

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 SERDANE

Visa : 

Quality Control : 8 April 1999

By : Michel BRUNEL

Visa : P. 

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- Mr	Cal. HAVENS	ACR Electronics, Inc.	(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)

INTERSPACE 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.

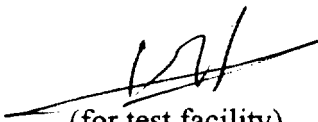
A3.9.5 Since this type of external GPS involves circuits active prior to beacon activation, the Operating Lifetime at Minimum Temperature test (A2.3), must involve testing beacon life time at the battery replacement time. Therefore, the beacon manufacturer should provide the data necessary to discharge 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 SO₂
Manufacturer & model n° : SAFT LO26SX
Size & number of cells : 3 cells, D size

Extra Features in Beacon	No		Yes		Details
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
a) Auxiliary Radio-Locating Device :	<input type="checkbox"/>	<input checked="" type="checkbox"/>			Frequency : 121.5 Power : 17 dBm Tx. Duty Cycle : 37%
b) Transmits Encoded Position Data	<input type="checkbox"/>	<input checked="" type="checkbox"/>			External Nav. Device 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 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 : ≥ 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 DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS			COMMENTS
			T _{min.} -40°C (±3)	T _{amb.} 20°C (±3)	T _{max.} 55°C (±3)	
1 - POWER OUTPUT						
o transmitter power output	35 - 39	dBm	37,7	38,3	38,4	Graphs p, 28, 31 and 34 Graphs pages 21, 22 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	√ *	√	√	√	
2 - DIGITAL MESSAGE						
o bit sync	Bits number 1-15	√	√	√	√	Graphs pages 26, 29 and 32
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	

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PARAMÈTRES TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS			COMMENTS
			T _{min.} -40°C (±3)	T _{amb.} 20°C (±3)	T _{max.} 55°C (±3)	
3 - DIGITAL MESSAGE GENERATOR						
o repetition rate ** :						
minimum T _R =	47,5	seconds	48,5	48,5	48,5	
maximum T _R =	52,5	seconds	52,5	52,5	52,5	
o bit rate						
minimum f _b =	396	bits/sec.	398,82	398,83	398,83	
maximum f _b =	404	bits/sec.	398,85	398,86	398,86	
o total transmission time :						
short message =	435.6 - 444.4	ms	522,05	522,05	522,04	
long message (optional) =	514.8 - 525.2	ms				
o CW preamble						
minimum T _I =	158,4	ms	160,90	160,93	160,92	
maximum T _I =	161,6	ms	160,92	160,94	160,93	
o first burst delay	> 47,5	seconds	51,50	49,50	50,00	

Data and graphs
pages 26 to 34

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

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

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

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PARAMÈTRES TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS	COMMENTS
<p>9 - THERMAL SHOCK ****(30° C change)</p> <ul style="list-style-type: none"> o Soak temperature (5) o Measurement temperature <p>the following parameters are to be met within 15 minutes of beacon and maintained for 2 hours</p> <ul style="list-style-type: none"> o Transmitted frequency : <ul style="list-style-type: none"> - nominal value - short term stability - medium term stability - slope - residual frequency variation o Transmitted power output o Digital message 	<p></p> <p></p> <p></p> <p>406.023 - 406.027 or 406.027 - 406.029***</p> <p>$\leq 2 \times 10^{-9}$</p> <p>$(-1 \text{ to } +1) \times 10^{-9}$ $\leq 3 \times 10^{-9}$</p> <p>35 - 39</p> <p>must be correct</p>	<p>°C</p> <p>°C</p> <p>MHz</p> <p>/100 ms</p> <p>/minute</p> <p>dBm</p> <p>√</p>	<p>Tsoak = 20</p> <p>TMeas = -10</p> <p>406,025214 / 406,025216</p> <p>4,6E-10</p> <p>-2E-10 / 8E-11 9,3E-11</p> <p>38,2 / 38,4</p> <p>√</p>	<p>Data and graphs pages 60 to 64</p>

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Ref. M1469

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

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

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PARAMÈTRES TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS	COMMENTS
17 - NAVIGATION SYSTEM****				
(as applicable)				
o position data default values	must be correct	✓	✓	See data pages 107 to 110
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 beacon degradation due to navigation device, 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 10⁹ 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 DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS			COMMENTS
			T _{min.} -40°C (±3)	T _{amb.} 20°C (±3)	T _{max.} 55°C (±3)	
1 - POWER OUTPUT						
o transmitter power output	35 - 39	dBm		38,4		Graph page 28 Graph page 24
o Power output rise time	< 5	ms		0,82		
o power output 1 ms before burst	must be < -10 dBm	√ *		√		
2 - DIGITAL MESSAGE						
o bit sync	Bits number 1-15	√		√		Graph page 35
o frame sync	16-24	√		√		
o format flag	25	√		0		
o protocol flag	26	√		1		
o identification/position code	27-85	√		√		
o BCH code	86-106	√		√		
o emerg. code/nat. use/supplem. data	107-112	data bits		010000		
o additional data/BCH (if applicable)	113-144	√		N/A		
o position error (if applicable)	< 5	km		N/A		

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PARAMÈTRES TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS			COMMENTS
			T _{min.} -40°C (±3)	T _{amb.} 20°C (±3)	T _{max.} 55°C (±3)	
3 - DIGITAL MESSAGE GENERATOR						
o repetition rate *** :						
minimum T _R =	47,5	seconds		49,5		
maximum T _R =	52,5	seconds		52,5		
o bit rate						
minimum f _b =	396	bits/sec.		398,84		
maximum f _b =	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 ₁ =	158,4	ms		160,91		
maximum T ₁ =	161,6	ms		160,91		
o first burst delay	> 47,5	seconds		50		

Data and graphs
page 35

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

Ref. MI469

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

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Ref: M1469

PARAMÈTRES TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS			COMMENTS
			T _{min.} -40°C (±3)	T _{amb.} 20°C (±3)	T _{max.} 55°C (±3)	
8 - SELF-TEST MODE (if applicable) o frame sync o format flag o single radiated burst o default position data (if applicable) o description provided	9 bits (011010000) 1/0 ≤ 440 /520 (+1%) must be correct	√ bit ms √ √	√ 0 441,79 N/A √		Data pages 57 to 59 Not applicable Manufacturer doc. Annex A	
14 - SATELLITE QUALITATIVE TESTS **** 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 10⁹ 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)

RL 10.00 dBm MKR #1 Δ SWT -1.313 msec

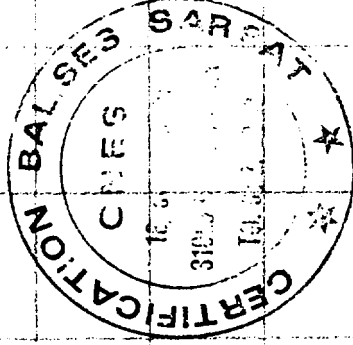
*ATTEN 20 dB -55.26 dB

10.00 dB/DIV

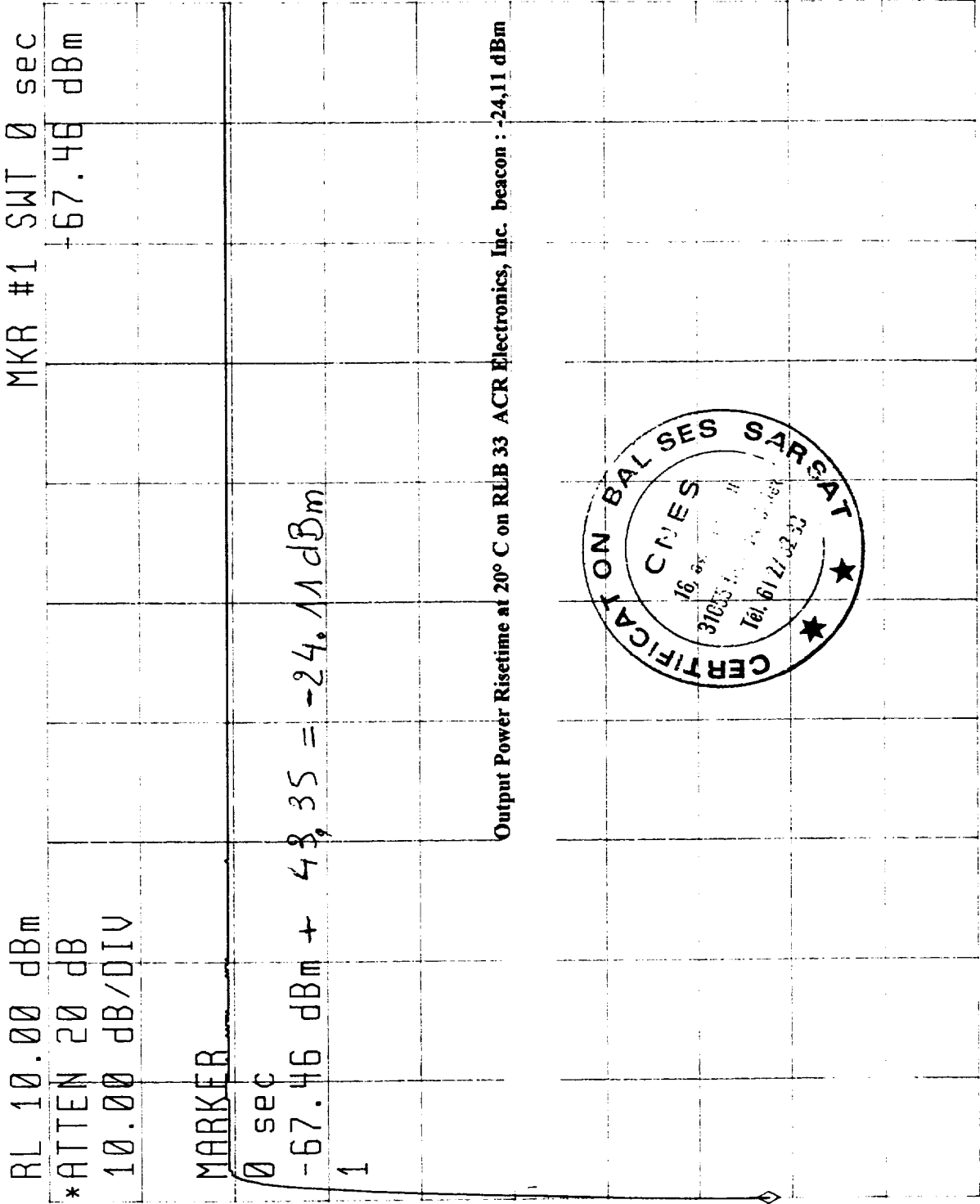
MARKER Δ
-1.313 msec
-65.26 dB + 43.85 = -21.91 dBm

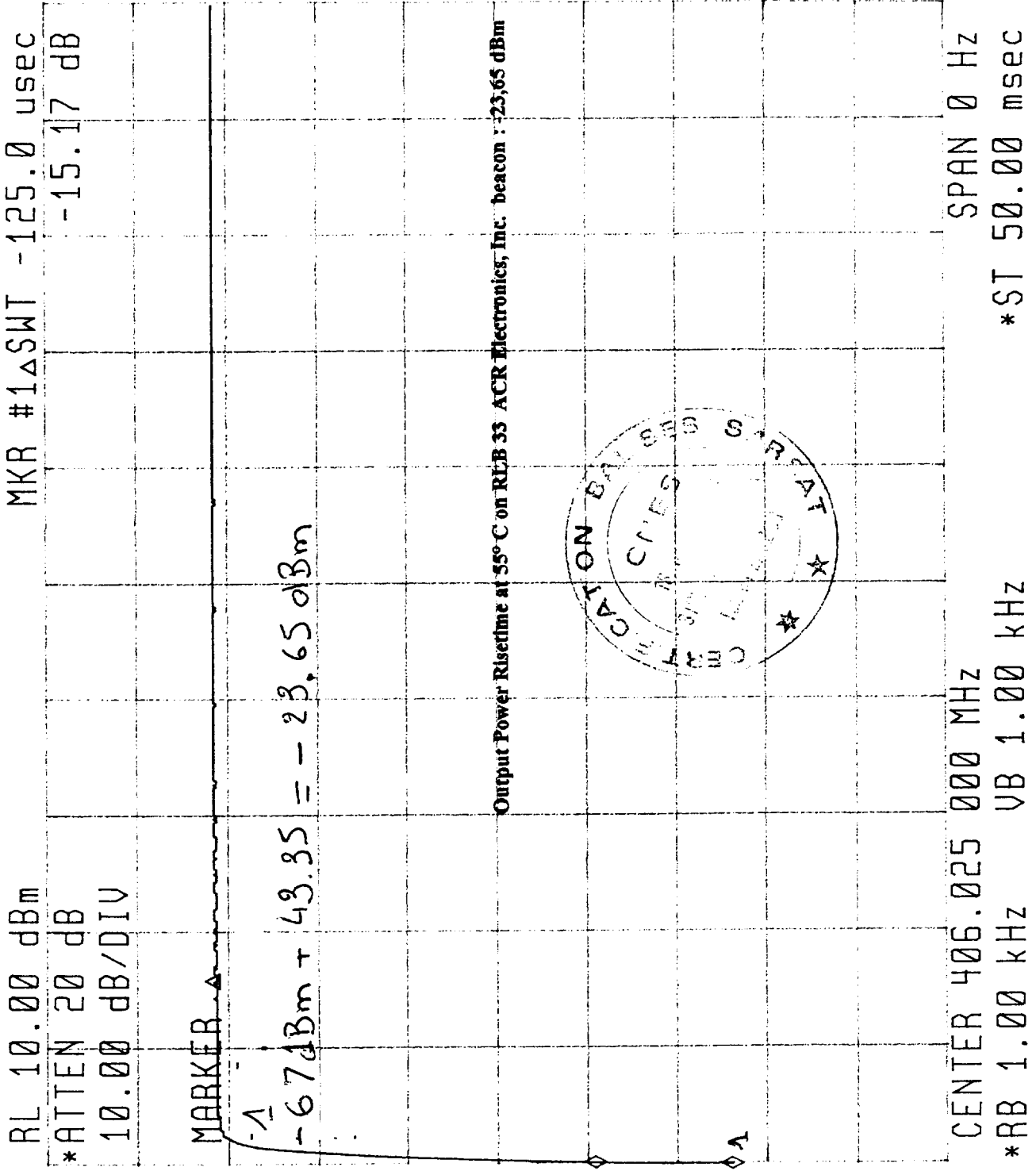
1

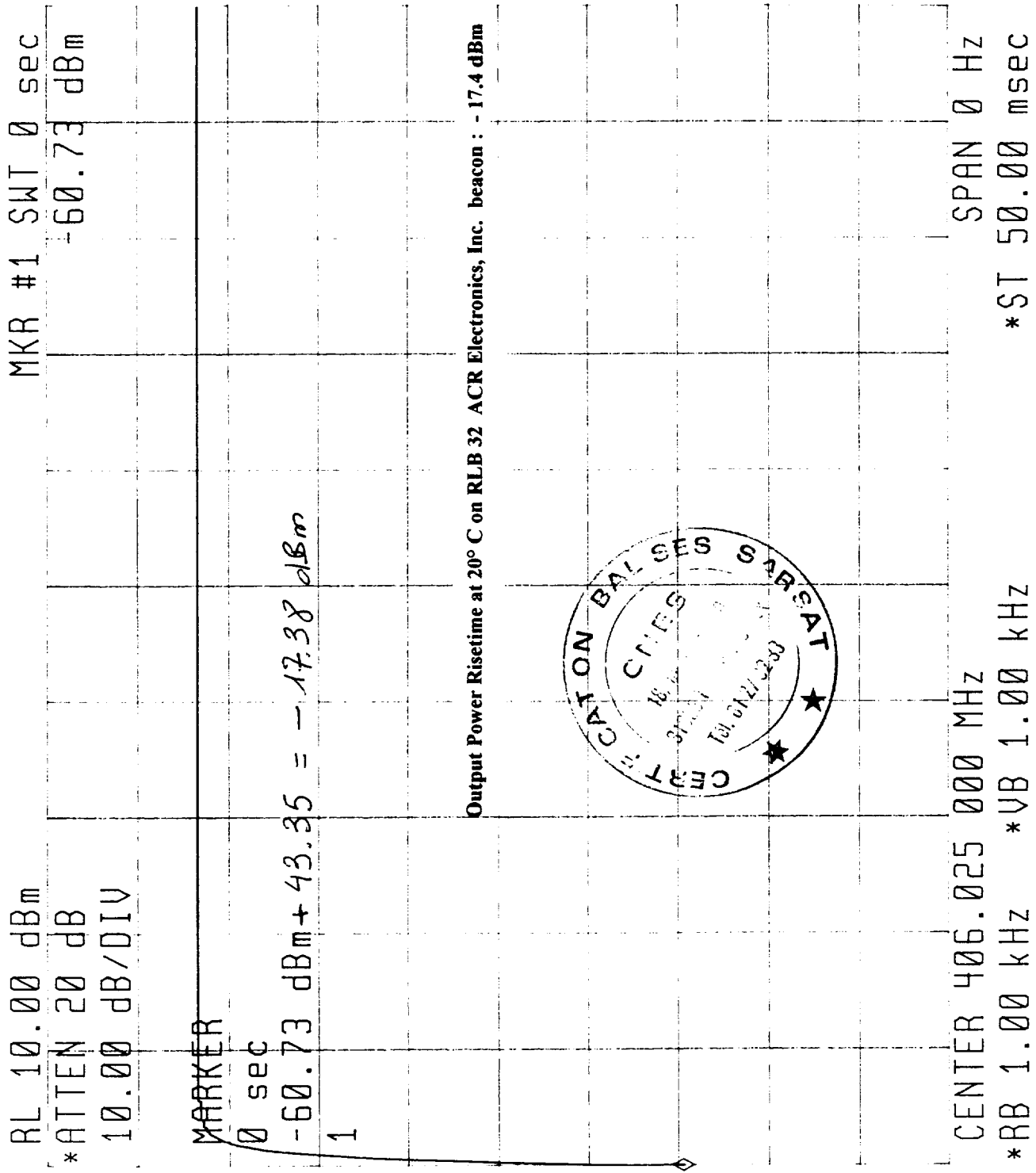
Output Power Risettime at -40° C on RLB 33 ACR Electronics, Inc. beacon : -21,91 dBm



CENTER 406.025 000 MHz SPAN 0 Hz
*RB 1.00 kHz *VB 1.00 kHz *ST 50.00 msec







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

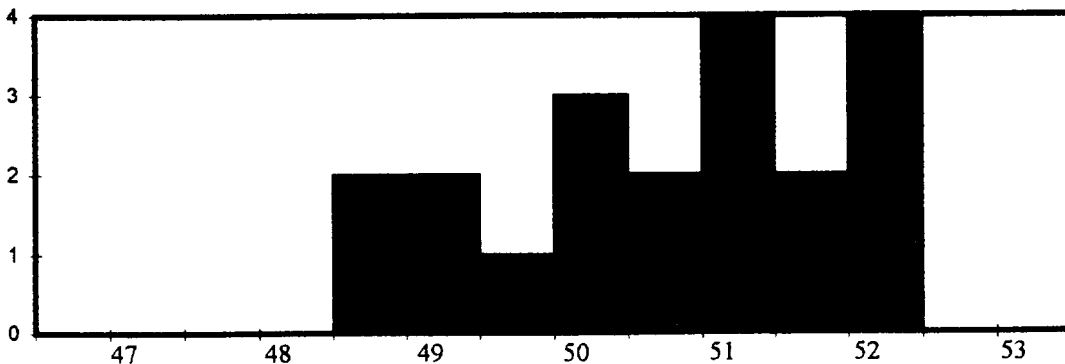
Manufacturer : ACR
 Beacon Type : RLB 33
 Number : 1
 Date of test : 16-mar-99

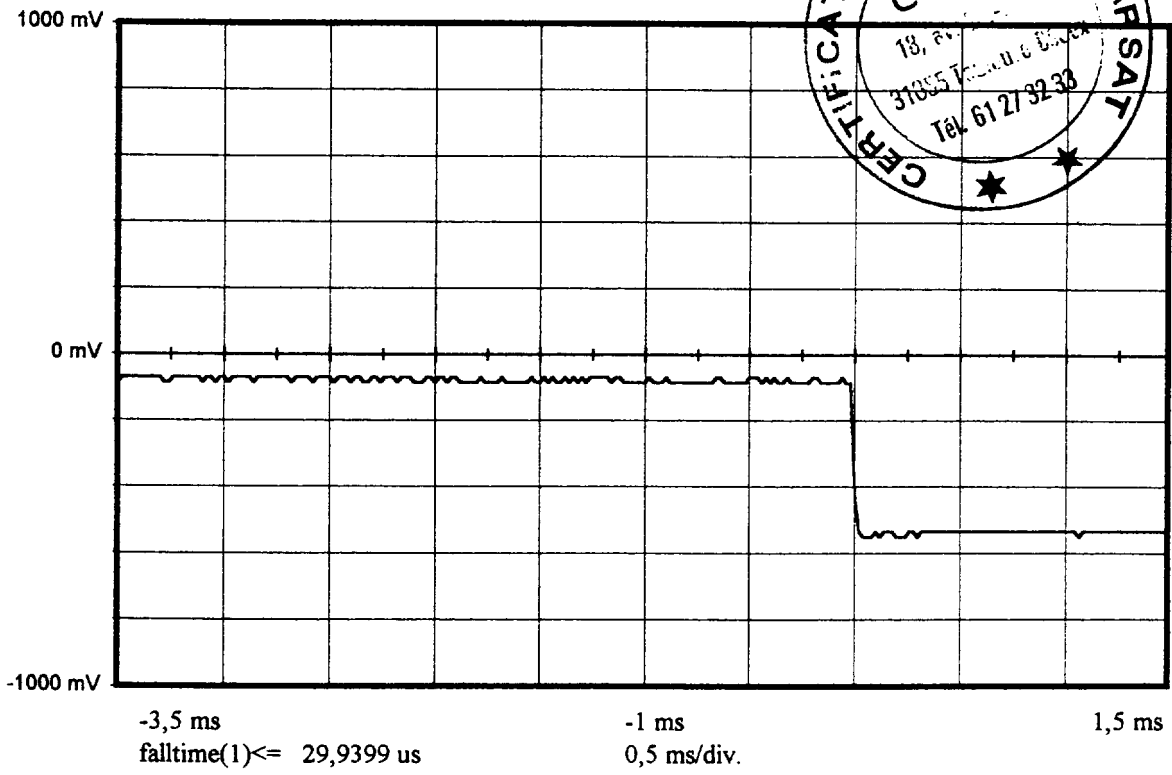
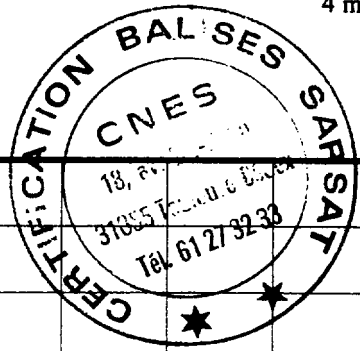
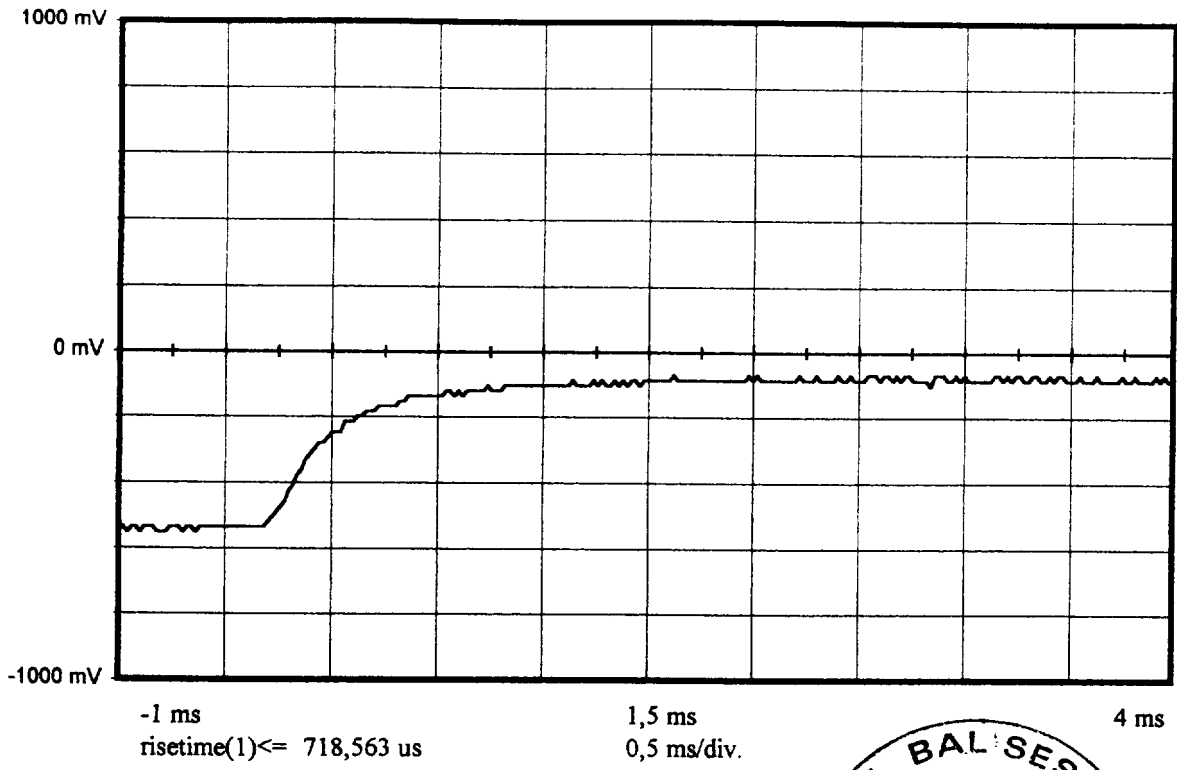
Message

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

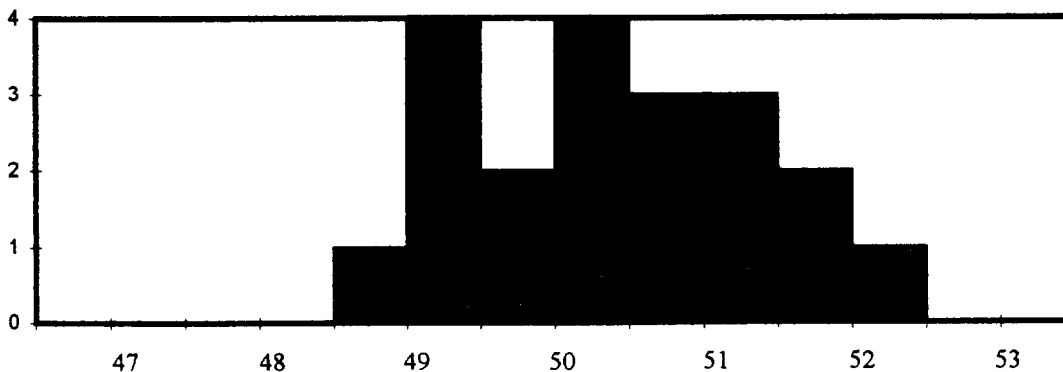
Manufacturer : ACR
 Beacon Type : RLB 33
 Number : 1
 Date of test : 15-mar-1999

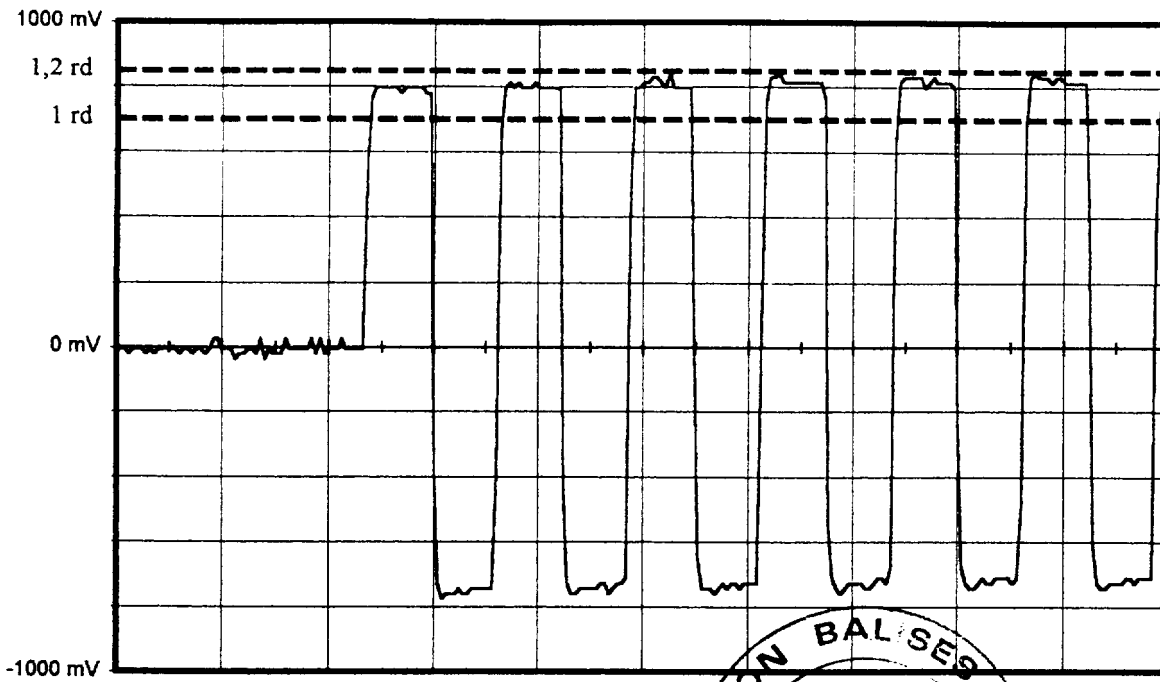
Message

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

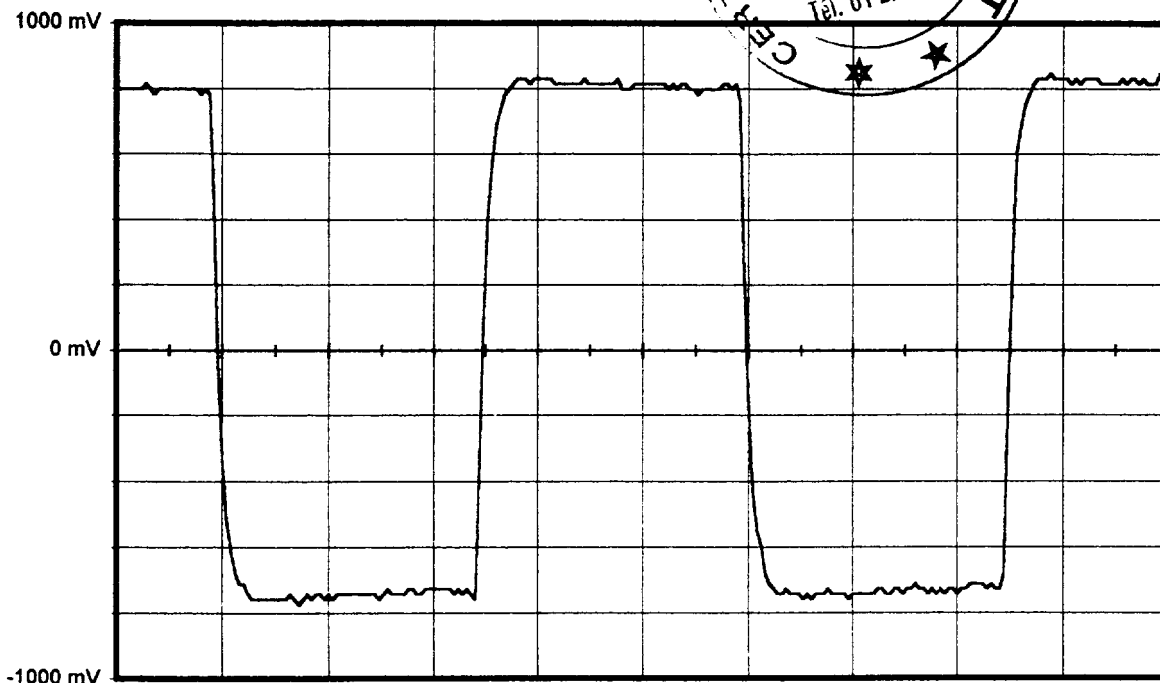
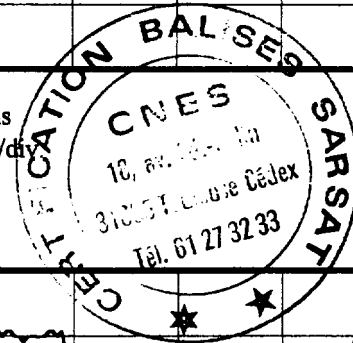




0 ms
 Vmarker1 850 mv => 1,2 rd
 Vmarker2 700 mv => 1 rd

10 ms
 2 ms/div

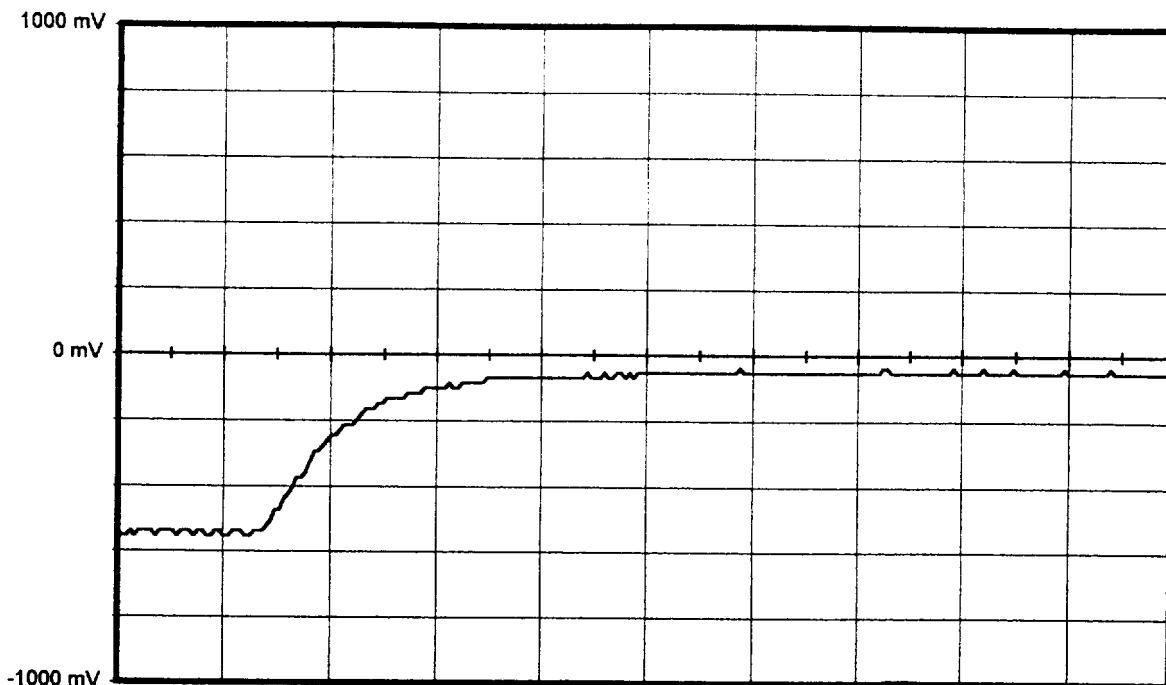
20 ms



8 ms
 Duty Cycle : 0,00398804
 falltime(1) <= 89,8205 us
 +width(1) 1,2475 ms

10,5 ms
 0,5 ms/div.
 risetime(1) <= 89,8205 us
 -width(1) 1,25749 ms

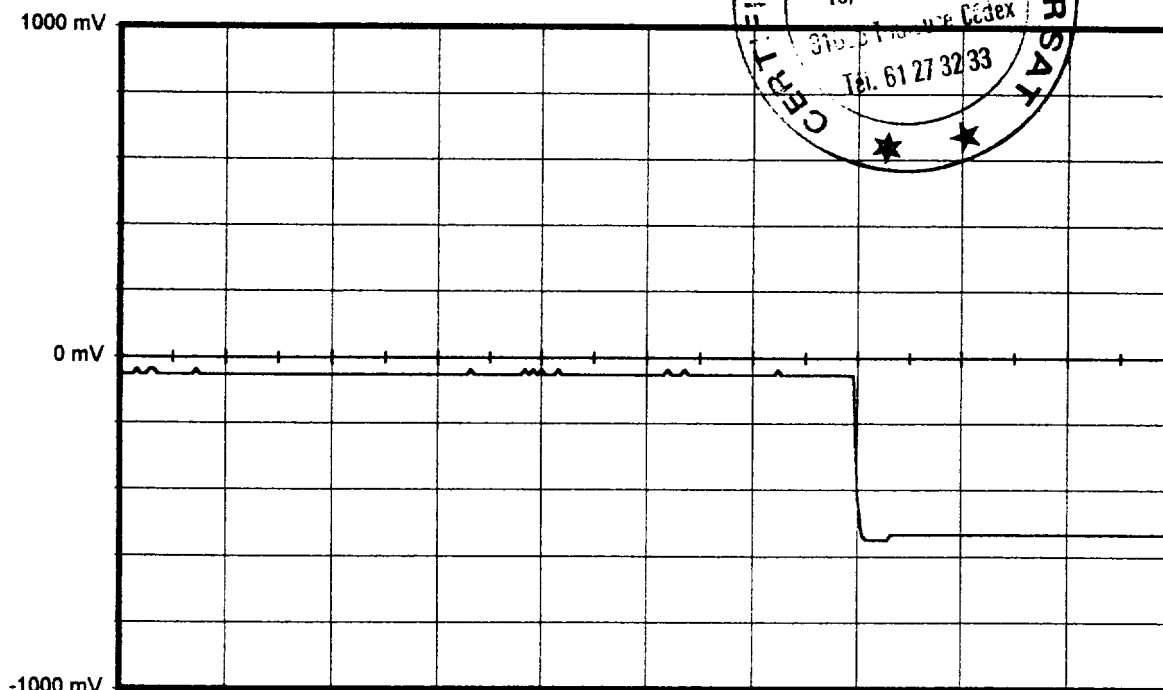
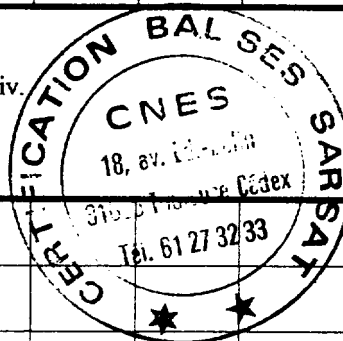
13 ms



-1 ms
risetime(1) <= 748,503 us

1,5 ms
0,5 ms/div.

4 ms



-3,5 ms
falltime(1) <= 29,9399 us

-1 ms
0,5 ms/div.

1,5 ms

Certification Test at 55°C

Manufacturer : ACR

Beacon Type : RLB 33

Number : 1

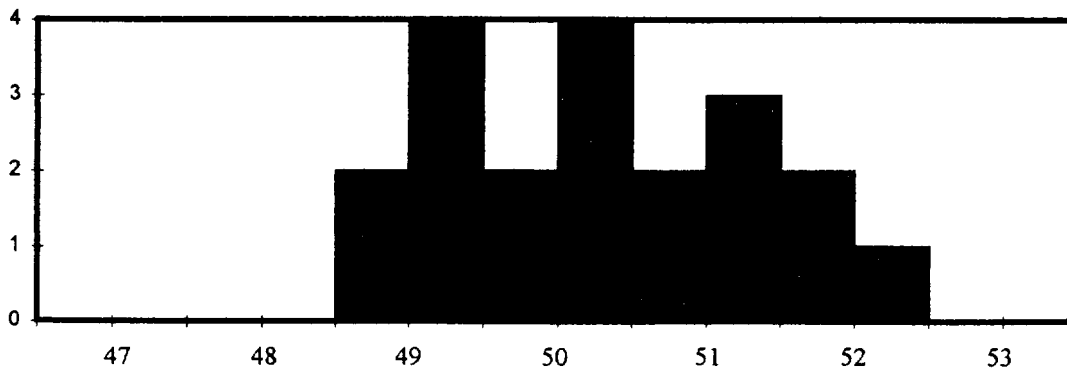
Date of test : 16-mar-1999

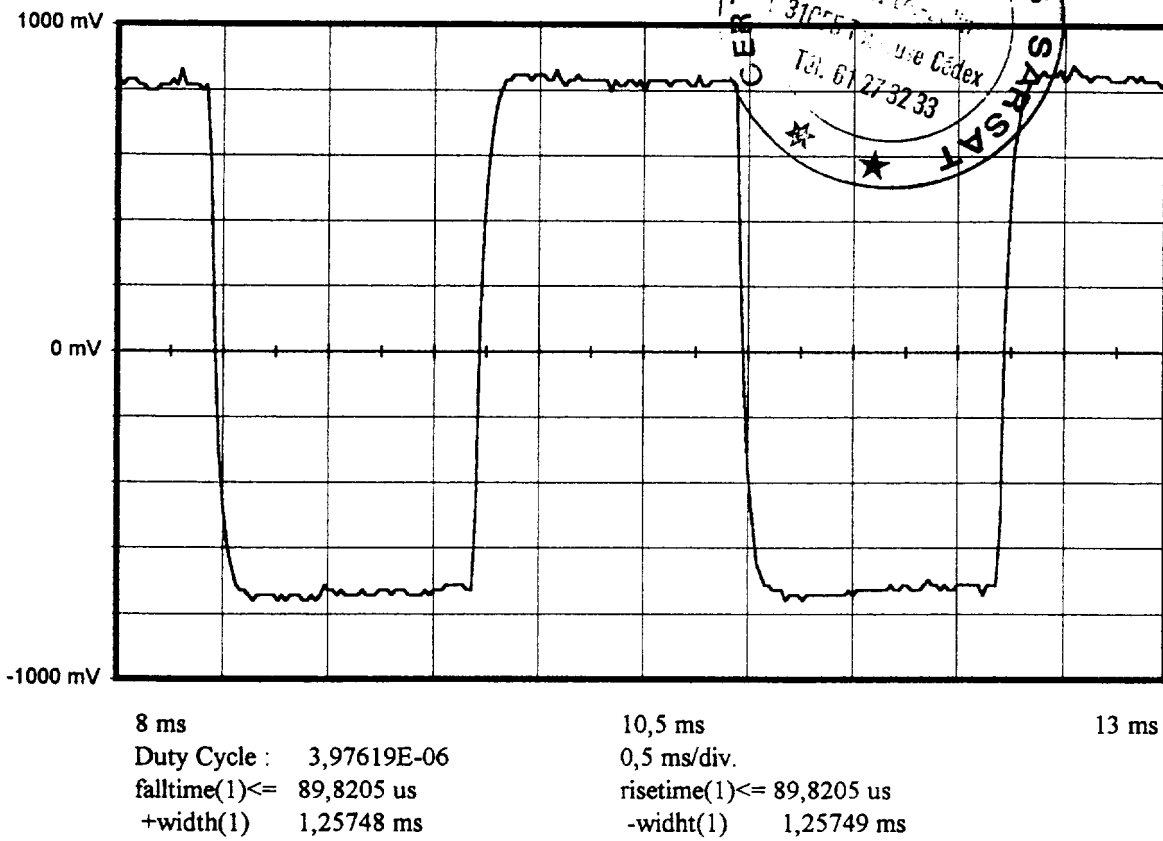
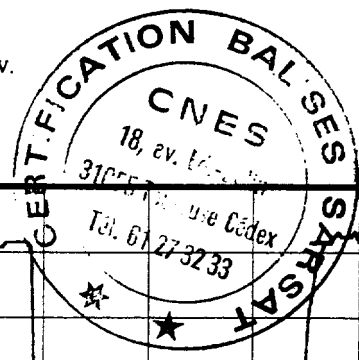
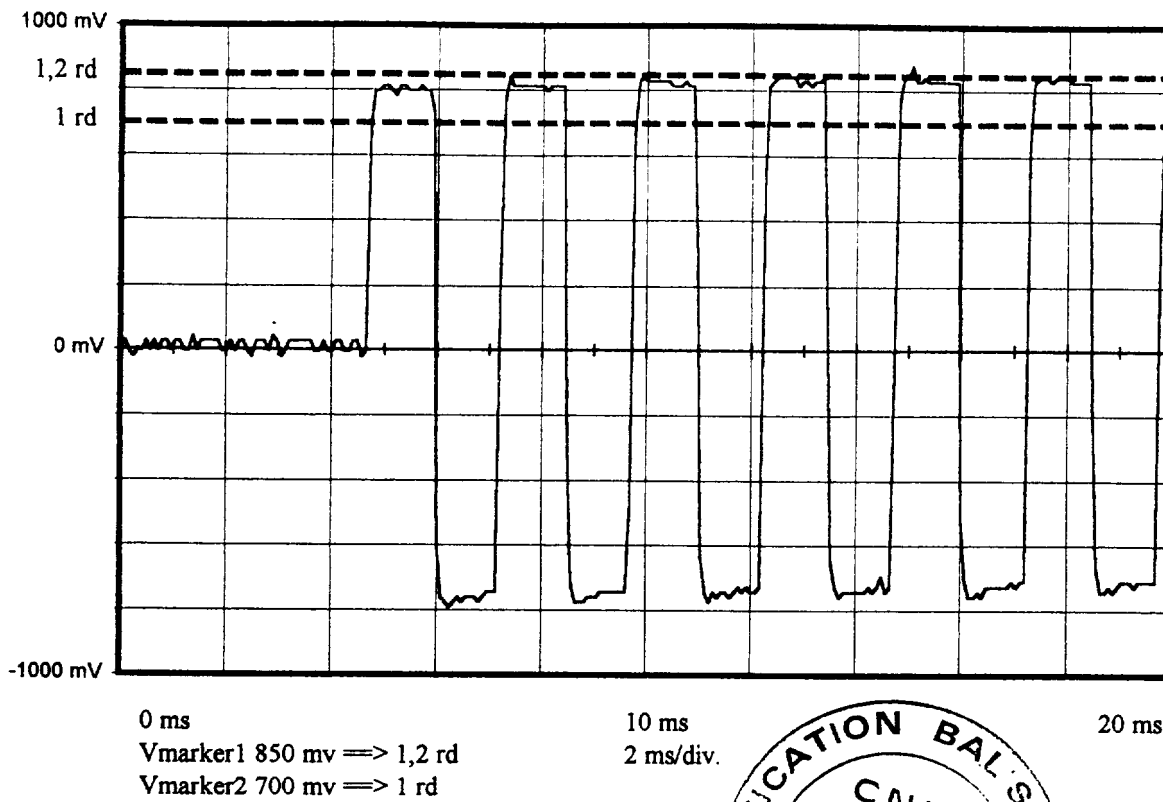
Message

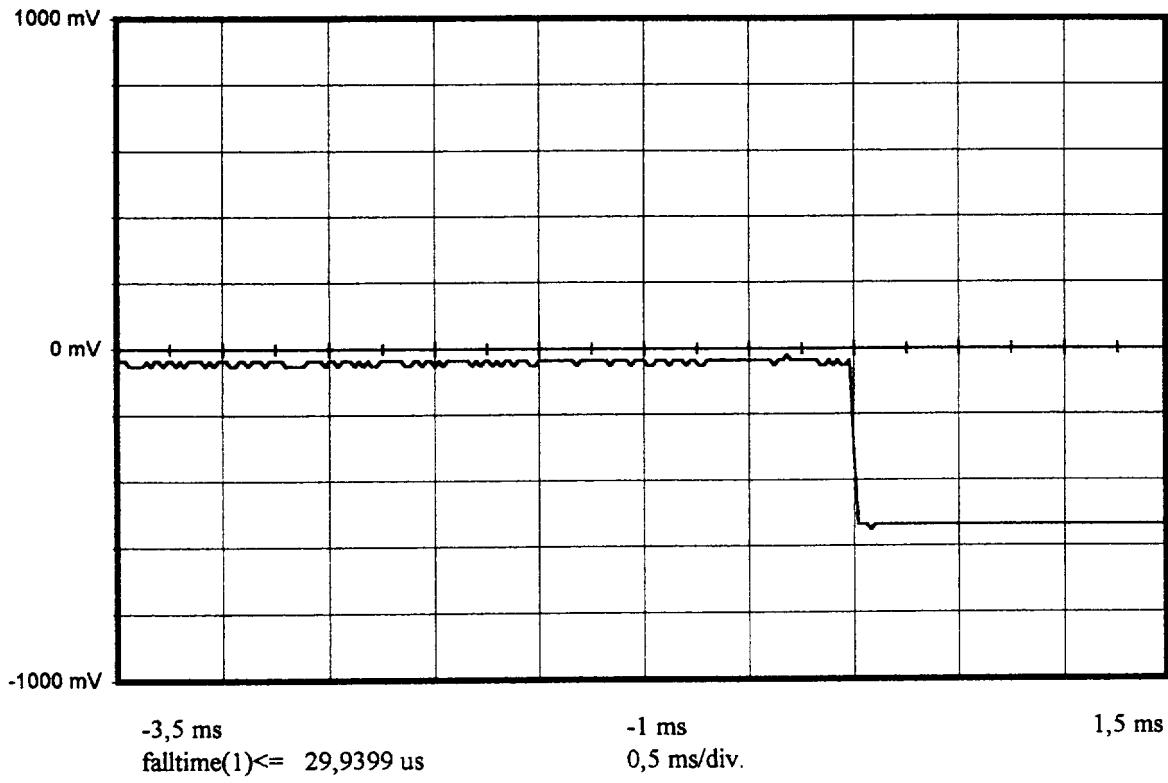
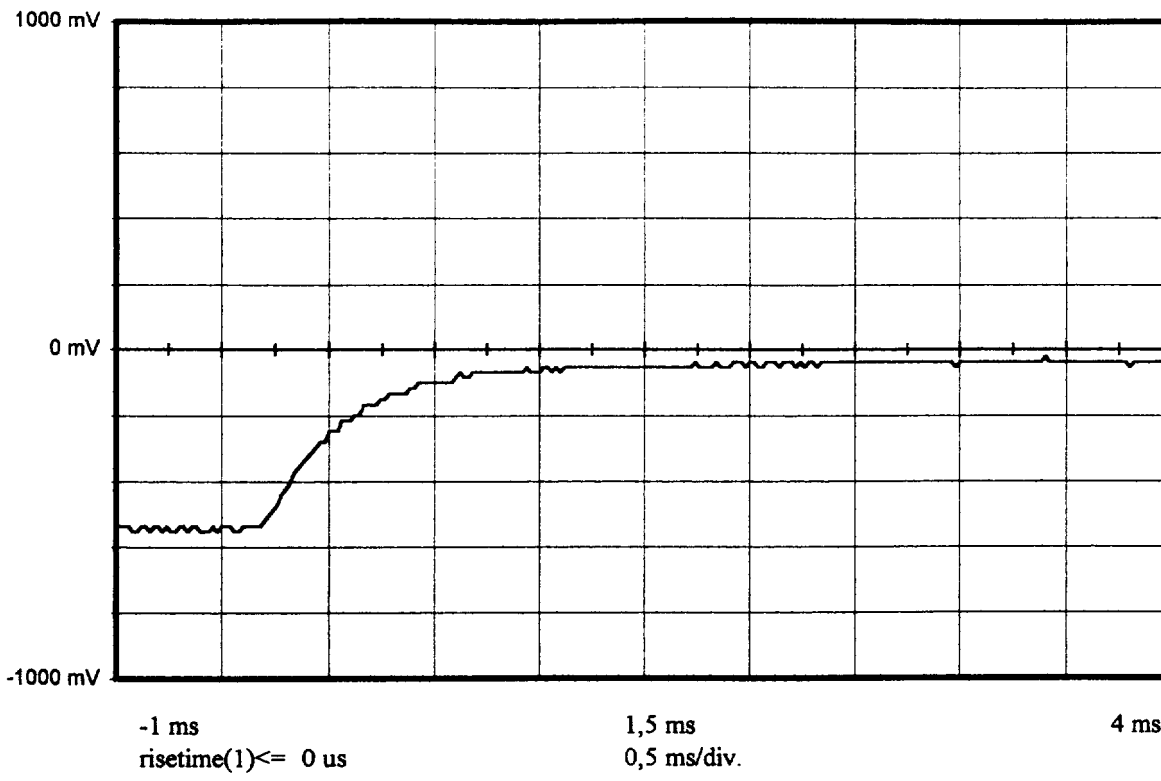
Message received		FFFE2F96EE2EC0012B0027FE91F5DAED3A63
Format Flag	25	1
Protocol flag	26	0
Country Code/Country	27-36	366 / USA
Protocol Code : U/Std-Nat	37-39/37-40	1110
Ident./Position code	27-85	
Calculated BCH1	25-85	1FFA47
Readed BCH1	86-106	1FFA47
Identification		
Protocol		Test-Standard Location
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

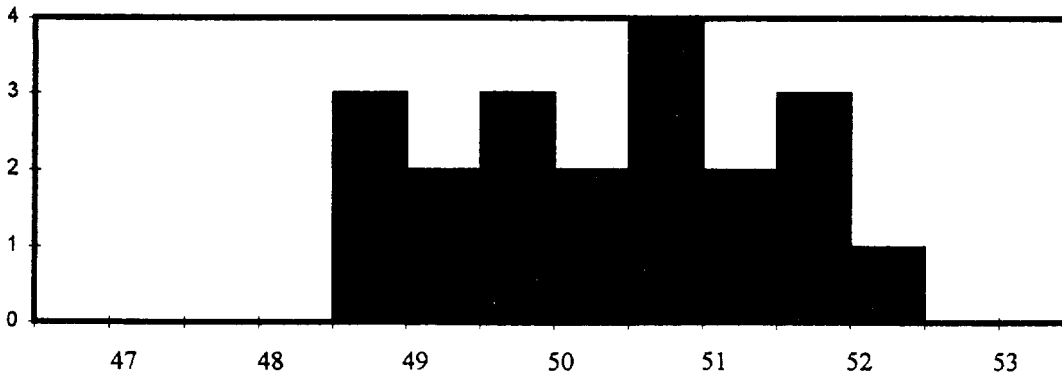
Manufacturer : ACR
 Beacon Type : RLB 32
 Number : 2
 Date of test : 18 Feb 1999

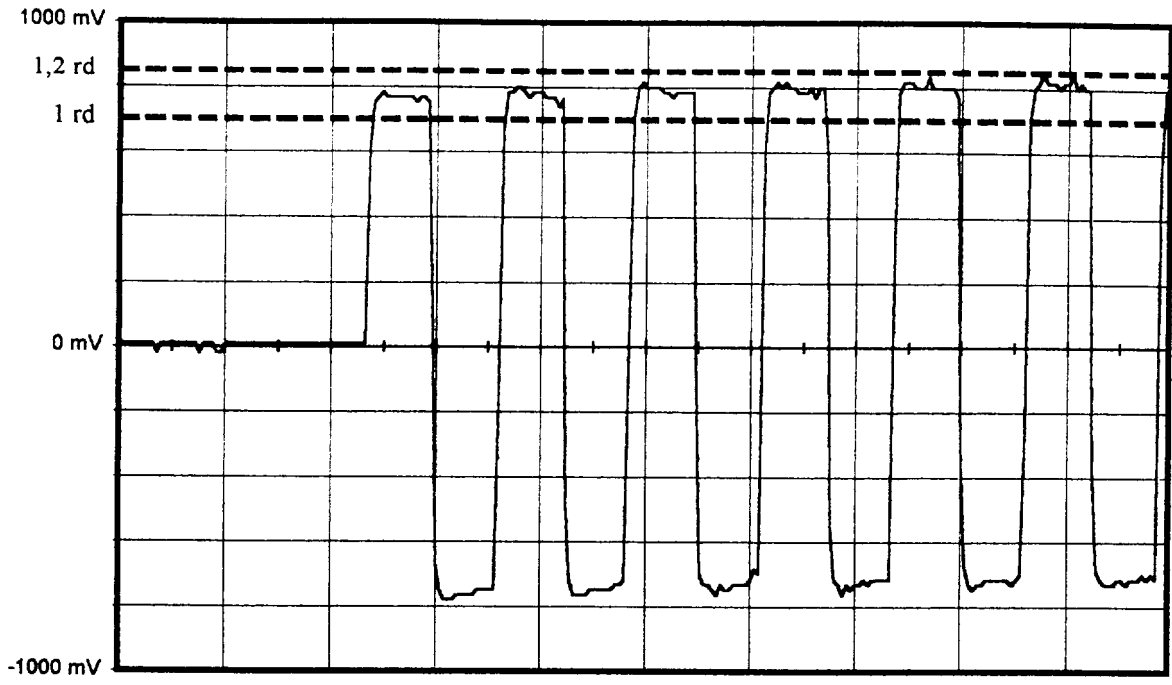
Message

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

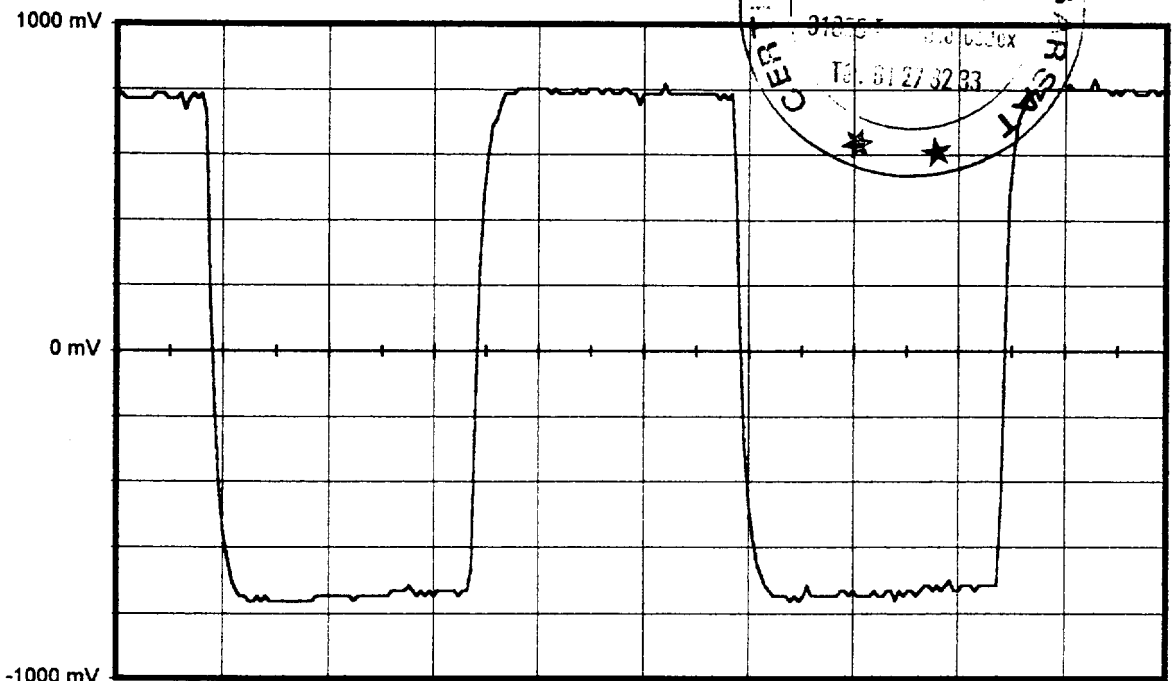
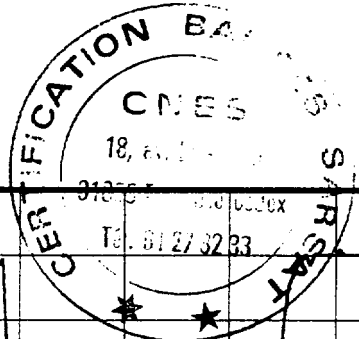




0 ms
Vmarker1 850 mv => 1,2 rd
Vmarker2 700 mv => 1 rd

10 ms
2 ms/div.

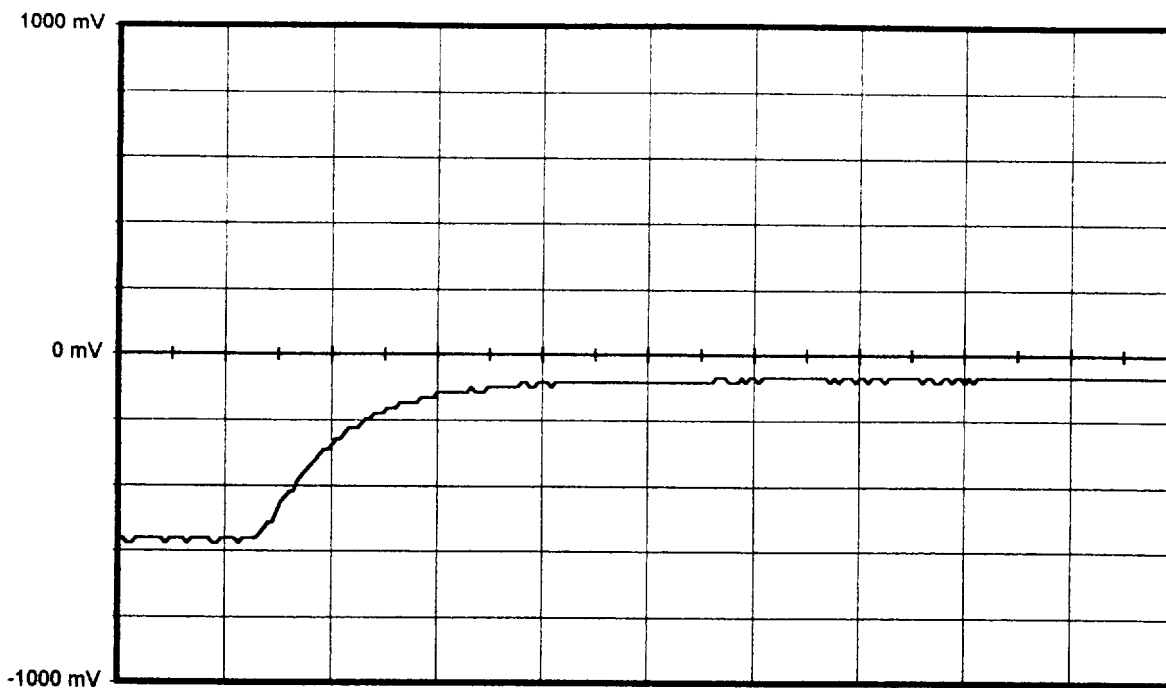
20 ms



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

10,5 ms
0,5 ms/div.
risetime(1) <= 89,8205 us
-widht(1) 1,25749 ms

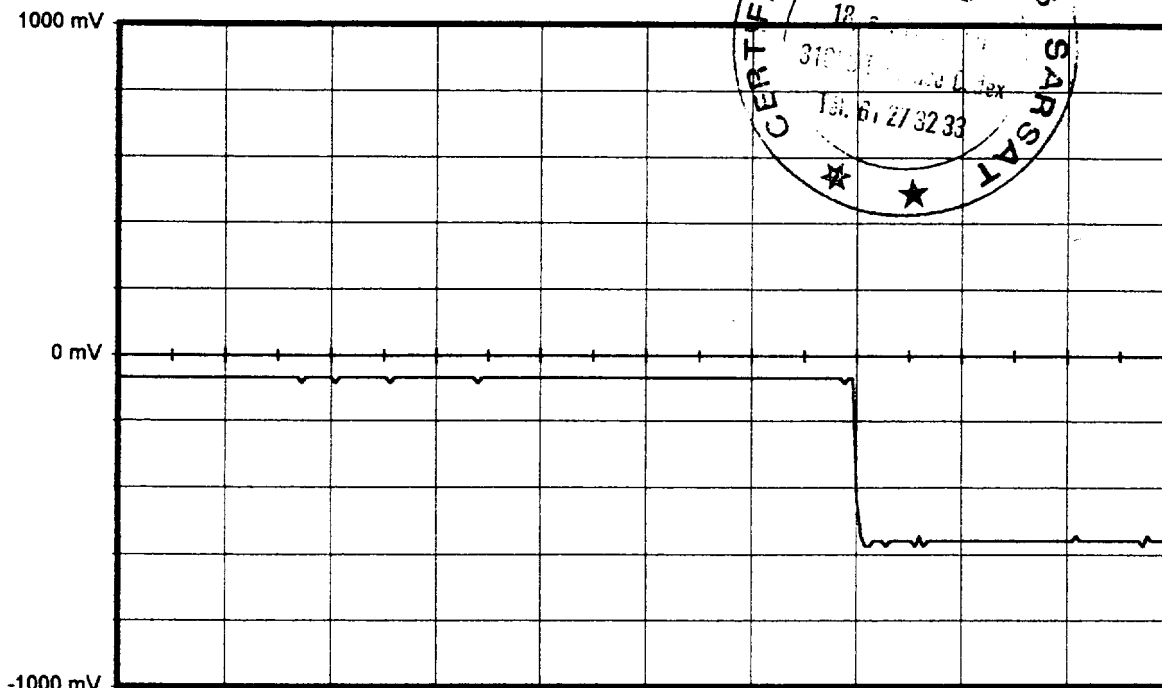
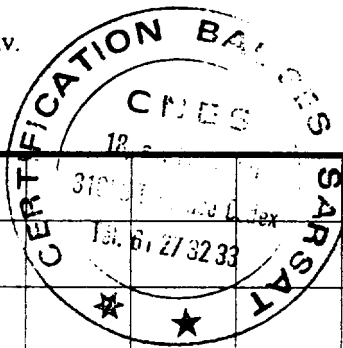
13 ms



-1 ms
risetime(1) <= 818,363 us

1,5 ms
0,5 ms/div.

4 ms



-3,5 ms
falltime(1) <= 29,9399 us

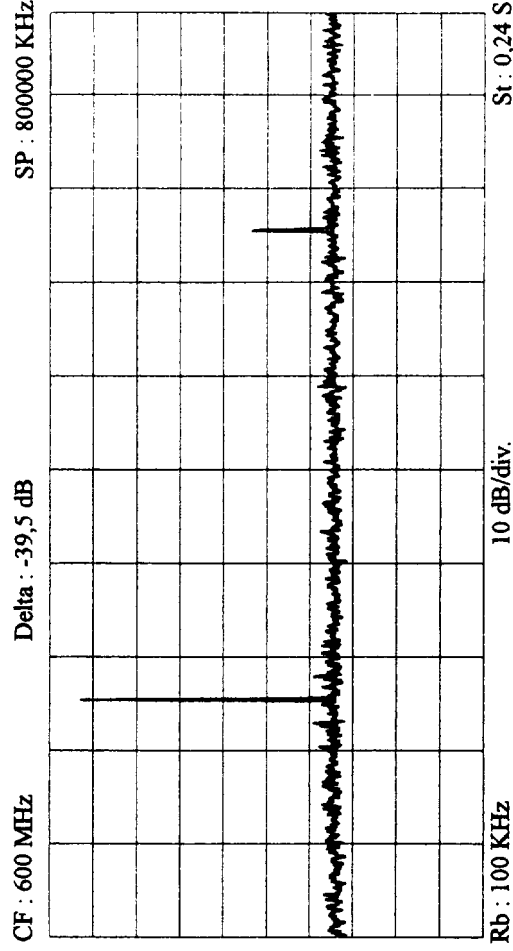
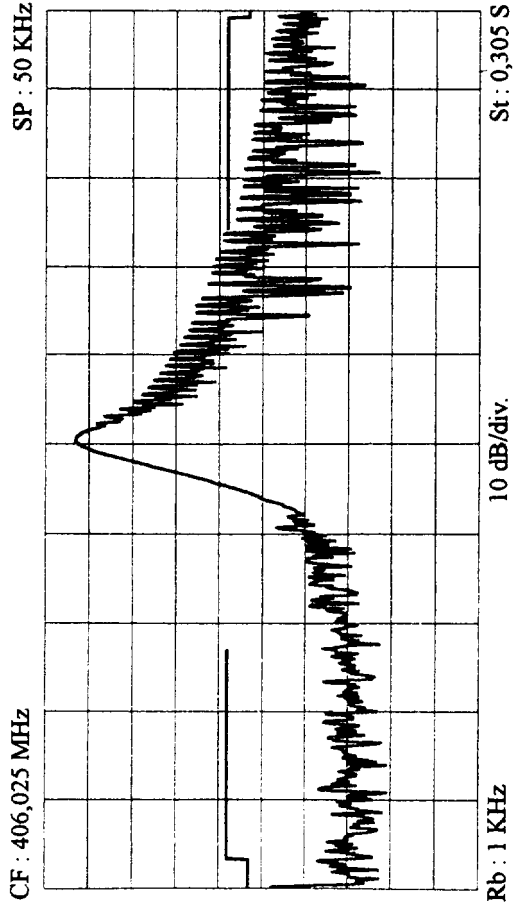
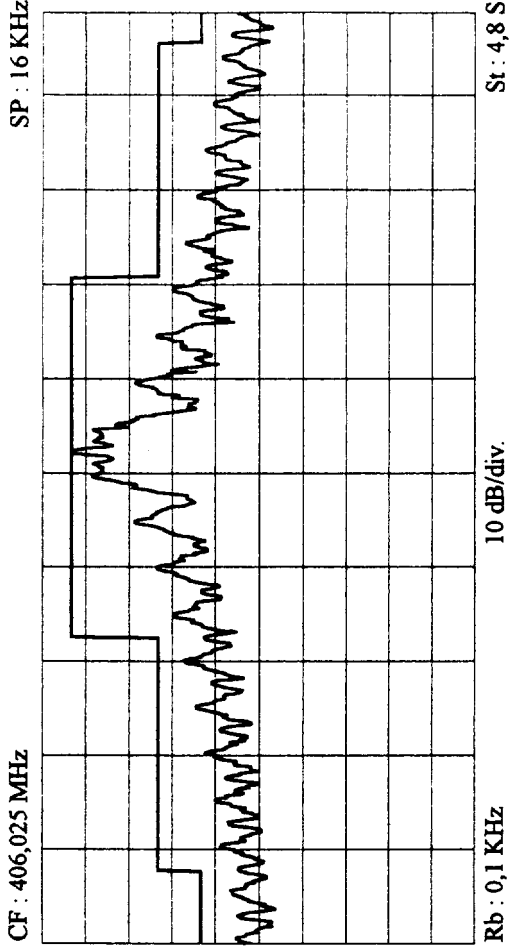
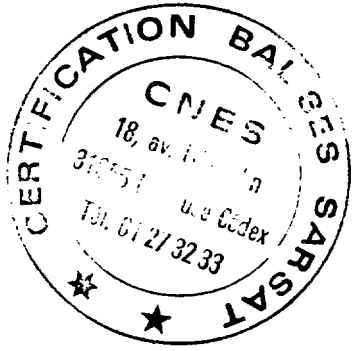
-1 ms
0,5 ms/div.

1,5 ms

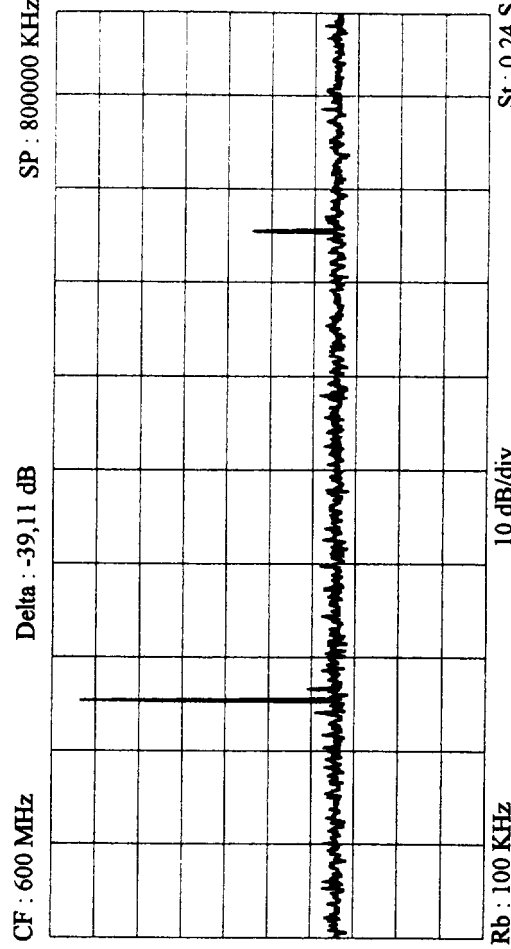
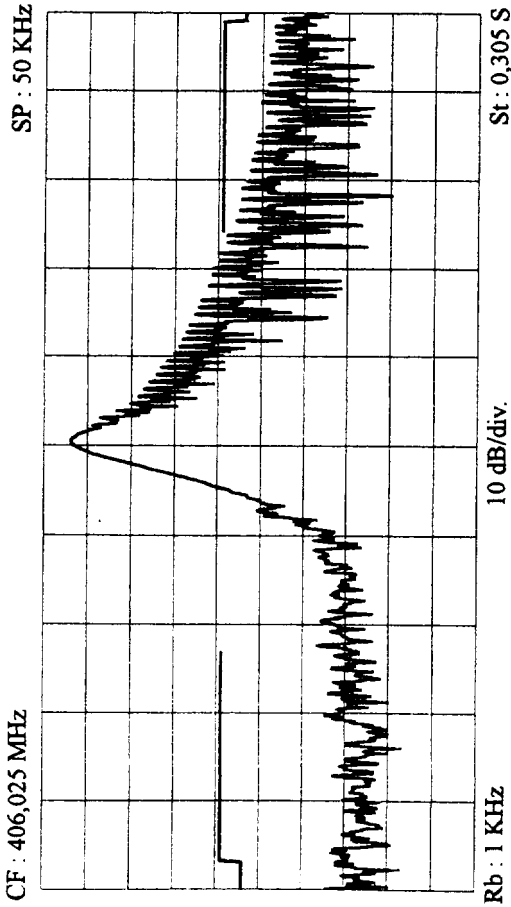
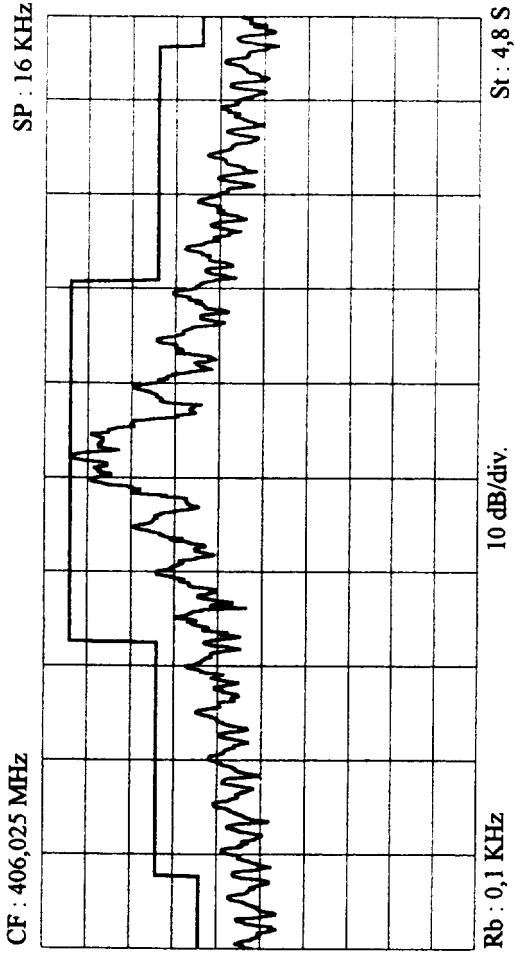
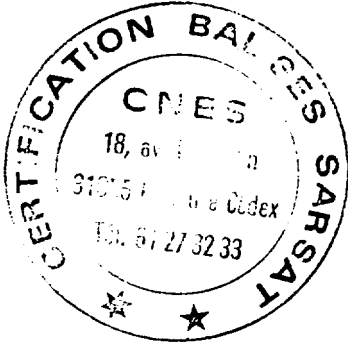
SPURIOUS EMISSIONS TEST RESULTS ON

- 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

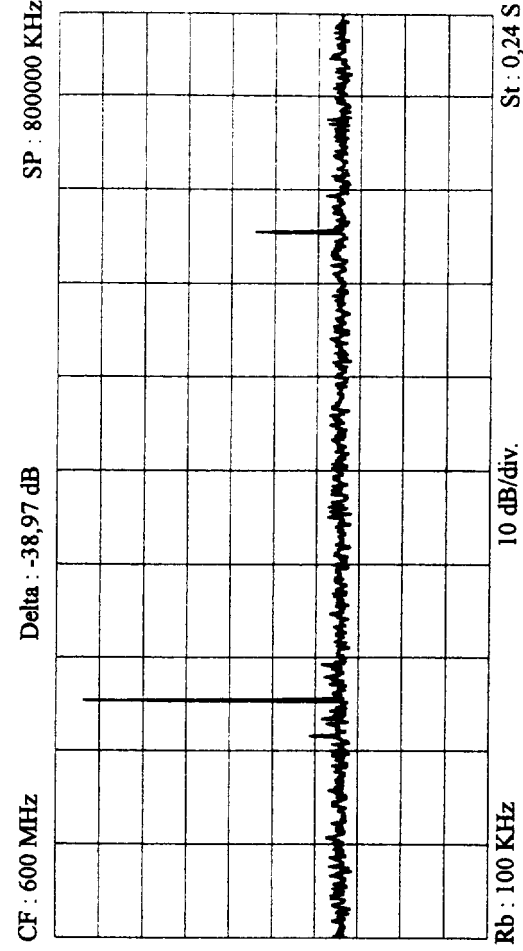
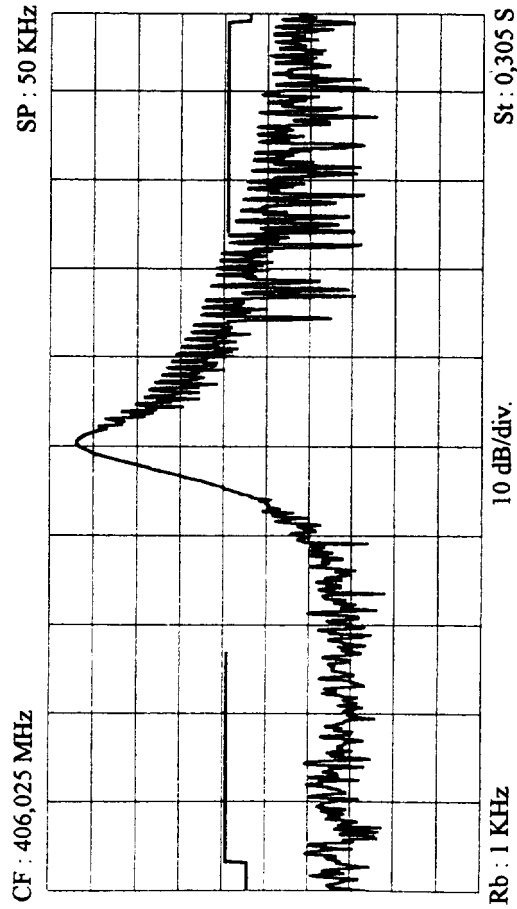
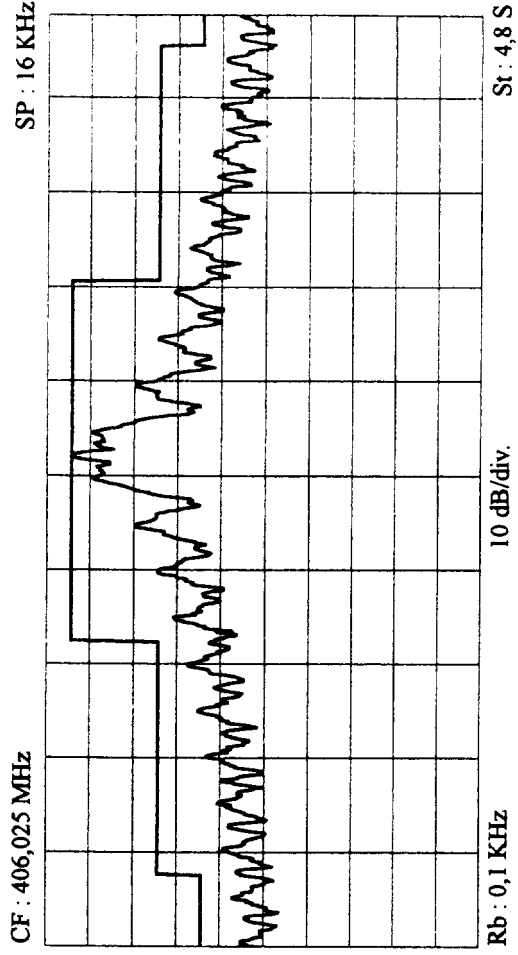
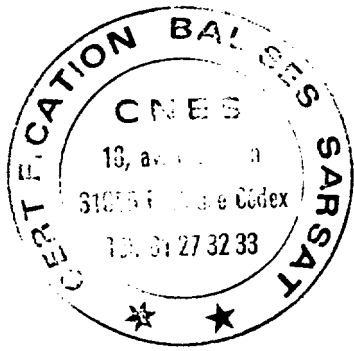
ACR Electronics, Inc.
RLB 33
1
Certification nominale
406 MHz
-40 °C



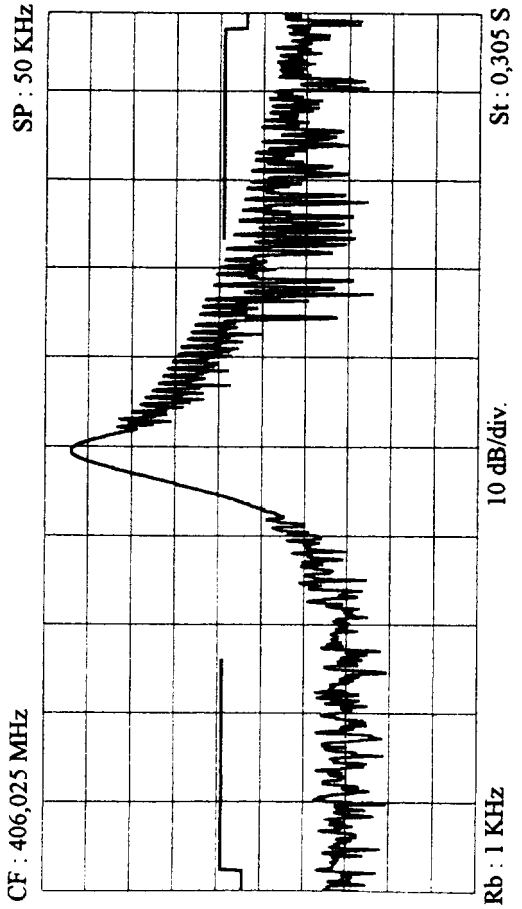
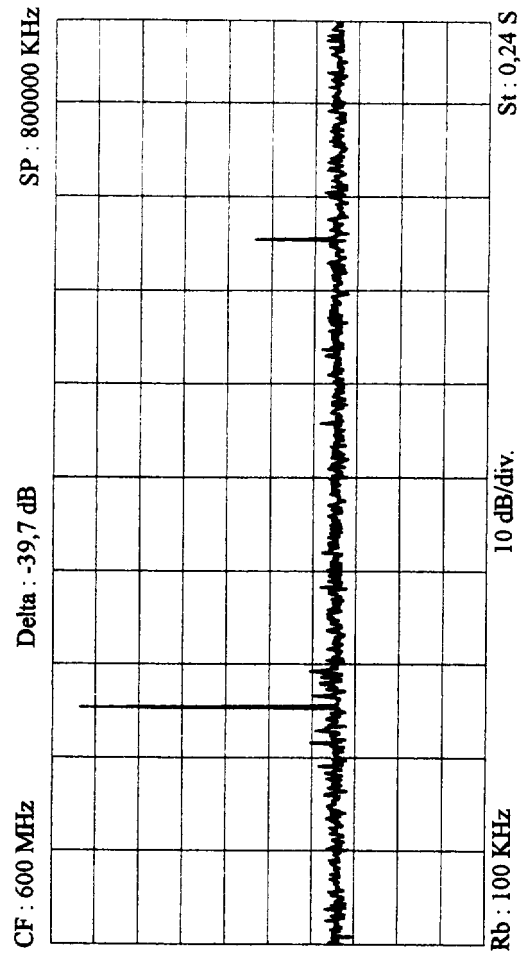
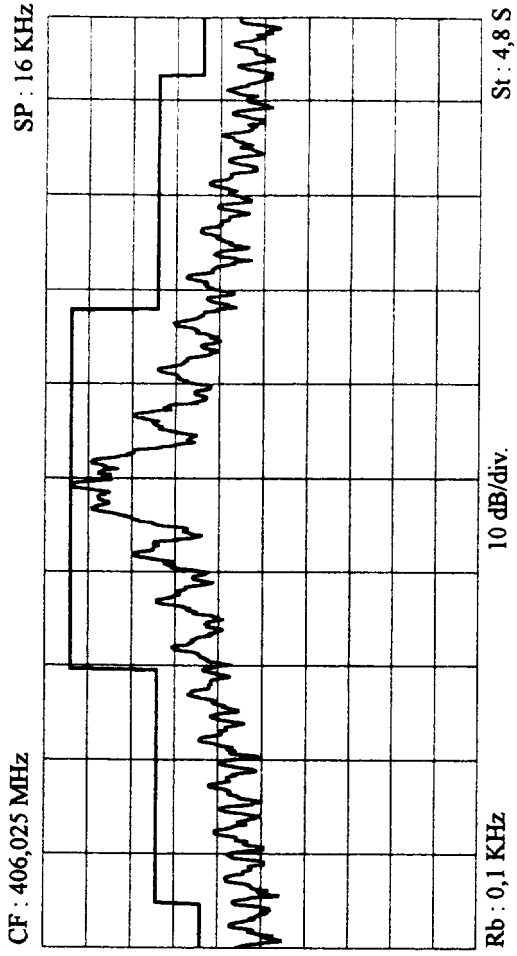
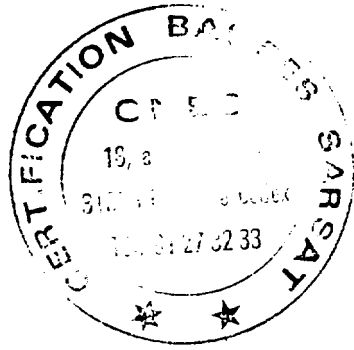
ACR Electronics, Inc.
RLB 33
1
Certification nominale
406 MHz
20 °C



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

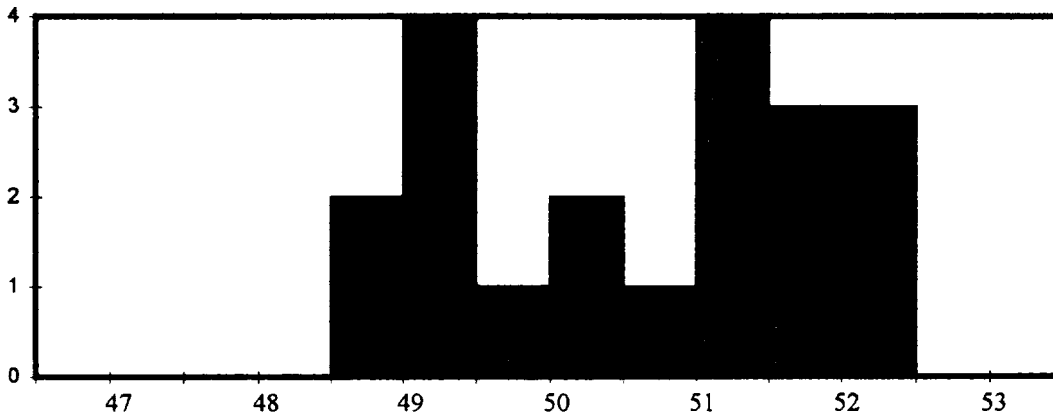
Manufacturer : ACR
 Beacon Type : RLB 33
 Number : 1
 Date of test : 17-mar-99

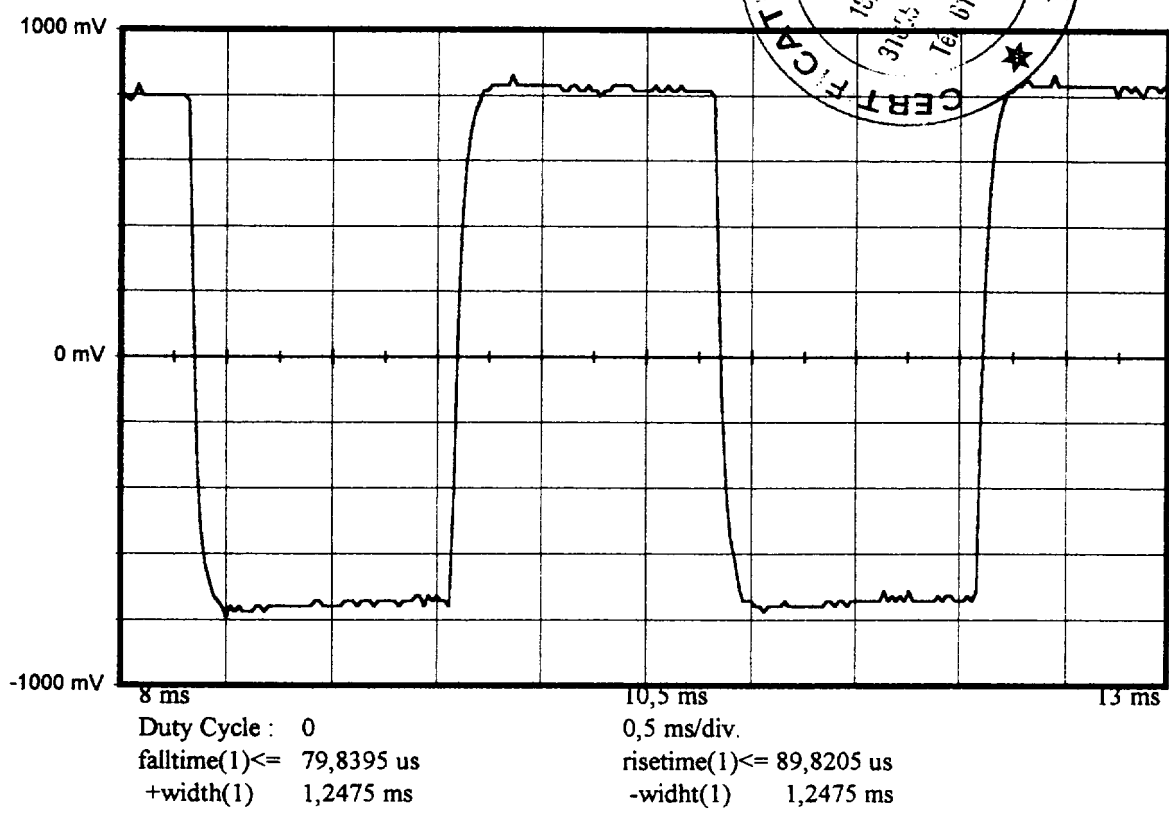
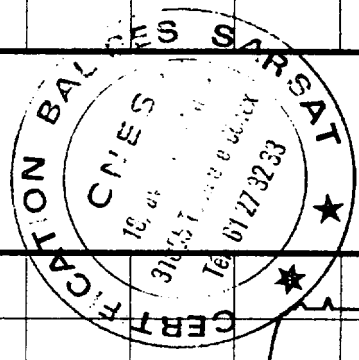
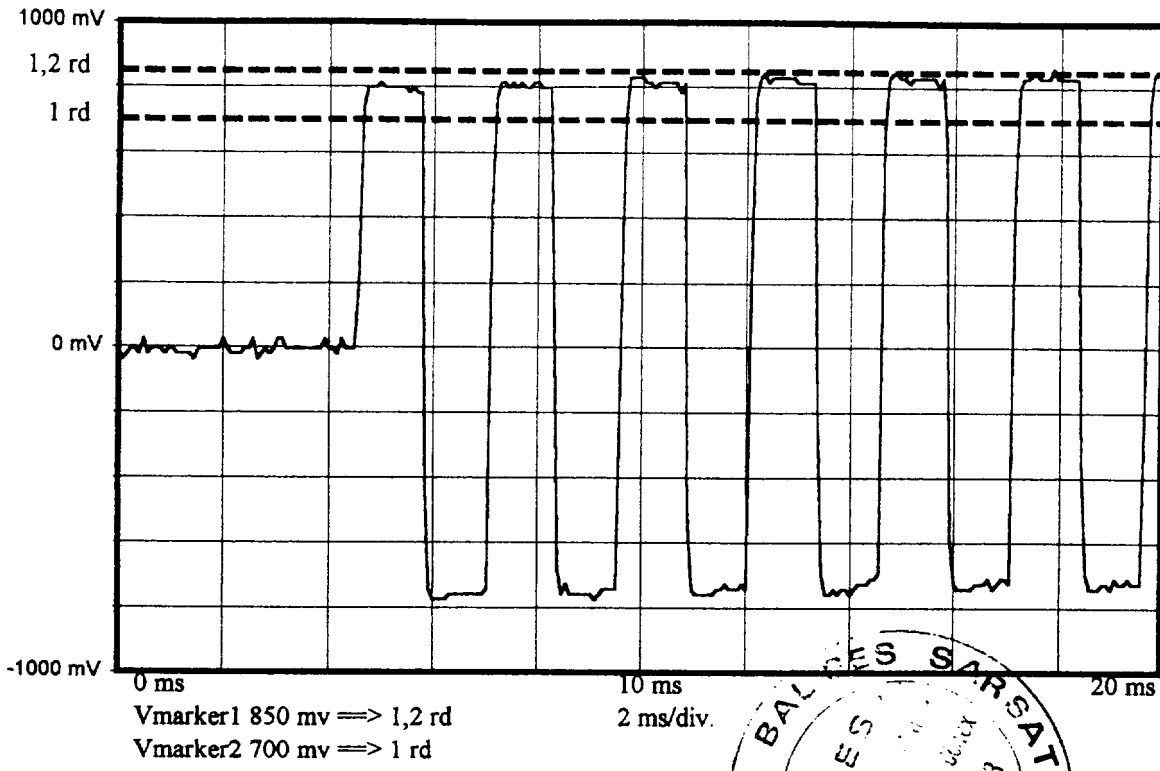
Message

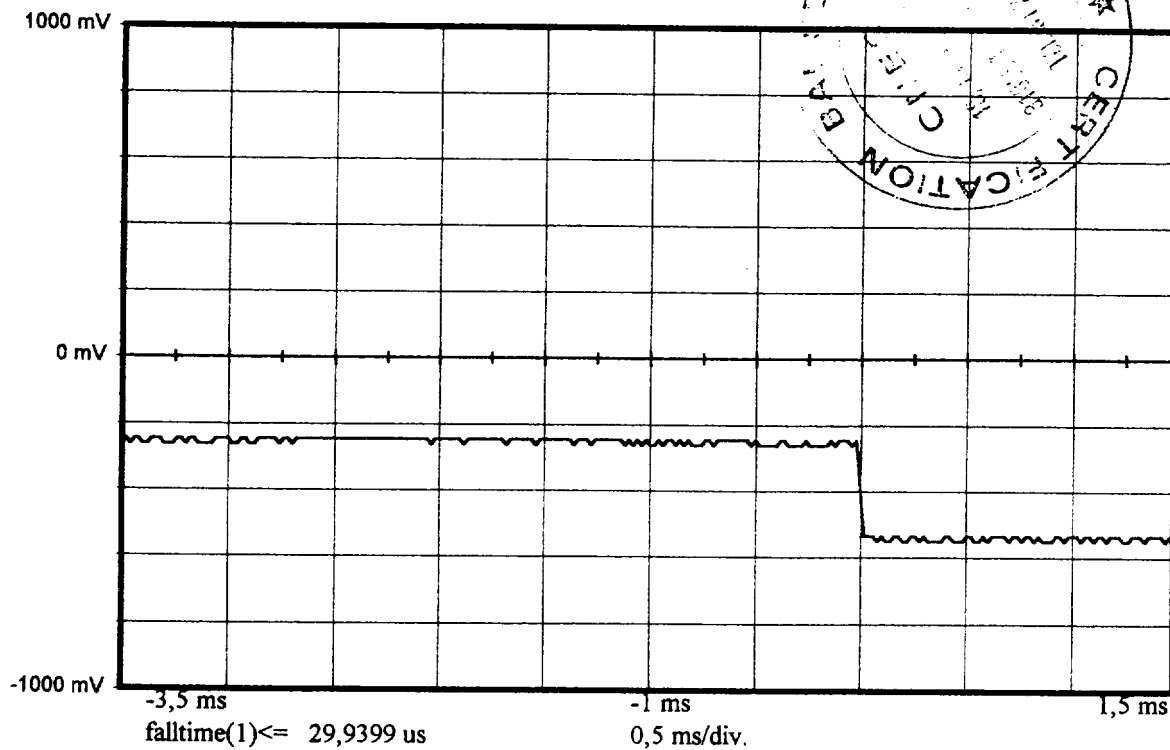
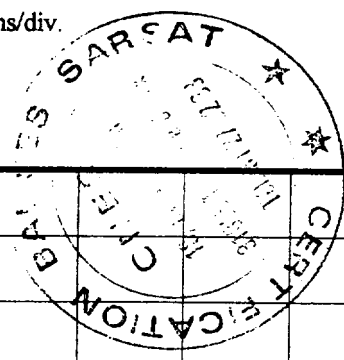
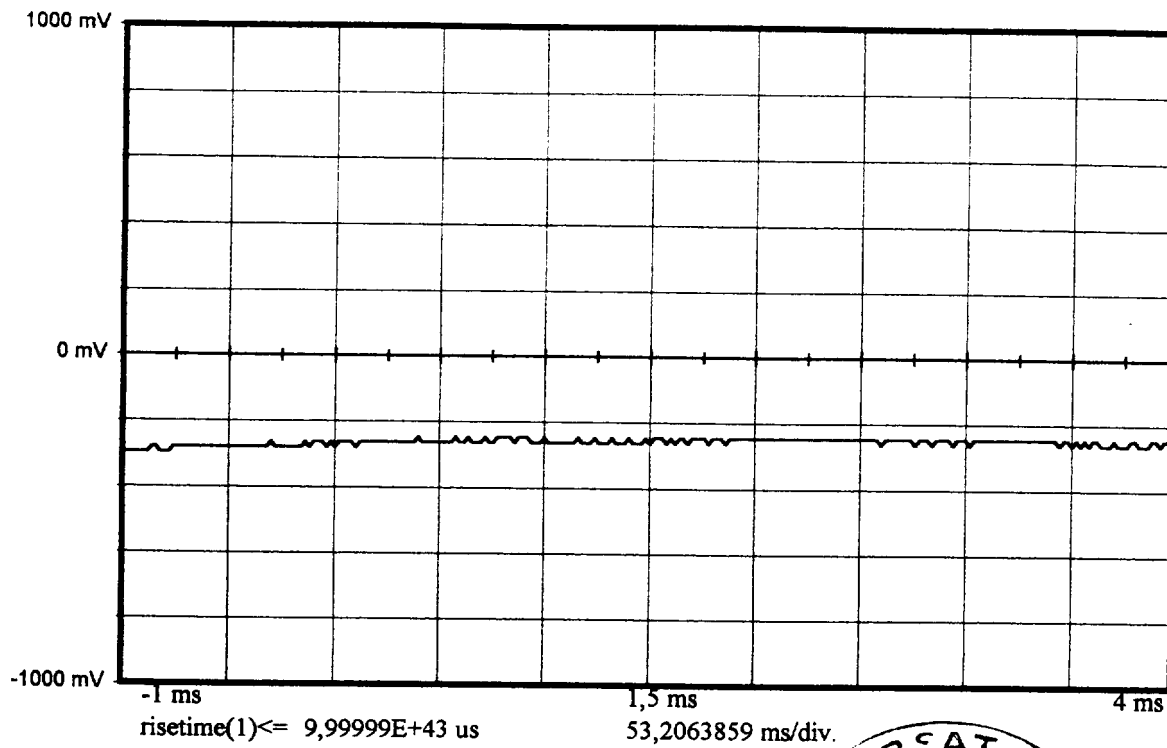
Message received		FFFE2F96EE2EC0012B0027FE91F5DAED3A63
Format Flag	25	1
Protocol flag	26	0
Country Code/Country	27-36	366 / USA
Protocol Code : U/Std-Nat	37-39/37-40	1110
Ident./Position code	27-85	
Calculated BCH1	25-85	1FFA47
Readed BCH1	86-106	1FFA47
Identification		
Protocol		Test-Standard Location
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	%	<=5 %	0,00
Nominal frequency : F2	Hz		406025219,32







Certification Test VSWR at 20°C

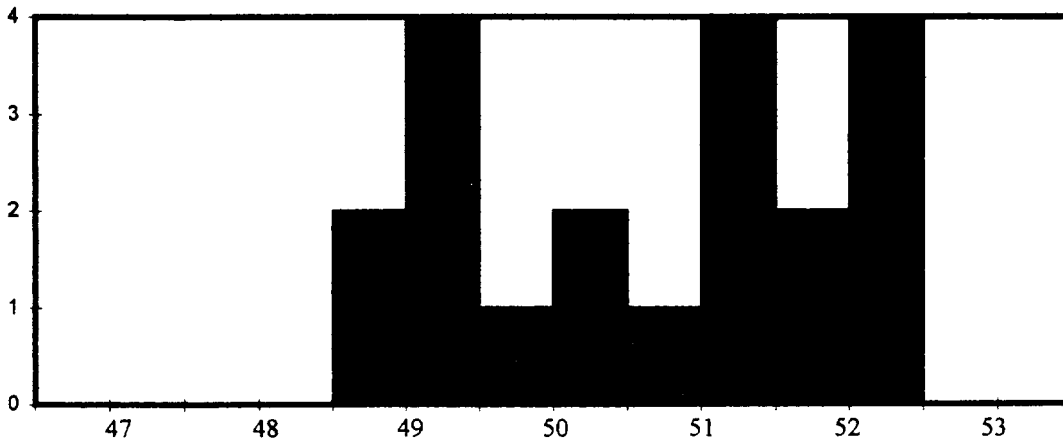
Manufacturer : ACR
 Beacon Type : RLB 33
 Number : 1
 Date of test : 16 mar 1999

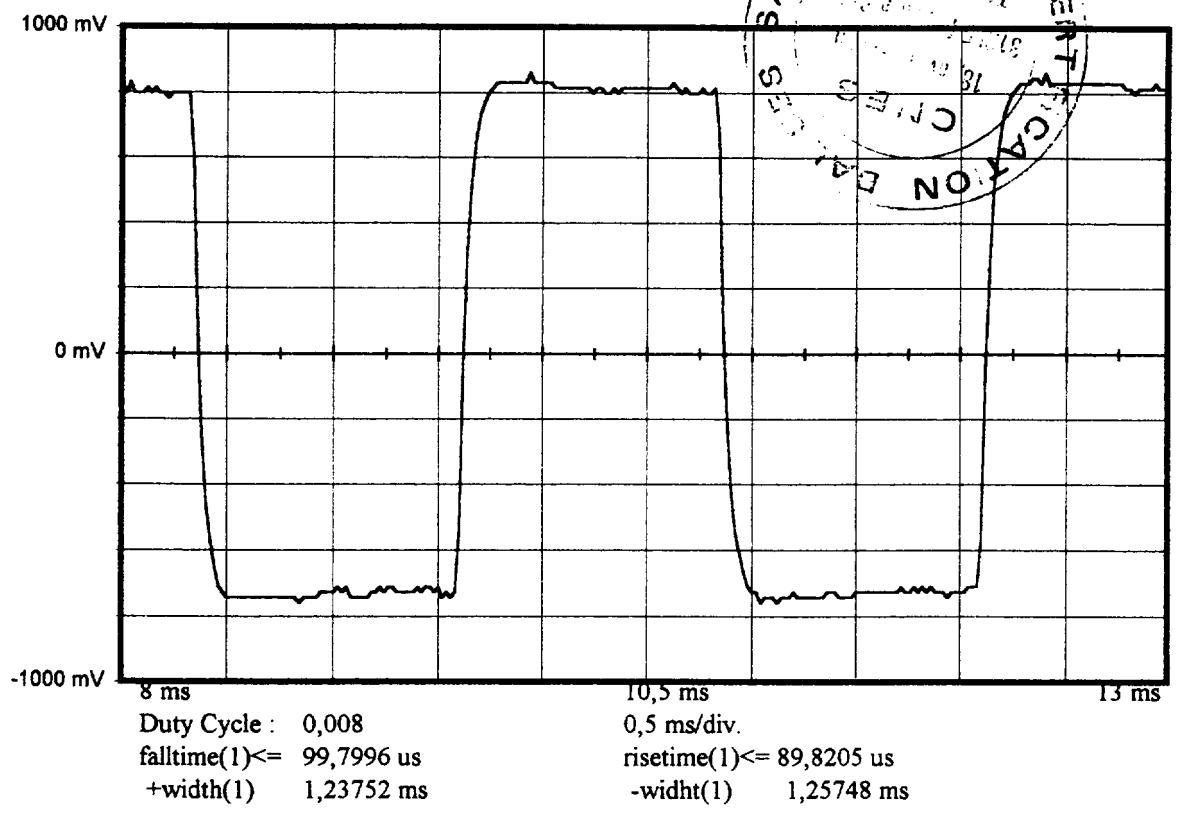
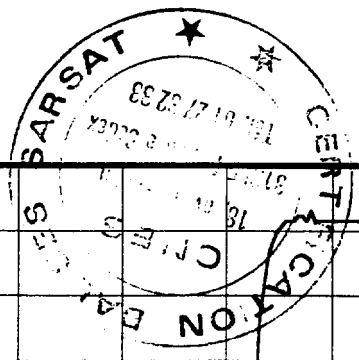
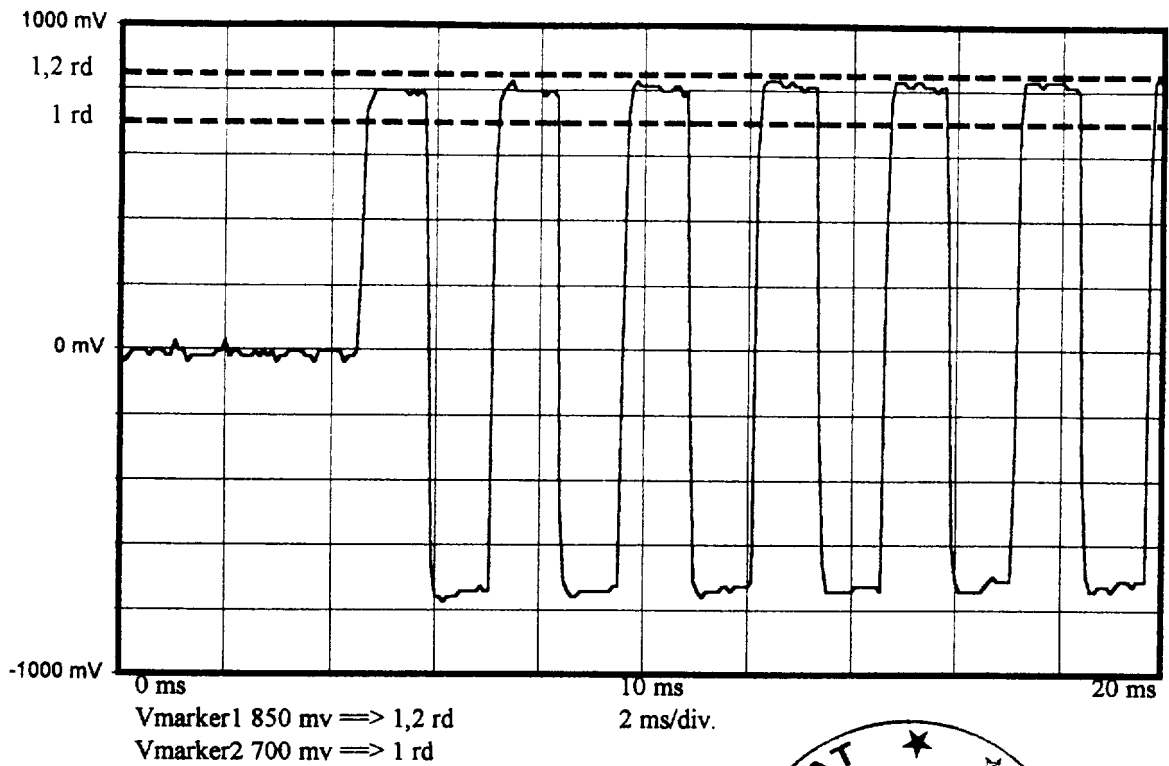
Message

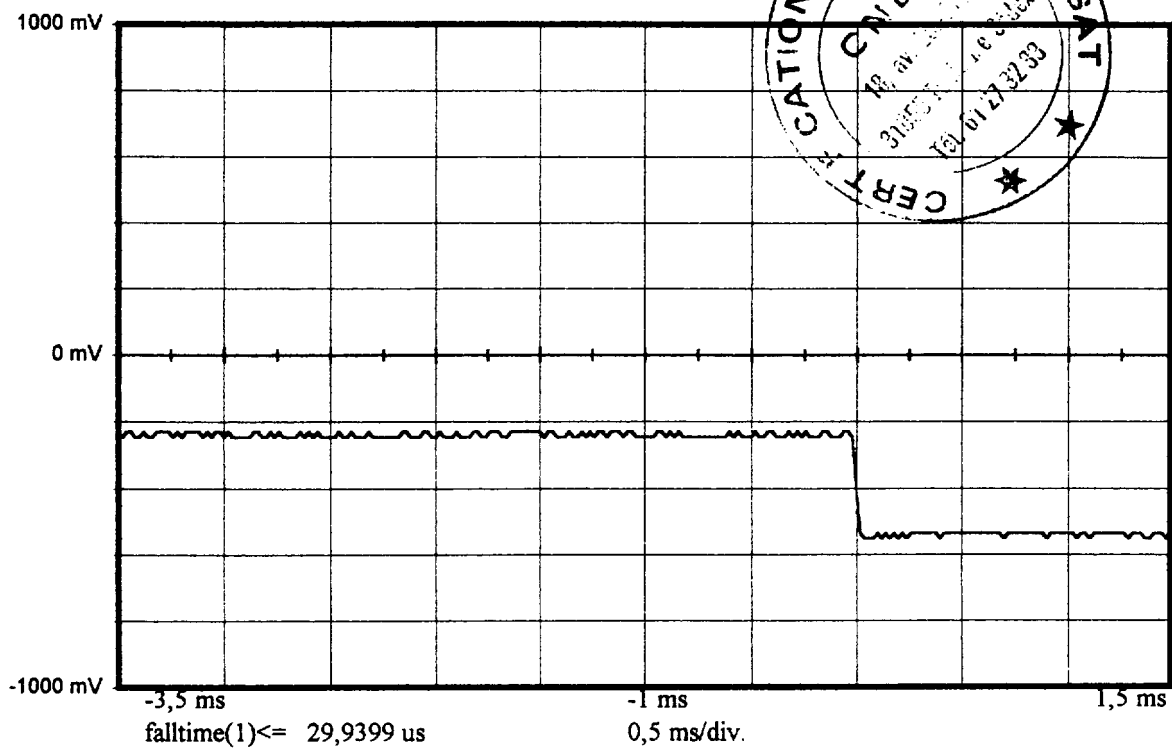
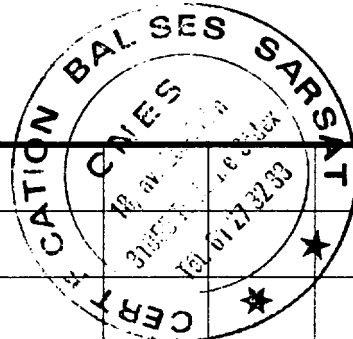
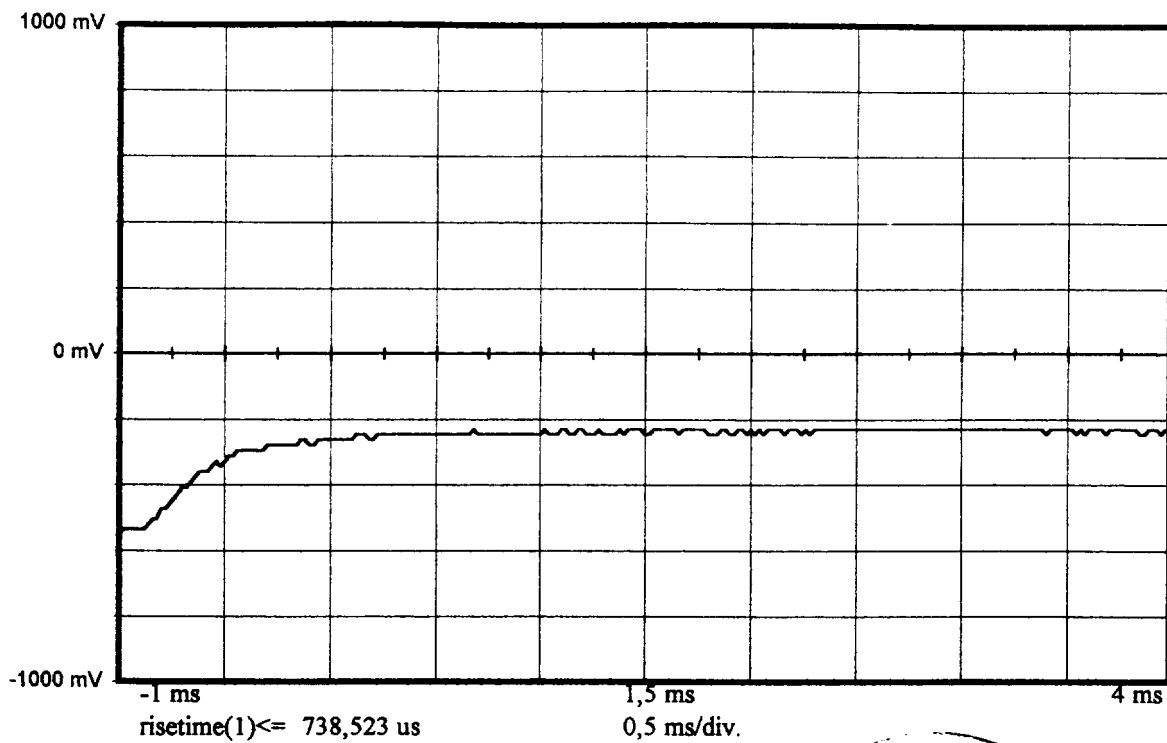
Message received		FFFE2F96EE2EC0012B0027FE91F5DAED3A63
Format Flag	25	1
Protocol flag	26	0
Country Code/Country	27-36	366 / USA
Protocol Code : U/Std-Nat	37-39/37-40	1110
Ident./Position code	27-85	0
Calculated BCH1	25-85	1FFA47
Readed BCH1	86-106	1FFA47
Identification		
Protocol		Test-Standard Location
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	%	<=5 %	0,80
Nominal frequency : F2	Hz		406025215,56







Certification Test VSWR at 55°C

Manufacturer : ACR
 Beacon Type : RLB 33
 Number : 1

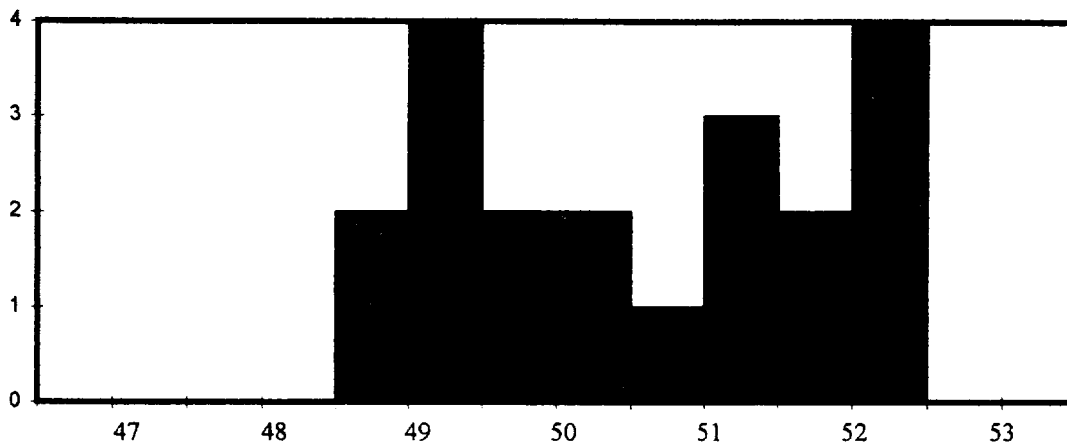
Date of test : 16 mar 1999

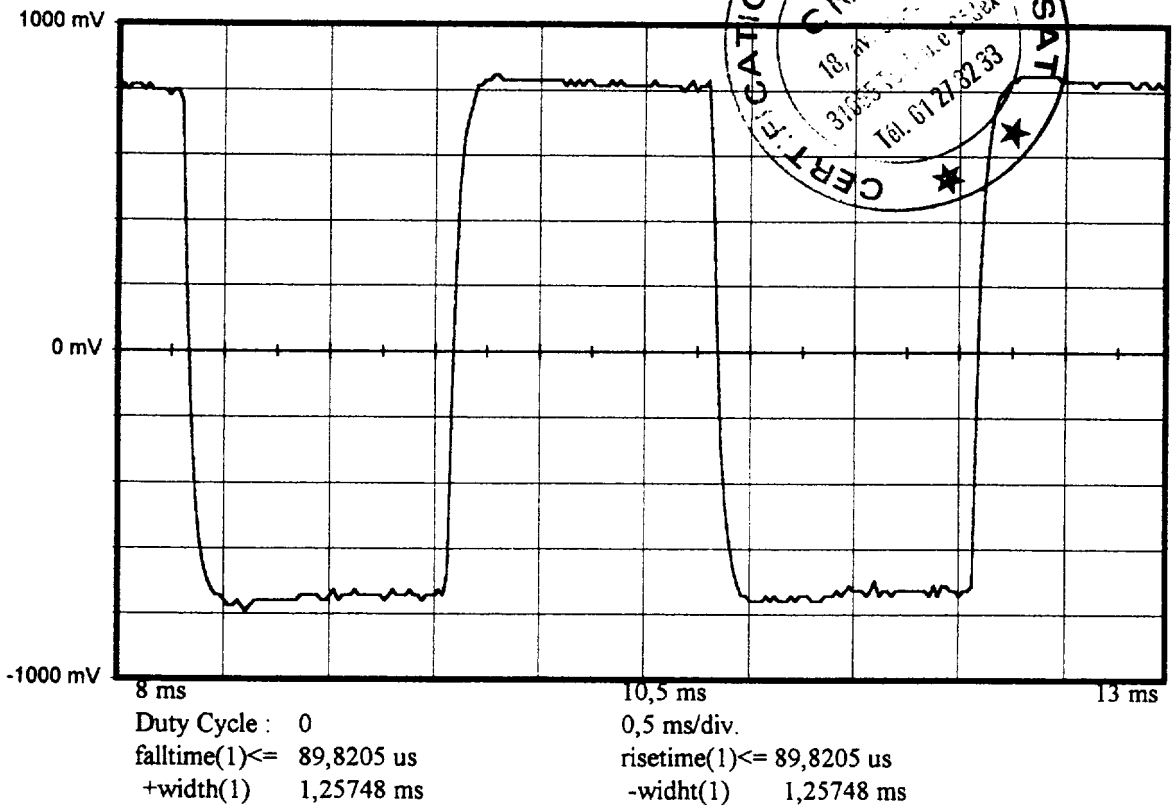
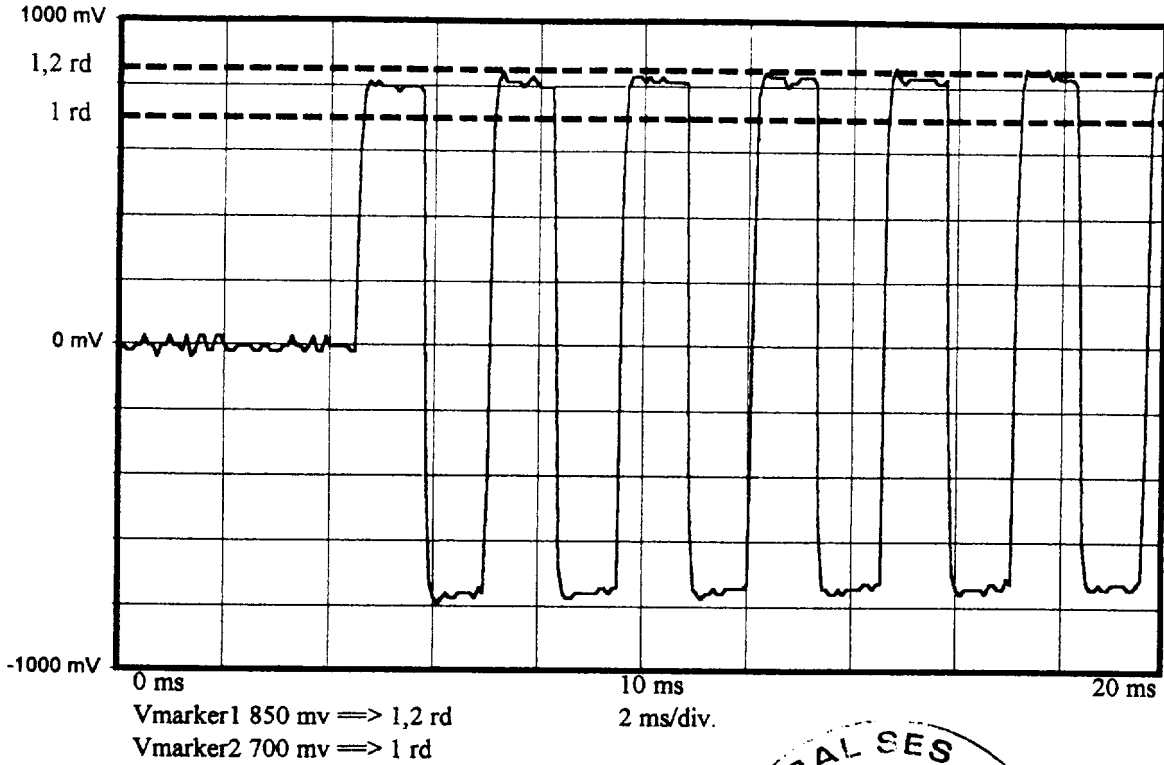
Message

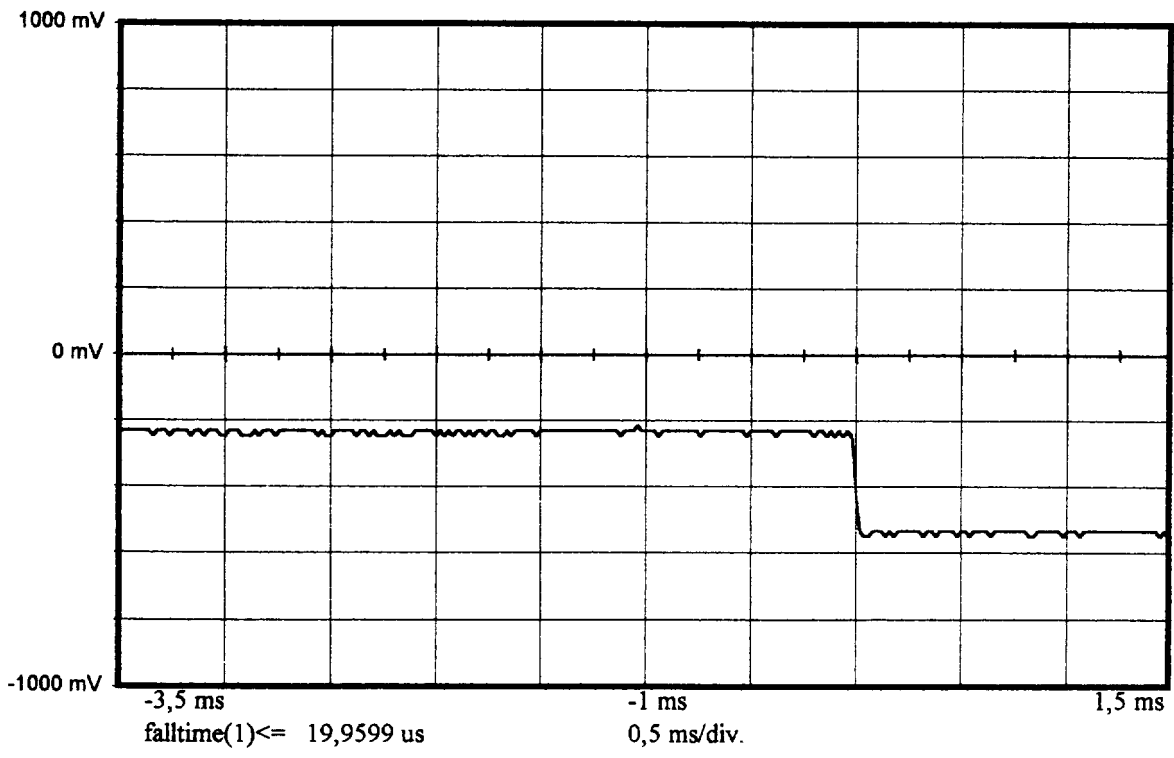
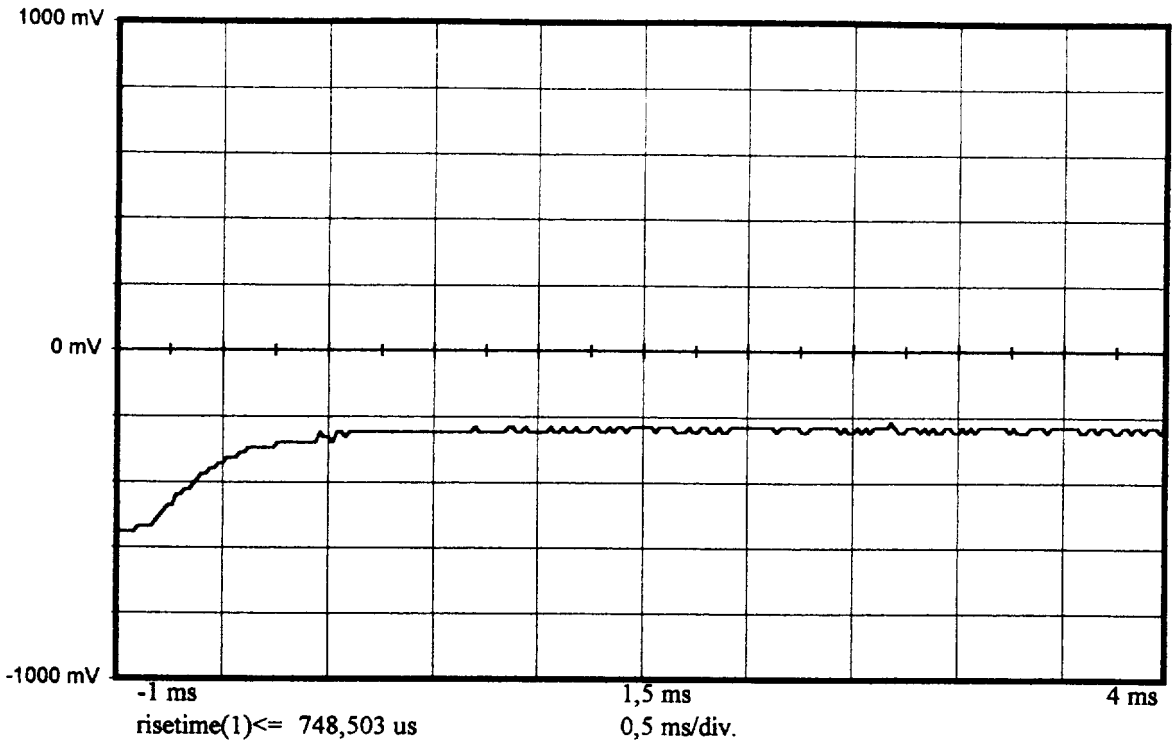
Message received		FFFE2F96EE2EC0012B0027FE91F5DAED3A63
Format Flag	25	1
Protocol flag	26	0
Country Code/Country	27-36	366 / USA
Protocol Code : U/Std-Nat	37-39/37-40	1110
Ident./Position code	27-85	
Calculated BCH1	25-85	1FFA47
Readed BCH1	86-106	1FFA47
Identification		
Protocol		Test-Standard Location
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







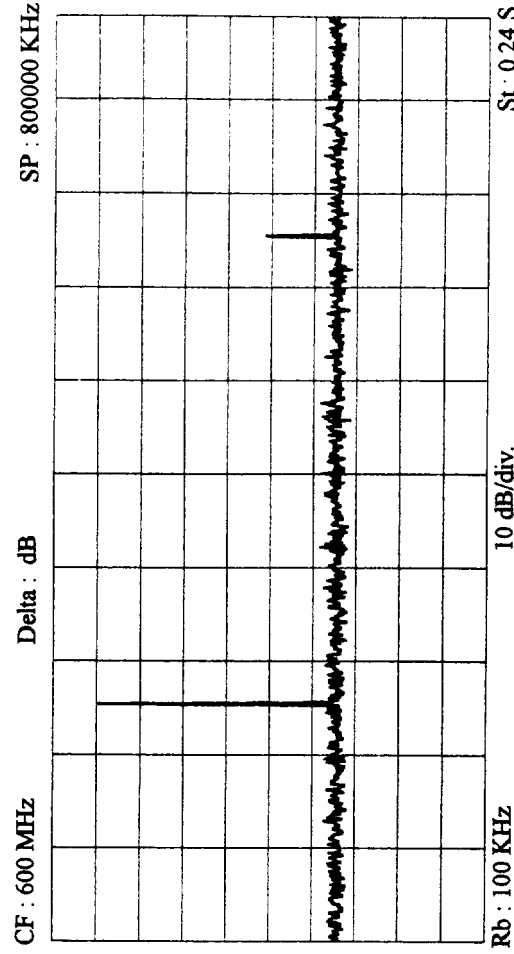
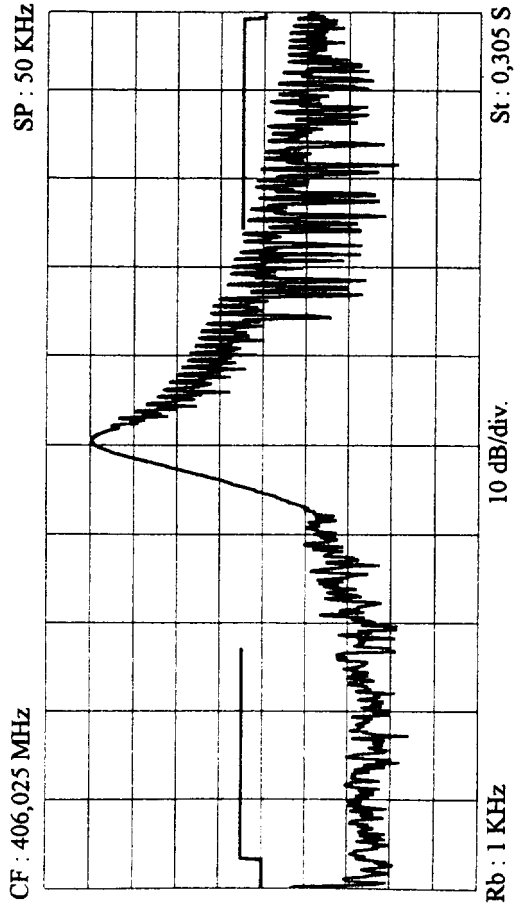
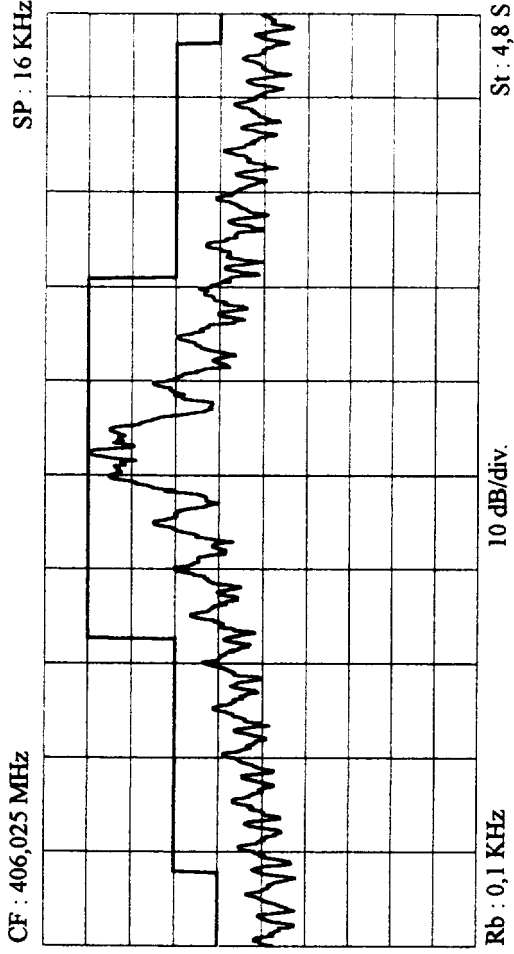
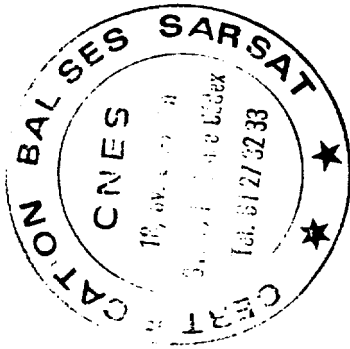
VSWR SPURIOUS EMISSIONS RESULTS

RLB 33 ACR Electronics, Inc.

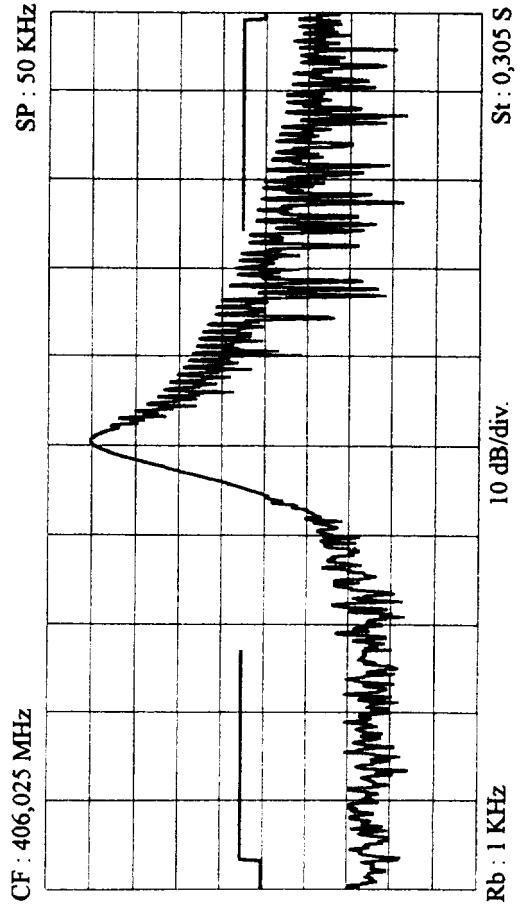
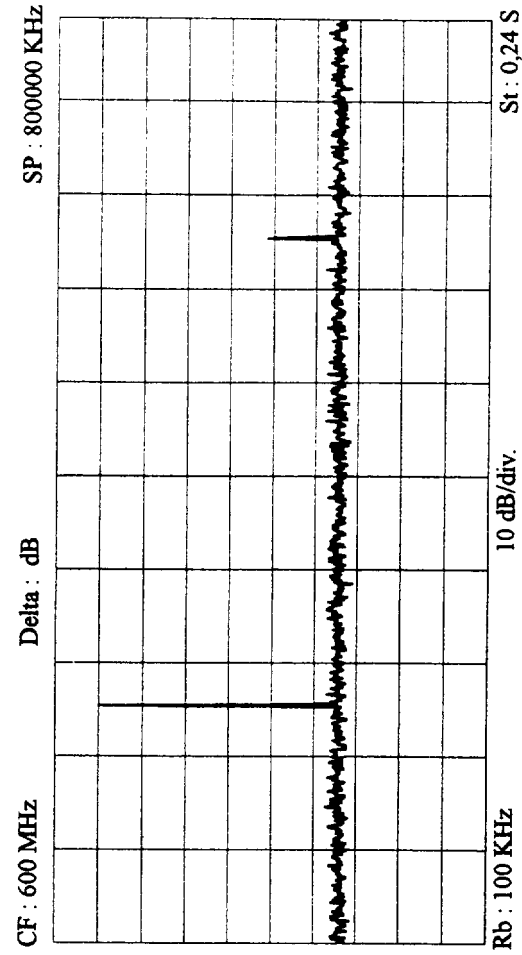
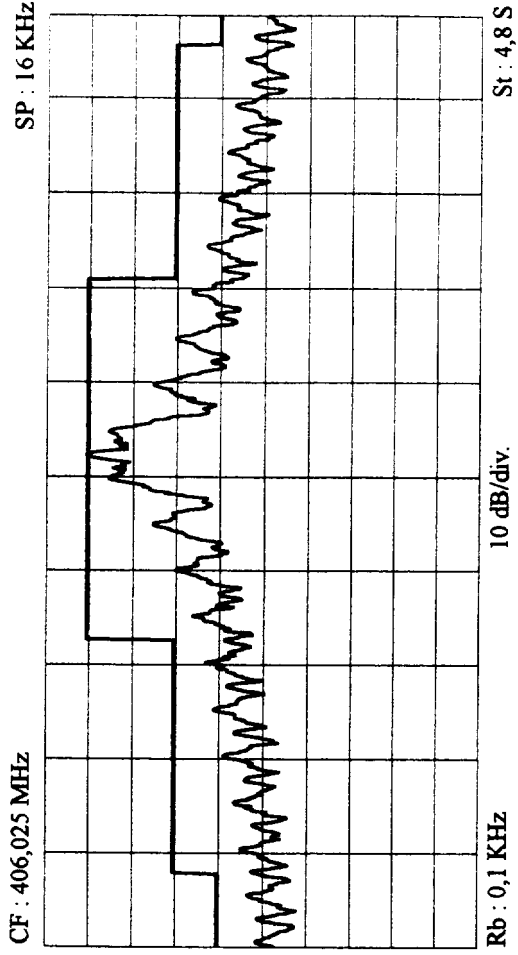
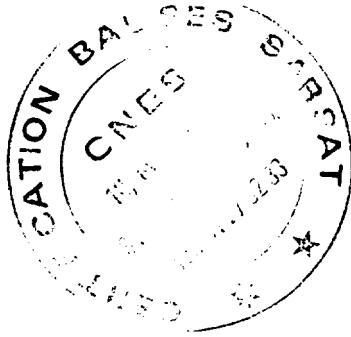
N° 1

at -40° C, 20° C and 55° C

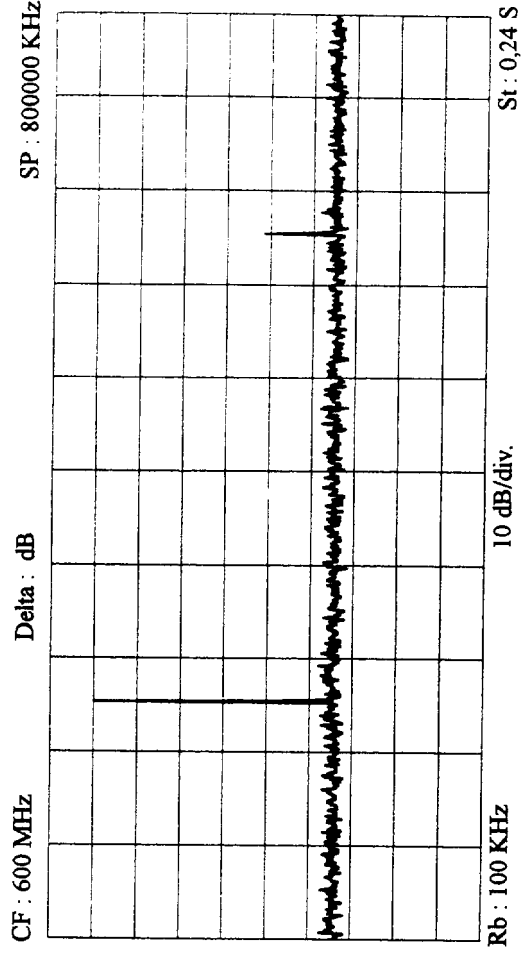
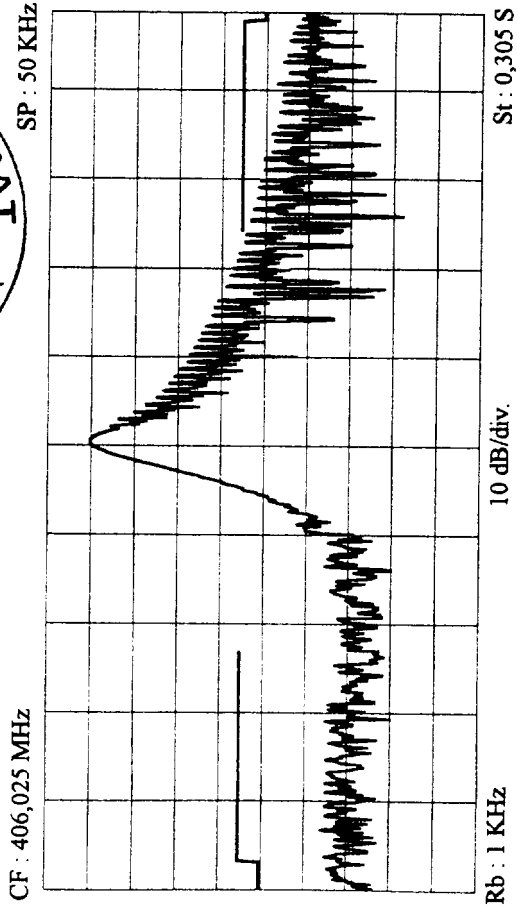
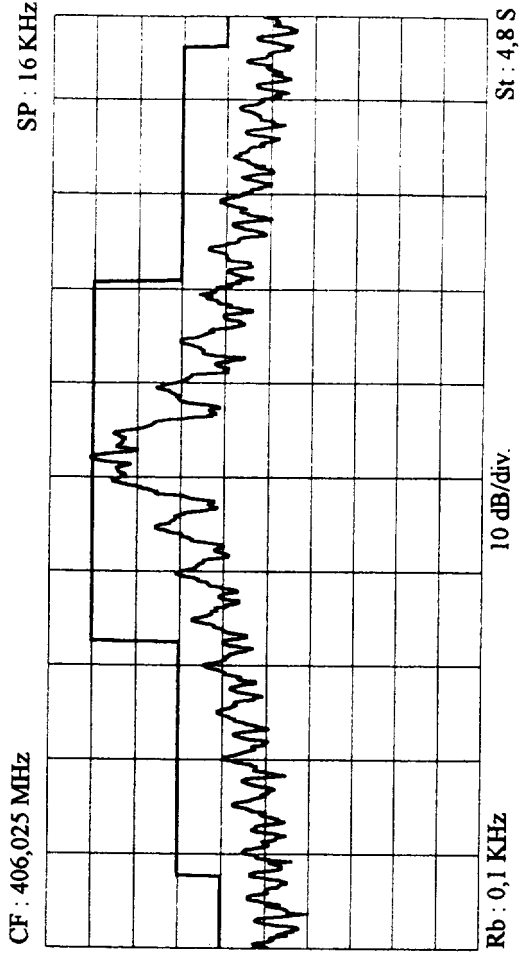
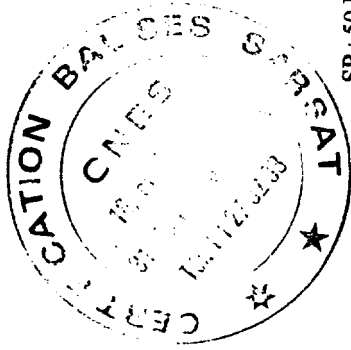
ACR Electronics, Inc.
RLB 33
1
Certification VSWR
406 MHz
-40 °C



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
1. Does beacon have a self-test mode ?		<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"/>	<input type="checkbox"/>
♦	does self-test transmit any other frequency (e.g. 243 MHz) ?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Result of self-test is indicated by :			
♦	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"/>	<input type="checkbox"/>
3. Can the self-test be performed without removing the beacon from its mounting bracket ?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
4. What parameters are internally tested by the self-test ?			
♦	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"/>	<input type="checkbox"/>
5. Do the above characteristics apply to this beacon model :			
♦	for all countries where beacon is sold , if no, please specify :	<input checked="" type="checkbox"/>	<input type="checkbox"/>
♦	for all production serial numbers ? if no, specify :	<input checked="" type="checkbox"/>	<input type="checkbox"/>

6. Comments

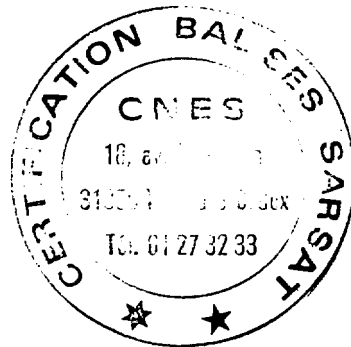
**THERMAL SHOCK TEST RESULT ON
RLB 33 ACR Electronics, Inc.
N° 1**

20°C to -10°C

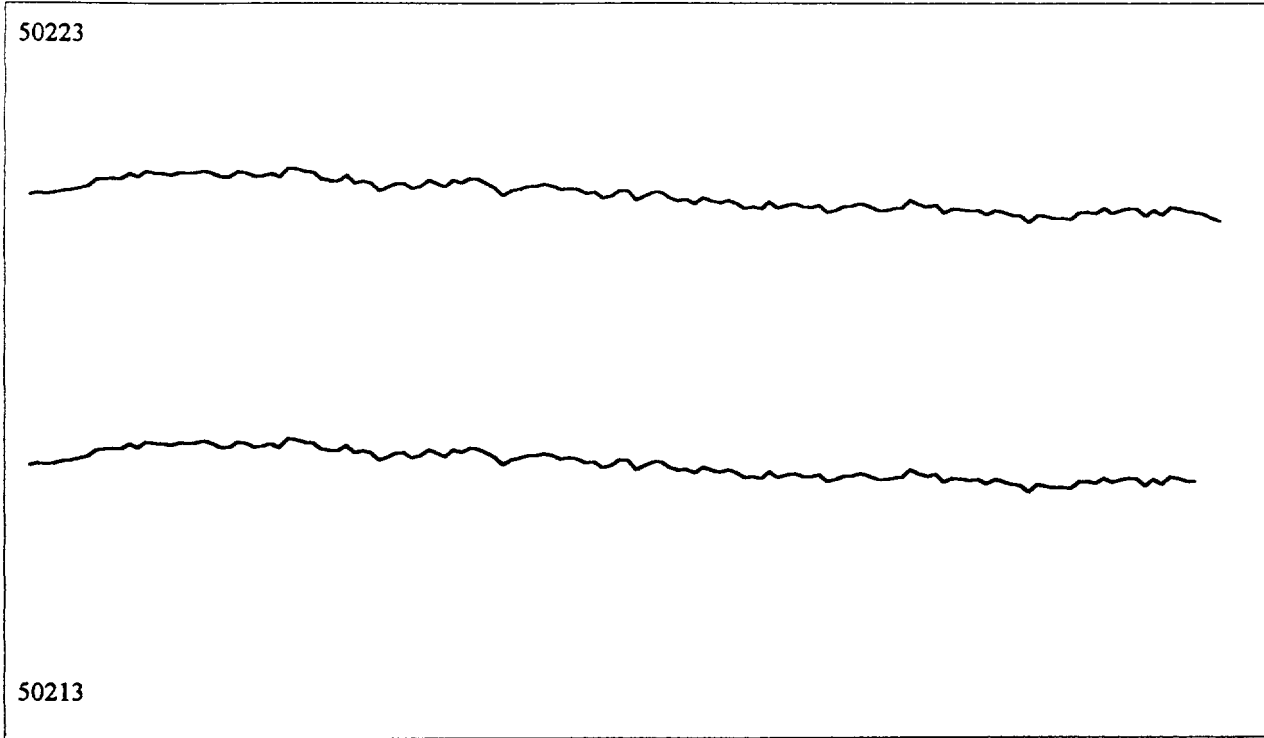
Temperature Soak : 20°C
 Temperature Measure : -10°C

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



— Initial tracing — Smoothed tracing

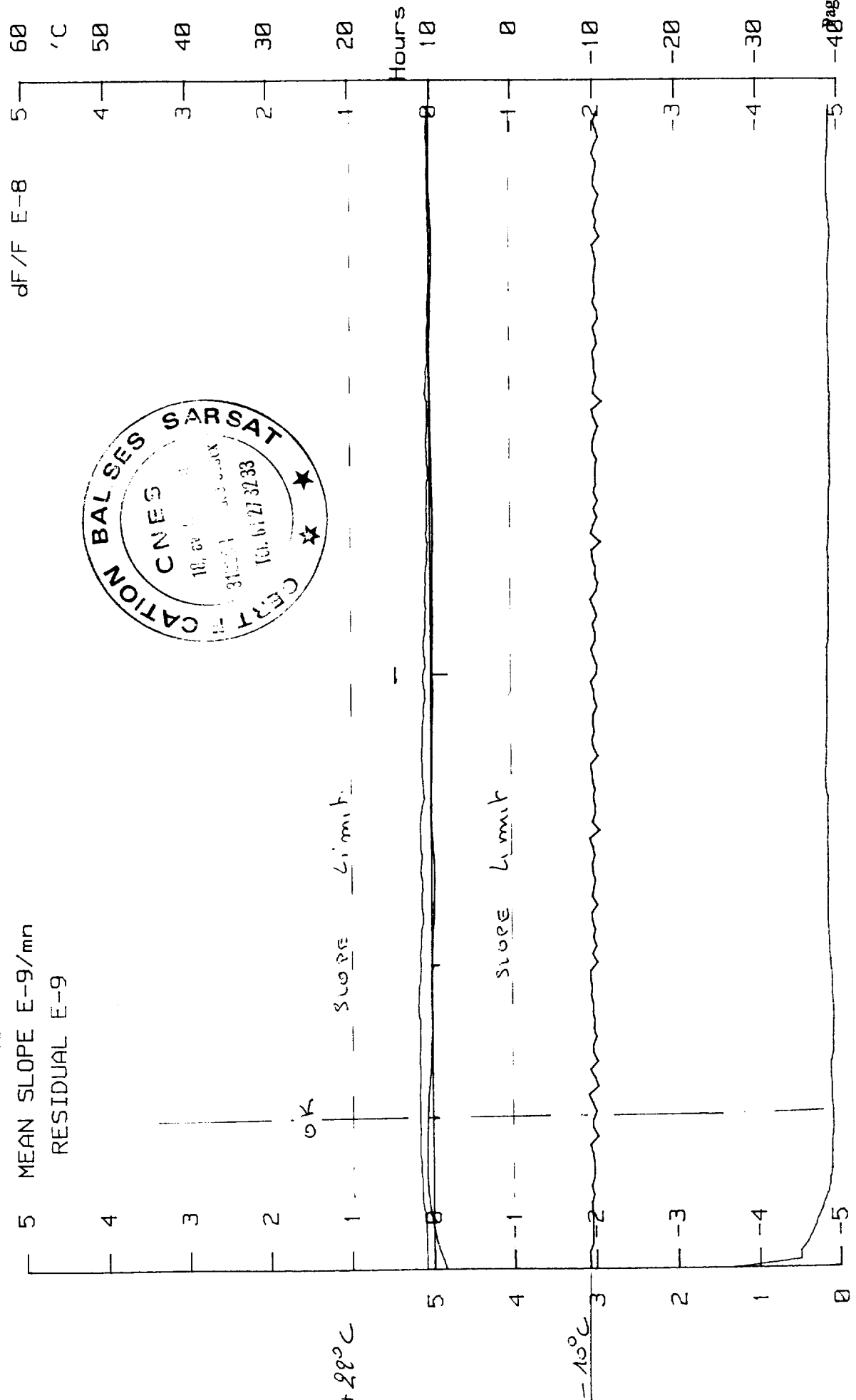
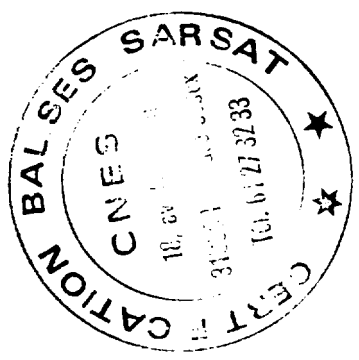
THERMAL SHOCK TEST / 30 °C char (20 °C to -10 °C) on N° . RLB 33 ACR Electron: Inc. beacon

Ref. M1469

MEDIUM TERM STABILITY

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

MEAN SLOPE E-9/mn
 RESIDUAL E-9

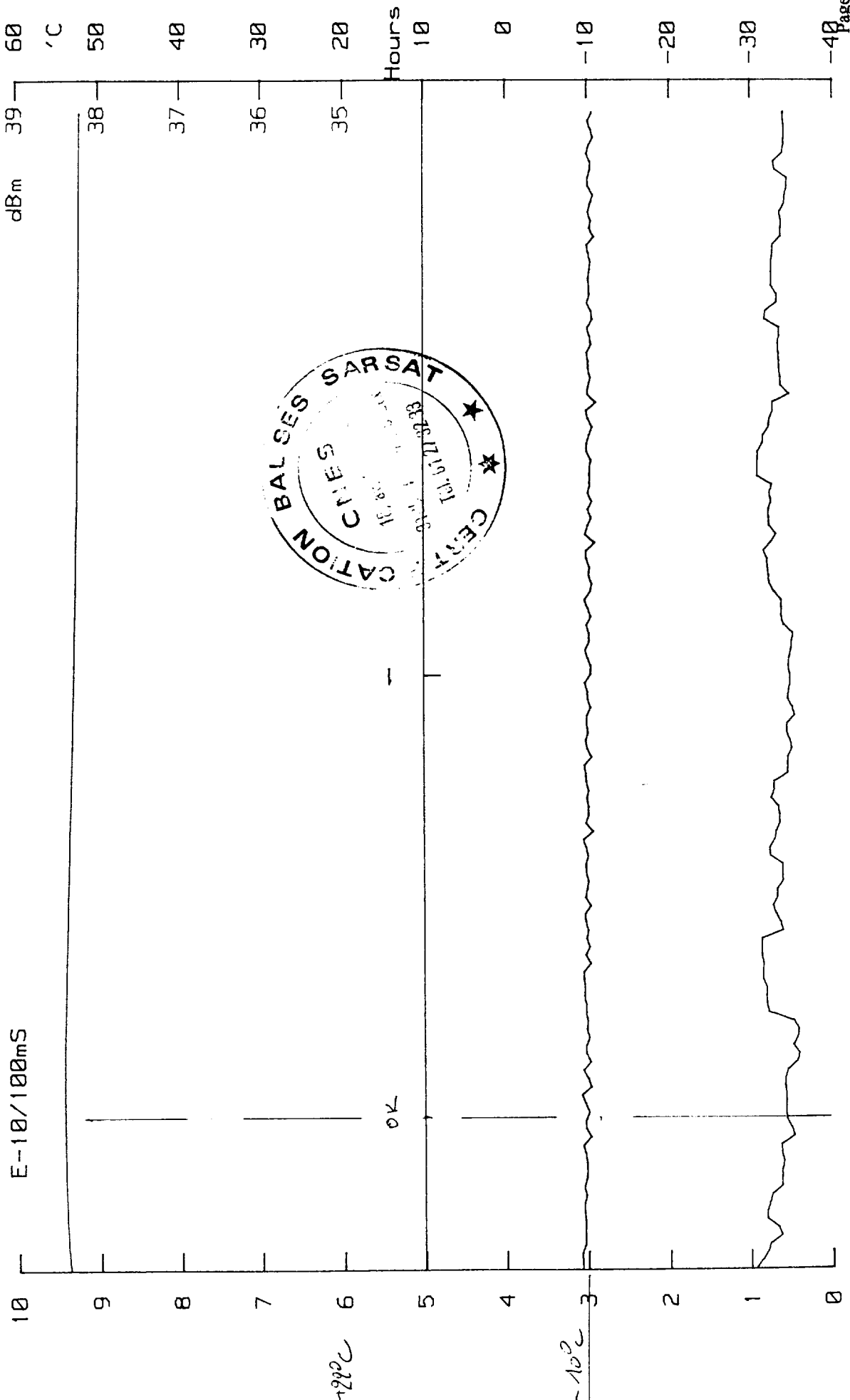


THERMAL SHOCK TEST / 30 °C cha (20 °C to -10 °C) on N° 1 RLB 33 ACR Electror Inc. beacon

Ref : M1469

OUTPUT POWER and SHORT TERM STABILITY

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



OPERATING LIFE TEST RESULTS ON
RLB 33 ACR Electronics, Inc.
N° 1
-40 °C

Average Current Drain Calculation

Prior to Life Test, we have applicated 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

$$Q_t = C_0(U_r \cdot N_p + U_0)$$

C₀ = 62,1E-06 Farad (measured with Intespace capacimeter)

U_r = 2,5 Volts, Standard

U₀ = 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 (HH:MM)	T Delay (sec)	Total Pulse N _p	Total Charge Q _t (Amp-Sec)	Current aver. (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 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

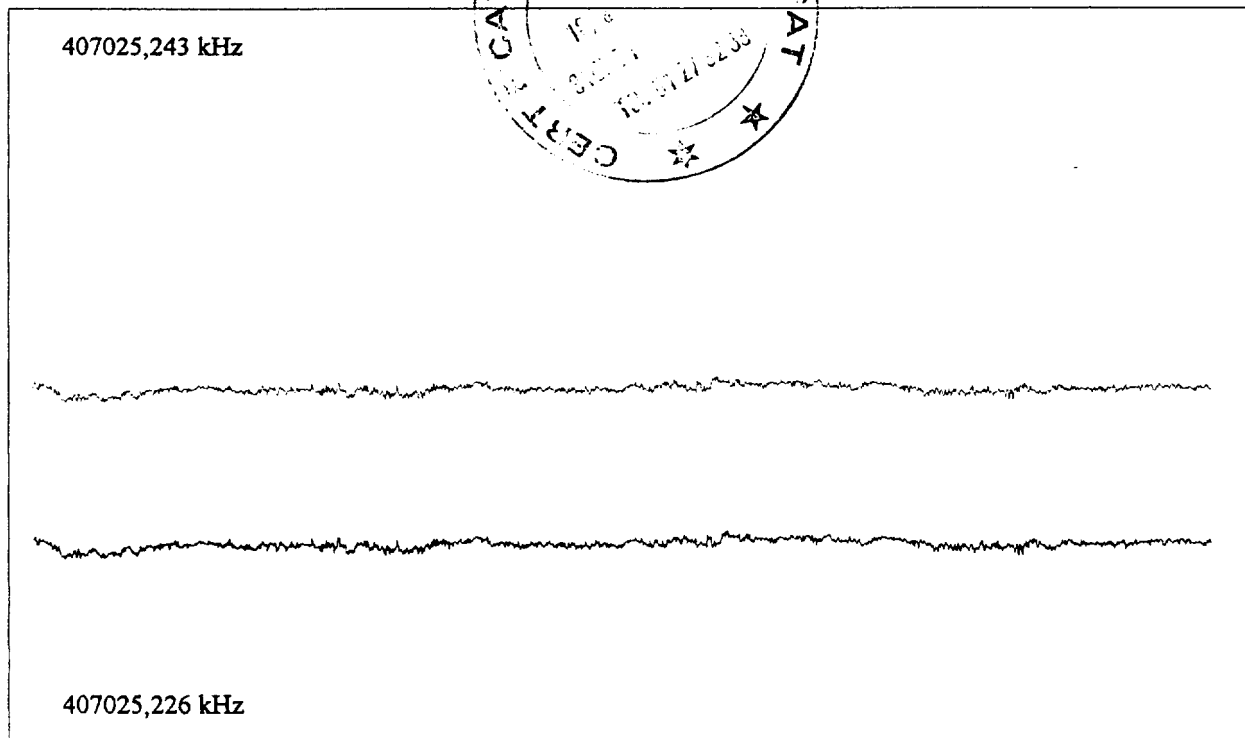
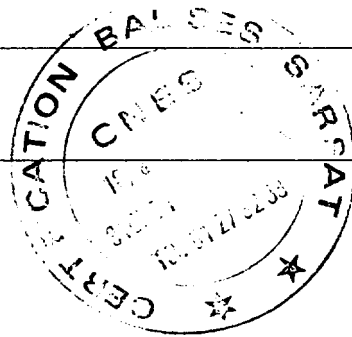
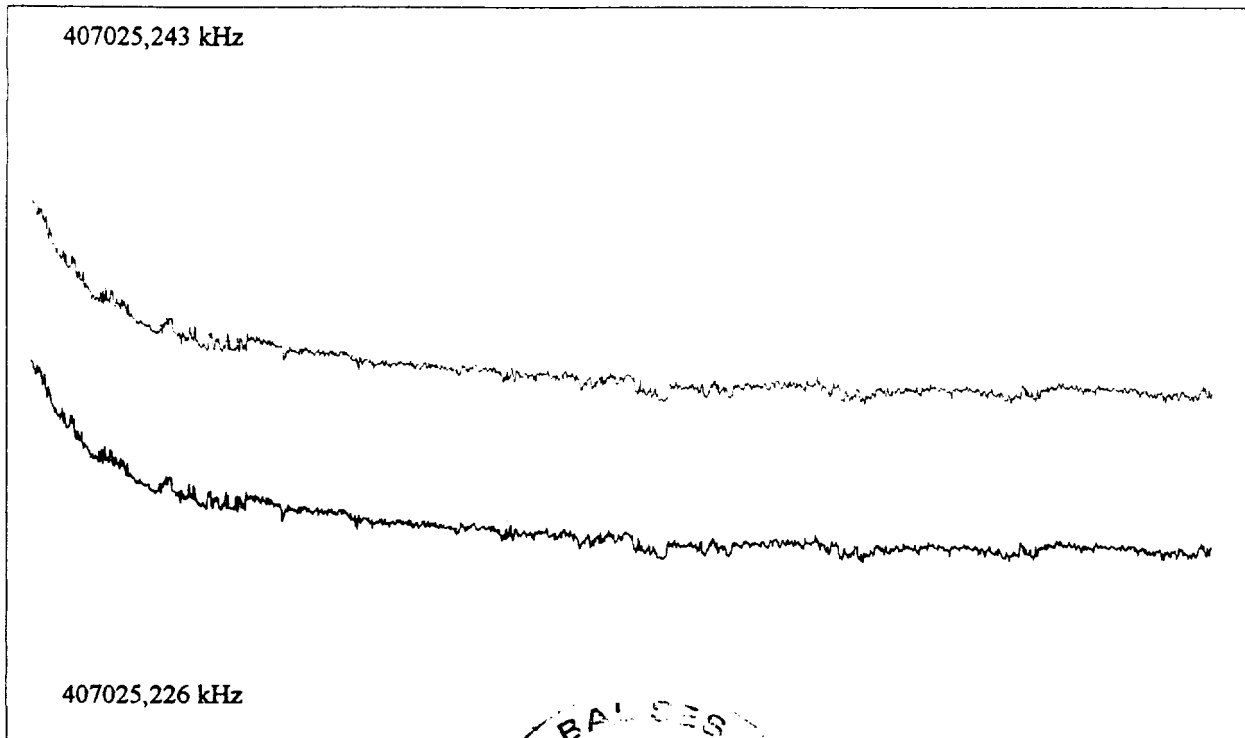
48h

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

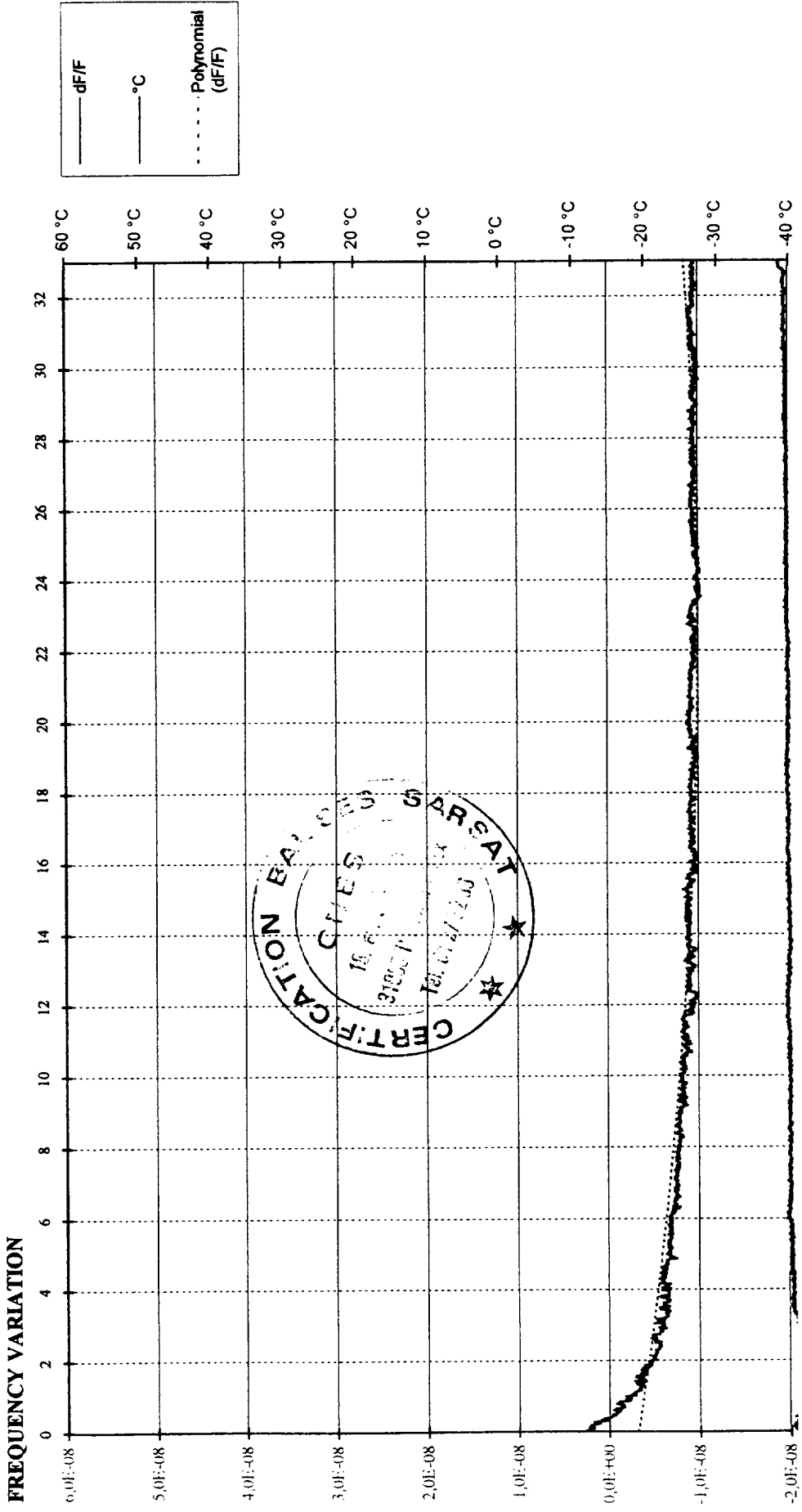


— Initial tracing — Smoothed tracing

LIFE TEST AT -20 °C

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

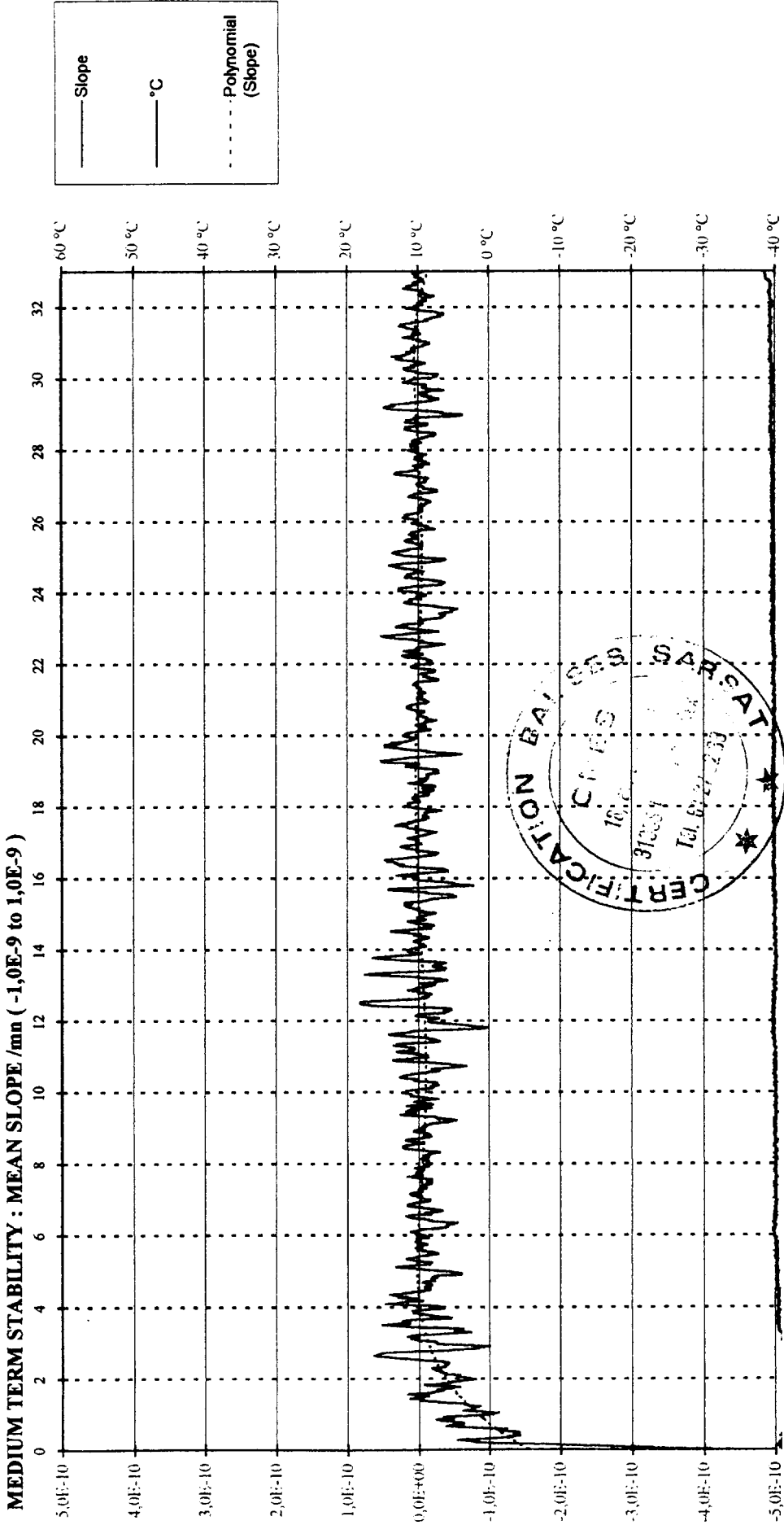
Date : 19/03/1999
Time : 00:10:50



LIFE TEST AT -20 °C

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

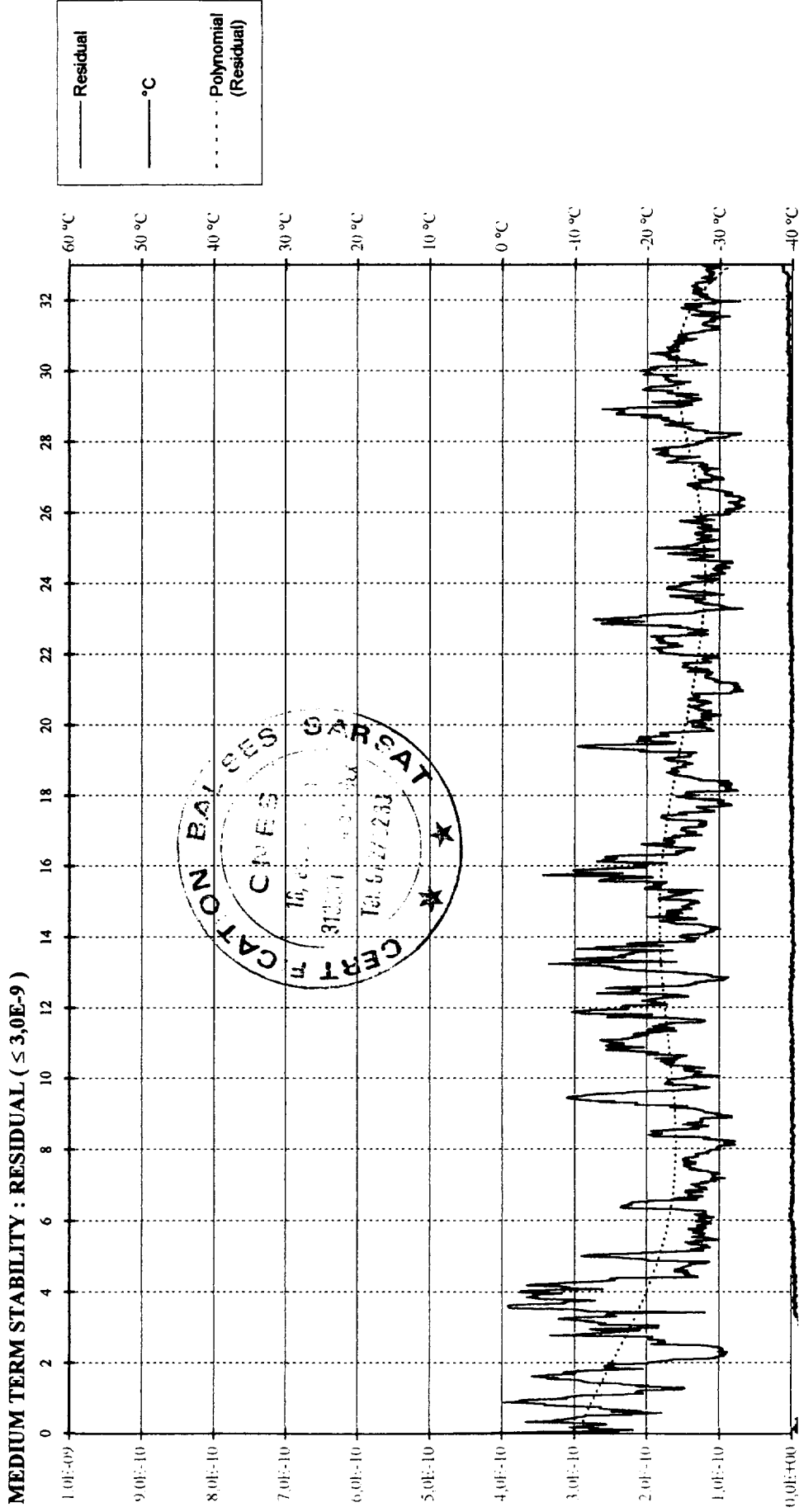
Date : 19/03/1999
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LIFE TEST AT -20 °C

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

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



LIFE TEST AT -20 °C

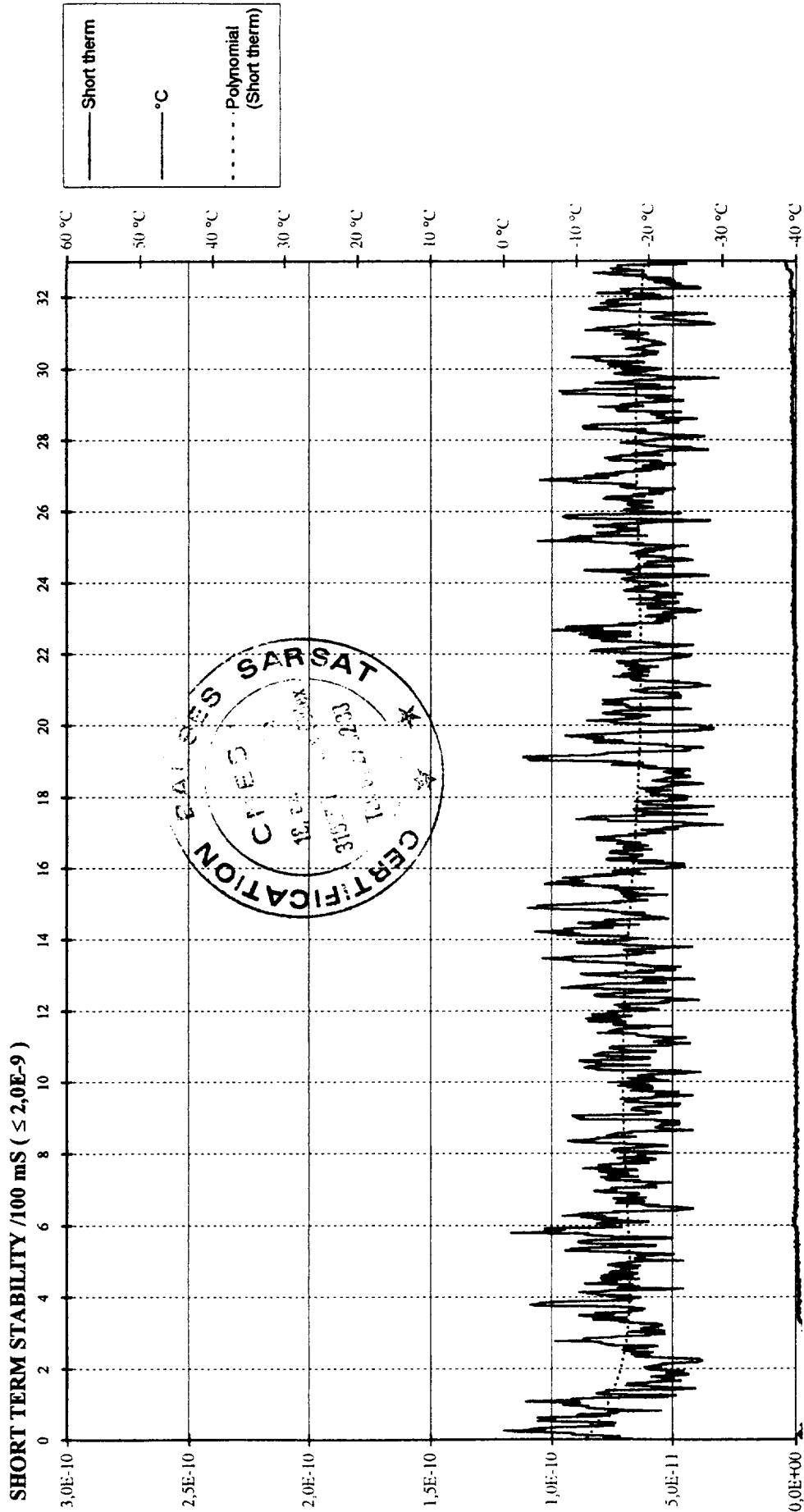
Manufacturer : ACR Electronics, Inc.

Model : RLB 33

Number : 1

Date : 19/03/1999

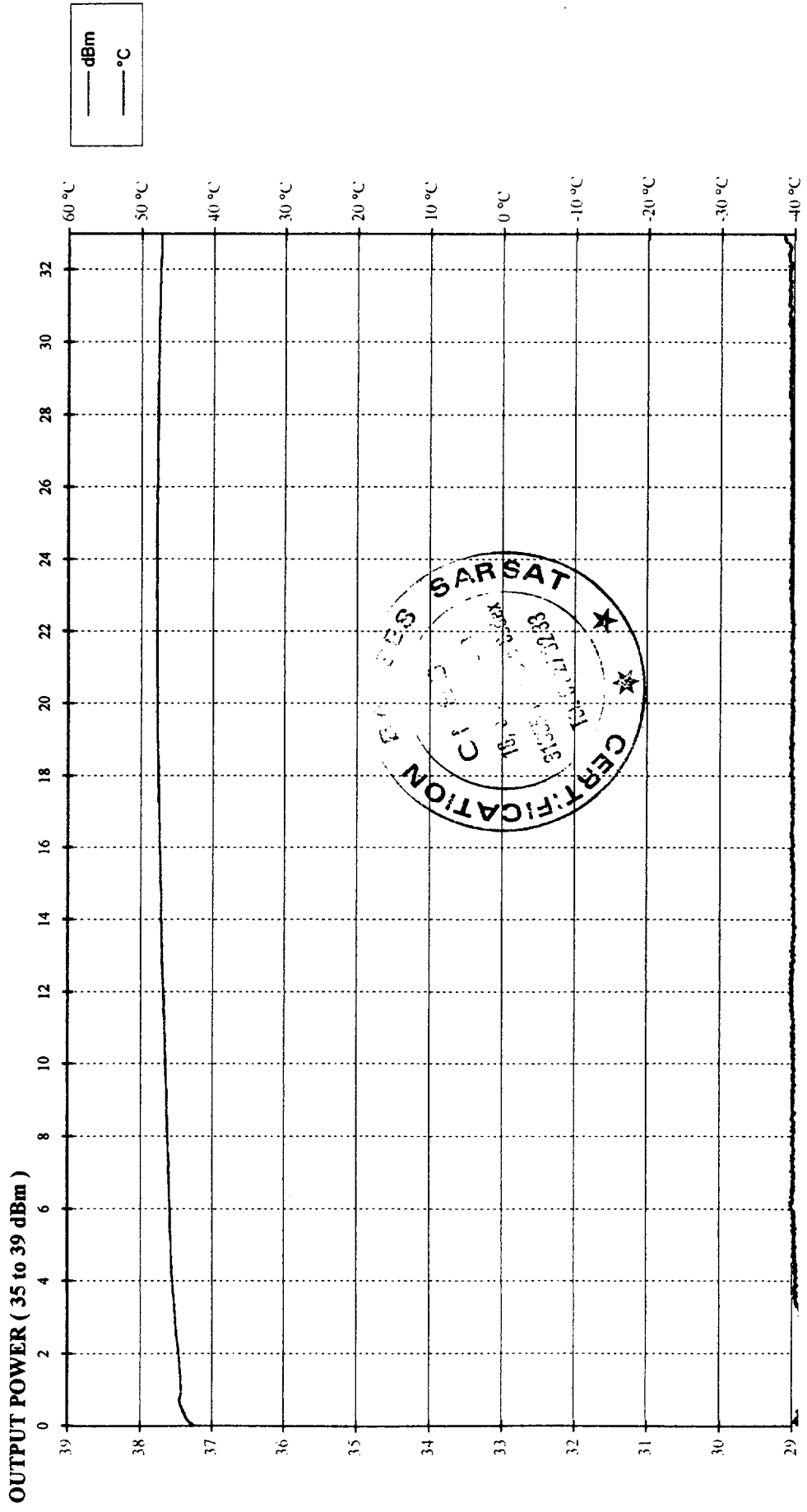
Time : 00:10:50



LIFE TEST AT -20 °C

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

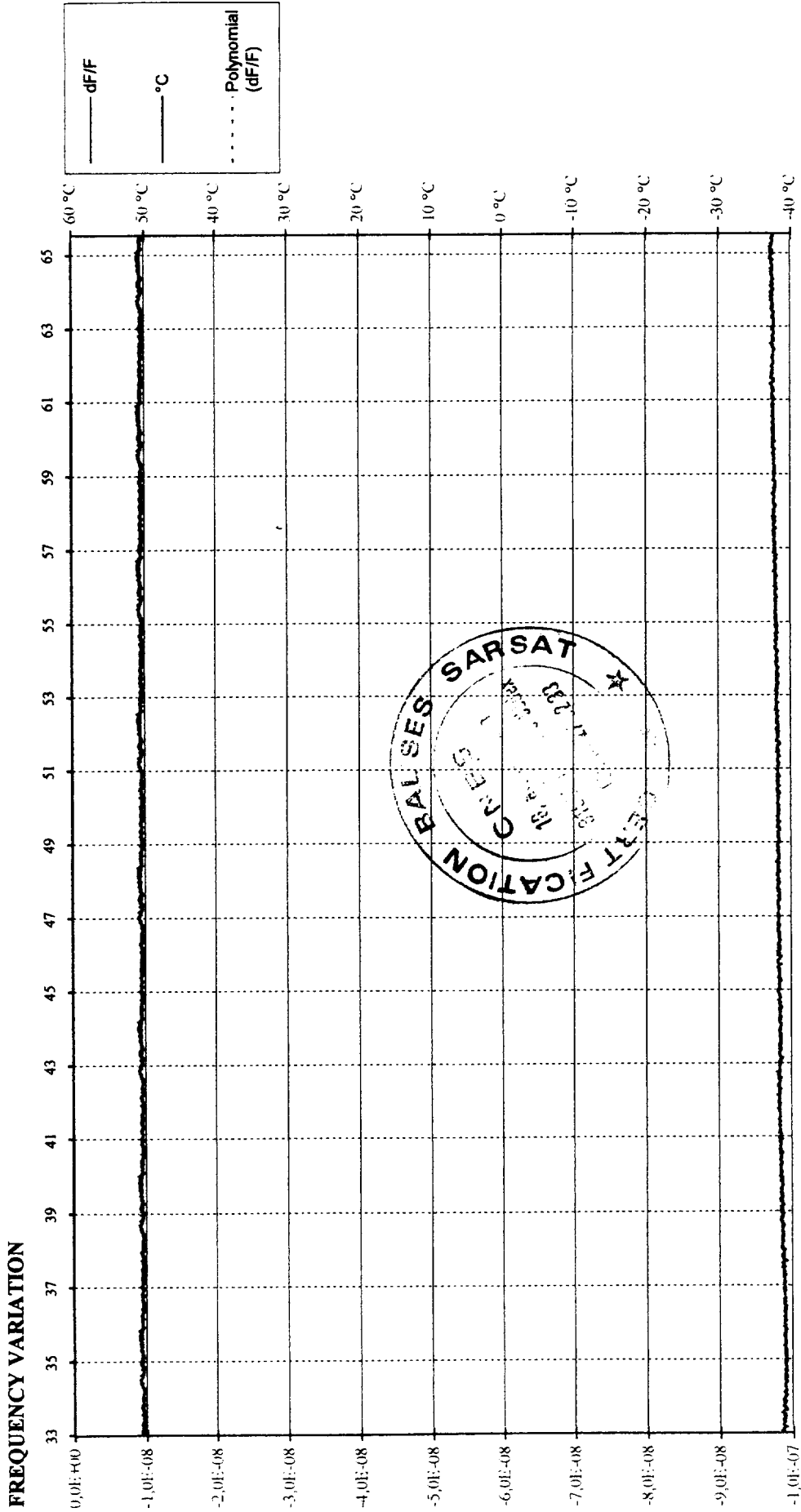
Date : 19/03/1999
Time : 00:10:50



LIFE TEST AT -20 °C

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

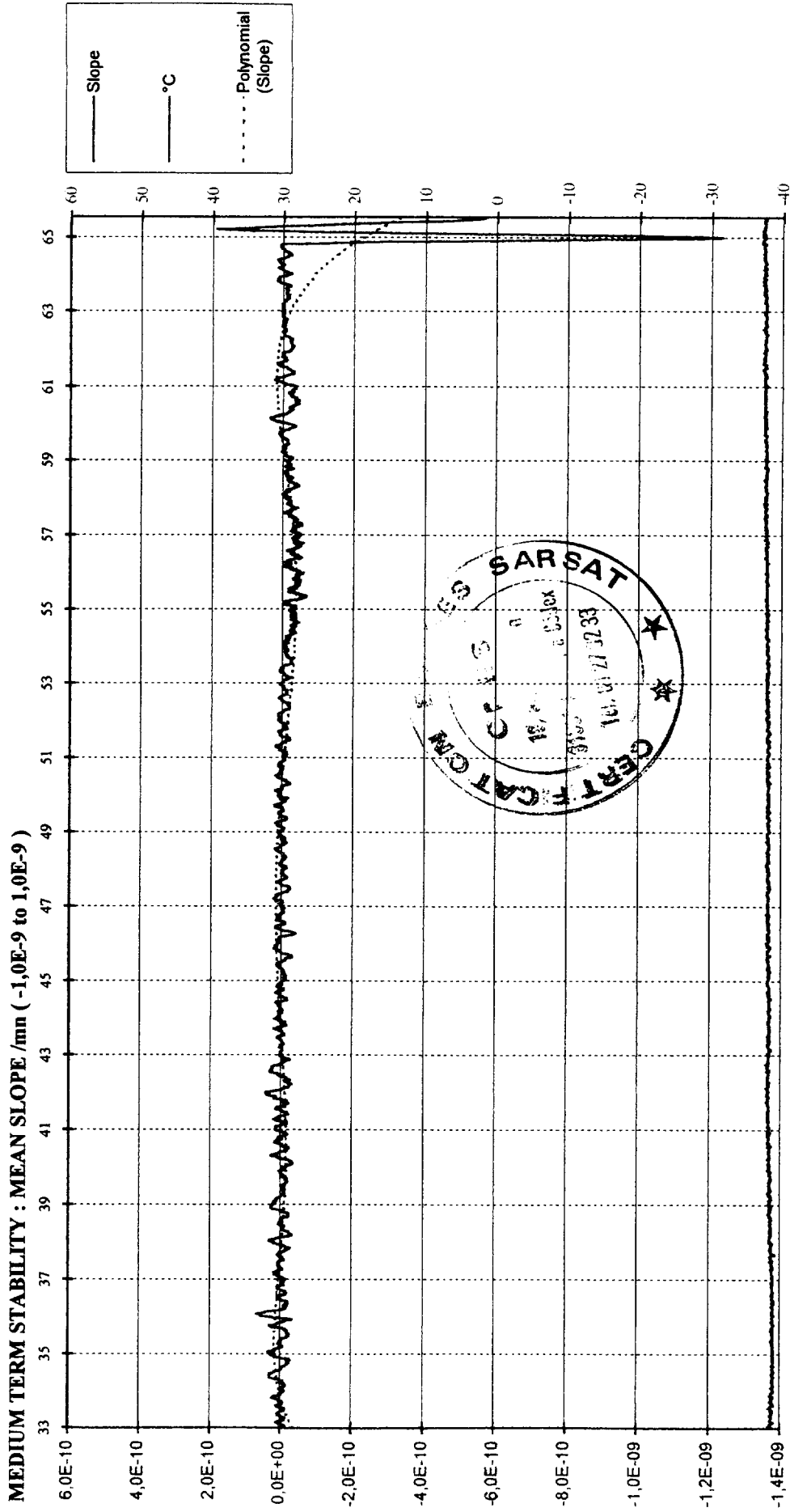
Date : 19/03/1999
Time : 00:10:50



LIFE TEST AT -20 °C

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

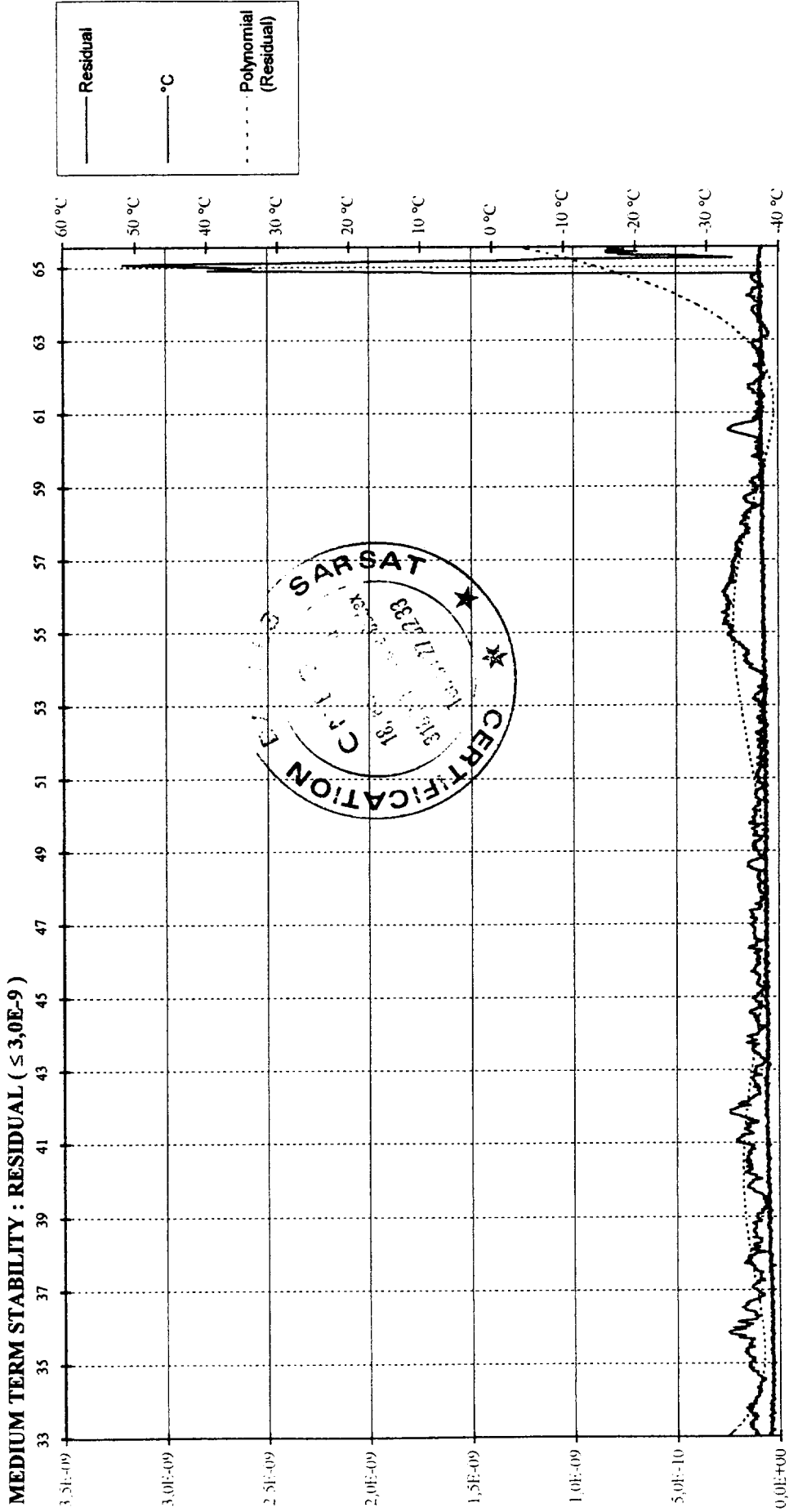
Date : 19/03/1999
Time : 00:10:50



LIFE TEST AT -20 °C

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

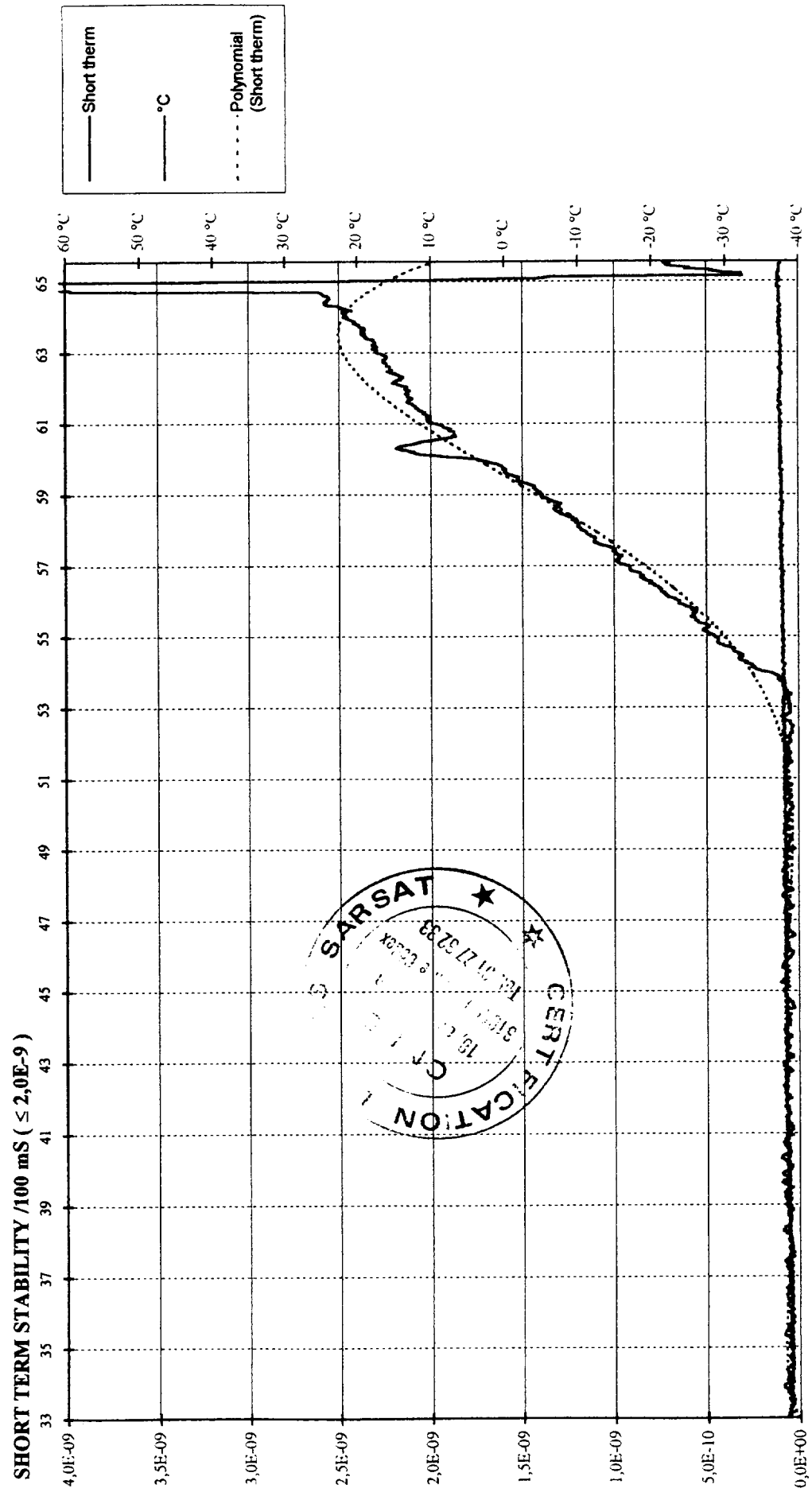
Date : 19/03/1999
Time : 00:10:50



LIFE TEST AT -20 °C

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

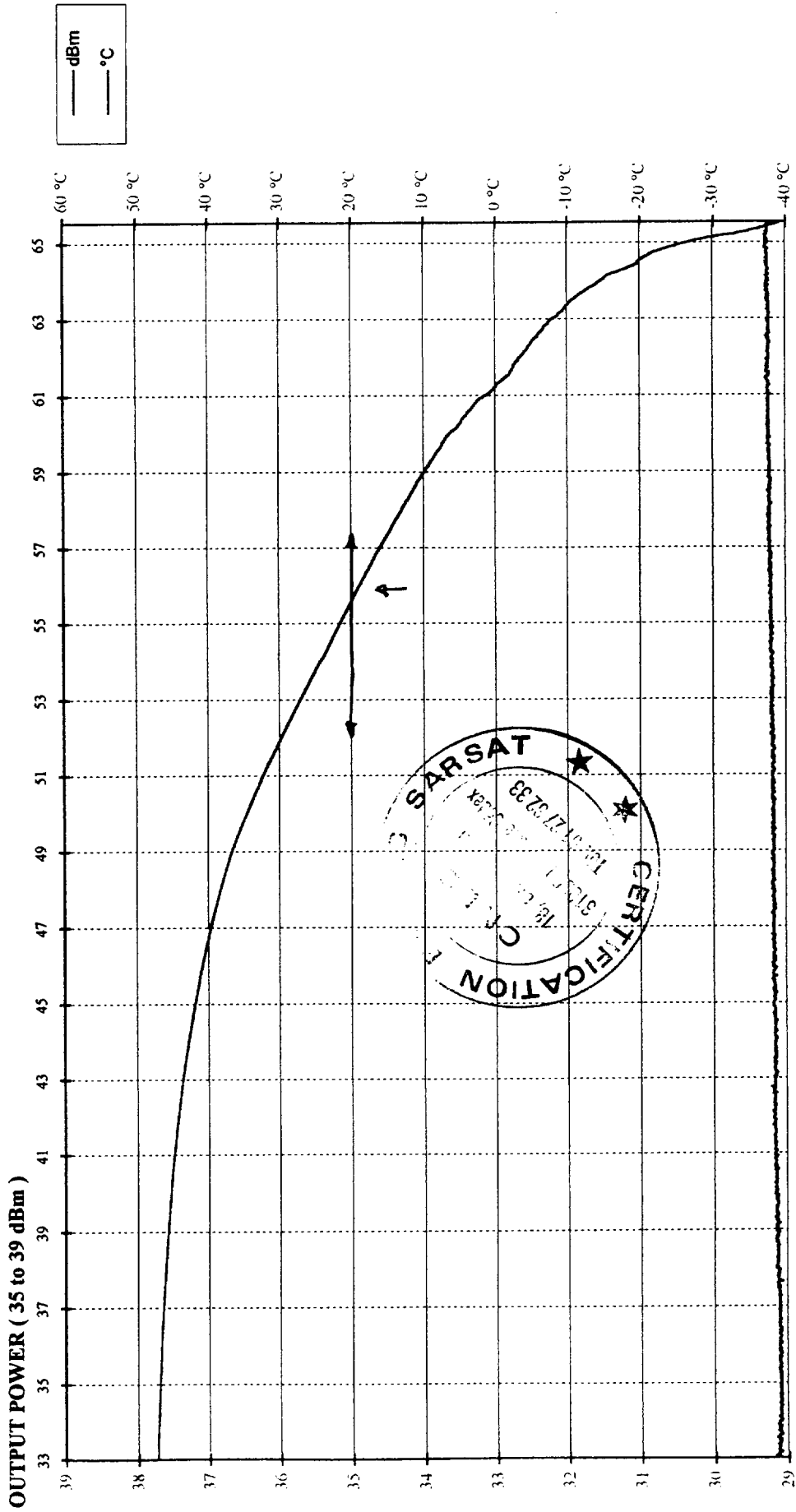
Date : 19/03/1999
Time : 00:10:50



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

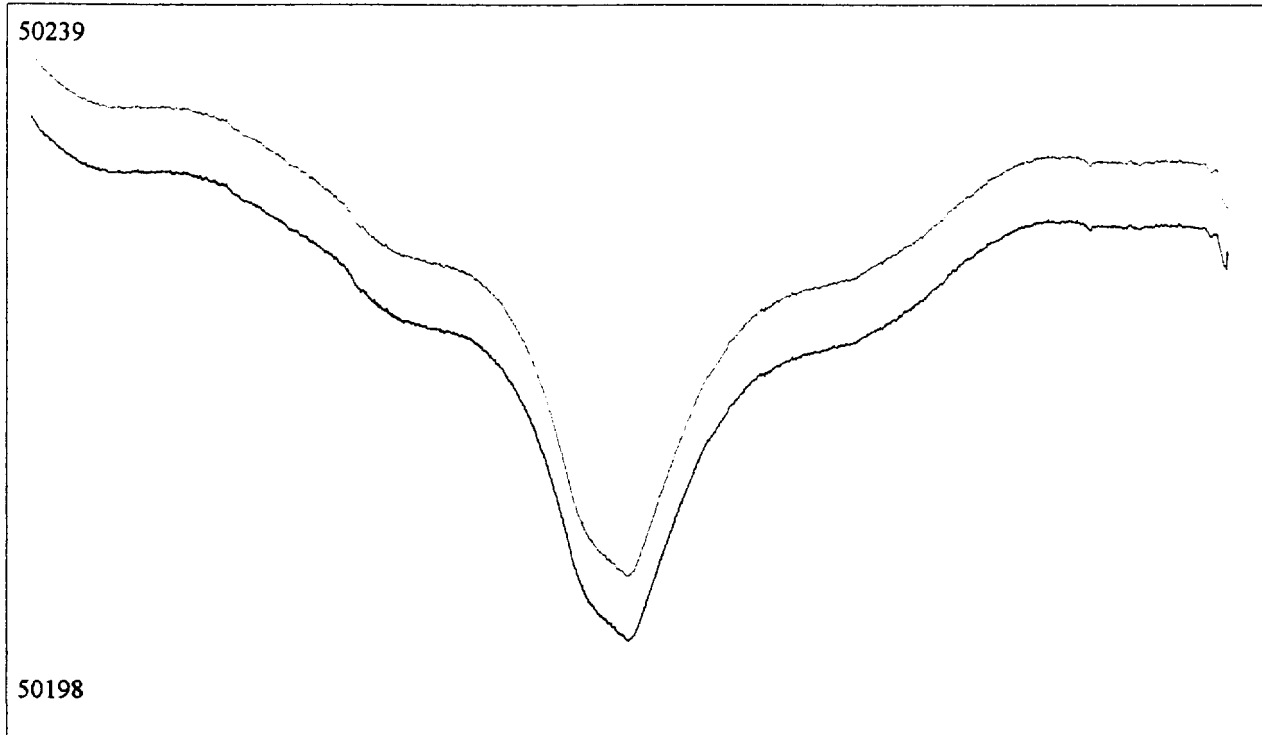
No	Frequency	Temp.	P406	P121.5
1	50234,24	-38,2	37,3	16,8
2	50234,01	-38,6	37,3	16,7
3	50234,04	-38,3	37,3	16,8
4	50233,91	-38,8	37,3	16,8
5	50233,91	-38,7	37,3	16,7
6	50233,86	-38,7	37,3	16,7
7	50233,72	-38,3	37,3	16,8
8	50233,71	-38,7	37,3	16,7
9	50233,61	-38,7	37,3	16,8
10	50233,51	-38,6	37,4	16,8
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)

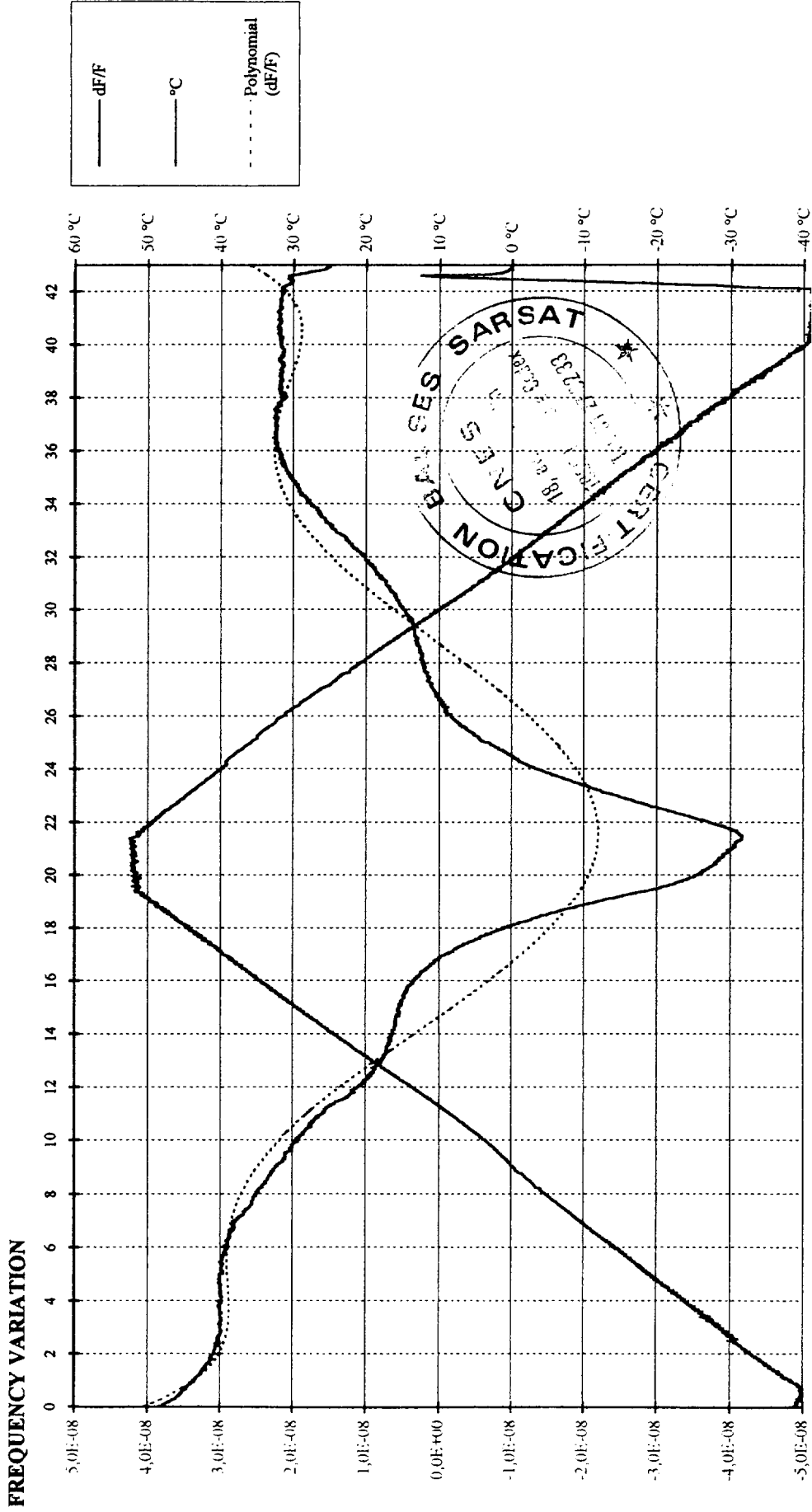
Manufacturer : ACR Electronics, Inc.

Model : RLB 33

Number : 1

Date : 17/03/1999

Time : 11:25:07



TEMPERATURE GRADIENT TEST RESULTS (5 °C / hour)

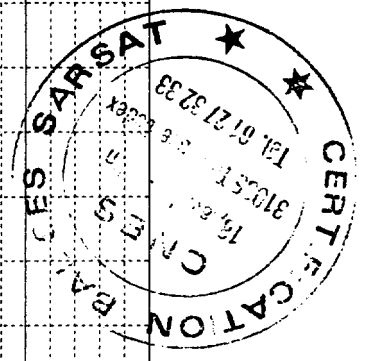
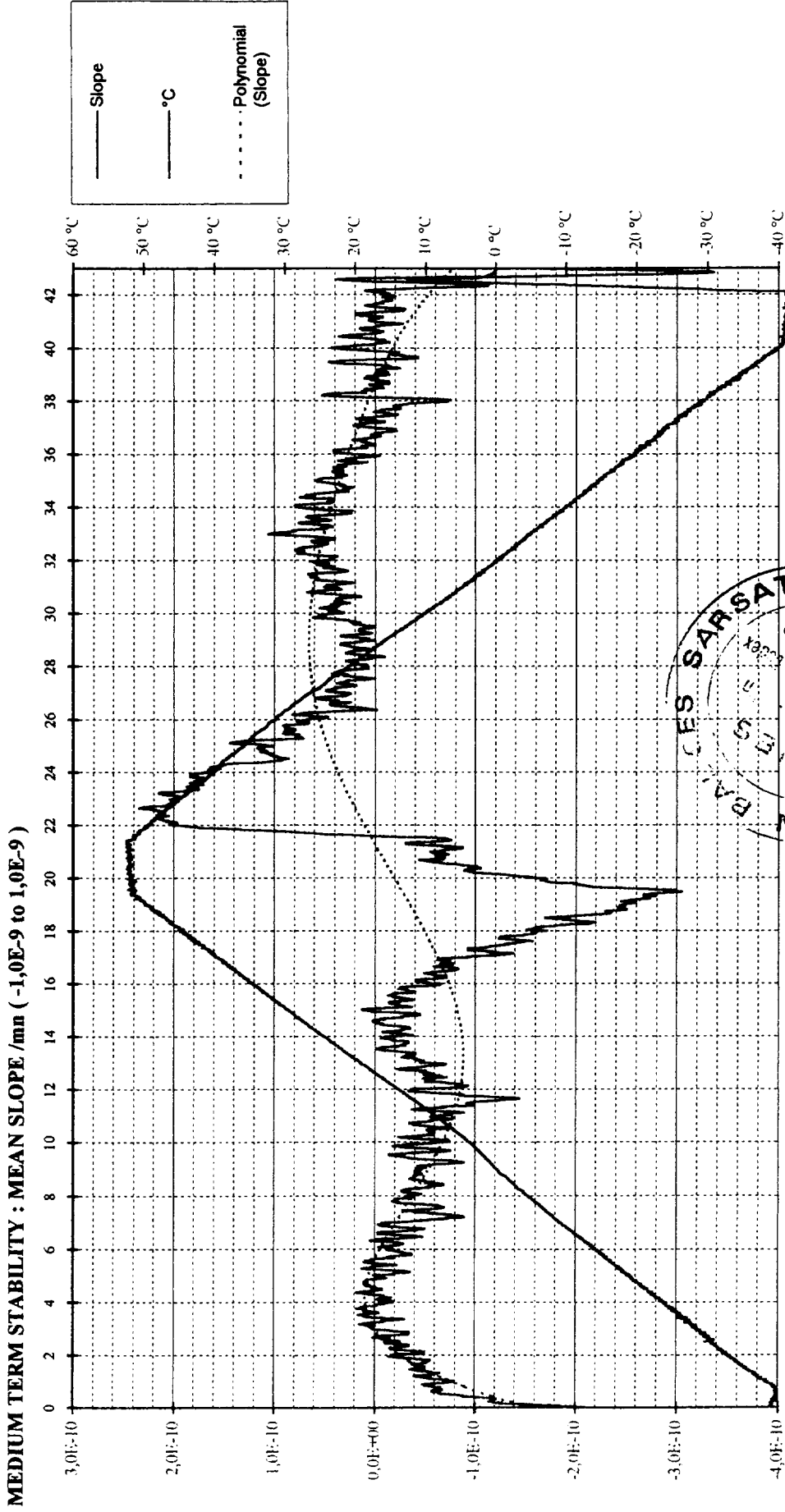
Manufacturer : ACR Electronics, Inc.

Model : RLB 33

Number : 1

Date : 17/03/1999

Time : 11:25:07



TEMPERATURE GRADIENT TEST RESULTS (5 °C / hour)

Manufacturer : ACR Electronics, Inc.

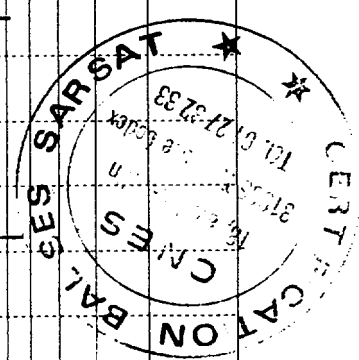
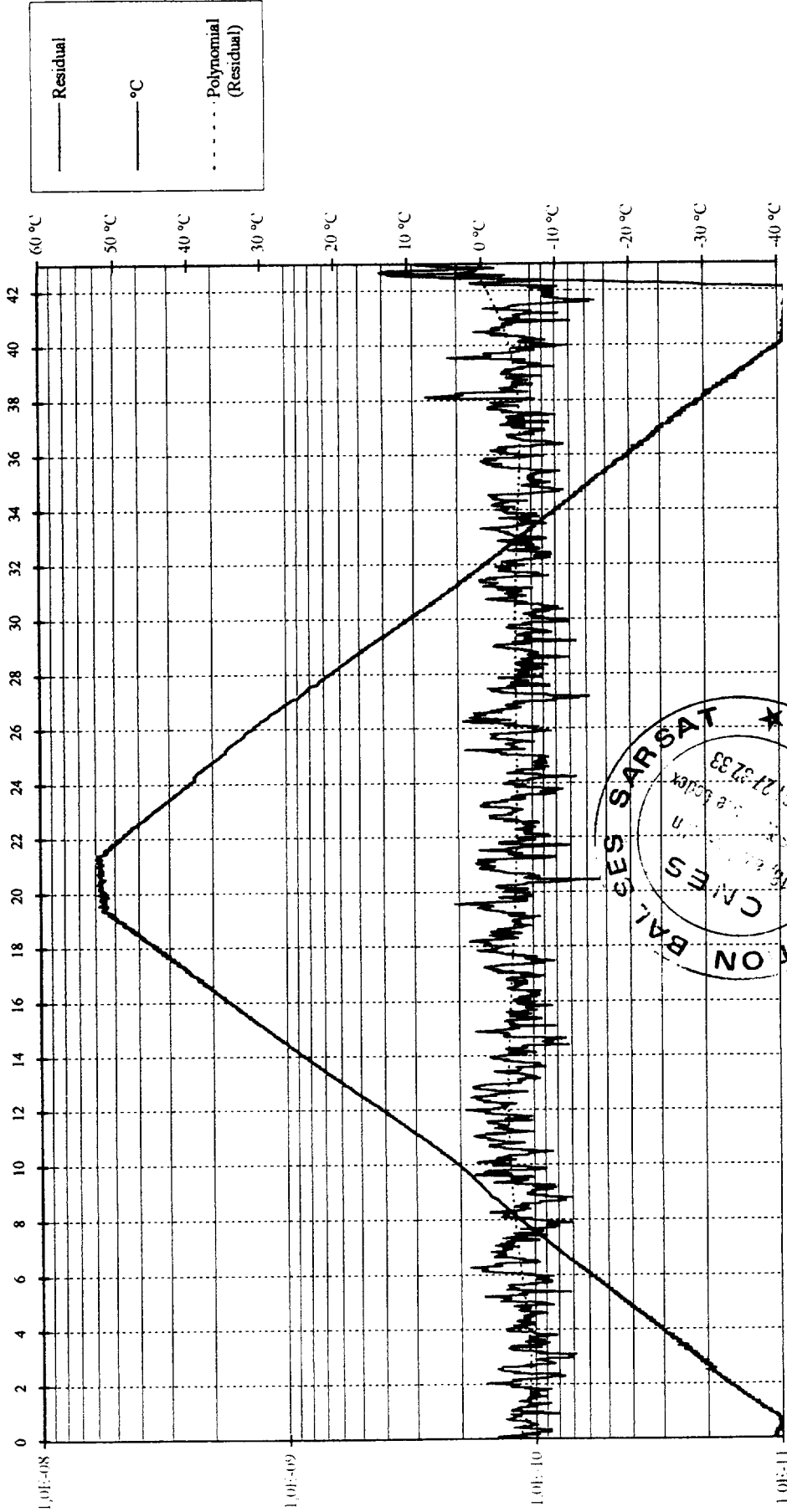
Model : RLB 33

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.

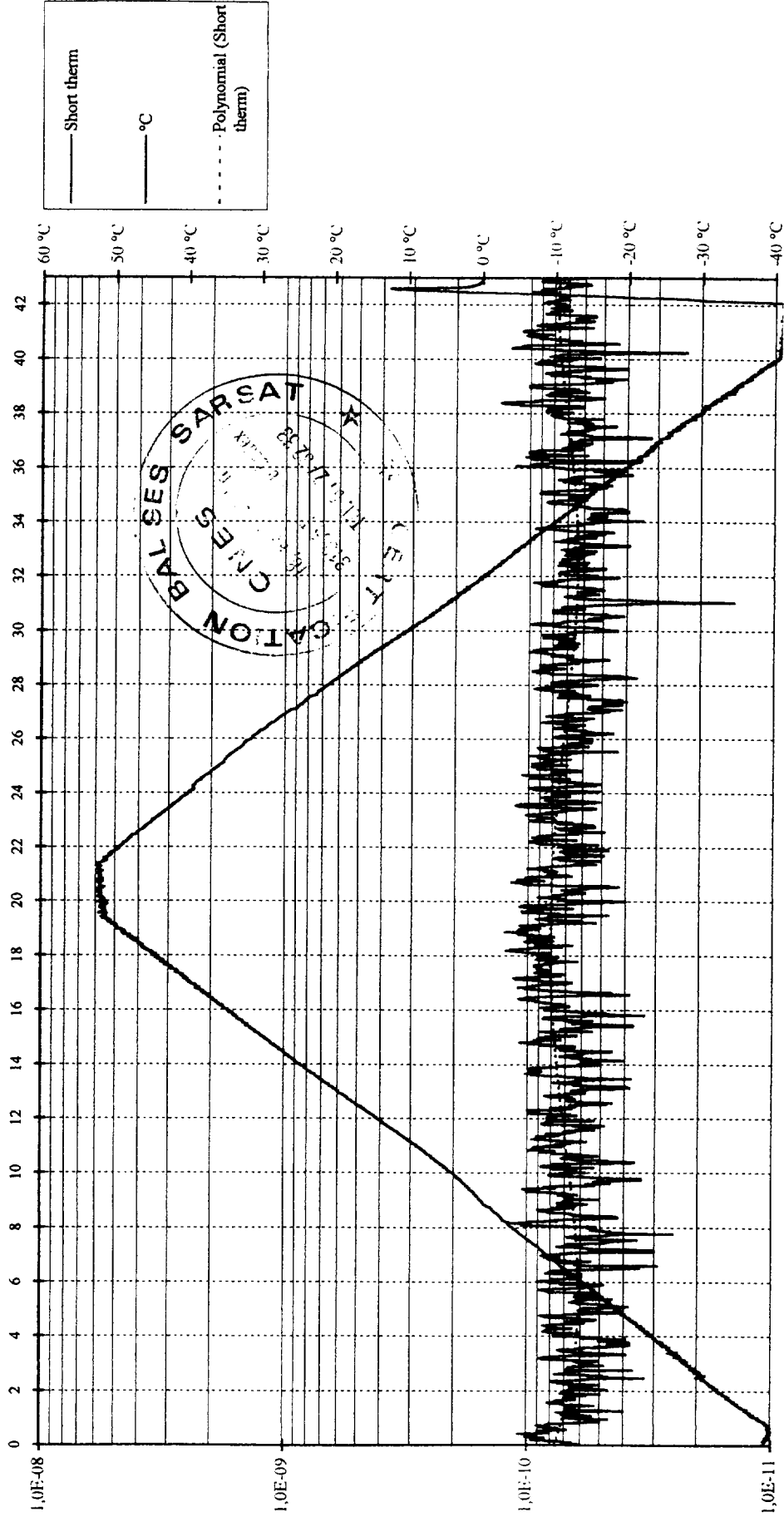
Model : RLB 33

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)

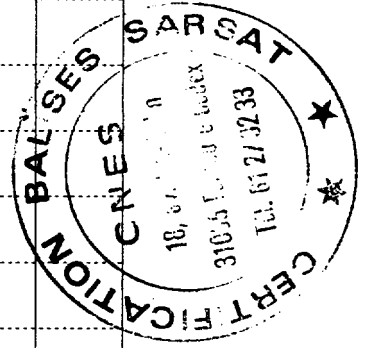
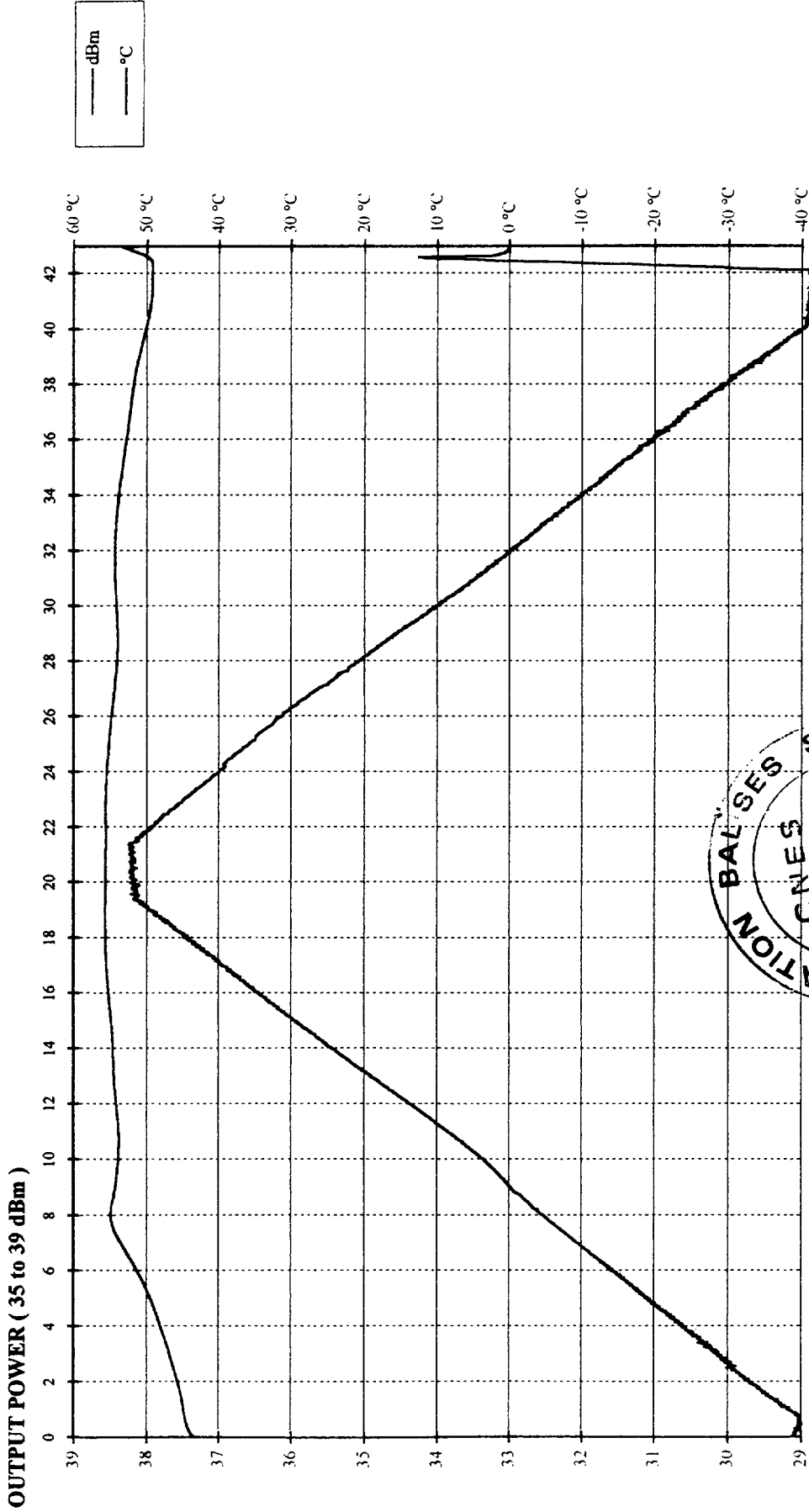
Manufacturer : ACR Electronics, Inc.

Model : RLB 33

Number : 1

Date : 17/03/1999

Time : 11:25:07



**SATELLITE QUALITATIVE TEST RESULTS ON
RLB 33 ACR Electronics, Inc.
N° 5**

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

PLB 33 N° 5

Code balise : 2DOC5D800A
 Nom balise : 2177
 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	BIAS	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/C	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	28331	*
* 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	95	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	32204	*		
* 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	30977	*		
* 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 07H39	07H49	* S07	5	*	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	07H51	* S07	13	*	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 08H36	08H46	* C06	4	*	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	18H50	* C06	4	*	43.557	1.467	74	1	-277	1.10	* 40.720	-32.264	* 12.8	L	1	0.3	4/0	2272	31006	*		
* 22/03 09H19	09H27	* S07	8	*	43.556	1.477	99	1	-113	0.47	* 50.702	-35.907	* 13.6	G	1	0.3	4/0	2271	31658	*		
* 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 09H19	20H52	* S07	13	*	43.559	1.482	99	1	-280	0.11	* 50.799	-35.979	* 13.6	G	0	0.2	4/0	2271	31902	*		
* 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	2272	31102	*		
* 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
 Référence 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 83 N° 5

Selected Field :
406 message : 96EE2EC0052C002332C9B569FCC483

406 message : 96EE2EC0052C002332C9B569FCC483

15 hexa : 2DDC5D800A58004

Beacon ID : 2DDC5D800A / 2DDC5D800AFFBF

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
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
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
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	69fcc483	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	69fec483	20/03/1999	20:12:03	.2375	406015852.764	-131	
53	9 96ee2ec0052c002332c9b5	69fce483	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.
N° 3**

RLB 32 N° 3 LIS. LOC.

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

Code balise : ADD02000040401

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	2272	27439	*
* 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	27250	*
* 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	27256	*
* 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 * 43.558 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 08H12 * S07 7 * 43.560 1.482 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 1.466 97 2 220 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 * 38.507 -24.049 * 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 21H46 21H55 * S04 12 * 43.557 1.482 98 1 216 0.44 * 45.159 -20.353 * 7.5 G 0 0.1 4/0 2272 28667 *
* 20/03 21H46 10H17 * S04 12 * 43.570 1.480 98 1 215 0.26 * 35.517 -36.792 * 14.6 L 0 0.4 4/0 2271 28621 *
* 21/03 02H43 02H54 * C08 14 * 43.560 1.462 97 1 214 1.25 * 35.529 -36.799 * 14.6 G 0 0.4 4/0 2272 29389 *
* 21/03 02H43 15H36 * C08 14 * 43.558 1.474 98 1 214 0.58 * 43.840 -1.893 * 1.0 L 0 0.1 4/0 2272 28765 *
* 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 2271 29673 *
* 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 28804 *
* 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 0.777 * 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 2271 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 1.445 * 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	2272	31526	*
* 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	2271	31903	*
* 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	31099	*
* 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
Min ref level		-128,0	Average ref level		-115,3	
Max ref level		-108,0				

	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
Min RLB 32 level		-128	Average RLB 32 level		-118,8	
Max RLB 32 level		-112				

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	10:32:09.9	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	20:14:00.9	406033	-116	
12	10	56ee810006a0200c16c890	19/03/1999	20:14:51.2	406033	-117	
12	10	56ee810006a0200c16c890	19/03/1999	20:15:39.9	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	20:19:53.9	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	21:56:35.9	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	6:39:36.39	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	10:00:56.7	406033	-119	
5	5 56ee810006a0200c16c890	21/03/1999	10:01:47.0	406033	-117	
5	5 56ee810006a0200c16c890	21/03/1999	10:02:35.6	406032	-117	
5	5 56ee810006a0200c16c890	21/03/1999	10:03:26.5	406032	-113	
5	5 56ee810006a0200c16c890	21/03/1999	10:04:15.5	406030	-121	
5	5 56ee810006a0200c16c890	21/03/1999	10:05:07.4	406028	-114	
5	5 56ee810006a0200c16c890	21/03/1999	10:06:49.6	406022	-110	-110
5	5 56ee810006a0200c16c890	21/03/1999	10:07:40.2	406020	-114	
5	5 56ee810006a0200c16c890	21/03/1999	10:08:29.2	406018	-123	
5	5 56ee810006a0200c16c890	21/03/1999	10:09:20.5	406017	-112	
5	5 56ee810006a0200c16c890	21/03/1999	10:10:10.1	406017	-119	
5	5 56ee810006a0200c16c890	21/03/1999	10:11:02.0	406016	-120	
5	5 56ee810006a0200c16c890	21/03/1999	10:11:52.3	406016	-128	
50	16 56ee810006a0200c16c890	21/03/1999	17:40:51.6	406031	-116	
50	16 56ee810006a0200c16c890	21/03/1999	17:41:43.6	406030	-114	
50	16 56ee810006a0200c16c880	21/03/1999	17:42:33.8	406029	-115	
50	16 56ee810006a0200c16c890	21/03/1999	17:43:22.5	406028	-112	-112
50	16 56ee810006a0200c16c890	21/03/1999	17:44:13.4	406026	-115	
50	16 56ee810006a0200c16c890	21/03/1999	17:48:27.1	406018	-121	
50	16 56ee810006a0200c16c890	21/03/1999	17:49:16.1	406017	-125	
50	16 56ee810006a0200c16c890	21/03/1999	17:50:07.4	406017	-127	
8	8 56ee810006a0200c16c890	21/03/1999	19:47:01.1	406033	-122	
8	8 56ee810006a0200c16c890	21/03/1999	19:50:21.6	406031	-116	
8	8 56ee810006a0200c16c890	21/03/1999	19:51:11.5	406030	-115	-115
8	8 56ee810006a0200c16c890	21/03/1999	19:52:03.8	406028	-116	
8	8 56ee810006a0200c16c890	21/03/1999	19:53:43.3	406022	-113	
8	8 56ee810006a0200c16c890	21/03/1999	19:55:24.2	406018	-119	
8	8 56ee810006a0200c16c890	21/03/1999	19:56:16.2	406017	-118	
8	8 56ee810006a0200c16c890	21/03/1999	19:56:16.2	406017	-113	
8	8 56ee810006a0200c16c890	21/03/1999	19:57:06.4	406017	-116	
27	10 56ee810006a0200c16c8b0	21/03/1999	21:04:20.8	406026	-133	
27	10 56ee810006a0200c16c890	21/03/1999	21:06:01.7	406024	-133	
27	10 56ee810006a0200c16c890	21/03/1999	21:06:53.6	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	9:52:54.59	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 01° 28' 48" E
	N° 1*	ITS-Laboratory	43° 33' 32" N + 4" 01° 28' 48" E
	N°2	Lauzerville :	43° 33' 14" N 01° 34' 14" E
	N°3	Lanta:	43° 33' 36" N 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.
N° 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.

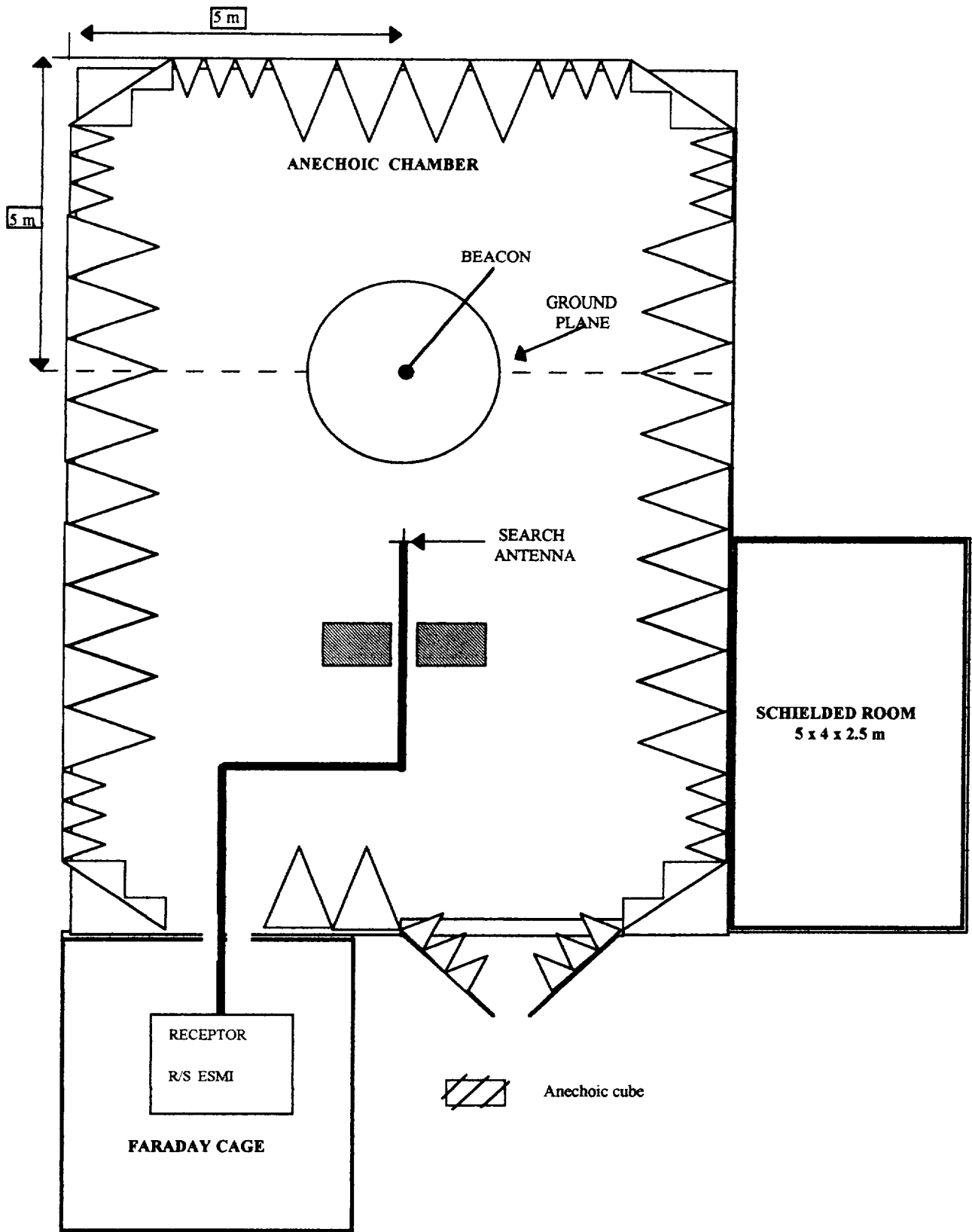


FIGURE 1

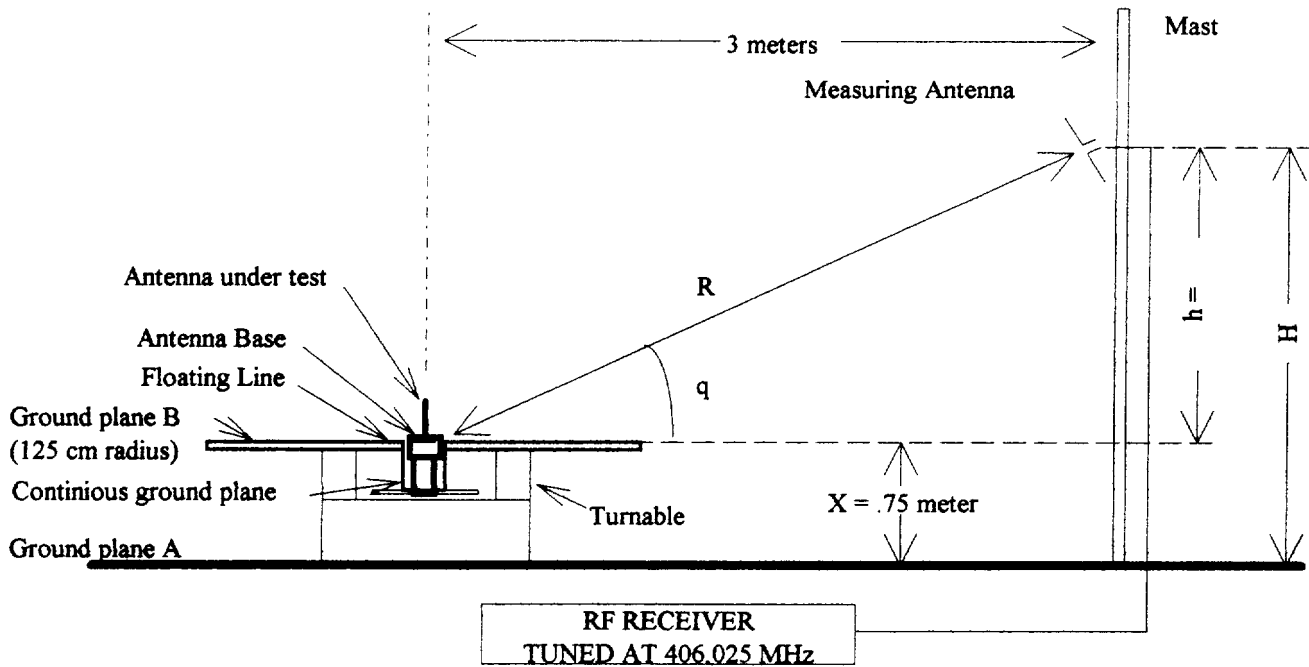


FIGURE 2 (C/S T.007 : B2c / B3a) :
 Equipement Test Set Up For BEACON Antenna Test
 (For BEACON designed for normal operation in water, ex: EPIRB)

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° to 360° by step of 30°) and for search antenna elevation (10° to 50°). 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 μ 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 MEASURED DURING TEST	END OF LIFE dB FACTOR after 24 hours 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

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.

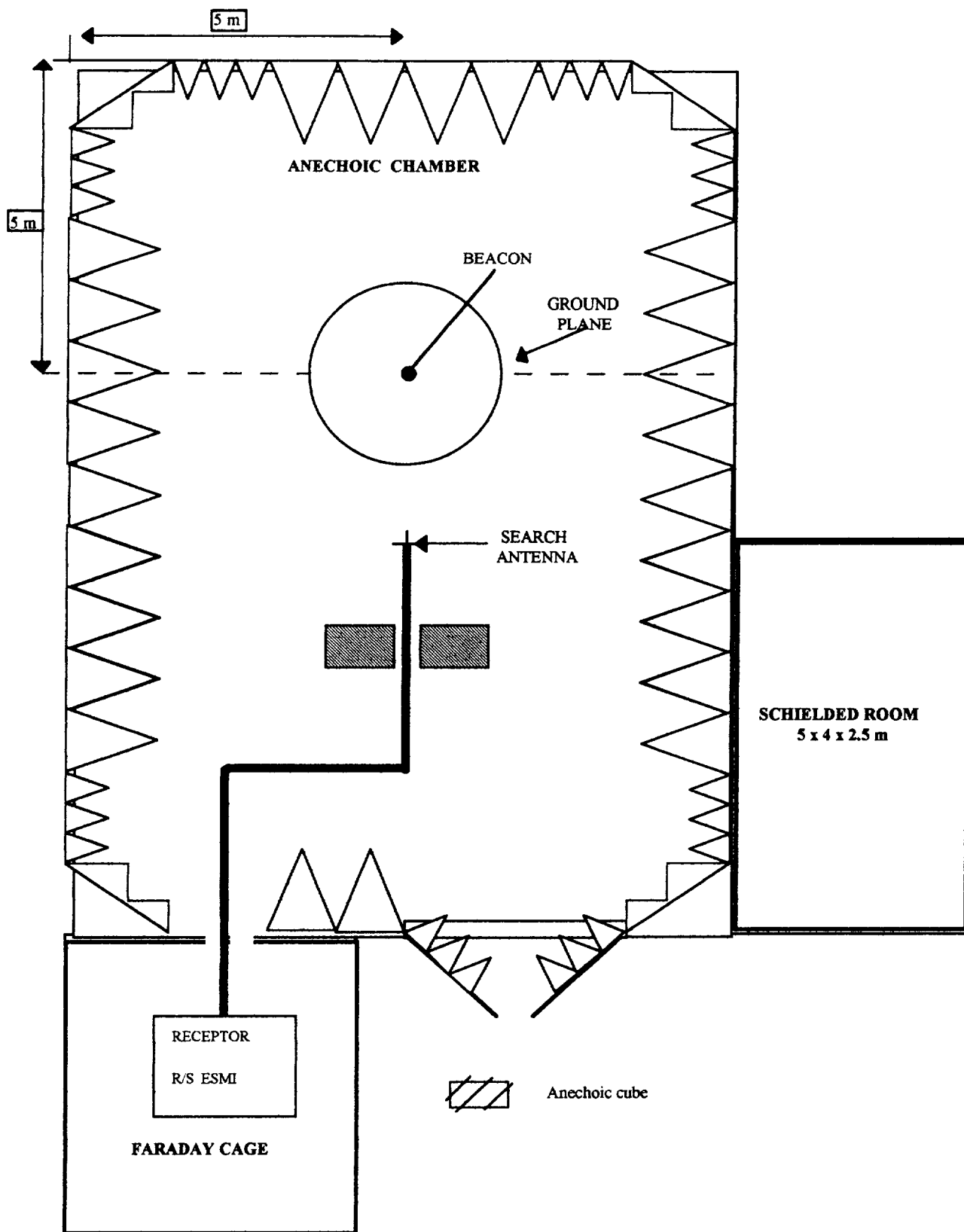


FIGURE 1

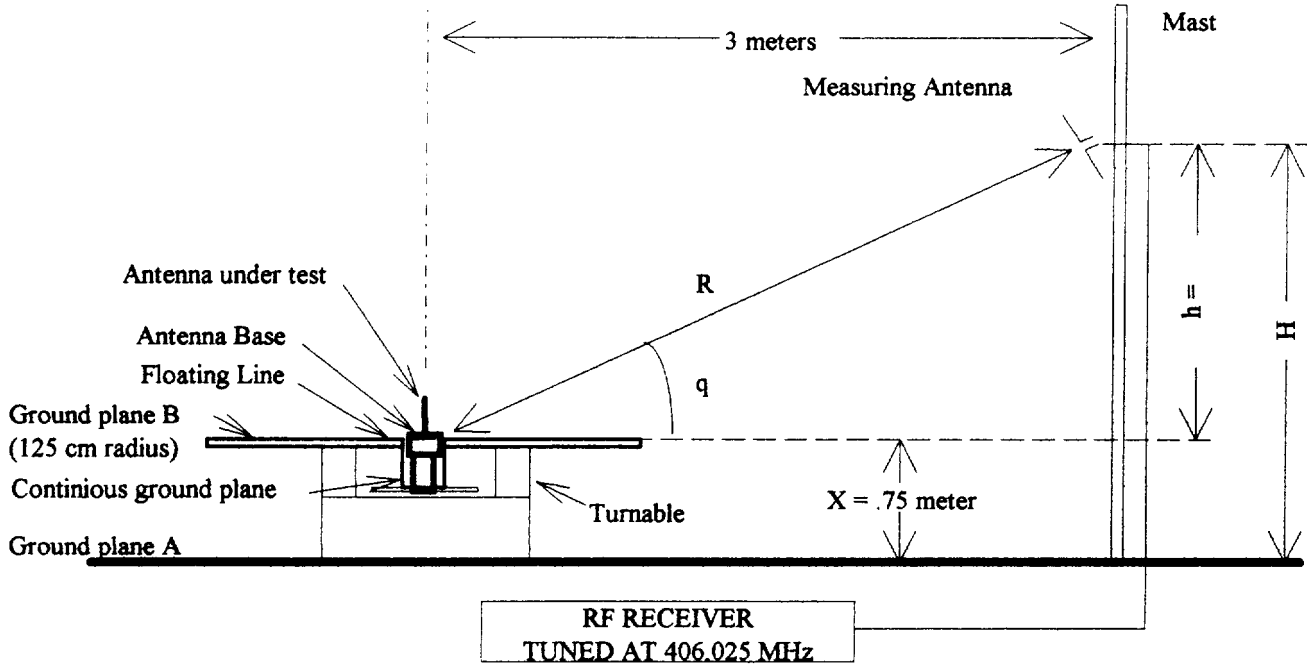


FIGURE 2 (C/S T.007 : B2c / B3a) :
 Equipement Test Set Up For BEACON Antenna Test
 (For BEACON designed for normal operation in water, ex: EPIRB)

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° to 360° by step of 30°) and for search antenna elevation (10° to 50°). 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 : 2,30 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 ($\text{dB}\mu\text{V RMS}$) 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 :

$$E_{\text{dB}\mu\text{V}/\text{m}} = U_{\text{dB}\mu\text{V}} + \text{AF} + \text{Dm} + \text{L} + \text{DF}$$

7.2. POWER CORRECTION FACTORS

EOL factor

TEST FREQUENCY	RF POWER MEASURED DURING TEST	END OF LIFE dB FACTOR after 24 hours 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 :

$$\text{ERP} = E^2 \times D^2 / 30$$

$$\text{ERP} = W$$

$$E = V/m$$

$$D = m$$

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

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

and apparent antenna gain :

$$\text{GidB} = \text{ERPdBm} - \text{RF PowerdBm}$$

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

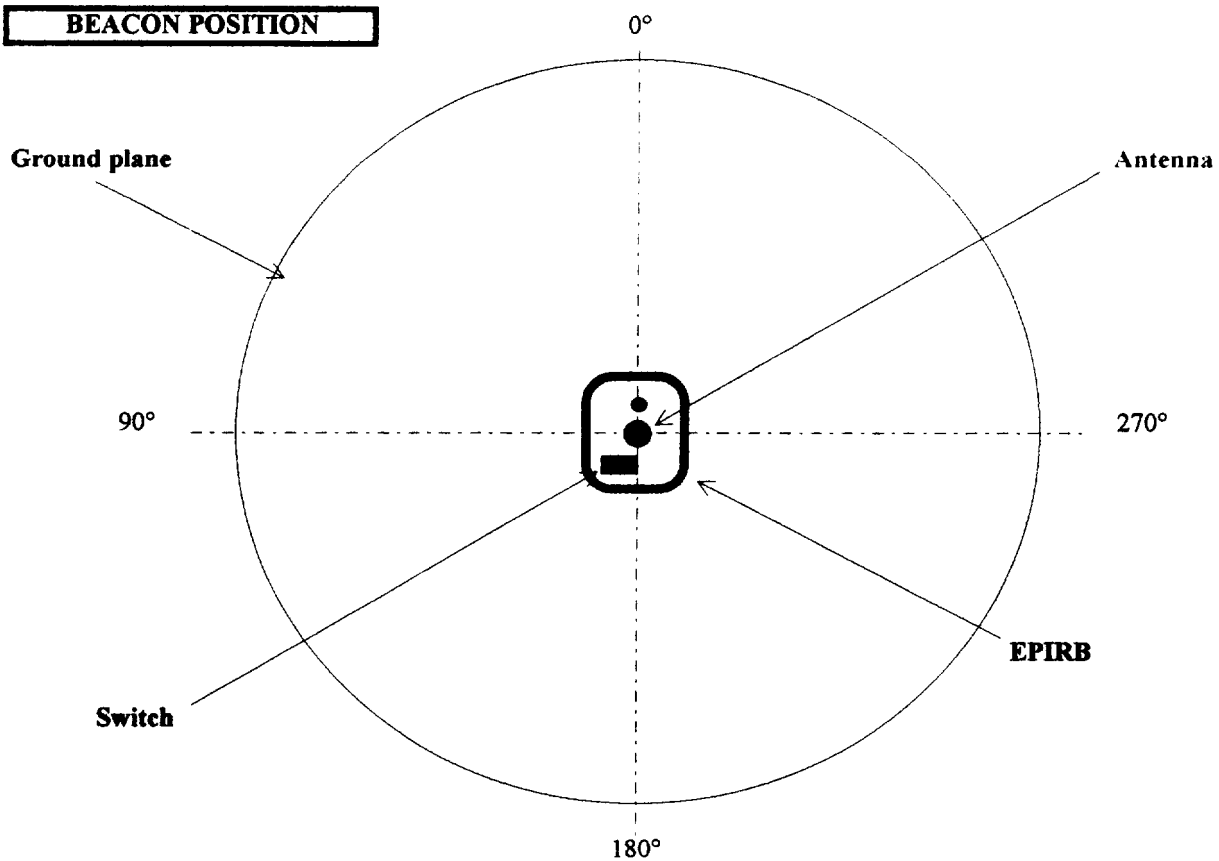
EPIRB antenna polarization is checked according to C/S T007 procedure paragraph B9 EPIRB antenna polarization is declared vertical when measurement obtained with vertical polarization search antenna are 10 dB greater or more than measurement obtained with

Antenna model	Angle	Vertical measurement dB μ V	Horizontal measurement dB μ 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 < ERP Ref < 20	According table C1

CONCLUSIONS

The ERP Beacon is on ERP reference limit .

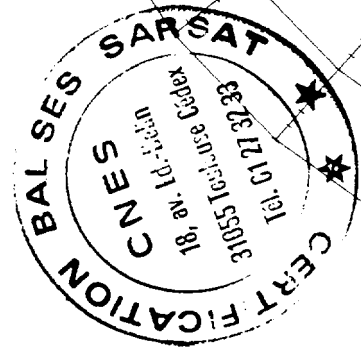
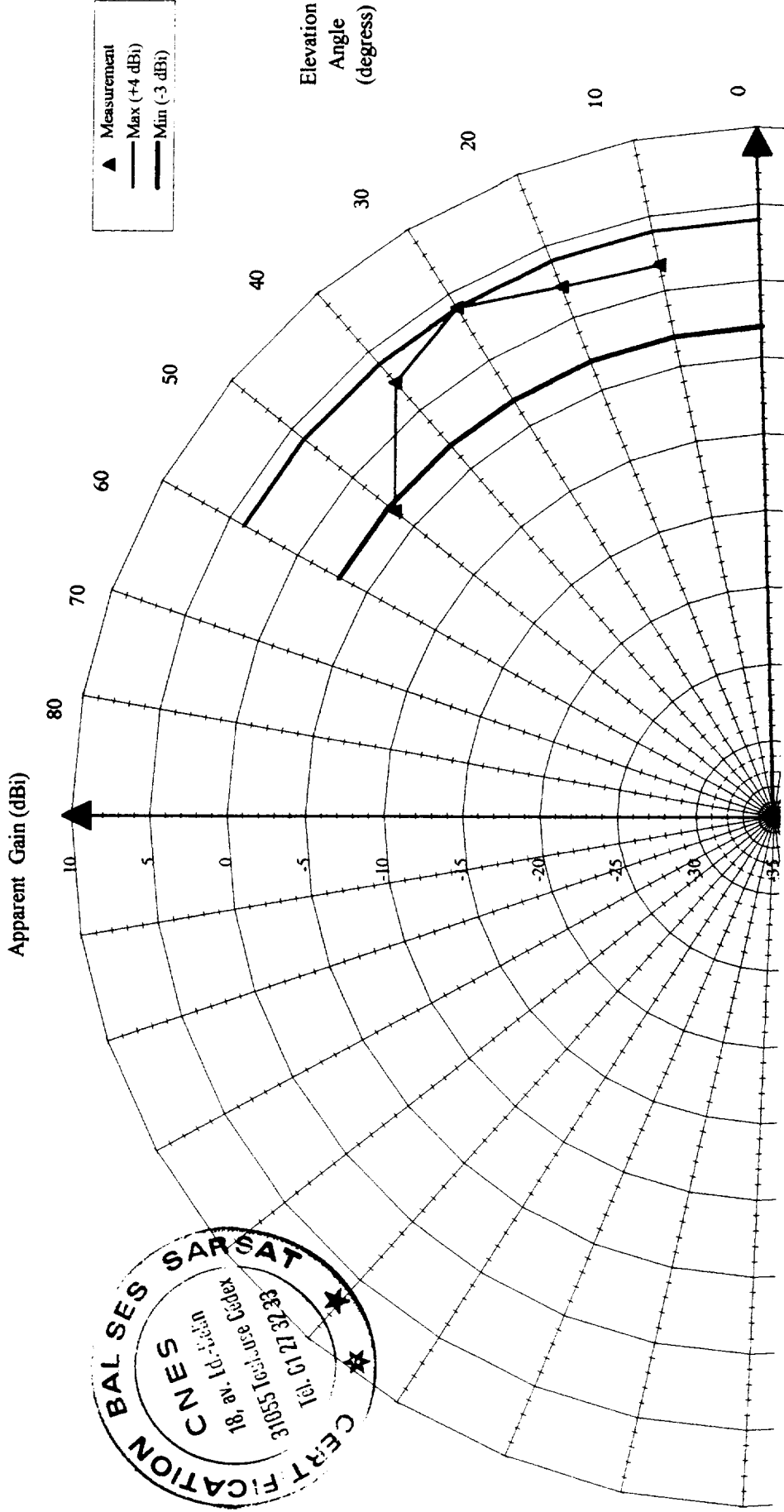
Table C1 : EFFECTIVE RADIATED POWER (dBm) / ANTENNA GAIN (dBi)

Azimuth 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

SATELLITE₂TM 406 and RAPIDFIXTM 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 **Satellite₂TM 406** and **RapidFixTM 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 **Satellite₂TM 406** and **RapidFixTM 406** Beacon provides distress alerting via radio transmission on 406 MHz to satellites of the COSPAS-SARSAT network. The message transmitted by the **Satellite₂TM 406** and **RapidFixTM 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 **Satellite₂TM 406** and **RapidFixTM 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 **Satellite₂TM 406** and **RapidFixTM 406** signal (406 MHz), relayed through the COSPAS-SARSAT network, they can converge on the GPS navigation position (RapidFixTM 406 only) or the position estimated by the satellite. Intermediate and short range location is aided by the **Satellite₂TM 406** and **RapidFixTM 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 **Satellite₂TM 406** and **RapidFixTM 406** may be deployed and activated automatically by the built-in hydrostatic float free release. Once free from the release bracket, the **Satellite₂TM 406** and **RapidFixTM 406** will automatically turn on if the water sensors are wet.

Alternately, the **Satellite₂TM 406** and **RapidFixTM 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 **Satellite₂TM 406** and **RapidFixTM 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 **Satellite₂TM 406 and RapidFixTM 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 **Satellite₂TM 406 and RapidFixTM 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 — **Satellite₂TM 406 and RapidFixTM 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 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 Format	RLB-32: Serialized ¹ RLB-33: Serialized ²
Duration	440 ms (RLB-32) 520 ms (RLB-33)
Rate	400 bps
Encoding	Biphase L
Modulation	±1.1 radians peak

¹ 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.

² 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 UV resistant plastic
Size	6.5" x 17.1" (16.51 cm x 43.4 cm)
Release System	Hydrostatic with manual override

Hydrostatic Release Kits

No. 9323

Satellite[™] 406 and RapidFix[™] 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[™] 406 and RapidFix[™] 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[™] 406 and RapidFix[™] 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 **Satellite₂TM 406 and RapidFixTM 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 **Satellite₂TM 406 and RapidFixTM 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 **Satellite₂TM 406 and RapidFixTM 406** Beacon Models 2774, and 2776 are designed to be automatically deployed and activated. The **Satellite₂TM 406 and RapidFixTM 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 **Satellite₂TM 406 and RapidFixTM 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 **Satellite₂TM 406 and RapidFixTM 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 **Satellite₂TM 406 and RapidFixTM 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 **Satellite₂TM 406** and **RapidFixTM 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 **Satellite₂TM 406** and **RapidFixTM 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 **Satellite₂TM 406** and **RapidFixTM 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 **Satellite₂TM 406** and **RapidFixTM 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 **Satellite₂TM 406** and **RapidFixTM 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 **Satellite₂TM 406** and **RapidFixTM 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 **Satellite₂TM 406** and **RapidFixTM 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 IntegrityBeep and lights up LEDs if passed
.....Stop if failed
2. Check 406 MHz SynthesizerBeep and lights up LEDs if passed
.....Stop if failed
3. Check RF Power/BatteryBeep 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 **SatelliteTM 406** and **RapidFixTM 406** on a quarterly basis.

3.7 External GPS Interface

3.7.1 Connecting the Rapid FixTM 406 to a GPS via the Optical Interface (IR Transmitter)

Your Rapid FixTM 406 comes with a GPS Optical Interface (transmitter plug with lead wires) and a keyed GPS bezel. The transmitter plug attaches to your Rapid FixTM 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 **RapidFixTM 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 **RapidFixTM 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 **RapidFixTM 406** before activation. Second, by connecting the GPS to the **RapidFixTM 406** and allowing sufficient time (approximately 30 minutes) for the **RapidFixTM 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 **RapidFixTM 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 FixTM 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 FixTM 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**

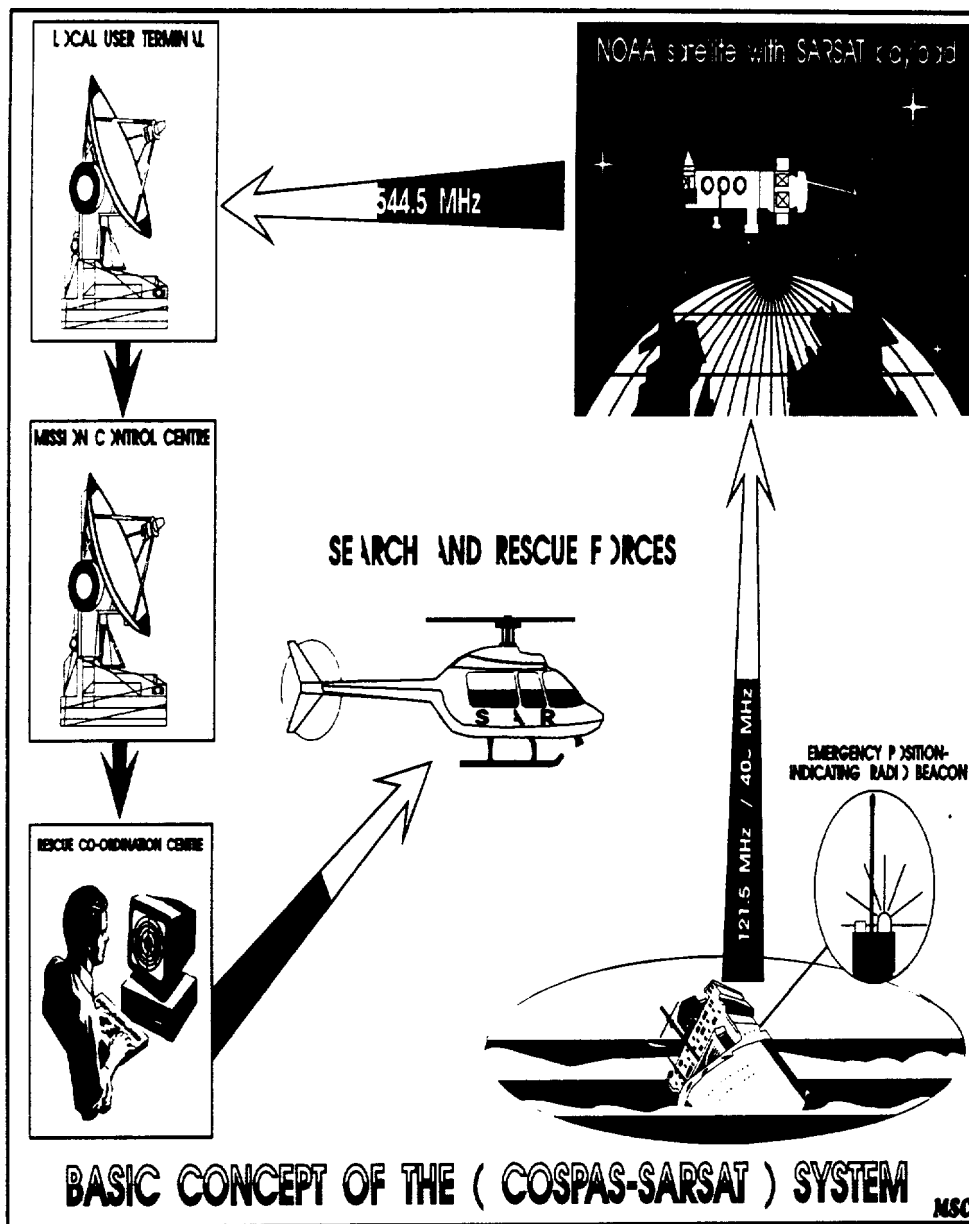


FIGURE 1: SATELLITE DETECTION

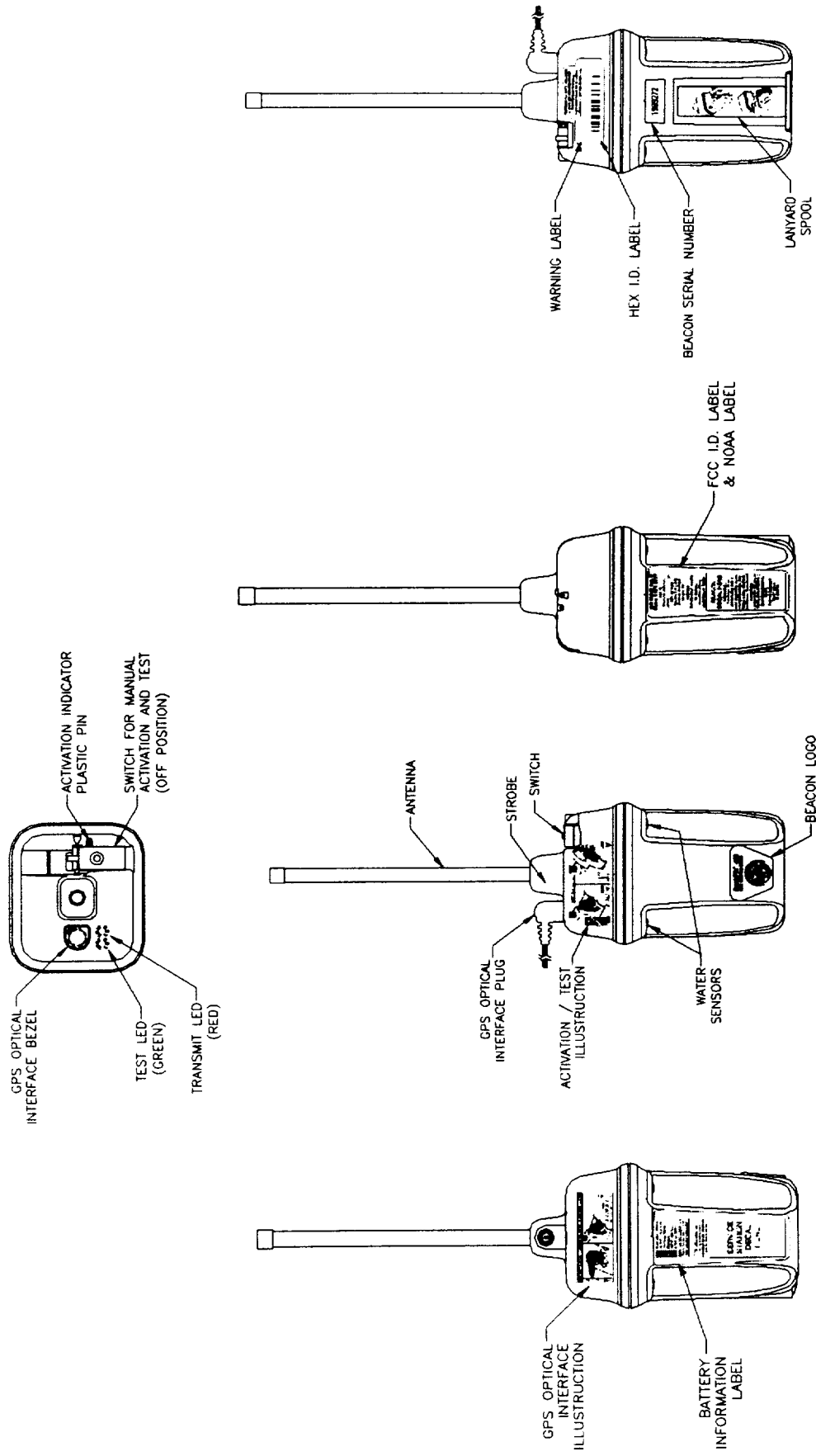
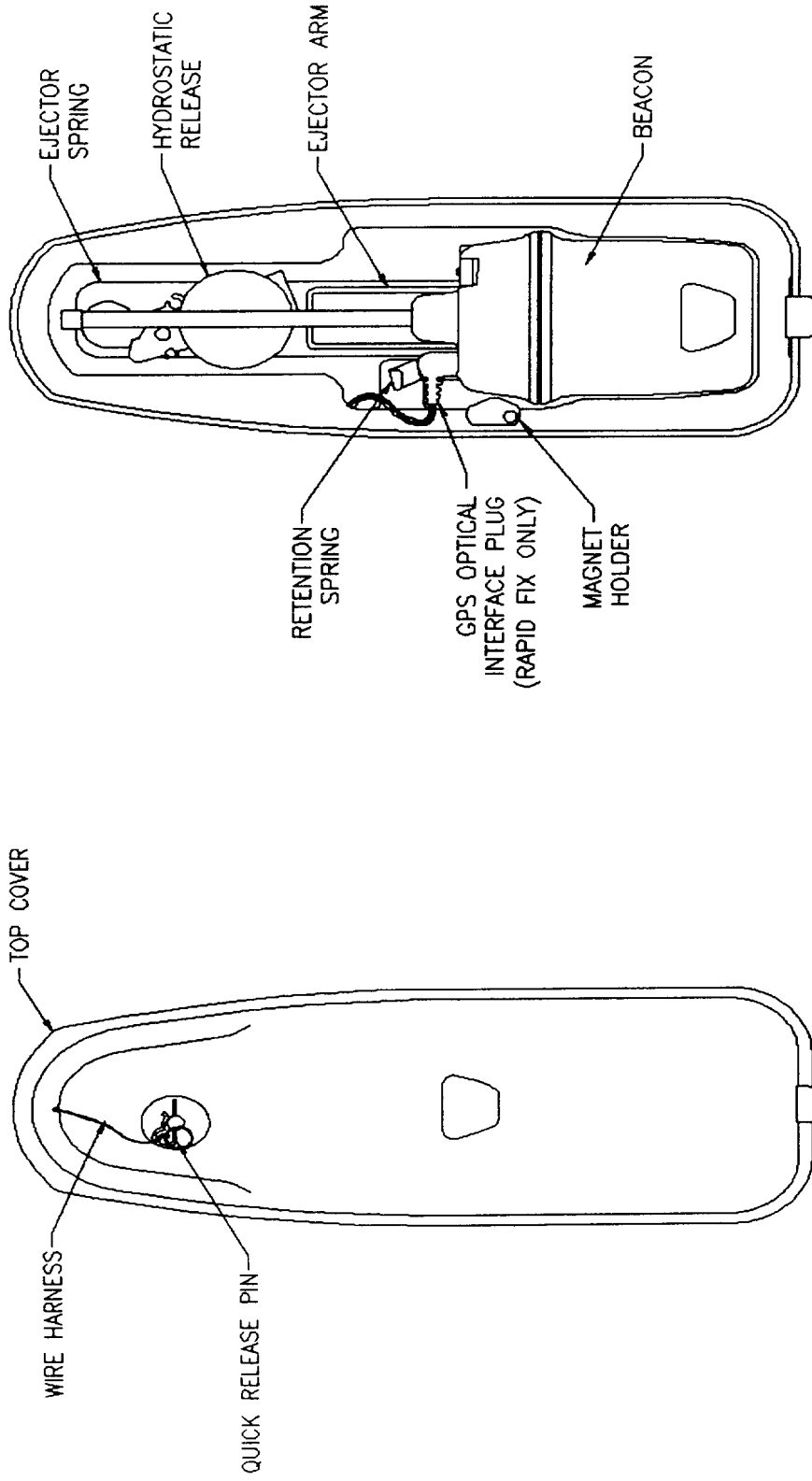


FIGURE 2:

ACR SatelliteTM 406 and RapidFixTM 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°

MATERIAL:

CONTRACT NO

DRAWN *JD* 6-15-94

CHECKED *MY* 6-15-94

ENG *MSB* 6-15-94

APVD *[Signature]* 6-15-94

ACR ELECTRONICS, INC.

5757 RAVENSWOOD RD., FT. LAUDERDALE, FL 33312

LITHIUM PRIMARY CELL SPECIFICATION, LiSO₂

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

Specification, Lithium Primary Cell, LiSO₂

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

LiSO₂

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 A	CODE IDENT NO 18560	DRAWING NO A1-13-0111	REV 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 A	CODE IDENT NO 18560	DRAWING NO A1-13-0111	REV 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

3/6/98

SAFT

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 Recommended	% (Optional) (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 ₂ 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 ₂ on burning lithium sulfur dioxide cells or batteries. 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 LiSO₂ 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).

LiSO₂ 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 LiSO₂ 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 (1).

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 LiSO₂ 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 LiSO₂ 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/SO₂ 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 ³ ; 52.8cc
Tolerances:	Diameter: ±0.015 in; 0.38mm Height: ±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
	Nominal: 2.8 volts (@240 ma)
	Final: 2.0 volts
Rated Capacity (at 240 ma discharge):	70°F (21°C): 7.5 Ah
	-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%
	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.

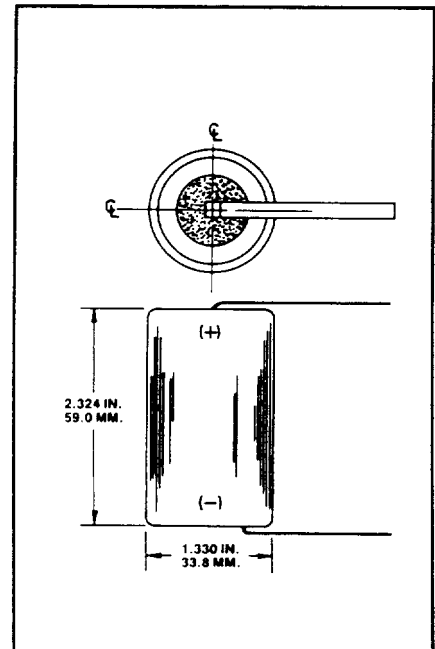
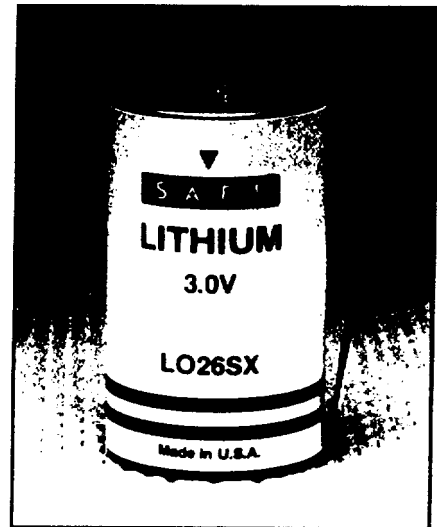


Figure 1. Overall Dimensions



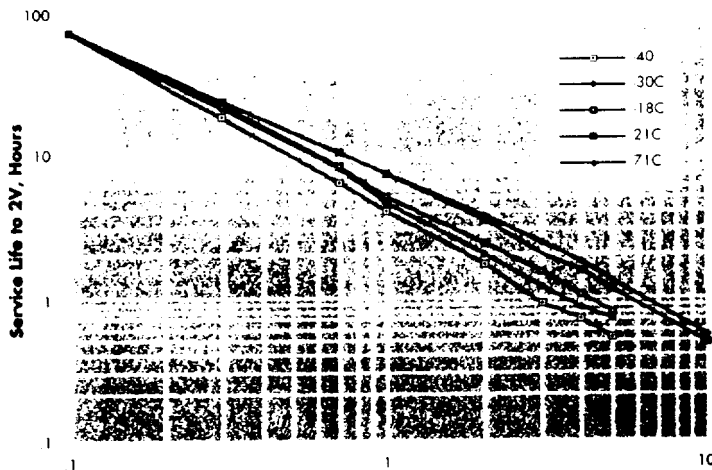


Figure 2: Discharge Current, Amps

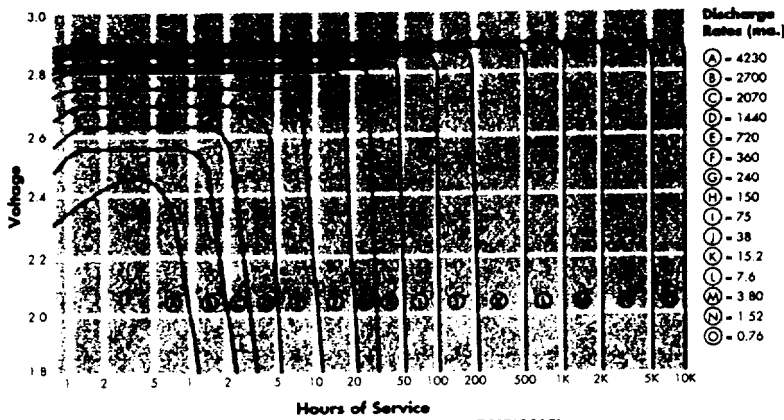


Figure 3: Typical Discharge Curves at 70°F (21°C)

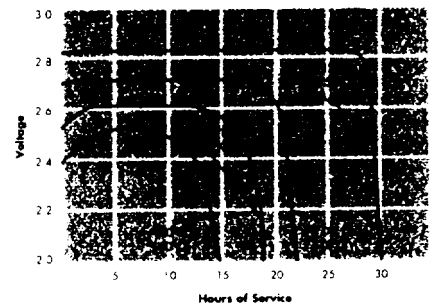


Figure 5: Typical Discharge Curves at 240 mA.

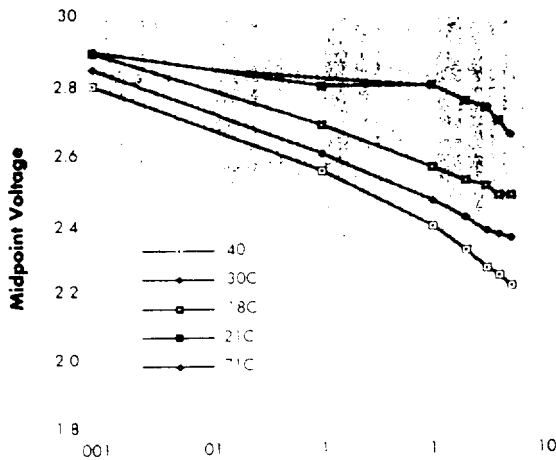


Figure 4: Discharge Current, Amps

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.

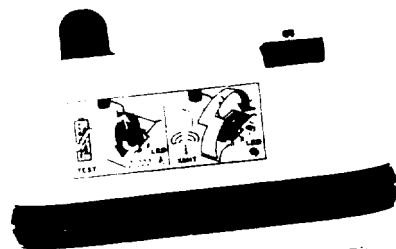


SAFT America Inc.
Lithium Battery Division
313 Crescent Street • Valdese, NC 28690
Tel. (704) 874-4111 • Fax (704) 874-2431

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 ± 2dB (406.025 MHz) 50 mW ± 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
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- > 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 ± 2dB (406.025 MHz) 50 mW ± 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

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 = 1.66794×10^{-8} Amps

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

Total Self-Test AMP-HOURS = $0.573634556 \text{ AMP-HOURS}$

OSPAS/SARSAT TEST FACTOR = 1.65

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

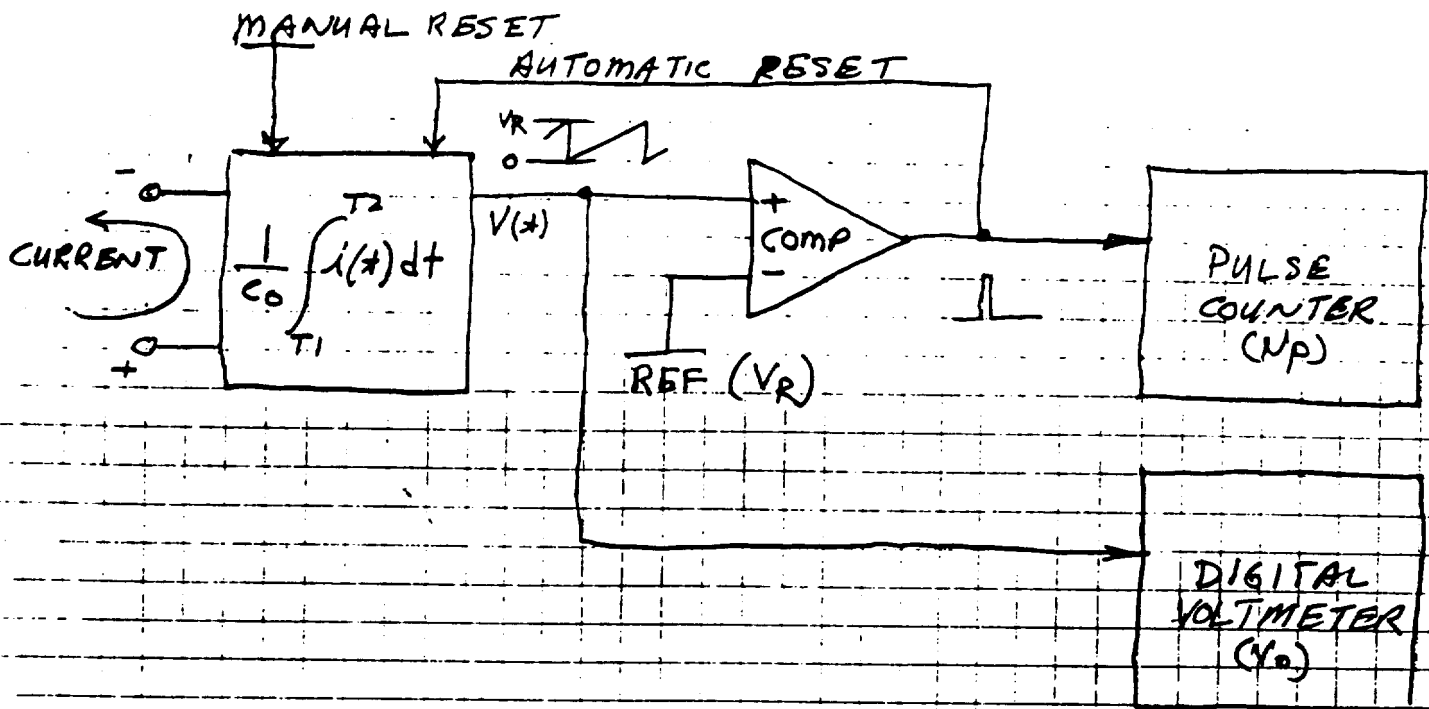
Current required for 24 hour burn = 0.039437376 Amps

Resistance required at 8.7 Volts = 220.602914 Ohms

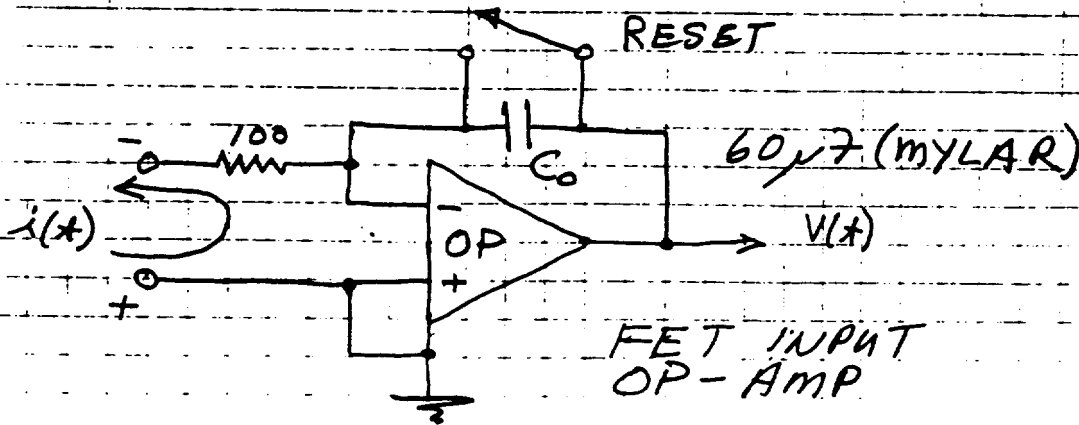
Power dissipation required at 8.7 Volts = 0.343105169 Watts

INTEGRATING CHARGE METER

(BLOCK DIAGRAM)

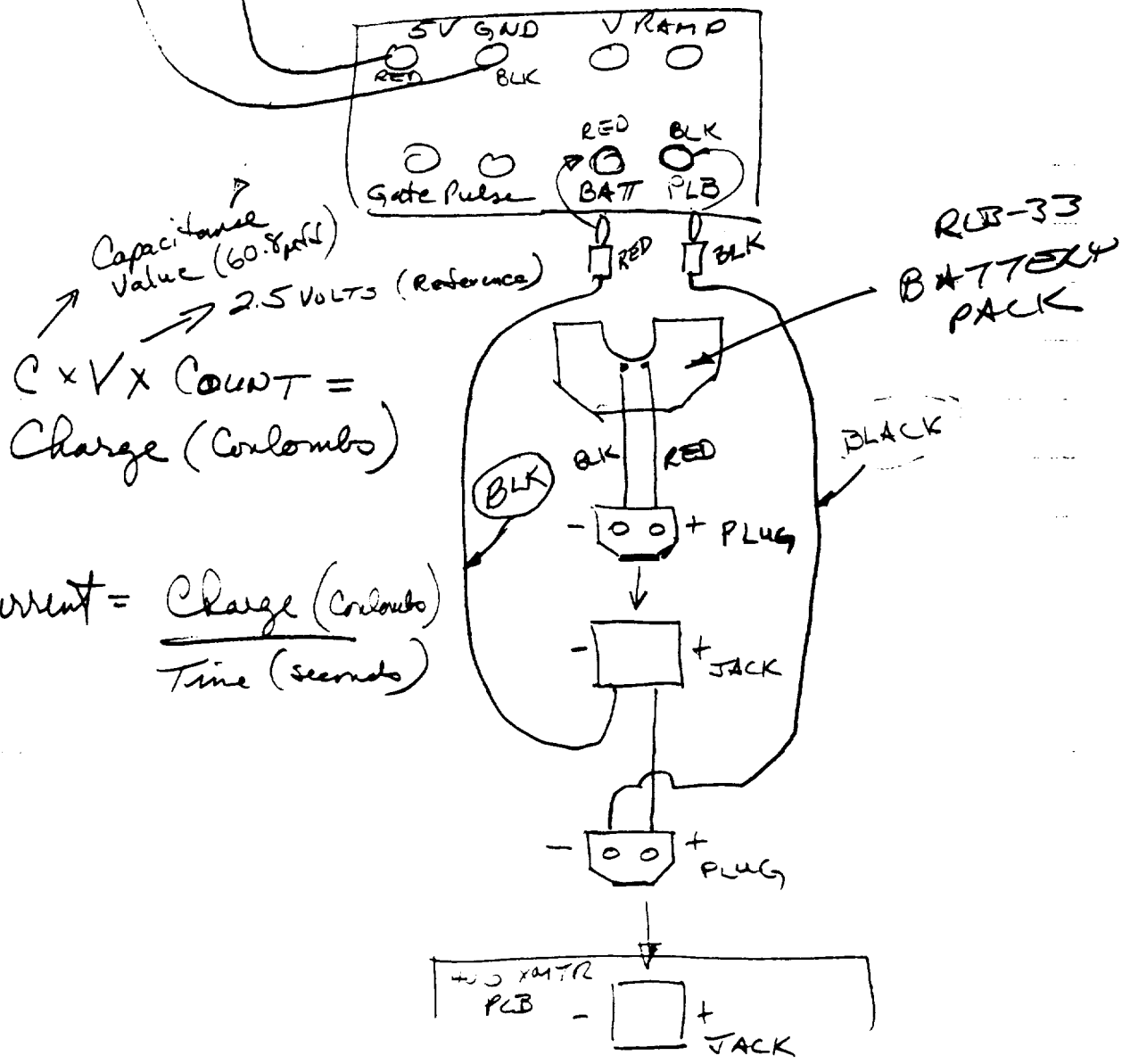
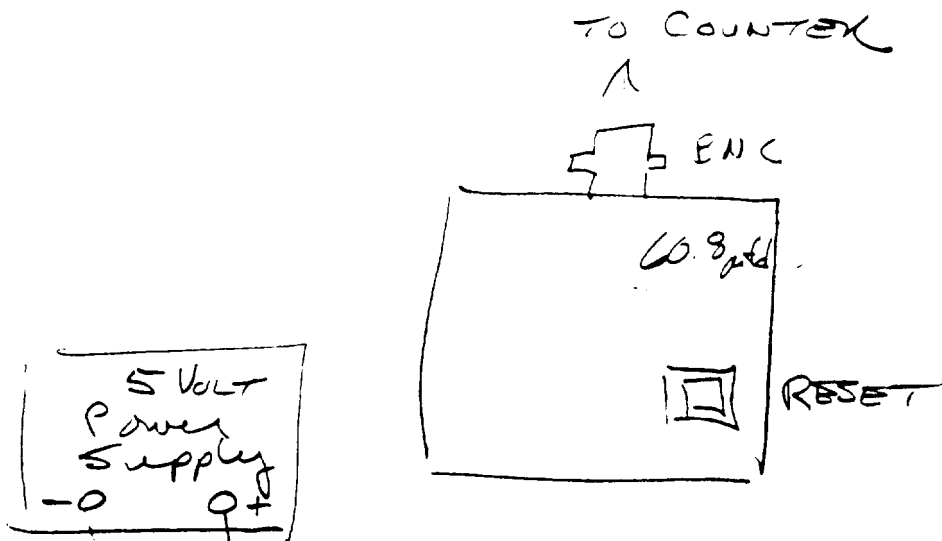


(INTEGRATOR CIRCUIT)



(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 μF)
 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 m^o 007

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 :

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

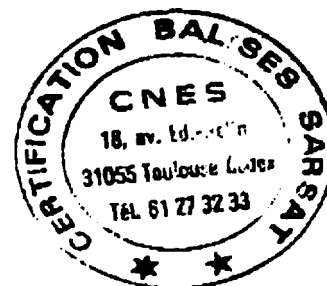
The curve providing the best fit to the points is plotted. Since its equation is not linear with respect to coefficient B, the least-squares method is not appropriate.

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

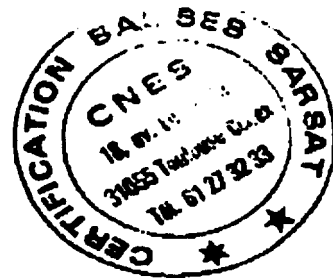
Frequency	Specifications	Measurements
F0	406025 MHz \pm 2 kHz	40602563 kHz
F(30) - F0	\pm 0.3 kHz	- 66 Hz
F(1825) - F0	\pm 5 kHz	\approx - 200 Hz

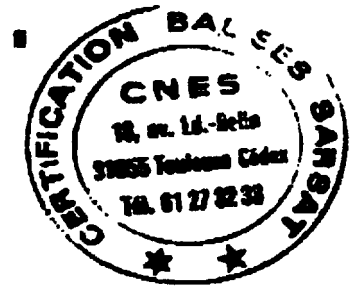
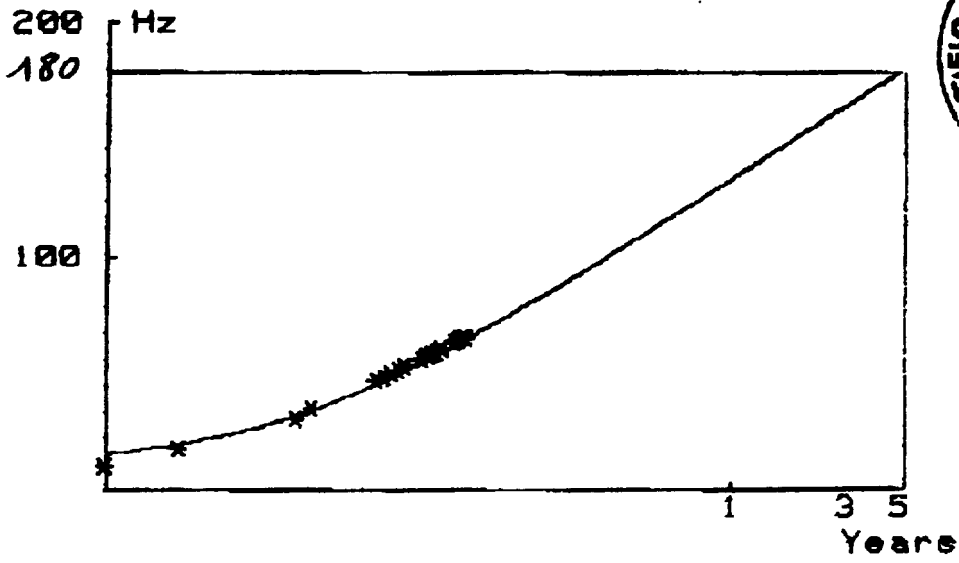
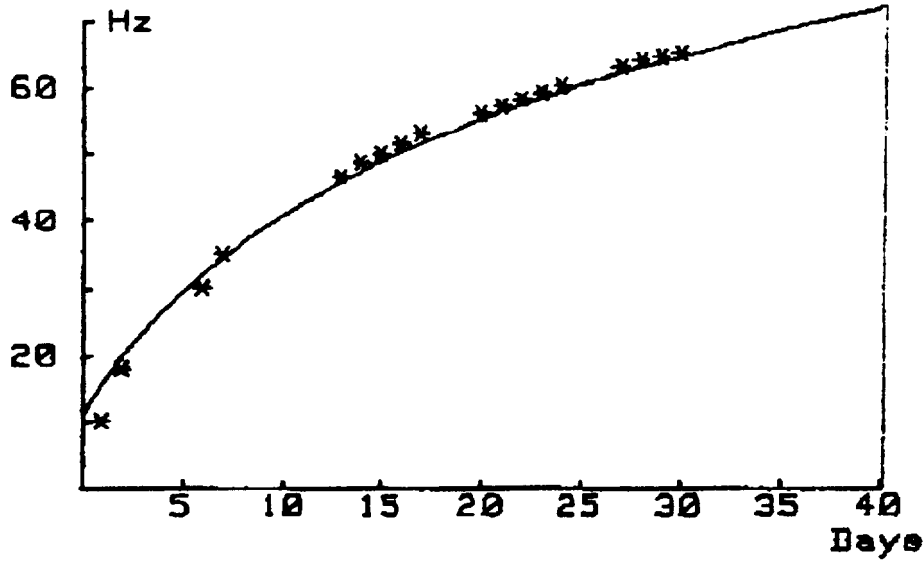


DATA OF MEASUREMENTS

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



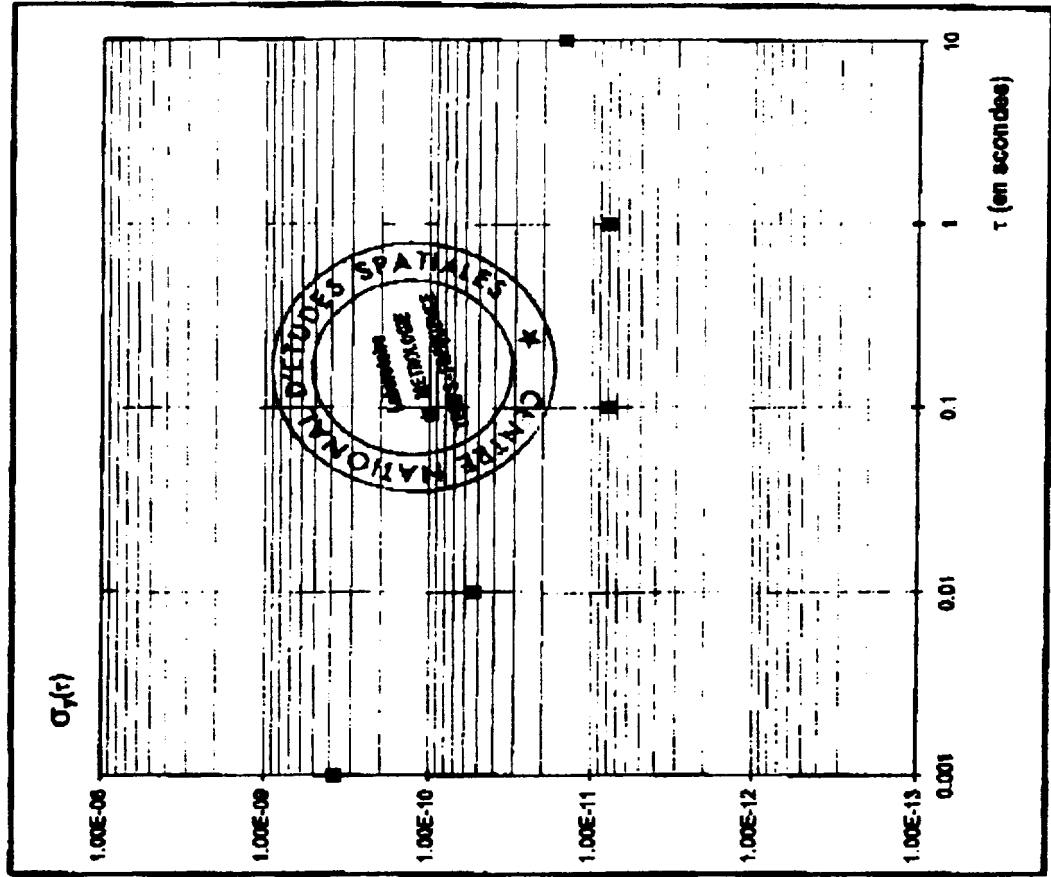


V. ALLAN

VARIANCE D'ALLAN SUR 30 ECHANTILLONS MOYENNEE 10 FOIS

06-jan-96

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



τ	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

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

CONTINUOUS OPERATION PROTECTION for RLB-32/33

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	

ART PROOF

GRAPHIC PRINTING CORP.
BOCA RATON, FL

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

To: SEITZ

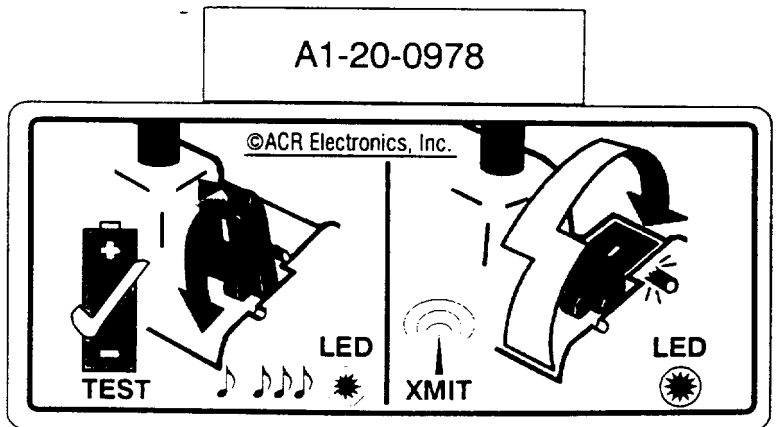
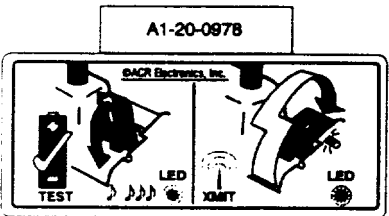
Attn:

Date: 2-16-99

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

Part No.: A1-20-0990(91) A,B
P.O. #

2.00 X .878 .0468 RADIUS



.0625 DIAM RADIUS

Material:
Colors: PMS 282, PMS 185, PMS 355

Approved By: *[Signature]*

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

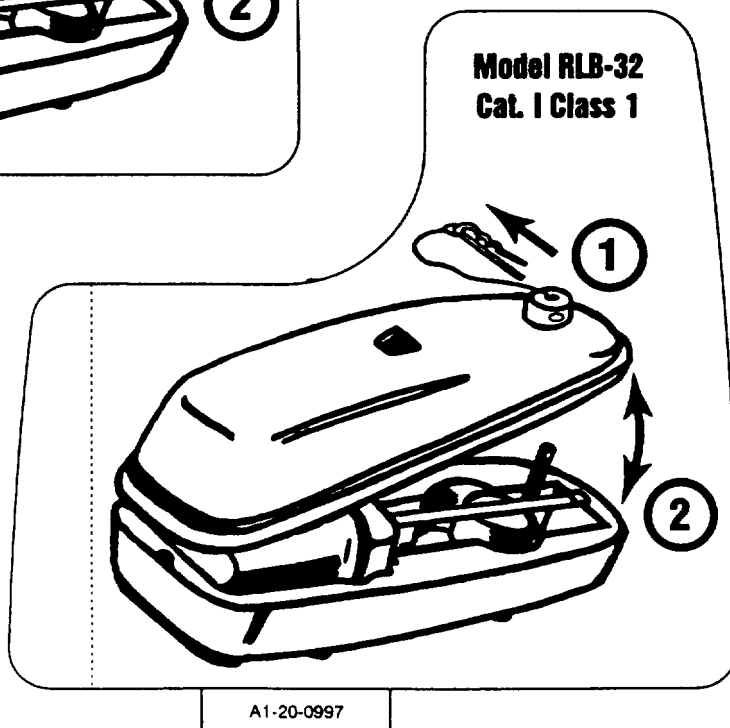
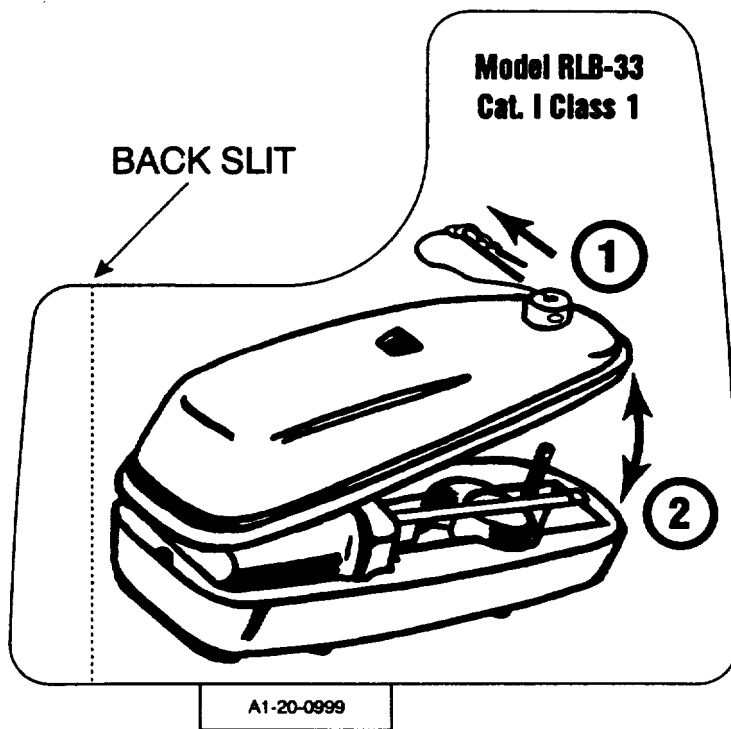
Please examine the attached artwork and fax back your approval or changes

PN: A1-20-0997

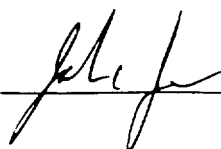
PO:

MATERIAL: .004 CLEAR POLYESTER

PMS 282C TEXT & GRAPHICS, CLEAR BACKGROUND



APPROVED BY:



DATE:

ART PROOF

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

TO: SEITZ

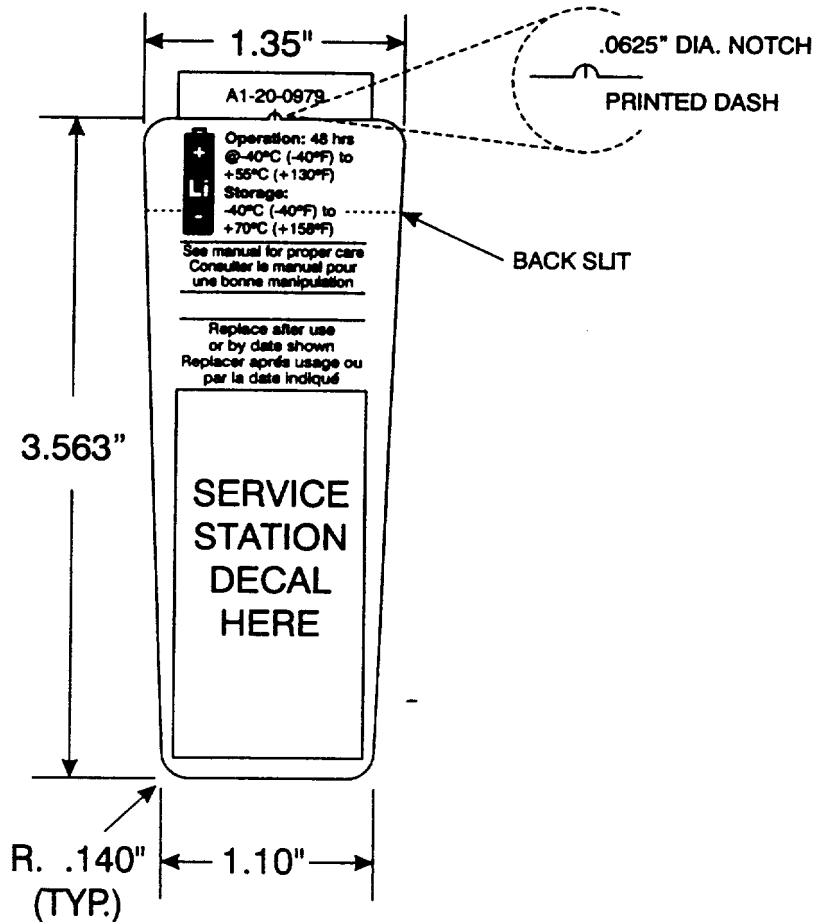
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DATE: 2.25.99

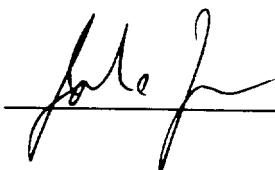
Please examine the attached artwork and fax back your approval or changes

PN: A1-20-0979 PO: MATERIAL: .004 CLEAR POLYESTER W/467 ADH.

PMS 282C TEXT & GRAPHICS ON CLEAR BACKGROUND



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DATE:

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GRAPHIC PRINTING CORP.
BOCA RATON, FL

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

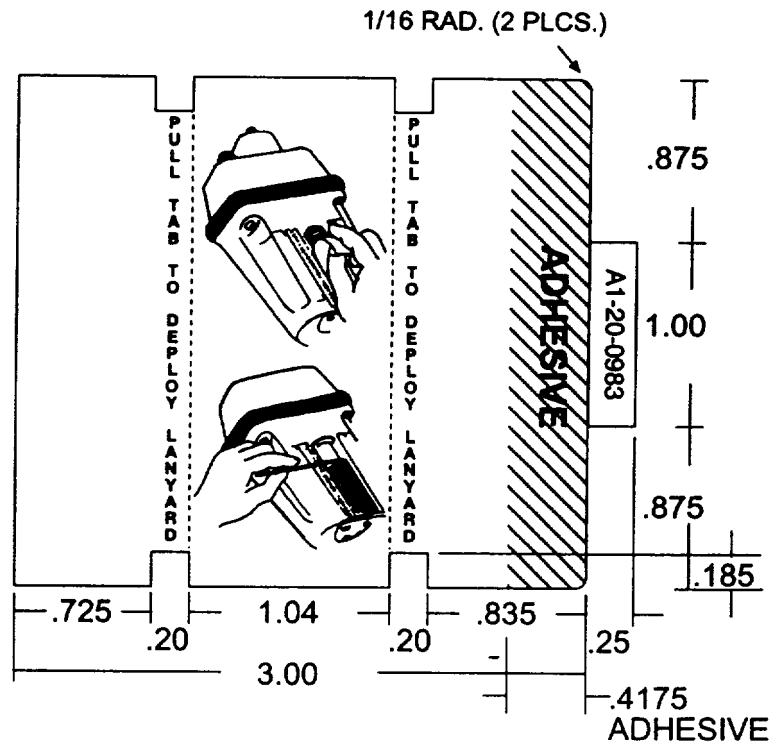
To: SEITZ

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:

ART PROOF

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

TO: SEITZ

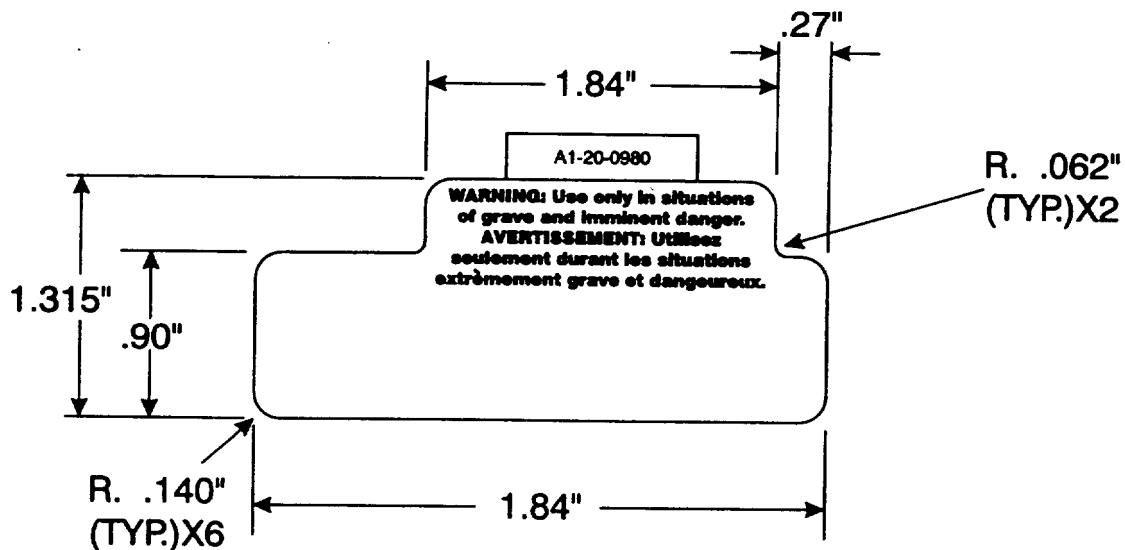
ATTN: LAURA

DATE: 2.25.99

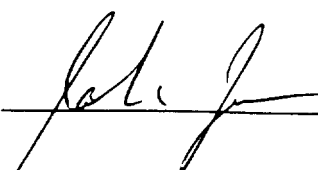
Please examine the attached artwork and fax back your approval or changes

PN: A1-20-0980 PO: MATERIAL: .004 CLEAR POLYESTER W/467 ADH.

PMS 282C TEXT & GRAPHICS ON CLEAR BACKGROUND



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

TO: SEITZ

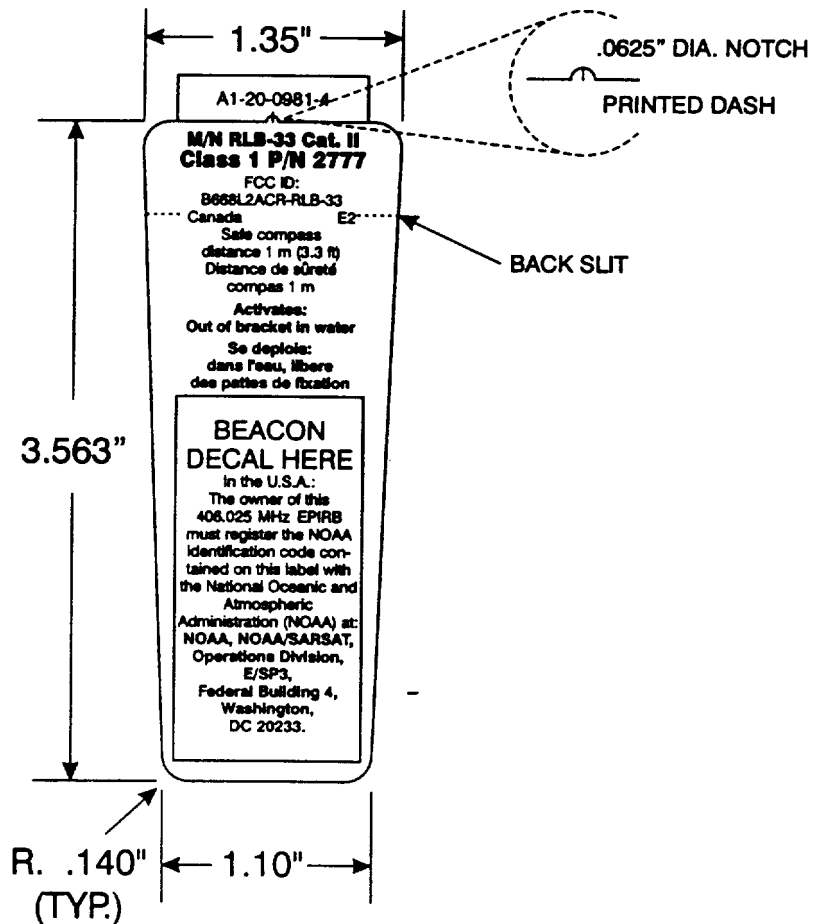
ATTN: LAURA

DATE: 2.25.99

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

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

PMS 282C TEXT & GRAPHICS ON CLEAR BACKGROUND



APPROVED BY:



DATE:



ART PROOF

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

TO: SEITZ

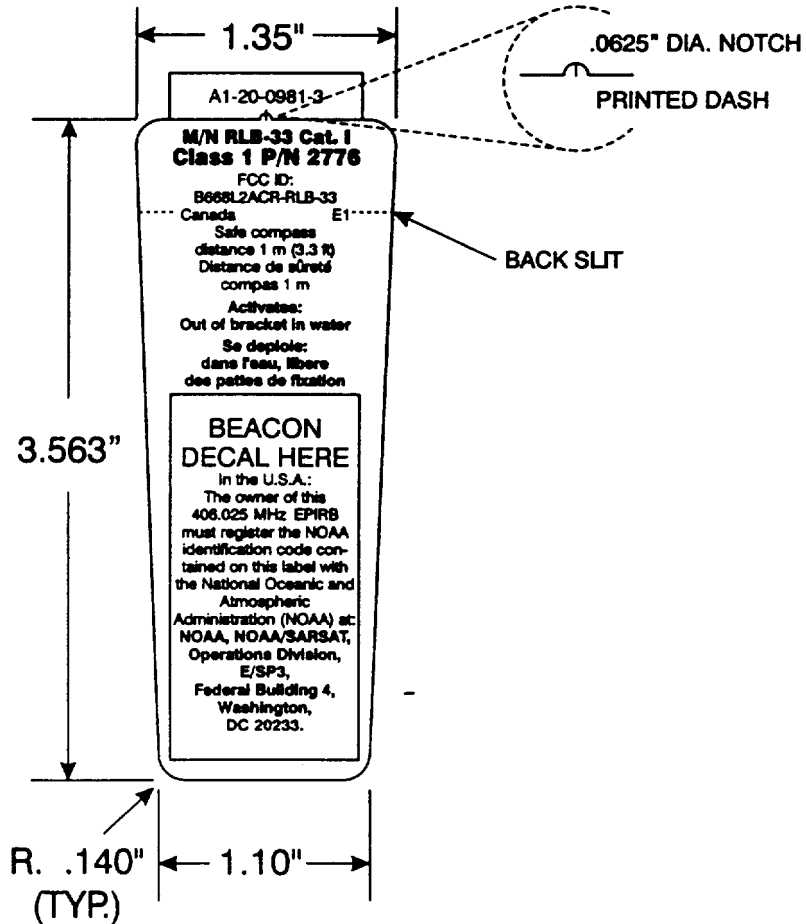
ATTN: LAURA

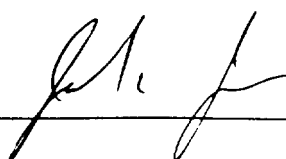
DATE: 2.25.99

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

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

PMS 282C TEXT & GRAPHICS ON CLEAR BACKGROUND



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DATE: _____

ART PROOF

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

TO: SEITZ

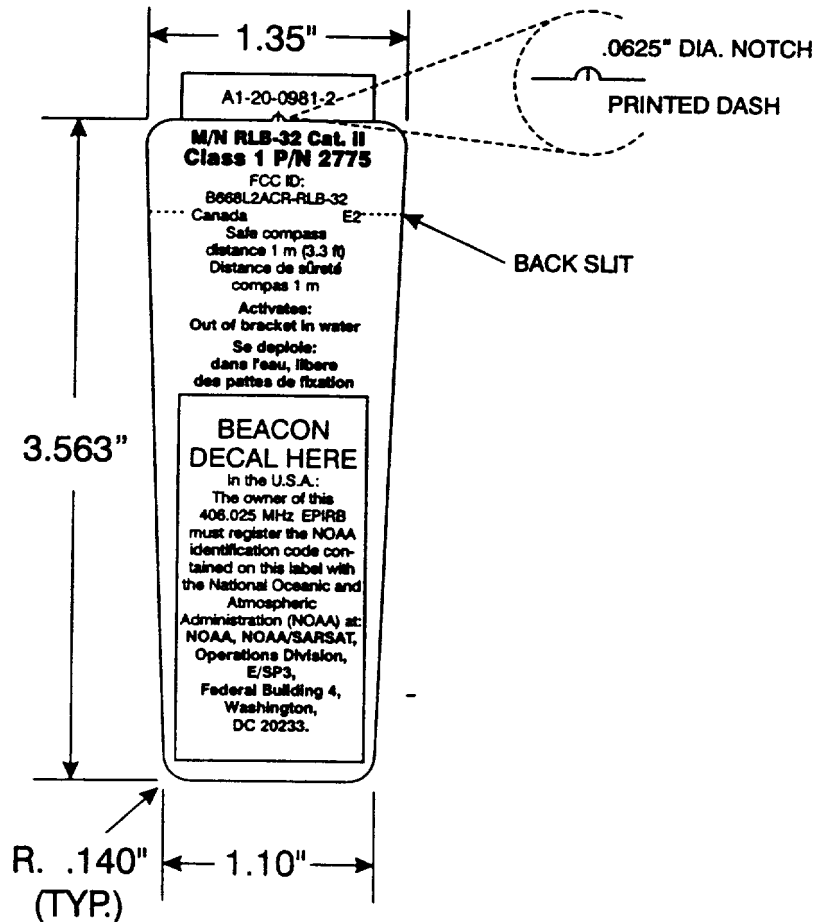
ATTN: LAURA

DATE: 2.25.99

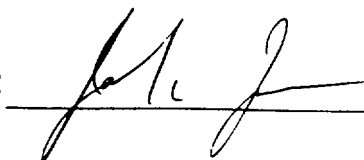
Please examine the attached artwork and fax back your approval or changes

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

PMS 282C TEXT & GRAPHICS ON CLEAR BACKGROUND



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DATE:

ART PROOF

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

TO: SEITZ

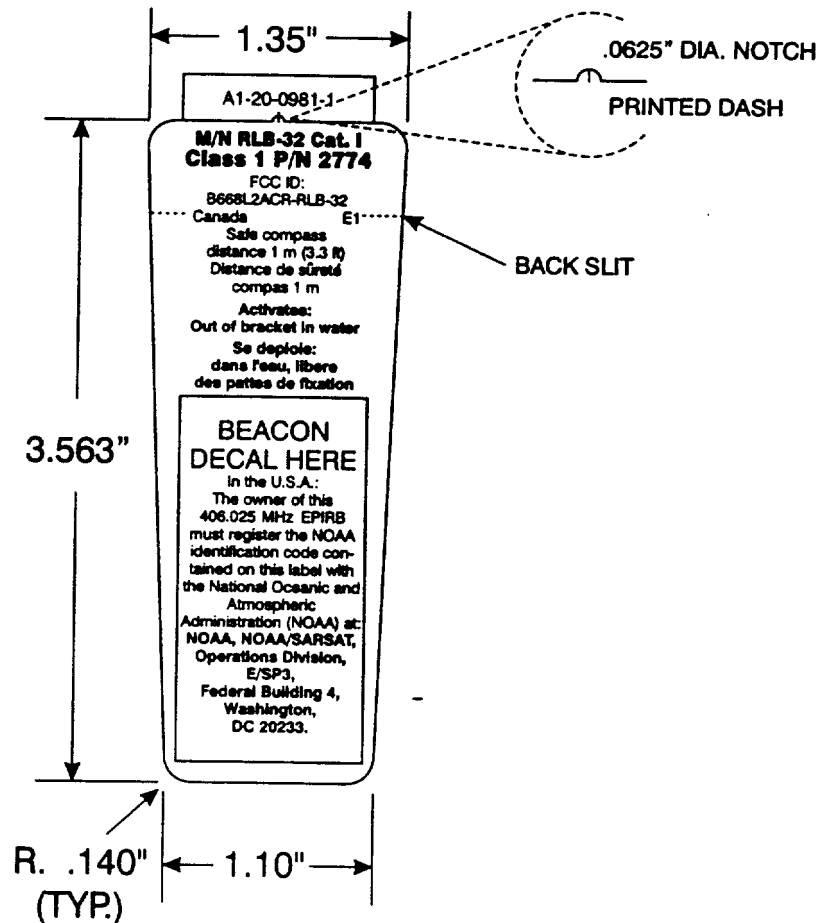
ATTN: LAURA

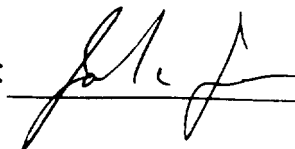
DATE: 2.25.99

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



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DATE: _____

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BOCA RATON, FL

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

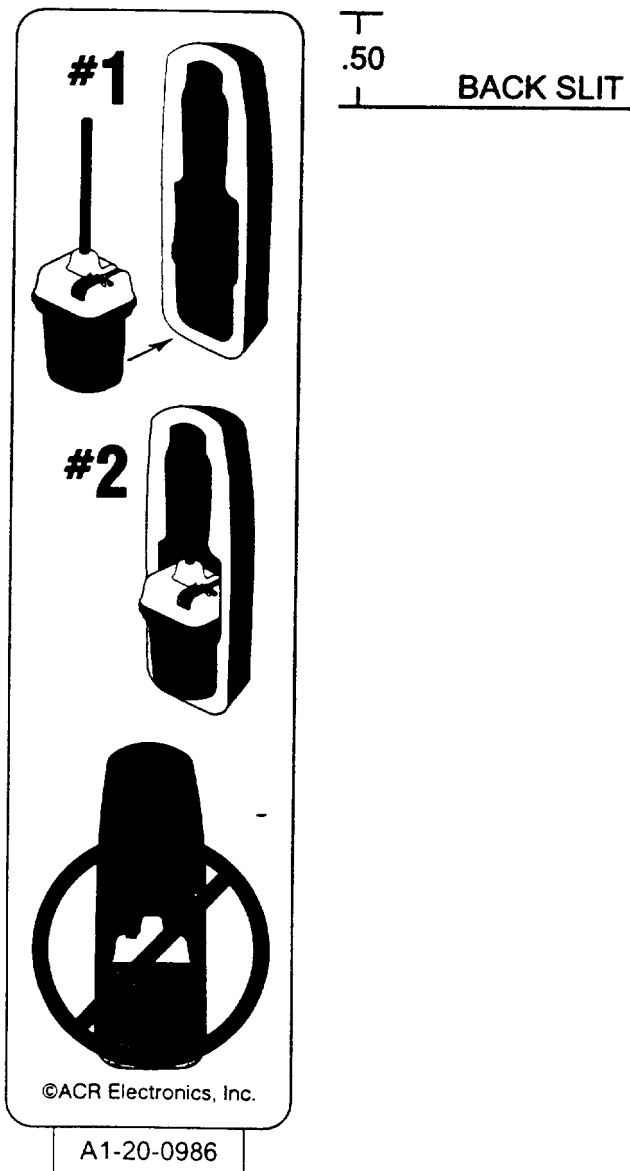
To: SEITZ

Attn:

Date: 2-15-99

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

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



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

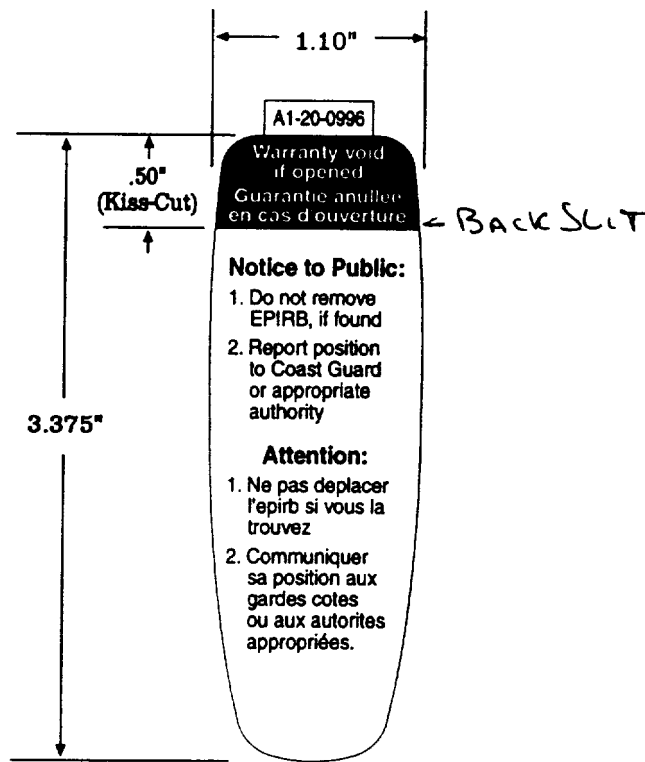
ATTN: LAURA

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

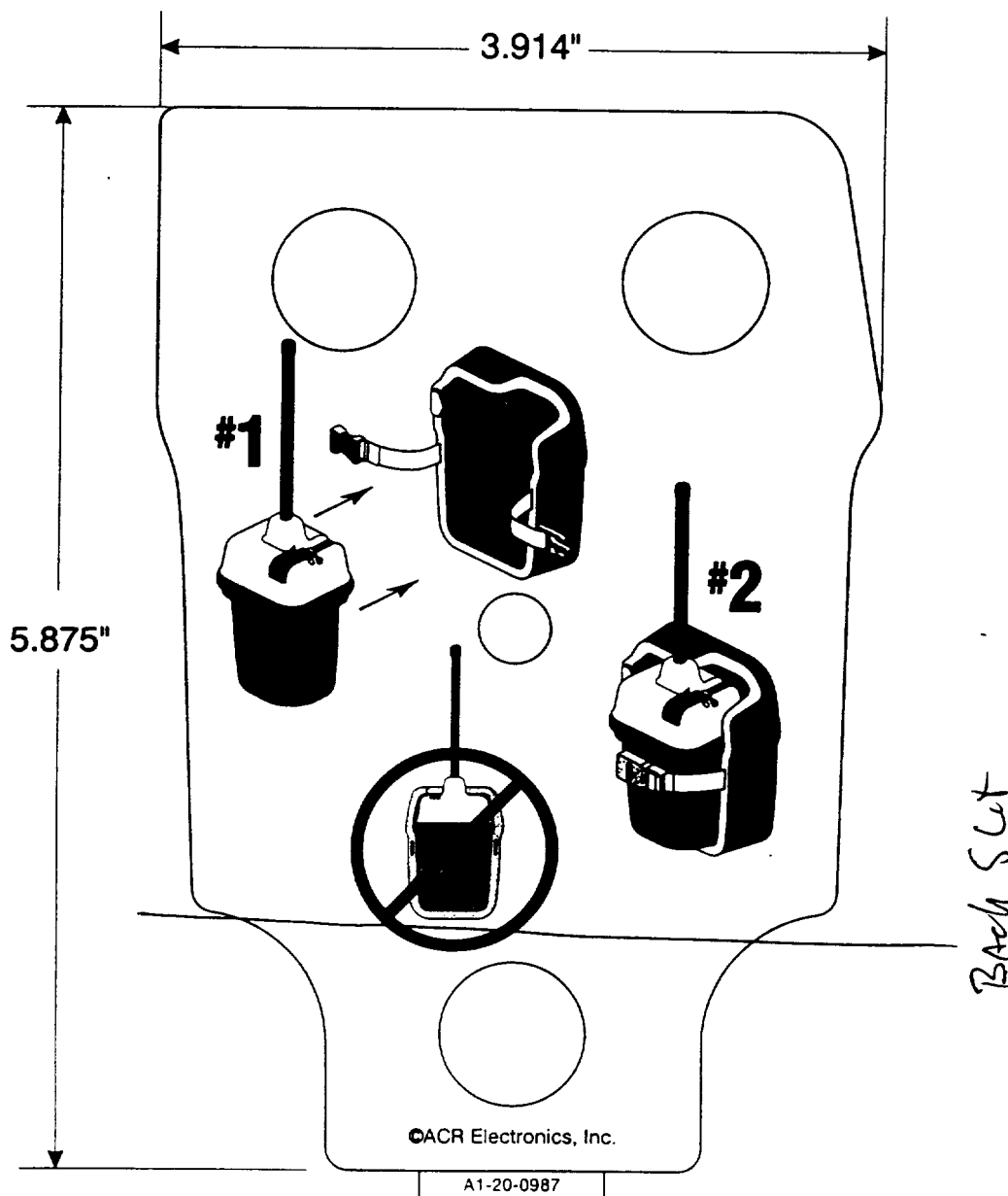
Please examine the attached artwork and fax back your approval or changes

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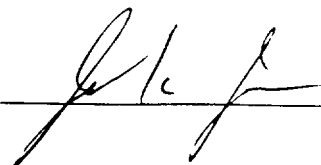
PO:

MATERIAL: .004 WHITE VINYL

PMS 282C TEXT & GRAPHICS ON WHITE VINYL



APPROVED BY:



DATE:

18560 A3-06-2068 14

REV	DATE	BY	APP'D
1			
2			
3			
4			

3

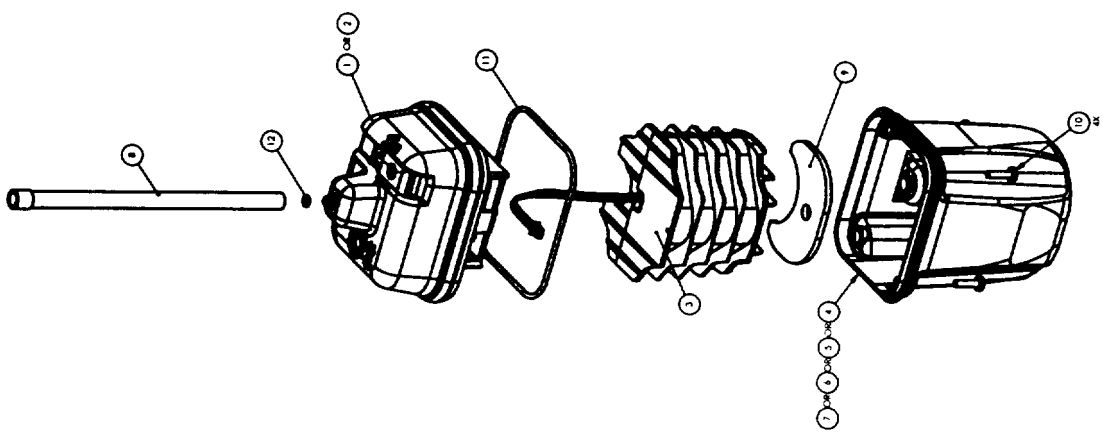
4

5

6

7

8



QUANTITY	DESCRIPTION	PROJECT NO.
1	REB-32/33 CAT 1	2776
2	REB-32/33 CAT 2	2776
3	REB-33 RAMPEN CAT 1	2776
4	REB-33 RAMPEN CAT 2	2777

REV	DATE	BY	APP'D
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			

ACR ELECTRONICS, INC.
 1375 BROADWAY, NEW YORK, N.Y. 10019
 FINAL ASSEMBLY,
 RLB-32/33
 D 18560 A3-06-2068-14

3

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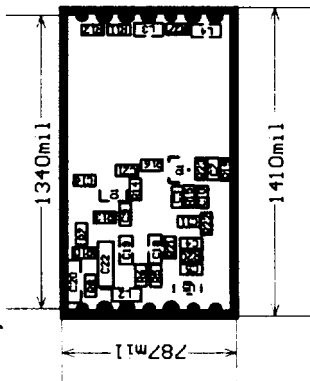
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18560 DATE REC A3-07-0237 REV 1 REV A

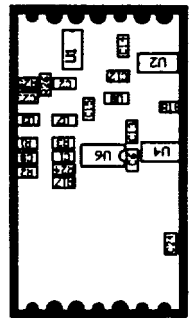
REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
A		RELEASED PER ECO XXXX J.C.		

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STEP 1, TOP:



STEP 2, BOTTOM:



SEE SEPARATE PARTS LIST

REV	DATE	BY	DESCRIPTION

LIST OF MATERIALS OR PARTS LIST

DATE	06-08-98		
DESIGNED BY	J.C.		
CHECKED BY			
DATE			
PART NO.			
QUANTITY			
DESCRIPTION	ACR ELECTRONICS, INC 870 WINDWOOD BL. FT. LAUDERDALE FL 33323		
DATE			
DESCRIPTION	PCB SMT ASSEMBLY 406MHZ PLL MODULATOR		
DATE			
DESCRIPTION	CODE TECH. NO. DRAWING NO.		
B	18560	A3-07-0237	REV A
SCALE 2/1		SHEET 1 OF 1	

4

3

2

1

4

3

2

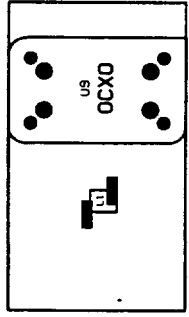
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18560 A3-07-0237-1 R

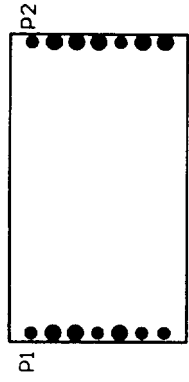
REVISIONS				
ZONE	REU	DESCRIPTION	DATE	APPROVED
	A	RELEASED PER ECO XXXX J.C.		

THIS DOCUMENT AND THE DATA DISCLOSED HEREIN OR HEREWITH IS PROPERTY OF AND BELONGS TO ACR ELECTRONICS, INC., FT. LAUDERDALE, FL. IT IS FURNISHED IN CONFIDENCE AND IS NOT TO BE REPRODUCED, COPIED OR DISCLOSED IN ANY MANNER WITHOUT THE PERMISSION OF ACR.

STEP 1, TOP:



STEP 2, BOTTOM:



ITEM NO.	QTY	UNIT	PART NO.	DATE OF ISSUE	IDENTIFICATION	REFERENCE DESIGNATION
4	2		AI-03-0265-007		KSA-007G, SEVEN PIN STRIP M/M	P1, P2
3	1		AI-08-0112		Coil, Air Core 2 Turn	L1
2	1		AI-11-0411		OSCILLATOR, 10.150625MHZ	U9
1	1		A3-07-0237		PCB SMT ASSEMBLY, 406MHZ PLL MODULATOR	

LIST OF MATERIALS OR PARTS LIST

DATE: 06/08/98

ACR ELECTRONICS, INC.
5707 WINDWOOD RD. FT. LAUDERDALE, FL 33323

PCB HAND PLACED ASSEMBLY
406MHZ PLL MODULATOR

SIZE: B 18560
DATE: 06/08/98
DRAWN BY: J.C.

SCALE: 2/1

FIGURE NO. A3-07-0237-1

SHEET 1 OF 1

Handwritten notes: "V. 3/2/98" and "10/1/98"

DATE: 02-06-1999 TIME: 14:50:17

ACR 12.0

2DDC5D800AFFBFF
C/S-187-USA-5

PASSED

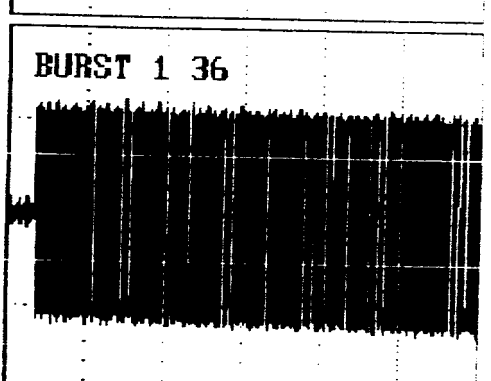
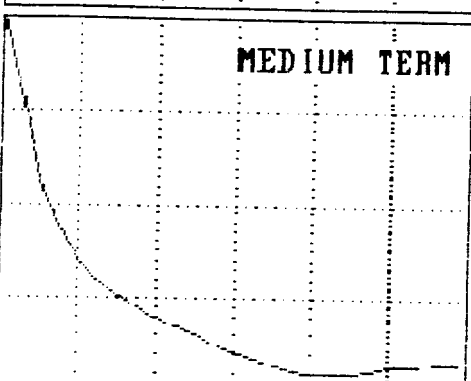
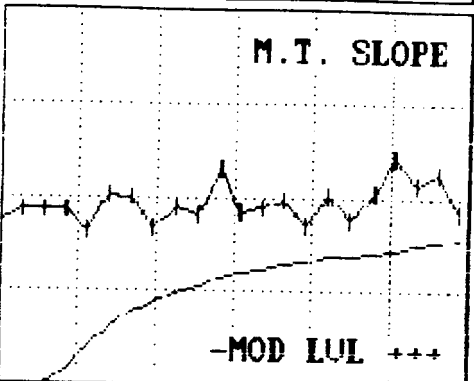
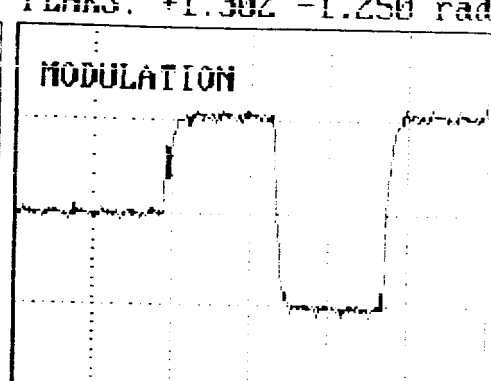
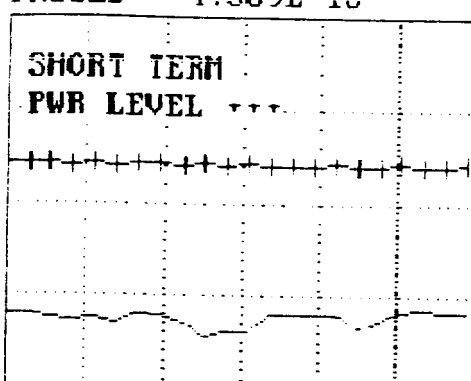
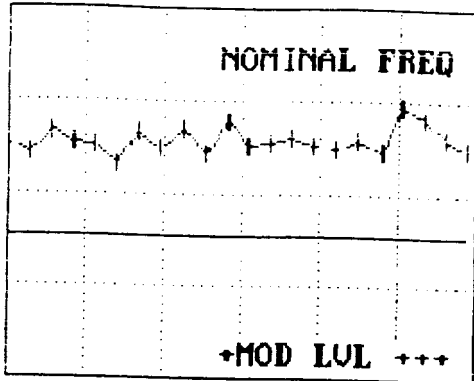
PASSED

-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 161.1 msec
 TOTAL DURATION 521.1 msec
 PREAMBLE LEAKAGE LEVEL 35.0 dBc
 LEAKAGE LENGTH 0.2 msec

HEXADECIMAL MESSAGE
 2DDC5D800AFFBFF
 FFFE2F96EE2EC0057F0FFD2535F593E0FAA3
 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 255.75
 ERROR CORRECTION CODE 1. OK
 ENCODED DATA SOURCE..... Internal
 101.5 MHz HOMING..... No
 SPARES status..... Not OK
 LATITUDE OFFSET..... + 0.50
 LONGITUDE OFFSET..... + 0.50
 ERROR CORRECTION CODE 2. OK



PV119

2/11/99

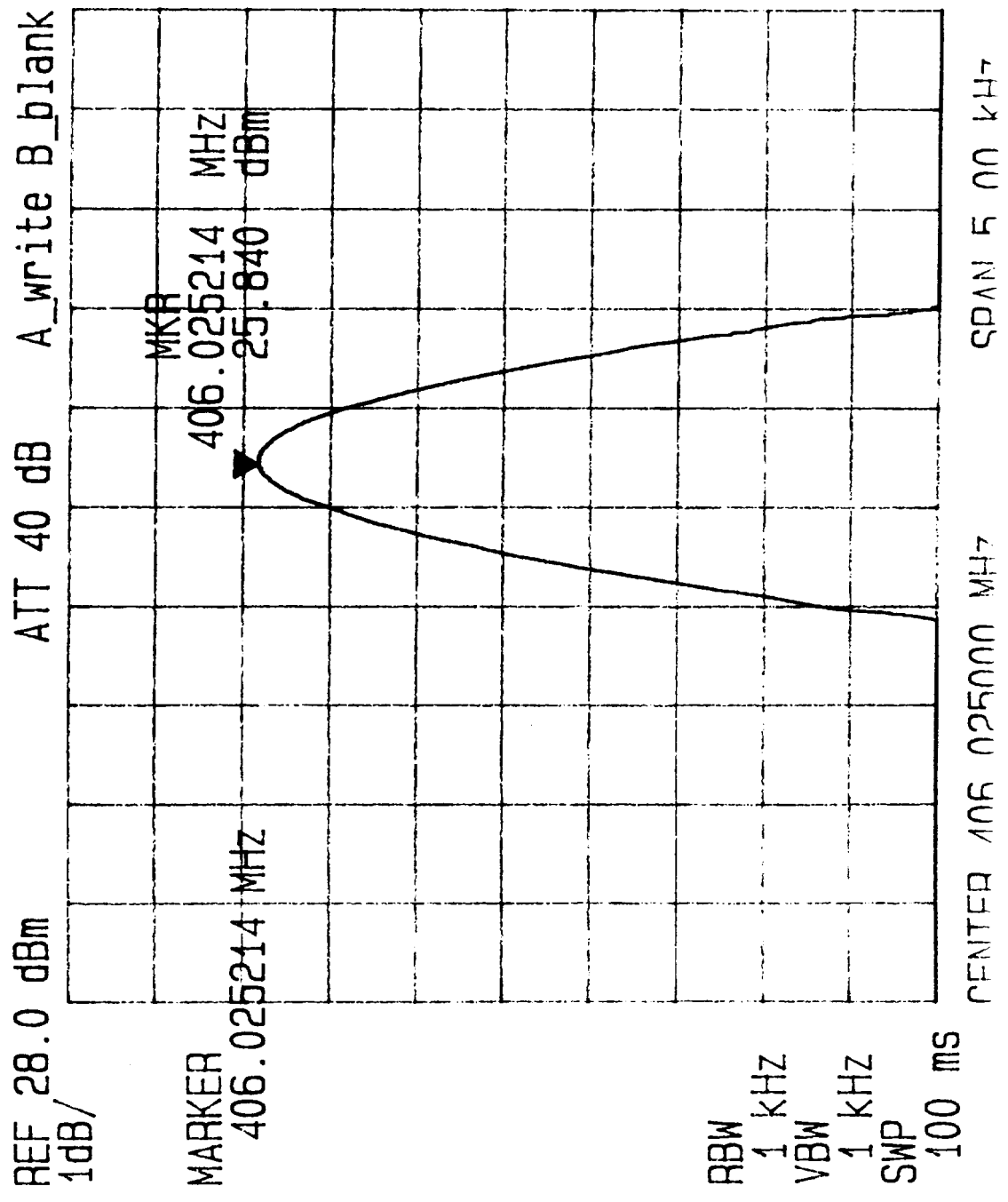
RLB-33 S/D 1

SUMMARY OF TEST RESULTS

PARAMETERS TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS			COMMENTS
			T _{min.} (°C)	T _{amb.} (24 °C)	T _{max.} (40 °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> <u>02FFBFF</u>	✓		✓		
3. Humidity Test						
• Aliveness Test					406. 025214	
- Carrier Frequency	406.025 ± 0.002	MHz				
- Power Output	35 - 39	dBm			38.24	
- Data Message	<u>2DDC5D80</u> <u>02FFBFF</u>	✓				

RLB-33 S/N 1 3.0 HUMIDITY TEST

8/11/99
10.06 OUT OF
CHAMBER



ATTEN:
12.7dB

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

ADR 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 POWER OUTPUT: 210000.000 watts +0.00 dbm POWER STABILITY: 21000.00 % POWER RISE TIME: 1000 µsec DRIFT SLOPE: +8.65E-02 rad/sec MODULATION LEVELS: +0.705 radians -0.720 radians OFFSET +0.000 radians MODULATION BIT RATE: 400.00 Hz EP IRB TIMES: SELF TEST 5.0 sec CARRIER DURATION 159.5 msec</p>	<p>HEXADECIMAL MESSAGE 2D1DC5D8002FFBFF FFFE2F96EE2EC0017F1FFC0A6135</p> <p>BIT SYNCHRONIZATION..... OK FRAME SYNCHRONIZATION... OK MESSAGE FORMAT..... LONG PROTOCOL FLAG..... Standard COUNTRY..... United States (366) MESSAGE PROTOCOL..... N/A CATEGORY/CLASS..... N/A MANUFACTURER ID NUMBER.. N/A</p>	<p>POWER OUTPUT POWER OUTPUT POWER STABILITY POWER RISE TIME</p>
<p>TOTAL DURATION 496.4 msec</p>	<p>PRODUCTION RUN NUMBER... N/A MODEL NUMBER..... N/A HUMING FACILITY..... OTHER OR MORE THA ERROR CORRECTION CODE... OK EMERGENCY CODE FLAG..... NOT OK ACTIVATION MODE..... AUTOMATIC NATURE OF DISTRESS..... LISTING</p>	

SUMMARY OF TEST RESULTS

PARAMETERS TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS			COMMENTS	
			T _{min} (<u> </u> °C)	T _{amb.} (<u> </u> °C)	T _{max.} (<u>55</u> °C)		
4. Dry Heat Cycle <ul style="list-style-type: none"> • Aliveness Test (during 2 hour period) - Carrier Frequency - Power Output - Data Message • Aliveness Test (at end of 2 hour period) - Carrier Frequency - Power Output - Data Message 	406.025 ± 0.002 35 - 39 <u>02DC57B0</u> <u>02EE8FF</u>	MHz dBm ✓				406.02518 37.74 ✓	
	406.025 ± 0.002 35 - 39 <u>02DC57B0</u> <u>02EE8FF</u>	MHz dBm ✓				406.02518 37.73 ✓	

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

ACK V6.0

2DDC5D8002FFBFF
C/S-187-USA-1

PASSED

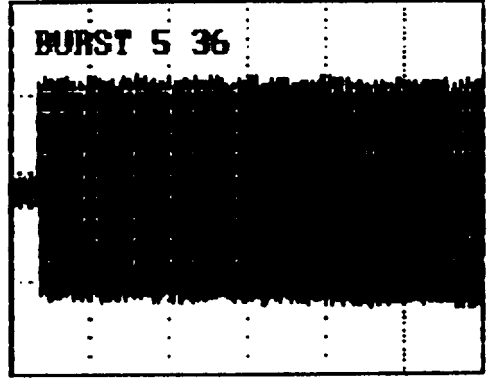
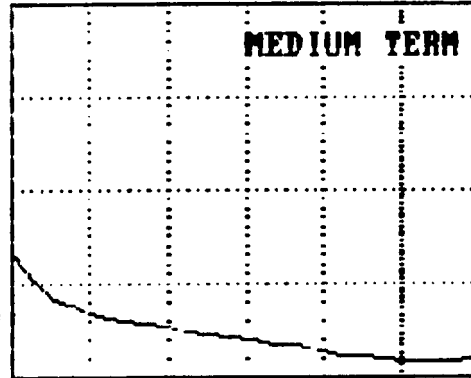
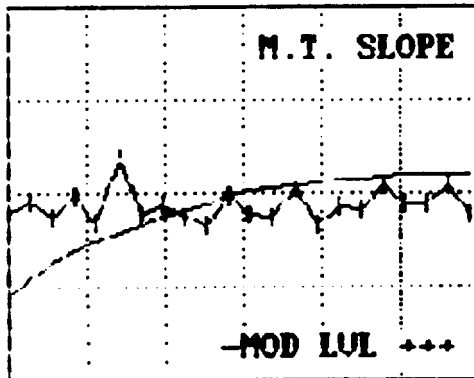
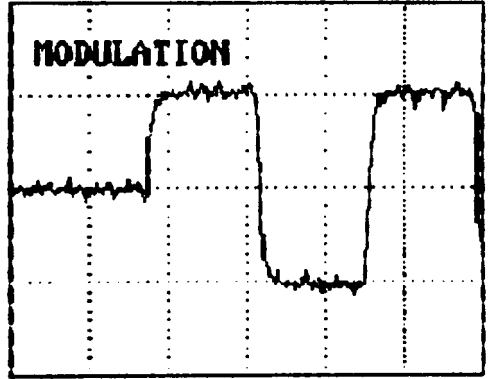
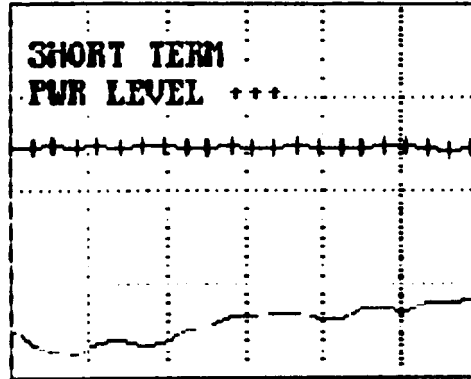
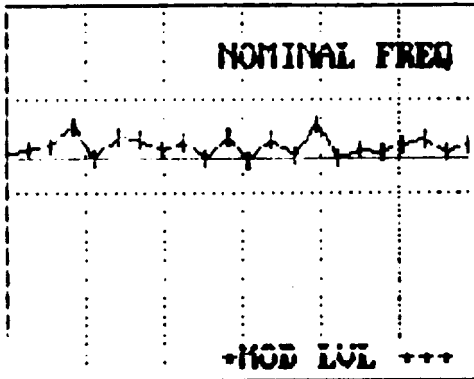
PASSED

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

NOMINAL FREQUENCY: 406.02018 MHz	HEXADECIMAL MESSAGE
PURKER OUTPUT: 5.939 Watts	2DDC5D8002FFBFF
+37.74 dbm	FFFE2F96EE2E10017AFFC0860080E0F0AD
PURKER STABILITY: 9.91 %	BIT SYNCHRONIZATION..... UK
PURKER RISE TIME: 730 usec	FRAME SYNCHRONIZATION... UK
PEAK VOLTAGE: +2.802 Volts	MESSAGE FORMAT..... LUNG
DRIFT SLOPES: 1) -1.99E-01 rad/sec	PROTOCOL FLAG..... STANDARD
2) -1.99E-01 rad/sec	COUNTRY..... USA
3) -1.99E-01 rad/sec	SERIALIZED USER..... TEST FILE
MODULATION LEVELS: +1.136 radians	C/S CERTIFICATE NO..... 187
+1.144 -1.115 -1.142 radians	SERIAL NUMBER..... 1
+0.015 OFFSET -0.003 radians	LATITUDE..... N 127.75
MODULATION TIMES: RISE 144 usec	LONGITUDE..... E 255.75
FALL 150 usec	ERROR CORRECTION CODE 1. UK
SYMMETRY 0.20 %	ENCODED DATA SOURCE..... Internal
MODULATION BIT RATE: 398.75 Hz	121.5 MHz HUMING..... No
BURST TIMES: AVG PERIOD 50.5 sec	SPARES status..... Not UK
CARRIER DURATION 160.0 msec	LATITUDE OFFSET..... + 0 60
MESSAGE DURATION 361.2 msec	LONGITUDE OFFSET..... + 0 60
TOTAL DURATION 521.2 msec	ERROR CORRECTION CODE 2. UK
PREAMBLE LEAKAGE LEVEL 35.0 dbc	
LEAKAGE LENGTH 0.1 msec	

SUMMARY OF TEST RESULTS

PARAMETERS TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS			COMMENTS
			T _{min} * (°C)	T _{amb.} (40 °C)	T _{max.} (°C)	
5. Damp Heat Cycle <ul style="list-style-type: none"> • Aliveness Test (during 2 hour period) - Carrier Frequency - Power Output - Data Message 	406.025 ± 0.002 35 - 39 <u>20 DCS D 80</u> <u>22 FEF EF</u>	MHz dBm ✓	406.02521 37.67 ✓			
<ul style="list-style-type: none"> • Aliveness Test (at end of 2 hour period) - Carrier Frequency - Power Output - Data Message 	406.025 ± 0.002 35 - 39 <u>20 DCS D 80</u> <u>22 FEF EF</u>	MHz dBm ✓	406.02520 37.71 ✓			

SUMMARY OF TEST RESULTS

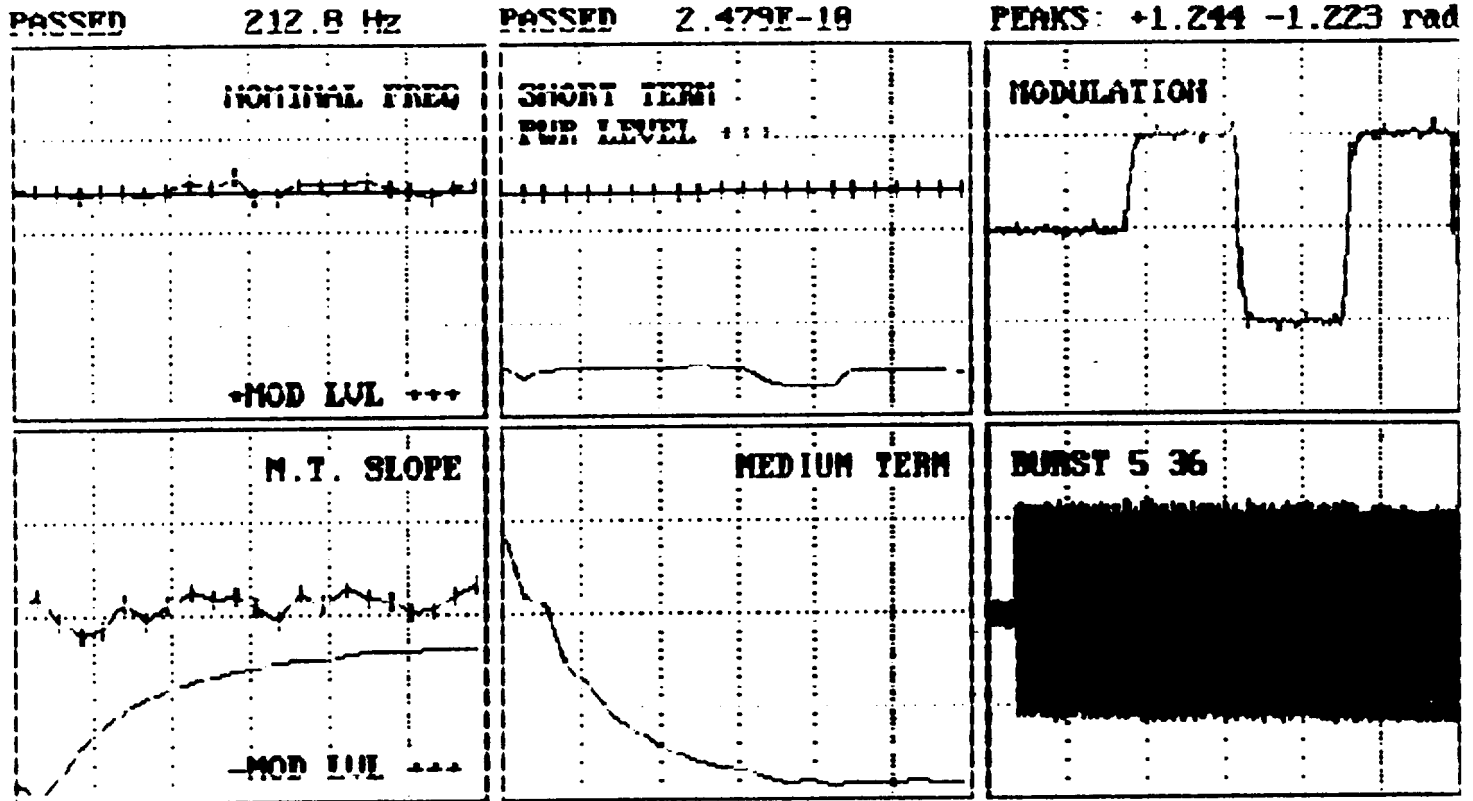
PARAMETERS TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS			COMMENTS
			T _{min.} (<u> </u> °C)	T _{amb.} (<u>25</u> °C)	T _{max.} (<u> </u> °C)	
6. Vibration Test (Non Activate) <ul style="list-style-type: none"> • Exterior Mechanical Inspection • Did not Activate • Aliveness Test <ul style="list-style-type: none"> - Carrier Frequency - Power Output - Data Message 	No Damage 406.025 ± 0.002 35 - 39 202505178	✓ ✓ MHz dBm ✓	✓ ✓ 406.02521 37.75 ✓	✓ ✓ 406.025178 406.025178 406.025178		
7. Vibration Test (Frequency) <ul style="list-style-type: none"> • Carrier Frequency (during test) • Exterior Mechanical Inspection • Aliveness Test: <ul style="list-style-type: none"> - Carrier Frequency - Power Output 	406.025 ± 0.002 No Damage 406.025 ± 0.002 35 - 39	MHz ✓ MHz dBm	✓ ✓ 406.025178 406.025178 406.025178	✓ ✓ 406.025178 406.025178 406.025178		

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

ACR v6.0

2DDC5D8002FFBF
075-187-USA-1

PASSED



PASSED -1.994E-18 PASSED 1.462E-18 PEAKS: +1.299 -1.362 rad

NOMINAL FREQUENCY: 406.02021 MHz POWER OUTPUT: 5.963 Watts +37.75 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: 376.75 KHz BURST TIMES: AVG PERIOD 50.0 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 FFFE276EE2E0017F1FF006103583E0FA8 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 SYNCH STATUS..... NOT OK LATITUDE OFFSET..... + 0 60 LONGITUDE OFFSET..... + 0 60 ERROR CORRECTION CODE 2. OK
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SUMMARY OF TEST RESULTS

PARAMETERS TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS			COMMENTS
			T _{min.} (<u> </u> °C)	T _{amb.} (<u>24</u> °C)	T _{max.} (<u> </u> °C)	
8. Bump Test <ul style="list-style-type: none"> • Exterior Mechanical Inspection • Aliveness Test - Carrier Frequency - Power Output - Data Message 	No Damage 406.025 ± 0.002 35 - 39 2DDC5D80 02FE8FE	✓ MHz dBm ✓	✓ 406.02521 37.80 ✓			
9. Salt Fog Test <ul style="list-style-type: none"> • Exterior Mechanical Inspection • Aliveness Test: <ul style="list-style-type: none"> - Carrier Frequency - Power Output - Data Message 	No Damage 406.025 ± 0.002 35 - 39 2DDC5D80 02FE8FE	✓ MHz dBm ✓	✓ 406.02521 37.09 ✓			

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

ACR v6.0

2DDC5D8002EFBFF
C/S-187-USA-1

PASSED

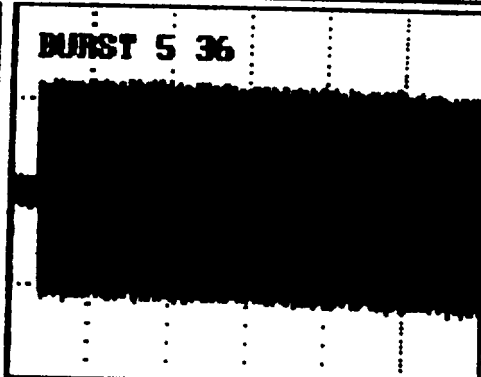
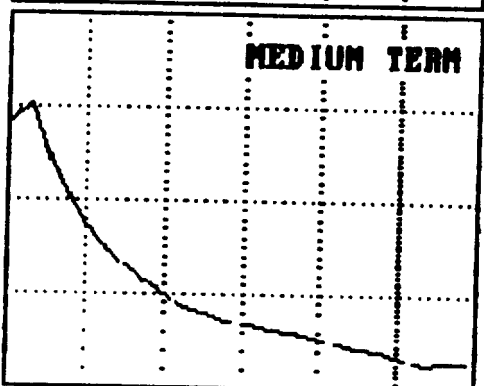
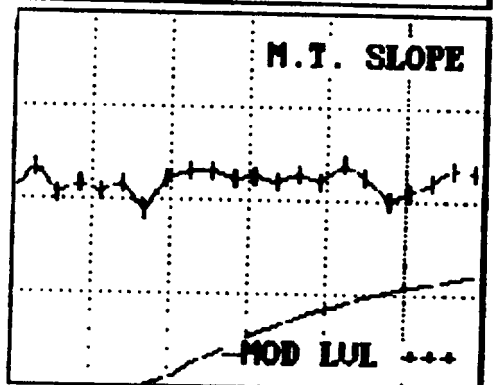
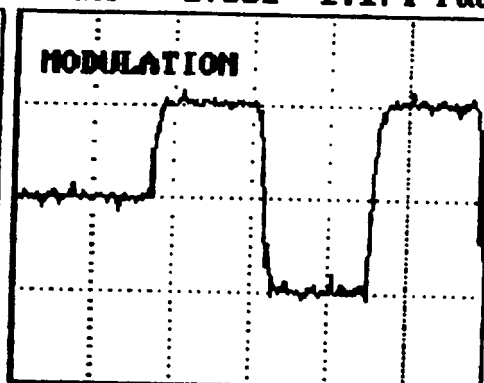
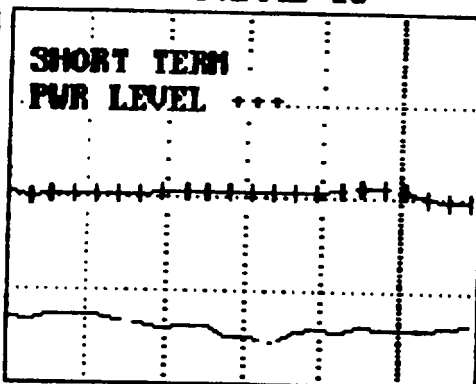
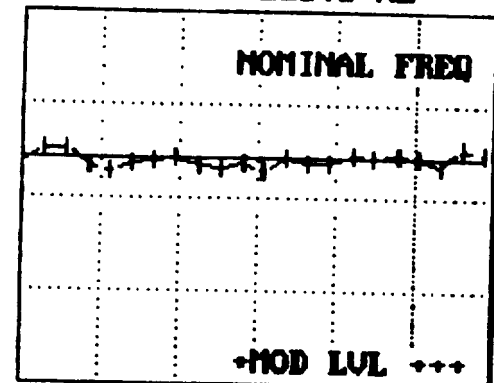
PASSED

216.0 Hz

PASSED

3.24E-10

PEAKS: +1.381 -1.174 rad



PASSED -4.612E-10

PASSED 2.334E-10

PEAKS: +1.334 -1.410 rad

<p>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 µsec MESSAGE DURATION 361.1 µsec TOTAL DURATION 521.2 µsec PREAMBLE LEAKAGE LEVEL 35.0 dBc LEAKAGE LENGTH 0.1 µsec</p>	<p>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</p>
---	---

SUMMARY OF TEST RESULTS

PARAMETERS TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS			COMMENTS
			T _{min} [*] (<u> </u> °C)	T _{amb.} (<u>20</u> °C)	T _{max.} (<u> </u> °C)	
10. Drop Test In Water <ul style="list-style-type: none"> • Exterior Mechanical Inspection • Aliveness Test - Carrier Frequency - Power Output - Data Message 	No Damage 406.025 ± 0.002 35 - 39 <u>2DDC5D80</u> <u>02FFBFF</u>	✓ MHz dBm ✓	✓ 406.02521 37.16 ✓	✓ 27°C ✓		
11. Drop Test On Hard Surface <ul style="list-style-type: none"> • Exterior Mechanical Inspection • Aliveness Test: <ul style="list-style-type: none"> - Carrier Frequency - Power Output - Data Message 	No Damage 406.025 ± 0.002 35 - 39 <u>2DDC5D80</u> <u>02FFBFF</u>	✓ MHz dBm ✓	✓ 406.02522 36.00 ✓	✓ ✓		

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

ACR v6.0

2DDC5D8002FFBFF
C/S-187-USA-1

PASSED

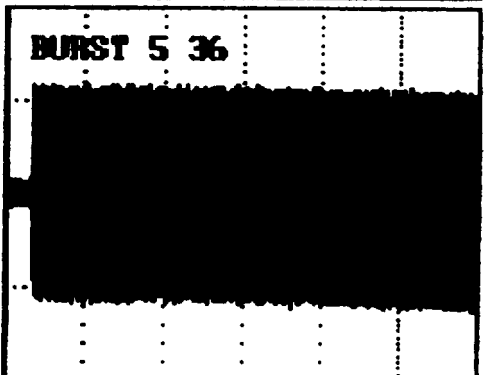
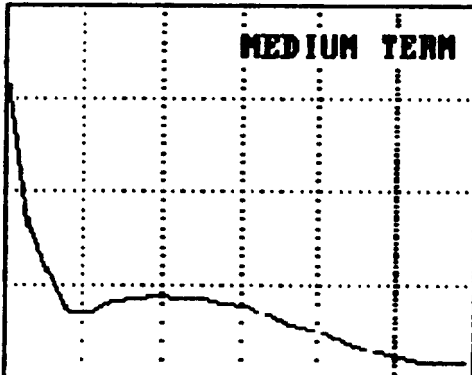
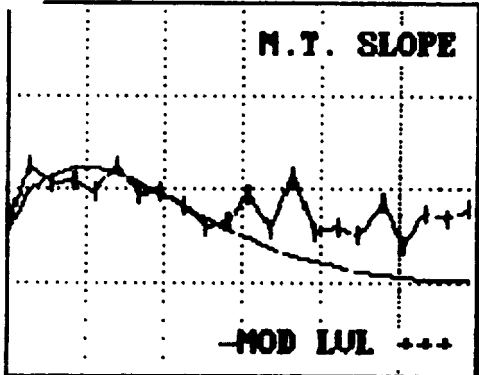
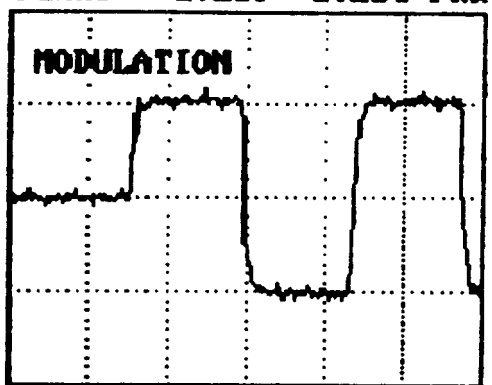
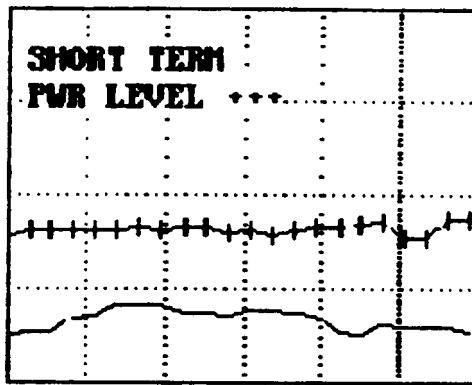
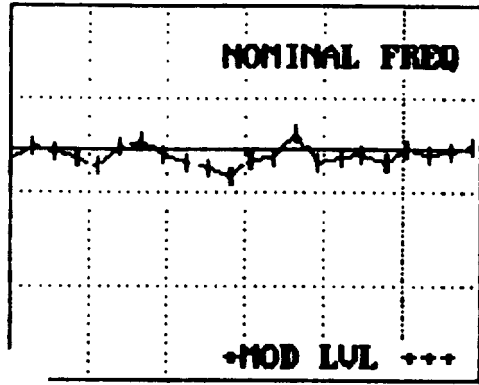
PASSED

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	HEXADECIMAL MESSAGE
POWER OUTPUT: 3.980 Watts	2DDC5D8002FFBFF
+36.00 dBm	FFFE2F96EE2ED0017FDFFD0A6D3583E0FAA8
POWER STABILITY: 9.93 %	BIT SYNCHRONIZATION..... OK
POWER RISE TIME: 580 µsec	FRAME SYNCHRONIZATION... OK
PEAK VOLTAGE: +2.282 Volts	MESSAGE FORMAT..... LONG
DRIFT SLOPES: 1) -1.15E-01 rad/sec	PROTOCOL FLAG..... STANDARD
2) -1.15E-01 rad/sec	COUNTRY..... USA
3) -1.15E-01 rad/sec	SERIALIZED USER..... TEST MODE
MODULATION LEVELS: +1.135 radians	C/S CERTIFICATE No..... 187
+1.139 -1.103 -1.141 radians	SERIAL NUMBER..... 1
+0.018 OFFSET -0.003 radians	LATITUDE..... N 127.75
MODULATION TIMES: RISE 147 µsec	LONGITUDE..... E 255.75
FALL 148 µsec	ERROR CORRECTION CODE 1. OK
SYMMETRY 0.53 %	ENCODED DATA SOURCE..... Internal
MODULATION BIT RATE: 398.75 Hz	121.5 MHz HOMING..... No
BURST TIMES: AVG PERIOD 50.5 sec	SPARES status..... Not OK
CARRIER DURATION 160.0 msec	LATITUDE OFFSET..... + 0 60
MESSAGE DURATION 361.2 msec	LONGITUDE OFFSET..... + 0 60
TOTAL DURATION 521.1 msec	ERROR CORRECTION CODE 2. OK
PREAMBLE LEAKAGE LEVEL 35.0 dBc	
LEAKAGE LENGTH 0.1 msec	

SUMMARY OF TEST RESULTS

PARAMETERS TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS			COMMENTS
			T _{min.} (-55 °C)	T _{amb.} (18 °C)	T _{max.} (70 °C)	
12. Automatic Release Mechanism Test <ul style="list-style-type: none"> • Normal mounted orientation Depth of Release • Rolling 90° starboard Depth of Release • Rolling 90° port Depth of Release • Rolling 90° bow down Depth of Release • Rolling 90° stern down Depth of Release • Upside down Depth of Release • Normal mounted orientation @ min. storage temperature Depth Release • Normal mounted orientation @ max. storage temperature Depth Release 	Automatic activation and release ≤ 4 meters ≤ 4 meters ≤ 4 meters ≤ 4 meters ≤ 4 meters ≤ 4 meters ≤ 4 meters ≤ 4 meters	Meters Meters Meters Meters Meters Meters Meters Meters	[Redacted] 3.50 3.20 2.97 3.12 3.05 2.82 [Redacted] 3.99 [Redacted]	[Redacted] [Redacted] [Redacted] [Redacted] [Redacted] [Redacted] [Redacted] [Redacted] [Redacted]	11' 6" 9' 9" + 9" 9' 0" + 9" 10' 3" - 0" 10' 0" 8' 6" + 9" 11' 9" + 16" 7' 0" + 16"	
					2.54	

SUMMARY OF TEST RESULTS

PARAMETERS TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS			COMMENTS
			T _{min.} (_____ °C)	T _{amb.} (_____ °C)	T _{max.} (_____ °C)	
13. Leakage And Immersion Test <ul style="list-style-type: none"> • Aliveness Test - Carrier Frequency - Power Output - Data Message • Interior Inspection 	 406.025 ± 0.002 35 - 39 <u>2DD2SD80</u> <u>02FFBFF</u> No water	 MHz dBm ✓ ✓	 406.02521 38.15 ✓ ✓	 	 	
14. Spurious Emissions Test <ul style="list-style-type: none"> • 406 MHz • 121.5 MHz 	 Figure 1 Figure 2	 ✓ (attach graphs) ✓ (attach graphs)	 ✓ ✓	 	 	

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

ACR v6.0

2DDC5D8002FFBFF
C/S-187-USA-1

~~FAILED~~
PASSED

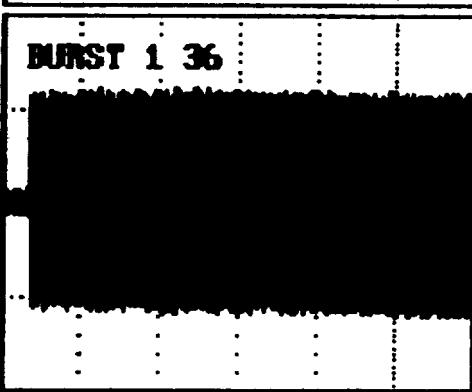
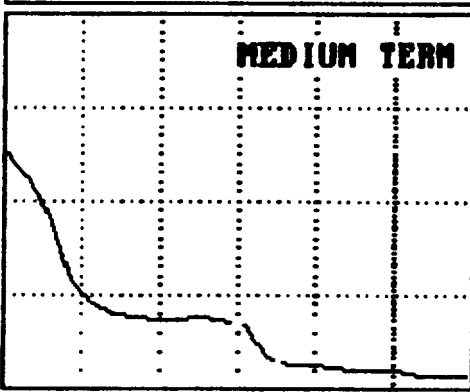
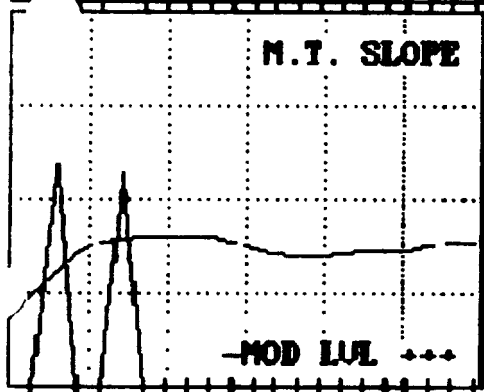
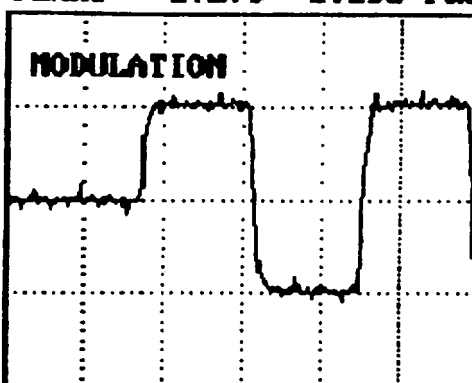
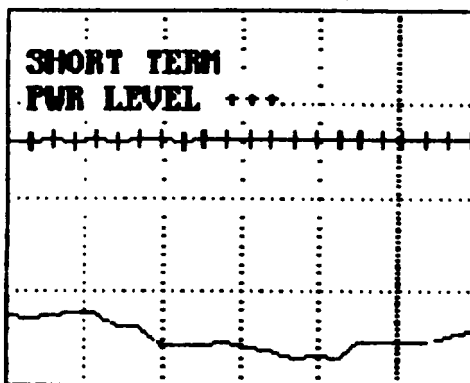
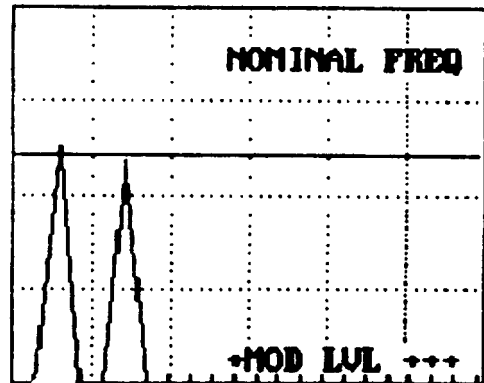
PASSED

213.5 Hz

PASSED

2.822E-10

PEAKS: +1.279 -1.193 rad



PASSED

-2.658E-10

PASSED

1.418E-10

PEAKS: +1.347 -1.324 rad

NOMINAL FREQUENCY: 406.02521 MHz
 POWER OUTPUT: 6.508 Watts
 +38.13 dBm
 FREQ 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
 FFFE2F96EE2ED0017FDFFC0A6D035B3E0FAA8
 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

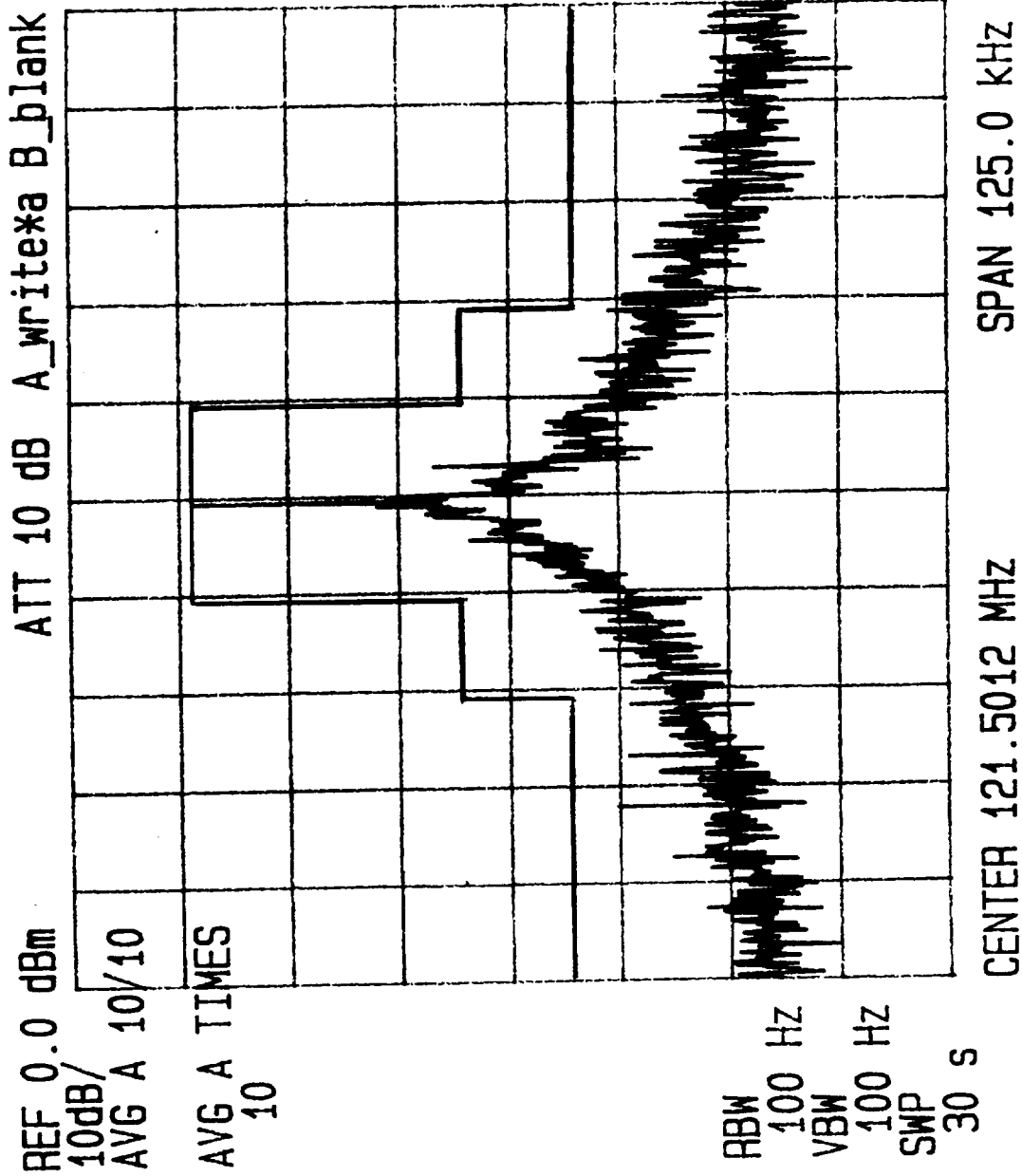
← MAX MODULATION LEVEL
← MIN MODULATION LEVEL

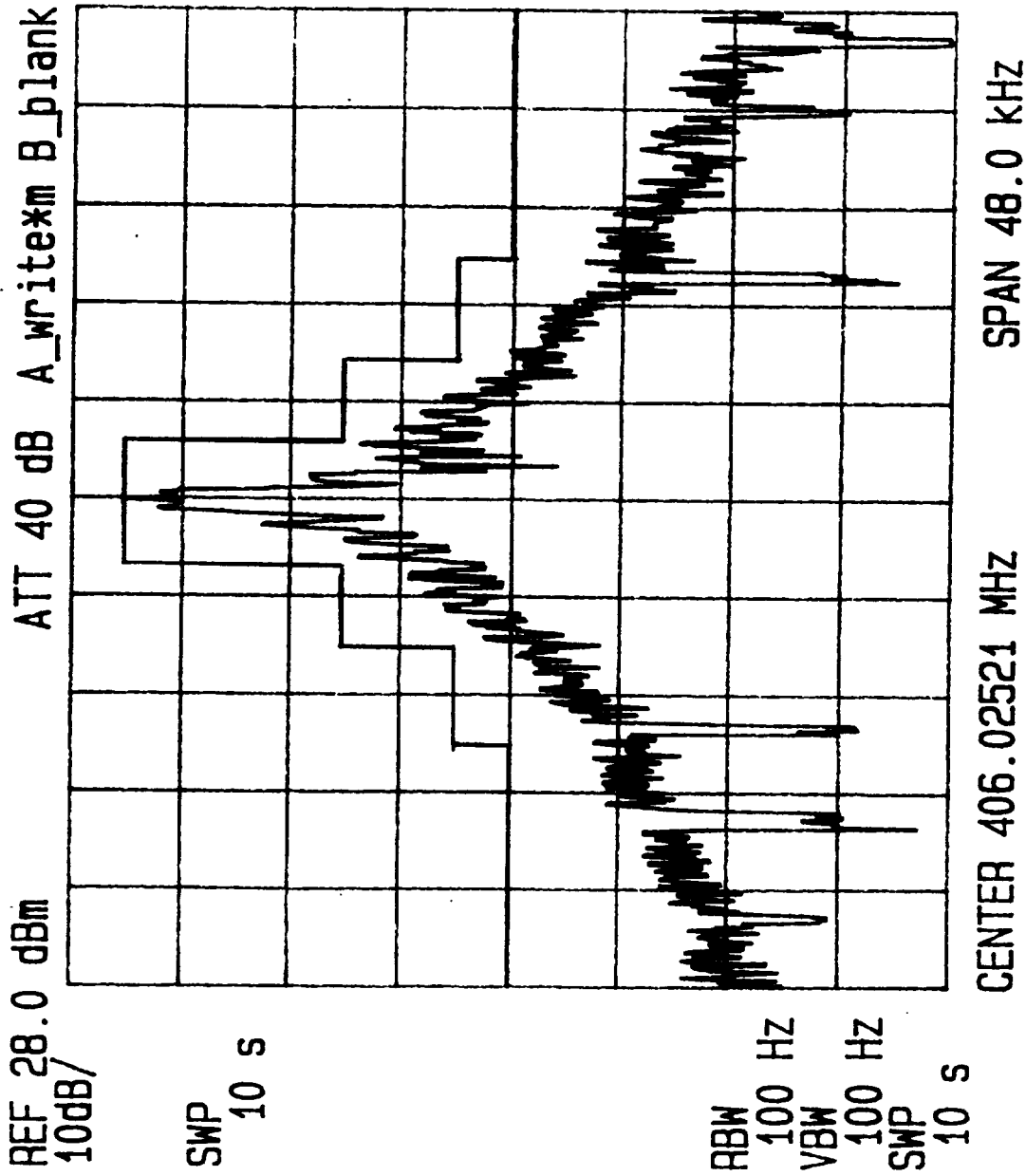
RLB-33

S/N 1

TEMP +55 DEG C

02/26/99



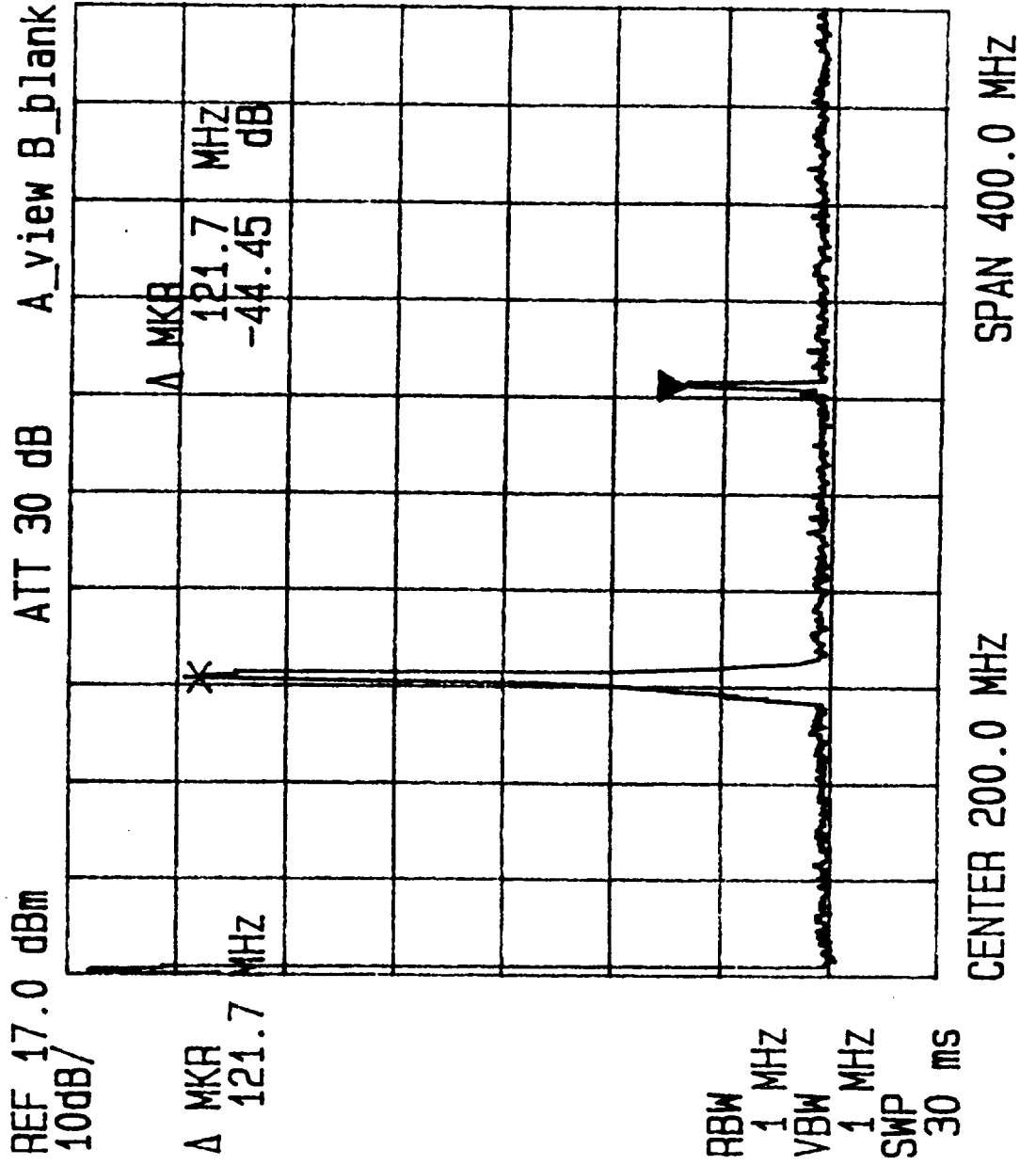


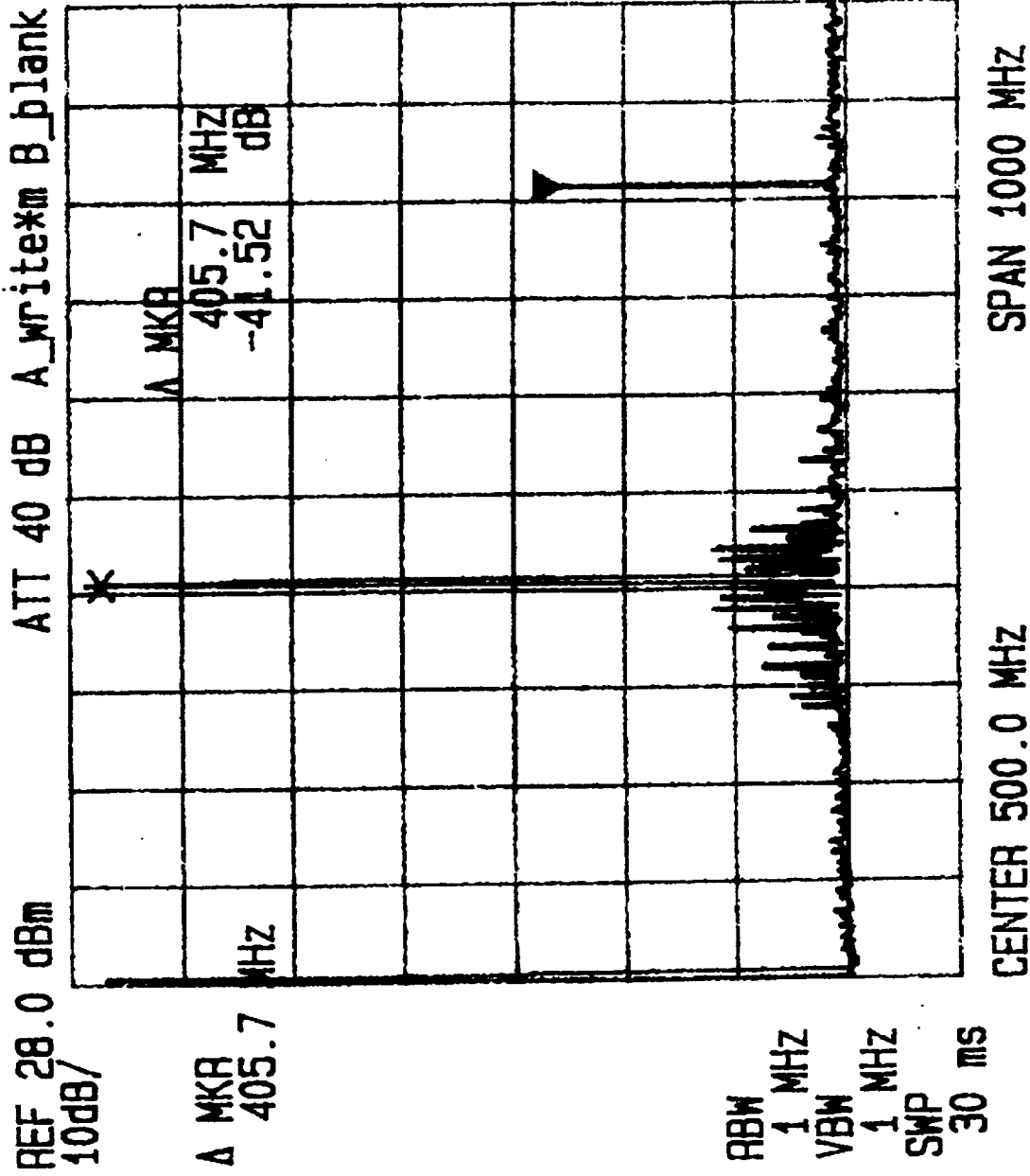
RLB-33

S/N 1

TEMP +55 DEG C

02/26/99



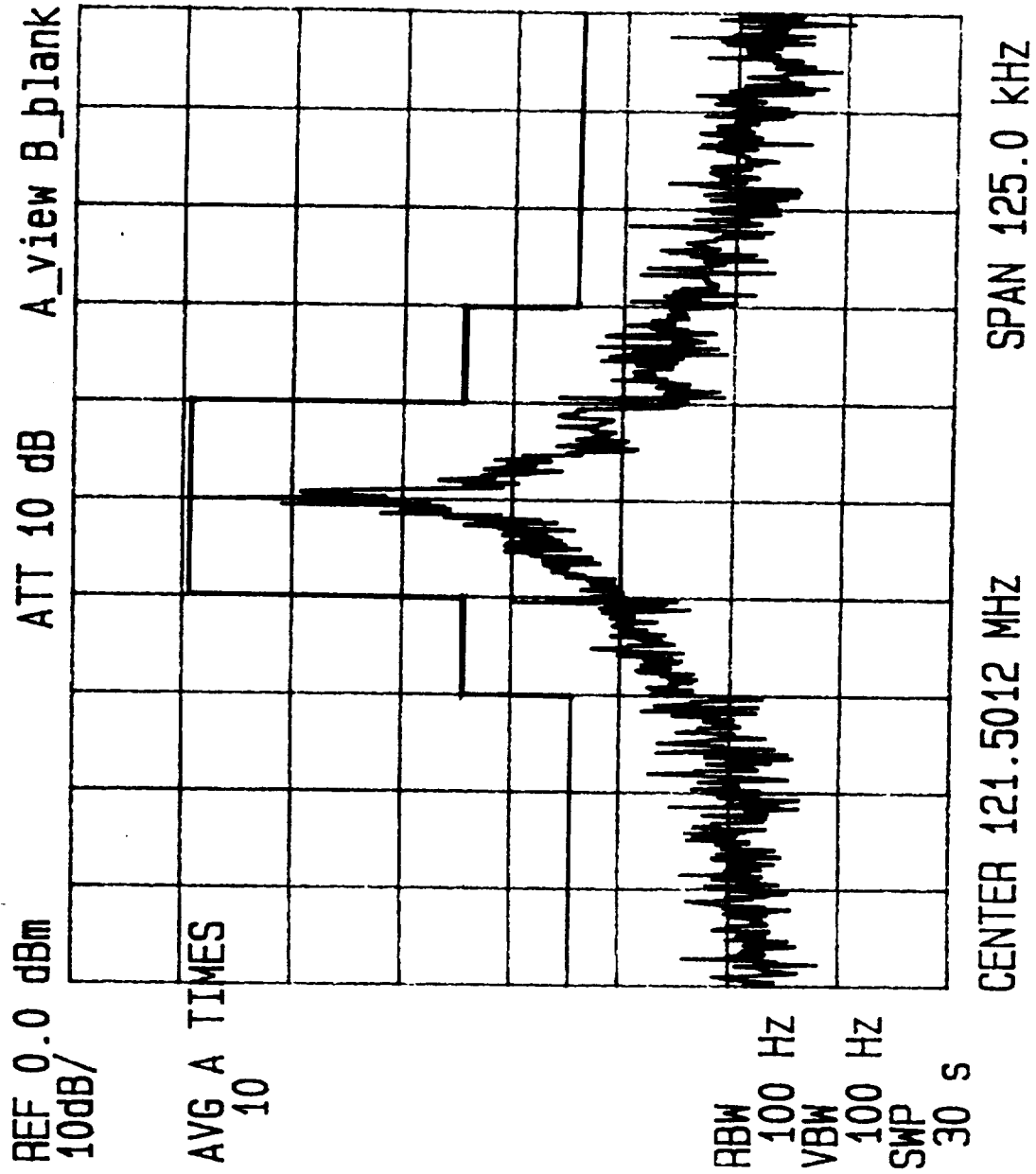


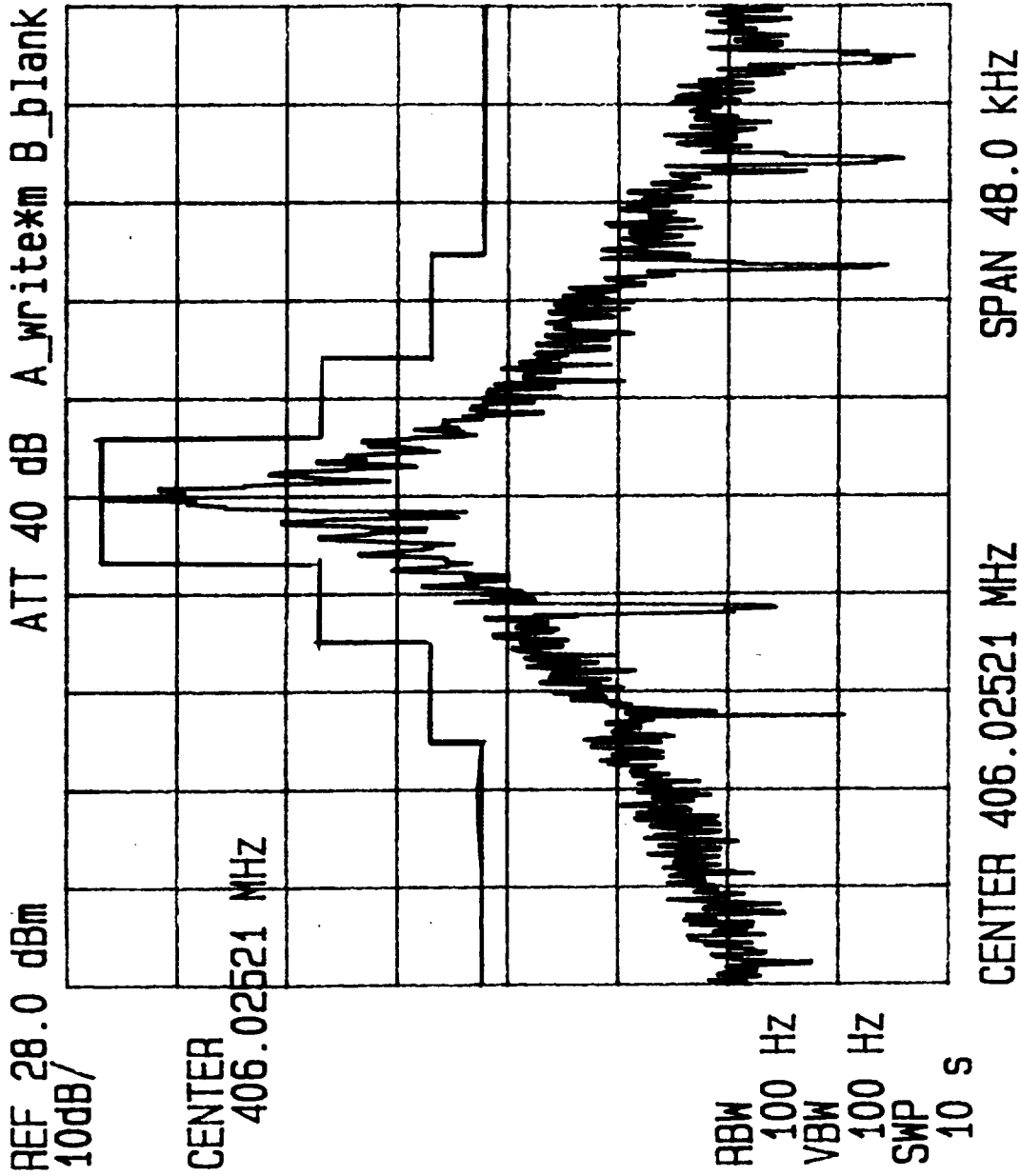
RLB-33

S/N 1

TEMP AMBIENT

02/26/99



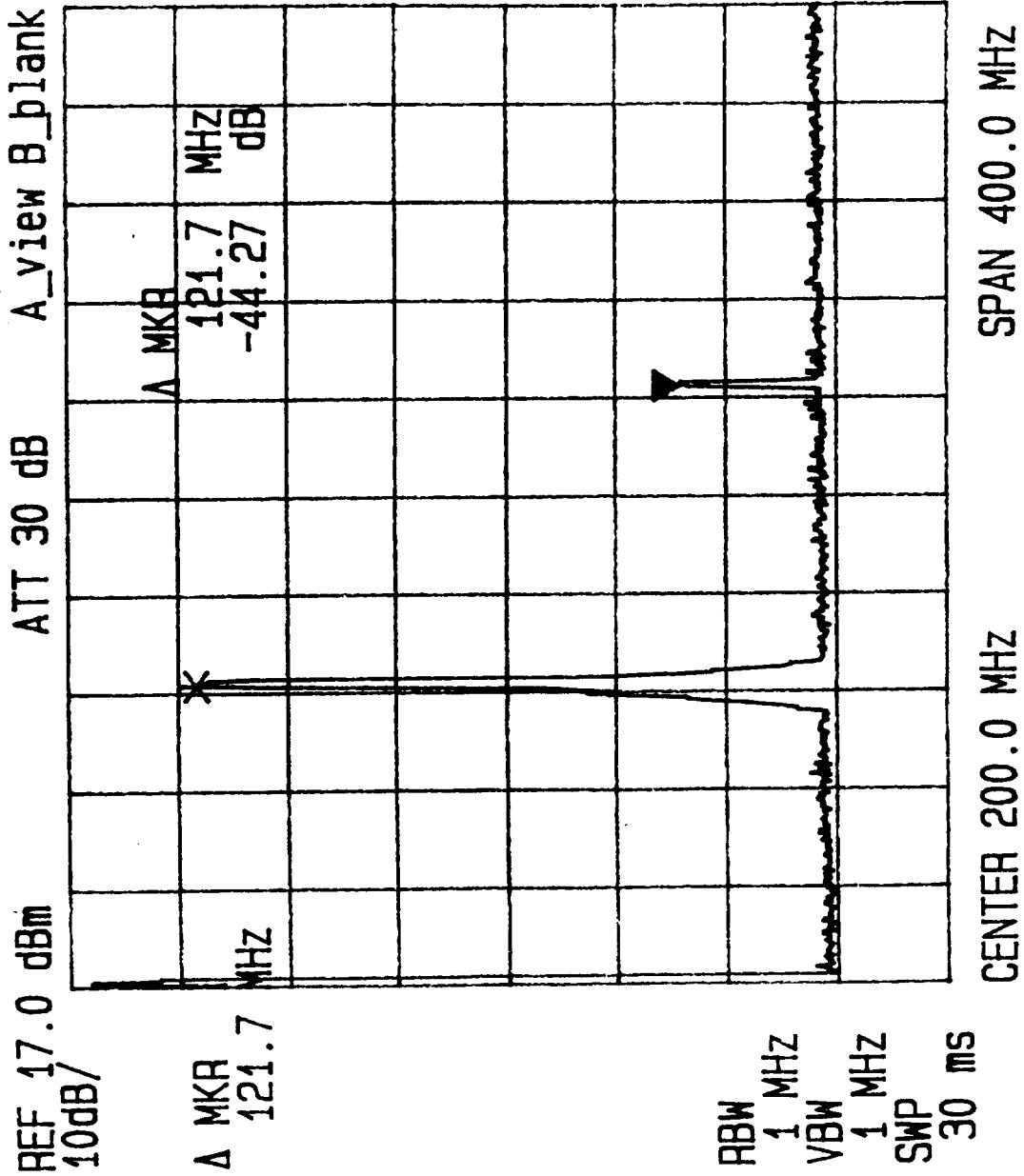


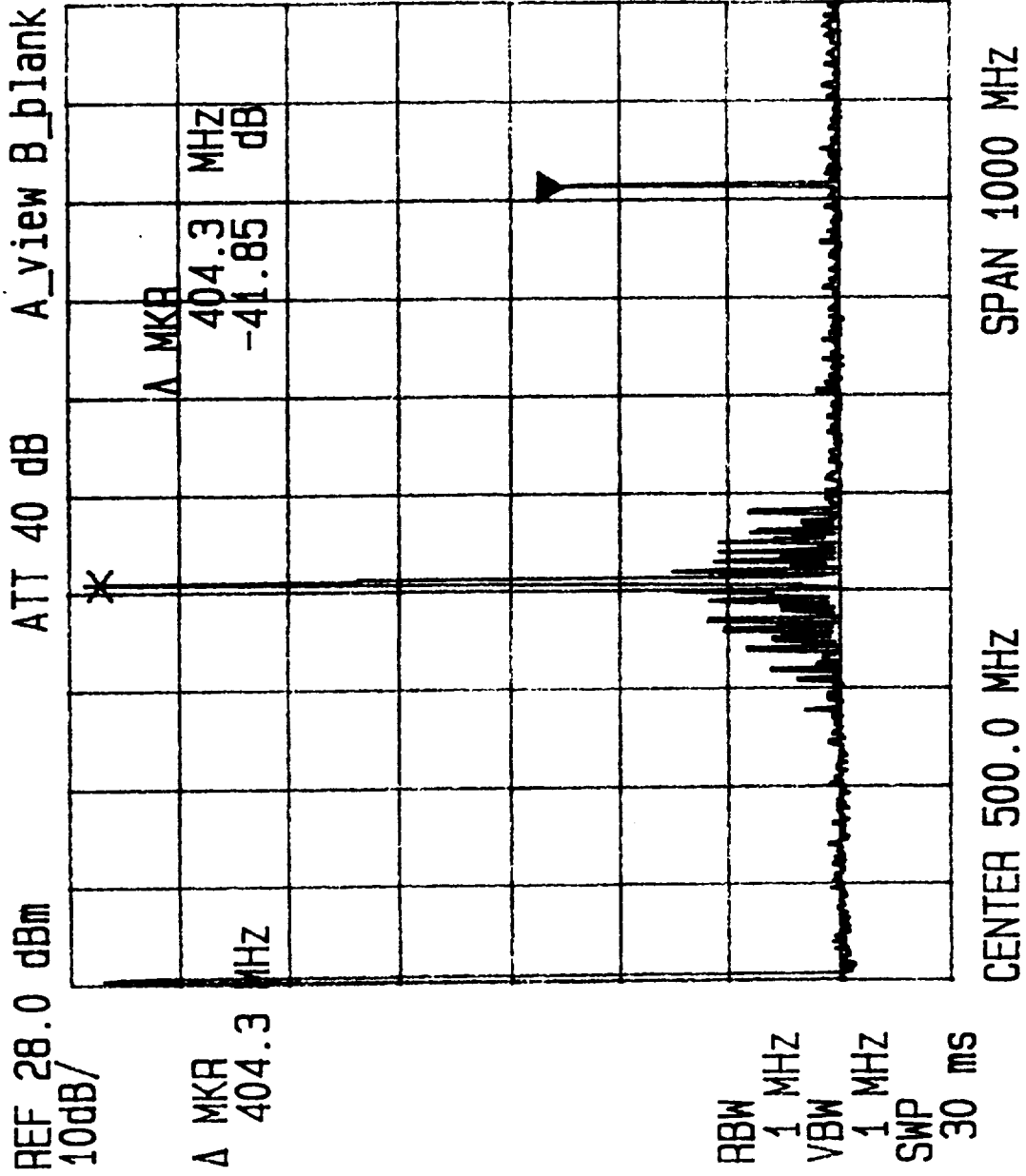
RLB-33

S/N 1

TEMP AMBIENT

02/26/99



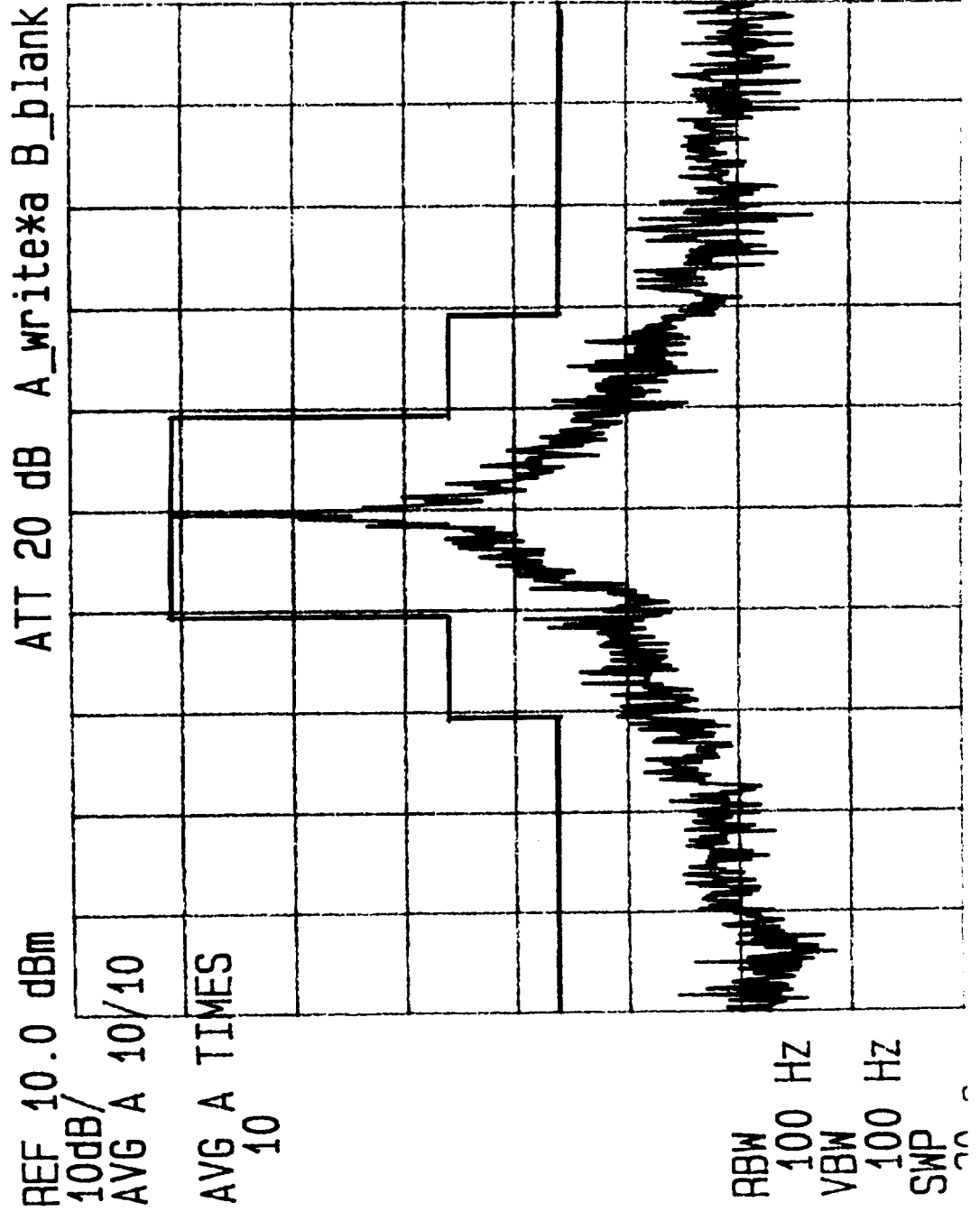


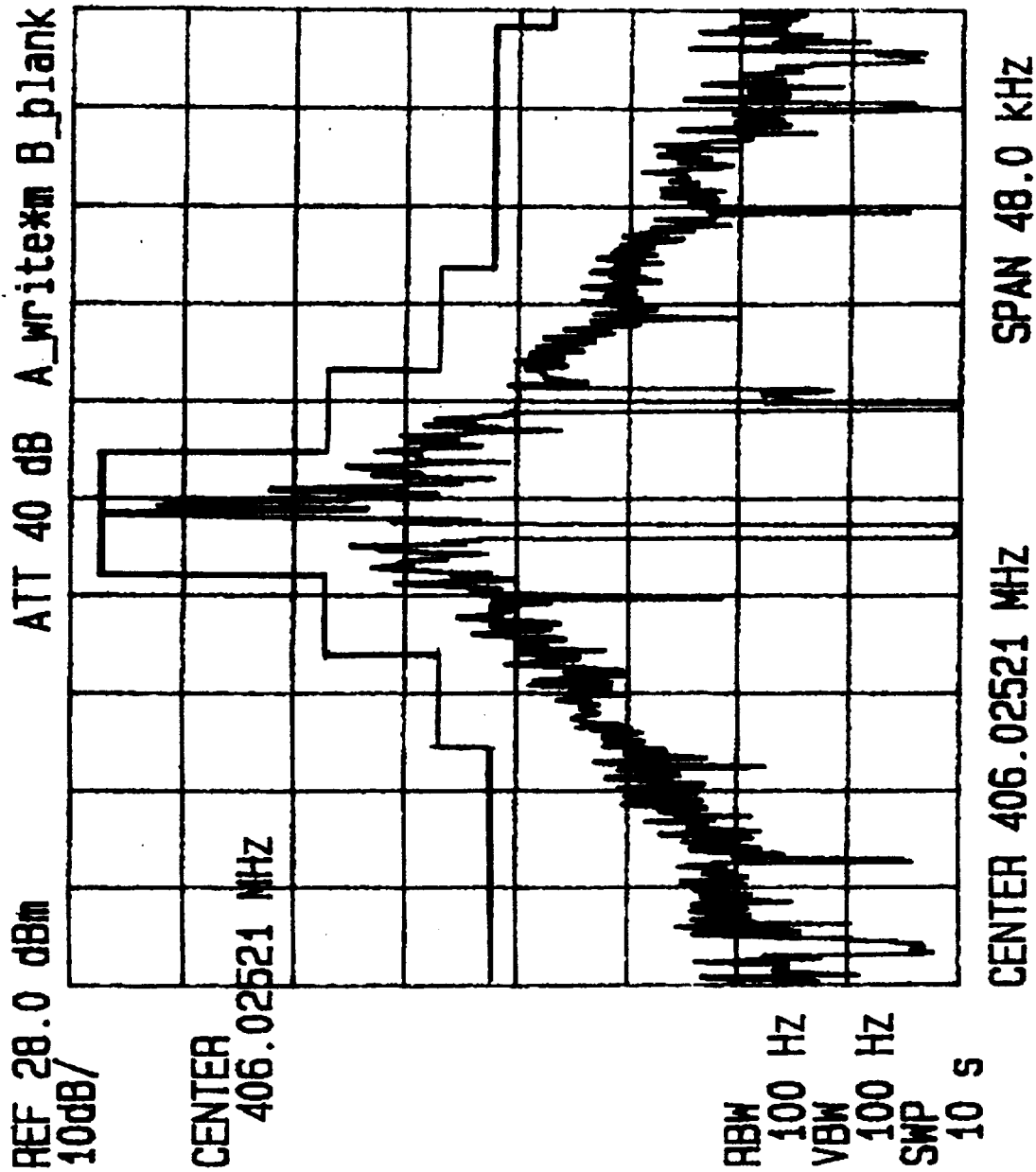
RLB-33

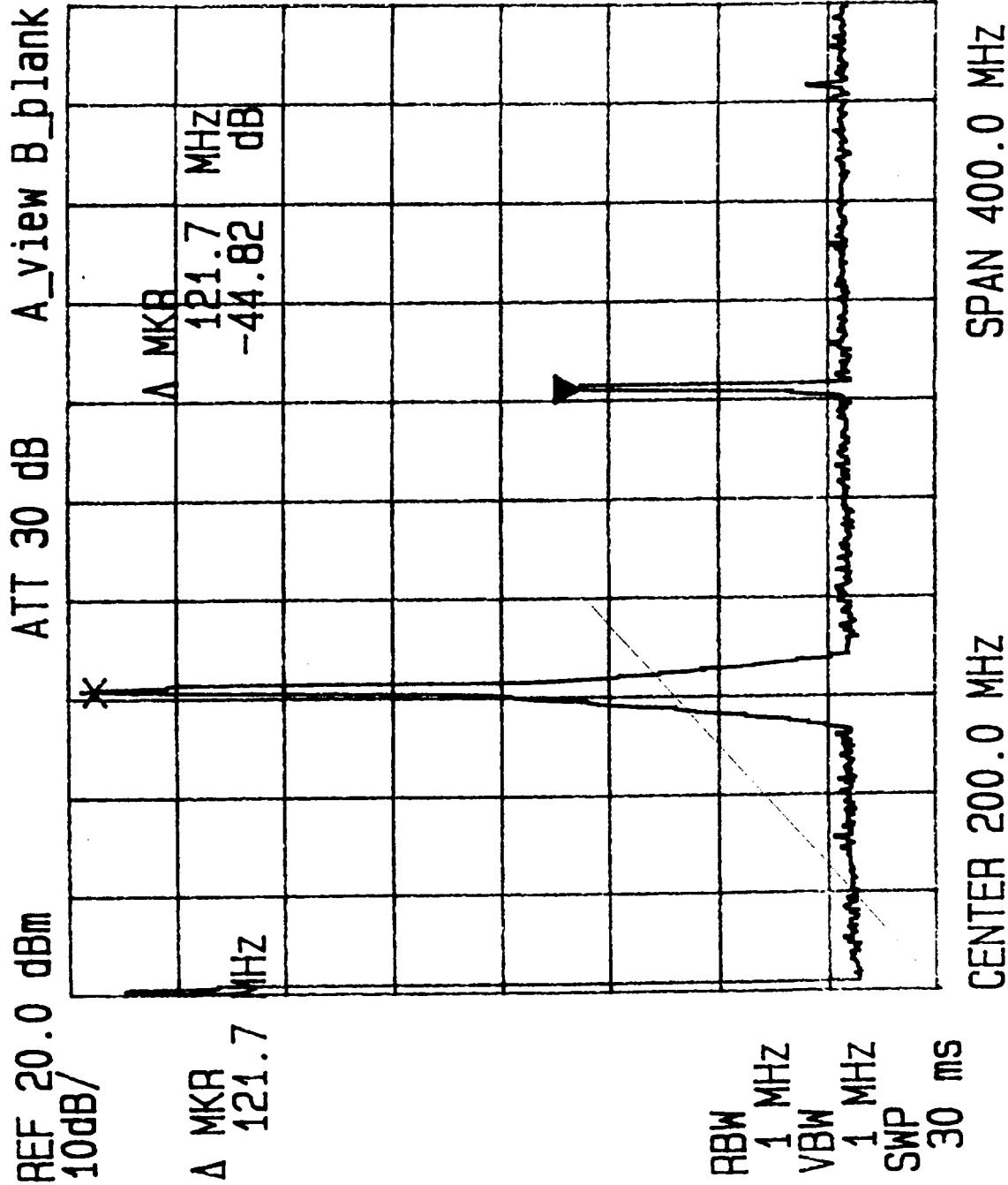
SIN 1

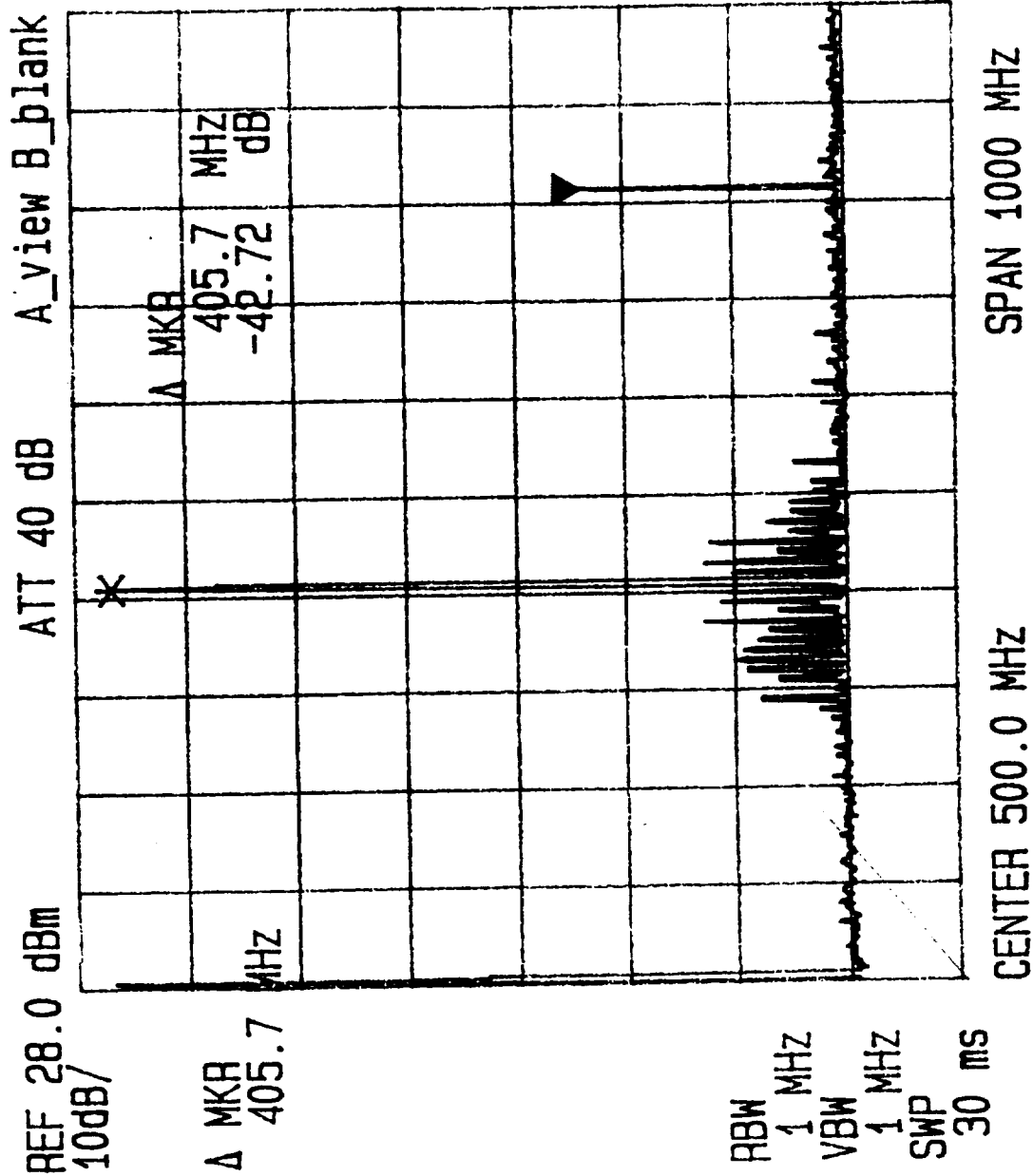
TEMP -40 DEG C

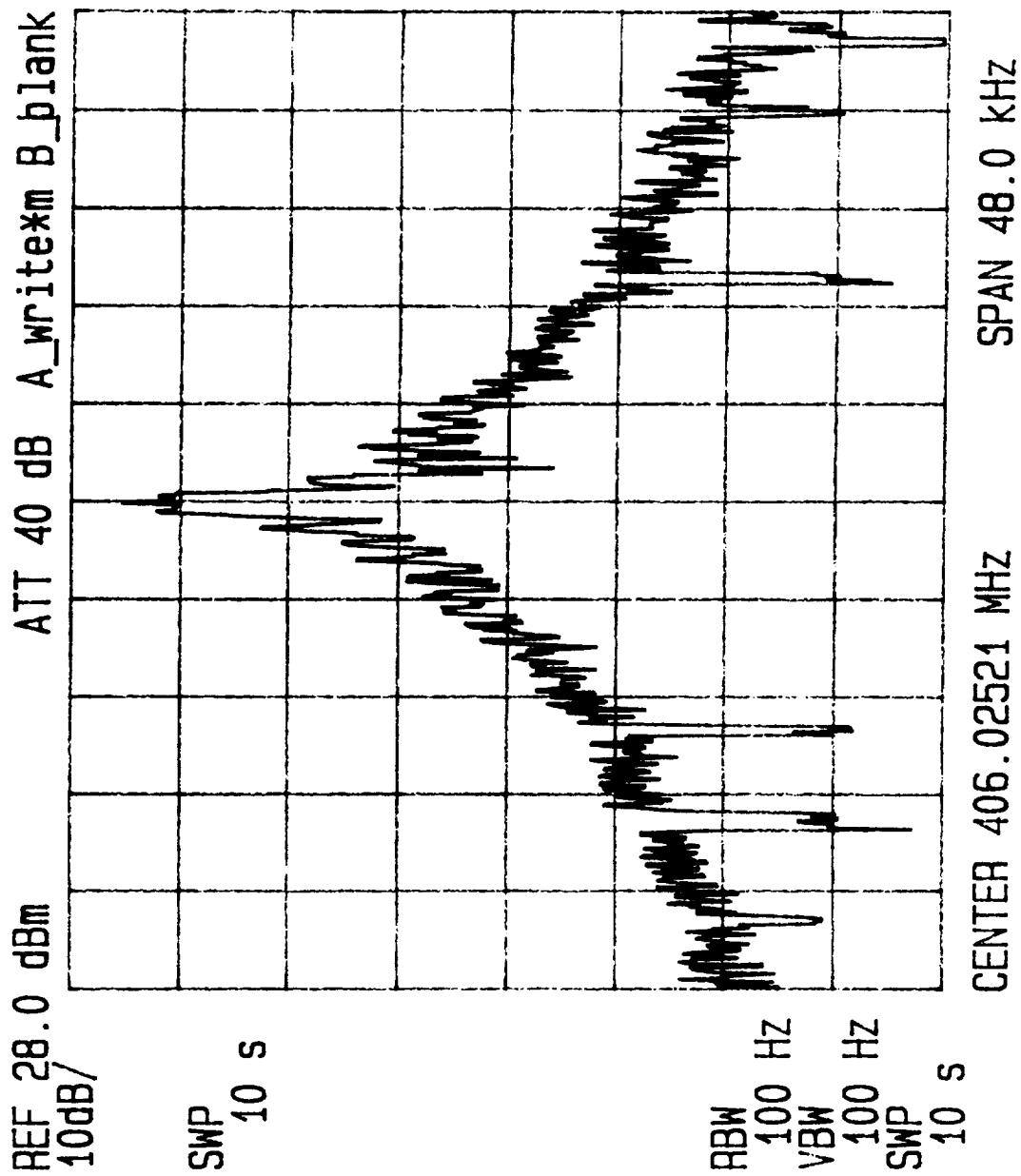
02/26/99

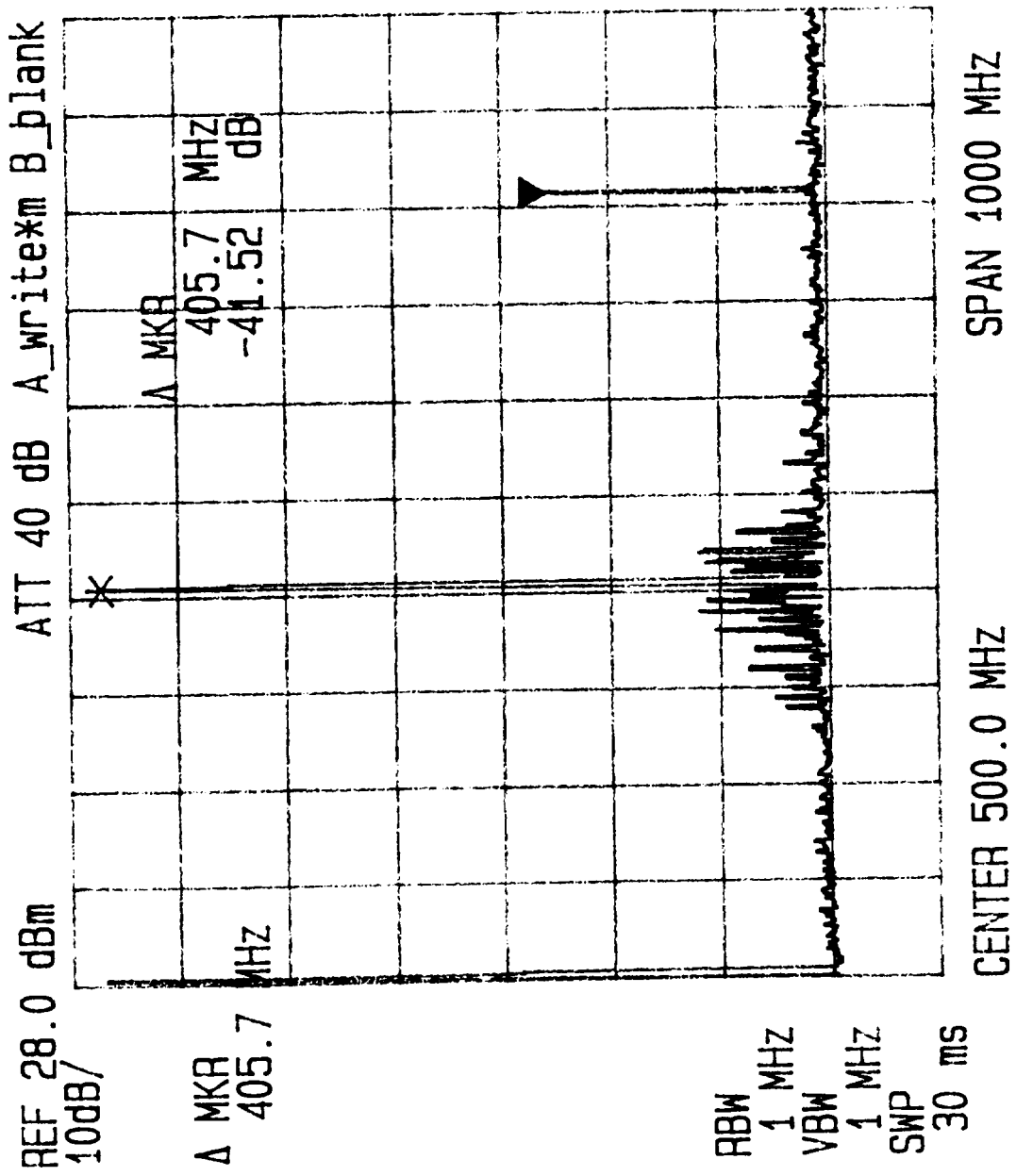










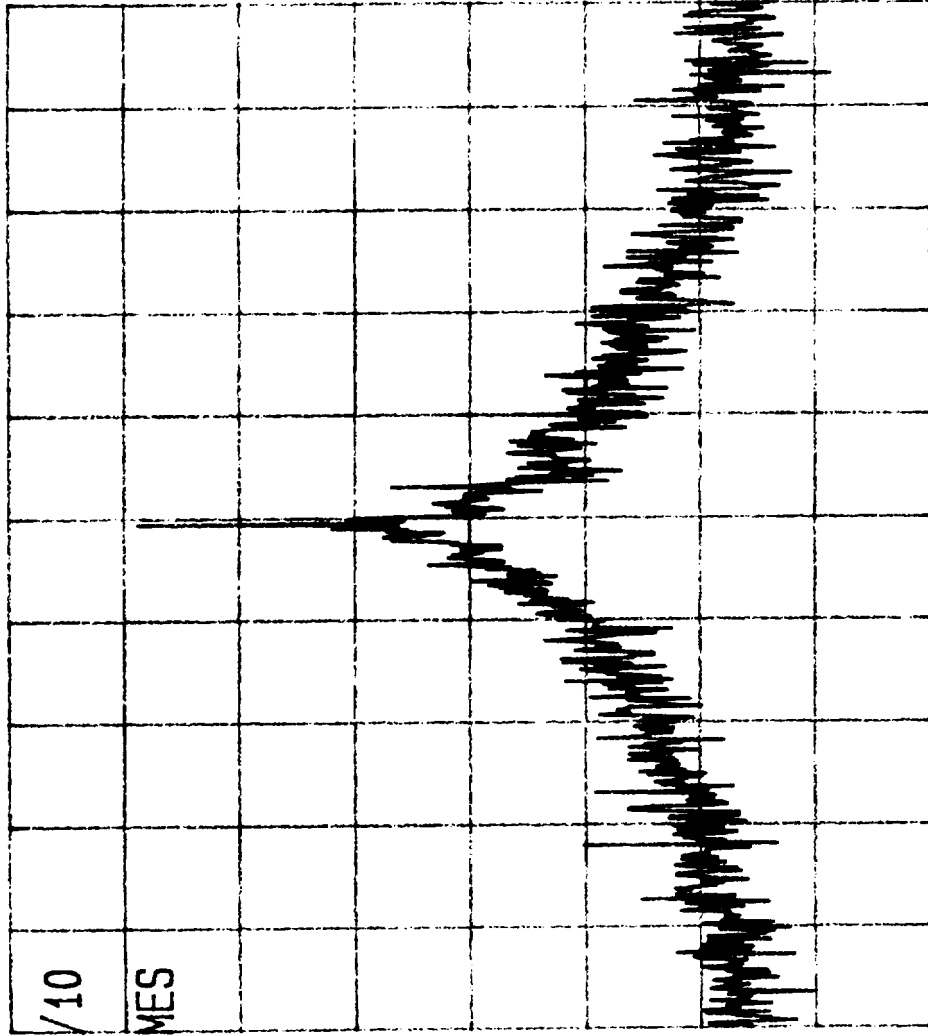


ATT 10 dB A_write* B_blank

REF 0.0 dBm

10dB/
AVG A 10/10

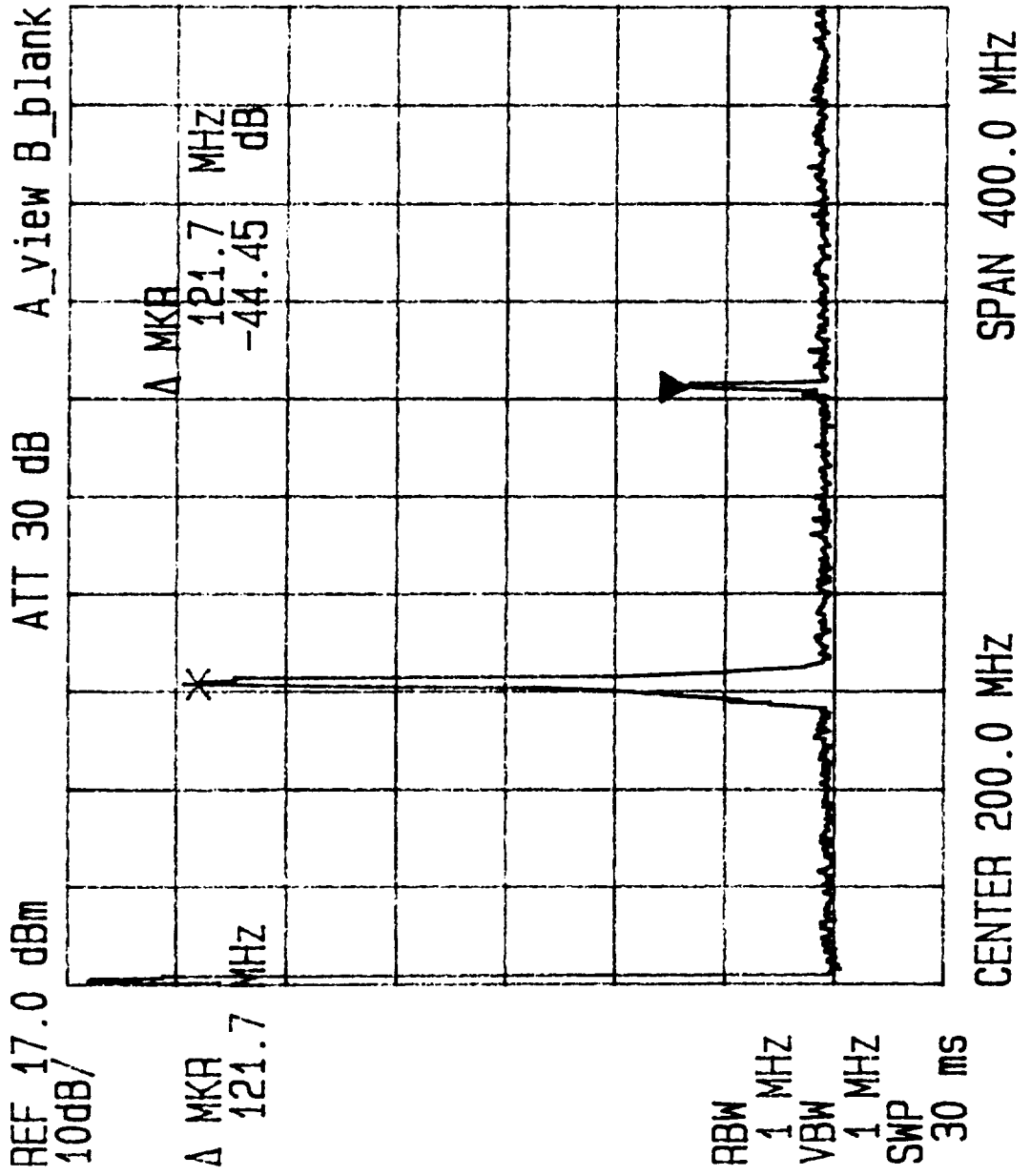
AVG A TIMES
10

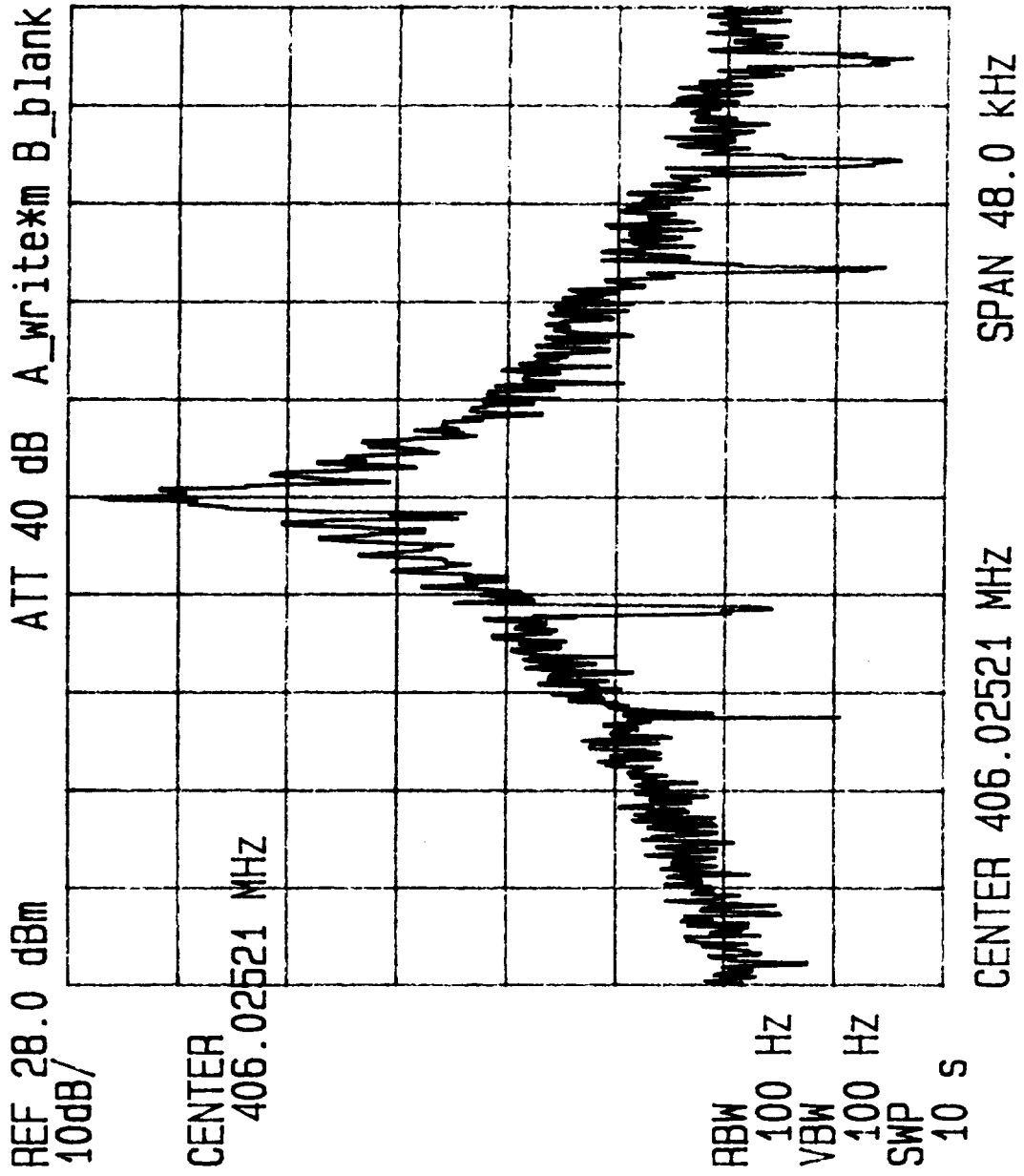


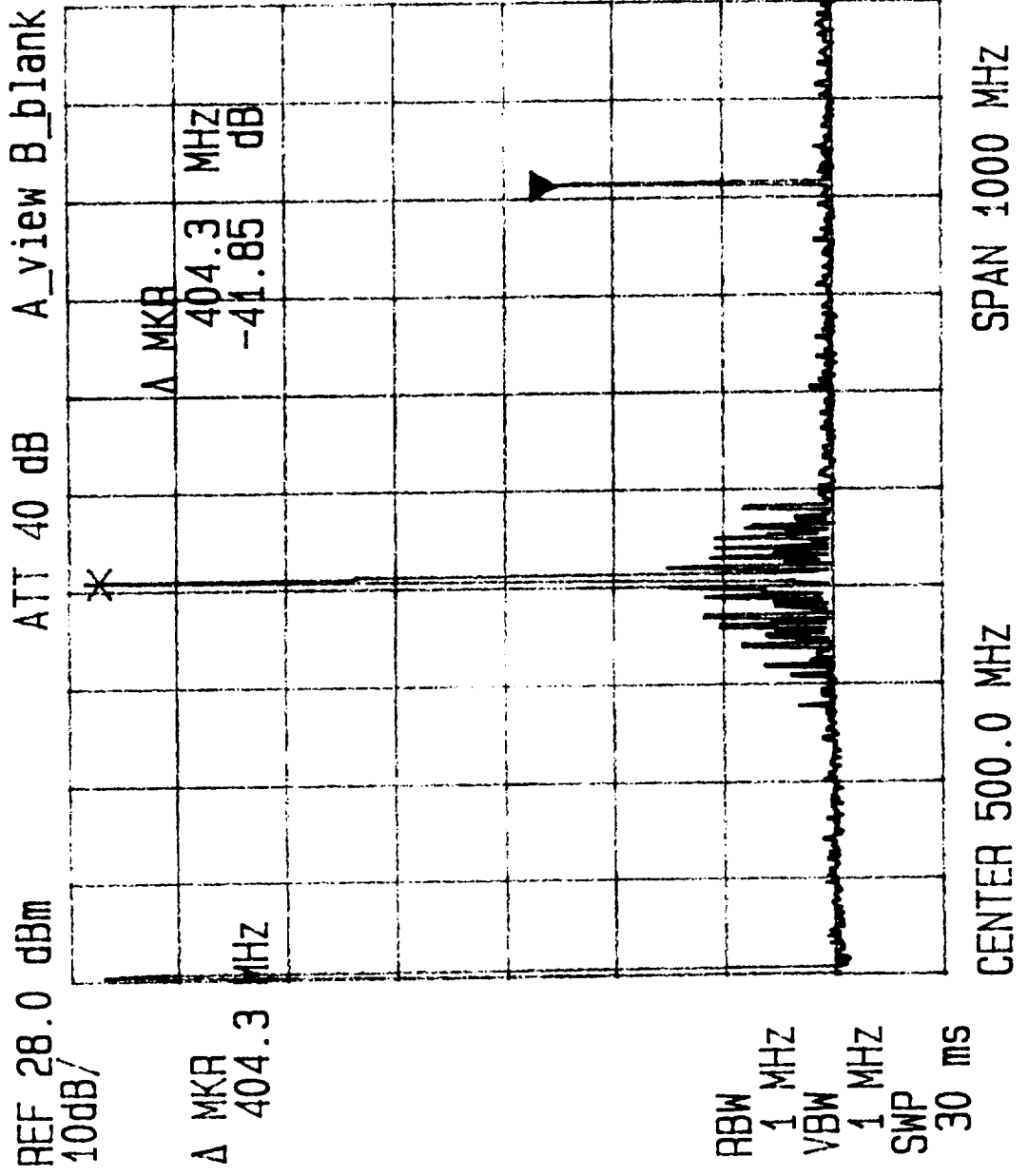
RBW 100 Hz
VBW 100 Hz
SWP 30 S

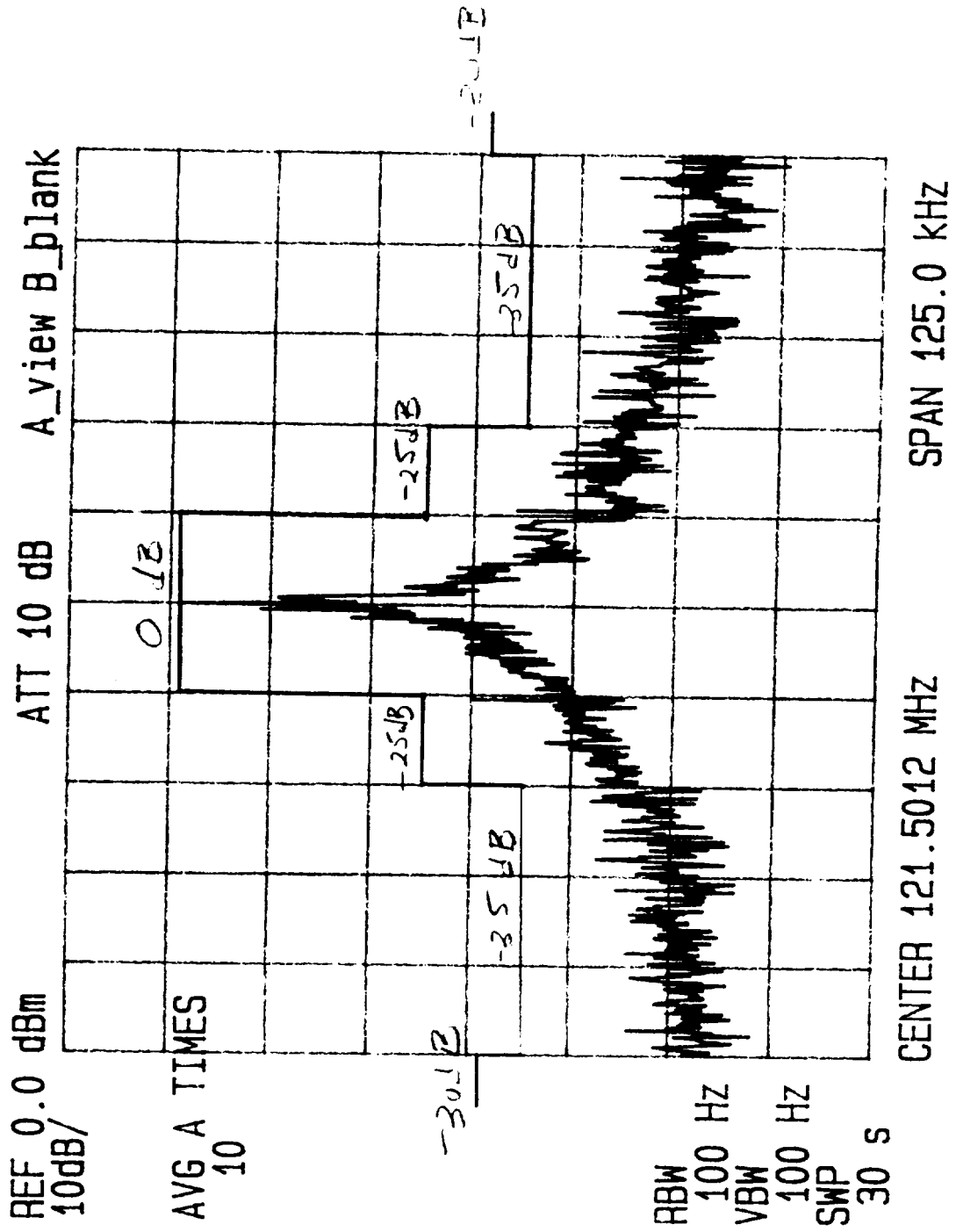
CENTER 121.5012 MHz

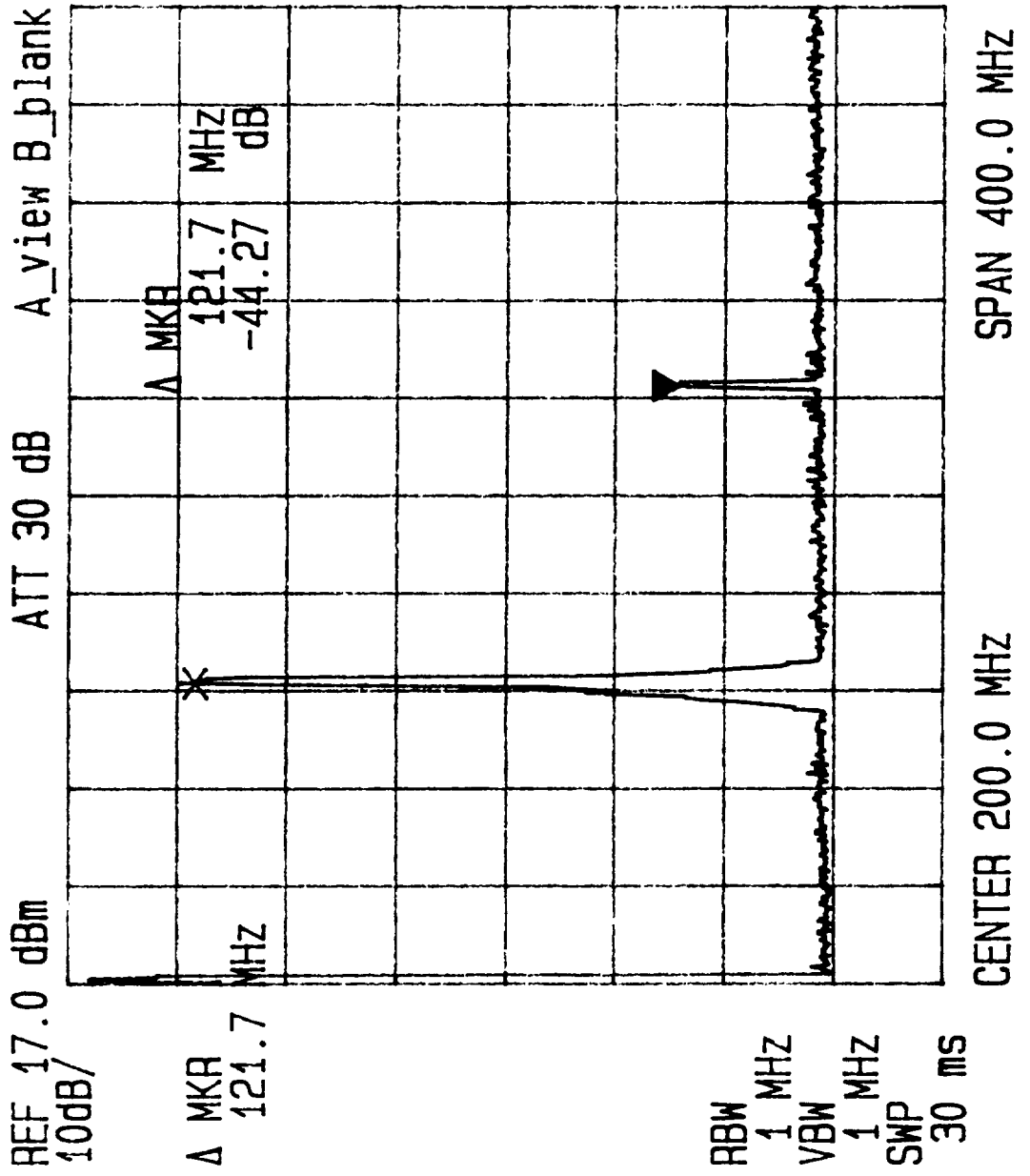
SPAN 125.0 kHz

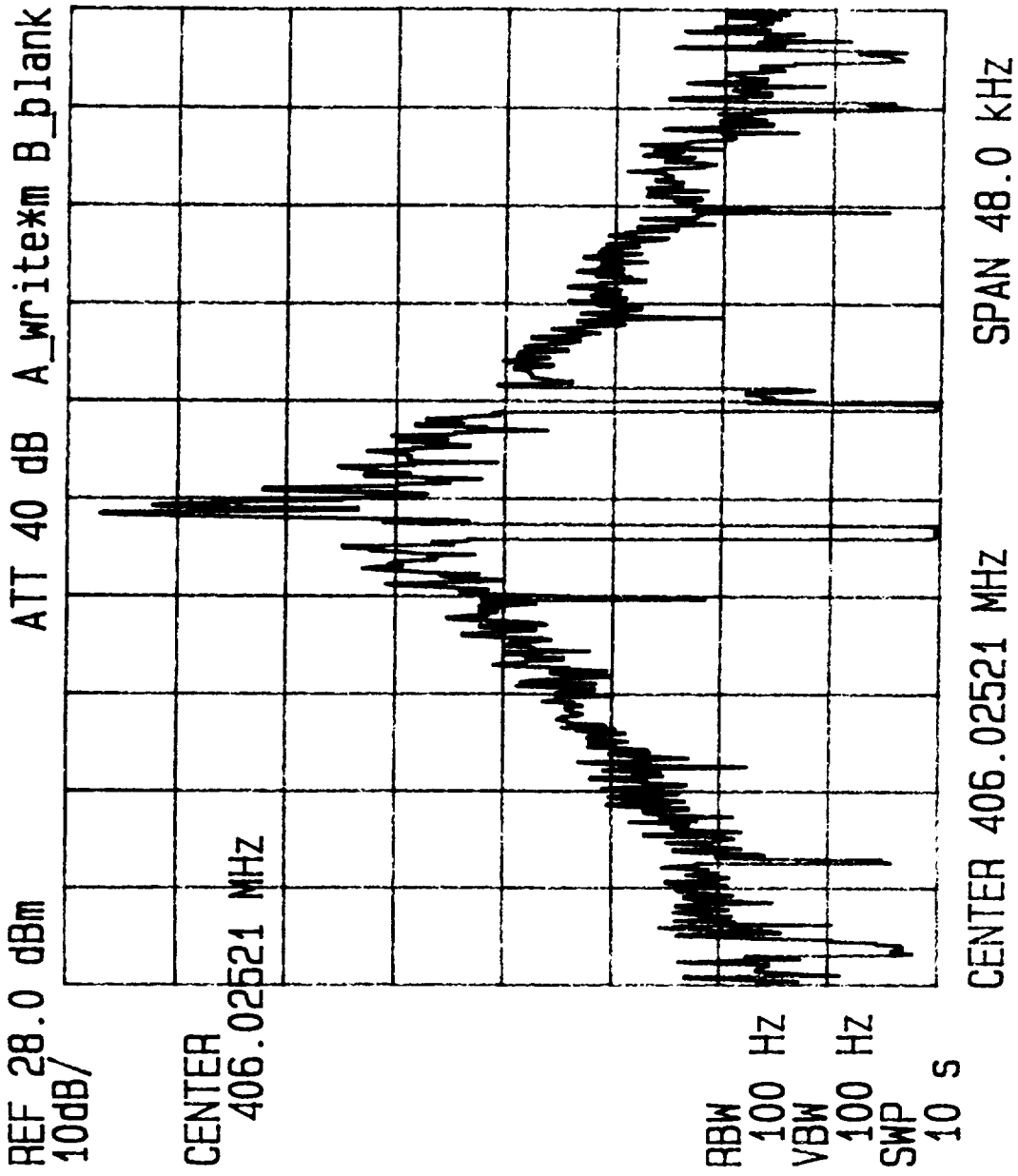


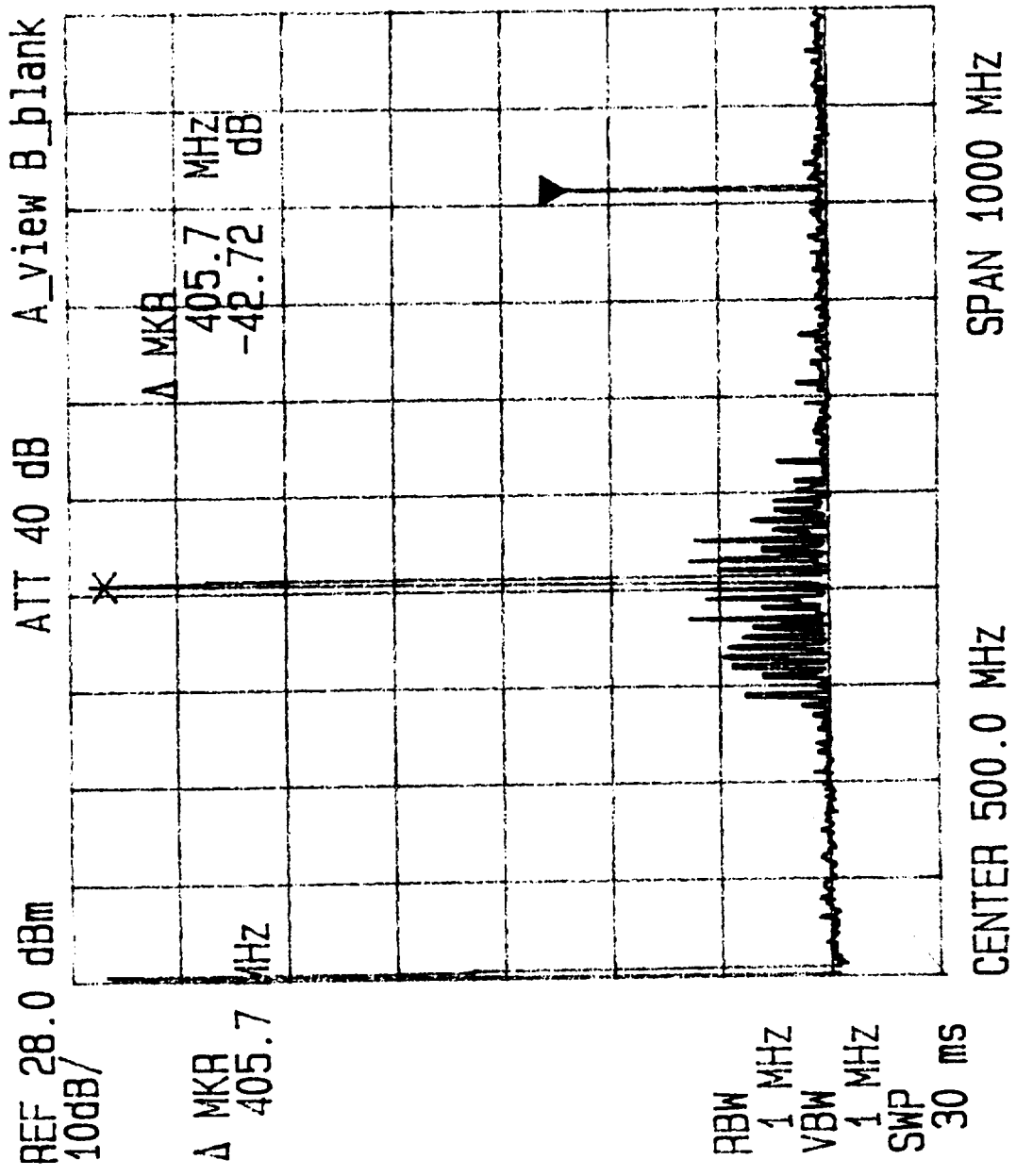


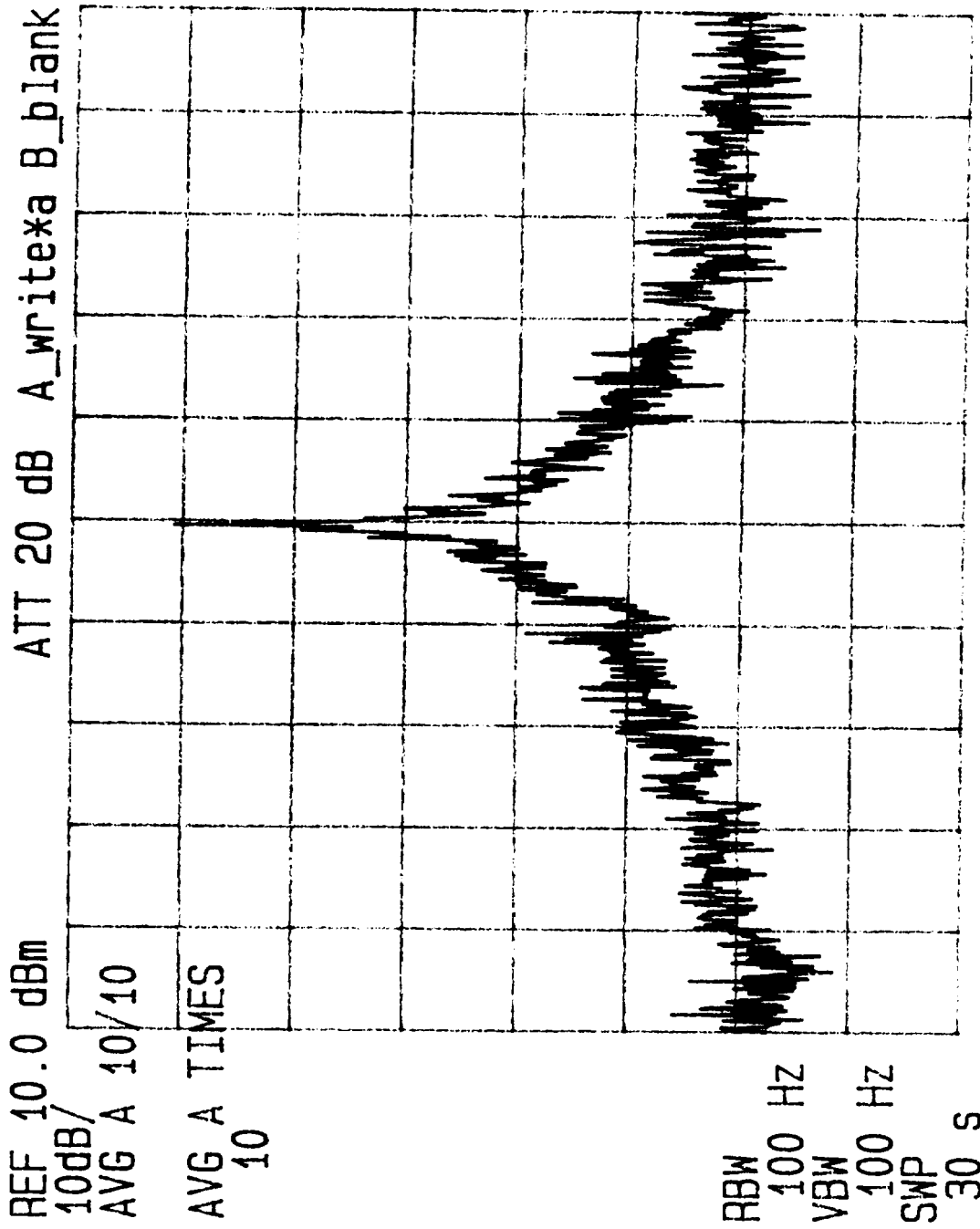


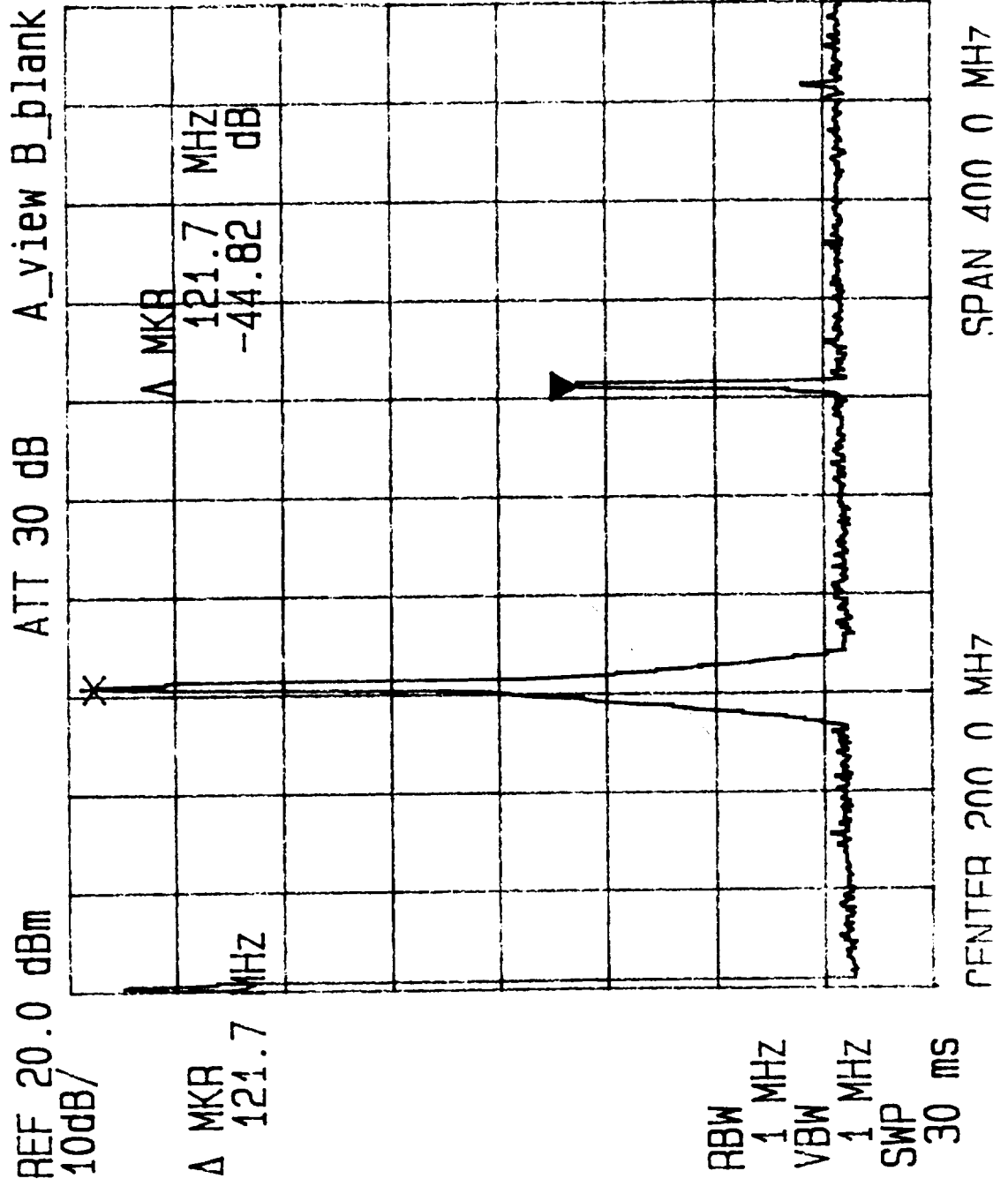












SUMMARY OF TEST RESULTS

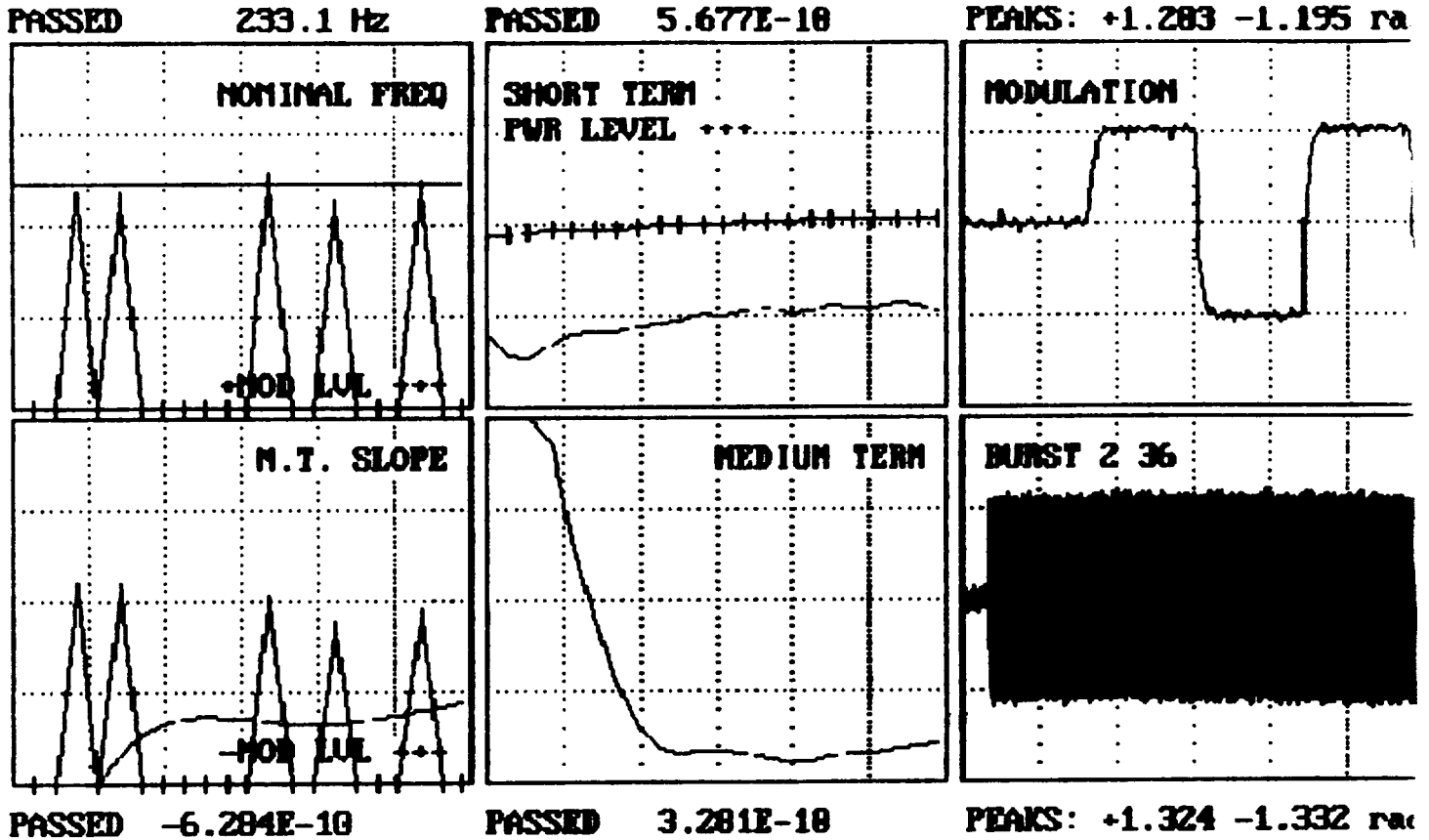
PARAMETERS TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS			COMMENTS
			T _{min} (<u>-55</u> °C)	T _{amb.} (<u> </u> °C)	T _{max.} (<u> </u> °C)	
15.1 Thermal Shock Test (Low-Temperature)						
<ul style="list-style-type: none"> • Self-activation in water • Aliveness Test - Carrier Frequency - Power Output - Data Message • Frequency Stability - short term stability - medium term stability: ▪ mean slope ▪ residual frequency variation 	≤ 5 406.025 ± 0.002 35 - 39 <u>2DDCS80</u> <u>02FFBFF</u> ≤ 0.002 ≤ 0.001 ≤ 0.003	minutes MHz dBm ✓ parts/ million in 100 ms parts / million / minute parts / million	/ sec. 406.02522 37.02 ✓ .0005677 .0006284 .0003281			

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

ACR v6.0

2DDC5D8002EFBFF
C/S-187-USA-1

~~FAILED~~
PASSED



<p>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</p>	<p>HEXADECIMAL MESSAGE 2DDC5D8002EFBFF FFFE2F96EE2ED0017DFFC0A6D3583E0FAAB</p>
<p>» 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</p>	<p>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</p>

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 _{min} (°C)	T _{amb} (°C)	T _{max} (°C)	
15.2 Thermal Shock Test (High-Temperature)	≤ 5	minutes			/ SEC.	
<ul style="list-style-type: none"> • Self-activation in water • Aliveness Test - Carrier Frequency - Power Output - Data Message • Frequency Stability - short term stability - medium term stability: ▪ mean slope ▪ residual frequency variation 	406.025 ± 0.002 35 - 39 <u>2DDCS80</u> <u>02FFBFF</u> ≤ 0.002	MHz dBm ✓ parts / million in 100 ms parts / million / minute parts / million	406.02521 37.37 ✓	.0001648 .0002111		

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

ACR v6.

2DDC5D8002FFBFF
C/S-187-USA-1

PASSED

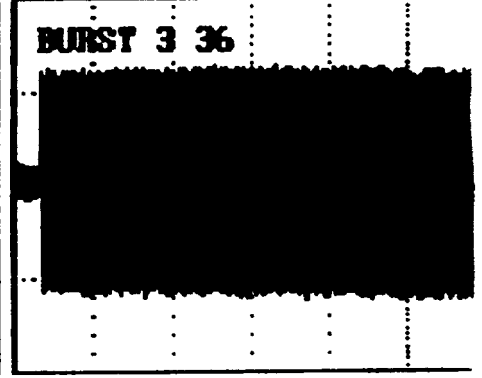
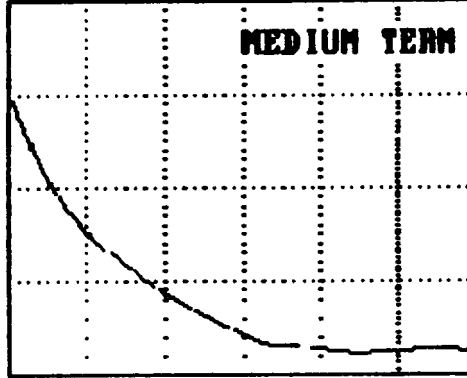
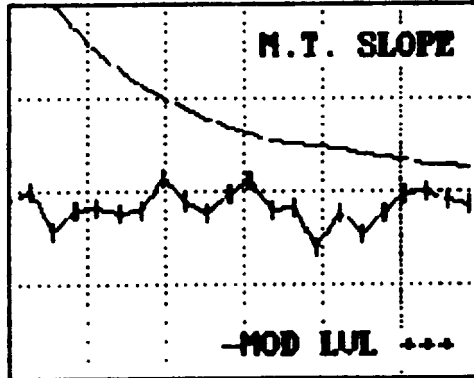
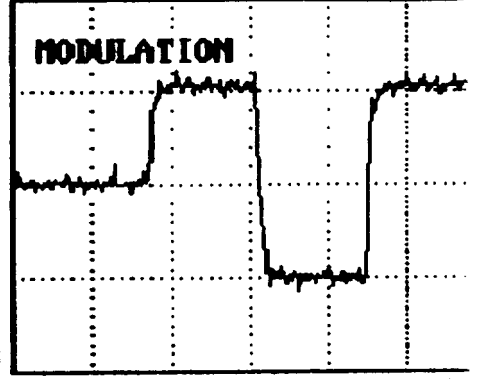
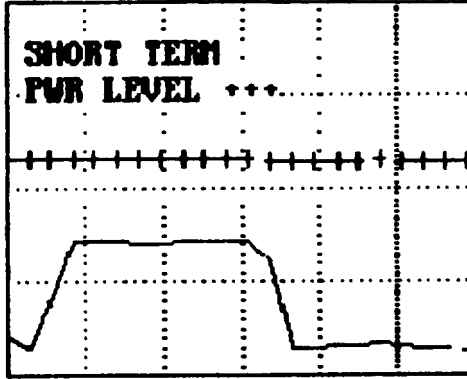
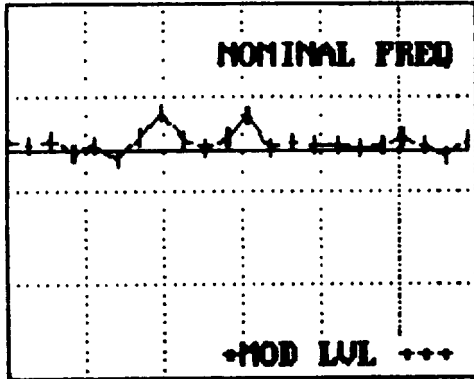
PASSED

216.9 Hz

PASSED

1.561E-10

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	HEXADECIMAL MESSAGE
POWER OUTPUT: 5.461 Watts	2DDC5D8002FFBFF
+37.37 dBm	FFFE2F96EE2ED0017DFDFCOAG6DGS83E0FAAB
POWER STABILITY: 8.96 %	BIT SYNCHRONIZATION..... OK
POWER RISE TIME: 690 µsec	FRAME SYNCHRONIZATION... OK
PEAK VOLTAGE: +2.592 Volts	MESSAGE FORMAT..... LONG
DRIFT SLOPES: 1) +1.13E-01 rad/sec	PROTOCOL FLAG..... STANDARD
2) +1.13E-01 rad/sec	COUNTRY..... USA
3) +1.13E-01 rad/sec	SERIALIZED USER..... TEST MODE
MODULATION LEVELS: +1.130 radians	C/S CERTIFICATE No..... 187
+1.151 -1.121 -1.135 radians	SERIAL NUMBER..... 1
+0.015 OFFSET -0.003 radians	LATITUDE..... N 127.75
MODULATION TIMES: RISE 149 µsec	LONGITUDE..... E 255.75
FALL 153 µsec	ERROR CORRECTION CODE 1. OK
SYMMETRY 0.16 %	ENCODED DATA SOURCE..... Internal
MODULATION BIT RATE: 398.65 Hz	121.5 MHz HOMING..... No
BURST TIMES: AVG PERIOD 50.6 sec	SPARES status..... Not OK
CARRIER DURATION 160.0 msec	LATITUDE OFFSET..... + 0 60
MESSAGE DURATION 361.2 msec	LONGITUDE OFFSET..... + 0 60
TOTAL DURATION 521.2 msec	ERROR CORRECTION CODE 2. OK
PREAMBLE LEAKAGE LEVEL 35.0 dBc	
LEAKAGE LENGTH 0.1 msec	

SUMMARY OF BEACON TEST RESULTS

page 1

PARAMETERS TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS			COMMENTS
			Tmin (-40C)	Tamb (23C)	Tmax (55C)	
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			N127.75	N127.75	N127.75	
longitude			E255.75	E255.75	E255.75	
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		✓	✓	✓	
	AGD35#3E0FAAB					
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	

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SUMMARY OF BEACON TEST RESULTS page 2

TEST RESULTS

PARAMETERS TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	Tmin (-40C)	Tamb (23C)	Tmax (55C)	COMMENTS
5 TRANSMITTED FREQUENCY						
nominal value	406.023/406.027	MHz	406.02523	406.02518	406.02519	
short term stability	< .002 ppm	/100 ms	4.523×10^{-10}	4.305×10^{-10}	4.444×10^{-10}	
medium term stability						
slope	< .001 ppm	/minute	-2.203×10^{-10}	9.505×10^{-11}	5.18×10^{-10}	
residual frequency variation	< .003 ppm		1.533×10^{-10}	1.294×10^{-10}	3.063×10^{-10}	
6 SPURIOUS EMISSIONS **						
in band 406.0 to 406.1 MHz	mask C/S T.001					
harmonics	< neg 30 dBc	dB				
7 406 MHz VSWR CHECK						
after open circuit, short circuit, 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 FC0A6D3583E0FAA8		✓	✓	✓	
8 SELF TEST MODE						
digital message	FFFED096EE2EC0017FDF 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

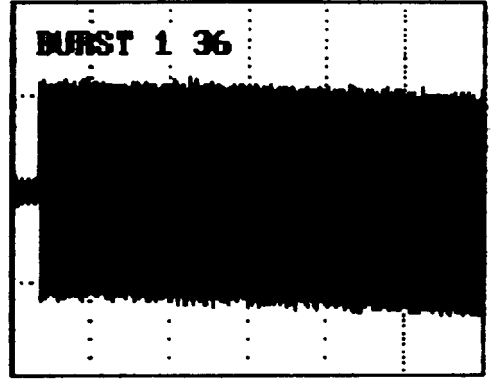
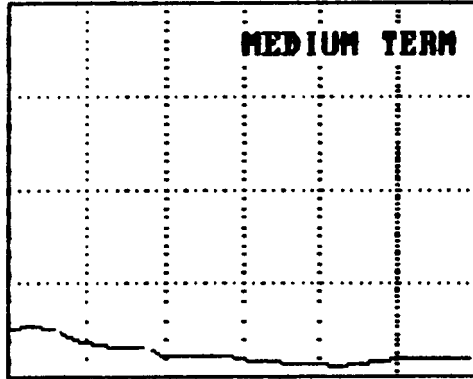
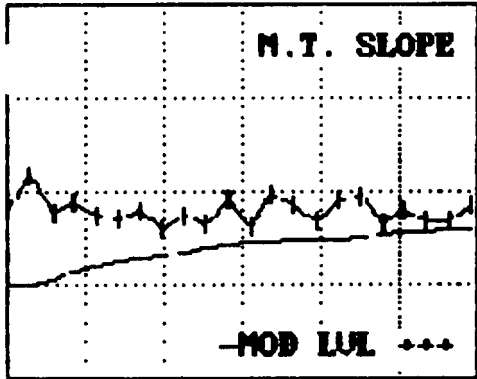
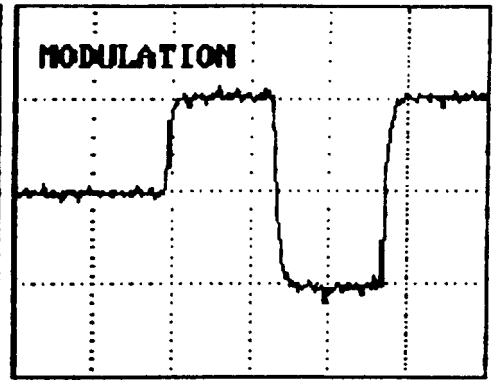
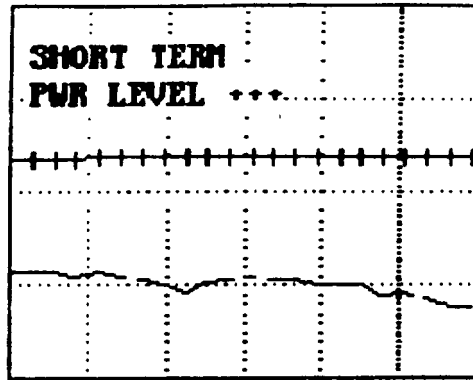
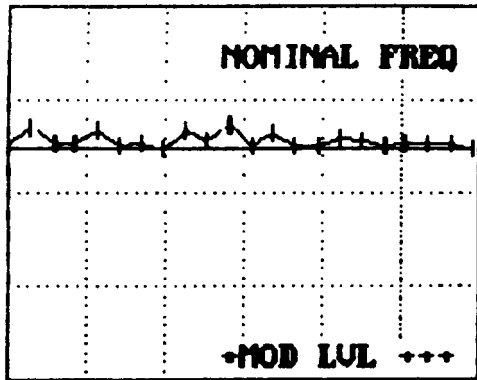
PASSED

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 FFFE2F96EE2ED0017DFFD0A6D3583E0FAA8 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
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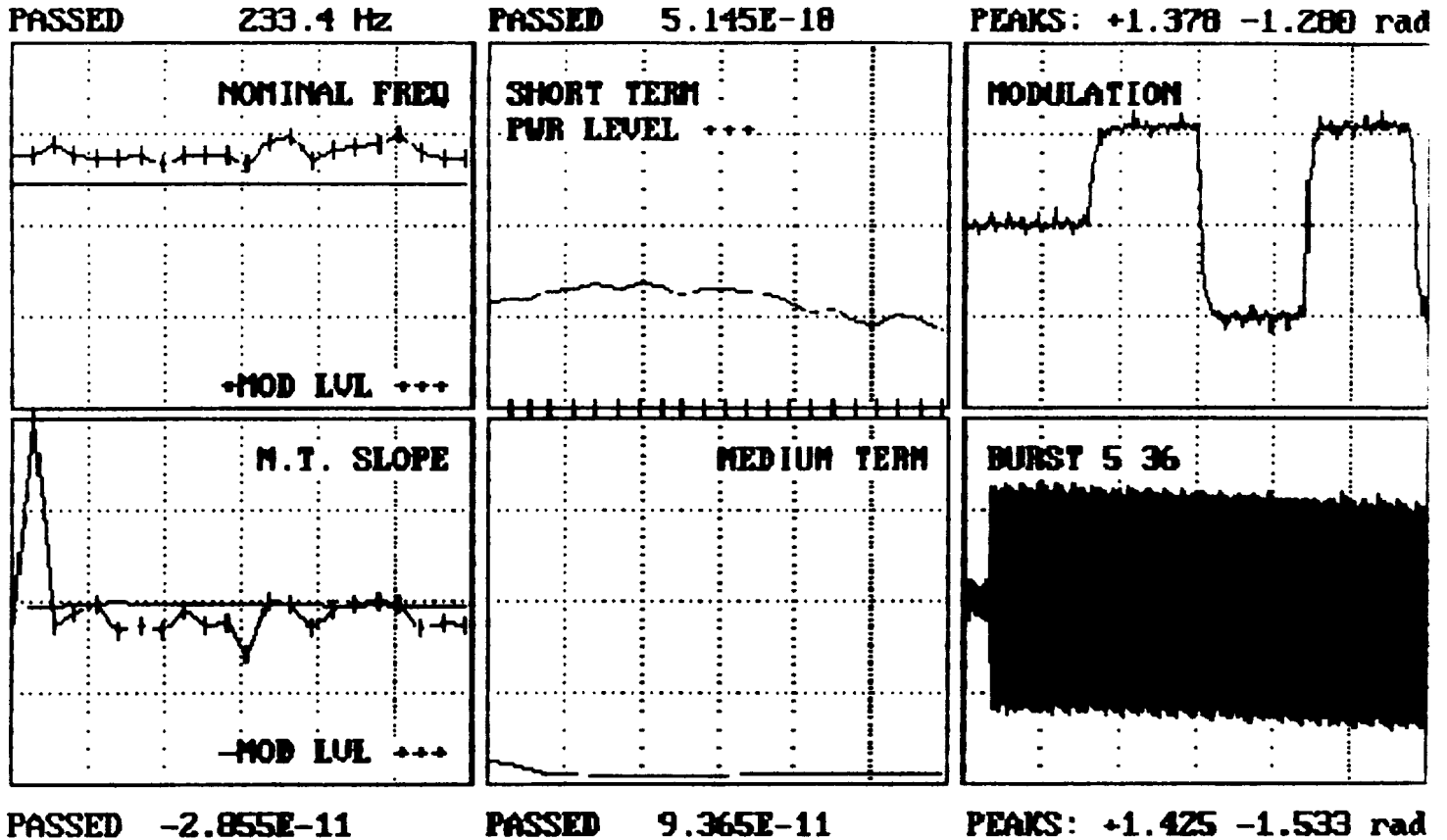
Σ-51 NEWK @ 406 MHz 2070 - -40°C

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

ACR v6.0

2DDC5D8002EFBFF
C/S-187-USA-1

FAILED



<p>NOMINAL FREQUENCY: 406.02523 MHz POWER OUTPUT: 1.695 Watts +32.29 dBm POWER STABILITY: 11.62 % POWER RISE TIME: 1050 µsec PEAK VOLTAGE: +1.389 Volts DRIFT SLOPES: 1) -2.38E-01 rad/sec 2) -2.38E-01 rad/sec 3) -2.38E-01 rad/sec MODULATION LEVELS: +1.152 radians +1.176 -1.124 -1.159 radians +0.026 OFFSET -0.003 radians MODULATION TIMES: RISE 148 µsec FALL 150 µsec SYMMETRY 0.68 % MODULATION BIT RATE: 398.78 Hz BURST TIMES: AVG PERIOD 50.6 sec CARRIER DURATION 159.6 msec MESSAGE DURATION 361.2 msec TOTAL DURATION 520.8 msec PREAMBLE LEAKAGE LEVEL 35.0 dBc LEAKAGE LENGTH 0.1 msec</p>	<p>HEXADECIMAL MESSAGE 2DDC5D8002EFBFF FFFE2F96EE2ED0017FDFFC0A6D35B3E0FAAB 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</p>	<p>POWER OUTPUT POWER OUTPUT</p>
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SELF-TEST MODE

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

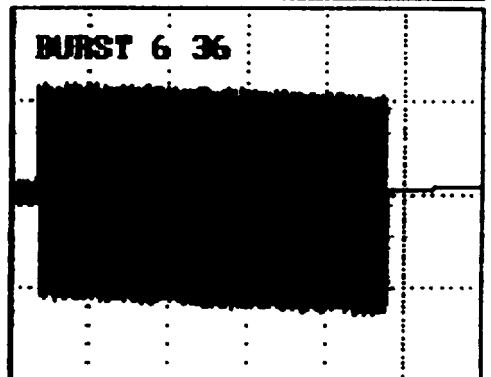
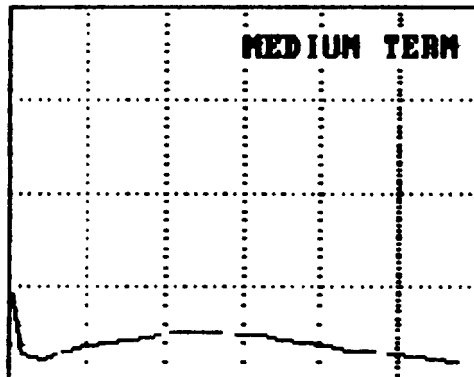
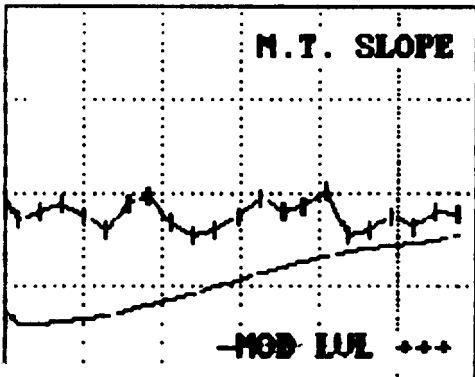
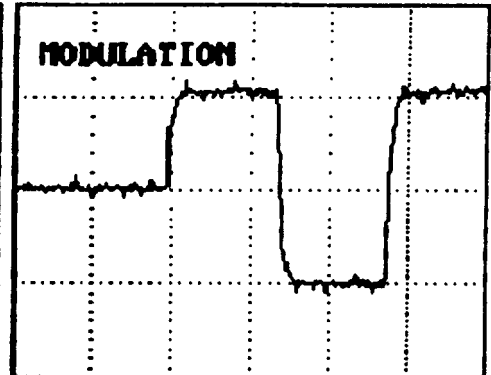
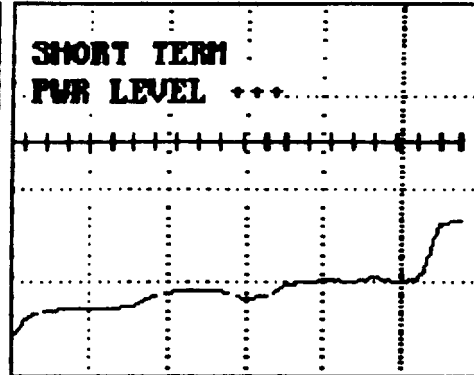
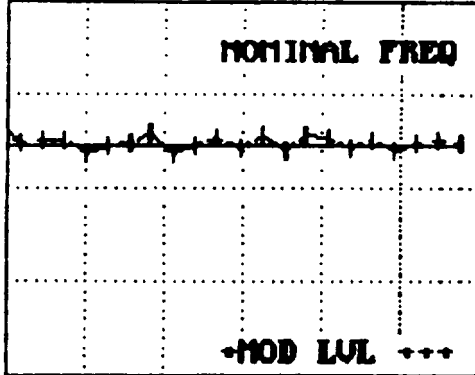
ACR v6.0

2DDC5D8002EFBFF
C/S-187-USA-1

-40°C

PASSED

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
 VOLTAGE: +2.640 Volts
 SLOPE 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 µsec
 MESSAGE DURATION 280.9 µsec
 TOTAL DURATION 441.0 µsec
 PREAMBLE LEAKAGE LEVEL 35.0 dBc
 LEAKAGE LENGTH 0.3 µsec

HEXADECIMAL MESSAGE
 2DDC5D8002EFBFF
 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

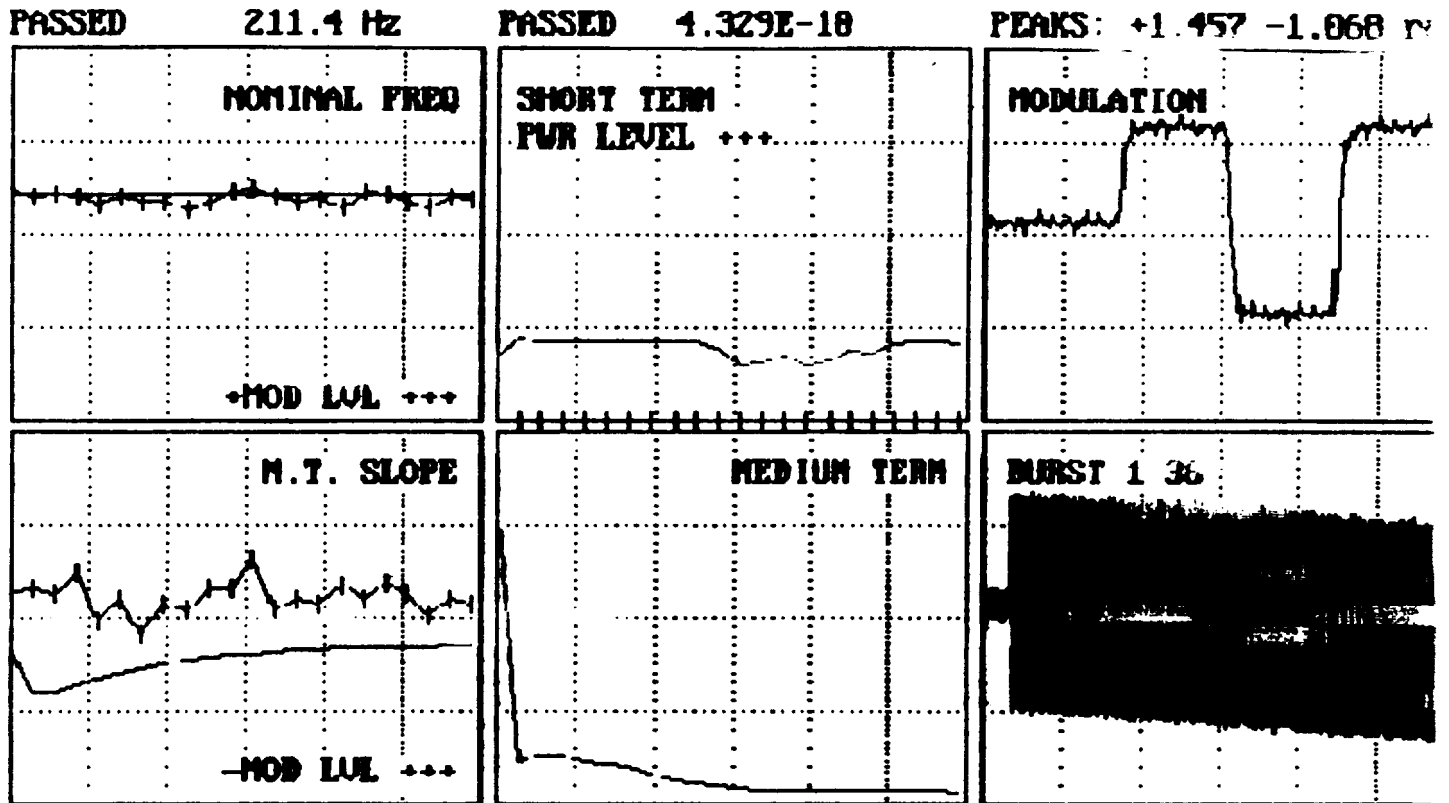
E-701 USUR @ 405 MHz J-TEST ROOM TEMP.

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

ACR v6.

2DDC5D8002FFBFF
C/S-187-USA-1

FAILED



PASSED -1.544E-10 PASSED 1.066E-10 PEAKS: +1.463 1.523 rad

<p>NOMINAL FREQUENCY: 406.02520 MHz POWER OUTPUT: 1.904 Watts +32.80 dBm POWER STABILITY: 9.61 % POWER RISE TIME: 1020 µsec VOLTAGE: +1.474 Volts DRIFT SLOPES: 1) +5.77E-02 rad/sec 2) +5.77E-02 rad/sec 3) +5.77E-02 rad/sec MODULATION LEVELS: +1.111 radians +1.137 -1.084 -1.119 radians +0.027 OFFSET -0.004 radians MODULATION TIMES: RISE 150 µsec FALL 153 µsec SYMMETRY 0.29 % MODULATION BIT RATE: 398.76 Hz BURST TIMES: AVG PERIOD 50.5 sec CARRIER DURATION 159.7 msec MESSAGE DURATION 361.1 msec TOTAL DURATION 520.8 msec PREAMBLE LEAKAGE LEVEL 35.0 dBc LENGTH 0.1 msec</p>	<p>HEXADECIMAL MESSAGE 2DDC5D8002FFBFF FFFE2F96EE2ED0017DFDFD0A6D3583E0FAA8 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 120.75 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</p>
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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

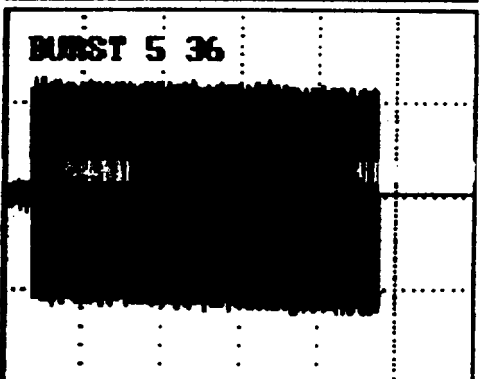
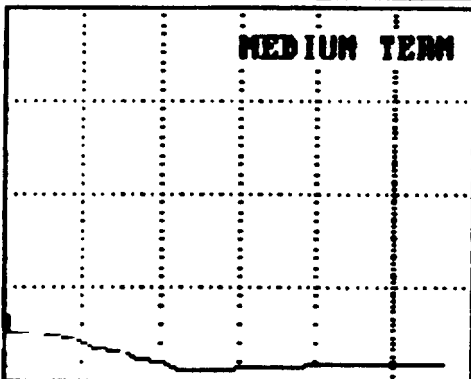
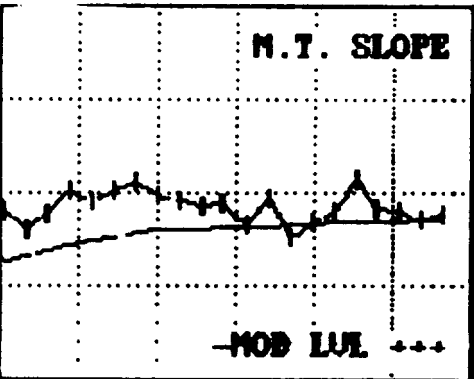
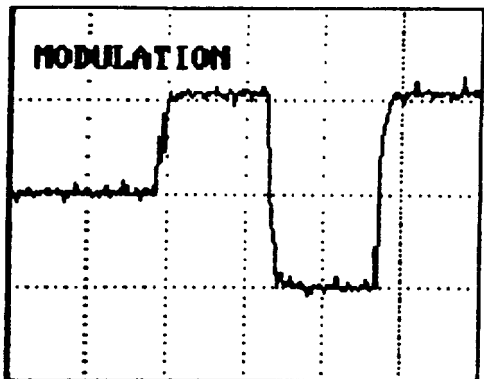
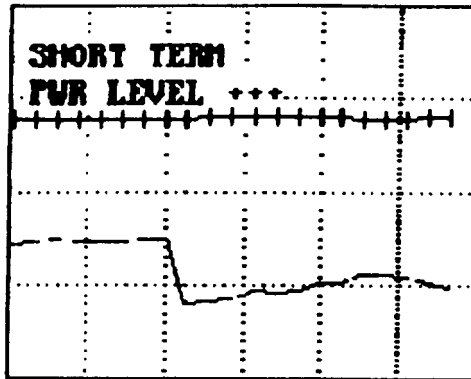
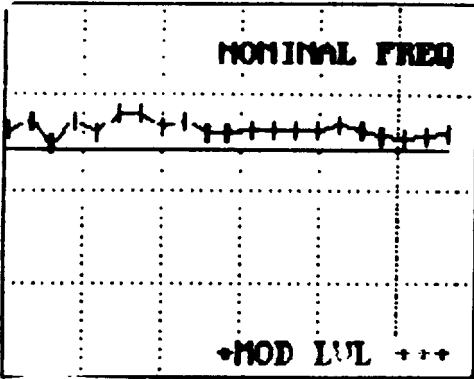
PASSED

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

<p>NOMINAL FREQUENCY: 406.02521 MHz</p> <p>POWER OUTPUT: 6.979 Watts +38.44 dBm</p> <p>POWER STABILITY: 10.55 %</p> <p>POWER RISE TIME: 920 µsec</p> <p>PEAK VOLTAGE: +2.813 Volts</p> <p>FT SLOPES: 1) -5.68E-02 rad/sec 2) -5.68E-02 rad/sec 3) -5.68E-02 rad/sec</p> <p>MODULATION LEVELS: +1.139 radians +1.166 -1.109 -1.148 radians +0.029 BURST 0.004 radians</p> <p>MODULATION TIMES: RISE 156 µsec FALL 160 µsec SYMMETRY 0.77 %</p> <p>MODULATION BIT RATE: 398.72 Hz</p> <p>BURST TIMES: AVG PERIOD 48.3 sec CARRIER DURATION 160.0 msec MESSAGE DURATION 280.9 msec TOTAL DURATION 440.9 msec</p> <p>PREAMBLE LEAKAGE LEVEL 35.0 dBc LEAKAGE LENGTH 0.2 msec</p>	<p>HEXADECIMAL MESSAGE</p> <p>2DDC5D8002FFBFF</p> <p>FFFD096EE2ED0017FDFFD0A6D35</p> <p>BIT SYNCHRONIZATION..... OK</p> <p>FRAME SYNCHRONIZATION... NOT 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 0</p> <p>LONGITUDE OFFSET..... - 0 0</p> <p>ERROR CORRECTION CODE 2. NOT OK</p>
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+55°C

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

ACR v6.

2DDC5D8002EFBFF
C/S-187-USA-1

PASSED

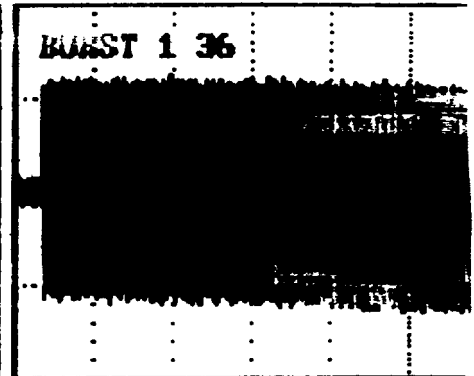
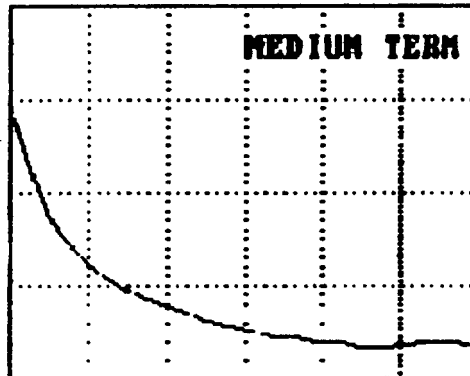
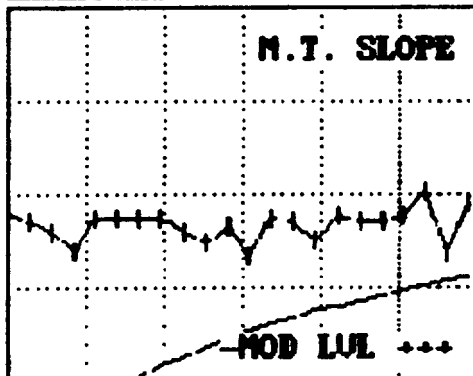
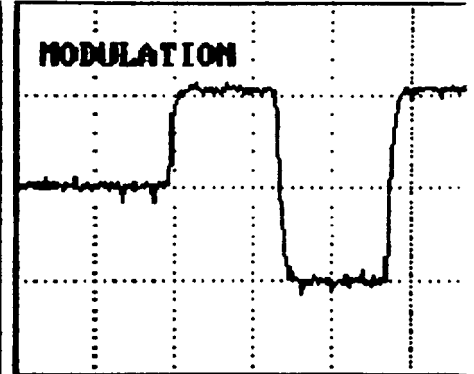
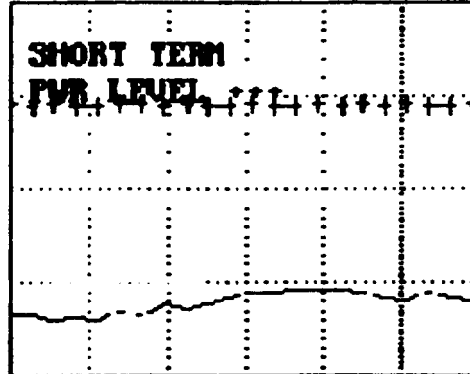
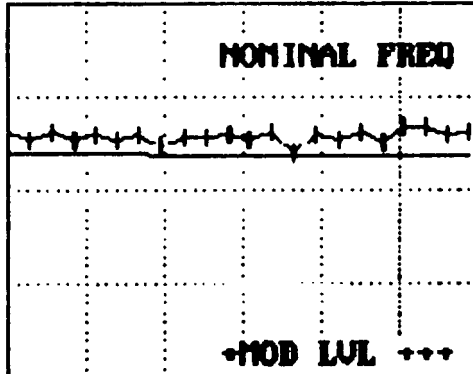
PASSED

121.4 Hz

PASSED

4.44E-10

PEAKS: +1.271 -1.247 rad



PASSED -5.180E-10

PASSED 3.863E-10

PEAKS: +1.378 -1.419 rad

NOMINAL FREQUENCY: 406.02519 MHz	HEXADECIMAL MESSAGE
OUTPUT: 7.344 Watts	2DDC5D8002EFBFF
38.66 dBm	FFFE2F96EE2ED0017FDFFD0A6D33B3E0FA98
POWER STABILITY: 8.98 %	BIT SYNCHRONIZATION..... OK
POWER RISE TIME: 940 µsec	FRAME SYNCHRONIZATION... OK
PEAK VOLTAGE: +2.883 Volts	MESSAGE FORMAT..... LONG
DRIFT SLOPES: 1) -1.11E-01 rad/sec	PROTOCOL FLAG..... STANDARD
2) -1.11E-01 rad/sec	COUNTRY..... USA
3) -1.11E-01 rad/sec	SERIALIZED USER..... TEST MODE
MODULATION LEVELS: +1.148 radians	C/S CERTIFICATE No..... 187
+1.157 -1.134 -1.154 radians	SERIAL NUMBER..... 1
+0.011 OFFSET -0.003 radians	LATITUDE..... N 127.75
MODULATION TIMES: RISE 152 µsec	LONGITUDE..... E 255.75
FALL 150 µsec	ERROR CORRECTION CODE 1. OK
SYMMETRY 0.18 %	ENCODED DATA SOURCE..... Internal
MODULATION BIT RATE: 398.71 Hz	121.5 MHz HOMING..... No
BURST TIMES: AVG PERIOD 50.5 µsec	SPARES status..... Not OK
CARRIER DURATION 160.0 µsec	LATITUDE OFFSET..... + 0 60
MESSAGE DURATION 361.1 µsec	LONGITUDE OFFSET..... + 0 60
TOTAL DURATION 521.1 µsec	ERROR CORRECTION CODE 2. OK
PREAMBLE LEAKAGE LEVEL 35.0 dBc	
PEAK LENGTH 0.2 µsec	

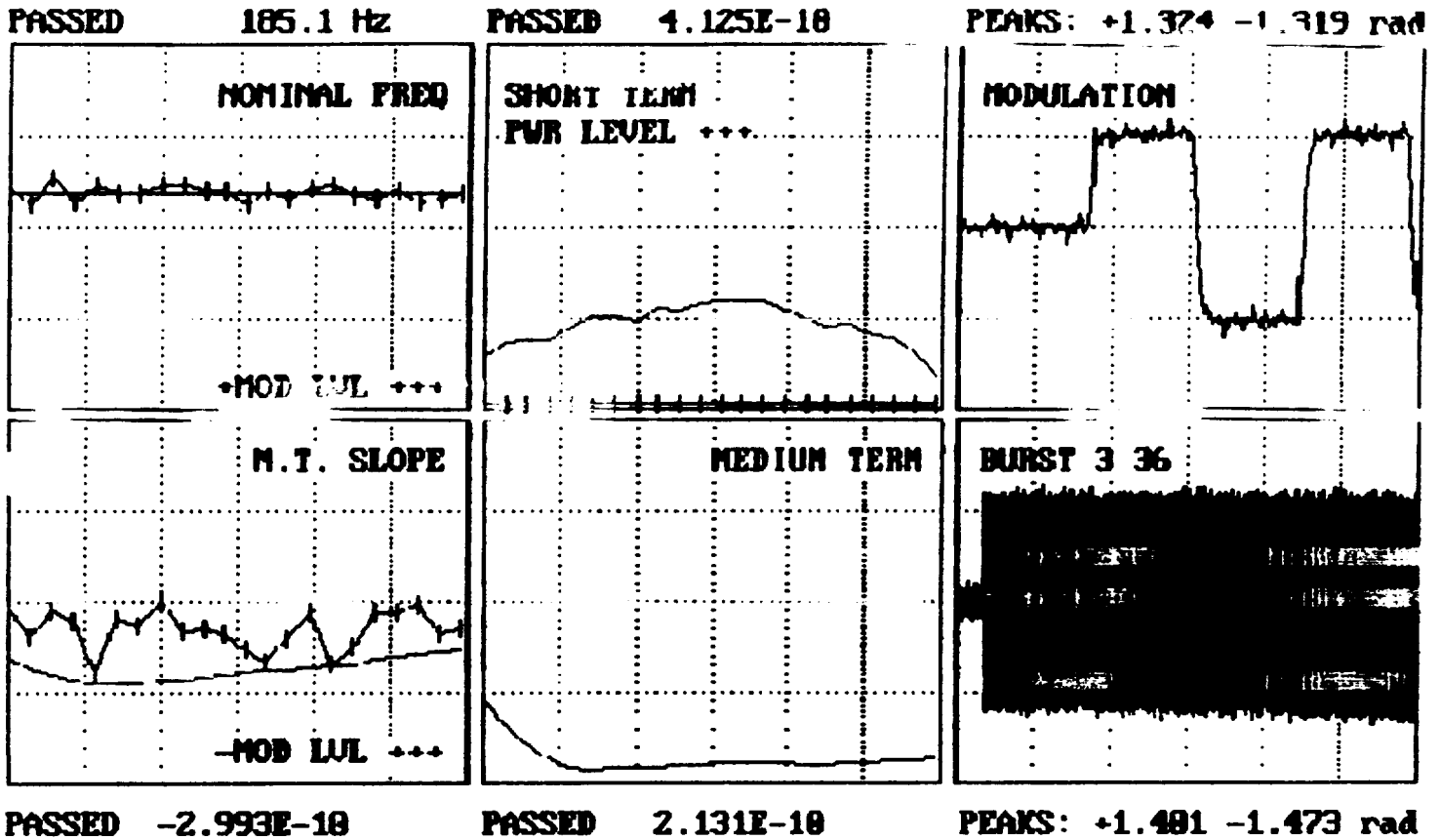
E TO / VSWR @ 406 MHz OUTPUT +55°C

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

ACR v6.0

2DDC5D8002FFBFF
C/S-187-USA-1

FAILED



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 100.0 μsec
 MESSAGE DURATION 361.1 μsec
 TOTAL DURATION 520.8 μsec
 PREAMBLE LEAKAGE LEVEL 35.0 dBc
 LEAKAGE LENGTH 0.1 μsec

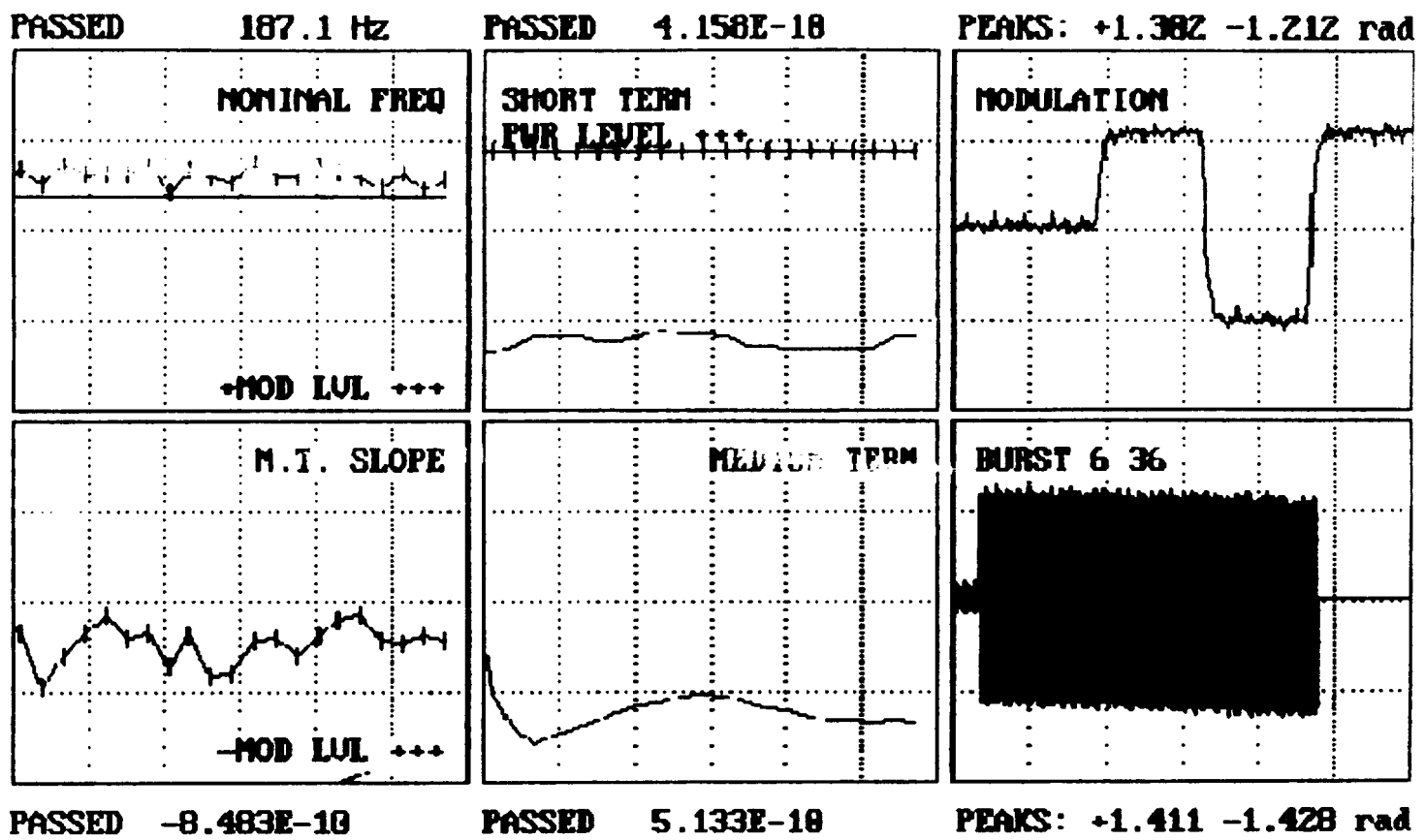
HEXADECIMAL MESSAGE
 2DDC5D8002FFBFF
 FFFE2F96EE2ED0017FDFFD0A6D03583E0FAA8

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

2DDC5D8002FFBFF
C/S-187-USA-1

PASSED



<p>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 radians 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</p>	<p>HEXADECIMAL MESSAGE 2DDC5D8002FFBFF FFFE096EE2ED0017DFFC0A6D35 BIT SYNCHRONIZATION..... OK FRAME SYNCHRONIZATION... NOT OK MESSAGE FORMAT..... LONG PROTOCOL FLAG..... STANDARD COUNTRY..... USA SERIALIZED USER..... TEST MODE MSG 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</p>
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PL-33 FW1

SUMMARY OF BEACON TEST RESULTS				page 3
PARAMETERS TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS	COMMENTS
LiSO2				
9 THERMAL SHOCK**				
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			
10 OPERATING LIFE, MIN TEMP**				
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			
11 TEMPERATURE GRADIENT**				
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 _{max} - T _{min}) < 1 sec, manufacturer must provide tech explanation A3.1.1				

13-03

SUMMARY OF BEACON TEST RESULTS				page 4
PARAMETERS TO BE MEASURED	RANGE OF			
DURING TESTS	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						dipole effective Area		
2	2.79 dB	ant factor	21.37 dB	406	0.7384	1.27	1.038						0.055 sq meters		
3															
4			10 degrees	20 degrees	30 degrees	40 degrees	49 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								1.752
7	39.56 dB		0.1942 dB	0.7786 dB	1.7609 dB	3.1648 dB	4.8705								4.8705
8															
9															
10	10H dBm	10V dBm	10Total dBV/m	20V dBm	20Total dBV/m	30V dBm	30Total dBV/m	40V dBm	40Total dBV/m	49H dBm	49V dBm	49Total dBV/m			
11															
12	0	-23.9	3.3	14.652	3.1	15.034	-21.2	4	16.92	-19.7	-0.8	13.527	-23.9	-8.4	7.6602
13	30	-35.4	3.3	14.645	3.5	15.429	-19.7	4.4	17.322	-23.1	-0.7	13.642	-28.1	-8.2	7.835
14	60	-31.1	3.6	14.946	3	14.933	-17.4	4	16.932	-19.5	-1.1	13.257	-31.4	-9.2	6.829
15	90	-31.8	3.5	14.845	3.3	15.23	-17.2	4	16.933	-18	-0.6	13.753	-22.4	-8.5	7.5778
16	120	-41.9	3.2	14.544	3.3	15.249	-14.1	4.4	17.352	-18	-0.7	13.644	-20.7	-8.5	7.605
17	150	-28.3	2.7	14.048	3	14.932	-16.4	4.4	17.335	-19.2	-0.7	13.627	-26.6	-7.5	8.5379
18	180	-28.8	2.9	14.247	3.3	15.232	-16.3	4.4	17.335	-23.2	-0.3	14.025	-23.1	-7.4	8.6584
19	210	-26.4	3.3	14.649	3.2	15.135	-17.9	4.3	17.228	-23.5	-0.3	14.038	-24.5	-7.4	8.648
20	240	-26.4	3.4	14.749	3	14.93	-16.3	3.9	16.838	-19.9	-0.2	14.146	-31.7	-7.6	8.426
21	270	-28.2	3.5	14.847	2.9	14.829	-17.3	3.9	16.833	-18.5	-0.3	14.048	-26.5	-7.6	8.4387
22	300	-29.1	3.3	14.647	3	14.935	-19.7	4.2	17.123	-18.3	-0.7	13.651	-21.2	-7.9	8.1862
23	330	-24.4	3.3	14.651	3.3	15.237	-19.1	4.5	17.424	-15.6	-0.3	14.076	-16.9	-7.9	8.2951
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

APPENDIX 7

INDEPENDENT LAB TEST REPORT (QC METALLURGICAL)

