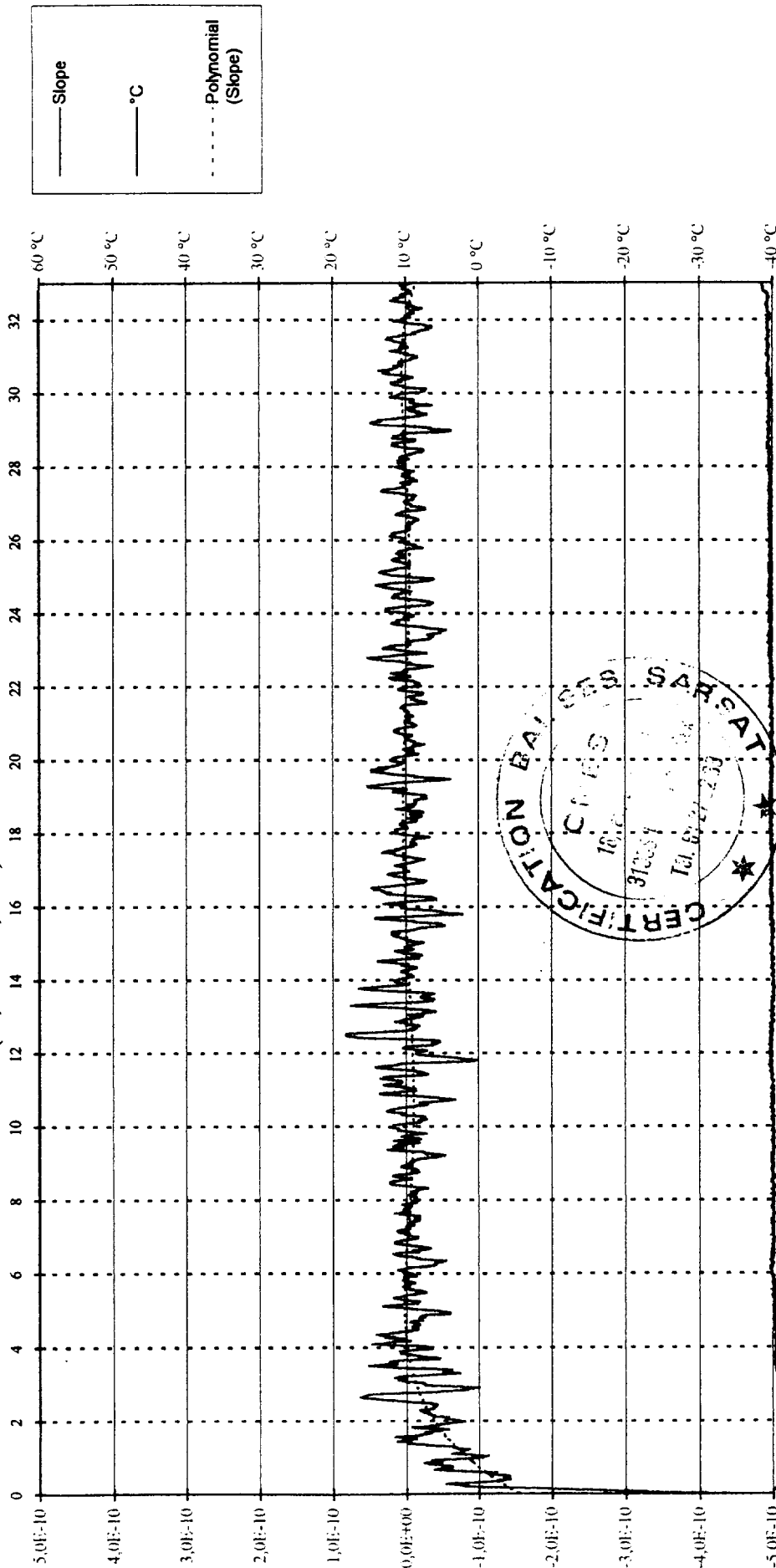
Model : RLB 33

Number : 1

Date : 19/03/1999

Time : 00:10:50

MEDIUM TERM STABILITY : MEAN SLOPE /mm ( -1,0E-9 to 1,0E-9 )



LIFE TEST AT -20 °C

Manufacturer : ACR Electronics, Inc.

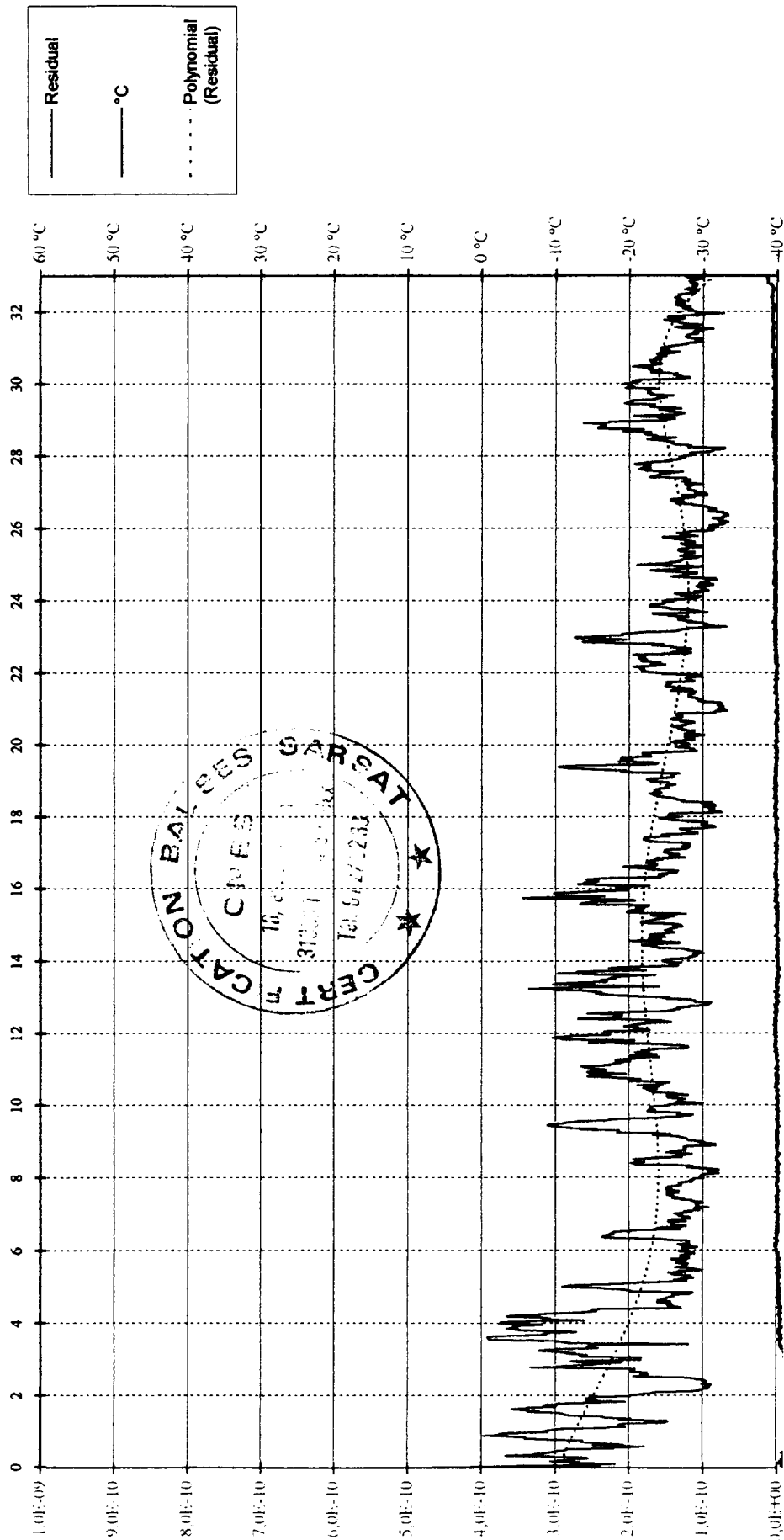
Model : RLB 33

Number : 1

Date : 19/03/1999

Time : 00:10:50

MEDIUM TERM STABILITY : RESIDUAL (  $\leq 3,0E-9$  )



# LIFE TEST AT -20 °C

Manufacturer : ACR Electronics, Inc.

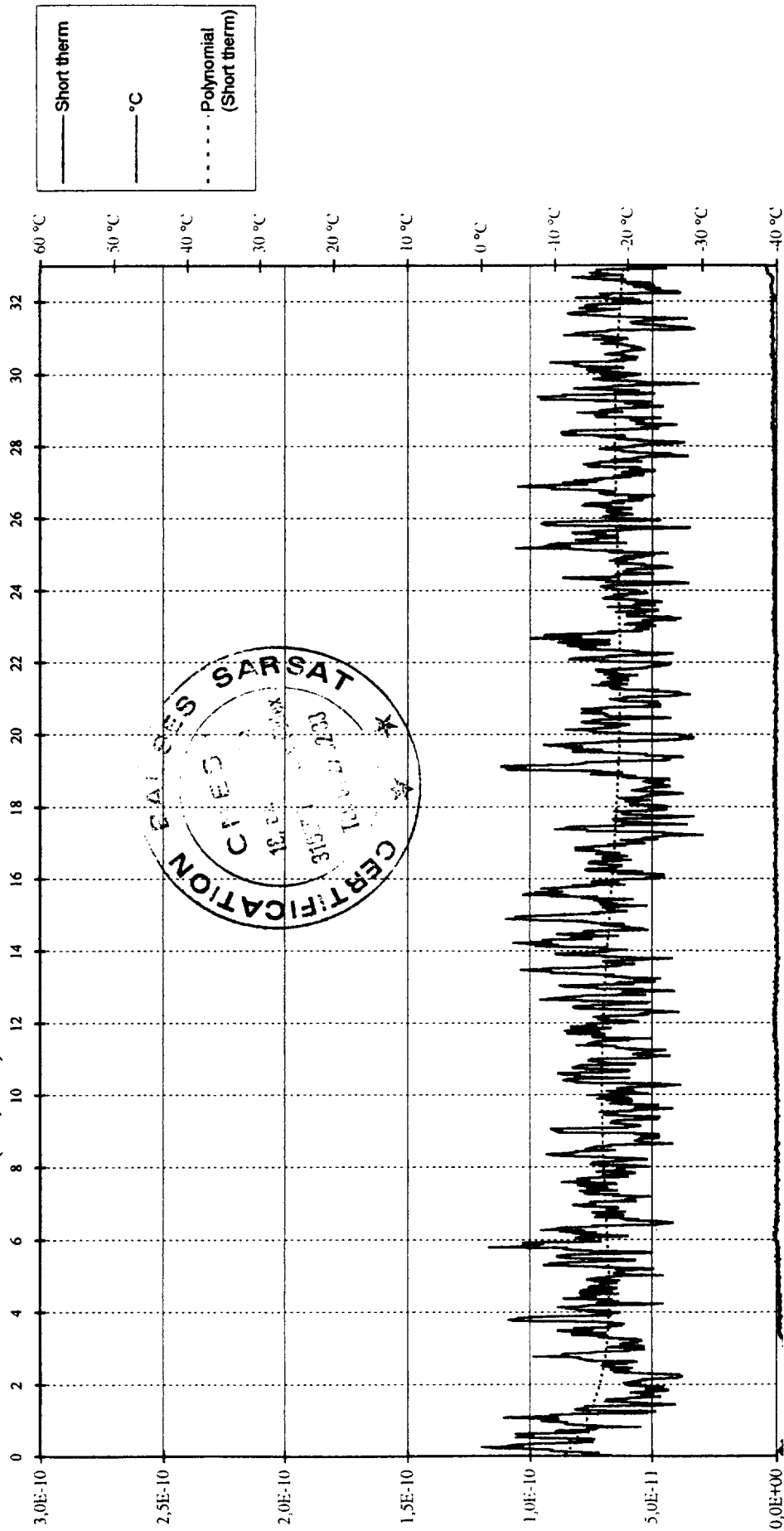
Model : RLB 33

Number : 1

Date : 19/03/1999

Time : 00:10:50

SHORT TERM STABILITY /100 mS (  $\leq 2,0E-9$  )



LIFE TEST AT -20 °C

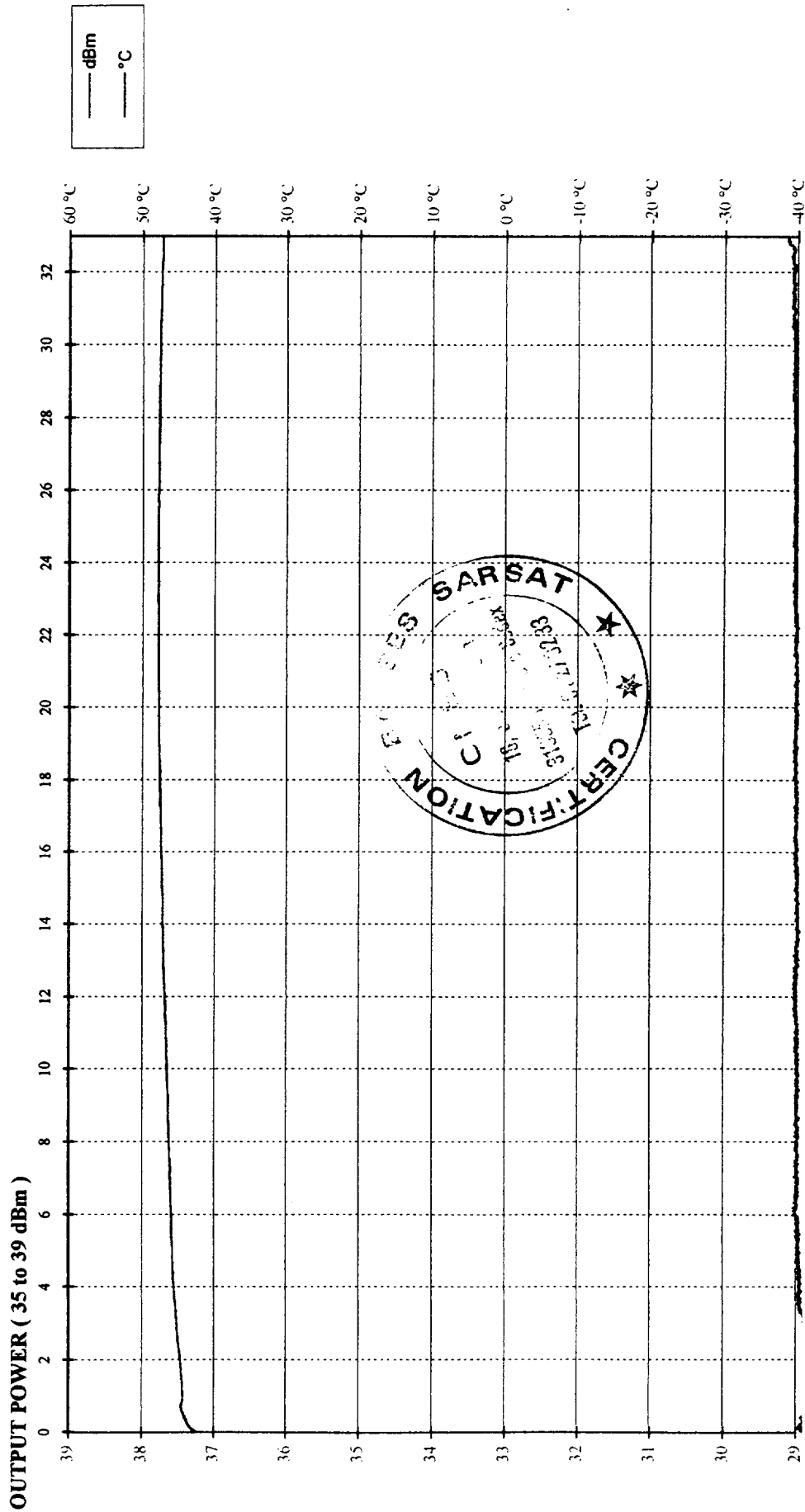
Manufacturer : ACR Electronics, Inc.

Model : RLB 33

Numero : 1

Date : 19/03/1999

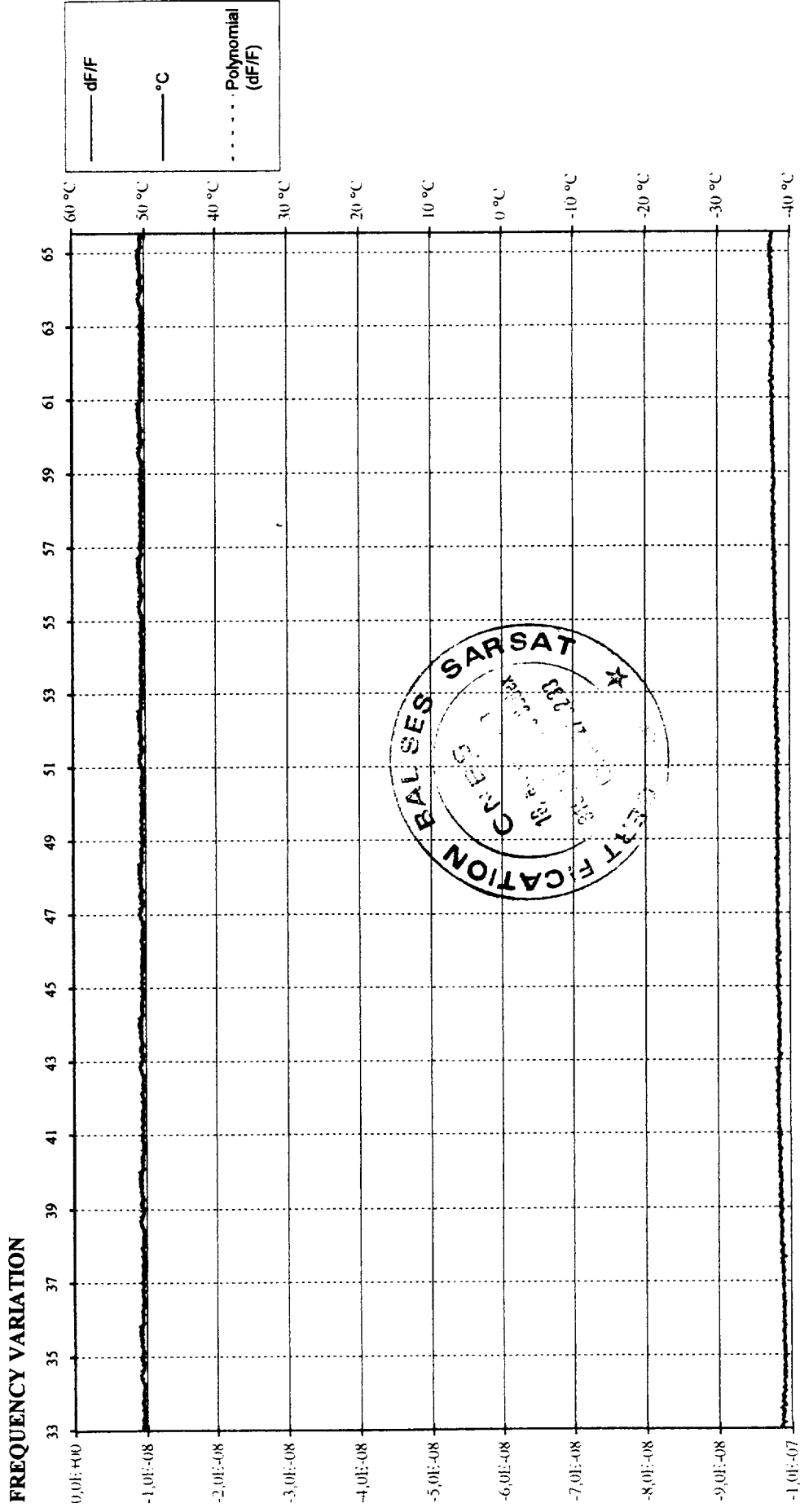
Time : 00:10:50



LIFE TEST AT -20 °C

Manufacturer : ACR Electronics, Inc.  
Model : RLB 33  
Numero : 1

Date : 19/03/1999  
Time : 00:10:50

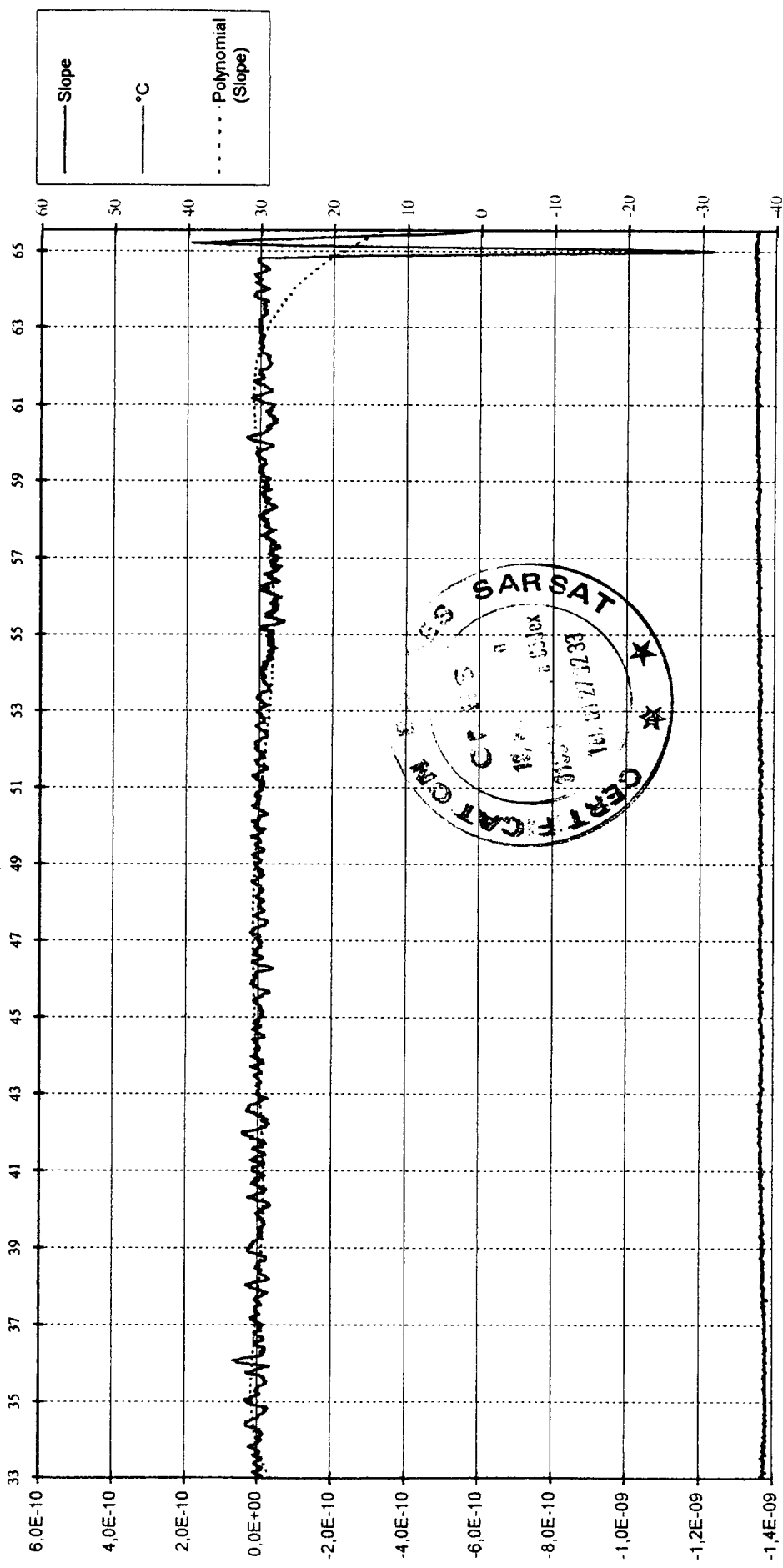


LIFE TEST AT -20 °C

Manufacturer : ACR Electronics, Inc.  
Model : RLB 33  
Numero : 1

Date : 19/03/1999  
Time : 00:10:50

MEDIUM TERM STABILITY : MEAN SLOPE /mn ( -1,0E-9 to 1,0E-9 )



LIFE TEST AT -20 °C

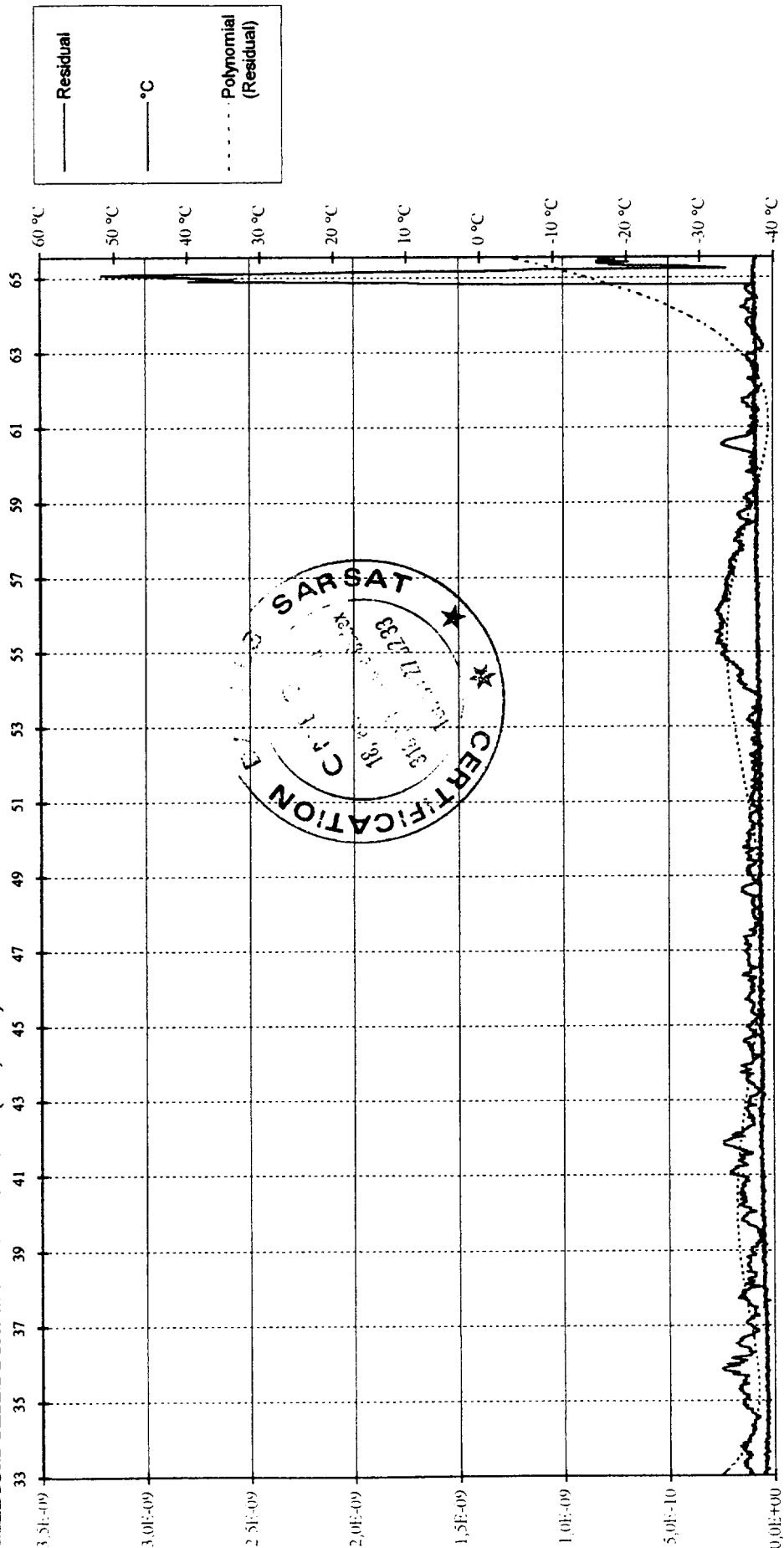
Manufacturer : ACR Electronics, Inc.

Model : RLB 33

Numero : 1

Date : 19/03/1999  
Time : 00:10:50

MEDIUM TERM STABILITY : RESIDUAL (  $\leq 3,0E-9$  )

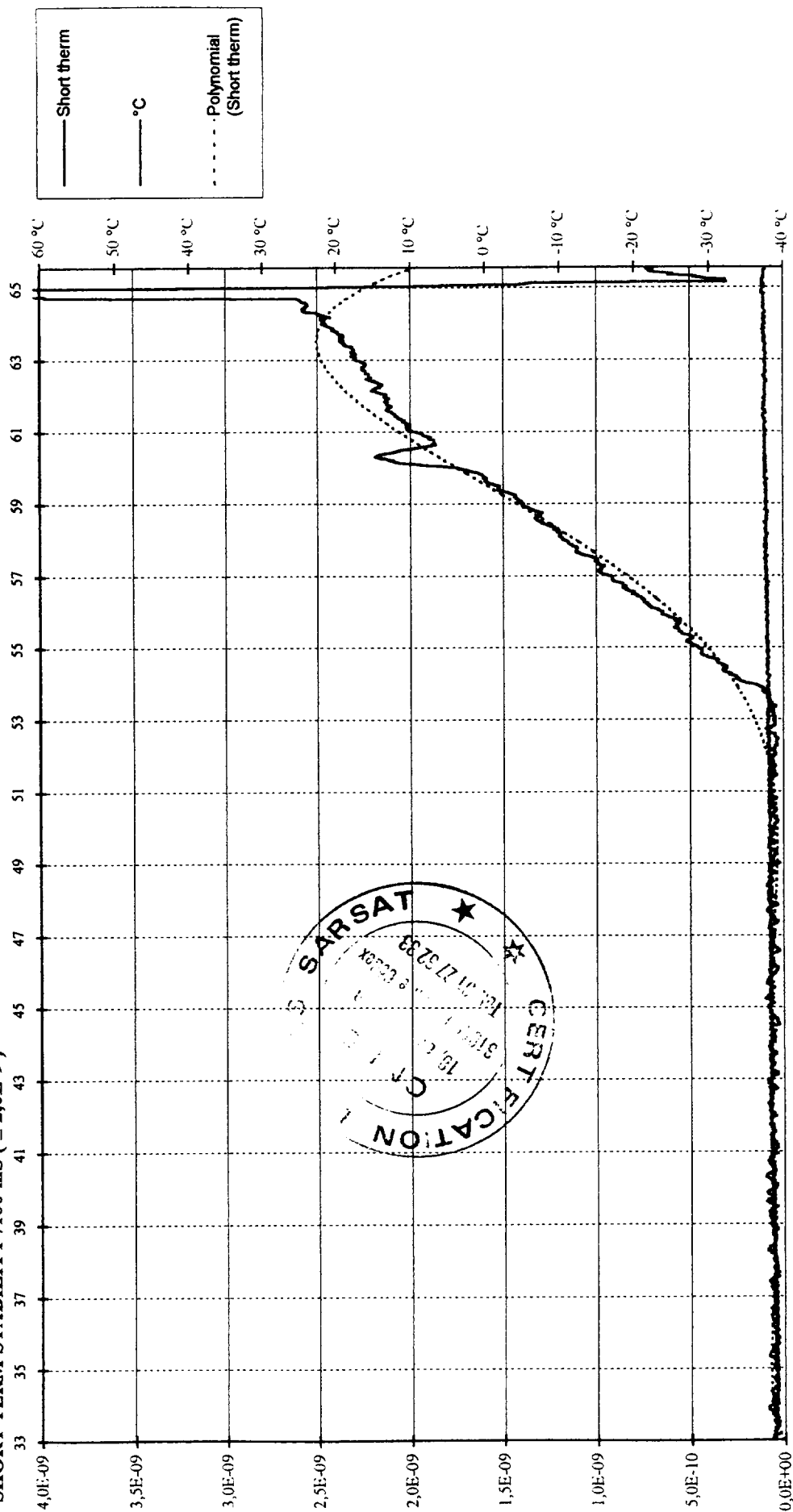


# LIFE TEST AT -20 °C

Manufacturer : ACR Electronics, Inc.  
 Model : RLB 33  
 Numero : 1

Date : 19/03/1999  
 Time : 00:10:50

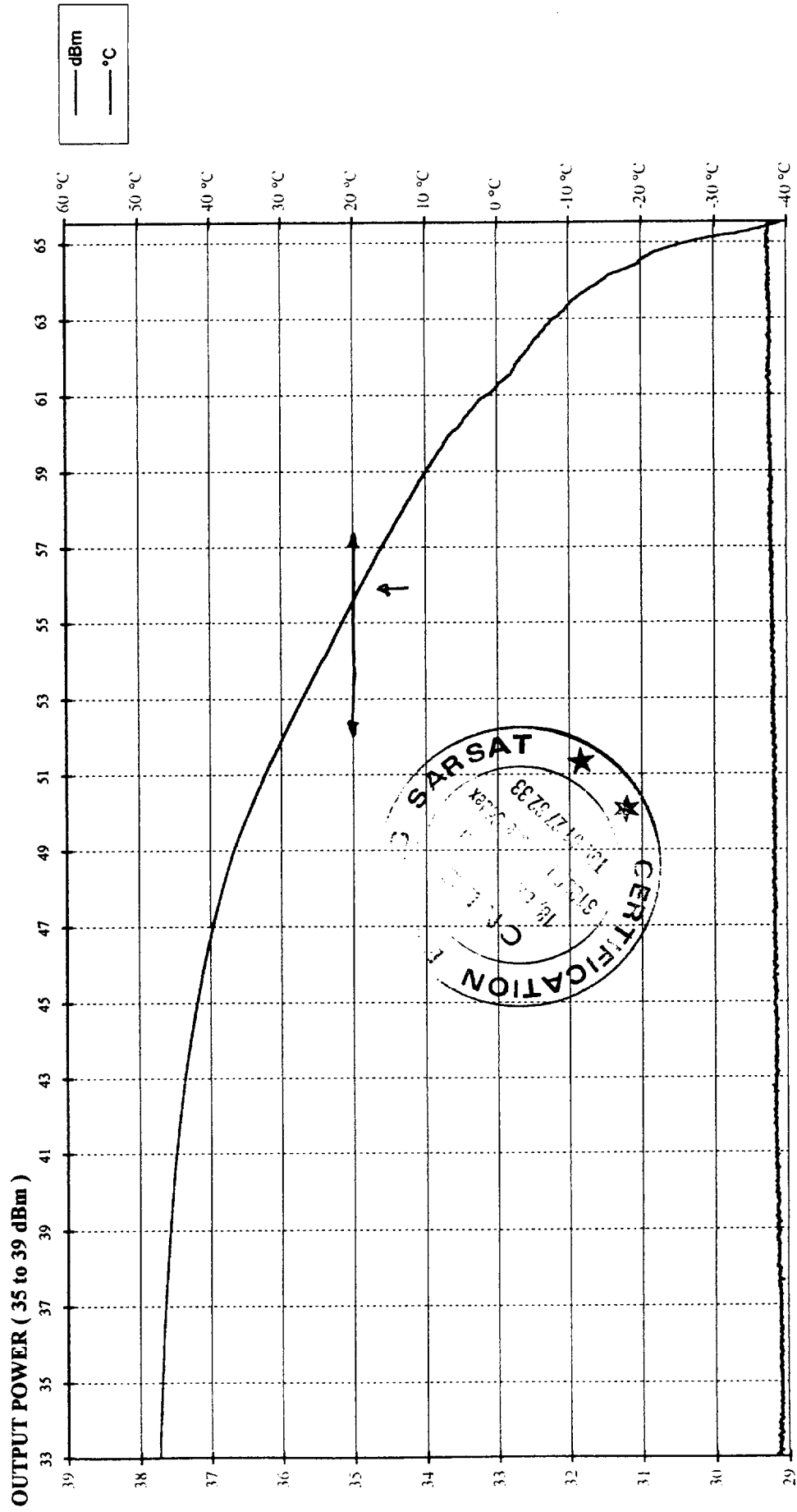
SHORT TERM STABILITY /100 mS (  $\leq 2,0E-9$  )



LIFE TEST AT -20 °C

Manufacturer : ACR Electronics, Inc.  
Model : RLB 33  
Numero : 1

Date : 19/03/1999  
Time : 00:10:50



**TEMPERATURE GRADIENT TEST RESULT ON**  
**RLB 33 ACR Electronics, Inc.**  
**N° 1**

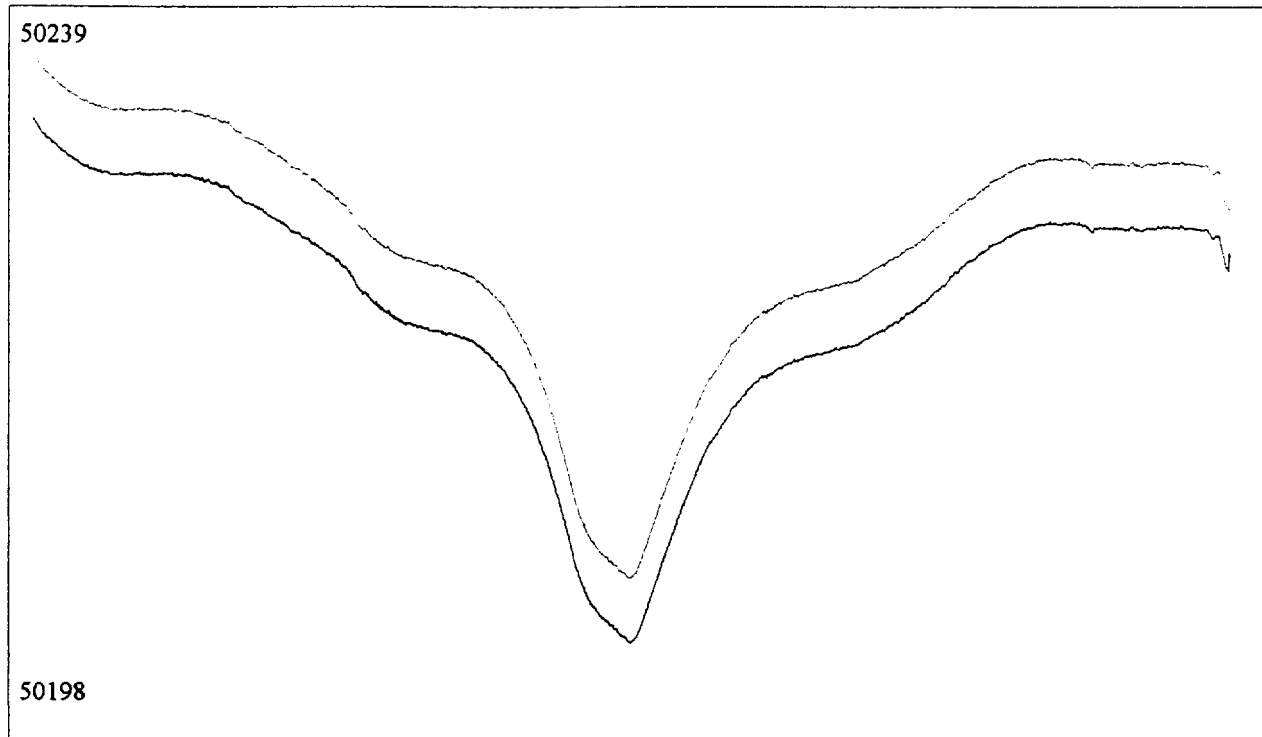
**at -40° C, 20° C and 55° C**

| No | Frequency | Temp. | P406 | P121.5 |
|----|-----------|-------|------|--------|
| 1  | 50234,24  | -38,2 | 37,3 | 16,8   |
| 2  | 50234,01  | -38,6 | 37,3 | 16,7   |
| 3  | 50234,04  | -38,3 | 37,3 | 16,8   |
| 4  | 50233,91  | -38,8 | 37,3 | 16,8   |
| 5  | 50233,91  | -38,7 | 37,3 | 16,7   |
| 6  | 50233,86  | -38,7 | 37,3 | 16,7   |
| 7  | 50233,72  | -38,3 | 37,3 | 16,8   |
| 8  | 50233,71  | -38,7 | 37,3 | 16,7   |
| 9  | 50233,61  | -38,7 | 37,3 | 16,8   |
| 10 | 50233,51  | -38,6 | 37,4 | 16,8   |
| 11 | 50233,43  | -38,7 | 37,4 | 16,8   |
| 12 | 50233,35  | -38,8 | 37,4 | 16,8   |
| 13 | 50233,29  | -38,9 | 37,4 | 16,8   |
| 14 | 50233,16  | -39,1 | 37,4 | 16,8   |
| 15 | 50233,19  | -38,8 | 37,4 | 16,7   |
| 16 | 50233,12  | -38,8 | 37,4 | 16,8   |
| 17 | 50233,03  | -39,0 | 37,4 | 16,8   |
| 18 | 50232,97  | -39,0 | 37,4 | 16,8   |

| No  | Temp. | Slope    | Sigma   | P406 | Short term | P121.5 |
|-----|-------|----------|---------|------|------------|--------|
| 1   | -38,8 | -2,1E-10 | 9,2E-11 | 37,3 | 6,1E-11    | 16,8   |
| 18  | -39,7 | -1,1E-10 | 1,0E-10 | 37,4 | 9,4E-11    | 16,8   |
| 31  | -39,9 | -8,9E-11 | 1,2E-10 | 37,4 | 1,1E-10    | 16,8   |
| 61  | -39,4 | -5,0E-11 | 1,2E-10 | 37,5 | 6,3E-11    | 16,8   |
| 91  | -36,8 | -5,7E-11 | 1,1E-10 | 37,5 | 6,0E-11    | 16,8   |
| 121 | -34,6 | -4,7E-11 | 9,9E-11 | 37,5 | 7,4E-11    | 16,9   |
| 151 | -32,8 | -4,9E-11 | 1,3E-10 | 37,6 | 6,0E-11    | 16,9   |
| 181 | -29,7 | -2,6E-11 | 1,4E-10 | 37,6 | 4,7E-11    | 16,9   |
| 211 | -28,7 | -1,6E-11 | 1,0E-10 | 37,7 | 5,4E-11    | 16,9   |
| 241 | -27,0 | -2,0E-11 | 1,3E-10 | 37,7 | 3,9E-11    | 16,9   |
| 271 | -25,0 | 1,0E-11  | 1,1E-10 | 37,8 | 4,2E-11    | 16,9   |
| 301 | -23,4 | -9,5E-12 | 1,2E-10 | 37,8 | 8,1E-11    | 16,9   |
| 331 | -21,2 | 1,5E-13  | 9,6E-11 | 37,9 | 5,3E-11    | 16,9   |
| 361 | -18,7 | 4,6E-13  | 9,7E-11 | 38,0 | 6,0E-11    | 16,9   |
| 391 | -17,1 | -2,2E-11 | 7,3E-11 | 38,0 | 5,2E-11    | 17,0   |
| 421 | -14,9 | -3,6E-11 | 9,6E-11 | 38,1 | 5,7E-11    | 16,9   |
| 451 | -13,2 | -2,4E-11 | 1,6E-10 | 38,2 | 6,1E-11    | 17,0   |
| 481 | -11,0 | -1,4E-11 | 1,3E-10 | 38,3 | 6,3E-11    | 17,0   |
| 511 | -8,9  | -3,9E-11 | 1,5E-10 | 38,4 | 5,1E-11    | 17,0   |
| 541 | -7,0  | -4,4E-11 | 1,2E-10 | 38,5 | 4,3E-11    | 17,0   |
| 571 | -5,0  | -3,2E-11 | 7,0E-11 | 38,5 | 5,5E-11    | 17,0   |
| 601 | -3,1  | -5,5E-11 | 1,3E-10 | 38,5 | 5,2E-11    | 17,0   |
| 631 | -1,4  | -3,9E-11 | 7,7E-11 | 38,5 | 6,7E-11    | 17,0   |
| 661 | 0,5   | -5,7E-11 | 8,3E-11 | 38,4 | 6,7E-11    | 16,9   |
| 691 | 1,9   | -2,4E-11 | 1,2E-10 | 38,4 | 5,8E-11    | 16,9   |
| 721 | 3,7   | -6,6E-11 | 1,4E-10 | 38,4 | 7,3E-11    | 16,9   |
| 751 | 5,6   | -5,7E-11 | 1,0E-10 | 38,4 | 4,3E-11    | 16,8   |
| 781 | 7,8   | -5,9E-11 | 1,3E-10 | 38,4 | 1,0E-10    | 16,8   |
| 811 | 9,8   | -4,2E-11 | 1,1E-10 | 38,4 | 9,1E-11    | 16,8   |
| 841 | 12,1  | -1,4E-10 | 1,2E-10 | 38,4 | 6,1E-11    | 16,8   |

| No   | Temp. | Slope    | Sigma   | P406 | Short term | P121.5 |
|------|-------|----------|---------|------|------------|--------|
| 871  | 14,3  | -8,5E-11 | 1,4E-10 | 38,4 | 8,1E-11    | 16,8   |
| 901  | 16,6  | -6,7E-11 | 1,8E-10 | 38,4 | 6,7E-11    | 16,7   |
| 931  | 18,8  | -6,7E-11 | 1,7E-10 | 38,5 | 6,9E-11    | 16,7   |
| 961  | 21,0  | -3,5E-11 | 1,1E-10 | 38,5 | 7,9E-11    | 16,7   |
| 991  | 23,2  | -3,2E-11 | 1,0E-10 | 38,5 | 8,9E-11    | 16,6   |
| 1021 | 25,2  | -7,1E-12 | 1,0E-10 | 38,5 | 4,3E-11    | 16,6   |
| 1051 | 27,3  | 9,5E-13  | 8,5E-11 | 38,5 | 6,7E-11    | 16,6   |
| 1081 | 29,5  | 1,0E-11  | 1,3E-10 | 38,5 | 8,5E-11    | 16,6   |
| 1111 | 31,8  | -3,4E-11 | 9,7E-11 | 38,5 | 3,8E-11    | 16,5   |
| 1141 | 33,7  | -3,2E-11 | 9,7E-11 | 38,5 | 4,4E-11    | 16,5   |
| 1171 | 35,9  | -7,1E-11 | 9,6E-11 | 38,5 | 8,4E-11    | 16,5   |
| 1201 | 37,7  | -5,9E-11 | 1,1E-10 | 38,6 | 4,7E-11    | 16,4   |
| 1231 | 40,1  | -1,1E-10 | 1,3E-10 | 38,6 | 8,9E-11    | 16,4   |
| 1261 | 42,2  | -1,3E-10 | 8,3E-11 | 38,6 | 8,8E-11    | 16,3   |
| 1291 | 44,3  | -1,6E-10 | 1,4E-10 | 38,6 | 8,2E-11    | 16,3   |
| 1321 | 46,4  | -2,2E-10 | 1,2E-10 | 38,6 | 7,3E-11    | 16,3   |
| 1351 | 48,2  | -2,3E-10 | 1,1E-10 | 38,6 | 1,0E-10    | 16,2   |
| 1381 | 50,1  | -2,5E-10 | 1,3E-10 | 38,6 | 8,7E-11    | 16,2   |
| 1411 | 52,2  | -2,7E-10 | 2,1E-10 | 38,6 | 8,1E-11    | 16,1   |
| 1441 | 52,0  | -1,6E-10 | 1,2E-10 | 38,6 | 4,0E-11    | 16,1   |
| 1471 | 52,0  | -1,0E-10 | 7,0E-11 | 38,6 | 7,3E-11    | 16,1   |
| 1501 | 52,1  | -6,7E-11 | 1,4E-10 | 38,6 | 9,4E-11    | 16,1   |
| 1531 | 52,2  | -4,0E-11 | 9,4E-11 | 38,6 | 9,1E-11    | 16,1   |
| 1561 | 50,7  | 5,8E-11  | 1,1E-10 | 38,6 | 6,6E-11    | 16,1   |
| 1591 | 49,0  | 2,0E-10  | 8,8E-11 | 38,6 | 6,7E-11    | 16,1   |
| 1621 | 47,1  | 2,1E-10  | 1,1E-10 | 38,6 | 6,3E-11    | 16,2   |
| 1651 | 45,2  | 2,0E-10  | 1,2E-10 | 38,6 | 6,7E-11    | 16,2   |
| 1681 | 43,3  | 1,8E-10  | 1,3E-10 | 38,6 | 8,1E-11    | 16,3   |
| 1711 | 41,2  | 1,8E-10  | 8,1E-11 | 38,6 | 8,6E-11    | 16,3   |
| 1741 | 39,2  | 1,6E-10  | 1,0E-10 | 38,6 | 9,6E-11    | 16,3   |
| 1771 | 37,9  | 9,9E-11  | 9,7E-11 | 38,5 | 1,0E-10    | 16,4   |
| 1801 | 35,8  | 1,0E-10  | 9,3E-11 | 38,5 | 9,8E-11    | 16,4   |
| 1831 | 34,3  | 7,7E-11  | 1,2E-10 | 38,5 | 8,6E-11    | 16,4   |
| 1861 | 32,4  | 6,7E-11  | 1,2E-10 | 38,5 | 7,0E-11    | 16,5   |
| 1891 | 30,4  | 6,4E-11  | 1,7E-10 | 38,5 | 5,4E-11    | 16,5   |
| 1921 | 28,1  | 4,2E-11  | 1,5E-10 | 38,5 | 7,3E-11    | 16,5   |
| 1951 | 25,9  | 4,8E-11  | 8,2E-11 | 38,4 | 4,2E-11    | 16,6   |
| 1981 | 23,5  | 4,4E-12  | 1,2E-10 | 38,4 | 5,7E-11    | 16,6   |
| 2011 | 21,3  | 7,1E-12  | 9,1E-11 | 38,4 | 8,3E-11    | 16,6   |
| 2041 | 19,1  | -3,1E-14 | 1,1E-10 | 38,4 | 4,3E-11    | 16,7   |
| 2071 | 17,1  | 2,6E-11  | 1,0E-10 | 38,4 | 9,1E-11    | 16,7   |
| 2101 | 14,8  | 2,7E-11  | 1,1E-10 | 38,4 | 8,6E-11    | 16,7   |
| 2131 | 12,3  | 2,2E-11  | 8,7E-11 | 38,4 | 6,8E-11    | 16,7   |
| 2161 | 10,3  | 3,4E-11  | 7,7E-11 | 38,4 | 4,7E-11    | 16,8   |
| 2191 | 7,8   | 3,4E-11  | 8,9E-11 | 38,4 | 5,5E-11    | 16,8   |
| 2221 | 5,7   | 6,3E-11  | 1,1E-10 | 38,4 | 7,0E-11    | 16,8   |
| 2251 | 3,6   | 5,8E-11  | 1,4E-10 | 38,4 | 6,6E-11    | 16,8   |
| 2281 | 1,3   | 4,5E-11  | 9,5E-11 | 38,4 | 8,9E-11    | 16,8   |
| 2311 | -0,7  | 4,4E-11  | 1,3E-10 | 38,4 | 7,2E-11    | 16,9   |
| 2341 | -2,6  | 6,4E-11  | 1,1E-10 | 38,4 | 5,8E-11    | 16,9   |
| 2371 | -4,5  | 7,6E-11  | 1,0E-10 | 38,4 | 5,9E-11    | 16,9   |

| No   | Temp. | Slope    | Sigma   | P406 | Short term | P121.5 |
|------|-------|----------|---------|------|------------|--------|
| 2401 | -6,5  | 5,3E-11  | 1,6E-10 | 38,4 | 7,4E-11    | 17,0   |
| 2431 | -8,7  | 3,3E-11  | 1,1E-10 | 38,4 | 8,8E-11    | 17,0   |
| 2461 | -10,8 | 4,3E-11  | 1,4E-10 | 38,4 | 5,7E-11    | 17,0   |
| 2491 | -12,8 | 2,7E-11  | 1,1E-10 | 38,4 | 6,4E-11    | 17,0   |
| 2521 | -14,6 | 5,6E-11  | 9,1E-11 | 38,3 | 5,8E-11    | 17,0   |
| 2551 | -17,0 | 3,9E-11  | 7,7E-11 | 38,3 | 5,8E-11    | 17,0   |
| 2581 | -18,6 | 2,2E-11  | 1,4E-10 | 38,3 | 4,9E-11    | 17,0   |
| 2611 | -21,1 | 8,1E-12  | 1,3E-10 | 38,3 | 4,3E-11    | 17,1   |
| 2641 | -22,9 | -5,4E-12 | 1,2E-10 | 38,3 | 7,6E-11    | 17,1   |
| 2671 | -24,4 | 2,2E-11  | 1,1E-10 | 38,2 | 5,0E-11    | 17,0   |
| 2701 | -27,1 | -2,0E-11 | 8,6E-11 | 38,2 | 4,5E-11    | 17,1   |
| 2731 | -29,1 | -3,7E-11 | 1,5E-10 | 38,2 | 7,6E-11    | 17,1   |
| 2761 | -30,9 | 1,3E-11  | 1,2E-10 | 38,2 | 1,1E-10    | 17,0   |
| 2791 | -33,7 | -1,3E-11 | 1,0E-10 | 38,1 | 7,7E-11    | 17,1   |
| 2821 | -35,7 | -5,5E-13 | 1,1E-10 | 38,1 | 4,7E-11    | 17,1   |
| 2851 | -37,7 | -1,5E-11 | 2,0E-10 | 38,1 | 7,1E-11    | 17,0   |
| 2881 | -40,0 | 3,9E-11  | 7,9E-11 | 38,0 | 6,7E-11    | 17,0   |
| 2911 | -41,1 | 2,9E-11  | 1,3E-10 | 38,0 | 1,1E-10    | 17,0   |
| 2941 | -40,8 | -4,6E-12 | 1,3E-10 | 38,0 | 8,8E-11    | 17,1   |
| 2971 | -41,7 | 1,6E-11  | 1,0E-10 | 37,9 | 9,5E-11    | 17,1   |
| 3001 | -41,4 | -3,9E-12 | 6,0E-11 | 37,9 | 8,8E-11    | 17,0   |
| 3031 | -41,2 | -8,7E-12 | 8,7E-11 | 37,9 | 8,3E-11    | 17,0   |
| 3061 | 4,9   | -2,0E-12 | 2,2E-10 | 37,9 | 8,2E-11    | 16,8   |
| 3091 | 0,1   | -2,6E-10 | 2,5E-10 | 38,3 | 8,7E-11    | 16,9   |
| 3121 |       |          |         |      |            |        |
| 3151 |       |          |         |      |            |        |
| 3181 |       |          |         |      |            |        |
| 3211 |       |          |         |      |            |        |
| 3241 |       |          |         |      |            |        |
| 3271 |       |          |         |      |            |        |
| 3301 |       |          |         |      |            |        |
| 3331 |       |          |         |      |            |        |
| 3361 |       |          |         |      |            |        |
| 3391 |       |          |         |      |            |        |
| 3421 |       |          |         |      |            |        |
| 3451 |       |          |         |      |            |        |
| 3481 |       |          |         |      |            |        |
| 3511 |       |          |         |      |            |        |
| 3541 |       |          |         |      |            |        |
| 3571 |       |          |         |      |            |        |
| 3601 |       |          |         |      |            |        |
| 3631 |       |          |         |      |            |        |
| 3661 |       |          |         |      |            |        |
| 3691 |       |          |         |      |            |        |
| 3721 |       |          |         |      |            |        |
| 3751 |       |          |         |      |            |        |
| 3781 |       |          |         |      |            |        |
| 3811 |       |          |         |      |            |        |
| 3841 |       |          |         |      |            |        |
| 3871 |       |          |         |      |            |        |
| 3901 |       |          |         |      |            |        |

**Frequency variation**

— Initial tracing    — Smoothed tracing

# TEMPERATURE GRADIENT TEST RESULTS ( 5 °C / hour )

Manufacturer : ACR Electronics, Inc.

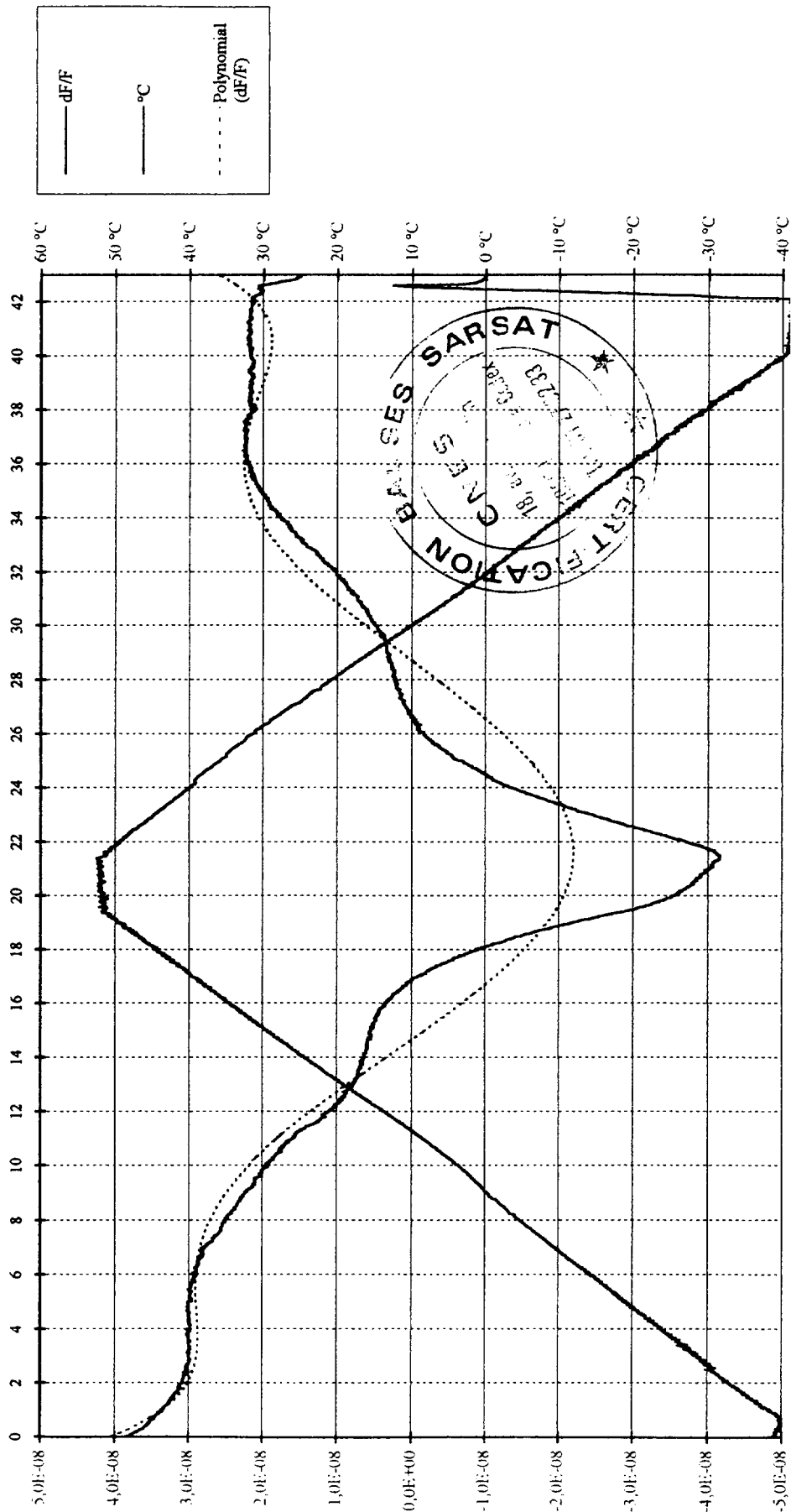
Model : RLB 33

Number : 1

Date : 17/03/1999

Time : 11:25:07

FREQUENCY VARIATION



# TEMPERATURE GRADIENT TEST RESULTS ( 5 °C / hour )

Manufacturer : ACR Electronics, Inc.

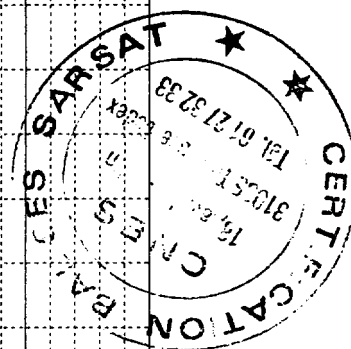
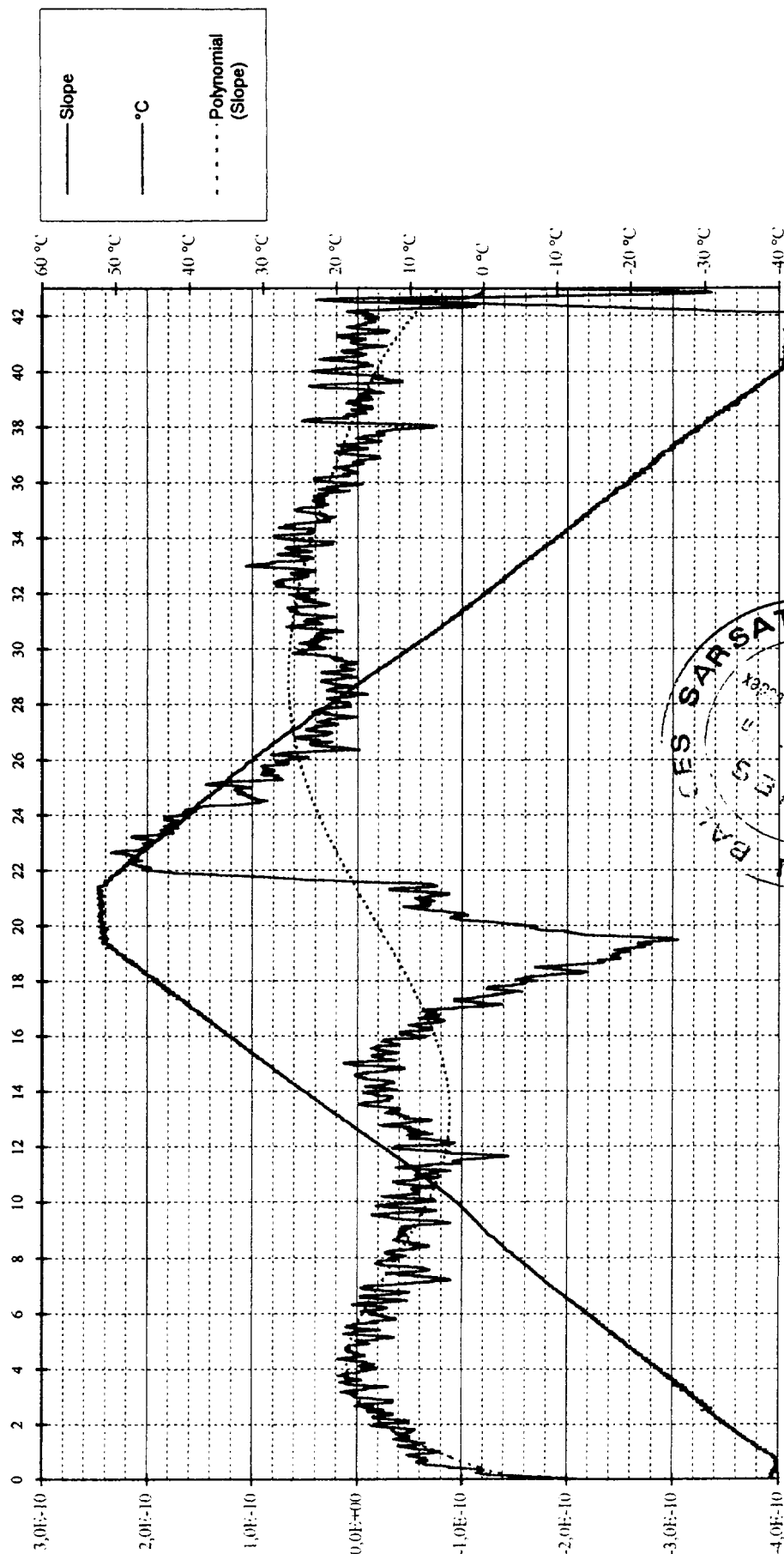
Model : RLB 33

Number : 1

Date : 17/03/1999

Time : 11:25:07

MEDIUM TERM STABILITY : MEAN SLOPE / mn ( -1,0E-9 to 1,0E-9 )



# TEMPERATURE GRADIENT TEST RESULTS ( 5 °C / hour )

Manufacturer : ACR Electronics, Inc.

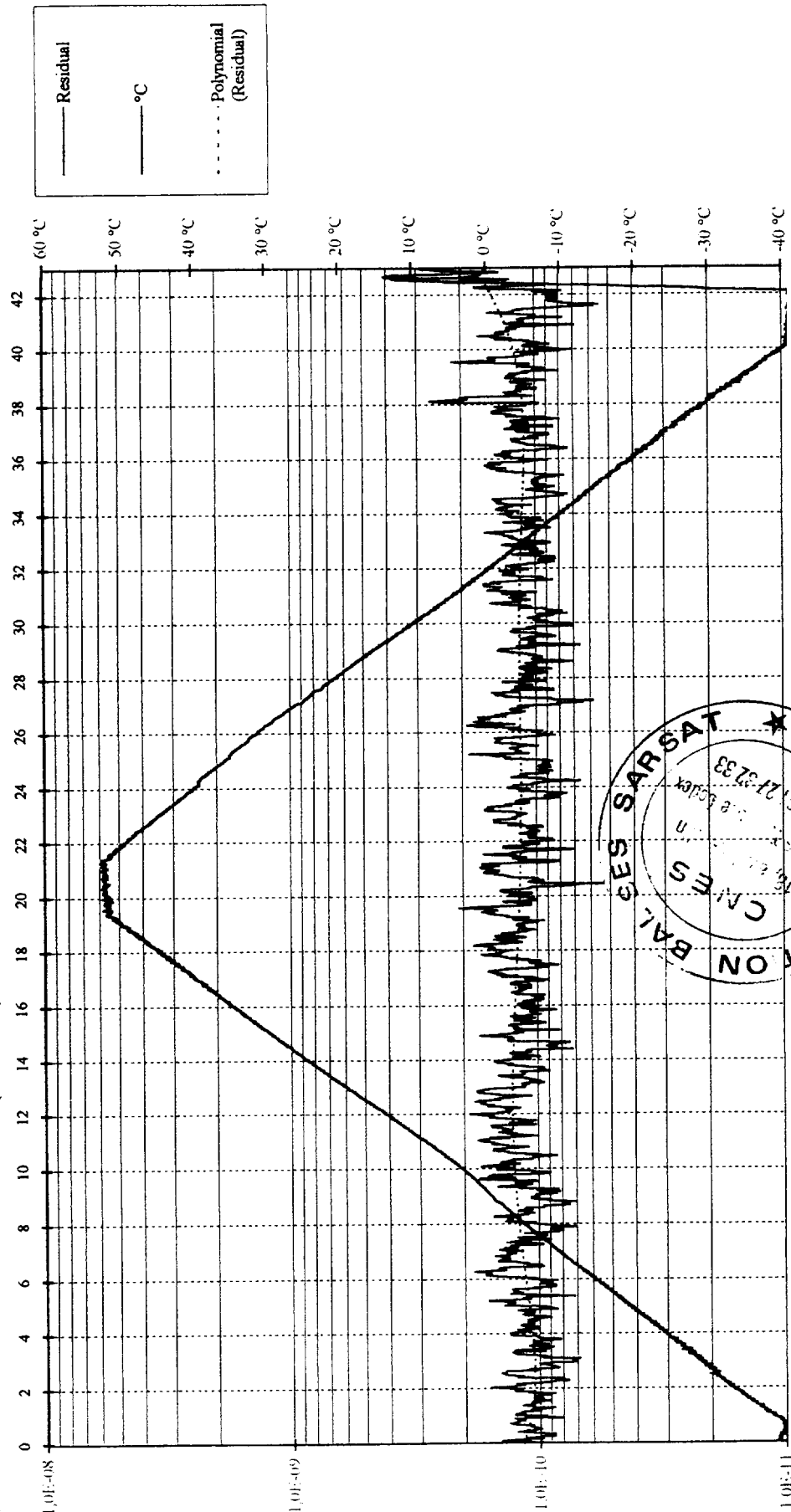
Model : RLB 33

Number : 1

Date : 17/03/1999

Time : 11:25:07

MEDIUM TERM STABILITY : RESIDUAL (  $\leq 3.0E-9$  )



# TEMPERATURE GRADIENT TEST RESULTS ( 5 °C / hour )

Manufacturer : ACR Electronics, Inc.

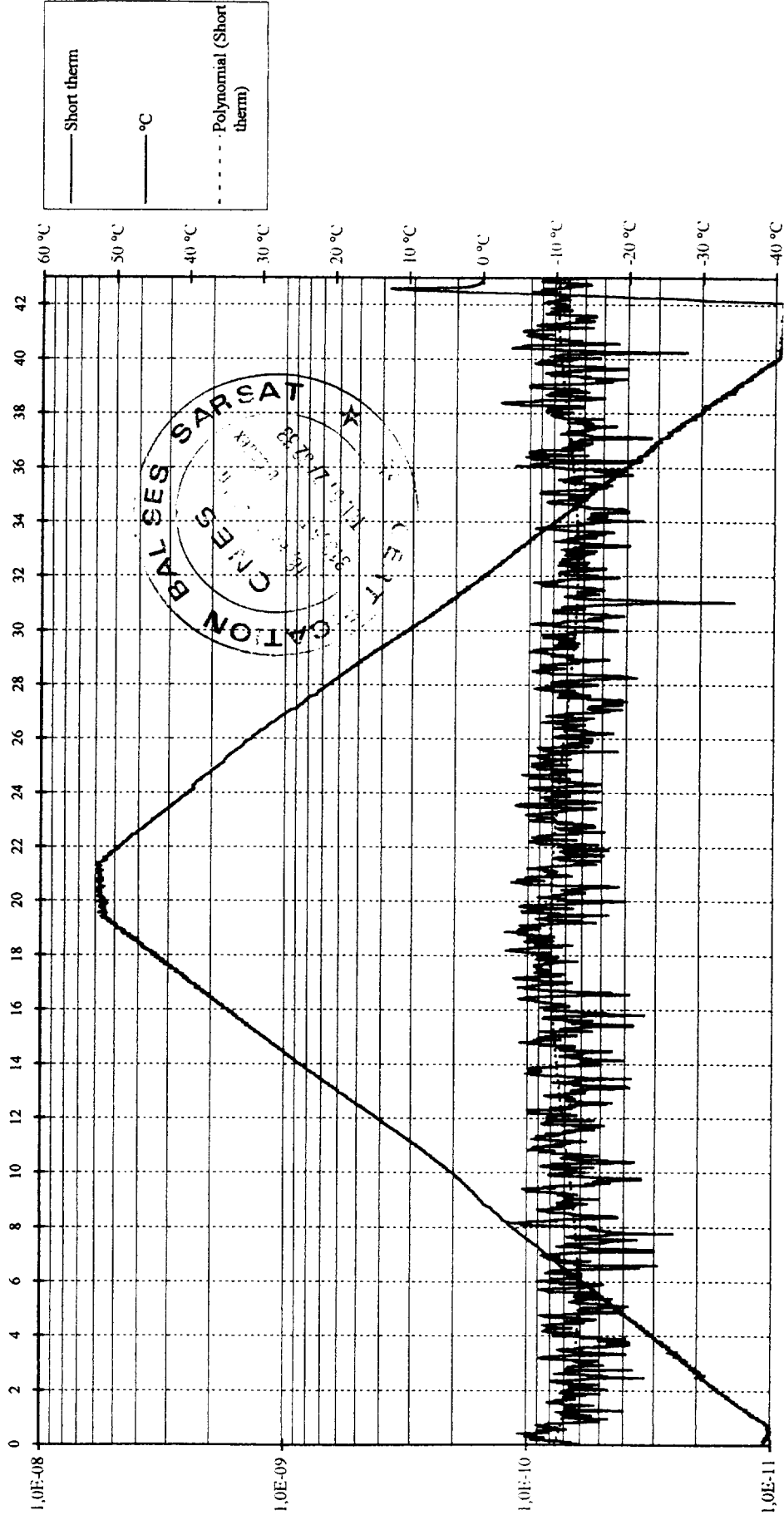
Model : RLB 33

Number : 1

Date : 17/03/1999

Time : 11:25:07

SHORT TERM STABILITY /100 mS ( ≤ 2,0E-9 )



# TEMPERATURE GRADIENT TEST RESULTS ( 5 °C / hour )

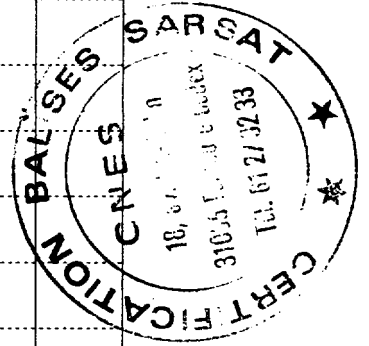
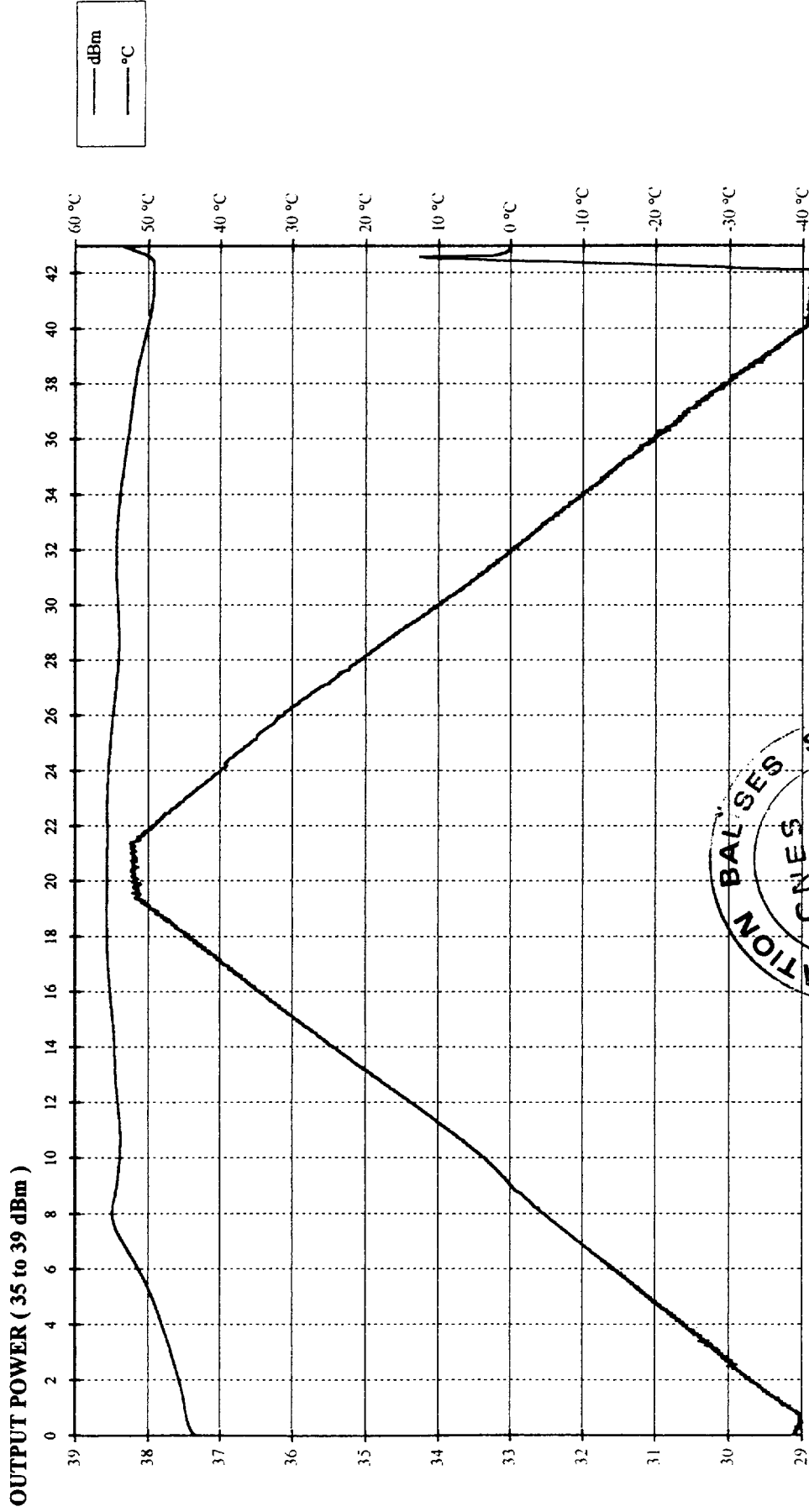
Manufacturer : ACR Electronics, Inc.

Model : RLB 33

Number : 1

Date : 17/03/1999

Time : 11:25:07



**SATELLITE QUALITATIVE TEST RESULTS ON**  
**RLB 33 ACR Electronics, Inc.**  
**Nº 5**

RECHERCHE du 26/03/1999 13:14:42

Code balise : 200C50800A

Nom balise : 2177

Pays : 366 USA

Classe utilisateur : TEST--

Période de consultation : 14/02/1999 13 à 26/03/1999 13

Position de référence : et

Fréquence : 406 MG+ML+MS

Toutes les luts

Tous les satellites

Date activation balise : // :

Recherche dans base principale

Résultats edites suivant chronologie du TCA

LB 33 N° 5

| * TCA         | TPC   | * SL  | PTS | * LAT1   | LONG1  | PB    | MAJ   | BIAIS | ERR    | * LAT2   | LONG2   | * CTA  | LG    | WF | SDV | CF    | SRCE  | MCCN       |
|---------------|-------|-------|-----|----------|--------|-------|-------|-------|--------|----------|---------|--------|-------|----|-----|-------|-------|------------|
| * 19/03 10H31 | 10H43 | * S04 | 13  | * 43.559 | 1.476  | 99    | 1     | -294  | 0.41   | * 48.840 | -24.848 | * 9.8  | L     | 0  | 0.3 | 4/0   | 2272  | 26549      |
| * 19/03 10H31 | 12H15 | * S04 | 13  | * 43.557 | 1.479  | 99    | 1     | -294  | 0.25   | * 48.841 | -24.844 | * 9.8  | G     | 0  | 0.3 | 4/0   | 2271  | 26583      |
| * 19/03 13H54 | 14H04 | * S06 | 7   | * 43.558 | 1.480  | 50    | 1     | -297  | 0.19   | * 46.911 | 18.498  | * 6.2  | L     | 0  | 0.6 | 4/0   | 2271  | 26641      |
| * 19/03 14H24 | 14H52 | * C08 | 10  | * 43.559 | 1.478  | 99    | 1     | -296  | 0.24   | * 42.459 | -12.422 | * 5.4  | L     | 0  | 0.2 | 4/0   | 2272  | 26682      |
| * 19/03 15H35 | 15H44 | * S06 | 13  | * 43.556 | 1.482  | 98    | 1     | -295  | 0.38   | * 37.101 | -29.497 | * 11.8 | L     | 0  | 0.3 | 4/0   | 2271  | 26689      |
| * 19/03 16H53 | 17H02 | * S03 | 6   | * 43.562 | 1.481  | 98    | 1     | -245  | 0.31   | * 38.709 | -23.402 | * 9.4  | S     | 0  | 0.4 | 4/0   | 2272  | 26825      |
| * 19/03 17H53 | 18H05 | * C04 | 5   | * 43.558 | 1.489  | 81    | 1     | -286  | 0.66   | * 42.380 | 14.899  | * 5.1  | L     | 0  | 0.3 | 4/0   | 2272  | 26888      |
| * 19/03 18H28 | 18H38 | * S07 | 4   | * 43.558 | 1.482  | 99    | 1     | -282  | 0.22   | * 45.648 | 12.527  | * 4.4  | L     | 0  | 0.0 | 4/0   | 2271  | 26918      |
| * 19/03 18H28 | 06H54 | * S07 | 4   | * 43.562 | 1.477  | 99    | 1     | -283  | 0.42   | * 45.655 | 12.543  | * 4.4  | G     | 0  | 0.1 | 4/0   | 2272  | 27513      |
| * 19/03 19H39 | 19H49 | * C04 | 10  | * 43.556 | 1.481  | 99    | 1     | -280  | 0.35   | * 46.799 | -38.658 | * 13.6 | L     | 0  | 0.2 | 4/0   | 2272  | 27001      |
| * 19/03 19H39 | 03H09 | * C04 | 10  | * 43.556 | 1.481  | 99    | 1     | -280  | 0.33   | * 46.802 | -38.655 | * 13.6 | G     | 0  | 0.2 | 4/0   | 2272  | 27302      |
| * 19/03 20H08 | 20H17 | * S07 | 13  | * 43.559 | 1.480  | 97    | 1     | -281  | 0.08   | * 36.355 | -34.422 | * 13.7 | L     | 0  | 0.7 | 4/0   | 2271  | 27017      |
| * 19/03 20H08 | 06H54 | * S07 | 13  | * 43.568 | 1.491  | 97    | 1     | -282  | 1.26   | * 36.366 | -34.425 | * 13.7 | G     | 0  | 0.7 | 4/0   | 2272  | 27514      |
| * 19/03 20H08 | 10H10 | * S07 | 13  | * 43.569 | 1.489  | 97    | 1     | -281  | 1.21   | * 36.368 | -34.423 | * 13.7 | G     | 0  | 0.7 | 4/0   | 2271  | 27815      |
| * 19/03 20H17 | 20H28 | * S04 | 13  | * 43.561 | 1.496  | 96    | 1     | -280  | 1.28   | * 44.172 | 4.484   | * 1.3  | L     | 0  | 0.1 | 4/0   | 2272  | 27051      |
| * 19/03 20H17 | 08H52 | * S04 | 13  | * 43.561 | 1.488  | 96    | 1     | -279  | 0.66   | * 44.175 | 4.490   | * 1.3  | G     | 0  | 0.1 | 4/0   | 2271  | 27764      |
| * 19/03 20H43 | 20H54 | * C06 | 9   | * 43.560 | 1.472  | 86    | 6     | -281  | 0.74   | * 43.877 | -2.267  | * 1.2  | L     | 0  | 0.9 | 4/0   | 2272  | 27064      |
| * 19/03 20H43 | 06H03 | * C06 | 9   | * 43.561 | 1.467  | 87    | 6     | -280  | 1.10   | * 43.877 | -2.261  | * 1.2  | G     | 0  | 0.9 | 4/0   | 2272  | 27440      |
| * 19/03 21H59 | 22H08 | * S04 | 10  | * 43.553 | 1.479  | 96    | 2     | -279  | 0.68   | * 34.417 | -42.728 | * 17.0 | L     | 0  | 0.9 | 4/0   | 2272  | 27149      |
| * 19/03 21H59 | 08H52 | * S04 | 10  | * 43.561 | 1.486  | 96    | 2     | -279  | 0.43   | * 34.421 | -42.728 | * 17.0 | G     | 0  | 0.9 | 4/0   | 2271  | 27765      |
| * 20/03 02H12 | 02H23 | * C08 | 5   | * 43.558 | 1.481  | 95    | 1     | -274  | 0.12   | * 42.235 | 16.870  | * 5.8  | L     | 0  | 0.2 | 4/0   | 2272  | 27251      |
| * 20/03 02H14 | 02H23 | * S06 | 2   | *        | .....  | ..... | ..... | 0     | .....  | *        | .....   | *      | ..... | L  | 9   | ..... | ..... | 2271 27258 |
| * 20/03 03H56 | 04H05 | * S06 | 14  | * 43.559 | 1.473  | 94    | 2     | -272  | 0.65   | * 45.033 | -5.810  | * 2.9  | L     | 0  | 0.4 | 4/0   | 2271  | 27320      |
| * 20/03 03H58 | 04H08 | * C08 | 8   | * 43.559 | 1.480  | 99    | 1     | -272  | 0.07   | * 46.531 | -36.763 | * 13.0 | L     | 0  | 0.1 | 4/0   | 2272  | 27335      |
| * 20/03 04H49 | 04H59 | * C04 | 3   | * 45.118 | 19.710 | 50    | 4     | -251  | 999.99 | * 43.554 | 1.480   | * 6.8  | G     | 0  | 0.0 | 0/0   | 2271  | 27365      |
| * 20/03 04H49 | 05H31 | * C04 | 3   | * 45.118 | 19.712 | 50    | 4     | -251  | 999.99 | * 43.554 | 1.482   | * 6.8  | G     | 0  | 0.0 | 0/0   | 2272  | 28935      |
| * 20/03 05H07 | 05H17 | * S03 | 4   | * 43.567 | 1.412  | 51    | 61    | -226  | 5.58   | * 43.612 | 1.224   | * 0.0  | S     | 1  | 1.8 | 1/0   | 2272  | 27378      |
| * 20/03 05H36 | 05H43 | * S06 | 8   | * 43.563 | 1.479  | 97    | 2     | -270  | 0.42   | * 54.481 | -53.909 | * 19.3 | L     | 0  | 1.0 | 4/0   | 2271  | 27394      |
| * 20/03 06H34 | 05H31 | * C04 | 8   | * 43.556 | 1.481  | 99    | 1     | -272  | 0.42   | * 40.875 | -31.522 | * 12.6 | G     | 0  | 0.2 | 4/0   | 2272  | 28936      |
| * 20/03 06H43 | 06H54 | * S07 | 4   | * 43.560 | 1.485  | 96    | 1     | -271  | 0.39   | * 36.222 | 37.673  | * 13.8 | L     | 0  | 0.7 | 4/0   | 2272  | 27515      |
| * 20/03 06H43 | 10H10 | * S07 | 4   | * 43.560 | 1.485  | 96    | 1     | -270  | 0.31   | * 36.222 | 37.671  | * 13.8 | G     | 0  | 0.7 | 4/0   | 2271  | 27816      |
| * 20/03 06H46 | 06H54 | * S03 | 6   | * 43.562 | 1.479  | 98    | 1     | -271  | 0.37   | * 52.582 | -45.777 | * 16.8 | L     | 0  | 0.6 | 4/0   | 2271  | 27501      |
| * 20/03 07H39 | 07H50 | * C06 | 7   | * 43.531 | 1.286  | 49    | 42    | -279  | 16.02  | * 43.579 | 1.745   | * 0.2  | L     | 0  | 0.6 | 3/0   | 2272  | 27614      |
| * 20/03 08H23 | 08H32 | * S07 | 8   | * 43.556 | 1.474  | 99    | 1     | -117  | 0.67   | * 45.662 | -9.514  | * 4.2  | S     | 0  | 0.1 | 4/0   | 2272  | 27642      |
| * 20/03 08H23 | 08H33 | * S07 | 13  | * 43.560 | 1.476  | 99    | 1     | -284  | 0.40   | * 45.680 | -9.440  | * 4.2  | L     | 0  | 0.1 | 4/0   | 2272  | 27639      |
| * 20/03 08H23 | 10H10 | * S07 | 13  | * 43.559 | 1.477  | 99    | 1     | -283  | 0.26   | * 45.681 | -9.444  | * 4.2  | G     | 0  | 0.1 | 4/0   | 2271  | 27817      |
| * 20/03 08H23 | 18H18 | * S07 | 13  | * 43.559 | 1.478  | 99    | 1     | -284  | 0.20   | * 45.681 | -9.448  | * 4.2  | G     | 0  | 0.1 | 4/0   | 2272  | 28306      |
| * 20/03 08H38 | 08H52 | * S04 | 6   | * 43.560 | 1.484  | 96    | 1     | -285  | 0.28   | * 38.076 | 28.417  | * 10.2 | L     | 0  | 0.6 | 4/0   | 2271  | 27766      |
| * 20/03 08H38 | 10H28 | * S04 | 6   | * 43.560 | 1.484  | 96    | 1     | -285  | 0.24   | * 38.077 | 28.417  | * 10.2 | G     | 0  | 0.6 | 4/0   | 2272  | 27902      |
| * 20/03 09H24 | 09H32 | * C06 | 4   | * 43.562 | 1.479  | 95    | 1     | -289  | 0.32   | * 39.729 | -47.989 | * 19.0 | L     | 0  | 0.5 | 4/0   | 2272  | 27803      |

|               |       |       |    |          |         |       |       |       |        |          |         |        |   |   |       |       |      |         |
|---------------|-------|-------|----|----------|---------|-------|-------|-------|--------|----------|---------|--------|---|---|-------|-------|------|---------|
| * 20/03 10H02 | 10H10 | * S07 | 10 | * 43.562 | 1.487   | 97    | 2     | -289  | 0.57   | * 54.765 | -57.741 | * 20.4 | L | 0 | 0.8   | 4/0   | 2271 | 27818 * |
| * 20/03 10H02 | 15H35 | * S07 | 10 | * 43.562 | 1.486   | 97    | 2     | -289  | 0.50   | * 54.765 | -57.744 | * 20.4 | G | 0 | 0.8   | 4/0   | 2271 | 28204 * |
| * 20/03 10H02 | 18H18 | * S07 | 10 | * 43.564 | 1.486   | 97    | 2     | -290  | 0.66   | * 54.765 | -57.744 | * 20.4 | G | 0 | 0.8   | 4/0   | 2272 | 28307 * |
| * 20/03 10H18 | 10H29 | * S04 | 14 | * 43.559 | 1.480   | 99    | 1     | -292  | 0.09   | * 47.643 | -18.831 | * 7.7  | L | 0 | 0.2   | 4/0   | 2272 | 27903 * |
| * 20/03 10H18 | 18H35 | * S04 | 14 | * 43.559 | 1.480   | 99    | 1     | -292  | 0.10   | * 47.642 | -18.831 | * 7.7  | G | 0 | 0.2   | 4/0   | 2271 | 28389 * |
| * 20/03 11H58 | 12H04 | * S04 | 2  | .....    | .....   | ..... | ..... | 0     | .....  | .....    | .....   | .....  | L | 9 | ..... | ..... | 2272 | 28016 * |
| * 20/03 11H58 | 18H35 | * S04 | 2  | .....    | .....   | ..... | ..... | 0     | .....  | .....    | .....   | .....  | G | 9 | ..... | ..... | 2271 | 28373 * |
| * 20/03 13H09 | 13H20 | * C08 | 3  | * 43.556 | 1.490   | 50    | 5     | -299  | 0.88   | * 45.116 | 20.943  | * 6.8  | G | 0 | 0.0   | 0/0   | 2272 | 28231 * |
| * 20/03 13H09 | 15H05 | * C08 | 3  | * 45.117 | 20.936  | 50    | 5     | -354  | 999.99 | * 43.557 | 1.489   | * 7.2  | G | 0 | 0.0   | 0/0   | 2271 | 28116 * |
| * 20/03 13H43 | 13H52 | * S06 | 9  | * 43.561 | 1.482   | 98    | 1     | -299  | 0.22   | * 48.040 | 23.254  | * 8.2  | L | 0 | 0.4   | 4/0   | 2271 | 28059 * |
| * 20/03 14H55 | 15H05 | * C08 | 8  | * 43.563 | 1.476   | 99    | 1     | -296  | 0.51   | * 41.120 | -30.365 | * 12.3 | L | 0 | 0.4   | 4/0   | 2271 | 28117 * |
| * 20/03 14H55 | 01H09 | * C08 | 8  | * 43.556 | 1.479   | 98    | 1     | -296  | 0.40   | * 41.113 | -30.363 | * 12.3 | G | 0 | 0.4   | 4/0   | 2272 | 28723 * |
| * 20/03 15H24 | 15H33 | * S06 | 6  | * 43.563 | 1.482   | 98    | 1     | -165  | 0.38   | * 38.389 | -24.127 | * 9.7  | S | 0 | 0.5   | 4/0   | 2272 | 28143 * |
| * 20/03 16H29 | 16H38 | * S03 | 5  | * 43.562 | 1.480   | 97    | 1     | -248  | 0.26   | * 40.962 | -11.842 | * 5.0  | S | 0 | 0.4   | 4/0   | 2272 | 28223 * |
| * 20/03 18H06 | 18H16 | * S07 | 3  | * 47.717 | 23.462  | 50    | 2     | -89   | 999.99 | * 43.566 | 1.480   | * 7.7  | G | 0 | 0.0   | 0/0   | 2272 | 28315 * |
| * 20/03 18H06 | 18H18 | * S07 | 5  | * 43.560 | 1.482   | 98    | 1     | -287  | 0.11   | * 47.840 | 23.295  | * 8.2  | L | 0 | 0.6   | 4/0   | 2272 | 28308 * |
| * 20/03 18H06 | 19H55 | * S07 | 5  | * 43.560 | 1.481   | 98    | 1     | -286  | 0.08   | * 47.840 | 23.288  | * 8.2  | G | 0 | 0.6   | 4/0   | 2271 | 28484 * |
| * 20/03 18H06 | 08H13 | * S07 | 5  | * 43.561 | 1.481   | 98    | 1     | -287  | 0.13   | * 47.842 | 23.295  | * 8.2  | G | 0 | 0.6   | 4/0   | 2272 | 29225 * |
| * 20/03 18H21 | 05H31 | * C04 | 6  | * 43.561 | 1.485   | 90    | 4     | -284  | 0.36   | * 43.953 | -2.782  | * 1.2  | G | 0 | 0.3   | 4/0   | 2272 | 28937 * |
| * 20/03 18H31 | 18H35 | * S04 | 2  | .....    | .....   | ..... | ..... | 0     | .....  | .....    | .....   | .....  | L | 9 | ..... | ..... | 2271 | 28394 * |
| * 20/03 18H31 | 20H16 | * S04 | 2  | .....    | .....   | ..... | ..... | 0     | .....  | .....    | .....   | .....  | G | 9 | ..... | ..... | 2272 | 28560 * |
| * 20/03 18H31 | 21H55 | * S04 | 2  | .....    | .....   | ..... | ..... | 0     | .....  | .....    | .....   | .....  | G | 9 | ..... | ..... | 2271 | 28638 * |
| * 20/03 19H46 | 19H56 | * S07 | 12 | * 43.555 | 1.481   | 99    | 1     | -282  | 0.43   | * 38.457 | -23.952 | * 9.6  | L | 0 | 0.1   | 4/0   | 2271 | 28485 * |
| * 20/03 19H46 | 06H30 | * S07 | 12 | * 43.564 | 1.483   | 99    | 1     | -282  | 0.53   | * 38.466 | -23.954 | * 9.6  | G | 0 | 0.1   | 4/0   | 2271 | 29052 * |
| * 20/03 19H46 | 08H14 | * S07 | 12 | * 43.572 | 1.482   | 99    | 1     | -283  | 1.37   | * 38.472 | -23.962 | * 9.6  | G | 0 | 0.1   | 4/0   | 2272 | 29226 * |
| * 20/03 20H05 | 20H16 | * S04 | 12 | * 43.560 | 1.480   | 97    | 2     | -281  | 0.13   | * 45.355 | 10.320  | * 3.5  | L | 0 | 0.3   | 4/0   | 2272 | 28548 * |
| * 20/03 20H05 | 21H55 | * S04 | 12 | * 43.560 | 1.483   | 97    | 2     | -282  | 0.20   | * 45.355 | 10.327  | * 3.5  | G | 0 | 0.3   | 4/0   | 2271 | 28618 * |
| * 20/03 20H05 | 10H16 | * S04 | 12 | * 43.571 | 1.475   | 97    | 2     | -281  | 1.38   | * 45.367 | 10.324  | * 3.5  | G | 0 | 0.3   | 4/0   | 2272 | 29379 * |
| * 20/03 20H08 | 05H31 | * C04 | 4  | * 43.563 | 1.481   | 99    | 4     | -283  | 0.45   | * 46.441 | -59.333 | * 19.4 | G | 1 | 4.7   | 4/0   | 2272 | 28938 * |
| * 20/03 21H12 | 21H22 | * C06 | 5  | * 43.555 | 1.479   | 98    | 1     | -279  | 0.48   | * 45.470 | -20.751 | * 7.5  | L | 0 | 0.2   | 4/0   | 2272 | 28587 * |
| * 20/03 21H46 | 21H55 | * S04 | 10 | * 43.558 | 1.484   | 98    | 1     | -280  | 0.31   | * 35.718 | -36.818 | * 14.6 | L | 0 | 0.4   | 4/0   | 2271 | 28619 * |
| * 20/03 21H46 | 10H16 | * S04 | 10 | * 43.572 | 1.482   | 98    | 1     | -280  | 1.39   | * 35.731 | -36.825 | * 14.6 | G | 0 | 0.4   | 4/0   | 2272 | 29380 * |
| * 21/03 02H43 | 02H54 | * C08 | 8  | * 43.560 | 1.464   | 63    | 2     | -272  | 1.31   | * 43.833 | -1.652  | * 1.0  | L | 1 | 0.2   | 4/0   | 2272 | 28768 * |
| * 21/03 02H43 | 15H36 | * C08 | 8  | * 43.558 | 1.475   | 63    | 2     | -273  | 0.43   | * 43.832 | -1.655  | * 1.0  | G | 1 | 0.2   | 4/0   | 2271 | 29678 * |
| * 21/03 03H45 | 03H54 | * S06 | 10 | * 43.559 | 1.458   | 94    | 2     | -137  | 1.83   | * 43.949 | -0.467  | * 0.9  | S | 0 | 0.2   | 4/0   | 2272 | 28805 * |
| * 21/03 04H30 | 04H39 | * C08 | 4  | * 43.544 | 1.483   | 73    | 4     | -267  | 1.76   | * 48.204 | -57.082 | * 19.3 | L | 1 | 6.5   | 4/0   | 2272 | 28837 * |
| * 21/03 04H30 | 15H36 | * C08 | 4  | * 43.540 | 1.485   | 73    | 4     | -267  | 2.14   | * 48.205 | -57.081 | * 19.3 | G | 1 | 6.6   | 4/0   | 2271 | 29679 * |
| * 21/03 04H43 | 04H52 | * S03 | 6  | * 43.559 | 1.483   | 90    | 2     | -270  | 0.22   | * 41.267 | 13.060  | * 4.3  | L | 0 | 0.8   | 4/0   | 2271 | 28848 * |
| * 21/03 05H17 | 05H31 | * C04 | 7  | * 43.566 | 1.579   | 75    | 7     | -271  | 7.99   | * 43.579 | 1.738   | * 0.0  | L | 0 | 0.2   | 4/0   | 2272 | 28939 * |
| * 21/03 05H17 | 07H10 | * C04 | 7  | * 43.563 | 1.549   | 84    | 5     | -271  | 5.54   | * 43.602 | 2.023   | * 0.0  | G | 0 | 0.2   | 4/0   | 2272 | 29137 * |
| * 21/03 05H25 | 05H32 | * S06 | 11 | * 43.560 | 1.480   | 98    | 1     | -270  | 0.13   | * 53.457 | -48.278 | * 17.6 | L | 0 | 0.5   | 4/0   | 2271 | 28971 * |
| * 21/03 07H02 | 07H10 | * C04 | 5  | * 40.470 | 4.569   | 1     | 99    | -1413 | 428.31 | * 39.653 | -47.965 | * 21.9 | L | 1 | 255.0 | 1/0   | 2272 | 29138 * |
| * 21/03 07H02 | 17H15 | * C04 | 5  | * 40.472 | 4.571   | 1     | 99    | -1413 | 428.20 | * 39.650 | -47.963 | * 21.9 | G | 1 | 255.0 | 1/0   | 2272 | 29777 * |
| * 21/03 07H02 | 20H46 | * C04 | 5  | * 40.474 | 4.569   | 1     | 99    | -1413 | 427.96 | * 39.652 | -47.962 | * 21.9 | G | 1 | 255.0 | 1/0   | 2271 | 30160 * |
| * 21/03 08H01 | 08H11 | * S07 | 6  | * 43.555 | 1.480   | 49    | 9     | -117  | 0.54   | * 43.695 | 0.743   | * 0.3  | S | 1 | 0.1   | 4/0   | 2272 | 29234 * |
| * 21/03 08H01 | 08H14 | * S07 | 12 | * 43.578 | 1.380   | 50    | 16    | -283  | 8.40   | * 43.716 | 0.661   | * 0.3  | L | 0 | 0.3   | 4/0   | 2272 | 29227 * |
| * 21/03 08H01 | 09H48 | * S07 | 12 | * 43.574 | 1.401   | 57    | 12    | -282  | 6.60   | * 43.699 | 0.754   | * 0.3  | G | 0 | 0.3   | 4/0   | 2271 | 29345 * |
| * 21/03 08H08 | 21H51 | * C06 | 7  | * 43.557 | 1.475   | 99    | 1     | -284  | 0.54   | * 42.185 | -15.132 | * 6.4  | G | 0 | 0.1   | 4/0   | 2272 | 30249 * |
| * 21/03 08H08 | 05H19 | * C06 | 7  | * 43.551 | 1.475   | 99    | 1     | -284  | 1.03   | * 42.180 | -15.134 | * 6.4  | G | 0 | 0.1   | 4/0   | 2271 | 30613 * |
| * 21/03 08H25 | 08H36 | * S04 | 5  | * 43.554 | 1.488   | 79    | 2     | -288  | 0.85   | * 36.754 | 34.152  | * 12.5 | L | 0 | 3.7   | 4/0   | 2271 | 29305 * |
| * 21/03 08H25 | 10H16 | * S04 | 5  | * 43.553 | 1.487   | 79    | 2     | -287  | 0.86   | * 36.750 | 34.154  | * 12.5 | G | 0 | 3.7   | 4/0   | 2272 | 29381 * |
| * 21/03 09H40 | 09H48 | * S07 | 11 | * 43.560 | 1.482   | 99    | 1     | -289  | 0.18   | * 52.762 | -46.692 | * 17.1 | L | 0 | 0.3   | 4/0   | 2271 | 29346 * |
| * 21/03 09H40 | 17H55 | * S07 | 11 | * 43.561 | 1.481   | 99    | 1     | -289  | 0.22   | * 52.761 | -46.693 | * 17.1 | G | 0 | 0.3   | 4/0   | 2272 | 29835 * |
| * 21/03 09H40 | 19H35 | * S07 | 11 | * 43.559 | 1.483   | 99    | 1     | -289  | 0.16   | * 52.760 | -46.691 | * 17.1 | G | 0 | 0.3   | 4/0   | 2271 | 30001 * |
| * 21/03 10H06 | 10H16 | * S04 | 12 | * 43.558 | 1.483   | 98    | 1     | -291  | 0.25   | * 46.441 | -12.807 | * 5.5  | L | 0 | 0.3   | 4/0   | 2272 | 29382 * |
| * 21/03 10H06 | 11H53 | * S04 | 12 | * 43.559 | 1.478   | 98    | 1     | -291  | 0.20   | * 46.441 | -12.809 | * 5.5  | G | 0 | 0.3   | 4/0   | 2271 | 29469 * |
| * 21/03 10H06 | 20H04 | * S04 | 12 | * 43.560 | 1.478   | 98    | 1     | -291  | 0.24   | * 46.443 | -12.820 | * 5.5  | G | 0 | 0.3   | 4/0   | 2272 | 30077 * |
| * 21/03 11H45 | 11H53 | * S04 | 3  | * 55.418 | -61.617 | 50    | 34    | -317  | 999.99 | * 43.571 | 1.471   | * 19.8 | G | 1 | 0.0   | 0/0   | 2271 | 29470 * |
| * 21/03 11H45 | 20H04 | * S04 | 3  | * 43.573 | 1.474   | 50    | 39    | -290  | 1.62   | * 55.417 | -61.625 | * 21.5 | G | 1 | 0.0   | 0/0   | 2272 | 30078 * |
| * 21/03 11H55 | 12H04 | * C08 | 2  | .....    | .....   | ..... | ..... | 0     | .....  | .....    | .....   | .....  | L | 9 | ..... | ..... | 2272 | 29516 * |

|               |       |       |    |   |        |         |    |       |      |        |          |         |        |   |       |     |      |       |       |   |
|---------------|-------|-------|----|---|--------|---------|----|-------|------|--------|----------|---------|--------|---|-------|-----|------|-------|-------|---|
| * 21/03 11H55 | 15H36 | * C08 | 2  | * | .....  | .....   | 0  | ..... | *    | .....  | *        | .....   | G      | 9 | ..... | ... | 2271 | 29701 | *     |   |
| * 21/03 13H32 | 13H41 | * S06 | 8  | * | 43.561 | 1.482   | 97 | 1     | -297 | 0.20   | * 49.128 | 28.572  | * 10.1 | L | 0     | 0.5 | 4/0  | 2271  | 29539 | * |
| * 21/03 13H41 | 13H51 | * C08 | 12 | * | 43.561 | 1.551   | 61 | 11    | -296 | 5.69   | * 43.533 | 1.233   | * 0.1  | L | 0     | 0.3 | 4/0  | 2272  | 29562 | * |
| * 21/03 13H41 | 15H36 | * C08 | 12 | * | 43.574 | 1.732   | 50 | 56    | -296 | 20.32  | * 43.538 | 1.297   | * 0.2  | G | 0     | 0.6 | 3/0  | 2271  | 29680 | * |
| * 21/03 15H13 | 15H22 | * S06 | 8  | * | 43.563 | 1.481   | 97 | 1     | -163 | 0.37   | * 39.468 | -18.803 | * 7.6  | S | 0     | 0.5 | 4/0  | 2272  | 29606 | * |
| * 21/03 15H25 | 15H36 | * C08 | 9  | * | 43.560 | 1.468   | 98 | 1     | -293 | 1.05   | * 39.845 | -48.109 | * 19.1 | L | 0     | 0.2 | 4/0  | 2271  | 29681 | * |
| * 21/03 15H25 | 01H41 | * C08 | 9  | * | 43.554 | 1.481   | 98 | 1     | -293 | 0.57   | * 39.843 | -48.101 | * 19.1 | G | 0     | 0.2 | 4/0  | 2272  | 30323 | * |
| * 21/03 16H04 | 16H14 | * S03 | 5  | * | 43.560 | 1.471   | 93 | 1     | -247 | 0.76   | * 43.204 | -0.350  | * 0.6  | S | 0     | 0.2 | 4/0  | 2272  | 29721 | * |
| * 21/03 17H47 | 17H55 | * S07 | 2  | * | .....  | .....   | 0  | ..... | *    | .....  | *        | .....   | L      | 9 | ..... | ... | 2272 | 29840 | *     |   |
| * 21/03 17H47 | 19H35 | * S07 | 2  | * | .....  | .....   | 0  | ..... | *    | .....  | *        | .....   | G      | 9 | ..... | ... | 2271 | 30010 | *     |   |
| * 21/03 18H50 | 19H00 | * C04 | 7  | * | 43.558 | 1.479   | 99 | 1     | -282 | 0.23   | * 45.403 | -20.144 | * 7.5  | L | 0     | 0.2 | 4/0  | 2272  | 29925 | * |
| * 21/03 18H50 | 20H46 | * C04 | 7  | * | 43.558 | 1.480   | 99 | 1     | -282 | 0.17   | * 45.405 | -20.148 | * 7.5  | G | 0     | 0.2 | 4/0  | 2271  | 30161 | * |
| * 21/03 19H24 | 19H35 | * S07 | 14 | * | 43.557 | 1.479   | 96 | 1     | -282 | 0.34   | * 40.586 | -13.583 | * 5.6  | L | 0     | 0.6 | 4/0  | 2271  | 30002 | * |
| * 21/03 19H24 | 21H12 | * S07 | 14 | * | 43.565 | 1.485   | 96 | 1     | -282 | 0.74   | * 40.593 | -13.582 | * 5.6  | G | 0     | 0.6 | 4/0  | 2272  | 30204 | * |
| * 21/03 19H52 | 20H04 | * S04 | 5  | * | 43.559 | 1.479   | 99 | 1     | -279 | 0.13   | * 46.555 | 16.307  | * 5.7  | L | 0     | 0.2 | 4/0  | 2272  | 30079 | * |
| * 21/03 19H52 | 21H43 | * S04 | 5  | * | 43.558 | 1.487   | 99 | 1     | -280 | 0.53   | * 46.553 | 16.316  | * 5.7  | G | 0     | 0.2 | 4/0  | 2271  | 30233 | * |
| * 21/03 19H52 | 10H05 | * S04 | 5  | * | 43.568 | 1.478   | 98 | 1     | -279 | 0.95   | * 46.564 | 16.312  | * 5.7  | G | 0     | 0.2 | 4/0  | 2272  | 31100 | * |
| * 21/03 19H55 | 21H51 | * C06 | 6  | * | 43.561 | 1.484   | 79 | 1     | -280 | 0.32   | * 42.409 | 14.681  | * 5.0  | G | 0     | 0.4 | 4/0  | 2272  | 30250 | * |
| * 21/03 19H55 | 05H19 | * C06 | 6  | * | 43.559 | 1.490   | 79 | 1     | -280 | 0.77   | * 42.407 | 14.680  | * 5.0  | G | 0     | 0.4 | 4/0  | 2271  | 30614 | * |
| * 21/03 21H05 | 21H12 | * S07 | 3  | * | 31.232 | -60.586 | 50 | 17    | -190 | 999.99 | * 43.542 | 1.484   | * 25.9 | G | 0     | 0.0 | 0/0  | 2272  | 30205 | * |
| * 21/03 21H05 | 06H06 | * S07 | 3  | * | 31.236 | -60.589 | 50 | 17    | -189 | 999.99 | * 43.547 | 1.483   | * 25.9 | G | 0     | 0.0 | 0/0  | 2271  | 30697 | * |
| * 21/03 21H33 | 21H43 | * S04 | 11 | * | 43.557 | 1.485   | 98 | 1     | -280 | 0.40   | * 36.851 | -30.859 | * 12.3 | L | 0     | 0.4 | 4/0  | 2271  | 30234 | * |
| * 21/03 21H33 | 08H23 | * S04 | 11 | * | 43.559 | 1.485   | 98 | 1     | -279 | 0.36   | * 36.853 | -30.858 | * 12.3 | G | 0     | 0.3 | 4/0  | 2271  | 30977 | * |
| * 21/03 21H33 | 10H05 | * S04 | 11 | * | 43.566 | 1.479   | 98 | 1     | -279 | 0.76   | * 36.859 | -30.866 | * 12.3 | G | 0     | 0.3 | 4/0  | 2272  | 31101 | * |
| * 21/03 21H41 | 21H51 | * C06 | 6  | * | 43.557 | 1.481   | 98 | 1     | -278 | 0.24   | * 46.965 | -38.801 | * 13.7 | L | 0     | 0.3 | 4/0  | 2272  | 30251 | * |
| * 21/03 21H41 | 05H19 | * C06 | 6  | * | 43.557 | 1.477   | 98 | 1     | -278 | 0.41   | * 46.965 | -38.801 | * 13.7 | G | 0     | 0.3 | 4/0  | 2271  | 30615 | * |
| * 22/03 01H29 | 01H41 | * C08 | 5  | * | 43.557 | 1.483   | 99 | 1     | -277 | 0.30   | * 41.325 | 30.786  | * 11.2 | L | 0     | 0.4 | 4/0  | 2272  | 30384 | * |
| * 22/03 03H15 | 03H25 | * C08 | 14 | * | 43.558 | 1.480   | 99 | 1     | -275 | 0.13   | * 45.414 | -21.260 | * 7.8  | L | 0     | 0.1 | 4/0  | 2272  | 30437 | * |
| * 22/03 03H34 | 03H43 | * S06 | 13 | * | 43.555 | 1.503   | 85 | 3     | -275 | 1.85   | * 42.881 | 4.823   | * 1.1  | L | 0     | 0.5 | 4/0  | 2271  | 30451 | * |
| * 22/03 05H14 | 05H22 | * S06 | 6  | * | 43.556 | 1.474   | 97 | 1     | -140 | 0.61   | * 52.127 | -43.061 | * 15.9 | S | 0     | 0.6 | 4/0  | 2272  | 30639 | * |
| * 22/03 05H45 | 07H38 | * C04 | 12 | * | 43.558 | 1.477   | 99 | 1     | -275 | 0.32   | * 42.238 | -14.882 | * 6.3  | G | 0     | 0.1 | 4/0  | 2271  | 30836 | * |
| * 22/03 05H58 | 06H07 | * S03 | 9  | * | 43.555 | 1.477   | 99 | 1     | -229 | 0.55   | * 48.101 | -22.486 | * 8.9  | S | 0     | 0.2 | 4/0  | 2272  | 30705 | * |
| * 22/03 06H51 | 07H02 | * C06 | 3  | * | 44.701 | 19.683  | 50 | 8     | -345 | 999.99 | * 43.560 | 1.485   | * 6.9  | G | 0     | 0.0 | 0/0  | 2272  | 30760 | * |
| * 22/03 06H51 | 18H50 | * C06 | 3  | * | 43.558 | 1.482   | 50 | 8     | -275 | 0.22   | * 44.699 | 19.682  | * 6.2  | G | 0     | 0.0 | 0/0  | 2271  | 31657 | * |
| * 22/03 07H39 | 07H49 | * S07 | 5  | * | 43.553 | 1.485   | 99 | 1     | -111 | 0.81   | * 41.616 | 11.318  | * 3.6  | S | 0     | 0.1 | 4/0  | 2272  | 30906 | * |
| * 22/03 07H39 | 07H51 | * S07 | 13 | * | 43.557 | 1.487   | 99 | 1     | -277 | 0.59   | * 41.618 | 11.368  | * 3.6  | L | 0     | 0.1 | 4/0  | 2272  | 30902 | * |
| * 22/03 08H36 | 08H46 | * C06 | 4  | * | 43.558 | 1.471   | 74 | 1     | -277 | 0.82   | * 40.721 | -32.263 | * 12.8 | L | 1     | 0.3 | 4/0  | 2272  | 31006 | * |
| * 22/03 08H36 | 18H50 | * C06 | 4  | * | 43.557 | 1.467   | 74 | 1     | -277 | 1.10   | * 40.720 | -32.264 | * 12.8 | G | 1     | 0.3 | 4/0  | 2271  | 31658 | * |
| * 22/03 09H19 | 09H27 | * S07 | 8  | * | 43.556 | 1.477   | 99 | 1     | -113 | 0.47   | * 50.702 | -35.907 | * 13.6 | S | 0     | 0.2 | 4/0  | 2272  | 31040 | * |
| * 22/03 09H19 | 09H27 | * S07 | 13 | * | 43.560 | 1.480   | 99 | 1     | -279 | 0.13   | * 50.801 | -35.975 | * 13.6 | L | 0     | 0.2 | 4/0  | 2272  | 31033 | * |
| * 22/03 09H19 | 17H32 | * S07 | 13 | * | 43.560 | 1.480   | 99 | 1     | -279 | 0.11   | * 50.799 | -35.979 | * 13.6 | G | 0     | 0.2 | 4/0  | 2272  | 31525 | * |
| * 22/03 09H53 | 10H05 | * S04 | 9  | * | 43.559 | 1.470   | 97 | 2     | -284 | 0.90   | * 45.225 | -6.870  | * 3.3  | L | 0     | 0.3 | 4/0  | 2271  | 31902 | * |
| * 22/03 09H53 | 11H40 | * S04 | 9  | * | 43.559 | 1.470   | 97 | 2     | -284 | 0.90   | * 45.224 | -6.868  | * 3.3  | G | 0     | 0.3 | 4/0  | 2272  | 31219 | * |
| * 22/03 11H33 | 11H40 | * S04 | 8  | * | 43.558 | 1.484   | 99 | 1     | -285 | 0.33   | * 54.660 | -54.988 | * 19.7 | L | 0     | 0.5 | 4/0  | 2272  | 31220 | * |
| * 22/03 11H33 | 18H08 | * S04 | 8  | * | 43.558 | 1.482   | 99 | 1     | -285 | 0.20   | * 54.654 | -54.996 | * 19.7 | G | 0     | 0.5 | 4/0  | 2272  | 31586 | * |

Zones géographiques BORDE/MARSA numero de dossier xxx

Nombre total de lignes (localisées + détectées) : 136 + 10 = 146

Nombre de localisées : 136

Nombre de balises-passage : 81

Nombre de localisations uniques : 76

Date première loc : 19/03/1999 10:31

Date dernière loc : 22/03/1999 11:33

Durée de l'émission : 73H 1mn

Reference pour calcul des erreurs : lat=+43.559 long= -1.481

RUB 33 N°5

Selected Field :

406 message : 96EE2EC0057FDFFD2535F583E0FAA8

406 message : 96EE2EC0057FDFFD2535F583E0FAA8

15 hexa : 2DDC5D800AFFBFF

Beacon ID : 2DDC5D800A / 2DDC5D800AFFBFF

Message Format : Long Message  
Protocol Flag : Standard Protocol  
Country Code : 366 USA  
User Protocol Type : Test  
Test beacon data : 2EC005 / ?1??  
Coded position : xx xx.xx/xxx xx.xx  
Coded offset : xx.xx/ xx.xx  
Calculated position : xx xx.xx/xxx xx.xx  
E.C.C 1 : 1494D7  
Reprocessed E.C.C 1 : 1494D7  
Encoded Position Data Source : External  
Homing : 121.500 Mhz  
E.C.C 2 : AA8  
Reprocessed E.C.C 2 : AA8

Default position  
at the beginning of test

Incoherencies :

None

RLB 33 N° 5

Selected Field :

406 message : 96EE2EC0052C002332C9B569FCC483

406 message : 96EE2EC0052C002332C9B569FCC483

15 hexa : 2DDC5D800A58004

Beacon ID : 2DDC5D800A / 2DDC5D800AFFBFF

Message Format : Long Message  
Protocol Flag : Standard Protocol  
Country Code : 366 USA  
User Protocol Type : Test  
Test beacon data : 2EC005 / ?I??  
Coded position : 44 00.0N/001 00.0E  
Coded offset : -26.47/ 28.80  
Calculated position : 43 33.5N/001 28.8E  
E.C.C 1 : OCCB26  
Reprocessed E.C.C 1 : OCCB26  
Encoded Position Data Source : External  
Homing : 121.500 Mhz  
E.C.C 2 : 483  
Reprocessed E.C.C 2 : 483

} → 43° 33' 28.2" N } OK  
1° 28' 48" E }

ITS LAB REFERENCE POSITION

43° 33' 28" N } → External  
1° 28' 48" E } GPS Data

Incoherencies :

Difference: 0.3" N

None

## COMPARISON LEVEL

LUT 2272

Pass N° 056 ( S7 )

|               |   | 001 Reference beacon  |                   | Date       | UT Time  |      | Freq          | Level dB |   |
|---------------|---|-----------------------|-------------------|------------|----------|------|---------------|----------|---|
| 6             | 6 | ce300000000000dbd0e40 | 7830240           | 19/03/1999 | 10:24:00 | 2384 | 406033417.677 | -117     | 1 |
| 6             | 6 | ce300000000000dbd0e40 | 7810243           | 19/03/1999 | 10:24:30 | 2395 | 406033327.907 | -118     | 1 |
| 6             | 6 | ce300000000000dbd0e40 | 7810250           | 19/03/1999 | 10:25:00 | 2406 | 406033213.485 | -116     | 1 |
| 6             | 6 | ce300000000000dbd0e40 | 7810253           | 19/03/1999 | 10:25:30 | 2416 | 406033066.906 | -118     | 1 |
| 6             | 6 | ce300000000000dbd0e40 | 7810260           | 19/03/1999 | 10:26:00 | 2427 | 406032881.393 | -118     | 1 |
| 6             | 6 | ce300000000000dbd0e40 | 7810263           | 19/03/1999 | 10:26:30 | 2438 | 406032646.082 | -113     | 1 |
| 6             | 6 | ce300000000000dbd0e40 | 7810270           | 19/03/1999 | 10:27:00 | 2449 | 406032349.004 | -117     | 1 |
| 6             | 6 | ce300000000000dbd0e40 | 7810273           | 19/03/1999 | 10:27:30 | 2460 | 406031972.583 | -115     | 1 |
| 6             | 6 | ce300000000000dbd0e40 | 7810280           | 19/03/1999 | 10:28:00 | 2471 | 406031497.827 | -114     | 1 |
| 6             | 6 | ce300000000000dbd0e40 | 7810283           | 19/03/1999 | 10:28:30 | 2286 | 406030900.732 | -116     | 1 |
| 6             | 6 | ce300000000000dbd0e40 | 7810290           | 19/03/1999 | 10:29:00 | 2297 | 406030155.297 | -113     | 1 |
| 6             | 6 | ce300000000000dbd0e40 | 7810300           | 19/03/1999 | 10:30:00 | 2318 | 406028151.860 | -121     | 1 |
| 6             | 6 | ce300000000000dbd0e40 | 7810303           | 19/03/1999 | 10:30:30 | 2329 | 406026900.332 | -114     | 1 |
| 6             | 6 | ce300000000000dbd0e40 | 7810310           | 19/03/1999 | 10:31:00 | 2340 | 406025537.294 | -110     | 1 |
| 6             | 6 | ce300000000000dbd0e40 | 7810313           | 19/03/1999 | 10:31:30 | 2351 | 406024140.929 | -113     | 1 |
| 6             | 6 | ce300000000000dbd0e40 | 7810320           | 19/03/1999 | 10:32:00 | 2362 | 406022799.079 | -113     | 1 |
| 6             | 6 | ce300000000000dbd0e40 | 7810323           | 19/03/1999 | 10:32:30 | 2373 | 406021583.079 | -111     | 1 |
| 6             | 6 | ce300000000000dbd0e40 | 7810330           | 19/03/1999 | 10:33:00 | 2384 | 406020534.757 | -123     | 1 |
| 6             | 6 | ce300000000000dbd0e40 | 7810333           | 19/03/1999 | 10:33:30 | 2395 | 406019663.585 | -114     | 1 |
| 6             | 6 | ce300000000000dbd0e40 | 7810340           | 19/03/1999 | 10:34:00 | 2406 | 406018956.783 | -111     | 1 |
| 6             | 6 | ce300000000000dbd0e40 | 7810343           | 19/03/1999 | 10:34:30 | 2416 | 406018391.581 | -109     | 1 |
| 6             | 6 | ce300000000000dbd0e40 | 7810350           | 19/03/1999 | 10:35:00 | 2427 | 406017943.099 | -111     | 1 |
| 6             | 6 | ce300000000000dbd0e40 | 7810353           | 19/03/1999 | 10:35:30 | 2438 | 406017588.991 | -110     | 1 |
| 6             | 6 | ce300000000000dbd0e40 | 7810360           | 19/03/1999 | 10:36:00 | 2449 | 406017308.973 | -114     | 1 |
| 6             | 6 | ce300000000000dbd0e40 | 7810363           | 19/03/1999 | 10:36:30 | 2460 | 406017088.002 | -114     | 1 |
| 6             | 6 | ce300000000000dbd0e40 | 7810370           | 19/03/1999 | 10:37:00 | 2471 | 406016913.863 | -114     | 1 |
| 6             | 6 | ce300000000000dbd0e40 | 7810373           | 19/03/1999 | 10:37:30 | 2482 | 406016777.569 | -117     | 1 |
| 6             | 6 | ce300000000000dbd0e40 | 7810380           | 19/03/1999 | 10:38:00 | 2493 | 406016670.962 | -122     | 1 |
| Min Ref level |   |                       | -123              |            |          |      |               |          |   |
| Max Ref level |   |                       | -109              |            |          |      |               |          |   |
|               |   |                       | Average ref level |            |          |      |               | -114,9   |   |

|                  |    | N°5 RLB33 ACR beacon   |                      | Date       | UT Time  |      | Freq          | Level dB |   |
|------------------|----|------------------------|----------------------|------------|----------|------|---------------|----------|---|
| 76               | 23 | 96ee2ec0057fdffd2535f5 | 83e0faa8             | 19/03/1999 | 10:25:56 | 6151 | 406032612.699 | -122     | 1 |
| 76               | 23 | 96ee2ec0057fdffd2535f5 | 83e0faa8             | 19/03/1999 | 10:26:48 | 6170 | 406032179.010 | -121     | 1 |
| 76               | 23 | 96ee2ec0057fdffd2535f5 | 83e0faa8             | 19/03/1999 | 10:27:40 | 2660 | 406031533.033 | -117     | 1 |
| 76               | 23 | 96ee2ec0057fdffd2535f5 | 83e0faa8             | 19/03/1999 | 10:28:31 | 6208 | 406030576.515 | -121     | 1 |
| 76               | 23 | 96ee2ec0057fdffd2535f5 | 83e0faa8             | 19/03/1999 | 10:29:22 | 6226 | 406029197.742 | -119     | 1 |
| 76               | 23 | 96ee2ec0057fdffd2535f5 | 83e0faa8             | 19/03/1999 | 10:30:13 | 3107 | 406027331.389 | -118     | 1 |
| 76               | 23 | 96ee2ec0057fdffd2535f5 | 83e0faa8             | 19/03/1999 | 10:31:03 | 6851 | 406025085.804 | -113     | 1 |
| 76               | 23 | 96ee2ec0057fdffd2535f5 | 83e0faa8             | 19/03/1999 | 10:31:53 | 7065 | 406022789.918 | -127     | 1 |
| 76               | 23 | 96ee2ec0057fdffd2535f5 | 83e0faa8             | 19/03/1999 | 10:32:43 | 4338 | 406020807.730 | -122     | 1 |
| 76               | 23 | 96ee2ec0057fdffd2535f5 | 83e0faa8             | 19/03/1999 | 10:33:32 | 8082 | 406019303.084 | -127     | 1 |
| 76               | 23 | 96ee2ec0057fdffd2535f5 | 83e0faa8             | 19/03/1999 | 10:34:21 | 8688 | 406018242.770 | -119     | 1 |
| 76               | 23 | 96ee2ec0057fdffd2535f5 | 83e0faa8             | 19/03/1999 | 10:35:10 | 5960 | 406017517.194 | -118     | 1 |
| 76               | 23 | 96ee2ec0057fdffd2535f5 | 83e0faa8             | 19/03/1999 | 10:36:02 | 9313 | 406016993.208 | -127     | 1 |
| Min RLB 33 level |    |                        | -127                 |            |          |      |               |          |   |
| Max RLB 33 level |    |                        | -113                 |            |          |      |               |          |   |
|                  |    |                        | Average RLB 33 level |            |          |      |               | -120,8   |   |

## RLB 33 N° 5 SATELLITE TEST DATA RESULTS

|     |     | N°5 RLB33 ACR beacon   |          | Date       | UT Time        | Freq          | Level dB | Max   |
|-----|-----|------------------------|----------|------------|----------------|---------------|----------|-------|
| 56  |     |                        |          |            |                |               |          |       |
| 76  | 23  | 96ee2ec0057fdffd2535f5 | 83e0faa8 | 19/03/1999 | 10:25:56 .6151 | 406032612.699 | -122     |       |
| 76  | 23  | 96ee2ec0057fdffd2535f5 | 83e0faa8 | 19/03/1999 | 10:26:48 .6170 | 406032179.010 | -121     |       |
| 76  | 23  | 96ee2ec0057fdffd2535f5 | 83e0faa8 | 19/03/1999 | 10:27:40 .2660 | 406031533.033 | -117     |       |
| 76  | 23  | 96ee2ec0057fdffd2535f5 | 83e0faa8 | 19/03/1999 | 10:28:31 .6208 | 406030576.515 | -121     |       |
| 76  | 23  | 96ee2ec0057fdffd2535f5 | 83e0faa8 | 19/03/1999 | 10:29:22 .6226 | 406029197.742 | -119     |       |
| 76  | 23  | 96ee2ec0057fdffd2535f5 | 83e0faa8 | 19/03/1999 | 10:30:13 .3107 | 406027331.389 | -118     |       |
| 76  | 23  | 96ee2ec0057fdffd2535f5 | 83e0faa8 | 19/03/1999 | 10:31:03 .6851 | 406025085.804 | -113     | -113  |
| 76  | 23  | 96ee2ec0057fdffd2535f5 | 83e0faa8 | 19/03/1999 | 10:31:53 .7065 | 406022789.918 | -127     |       |
| 76  | 23  | 96ee2ec0057fdffd2535f5 | 83e0faa8 | 19/03/1999 | 10:32:43 .4338 | 406020807.730 | -122     |       |
| 76  | 23  | 96ee2ec0057fdffd2535f5 | 83e0faa8 | 19/03/1999 | 10:33:32 .8082 | 406019303.084 | -127     |       |
| 76  | 23  | 96ee2ec0057fdffd2535f5 | 83e0faa8 | 19/03/1999 | 10:34:21 .8688 | 406018242.770 | -119     |       |
| 76  | 23  | 96ee2ec0057fdffd2535f5 | 83e0faa8 | 19/03/1999 | 10:35:10 .5960 | 406017517.194 | -118     |       |
| 76  | 23  | 96ee2ec0057fdffd2535f5 | 83e0faa8 | 19/03/1999 | 10:36:02 .9313 | 406016993.208 | -127     |       |
| --- | --- | -----                  | -----    | -----      | -----          | -----         | -----    | ----- |
| 72  |     |                        |          |            |                |               |          |       |
| 49  | 20  | 96ee2ec0052c002332c9b5 | 69fcc483 | 19/03/1999 | 18:39:47 .8841 | 406022106.727 | -119     |       |
| --- | --- | -----                  | -----    | -----      | -----          | -----         | -----    | ----- |
| 76  |     |                        |          |            |                |               |          |       |
| 13  | 11  | 96ee2ec0052c002332c9b5 | 69fcc483 | 19/03/1999 | 20:14:04 .1090 | 406033124.088 | -120     |       |
| 13  | 11  | 96ee2ec0052c002332c9b5 | 69fcc483 | 19/03/1999 | 20:14:52 .8363 | 406032648.792 | -112     |       |
| 13  | 11  | 96ee2ec0052c002332c9b5 | 69fcc483 | 19/03/1999 | 20:15:45 .1519 | 406031716.348 | -109     | -109  |
| 13  | 11  | 96ee2ec0052c002332c9b5 | 69fcc483 | 19/03/1999 | 20:16:37 .1538 | 406029958.394 | -112     |       |
| 13  | 11  | 96ee2ec0052c002332c9b5 | 69fcc483 | 19/03/1999 | 20:17:28 .8223 | 406026912.303 | -120     |       |
| 13  | 11  | 96ee2ec0052c002332c9b5 | 69fcc483 | 19/03/1999 | 20:18:20 .1575 | 406023011.908 | -118     |       |
| 13  | 11  | 96ee2ec0052c002332c9b5 | 69fcc483 | 19/03/1999 | 20:19:11 .1790 | 406019829.075 | -114     |       |
| 13  | 11  | 96ee2ec0052c002332c9b5 | 69fcc483 | 19/03/1999 | 20:20:01 .8671 | 406017949.564 | -118     |       |
| 13  | 11  | 96ee2ec0052c002332c9b5 | 69fcc483 | 19/03/1999 | 20:20:52 .2219 | 406016944.559 | -117     |       |
| 13  | 11  | 96ee2ec0052c002332c9b5 | 69fcc483 | 19/03/1999 | 20:21:42 .2629 | 406016399.845 | -116     |       |
| 13  | 11  | 96ee2ec0052c002332c9b5 | 69fcc483 | 19/03/1999 | 20:22:31 .9706 | 406016093.305 | -117     |       |
| 13  | 11  | 96ee2ec0052c002332c9b5 | 69fcc483 | 19/03/1999 | 20:23:21 .3645 | 406015918.911 | -124     |       |
| 13  | 11  | 96ee2ec0052c002332c9b5 | 69fcc583 | 19/03/1999 | 20:24:10 .4251 | 406015821.043 | -129     |       |
| --- | --- | -----                  | -----    | -----      | -----          | -----         | -----    | ----- |
| 97  |     |                        |          |            |                |               |          |       |
| 12  | 9   | 96ee2ec0052c002332c9b5 | 69fcc483 | 20/03/1999 | 08:18:11 .8687 | 406033490.065 | -128     |       |
| 12  | 9   | 96ee2ec0052c002332c9b5 | 69fcc483 | 20/03/1999 | 08:19:01 .9001 | 406033283.133 | -128     |       |
| 12  | 9   | 96ee2ec0052c002332c9b5 | 69fcc483 | 20/03/1999 | 08:19:51 .6068 | 406032935.066 | -123     |       |
| 12  | 9   | 96ee2ec0052c002332c9b5 | 69fcc481 | 20/03/1999 | 08:20:41 .0079 | 406032344.012 | -120     |       |
| 12  | 9   | 96ee2ec0052c002332c9b5 | 69ece4a2 | 20/03/1999 | 08:22:18 .7981 | 406029558.108 | -127     |       |
| 12  | 9   | 96ee2ec0052c002332c9b5 | 69fcc483 | 20/03/1999 | 08:23:11 .1019 | 406026530.600 | -115     |       |
| 12  | 9   | 96ee2ec0052c002332c9b5 | 69fcc483 | 20/03/1999 | 08:24:03 .1000 | 406022861.271 | -120     |       |
| 12  | 9   | 96ee2ec0052c002332c9b5 | 69fcc483 | 20/03/1999 | 08:24:54 .7736 | 406019875.623 | -111     | -111  |
| 12  | 9   | 96ee2ec0052c002332c9b5 | 69fcc483 | 20/03/1999 | 08:25:46 .1035 | 406018042.851 | -117     |       |
| 12  | 9   | 96ee2ec0052c002332c9b5 | 69fcc483 | 20/03/1999 | 08:26:37 .1278 | 406017019.230 | -119     |       |
| 12  | 9   | 96ee2ec0052c002332c9b5 | 69fcc483 | 20/03/1999 | 08:27:27 .8083 | 406016445.687 | -119     |       |
| 12  | 9   | 96ee2ec0052c002332c9b5 | 69fcc483 | 20/03/1999 | 08:28:18 .1834 | 406016115.019 | -124     |       |
| 12  | 9   | 96ee2ec0052c002332c9b5 |          | 20/03/1999 | 08:29:08 .2147 | 406015922.306 | -133     |       |
| --- | --- | -----                  | -----    | -----      | -----          | -----         | -----    | ----- |
| 103 |     |                        |          |            |                |               |          |       |
| 8   | 8   | 96ee2ec0052c002332c9b5 | 69fcc483 | 20/03/1999 | 11:57:50 .7492 | 406024698.960 | -134     |       |
| 8   | 8   | 96ee2ec0052c002332c9b5 | 69fcc483 | 20/03/1999 | 11:58:43 .0648 | 406023526.719 | -132     |       |

|     |     | N°5 RLB33 ACR beacon   |          | Date       | UT Time  |       | Freq          | Level dB | Max  |
|-----|-----|------------------------|----------|------------|----------|-------|---------------|----------|------|
| 114 |     |                        |          |            |          |       |               |          |      |
| 27  | 17  | 96ee2ec0052c002332c9b5 | 69fcc483 | 20/03/1999 | 18:04:09 | .9058 | 406030637.092 | -116     |      |
| 27  | 17  | 96ee2ec0052c002332c9b5 | 69fcc483 | 20/03/1999 | 18:05:49 | .6629 | 406026845.935 | -116     | -116 |
| 27  | 17  | 96ee2ec0052c002332c9b5 | 69ecc483 | 20/03/1999 | 18:06:39 | .0450 | 406024240.164 | -118     |      |
| 27  | 17  | 96ee2ec0052c002332c9b5 | 6dfcc483 | 20/03/1999 | 18:09:09 | .1580 | 406018340.374 | -118     |      |
| 27  | 17  | 96ee2ec0052c002332c9b5 | 6bfcc483 | 20/03/1999 | 18:13:25 | .8645 | 406016086.105 | -129     |      |
| --- | --- | -----                  | -----    | -----      | -----    |       |               |          |      |
| 120 |     |                        |          |            |          |       |               |          |      |
| 53  | 9   | 96ee2ec0052c002332c9b5 | 69fcc483 | 20/03/1999 | 20:01:10 | .4883 | 406033098.384 | -122     |      |
| 53  | 9   | 96ee2ec0052c002332c9b5 | 69fcc483 | 20/03/1999 | 20:02:02 | .1568 | 406032635.086 | -115     |      |
| 53  | 9   | 96ee2ec0052c002332c9b5 | 69fcc483 | 20/03/1999 | 20:02:53 | .4920 | 406031824.226 | -118     |      |
| 53  | 9   | 96ee2ec0052c002332c9b5 | 69fcc483 | 20/03/1999 | 20:03:44 | .4939 | 406030385.555 | -110     | -110 |
| 53  | 9   | 96ee2ec0052c002332c9b5 | 69fcc483 | 20/03/1999 | 20:04:35 | .1820 | 406027955.639 | -114     |      |
| 53  | 9   | 96ee2ec0052c002332c9b5 | 69fcc483 | 20/03/1999 | 20:05:25 | .5564 | 406024579.288 | -117     |      |
| 53  | 9   | 96ee2ec0052c002332c9b5 | 69fcc483 | 20/03/1999 | 20:08:43 | .7400 | 406016824.428 | -114     |      |
| 53  | 9   | 96ee2ec0052c002332c9b5 | 69fcc483 | 20/03/1999 | 20:09:32 | .4869 | 406016376.212 | -118     |      |
| 53  | 9   | 96ee2ec0052c002332c9b5 | 69fcc483 | 20/03/1999 | 20:10:24 | .8025 | 406016095.162 | -118     |      |
| 53  | 9   | 96ee2ec0052c002332c9b5 | 69fcc483 | 20/03/1999 | 20:11:14 | .1769 | 406015939.663 | -122     |      |
| 53  | 9   | 96ee2ec0052c002332c9b5 | 69fcc483 | 20/03/1999 | 20:12:03 | .2375 | 406015852.764 | -131     |      |
| 53  | 9   | 96ee2ec0052c002332c9b5 | 69fcc483 | 20/03/1999 | 20:12:51 | .9843 | 406015808.663 | -131     |      |
| --- | --- | -----                  | -----    | -----      | -----    |       |               |          |      |
| 140 |     |                        |          |            |          |       |               |          |      |
| 70  | 19  | 96ee2ec0052c002332c9b5 | 69fcc483 | 21/03/1999 | 07:56:48 | .4283 | 406033539.996 | -123     |      |
| 70  | 19  | 96ee2ec0052c002332c9b5 | 69fcc483 | 21/03/1999 | 07:57:38 | .1541 | 406033303.371 | -120     |      |
| 70  | 19  | 96ee2ec0052c002332c9b5 | 69fcc483 | 21/03/1999 | 07:58:27 | .5361 | 406032881.841 | -119     |      |
| 70  | 19  | 96ee2ec0052c002332c9b5 | 69fcc483 | 21/03/1999 | 08:00:57 | .6301 | 406027720.142 | -129     |      |
| 70  | 19  | 96ee2ec0052c002332c9b5 | 69fcc483 | 21/03/1999 | 08:01:49 | .6283 | 406023524.808 | -117     |      |
| 70  | 19  | 96ee2ec0052c002332c9b5 | 69fcc483 | 21/03/1999 | 08:02:41 | .3018 | 406019919.829 | -111     | -111 |
| 70  | 19  | 96ee2ec0052c002332c9b5 | 69fcc483 | 21/03/1999 | 08:03:32 | .6317 | 406017848.587 | -112     |      |
| 70  | 19  | 96ee2ec0052c002332c9b5 | 69fcc483 | 21/03/1999 | 08:04:23 | .6560 | 406016794.986 | -114     |      |
| 70  | 19  | 96ee2ec0052c002332c9b5 | 69fcc483 | 21/03/1999 | 08:05:14 | .3365 | 406016248.162 | -115     |      |
| 70  | 19  | 96ee2ec0052c002332c9b5 | 69fcc483 | 21/03/1999 | 08:06:04 | .7116 | 406015950.655 | -118     |      |
| 70  | 19  | 96ee2ec0052c002332c9b5 | 69fcc483 | 21/03/1999 | 08:06:54 | .7429 | 406015785.949 | -123     |      |
| 70  | 19  | 96ee2ec0052c002332c9b5 | 69fcc483 | 21/03/1999 | 08:07:44 | .4496 | 406015697.902 | -133     |      |
| --- | --- | -----                  | -----    | -----      | -----    |       |               |          |      |
| 146 |     |                        |          |            |          |       |               |          |      |
| 3   | 3   | 96ee2ec0052c002332c9b5 | 69fcc483 | 21/03/1999 | 09:58:53 | .8296 | 406033505.540 | -124     |      |
| 3   | 3   | 96ee2ec0052c002332c9b5 | 69fcc483 | 21/03/1999 | 10:01:21 | .0114 | 406033072.058 | -124     |      |
| 3   | 3   | 96ee2ec0052c002332c9b5 | 69fcc483 | 21/03/1999 | 10:02:13 | .3270 | 406032688.057 | -118     |      |
| 3   | 3   | 96ee2ec0052c002332c9b5 | 69fcc483 | 21/03/1999 | 10:03:05 | .3093 | 406032051.489 | -118     |      |
| 3   | 3   | 96ee2ec0052c002332c9b5 | 69fcc483 | 21/03/1999 | 10:03:56 | .9779 | 406030985.727 | -119     |      |
| 3   | 3   | 96ee2ec0052c002332c9b5 | 69fcc483 | 21/03/1999 | 10:05:39 | .3345 | 406026611.395 | -114     |      |
| 3   | 3   | 96ee2ec0052c002332c9b5 | 69fcc483 | 21/03/1999 | 10:07:20 | .3774 | 406020721.560 | -111     | -111 |
| 3   | 3   | 96ee2ec0052c002332c9b5 | 69fcc483 | 21/03/1999 | 10:08:10 | .4184 | 406018807.282 | -113     |      |
| 3   | 3   | 96ee2ec0052c002332c9b5 | 69fcc483 | 21/03/1999 | 10:09:49 | .5201 | 406016913.603 | -117     |      |
| 3   | 3   | 96ee2ec0052c002332c9b5 | 69fcc483 | 21/03/1999 | 10:10:38 | .5807 | 406016480.423 | -120     |      |
| 3   | 3   | 96ee2ec0052c002332c9b5 | 69fcc483 | 21/03/1999 | 10:11:27 | .3079 | 406016212.522 | -121     |      |
| 3   | 3   | 96ee2ec0052c002332c9b5 | 69fcc483 | 21/03/1999 | 10:12:19 | .6236 | 406016037.125 | -134     |      |
| --- | --- | -----                  | -----    | -----      | -----    |       |               |          |      |
| 159 |     |                        |          |            |          |       |               |          |      |
| 52  | 15  | 96ee2ec0052c002332c9b5 | 69fcc483 | 21/03/1999 | 17:43:36 | .1911 | 406027201.313 | -114     |      |
| 52  | 15  | 96ee2ec0052c002332c9b5 | 69fcc483 | 21/03/1999 | 17:47:47 | .6844 | 406018610.934 | -119     |      |

|     |    | N°5 RLB33 ACR beacon   |          | Date       | UT Time  |      | Freq          | Level dB | Max  |
|-----|----|------------------------|----------|------------|----------|------|---------------|----------|------|
| 165 |    |                        |          |            |          |      |               |          |      |
| 60  | 20 | 96ee2ec0052c002332c9b5 | 69fcc483 | 21/03/1999 | 19:49:54 | 9964 | 406031883.725 | -121     |      |
| 60  | 20 | 96ee2ec0052c002332c9b5 | 69fcc483 | 21/03/1999 | 19:50:46 | 3316 | 406030717.056 | -108     | -108 |
| 60  | 20 | 96ee2ec0052c002332c9b5 | 69bcc483 | 21/03/1999 | 19:52:28 | 0216 | 406026114.660 | -116     |      |
| 60  | 20 | 96ee2ec0052c002332c9b5 | 69fdc681 | 21/03/1999 | 19:56:36 | 5796 | 406016873.347 | -121     |      |
| 60  | 20 | 96ee2ec0052c002332c9b5 | 69fcc483 | 21/03/1999 | 19:58:17 | 6421 | 406016193.200 | -125     |      |
| 168 |    |                        |          |            |          |      |               |          |      |
| 26  | 11 | 96ee2ec0052c002332c9b5 | 69fcc581 | 21/03/1999 | 21:03:12 | 1605 | 406027390.657 | -137     |      |
| 26  | 11 | 96ee2ec0052c002332c9b5 | 69fcc483 | 21/03/1999 | 21:04:52 | 5668 | 406025463.270 | -135     |      |
| 26  | 11 | 96ee2ec0052c002332c9b5 | 69fcc483 | 21/03/1999 | 21:06:31 | 6556 | 406023457.618 | -137     |      |
| 188 |    |                        |          |            |          |      |               |          |      |
| 51  | 19 | 96ee2ec0052c002332c9b5 | 69fcc483 | 22/03/1999 | 07:33:43 | 6838 | 406033526.145 | -123     |      |
| 51  | 19 | 96ee2ec0052c002332c9b5 | 69fcc483 | 22/03/1999 | 07:36:16 | 7185 | 406032620.359 | -115     |      |
| 51  | 19 | 96ee2ec0052c002332c9b5 | 69fcc483 | 22/03/1999 | 07:37:08 | 3730 | 406031750.311 | -114     |      |
| 51  | 19 | 96ee2ec0052c002332c9b5 | 69fcc483 | 22/03/1999 | 07:38:50 | 7271 | 406027470.557 | -110     |      |
| 51  | 19 | 96ee2ec0052c002332c9b5 | 69fcc483 | 22/03/1999 | 07:39:41 | 4268 | 406023853.060 | -119     |      |
| 51  | 19 | 96ee2ec0052c002332c9b5 | 69fcc483 | 22/03/1999 | 07:40:31 | 7827 | 406020583.885 | -112     |      |
| 51  | 19 | 96ee2ec0052c002332c9b5 | 69fcc483 | 22/03/1999 | 07:41:21 | 8140 | 406018464.612 | -108     | -108 |
| 51  | 19 | 96ee2ec0052c002332c9b5 | 69fcc483 | 22/03/1999 | 07:42:11 | 5398 | 406017269.622 | -116     |      |
| 51  | 19 | 96ee2ec0052c002332c9b5 | 69dcc483 | 22/03/1999 | 07:43:00 | 9219 | 406016603.928 | -119     |      |
| 51  | 19 | 96ee2ec0052c002332c9b5 | 69fcc483 | 22/03/1999 | 07:43:49 | 9793 | 406016221.063 | -123     |      |
| 51  | 19 | 96ee2ec0052c002332c9b5 | 69fcc483 | 22/03/1999 | 07:44:38 | 7121 | 406015996.413 | -127     |      |
| 192 |    |                        |          |            |          |      |               |          |      |
| 5   | 5  | 96ee2ec0052c002332c9b5 | 69fcc483 | 22/03/1999 | 09:13:06 | 9584 | 406032387.314 | -128     |      |
| 5   | 5  | 96ee2ec0052c002332c9b5 | 69fcc483 | 22/03/1999 | 09:13:57 | 6581 | 406031989.816 | -128     |      |
| 5   | 5  | 96ee2ec0052c002332c9b5 | 69fcc483 | 22/03/1999 | 09:14:48 | 0140 | 406031439.636 | -125     |      |
| 5   | 5  | 96ee2ec0052c002332c9b5 | 69fcc483 | 22/03/1999 | 09:15:38 | 0453 | 406030685.594 | -122     |      |
| 5   | 5  | 96ee2ec0052c002332c9b5 | 69fcc483 | 22/03/1999 | 09:16:27 | 7520 | 406029671.436 | -124     |      |
| 5   | 5  | 96ee2ec0052c002332c9b5 | 69fcc483 | 22/03/1999 | 09:17:17 | 1532 | 406028355.811 | -126     |      |
| 5   | 5  | 96ee2ec0052c002332c9b5 | 69fcc483 | 22/03/1999 | 09:18:06 | 2106 | 406026750.106 | -125     |      |
| 5   | 5  | 96ee2ec0052c002332c9b5 | 69fcc483 | 22/03/1999 | 09:18:54 | 9434 | 406024952.165 | -120     | -120 |
| 5   | 5  | 96ee2ec0052c002332c9b5 | 69fcc483 | 22/03/1999 | 09:19:47 | 2471 | 406023001.621 | -133     |      |
| 5   | 5  | 96ee2ec0052c002332c9b5 | 69fcc483 | 22/03/1999 | 09:20:39 | 2453 | 406021262.812 | -127     |      |
| 5   | 5  | 96ee2ec0052c002332c9b5 | 69fcc483 | 22/03/1999 | 09:21:30 | 9189 | 406019860.349 | -124     |      |
| 5   | 5  | 96ee2ec0052c002332c9b5 | 69fcc483 | 22/03/1999 | 09:22:22 | 2487 | 406018802.311 | -127     |      |
| 5   | 5  | 96ee2ec0052c002332c9b5 | 69fcc483 | 22/03/1999 | 09:23:13 | 2730 | 406018031.633 | -132     |      |
| 193 |    |                        |          |            |          |      |               |          |      |
| 76  | 8  | 96ee2ec0052c002332c9b5 | 69fcc483 | 22/03/1999 | 09:49:13 | 8442 | 406033162.034 | -118     |      |
| 76  | 8  | 96ee2ec0052c002332c9b5 | 69fcc483 | 22/03/1999 | 09:53:32 | 1870 | 406025091.233 | -117     |      |
| 76  | 8  | 96ee2ec0052c002332c9b5 | 69fcc483 | 22/03/1999 | 09:54:22 | 8751 | 406021640.678 | -110     |      |
| 76  | 8  | 96ee2ec0052c002332c9b5 | 69fcc483 | 22/03/1999 | 09:55:13 | 2298 | 406019154.174 | -109     | -109 |
| 76  | 8  | 96ee2ec0052c002332c9b5 | 69fcc483 | 22/03/1999 | 09:56:03 | 2709 | 406017688.128 | -112     |      |
| 76  | 8  | 96ee2ec0052c002332c9b5 | 69fcc483 | 22/03/1999 | 09:56:52 | 9786 | 406016862.755 | -114     |      |
| 76  | 8  | 96ee2ec0052c002332c9b5 | 69fcc483 | 22/03/1999 | 09:57:42 | 3725 | 406016390.177 | -116     |      |
| 76  | 8  | 96ee2ec0052c002332c9b5 | 69fcc483 | 22/03/1999 | 09:58:31 | 4331 | 406016112.298 | -118     |      |
| 76  | 8  | 96ee2ec0052c002332c9b5 | 69fcc483 | 22/03/1999 | 09:59:20 | 1604 | 406015947.286 | -128     |      |

**SATELLITE QUALITATIVE TEST RESULTS ON**  
**RLB 32 ACR Electronics, Inc.**  
**Nº 3**

RECHERCHE du 26/03/1999 13:17:27

## RLB 32 N° 3 LIS. LOC.

Code balise : ADD002000040401

Nom balise : 3729757

Pays : 366 USA

Classe utilisateur : TEST--

Periode de consultation : 14/02/1999 13 a 26/03/1999 13

Position de reference : et

Frequence : 406 MG+ML+MS

Toutes les luts

Tous les satellites

Date activation balise : // :

Recherche dans base principale

Resultats edites suivant chronologie du TCA

| * | TCA   | TPC   | *     | SL | PTS | *  | LAT1 | LONG1  | PB    | MAJ | BIAIS | ERR | *     | LAT2 | LONG2  | *       | CTA | LG    | WF | SDV | CF    | SRCE | MCCN | *     |   |
|---|-------|-------|-------|----|-----|----|------|--------|-------|-----|-------|-----|-------|------|--------|---------|-----|-------|----|-----|-------|------|------|-------|---|
| * | 19/03 | 10H24 | 10H29 | *  | S07 | 5  | *    | 43.562 | 1.494 | 88  | 2     | 223 | 1.13  | *    | 56.703 | -69.169 | *   | 23.5  | L  | 0   | 2.1   | 4/0  | 2271 | 26467 | * |
| * | 19/03 | 10H24 | 06H54 | *  | S07 | 5  | *    | 43.561 | 1.494 | 88  | 2     | 222 | 1.07  | *    | 56.694 | -69.169 | *   | 23.5  | G  | 0   | 2.1   | 4/0  | 2272 | 27507 | * |
| * | 19/03 | 10H31 | 10H43 | *  | S04 | 9  | *    | 43.558 | 1.478 | 98  | 1     | 219 | 0.24  | *    | 48.817 | -24.864 | *   | 9.8   | L  | 0   | 0.3   | 4/0  | 2272 | 26550 | * |
| * | 19/03 | 10H31 | 12H15 | *  | S04 | 9  | *    | 43.556 | 1.482 | 98  | 1     | 220 | 0.27  | *    | 48.817 | -24.861 | *   | 9.8   | G  | 0   | 0.3   | 4/0  | 2271 | 26584 | * |
| * | 19/03 | 12H09 | 12H15 | *  | S04 | 2  | *    | .....  | ..... | ..  | ...   | 0   | ..... | *    | .....  | .....   | *   | ..... | L  | 9   | ..... | ...  | 2271 | 26585 | * |
| * | 19/03 | 12H09 | 18H47 | *  | S04 | 2  | *    | .....  | ..... | ..  | ...   | 0   | ..... | *    | .....  | .....   | *   | ..... | G  | 9   | ..... | ...  | 2272 | 26972 | * |
| * | 19/03 | 13H54 | 14H04 | *  | S06 | 11 | *    | 43.557 | 1.481 | 95  | 1     | 223 | 0.19  | *    | 46.807 | 17.843  | *   | 6.2   | L  | 0   | 0.5   | 4/0  | 2271 | 26640 | * |
| * | 19/03 | 14H24 | 14H52 | *  | C08 | 9  | *    | 43.557 | 1.480 | 98  | 1     | 224 | 0.16  | *    | 42.506 | -12.258 | *   | 5.4   | L  | 0   | 0.2   | 4/0  | 2272 | 26683 | * |
| * | 19/03 | 14H24 | 16H15 | *  | C08 | 6  | *    | 43.556 | 1.479 | 98  | 1     | 224 | 0.38  | *    | 42.545 | -12.234 | *   | 5.4   | G  | 0   | 0.2   | 4/0  | 2272 | 26720 | * |
| * | 19/03 | 15H35 | 15H44 | *  | S06 | 12 | *    | 43.557 | 1.480 | 98  | 1     | 223 | 0.20  | *    | 37.104 | -29.480 | *   | 11.8  | L  | 0   | 0.4   | 4/0  | 2271 | 26690 | * |
| * | 19/03 | 16H53 | 17H02 | *  | S03 | 6  | *    | 43.561 | 1.480 | 96  | 1     | 267 | 0.29  | *    | 38.734 | -23.369 | *   | 9.4   | S  | 0   | 0.7   | 4/0  | 2272 | 26824 | * |
| * | 19/03 | 17H53 | 18H05 | *  | C04 | 6  | *    | 43.558 | 1.486 | 98  | 1     | 218 | 0.45  | *    | 42.415 | 14.908  | *   | 5.1   | L  | 0   | 0.2   | 4/0  | 2272 | 26889 | * |
| * | 19/03 | 18H28 | 18H38 | *  | S07 | 7  | *    | 43.558 | 1.485 | 98  | 1     | 216 | 0.32  | *    | 45.729 | 12.866  | *   | 4.4   | L  | 0   | 0.3   | 4/0  | 2271 | 26917 | * |
| * | 19/03 | 18H28 | 06H54 | *  | S07 | 7  | *    | 43.563 | 1.482 | 97  | 1     | 216 | 0.42  | *    | 45.736 | 12.880  | *   | 4.4   | G  | 0   | 0.4   | 4/0  | 2272 | 27509 | * |
| * | 19/03 | 18H38 | 18H48 | *  | S04 | 4  | *    | 43.562 | 1.471 | 77  | 3     | 212 | 0.88  | *    | 53.888 | 53.066  | *   | 18.0  | L  | 0   | 3.2   | 4/0  | 2272 | 26969 | * |
| * | 19/03 | 18H38 | 20H28 | *  | S04 | 4  | *    | 43.561 | 1.468 | 77  | 3     | 212 | 1.06  | *    | 53.890 | 53.066  | *   | 18.0  | G  | 0   | 3.2   | 4/0  | 2272 | 27049 | * |
| * | 19/03 | 18H38 | 08H52 | *  | S04 | 4  | *    | 43.561 | 1.466 | 77  | 3     | 212 | 1.23  | *    | 53.892 | 53.065  | *   | 18.0  | G  | 0   | 3.2   | 4/0  | 2271 | 27760 | * |
| * | 19/03 | 19H39 | 19H49 | *  | C04 | 8  | *    | 43.556 | 1.480 | 99  | 1     | 216 | 0.27  | *    | 46.816 | -38.672 | *   | 13.6  | L  | 0   | 0.2   | 4/0  | 2272 | 27002 | * |
| * | 19/03 | 19H39 | 03H09 | *  | C04 | 8  | *    | 43.557 | 1.480 | 99  | 1     | 216 | 0.25  | *    | 46.819 | -38.669 | *   | 13.6  | G  | 0   | 0.2   | 4/0  | 2272 | 27303 | * |
| * | 19/03 | 20H08 | 20H17 | *  | S07 | 14 | *    | 43.559 | 1.480 | 97  | 1     | 213 | 0.11  | *    | 36.317 | -34.418 | *   | 13.7  | L  | 0   | 0.6   | 4/0  | 2271 | 27016 | * |
| * | 19/03 | 20H08 | 06H54 | *  | S07 | 14 | *    | 43.568 | 1.490 | 97  | 1     | 212 | 1.30  | *    | 36.327 | -34.421 | *   | 13.7  | G  | 0   | 0.6   | 4/0  | 2272 | 27511 | * |
| * | 19/03 | 20H08 | 10H10 | *  | S07 | 14 | *    | 43.569 | 1.488 | 97  | 1     | 213 | 1.27  | *    | 36.330 | -34.419 | *   | 13.7  | G  | 0   | 0.6   | 4/0  | 2271 | 27832 | * |
| * | 19/03 | 20H17 | 20H28 | *  | S04 | 13 | *    | 43.562 | 1.501 | 94  | 2     | 214 | 1.68  | *    | 44.170 | 4.451   | *   | 1.3   | L  | 0   | 0.2   | 4/0  | 2272 | 27050 | * |
| * | 19/03 | 20H17 | 08H52 | *  | S04 | 13 | *    | 43.562 | 1.493 | 94  | 2     | 215 | 1.04  | *    | 44.174 | 4.457   | *   | 1.3   | G  | 0   | 0.2   | 4/0  | 2271 | 27761 | * |
| * | 19/03 | 20H43 | 20H54 | *  | C06 | 6  | *    | 43.563 | 1.472 | 73  | 7     | 211 | 0.83  | *    | 43.880 | -2.174  | *   | 1.2   | L  | 0   | 1.8   | 4/0  | 2272 | 27063 | * |
| * | 19/03 | 21H59 | 22H08 | *  | S04 | 13 | *    | 43.554 | 1.481 | 97  | 1     | 212 | 0.50  | *    | 34.262 | -42.708 | *   | 17.0  | L  | 0   | 0.6   | 4/0  | 2272 | 27148 | * |
| * | 19/03 | 21H59 | 08H52 | *  | S04 | 13 | *    | 43.562 | 1.487 | 97  | 1     | 212 | 0.60  | *    | 34.266 | -42.708 | *   | 17.0  | G  | 0   | 0.6   | 4/0  | 2271 | 27762 | * |
| * | 19/03 | 22H30 | 22H39 | *  | C06 | 5  | *    | 43.557 | 1.477 | 95  | 1     | 214 | 0.40  | *    | 47.921 | -57.406 | *   | 19.4  | L  | 0   | 1.2   | 4/0  | 2271 | 27159 | * |
| * | 19/03 | 22H30 | 06H03 | *  | C06 | 5  | *    | 43.561 | 1.480 | 95  | 1     | 214 | 0.26  | *    | 47.926 | -57.408 | *   | 19.4  | G  | 0   | 1.2   | 4/0  | 2272 | 27439 | * |
| * | 20/03 | 02H12 | 02H23 | *  | C08 | 7  | *    | 43.558 | 1.486 | 94  | 1     | 212 | 0.40  | *    | 42.238 | 16.784  | *   | 5.8   | L  | 0   | 0.1   | 4/0  | 2272 | 27250 | * |
| * | 20/03 | 02H15 | 02H23 | *  | S06 | 7  | *    | 43.555 | 1.481 | 92  | 2     | 211 | 0.48  | *    | 35.491 | 41.396  | *   | 15.3  | L  | 0   | 0.8   | 4/0  | 2271 | 27256 | * |
| * | 20/03 | 03H56 | 04H05 | *  | S06 | 15 | *    | 43.561 | 1.470 | 93  | 2     | 214 | 0.92  | *    | 45.044 | -5.797  | *   | 2.9   | L  | 0   | 0.6   | 4/0  | 2271 | 27316 | * |
| * | 20/03 | 03H58 | 04H08 | *  | C08 | 11 | *    | 43.560 | 1.478 | 99  | 1     | 212 | 0.27  | *    | 46.436 | -36.778 | *   | 12.9  | L  | 0   | 0.3   | 4/0  | 2272 | 27336 | * |
| * | 20/03 | 03H58 | 11H30 | *  | C08 | 11 | *    | 43.561 | 1.479 | 99  | 1     | 212 | 0.26  | *    | 46.437 | -36.778 | *   | 12.9  | G  | 0   | 0.3   | 4/0  | 2272 | 27993 | * |
| * | 20/03 | 04H49 | 04H59 | *  | C04 | 10 | *    | 43.559 | 1.486 | 99  | 1     | 212 | 0.39  | *    | 45.043 | 19.934  | *   | 6.4   | L  | 0   | 0.2   | 4/0  | 2271 | 27363 | * |
| * | 20/03 | 04H49 | 05H31 | *  | C04 | 10 | *    | 43.559 | 1.487 | 99  | 1     | 213 | 0.50  | *    | 45.044 | 19.935  | *   | 6.4   | G  | 0   | 0.2   | 4/0  | 2272 | 28929 | * |
| * | 20/03 | 05H07 | 05H17 | *  | S03 | 6  | *    | 43.551 | 1.496 | 52  | 62    | 258 | 1.47  | *    | 43.613 | 1.169   | *   | 0.1   | S  | 0   | 0.8   | 3/0  | 2272 | 27379 | * |
| * | 20/03 | 05H36 | 05H43 | *  | S06 | 9  | *    | 43.565 | 1.486 | 96  | 2     | 215 | 0.80  | *    | 54.638 | -54.196 | *   | 19.3  | L  | 0   | 1.0   | 4/0  | 2271 | 27393 | * |
| * | 20/03 | 06H34 | 05H31 | *  | C04 | 9  | *    | 43.557 | 1.482 | 99  | 1     | 212 | 0.23  | *    | 40.840 | -31.582 | *   | 12.6  | G  | 0   | 0.1   | 4/0  | 2272 | 28930 | * |
| * | 20/03 | 06H43 | 06H54 | *  | S07 | 11 | *    | 43.557 | 1.482 | 98  | 1     | 211 | 0.19  | *    | 36.438 | 37.773  | *   | 13.8  | L  | 0   | 0.4   | 4/0  | 2272 | 27512 | * |

|               |             |    |          |         |    |     |     |        |          |         |        |   |   |       |     |      |         |
|---------------|-------------|----|----------|---------|----|-----|-----|--------|----------|---------|--------|---|---|-------|-----|------|---------|
| * 20/03 06H43 | 08H33 * S07 | 11 | * 43.557 | 1.482   | 98 | 1   | 211 | 0.22   | * 36.438 | 37.770  | * 13.8 | G | 0 | 0.4   | 4/0 | 2272 | 27635 * |
| * 20/03 06H43 | 10H10 * S07 | 11 | * 43.557 | 1.481   | 98 | 1   | 212 | 0.16   | * 36.438 | 37.772  | * 13.8 | G | 0 | 0.4   | 4/0 | 2271 | 27833 * |
| * 20/03 06H44 | 06H53 * S07 | 2  | *        | .....   | .. | ... | 0   | .....  | *        | .....   | *      | L | 9 | ..... | ... | 2272 | 27593 * |
| * 20/03 06H46 | 06H54 * S03 | 7  | * 43.560 | 1.483   | 97 | 1   | 213 | 0.21   | * 52.526 | -45.928 | * 16.8 | L | 0 | 0.8   | 4/0 | 2271 | 27506 * |
| * 20/03 07H39 | 07H50 * C06 | 8  | * 43.562 | 1.521   | 50 | 7   | 214 | 3.24   | * 43.563 | 1.548   | * 0.0  | L | 0 | 0.2   | 4/0 | 2272 | 27613 * |
| * 20/03 08H23 | 08H32 * S07 | 12 | * 43.556 | 1.476   | 99 | 1   | 384 | 0.53   | * 45.692 | -9.471  | * 4.2  | S | 0 | 0.1   | 4/0 | 2272 | 27641 * |
| * 20/03 08H23 | 08H33 * S07 | 13 | * 43.559 | 1.478   | 99 | 1   | 217 | 0.22   | * 45.695 | -9.469  | * 4.2  | L | 0 | 0.1   | 4/0 | 2272 | 27636 * |
| * 20/03 08H23 | 10H10 * S07 | 13 | * 43.559 | 1.480   | 99 | 1   | 218 | 0.10   | * 45.696 | -9.472  | * 4.2  | G | 0 | 0.1   | 4/0 | 2271 | 27834 * |
| * 20/03 08H23 | 18H16 * S07 | 13 | * 43.558 | 1.480   | 99 | 1   | 217 | 0.07   | * 45.696 | -9.476  | * 4.2  | G | 0 | 0.2   | 4/0 | 2272 | 28260 * |
| * 20/03 08H38 | 08H52 * S04 | 6  | * 43.560 | 1.482   | 98 | 1   | 219 | 0.18   | * 38.076 | 28.429  | * 10.2 | L | 0 | 0.4   | 4/0 | 2271 | 27763 * |
| * 20/03 08H38 | 10H29 * S04 | 6  | * 43.560 | 1.482   | 98 | 1   | 220 | 0.15   | * 38.076 | 28.428  | * 10.2 | G | 0 | 0.4   | 4/0 | 2272 | 27915 * |
| * 20/03 08H38 | 18H35 * S04 | 6  | * 43.560 | 1.479   | 98 | 1   | 219 | 0.21   | * 38.076 | 28.431  | * 10.2 | G | 0 | 0.4   | 4/0 | 2271 | 28386 * |
| * 20/03 10H02 | 10H10 * S07 | 8  | * 43.556 | 1.480   | 96 | 2   | 222 | 0.35   | * 54.669 | -57.746 | * 20.4 | L | 0 | 0.9   | 4/0 | 2271 | 27835 * |
| * 20/03 10H02 | 16H35 * S07 | 8  | * 43.556 | 1.479   | 96 | 2   | 222 | 0.40   | * 54.669 | -57.750 | * 20.4 | G | 0 | 0.9   | 4/0 | 2271 | 28205 * |
| * 20/03 10H02 | 18H16 * S07 | 8  | * 43.557 | 1.480   | 96 | 2   | 221 | 0.19   | * 54.668 | -57.750 | * 20.4 | G | 0 | 0.9   | 4/0 | 2272 | 28261 * |
| * 20/03 10H18 | 10H29 * S04 | 13 | * 43.558 | 1.482   | 99 | 1   | 224 | 0.08   | * 47.653 | -18.803 | * 7.7  | L | 0 | 0.2   | 4/0 | 2272 | 27916 * |
| * 20/03 10H18 | 18H35 * S04 | 13 | * 43.558 | 1.482   | 99 | 1   | 223 | 0.09   | * 47.651 | -18.804 | * 7.7  | G | 0 | 0.2   | 4/0 | 2271 | 28387 * |
| * 20/03 11H57 | 12H04 * S04 | 3  | * 43.573 | 1.507   | 50 | 19  | 234 | 2.61   | * 56.886 | -68.049 | * 23.3 | G | 0 | 0.0   | 0/0 | 2272 | 28015 * |
| * 20/03 11H57 | 18H35 * S04 | 3  | * 56.882 | -68.050 | 50 | 16  | 367 | 999.99 | * 43.573 | 1.503   | * 21.2 | G | 0 | 0.0   | 0/0 | 2271 | 28388 * |
| * 20/03 13H09 | 13H20 * C08 | 9  | * 43.558 | 1.485   | 99 | 1   | 227 | 0.36   | * 45.173 | 21.175  | * 6.8  | L | 0 | 0.3   | 4/0 | 2272 | 28030 * |
| * 20/03 13H09 | 15H05 * C08 | 9  | * 43.558 | 1.484   | 99 | 1   | 227 | 0.25   | * 45.174 | 21.168  | * 6.8  | G | 0 | 0.2   | 4/0 | 2271 | 28111 * |
| * 20/03 13H43 | 13H52 * S06 | 10 | * 43.560 | 1.482   | 98 | 1   | 226 | 0.16   | * 47.991 | 23.196  | * 8.2  | L | 0 | 0.4   | 4/0 | 2271 | 28057 * |
| * 20/03 14H55 | 15H05 * C08 | 13 | * 43.562 | 1.476   | 99 | 1   | 228 | 0.53   | * 41.179 | -30.333 | * 12.3 | L | 0 | 0.2   | 4/0 | 2271 | 28112 * |
| * 20/03 14H55 | 01H09 * C08 | 13 | * 43.555 | 1.478   | 99 | 1   | 228 | 0.48   | * 41.171 | -30.331 | * 12.3 | G | 0 | 0.2   | 4/0 | 2272 | 28722 * |
| * 20/03 15H24 | 15H33 * S06 | 8  | * 43.561 | 1.482   | 98 | 1   | 360 | 0.22   | * 38.206 | -24.160 | * 9.7  | S | 0 | 0.5   | 4/0 | 2272 | 28144 * |
| * 20/03 16H29 | 16H38 * S03 | 6  | * 43.562 | 1.477   | 98 | 1   | 271 | 0.44   | * 40.933 | -11.905 | * 4.9  | S | 0 | 0.3   | 4/0 | 2272 | 28222 * |
| * 20/03 16H36 | 05H31 * C04 | 3  | * 43.561 | 1.481   | 50 | 4   | 224 | 0.19   | * 40.176 | 47.822  | * 17.8 | G | 0 | 0.0   | 0/0 | 2272 | 28931 * |
| * 20/03 18H06 | 18H16 * S07 | 6  | * 43.563 | 1.483   | 98 | 1   | 387 | 0.52   | * 47.748 | 23.252  | * 8.2  | S | 0 | 0.3   | 4/0 | 2272 | 28314 * |
| * 20/03 18H06 | 18H16 * S07 | 7  | * 43.559 | 1.483   | 99 | 1   | 220 | 0.19   | * 47.785 | 23.221  | * 8.2  | L | 0 | 0.2   | 4/0 | 2272 | 28262 * |
| * 20/03 18H06 | 19H56 * S07 | 7  | * 43.559 | 1.483   | 99 | 1   | 220 | 0.15   | * 47.785 | 23.214  | * 8.2  | G | 0 | 0.2   | 4/0 | 2271 | 28486 * |
| * 20/03 18H21 | 05H31 * C04 | 9  | * 43.560 | 1.482   | 99 | 1   | 220 | 0.13   | * 47.787 | 23.221  | * 8.2  | G | 0 | 0.2   | 4/0 | 2272 | 29195 * |
| * 20/03 19H46 | 19H56 * S07 | 12 | * 43.559 | 1.482   | 95 | 2   | 219 | 1.19   | * 43.877 | -2.475  | * 1.2  | G | 0 | 0.1   | 4/0 | 2272 | 28932 * |
| * 20/03 19H46 | 06H29 * S07 | 12 | * 43.567 | 1.485   | 95 | 2   | 216 | 0.12   | * 38.499 | -24.046 | * 9.6  | L | 0 | 1.1   | 4/0 | 2271 | 28487 * |
| * 20/03 19H46 | 08H12 * S07 | 12 | * 43.575 | 1.484   | 95 | 2   | 215 | 1.83   | * 38.514 | -24.057 | * 9.6  | G | 0 | 1.1   | 4/0 | 2272 | 29022 * |
| * 20/03 20H05 | 20H16 * S04 | 8  | * 43.560 | 1.479   | 98 | 1   | 218 | 0.20   | * 45.359 | 10.468  | * 3.5  | L | 0 | 0.3   | 4/0 | 2272 | 28549 * |
| * 20/03 20H05 | 21H55 * S04 | 8  | * 43.560 | 1.482   | 98 | 1   | 217 | 0.16   | * 45.360 | 10.475  | * 3.5  | G | 0 | 0.3   | 4/0 | 2271 | 28620 * |
| * 20/03 20H08 | 05H31 * C04 | 4  | * 43.560 | 1.479   | 89 | 2   | 217 | 0.24   | * 48.035 | -57.715 | * 19.4 | G | 0 | 1.6   | 4/0 | 2272 | 28933 * |
| * 20/03 21H12 | 21H22 * C06 | 4  | * 43.556 | 1.481   | 99 | 1   | 216 | 0.31   | * 45.153 | -20.354 | * 7.5  | L | 0 | 0.1   | 4/0 | 2272 | 28588 * |
| * 20/03 21H12 | 23H06 * C06 | 4  | * 43.562 | 1.484   | 99 | 1   | 216 | 0.44   | * 45.159 | -20.353 | * 7.5  | G | 0 | 0.1   | 4/0 | 2272 | 28667 * |
| * 20/03 21H46 | 21H55 * S04 | 12 | * 43.557 | 1.482   | 98 | 1   | 215 | 0.26   | * 35.517 | -36.792 | * 14.6 | L | 0 | 0.4   | 4/0 | 2271 | 28621 * |
| * 20/03 21H46 | 10H17 * S04 | 12 | * 43.570 | 1.480   | 98 | 1   | 216 | 1.25   | * 35.529 | -36.799 | * 14.6 | G | 0 | 0.4   | 4/0 | 2272 | 29389 * |
| * 21/03 02H43 | 02H54 * C08 | 14 | * 43.560 | 1.462   | 97 | 1   | 214 | 1.55   | * 43.840 | -1.893  | * 1.0  | L | 0 | 0.1   | 4/0 | 2272 | 28765 * |
| * 21/03 02H43 | 15H36 * C08 | 14 | * 43.558 | 1.474   | 98 | 1   | 214 | 0.58   | * 43.840 | -1.897  | * 1.0  | G | 0 | 0.1   | 4/0 | 2271 | 29673 * |
| * 21/03 03H45 | 03H54 * S06 | 12 | * 43.562 | 1.446   | 93 | 2   | 348 | 2.84   | * 43.951 | -0.472  | * 0.9  | S | 0 | 0.1   | 4/0 | 2272 | 28804 * |
| * 21/03 04H30 | 04H39 * C08 | 3  | * 43.561 | 1.492   | 50 | 12  | 210 | 0.88   | * 47.814 | -57.079 | * 19.3 | G | 0 | 0.0   | 0/0 | 2272 | 28838 * |
| * 21/03 04H30 | 15H36 * C08 | 3  | * 47.815 | -57.078 | 50 | 14  | 352 | 999.99 | * 43.557 | 1.493   | * 21.0 | G | 0 | 0.0   | 0/0 | 2271 | 29674 * |
| * 21/03 04H43 | 04H52 * S03 | 8  | * 43.558 | 1.485   | 95 | 1   | 213 | 0.37   | * 41.298 | 13.214  | * 4.3  | L | 0 | 0.6   | 4/0 | 2271 | 28849 * |
| * 21/03 05H17 | 05H31 * C04 | 10 | * 43.567 | 1.591   | 71 | 8   | 214 | 8.92   | * 43.607 | 2.062   | * 0.0  | L | 0 | 0.2   | 4/0 | 2272 | 28934 * |
| * 21/03 05H17 | 07H10 * C04 | 10 | * 43.564 | 1.560   | 73 | 7   | 214 | 6.41   | * 43.612 | 2.126   | * 0.0  | G | 0 | 0.2   | 4/0 | 2272 | 29135 * |
| * 21/03 05H25 | 05H32 * S06 | 8  | * 43.560 | 1.482   | 98 | 1   | 214 | 0.13   | * 53.527 | -48.611 | * 17.6 | L | 0 | 0.5   | 4/0 | 2271 | 28976 * |
| * 21/03 06H20 | 06H29 * S07 | 4  | * 43.560 | 1.482   | 97 | 1   | 214 | 0.18   | * 34.172 | 48.014  | * 17.9 | L | 0 | 0.7   | 4/0 | 2271 | 29023 * |
| * 21/03 06H20 | 08H12 * S07 | 4  | * 43.560 | 1.482   | 97 | 1   | 214 | 0.15   | * 34.174 | 48.009  | * 17.9 | G | 0 | 0.7   | 4/0 | 2272 | 29197 * |
| * 21/03 06H22 | 06H33 * C06 | 3  | * 46.329 | 38.165  | 50 | 2   | 133 | 999.99 | * 43.556 | 1.486   | * 13.6 | G | 0 | 0.0   | 0/0 | 2272 | 29097 * |
| * 21/03 06H22 | 05H19 * C06 | 3  | * 46.322 | 38.162  | 50 | 2   | 134 | 999.99 | * 43.550 | 1.485   | * 13.6 | G | 0 | 0.0   | 0/0 | 2271 | 30609 * |
| * 21/03 07H02 | 07H10 * C04 | 4  | * 43.551 | 1.484   | 50 | 16  | 212 | 0.92   | * 39.720 | -47.899 | * 19.0 | G | 0 | 0.0   | 0/0 | 2272 | 29136 * |
| * 21/03 08H01 | 08H11 * S07 | 11 | * 43.570 | 1.403   | 79 | 4   | 386 | 6.44   | * 43.652 | 0.977   | * 0.3  | S | 0 | 0.1   | 4/0 | 2272 | 29231 * |
| * 21/03 08H01 | 08H12 * S07 | 14 | * 43.569 | 1.425   | 50 | 4   | 218 | 4.65   | * 43.725 | 0.615   | * 0.3  | L | 0 | 0.1   | 4/0 | 2272 | 29198 * |
| * 21/03 08H01 | 09H48 * S07 | 14 | * 43.564 | 1.450   | 50 | 3   | 219 | 2.61   | * 43.729 | 0.595   | * 0.3  | G | 0 | 0.1   | 4/0 | 2271 | 29334 * |
| * 21/03 08H08 | 21H51 * C06 | 8  | * 43.557 | 1.481   | 99 | 1   | 219 | 0.17   | * 42.209 | -14.946 | * 6.4  | G | 0 | 0.2   | 4/0 | 2272 | 30246 * |

|                           |    |   |        |         |       |       |     |        |   |        |         |   |       |   |   |       |       |      |       |   |
|---------------------------|----|---|--------|---------|-------|-------|-----|--------|---|--------|---------|---|-------|---|---|-------|-------|------|-------|---|
| * 21/03 08H08 05H19 * C06 | 8  | * | 43.552 | 1.481   | 99    | 1     | 219 | 0.79   | * | 42.204 | -14.949 | * | 6.4   | G | 0 | 0.2   | 4/0   | 2271 | 30610 | * |
| * 21/03 08H25 08H36 * S04 | 9  | * | 43.558 | 1.484   | 98    | 1     | 221 | 0.22   | * | 36.828 | 34.392  | * | 12.5  | L | 0 | 0.4   | 4/0   | 2271 | 29304 | * |
| * 21/03 08H25 10H17 * S04 | 9  | * | 43.558 | 1.483   | 98    | 1     | 221 | 0.19   | * | 36.825 | 34.395  | * | 12.5  | G | 0 | 0.4   | 4/0   | 2272 | 29390 | * |
| * 21/03 08H25 11H52 * S04 | 9  | * | 43.558 | 1.482   | 98    | 1     | 221 | 0.13   | * | 36.827 | 34.392  | * | 12.5  | G | 0 | 0.4   | 4/0   | 2271 | 29462 | * |
| * 21/03 09H40 09H48 * S07 | 11 | * | 43.559 | 1.484   | 99    | 1     | 225 | 0.26   | * | 52.836 | -46.774 | * | 17.1  | L | 0 | 0.3   | 4/0   | 2271 | 29335 | * |
| * 21/03 09H40 17H55 * S07 | 11 | * | 43.560 | 1.483   | 99    | 1     | 224 | 0.24   | * | 52.835 | -46.775 | * | 17.1  | G | 0 | 0.3   | 4/0   | 2272 | 29836 | * |
| * 21/03 10H06 10H17 * S04 | 14 | * | 43.557 | 1.485   | 99    | 1     | 225 | 0.34   | * | 46.454 | -12.842 | * | 5.5   | L | 0 | 0.1   | 4/0   | 2272 | 29391 | * |
| * 21/03 10H06 11H52 * S04 | 14 | * | 43.559 | 1.480   | 99    | 1     | 225 | 0.08   | * | 46.454 | -12.844 | * | 5.5   | G | 0 | 0.1   | 4/0   | 2271 | 29463 | * |
| * 21/03 10H06 20H03 * S04 | 14 | * | 43.560 | 1.480   | 99    | 1     | 225 | 0.15   | * | 46.456 | -12.855 | * | 5.5   | G | 0 | 0.2   | 4/0   | 2272 | 30043 | * |
| * 21/03 11H45 11H52 * S04 | 7  | * | 43.559 | 1.477   | 98    | 1     | 227 | 0.34   | * | 55.612 | -61.436 | * | 21.5  | L | 0 | 0.5   | 4/0   | 2271 | 29464 | * |
| * 21/03 11H45 18H21 * S04 | 7  | * | 43.559 | 1.477   | 98    | 1     | 227 | 0.34   | * | 55.609 | -61.442 | * | 21.5  | G | 0 | 0.5   | 4/0   | 2271 | 29889 | * |
| * 21/03 11H45 20H03 * S04 | 7  | * | 43.561 | 1.479   | 98    | 1     | 228 | 0.25   | * | 55.610 | -61.444 | * | 21.5  | G | 0 | 0.5   | 4/0   | 2272 | 30044 | * |
| * 21/03 11H54 12H04 * C08 | 7  | * | 43.559 | 1.480   | 99    | 1     | 229 | 0.05   | * | 47.413 | 56.869  | * | 18.3  | L | 0 | 0.3   | 4/0   | 2272 | 29511 | * |
| * 21/03 11H54 15H36 * C08 | 7  | * | 43.555 | 1.477   | 99    | 1     | 229 | 0.59   | * | 47.414 | 56.855  | * | 18.3  | G | 0 | 0.3   | 4/0   | 2271 | 29675 | * |
| * 21/03 13H32 13H41 * S06 | 9  | * | 43.560 | 1.483   | 98    | 1     | 228 | 0.18   | * | 49.025 | 28.508  | * | 10.1  | L | 0 | 0.4   | 4/0   | 2271 | 29537 | * |
| * 21/03 13H41 13H51 * C08 | 13 | * | 43.561 | 1.525   | 50    | 18    | 229 | 3.56   | * | 43.551 | 1.415   | * | 0.0   | L | 0 | 0.6   | 4/0   | 2272 | 29564 | * |
| * 21/03 13H41 15H36 * C08 | 12 | * | 43.560 | 1.549   | 55    | 33    | 229 | 5.47   | * | 43.524 | 1.124   | * | 0.1   | G | 0 | 0.7   | 4/0   | 2271 | 29676 | * |
| * 21/03 15H13 15H22 * S06 | 7  | * | 43.559 | 1.480   | 98    | 1     | 362 | 0.09   | * | 39.302 | -18.807 | * | 7.6   | S | 0 | 0.3   | 4/0   | 2272 | 29608 | * |
| * 21/03 15H25 15H36 * C08 | 9  | * | 43.559 | 1.465   | 99    | 1     | 228 | 1.31   | * | 40.034 | -48.099 | * | 19.1  | L | 0 | 0.3   | 4/0   | 2271 | 29677 | * |
| * 21/03 15H25 01H42 * C08 | 9  | * | 43.553 | 1.478   | 99    | 1     | 228 | 0.69   | * | 40.032 | -48.091 | * | 19.1  | G | 0 | 0.3   | 4/0   | 2272 | 30385 | * |
| * 21/03 16H04 16H14 * S03 | 5  | * | 43.560 | 1.467   | 85    | 1     | 272 | 1.18   | * | 43.217 | -0.289  | * | 0.6   | S | 0 | 0.3   | 4/0   | 2272 | 29720 | * |
| * 21/03 17H04 19H00 * C04 | 3  | * | 43.561 | 1.490   | 50    | 2     | 222 | 0.80   | * | 41.583 | 31.187  | * | 11.5  | G | 0 | 0.0   | 0/0   | 2272 | 29923 | * |
| * 21/03 17H04 20H46 * C04 | 3  | * | 43.561 | 1.484   | 50    | 2     | 222 | 0.37   | * | 41.583 | 31.188  | * | 11.5  | G | 0 | 0.0   | 0/0   | 2271 | 30158 | * |
| * 21/03 17H06 17H15 * C04 | 2  | * | .....  | .....   | ..... | ..... | 0   | .....  | * | .....  | .....   | * | ..... | L | 9 | ..... | ..... | 2272 | 29780 | * |
| * 21/03 17H44 17H55 * S07 | 8  | * | 43.558 | 1.485   | 99    | 1     | 221 | 0.34   | * | 49.729 | 33.610  | * | 11.8  | L | 0 | 0.2   | 4/0   | 2272 | 29837 | * |
| * 21/03 17H44 19H35 * S07 | 8  | * | 43.557 | 1.483   | 99    | 1     | 222 | 0.24   | * | 49.730 | 33.605  | * | 11.8  | G | 0 | 0.2   | 4/0   | 2271 | 29999 | * |
| * 21/03 17H44 21H12 * S07 | 8  | * | 43.558 | 1.484   | 99    | 1     | 221 | 0.27   | * | 49.732 | 33.606  | * | 11.8  | G | 0 | 0.2   | 4/0   | 2272 | 30201 | * |
| * 21/03 18H50 19H00 * C04 | 11 | * | 43.554 | 1.453   | 86    | 5     | 224 | 2.29   | * | 45.306 | -20.445 | * | 7.5   | L | 0 | 2.6   | 4/0   | 2272 | 29924 | * |
| * 21/03 18H50 20H46 * C04 | 11 | * | 43.558 | 1.480   | 99    | 1     | 220 | 0.16   | * | 45.316 | -20.475 | * | 7.5   | G | 0 | 0.1   | 4/0   | 2271 | 30159 | * |
| * 21/03 19H24 19H35 * S07 | 14 | * | 43.556 | 1.478   | 98    | 1     | 219 | 0.39   | * | 40.559 | -13.609 | * | 5.6   | L | 0 | 0.2   | 4/0   | 2271 | 30000 | * |
| * 21/03 19H24 21H12 * S07 | 14 | * | 43.564 | 1.485   | 98    | 1     | 219 | 0.69   | * | 40.566 | -13.608 | * | 5.6   | G | 0 | 0.2   | 4/0   | 2272 | 30202 | * |
| * 21/03 19H52 20H03 * S04 | 8  | * | 43.559 | 1.473   | 98    | 1     | 220 | 0.66   | * | 46.563 | 16.439  | * | 5.7   | L | 0 | 0.4   | 4/0   | 2272 | 30045 | * |
| * 21/03 19H52 21H43 * S04 | 8  | * | 43.558 | 1.480   | 98    | 1     | 219 | 0.07   | * | 46.561 | 16.447  | * | 5.7   | G | 0 | 0.4   | 4/0   | 2271 | 30235 | * |
| * 21/03 19H55 21H51 * C06 | 4  | * | 43.561 | 1.489   | 73    | 2     | 219 | 0.68   | * | 42.407 | 14.723  | * | 5.0   | G | 1 | 0.5   | 4/0   | 2272 | 30247 | * |
| * 21/03 19H55 05H19 * C06 | 4  | * | 43.560 | 1.495   | 73    | 2     | 219 | 1.12   | * | 42.406 | 14.722  | * | 5.0   | G | 1 | 0.5   | 4/0   | 2271 | 30611 | * |
| * 21/03 21H05 21H12 * S07 | 3  | * | 31.045 | -60.424 | 50    | 31    | 390 | 999.99 | * | 43.496 | 1.467   | * | 25.8  | G | 0 | 0.0   | 0/0   | 2272 | 30203 | * |
| * 21/03 21H05 06H05 * S07 | 3  | * | 31.049 | -60.427 | 50    | 31    | 391 | 999.99 | * | 43.501 | 1.466   | * | 25.8  | G | 0 | 0.0   | 0/0   | 2271 | 30685 | * |
| * 21/03 21H33 21H44 * S04 | 13 | * | 43.559 | 1.485   | 99    | 1     | 218 | 0.31   | * | 36.817 | -30.866 | * | 12.3  | L | 0 | 0.2   | 4/0   | 2271 | 30236 | * |
| * 21/03 21H33 08H22 * S04 | 13 | * | 43.561 | 1.485   | 99    | 1     | 218 | 0.39   | * | 36.819 | -30.864 | * | 12.3  | G | 0 | 0.2   | 4/0   | 2271 | 30954 | * |
| * 21/03 21H33 10H05 * S04 | 13 | * | 43.568 | 1.479   | 99    | 1     | 219 | 1.01   | * | 36.825 | -30.872 | * | 12.3  | G | 0 | 0.2   | 4/0   | 2272 | 31097 | * |
| * 21/03 21H41 21H51 * C06 | 7  | * | 43.559 | 1.480   | 98    | 1     | 219 | 0.07   | * | 46.851 | -39.035 | * | 13.7  | L | 0 | 0.4   | 4/0   | 2272 | 30248 | * |
| * 21/03 21H41 05H19 * C06 | 6  | * | 43.559 | 1.476   | 99    | 1     | 219 | 0.40   | * | 46.851 | -39.049 | * | 13.7  | G | 0 | 0.2   | 4/0   | 2271 | 30612 | * |
| * 22/03 01H29 01H42 * C08 | 6  | * | 43.556 | 1.486   | 97    | 1     | 218 | 0.48   | * | 41.251 | 30.687  | * | 11.2  | L | 0 | 0.6   | 4/0   | 2272 | 30386 | * |
| * 22/03 03H15 03H25 * C08 | 9  | * | 43.560 | 1.478   | 99    | 1     | 217 | 0.25   | * | 45.403 | -21.259 | * | 7.8   | L | 0 | 0.3   | 4/0   | 2272 | 30438 | * |
| * 22/03 03H34 03H43 * S06 | 14 | * | 43.556 | 1.502   | 84    | 3     | 217 | 1.72   | * | 42.880 | 4.811   | * | 1.1   | L | 0 | 0.5   | 4/0   | 2271 | 30450 | * |
| * 22/03 03H59 07H38 * C04 | 4  | * | 46.591 | 38.081  | 50    | 3     | 225 | 999.99 | * | 43.562 | 1.481   | * | 13.4  | G | 0 | 0.0   | 0/0   | 2271 | 30834 | * |
| * 22/03 04H18 04H27 * S03 | 4  | * | 43.554 | 1.477   | 84    | 2     | 261 | 0.67   | * | 39.163 | 24.582  | * | 8.8   | S | 1 | 0.9   | 4/0   | 2272 | 30474 | * |
| * 22/03 05H14 05H22 * S06 | 7  | * | 43.555 | 1.474   | 96    | 2     | 351 | 0.73   | * | 52.234 | -42.938 | * | 15.9  | S | 0 | 1.0   | 4/0   | 2272 | 30638 | * |
| * 22/03 05H45 07H38 * C04 | 12 | * | 43.557 | 1.477   | 99    | 1     | 217 | 0.39   | * | 42.193 | -14.899 | * | 6.3   | G | 0 | 0.1   | 4/0   | 2271 | 30835 | * |
| * 22/03 05H58 06H07 * S03 | 8  | * | 43.556 | 1.475   | 99    | 1     | 262 | 0.59   | * | 48.148 | -22.421 | * | 8.9   | S | 0 | 0.2   | 4/0   | 2272 | 30704 | * |
| * 22/03 06H00 06H05 * S07 | 2  | * | .....  | .....   | ..... | ..... | 0   | .....  | * | .....  | .....   | * | ..... | L | 9 | ..... | ..... | 2271 | 30701 | * |
| * 22/03 06H00 07H49 * S07 | 2  | * | .....  | .....   | ..... | ..... | 0   | .....  | * | .....  | .....   | * | ..... | G | 9 | ..... | ..... | 2272 | 30903 | * |
| * 22/03 06H51 07H02 * C06 | 10 | * | 43.559 | 1.485   | 99    | 1     | 218 | 0.31   | * | 44.996 | 19.401  | * | 6.2   | L | 0 | 0.2   | 4/0   | 2272 | 30759 | * |
| * 22/03 06H51 18H50 * C06 | 9  | * | 43.558 | 1.483   | 99    | 1     | 218 | 0.17   | * | 45.003 | 19.383  | * | 6.2   | G | 0 | 0.2   | 4/0   | 2271 | 31655 | * |
| * 22/03 07H39 07H49 * S07 | 8  | * | 43.554 | 1.483   | 94    | 1     | 384 | 0.59   | * | 41.684 | 11.245  | * | 3.6   | S | 0 | 0.2   | 4/0   | 2272 | 30905 | * |
| * 22/03 07H39 07H49 * S07 | 15 | * | 43.557 | 1.485   | 99    | 1     | 218 | 0.34   | * | 41.619 | 11.390  | * | 3.6   | L | 0 | 0.1   | 4/0   | 2272 | 30878 | * |
| * 22/03 08H12 08H22 * S04 | 8  | * | 43.559 | 1.480   | 95    | 1     | 219 | 0.07   | * | 35.703 | 40.316  | * | 14.9  | L | 0 | 0.8   | 4/0   | 2271 | 30955 | * |
| * 22/03 08H12 10H05 * S04 | 8  | * | 43.558 | 1.480   | 95    | 1     | 219 | 0.13   | * | 35.700 | 40.314  | * | 14.9  | G | 0 | 0.8   | 4/0   | 2272 | 31098 | * |
| * 22/03 08H36 08H46 * C06 | 7  | * | 43.559 | 1.479   | 99    | 1     | 219 | 0.16   | * | 41.017 | -31.868 | * | 12.9  | L | 0 | 0.1   | 4/0   | 2272 | 31001 | * |
| * 22/03 08H36 18H50 * C06 | 7  | * | 43.557 | 1.476   | 99    | 1     | 219 | 0.45   | * | 41.016 | -31.868 | * | 12.9  | G | 0 | 0.1   | 4/0   | 2271 | 31656 | * |

|               |       |       |    |   |        |       |    |   |     |      |   |        |         |   |      |   |   |     |     |      |       |   |
|---------------|-------|-------|----|---|--------|-------|----|---|-----|------|---|--------|---------|---|------|---|---|-----|-----|------|-------|---|
| * 22/03 08H36 | 20H36 | * C06 | 7  | * | 43.556 | 1.480 | 99 | 1 | 219 | 0.36 | * | 41.014 | -31.867 | * | 12.9 | G | 0 | 0.1 | 4/0 | 2272 | 31833 | * |
| * 22/03 09H19 | 09H27 | * S07 | 6  | * | 43.555 | 1.478 | 99 | 1 | 386 | 0.54 | * | 50.692 | -36.027 | * | 13.6 | S | 0 | 0.4 | 4/0 | 2272 | 31043 | * |
| * 22/03 09H19 | 09H27 | * S07 | 10 | * | 43.560 | 1.481 | 99 | 1 | 220 | 0.08 | * | 50.772 | -36.036 | * | 13.6 | L | 0 | 0.2 | 4/0 | 2272 | 31038 | * |
| * 22/03 09H19 | 17H32 | * S07 | 10 | * | 43.559 | 1.481 | 99 | 1 | 220 | 0.06 | * | 50.771 | -36.040 | * | 13.6 | G | 0 | 0.2 | 4/0 | 2272 | 31526 | * |
| * 22/03 09H19 | 20H52 | * S07 | 10 | * | 43.558 | 1.483 | 99 | 1 | 220 | 0.21 | * | 50.771 | -36.040 | * | 13.6 | G | 0 | 0.2 | 4/0 | 2271 | 31903 | * |
| * 22/03 09H53 | 10H05 | * S04 | 14 | * | 43.559 | 1.480 | 97 | 1 | 223 | 0.10 | * | 45.257 | -6.903  | * | 3.3  | L | 0 | 0.2 | 4/0 | 2272 | 31099 | * |
| * 22/03 09H53 | 11H41 | * S04 | 14 | * | 43.558 | 1.480 | 97 | 1 | 223 | 0.10 | * | 45.257 | -6.901  | * | 3.3  | G | 0 | 0.2 | 4/0 | 2272 | 31227 | * |
| * 22/03 11H33 | 11H41 | * S04 | 8  | * | 43.558 | 1.479 | 97 | 1 | 224 | 0.19 | * | 54.434 | -55.116 | * | 19.7 | L | 0 | 0.7 | 4/0 | 2272 | 31228 | * |
| * 22/03 11H33 | 18H08 | * S04 | 8  | * | 43.558 | 1.477 | 97 | 1 | 223 | 0.31 | * | 54.428 | -55.123 | * | 19.7 | G | 0 | 0.7 | 4/0 | 2272 | 31585 | * |

Zones géographiques BORDE/MARSA numero de dossier xxx

Nombre total de lignes (localisées + détectées) : 163 + 6 = 169

Nombre de localisées : 163

Nombre de balises-passage : 91

Nombre de localisations uniques : 89

Date première loc : 19/03/1999 10:24

Date dernière loc : 22/03/1999 11:33

Durée de l'émission : 73H 9mn

Reference pour calcul des erreurs : lat=+43.559 long= +1.481

## COMPARISON LEVEL

LUT 2272

Pass N° 076 (S4)

|                      |   | 001 Reference beacon  |               | Date                     | UT Time  |               |               | Level dB |  |
|----------------------|---|-----------------------|---------------|--------------------------|----------|---------------|---------------|----------|--|
| 1                    | 1 | ce300000000000dbd0e40 | 7820103       | 19/03/1999               | 20:10:30 | 2385          | 406033977.542 | -124,0   |  |
| 1                    | 1 | ce300000000000dbd0e40 | 7820113       | 19/03/1999               | 20:11:30 | 2407          | 406033932.631 | -122,0   |  |
| 1                    | 1 | ce300000000000dbd0e40 | 7820120       | 19/03/1999               | 20:12:00 | 2418          | 406033890.130 | -122,0   |  |
| 1                    | 1 | ce300000000000dbd0e40 | 7820123       | 19/03/1999               | 20:12:30 | 2429          | 406033827.698 | -118,0   |  |
| 1                    | 1 | ce300000000000dbd0e40 | 7820130       | 19/03/1999               | 20:13:00 | 2440          | 406033736.920 | -117,0   |  |
| 1                    | 1 | ce300000000000dbd0e40 | 7820133       | 19/03/1999               | 20:13:30 | 2254          | 406033609.002 | -116,0   |  |
| 1                    | 1 | ce300000000000dbd0e40 | 7820140       | 19/03/1999               | 20:14:00 | 2265          | 406033430.918 | -116,0   |  |
| 1                    | 1 | ce300000000000dbd0e40 | 7820143       | 19/03/1999               | 20:14:30 | 2276          | 406033181.931 | -113,0   |  |
| 1                    | 1 | ce300000000000dbd0e40 | 7820150       | 19/03/1999               | 20:15:00 | 2287          | 406032829.531 | -110,0   |  |
| 1                    | 1 | ce300000000000dbd0e40 | 7820153       | 19/03/1999               | 20:15:30 | 2298          | 406032325.299 | -110,0   |  |
| 1                    | 1 | ce300000000000dbd0e40 | 7820160       | 19/03/1999               | 20:16:00 | 2309          | 406031595.511 | -108,0   |  |
| 1                    | 1 | ce300000000000dbd0e40 | 7820163       | 19/03/1999               | 20:16:30 | 2320          | 406030540.900 | -115,0   |  |
| 1                    | 1 | ce300000000000dbd0e40 | 7822170       | 19/03/1999               | 20:17:00 | 2331          | 406029052.043 | -113,0   |  |
| 1                    | 1 | ce300000000000dbd0e40 | 7820173       | 19/03/1999               | 20:17:30 | 2341          | 406027092.106 | -110,0   |  |
| 1                    | 1 | ce300000000000dbd0e40 | 7820180       | 19/03/1999               | 20:18:00 | 2352          | 406024812.753 | -112,0   |  |
| 1                    | 1 | ce300000000000dbd0e40 | 7820183       | 19/03/1999               | 20:18:30 | 2363          | 406022565.477 | -112,0   |  |
| 1                    | 1 | ce300000000000dbd0e40 | 7820190       | 19/03/1999               | 20:19:00 | 2374          | 406020678.885 | -108,0   |  |
| 1                    | 1 | ce300000000000dbd0e40 | 7820193       | 19/03/1999               | 20:19:30 | 2385          | 406019267.304 | -109,0   |  |
| 1                    | 1 | ce300000000000dbd0e40 | 7820200       | 19/03/1999               | 20:20:00 | 2396          | 406018273.472 | -122,0   |  |
| 1                    | 1 | ce300000000000dbd0e40 | 7820203       | 19/03/1999               | 20:20:30 | 2407          | 406017587.732 | -128,0   |  |
| 1                    | 1 | ce300000000000dbd0e40 | 7820210       | 19/03/1999               | 20:21:00 | 2418          | 406017113.824 | -112,0   |  |
| 1                    | 1 | ce300000000000dbd0e40 | 7820213       | 19/03/1999               | 20:21:30 | 2429          | 406016782.298 | -112,0   |  |
| 1                    | 1 | ce300000000000dbd0e40 | 7820220       | 19/03/1999               | 20:22:00 | 2439          | 406016548.034 | -114,0   |  |
| 1                    | 1 | ce300000000000dbd0e40 | 7820223       | 19/03/1999               | 20:22:30 | 2450          | 406016380.632 | -114,0   |  |
| 1                    | 1 | ce300000000000dbd0e40 | 7820230       | 19/03/1999               | 20:23:00 | 2265          | 406016260.960 | -115,0   |  |
| 1                    | 1 | ce300000000000dbd0e40 | 7820233       | 19/03/1999               | 20:23:30 | 2276          | 406016175.518 | -117,0   |  |
| 1                    | 1 | ce300000000000dbd0e40 | 7820240       | 19/03/1999               | 20:24:00 | 2287          | 406016115.724 | -116,0   |  |
| 1                    | 1 | ce300000000000dbd0e40 | 7820243       | 19/03/1999               | 20:24:30 | 2298          | 406016075.717 | -117,0   |  |
| 1                    | 1 | ce300000000000dbd0e40 | 7820250       | 19/03/1999               | 20:25:00 | 2309          | 406016051.096 | -120,0   |  |
| 1                    | 1 | ce300000000000dbd0e40 | 7820253       | 19/03/1999               | 20:25:30 | 2320          | 406016038.496 | -117,0   |  |
| <b>Min ref level</b> |   |                       | <b>-128,0</b> |                          |          |               |               |          |  |
| <b>Max ref level</b> |   |                       | <b>-108,0</b> | <b>Average ref level</b> |          | <b>-115,3</b> |               |          |  |

|                         |    | N°3 RLB32 ACR beacon   |             | Date                        | UT Time  |               |               | Level dB |  |
|-------------------------|----|------------------------|-------------|-----------------------------|----------|---------------|---------------|----------|--|
| 12                      | 10 | 56ee810006a0200c16c890 |             | 19/03/1999                  | 20:14:00 | 9716          | 406033640.914 | -116     |  |
| 12                      | 10 | 56ee810006a0200c16c890 |             | 19/03/1999                  | 20:14:51 | 2676          | 406033163.274 | -117     |  |
| 12                      | 10 | 56ee810006a0200c16c890 |             | 19/03/1999                  | 20:15:39 | 9164          | 406032333.799 | -116     |  |
| 12                      | 10 | 56ee810006a0200c16c890 |             | 19/03/1999                  | 20:16:30 | 8398          | 406030728.264 | -114     |  |
| 12                      | 10 | 56ee810006a0200c16c890 |             | 19/03/1999                  | 20:18:11 | 7455          | 406024138.434 | -115     |  |
| 12                      | 10 | 56ee810006a0200c16c890 |             | 19/03/1999                  | 20:19:01 | 6884          | 406020812.265 | -118     |  |
| 12                      | 10 | 56ee810006a0200c16c890 |             | 19/03/1999                  | 20:19:53 | 9256          | 406018667.106 | -126     |  |
| 12                      | 10 | 56ee810006a0200c16c890 |             | 19/03/1999                  | 20:20:44 | 5353          | 406017554.946 | -112     |  |
| 12                      | 10 | 56ee810006a0200c16c890 |             | 19/03/1999                  | 20:21:33 | 5175          | 406016967.515 | -120     |  |
| 12                      | 10 | 56ee810006a0200c16c890 |             | 19/03/1999                  | 20:22:24 | 7939          | 406016622.123 | -117     |  |
| 12                      | 10 | 56ee810006a0200c16c890 |             | 19/03/1999                  | 20:23:14 | 4231          | 406016431.997 | -120     |  |
| 12                      | 10 | 56ee810006a0200c16c890 |             | 19/03/1999                  | 20:24:06 | 3270          | 406016321.640 | -125     |  |
| 12                      | 10 | 56ee810006a0200c16c890 |             | 19/03/1999                  | 20:24:56 | 6229          | 406016268.679 | -128     |  |
| <b>Min RLB 32 level</b> |    |                        | <b>-128</b> |                             |          |               |               |          |  |
| <b>Max RLB 32 level</b> |    |                        | <b>-112</b> | <b>Average RLB 32 level</b> |          | <b>-118,8</b> |               |          |  |

## RLB 32 N° 3 SATELLITE TEST DATA RESULTS

| Pass |    | N°5 RLB33 ACR beacon   | Date       | UT Time    | Freq   | Level dB | Max  |
|------|----|------------------------|------------|------------|--------|----------|------|
| 56   |    |                        |            |            |        |          |      |
| 78   | 25 | 56ee810006a0200c16c890 | 19/03/1999 | 10:27:05.3 | 406032 | -119     |      |
| 78   | 25 | 56ee810006a0200c16c890 | 19/03/1999 | 10:27:57.5 | 406031 | -117     |      |
| 78   | 25 | 56ee810006a0200c16c890 | 19/03/1999 | 10:28:48.1 | 406030 | -114     |      |
| 78   | 25 | 56ee810006a0200c16c890 | 19/03/1999 | 10:30:28.4 | 406027 | -118     |      |
| 78   | 25 | 56ee810006a0200c16c890 | 19/03/1999 | 10:31:18.0 | 406024 | -114     | -114 |
| 78   | 25 | 56ee810006a0200c16c890 | 19/03/1999 | 10:32:09.5 | 406022 | -122     |      |
| 78   | 25 | 56ee810006a0200c16c890 | 19/03/1999 | 10:33:48.8 | 406019 | -115     |      |
| 78   | 25 | 56ee810006a0200c16c890 | 19/03/1999 | 10:34:39.8 | 406018 | -114     |      |
| 78   | 25 | 56ee810006a0200c16c890 | 19/03/1999 | 10:35:29.1 | 406017 | -120     |      |
| 48   | 19 | 56ee810006a0200c16c890 | 19/03/1999 | 18:38:08.2 | 406025 | -119     |      |
| 48   | 19 | 56ee810006a0200c16c890 | 19/03/1999 | 18:41:31.3 | 406020 | -123     | -123 |
| 48   | 19 | 56ee810006a0200c16c890 | 19/03/1999 | 18:43:12.8 | 406018 | -124     |      |
| 48   | 19 | 56ee810006a0200c16c890 | 19/03/1999 | 18:44:03.1 | 406018 | -127     |      |
| 76   |    |                        |            |            |        |          |      |
| 12   | 10 | 56ee810006a0200c16c890 | 19/03/1999 | 20:14:00.5 | 406033 | -116     |      |
| 12   | 10 | 56ee810006a0200c16c890 | 19/03/1999 | 20:14:51.2 | 406033 | -117     |      |
| 12   | 10 | 56ee810006a0200c16c890 | 19/03/1999 | 20:15:39.5 | 406032 | -116     |      |
| 12   | 10 | 56ee810006a0200c16c890 | 19/03/1999 | 20:16:30.8 | 406030 | -114     |      |
| 12   | 10 | 56ee810006a0200c16c890 | 19/03/1999 | 20:18:11.7 | 406024 | -115     |      |
| 12   | 10 | 56ee810006a0200c16c890 | 19/03/1999 | 20:19:01.6 | 406020 | -118     |      |
| 12   | 10 | 56ee810006a0200c16c890 | 19/03/1999 | 20:19:53.5 | 406018 | -126     |      |
| 12   | 10 | 56ee810006a0200c16c890 | 19/03/1999 | 20:20:44.5 | 406017 | -112     | -112 |
| 12   | 10 | 56ee810006a0200c16c890 | 19/03/1999 | 20:21:33.5 | 406016 | -120     |      |
| 12   | 10 | 56ee810006a0200c16c890 | 19/03/1999 | 20:22:24.7 | 406016 | -117     |      |
| 12   | 10 | 56ee810006a0200c16c890 | 19/03/1999 | 20:23:14.4 | 406016 | -120     |      |
| 12   | 10 | 56ee810006a0200c16c890 | 19/03/1999 | 20:24:06.3 | 406016 | -125     |      |
| 12   | 10 | 56ee810006a0200c16c890 | 19/03/1999 | 20:24:56.6 | 406016 | -128     |      |
| 9    | 8  | 56ee810006a0200c16c890 | 19/03/1999 | 21:54:55.7 | 406030 | -133     |      |
| 9    | 8  | 56ee810006a0200c16c890 | 19/03/1999 | 21:55:44.7 | 406030 | -121     |      |
| 9    | 8  | 56ee810006a0200c16c890 | 19/03/1999 | 21:56:35.5 | 406029 | -120     |      |
| 9    | 8  | 56ee810006a0200c16c890 | 19/03/1999 | 21:57:25.6 | 406028 | -118     | -118 |
| 9    | 8  | 56ee810006a0200c16c890 | 19/03/1999 | 21:58:17.5 | 406026 | -122     |      |
| 9    | 8  | 56ee810006a0200c16c890 | 19/03/1999 | 21:59:07.8 | 406025 | -121     |      |
| 9    | 8  | 56ee810006a0200c16c890 | 19/03/1999 | 21:59:56.4 | 406023 | -125     |      |
| 9    | 8  | 56ee810006a0200c16c890 | 19/03/1999 | 22:00:47.4 | 406022 | -122     |      |
| 9    | 8  | 56ee810006a0200c16c890 | 19/03/1999 | 22:01:36.7 | 406021 | -125     |      |
| 9    | 8  | 56ee810006a0200c16c890 | 19/03/1999 | 22:02:28.3 | 406020 | -130     |      |
| 9    | 8  | 56ee810006a0200c16c890 | 19/03/1999 | 22:03:18.2 | 406019 | -126     |      |
| 9    | 8  | 56ee810006a0200c16c890 | 19/03/1999 | 22:04:10.4 | 406019 | -132     |      |
| 9    | 8  | 56ee810006a0200c16c890 | 19/03/1999 | 22:05:01.0 | 406018 | -132     |      |
| 6    | 6  | 56ee810006a0200c16c890 | 20/03/1999 | 6:39:36.35 | 406031 | -123     |      |
| 6    | 6  | 56ee810006a0200c16c894 | 20/03/1999 | 6:41:15.32 | 406029 | -118     |      |
| 6    | 6  | 56ee810006a0200c16c890 | 20/03/1999 | 6:42:06.27 | 406027 | -115     |      |
| 6    | 6  | 56ee810006a0200c16c890 | 20/03/1999 | 6:42:55.58 | 406025 | -110     | -110 |
| 6    | 6  | 56ee810006a0200c16c890 | 20/03/1999 | 6:43:47.15 | 406024 | -118     |      |
| 6    | 6  | 56ee810006a0200c16c890 | 20/03/1999 | 6:44:37.11 | 406022 | -115     |      |
| 6    | 6  | 56ee810006a0200c16c890 | 20/03/1999 | 6:45:29.36 | 406020 | -118     |      |
| 6    | 6  | 56ee810006a0200c16c890 | 20/03/1999 | 6:46:19.96 | 406019 | -121     |      |
| 6    | 6  | 56ee810006a0200c16c890 | 20/03/1999 | 6:47:08.94 | 406019 | -121     |      |
| 6    | 6  | 56ee810006a0200c16c890 | 20/03/1999 | 6:48:49.82 | 406017 | -131     |      |
| 6    | 6  | 56ee810006a0200c16c890 | 20/03/1999 | 6:49:41.75 | 406017 | -137     |      |

| Pass |    | N°5 RLB33 ACR beacon   | Date       | UT Time    | Freq   | Level dB | Max  |
|------|----|------------------------|------------|------------|--------|----------|------|
| 11   | 7  | 56ee810006a0200c16c890 | 20/03/1999 | 8:17:58.36 | 406034 | -126     |      |
| 11   | 7  | 56ee810006a0200c16c890 | 20/03/1999 | 8:18:48.32 | 406033 | -123     |      |
| 11   | 7  | 56ee810006a0200c16c890 | 20/03/1999 | 8:19:40.56 | 406033 | -118     |      |
| 11   | 7  | 56ee810006a0200c16c890 | 20/03/1999 | 8:20:31.17 | 406032 | -123     |      |
| 11   | 7  | 56ee810006a0200c16c890 | 20/03/1999 | 8:21:20.15 | 406032 | -115     |      |
| 11   | 7  | 56ee810006a0200c16c890 | 20/03/1999 | 8:22:11.40 | 406030 | -113     | -113 |
| 11   | 7  | 56ee810006a0200c16c890 | 20/03/1999 | 8:23:01.03 | 406027 | -114     |      |
| 11   | 7  | 56ee810006a0200c16c890 | 20/03/1999 | 8:23:52.96 | 406024 | -124     |      |
| 11   | 7  | 56ee810006a0200c16c890 | 20/03/1999 | 8:24:43.23 | 406020 | -118     |      |
| 11   | 7  | 56ee810006a0200c16c890 | 20/03/1999 | 8:25:31.89 | 406018 | -116     |      |
| 11   | 7  | 56ee810006a0200c16c890 | 20/03/1999 | 8:26:22.82 | 406017 | -115     |      |
| 11   | 7  | 56ee810006a0200c16c890 | 20/03/1999 | 8:27:12.13 | 406017 | -116     |      |
| 11   | 7  | 56ee810006a0200c16c890 | 20/03/1999 | 8:28:03.70 | 406016 | -127     |      |
| 35   | 7  | 56ee810006a0200c16c890 | 20/03/1999 | 10:12:18.9 | 406033 | -124     |      |
| 35   | 7  | 56ee810006a0200c16c890 | 20/03/1999 | 10:13:10.2 | 406033 | -121     |      |
| 35   | 7  | 56ee810006a0200c16c890 | 20/03/1999 | 10:14:51.7 | 406032 | -120     |      |
| 35   | 7  | 56ee810006a0200c16c890 | 20/03/1999 | 10:15:42.0 | 406032 | -123     |      |
| 35   | 7  | 56ee810006a0200c16c890 | 20/03/1999 | 10:17:21.6 | 406029 | -117     |      |
| 35   | 7  | 56ee810006a0200c16c890 | 20/03/1999 | 10:18:10.9 | 406026 | -120     |      |
| 35   | 7  | 56ee810006a0200c16c890 | 20/03/1999 | 10:19:02.5 | 406024 | -121     |      |
| 35   | 7  | 56ee810006a0200c16c890 | 20/03/1999 | 10:19:52.4 | 406021 | -118     |      |
| 35   | 7  | 56ee810006a0200c16c890 | 20/03/1999 | 10:20:44.7 | 406019 | -114     |      |
| 35   | 7  | 56ee810006a0200c16c890 | 20/03/1999 | 10:21:35.3 | 406018 | -111     | -111 |
| 35   | 7  | 56ee810006a0200c16c890 | 20/03/1999 | 10:22:24.3 | 406017 | -116     |      |
| 35   | 7  | 56ee810006a0200c16c890 | 20/03/1999 | 10:23:15.5 | 406017 | -117     |      |
| 35   | 7  | 56ee810006a0200c16c890 | 20/03/1999 | 10:24:05.2 | 406016 | -124     |      |
| 7    | 7  | 56ee810006a0200c16c890 | 20/03/1999 | 11:55:46.5 | 406027 | -129     |      |
| 7    | 7  | 56ee810006a0200c16c890 | 20/03/1999 | 11:56:35.5 | 406026 | -127     |      |
| 7    | 7  | 56ee810006a0200c16c890 | 20/03/1999 | 11:59:08.3 | 406023 | -129     |      |
| 2    | 2  | 56ee810006a0200c16c890 | 20/03/1999 | 18:03:12.5 | 406032 | -120     |      |
| 2    | 2  | 56ee810006a0200c16c890 | 20/03/1999 | 18:04:02.4 | 406031 | -114     |      |
| 2    | 2  | 56ee810006a0200c16c890 | 20/03/1999 | 18:05:45.3 | 406027 | -112     | -112 |
| 2    | 2  | 56ee810006a0200c16c890 | 20/03/1999 | 18:06:34.2 | 406025 | -112     |      |
| 2    | 2  | 56ee810006a0200c16c890 | 20/03/1999 | 18:09:07.0 | 406018 | -116     |      |
| 2    | 2  | 56ee810006a0200c16c890 | 20/03/1999 | 18:09:57.3 | 406017 | -116     |      |
| 2    | 2  | 56ee810006a0200c16c890 | 20/03/1999 | 18:12:26.2 | 406016 | -126     |      |
| 12   | 10 | 56ee810006a0200c16c891 | 20/03/1999 | 19:59:14.0 | 406034 | -132     |      |
| 12   | 10 | 56ee810006a0200c16c890 | 20/03/1999 | 20:01:44.8 | 406033 | -114     |      |
| 12   | 10 | 56ee810006a0200c16c890 | 20/03/1999 | 20:02:35.7 | 406032 | -115     |      |
| 12   | 10 | 56ee810006a0200c16c890 | 20/03/1999 | 20:04:16.6 | 406029 | -113     |      |
| 12   | 10 | 56ee810006a0200c16c890 | 20/03/1999 | 20:05:06.6 | 406026 | -122     |      |
| 12   | 10 | 56ee810006a0200c16c890 | 20/03/1999 | 20:06:49.4 | 406020 | -109     | -109 |
| 12   | 10 | 56ee810006a0200c16c890 | 20/03/1999 | 20:07:38.4 | 406018 | -115     |      |
| 12   | 10 | 56ee810006a0200c16c890 | 20/03/1999 | 20:10:11.2 | 406016 | -119     |      |

| Pass |    | N°5 RLB33 ACR beacon   |  | Date       | UT Time     |        | Freq | Level dB | Max  |
|------|----|------------------------|--|------------|-------------|--------|------|----------|------|
| 63   | 7  | 56ee810006a0200c16c890 |  | 21/03/1999 | 7:55:37.54  | 406034 |      | -124     |      |
| 63   | 7  | 56ee810006a0200c16c890 |  | 21/03/1999 | 7:56:29.46  | 406034 |      | -122     |      |
| 63   | 7  | 56ee810006a0200c16c890 |  | 21/03/1999 | 7:57:19.74  | 406033 |      | -117     |      |
| 63   | 7  | 56ee810006a0200c16c890 |  | 21/03/1999 | 7:58:08.40  | 406033 |      | -114     |      |
| 63   | 7  | 56ee810006a0200c16c890 |  | 21/03/1999 | 7:58:59.33  | 406032 |      | -112     |      |
| 63   | 7  | 56ee810006a0200c16c890 |  | 21/03/1999 | 7:59:48.63  | 406031 |      | -108     | -108 |
| 63   | 7  | 56ee810006a0200c16c890 |  | 21/03/1999 | 8:00:40.21  | 406029 |      | -115     |      |
| 63   | 7  | 56ee810006a0200c16c890 |  | 21/03/1999 | 8:02:22.41  | 406021 |      | -118     |      |
| 63   | 7  | 56ee810006a0200c16c890 |  | 21/03/1999 | 8:03:13.02  | 406018 |      | -119     |      |
| 63   | 7  | 56ee810006a0200c16c890 |  | 21/03/1999 | 8:04:02.00  | 406017 |      | -119     |      |
| 63   | 7  | 56ee810006a0200c16c890 |  | 21/03/1999 | 8:04:53.25  | 406016 |      | -116     |      |
| 63   | 7  | 56ee810006a0200c16c890 |  | 21/03/1999 | 8:05:42.88  | 406016 |      | -118     |      |
| 63   | 7  | 56ee810006a0200c16c890 |  | 21/03/1999 | 8:06:34.80  | 406016 |      | -123     |      |
| 63   | 7  | 56ee810006a0200c16c890 |  | 21/03/1999 | 8:07:25.08  | 406016 |      | -128     |      |
| 5    | 5  | 56ee810006a0200c16c8b0 |  | 21/03/1999 | 9:59:15.18  | 406033 |      | -120     |      |
| 5    | 5  | 56ee810006a0200c16c890 |  | 21/03/1999 | 10:00:56.74 | 406033 |      | -119     |      |
| 5    | 5  | 56ee810006a0200c16c890 |  | 21/03/1999 | 10:01:47.00 | 406033 |      | -117     |      |
| 5    | 5  | 56ee810006a0200c16c890 |  | 21/03/1999 | 10:02:35.60 | 406032 |      | -117     |      |
| 5    | 5  | 56ee810006a0200c16c890 |  | 21/03/1999 | 10:03:26.50 | 406032 |      | -113     |      |
| 5    | 5  | 56ee810006a0200c16c890 |  | 21/03/1999 | 10:04:15.50 | 406030 |      | -121     |      |
| 5    | 5  | 56ee810006a0200c16c890 |  | 21/03/1999 | 10:05:07.40 | 406028 |      | -114     |      |
| 5    | 5  | 56ee810006a0200c16c890 |  | 21/03/1999 | 10:06:49.60 | 406022 |      | -110     | -110 |
| 5    | 5  | 56ee810006a0200c16c890 |  | 21/03/1999 | 10:07:40.20 | 406020 |      | -114     |      |
| 5    | 5  | 56ee810006a0200c16c890 |  | 21/03/1999 | 10:08:29.20 | 406018 |      | -123     |      |
| 5    | 5  | 56ee810006a0200c16c890 |  | 21/03/1999 | 10:09:20.50 | 406017 |      | -112     |      |
| 5    | 5  | 56ee810006a0200c16c890 |  | 21/03/1999 | 10:10:10.10 | 406017 |      | -119     |      |
| 5    | 5  | 56ee810006a0200c16c890 |  | 21/03/1999 | 10:11:02.00 | 406016 |      | -120     |      |
| 5    | 5  | 56ee810006a0200c16c890 |  | 21/03/1999 | 10:11:52.30 | 406016 |      | -128     |      |
| 50   | 16 | 56ee810006a0200c16c890 |  | 21/03/1999 | 17:40:51.60 | 406031 |      | -116     |      |
| 50   | 16 | 56ee810006a0200c16c890 |  | 21/03/1999 | 17:41:43.60 | 406030 |      | -114     |      |
| 50   | 16 | 56ee810006a0200c16c880 |  | 21/03/1999 | 17:42:33.80 | 406029 |      | -115     |      |
| 50   | 16 | 56ee810006a0200c16c890 |  | 21/03/1999 | 17:43:22.50 | 406028 |      | -112     | -112 |
| 50   | 16 | 56ee810006a0200c16c890 |  | 21/03/1999 | 17:44:13.40 | 406026 |      | -115     |      |
| 50   | 16 | 56ee810006a0200c16c890 |  | 21/03/1999 | 17:48:27.10 | 406018 |      | -121     |      |
| 50   | 16 | 56ee810006a0200c16c890 |  | 21/03/1999 | 17:49:16.10 | 406017 |      | -125     |      |
| 50   | 16 | 56ee810006a0200c16c890 |  | 21/03/1999 | 17:50:07.40 | 406017 |      | -127     |      |
| 8    | 8  | 56ee810006a0200c16c890 |  | 21/03/1999 | 19:47:01.10 | 406033 |      | -122     |      |
| 8    | 8  | 56ee810006a0200c16c890 |  | 21/03/1999 | 19:50:21.60 | 406031 |      | -116     |      |
| 8    | 8  | 56ee810006a0200c16c890 |  | 21/03/1999 | 19:51:11.50 | 406030 |      | -115     | -115 |
| 8    | 8  | 56ee810006a0200c16c890 |  | 21/03/1999 | 19:52:03.80 | 406028 |      | -116     |      |
| 8    | 8  | 56ee810006a0200c16c890 |  | 21/03/1999 | 19:53:43.30 | 406022 |      | -113     |      |
| 8    | 8  | 56ee810006a0200c16c890 |  | 21/03/1999 | 19:55:24.20 | 406018 |      | -119     |      |
| 8    | 8  | 56ee810006a0200c16c890 |  | 21/03/1999 | 19:56:16.20 | 406017 |      | -118     |      |
| 8    | 8  | 56ee810006a0200c16c890 |  | 21/03/1999 | 19:56:16.20 | 406017 |      | -113     |      |
| 8    | 8  | 56ee810006a0200c16c890 |  | 21/03/1999 | 19:57:06.40 | 406017 |      | -116     |      |
| 27   | 10 | 56ee810006a0200c16c8b0 |  | 21/03/1999 | 21:04:20.80 | 406026 |      | -133     |      |
| 27   | 10 | 56ee810006a0200c16c890 |  | 21/03/1999 | 21:06:01.70 | 406024 |      | -133     |      |
| 27   | 10 | 56ee810006a0200c16c890 |  | 21/03/1999 | 21:06:53.60 | 406023 |      | -135     |      |

| Pass | N°5 RLB33 ACR beacon      | Date       | UT Time    | Freq   | Level dB | Max  |
|------|---------------------------|------------|------------|--------|----------|------|
| 52   | 7 56ee810006a0200c16c890  | 22/03/1999 | 7:34:07.99 | 406033 | -122     |      |
| 52   | 7 56ee810006a0200c16c890  | 22/03/1999 | 7:34:58.92 | 406033 | -118     |      |
| 52   | 7 56ee810006a0200c16c890  | 22/03/1999 | 7:35:48.22 | 406033 | -118     |      |
| 52   | 7 56ee810006a0200c16c890  | 22/03/1999 | 7:36:39.80 | 406032 | -119     |      |
| 52   | 7 56ee810006a0200c16c890  | 22/03/1999 | 7:37:29.76 | 406031 | -115     |      |
| 52   | 7 56ee810006a0200c16c890  | 22/03/1999 | 7:38:22.00 | 406029 | -114     |      |
| 52   | 7 56ee810006a0200c16c890  | 22/03/1999 | 7:39:12.61 | 406026 | -121     |      |
| 52   | 7 56ee810006a0200c16c890  | 22/03/1999 | 7:40:01.59 | 406022 | -112     |      |
| 52   | 7 56ee810006a0200c16c890  | 22/03/1999 | 7:40:52.84 | 406020 | -111     | -111 |
| 52   | 7 56ee810006a0200c16c890  | 22/03/1999 | 7:41:42.47 | 406018 | -124     |      |
| 52   | 7 56ee810006a0200c16c890  | 22/03/1999 | 7:42:34.39 | 406017 | -116     |      |
| 52   | 7 56ee810006a0200c16c890  | 22/03/1999 | 7:43:24.67 | 406016 | -115     |      |
| 52   | 7 56ee810006a0200c16c890  | 22/03/1999 | 7:44:13.33 | 406016 | -116     |      |
| 52   | 7 56ee810006a0200c16c890  | 22/03/1999 | 7:45:04.26 | 406016 | -121     |      |
| 52   | 7 56ee810006a0200c16c890  | 22/03/1999 | 7:45:53.56 | 406016 | -132     |      |
|      |                           |            |            |        |          |      |
| 11   | 10 56ee810006a0200c16c890 | 22/03/1999 | 9:14:12.80 | 406032 | -132     |      |
| 11   | 10 56ee810006a0200c16c890 | 22/03/1999 | 9:15:01.45 | 406031 | -124     |      |
| 11   | 10 56ee810006a0200c16c890 | 22/03/1999 | 9:15:52.38 | 406030 | -121     |      |
| 11   | 10 56ee810006a0200c16c890 | 22/03/1999 | 9:16:41.69 | 406029 | -120     | -120 |
| 11   | 10 56ee810006a0200c16c890 | 22/03/1999 | 9:17:33.28 | 406028 | -123     |      |
| 11   | 10 56ee810006a0200c16c890 | 22/03/1999 | 9:19:15.47 | 406024 | -124     |      |
| 11   | 10 56ee810006a0200c16c890 | 22/03/1999 | 9:20:06.09 | 406022 | -132     |      |
| 11   | 10 56ee810006a0200c16c890 | 22/03/1999 | 9:20:55.05 | 406021 | -127     |      |
| 11   | 10 56ee810006a0200c16c890 | 22/03/1999 | 9:21:46.32 | 406020 | -123     |      |
| 11   | 10 56ee810006a0200c16c890 | 22/03/1999 | 9:22:35.95 | 406019 | -126     |      |
|      |                           |            |            |        |          |      |
| 21   | 7 56ee810006a0200c16c890  | 22/03/1999 | 9:47:51.93 | 406033 | -119     |      |
| 21   | 7 56ee810006a0200c16c890  | 22/03/1999 | 9:48:40.58 | 406033 | -119     |      |
| 21   | 7 56ee810006a0200c16c890  | 22/03/1999 | 9:49:31.51 | 406033 | -114     |      |
| 21   | 7 56ee810006a0200c16c890  | 22/03/1999 | 9:50:20.82 | 406033 | -112     | -112 |
| 21   | 7 56ee810006a0200c16c890  | 22/03/1999 | 9:51:12.41 | 406032 | -113     |      |
| 21   | 7 56ee810006a0200c16c890  | 22/03/1999 | 9:52:02.36 | 406030 | -117     |      |
| 21   | 7 56ee810006a0200c16c890  | 22/03/1999 | 9:52:54.55 | 406028 | -119     |      |
| 21   | 7 56ee810006a0200c16c890  | 22/03/1999 | 9:53:45.20 | 406024 | -121     |      |
| 21   | 7 56ee810006a0200c16c890  | 22/03/1999 | 9:54:34.18 | 406021 | -113     |      |
| 21   | 7 56ee810006a0200c16c890  | 22/03/1999 | 9:55:25.44 | 406019 | -118     |      |
| 21   | 7 56ee810006a0200c16c890  | 22/03/1999 | 9:56:15.07 | 406017 | -118     |      |
| 21   | 7 56ee810006a0200c16c890  | 22/03/1999 | 9:57:06.99 | 406017 | -119     |      |
| 21   | 7 56ee810006a0200c16c890  | 22/03/1999 | 9:57:57.27 | 406016 | -120     |      |
| 21   | 7 56ee810006a0200c16c890  | 22/03/1999 | 9:58:45.94 | 406016 | -123     |      |
|      |                           |            |            |        |          |      |
| 13   | 9 56ee810006a0200c16c890  | 22/03/1999 | 11:30:25.0 | 406029 | -122     |      |
| 13   | 9 56ee810006a0200c16c890  | 22/03/1999 | 11:31:14.3 | 406028 | -125     |      |
| 13   | 9 56ee810006a0200c16c890  | 22/03/1999 | 11:32:05.8 | 406026 | -129     |      |
| 13   | 9 56ee810006a0200c16c890  | 22/03/1999 | 11:32:55.8 | 406025 | -129     |      |
| 13   | 9 56ee810006a0200c16c890  | 22/03/1999 | 11:33:48.0 | 406024 | -126     |      |
| 13   | 9 56ee810006a0200c16c890  | 22/03/1999 | 11:34:38.7 | 406022 | -120     | -120 |
| 13   | 9 56ee810006a0200c16c890  | 22/03/1999 | 11:35:27.6 | 406021 | -124     |      |
| 13   | 9 56ee810006a0200c16c890  | 22/03/1999 | 11:37:08.5 | 406020 | -135     |      |

**BEACON CODING SOFTWARE AND  
NAVIGATION SYSTEM TEST ON  
RLB 33 ACR Electronics, Inc.  
N° 1**

Alls GPS Tests were performed with a simulator GPS position software.  
This ACR GPS simulator input gps data to the beacon by a GPS optical interface .

### 1-Initial GPS Position Acquisition and Last Valid GPS Postion Retained

This test is performed in compliance with § A3.9.1 and § A3.9.4 of C/S Specific Test Procedure given pages above

#### Reference position data : ACR Toulouse

43° 22' 45,6" N

01° 13' 13,32" E

Date of last reference GPS data transmission into the beacon :

22/03/1999 08:50

Date of the beacon activation :

23/03/1999 11:00

Time of first GPS location :

at the first burst

| Time     | Latitude      | Longitude    | Def. | Delta   | BCH1 read./calcul. | BCH2 read./calcul. |
|----------|---------------|--------------|------|---------|--------------------|--------------------|
| 10:59:54 | 43° 22' 44" N | 1° 13' 12" E |      | 0,07 km | 1FFA47/1FFA47      | A63/A63            |
| 11:00:44 | 43° 22' 44" N | 1° 13' 12" E |      | 0,07 km | 1FFA47/1FFA47      | A63/A63            |
| 11:01:36 | 43° 22' 44" N | 1° 13' 12" E |      | 0,07 km | 1FFA47/1FFA47      | A63/A63            |
| 11:02:27 | 43° 22' 44" N | 1° 13' 12" E |      | 0,07 km | 1FFA47/1FFA47      | A63/A63            |
| 11:03:17 | 43° 22' 44" N | 1° 13' 12" E |      | 0,07 km | 1FFA47/1FFA47      | A63/A63            |
| 11:04:06 | 43° 22' 44" N | 1° 13' 12" E |      | 0,07 km | 1FFA47/1FFA47      | A63/A63            |
| 11:04:58 | 43° 22' 44" N | 1° 13' 12" E |      | 0,07 km | 1FFA47/1FFA47      | A63/A63            |
| 11:05:50 | 43° 22' 44" N | 1° 13' 12" E |      | 0,07 km | 1FFA47/1FFA47      | A63/A63            |
| 11:06:42 | 43° 22' 44" N | 1° 13' 12" E |      | 0,07 km | 1FFA47/1FFA47      | A63/A63            |
| 11:07:32 | 43° 22' 44" N | 1° 13' 12" E |      | 0,07 km | 1FFA47/1FFA47      | A63/A63            |
| 11:08:22 | 43° 22' 44" N | 1° 13' 12" E |      | 0,07 km | 1FFA47/1FFA47      | A63/A63            |
| 11:09:12 | 43° 22' 44" N | 1° 13' 12" E |      | 0,07 km | 1FFA47/1FFA47      | A63/A63            |
| 11:10:02 | 43° 22' 44" N | 1° 13' 12" E |      | 0,07 km | 1FFA47/1FFA47      | A63/A63            |
| 11:10:52 | 43° 22' 44" N | 1° 13' 12" E |      | 0,07 km | 1FFA47/1FFA47      | A63/A63            |
| 11:11:41 | 43° 22' 44" N | 1° 13' 12" E |      | 0,07 km | 1FFA47/1FFA47      | A63/A63            |
| 11:12:31 | 43° 22' 44" N | 1° 13' 12" E |      | 0,07 km | 1FFA47/1FFA47      | A63/A63            |
| 11:13:20 | 43° 22' 44" N | 1° 13' 12" E |      | 0,07 km | 1FFA47/1FFA47      | A63/A63            |
| 11:14:12 | 43° 22' 44" N | 1° 13' 12" E |      | 0,07 km | 1FFA47/1FFA47      | A63/A63            |
| 11:15:03 | 43° 22' 44" N | 1° 13' 12" E |      | 0,07 km | 1FFA47/1FFA47      | A63/A63            |
| 11:15:54 | 43° 22' 44" N | 1° 13' 12" E |      | 0,07 km | 1FFA47/1FFA47      | A63/A63            |
| 11:16:46 | 43° 22' 44" N | 1° 13' 12" E |      | 0,07 km | 1FFA47/1FFA47      | A63/A63            |
| 11:17:36 | 43° 22' 44" N | 1° 13' 12" E |      | 0,07 km | 1FFA47/1FFA47      | A63/A63            |
| 11:18:26 | 43° 22' 44" N | 1° 13' 12" E |      | 0,07 km | 1FFA47/1FFA47      | A63/A63            |
| 11:19:16 | 43° 22' 44" N | 1° 13' 12" E |      | 0,07 km | 1FFA47/1FFA47      | A63/A63            |
| 11:20:07 | 43° 22' 44" N | 1° 13' 12" E |      | 0,07 km | 1FFA47/1FFA47      | A63/A63            |
| 11:20:57 | 43° 22' 44" N | 1° 13' 12" E |      | 0,07 km | 1FFA47/1FFA47      | A63/A63            |
| 11:21:48 | 43° 22' 44" N | 1° 13' 12" E |      | 0,07 km | 1FFA47/1FFA47      | A63/A63            |
| 11:22:38 | 43° 22' 44" N | 1° 13' 12" E |      | 0,07 km | 1FFA47/1FFA47      | A63/A63            |
| 11:23:27 | 43° 22' 44" N | 1° 13' 12" E |      | 0,07 km | 1FFA47/1FFA47      | A63/A63            |
| 11:24:19 | 43° 22' 44" N | 1° 13' 12" E |      | 0,07 km | 1FFA47/1FFA47      | A63/A63            |
| 11:25:09 | 43° 22' 44" N | 1° 13' 12" E |      | 0,07 km | 1FFA47/1FFA47      | A63/A63            |
| 11:25:58 | 43° 22' 44" N | 1° 13' 12" E |      | 0,07 km | 1FFA47/1FFA47      | A63/A63            |
| 11:26:49 | 43° 22' 44" N | 1° 13' 12" E |      | 0,07 km | 1FFA47/1FFA47      | A63/A63            |
| 11:27:39 | 43° 22' 44" N | 1° 13' 12" E |      | 0,07 km | 1FFA47/1FFA47      | A63/A63            |
| 11:28:29 | 43° 22' 44" N | 1° 13' 12" E |      | 0,07 km | 1FFA47/1FFA47      | A63/A63            |
| 11:29:20 | 43° 22' 44" N | 1° 13' 12" E |      | 0,07 km | 1FFA47/1FFA47      | A63/A63            |
| 11:30:10 | 43° 22' 44" N | 1° 13' 12" E |      | 0,07 km | 1FFA47/1FFA47      | A63/A63            |
| 11:30:59 | 43° 22' 44" N | 1° 13' 12" E |      | 0,07 km | 1FFA47/1FFA47      | A63/A63            |
| 11:31:50 | 43° 22' 44" N | 1° 13' 12" E |      | 0,07 km | 1FFA47/1FFA47      | A63/A63            |

**2-Different navigation data input Test**

Date : 24-mar-1999

This test is performed in compliance with § A3.9.2 of C/S Specific Test Procedure

**Ref. pos. Data Source:**

|       |                |                                     |
|-------|----------------|-------------------------------------|
| N° 1  | ITS-Laboratory | 43° 33' 32" N<br>01° 28' 48" E      |
| N° 1* | ITS-Laboratory | 43° 33' 32" N + 4"<br>01° 28' 48" E |
| N°2   | Lauzerville :  | 43° 33' 14" N<br>01° 34' 14" E      |
| N°3   | Lanta:         | 43° 33' 36" N<br>01° 39' 48" E      |

**Results :** Correct

| Ref. Pos | Time     | Latitude      | Longitude     | Def. | Delta   | BCH1 read./calcul. | BCH2 read./calcul. |
|----------|----------|---------------|---------------|------|---------|--------------------|--------------------|
| N° 1     | 10:02:00 | 43° 33' 32" N | 01° 28' 48" E |      | 0,00 km | 087645/087645      | 483/483            |
| N° 1*    | 10:20:00 | 43° 33' 36" N | 01° 28' 48" E |      | 0,12 km | 087645/087645      | 9A9/9A9            |
| N° 2     | 10:40:00 | 43° 33' 14" N | 01° 34' 14" E |      | 0,09 km | 030732/030732      | D33/D33            |
| N° 3     | 11:00:00 | 43° 33' 36" N | 01° 39' 48" E |      | 0,00 km | 030732/030732      | 6FB/6FB            |
| N° 1     | 10:02:00 | 43° 33' 32" N | 01° 28' 48" E |      | 0,00 km | 087645/087645      | 483/483            |

**3-Tests of default position**

This test is performed in compliance with § A3.9.3 of C/S Specific Test Procedure

**Beacon without navigation input.**

Date : 23 Feb 1999

Always default value after 30 min. : Correct

| Time     | Latitude       | Longitude       | Def. | Delta | BCH1 lu/calculé | BCH2 lu/calculé |
|----------|----------------|-----------------|------|-------|-----------------|-----------------|
| 11:34:09 | 127,75° 0' 60" | 1255,75° 0' 60" | *    |       | 1029B4/1029B4   | AA8/AA8         |
| 11:35:01 | 127,75° 0' 60" | 1255,75° 0' 60" | *    |       | 1029B4/1029B4   | AA8/AA8         |
| 11:35:51 | 127,75° 0' 60" | 1255,75° 0' 60" | *    |       | 1029B4/1029B4   | AA8/AA8         |
| 11:36:43 | 127,75° 0' 60" | 1255,75° 0' 60" | *    |       | 1029B4/1029B4   | AA8/AA8         |
| 11:37:32 | 127,75° 0' 60" | 1255,75° 0' 60" | *    |       | 1029B4/1029B4   | AA8/AA8         |
| 11:38:23 | 127,75° 0' 60" | 1255,75° 0' 60" | *    |       | 1029B4/1029B4   | AA8/AA8         |
| 11:39:12 | 127,75° 0' 60" | 1255,75° 0' 60" | *    |       | 1029B4/1029B4   | AA8/AA8         |
| 11:40:02 | 127,75° 0' 60" | 1255,75° 0' 60" | *    |       | 1029B4/1029B4   | AA8/AA8         |
| 11:40:54 | 127,75° 0' 60" | 1255,75° 0' 60" | *    |       | 1029B4/1029B4   | AA8/AA8         |
| 11:41:44 | 127,75° 0' 60" | 1255,75° 0' 60" | *    |       | 1029B4/1029B4   | AA8/AA8         |
| 11:42:35 | 127,75° 0' 60" | 1255,75° 0' 60" | *    |       | 1029B4/1029B4   | AA8/AA8         |
| 11:43:24 | 127,75° 0' 60" | 1255,75° 0' 60" | *    |       | 1029B4/1029B4   | AA8/AA8         |
| 11:44:15 | 127,75° 0' 60" | 1255,75° 0' 60" | *    |       | 1029B4/1029B4   | AA8/AA8         |
| 11:45:07 | 127,75° 0' 60" | 1255,75° 0' 60" | *    |       | 1029B4/1029B4   | AA8/AA8         |
| 11:45:57 | 127,75° 0' 60" | 1255,75° 0' 60" | *    |       | 1029B4/1029B4   | AA8/AA8         |
| 11:46:49 | 127,75° 0' 60" | 1255,75° 0' 60" | *    |       | 1029B4/1029B4   | AA8/AA8         |
| 11:47:38 | 127,75° 0' 60" | 1255,75° 0' 60" | *    |       | 1029B4/1029B4   | AA8/AA8         |
| 11:48:29 | 127,75° 0' 60" | 1255,75° 0' 60" | *    |       | 1029B4/1029B4   | AA8/AA8         |
| 11:49:18 | 127,75° 0' 60" | 1255,75° 0' 60" | *    |       | 1029B4/1029B4   | AA8/AA8         |
| 11:50:09 | 127,75° 0' 60" | 1255,75° 0' 60" | *    |       | 1029B4/1029B4   | AA8/AA8         |
| 11:51:01 | 127,75° 0' 60" | 1255,75° 0' 60" | *    |       | 1029B4/1029B4   | AA8/AA8         |
| 11:51:50 | 127,75° 0' 60" | 1255,75° 0' 60" | *    |       | 1029B4/1029B4   | AA8/AA8         |
| 11:52:42 | 127,75° 0' 60" | 1255,75° 0' 60" | *    |       | 1029B4/1029B4   | AA8/AA8         |
| 11:53:31 | 127,75° 0' 60" | 1255,75° 0' 60" | *    |       | 1029B4/1029B4   | AA8/AA8         |
| 11:54:21 | 127,75° 0' 60" | 1255,75° 0' 60" | *    |       | 1029B4/1029B4   | AA8/AA8         |
| 11:55:14 | 127,75° 0' 60" | 1255,75° 0' 60" | *    |       | 1029B4/1029B4   | AA8/AA8         |
| 11:56:04 | 127,75° 0' 60" | 1255,75° 0' 60" | *    |       | 1029B4/1029B4   | AA8/AA8         |
| 11:56:55 | 127,75° 0' 60" | 1255,75° 0' 60" | *    |       | 1029B4/1029B4   | AA8/AA8         |
| 11:57:45 | 127,75° 0' 60" | 1255,75° 0' 60" | *    |       | 1029B4/1029B4   | AA8/AA8         |
| 11:58:36 | 127,75° 0' 60" | 1255,75° 0' 60" | *    |       | 1029B4/1029B4   | AA8/AA8         |
| 11:59:25 | 127,75° 0' 60" | 1255,75° 0' 60" | *    |       | 1029B4/1029B4   | AA8/AA8         |
| 12:00:15 | 127,75° 0' 60" | 1255,75° 0' 60" | *    |       | 1029B4/1029B4   | AA8/AA8         |
| 12:01:07 | 127,75° 0' 60" | 1255,75° 0' 60" | *    |       | 1029B4/1029B4   | AA8/AA8         |
| 12:01:57 | 127,75° 0' 60" | 1255,75° 0' 60" | *    |       | 1029B4/1029B4   | AA8/AA8         |
| 12:02:48 | 127,75° 0' 60" | 1255,75° 0' 60" | *    |       | 1029B4/1029B4   | AA8/AA8         |
| 12:03:37 | 127,75° 0' 60" | 1255,75° 0' 60" | *    |       | 1029B4/1029B4   | AA8/AA8         |
| 12:04:28 | 127,75° 0' 60" | 1255,75° 0' 60" | *    |       | 1029B4/1029B4   | AA8/AA8         |

**ANTENNA TEST RESULTS ON**  
**RLB 33 ACR Electronics, Inc.**  
**Nº 1**

## 1 - ADMINISTRATION

1. WORK ORDER :                      Reference ITS :    M1469

1. TEST TEAM :                      P. SEVOZ EX/CEM

1. SCHEDULE :                      24/03/99 and 7/04/99

## 2 - PURPOSE

The radiation tests of the dedicated radio beacon are performed in INTESPACE EMC Laboratory in compliance with the test methods described in the COSPAS-SARSAT 406 MHz distress beacon type approval standard : "C/S T. 007- Issue 3 - Revision 5 - October 1998"

## 3 - RADIO BEACON IDENTIFICATIONS

Manufacturer :                      ACR Electronics, Inc.

Model N° :                          RLB 33

Serial N° :                          1

Antenna :                            ACR A3-06-1791-1 quarter wave

## 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 figure N° 1 and N° 2.

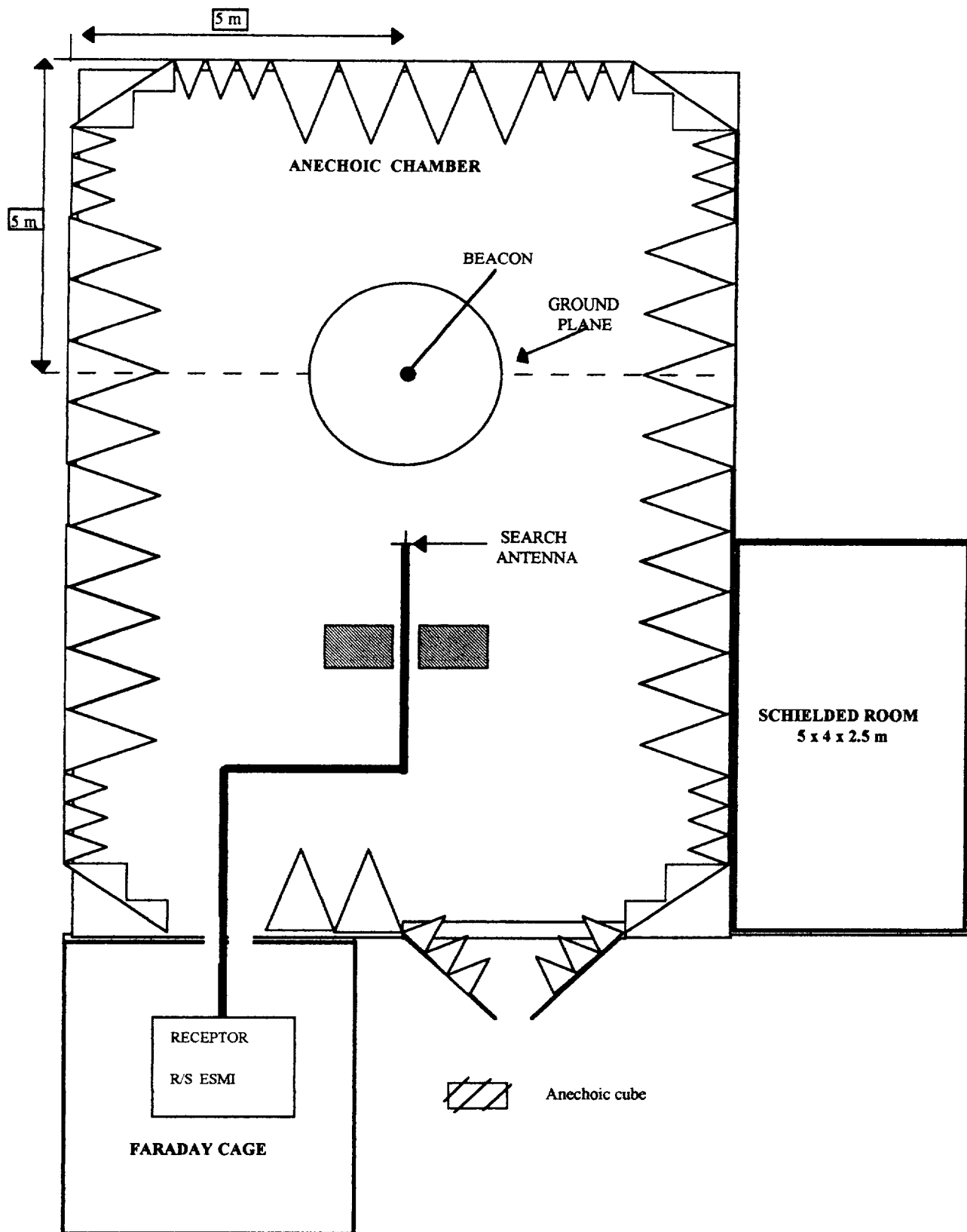


FIGURE 1

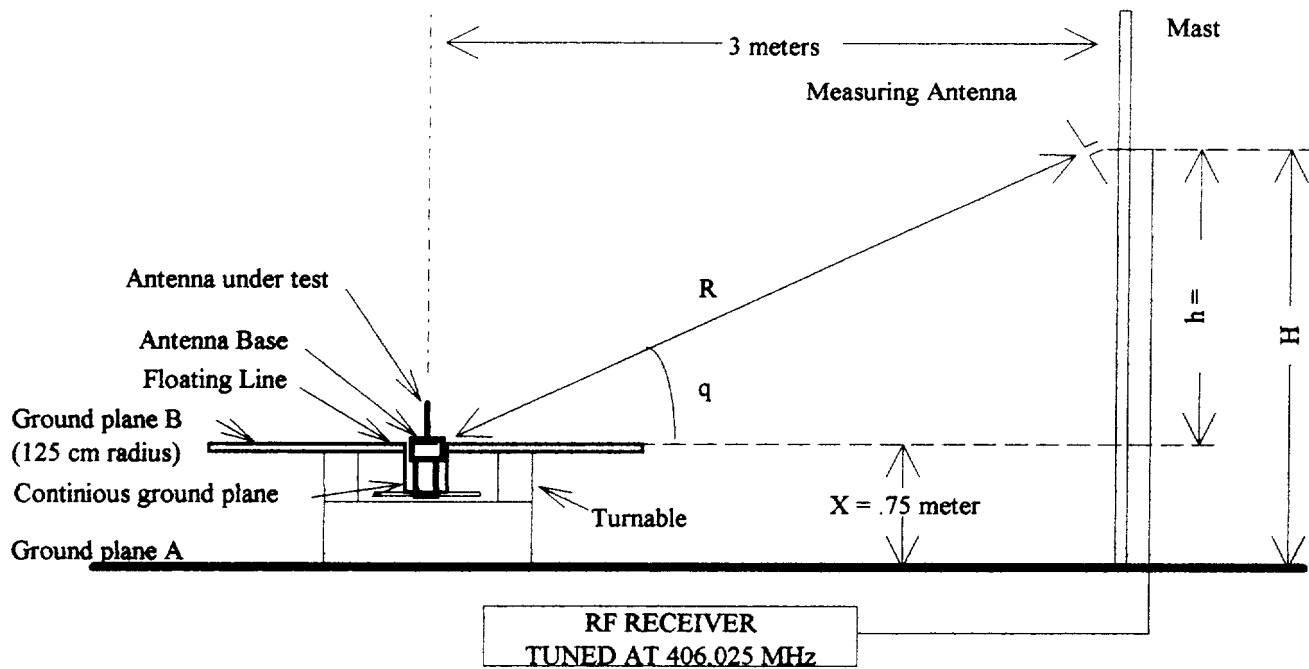


FIGURE 2 (C/S T.007 : B2c / B3a) :  
 Equipement Test Set Up For BEACON Antenna Test  
 (For BEACON designed for normal operation in water, ex: EPIRB)

## 5 - TEST METHOD

The test method describes here after, according to "C/S T. 007- Issue 3 - Revision 5 - October 1998" the sequences for each frequency. Following measurements are performed :

- 1/ Electrical ground plane of 1.25 m of radius is placed at flotation level of the beacon.
- 2/ EPIRB transmitting antenna polarization is determined prior to test.
- 3/ Determination of E field strength in term of  $\text{dB}\mu\text{V/m}$  at 3 m far from the EPIRB for all direction ( $0^\circ$  to  $360^\circ$  by step of  $30^\circ$ ) and for search antenna elevation ( $10^\circ$  to  $50^\circ$ ). Search antenna is tilted in direction of the beacon antenna for each elevation ( Fig : 2 ) .
- 4/ An ERP (Equivalent Radiated Power) from the PLB is calculated
- 5/ ERP is corrected with EOL (end of life factor)
- 6/ Actual ERP are compared to specified ERP to be in the range 1.6 W to 20 W (+ 32 dBm to + 43 dBm).

## 6 - TESTS EQUIPMENTS

### 6.1. SEARCH ANTENNA

- 406 MHz test : Rhode & Schwartz Ref HUF-Z3  
Serial number : S/N 891551/10

### 6.2. SPECTRUM ANALYSER

- R/S ESMI

### 6.3. CABLES

- 20 m cable SUCOFLEX type 100 - cable loss at 406 MHz is : 2,00 dB

## 7 - TESTS OPERATIONS

### 7.1. EMISSION FIELD STRENGTH FROM EPIRB

The electrical field intensity is measured with the following antenna :

- Rhode & Schwartz Ref HUF-Z3

EPIRB electric field strength is obtained from measurement of the output voltage (dB $\mu$ V RMS) at antenna port (typical set up are shown figure N° 3 for 406 MHz) and computed with following parameters :

- Antenna factor of search antenna AF in dB (manufacturer calibration is 17 dBi ) .
- Cable loss L = 2,3 dB at 406 MHz
- DF : distance factor in dB - To calculate field at a constant distance (3 m) from EPIRB due to the elevation of the search antenna.
- Power correction factor : end of life correction factor EOL is calculated from the difference between RF power measured during test and end of life power after 24 hours operation. This factor is applied to correct ERP as shown on final test result table
- The measurements are performed on the carrier signal, just before to apply the modulation.
- The effective field strength at 3 m from EPIRB is computed from :

$$EdB_{\mu V/m} = UdB_{\mu V} + AF + Dm + L + DF$$

### 7.2. POWER CORRECTION FACTORS

#### EOL factor

| TEST FREQUENCY | RF POWER<br>MEASURED DURING<br>TEST | END OF LIFE dB<br>FACTOR after 24 hours<br>operation at min temp. |
|----------------|-------------------------------------|-------------------------------------------------------------------|
| 406 MHz        | 38,3 dBm                            | 0,0 dB                                                            |

**ANTENNA TEST RESULTS ON**  
**RLB 33 ACR Electronics, Inc.**  
**N° 1**

## 1 - ADMINISTRATION

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Tests are performed in an anechoic chamber (size 16 m x 10 m x 11 m)

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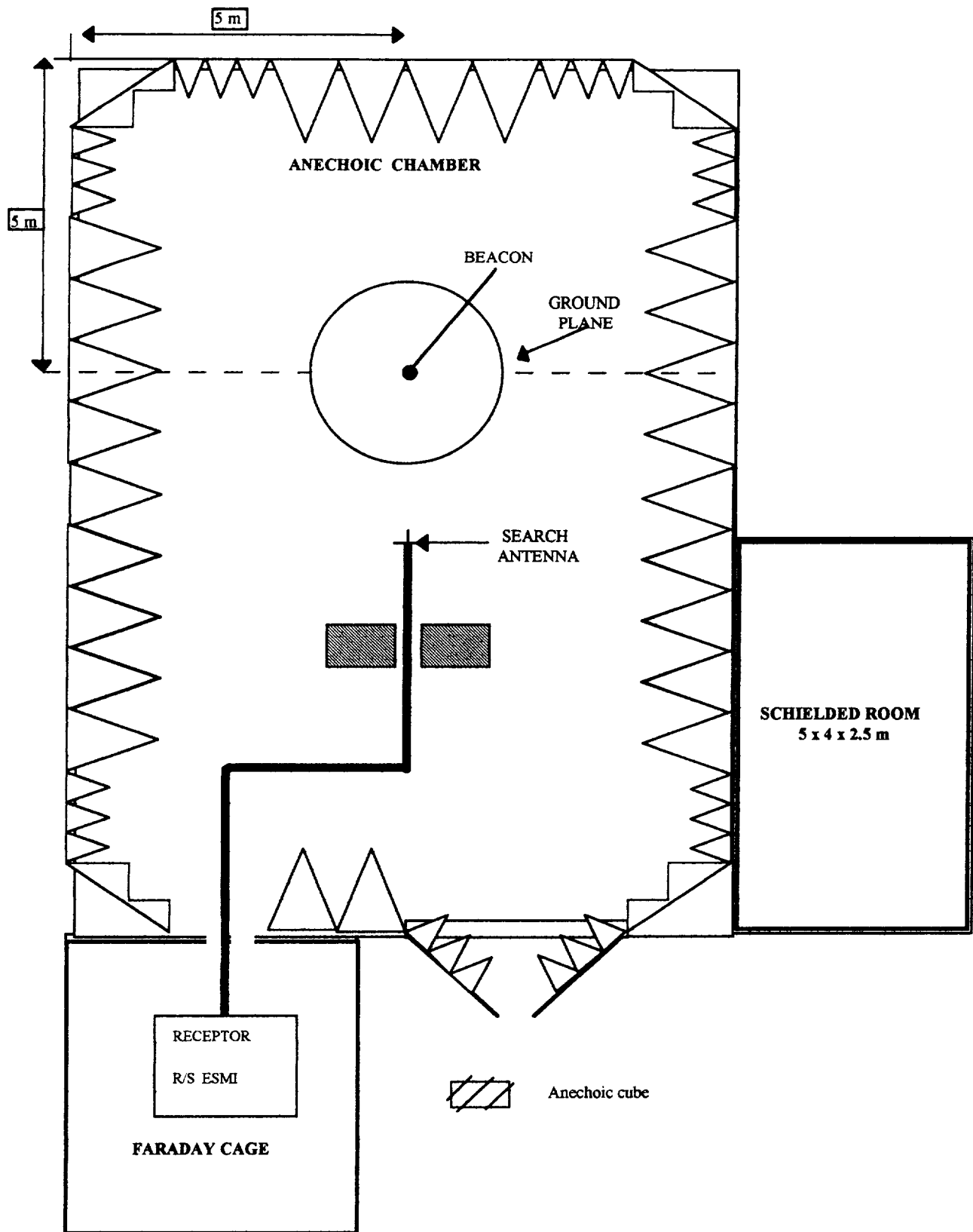


FIGURE 1

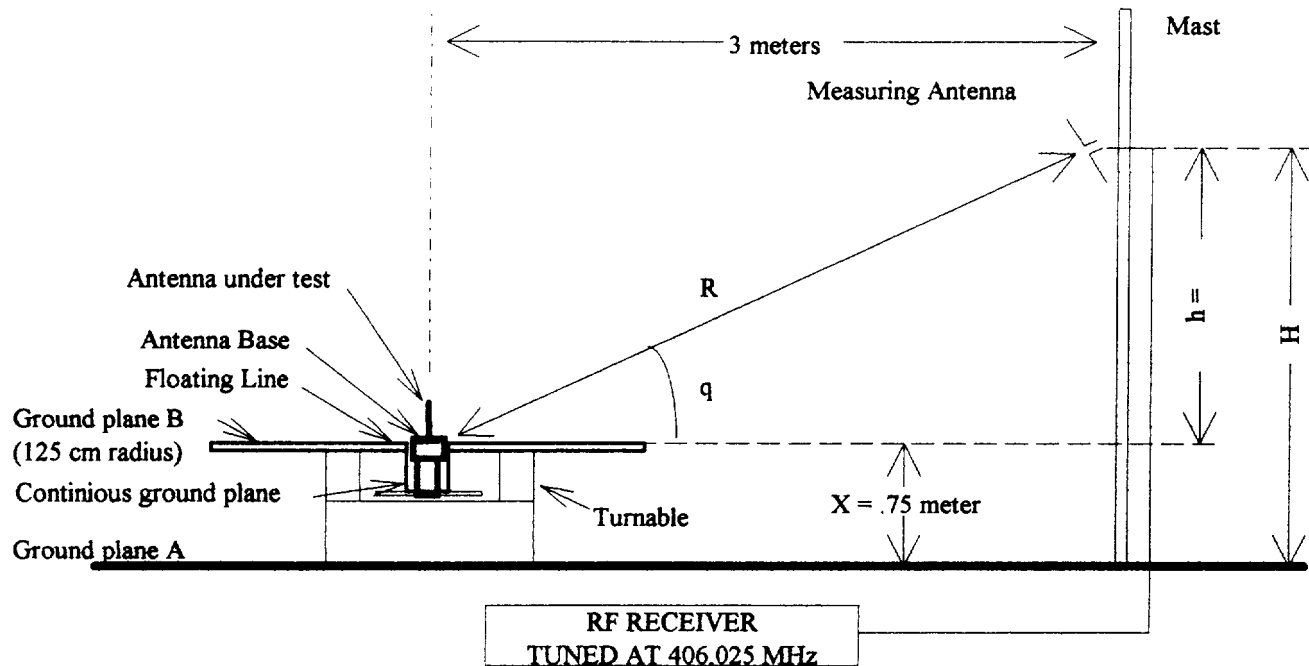


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- 1/ Electrical ground plane of 1.25 m of radius is placed at flotation level of the beacon.
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Serial number : S/N 891551/10

### 6.2. SPECTRUM ANALYSER

- R/S ESMI

### 6.3. CABLES

- 20 m cable SUCOFLEX type 100 - cable loss at 406 MHz is : 2,30 dB

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### 7.1. EMISSION FIELD STRENGTH FROM EPIRB

The electrical field intensity is measured with the following antenna :

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EPIRB electric field strength is obtained from measurement of the output voltage (dBμV RMS) at antenna port (typical set up are shown figure N° 3 for 406 MHz) and computed with following parameters :

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- Cable loss L = 2,3 dB at 406 MHz
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- The effective field strength at 3 m from EPIRB is computed from :

$$EdB_{\mu V/m} = UdB_{\mu V} + AF + Dm + L + DF$$

### 7.2. POWER CORRECTION FACTORS

#### EOL factor

| TEST FREQUENCY | RF POWER<br>MEASURED DURING<br>TEST | END OF LIFE dB<br>FACTOR after 24 hours<br>operation at min temp. |
|----------------|-------------------------------------|-------------------------------------------------------------------|
| 406 MHz        | 38,3 dBm                            | 0,0 dB                                                            |

## 8 - RADIATED POWER CALCULATIONS

### 8.1. EFFECTIVE RADIATED POWER OF EPIRB

ERP of EPIRB is directly calculated from equation :

$$ERP = E^2 \times D^2 / 30$$

$$ERP = W$$

$$E = V/m$$

$$D = m$$

Results shown in table N° C1 are given in dBm where :

$$ERP \text{ dBm} = 10 \log (ERP \text{ W}) + 30$$

and apparent antenna gain :

$$G_{dB} = ERP_{dBm} - RF \text{ Power}_{dBm}$$

## 9 - SUCCESS CRITERIA

90% of EPIRB measurements must be equal or greater than 1,6 W ERP (32 dBm) .  
and less than 20 W ERP (43 dBm)

## 10 - EPIRB ANTENNA POLARIZATION

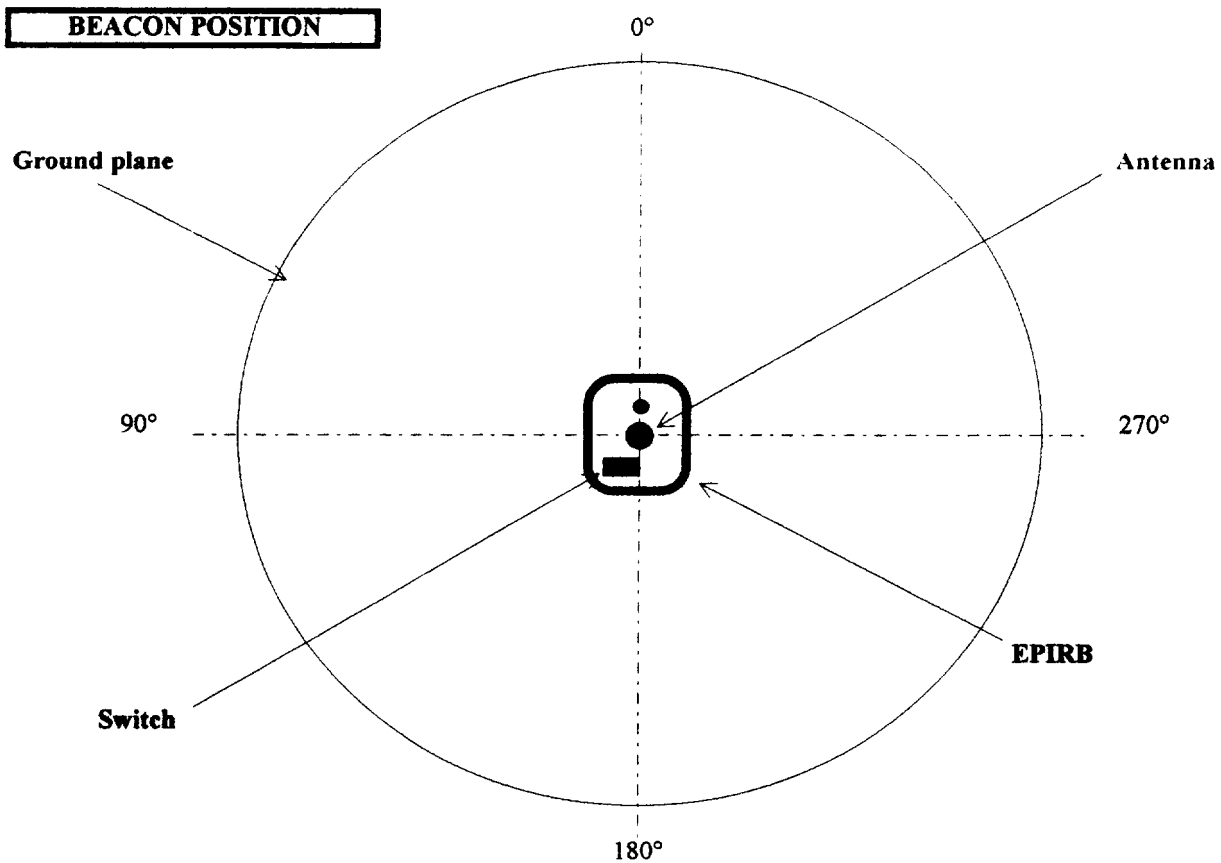
EPIRB antenna polarization is checked according to C/S T007 procedure paragraph B9 EPIRB antenna polarization is declared vertical when measurement obtained with vertical polarization search antenna are 10 dB greater or more than measurement obtained with

| Antenna model | Angle | Vertical measurement<br>dB $\mu$ V | Horizontal measurement<br>dB $\mu$ V | /       |
|---------------|-------|------------------------------------|--------------------------------------|---------|
|               | 10°   | 115,6                              | 90,3                                 | 25,3 dB |

EPIRB antenna is declared : Vertical polarized antenna.

## 11 - EPIRB MECHANICAL SET UP

EPIRB 0°axis is identified with 0° azimuth direction of turn table.  
Antenna is the center of rotation of azimuth angle.



NOT TO SCALE

## 12 - RESULTS

| Test frequency | Polarization | Reference ERP (W)           | Measurement ERP    |
|----------------|--------------|-----------------------------|--------------------|
| 406 MHz        | Vertical     | $1.6 < \text{ERP Ref} < 20$ | According table C1 |

## CONCLUSIONS

The ERP Beacon is on ERP reference limit.

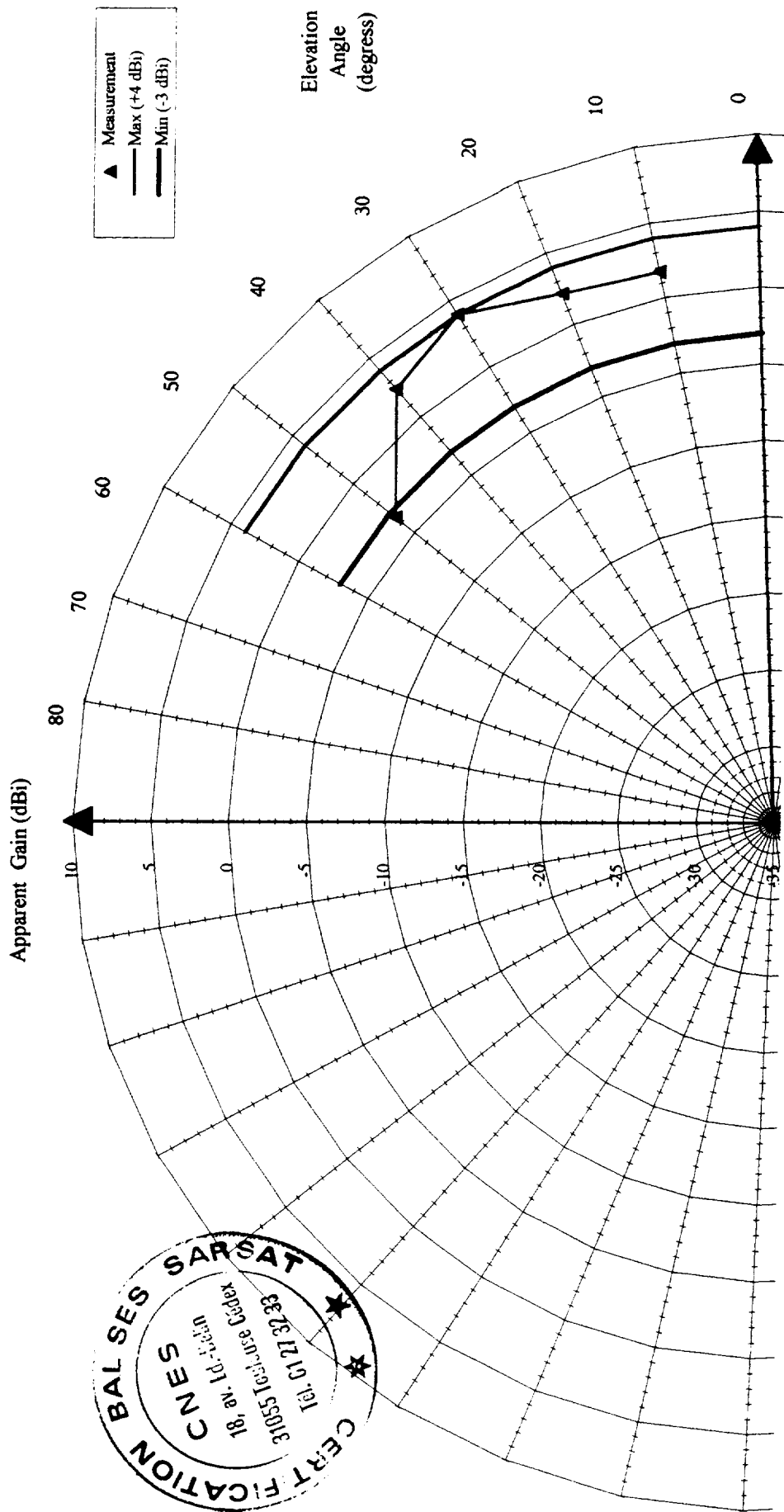
**Table C1 : EFFECTIVE RADIATED POWER (dBm) / ANTENNA GAIN (dBi)**

| Azimuth<br>Angle (Degrees) | Elevation Angle (Degrees) |              |              |              |               |
|----------------------------|---------------------------|--------------|--------------|--------------|---------------|
|                            | 10                        | 20           | 30           | 40           | 50            |
| 0                          | 39,80 / 1,50              | 40,21 / 1,91 | 42,02 / 3,72 | 40,59 / 2,29 | 34,91 / -3,39 |
| 30                         | 40,00 / 1,70              | 40,31 / 2,01 | 42,12 / 3,82 | 40,79 / 2,49 | 34,81 / -3,49 |
| 60                         | 40,10 / 1,80              | 40,51 / 2,21 | 42,42 / 4,12 | 40,79 / 2,49 | 34,71 / -3,59 |
| 90                         | 40,10 / 1,80              | 40,61 / 2,31 | 42,42 / 4,12 | 40,79 / 2,49 | 35,11 / -3,19 |
| 120                        | 40,00 / 1,70              | 40,61 / 2,31 | 42,52 / 4,22 | 40,79 / 2,49 | 34,91 / -3,39 |
| 150                        | 39,90 / 1,60              | 40,41 / 2,11 | 42,32 / 4,02 | 40,59 / 2,29 | 34,81 / -3,49 |
| 180                        | 39,90 / 1,60              | 40,31 / 2,01 | 42,22 / 3,92 | 40,59 / 2,29 | 34,81 / -3,49 |
| 210                        | 39,90 / 1,60              | 40,31 / 2,01 | 42,22 / 3,92 | 40,59 / 2,29 | 34,71 / -3,59 |
| 240                        | 40,10 / 1,80              | 40,51 / 2,21 | 42,22 / 3,92 | 40,59 / 2,29 | 35,11 / -3,19 |
| 270                        | 40,20 / 1,90              | 40,61 / 2,31 | 42,22 / 3,92 | 40,69 / 2,39 | 34,91 / -3,39 |
| 300                        | 40,10 / 1,80              | 40,51 / 2,21 | 42,42 / 4,12 | 40,89 / 2,59 | 34,71 / -3,59 |
| 330                        | 40,00 / 1,70              | 40,51 / 2,21 | 42,32 / 4,02 | 40,69 / 2,39 | 34,81 / -3,49 |
| Average                    | 40,01 / 1,71              | 40,45 / 2,15 | 42,29 / 3,99 | 40,69 / 2,39 | 34,86 / -3,44 |
| Overall Gain Variation     | 0,40 dB                   | 0,40 dB      | 0,50 dB      | 0,30 dB      | 0,40 dB       |

$$ERP_{\max \text{ EOL}} = ERP_{\max} - ERP_{\text{LOSS}} = 42,52 - 0 = 42,52 \text{ dBm}$$

$$ERP_{\min \text{ EOL}} = ERP_{\min} - ERP_{\text{LOSS}} = 34,71 - 0 = 34,71 \text{ dBm}$$

ACR Electronics, Inc. ACR A3-06-1791-1 ANTENNA PATTERN



**ANNEX A**  
**OF TEST REPORT REF. N° M1469**

**MANUFACTURER DOCUMENTATION ON**  
**RLB 32 and RLB 33 ACR Electronics, Inc. Beacon**



# ***PRODUCT SUPPORT MANUAL***

Y1-03-0148  
Rev. A

## **SATELLITE<sub>2</sub><sup>TM</sup> 406 and RAPIDFIX<sup>TM</sup> 406**

**Emergency Position  
Indicating Radio Beacon**

**FCC Type Accepted**

**Product No. 2774 Cat. I  
Product No. 2775 Cat. II  
Product No. 2776 Cat. I, GPS  
Product No. 2777 Cat. II, GPS**

**ACR Electronics, Inc.**  
5757 Ravenswood Road  
Fort Lauderdale, FL 33312 USA  
(954) 981-3333 • Fax (954) 983-5087

## SECTION 1 - THE SYSTEM

### 1.1 GENERAL

- 1.1.1 This manual provides installation, operation and maintenance instructions for the **Satellite<sub>2</sub><sup>TM</sup> 406** and **RapidFix<sup>TM</sup> 406** Emergency Position Indicating Radio Beacon, hereinafter referred to as the Beacon. This section describes the characteristics and details of the Beacon System. The FCC authorizes the use of 406 MHz Radio Beacons by any ship that is also equipped with a VHF Ship Station. This will make the 406 MHz Radio Beacon available for use on most U.S. ships and boats. EPIRB carriage requirements are contained in USCG regulations.

### 1.2 PURPOSE

- 1.2.1 The **Satellite<sub>2</sub><sup>TM</sup> 406** and **RapidFix<sup>TM</sup> 406** Beacon provides distress alerting via radio transmission on 406 MHz to satellites of the COSPAS-SARSAT network. The message transmitted by the **Satellite<sub>2</sub><sup>TM</sup> 406** and **RapidFix<sup>TM</sup> 406** is unique for each EPIRB, which provides identification of the transmitter through computer access of registration files maintained by the National Oceanic and Atmospheric Administration or other national authority. **It is the users responsibility to fill out and mail the enclosed registration form to the appropriate agency of the country under which the vessel is registered.** US flagged vessels send the enclosed NOAA/NESDIS form to NOAA in the stamped envelope provided. For vessels registered in other countries, the **Satellite<sub>2</sub><sup>TM</sup> 406** and **RapidFix<sup>TM</sup> 406** must be reprogrammed by an ACR authorized programming facility for the registered country. **Remember, if your EPIRB is not registered, SAR Authorities do not know who you are, what type of vessel, your home port, or where to contact anyone who might know anything about your situation.**
- 1.2.2 Once Search and Rescue (SAR) forces are alerted by the **Satellite<sub>2</sub><sup>TM</sup> 406** and **RapidFix<sup>TM</sup> 406** signal (406 MHz), relayed through the COSPAS-SARSAT network, they can converge on the GPS navigation position (RapidFix<sup>TM</sup> 406 only) or the position estimated by the satellite. Intermediate and short range location is aided by the **Satellite<sub>2</sub><sup>TM</sup> 406** and **RapidFix<sup>TM</sup> 406** on board radio beacon transmitter (121.5 MHz) and high intensity xenon strobe light.
- 1.2.3 Model numbers 2774 and 2776 of the **Satellite<sub>2</sub><sup>TM</sup> 406** and **RapidFix<sup>TM</sup> 406** may be deployed and activated automatically by the built-in hydrostatic float free release. Once free from the release bracket, the **Satellite<sub>2</sub><sup>TM</sup> 406** and **RapidFix<sup>TM</sup> 406** will automatically turn on if the water sensors are wet.

Alternately, the **Satellite<sub>2</sub><sup>TM</sup> 406** and **RapidFix<sup>TM</sup> 406** can be manually activated by lifting the thumb switch to a vertical position, sliding it toward the antenna and

pushing back down to the opposite side of the EPIRB. Activating the beacon in this manner breaks off the "Activation Indicator Plastic Pin" and allows the switch to properly seat, showing the "■" symbol (ON).

- 1.2.4 Power is provided by self contained long life batteries with a five year recommended replacement cycle.
- 1.2.5 Self test is initiated by momentarily lifting the thumb switch to a vertical position and holding it in this position for at least one second. The initiation of the test is indicated by a beep and the simultaneous lighting of the green and red LED's. The buzzer will beep three times as both the red and green LED's light simultaneously. The green LED will then light, followed by a flash of the strobe, indicating a successful test. During self test, an actual satellite message is transmitted while certain key performance parameters are measured and recorded. The self test message is modified to prevent the satellite from forwarding an alert message during self test.
- 1.2.6 Following self test, the **RapidFix™ 406** (if connected to a GPS), will beep and simultaneously light the green and red LED's, to indicate valid GPS data acquisition. This GPS data is then stored in the beacon. (See Section 3.7)

### 1.3 SATELLITE DETECTION

- 1.3.1 The **Satellite™ 406** and **RapidFix™ 406** constitute the satellite EPIRB portion of the COSPAS-SARSAT System. The system was developed and implemented by the COSPAS-SARSAT Partners (Russian Federation, Canada, France and the United States).
- 1.3.2 COSPAS-SARSAT is an international system that uses Russian Federation and United States low altitude, near-polar orbiting satellites that assist in detecting and locating activated 121.5/243 MHz EPIRBs and 406 MHz Satellite EPIRBs. The Russian Federation provides aboard COSMOS navigation spacecraft COSPAS payloads that are inter-operable with the SARSAT System. In addition to weather and environmental sensors, SARSAT payloads, provided by Canada and France, are carried aboard the United States National Oceanic and Atmospheric Administration's (NOAA's) Advanced TIROS environmental satellites. (See Figure 1: Satellite Detection)
- 1.3.3 COSPAS and SARSAT satellites receive distress signals from satellite EPIRBs transmitting on the frequency of 406.025 MHz. The COSPAS-SARSAT 406 MHz satellite EPIRB signal consists of a transmission of non-modulated carrier followed by a digital message format that provides identification data. The 406 MHz system uses spacecraft-borne equipment to measure and store the Doppler-shifted frequency along with the satellite EPIRB digital data message and time of measurement. This information is transmitted in real time to an earth station

called the Local User Terminal (LUT), which may be within the view of the satellite, as well as being stored for later transmission to other LUTs. In the real-time mode, the signal detection is limited to a mutual EPIRB-satellite-LUT circular visibility area of about 2500 km radius that moves with the satellite along its track. However, because of the stored-mode capability at 406 MHz, the need for this mutual EPIRB-satellite-LUT visibility is not essential, and the system is fully functional worldwide.

- 1.3.4 The LUT processes the Doppler-shifted signal and determines the location of the satellite EPIRB; then the LUT relays the position of the distress to a Mission Control Center (MCC) where the distress alert and location information is immediately forwarded to an appropriate maritime Rescue Coordination Center (RCC). The RCC dispatches Search and Rescue (SAR) forces.
- 1.3.5 The COSPAS-SARSAT System includes 33 LUTs and 19 MCCs that provide real-time as well as global-mode coverage for the Northern Hemisphere, while the Southern Hemisphere is presently served primarily by the global mode. Additional LUTs and MCCs are planned for installation in the near future both in the northern and southern hemispheres.
- 1.3.6 Because most of the search and rescue forces presently are not equipped to home on the 406 MHz Satellite EPIRB signal, homing must be accomplished at 121.5 MHz.
- 1.3.7 The **Satellite<sup>TM</sup> 406** and **RapidFix<sup>TM</sup> 406** EPIRB are available in multiple combinations. The following product codes define the options available to meet specific operational requirements:

:

| Product No. | Model No. | Cat. I | Cat. II | GPS Interface |
|-------------|-----------|--------|---------|---------------|
| 2774        | RLB-32    | X      |         |               |
| 2775        | RLB-32    |        | X       |               |
| 2776        | RLB-33    | X      |         | X             |
| 2777        | RLB-33    |        | X       | X             |

*Note: All models above conform to Class 1  
Requirements (operations: -40°C to 55° C    storage: -50°C to 70°C)*

## 1.4 AUTHORIZATIONS

- 1.4.1 The **Satellite<sub>2</sub><sup>TM</sup> 406 and RapidFix<sup>TM</sup> 406** EPIRB meets the requirements of Federal Communications Commission (FCC) Part 80 (Product No.'s 2774, 2775, 2776, and 2777) and GMDSS (Product No.'s 2774 and 2776)

## 1.5 CHARACTERISTICS

- 1.5.1 The **Satellite<sub>2</sub><sup>TM</sup> 406 and RapidFix<sup>TM</sup> 406** EPIRB is a floatable, battery operated unit. The beacon case, with its external antenna, is waterproof. The semiconductor circuits are mounted within the case assembly that also contains the battery power supply. A "Test/On" switch is installed on top of the beacon, along with a strobe light. The beacon must be stored in its special mount, free of obstructions aboard a vessel for automatic float-off. The unit is self buoyant and no external floatation devices are required.

## 1.6 TECHNICAL DATA — **Satellite<sub>2</sub><sup>TM</sup> 406 and RapidFix<sup>TM</sup> 406**

### 1.6.1 Applicable Documents

|               |                                                                                  |
|---------------|----------------------------------------------------------------------------------|
| RTCM          | Standard for 406 MHz Satellite EPIRBs                                            |
| COSPAS-SARSAT | Document C/S T.001 Oct. 98                                                       |
| FCC           | Part 80 (Model No.'s RLB-32 and RLB-33) and<br>GMDSS (Product No.'s 2774 & 2776) |

### 1.6.2 Specifications

#### 406 MHz Transmitter

|                           |                                                                    |
|---------------------------|--------------------------------------------------------------------|
| Frequency                 | 406.025 MHz                                                        |
| Frequency Stability       | ±2 parts per billion/100ms                                         |
| Output Power              | 5 watts                                                            |
| Digital Message<br>Format | RLB-32: Serialized <sup>1</sup><br>RLB-33: Serialized <sup>2</sup> |
| Duration                  | 440 ms (RLB-32)<br>520 ms (RLB-33)                                 |
| Rate                      | 400 bps                                                            |
| Encoding                  | Biphase L                                                          |
| Modulation                | ±1.1 radians peak                                                  |

<sup>1</sup> Leaves ACR with Serialized U.S. code but can be reprogrammed at a service center to Maritime or other coded format including nationality of registration.

<sup>2</sup> Leaves ACR with Serialized U.S. code but can be reprogrammed at a Service center to Maritime MMSI.

121.5 MHz Transmitter

|                     |                |
|---------------------|----------------|
| Frequency           | 121.5 MHz      |
| Frequency Tolerance | ±50 ppm        |
| Output Power        | 25 mW PEP      |
| Modulation          |                |
| Type                | AM (3K20A3X)   |
| Sweep Range         | 400 to 1200 Hz |
| Sweep Rate          | 3 Hz           |
| Duty Cycle          | 37.5%          |

Antenna

|              |                       |
|--------------|-----------------------|
| Frequency    | 406.025 & 121.500 MHz |
| Polarization | Vertical              |
| VSWR         | Less than 1.5/1       |

Xenon Strobe

|              |                        |
|--------------|------------------------|
| Light Color  | White                  |
| Output Power | 0.75 effective candela |
| Flash Rate   | 20—30 per minute       |

General/Environmental

|                      |                                      |
|----------------------|--------------------------------------|
| Battery Life         |                                      |
| Operating            | 48 hours minimum                     |
| Replacement Interval | 5 years                              |
| Size                 |                                      |
| EPIRB less Antenna   | 7.20" (18.29 cm)                     |
| Antenna              | 7.39" (18.77 cm)                     |
| Material, EPIRB      | High impact and UV resistant plastic |
| Color                | Yellow                               |
| Weight               | 1.9 lbs.                             |
| Temperature Range    |                                      |
| Operating            | Class I      -40°C to +55°C          |
| Stowage              | Class I      -50°C to +70°C          |

Mounting Case (Product No's 2774 & 2776 only)

|                |                                               |
|----------------|-----------------------------------------------|
| Construction   | White High Impact and<br>UV resistant plastic |
| Size           | 6.5" x 17.1"<br>(16.51 cm x 43.4 cm)          |
| Release System | Hydrostatic with manual override              |

Hydrostatic Release Kits

No. 9323

**Satellite<sup>TM</sup> 406 and RapidFix<sup>TM</sup> 406**  
hydro release kit

Replacement Parts

GPS Plug

Encapsulated Logo

Optional Mounting Brackets are available for Product No's 2775 and 2777.

Construction

White High Impact and UV resistant plastic

Size

6.0" x 7.7"

(15.2cm x 19.5 cm)

**SECTION 2 - INSTALLATION** (Attach antenna tightly onto unit)

**2.1 MOUNTING LOCATION** (Product No's 2774, 2776)

2.1.1 The **Satellite<sup>TM</sup> 406 and RapidFix<sup>TM</sup> 406** float-off mounting bracket should be mounted securely to a *vertical or horizontal surface* (the mount has predrilled holes for attachment to a flat surface) where there are no overhead obstructions. Location aboard a vessel must be chosen to allow the EPIRB to float free of sinking craft and as high as possible especially on small vessels. This will help ensure operation of the hydrostatic release unit in the event the vessel capsizes without sinking.

2.1.2 The location selected must be sufficiently rigid to support the weight of the total installation and at the same time consider vibration, exposure to the elements, exposure to surrounding hazards such as equipment movement, doors being opened, accidental covering, personnel traffic, etc., and yet be readily accessible at all times for the emergency use for which the beacon is intended.

2.1.3 Also to be considered in selecting a location for installation is the harmful effect that certain corrosive vapors might have on the beacon. Under no circumstances should a location be selected for installation where the beacon would be jeopardized by any foreign articles being temporarily or permanently emplaced during "at sea" or "in port" activities.

**CAUTION:** Care must be taken to prevent any lanyard, line, or other emergency equipment that may be attached to the beacon from becoming entangled or fouled which could prevent the beacon from being removed in an emergency.

2.1.4 The **Satellite<sup>TM</sup> 406 and RapidFix<sup>TM</sup> 406** float-off mounting bracket should be securely attached to the vessel. The use of #10 stainless steel hardware is recommended.

- 2.1.5 Do not mount the **Satellite<sub>2</sub><sup>TM</sup> 406 and RapidFix<sup>TM</sup> 406** in the vicinity (2 meters) of strong magnetic (such as loud speakers) or electric (such as radar or high power radio transmitter) fields.
- 2.1.6 Consideration should be given to mounting the **Satellite<sub>2</sub><sup>TM</sup> 406 and RapidFix<sup>TM</sup> 406** in a vertical (antenna upward position). In certain circumstances, such as medical emergencies or disabled vessels, manual activation of the EPIRB for location and homing purposes is sometimes requested. Mounting in this orientation provides the best homing signal.

## **2.2 VISUAL INSPECTION**

- 2.2.1 Visually inspect the area surrounding the mounting bracket installation site for hidden hazards, obstacles, etc., that may have been overlooked during selection. If there is any doubt as to the ready accessibility to the beacon at all times or if any condition may appear to be questionable, make complete and thorough investigation before making final approval of the installation.

## **SECTION 3 - OPERATION**

### **3.1 GENERAL**

- 3.1.1 The **Satellite<sub>2</sub><sup>TM</sup> 406 and RapidFix<sup>TM</sup> 406** Beacon Models 2774, and 2776 are designed to be automatically deployed and activated. The **Satellite<sub>2</sub><sup>TM</sup> 406 and RapidFix<sup>TM</sup> 406** may also be hand held on the deck of vessels, or floated in water and attached to a raft or life vest with the lanyard provided. The **Satellite<sub>2</sub><sup>TM</sup> 406 and RapidFix<sup>TM</sup> 406** are designed to operate best while floating in water. Hand held operation should be avoided when possible. Do not operate inside liferaft or under any similar cover or canopy.
- 3.1.2 The **Satellite<sub>2</sub><sup>TM</sup> 406 and RapidFix<sup>TM</sup> 406** Beacon can be deployed and activated manually in any of the available products.
- 3.1.3 Because many users failed to properly place earlier generation beacons in the "ARMED" or "READY" positions when installing them in their brackets, U.S. and International specifications require the elimination of the "OFF" switch position and the inclusion of sensors to automatically activate the beacon under specific conditions.

The **Satellite<sub>2</sub><sup>TM</sup> 406 and RapidFix<sup>TM</sup> 406** are equipped with sensors to detect when it is no longer in its bracket (a deployment condition) and other sensors to determine if it's in water.

Two conditions must be satisfied for the **Satellite<sub>2</sub><sup>TM</sup> 406** and **RapidFix<sup>TM</sup> 406** to automatically activate:

- 1) It must be out of its bracket,
- 2) It must be in the water,

Note: Either condition by itself will *not* activate the beacon.

3.1.4 The **Satellite<sub>2</sub><sup>TM</sup> 406** and **RapidFix<sup>TM</sup> 406** are designed to allow the user to perform periodic testing while EPIRB is in the release bracket to assure a functioning beacon.

3.1.5 Place the **Satellite<sub>2</sub><sup>TM</sup> 406** and **RapidFix<sup>TM</sup> 406** Product No's 2774 and 2756 into the release bracket with the coiled lanyard inward. The beacon should now be firmly held in the release bracket and ready for automatic deployment.

### **3.2 AUTOMATIC DEPLOYMENT & DEACTIVATION** (Product No's 2774 & 2776 only)

3.2.1 Automatic deployment and activation occurs when the vessel sinks and a hydrostatic release device frees the beacon from the bracket allowing it to float to the surface. Built-in sensors detect that the beacon is no longer in its bracket and is in water. This condition will automatically activate the beacon.

Note: Transmissions of the 121.5 MHz and 406 MHz signal will not occur until 50 seconds after activation.

### **3.3 MANUAL DEPLOYMENT & ACTIVATION**

3.3.1 The **Satellite<sub>2</sub><sup>TM</sup> 406** and **RapidFix<sup>TM</sup> 406** can be manually deployed by removing the retaining pin, removing the cover, then removing the beacon from the bracket. Once removed, the beacon can be activated by being placed in water or by lifting the thumb switch towards the antenna and placing the thumb switch back down on the opposite side of the EPIRB. Activating the beacon in this manner breaks off the Activation Indicator Plastic Pin and exposes the Signal Radiation Symbol on the thumb switch indicating the beacon is turned ON.

Note: Some countries fine vessel owners for causing false alarms. The permanent breakage of the Activation Indicator Plastic Pin is a positive indication of a manual activation.

### 3.4 MANUAL ACTIVATION WITHOUT DEPLOYMENT

- 3.4.1 The **Satellite<sub>2</sub><sup>TM</sup> 406** and **RapidFix<sup>TM</sup> 406** can be activated while still in its bracket by placing the thumb switch in the ON position. Activation by this method overrides all sensors and turns the beacon "ON".

The caution note above still applies.

### 3.5 DEACTIVATION

- 3.5.1 The **Satellite<sub>2</sub><sup>TM</sup> 406** and **RapidFix<sup>TM</sup> 406** can be deactivated by:

If manually activated:

- 1) Returning the thumb switch to the original OFF position.

If automatically activated:

- 1) Removing the beacon from the water. The beacon normally takes up to 15 seconds to deactivate, or
- 2) Placing the beacon back into the release bracket.

- 3.5.2 If the beacon continues to operate after it has been deactivated, remove the four screws holding the unit together and unplug the battery to disable the unit. Return it to a service center for repair.

### 3.6 TEST

- 3.6.1 The **Satellite<sub>2</sub><sup>TM</sup> 406** and **RapidFix<sup>TM</sup> 406** can be tested in or out of the release bracket. A Self Test is initiated by lifting the thumb switch to a vertical position and holding it in this position for at least one second. The initiation of the test is indicated by a beep and the simultaneous lighting of the green and red LED's.

The sequence of tests is:

1. Check Data Integrity .....Beep and lights up LEDs if passed  
.....Stop if failed
2. Check 406 MHz Synthesizer .....Beep and lights up LEDs if passed  
.....Stop if failed
3. Check RF Power/Battery .....Beep and lights up LEDs if passed  
.....Stop if failed
4. Turn on green LED to indicate Successful Test.
5. Flash Strobe Light to test Strobe.

*If all of the above occurs, the test has been successful.*

NOTE: The homing beacon at 121.5 MHz is inhibited during self test.

- 3.6.2 It is strongly recommended to test the **Satellite<sup>TM</sup> 406** and **RapidFix<sup>TM</sup> 406** on a quarterly basis.

### 3.7 External GPS Interface

#### 3.7.1 Connecting the Rapid Fix<sup>TM</sup> 406 to a GPS via the Optical Interface (IR Transmitter)

Your Rapid Fix<sup>TM</sup> 406 comes with a GPS Optical Interface (transmitter plug with lead wires) and a keyed GPS bezel. The transmitter plug attaches to your Rapid Fix<sup>TM</sup> 406, via the keyed bezel. The GPS Optical Interface lead wires attach to your GPS via the NMEA 0183 connector from your GPS receiver. The black lead wire with white stripes should be connected to the positive transmitter pin. The black wire should be connected to the negative pin.

**NOTE:** The baud rate output for your GPS receiver NMEA 0183 should be 4800 bps. Consult your GPS manufacturer for correct installation.

#### 3.7.2 Using the GPS Interface

Once a compatible, operating GPS receiver is connected to the **RapidFix<sup>TM</sup> 406**, the beacon will store data for incorporation into the emergency message, which is transmitted to the satellite. This can provide more accurate positioning data to the Search and Rescue Authority and may lead to faster rescue. Since the last valid GPS position data is always kept in the memory of the **RapidFix<sup>TM</sup> 406**, the user should take care to make sure that the GPS position data stored is accurate. This can be accomplished by two methods: First, by always leaving a properly functioning GPS connected to the **RapidFix<sup>TM</sup> 406** before activation. Second, by connecting the GPS to the **RapidFix<sup>TM</sup> 406** and allowing sufficient time (approximately 30 minutes) for the **RapidFix<sup>TM</sup> 406** to acquire valid GPS data before the beacon is activated. If valid GPS position data is not available, it is preferable to reset the **RapidFix<sup>TM</sup> 406** with the beacon's default message (See Section 3.7.5).

#### 3.7.3 Testing the GPS Interface

Connect the Optical Interface Plug to the **Rapid Fix<sup>TM</sup> 406** bezel and allow sufficient time for the GPS receiver to acquire valid GPS position data (usually less than 1 minute; but it can take up to 30 minutes). Lift the thumb switch to the vertical (Self-Test) position and release. Your **Rapid Fix<sup>TM</sup> 406** will confirm that it has acquired valid GPS data by emitting a beep along with a flash of the red and green LED's. This will occur approximately 2.5 seconds after the Self-Test.

#### 3.7.4 Updating GPS Position data

When the beacon is properly connected to a functioning and compatible GPS receiver, GPS position data is automatically updated about every 20 minutes, while valid GPS position data is present.

The operator can force the immediate acquisition of new GPS position data, by executing Self-Test of the beacon. This by-passes the normal, programmed, waiting time of 20 minutes for the automatic update of GPS position data.

NOTE: When the beacon is not activated, GPS position data will be received and stored by the **Rapid Fix™ 406** (No GPS position data updates will occur while the beacon is activated).

#### 3.7.5 Position data set to default:

A new **Rapid Fix™ 406**, is programmed with the GPS position data set to “default”. This “default” GPS position data indicates, upon activation, that to the satellite system that the beacon has no valid GPS position stored in memory. Once a functioning and compatible GPS receiver is properly connected to the beacon, this “default” data will be replaced by valid GPS position data, as described in the previous sections.

Position data will be reset to default by activating the beacon (turning the beacon ON) and then turning the beacon OFF.

NOTE: The action of turning the beacon ON and then OFF clears any stored GPS position data.

### 4.0 MAINTENANCE (Check antenna for tightness)

- 4.1 At least every ninety days, the float free mounting bracket and **Satellite™ 406 and RapidFix™ 406** EPIRB should be inspected for deterioration and/or buildup that may affect the function of the beacon or automatic release.

Also carefully inspect the EPIRB case for any visible cracks. Cracks may admit moisture which could falsely activate the beacon or otherwise cause a malfunction. Any cracking observed should be immediately referred to ACR for evaluation, (1-800-432-0227 Ext. 112)

- 4.2 Clean the beacon and the mounting bracket to remove residue buildups. It is recommended that the mounting bracket be waxed with a high quality marine wax.
- 4.3 The hydrostatic release must be replaced by the date indicated on the float free mounting bracket. The hydrostatic release can be replaced by removing the Beacon from the bracket, then sliding the hydrostatic release out of the keyed opening on the spring and mounting bracket. Insert the new hydrostatic release assembly, in place by engaging it to the opening of the ejection spring and case.

Place beacon into the mounting bracket, and replace cover, securing in place with hitch pin going through the hydrostatic release rod.

- 4.4 The battery must be replaced by the date indicated on the beacon. At each inspection, check the time remaining until replacement is required.

NOTE: There are no user serviceable items inside the EPIRB. DO NOT OPEN THE EPIRB UNLESS TO DISABLE IN CASE OF FAULTY ACTIVATION.

Refer all long life battery replacement and other internal EPIRB service to a factory authorized service center.

For the nearest location of a factory authorized service center, call 1-800-432-0227 Ext. 112 (toll free).

- 4.5 The **Satellite2™ 406 and RapidFix™ 406** contain lithium batteries which are not subject to the requirements of the DOT Subchapter C, Hazardous Materials Regulations, because they meet the United Nations Classification of LiS02 Batteries for Shipment of "Non – Dangerous".

## 5.0 REGISTRATION

- 5.1 It is imperative that this EPIRB be registered with NOAA (National Oceanic and Atmospheric Administration) in the USA or with your own national authority. The EPIRB has been programmed with a unique identification number or code which is broadcast on 406 MHz. Registration provides the Search and Rescue people with important information which will speed up the rescue operation and minimize false alarms.
- 5.2 To register this EPIRB with NOAA (USA registration only), simply fill out and mail the provided form in the enclosed pre-addressed envelope to NOAA or fax the completed form to NOAA at (301) 457-5406.
- 5.3 NOAA will supply a Beacon Registration decal which is to be affixed to the **Satellite2™ 406 and RapidFix™ 406**. The recommended mounting location is on the front of bottom case above the instruction label. (See *Figure 2*)

## **6.0 FALSE ALARMS**

- 6.1 Should there be, for any reason, an inadvertent activation or false alarm, it must be reported to the nearest search and rescue authorities. The information that should be reported includes the satellite EPIRB Unique Identifier Number (UIN); date, time, duration, and cause of activation; and the location at the time of activation.
- 6.2 Contact the following to report false alarms (US):

Atlantic Ocean/Gulf of Mexico—

USCG Atlantic Area Command Center

Tel: (212) 668-7055

Pacific Ocean Area—

USCG Pacific Area Command Center

Tel: (510) 437-3700

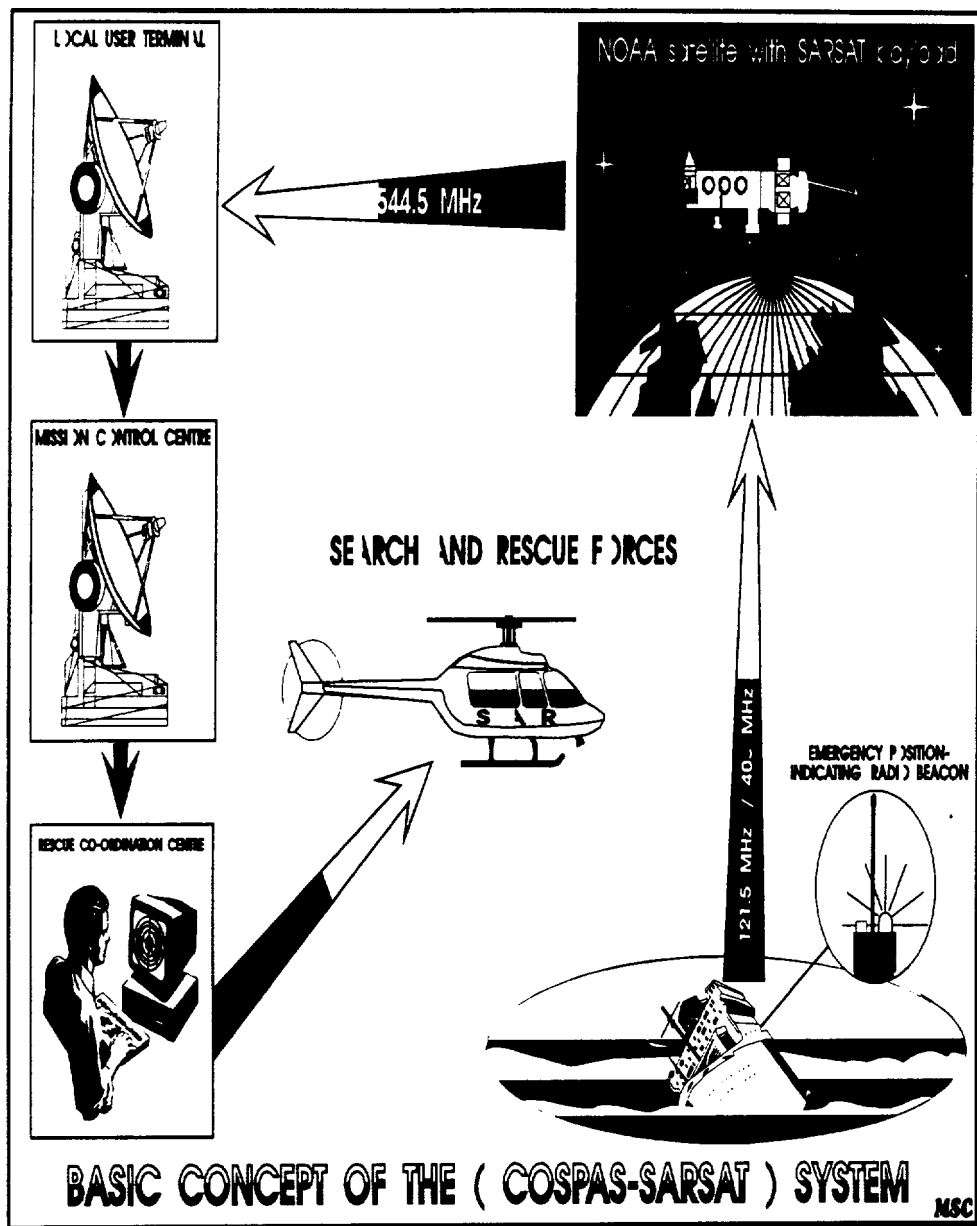
From any location—

USCG HQ Command Center

Tel: (800) 323-7233

**\*\*\*WARNING\*\*\***

**THIS TRANSMITTER IS AUTHORIZED FOR USE  
ONLY DURING SITUATIONS OF GRAVE  
AND IMMINENT DANGER**



**FIGURE 1: SATELLITE DETECTION**

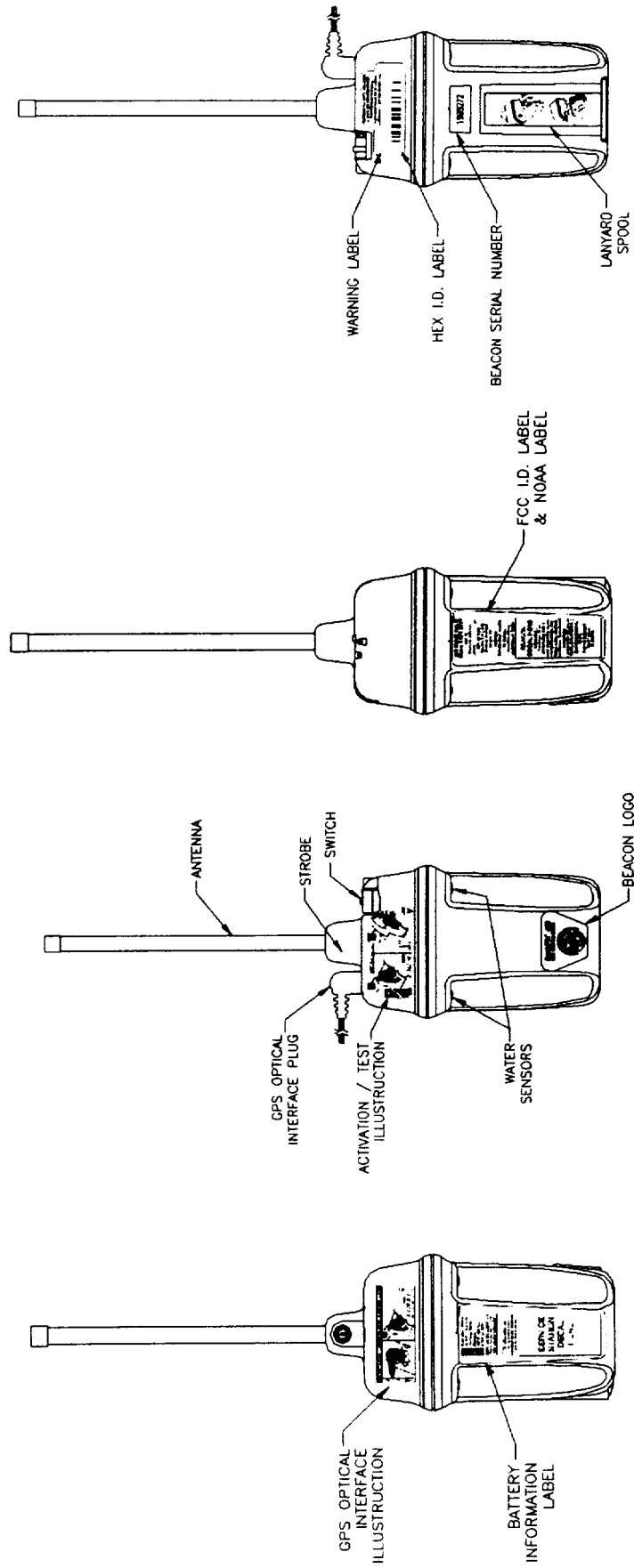
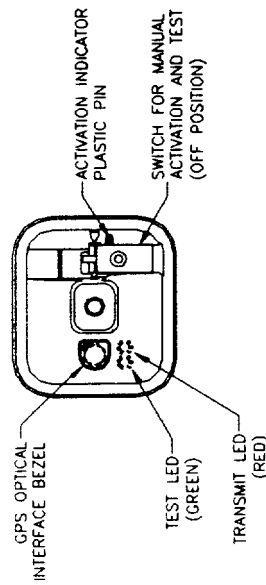
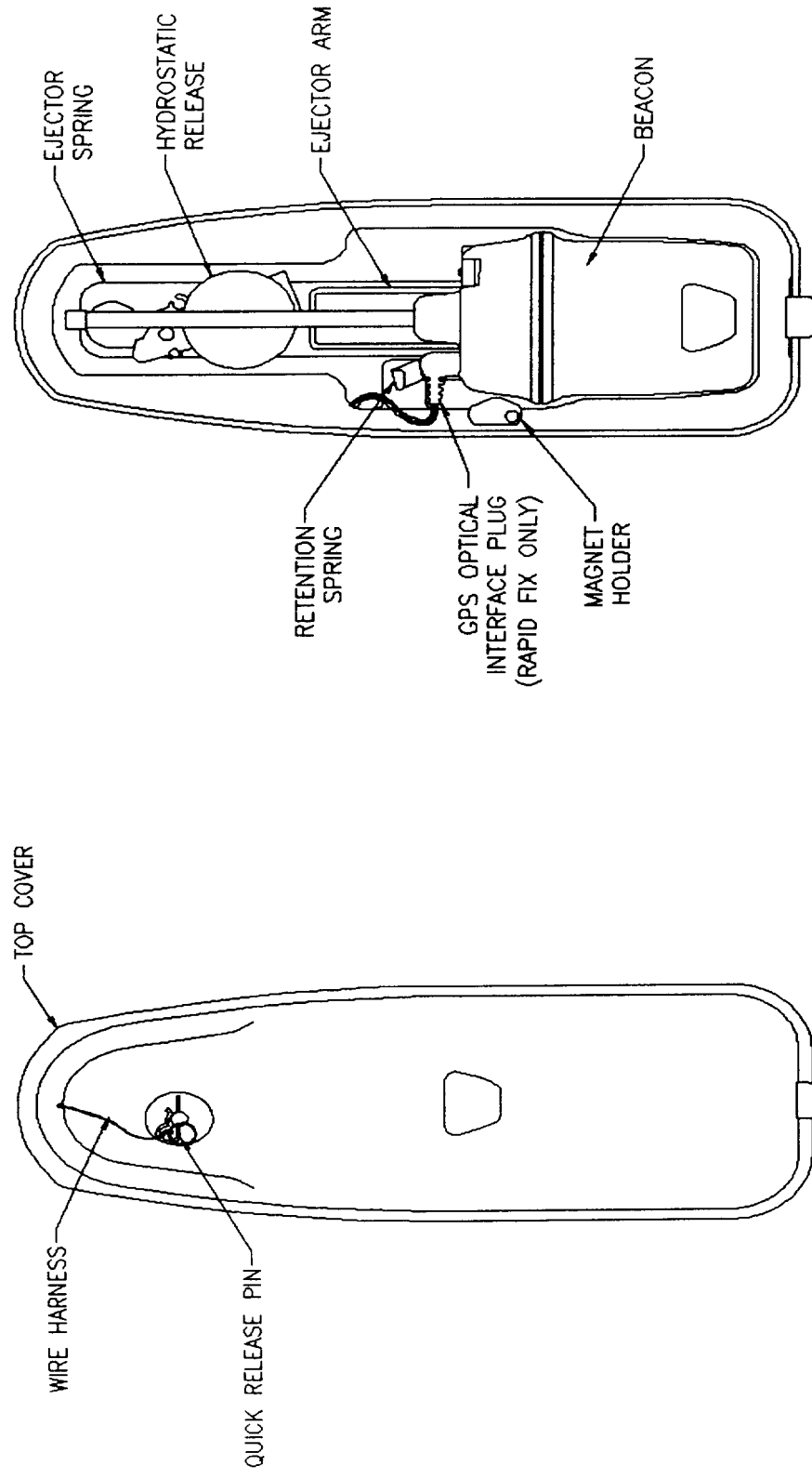


FIGURE 2:

# ACR Satellite<sup>TM</sup> 406 and RapidFix<sup>TM</sup> 406 (RLB-32/33)



**FIGURE 3:**  
**Sea Shelter with Beacon**

HEREIN OR HEREWITH IS PROPRIETARY AND BELONGS TO ACR ELECTRONICS, INC. FT. LAUDERDALE, FL. IT IS FURNISHED IN CONFIDENCE SOLELY FOR INFORMATIONAL PURPOSES. IT IS NOT TO BE REPRODUCED, USED, OR DISCLOSED IN WHOLE OR IN PART TO ANYONE WITHOUT THE PERMISSION OF ACR.

| REV | DESCRIPTION             | DATE    | BY     |
|-----|-------------------------|---------|--------|
| A   | Released Per ECO # 7861 | 6/16/94 | Joe m. |
|     |                         |         |        |
|     |                         |         |        |

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES  
TOLERANCES ON DEG  
FRACT .XX ± .010 ANG  
± 1/64 .XXX ± .005 ± 1/2°

CONTRACT NO

**ACR ELECTRONICS, INC.**  
5757 RAVENSWOOD RD., FT. LAUDERDALE, FL 33312

DRAWN *[Signature]* 6-15-94

CHECKED *[Signature]* 6-15-94

ENG *[Signature]* 6-15-94

APVD *[Signature]* 6-15-94

**LITHIUM PRIMARY CELL  
SPECIFICATION, LiSO<sub>2</sub>**

|       |               |            |     |
|-------|---------------|------------|-----|
| SIZE  | CODE IDENT NO | DRAWING NO | REV |
| A     | 18560         | A1-13-0111 | A   |
| SCALE | SHEET 1 OF 3  |            |     |

MATERIAL:

# Specification, Lithium Primary Cell, $\text{LiSO}_2$

## General

The cell specified in this document is intended for use in a three (3) cell (series connected) battery to be used in an **Emergency Position Indicating Radio Beacon (EPIRB)** or in an **Emergency Locator Transmitter (ELT)**. The battery will be installed in an "o-ring" sealed plastic case intended for use on ships, survival craft and aircraft under emergency conditions. Reliability and safety of the cells are of primary importance.

## Specifications:

Chemical System

$\text{LiSO}_2$

Physical Characteristics:

Diameter

34.5 mm Maximum

Length

61.5 mm Maximum

Weight

90 grams Maximum

Contacts

Suitable for spot welding nickel ribbon interconnections.

Insulation

Suitable for electrically isolating cells from each other under all environmental conditions specified herein.

Sealing

Hermetic with pressure/temperature operated safety vents.

Electrical Characteristics (@ 25°C Except as Noted):

Voltage, Open Circuit

3.0 Volts

Rated Capacity (Note 1)

7.5 A hr.

Load Voltage (Note 2)

2.0 Volts Minimum

Environmental Characteristics:

Ambient Temperature Range:

a) Operating:

-40°C to +65°C

b) Storage:

-55°C to +75°C

c) Vibration:

Per RTCA/DO-204 Section 2.3.5

d) Over Pressure Test:

Per RTCA/DO-204 Section 2.3.1.5

e) Thermal Shock:

Per RTCA/DO-204 Section 2.3.2.4

f) Altitude:

Per RTCA/DO-204 Section 2.3.1.3

g) Decompression Test:

Per RTCA/DO-204 Section 2.3.1.4

h) Shock Test:

Per RTCA DO-204 Section 2.3.4.1

| SIZE  | CODE IDENT NO | DRAWING NO   | REV |
|-------|---------------|--------------|-----|
| A     | 18560         | A1-13-0111   | A   |
| SCALE |               | SHEET 2 OF 3 |     |

Note 1: Under Steady D.C. load test condition:

|             |                   |
|-------------|-------------------|
| Temperature | 21°C              |
| Current     | 240 mA            |
| End Voltage | 2.0 Volts Minimum |

Note 2: Under Pulse Load test conditions:

|                    |                  |
|--------------------|------------------|
| Temperature        | -40 °C           |
| Background Current | 80 mA            |
| Pulse              |                  |
| Current            | 2.0 Amps         |
| Width              | 440 m Sec.       |
| Rep. Period        | 50 Sec.          |
| Duration           | 54 Hours Minimum |

Qualification — Purchase only from sources qualified and approved by ACR Engineering.

|           |                        |                          |          |
|-----------|------------------------|--------------------------|----------|
| SIZE<br>A | CODE IDENT NO<br>18560 | DRAWING NO<br>A1-13-0111 | REV<br>A |
| SCALE     |                        | SHEET 3 OF 3             |          |

**UN Classification of LiSO2 Batteries for Shipment**  
**SAFT America, Lithium Battery Division**

*Battery - RLB 32,33*

Battery Type: ACR A3-06-2067 Classification: Non-Dangerous  
Product Engineer: *[Signature]* Date: 2/17/99  
Quality Assurance: *Bl Va Verk* Date: 2-17-99  
Product Evaluation Lab: *Rina P.O.* Date: 2/17/99

---

**CLASSIFICATION CRITERIA:**

**NON-DANGEROUS**

No disassembly or fire from any group.

No vents or leaks in Groups I, II and V (Altitude, Extreme Temperature, Short Circuit; Vibration, Shock, Short Circuit; Vibration, Shock, Low Capacity Cell).

No vents or leaks in Groups III and VI (Vibration, Shock, Charge; Forced Discharge).

**CLASS 2**

No Disassembly or fire from any group.

Vents or leaks in Groups I, II, III, V or VI.

**SPECIAL AUTHORIZATION REQUIRED**

Disassembly or fire during any testing.

*CC* *2-18-99* *am*  
*C H*  
*J M*  
*J A*  
*J L*  
*B C*  
*P H*  
*P F*  
*C S*  
*SAFT FILE*  
*DOT FILE*



P.O. 52680

3/6/98

## MATERIAL SAFETY DATA SHEET

### PRODUCT NAME: LITHIUM SULFUR DIOXIDE BATTERY

May be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910, 1200. Standard must be consulted for specific requirements.

U.S. Department of Labor  
Occupational Safety and Health  
Administration  
(Non-Mandatory Form)  
Form Approved  
OMB No. 1218-0072

#### SECTION 1 - MATERIAL IDENTIFICATION

Manufacturer's Name: SAFT AMERICA, INC.  
Address: 313 Crescent Street  
Valdese, NC 28690

EMERGENCY TELEPHONE NUMBER:  
CHEMTREC - 1-800-424-9300  
Telephone Number for Information: 704-874-4111 or 438-3287

DATE PREPARED: 01/01/98

#### SECTION 2 - HAZARDOUS INGREDIENTS / IDENTITY INFORMATION

Hazardous Components (Specific Chemical Identity: Common Name(s))

|                 | OSHA PEL | ACGIH TLV | Other Limits<br>Recommended | % (Optional)<br>(typically) |
|-----------------|----------|-----------|-----------------------------|-----------------------------|
| Lithium Metal   | N/A      | N/A       | N/A                         | < 2.5%                      |
| Sulfur Dioxide  | 5 ppm    | 2 ppm     | N/A                         | < 25%                       |
| Acetonitrile    | 40 ppm   | 40 ppm    | N/A                         | < 6%                        |
| Acetylene Black | 3.5 ppm  | 3.5 ppm   | N/A                         | < 5%                        |

#### SECTION 3 - PHYSICAL / CHEMICAL CHARACTERISTICS

|                         |                      |                                         |       |
|-------------------------|----------------------|-----------------------------------------|-------|
| Boiling Point           | N/A                  | Specific Gravity (H <sub>2</sub> O = 1) | > 1   |
| Vapor Pressure (mm Hg.) | N/A                  | Melting Point                           | 190 C |
| Vapor Density           | N/A                  | Evaporation Rate (Butyl Acetate = 1)    | N/A   |
| Solubility In Water     | Not soluble in water |                                         |       |
| Appearance and Odor     | N/A                  |                                         |       |

#### SECTION 4 - FIRE AND EXPLOSION DATA

|                                   |                                                                                                                                                          |
|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Flash Point (Method Used):        | Nonflammable (open flame)                                                                                                                                |
| Extinguishing Media:              | Use water or CO <sub>2</sub> on burning lithium sulfur dioxide cells or batteries.<br>Use a class D fire extinguishing agent only on a raw lithium fire. |
| Special Fire Fighting Procedures: | Use self-contained breathing apparatus.                                                                                                                  |
| Usual Fire and Explosion Hazards: | Battery may vent when subject to excessive heat - exposing contents.                                                                                     |
| Flammable Limits:                 | N/A                                                                                                                                                      |
| EL:                               | N/A                                                                                                                                                      |
| REL:                              | N/A                                                                                                                                                      |

## SECTION 5 - REACTIVITY DATA

Stability: Stable  
Conditions to Avoid: Battery contains hermetically sealed cells and is nonreactive provided the battery integrity is maintained and the cell seal remains intact.  
Incompatibility (Materials to Avoid): N/A  
Hazardous Decomposition or Byproducts: N/A  
Hazardous Polymerization: Will Not Occur  
Conditions To Avoid: Heating, mechanical abuse, and electrical abuse (such as recharging, voltage reversal and short circuiting) may result in venting.

## SECTION 6 - HEALTH HAZARD DATA

Route(s) of Entry:

Inhalation? Yes  
Skin? Yes  
Ingestion? Yes

Health Hazards (Acute and Chronic): Depending on the concentration of sulfur dioxide exposure, it acts as an asphyxiant and may possibly cause unconsciousness with no known chronic health effects.

Carcinogenicity: None  
NTP?

IARC Monographs?

OSHA Regulated?

Signs and Symptoms of Exposure: Sulfur Dioxide - Irritation of nose, throat, eyes, and/or skin: suffocating odor.

Medical Conditions: Generally Aggravated by Exposure - Sulfur Dioxide - Asthma and other respiratory diseases

Emergency and First Aid Procedures: If cell vents, personnel should be evacuated from contaminated areas. Artificial respiration should be given if breathing stops. Flush any material from skin.

## SECTION 7 - PRECAUTIONS FOR SAFE HANDLING AND USE

Steps to Be Taken in Case Material Is Released or Spilled: Keep out of area unless using impervious gloves and clothing, and full face breathing apparatus. Provide maximum ventilation to clear out hazardous gases.

Waste Disposal Method: Dispose of in accordance with local, state, and federal environmental regulations.

Precautions to Be Taken in Handling and Storing: See Page 3

Other Precautions: Do not remove or bypass electrical or thermal fuses.  
Do not heat above 70°C

## SECTION 8 - CONTROL MEASURES

Respiratory Protection (Specify Type): N/A

Ventilation: Local Exhaust N/A

Mechanical (General) N/A

Special N/A

Other N/A

Protective Gloves: N/A

Eye Protection: Safety glasses with side shields

Other Protective Clothing or Equipment: N/A

Work/Hygienic Practices: N/A

**SAFT AMERICA, INC.**  
**LITHIUM SULFUR DIOXIDE BATTERY MSDS**

**STORAGE:**

The LiSO<sub>2</sub> cell is capable of long term storage at temperatures as high as 160°F (71°C), compared to a maximum of acute 130°F (54°C) for most primary battery systems.

Storage for more than one year at 160°F (71°C) has been demonstrated. Storage at lower temperatures will improve the capacity retention of the battery. For example, a shelf life of 10 years is projected for storage at 70°F (21°C).

LiSO<sub>2</sub> cells and batteries should be stored in a well-ventilated, sprinkler protected, non-combustible structure with adequate clearance between walls and battery stacks. The batteries should be separated from other materials. Air conditioning or cooling is not required unless excessively high temperatures will be encountered, but the batteries should be kept as cool as possible in order to maximize shelf life. Temperatures above 160°F (71°C) should be avoided.

Hermetically sealed lithium cells do not outgas. However, if exposed to extreme temperatures or rough handling, they may release sulfur dioxide gas if the vent is activated or the battery damaged. A well-ventilated storage area should be used to prevent inadvertent concentration of the gas if extremes are anticipated. If large quantities of batteries are stored, it may be advisable to install alarm devices in the storage area to detect smoke or accumulation of gases.

**PACKAGING AND TRANSPORTATION:**

• **DOMESTIC:**

Procedures for the transportation of LiSO<sub>2</sub> batteries within the United States are specified by the Department of Transportation in the Code of Federal Regulations, CFR 49, "Transportation".

Lithium batteries and cells containing less than 12 grams of lithium or lithium alloy are authorized for transportation by highway, rail, vessel, and cargo-only aircraft provided they meet the provisions of Subchapter 173.185.

Lithium batteries containing less than 1 gram of lithium or lithium alloy and cells containing less than 0.5 grams of lithium or lithium alloy are subject to lesser transportation restrictions provided they meet the requirements of Subchapter 173.185 para (i).

Lithium cells or batteries, for disposal, may be offered only for motor vehicle transportation per the restrictions of Subchapter 173.185 para (j) and para (l).

Lithium cells or batteries discharged to below 2 volts, not to exceed 100 cells or batteries per shipment, may be shipped for testing purposes by highway only.

## INTERNATIONAL:

Procedures for international air transportation of LiSO<sub>2</sub> batteries are specified by the International Civil Aviation Organization (ICAO), Montreal, Quebec: publication "Technical Instructions for the Safe Transport of Dangerous Goods by Air." This document is published annually.

The ICAO procedures for air shipment of LiSO<sub>2</sub> cells and batteries are similar, but not necessarily identical, to those specified by the US Department of Transportation.

Regulations for the shipment of lithium batteries with cells containing less than 0.5 grams of lithium are given in Special Provision A45.

Regulations for the shipment of lithium batteries with cells containing no more than 12 grams of lithium are covered in Packaging Instruction 903.

## NOTE:

Department of Transportation and ICAO regulations for the transportation of lithium batteries are periodically revised.

## TRANSPORTATION DATA:

|                       |                      |
|-----------------------|----------------------|
| Proper Shipping Name: | Lithium Batteries    |
| UN-DTO Hazard Class:  | Class 9              |
| UN ID No:             | UN 3090              |
| Hazard Label:         | Miscellaneous Hazard |
| Container Marking:    | Miscellaneous Hazard |
| placard:              | Miscellaneous Hazard |

# LITHIUM/ SULFUR DIOXIDE Li/SO<sub>2</sub> PRIMARY CELL

Cell Type: LO26SX  
Rating: 7.5 Ah

## Physical Specifications

|               |                                                                    |
|---------------|--------------------------------------------------------------------|
| Weight:       | 2.98 oz; 85 gr.                                                    |
| Weight of Li: | 2.4 gr.                                                            |
| Dimensions:   | Figure 1                                                           |
| Volume:       | 3.2 in <sup>3</sup> ; 52.8cc                                       |
| Tolerances:   | Diameter: $\pm 0.015$ in; 0.38mm<br>Height: $\pm 0.030$ in; 0.76mm |

Cell is hermetically sealed; Glass-to-metal seal is located at positive end. Venting device is located at negative end. Cell is supplied with insulating sleeve and flexible nickel tab terminals.

Environmental: Meets shock, vibration and other environmental requirements of federal and military specifications.

|                                       |                                                                    |
|---------------------------------------|--------------------------------------------------------------------|
| Voltage:                              | OCV: 3.0 volts<br>Nominal: 2.8 volts (@240 ma)<br>Final: 2.0 volts |
| Rated Capacity (at 240 ma discharge): | 70°F (21°C): 7.5 Ah<br>-20°F (-29°C): 5.5 Ah                       |
| Operating Temperature Range:          | -40°F (-40°C) to 160°F (71°C)                                      |
| Storage (% of Rated Capacity):        | 1 year @ 70° F (21°C): >95%<br>1 month @ 160°F (71°C): >90%        |
| Service Life To 2V                    | Fig. 2                                                             |
| Typical Discharge Curves              | Fig. 3                                                             |
| Midpoint Discharge Voltage            | Fig. 4                                                             |
| Typical Discharge Curves              | Fig. 5                                                             |

## Handling

- Do not puncture, open or mutilate. Cell is pressurized.
- Do not obstruct venting mechanism.
- Do not short circuit or charge.
- Do not expose to fire or temperatures above 160°F (71°C).
- Cell may vent or explode if exposed to these conditions.

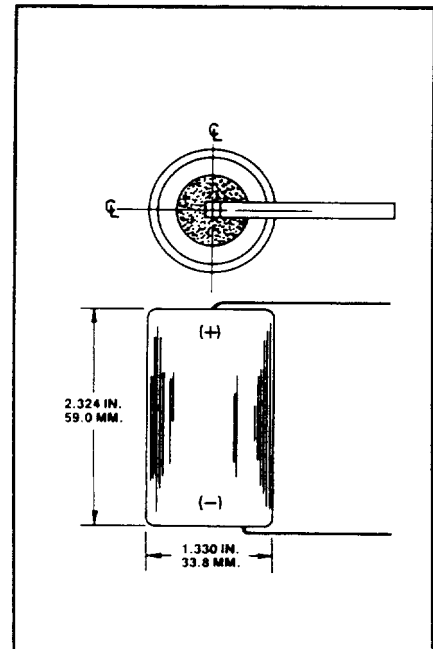
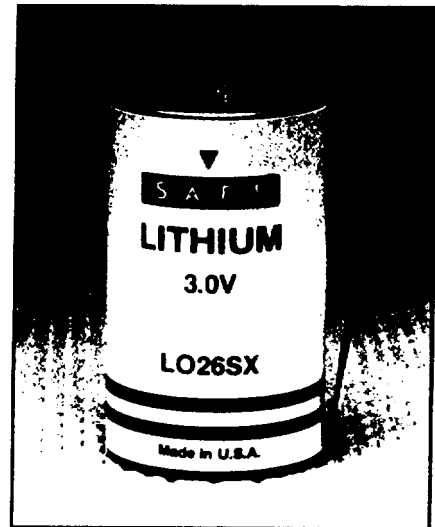


Figure 1. Overall Dimensions

S A F T

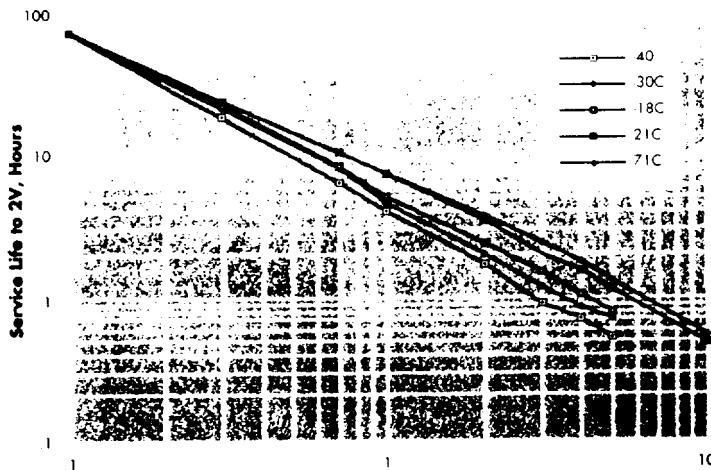


Figure 2: Discharge Current, Amps

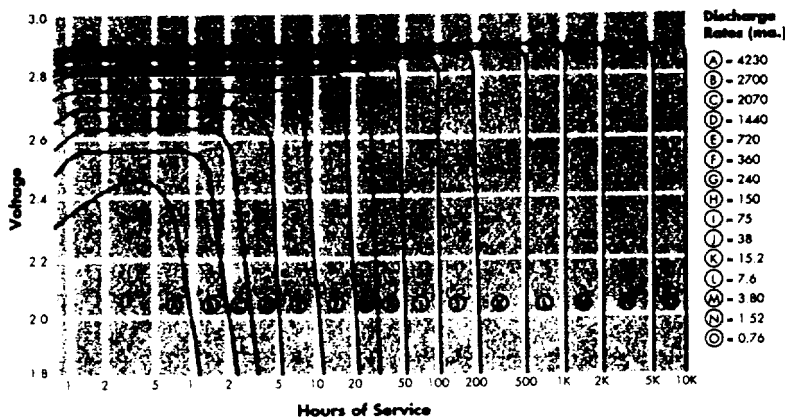


Figure 3: Typical Discharge Curves at 70°F (21°C)

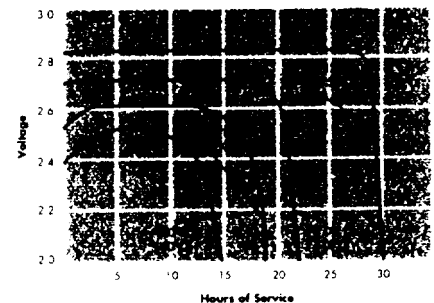


Figure 5: Typical Discharge Curves at 240 ma.

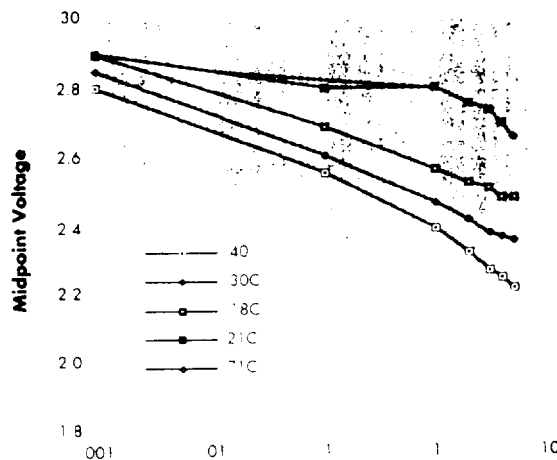


Figure 4: Discharge Current, Amps

## Operating Conditions

**Discharge Rate:** Discharges above 2 amps or at elevated temperatures should be intermittent, controlled or monitored to prevent overheating and possible venting. Actual heat rise depends on battery design, type of discharge, temperature, end voltage, etc.

**End Voltage:** Cells should not be discharged below zero volts.

**Fusing:** Discharge circuits should be fused or protected to prevent short circuit or high rate discharges.

**Series and/or Parallel Cells:** Cells should not be arranged in series and/or parallel without diode protection to prevent charging.

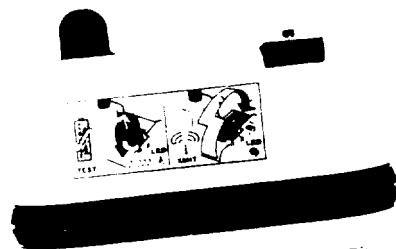


SAFT America Inc.  
Lithium Battery Division  
313 Crescent Street • Valdese, NC 28690  
Tel: (704) 874-4111 • Fax: (704) 874-2431

**NEW ITEM**

## **RapidFix 406™**

**Product No. 2777 Cat II (manually deployable)  
406 MHz EPIRB with GPS Interface  
Model No.: RLB-33**



- > GPS Interface - connection via Infrared diode (NMEA 0183): transmits your exact GPS LAT/LONG coordinates through GEOSAR satellite system allowing SAR to respond at once - No More Waiting for a Satellite Pass!
  - > World's smallest 406 MHz EPIRB that meets all regulations and is fully approved worldwide
  - > Built-in strobe for enhanced location in poor visibility conditions
  - > Single, three-position switch for easy test and operation. Steady green LED indicates unit has passed full functional test, flashing red LED indicates unit is "ON"
  - > Transmits on 406 MHz (COSPAS-SARSAT) with your registered, digitally-coded distress signal, and 121.5 MHz (SAR homing frequency)
  - > Can be manually activated; self-buoyant - no external float collar to lose
  - > Lanyard coiled on recessed spool for non-tangling deployment
  - > Exclusive, polycarbonate blend designed for maximum resistance to UV and chemicals; maximum durability when exposed to extreme temperatures or shock
- > Field programmable - built-in vessel code can be reprogrammed by any ACR Authorized Service Center worldwide (Maritime/Serialized/Radio Call Sign/MID Protocols, Country Code, etc.)
  - > Product label includes universal test/operation symbols, English and French languages, plus ability to substitute other foreign language
  - > 5-year limited warranty
  - > 5-year replacement life (11-year useful life) lithium battery
  - > Operating life - 48 hours @ -40°C (-40°F)

**Size: 3.7 x 7.2 x 4.3 in (9.4 x 18.3 x 10.9 cm)**

**Antenna: 7.4 in (18.8 cm)**

**Weight: 2 lbs (900 g)**

**Material:** High impact polycarbonate blend case

**Color:** Hi-Viz Yellow

**Deployment:** Manual

**Operation:** Lift switch up, slide left, push back and down fully, breaking tab

**Waterproof:** 32.8 ft (10 m)

**Certification:** Approved by COSPAS-SARSAT, FCC, USCG; CE

**Limited Warranty:** 5 years

**Carton Dimensions:**

**Units Per Carton:** 1

**Carton Weight:**

**Frequency:** 406.025 MHz, 121.5 MHz

**Battery Type:** Lithium - 5-year replacement life (11-year useful life)

**Modulation:** AM

**Radiated Power:** 5 watts  $\pm$  2dB (406.025 MHz) 50 mW  $\pm$  3dB (121.5 MHz)

**Operational Life:** 48 hours @ -40°C (-40°F)



**ACR Electronics, Inc.**  
5757 Ravenswood Road  
Fort Lauderdale, FL 33312, U.S.A.  
Tel Worldwide: +1(954) 981-3333  
Fax: +1(954) 983-5087

**NEW ITEM**

## **RapidFix 406™**

**Product No. 2776 Cat I (automatically deployable)  
406 MHz EPIRB with GPS Interface  
Model No.: RLB-33**

- > Connects to GPS via Infrared Interface (NMEA 0183): transmits your exact GPS LAT/LONG coordinates through GEOSAR satellite system allowing SAR to respond at once - No More Waiting for a Satellite Pass!
- > Fully enclosed polyethylene bracket Form-Function design withstands extremely abusive environments
- > Hydrostatic release automatically deploys EPIRB if vessel sinks to approximately 13 ft (4 m)
- > World's smallest 406 MHz EPIRB that meets all regulations and is fully approved worldwide
- > Built-in strobe for enhanced location in poor visibility conditions
- > Single, three-position switch for easy test and operation. Steady green LED indicates unit has passed full functional test, flashing red LED indicates unit is "ON"
- > Transmits on 406 MHz (COSPAS-SARSAT) with your registered, digitally-coded distress signal, and 121.5 MHz (SAR homing frequency)

- > Can be manually activated; self-buoyant - no external float collar to lose
- > Lanyard coiled on recessed spool for non-tangling deployment
- > Exclusive, polycarbonate blend designed for maximum resistance to UV and chemicals; maximum durability when exposed to extreme temperatures or shock
- > Field programmable - built-in vessel code can be reprogrammed by any ACR Authorized Service Center worldwide (Maritime/Serialized/Radio Call Sign/MID Protocols, Country Code, etc.)
- > Product label includes universal test/operation symbols, English and French languages, plus ability to substitute other foreign language
- > 5-year limited warranty
- > 5-year replacement life (11-year useful life) lithium battery
- > Operating life - 48 hours @ -40°C (-40°F)

**Size: 16.50 x 5.80 x 4.47 in (42.0 x 14.7 x 11.0 cm)**

**Weight:**

**Material:** High impact polycarbonate blend case (RLB - 33)

**Color:** Hi-Viz Yellow

**Deployment:** Automatic, hydrostatic release

**Operation:** Automatically deploys when water depth is approximately 13 ft (4 m) and begins transmitting

**Waterproof:** 32.8 ft (10 m)

**Certification:** Complies with GMDSS, approved by COSPAS-SARSAT, FCC, USCG and DOT (UK); CE

**Limited Warranty:** 5 years

**Carton Dimensions:**

**Units Per Carton:** 1

**Carton Weight:**

**Frequency:** 406.025 MHz, 121.5 MHz

**Battery Type:** Lithium - 5-year replacement life (11-year useful life)

**Modulation:** AM

**Radiated Power:** 5 watts  $\pm$  2dB (406.025 MHz) 50 mW  $\pm$  3dB (121.5 MHz)

**Operational Life:** 48 hours @ -40°C (-40°F)



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**Tel Worldwide: +1(954) 981-3333**  
**Fax: +1(954) 983-5087**

## **Integrating Charge Meter**

### **Method of operation \*\***

- A) Connect the current to be measured across the input terminals of the integrator.
- B) Manual reset (zero) the integrator and pulse counter.
- C) Note the time of start of test (T1).
- D) Operate the test for desired time (seconds up to hours) (T2).

**Total charge (Qt) = C0 (Vr Np + V0) Amp Seconds**

$$Q_t = (1/3600) C_0 (V_r N_p + V_0) \text{ Amp Hours}$$

**Where**      C0 = Integrator Capacitor Value (60microfarads Mylar)  
                 Np = Pulse counter output (count)  
                 V0 = Digital voltmeter output (volts) at end of test  
                 Vr = 10 volts, standard

**The results (Qt) may be scaled to any time interval desired**

$$Q \text{ (scaled)} = Q_t [\text{desired time}/(T_2 - T_1)]$$

**\*\* Calibrate the system prior to use with known current within the range of current to be measured.**

2/16/99

## CALCULATIONS FOR BATTERY DRAIN PRIOR TO LIFE TEST

### GPS INTERFACE:

RLB33 #1A with GPS data (searching every 19min) with GPS plug attached = 13.08uA

Worst case RLB-33 GPS current over battery life of 5 years = 0.00001308 Amps

Hours in 5 years =  $365 \times 24 \times 5 = 43800$  Hours

GPS INTERFACE AMP-HOURS = 0.572904 AMP-HOURS

### SELF-TEST:

our self tests per year for 5 years = 20 tests

Background current = 0.25 Amps

Duration = 7 Seconds

Burst current = 2 Amps

Duration = 0.44 Seconds

Total self-test charge battery drain in 5 years =  $2.63 \text{ Coulombs} \times 20$

Total seconds in 5 years =  $5 \times 365 \times 24 \times 60 \times 60 = 157680000$  Seconds

Average battery self-test battery drain =  $1.66794 \times 10^{-8}$  Amps

Self-Test AMP-HOURS =  $0.000730556 \text{ AMP-HOURS} \times 20$

Total Self-Test AMP-HOURS = 0.573634556 AMP-HOURS

OSPAS/SARSAT TEST FACTOR = 1.65

Total AMP-HOUR burn off battery for -40 C life test = 0.946497017 AMP-HOURS

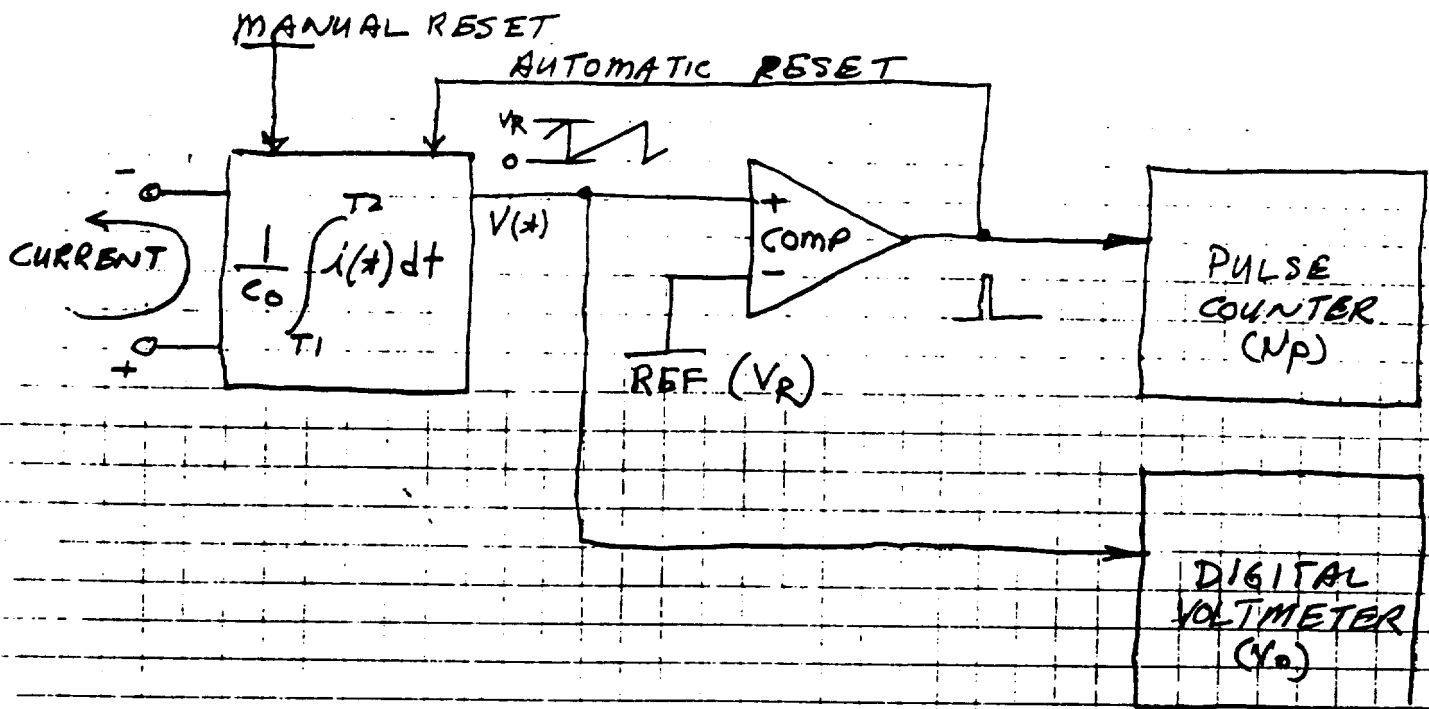
Current required for 24 hour burn = 0.039437376 Amps

Resistance required at 8.7 Volts = 220.602914 Ohms

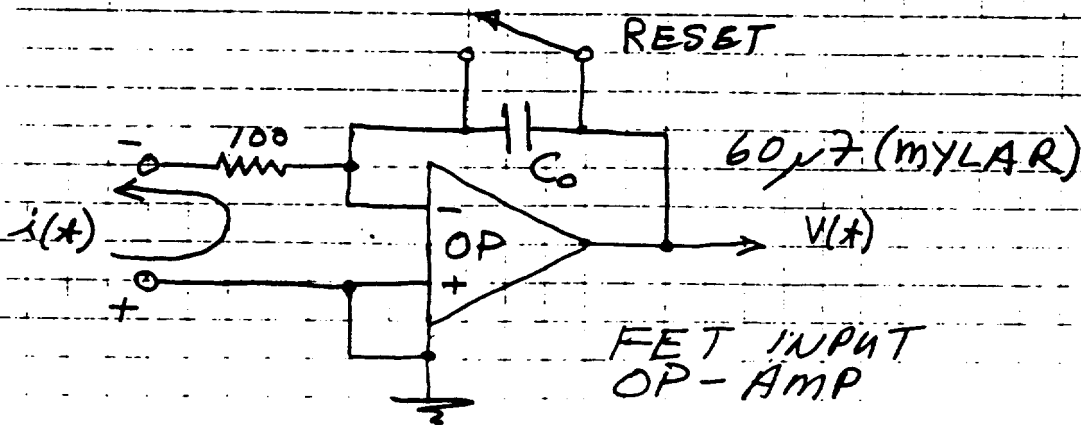
Power dissipation required at 8.7 Volts = 0.343105169 Watts

# INTEGRATING CHARGE METER

(BLOCK DIAGRAM)

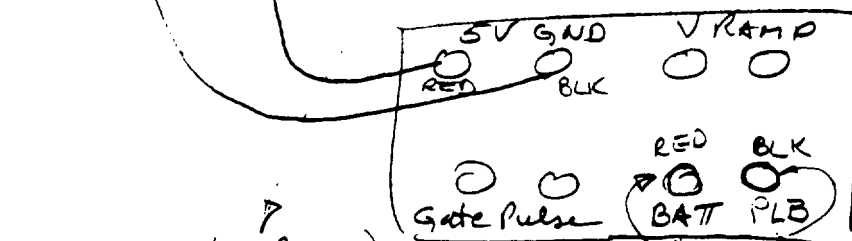
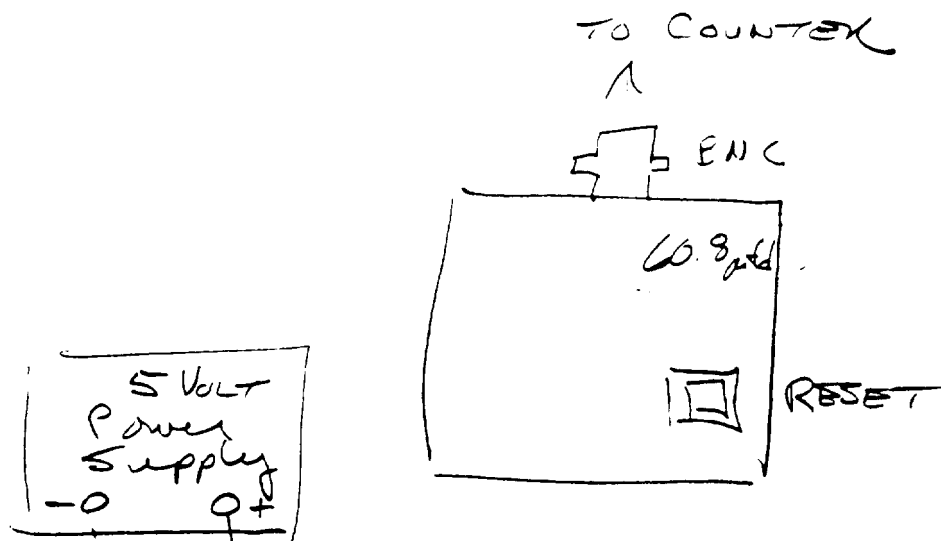


(INTEGRATOR CIRCUIT)



(SPECIFICATIONS, INTEGRATOR)

|              |                 |
|--------------|-----------------|
| INPUT RANGE  | 0 to 5 ma       |
| OUTPUT RANGE | 0 to 12 V       |
| ACCURACY     | $\pm 0.3 \mu a$ |
| BANDWIDTH    | 0 to 10 KHz     |

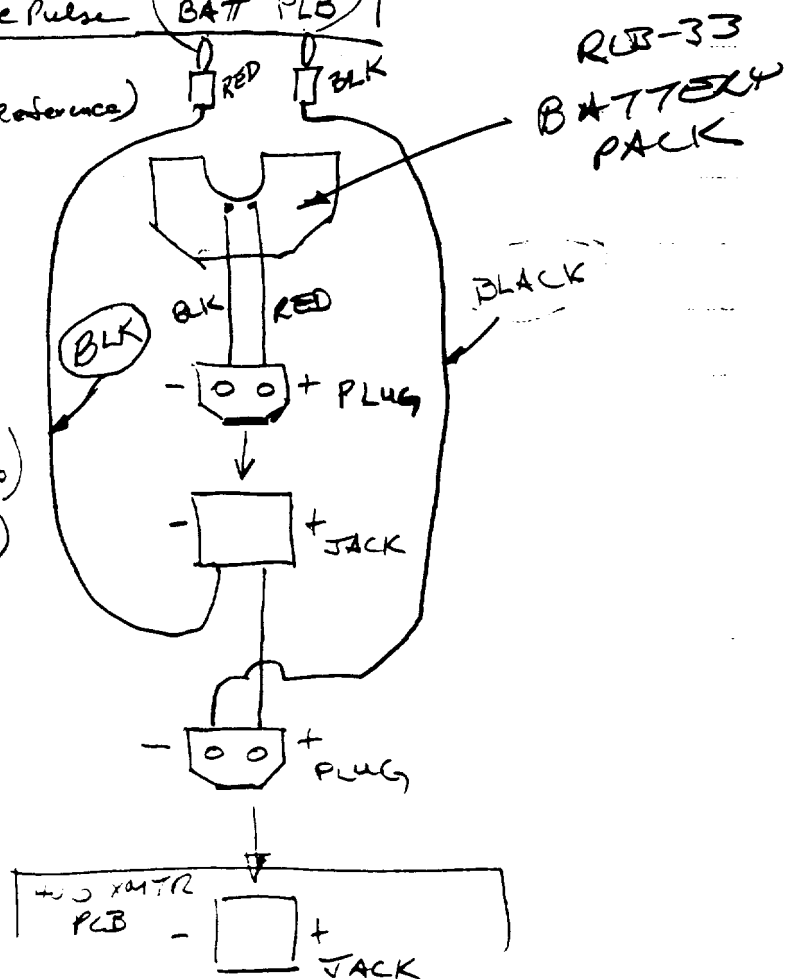


Capacitance  
Value (60.8  $\mu$ F)

2.5 VOLTS (Reference)

$$C \times V \times \text{COUNT} = \text{Charge (Coulombs)}$$

$$\text{Current} = \frac{\text{Charge (Coulombs)}}{\text{Time (seconds)}}$$



**LONG-TERM DRIFT ON UUT 2/2**

SOREP minus 406 m0007

UUT : 2/2  
Name : SOREP  
Type : micro  
Number : 07  
Date : November / December, 1994

### 15.1. DEFINITION

The beacon was tested for 30 days at the laboratory ambient temperature. An external 7-V power supply was used. The different frequency measurements are plotted on the two diagrams below.

Experience shows that oscillator frequency drift depends on several factors, of which the most significant can be expressed by a law of the following form :

$$A \log(B.t + 1) + C$$

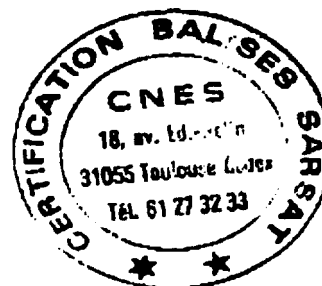
The curve providing the best fit to the points is plotted. Since its equation is not linear with respect to coefficient B, the least-squares method is not appropriate.

Refer to the appended note entitled "Aging specification measurement and analysis" by Raymond L. Filler, recommending a computerized series of iterations to determine the coefficients of the curve.

Once the coefficients are defined, the curve can be extrapolated to a five-year period and a check made to ensure that the results meet the specification.

### 15.2. RESULTS

| Frequency    | Specifications         | Measurements       |
|--------------|------------------------|--------------------|
| F0           | 406025 MHz $\pm$ 2 kHz | 40602563 kHz       |
| F(30) - F0   | $\pm$ 0.3 kHz          | - 66 Hz            |
| F(1825) - F0 | $\pm$ 5 kHz            | $\approx$ - 200 Hz |



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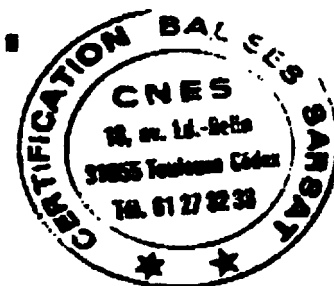
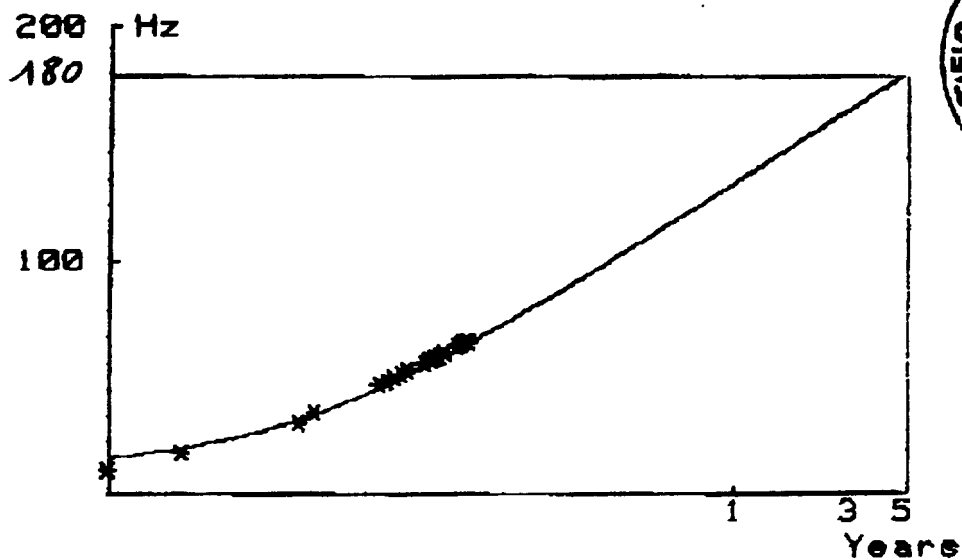
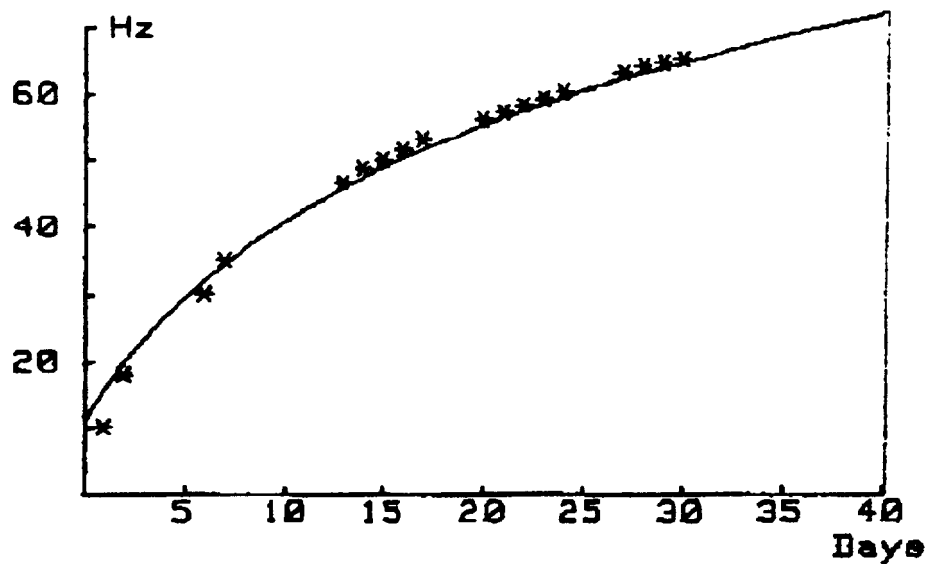
## DATA OF MEASUREMENTS

F0 = 406.025063 Hz

| Days          | Frequency difference |
|---------------|----------------------|
| 1 day after   | F0 - 10 Hz           |
| 2 days after  | F0 - 18 Hz           |
| 6 days after  | F0 - 30 Hz           |
| 7 days after  | F0 - 35 Hz           |
| 13 days after | F0 - 46.5 Hz         |
| 14 days after | F0 - 48.5 Hz         |
| 15 days after | F0 - 50 Hz           |
| 16 days after | F0 - 51.5 Hz         |
| 17 days after | F0 - 53 Hz           |
| 20 days after | F0 - 56 Hz           |
| 21 days after | F0 - 57 Hz           |
| 22 days after | F0 - 58 Hz           |
| 23 days after | F0 - 59 Hz           |
| 24 days after | F0 - 60 Hz           |
| 27 days after | F0 - 63 Hz           |
| 28 days after | F0 - 64 Hz           |
| 29 days after | F0 - 64.5 Hz         |
| 30 days after | F0 - 65 Hz           |



130

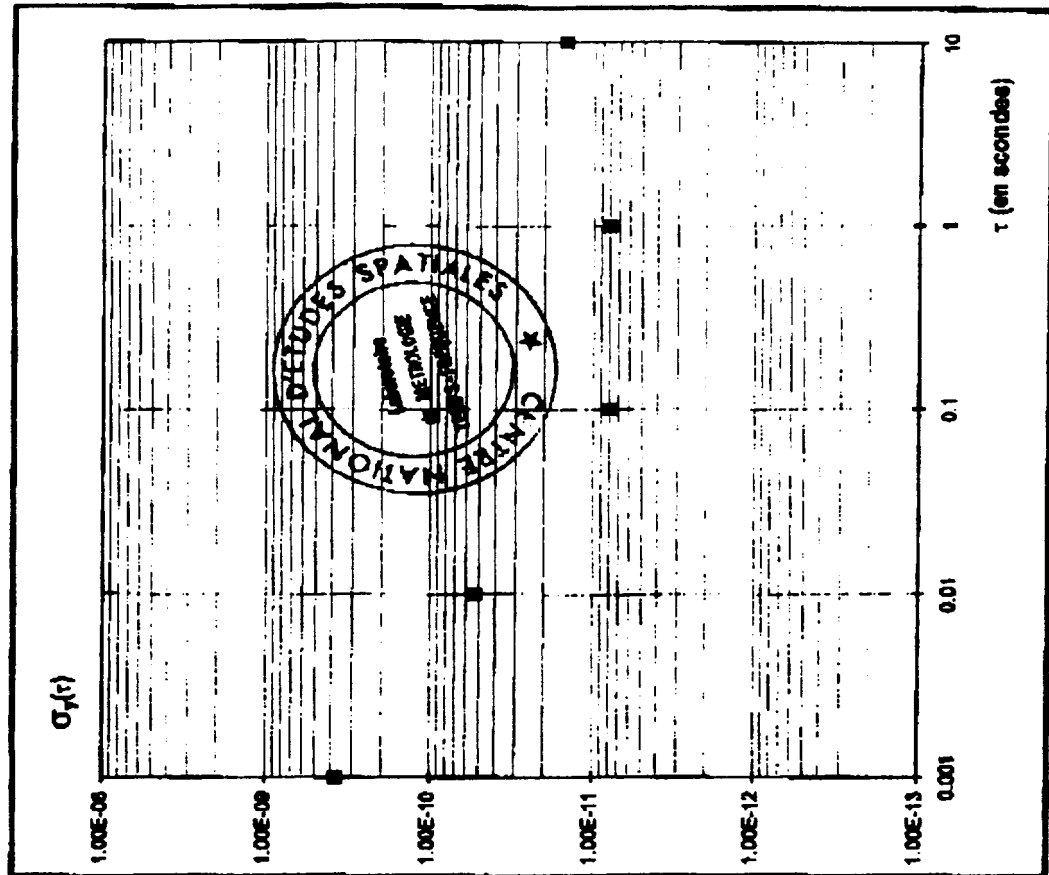


V. ALLAN

## VARIANCE D'ALLAN SUR 30 ECHANTILLONS MOYENNEE 10 FOIS

06-jan-96

Constructeur : SOREP  
 Type OUS : EWOS 0501  
 N° OUS : 763  
 Fréquence : 10150625 Hz



| $\tau$ | Minimum  | Moyenne  | Maximum  |
|--------|----------|----------|----------|
| 1 ms   | 3.10E-10 | 3.80E-10 | 4.50E-10 |
| 10 ms  | 4.50E-11 | 5.30E-11 | 6.20E-11 |
| 100 ms | 6.60E-12 | 7.80E-12 | 8.90E-12 |
| 1 s    | 6.70E-12 | 8.00E-12 | 9.30E-12 |
| 10 s   | 1.10E-11 | 1.50E-11 | 3.00E-11 |

CNESCT/AE/TU/JTF

12/03/98

## **RANDOMIZATION OF BURST REPETITION PERIOD FOR RLB-32/33**

Once the RLB-32/33 is activated, the time between 406 MHz bursts is varied in a pseudo random manner between 48.7 to 51.3 seconds. The microprocessor control selects from nine different burst repetition periods separated by 325 milliseconds. For the first 39 bursts, the seed for the pseudo random code generator is set to the same value so the same pseudo random burst repetition periods are used to allow the production system tester to test multiple EPIRBs. After the 39th burst, the data message checksum is used for the seed, thus randomizing the burst repetition period between EPIRBs.

c:\winword\mini406\burstrep.doc

The protection against continuous transmission of the 406 MHz signal is provided through redundant controlling hardware and software. The 406 MHz RF power module is controlled by two switches under microprocessor control. The transmitted output would cease if either switch turns off. The frequency synthesizer is also controlled by the microprocessor in an independent manner. The entire synthesizer/modulator circuitry is turned on and off for each transmission. Therefore, the transmitter output would cease when the synthesizer is turned off.

The microprocessor used in this design has a built in function that periodically resets the microprocessor unless it is cleared during operation. This provides protection should the software ever get to an unknown state or stop completely. When the microprocessor is reset, the control for the RF power module is turned off. A voltage supervisor IC is also used with the control microprocessor to prevent the hardware from ever getting the control microprocessor to an unprogrammed or unknown state.

Therefore, continuous transmissions of the 406 MHz signal can only occur under the extremely unlikely condition of multiple failures within the system.

C:\winword\mini406\continop.doc

| Product No.  | Description                   | 2774 | 2775 | 2776 | 2777 |
|--------------|-------------------------------|------|------|------|------|
| A1-20-0976   | RapidFix Logo encapsulated    |      |      | X    | X    |
| A1-20-0977   | Satellite 2 Logo encapsulated | X    | X    |      |      |
| A1-20-0978   | Main Instruction              | X    | X    | X    | X    |
| A1-20-0979   | Battery info & temp           | X    | X    | X    | X    |
| A1-20-0980   | Warning, imminent danger      | X    | X    | X    | X    |
| A1-20-0981-1 | FCC ID RLB-32 CAT I           | X    |      |      |      |
| A1-20-0981-2 | FCC ID RLB-32 CATN            |      | X    |      |      |
| A1-20-0981-3 | FCC ID RLB-33 CATI            |      |      | X    |      |
| A1-20-0981-4 | FCC ID RLB-33 CATN            |      |      |      | X    |
| A1-20-0982   | GPS loading instruction       |      |      | X    | X    |
| A1-20-0983   | Lanyard Wrap                  | X    | X    | X    | X    |
| A1-20-0983   | Cat I Bracket Must            | X    |      | X    |      |
| A1-20-0987   | CATN Bracket label            |      | X    |      | X    |
| A1-20-0990   | GPS Must Cat I                |      |      | X    |      |
| A1-20-0991   | GPS Must Cat II               |      |      |      | X    |
| A1-20-0996   | Warranty public notice        | X    | X    | X    | X    |
| A1-20-0997   | Cat I Bracket Must            | X    |      |      |      |
| A1-20-0999   | Cat I Bracket Must            |      |      | X    |      |
|              |                               |      |      |      |      |

**FAX: (561) 998-7665**

A1-20-0978

The diagram illustrates the two operational modes of the A1-20-0978 device. On the left, the 'TEST' mode is shown with a battery icon, a checkmark, and musical notes, indicating a signal test. On the right, the 'XMIT' mode is shown with a radio tower icon and a starburst, indicating transmission. The device is a small, dark, rectangular unit with a circular component on top. The entire diagram is enclosed in a rectangular frame with a title box at the top.



Graphic Printing Corp. Boca Raton, FL 561-994-3586 FAX: 561-994-1728

TO: SEITZ

ATTN: LAURA

DATE: 2.25.99

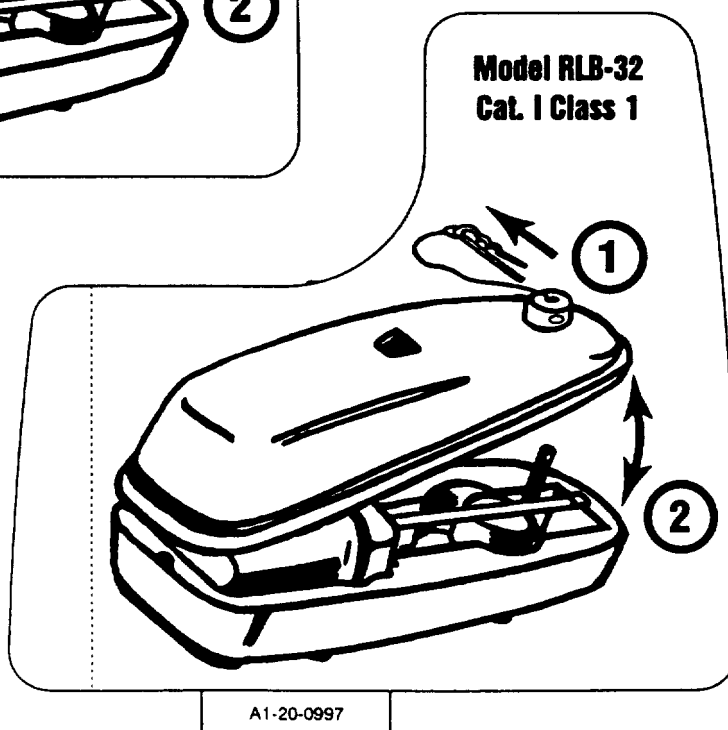
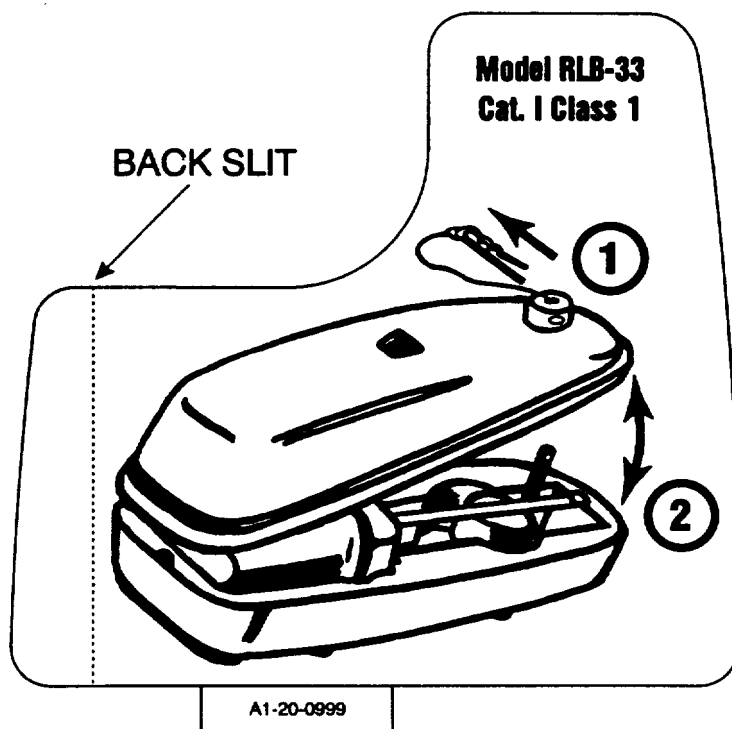
**Please examine the attached artwork and fax back your approval or changes**

PN: A1-20-0997

PO:

MATERIAL: .004 CLEAR POLYESTER

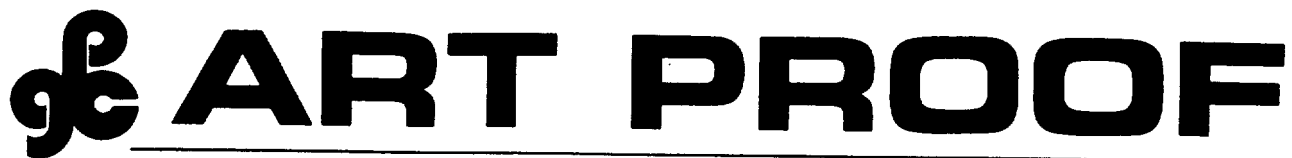
**PMS 282C TEXT & GRAPHICS, CLEAR BACKGROUND**



APPROVED BY:

A handwritten signature in black ink, appearing to be "J. Seitz", written over a horizontal line.

DATE:



Graphic Printing Corp. Boca Raton, FL 561-994-3586 FAX: 561-994-1728

TO: SEITZ

ATTN: LAURA

DATE: 2.25.99

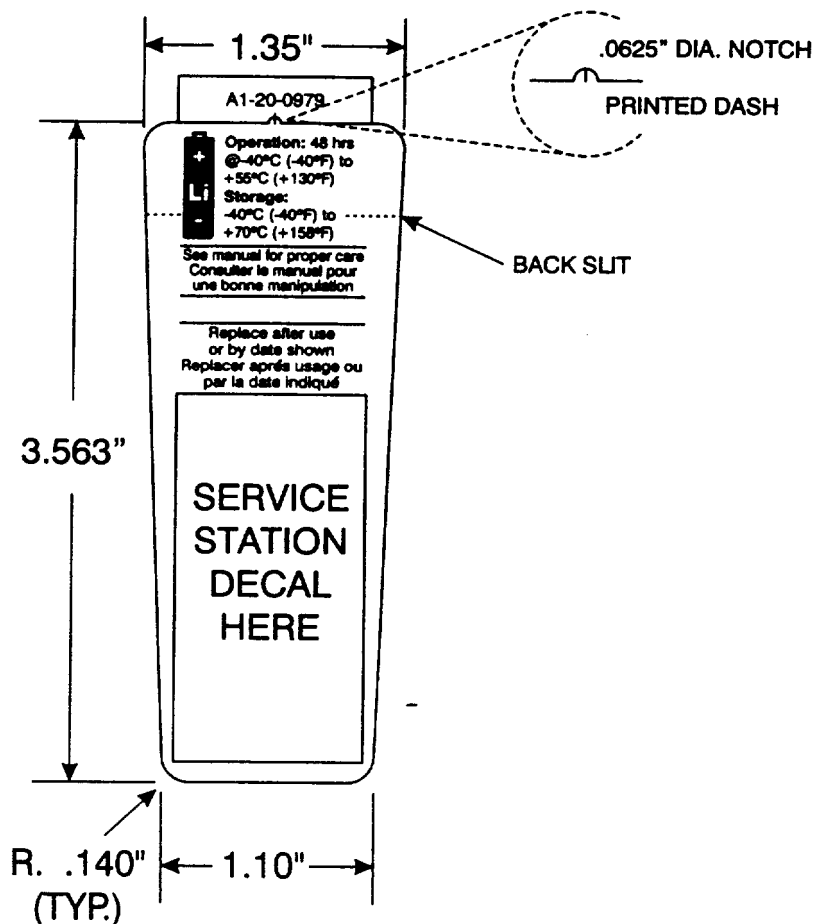
**Please examine the attached artwork and fax back your approval or changes**

PN: A1-20-0979

PO:

MATERIAL: .004 CLEAR POLYESTER W/467 ADH.

**PMS 282C TEXT & GRAPHICS ON CLEAR BACKGROUND**



APPROVED BY:

A handwritten signature in black ink, appearing to be "John L.", written over a horizontal line.

DATE:

\_\_\_\_\_

# ART PROOF

GRAPHIC PRINTING CORP.  
BOCA RATON, FL

(561) 994-3586  
FAX: (561) 998-7665

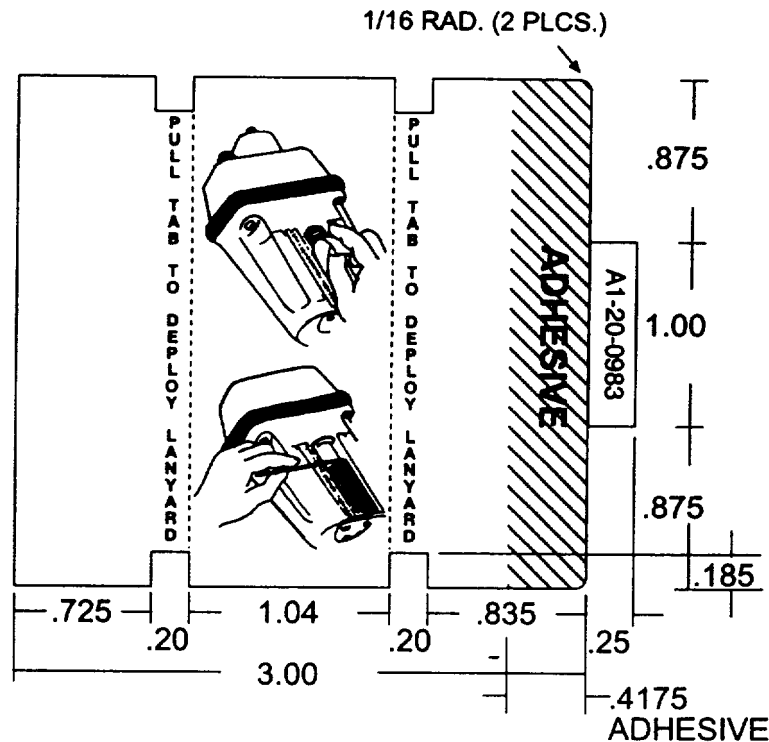
To: SEITZ

Attn:

Date: 2-23-99

Please examine the attached artwork and fax back your approval or changes.

Part No.: A1-20-0983  
P.O. #



Material:  
Colors:

☐ Approved By: *[Signature]*

Date: \_\_\_\_\_

☐ Please Make The Following Changes:



Graphic Printing Corp. Boca Raton, FL 561-994-3586 FAX: 561-994-1728

TO: SEITZ

ATTN: LAURA

DATE: 2.25.99

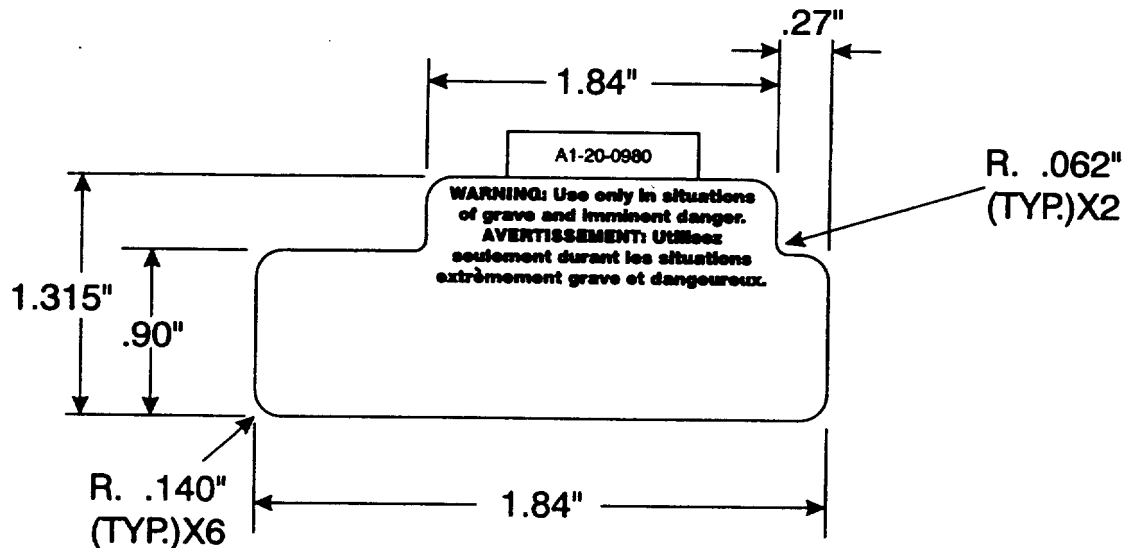
**Please examine the attached artwork and fax back your approval or changes**

PN: A1-20-0980

PO:

MATERIAL: .004 CLEAR POLYESTER W/467 ADH.

**PMS 282C TEXT & GRAPHICS ON CLEAR BACKGROUND**



APPROVED BY:

A handwritten signature in black ink, appearing to be "L. J.", written over a horizontal line.

DATE:

\_\_\_\_\_



Graphic Printing Corp. Boca Raton, FL 561-994-3586 FAX: 561-994-1728

TO: SEITZ

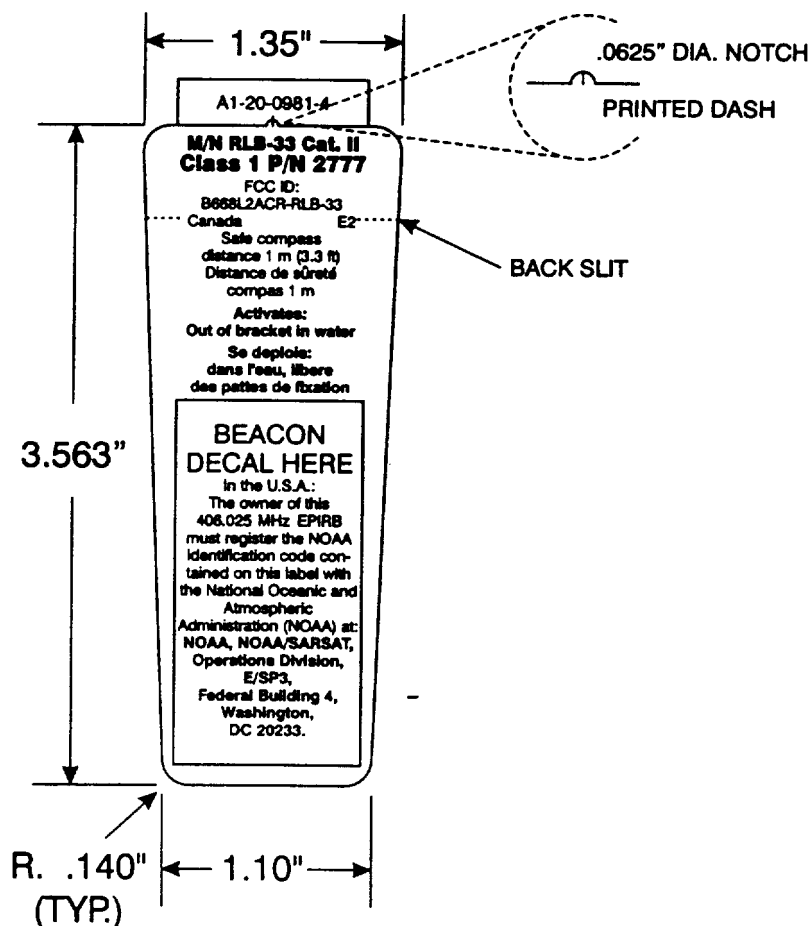
ATTN: LAURA

DATE: 2.25.99

**Please examine the attached artwork and fax back your approval or changes**

PN: A1-20-0981-4 PO: MATERIAL: .004 CLEAR POLYESTER W/467 ADH.

**PMS 282C TEXT & GRAPHICS ON CLEAR BACKGROUND**



APPROVED BY:

A handwritten signature in black ink, appearing to be "J. H. J.", written over a horizontal line.

DATE:

\_\_\_\_\_



Graphic Printing Corp. Boca Raton, FL 561-994-3586 FAX: 561-994-1728

TO: SEITZ

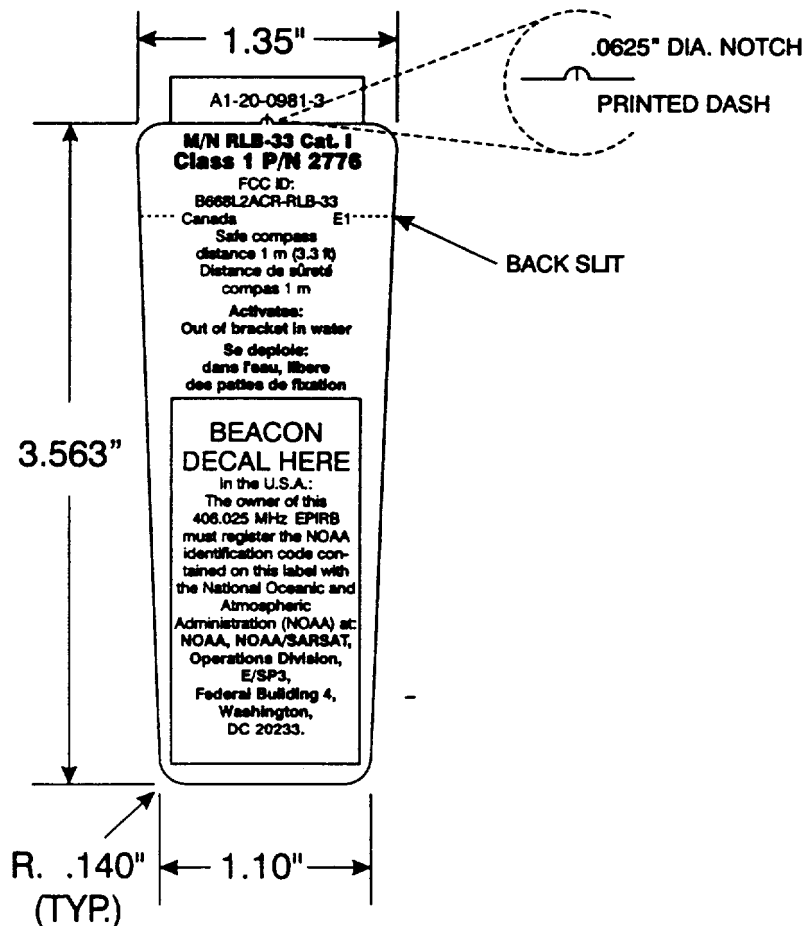
ATTN: LAURA

DATE: 2.25.99

**Please examine the attached artwork and fax back your approval or changes**

PN: A1-20-0981-3 PO: MATERIAL: .004 CLEAR POLYESTER W/467 ADH.

**PMS 282C TEXT & GRAPHICS ON CLEAR BACKGROUND**



APPROVED BY:

A handwritten signature in black ink, appearing to be "J. L. F.", written over a horizontal line.

DATE:

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Graphic Printing Corp. Boca Raton, FL 561-994-3586 FAX: 561-994-1728

TO: SEITZ

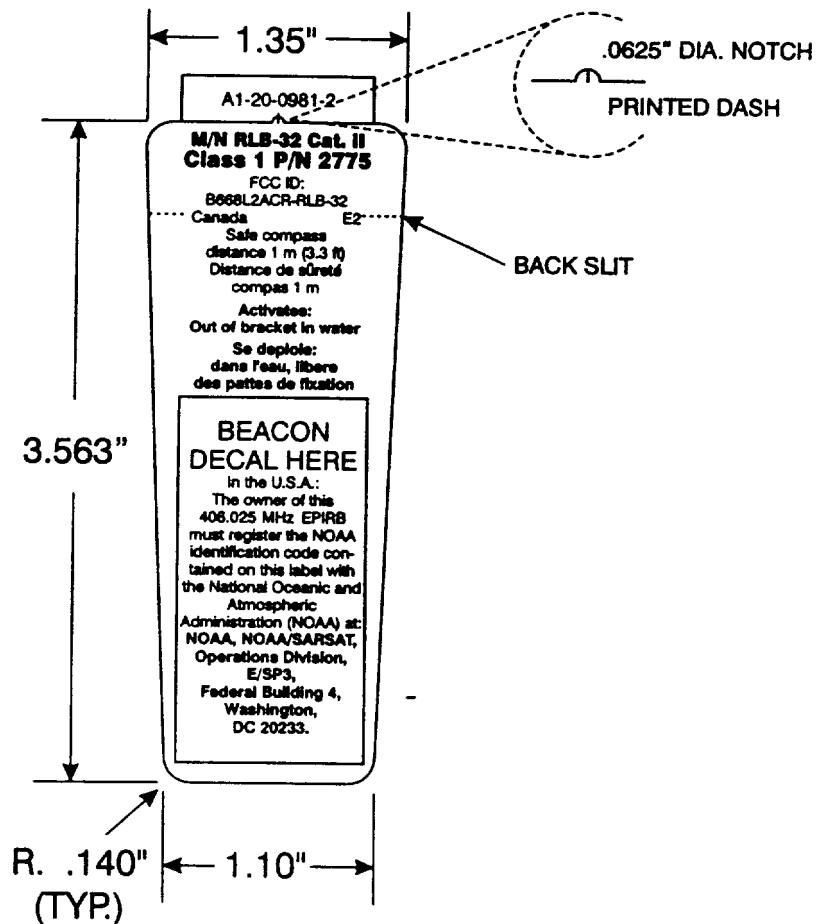
ATTN: LAURA

DATE: 2.25.99

**Please examine the attached artwork and fax back your approval or changes**

PN: A1-20-0981-2 PO: MATERIAL: .004 POLYESTER W/467 ADH.

**PMS 282C TEXT & GRAPHICS ON CLEAR BACKGROUND**



APPROVED BY:

A handwritten signature in black ink, appearing to be "M. J.", written over a horizontal line.

DATE:

# ART PROOF

Graphic Printing Corp. Boca Raton, FL 561-994-3586 FAX: 561-994-1728

TO: SEITZ

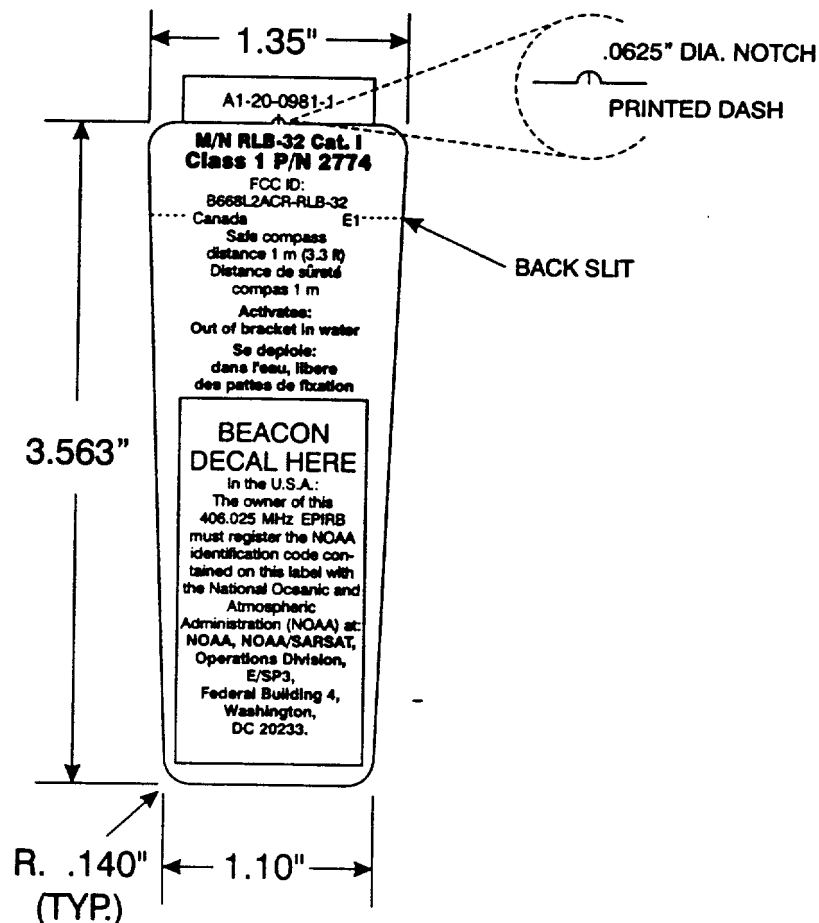
ATTN: LAURA

DATE: 2.25.99

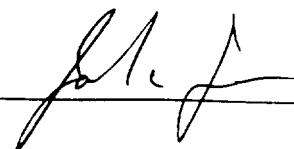
**Please examine the attached artwork and fax back your approval or changes**

PN: A1-20-0981-1 PO: MATERIAL: .004 CLEAR POLYESTER W/467 ADH.

## PMS 282C TEXT & GRAPHICS ON CLEAR BACKGROUND



APPROVED BY:



DATE:

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# ART PROOF

GRAPHIC PRINTING CORP.  
BOCA RATON, FL

(561) 994-3586  
FAX: (561) 998-7665

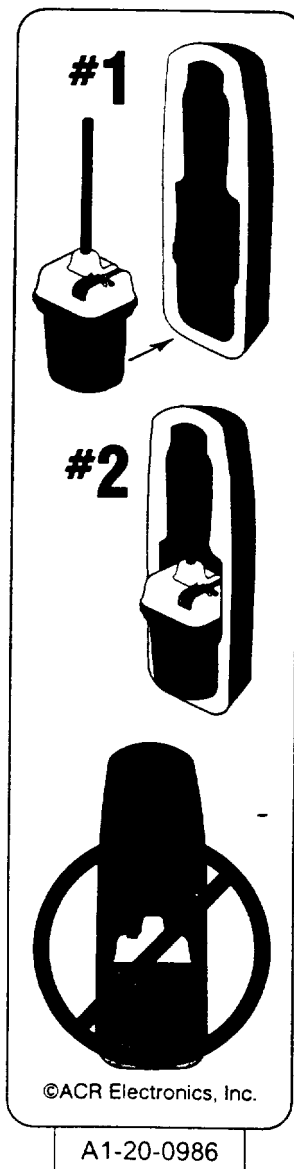
To: SEITZ

Attn:

Date: 2-15-99

Please examine the attached artwork and fax back your approval or changes.

Part No.: A1-20-0986  
P.O. #



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BACK SLIT

Material: VINYL  
Colors: PMS 282

☐ Approved By: [Signature] Date: \_\_\_\_\_

☐ Please Make The Following Changes:



Graphic Printing Corp. Boca Raton, FL 561-994-3586 FAX: 561-998-7665

TO: SEITZ

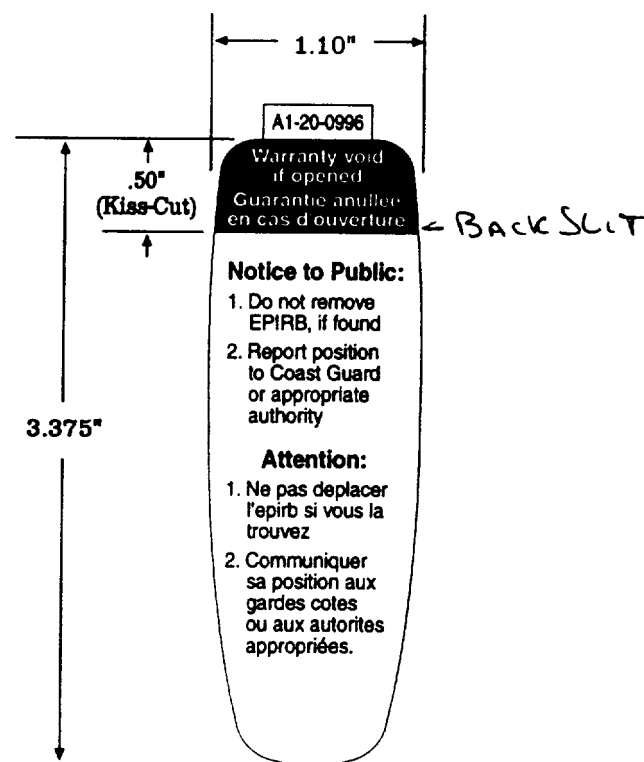
ATTN: LAURA

DATE: 2-22-99

PLEASE EXAMINE THE ATTACHED ARTWORK AND FAX BACK YOUR APPROVAL OR CHANGES.

PART NO.: A1-20-0996

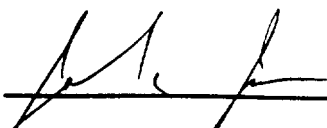
P.O. #



ACTUAL SIZE -

MATERIAL: .004" Clear Polyester w/ .002" 3M 468 Adhesive

COLORS: Pms# 282C (Blue) on a Clear Background

☐ APPROVED BY: 

DATE: \_\_\_\_\_

☐ PLEASE MAKE THE FOLLOWING CHANGES:

# ART PROOF

Graphic Printing Corp. Boca Raton, FL 561-994-3586 FAX: 561-994-1728

TO: SEITZ

ATTN: LAURA

DATE: 2.25.99

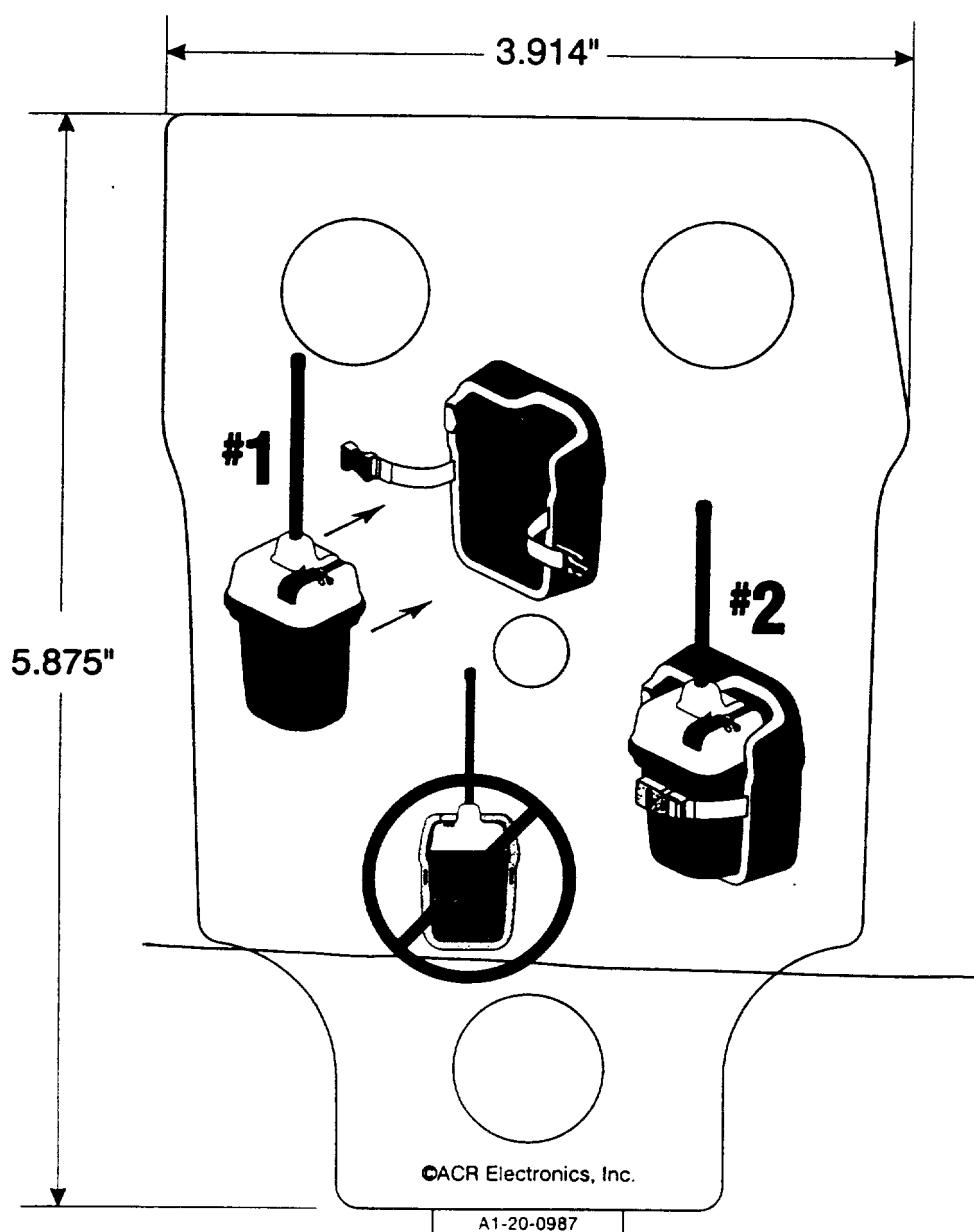
**Please examine the attached artwork and fax back your approval or changes**

PN: A1-20-0987

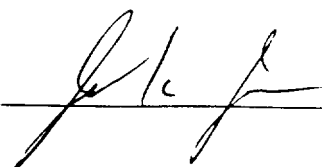
PO:

MATERIAL: .004 WHITE VINYL

**PMS 282C TEXT & GRAPHICS ON WHITE VINYL**

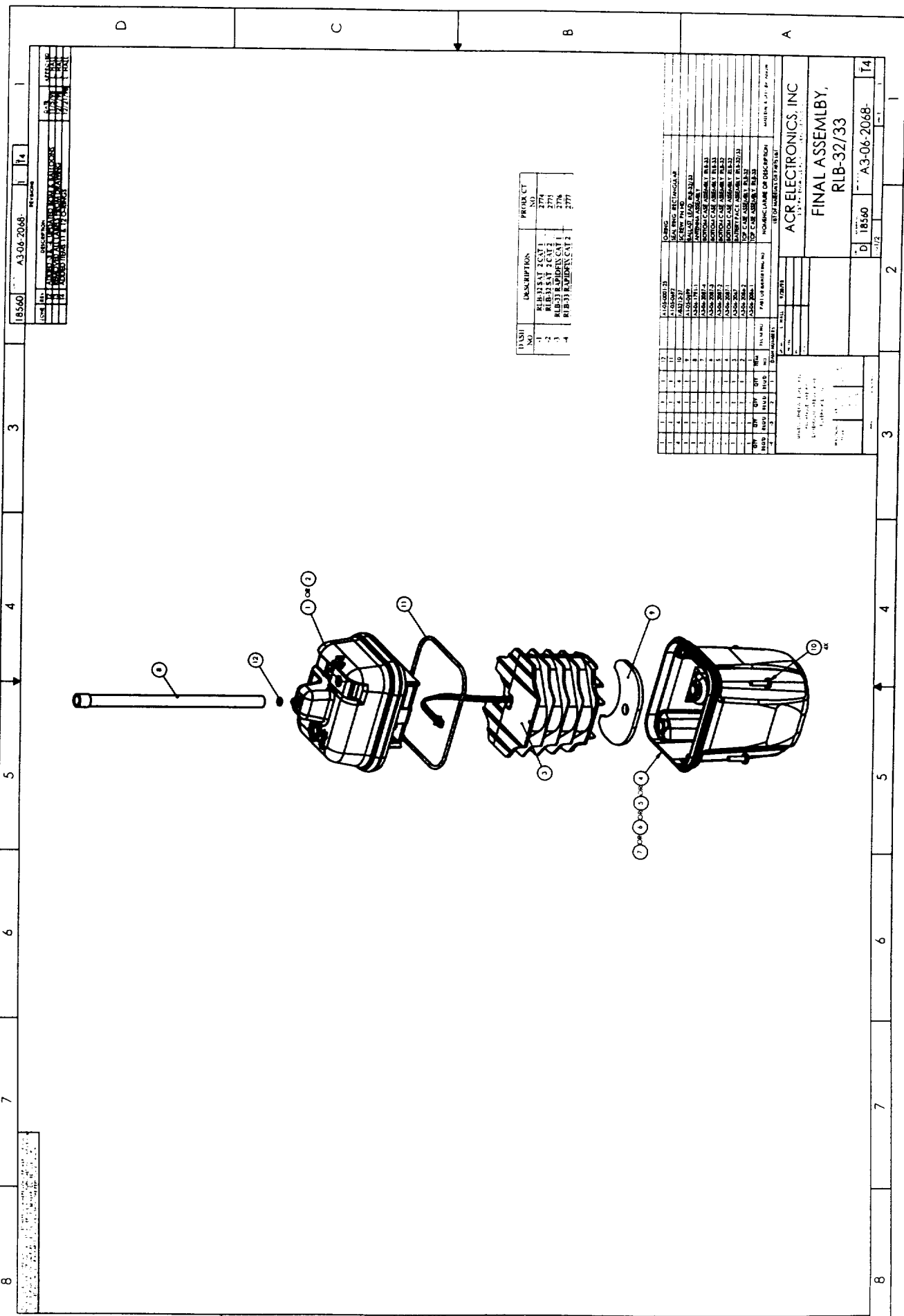


APPROVED BY:



DATE:

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PASSED

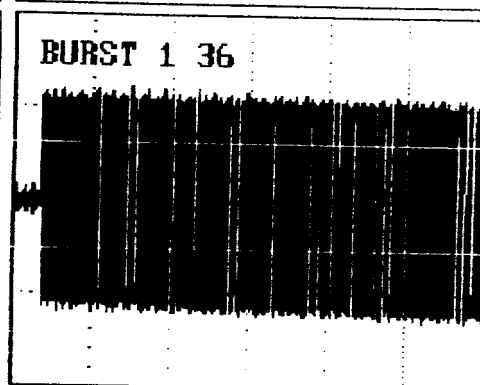
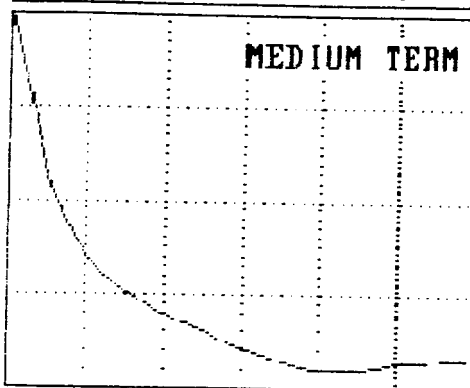
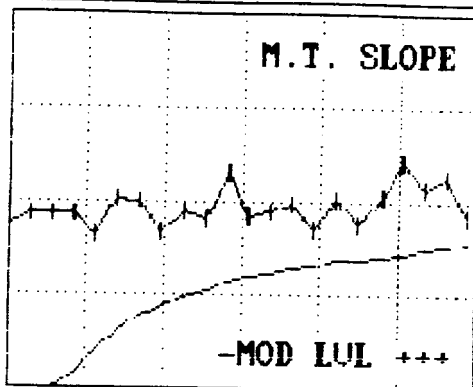
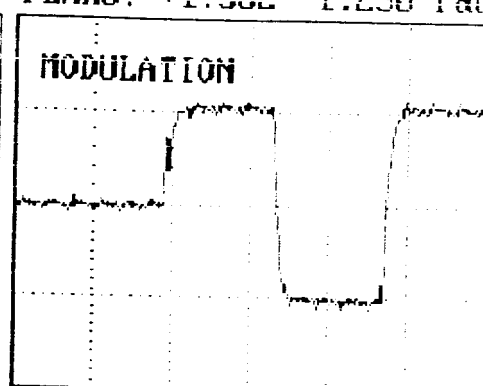
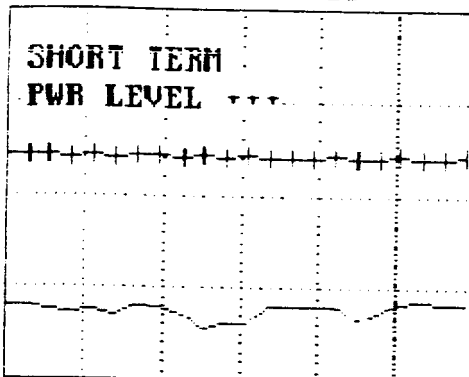
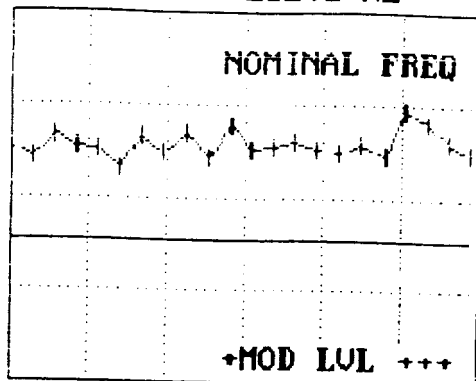
PASSED

-232.1 Hz

PASSED

4.309E-10

PEAKS: +1.302 -1.250 rad



PASSED -2.789E-10

PASSED 2.449E-10

PEAKS: +1.358 -1.440 rad

NOMINAL FREQUENCY: 406.02476 MHz  
 POWER OUTPUT: 5.893 Watts  
 +37.70 dBm  
 POWER STABILITY: 9.62 %  
 POWER RISE TIME: 970 usec  
 PEAK VOLTAGE: +2.015 Volts  
 DRIFT SLOPES: 1) -2.83E-01 rad/sec  
 2) -2.83E-01 rad/sec  
 3) -2.83E-01 rad/sec  
 MODULATION LEVELS: +1.142 radians  
 +1.149 -1.121 -1.149 radians  
 +0.014 OFFSET -0.003 radians  
 MODULATION TIMES: RISE 163 usec  
 FALL 162 usec  
 SYMMETRY 0.01 %  
 MODULATION BIT RATE: 398.76 Hz  
 BURST TIMES: AVG PERIOD 50.5 sec  
 CARRIER DURATION 159.9 msec  
 MESSAGE DURATION 261.1 msec  
 TOTAL DURATION 521.1 msec  
 PREAMBLE LEAKAGE LEVEL 35.0 dBc  
 LEAKAGE LENGTH 0.2 msec

#### HEXADECIMAL MESSAGE

2DDC5D800AFFBFF  
 FFFEDF96EE2EC0057F0FFD2535F593E0FAA3  
 BIT SYNCHRONIZATION..... OK  
 FRAME SYNCHRONIZATION... OK  
 MESSAGE FORMAT..... LONG  
 PROTOCOL FLAG..... STANDARD  
 COUNTRY..... USA  
 SERIALIZED USER..... TEST MODE  
 C/S CERTIFICATE No..... 137  
 SERIAL NUMBER..... 5  
 LATITUDE..... N 127.75  
 LONGITUDE..... E 265.75  
 ERROR CORRECTION CODE 1. OK  
 ENCODED DATA SOURCE..... Internal  
 121.5 MHz HOMING..... No  
 SPARES status..... Not OK  
 LATITUDE OFFSET..... + 0.50  
 LONGITUDE OFFSET..... + 0.50  
 ERROR CORRECTION CODE 2. OK

PV119



2/11/99

RLB-33 S/W 1

SUMMARY OF TEST RESULTS

| PARAMETERS TO BE MEASURED DURING TESTS | RANGE OF SPECIFICATION            | UNITS | TEST RESULTS                          |                                     |                                     | COMMENTS |
|----------------------------------------|-----------------------------------|-------|---------------------------------------|-------------------------------------|-------------------------------------|----------|
|                                        |                                   |       | T <sub>min</sub><br>( <u>    </u> °C) | T <sub>amb</sub><br>( <u>24</u> °C) | T <sub>max</sub><br>( <u>40</u> °C) |          |
| 1. N/A                                 |                                   |       |                                       |                                     |                                     |          |
| 2. Initial Aliveness Test              |                                   |       |                                       |                                     |                                     |          |
| • Carrier Frequency                    | 406.025 ± 0.002                   | MHz   |                                       | 406.02526                           |                                     |          |
| • Power Output                         | 35 - 39                           | dBm   |                                       | 38.71                               |                                     |          |
| • Data Message                         | <u>2DDC5D80</u><br><u>02FFBFF</u> | ✓     |                                       | ✓                                   |                                     |          |
| 3. Humidity Test                       |                                   |       |                                       |                                     |                                     |          |
| • Aliveness Test                       |                                   |       |                                       |                                     |                                     |          |
| - Carrier Frequency                    | 406.025 ± 0.002                   | MHz   |                                       |                                     | 406.025214                          |          |
| - Power Output                         | 35 - 39                           | dBm   |                                       |                                     | 38.24                               |          |
| - Data Message                         | <u>2DDC5D80</u><br><u>02FFBFF</u> | ✓     |                                       |                                     |                                     |          |

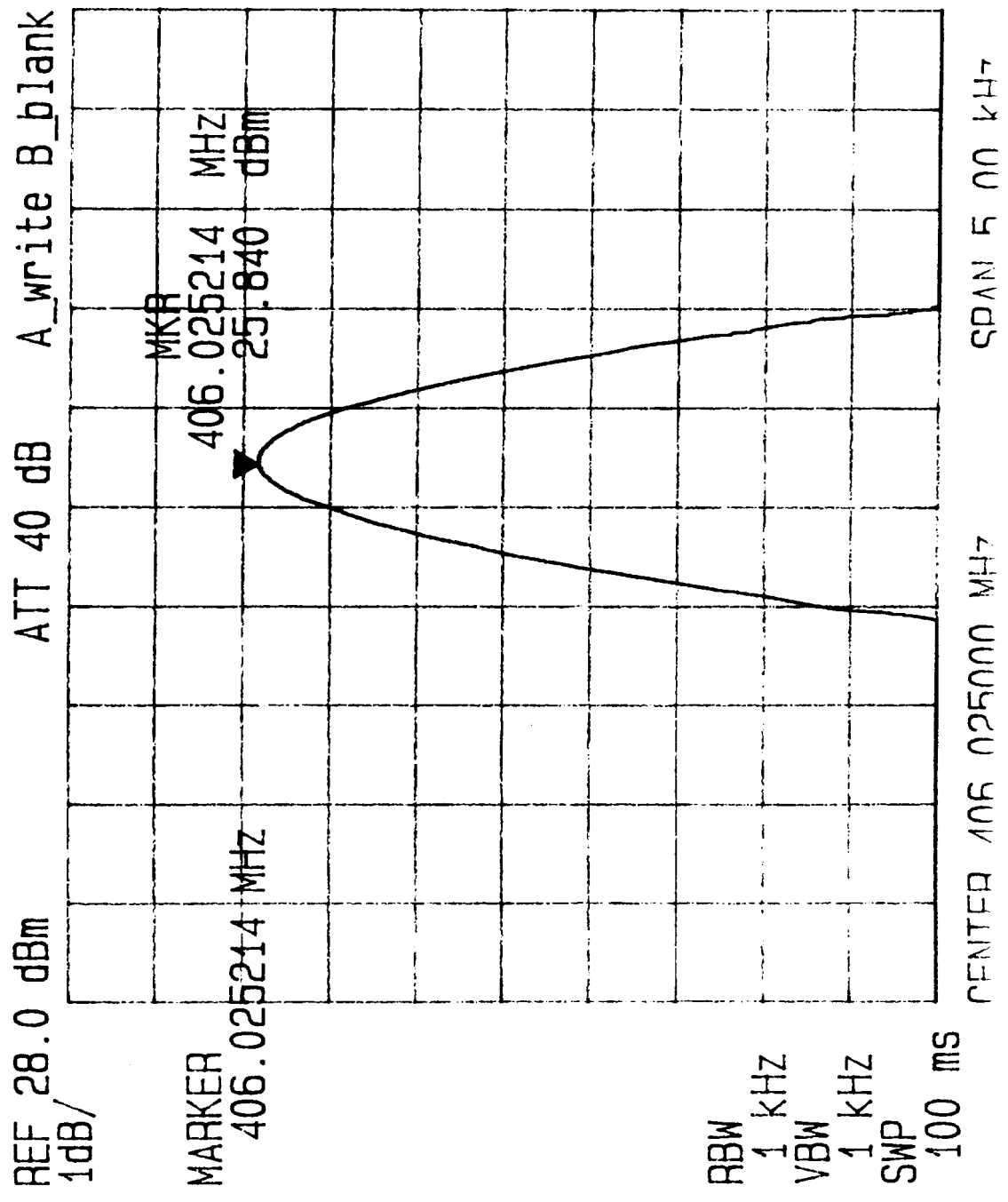
|               |           |
|---------------|-----------|
| Long molecule | Proteinol |
| Std Location  |           |
| Country Code  | 36        |

TEST PROCEDURE

Defect + C

RLB-33 S/N 1 3.0 HUMIDITY TEST

8/11/99  
10'06 OUT OF  
CHAMBER



DATE: 02-11-1999 TIME: 10:18:42

ACR V1.8

PLB-33 S/N 1

3.0 HUMIDITY  
TEST

EP IRB ~~PLB27/28~~ FAILED

SERIAL# N/A

United States (366)

|                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                              |                                                                              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|
| <p>NOMINAL FREQUENCY: 406.02518 MHz<br/>» POWER OUTPUT: 210000.000 watts<br/>» +0.00 dbm<br/>» POWER STABILITY: 21000.00 %<br/>» POWER RISE TIME: 1000 µsec<br/>DRIFT SLOPE: +8.65E-02 rad/sec<br/>MODULATION LEVELS: +0.705 radians<br/>-0.720 radians<br/>OFFSET +0.000 radians<br/>MODULATION BIT RATE: 400.00 Hz<br/>EP IRB TIMES: SELF TEST 5.0 sec<br/>CARRIER DURATION 159.5 msec</p> | <p>HEXADECIMAL MESSAGE<br/>2D1C5D8002FFBFF<br/>FFFE2F96EE2EC0017F1FFC0A61G5<br/>BIT SYNCHRONIZATION..... OK<br/>FRAME SYNCHRONIZATION... OK<br/>MESSAGE FORMAT..... LONG<br/>PROTOCOL FLAG..... Standard<br/>COUNTRY..... United States (366)<br/>MESSAGE PROTOCOL..... N/A<br/>CATEGORY/CLASS..... N/A<br/>MANUFACTURER ID NUMBER.. N/A</p> | <p>POWER OUTPUT<br/>POWER OUTPUT<br/>POWER STABILITY<br/>POWER RISE TIME</p> |
| <p>TOTAL DURATION 496.4 msec</p>                                                                                                                                                                                                                                                                                                                                                             | <p>PRODUCTION RUN NUMBER... N/A<br/>MODEL NUMBER..... N/A<br/>HUMING FACILITY..... OTHER OR MORE THA<br/>ERROR CORRECTION CODE... OK<br/>EMERGENCY CODE FLAG..... NOT OK<br/>ACTIVATION MODE..... AUTOMATIC<br/>NATURE OF DISTRESS..... LISTING</p>                                                                                          |                                                                              |

# SUMMARY OF TEST RESULTS

| PARAMETERS TO BE MEASURED DURING TESTS                                                                                | RANGE OF SPECIFICATION                                                  | UNITS           | TEST RESULTS                            |                                          |                                      | COMMENTS |
|-----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|-----------------|-----------------------------------------|------------------------------------------|--------------------------------------|----------|
|                                                                                                                       |                                                                         |                 | T <sub>min</sub><br>( <u>      </u> °C) | T <sub>amb.</sub><br>( <u>      </u> °C) | T <sub>max.</sub><br>( <u>55</u> °C) |          |
| 4. Dry Heat Cycle                                                                                                     |                                                                         |                 |                                         |                                          |                                      |          |
| <ul style="list-style-type: none"> <li>• Aliveness Test (during 2 hour period)</li> </ul>                             |                                                                         |                 |                                         |                                          |                                      |          |
| <ul style="list-style-type: none"> <li>- Carrier Frequency</li> <li>- Power Output</li> <li>- Data Message</li> </ul> | 406.025 ± 0.002<br>35 - 39<br><del>2DDC57B0</del><br><del>02FE8FF</del> | MHz<br>dBm<br>✓ |                                         |                                          | 406.02518<br>37.74<br>✓              |          |
| <ul style="list-style-type: none"> <li>• Aliveness Test (at end of 2 hour period)</li> </ul>                          |                                                                         |                 |                                         |                                          |                                      |          |
| <ul style="list-style-type: none"> <li>- Carrier Frequency</li> <li>- Power Output</li> <li>- Data Message</li> </ul> | 406.025 ± 0.002<br>35 - 39<br><del>2DDC57B0</del><br><del>02FE8FF</del> | MHz<br>dBm<br>✓ |                                         |                                          | 406.02518<br>37.73<br>✓              |          |
|                                                                                                                       |                                                                         |                 |                                         |                                          |                                      |          |

DATE: 02-12-1999 TIME: 16:55:24

ACK V6.0

2DDC5D8002FFBFF  
C/S-187-USA-1

PASSED

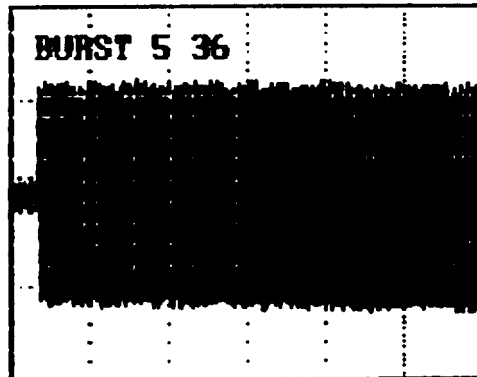
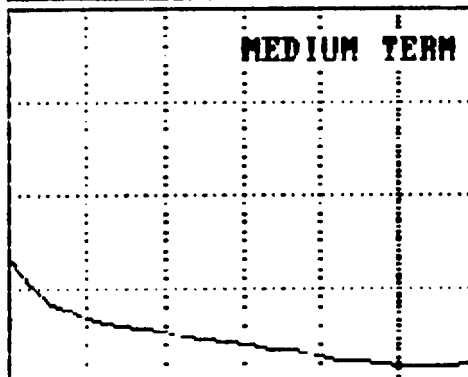
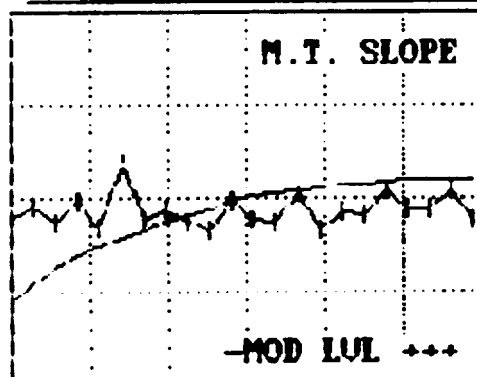
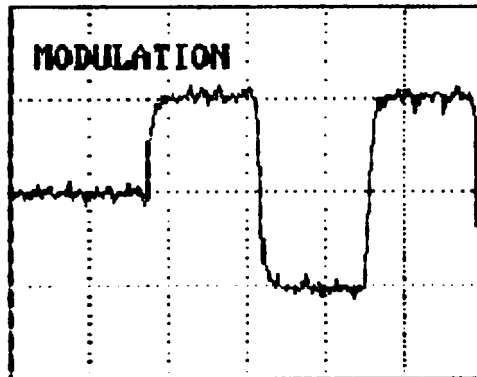
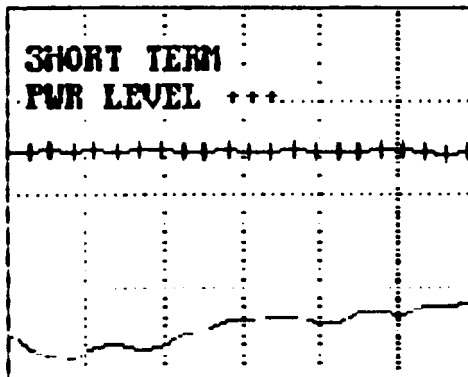
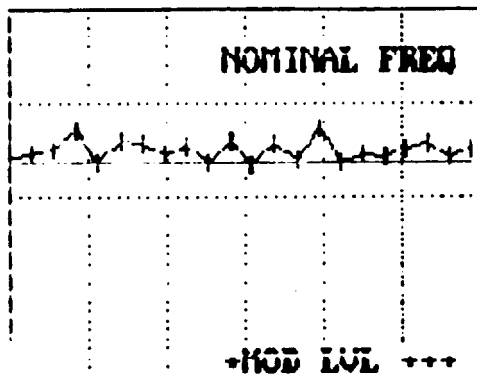
PASSED

186.4 Hz

PASSED

4.182E-10

PEAKS: +1.263 -1.243 rad



PASSED

9.585E-11

PASSED

1.394E-10

PEAKS: +1.344 -1.427 rad

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| <p>NOMINAL FREQUENCY: 406.02518 MHz<br/> PWRK OUTPUT: 5.959 Watts<br/> +37.74 dbm<br/> PWRK STABILITY: 9.91 %<br/> PWRK RISE TIME: 730 µsec<br/> PEAK VOLTAGE: +2.802 Volts<br/> DRIFT SLOPES: 1) -1.99E-01 rad/sec<br/> 2) -1.99E-01 rad/sec<br/> 3) -1.99E-01 rad/sec<br/> MODULATION LEVELS: +1.136 radians<br/> +1.144 -1.115 -1.142 radians<br/> +0.015 OFFSET -0.003 radians<br/> MODULATION TIMES: RISE 144 µsec<br/> FALL 150 µsec<br/> SYMMETRY 0.20 %<br/> MODULATION BIT RATE: 398.75 Hz<br/> BURST TIMES: AVG PERIOD 50.5 sec<br/> CARRIER DURATION 160.0 msec<br/> MESSAGE DURATION 361.2 msec<br/> TOTAL DURATION 521.2 msec<br/> PREAMBLE LEAKAGE LEVEL 35.0 dbc<br/> LEAKAGE LENGTH 0.1 msec</p> |  | <p>HEXADECIMAL MESSAGE<br/> 2DDC5D8002FFBFF<br/> FFFE2F96EE2E0017AFFC0B6C083E0FAD<br/> BIT SYNCHRONIZATION.... UK<br/> FRAME SYNCHRONIZATION... UK<br/> MESSAGE FORMAT..... LONG<br/> PROTOCOL FLAG..... STANDARD<br/> COUNTRY..... USA<br/> SERIALIZED USER..... TEST FILE<br/> C/S CERTIFICATE NO..... 187<br/> SERIAL NUMBER..... 1<br/> LATITUDE..... N 127.75<br/> LONGITUDE..... E 255.75<br/> ERROR CORRECTION CODE 1. UK<br/> ENCODED DATA SOURCE..... Internal<br/> 121.5 MHz HUMING..... No<br/> SPARES status..... Not UK<br/> LATITUDE OFFSET..... + 0 60<br/> LONGITUDE OFFSET..... + 0 60<br/> ERROR CORRECTION CODE 2. UK</p> |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|

# SUMMARY OF TEST RESULTS

| PARAMETERS TO BE MEASURED DURING TESTS                                                       | RANGE OF SPECIFICATION            | UNITS | TEST RESULTS                            |                                     |                                         | COMMENTS |
|----------------------------------------------------------------------------------------------|-----------------------------------|-------|-----------------------------------------|-------------------------------------|-----------------------------------------|----------|
|                                                                                              |                                   |       | T <sub>min</sub><br>( <u>      </u> °C) | T <sub>amb</sub><br>( <u>40</u> °C) | T <sub>max</sub><br>( <u>      </u> °C) |          |
| 5. Damp Heat Cycle                                                                           |                                   |       |                                         |                                     |                                         |          |
| <ul style="list-style-type: none"> <li>• Aliveness Test (during 2 hour period)</li> </ul>    |                                   |       |                                         |                                     |                                         |          |
| - Carrier Frequency                                                                          | 406.025 ± 0.002                   | MHz   |                                         | 406.02521                           |                                         |          |
| - Power Output                                                                               | 35 - 39                           | dBm   |                                         | 37.67                               |                                         |          |
| - Data Message                                                                               | <u>20DC5D80</u><br><u>22FE8FE</u> | ✓     |                                         | ✓                                   |                                         |          |
| <ul style="list-style-type: none"> <li>• Aliveness Test (at end of 2 hour period)</li> </ul> |                                   |       |                                         |                                     |                                         |          |
| - Carrier Frequency                                                                          | 406.025 ± 0.002                   | MHz   |                                         | 406.02520                           |                                         |          |
| - Power Output                                                                               | 35 - 39                           | dBm   |                                         | 37.71                               |                                         |          |
| - Data Message                                                                               | <u>20DC5D80</u><br><u>22FE8FE</u> | ✓     |                                         | ✓                                   |                                         |          |
|                                                                                              |                                   |       |                                         |                                     |                                         |          |

## SUMMARY OF TEST RESULTS

| PARAMETERS TO BE MEASURED DURING TESTS | RANGE OF SPECIFICATION | UNITS | TEST RESULTS           |                           |                        | COMMENTS |
|----------------------------------------|------------------------|-------|------------------------|---------------------------|------------------------|----------|
|                                        |                        |       | T <sub>min</sub> ( °C) | T <sub>amb</sub> ( 25 °C) | T <sub>max</sub> ( °C) |          |
| 6. Vibration Test (Non Activate)       |                        |       |                        |                           |                        |          |
| • Exterior Mechanical Inspection       | No Damage              | ✓     |                        | ✓                         |                        |          |
| • Did not Activate                     |                        | ✓     |                        | ✓                         |                        |          |
| • Aliveness Test                       |                        |       |                        |                           |                        |          |
| - Carrier Frequency                    | 406.025 ± 0.002        | MHz   |                        | 406.02521                 |                        |          |
| - Power Output                         | 35 – 39                | dBm   |                        | 37.75                     |                        |          |
| - Data Message                         | NO MESSAGE             | ✓     |                        | ✓                         |                        |          |
| 7. Vibration Test (Frequency)          |                        |       |                        |                           |                        |          |
| • Carrier Frequency (during test)      | 406.025 ± 0.002        | MHz   |                        | 406.025178                |                        |          |
| • Exterior Mechanical Inspection       | No Damage              | ✓     |                        | ✓                         |                        |          |
| • Aliveness Test:                      |                        |       |                        |                           |                        |          |
| - Carrier Frequency                    | 406.025 ± 0.002        | MHz   |                        | 406.025171                |                        |          |
| - Power Output                         | 35 – 39                | dBm   |                        |                           |                        |          |

DATE: 02-16-1999 TIME: 09:07:53

ACR v6.0

2DDC5D8002FFBF  
U/S-187-USA-1

PASSED

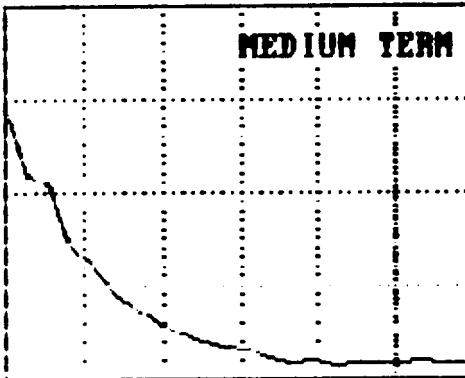
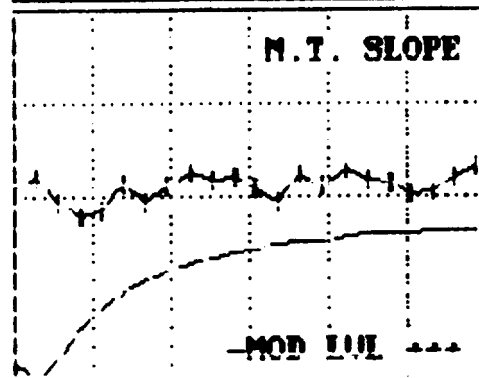
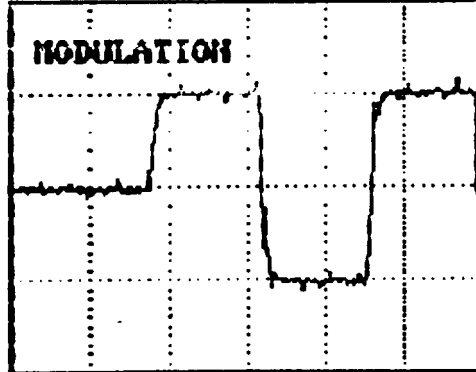
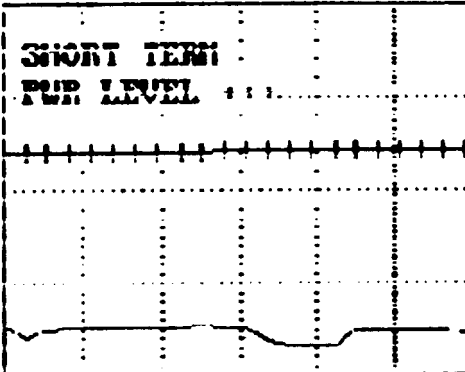
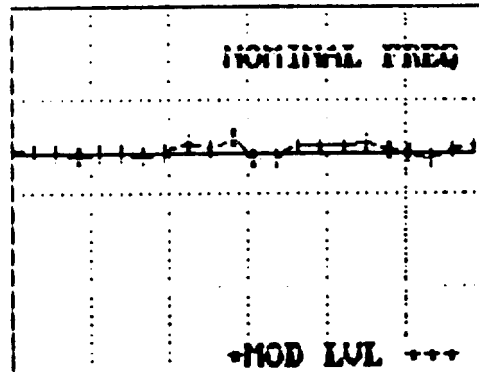
PASSED

212.8 Hz

PASSED

2.479E-18

PEAKS: +1.244 -1.223 rad



PASSED -1.994E-18

PASSED 1.462E-18

PEAKS: +1.299 -1.362 rad

NOMINAL FREQUENCY: 406.02521 MHz  
POWER OUTPUT: 5.963 Watts  
+3/-0.5 dBm  
POWER STABILITY: 9.61 %  
POWER RISE TIME: 740 µsec  
PEAK VOLTAGE: +2.765 Volts  
DRIFT SLOPES: 1) -1.67E-01 rad/sec  
2) -1.67E-01 rad/sec  
3) -1.67E-01 rad/sec  
MODULATION LEVELS: +1.119 radians  
+1.145 -1.050 -1.125 radians  
+0.025 OFFSET -0.003 radians  
MODULATION TIMES: RISE 155 µsec  
FALL 156 µsec  
SYMMETRY 0.52 %  
MODULATION BIT RATE: 375.75 Hz  
BURST TIMES: AVG PERIOD 50.5 sec  
CARRIER DURATION 160.0 msec  
MESSAGE DURATION 361.1 msec  
TOTAL DURATION 521.1 msec  
PREAMBLE LEAKAGE LEVEL 50.0 dBc  
LEAKAGE LENGTH 0.1 msec

#### HEXADECIMAL MESSAGE

2DDC5D8002FFBF

FFFE2F96EE2ED0017F1FFC0A6D3583E0FA8  
BIT SYNCHRONIZATION..... OK  
FRAME SYNCHRONIZATION... OK  
MESSAGE FORMAT..... LONG  
PROTOCOL FLAG..... STANDARD  
COUNTRY..... USA  
SERIALIZED USER..... TEST MODE  
C/S CERTIFICATE No..... 187  
SERIAL NUMBER..... 1  
LATITUDE..... N 127.75  
LONGITUDE..... E 255.75  
ERROR CORRECTION CODE 1. OK  
ENCODED DATA SOURCE..... Internal  
121.5 MHz HURLING..... NO  
SPRINTS STATUS..... NOT OK  
LATITUDE OFFSET..... + 0 60  
LONGITUDE OFFSET..... + 0 60  
ERROR CORRECTION CODE 2. OK

# SUMMARY OF TEST RESULTS

| PARAMETERS TO BE MEASURED DURING TESTS                                                                                                                                                                                                             | RANGE OF SPECIFICATION                                                           | UNITS                    | TEST RESULTS                           |                                      |                                        | COMMENTS |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|--------------------------|----------------------------------------|--------------------------------------|----------------------------------------|----------|
|                                                                                                                                                                                                                                                    |                                                                                  |                          | T <sub>min.</sub><br>( <u>    </u> °C) | T <sub>amb.</sub><br>( <u>24</u> °C) | T <sub>max.</sub><br>( <u>    </u> °C) |          |
| <b>8. Bump Test</b> <ul style="list-style-type: none"> <li>Exterior Mechanical Inspection</li> <li>Aliveness Test <ul style="list-style-type: none"> <li>Carrier Frequency</li> <li>Power Output</li> <li>Data Message</li> </ul> </li> </ul>      | No Damage<br><br>406.025 ± 0.002<br>35 - 39<br><u>2DDC5D80</u><br><u>02EE8FE</u> | ✓<br><br>MHz<br>dBm<br>✓ |                                        | ✓<br><br>406.02521<br>37.80<br>✓     |                                        |          |
| <b>9. Salt Fog Test</b> <ul style="list-style-type: none"> <li>Exterior Mechanical Inspection</li> <li>Aliveness Test: <ul style="list-style-type: none"> <li>Carrier Frequency</li> <li>Power Output</li> <li>Data Message</li> </ul> </li> </ul> | No Damage<br><br>406.025 ± 0.002<br>35 - 39<br><u>2DDC5D80</u><br><u>02EE8FE</u> | ✓<br><br>MHz<br>dBm<br>✓ |                                        | ✓<br><br>406.02521<br>37.09<br>✓     |                                        |          |

DATE: 02-22-1999 TIME: 09:20:00

ACR v6.0

2DDC5D8002FFBFF  
C/S-187-USA-1

PASSED

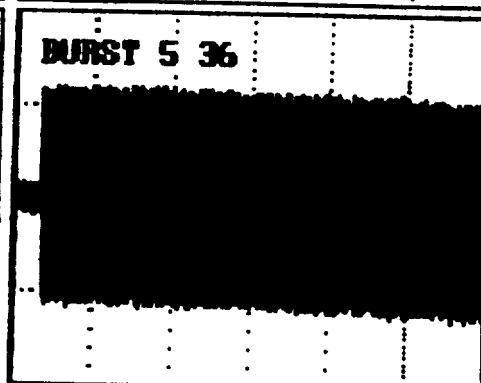
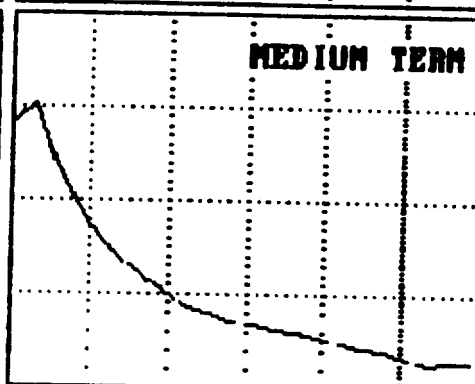
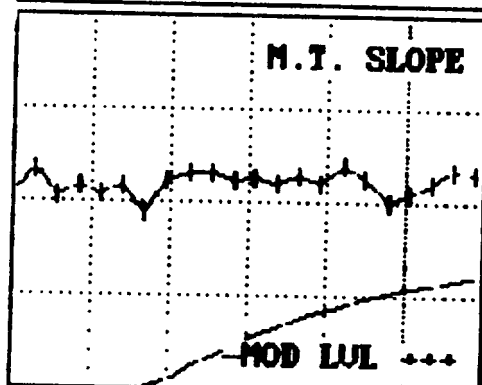
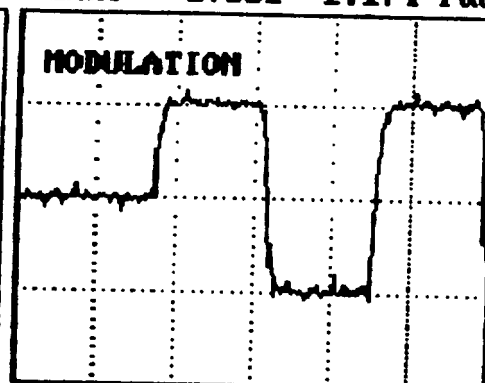
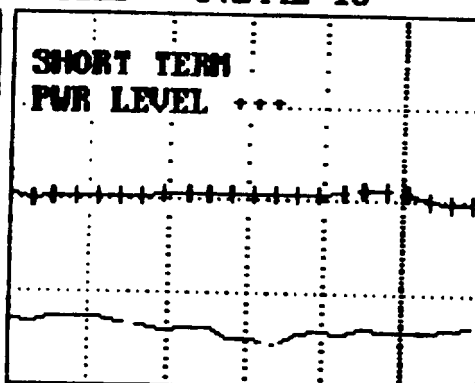
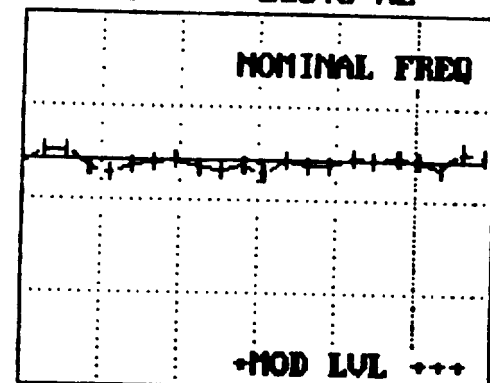
PASSED

216.0 Hz

PASSED

3.244E-10

PEAKS: +1.381 -1.174 rad



PASSED -4.612E-10

PASSED 2.334E-10

PEAKS: +1.334 -1.410 rad

NOMINAL FREQUENCY: 406.02521 MHz  
POWER OUTPUT: 5.114 Watts  
+37.09 dBm  
POWER STABILITY: 9.19 %  
POWER RISE TIME: 690 µsec  
PEAK VOLTAGE: +2.587 Volts  
DRIFT SLOPES: 1) -1.34E-01 rad/sec  
2) -1.34E-01 rad/sec  
3) -1.34E-01 rad/sec  
MODULATION LEVELS: +1.111 radians  
+1.140 -1.086 -1.117 radians  
+0.027 OFFSET -0.003 radians  
MODULATION TIMES: RISE 153 µsec  
FALL 153 µsec  
SYMMETRY 0.68 %  
MODULATION BIT RATE: 398.75 Hz  
BURST TIMES: AVG PERIOD 50.5 sec  
CARRIER DURATION 160.0 msec  
MESSAGE DURATION 361.1 msec  
TOTAL DURATION 521.2 msec  
PREAMBLE LEAKAGE LEVEL 35.0 dBc  
LEAKAGE LENGTH 0.1 msec

#### HEXADECIMAL MESSAGE

2DDC5D8002FFBFF  
FFFE2F96EE2ED0017FDFFD0A6D3583E0FAA8  
BIT SYNCHRONIZATION.... OK  
FRAME SYNCHRONIZATION... OK  
MESSAGE FORMAT..... LONG  
PROTOCOL FLAG..... STANDARD  
COUNTRY..... USA  
SERIALIZED USER..... TEST MODE  
C/S CERTIFICATE No..... 187  
SERIAL NUMBER..... 1  
LATITUDE..... N 127.75  
LONGITUDE..... E 255.75  
ERROR CORRECTION CODE 1. OK  
ENCODED DATA SOURCE..... Internal  
121.5 MHz HOMING..... No  
SPARES status..... Not OK  
LATITUDE OFFSET..... + 0 60  
LONGITUDE OFFSET..... + 0 60  
ERROR CORRECTION CODE 2. OK

# SUMMARY OF TEST RESULTS

| PARAMETERS TO BE MEASURED DURING TESTS                                                                                                                                                                                                                                    | RANGE OF SPECIFICATION                                                          | UNITS                    | TEST RESULTS                           |                                          |                                        | COMMENTS |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|--------------------------|----------------------------------------|------------------------------------------|----------------------------------------|----------|
|                                                                                                                                                                                                                                                                           |                                                                                 |                          | T <sub>min.</sub><br>( <u>    </u> °C) | T <sub>amb.</sub><br>( <u>20</u> °C)     | T <sub>max.</sub><br>( <u>    </u> °C) |          |
| <b>10. Drop Test In Water</b> <ul style="list-style-type: none"> <li>• Exterior Mechanical Inspection</li> <li>• Aliveness Test <ul style="list-style-type: none"> <li>- Carrier Frequency</li> <li>- Power Output</li> <li>- Data Message</li> </ul> </li> </ul>         | No Damage<br><br>406.025 ± 0.002<br>35 – 39<br><u>20DC5D80</u><br><u>02FFBF</u> | ✓<br><br>MHz<br>dBm<br>✓ |                                        | ✓<br><br>406.02521<br>37.16<br>✓         |                                        |          |
| <b>11. Drop Test On Hard Surface</b> <ul style="list-style-type: none"> <li>• Exterior Mechanical Inspection</li> <li>• Aliveness Test: <ul style="list-style-type: none"> <li>- Carrier Frequency</li> <li>- Power Output</li> <li>- Data Message</li> </ul> </li> </ul> | No Damage<br><br>406.025 ± 0.002<br>35 – 39<br><u>20DC5D80</u><br><u>02FFBF</u> | ✓<br><br>MHz<br>dBm<br>✓ |                                        | 27°C<br>✓<br><br>406.02522<br>36.00<br>✓ |                                        |          |

DATE: 02-22-1999 TIME: 16:43:11

ACR v6.0

2DDC5D8002FFBFF  
C/S-187-USA-1

PASSED

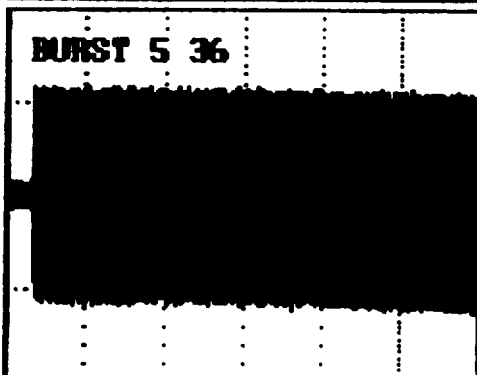
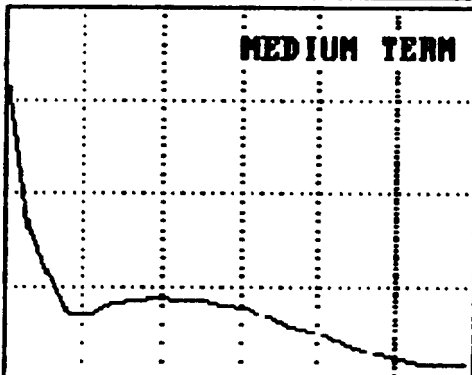
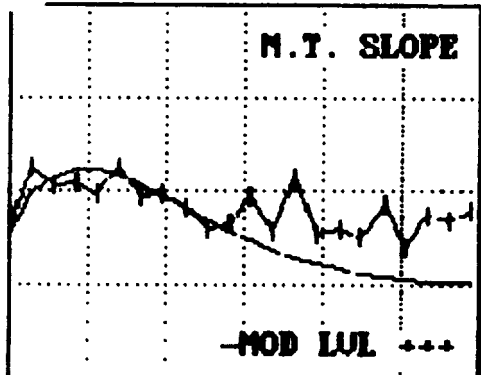
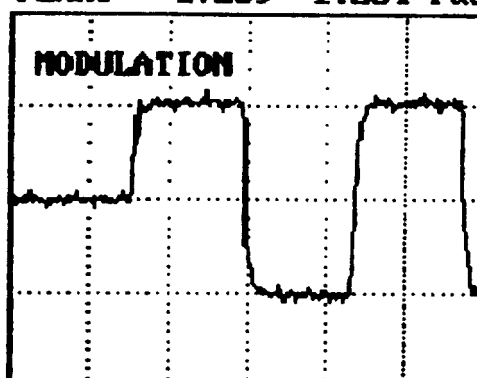
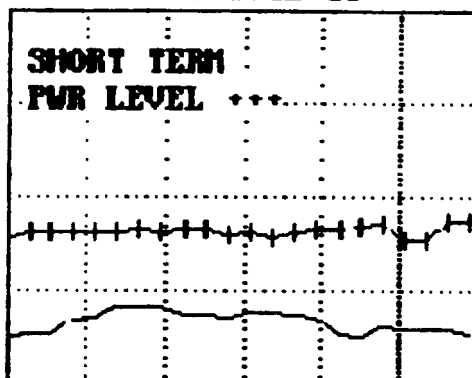
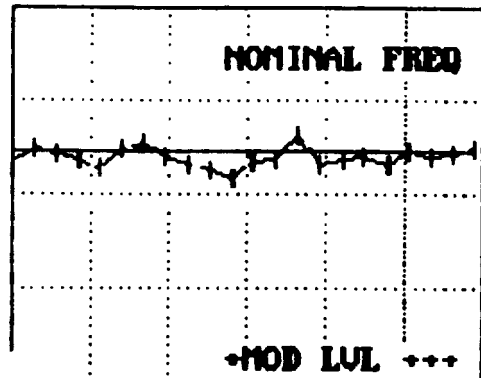
PASSED

228.2 Hz

PASSED

3.871E-10

PEAKS: +1.289 -1.204 rad



PASSED -4.925E-10

PASSED 1.737E-10

PEAKS: +1.384 -1.381 rad

NOMINAL FREQUENCY: 406.02522 MHz  
OWER OUTPUT: 3.980 Watts  
+36.00 dBm  
POWER STABILITY: 9.93 %  
POWER RISE TIME: 580 µsec  
PEAK VOLTAGE: +2.282 Volts  
DRIFT SLOPES: 1) -1.15E-01 rad/sec  
2) -1.15E-01 rad/sec  
3) -1.15E-01 rad/sec  
MODULATION LEVELS: +1.135 radians  
+1.139 -1.103 -1.141 radians  
+0.018 OFFSET -0.003 radians  
MODULATION TIMES: RISE 147 µsec  
FALL 148 µsec  
SYMMETRY 0.53 %  
MODULATION BIT RATE: 398.75 Hz  
BURST TIMES: AVG PERIOD 50.5 sec  
CARRIER DURATION 160.0 msec  
MESSAGE DURATION 361.2 msec  
TOTAL DURATION 521.1 msec  
PREAMBLE LEAKAGE LEVEL 35.0 dBc  
LEAKAGE LENGTH 0.1 msec

#### HEXADECIMAL MESSAGE

2DDC5D8002FFBFF  
FFFE2F96EE2ED0017FDFFD0A6D3583E0FAA8  
BIT SYNCHRONIZATION.... OK  
FRAME SYNCHRONIZATION... OK  
MESSAGE FORMAT..... LONG  
PROTOCOL FLAG..... STANDARD  
COUNTRY..... USA  
SERIALIZED USER..... TEST MODE  
C/S CERTIFICATE No..... 187  
SERIAL NUMBER..... 1  
LATITUDE..... N 127.75  
LONGITUDE..... E 255.75  
ERROR CORRECTION CODE 1. OK  
ENCODED DATA SOURCE..... Internal  
121.5 MHz HOMING..... No  
SPARES status..... Not OK  
LATITUDE OFFSET..... + 0 60  
LONGITUDE OFFSET..... + 0 60  
ERROR CORRECTION CODE 2. OK

# SUMMARY OF TEST RESULTS

| PARAMETERS TO BE MEASURED DURING TESTS                                        | RANGE OF SPECIFICATION                           | UNITS  | TEST RESULTS                            |                                        |                                        | COMMENTS     |
|-------------------------------------------------------------------------------|--------------------------------------------------|--------|-----------------------------------------|----------------------------------------|----------------------------------------|--------------|
|                                                                               |                                                  |        | $T_{min.}$<br>( $-55^{\circ}\text{C}$ ) | $T_{amb.}$<br>( $18^{\circ}\text{C}$ ) | $T_{max.}$<br>( $70^{\circ}\text{C}$ ) |              |
| 12. Automatic Release Mechanism Test                                          | Automatic activation and release $\leq 4$ meters | Meters |                                         | 3.50                                   |                                        | 11' 6"       |
| • Normal mounted orientation<br>- Depth of Release                            | $\leq 4$ meters                                  | Meters |                                         | 3.20                                   |                                        | 9' 9" + 9"   |
| • Rolling 90° starboard<br>- Depth of Release                                 | $\leq 4$ meters                                  | Meters |                                         | 2.97                                   |                                        | 9' 0" + 9"   |
| • Rolling 90° port<br>- Depth of Release                                      | $\leq 4$ meters                                  | Meters |                                         | 3.12                                   |                                        | 10' 3" - 0"  |
| • Rolling 90° bow down<br>- Depth of Release                                  | $\leq 4$ meters                                  | Meters |                                         | 3.05                                   |                                        | 10' 0" - 0"  |
| • Rolling 90° stern down<br>- Depth of Release                                | $\leq 4$ meters                                  | Meters |                                         | 2.82                                   |                                        | 8' 6" + 9"   |
| • Upside down<br>- Depth of Release                                           | $\leq 4$ meters                                  | Meters |                                         |                                        |                                        | 11' 9" + 16" |
| • Normal mounted orientation<br>@ min. storage temperature<br>- Depth Release | $\leq 4$ meters                                  | Meters | 3.99                                    |                                        |                                        | 7' 0" + 16"  |
| • Normal mounted orientation<br>@ max. storage temperature<br>- Depth Release | $\leq 4$ meters                                  | Meters |                                         |                                        | 2.54                                   |              |

# SUMMARY OF TEST RESULTS

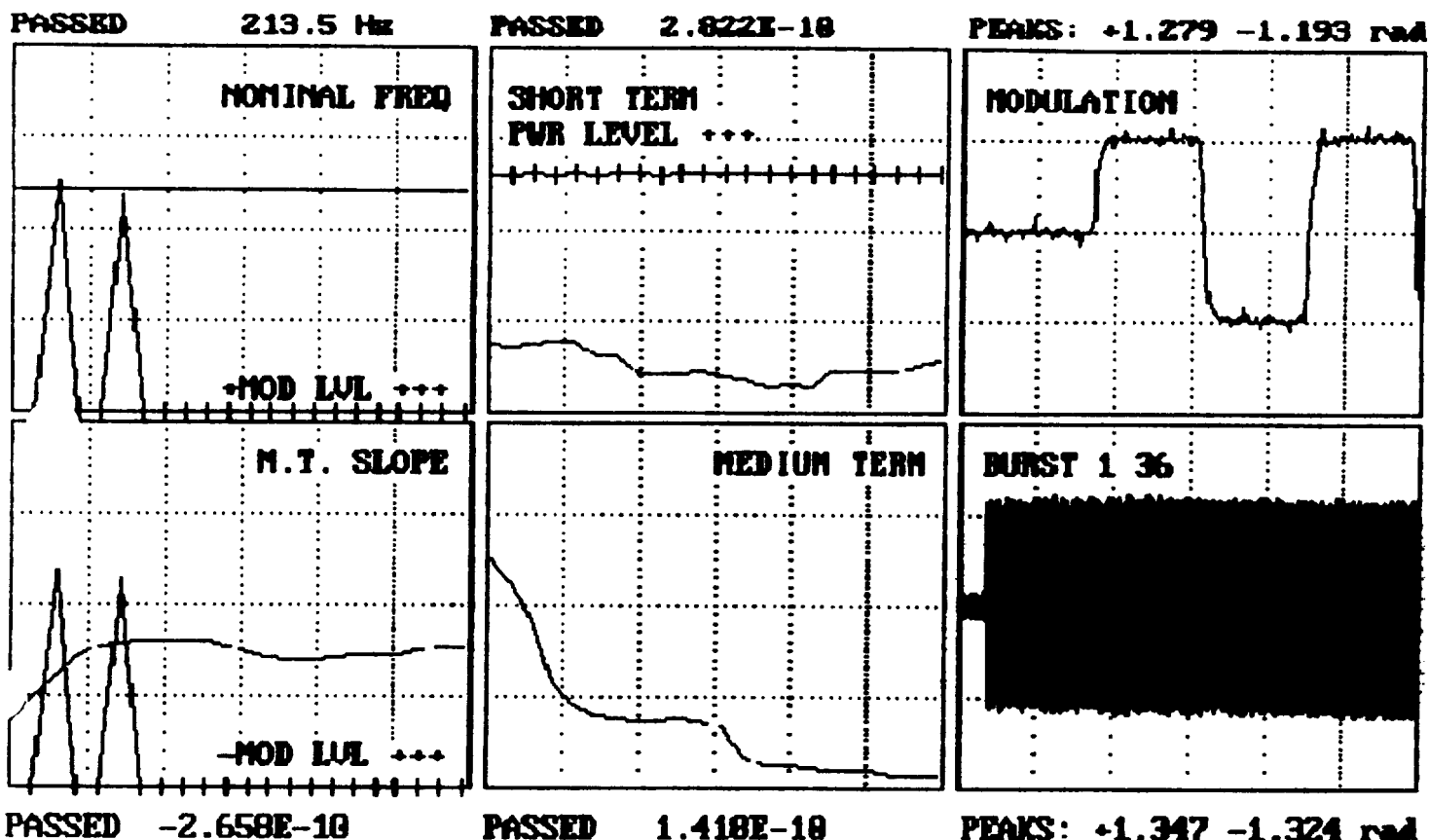
| PARAMETERS TO BE MEASURED DURING TESTS                                                                                                                                                                                                                         | RANGE OF SPECIFICATION                                                           | UNITS                                            | TEST RESULTS               |                            |                            | COMMENTS |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|--------------------------------------------------|----------------------------|----------------------------|----------------------------|----------|
|                                                                                                                                                                                                                                                                |                                                                                  |                                                  | T <sub>min.</sub><br>( °C) | T <sub>amb.</sub><br>( °C) | T <sub>max.</sub><br>( °C) |          |
| <b>13. Leakage And Immersion Test</b> <ul style="list-style-type: none"> <li>• Aliveness Test <ul style="list-style-type: none"> <li>- Carrier Frequency</li> <li>- Power Output</li> <li>- Data Message</li> </ul> </li> <li>• Interior Inspection</li> </ul> | 406.025 ± 0.002<br>35 - 39<br><u>2DDCSDD80</u><br><u>02FFBFF</u><br><br>No water | MHz<br>dBm<br>✓<br>✓                             |                            | 406.02521<br>38.15 ✓<br>✓  |                            |          |
| <b>14. Spurious Emissions Test</b> <ul style="list-style-type: none"> <li>• 406 MHz</li> <li>• 121.5 MHz</li> </ul>                                                                                                                                            | Figure 1<br><br>Figure 2                                                         | ✓<br>(attach graphs)<br><br>✓<br>(attach graphs) |                            | ✓<br><br>✓                 |                            |          |

DATE: 02-26-1999 TIME: 10:54:56

ACR v6.0

2DDC5D8002FFBFF  
C/S-187-USA-1

~~FAILED~~  
PASSED



NOMINAL FREQUENCY: 406.02521 MHz  
 POWER OUTPUT: 6.508 Watts  
 +38.13 dBm  
 POWER STABILITY: 8.89 %  
 POWER RISE TIME: 780 µsec  
 PEAK VOLTAGE: +2.809 Volts  
 DRIFT SLOPES: 1) +2.79E-02 rad/sec  
 2) +2.79E-02 rad/sec  
 3) +2.79E-02 rad/sec  
 MODULATION LEVELS: +1.107 radians  
 +0.272 -1.942 -1.112 radians  
 -0.835 OFFSET -0.003 radians  
 MODULATION TIMES: RISE 156 µsec  
 FALL 156 µsec  
 SYMMETRY 0.26 %  
 MODULATION BIT RATE: 398.74 Hz  
 BURST TIMES: AVG PERIOD 50.6 sec  
 CARRIER DURATION 160.0 msec  
 MESSAGE DURATION 361.2 msec  
 TOTAL DURATION 521.1 msec  
 PREAMBLE LEAKAGE LEVEL 35.0 dBc  
 LEAKAGE LENGTH 0.1 msec

HEXADECIMAL MESSAGE  
 2DDC5D8002FFBFF  
 FFFE2F96EE2ED0017FDFFD0A6D3583E0FAA8  
 BIT SYNCHRONIZATION..... OK  
 FRAME SYNCHRONIZATION... OK  
 MESSAGE FORMAT..... LONG  
 PROTOCOL FLAG..... STANDARD  
 COUNTRY..... USA  
 SERIALIZED USER..... TEST MODE  
 C/S CERTIFICATE No..... 187  
 SERIAL NUMBER..... 1  
 LATITUDE..... N 127.75  
 LONGITUDE..... E 255.75  
 ERROR CORRECTION CODE 1. OK  
 ENCODED DATA SOURCE..... Internal  
 121.5 MHz HOMING..... No  
 SPARES status..... Not OK  
 LATITUDE OFFSET..... + 0 60  
 LONGITUDE OFFSET..... + 0 60  
 ERROR CORRECTION CODE 2. OK

OK MODULATION

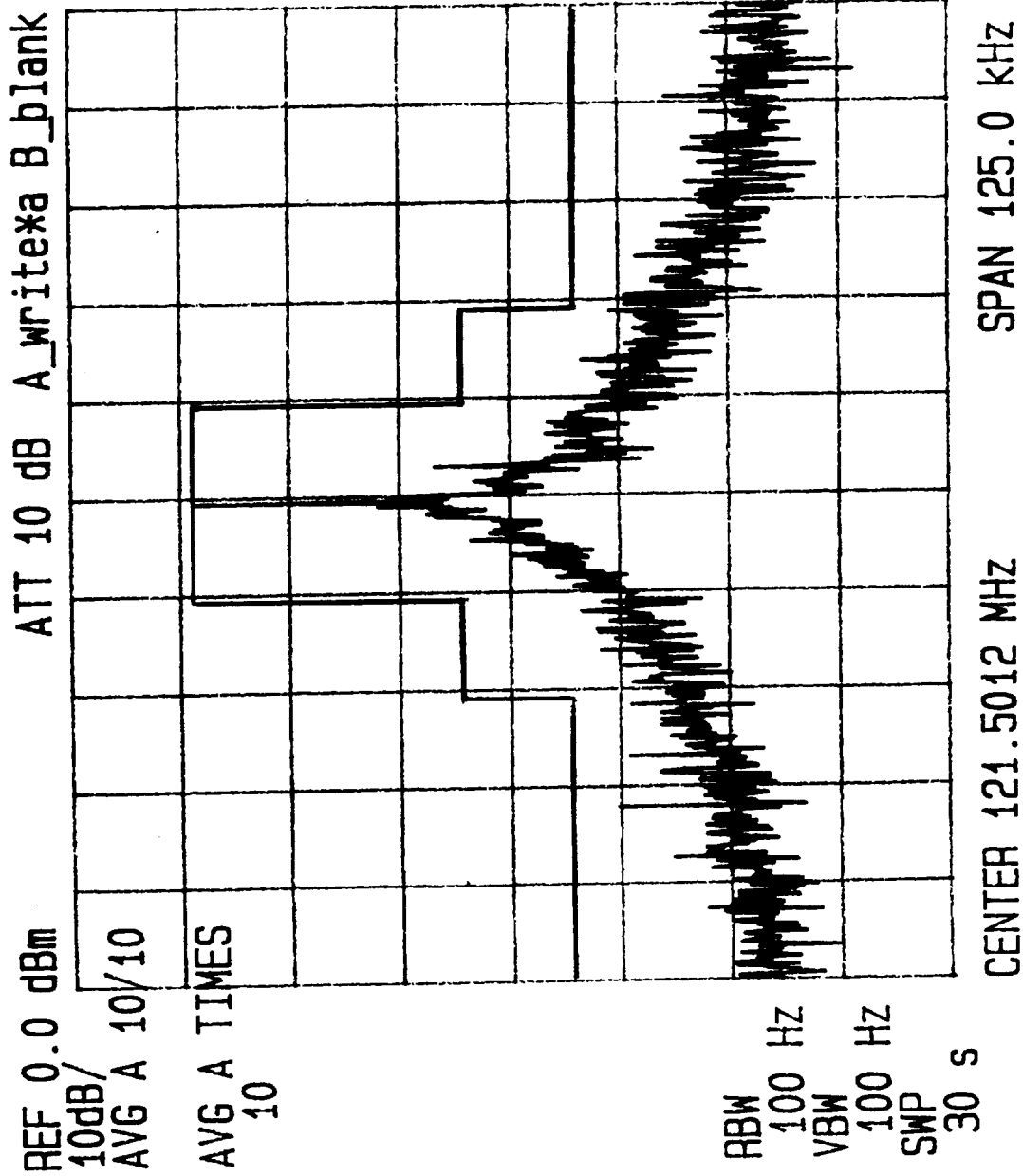
← MAX MODULATION LEVEL  
 ← MIN MODULATION LEVEL

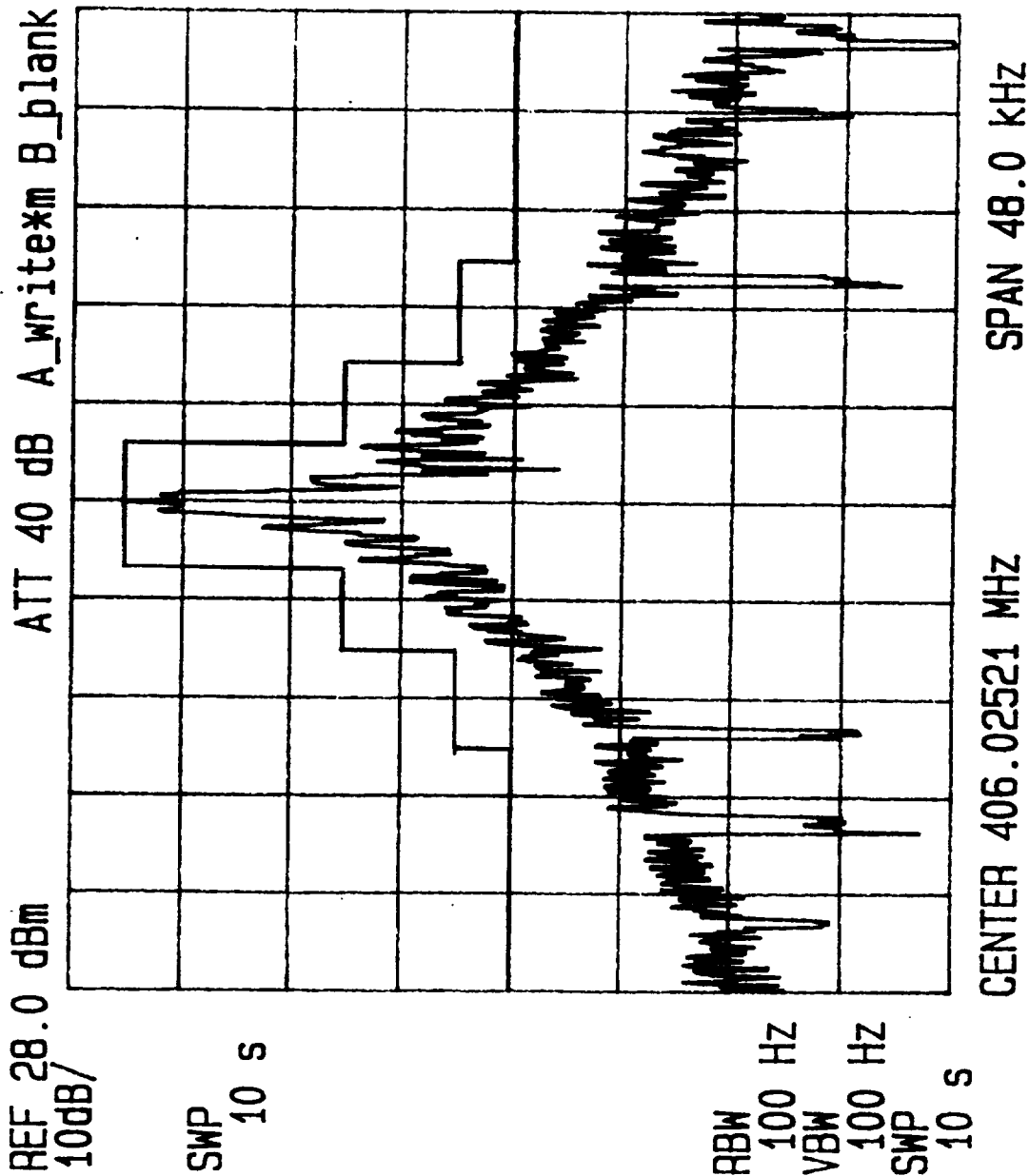
RLB-33

S/N 1

TEMP +55 DEG C

02/26/99



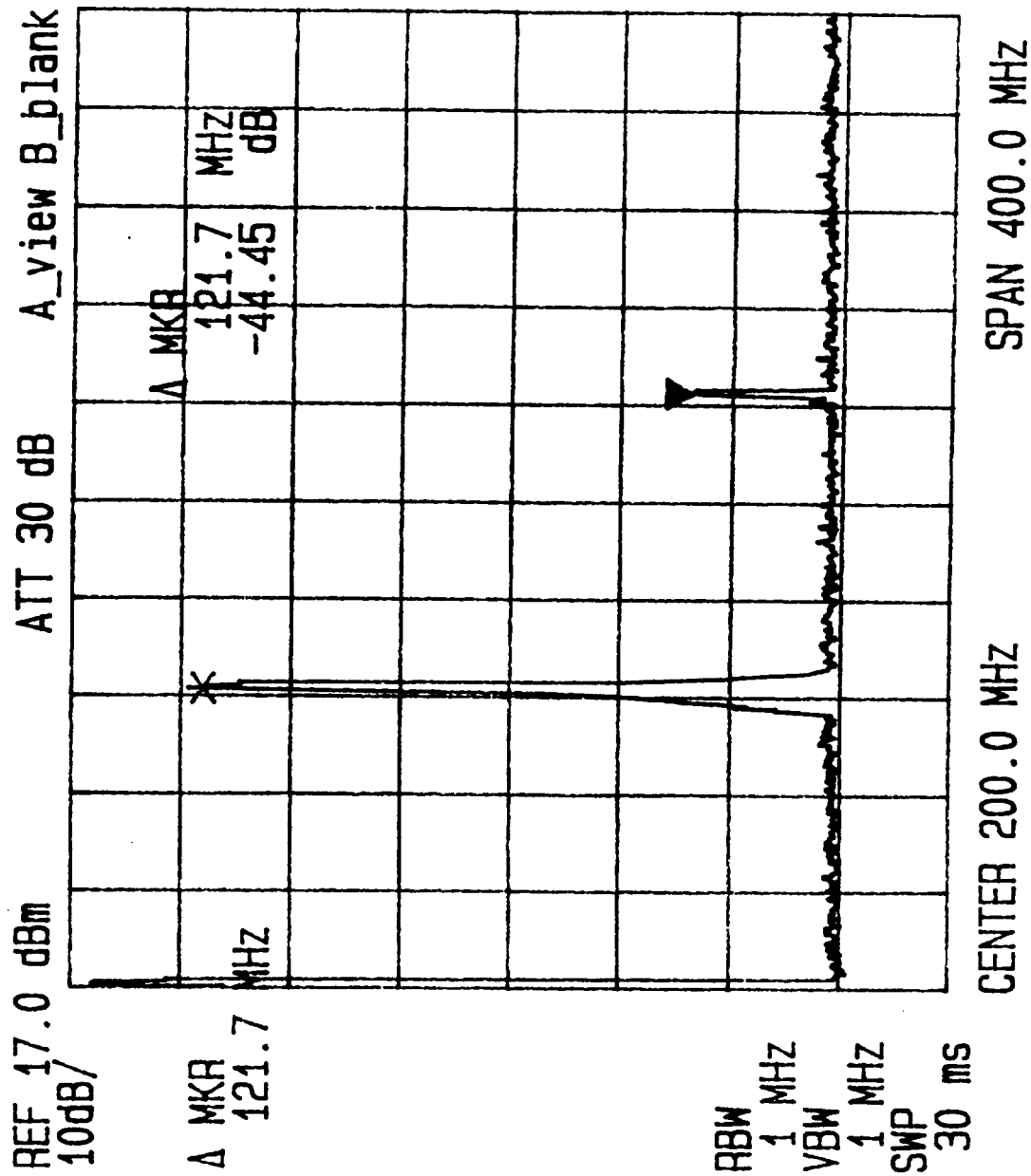


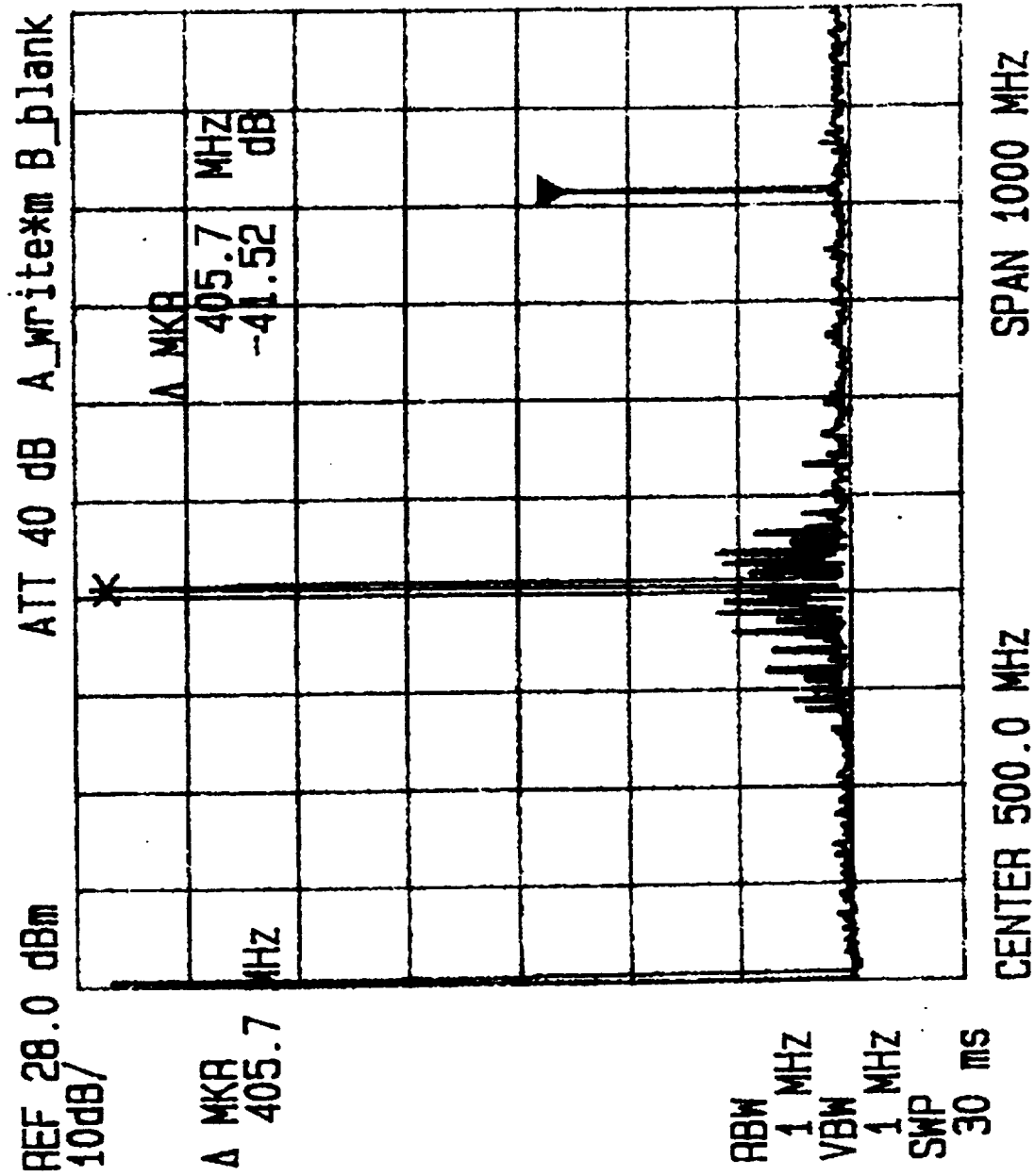
RLB-33

S/N 1

TEMP +55 DEG C

02/26/99



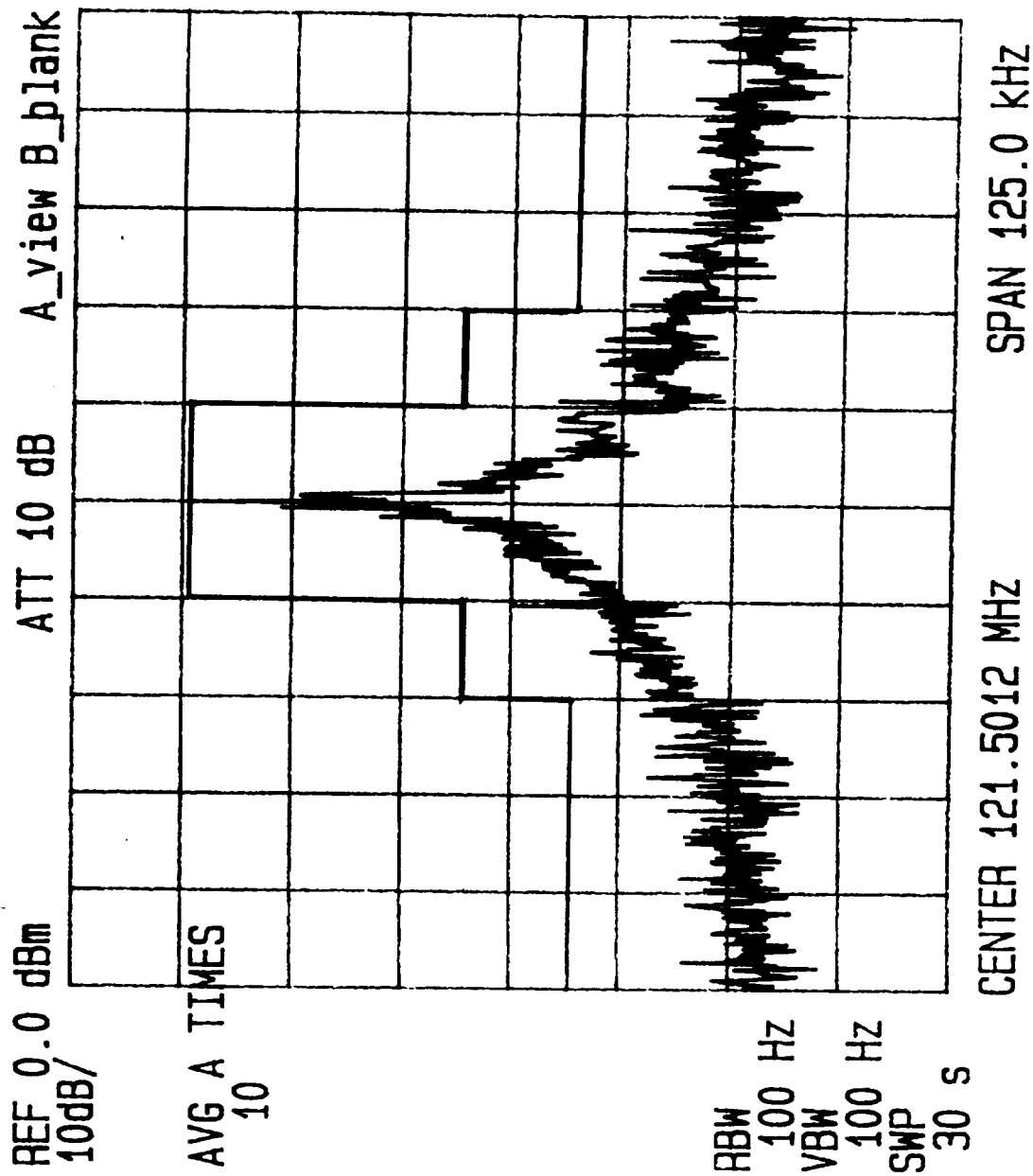


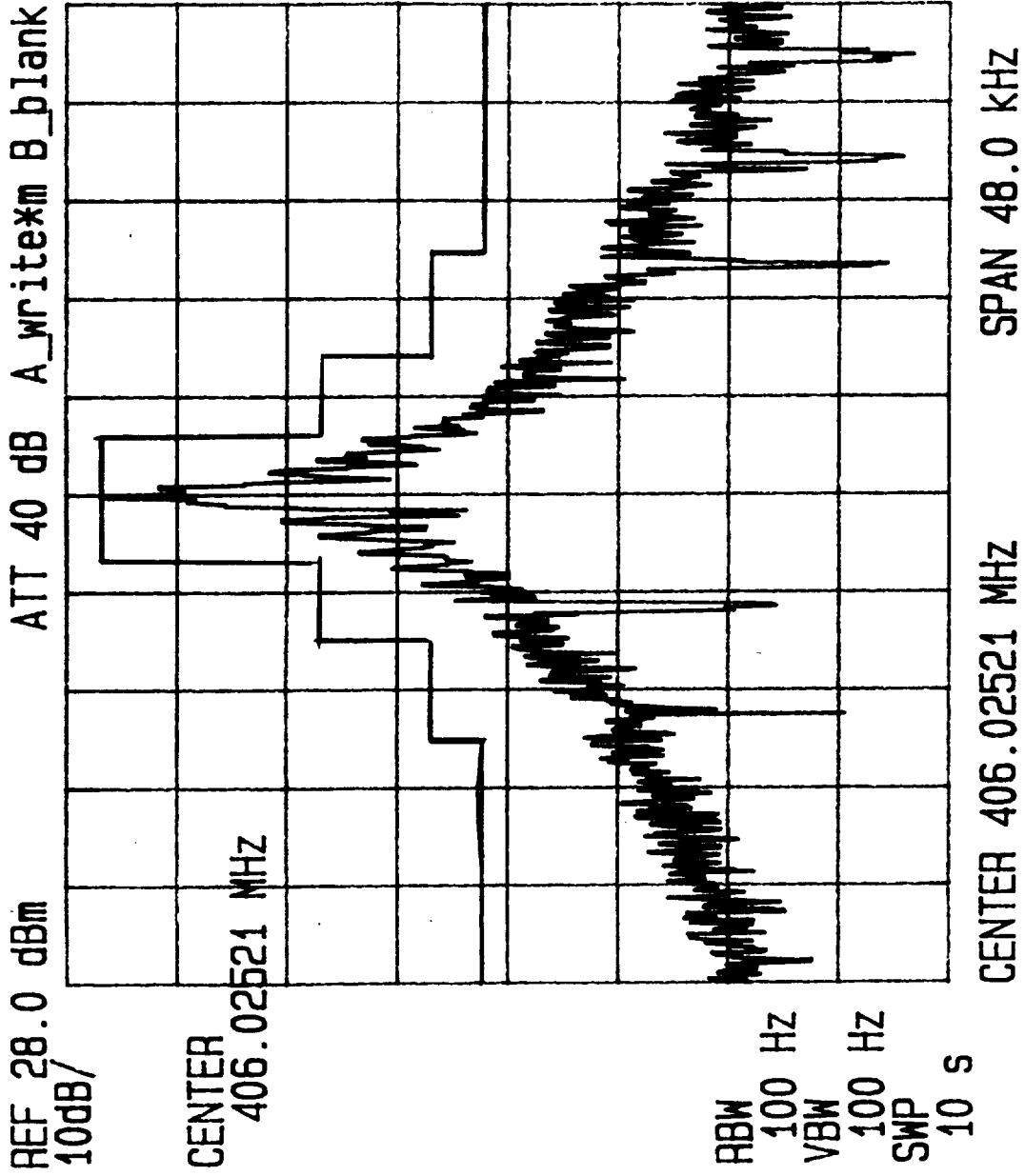
RLB-33

S/N 1

TEMP AMBIENT

02/26/99



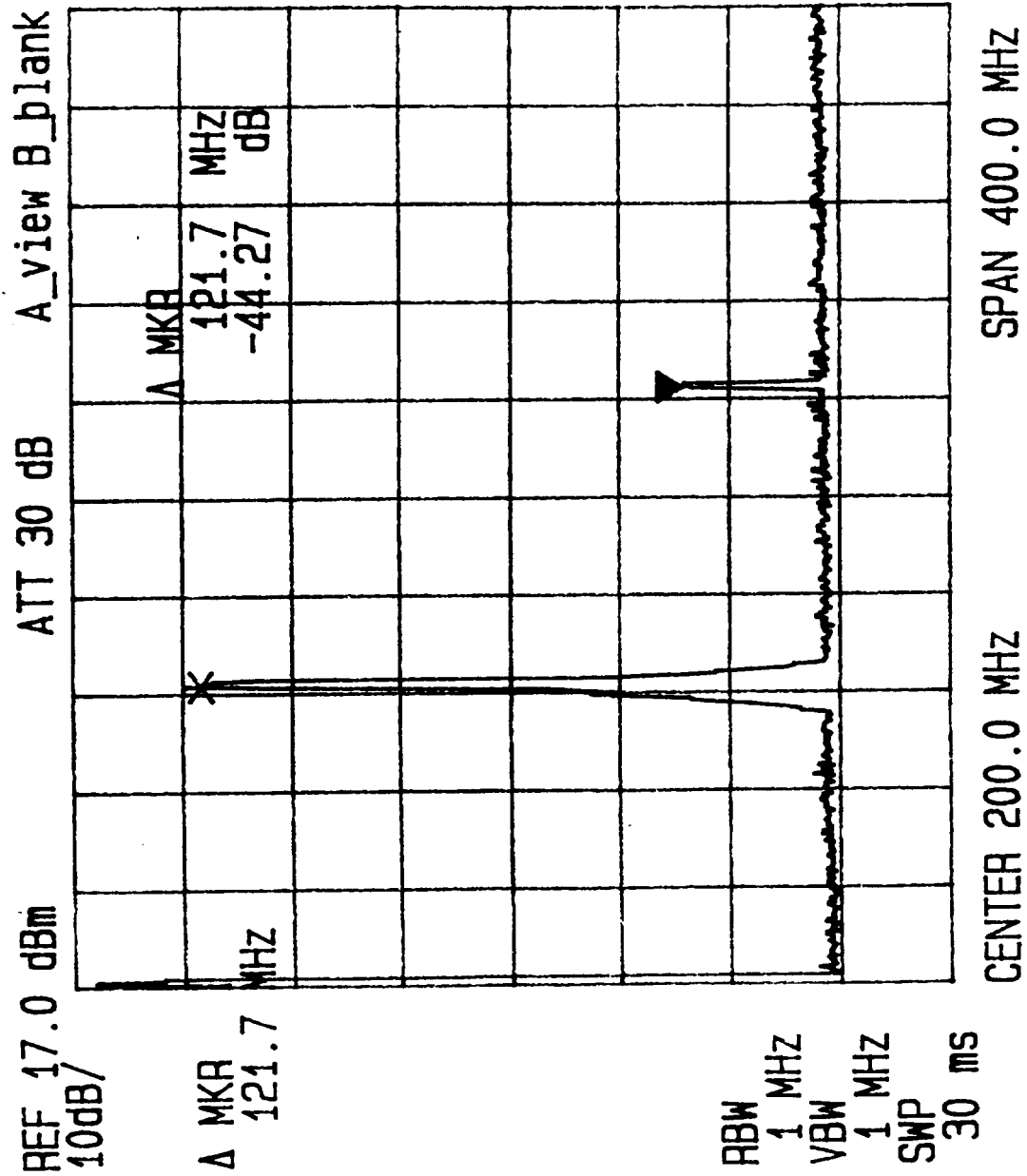


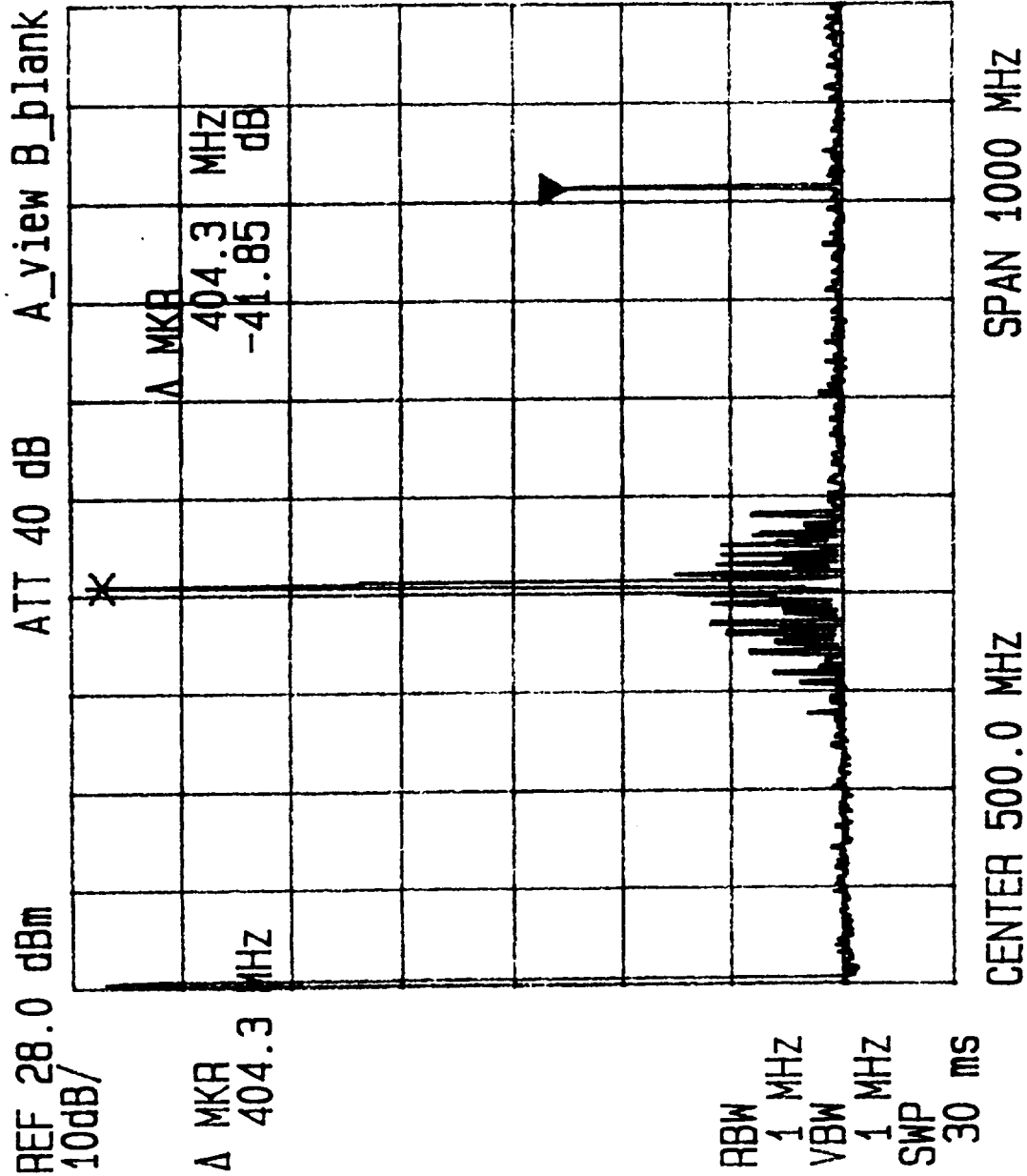
RLB-33

S/N 1

TEMP AMBIENT

02/26/99



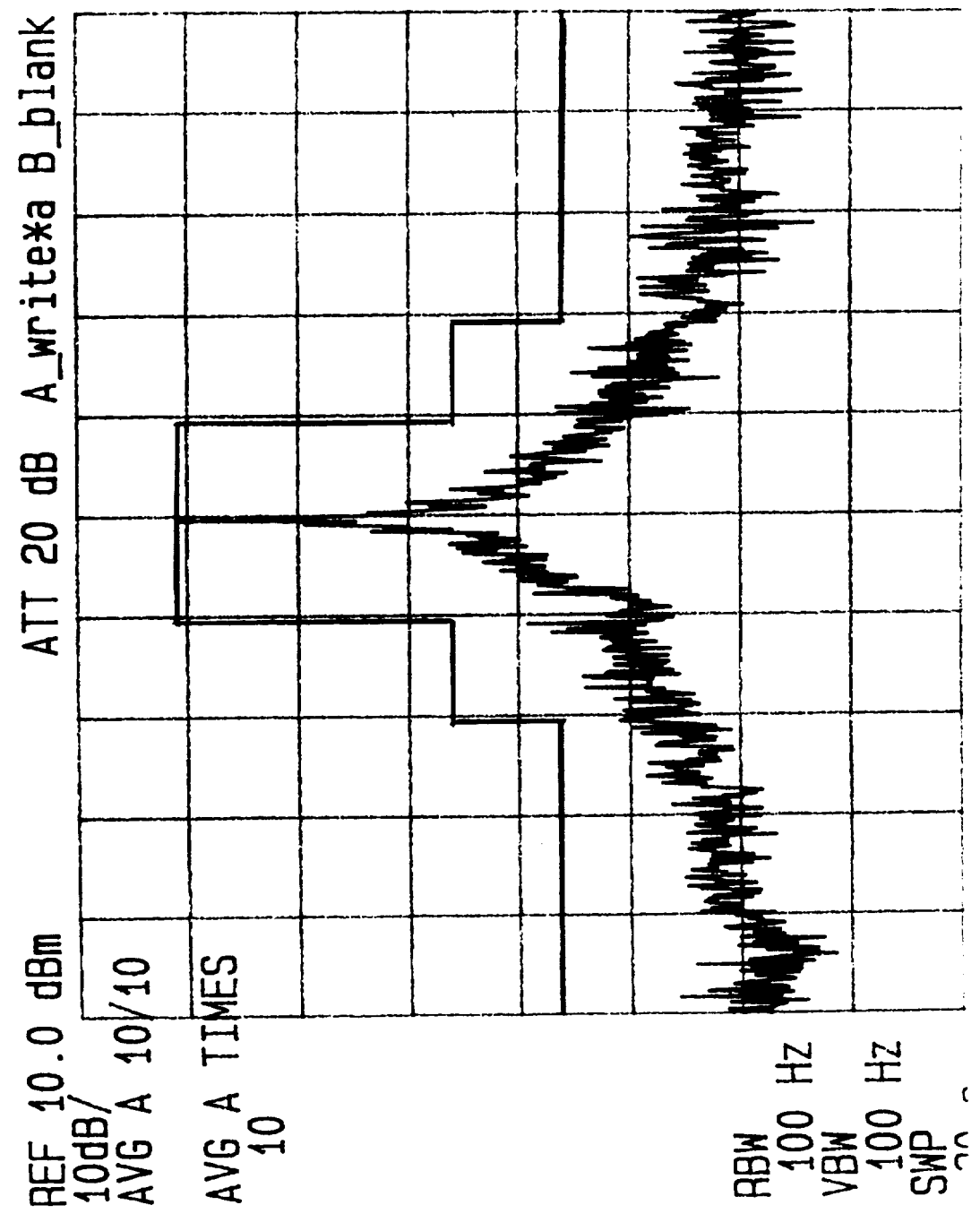


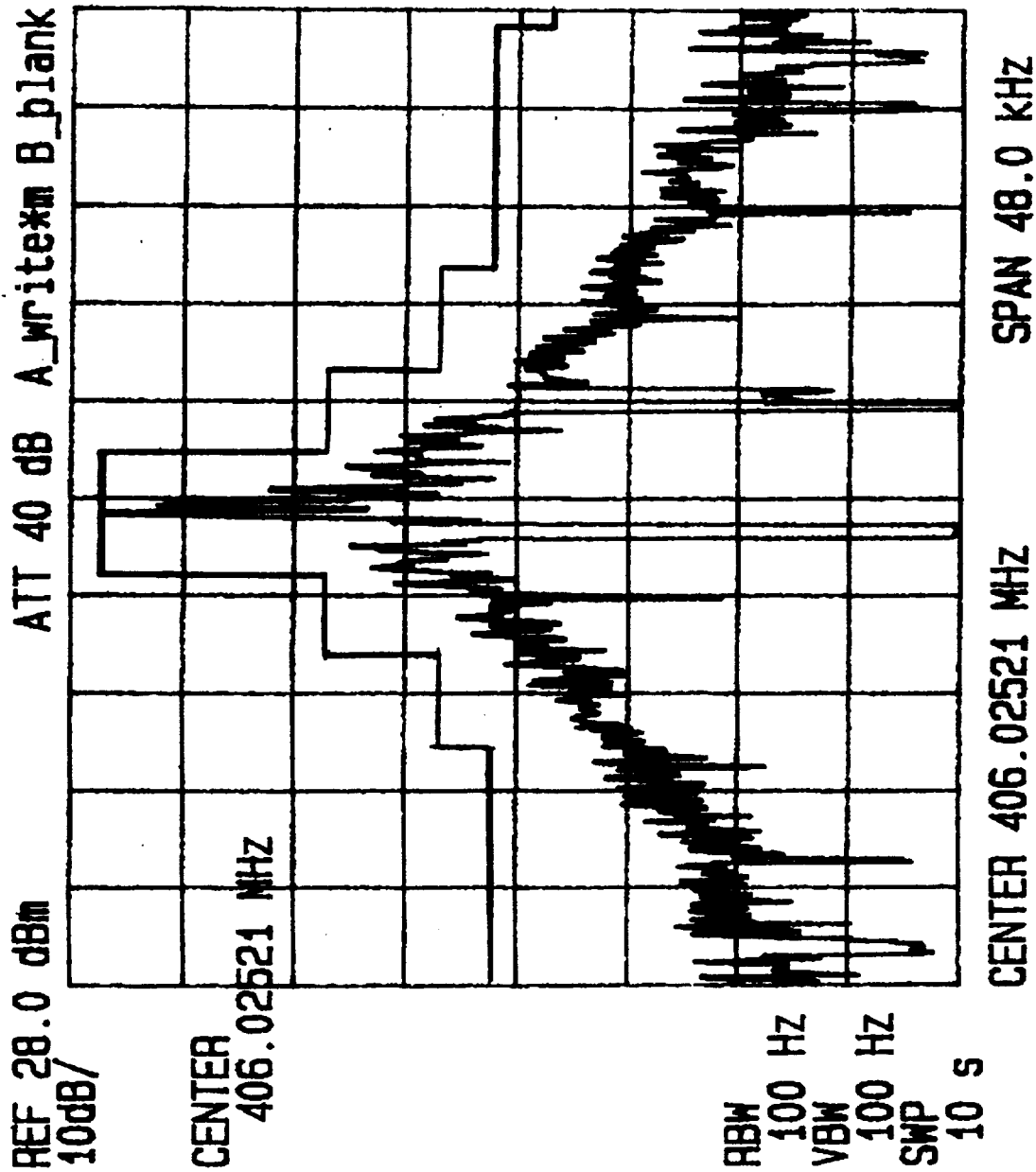
RLB-33

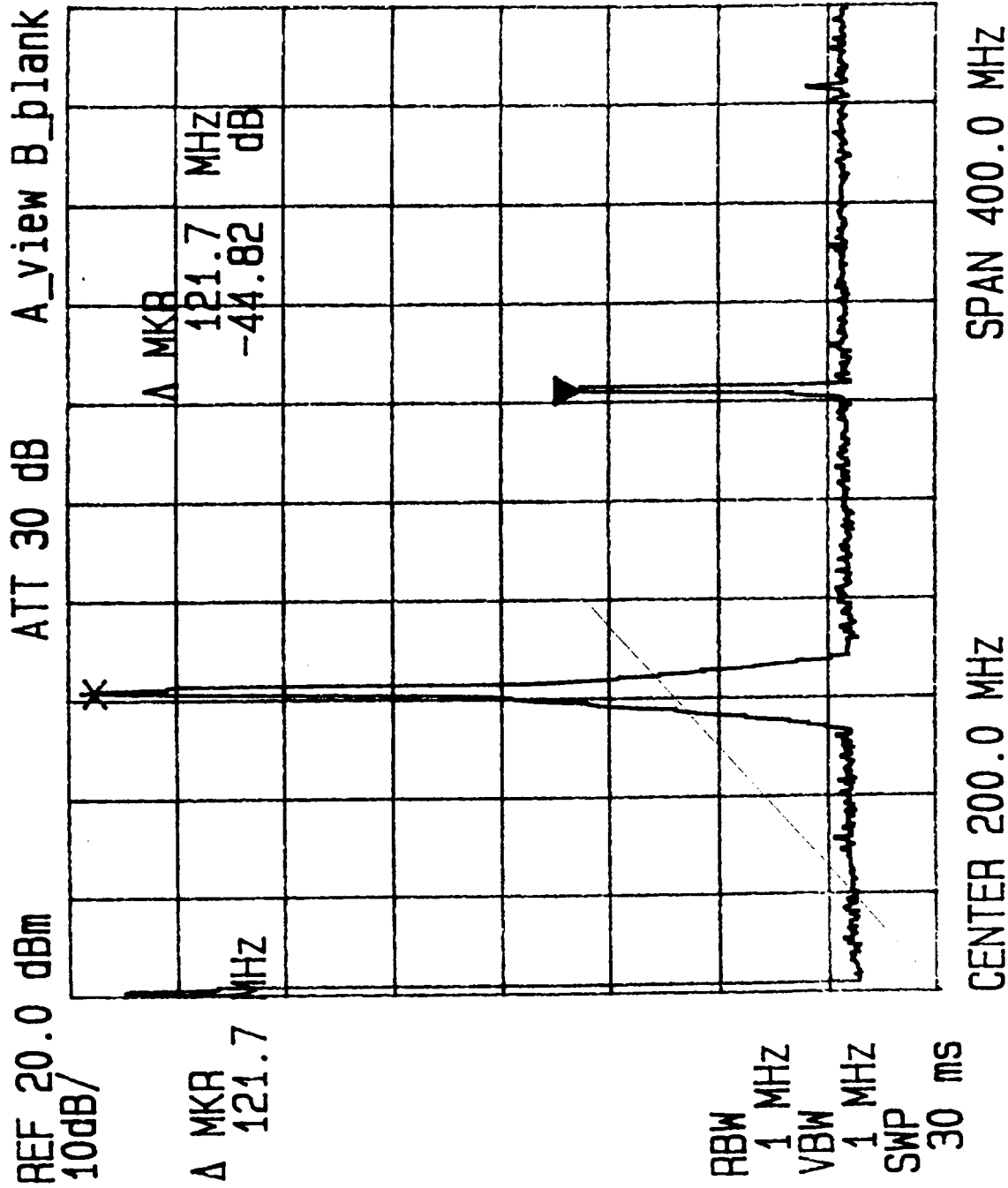
S/N 1

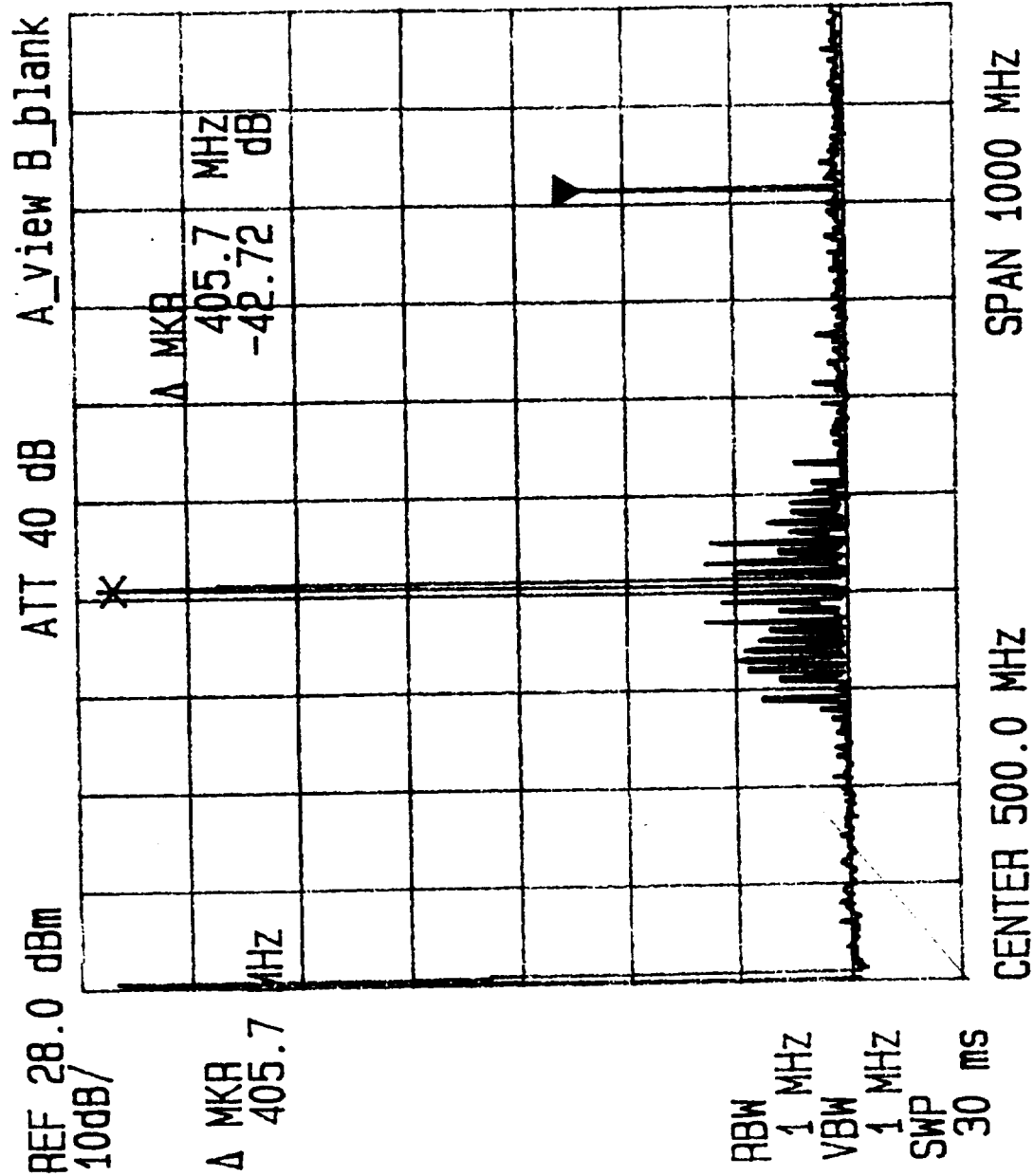
TEMP -40 DEG C

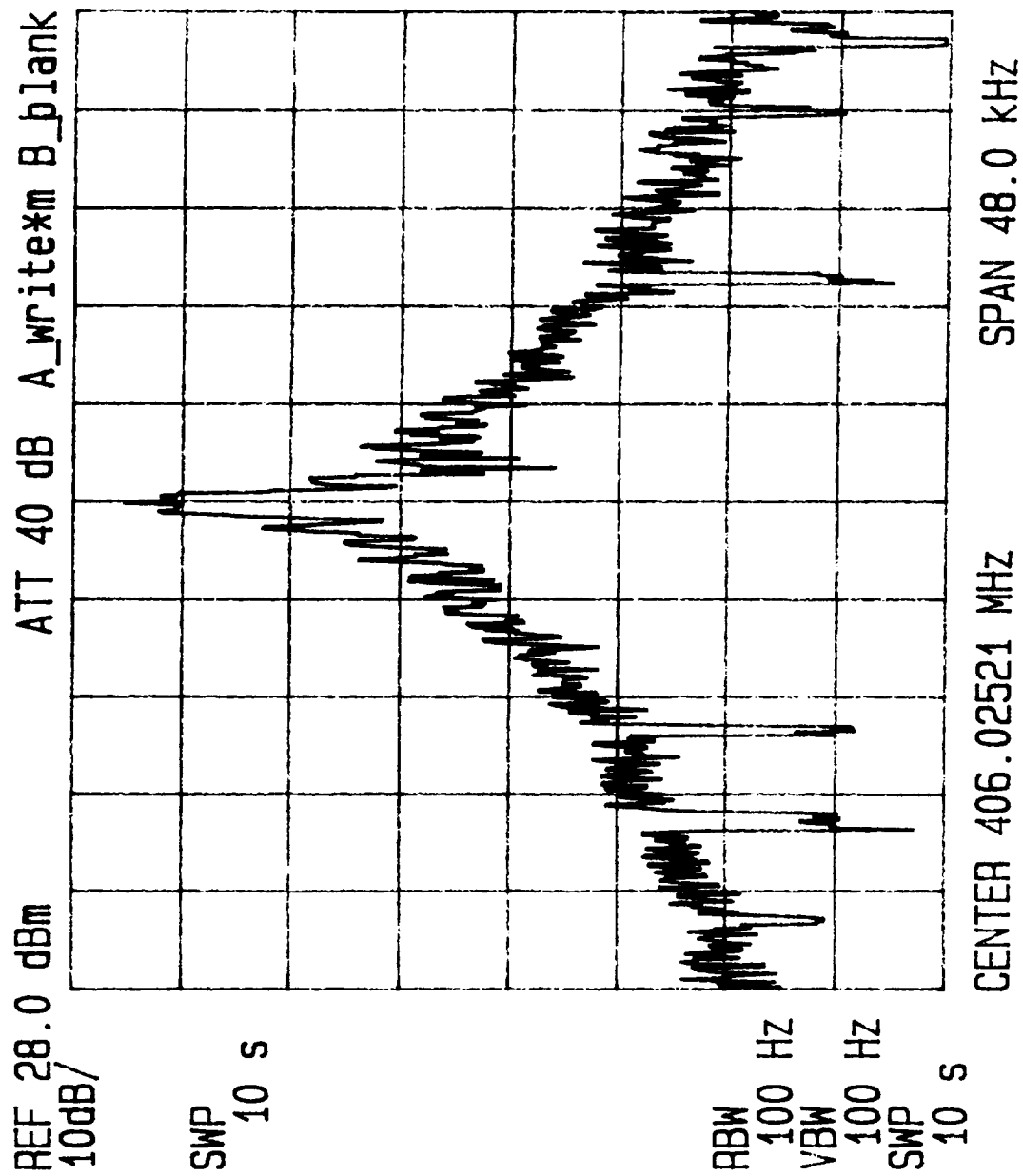
02/26/99

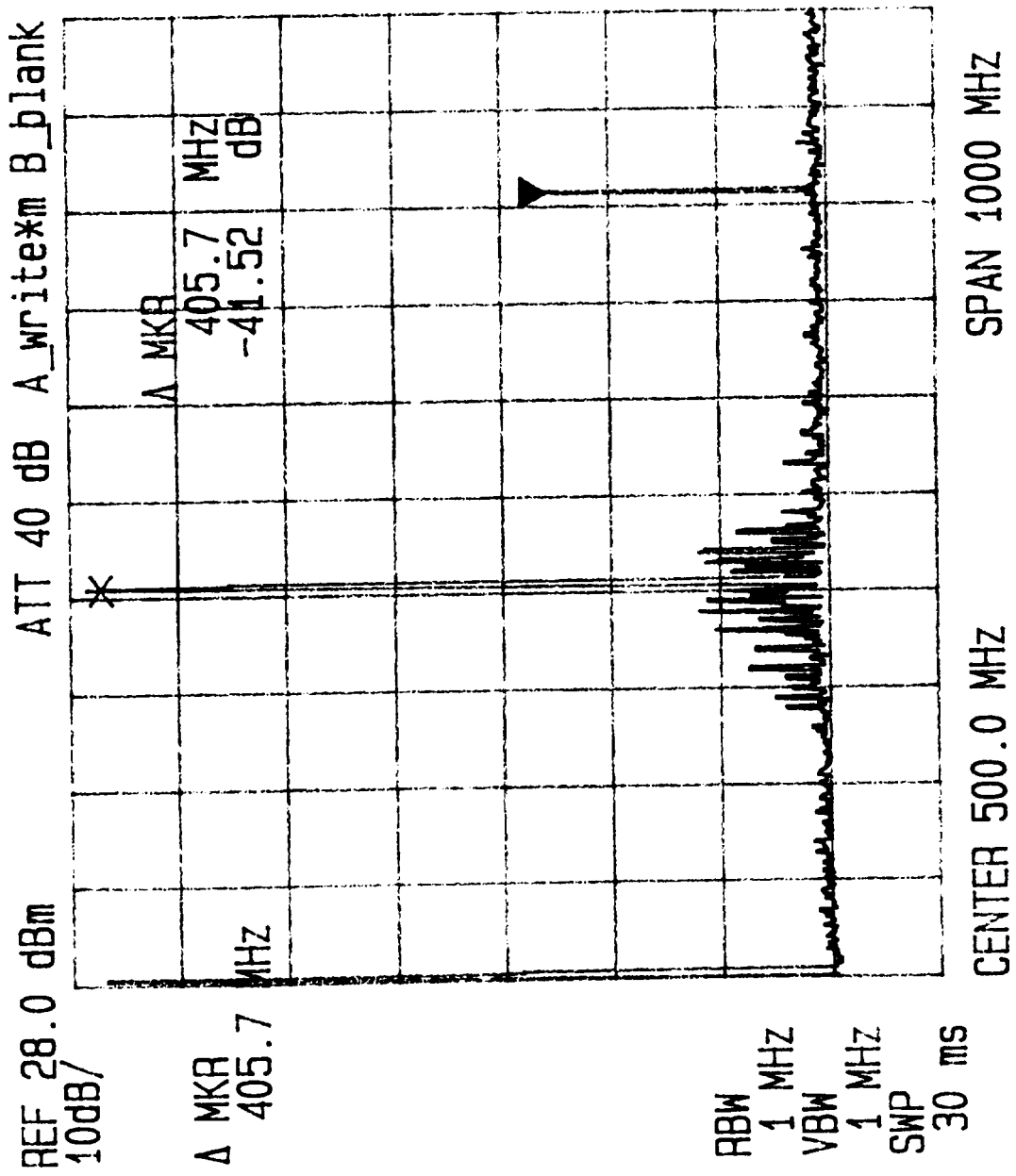




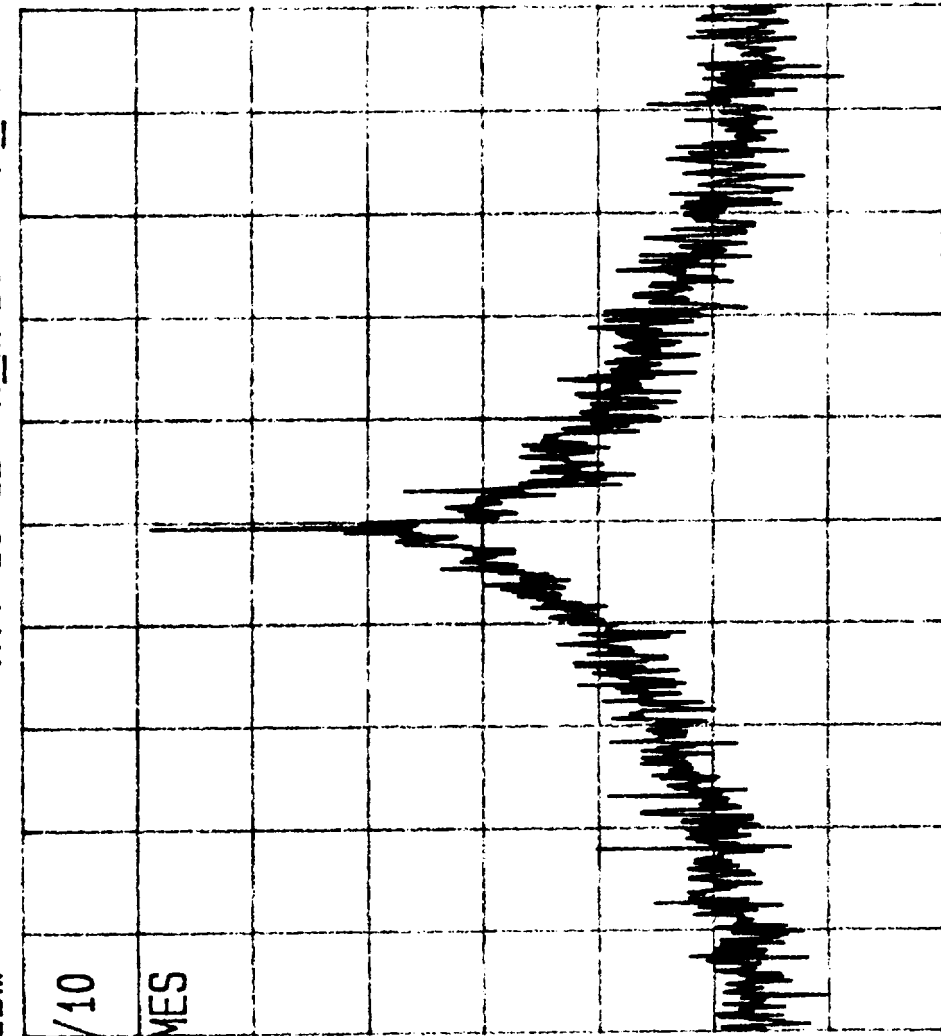








REF 0.0 dBm ATT 10 dB A\_write B\_blank



CENTER 121.5012 MHz SPAN 125.0 kHz

REF 0.0 dBm

10dB/

AVG A 10/10

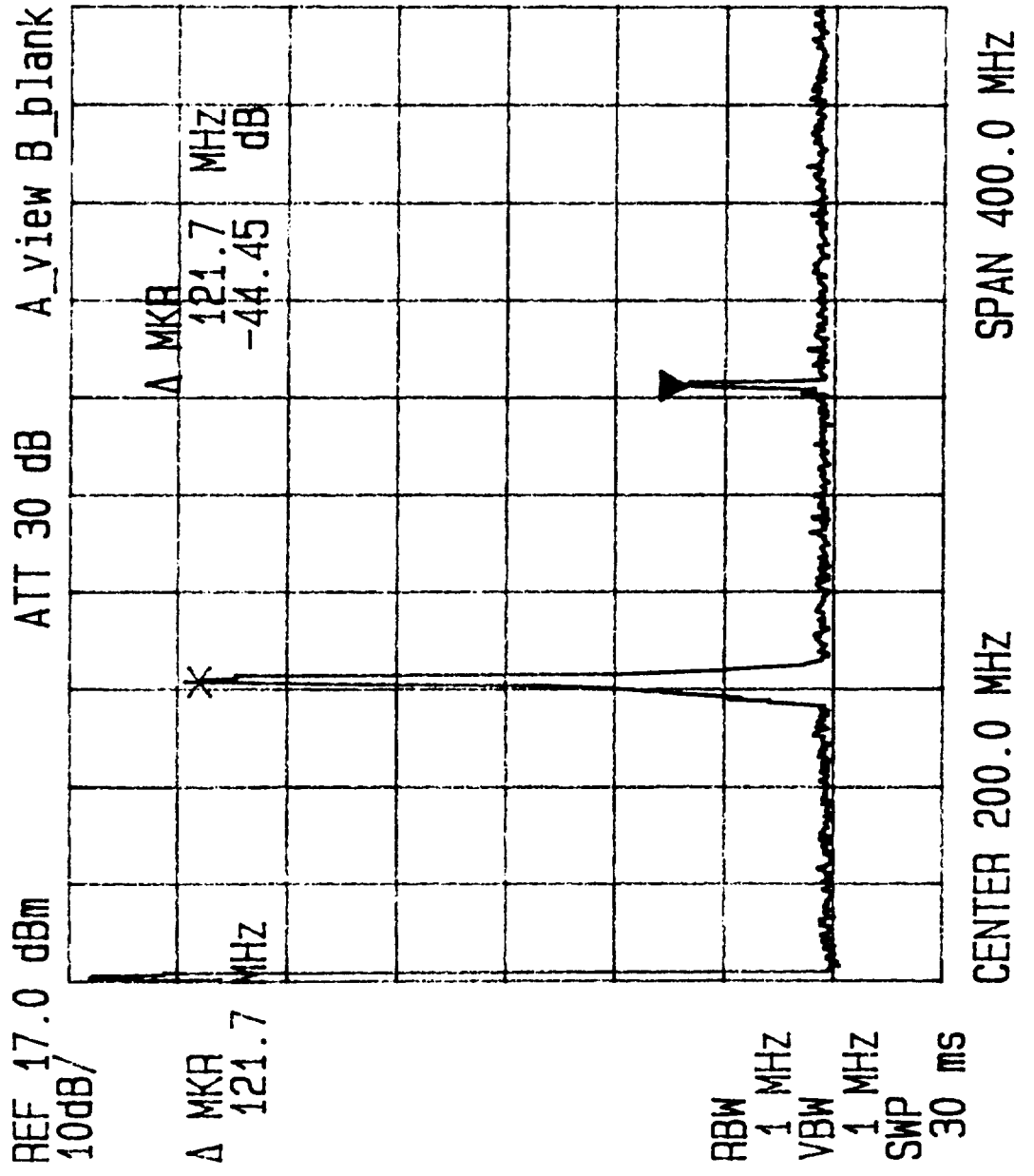
AVG A TIMES

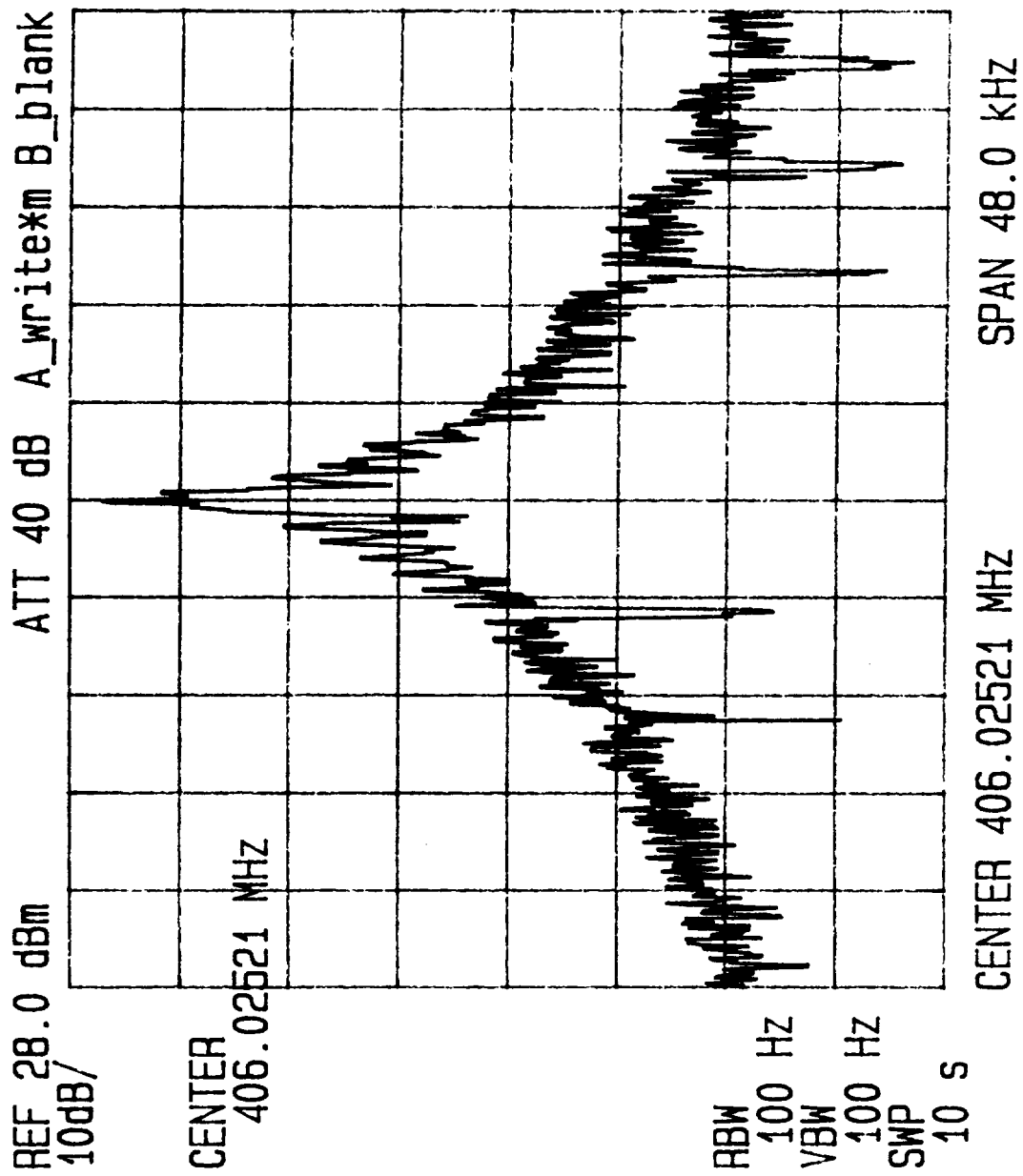
10

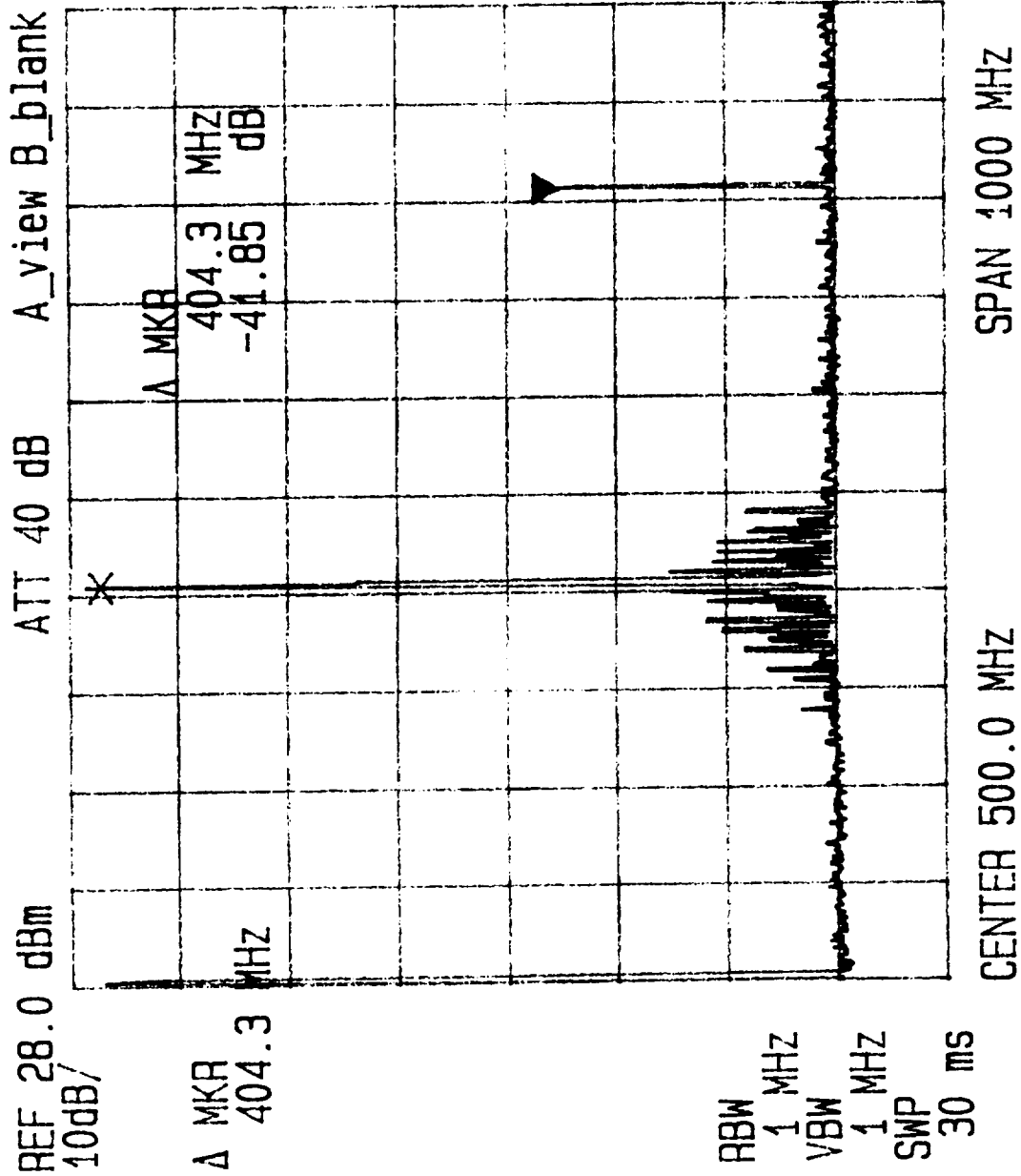
RBW 100 Hz

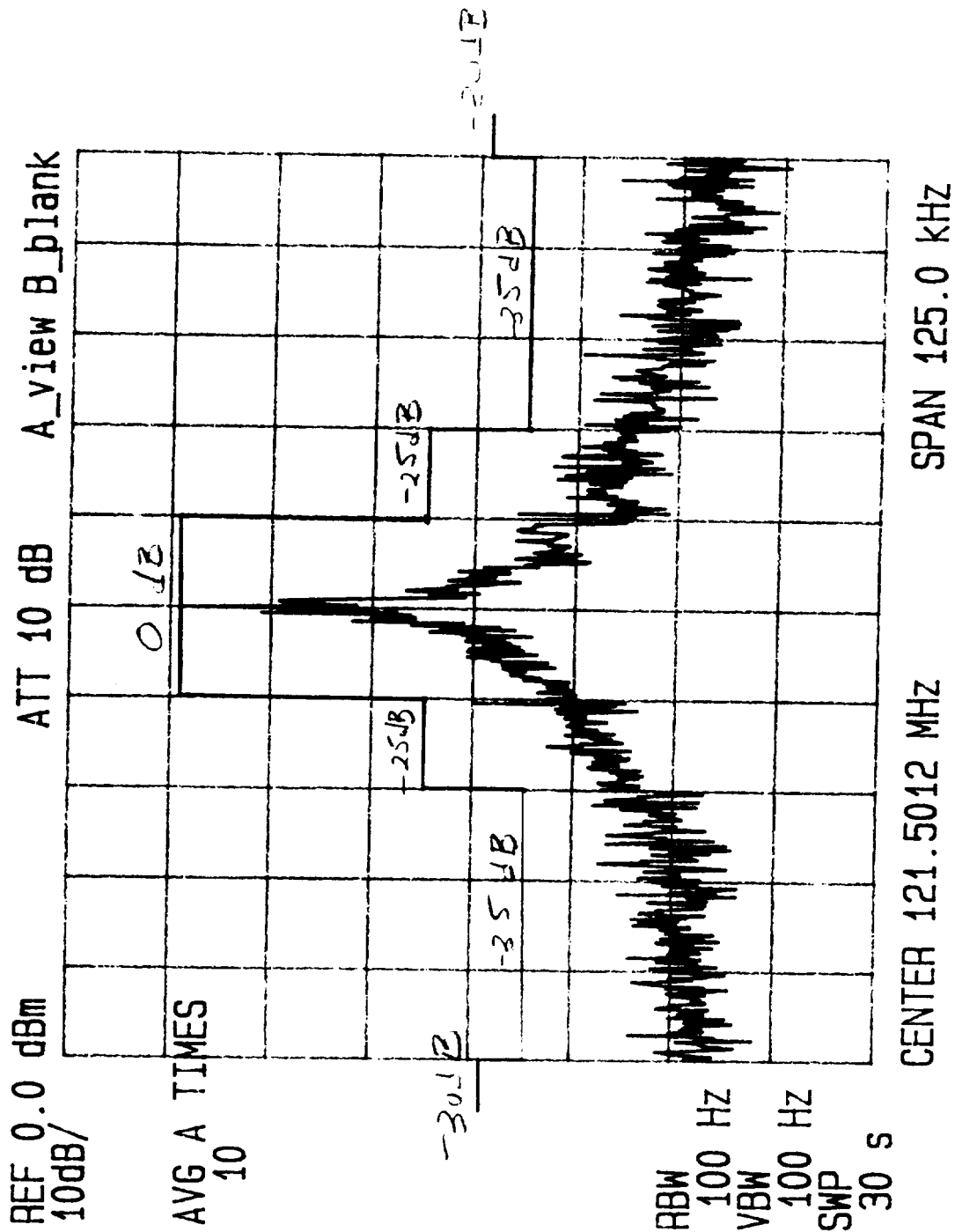
VBW 100 Hz

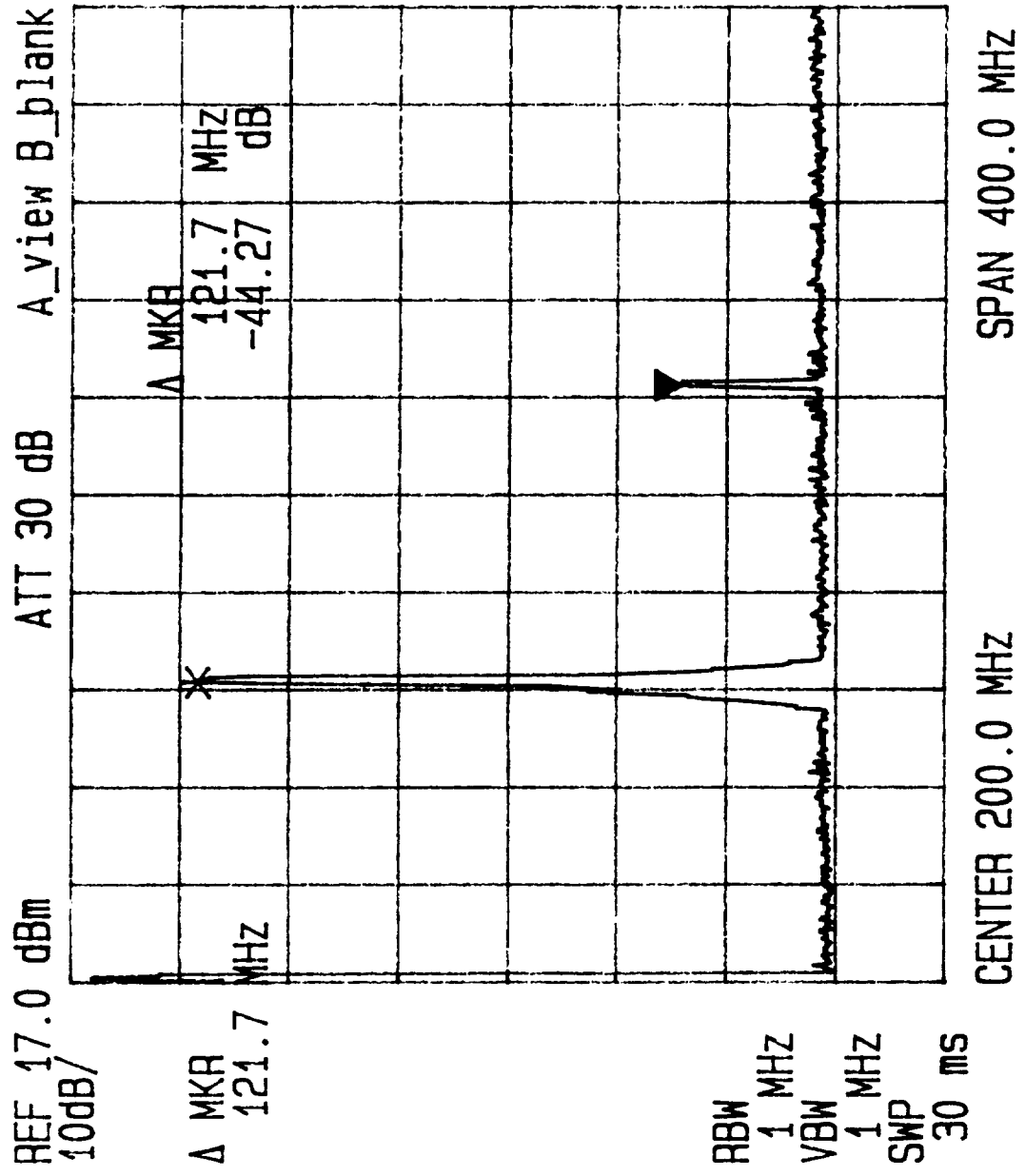
SWP 30 S

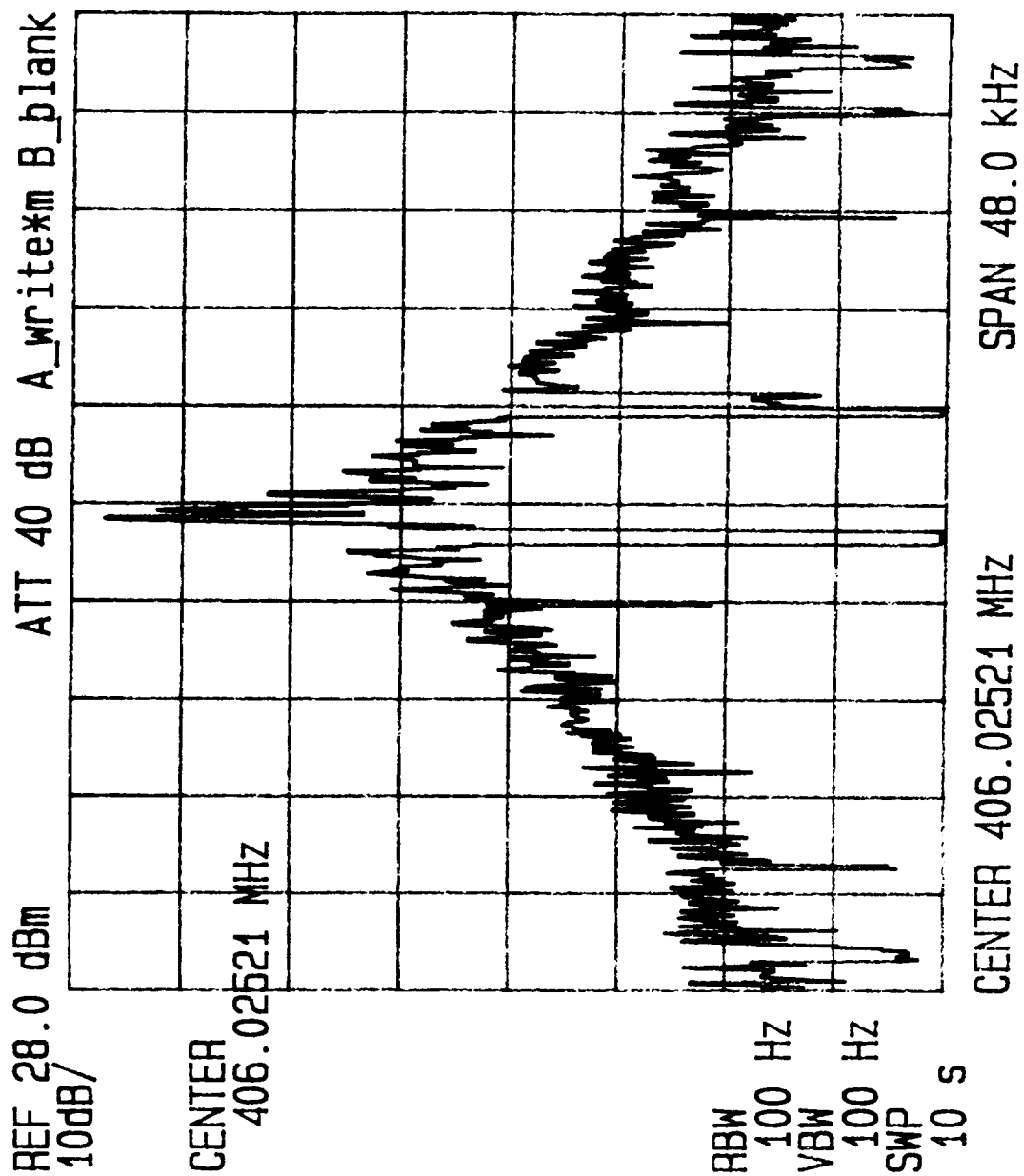


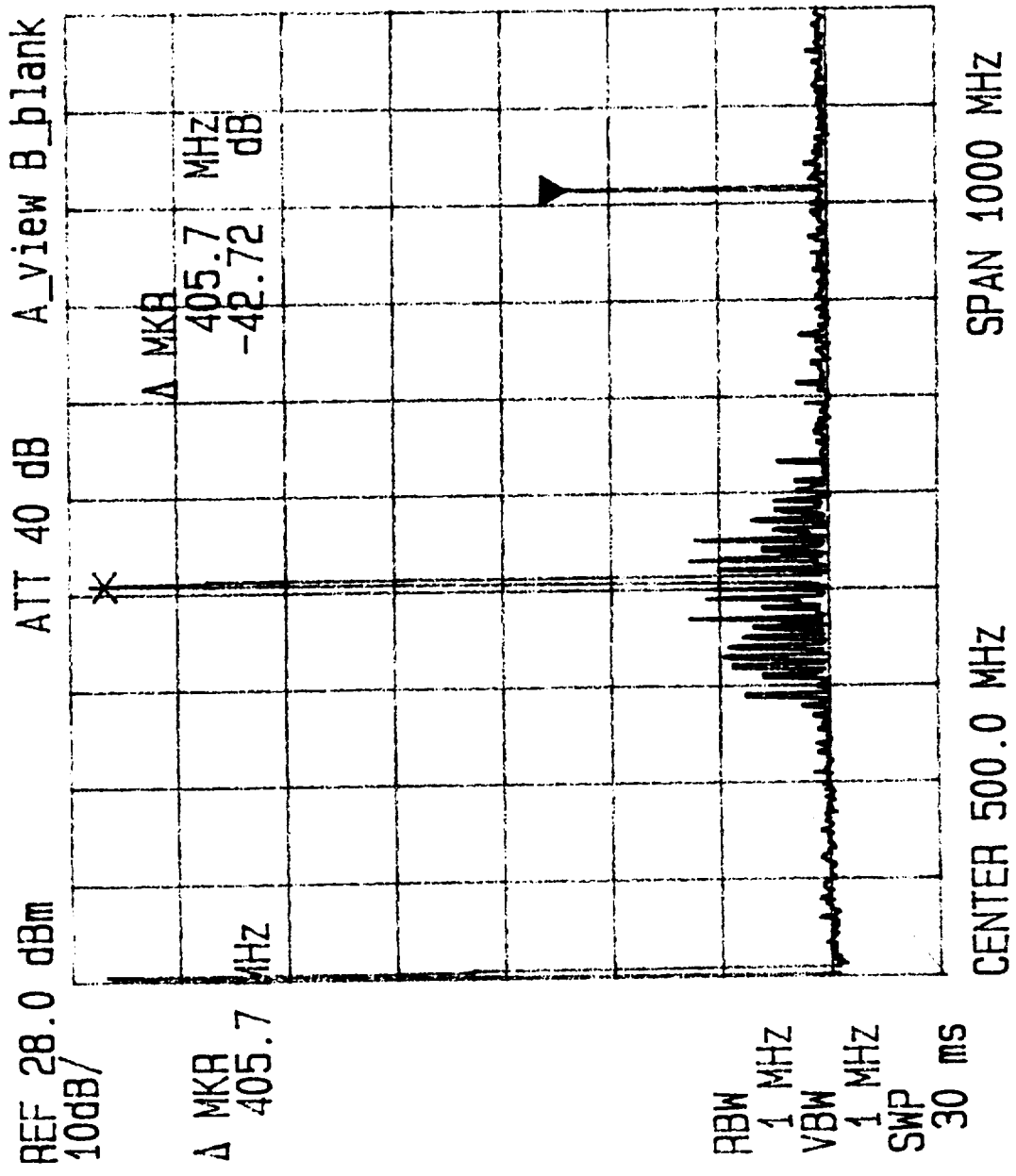


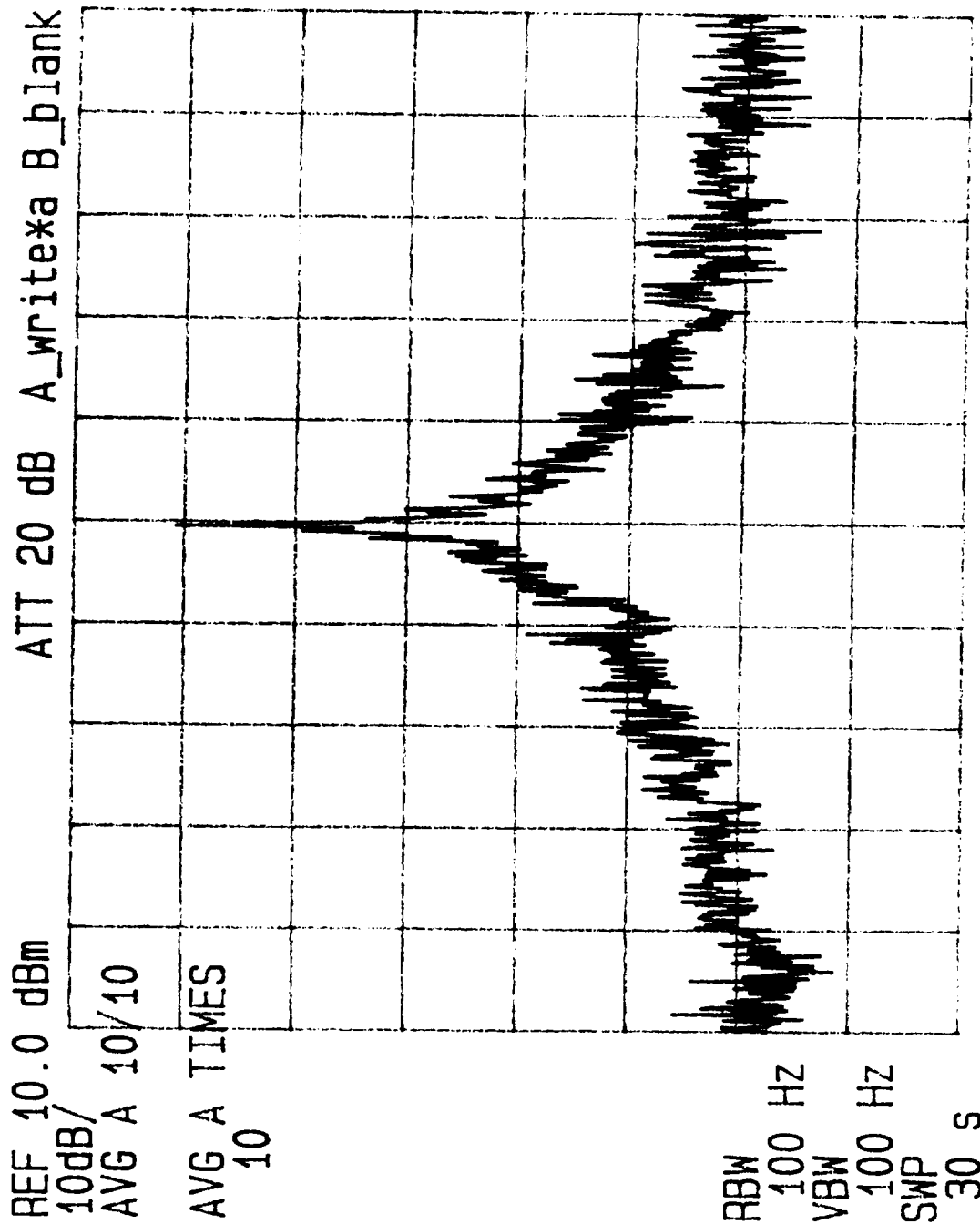




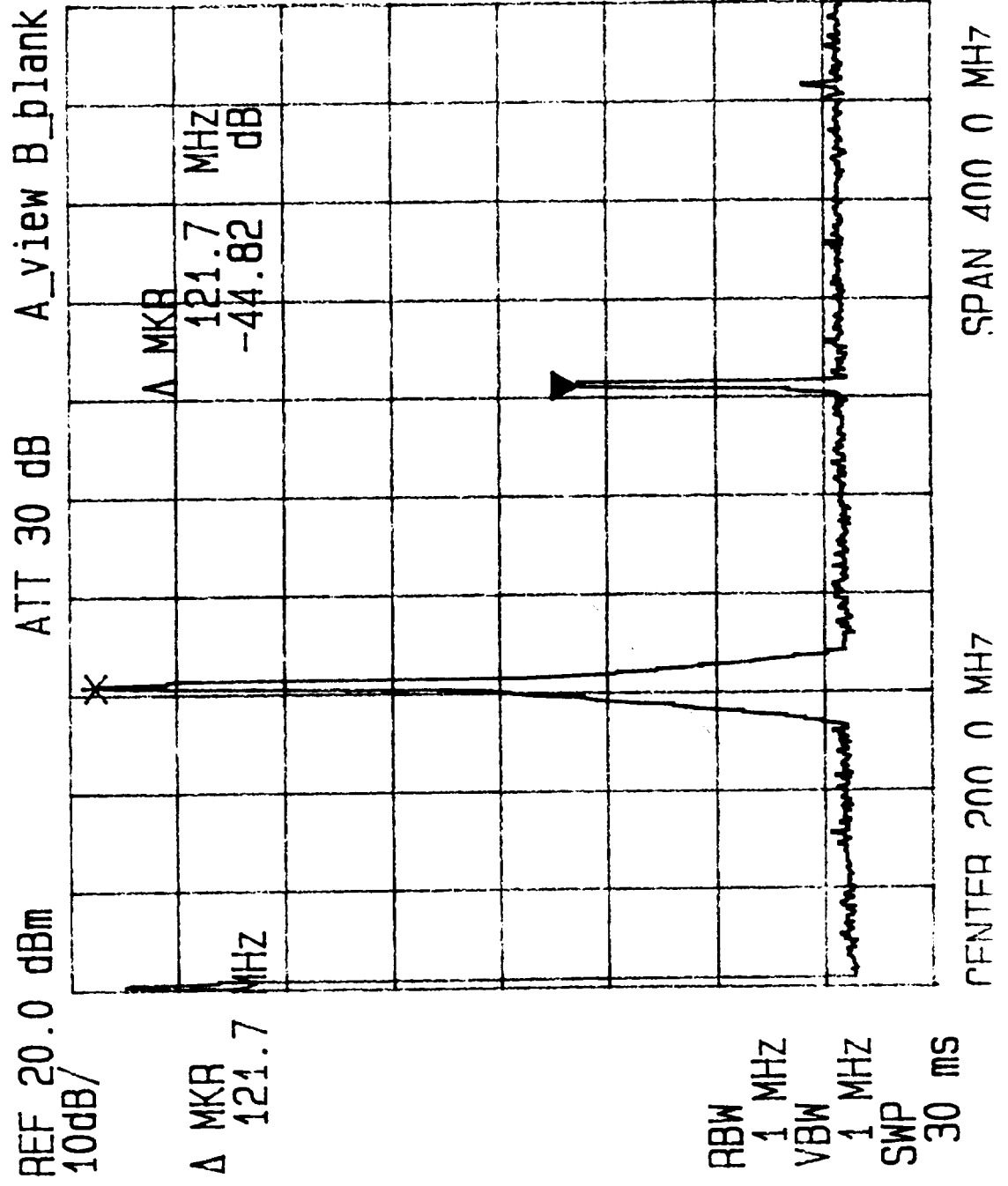








CENTER 121.5014 MHz SPAN 125.0 KHz



# SUMMARY OF TEST RESULTS

| PARAMETERS TO BE MEASURED DURING TESTS       | RANGE OF SPECIFICATION           | UNITS                              | TEST RESULTS                         |                                         |                                         | COMMENTS |
|----------------------------------------------|----------------------------------|------------------------------------|--------------------------------------|-----------------------------------------|-----------------------------------------|----------|
|                                              |                                  |                                    | T <sub>min</sub><br>( <u>-55</u> °C) | T <sub>amb</sub><br>( <u>      </u> °C) | T <sub>max</sub><br>( <u>      </u> °C) |          |
| 15.1 Thermal Shock Test<br>(Low-Temperature) |                                  |                                    |                                      |                                         |                                         |          |
| • Self-activation in water                   | ≤ 5                              | minutes                            | /sec.                                |                                         |                                         |          |
| • Aliveness Test                             |                                  |                                    |                                      |                                         |                                         |          |
| - Carrier Frequency                          | 406.025 ± 0.002                  | MHz                                | 406.02522                            |                                         |                                         |          |
| - Power Output                               | 35 - 39                          | dBm                                | 37.02                                |                                         |                                         |          |
| - Data Message                               | <u>20DC580</u><br><u>02FFBFF</u> | ✓                                  | ✓                                    |                                         |                                         |          |
| • Frequency Stability                        | ≤ 0.002                          | parts /<br>million<br>in 100<br>ms | .0005677                             |                                         |                                         |          |
| - short term stability                       |                                  |                                    |                                      |                                         |                                         |          |
| - medium term stability:                     |                                  |                                    |                                      |                                         |                                         |          |
| ▪ mean slope                                 | ≤ 0.001                          | parts /<br>million /<br>minute     | .0006284                             |                                         |                                         |          |
| ▪ residual frequency variation               | ≤ 0.003                          | parts /<br>million                 | .0003281                             |                                         |                                         |          |

DATE: 02-27-1999 TIME: 16:51:02

ACR v6.0

2DDC5D8002FFBFF  
C/S-187-USA-1

~~FAILED~~  
PASSED

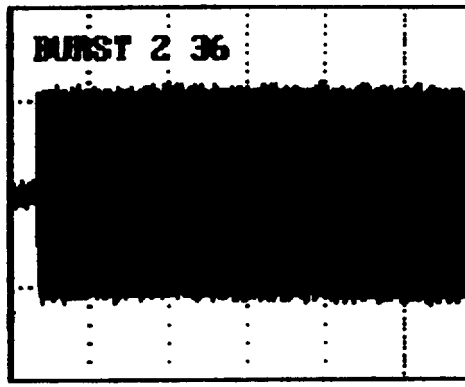
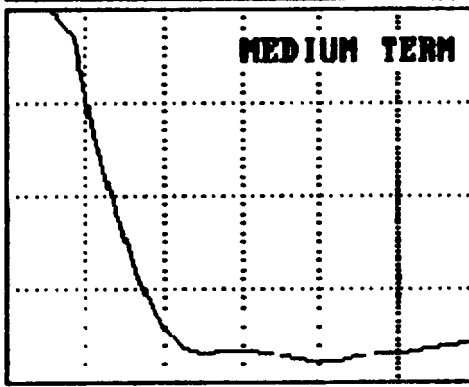
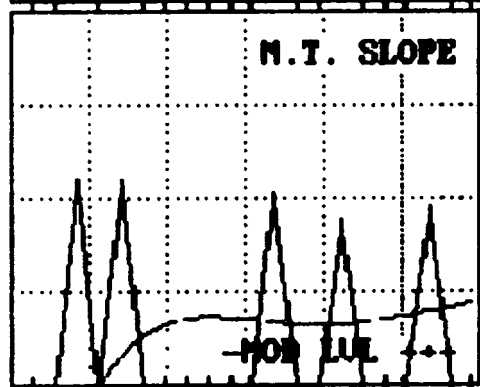
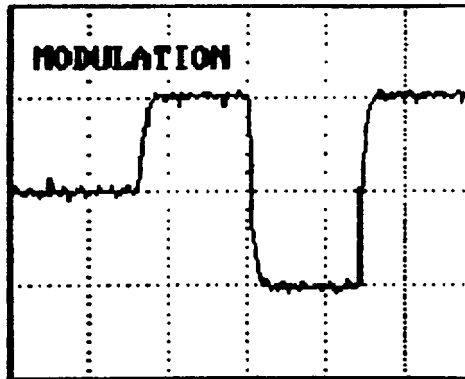
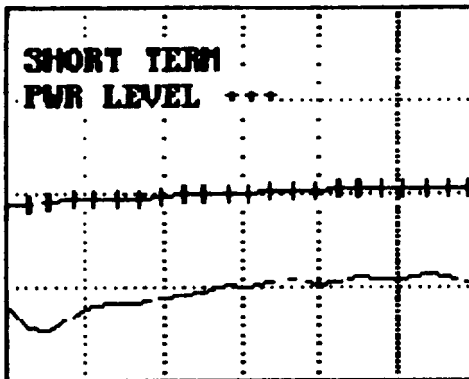
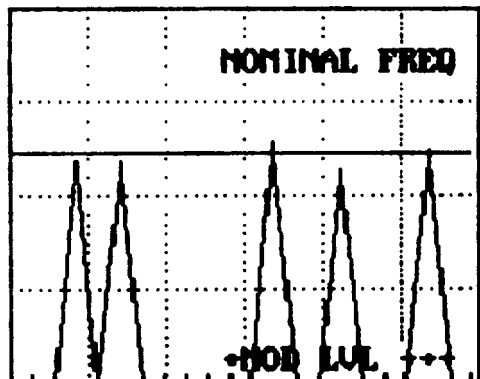
PASSED

233.1 Hz

PASSED

5.677E-10

PEAKS: +1.283 -1.195 rad



PASSED

-6.284E-10

PASSED

3.281E-10

PEAKS: +1.324 -1.332 rad

NOMINAL FREQUENCY: 406.02522 MHz  
POWER OUTPUT: 5.037 Watts  
+37.02 dBm  
POWER STABILITY: 11.05 %  
POWER RISE TIME: 760 µsec  
PEAK VOLTAGE: +2.464 Volts  
DRIFT SLOPES: 1) -2.88E-03 rad/sec  
2) -2.88E-03 rad/sec  
3) -2.88E-03 rad/sec  
» MODULATION LEVELS: +1.134 radians  
» +0.342 -1.883 -1.140 radians  
-0.771 OFFSET -0.003 radians  
MODULATION TIMES: RISE 146 µsec  
FALL 147 µsec  
SYMMETRY 0.62 %  
MODULATION BIT RATE: 398.75 Hz  
BURST TIMES: AVG PERIOD 50.6 sec  
CARRIER DURATION 160.0 msec  
MESSAGE DURATION 361.2 msec  
TOTAL DURATION 521.1 msec  
PREAMBLE LEAKAGE LEVEL 35.0 dBc  
LEAKAGE LENGTH 0.1 msec

#### HEXADECIMAL MESSAGE

2DDC5D8002FFBFF  
FFFE2F96EE2ED0017FDFFC0A6D8583E0FAAB  
BIT SYNCHRONIZATION..... OK  
FRAME SYNCHRONIZATION... OK  
MESSAGE FORMAT..... LONG  
PROTOCOL FLAG..... STANDARD  
COUNTRY..... USA  
SERIALIZED USER..... TEST MODE  
C/S CERTIFICATE No..... 187  
SERIAL NUMBER..... 1  
LATITUDE..... N 127.75  
LONGITUDE..... E 255.75  
ERROR CORRECTION CODE 1. OK  
ENCODED DATA SOURCE..... Internal  
121.5 MHz HOMING..... No  
SPARES status..... Not OK  
LATITUDE OFFSET..... + 0 60  
LONGITUDE OFFSET..... + 0 60  
ERROR CORRECTION CODE 2. OK

OK

« — MAX MODULATION LEV  
« — MIN MODULATION LEV

# SUMMARY OF TEST RESULTS

| PARAMETERS TO BE MEASURED DURING TESTS                                                                                                                                                                                                                                                                                                                                                                                                         | RANGE OF SPECIFICATION                                                    | UNITS                                                                                       | TEST RESULTS           |                        |                                                          | COMMENTS |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|------------------------|------------------------|----------------------------------------------------------|----------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                           |                                                                                             | T <sub>min</sub> ( °C) | T <sub>amb</sub> ( °C) | T <sub>max</sub> ( °C)                                   |          |
| 15.2 Thermal Shock Test (High-Temperature)                                                                                                                                                                                                                                                                                                                                                                                                     | ≤ 5                                                                       | minutes                                                                                     |                        |                        | / 5 sec.                                                 |          |
| <ul style="list-style-type: none"> <li>Self-activation in water</li> <li>Aliveness Test               <ul style="list-style-type: none"> <li>Carrier Frequency</li> <li>Power Output</li> <li>Data Message</li> </ul> </li> <li>Frequency Stability               <ul style="list-style-type: none"> <li>short term stability</li> <li>medium term stability:</li> <li>mean slope</li> <li>residual frequency variation</li> </ul> </li> </ul> | 406.025 ± 0.002<br>35 - 39<br><u>2DDCS80</u><br><u>02FFBFF</u><br>≤ 0.002 | MHz<br>dBm<br>✓<br>parts / million in 100 ms<br>parts / million / minute<br>parts / million |                        |                        | 406.02521<br>37.37 ✓<br>.0000561<br>.0001648<br>.0002111 |          |

DATE: 03-01-1999 TIME: 12:17:38

ACR v6.

2DDC5D8002FFBFF  
C/S-187-USA-1

PASSED

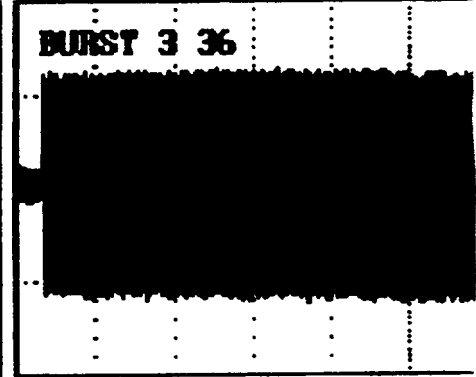
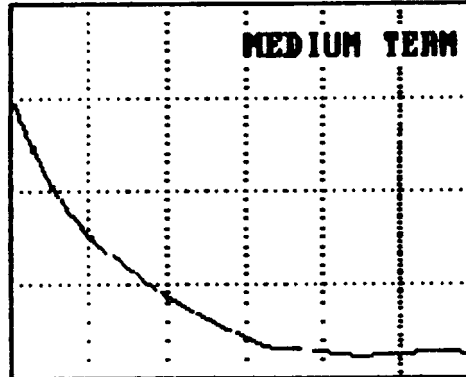
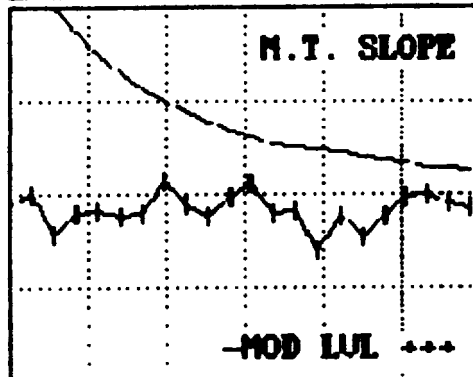
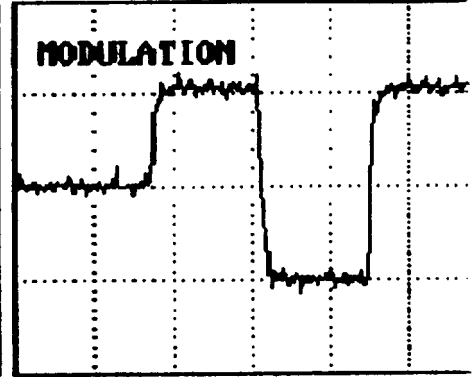
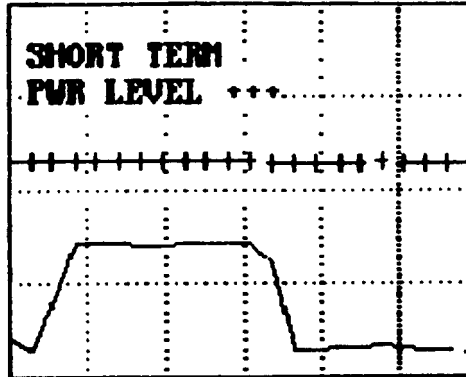
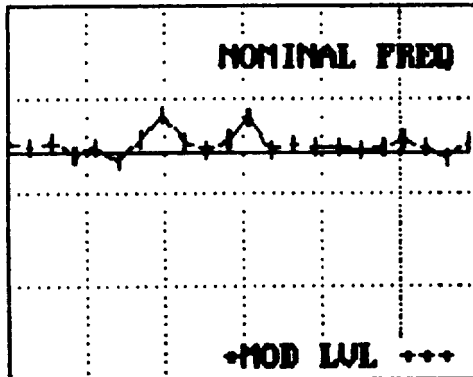
PASSED

216.9 Hz

PASSED

1.561E-18

PEAKS: +1.345 -1.270 ra



PASSED

1.648E-10

PASSED

2.111E-10

PEAKS: +1.484 -1.366 ra

NOMINAL FREQUENCY: 406.02521 MHz  
POWER OUTPUT: 5.461 Watts  
+37.37 dBm  
POWER STABILITY: 8.96 %  
POWER RISE TIME: 690 µsec  
PEAK VOLTAGE: +2.592 Volts  
DRIFT SLOPES: 1) +1.13E-01 rad/sec  
2) +1.13E-01 rad/sec  
3) +1.13E-01 rad/sec  
MODULATION LEVELS: +1.130 radians  
+1.151 -1.121 -1.135 radians  
+0.015 OFFSET -0.003 radians  
MODULATION TIMES: RISE 149 µsec  
FALL 153 µsec  
SYMMETRY 0.16 %  
MODULATION BIT RATE: 398.65 Hz  
BURST TIMES: AVG PERIOD 50.6 sec  
CARRIER DURATION 160.0 msec  
MESSAGE DURATION 361.2 msec  
TOTAL DURATION 521.2 msec  
PREAMBLE LEAKAGE LEVEL 35.0 dBc  
LEAKAGE LENGTH 0.1 msec

#### HEXADECIMAL MESSAGE

2DDC5D8002FFBFF  
FFFE2F96EE2ED0017DFDFC0A6D3583E0FAAB  
BIT SYNCHRONIZATION..... OK  
FRAME SYNCHRONIZATION... OK  
MESSAGE FORMAT..... LONG  
PROTOCOL FLAG..... STANDARD  
COUNTRY..... USA  
SERIALIZED USER..... TEST MODE  
C/S CERTIFICATE No..... 187  
SERIAL NUMBER..... 1  
LATITUDE..... N 127.75  
LONGITUDE..... E 255.75  
ERROR CORRECTION CODE 1. OK  
ENCODED DATA SOURCE..... Internal  
121.5 MHz HOMING..... No  
SPARES status..... Not OK  
LATITUDE OFFSET..... + 0 60  
LONGITUDE OFFSET..... + 0 60  
ERROR CORRECTION CODE 2. OK

## SUMMARY OF BEACON TEST RESULTS

page 1

|                                |                         |           | TEST RESULTS |           |           |          |
|--------------------------------|-------------------------|-----------|--------------|-----------|-----------|----------|
| PARAMETERS TO BE MEASURED      | RANGE OF                |           | Tmin         | Tamb      | Tmax      |          |
| DURING TESTS                   | SPECIFICATION           | UNITS     | (-40C)       | (23C)     | (55C)     | COMMENTS |
| 1 POWER OUTPUT                 |                         |           |              |           |           |          |
| transmitter power output       | 35 to 39                | dBm       | 37.66        | 38.38     | 38.66     |          |
| power output rise time         | < 5                     | ms        | .89          | .73       | .94       |          |
| power output 1 ms before burst | < -10 dBm               |           | ✓            | ✓         | ✓         |          |
| 2 DIGITAL MESSAGE              |                         |           |              |           |           |          |
| bit sync                       |                         |           | OK           | OK        | OK        |          |
| frame sync                     |                         |           | OK           | OK        | OK        |          |
| message format                 |                         |           | LONG         | LONG      | LONG      |          |
| protocol flag                  |                         |           | STANDARD     | STANDARD  | STANDARD  |          |
| country                        |                         |           | USA          | USA       | USA       |          |
| serialized user                |                         |           | TEST MODE    | TEST MODE | TEST MODE |          |
| 1/s certificate no.            |                         |           | 187          | 187       | 187       |          |
| serial no.                     |                         |           | 1            | 1         | 1         |          |
| latitude                       |                         |           | N 127.75     | N 127.75  | N 127.75  |          |
| longitude                      |                         |           | E 255.75     | E 255.75  | E 255.75  |          |
| error correction code 1        |                         |           | OK           | OK        | OK        |          |
| encoded data source            |                         |           | INTERNAL     | INTERNAL  | INTERNAL  |          |
| 121.5 MHz homing               |                         |           | NO           | NO        | NO        |          |
| spares status                  |                         |           | NOT OK       | NOT OK    | NOT OK    |          |
| latitude offset                |                         |           | + 0 60       | + 0 60    | + 0 60    |          |
| longitude offset               |                         |           | + 0 60       | + 0 60    | + 0 60    |          |
| error correction code 2        |                         |           | OK           | OK        | OK        |          |
| hexadecimal long message       | FFFE2F96EE2EC0017FDFFC0 |           | ✓            | ✓         | ✓         |          |
|                                | AGD3503E0FAAB           |           |              |           |           |          |
| 3 DIGIT MESSAGE GENERATOR      |                         |           |              |           |           |          |
| repetition rate ***            |                         |           |              |           |           |          |
| minimum Tr                     | 47.5                    | seconds   | 50.6         | 50.5      | 50.5      | ave.     |
| maximum Tr                     | 52.5                    | seconds   |              |           |           |          |
| bit rate                       |                         |           |              |           |           |          |
| minimum Fb                     | 396                     | bits/sec  | 398.80       | 399.75    | 399.71    |          |
| maximum Fb                     | 404                     | bits/sec  |              |           |           |          |
| local transmission time        |                         |           |              |           |           |          |
| short message =                | 435.6-444.4             | ms        |              |           |           |          |
| long message =                 | 514.8-525.2             | ms        | 521.1        | 521.2     | 521.1     |          |
| CW preamble                    |                         |           |              |           |           |          |
| minimum T1                     | 158.4                   | ms        | 160.0        | 160.0     | 160.0     |          |
| maximum T1                     | 161.6                   | ms        |              |           |           |          |
| 4 MODULATION                   |                         |           |              |           |           |          |
| rise time                      | 50 - 250                | microsec. | 153          | 144       | 152       |          |
| fall time                      | 50 - 250                | microsec. | 150          | 150       | 150       |          |
| phase deviation: positive      | 1.0 to 1.2              | radians   | 1.137        | 1.36      | 1.148     |          |
| phase deviation: negative      | neg. 1.0 to neg. 1.2    | radians   | -1.145       | -1.102    | -1.154    |          |
| symmetry measurement           | < 5.0                   | %         | 0.44         | 0.2       | 0.18      |          |

K-3-33 - 111

## SUMMARY OF BEACON TEST RESULTS

page 2

## TEST RESULTS

| PARAMETERS TO BE MEASURED<br>DURING TESTS                              | RANGE OF<br>SPECIFICATION | UNITS     | Tmin<br>(-40C)           | Tamb<br>(23C)           | Tmax<br>(55C)           | COMMENTS |
|------------------------------------------------------------------------|---------------------------|-----------|--------------------------|-------------------------|-------------------------|----------|
| <b>5 TRANSMITTED FREQUENCY</b>                                         |                           |           |                          |                         |                         |          |
| nominal value                                                          | 406.023/406.027           | MHz       | 406.02523                | 406.02518               | 406.02519               |          |
| short term stability                                                   | < .002 ppm                | /100 ms   | $4.023 \times 10^{-10}$  | $4.305 \times 10^{-10}$ | $4.444 \times 10^{-10}$ |          |
| medium term stability                                                  |                           |           |                          |                         |                         |          |
| slope                                                                  | < .001 ppm                | /minute   | $-2.203 \times 10^{-10}$ | $9.505 \times 10^{-11}$ | $5.18 \times 10^{-10}$  |          |
| residual frequency variation                                           | < .003 ppm                |           | $1.533 \times 10^{-10}$  | $1.294 \times 10^{-10}$ | $3.063 \times 10^{-10}$ |          |
| <b>6 SPURIOUS EMISSIONS **</b>                                         |                           |           |                          |                         |                         |          |
| in band 406.0 to 406.1 MHz                                             | mask C/S T.001            |           |                          |                         |                         |          |
| harmonics                                                              | < neg 30 dBc              | dB        |                          |                         |                         |          |
| <b>7 406 MHz VSWR CHECK</b>                                            |                           |           |                          |                         |                         |          |
| after open circuit, short circuit,<br>then while VSWR is 3:1, measure: |                           |           |                          |                         |                         |          |
| nominal transmitted frequency                                          | 406.023/406.027           | MHz       | 406.02523                | 406.02520               | 406.02518               |          |
| Modulation                                                             |                           |           |                          |                         |                         |          |
| rise time                                                              | 50 - 250                  | microsec. | 148                      | 150                     | 149                     |          |
| fall time                                                              | 50 - 250                  | microsec. | 150                      | 153                     | 146                     |          |
| phase deviation: positive                                              | 1.0 to 1.2                | radians   | 1.152                    | 1.111                   | 1.139                   |          |
| phase deviation: negative                                              | neg.1.0 to neg.1.2        | radians   | -1.159                   | -1.119                  | -1.145                  |          |
| symmetry measurement                                                   | < 5.0                     | %         |                          | 0.29                    | 0.50                    |          |
| digital message                                                        | FFFE2F96EE2EC0017FDF      |           | ✓                        | ✓                       | ✓                       |          |
|                                                                        | FC0A6D3583E0FAAB          |           |                          |                         |                         |          |
| <b>8 SELF TEST MODE</b>                                                |                           |           |                          |                         |                         |          |
| digital message                                                        | FFFE096EE2EC0017FDF       |           | ✓                        | ✓                       | ✓                       |          |
|                                                                        | FC0A6D35                  |           |                          |                         |                         |          |
| single !! Radiated burst                                               | 435.6-444.4               | ms        | 441.0                    | 440.9                   | 440.9                   |          |
| description provided                                                   |                           |           |                          |                         |                         |          |

-40°C

DATE: 03-08-1999 TIME: 13:46:29

ACR v6.0

2DDC5D8002FFBFF  
C/S-187-USA-1

PASSED

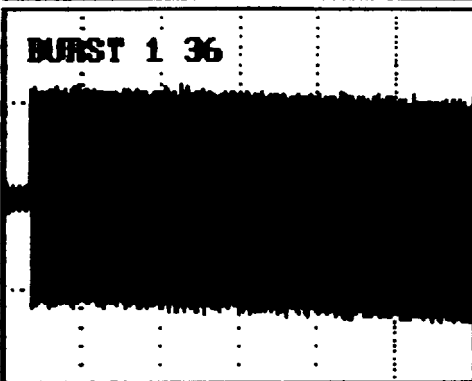
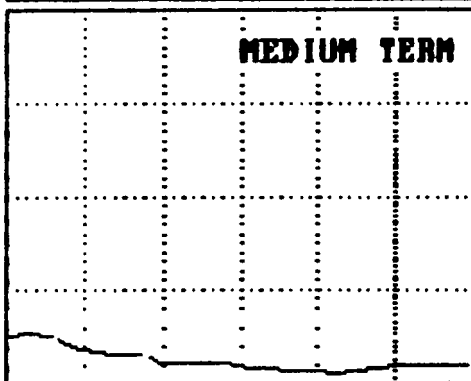
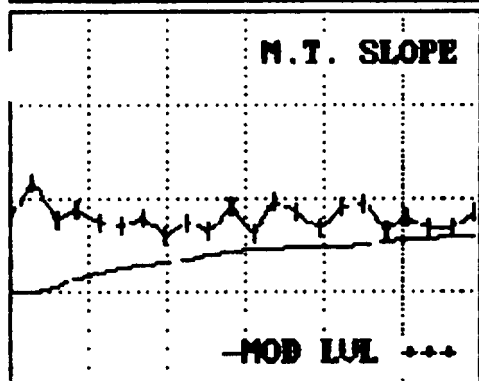
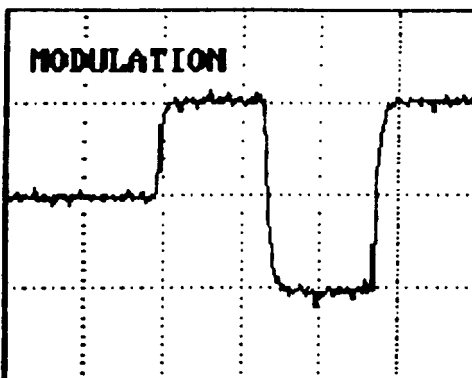
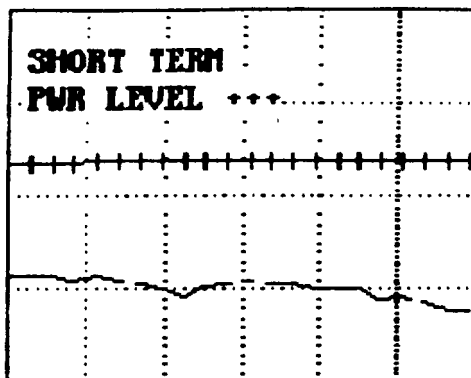
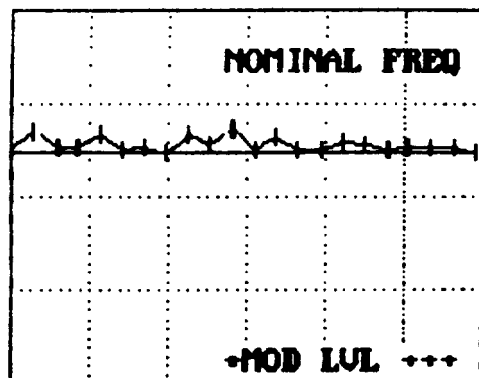
PASSED

238.7 Hz

PASSED

4.688E-18

PEAKS: +1.242 -1.331 rad



PASSED -2.283E-10

PASSED 1.533E-10

PEAKS: +1.311 -1.492 rad

NOMINAL FREQUENCY: 406.02523 MHz  
POWER OUTPUT: 5.835 Watts  
+37.66 dBm  
POWER STABILITY: 11.03 %  
POWER RISE TIME: 890 µsec  
PEAK VOLTAGE: +2.565 Volts  
DRIFT SLOPES: 1) -4.29E-01 rad/sec  
2) -4.29E-01 rad/sec  
3) -4.29E-01 rad/sec  
MODULATION LEVELS: +1.137 radians  
+1.156 -1.116 -1.145 radians  
+0.020 OFFSET -0.004 radians  
MODULATION TIMES: RISE 153 µsec  
FALL 150 µsec  
SYMMETRY 0.44 %  
MODULATION BIT RATE: 398.80 Hz  
BURST TIMES: AVG PERIOD 50.6 sec  
CARRIER DURATION 160.0 msec  
MESSAGE DURATION 361.1 msec  
TOTAL DURATION 521.1 msec  
PREAMBLE LEAKAGE LEVEL 35.0 dBc  
LEAKAGE LENGTH 0.2 msec

#### HEXADECIMAL MESSAGE

2DDC5D8002FFBFF  
FFFE2F96EE2ED0017FDFFD0A6D3583E0FAA8  
BIT SYNCHRONIZATION..... OK  
FRAME SYNCHRONIZATION... OK  
MESSAGE FORMAT..... LONG  
PROTOCOL FLAG..... STANDARD  
COUNTRY..... USA  
SERIALIZED USER..... TEST MODE  
C/S CERTIFICATE No..... 187  
SERIAL NUMBER..... 1  
LATITUDE..... N 127.75  
LONGITUDE..... E 255.75  
ERROR CORRECTION CODE 1. OK  
ENCODED DATA SOURCE..... Internal  
121.5 MHz HOMING..... No  
SPARES status..... Not OK  
LATITUDE OFFSET..... + 0 60  
LONGITUDE OFFSET..... + 0 60  
ERROR CORRECTION CODE 2. OK

3-01 NEWK @ 406 MHz 2070 - -40°C

DATE: 03-08-1999 TIME: 14:55:15

ACR v6.0

2DDC5D8002EFBFF  
C/S-187-USA-1

FAILED

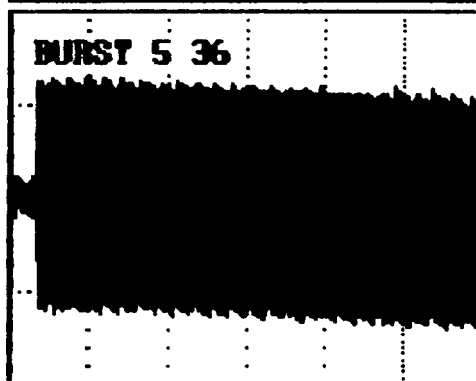
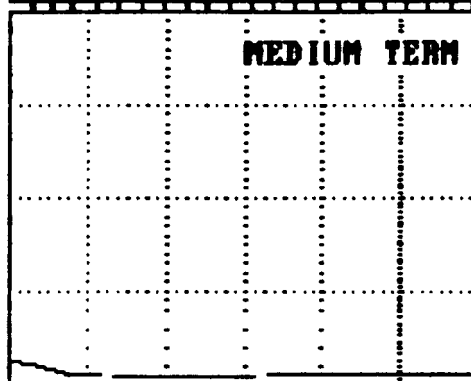
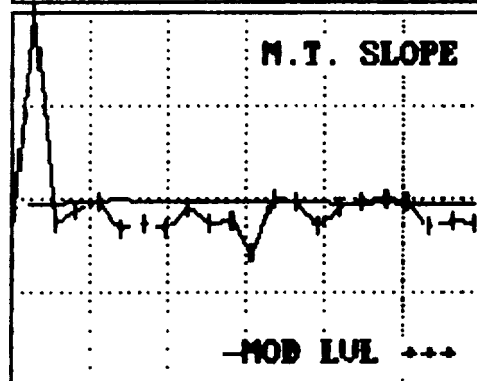
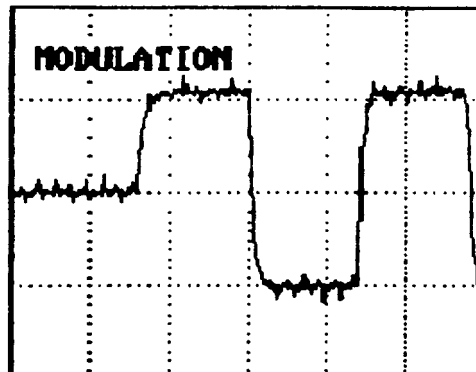
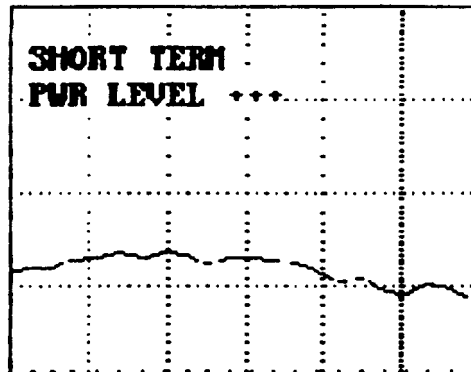
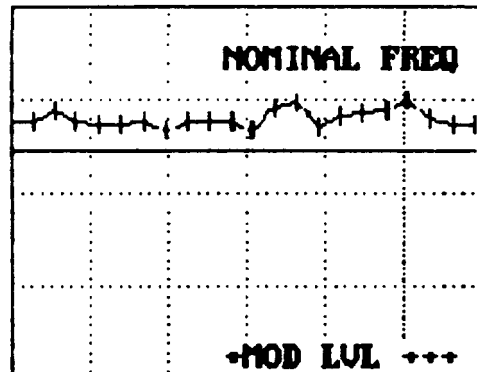
PASSED

233.4 Hz

PASSED

5.145E-18

PEAKS: +1.378 -1.280 rad



PASSED -2.855E-11

PASSED 9.365E-11

PEAKS: +1.425 -1.533 rad

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>NOMINAL FREQUENCY: 406.02523 MHz</p> <p>POWER OUTPUT: 1.695 Watts<br/>+32.29 dBm</p> <p>POWER STABILITY: 11.62 %</p> <p>POWER RISE TIME: 1050 µsec</p> <p>PEAK VOLTAGE: +1.389 Volts</p> <p>DRIFT SLOPES: 1) -2.38E-01 rad/sec<br/>2) -2.38E-01 rad/sec<br/>3) -2.38E-01 rad/sec</p> <p>MODULATION LEVELS: +1.152 radians<br/>+1.176 -1.124 -1.159 radians<br/>+0.026 OFFSET -0.003 radians</p> <p>MODULATION TIMES: RISE 148 µsec<br/>FALL 150 µsec<br/>SYMMETRY 0.68 %</p> <p>MODULATION BIT RATE: 398.78 Hz</p> <p>BURST TIMES: AVG PERIOD 50.6 sec<br/>CARRIER DURATION 159.6 msec<br/>MESSAGE DURATION 361.2 msec<br/>TOTAL DURATION 520.8 msec</p> <p>PREAMBLE LEAKAGE LEVEL 35.0 dBc<br/>LEAKAGE LENGTH 0.1 msec</p> | <p>HEXADECIMAL MESSAGE</p> <p>2DDC5D8002EFBFF</p> <p>FFFE2F96EE2ED0017DFFC0A6D3583E0FAAB</p> <p>BIT SYNCHRONIZATION..... OK</p> <p>FRAME SYNCHRONIZATION... OK</p> <p>MESSAGE FORMAT..... LONG</p> <p>PROTOCOL FLAG..... STANDARD</p> <p>COUNTRY..... USA</p> <p>SERIALIZED USER..... TEST MODE</p> <p>C/S CERTIFICATE No..... 187</p> <p>SERIAL NUMBER..... 1</p> <p>LATITUDE..... N 127.75</p> <p>LONGITUDE..... E 255.75</p> <p>ERROR CORRECTION CODE 1. OK</p> <p>ENCODED DATA SOURCE..... Internal</p> <p>121.5 MHz HOMING..... No</p> <p>SPARES status..... Not OK</p> <p>LATITUDE OFFSET..... + 0 60</p> <p>LONGITUDE OFFSET..... + 0 60</p> <p>ERROR CORRECTION CODE 2. OK</p> |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

« POWER OUTPUT  
« POWER OUTPUT

SELF-TEST MODE

DATE: 03-08-1999 TIME: 15:49:09

ACR v6.0

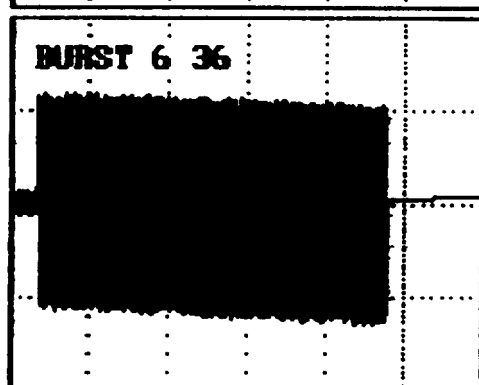
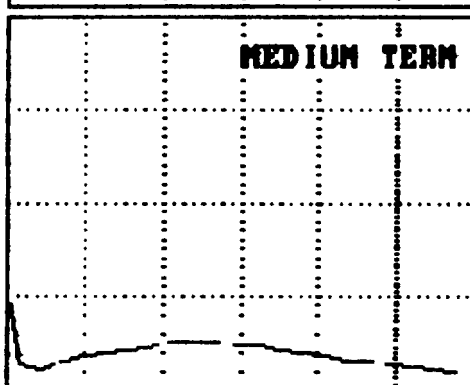
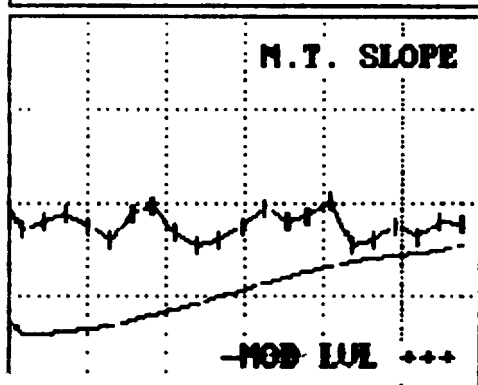
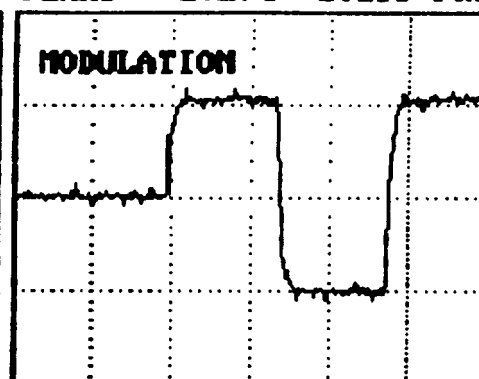
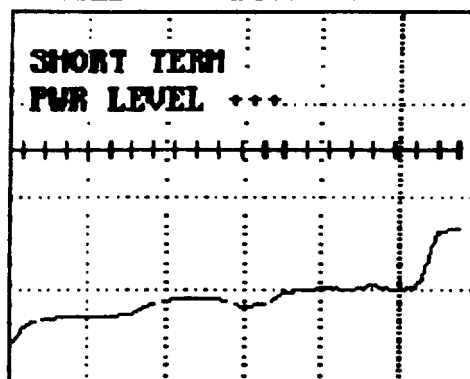
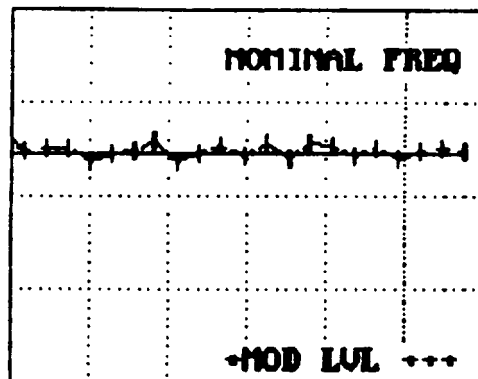
2DDC5D8002EFBFF

-40°C

PASSED

C/S-187-USA-1

PASSED 228.1 Hz PASSED 8.218E-10 PEAKS: +1.274 -1.199 rad



PASSED -2.668E-10 PASSED 1.898E-10 PEAKS: +1.323 -1.417 rad

NOMINAL FREQUENCY: 406.02522 MHz  
 POWER OUTPUT: 6.169 Watts  
 +37.90 dBm  
 POWER STABILITY: 11.42 %  
 POWER RISE TIME: 840 µsec  
 V VOLTAGE: +2.640 Volts  
 LEFT SLOPES: 1) -2.25E-01 rad/sec  
 2) -2.25E-01 rad/sec  
 3) -2.25E-01 rad/sec  
 MODULATION LEVELS: +1.135 radians  
 +1.155 -1.111 -1.143 radians  
 +0.022 OFFSET -0.004 radians  
 MODULATION TIMES: RISE 150 µsec  
 FALL 148 µsec  
 SYMMETRY 0.36 %  
 MODULATION BIT RATE: 398.69 Hz  
 BURST TIMES: AVG PERIOD 49.3 sec  
 CARRIER DURATION 160.1 msec  
 MESSAGE DURATION 280.9 msec  
 TOTAL DURATION 441.0 msec  
 PREAMBLE LEAKAGE LEVEL 35.0 dBc  
 LEAKAGE LENGTH 0.3 msec

## HEXADECIMAL MESSAGE

2DDC5D8002FFBFF  
 FFFED096EE2ED0017FDFFC0A6D35  
 BIT SYNCHRONIZATION..... OK  
 FRAME SYNCHRONIZATION... NOT OK  
 MESSAGE FORMAT..... LONG  
 PROTOCOL FLAG..... STANDARD  
 COUNTRY..... USA  
 SERIALIZED USER..... TEST MODE  
 C/S CERTIFICATE No..... 187  
 SERIAL NUMBER..... 1  
 LATITUDE..... N 127.75  
 LONGITUDE..... E 255.75  
 ERROR CORRECTION CODE 1. OK  
 ENCODED DATA SOURCE..... Internal  
 121.5 MHz HOMING..... No  
 SPARES status..... Not OK  
 LATITUDE OFFSET..... - 0 0  
 LONGITUDE OFFSET..... - 0 0  
 ERROR CORRECTION CODE 2. NOT OK

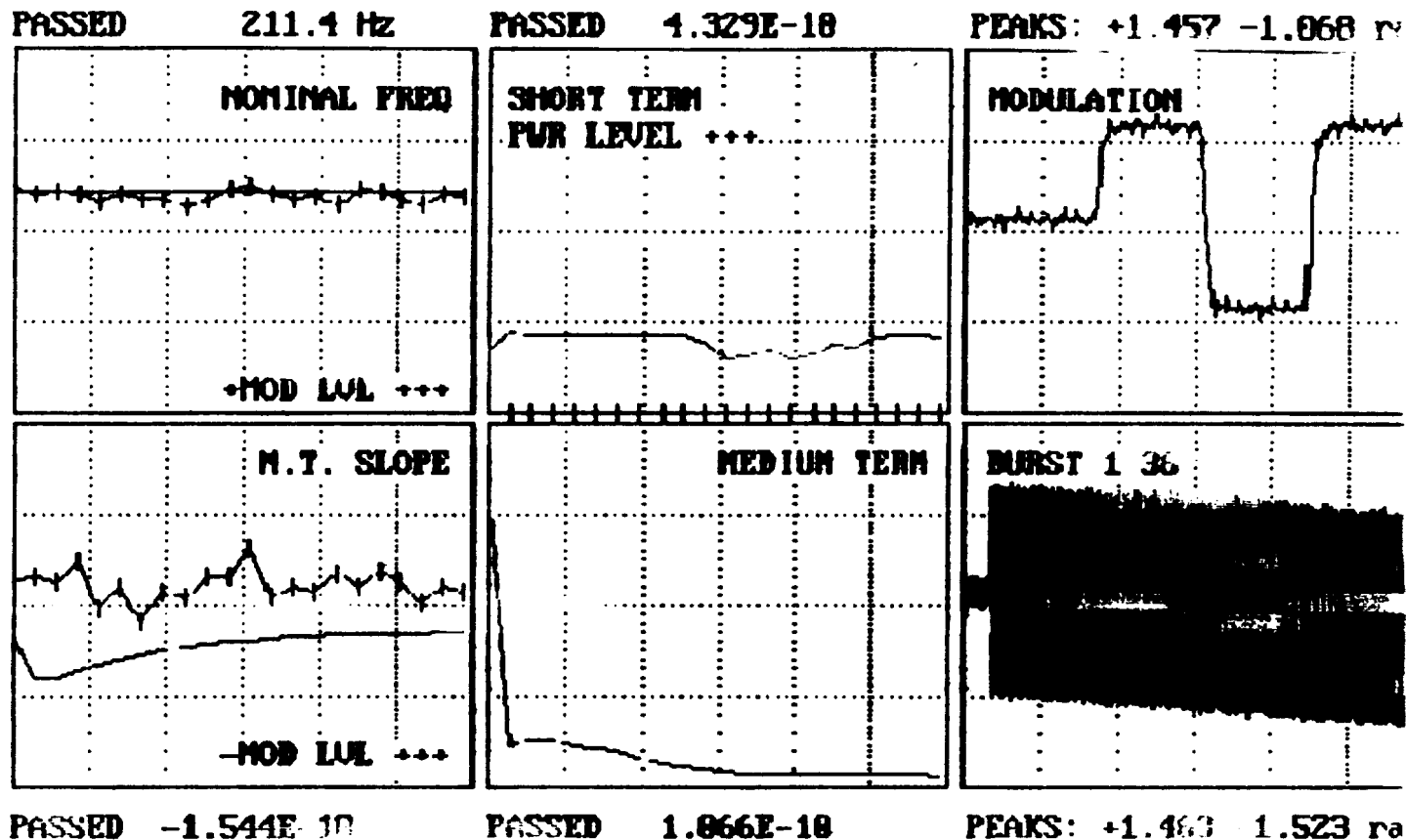
E-TO / USUR @ 405 MHz Output Room Temp.

DATE: 03-04-1999 TIME: 12:14:03

ACR v6.

2DDC5D8002EFBFF  
C/S-187-USA-1

FAILED



|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>NOMINAL FREQUENCY: 406.02520 MHz</p> <p>POWER OUTPUT: 1.904 Watts<br/>+32.80 dBm</p> <p>POWER STABILITY: 9.61 %</p> <p>POWER RISE TIME: 1020 µsec</p> <p>VOLTAGE: +1.474 Volts</p> <p>DRIFT SLOPES: 1) +5.77E-02 rad/sec<br/>2) +5.77E-02 rad/sec<br/>3) +5.77E-02 rad/sec</p> <p>MODULATION LEVELS: +1.111 radians<br/>+1.137 -1.084 -1.119 radians<br/>+0.027 OFFSET -0.004 radians</p> <p>MODULATION TIMES: RISE 150 µsec<br/>FALL 153 µsec</p> <p>SYMMETRY 0.29 %</p> <p>MODULATION BIT RATE: 398.76 Hz</p> <p>BURST TIMES: AVG PERIOD 50.5 sec<br/>CARRIER DURATION 159.7 msec<br/>MESSAGE DURATION 361.1 msec<br/>TOTAL DURATION 520.8 msec</p> <p>PREAMBLE LEAKAGE LEVEL 35.0 dBc</p> <p>LENGTH 0.1 msec</p> | <p>HEXADECIMAL MESSAGE</p> <p>2DDC5D8002FFBFF</p> <p>FFFE2F96EE2ED0017FDFFD0A6D3583E0FAA8</p> <p>BIT SYNCHRONIZATION.... OK</p> <p>FRAME SYNCHRONIZATION... OK</p> <p>MESSAGE FORMAT..... LONG</p> <p>PROTOCOL FLAG..... STANDARD</p> <p>COUNTRY..... USA</p> <p>SERIALIZED USER..... TEST MODE</p> <p>C/S CERTIFICATE No..... 187</p> <p>SERIAL NUMBER..... 1</p> <p>LATITUDE..... N 127.75</p> <p>LONGITUDE..... E 120.75</p> <p>ERROR CORRECTION CODE 1. OK</p> <p>ENCODED DATA SOURCE..... Internal</p> <p>121.5 MHz HOMING..... No</p> <p>SPARES status..... Not OK</p> <p>LATITUDE OFFSET..... + 0 60</p> <p>LONGITUDE OFFSET..... + 0 60</p> <p>ERROR CORRECTION CODE 2. OK</p> |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

« POWER OUTPUT  
« POWER OUTPUT

DATE: 03-04-1999 TIME: 1:01:01

SELF TEST MODE

ROOM TEMP

ACR v6.0

2DDC5D8002FFBFF

C/S 187-USA-1

PASSED

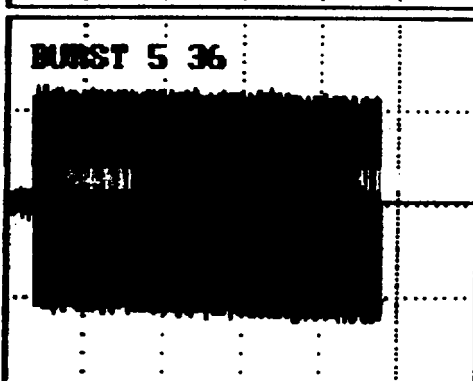
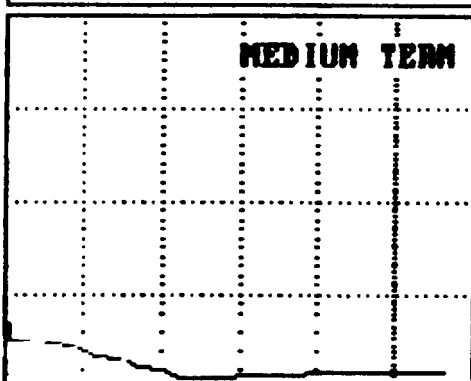
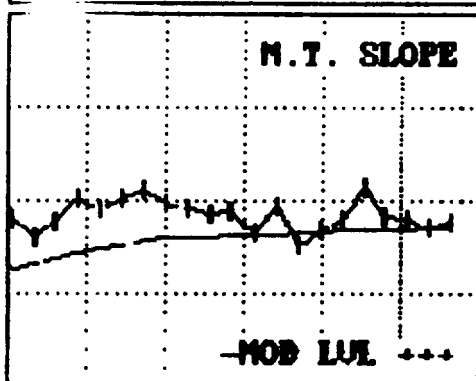
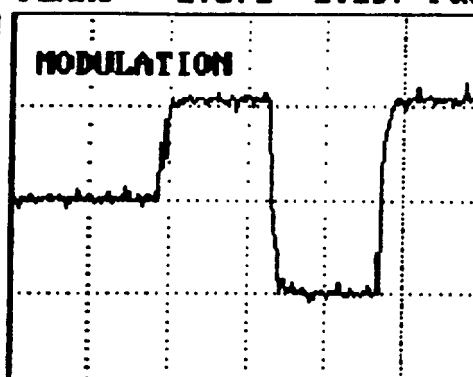
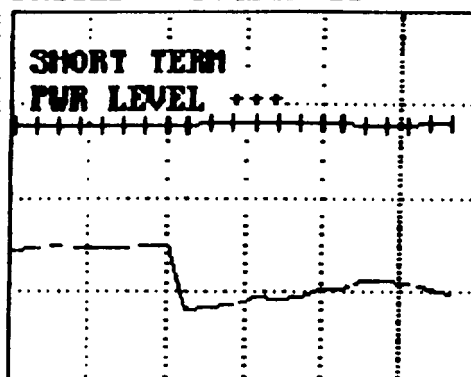
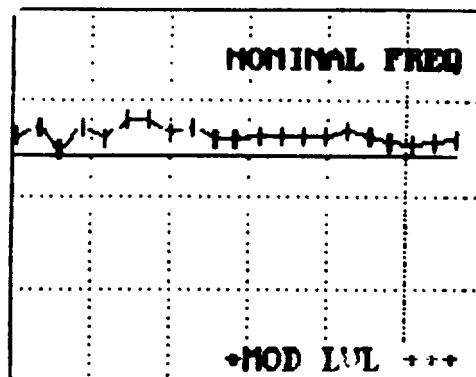
PASSED

212.0 Hz

PASSED

5.426E-10

PEAKS: +1.371 -1.197 rad



PASSED -1.588E-10

PASSED 1.364E-10

PEAKS: +1.395 -1.398 rad

NOMINAL FREQUENCY: 406.02521 MHz  
 POWER OUTPUT: 6.979 Watts  
 +38.44 dBm  
 POWER STABILITY: 10.55 %  
 POWER RISE TIME: 920 µsec  
 PEAK VOLTAGE: +2.813 Volts  
 FT SLOPES: 1) -5.68E-02 rad/sec  
 2) -5.68E-02 rad/sec  
 3) -5.68E-02 rad/sec  
 MODULATION LEVELS: +1.139 radians  
 +1.166 -1.109 -1.148 radians  
 +0.029 OFFSET 0.004 radians  
 MODULATION TIMES: RISE 156 µsec  
 FALL 160 µsec  
 SYMMETRY 0.77 %  
 MODULATION BIT RATE: 398.72 Hz  
 BURST TIMES: AVG PERIOD 48.3 sec  
 CARRIER DURATION 160.0 msec  
 MESSAGE DURATION 280.9 msec  
 TOTAL DURATION 440.9 msec  
 PREAMBLE LEAKAGE LEVEL 35.0 dBc  
 LEAKAGE LENGTH 0.2 msec

## HEXADECIMAL MESSAGE

2DDC5D8002FFBFF  
 FFFED096EE2ED0017FDFFD0A6D35  
 BIT SYNCHRONIZATION..... OK  
 FRAME SYNCHRONIZATION... NOT OK  
 MESSAGE FORMAT..... LONG  
 PROTOCOL FLAG..... STANDARD  
 COUNTRY..... USA  
 SERIALIZED USER..... TEST MODE  
 C/S CERTIFICATE No..... 187  
 SERIAL NUMBER..... 1  
 LATITUDE..... N 127.75  
 LONGITUDE..... E 255.75  
 ERROR CORRECTION CODE 1. OK  
 ENCODED DATA SOURCE..... Internal  
 121.5 MHz HOMING..... No  
 SPARES status..... Not OK  
 LATITUDE OFFSET..... - 0 0  
 LONGITUDE OFFSET..... - 0 0  
 ERROR CORRECTION CODE 2. NOT OK

+55°C

DATE: 03-04-1999 TIME: 17:04:21

ACR v6.

2DDC5D8002EFBFF  
C/S-187-USA-1

PASSED

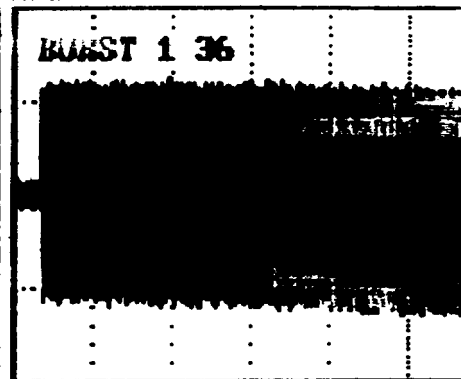
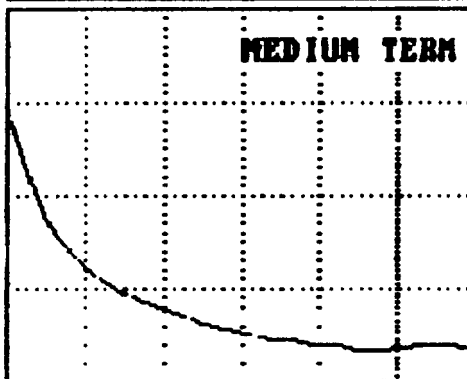
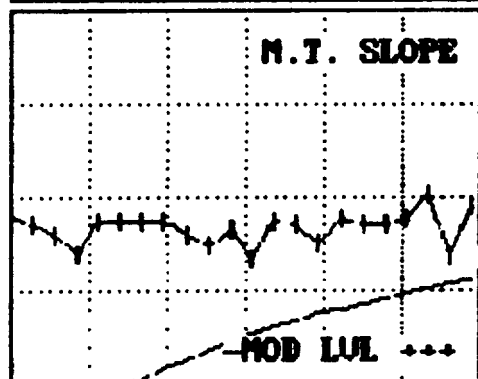
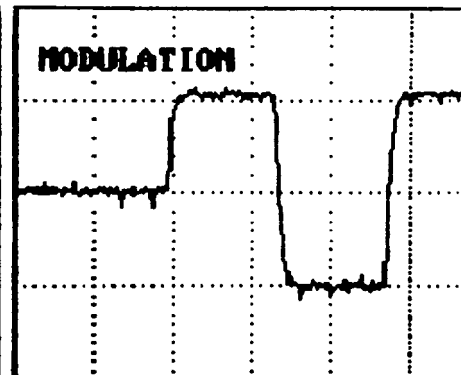
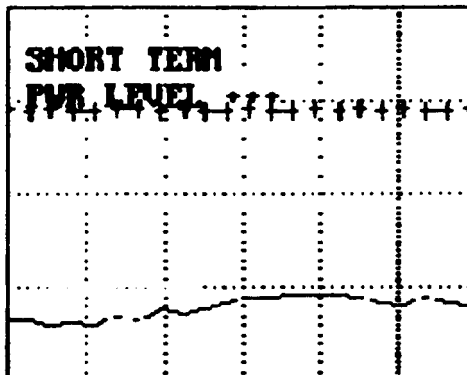
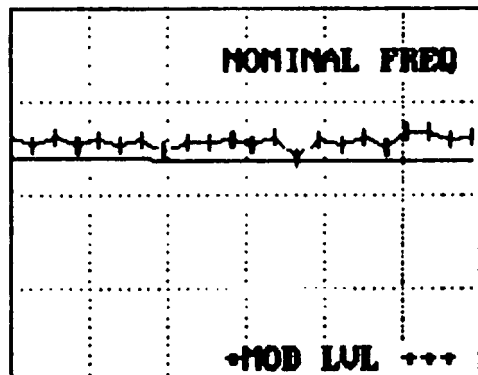
PASSED

101.4 Hz

PASSED

4.44E-18

PEAKS: +1.271 -1.247 rad



PASSED -5.180E-10

PASSED 3.863E-18

PEAKS: +1.378 -1.419 rad

NOMINAL FREQUENCY: 406.02519 MHz

OUTPUT: 7.344 Watts

+38.66 dBm

POWER STABILITY: 8.98 %

POWER RISE TIME: 940 µsec

PEAK VOLTAGE: +2.883 Volts

DRIFT SLOPES: 1) -1.11E-01 rad/sec

2) -1.11E-01 rad/sec

3) -1.11E-01 rad/sec

MODULATION LEVELS: +1.148 radians

+1.157 -1.134 -1.154 radians

+0.011 OFFSET -0.003 radians

MODULATION TIMES: RISE 152 µsec

FALL 150 µsec

SYMMETRY 0.18 %

MODULATION BIT RATE: 398.71 Hz

PULSE TIMES: AVG PERIOD 50.5 µsec

CARRIER DURATION 160.0 µsec

MESSAGE DURATION 361.1 µsec

TOTAL DURATION 521.1 µsec

PREAMBLE LEAKAGE LEVEL 35.0 dBc

PEAK LENGTH 0.2 µsec

HEXADECIMAL MESSAGE

2DDC5D8002EFBFF

FFFE2F96EE2ED0017FDFFD0A6D3383E0FAA8

BIT SYNCHRONIZATION..... OK

FRAME SYNCHRONIZATION... OK

MESSAGE FORMAT..... LONG

PROTOCOL FLAG..... STANDARD

COUNTRY..... USA

SERIALIZED USER..... TEST MODE

C/S CERTIFICATE No..... 187

SERIAL NUMBER..... 1

LATITUDE..... N 127.75

LONGITUDE..... E 255.75

ERROR CORRECTION CODE 1. OK

ENCODED DATA SOURCE..... Internal

121.5 MHz HOMING..... No

SPARES status..... Not OK

LATITUDE OFFSET..... + 0 60

LONGITUDE OFFSET..... + 0 60

ERROR CORRECTION CODE 2. OK

3 TO 1 VSWR @ 406 MHz OUTPUT +55°C

DATE: 03-05-1999 TIME: 10:35:21

ACR v6.0

2DDC5D8002EFBFF  
C/S-187-USA-1

FAILED

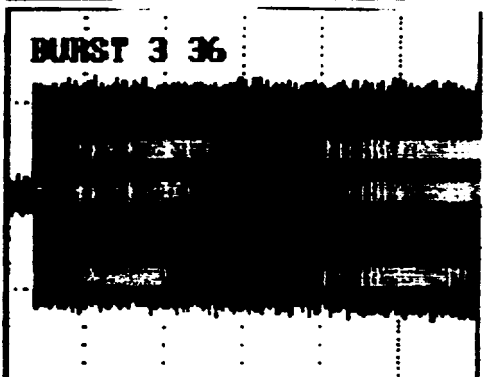
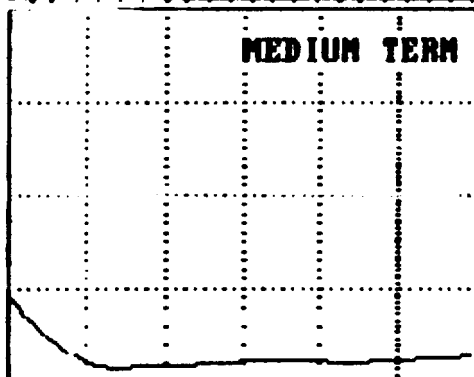
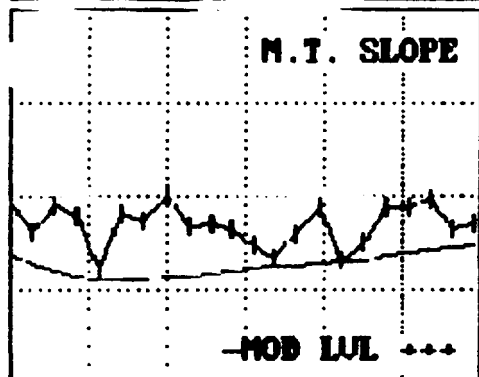
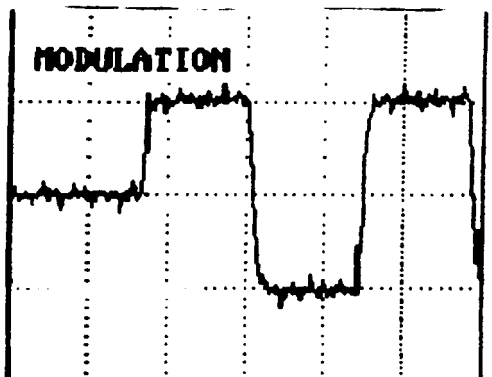
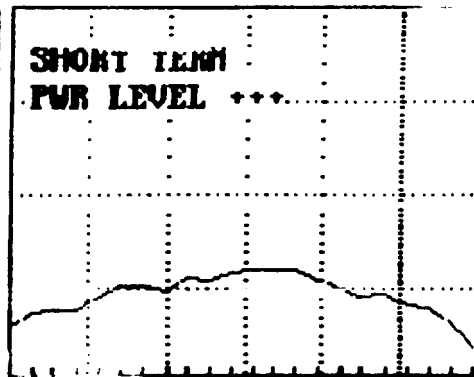
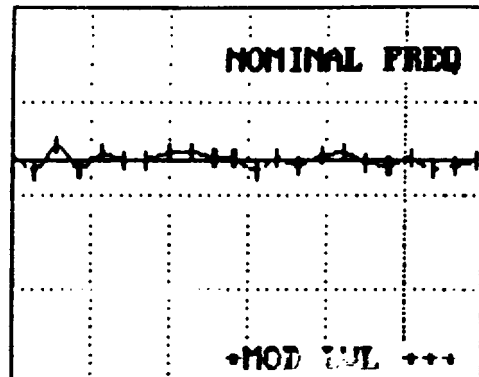
PASSED

185.1 Hz

PASSED

4.125E-10

PEAKS: +1.324 -1.319 rad



PASSED -2.993E-10

PASSED 2.131E-10

PEAKS: +1.481 -1.473 rad

NOMINAL FREQUENCY: 406.02518 MHz  
POWER OUTPUT: 1.978 Watts  
+32.96 dBm  
POWER STABILITY: 10.31 %  
POWER RISE TIME: 1060 µsec  
PEAK VOLTAGE: +1.508 Volts  
DRIFT SLOPES: 1) -1.57E-01 rad/sec  
2) -1.57E-01 rad/sec  
3) -1.57E-01 rad/sec  
MODULATION LEVELS: +1.139 radians  
+1.135 -1.134 -1.145 radians  
+0.000 OFFSET -0.003 radians  
MODULATION TIMES: RISE 149 µsec  
SYMMETRY 0.50 %  
MODULATION BIT RATE: 398.75 Hz  
BURST TIMES: AVG PERIOD 50.7 sec  
CARRIER DURATION 100.6 msec  
MESSAGE DURATION 361.1 msec  
TOTAL DURATION 520.8 msec  
PREAMBLE LEAKAGE LEVEL 35.0 dBc  
LEAKAGE LENGTH 0.1 msec

#### HEXADECIMAL MESSAGE

2DDC5D8002EFBFF  
FFFE2F96EE2ED0017FDFFD0A6D3583E0FAA8  
FRAME SYNCHRONIZATION... OK  
MESSAGE FORMAT..... LONG  
PROTOCOL FLAG..... STANDARD  
COUNTRY..... USA  
SERIALIZED USER..... TEST MODE  
C/S CERTIFICATE No..... 187  
SERIAL NUMBER..... 1  
LATITUDE..... N 127.75  
LONGITUDE..... E 255.75  
ERROR CORRECTION CODE 1. OK  
ENCODED DATA SOURCE..... Internal  
121.5 MHz HOMING..... No  
SPARES status..... Not OK  
LATITUDE OFFSET..... + 0 60  
LONGITUDE OFFSET..... + 0 60  
ERROR CORRECTION CODE 2. OK

« POWER OUTPUT  
« POWER OUTPUT

03-05-1999 TIME: 14:25:47

SELF-TEST MODE

ACR v6.0

+55°C

2DDC5D8002FFBFF  
C/S-187-USA-1

PASSED

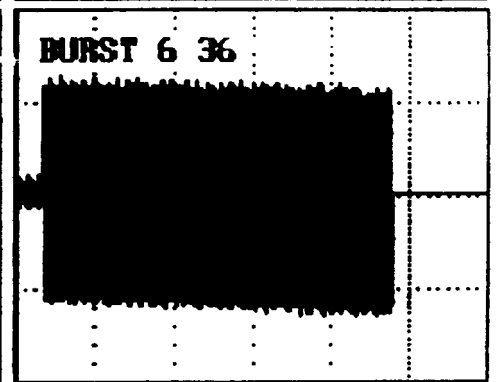
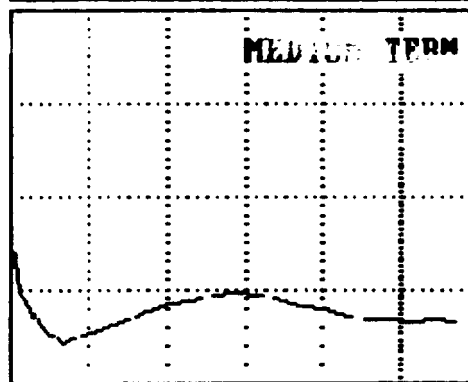
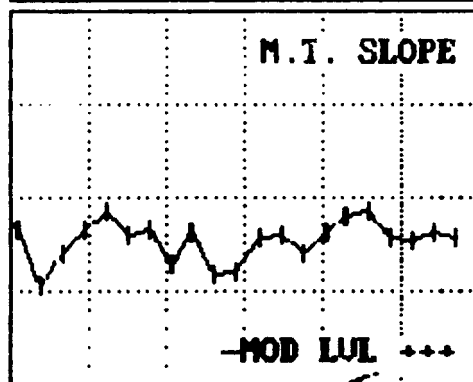
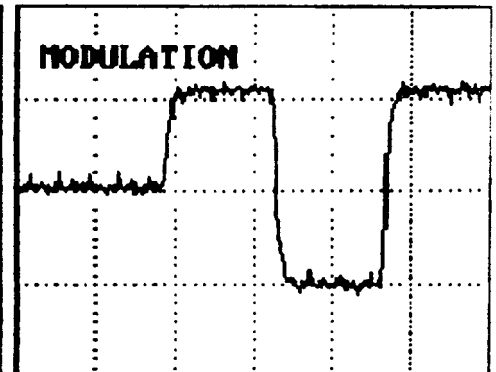
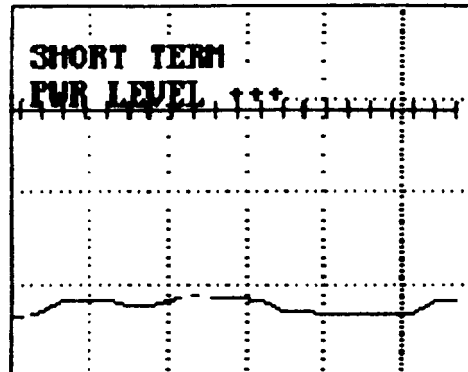
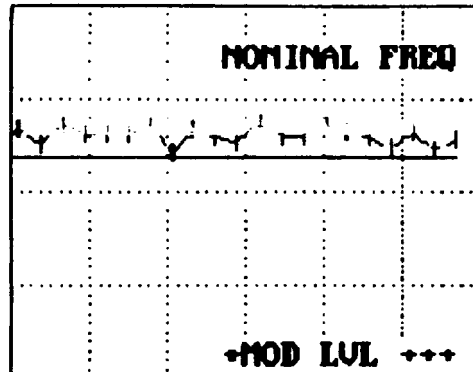
PASSED

187.1 Hz

PASSED

4.158E-10

PEAKS: +1.382 -1.212 rad



PASSED -8.483E-10

PASSED 5.133E-10

PEAKS: +1.411 -1.428 rad

NOMINAL FREQUENCY: 406.02518 MHz  
POWER OUTPUT: 7.248 Watts  
+38.60 dBm  
POWER STABILITY: 8.46 %  
POWER RISE TIME: 880 µsec  
PEAK VOLTAGE: +2.874 Volts  
DRIFT SLOPES: 1) -5.08E-02 rad/sec  
2) -5.08E-02 rad/sec  
3) -5.08E-02 rad/sec  
MODULATION LEVELS: +1.150 radians  
+1.167 -1.135 -1.158 radians  
+0.016 OFFSET -0.004  
MODULATION TIMES: RISE 149 µsec  
FALL 148 µsec  
SYMMETRY 0.71 %  
MODULATION BIT RATE: 398.78 Hz  
BURST TIMES: AVG PERIOD 48.8 sec  
CARRIER TIME 160.0 msec  
MESSAGE DURATION 280.9 msec  
TOTAL DURATION 440.9 msec  
PREAMBLE LEAKAGE LEVEL 35.0 dBc  
LEAKAGE LENGTH 0.3 msec

# HEXADECIMAL MESSAGE

2DDC5D8002FFBFF

FFFE096EE2ED0017DFFC0A6D35

BIT SYNCHRONIZATION..... OK  
FRAME SYNCHRONIZATION... NOT OK  
MESSAGE FORMAT..... LONG  
PROTOCOL FLAG..... STANDARD  
COUNTRY..... USA  
SERIALIZED USER..... TEST MODE  
C/S CERTIFICATE No..... 187  
SERIAL NUMBER..... 1  
LATITUDE..... N 127.75  
LONGITUDE..... E 255.75  
ERROR CORRECTION CODE 1. OK  
ENCODED DATA SOURCE..... Internal  
121.5 MHz HOMING..... No  
SPARES status..... Not OK  
LATITUDE OFFSET..... - 0 0  
LONGITUDE OFFSET..... - 0 0  
ERROR CORRECTION CODE 2. NOT OK

FILE-33-FW1

| SUMMARY OF BEACON TEST RESULTS                                                                             |                           |         |              | page 3   |
|------------------------------------------------------------------------------------------------------------|---------------------------|---------|--------------|----------|
| PARAMETERS TO BE MEASURED<br>DURING TESTS                                                                  | RANGE OF<br>SPECIFICATION | UNITS   | TEST RESULTS | COMMENTS |
|                                                                                                            |                           |         | LiSO2        |          |
| <b>9 THERMAL SHOCK**</b>                                                                                   |                           |         |              |          |
| Soak temperature                                                                                           |                           |         |              |          |
| Measurement temperature                                                                                    |                           |         |              |          |
| Transmitted frequency:                                                                                     |                           |         |              |          |
| nominal value                                                                                              | 406.023/406.027           | MHz     |              |          |
| short term stability                                                                                       | < .002 ppm                | /100 ms |              |          |
| medium term stability                                                                                      |                           |         |              |          |
| slope                                                                                                      | < .001 ppm                | /minute |              |          |
| residual frequency variation                                                                               | < .003 ppm                |         |              |          |
| Transmitted power output                                                                                   | 35 to 39                  | dBm     |              |          |
| Digital message                                                                                            | must be correct           |         |              |          |
| <b>10 OPERATING LIFE, MIN TEMP**</b>                                                                       |                           |         |              |          |
| Duration                                                                                                   | > 48                      | hours   |              |          |
| Transmitted frequency:                                                                                     |                           |         |              |          |
| nominal value                                                                                              | 406.023/406.027           | MHz     |              |          |
| short term stability                                                                                       | < .002 ppm                | /100 ms |              |          |
| medium term stability                                                                                      |                           |         |              |          |
| slope                                                                                                      | < .001 ppm                | /minute |              |          |
| residual frequency variation                                                                               | < .003 ppm                |         |              |          |
| Transmitted power output                                                                                   | 35 to 39                  | dBm     |              |          |
| Digital message                                                                                            | must be correct           |         |              |          |
| <b>11 TEMPERATURE GRADIENT**</b>                                                                           |                           |         |              |          |
| Transmitted frequency:                                                                                     |                           |         |              |          |
| nominal value                                                                                              | 406.023/406.027           | MHz     |              |          |
| short term stability                                                                                       | < .002 ppm                | /100 ms |              |          |
| medium term stability                                                                                      |                           |         |              |          |
| slope                                                                                                      | < .001 ppm                | /minute |              |          |
| residual frequency variation                                                                               | < .003 ppm                |         |              |          |
| Transmitted power output                                                                                   | 35 to 39                  | dBm     |              |          |
| Digital message                                                                                            | must be correct           |         |              |          |
| ** Attach graphs of test results for test numbers 6,9,10 and 11.                                           |                           |         |              |          |
| *** If (T <sub>rmax</sub> - T <sub>rmin</sub> ) < 1 sec, manufacturer must provide tech explanation A3.1.1 |                           |         |              |          |

| SUMMARY OF BEACON TEST RESULTS            |                           |           |              | page 4   |
|-------------------------------------------|---------------------------|-----------|--------------|----------|
| PARAMETERS TO BE MEASURED<br>DURING TESTS | RANGE OF<br>SPECIFICATION | UNITS     | TEST RESULTS | COMMENTS |
| 17. NAVIGATION SYSTEM (EXT)               |                           |           |              |          |
| position data default values              | must be correct           |           |              |          |
| position acquisition time                 | < 30                      | minutes   |              |          |
| delta offset:                             |                           |           |              |          |
| positive direction                        | must be correct           |           |              |          |
| negative direction                        | must be correct           |           |              |          |
| overrange to 4 seconds                    | must be correct           |           |              |          |
| last valid position:                      |                           |           |              |          |
| retained after nav signal lost            | must be correct           |           |              |          |
| cleared when beacon reactivated           | must be correct           |           |              |          |
| GPS interface current drain               |                           | microamps | 18.03        |          |

| A  | B                 | C          | D        | E                 | F                 | G                 | H          | I     | J       | K         | L     | M       | N      | O                     | P       |
|----|-------------------|------------|----------|-------------------|-------------------|-------------------|------------|-------|---------|-----------|-------|---------|--------|-----------------------|---------|
| 1  | cable atten       |            |          | F MHz             | wavelength meters | dipole Gain       | Gain dB    |       |         |           |       |         |        |                       |         |
| 2  | 2.79 dB           | ant factor | 21.37 dB | 406               | 0.7384            |                   |            | 1.27  |         | 1.038     |       |         |        | dipole effective Area |         |
| 3  |                   |            |          |                   |                   |                   |            |       |         |           |       |         |        | 0.055 sq meters       |         |
| 4  |                   |            |          | 10 degrees        |                   | 20 degrees        | 30 degrees |       |         |           |       |         |        | 40 degrees            | 49.15   |
| 5  | 1.5708            |            |          | 0.1745 radians    | 0.3491 radians    | 0.5236 radians    |            |       |         |           |       |         |        | 0.6981 radians        | 0.8578  |
| 6  | Power Transmitted |            |          | 1.0226 ant factor | 1.0938 ant factor | 1.2247 ant factor |            |       |         |           |       |         |        | 1.4396 ant factor     | 1.752   |
| 7  | 39.56 dB          |            |          | 0.1942 dB         | 0.7786 dB         |                   |            |       |         | 1.7609 dB |       |         |        | 3.1648 dB             | 4.8705  |
| 8  |                   |            |          |                   |                   |                   |            |       |         |           |       |         |        |                       |         |
| 9  |                   |            |          |                   |                   |                   |            |       |         |           |       |         |        |                       |         |
| 10 | 10H               | 10V        | 10Total  | 20H               | 20V               | 20Total           | 30H        | 30V   | 30Total | 40H       | 40V   | 40Total | 49H    | 49V                   | 49Total |
| 11 | dBm               | dBm        | dBV/m    | dBm               | dBm               | dBV/m             | dBm        | dBm   | dBV/m   | dBm       | dBm   | dBV/m   | dBm    | dBm                   | dBV/m   |
| 12 | 0                 | -23.9      | 3.3      | 14.652            | -25.4             | 3.1               | 15.034     | -21.2 | 4       | 16.92     | -19.7 | -0.8    | 13.527 | -23.9                 | -8.4    |
| 13 | 30                | -35.4      | 3.3      | 14.645            | -33.9             | 3.5               | 15.429     | -19.7 | 4.4     | 17.322    | -23.1 | -0.7    | 13.642 | -28.1                 | -8.2    |
| 14 | 60                | -31.1      | 3.6      | 14.946            | -26               | 3                 | 14.933     | -17.4 | 4       | 16.932    | -19.5 | -1.1    | 13.257 | -31.4                 | -9.2    |
| 15 | 90                | -31.8      | 3.5      | 14.845            | -30.1             | 3.3               | 15.23      | -17.2 | 4       | 16.933    | -18   | -0.6    | 13.753 | -22.4                 | -8.5    |
| 16 | 120               | -41.9      | 3.2      | 14.544            | -19.2             | 3.3               | 15.249     | -14.1 | 4.4     | 17.352    | -18   | -0.7    | 13.644 | -20.7                 | -8.5    |
| 17 | 150               | -28.3      | 2.7      | 14.048            | -27.7             | 3                 | 14.932     | -16.4 | 4.4     | 17.335    | -19.2 | -0.7    | 13.627 | -26.6                 | -7.5    |
| 18 | 180               | -28.8      | 2.9      | 14.247            | -27.5             | 3.3               | 15.232     | -16.3 | 4.4     | 17.335    | -23.2 | -0.3    | 14.025 | -23.1                 | -7.4    |
| 19 | 210               | -26.4      | 3.3      | 14.649            | -24.5             | 3.2               | 15.135     | -17.9 | 4.3     | 17.228    | -23.5 | -0.3    | 14.038 | -24.5                 | -7.4    |
| 20 | 240               | -26.4      | 3.4      | 14.749            | -32.6             | 3                 | 14.93      | -16.3 | 3.9     | 16.838    | -19.9 | -0.2    | 14.146 | -31.7                 | -7.6    |
| 21 | 270               | -28.2      | 3.5      | 14.847            | -33.4             | 2.9               | 14.829     | -17.3 | 3.9     | 16.833    | -18.5 | -0.3    | 14.048 | -26.5                 | -7.6    |
| 22 | 300               | -29.1      | 3.3      | 14.647            | -24.8             | 3                 | 14.935     | -19.7 | 4.2     | 17.123    | -18.3 | -0.7    | 13.651 | -21.2                 | -7.9    |
| 23 | 330               | -24.4      | 3.3      | 14.651            | -23.3             | 3.3               | 15.237     | -19.1 | 4.5     | 17.424    | -15.6 | -0.3    | 14.076 | -16.9                 | -7.9    |
| 24 |                   |            |          |                   |                   |                   |            |       |         |           |       |         |        |                       |         |
| 25 |                   |            |          |                   |                   |                   |            |       |         |           |       |         |        |                       |         |
| 26 | mW                | dBm        | Gi (dB)  | mW                | dBm               | Gi (dB)           | mW         | dBm   | Gi (dB) | mW        | dBm   | Gi (dB) | mW     | dBm                   | Gi (dB) |
| 27 | 9028.9            | 39.556     | -0.004   | 10827             | 40.345            | 0.7852            | 19680      | 42.94 | 3.3802  | 11517     | 40.61 | 1.0533  | 4091   | 36.12                 | -3.441  |
| 28 | 9013.6            | 39.549     | -0.011   | 11860             | 40.741            | 1.1808            | 21591      | 43.34 | 3.7828  | 11826     | 40.73 | 1.1685  | 4259   | 36.29                 | -3.266  |
| 29 | 9660.1            | 39.85      | 0.2898   | 10580             | 40.245            | 0.6847            | 19735      | 42.95 | 3.3924  | 10823     | 40.34 | 0.7835  | 3379   | 35.29                 | -4.272  |
| 30 | 9439.8            | 39.75      | 0.1896   | 11329             | 40.542            | 0.9818            | 19740      | 42.95 | 3.3934  | 12131     | 40.84 | 1.2789  | 4015   | 36.04                 | -3.524  |
| 31 | 8807.5            | 39.449     | -0.111   | 11378             | 40.56             | 1.0005            | 21738      | 43.37 | 3.8122  | 11832     | 40.73 | 1.1704  | 4040   | 36.06                 | -3.496  |
| 32 | 7855.5            | 38.952     | -0.608   | 10576             | 40.243            | 0.6832            | 21655      | 43.36 | 3.7955  | 11783     | 40.71 | 1.1527  | 5008   | 37                    | -2.564  |
| 33 | 8224.8            | 39.151     | -0.409   | 11332             | 40.543            | 0.9831            | 21658      | 43.36 | 3.7961  | 12915     | 41.11 | 1.551   | 5149   | 37.12                 | -2.443  |
| 34 | 9021.7            | 39.553     | -0.007   | 11082             | 40.446            | 0.8863            | 21130      | 43.25 | 3.6889  | 12953     | 41.12 | 1.5639  | 5136   | 37.11                 | -2.453  |
| 35 | 9231.6            | 39.653     | 0.0928   | 10571             | 40.241            | 0.6811            | 19316      | 42.86 | 3.2991  | 13280     | 41.23 | 1.6718  | 4880   | 36.88                 | -2.675  |

|    | A              | B      | C      | D      | E     | F          | G      | H                 | I     | J      | K     | L     | M      | N    | O     | P      |
|----|----------------|--------|--------|--------|-------|------------|--------|-------------------|-------|--------|-------|-------|--------|------|-------|--------|
| 36 |                | 9443.3 | 39.751 | 0.1912 | 10330 | 40.141     | 0.581  | 19290             | 42.85 | 3.2934 | 12984 | 41.13 | 1.574  | 4895 | 36.9  | -2.663 |
| 37 |                | 9017.4 | 39.551 | -0.009 | 10583 | 40.246     | 0.6861 | 20622             | 43.14 | 3.5833 | 11850 | 40.74 | 1.1772 | 4618 | 36.64 | -2.915 |
| 38 |                | 9027.1 | 39.555 | -0.005 | 11345 | 40.548     | 0.988  | 22101             | 43.44 | 3.8841 | 13069 | 41.16 | 1.6024 | 4736 | 36.75 | -2.806 |
| 39 | Deltas dB      |        |        | 0.8981 |       |            | 0.5998 |                   |       | 0.5907 |       |       | 0.8883 |      |       | 1.8294 |
| 40 |                |        |        |        |       |            |        |                   |       |        |       |       |        |      |       |        |
| 41 | Total Delta dB |        |        | 8.0846 |       | total Max. |        | 43.44             |       |        |       |       |        |      |       |        |
| 42 |                |        |        |        |       | total Min  |        | 35.29             |       |        |       |       |        |      |       |        |
| 43 |                |        |        |        |       |            |        | Total delta - 10% |       |        |       |       |        |      |       |        |
| 44 |                |        |        |        |       |            |        | dB                |       |        |       |       |        |      |       |        |

Page 2

# APPENDIX 7

## INDEPENDENT LAB TEST REPORT (QC METALLURGICAL)

