

Toulouse, 4 July 2001

INTESPACE reference : M3223_C-S

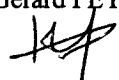
TEST REPORT OF 406 MHz DISTRESS BEACON

MANUFACTURER : ACR Electronics, Inc.

BEACON MODEL : RLB35

Written : 4 July 2001

By : Gérard PEYROU

Visa : 

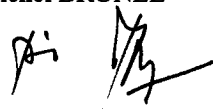
Approved : 5 July 01

By : Alain SERDANE

Visa : 

Quality Control : 05-07-01

By : Michel BRUNEL

Visa : 

Distribution :

- Mr	Cal HAVENS	ACR Electronics, Inc.	(1 copy)
- Mr	S. MIKAILOV	COSPAS/SARSAT Sec	(1 copy)
- Mr	C. GAL	CNES - CT/RC/AD/LM	(1 copy)
- INTESPACE		ITS/AP/ET	(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 33312-6645

Represented by : Mr Cal HAVENS

1.2. INTESPACE TEST CENTER

The test operations have been conducted by : Mr G. PEYROU

1.3. SCHEDULE

Start of test: 17 April 2001

End of test : 22 June 2001

1.4. WORK REFERENCE : M3223_C-S

1.5. EQUIPMENT UNDER TEST

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

- Commercial designation :
- Model : RLB35
- S  rial number: 7

2 - TEST FACILITIES

- ARGOS - COSPAS/SARSAT Certification Test 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 3 - October 1999 "
- "C/S T. 007- Issue 3 - Revision 6 - October 1999"

INTESPACE Radio Beacon Test Procédures :

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

4 - RESULTS

See the following pages :

- application form for a COSPAS-SARSAT 406 MHz beacon Type Approval Certificate,
- summary of 406 MHz beacon test results
- test results : data and graphs
- and manufacturer technical data Annex A

5 - COMMENTS

Prior to Operating LifeTime Test at Minimum Temperature we have examined the Beacon calculation of average current drain before to beacon activation over the rated life battery pack (See the Manufacturer description and calculation Annex A) .

We have agreed with estimate Manufacturer calculation, Cospas Sarsat method, and we have discharge the battery following it .

ITS - AP/ET M3223_C-S
CNES - DSO/RC//AS N° 01-122

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

Beacon Manufacturer : ACR Electronics, Inc.

Beacon model : RLB35

Beacon Number : 7

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

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

Antenna Model : ACR Antenna 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 : LiSO2

Manufacturer & model n° : SAFT LO26SX

Size & number of cells : D size, 3 Cells

Extra Features in Beacon	No	Yes	Details
a) Auxiliary Radio-Locating Device :	☐	☒	Frequency : 121.5 MHz Power : 17 dBm Tx. Duty Cycle : 99 %
b) Transmits Encoded Position Data	☐	☒	Nav. Device : Internal Type : GPS Manufacturer : Axiom Navigation Model : Swift A1
c) Transmits Long Message (144 bits)	☐	☒	
c) Automatic Activation :	☐	☒	
d) Built-in Strobe light :	☐	☒	Intensity : >= 0.75 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 : 05 July 2001

Signed :

(for test facility)

Table C2 : SUMMARY OF 406 MHz BEACON TEST RESULTS

Ref : M3223_C-SPV

PARAMÈTRES TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS			COMMENTS
			T _{min.} -40°C (±3)	T _{amb.} 22°C (±3)	T _{max.} 55°C (±3)	
1 - POWER OUTPUT						
o transmitter power output	35 - 39	dBm	36,6	37,5	37,6	Graphs p. 20, 23 and 26 Graphs pages 14 to 16
o Power output rise time	< 5	ms	0,85	0,77	0,85	
o power output 1 ms before burst	must be < -10 dBm	√ *	√	√	√	
2 - DIGITAL MESSAGE						Data and graphs pages 17 to 26
Bits number						
o bit sync	15 bits "1"	√	√	√	√	
o frame sync	9 bits (000101111)	√	√	√	√	
o format flag	1 bit	√	1	1	1	
o protocol flag	1 bit	√	0	0	0	
o identification/position code	59 bits	√	√	√	√	
o BCH code	21 bits	√	√	√	√	
o emerg. code/nat. use/supplem. data	6 bits	data bits	110111	110111	110111	
o additional data/BCH (if applicable)	32 bits	√	√	√	√	
o position error (if applicable)	< 5	km	Default pos.	0,000 km	Default pos.	

PARAMÈTRES TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS			COMMENTS
			T _{min.} -40°C (±3)	T _{amb.} 22°C (±3)	T _{max.} 55°C (±3)	
3 - DIGITAL MESSAGE GENERATOR						Data and graphs pages 17 to 26
o repetition rate *** :						
minimum T _R =	47,5	seconds	49,5	49,5	49,5	
maximum T _R =	52,5	seconds	52,5	52,0	52,5	
o bit rate						
minimum f _b =	396	bits/sec.	401,28	401,28	401,27	
maximum f _b =	404	bits/sec.	401,30	401,31	401,29	
o total transmission time :						
short message =	435.6 - 444.4	ms				
long message (optional) =	514.8 - 525.2	ms	519,27	519,35	519,35	
o CW preamble						
minimum T _I =	158,4	ms	160,27	160,37	160,35	
maximum T _I =	161,6	ms	160,30	160,38	160,36	
o first burst delay	> 47,5	seconds				

PARAMÈTRES TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS			COMMENTS
			T _{min.} -40°C (±3)	T _{amb.} 22°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 17 to 26
	50 - 250	microsec.	80	90	80	
	50 - 250	microsec.	80	90	80	
	+ (1.0 to 1.2)	radians	+ 1,15	+ 1,15	+ 1,15	
	- (1.0 to 1.2)	radians	- 1,16	- 1,12	- 1,11	
	≤ 0.05		+ 0,020	+ 0,020	+ 0,024	
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	406,0245816	406,0245117	406,0245020	Data pages 18, 21 and 24
	≤ 2 x 10 ⁻⁹	/100 ms	3,57E-10	3,23E-10	1,05E-10	
	(-1 to +1) x 10 ⁻⁹	/minute	-2,61E-11	-2,99E-12	-1,67E-10	
	≤ 3 x 10 ⁻⁹		7,65E-11	1,09E-10	1,10E-10	
6 - SPURIOUS EMISSION **** (into 50 ohms) o in-band (406.0 - 406.1 MHz)	see spurious emission mask in C/S T.001	✓	✓	✓	✓	See graphs pages 27 to 30

PARAMÈTRES TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS			COMMENTS
			T min. -40°C (±3)	T amb. 22°C (±3)	T max. 55°C (±3)	
7 - 406 MHz VSWR CHECK after open circuit, short circuit, then while VSWR is 3:1, measure : o nominal transmitted frequency Modulation : o rise time o fall time o phase deviation : positive o phase deviation : negative o symmetry measurement o digital message	406.023 - 406.027 or 406.027 - 406.029***	MHz	406,0245790	406,0244952	406,0245029	See data and graphs pages 31 to 37
	50 - 250	microsec.	79,8	79,8	79,8	
	50 - 250	microsec.	89,8	89,8	89,8	
	+ (1.0 to 1.2)	radians	1,16	1,13	1,14	
	- (1.0 to 1.2)	radians	-1,11	-1,13	-1,09	
	≤ 0.05	✓	+ 0,016	+ 0,024	+ 0,024	
	must be correct	✓	✓	✓	✓	
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 o design data provided on protection against repetitive self-test mode transmissions o single burst verification o provides for beacon 15 Hex ID	9 bits (011010000)	✓	✓	✓	✓	Data pages 42 to 44 Manufacturer doc. Annex A Data page 43
	1/0	bit	1	1	1	
	≤ 440 / 520 (+/- 1%)	ms	439,46	439,54	439,53	
	must be correct	✓	✓	✓	✓	
	protection provided	✓	✓	✓	✓	
	one burst	✓	✓	✓	✓	
	must be correct	✓	✓	✓	✓	

PARAMÈTRES TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS	COMMENTS
9 - THERMAL SHOCK (30° C change)				Data and graphs pages 45 to 52
o Soak temperature :		°C	T _{soak} = 55	
o Measurement temperature :		°C	T _{Meas} = 22	
the following parameters are to be met within 15 minutes of beacon and maintained for 2 hours				
o Transmitted frequency :				
- nominal value	406.023 - 406.027 or 406.027 - 406.029***	MHz	406,024503 / 406,024522	
- short term stability	$\leq 2 \times 10^{-9}$	/100 ms	1,00E-09	
- medium term stability :				
. slope	$(-1 \text{ to } +1) \times 10^{-9}$	/minute	-4E-11 / 1E-09	
. residual frequency variation	$\leq 3 \times 10^{-9}$		1,93E-10	
o Transmitted power output	35 - 39	dBm	37,5 / 37,7	
o Digital message	must be correct	✓	✓	

PARAMÈTRES TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS	COMMENTS
10 - OPERATING LIFETIME AT MINIMUM TEMPERATURE ****				Data and graphs pages 53 to 67
o Duration	> 24	hours	50 hours at T _{min} = -40 °C	
o Transmitted frequency :				
- nominal value	406.023 - 406.027 or 406.027 - 406.029***	MHz	406,02456 / 406,024538	
- short term stability		/100 ms	2,3E-10	
- medium term stability		/minute	-9,7E-10 / 1,0E-10	
. slope	(-1 to +1) x 10 ⁻⁹		1,08E-09	
. residual frequency variation	≤ 3 x 10 ⁻⁹		36,0 / 36,9	
o Transmitted power output	35 - 39	dBm		
o Digital message	must be correct	✓	✓	
11 - TEMPERATURE GRADIENT **** (5° C/hr)				Data and graphs pages 69 to 82
o Transmitted frequency :				
- nominal value	406.023 - 406.027 or 406.027 - 406.029***	MHz	406,024488 / 406,024601	
- short term stability	≤ 2 x 10 ⁻⁹	/100 ms	2,4E-10	
- medium term stability		/minute	-6,2E-10 / 2,3E-10	
. slope	(-1 to +1) x 10 ⁻⁹		1,2E-09	
. residual frequency variation	≤ 3 x 10 ⁻⁹		36,8 / 37,8	
o Transmitted power output	35 - 39	dBm		
o Digital message	must be correct	✓	✓	
12 - LONG TERM FREQUENCY STABILITY				Constructor explanations in Annex A
o Data provided	406.023 - 406.027 or 406.027 - 406.029***	MHz	✓	

TableC2 : SUMMARY OF 406 MHz BEACON TEST RESULTS

Ref: M3223_C-SPV

PARAMÈTRES TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS	COMMENTS
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 83 to 93
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	✓ no measured 19,0 2,5 0,8	Antenna test report pages 94 to 103
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 o sample self-test message provided for each coding option of the applicable coding protocol types	must be correct (attach to report) must be correct (attach to report) must be correct (attach to report)	✓ ✓ ✓	NA NA NA	

PARAMÈTRES TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS	COMMENTS
17 - NAVIGATION SYSTEM**** (as applicable) o position data default values o position acquisition time o encoded position data update interval o position data input update interval (as applicable) o delta offset : - positive direction - negative direction - overrange to 2 times coarse res. o last valid position : - retained after nav signal lost - cleared when beacon reactivated o design data provided on protection against beacon degradation due to navigation device, interface or signal failure or malfunction	must be correct < 30 > 20 20 / 1 must be correct must be correct must be correct 4 must be correct no degradation	✓ minutes minutes minutes ✓ ✓ ✓ hours ✓ ✓	✓ 02:31 around 22 minutes NA ✓ ✓ ✓ 4:00 ✓ ✓	See data page 104

* 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 $406.028 \text{ MHz} \pm 1 \text{ kHz}$. The transmitted frequency shall not vary more than $\pm 2 \text{ kHz}$ / $- 5 \text{ kHz}$ from 406.028 MHz in 5 years. It shall not vary more than 2 parts in 10^7 in 100 ms. After 1 January 2002, all new beacon models submitted for the type approval must be set at the frequency $406.028 \text{ MHz} \pm 1 \text{ kHz}$ and satisfy the above stability requirements.

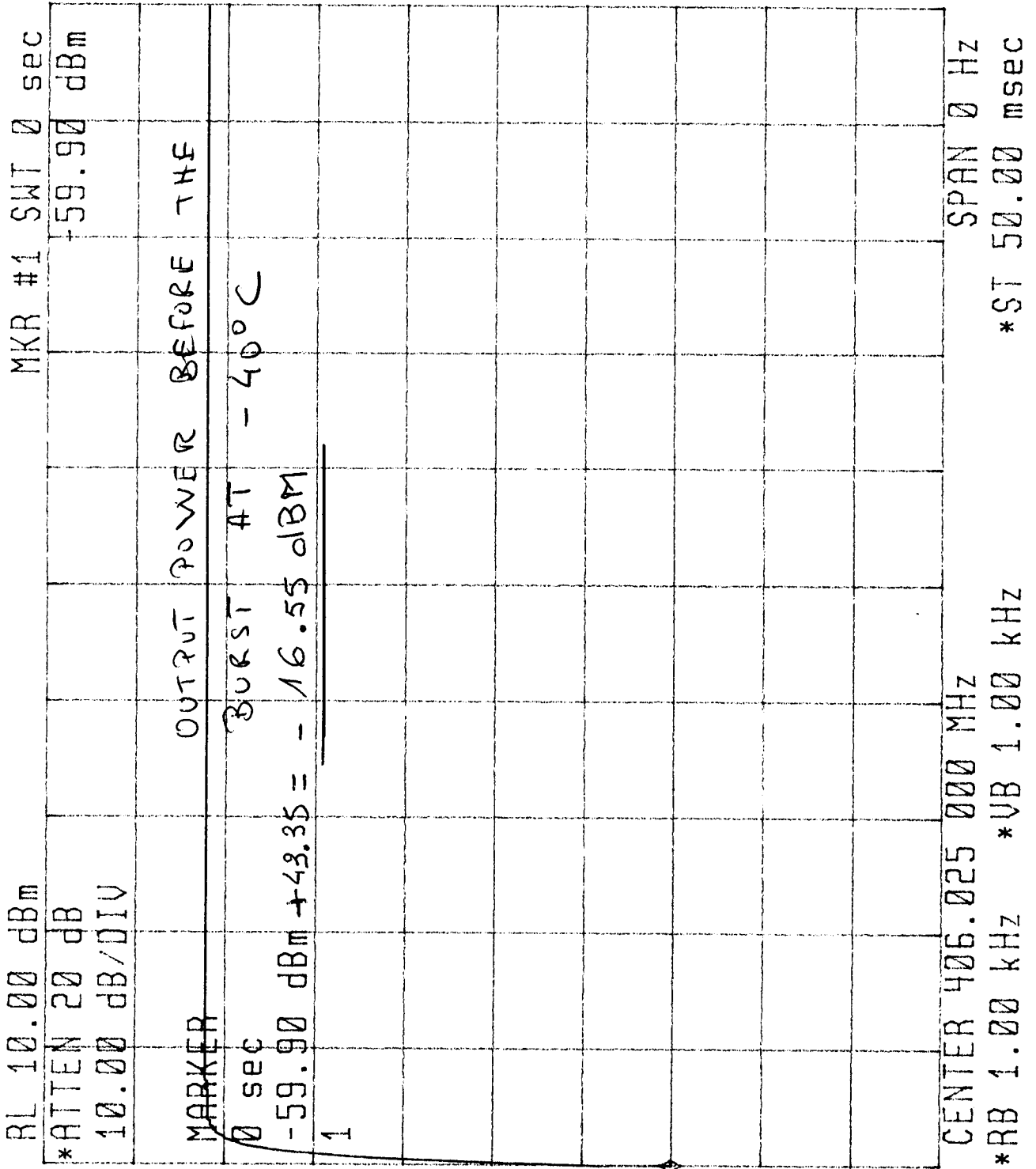
**** attach graphs of test results for test number 6, 9, 10 and 11 and a summary table of results for test number 14, and, if applicable, test number 17.

**TRANSMITTER OUTPUT POWER RISE TIME TEST RESULT ON
RLB35 ACR Electronics, Inc.**

N° 7

(1 ms before 10 % of the burst)

at -40° C, 22° C and 55° C

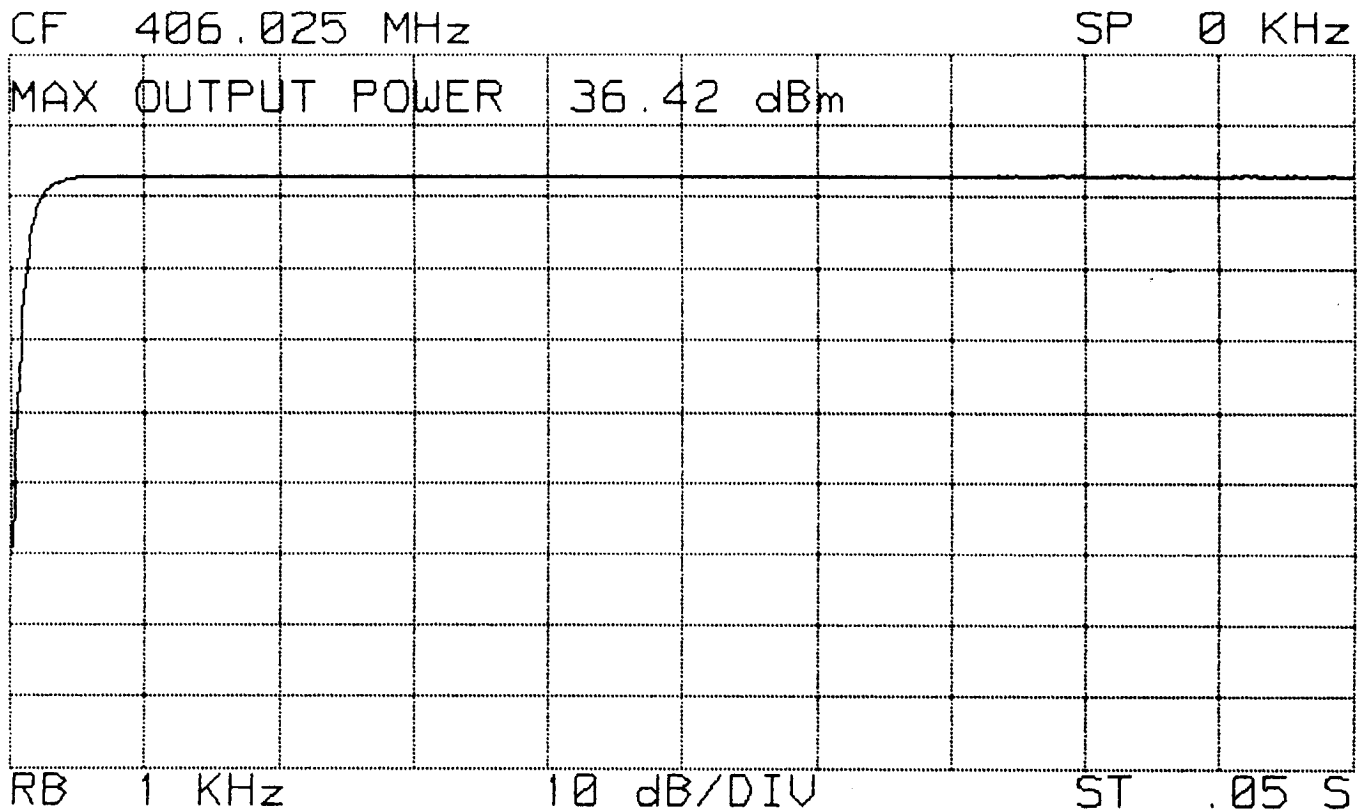


OUTPUT POWER BEFORE THE BURST

AT $+22^{\circ}\text{C}$

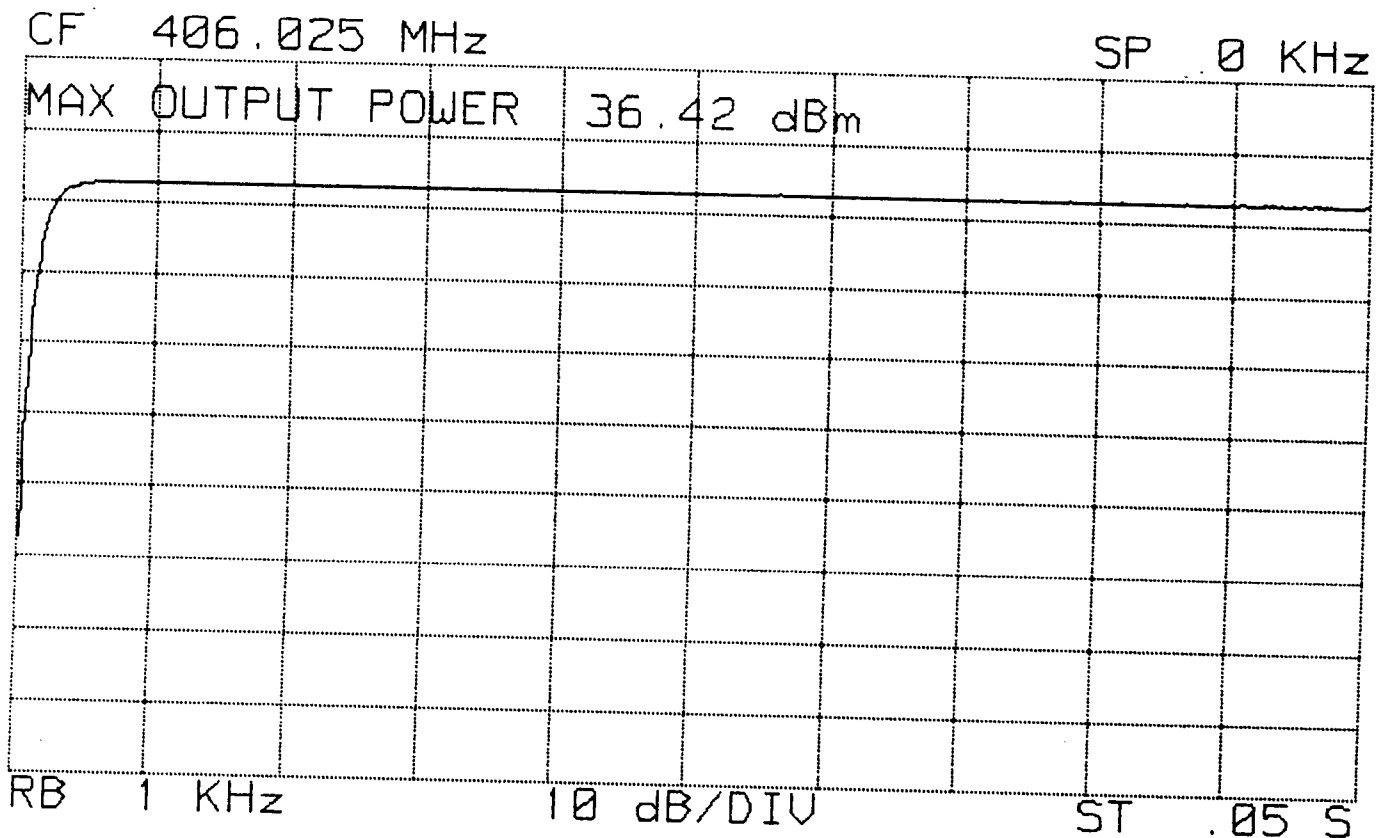
$$+36.40\text{ dBm} - 53\text{ dBm} = \underline{\underline{-16.6\text{ dBm}}}$$

Puissance avant emission



OUTPUT POWER BEFORE THE BURST
 AT $+55^{\circ}\text{C}$
 $+36.40\text{ dBm} - 50\text{ dBm} = \underline{\underline{-13.6\text{ dBm}}}$

Puissance avant emission



CERTIFICATION TEST RESULTS ON
RLB35 ACR Electronics, Inc.
N° 7

at -40° C, 22° C and 55° C

Certification Test at -40°C

Date of test : 25 Apr 2001

Manufacturer : ACR

Beacon Type : RLB35

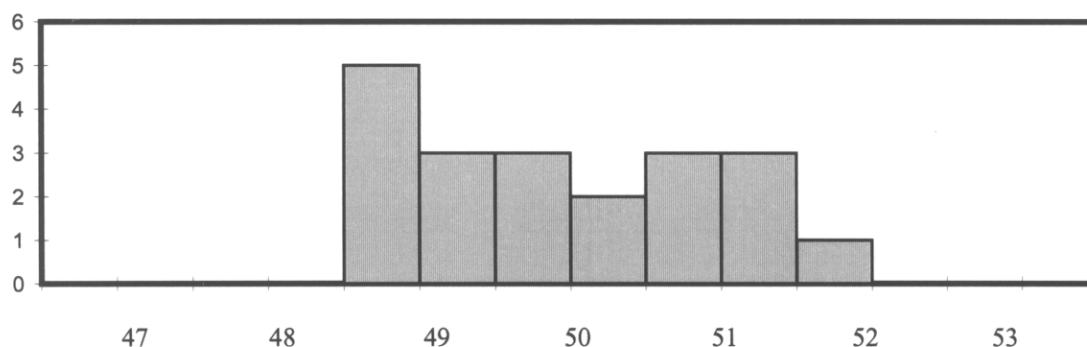
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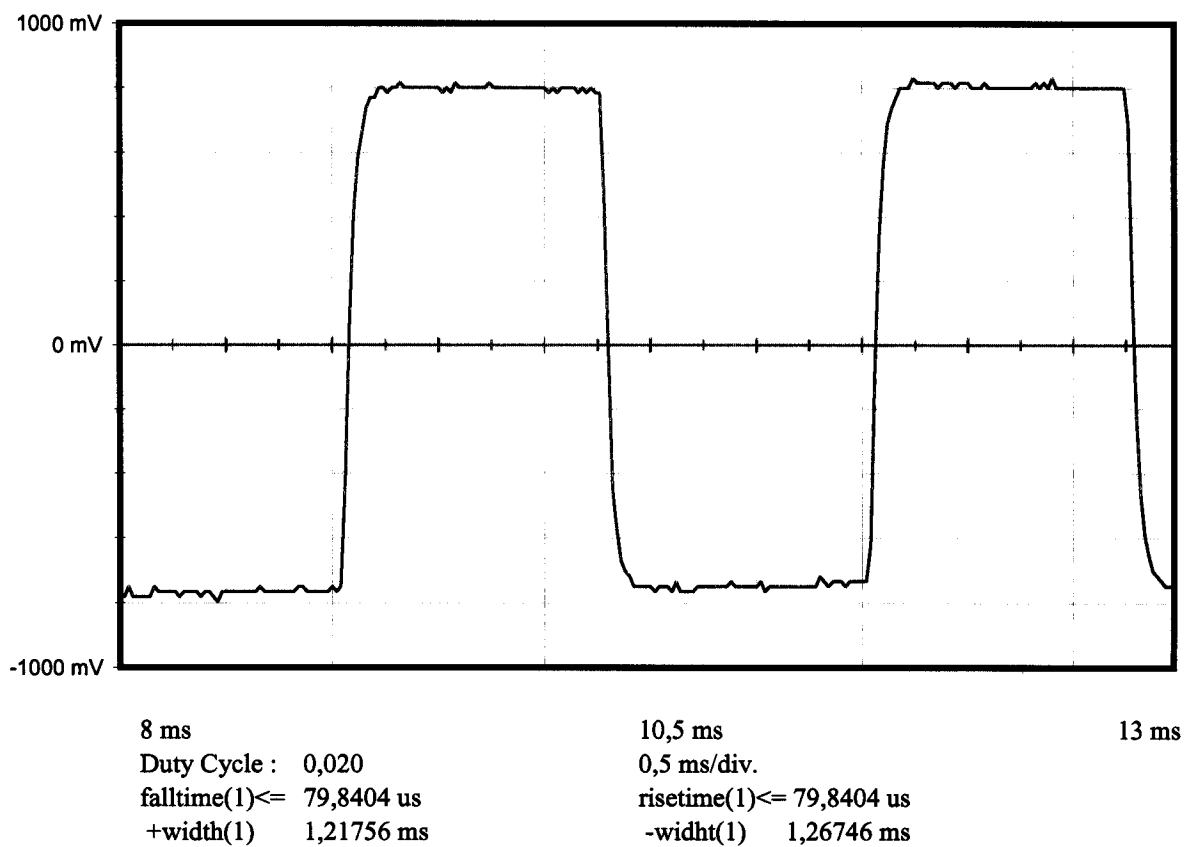
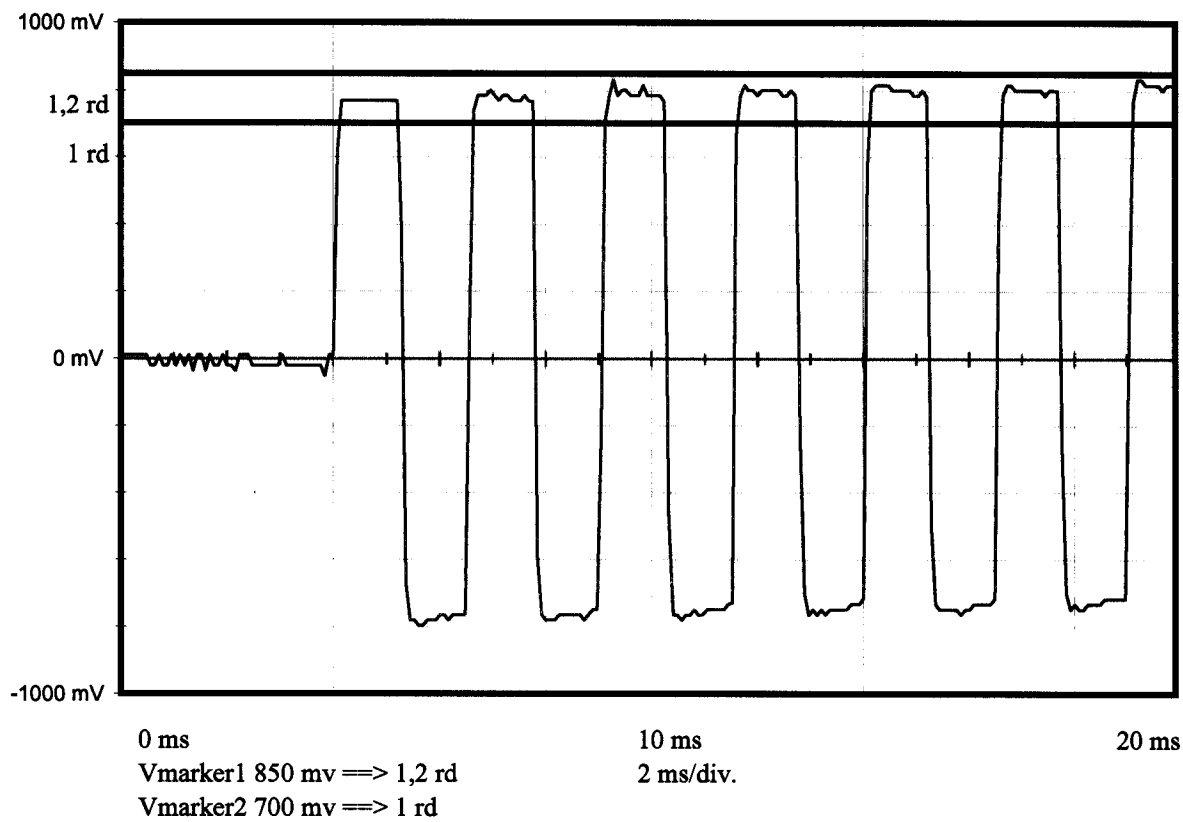
Message

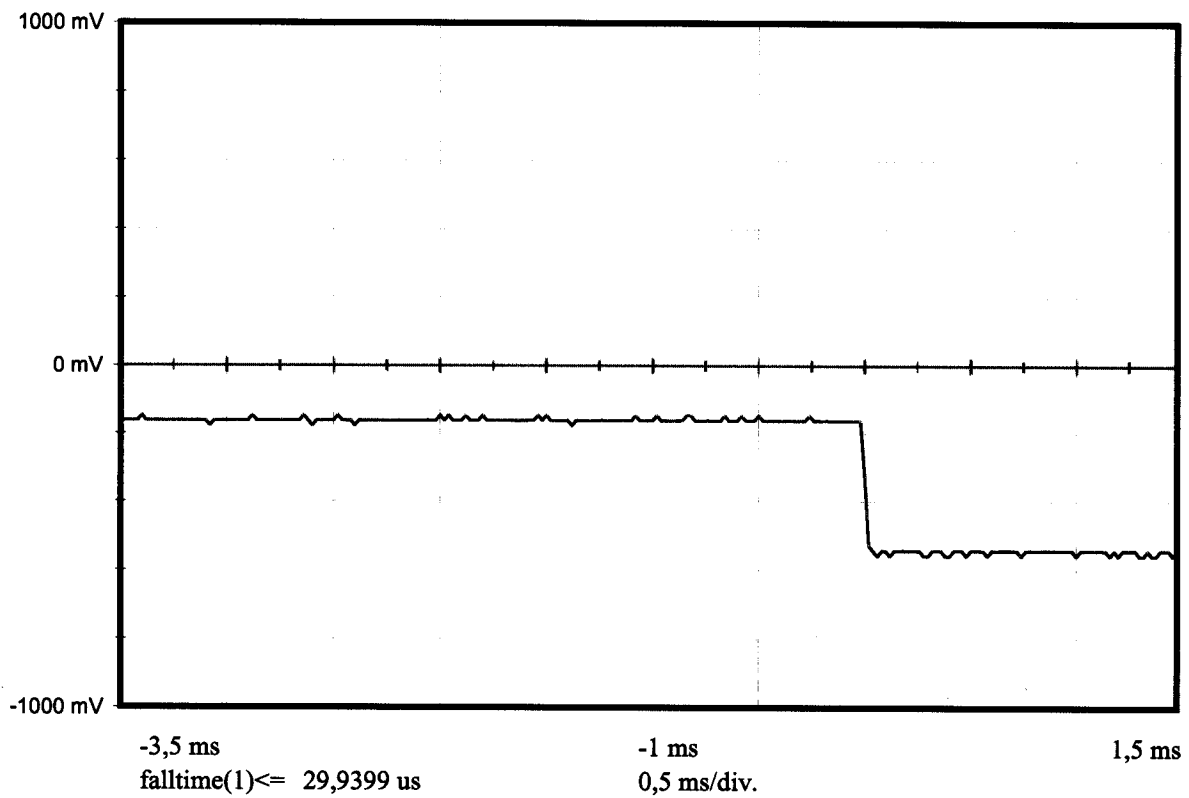
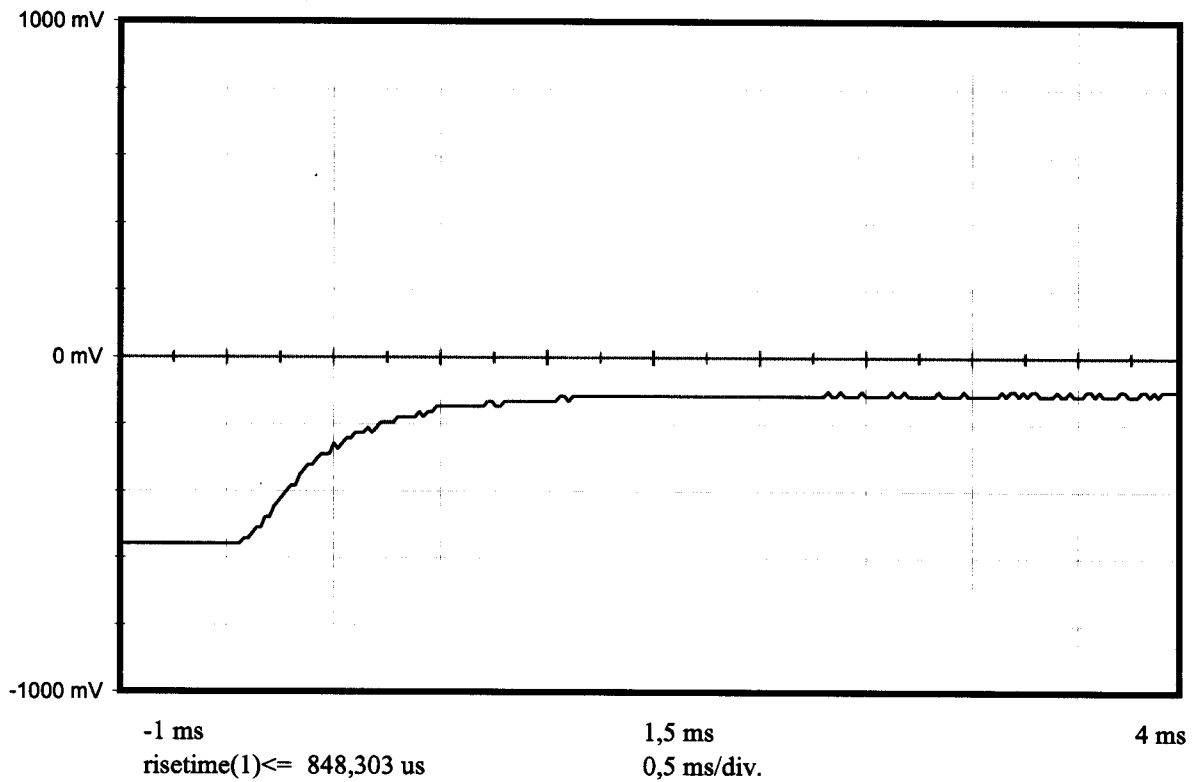
Message received		FFFE2F96EE2EC0017FDFFC0A6D3783E0F66C
Format Flag	25	1
Protocol flag	26	0
Ident./Position code	27-85	0
Country Code/Country	27-36	366 / USA
Protocol Code : U/Std-Nat	37-39/37-40	1110
Protocol Code Used	37-39/37-40	Test-Standard Location
Identification Data	40-85/41-64/41-58	
Identification Used		
Calculated BCH1	25-85	1029B4
Readed BCH1	86-106	1029B4
Homing	112	1
Em.cod/nat.use/supp.data	107-112	110111
Encod pos data	111	1
Fixed Data "1"	108	1 OK
Calculated BCH2	107-132	66C
Readed BCH2	133-144	66C
Latitude position		Nord 127,75° 0' 60"
Longitude position		Est 255,75° 0' 60"
Delta position		Default pos.

Electrical and other parameters

CW preamble	ms	158,4 <	< 162,6	160,29
Total transmission time	ms	513,8 <	< 526,2	519,27
Modulation frequency	Hz	395,4 <	< 404,6	401,29
Phase deviation : total	rd		<=2,40	2,30
Phase deviation : positive	rd	1,00 <	< 1,20	1,15
Phase deviation : negative	rd	-1,20 <	< -1,00	-1,16
Symmetry measurement	%		<=5 %	2,01
Nominal frequency : F2	Hz			406024581,64
Short term2				8,66E-11
Short term3				3,57E-10
Slope				-2,61E-11
Residual				7,65E-11
406 MHz power output	dBm			36,6
Homing frequency	MHz			121,50
121,5 MHz power output	dBm			18,1
Soak temperature	°C			-40,3
Extra feature				No







Certification Test at 22°C

Date of test : 18 Apr 2001

Manufacturer : ACR

Beacon Type : RLB35

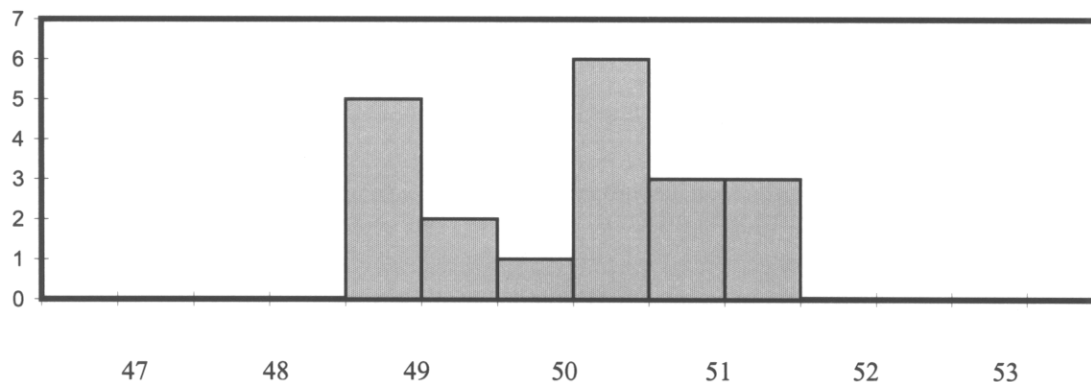
Number : 7

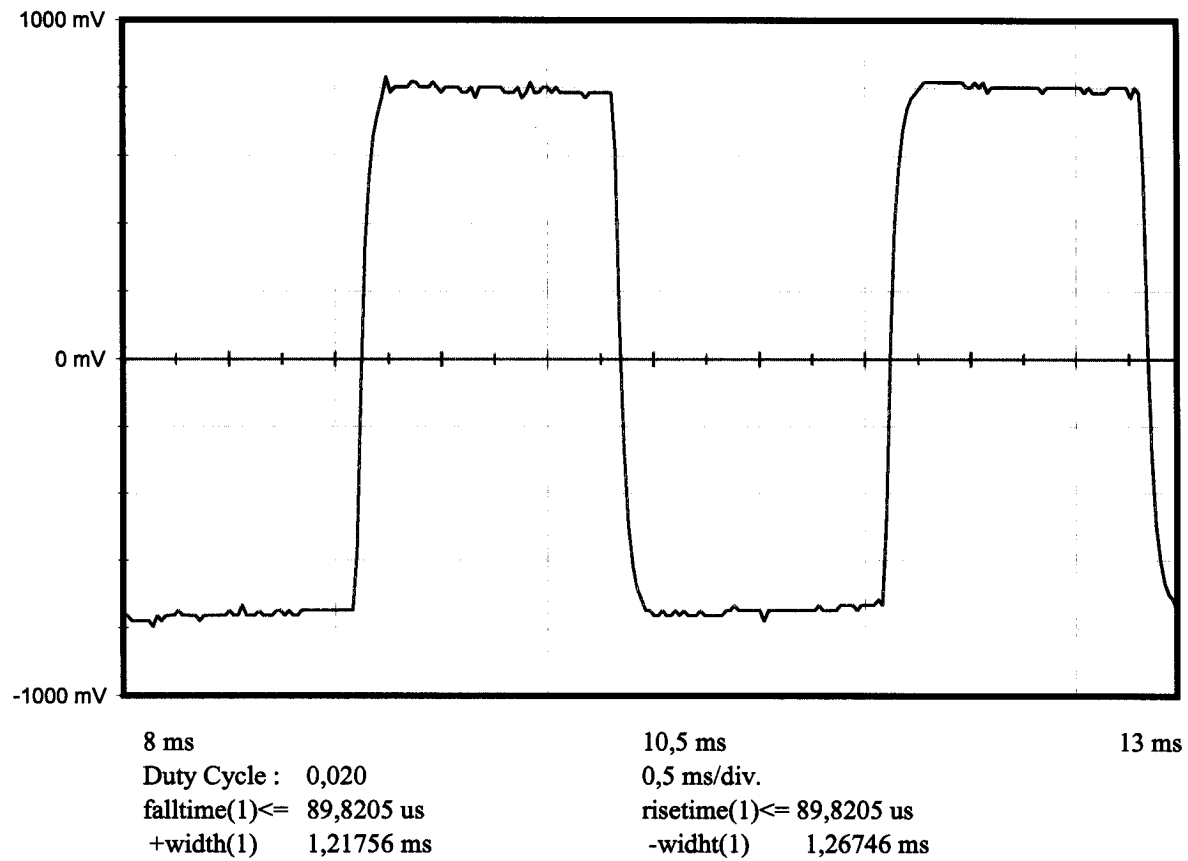
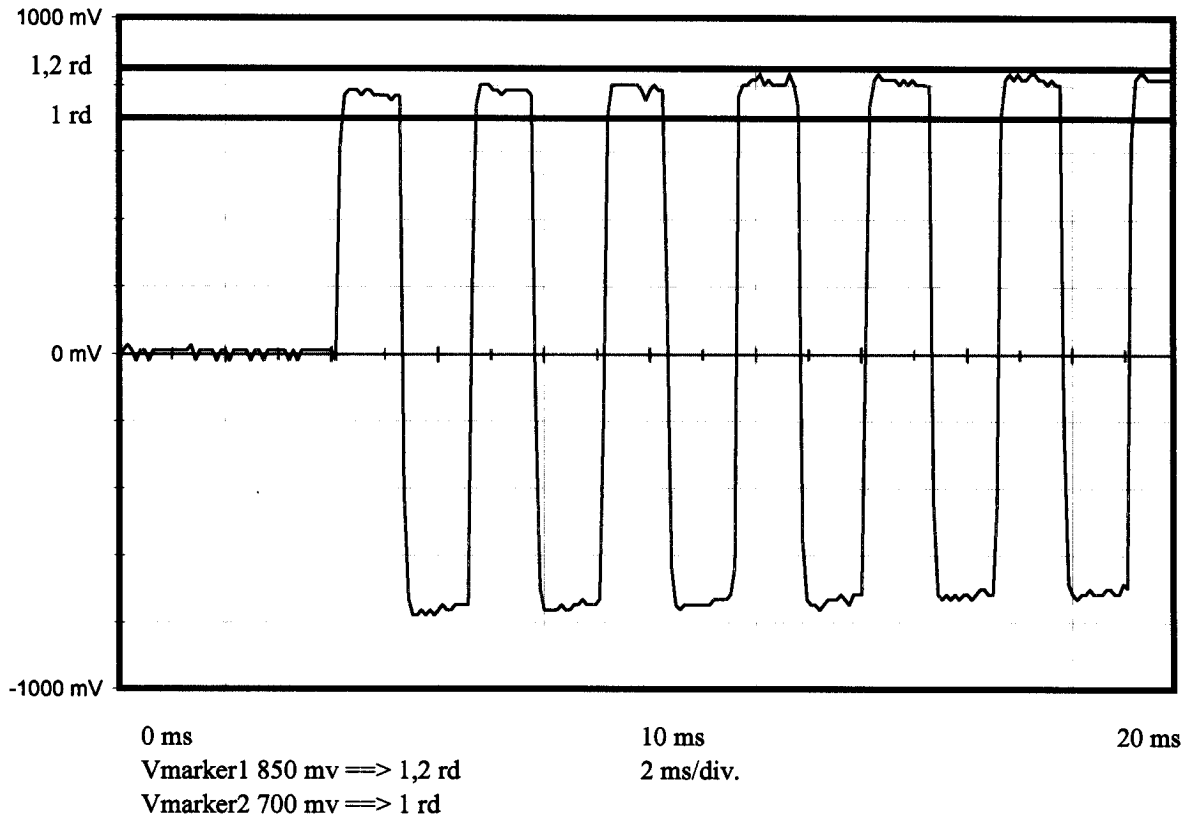
Message

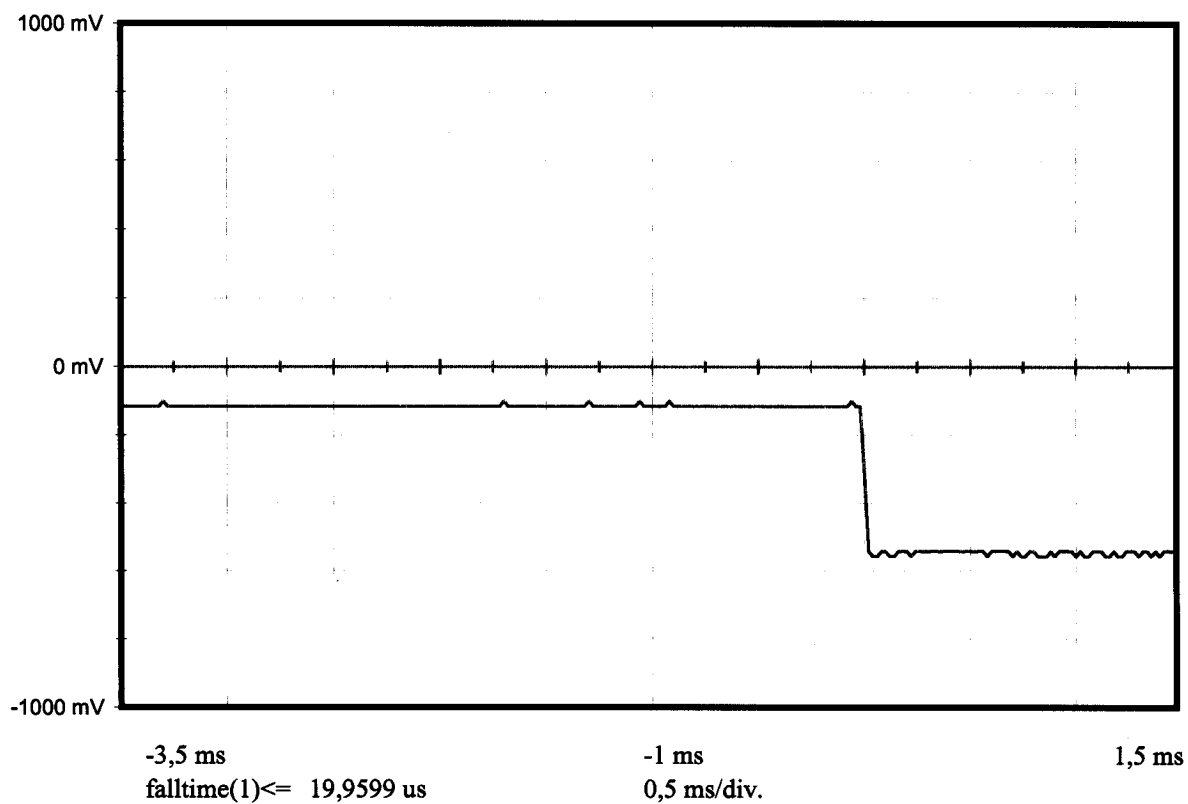
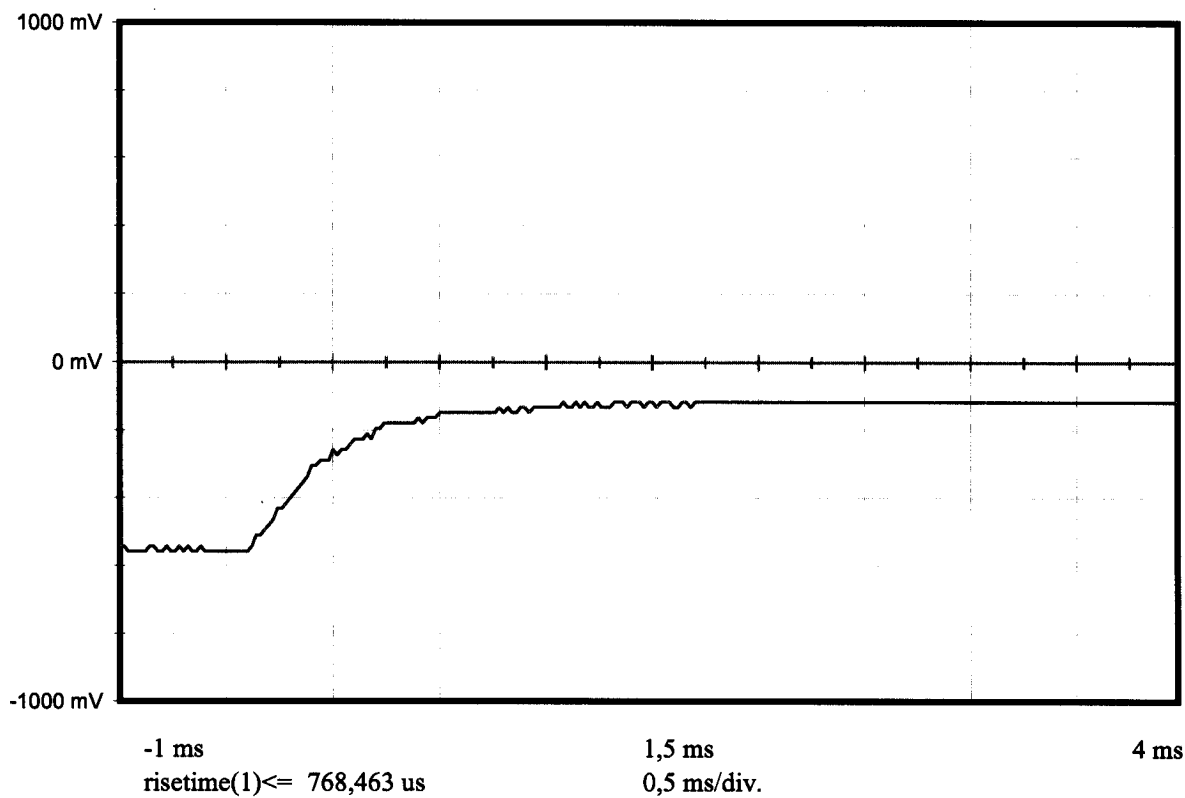
Message received		FFFE2F96EE2EC0012C00221D917769FCB6D1
Format Flag	25	1
Protocol flag	26	0
Ident./Position code	27-85	0
Country Code/Country	27-36	366 / USA
Protocol Code : U/Std-Nat	37-39/37-40	1110
Protocol Code Used	37-39/37-40	Test-Standard Location
Identification Data	40-85/41-64/41-58	
Identification Used		
Calculated BCH1	25-85	87645
Readed BCH1	86-106	87645
Homing	112	1
Em.cod/nat.use/supp.data	107-112	110111
Encod pos data	111	1
Fixed Data "1"	108	1
Calculated BCH2	107-132	6D1
Readed BCH2	133-144	6D1
Latitude position		Nord 43° 33' 32"
Longitude position		Est 1° 28' 44"
Delta position		0,000 km

Electrical and other parameters

CW preamble	ms	158,4 <	< 162,6	160,37
Total transmission time	ms	513,8 <	< 526,2	519,35
Modulation frequency	Hz	395,4 <	< 404,6	401,29
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 %	2,01
Nominal frequency : F2	Hz			406024511,70
Short term2				1,34E-10
Short term3				3,23E-10
Slope				-2,99E-12
Residual				1,09E-10
406 MHz power output	dBm			37,5
Homing frequency	MHz			121,50
121,5 MHz power output	dBm			17,9
Soak temperature	°C			22,5
Extra feature				No







Certification Test at 55°C

Date of test : 19 Apr 2001

Manufacturer : ACR

Beacon Type : RLB35

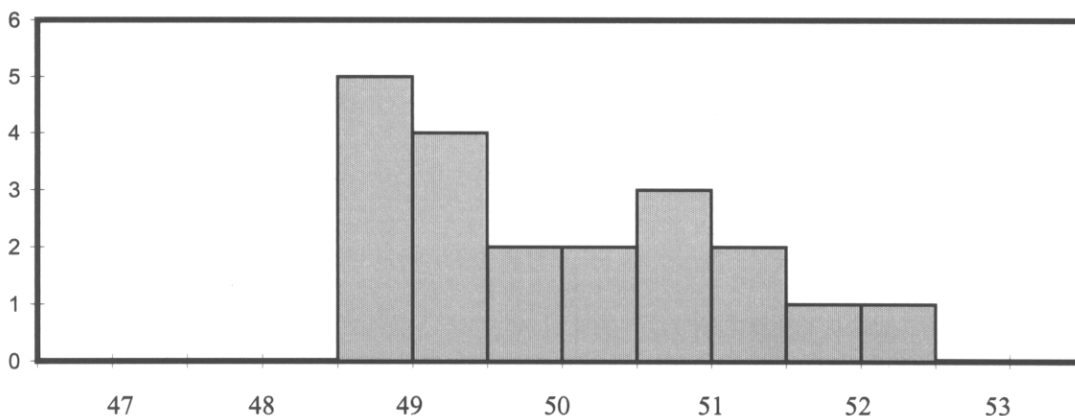
Number : 7

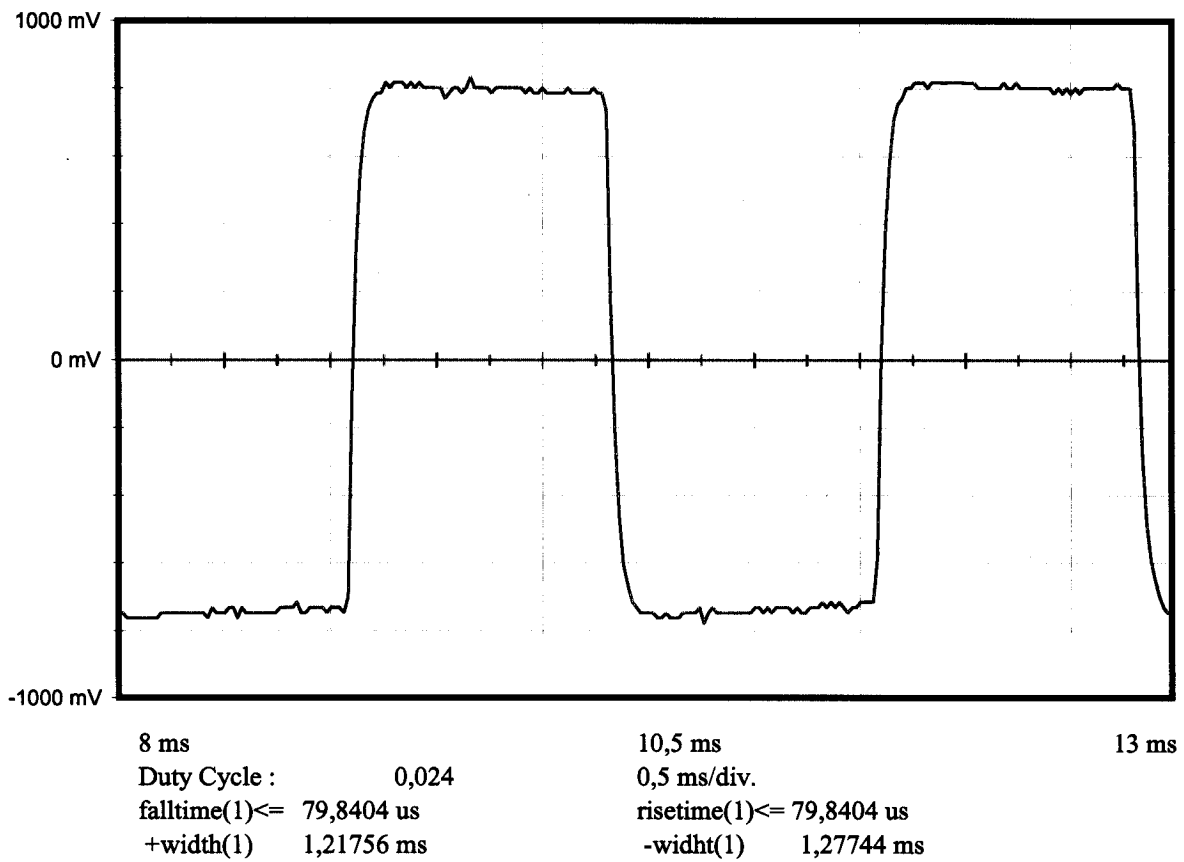
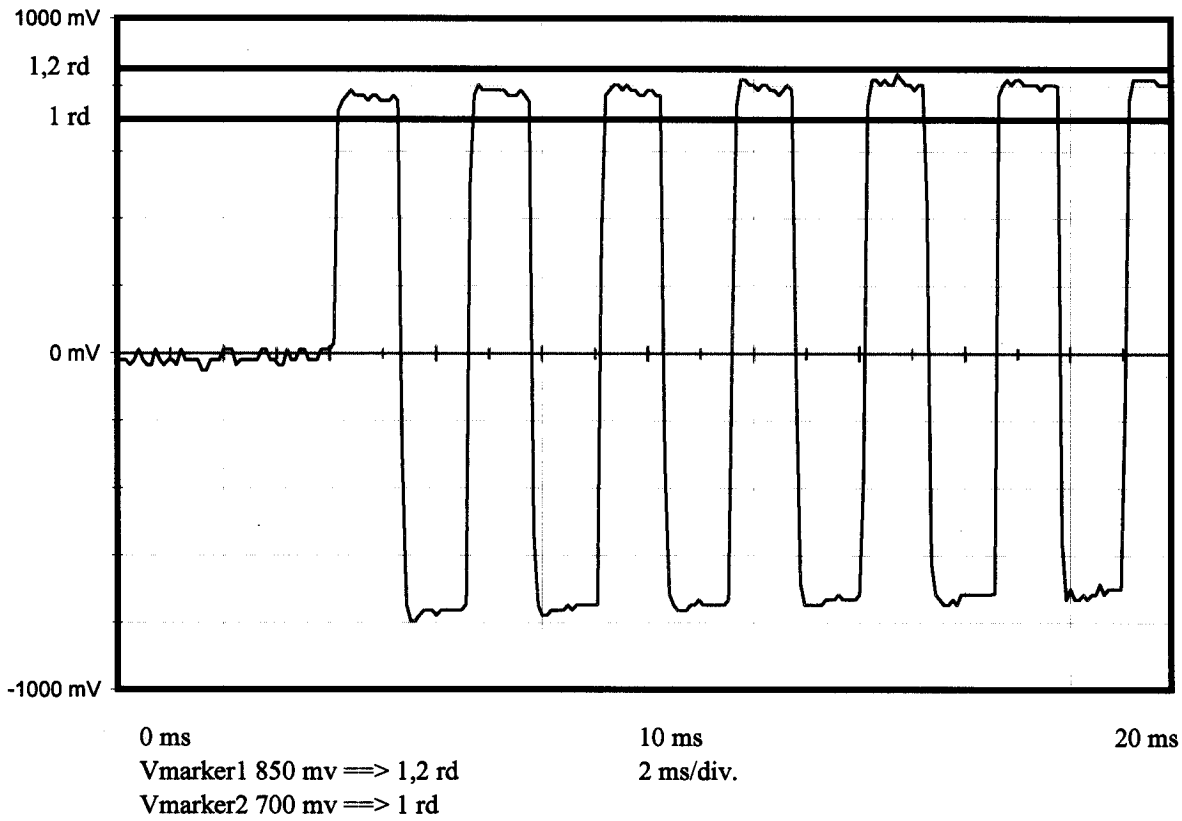
Message

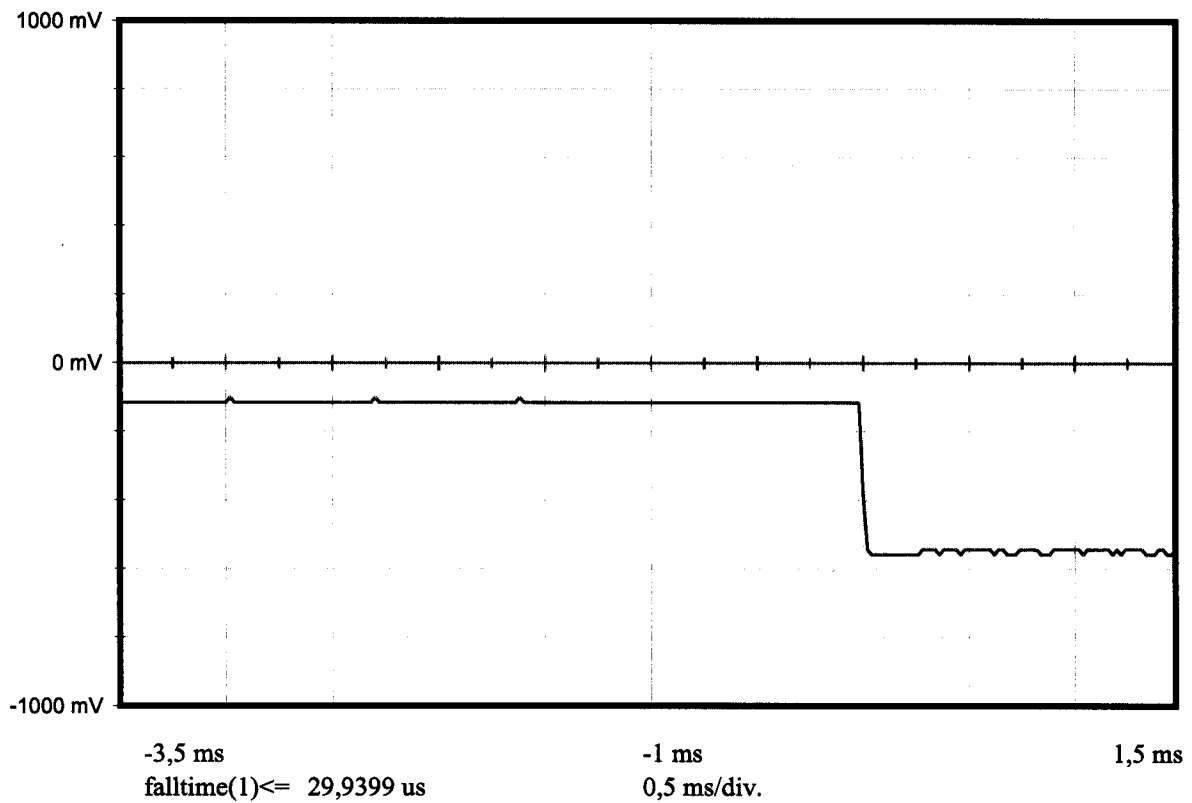
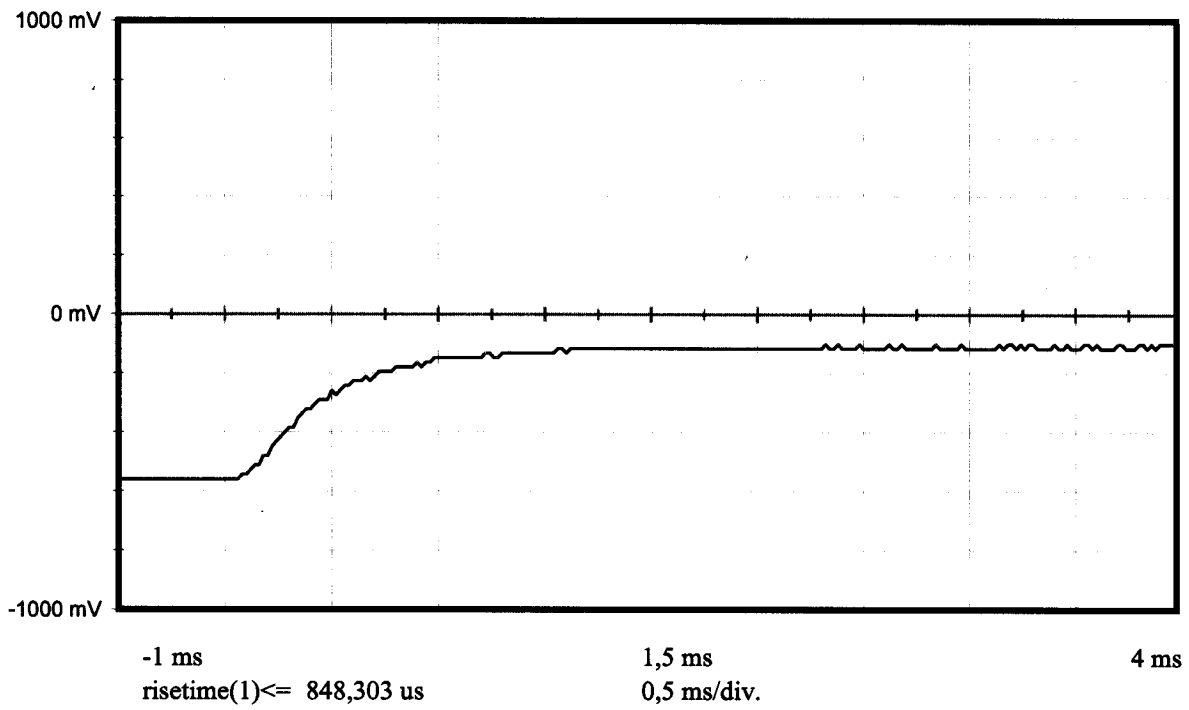
Message received		FFFE2F96EE2EC0017FDFFC0A6D3783E0F66C
Format Flag	25	1
Protocol flag	26	0
Ident./Position code	27-85	0
Country Code/Country	27-36	366 / USA
Protocol Code : U/Std-Nat	37-39/37-40	1110
Protocol Code Used	37-39/37-40	Test-Standard Location
Identification Data	40-85/41-64/41-58	
Identification Used		
Calculated BCH1	25-85	1029B4
Readed BCH1	86-106	1029B4
Homing	112	1
Em.cod/nat.use/supp.data	107-112	110111
Encod pos data	111	1
Fixed Data "1"	108	1
Calculated BCH2	107-132	66C
Readed BCH2	133-144	66C
Latitude position		Nord 127,75° 0' 60"
Longitude position		Est 255,75° 0' 60"
Delta position		Default pos.

Electrical and other parameters

CW preamble	ms	158,4 <	< 162,6	160,35
Total transmission time	ms	513,8 <	< 526,2	519,35
Modulation frequency	Hz	395,4 <	< 404,6	401,29
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	-1,11
Symmetry measurement	%		<= 5 %	2,40
Nominal frequency : F2	Hz			406024502,04
Short term2				1,86E-10
Short term3				1,05E-10
Slope				-1,67E-10
Residual				1,10E-10
406 MHz power output	dBm			37,6
Homing frequency	MHz			121,50
121,5 MHz power output	dBm			17,6
Soak temperature	°C			19,1
Extra feature				No







SPURIOUS EMISSIONS RESULTS

RLB35 ACR Electronics, Inc.

N° 7

at -40° C, 22° C and 55° C

ACR Electronics, Inc.

RLB35

7

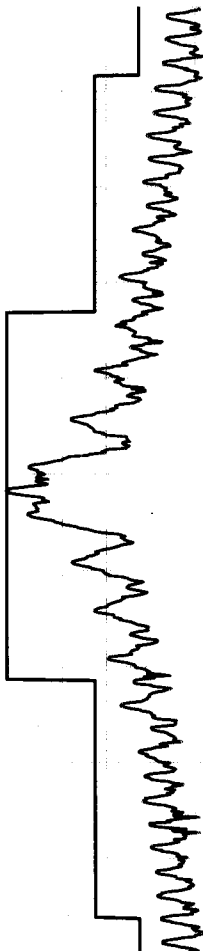
Certification nominale

406 MHz

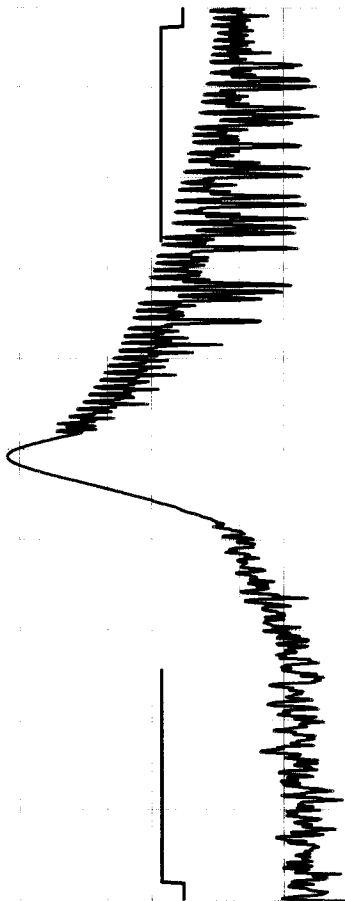
-40 °C

CF : 406,025 MHz

SP : 16 KHz



CF : 406,025 MHz



Rb : 1 KHz

10 dB/div.

St : 0,305 S

Rb : 0,1 KHz

10 dB/div.

St : 4,8 S

SP : 50 KHz

CF : 600 MHz

Delta : -36,21 dB

SP : 800000 KHz



Rb : 100 KHz

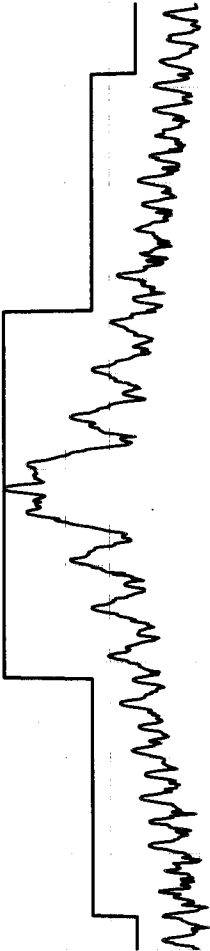
10 dB/div.

St : 0,24 S

ACR Electronics, Inc.
RLB35
7
Certification nominale
406 MHz
22 °C

CF : 406,025 MHz

SP : 16 KHz



St : 4,8 S

10 dB/div.

Rb : 0,1 KHz

SP : 800000 KHz

Delta : -34,72 dB

CF : 600 MHz

SP : 50 KHz



St : 0,24 S

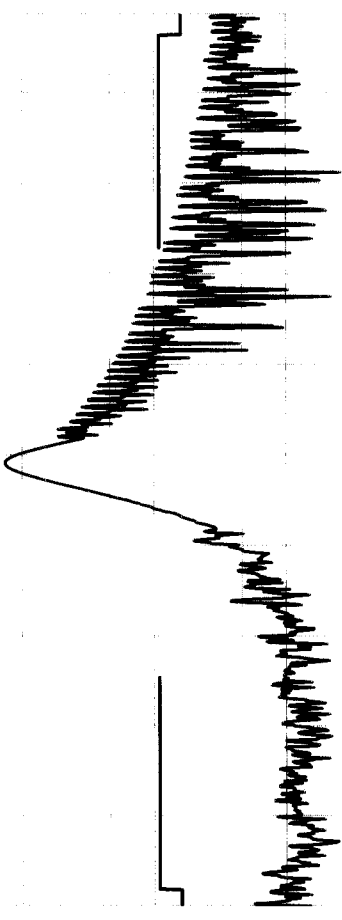
10 dB/div.

Rb : 100 KHz

St : 0,305 S

10 dB/div.

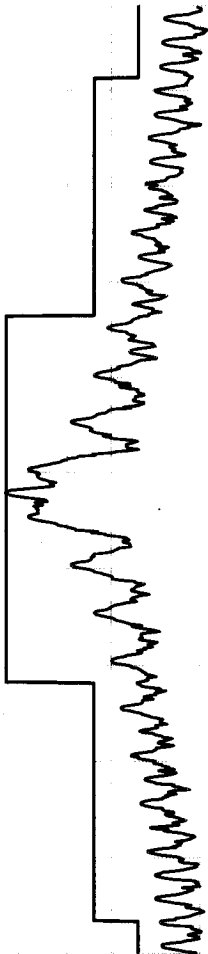
Rb : 1 KHz



ACR Electronics, Inc.
RLB35
7
Certification nominale
406 MHz
55 °C

CF : 406,025 MHz

SP : 16 KHz



Rb : 0,1 KHz

10 dB/div.

St : 4,8 S

CF : 600 MHz

Delta : -35,15 dB

SP : 800000 KHz

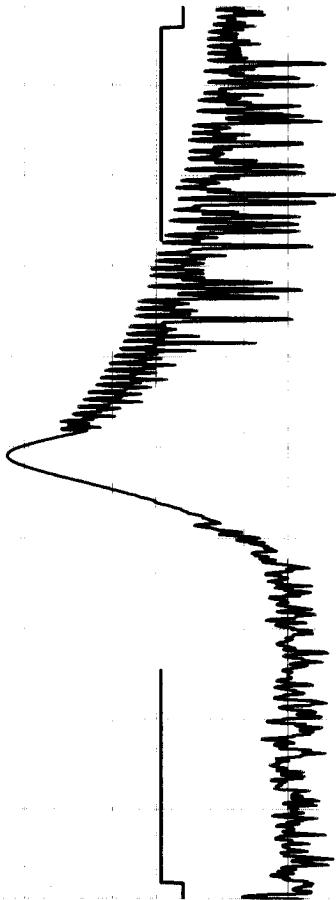


Rb : 100 KHz

10 dB/div.

St : 0,24 S

CF : 406,025 MHz



Rb : 1 KHz

10 dB/div.

St : 0,305 S

**406 MHz VSWR 3:1 TEST RESULTS ON
RLB35 ACR Electronics, Inc.
N° 7**

at -40° C, 22° C and 55° C

Certification Test VSWR at -40°C

Date of test : 25 Apr 2001

Manufacturer : ACR

Beacon Type : RLB35

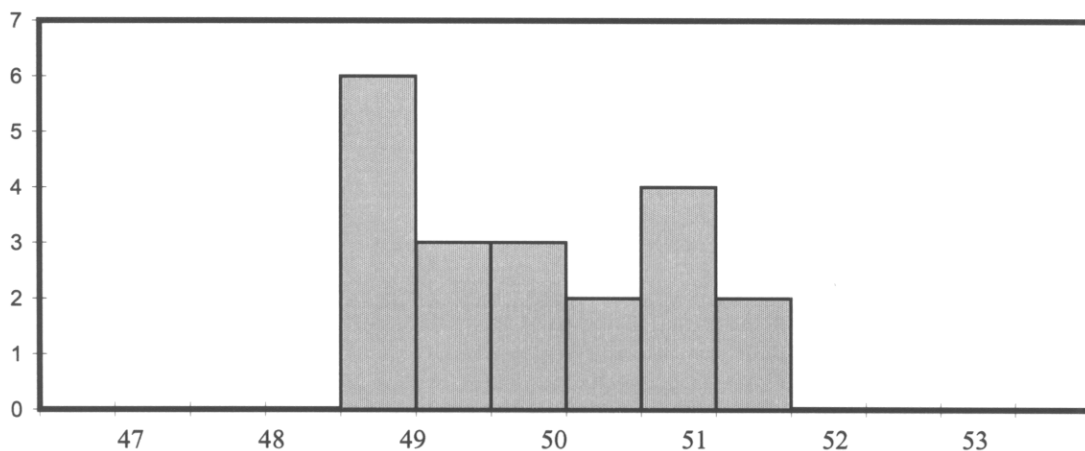
Number : 7

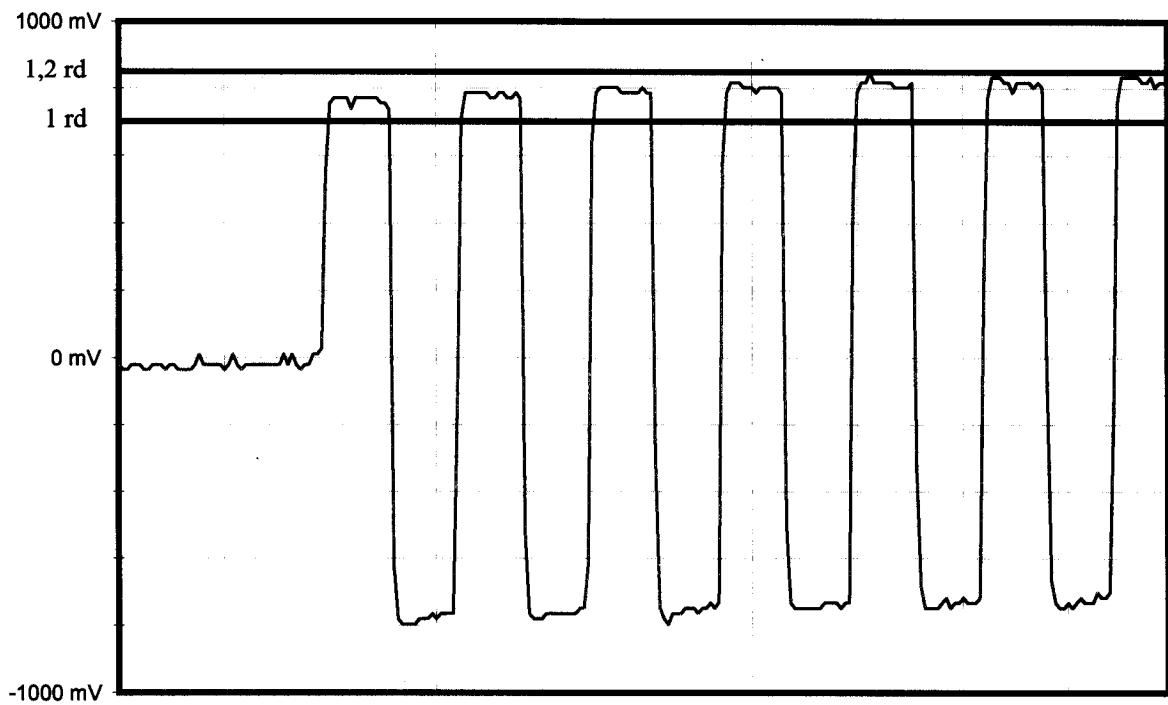
Message

Message received		FFFE2F96EE2EC0012C00221D9177693CA1AF
Format Flag	25	1
Protocol flag	26	0
Ident./Position code	27-85	0
Country Code/Country	27-36	366 / USA
Protocol Code : U/Std-Nat	37-39/37-40	1110
Protocol Code Used	37-39/37-40	Test-Standard Location
Identification Data	40-85/41-64/41-58	
Identification Used		
Calculated BCH1	25-85	87645
Readed BCH1	86-106	87645
Homing	112	1
Em.cod/nat.use/supp.data	107-112	110111
Encod pos data	111	1
Fixed Data "1"	108	1
Calculated BCH2	107-132	1AF
Readed BCH2	147-144	1AF
Latitude position		Nord 43° 33' 44"
Longitude position		Est 1° 28' 40"
Delta position		0,000 km

Electrical and other parameters

Rise time Modulation	ms	0,0798
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 %	1,61
Nominal frequency : F2	Hz	406024579,01

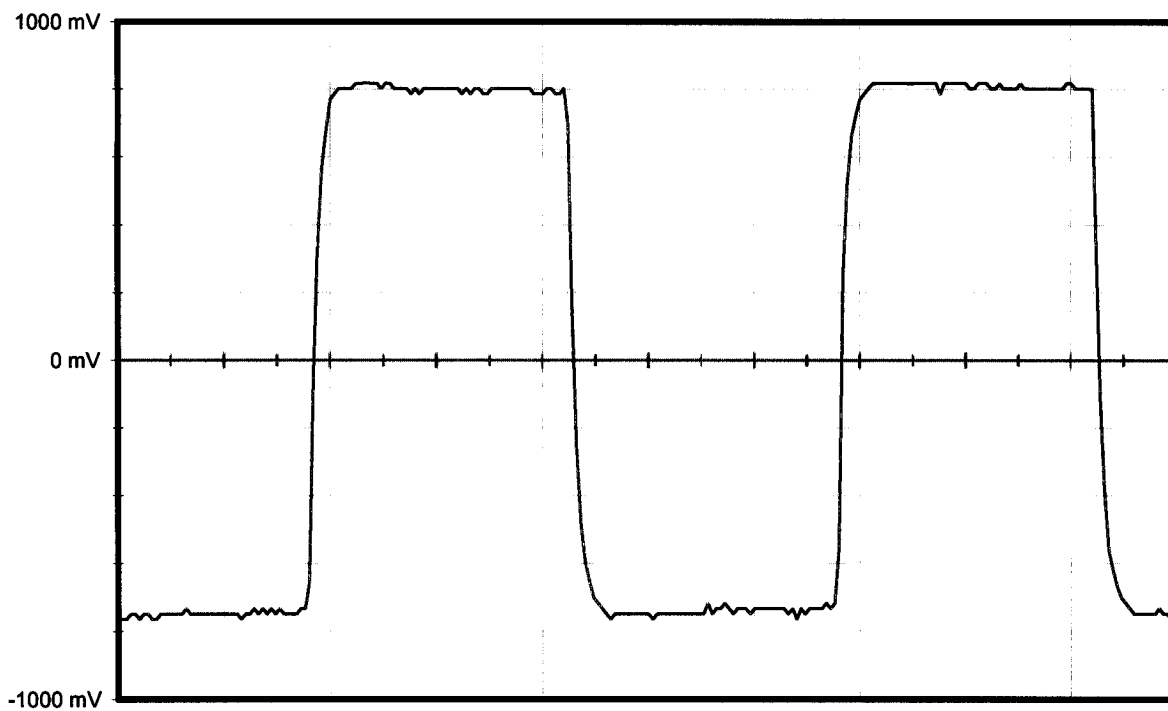




Vmarker1 850 mv ==> 1,2 rd

2 ms/div.

Vmarker2 700 mv ==> 1 rd



Duty Cycle : 0,016

0,5 ms/div.

falltime(1)<= 89,8205 us

risetime(1)<= 79,8404 us

+width(1) 1,21756 ms

-width(1) 1,25749 ms

Certification Test VSWR at 22°C

Date of test : 27 Apr 2001

Manufacturer : ACR

Beacon Type : RLB35

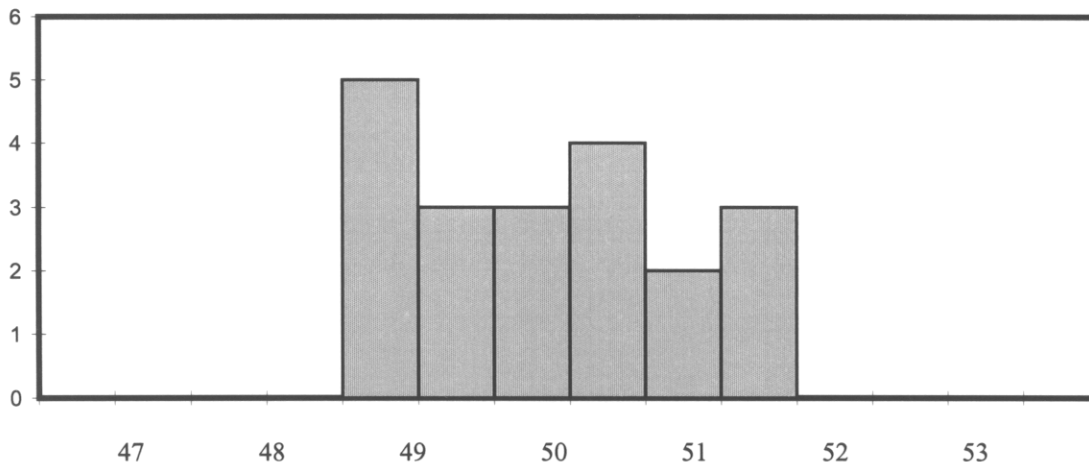
Number : 7

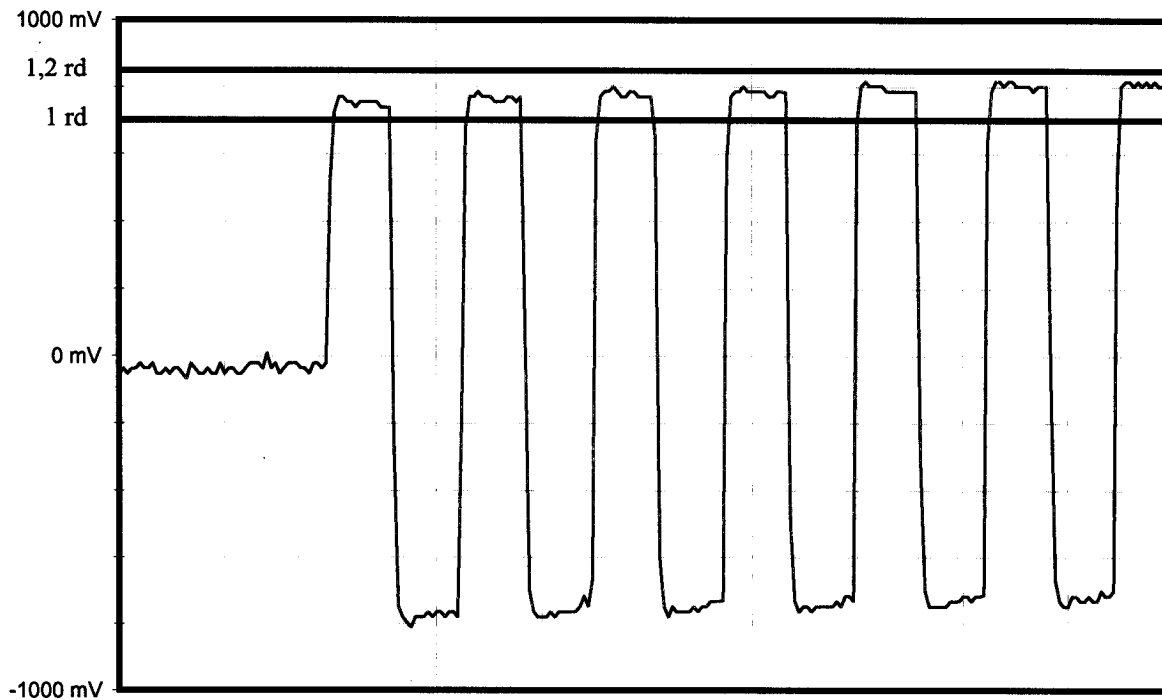
Message

Message received		FFFE2F96EE2EC0017FDFFC0A6D3783E0F66C
Format Flag	25	1
Protocol flag	26	0
Ident./Position code	27-85	0
Country Code/Country	27-36	366 / USA
Protocol Code : U/Std-Nat	37-39/37-40	1110
Protocol Code Used	37-39/37-40	Test-Standard Location
Identification Data	40-85/41-64/41-58	
Identification Used		
Calculated BCH1	25-85	1029B4
Readed BCH1	86-106	1029B4
Homing	112	1
Em.cod/nat.use/supp.data	107-112	110111
Encod pos data	111	1
Fixed Data "1"	108	1
Calculated BCH2	107-132	66C
Readed BCH2	147-144	66C
Latitude position		Nord 127,75° 0' 60"
Longitude position		Est 255,75° 0' 60"
Delta position		Default pos.

Electrical and other parameters

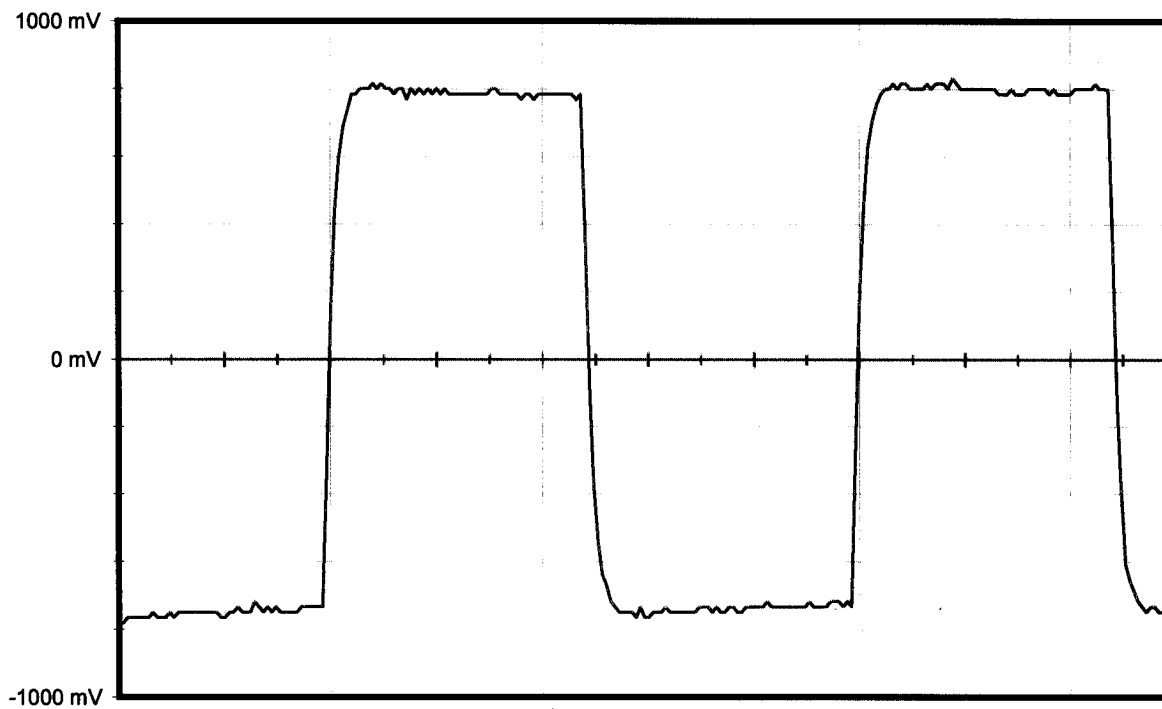
Rise time Modulation	ms	0,0798
Fall time Modulation	ms	0,0898
Phase deviation : positive	rd 1,00 < < 1,20	1,13
Phase deviation : negative	rd -1,20 < < -1,00	-1,13
Symmetry measurement	% <=5 %	2,40
Nominal frequency : F2	Hz	406024495,15





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

2 ms/div.



Duty Cycle : 0,024
falltime(1) $\leq$ 89,8205 us
+width(1) 1,21756 ms

0,5 ms/div.
risetime(1) $\leq$ 79,8404 us
-width(1) 1,27745 ms

Certification Test VSWR at 55°C

Date of test : 19 Apr 2001

Manufacturer : ACR

Beacon Type : RLB35

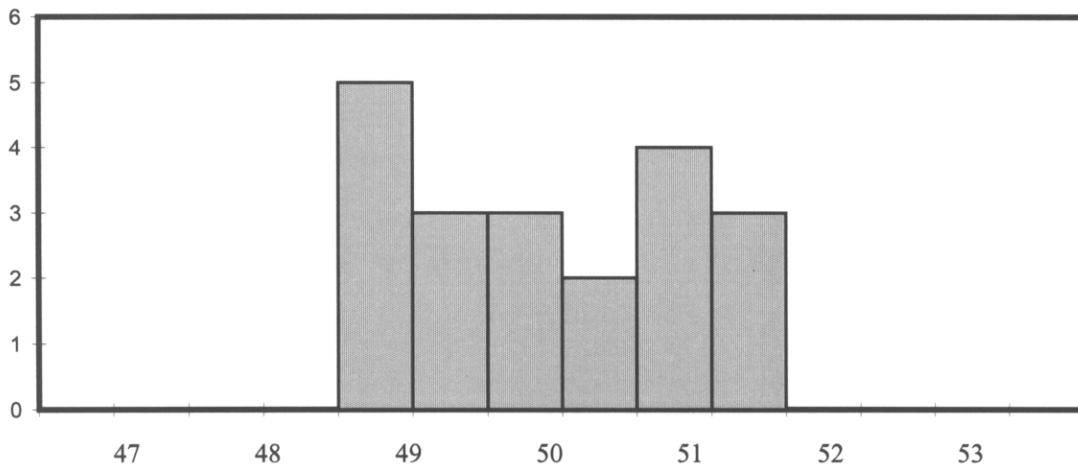
Number : 7

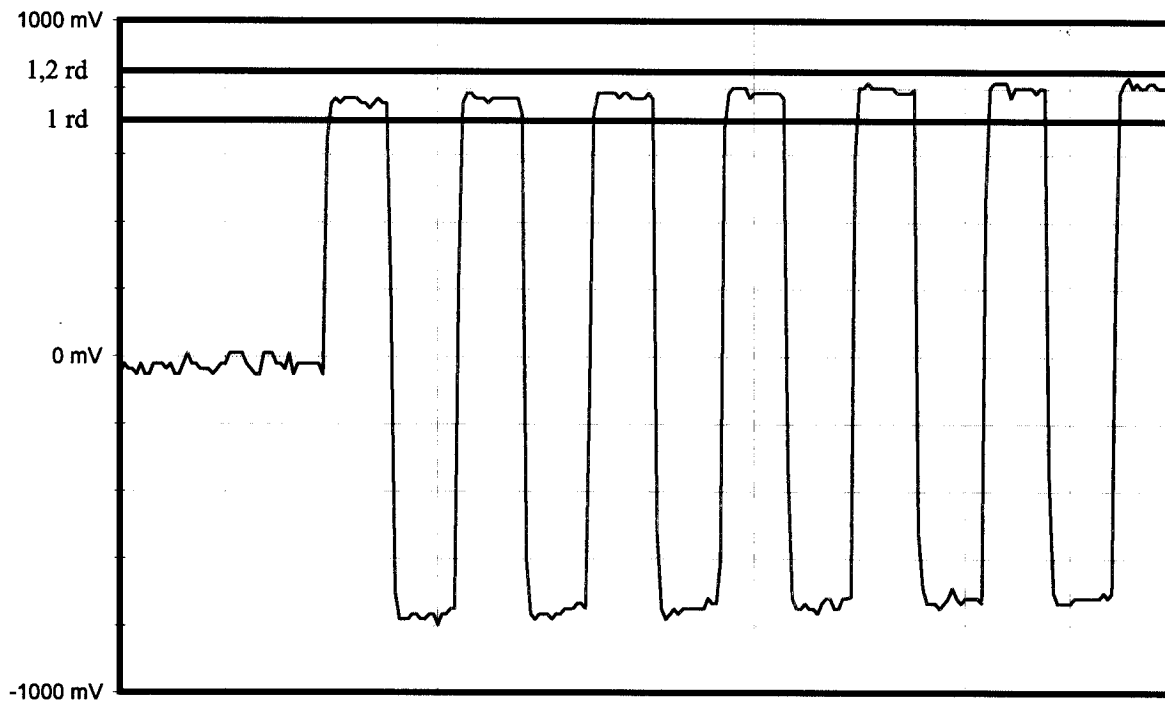
Message

Message received		FFFE2F96EE2EC0017FDFFC0A6D3783E0F66C
Format Flag	25	1
Protocol flag	26	0
Ident./Position code	27-85	0
Country Code/Country	27-36	366 / USA
Protocol Code : U/Std-Nat	37-39/37-40	1110
Protocol Code Used	37-39/37-40	Test-Standard Location
Identification Data	40-85/41-64/41-58	
Identification Used		
Calculated BCH1	25-85	1029B4
Readed BCH1	86-106	1029B4
Homing	112	1
Em.cod/nat.use/supp.data	107-112	110111
Encod pos data	111	1
Fixed Data "1"	108	1
Calculated BCH2	107-132	66C
Readed BCH2	147-144	66C
Latitude position		Nord 127,75° 0' 60"
Longitude position		Est 255,75° 0' 60"
Delta position		Default pos.

Electrical and other parameters

Rise time Modulation	ms		0,0898
Fall time Modulation	ms		0,0798
Phase deviation : positive	rd 1,00 <	< 1,20	1,14
Phase deviation : negative	rd -1,20 <	< -1,00	-1,09
Symmetry measurement	%	<=5 %	2,40
Nominal frequency : F2	Hz		406024502,93

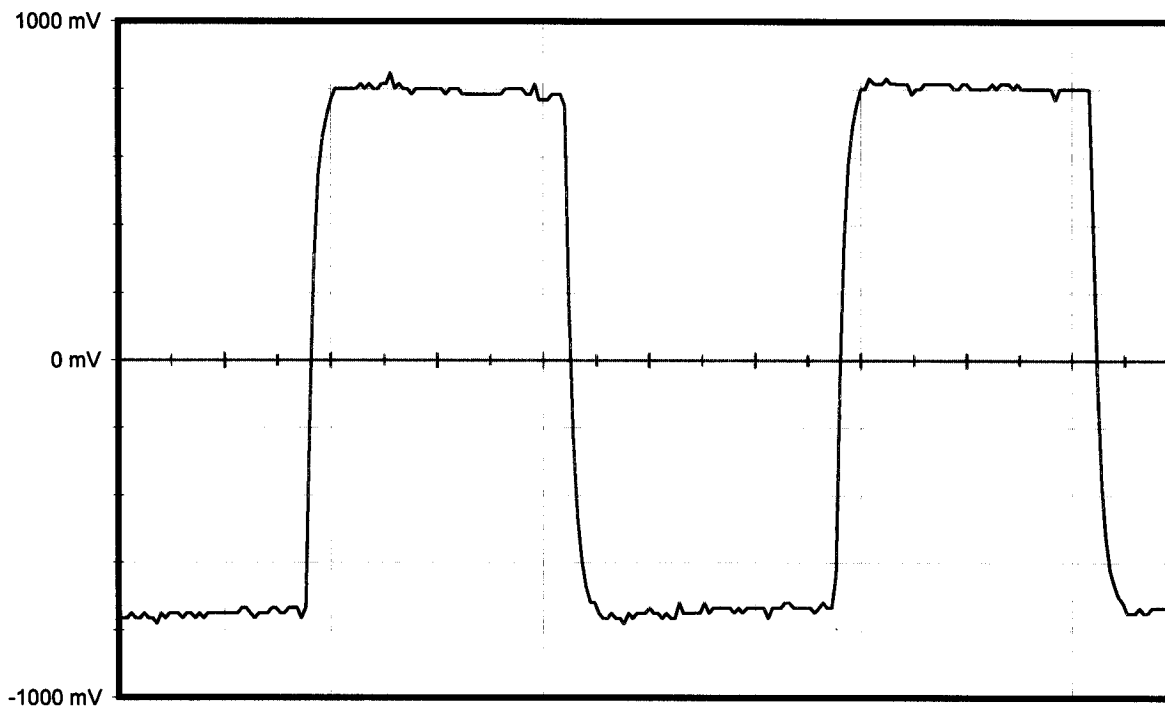




Vmarker1 850 mv ==> 1,2 rd

2 ms/div.

Vmarker2 700 mv ==> 1 rd



Duty Cycle : 0,024

0,5 ms/div.

falltime(1) <= 89,8205 us

risetime(1) <= 79,8404 us

+width(1) 1,21756 ms

-width(1) 1,27745 ms

VSWR SPURIOUS EMISSIONS RESULTS
RLB35 ACR Electronics, Inc.
N° 7

at -40° C, 22° C and 55° C

ACR Electronics, Inc.

RLB35

7

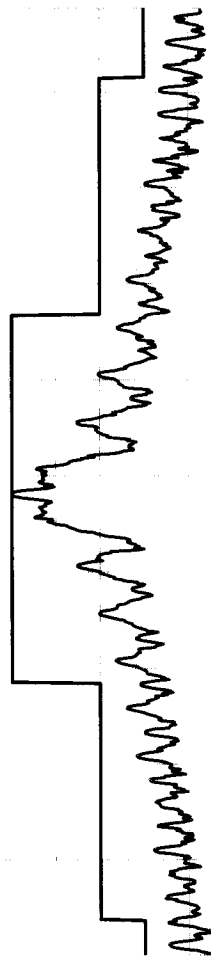
Certification VSWR

406 MHz

-40 °C

CF : 406,025 MHz

SP : 16 KHz



Rb : 0,1 KHz

10 dB/div.

St : 4,8 S

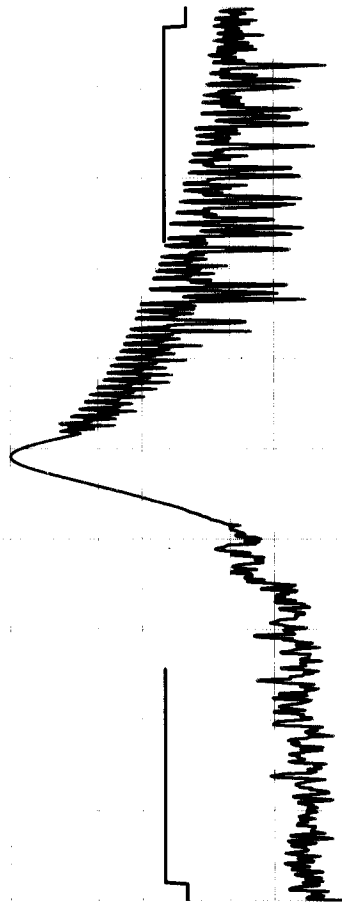
CF : 406,025 MHz

SP : 50 KHz

CF : 600 MHz

Delta : -37,09 dB

SP : 80000 KHz



Rb : 1 KHz

10 dB/div.

St : 0,305 S

Rb : 100 KHz

10 dB/div.

St : 0,24 S

ACR Electronics, Inc.

RLB35

7

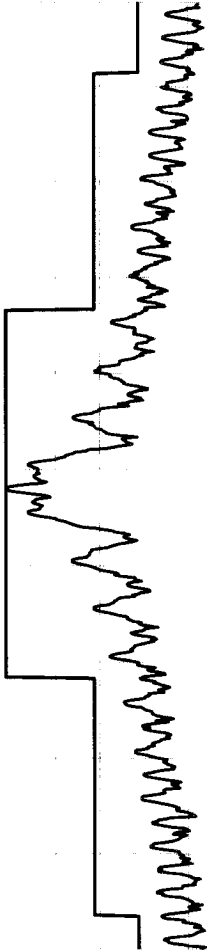
Certification VSWR

406 MHz

22 °C

CF : 406,025 MHz

SP : 16 KHz



Rb : 0,1 KHz

St : 4,8 S

10 dB/div.

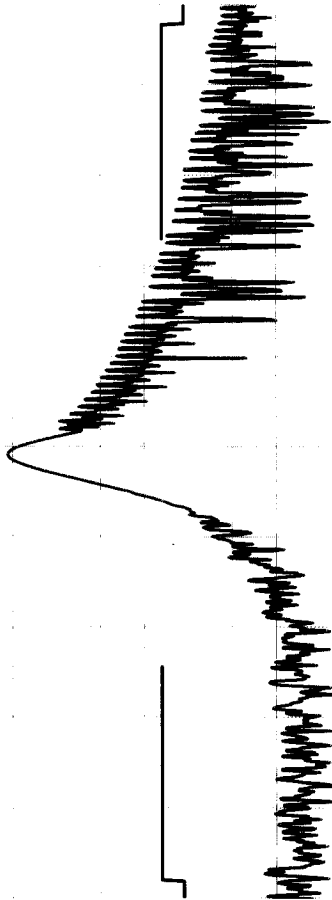
CF : 406,025 MHz

SP : 50 KHz

CF : 600 MHz

Delta : -36,09 dB

SP : 80000 KHz



Rb : 1 KHz

St : 0,305 S

10 dB/div.

Rb : 100 KHz

10 dB/div.

St : 0,24 S

