APPENDIX
8

USCG Approved Lab Test Report
to
RTCM Specification 76-2002/SC110-STD
(Additional test report qualified the unit floating for Category 1)

Dated 12/14/2002

FCC ID: B66-ACR-PLB100

Type acceptance under Part 95 Subpart K

ACR ELECTRONICS INC
5757 Ravenswood Road
FT. Lauderdale Fl.
(954) 981-3333

DRAWN. Bill Cox	DATE. 4/9/2003
CHECKED.	DATE.
ENG Bill Cox	DATE. 4/9/2003
APVD	DATE.

A	18560	Cover Sheet

RTCM Test Report PLB-100

DRAWING NO **APPENDIX 8**

REV A

METALLURGICAL, INC.
Testing & Consulting Services

2870 Stirling Road · Hollywood, FL 33020-1199 · (954) 925-0499

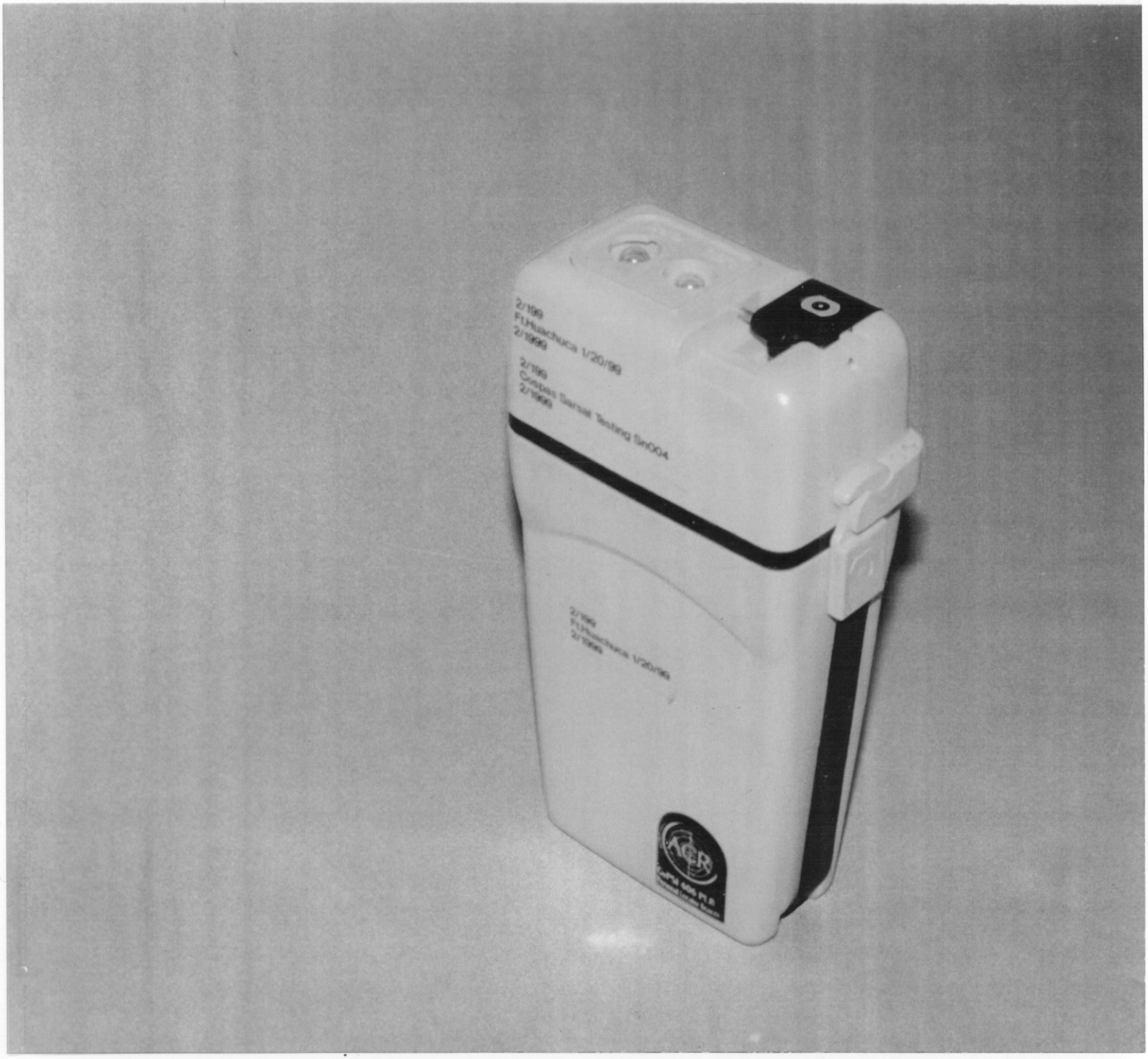
Test Report For PLB-100

Test conducted for:

ACR Electronics, Inc.
5757 Ravenswood Road
Fort Lauderdale, Fl 33312
Ph (954) 981-3333 Fax (954) 983-5087

Test conducted by:

Q. C. Metallurgical, Inc.
2870 Stirling Road
Hollywood, Fl 33020
Ph (954) 925-0499 Fax (954) 925-0988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TEST REPORT
SIGNATURE PAGE

Performance Test for PLB-100

Test conducted for:

ACR Electronics, Inc.
5757 Ravenswood Road
Fort Lauderdale, Fl 33312

Test conducted by:

Q.C. Metallurgical, Inc.
2870 Stirling Road
Hollywood, Fl 33020

Executive Signature
Q.C. Metallurgical, Inc.

R. Dean Stickler
Date: 3/17/99

Test Program Directed By:
Q.C. Metallurgical, Inc.

J. Bankemper, Jr.
Date: 3/17/99

Test Witnessed By:
ACR Electronics, Inc.

William Cox
Date: 3/17/99

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SUMMARY

Subject: **Environmental and Operational Performance Test For PLB-100.**

Attached is the complete report covering the tests performed on ACR's Model PLB-100.

Tests performed were:

1. Initial Aliveness
2. Humidity
3. Vibration
4. Drop
5. Submersion
6. 121.5 MHz Auxiliary Radio-Locating Device Transmitter
7. Carrier Frequency (121.5 MHz)
8. Output Power (121.5 MHz)
9. Unwanted Emissions
10. Modulation Characteristics
11. Spectrum Characteristics

All test parameters were found to be satisfactory.

J. Bankemper, Jr.
Q.C. Metallurgical, Inc.

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2.0 Initial Aliveness Test

The initial aliveness test was performed on PLB-100, S/N 3.

The unit was checked for:

(a) Frequency accuracy.

(b) Medium and short term stability.

(c) RF power output into a 50 ohm dummy load (5W +/- 3dB).

PLB-100, S/N 3 passed the requirements outlined in the Performance Test Plan Section 2.0.

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SUMMARY OF TEST RESULTS

PARAMETERS TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS			COMMENTS
			$T_{min.}$ (____°C)	$T_{amb.}$ (25±5 °C)	$T_{max.}$ (____°C)	
1. N/A						
2. Initial Aliveness Test						
• Carrier Frequency	406.025 ± 0.002	MHz		406.02493		PLB-100 S/N 3 Passed
• Power Output	35 – 39	dBm		37.75dBm		
• Data Message	2DDC048006FFBFF					
5. Humidity Test 8 hrs @ 40°C						
• Carrier Frequency	406.025 ± 0.002	MHz			T = 40°C 406.02492	
• Power Output	35 – 39	dBm			37.66dBm	
• Data Message	2DDC048006FFBFF					
• Medium term stability - mean slope	≤ 0.001	parts million/ minute			.0003204	Passed
• Short term stability	≤ 0.002	parts/ million in 100 ms			.0002015	

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5.0 Humidity Test

PLB-100, S/N 3 was exposed for 8 hours at 40°C/95% R.H.

The unit was removed from the test chamber and activated within the five minute time period.

Within the fifteen minutes allowed, the unit was checked for:

(a) Frequency accuracy.

(b) Medium and short term stability.

(c) RF power output into a 50 ohm dummy load (5W +/- 3dB).

PLB-100, S/N 3 passed the humidity test requirements outlined in the Performance Test Plan Section 5.0.

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6.0 Vibration Test

PLB-100, S/N 3 was exposed to a loose cargo environment.

The test duration was divided into six periods. At the end of each period the unit was rotated on to a different face so that at the end of the total duration, the unit rested on each of its' six sides.

The PLB-100 did not activate during exposure to the vibration test. The exterior mechanical inspection revealed no damage.

The unit was checked for:

(a) Frequency accuracy.

(b) Medium and short term stability.

(c) RF power output into a 50 ohm dummy load (5W +/- 3dB).

PLB-100, S/N 3 passed the vibration test as outlined in the Performance Test Plan Section 6.0.

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SUMMARY OF TEST RESULTS

PARAMETERS TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS			COMMENTS
			$T_{min.}$ (____°C)	$T_{amb.}$ (25±5 °C)	$T_{max.}$ (____°C)	
6. Vibration Test						
• Mechanical Inspection (nothing loose)	No Damage					No Damage
• Aliveness Test						
- Carrier Frequency	406.025 ± 0.002	MHz		406.02493		
- Power Output	35 – 39	dBm		37.41dBm		
- Short term stability	≤ 0.002	parts/ million 100 ms		.0001454		
- Medium term stability	≤ 0.001	parts million/ minute		.0005449		

SUMMARY OF TEST RESULTS

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7.0 Drop Test

PLB-100, S/N 3 was placed in its' transportation case. The unit was dropped from 122 cm six times, once on each face.

Upon completion of the drop test, an exterior and interior inspection was performed.

Within fifteen minutes the unit was checked for:

(a) Frequency accuracy.

(b) Medium and short term stability.

(c) RF power output into a 50 ohm dummy load (5W +/- 3dB).

PLB-100, S/N 3 passed the drop test outlined in the Performance Test Plan Section 7.0.

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PARAMETERS TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS			COMMENTS
			$T_{min.}$ (____°C)	$T_{amb.}$ (25±5 °C)	$T_{max.}$ (____°C)	
7. Drop Test (122 cm x 6)						
On Hard Surface (2 inch plywood)						
• Exterior Mechanical Inspection (nothing loose)	No Damage					Passed No Damage
• Aliveness Test						
- Carrier Frequency	406.025 ± 0.002	MHz		406.02493		
- Power Output	35 – 39	dBm		37.51		
- Short term stability	≤ 0.002	parts/ million/ 100 ms		.0001453		
- Medium term stability	≤0.001	parts/ million/ minute		.0003825		

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8.0 Submersion Test

PLB-100, S/N 3 was submerged in water at 18°C +/- 2°C. The unit was placed at a depth of one meter for one hour.

Upon removal, the PLB was wiped dry and opened for examination. There was no evidence of water leakage.

Fifteen minutes after the power was applied, the unit was checked for:

(a) Frequency accuracy.

(b) Medium and short term stability.

(c) RF power output into a 50 ohm dummy load (5W +/- 3dB).

PLB-100, S/N 3 passed the submersion test outlined in the Performance Test Plan Section 8.0.

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SUMMARY OF TEST RESULTS

PARAMETERS TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS			COMMENTS
			$T_{min.}$ (____°C)	$T_{amb.}$ (18±2°C)	$T_{max.}$ (____°C)	
8. Submersion Test						
• Aliveness Test						
- Carrier Frequency	406.025 ± 0.002	MHz		406.02493		
- Power Output	35 – 39	dBm		37.54dBm		
• Interior exterior mechanical Inspection	No water or damage					Passed

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9.0 121.5 MHz Auxiliary Radio-Locating Device Transmitter Test.

9.1 Carrier frequency (121.5 MHz).

9.2 Output Power (121.5 MHz).

9.3 Unwanted Emissions.

9.4 Modulation Characteristics.

9.5 Spectrum Characteristics.

The above tests were conducted by James Jesse of Atlantic Coast Engineering Systems, Inc. on behalf of Q.C. Metallurgical, Inc.

PLB-100, S/N 3 passed the requirements outlined in the Performance Test Plan.

Test results and graphs are attached.

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SUMMARY OF TEST RESULTS

PARAMETERS TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	Nominal Supply Voltage TEST RESULTS									
			-40°C	-30°	-20°	-10°	0°	+10°	+20°	+35°	+45°	+55°
9.1 Auxiliary Radio-locating Device Transmitter test												
• Carrier Frequency	121.5 MHz ± 6.075	KHz	-0.3	0.8	1.41	1.71	1.74	1.57	1.24	0.76	0.46	0.30
• Carrier Frequency (20°C) +15% Supply Voltage	121.5 MHz ± 6.075	KHz							1.24			
• Carrier Frequency (20°C) -15% Supply Voltage	121.5 MHz ± 6.075	KHz							1.24			
9.2 Auxiliary Radio-locating Device Transmitter Test												
• Output Power	14 Min	dBm	20.43	20.5	20.5	20.4	20.4	20.4	20.4	20.3	20.3	20.2
• Output Power (20°C) +15% Supply Voltage	14 Min	dBm							20.4			
• Output Power (20°C)–15% Supply Voltage	14Min	dBm							20.4			

J. Bankemper, Jr.
Q.C. Metallurgical, Inc.

SUMMARY OF TEST RESULTS

PARAMETERS TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS			COMMENTS
			$T_{min.}$ (-40.9 °C)	$T_{amb.}$ (22.1 °C)	$T_{max.}$ (55.6 °C)	
9.3 Auxiliary Radio-locating Device Transmitter Test						
• Spurious Emissions 121 MHz	Figure 1	(attach graph)				
9.4 Auxiliary Radio-locating Device Transmitter Test						
• Modulation						
- Frequency	≥ 700 Hz within range of 300 – 1600 Hz	Hz	902.3 339 1241.3	892.3 338.7 1231	889.4 341.3 1230.7	DIFFERENCE MIN MAX
- Direction	Upward					
- Duty Cycle	33 – 55	%	36%	37.9%	39.4%	
- Factor	0.85 – 1.0	#	1	1	1	
- Sweep repetition rate	2 - 4	Hz	3	3	3	

J. Bankemper, Jr.
Q.C. Metallurgical, Inc.

SUMMARY OF TEST RESULTS

PARAMETERS TO BE MEASURED DURING TESTS	Power in dBm	Power in mW	Power in Carrier	Carrier Bandwidth	COMMENTS
9.5 Auxiliary Radio-locating Device Transmitter Test					
• Spectrum					
- Range of specification			≥30%	≤ 60 Hz	
- Carrier	12.5	17.8			
- LSB1	9.3	8.5			
- LSB3	0.8	1.2			
- LSB5	-3.6	0.44			
- LSB7	-9.5	0.11			
- LSB9	-14.4	0.04			
- USB1	9.6	9.1			
- USB3	1.0	1.26			
- USB5	-2.4	0.58			
- USB7	-9.3	0.12			
- USB9	-13.8	0.04			
- % Power in Carrier			45.4		
- Carrier Bandwidth				30	Hz

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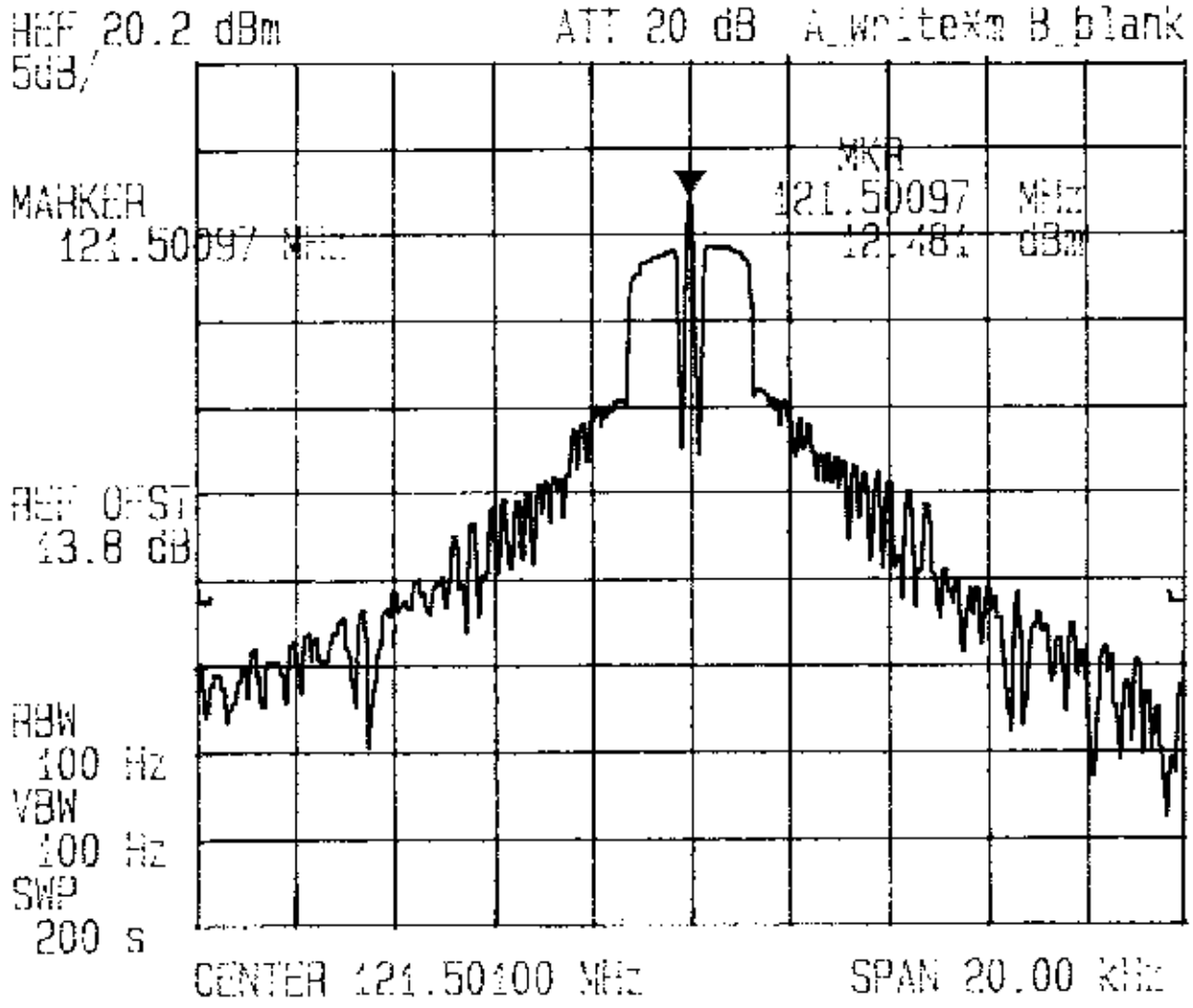
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5dB/
MKR
121.50097 MHz
12.48 dBm
MARKER
121.50097 MHz
REF OFST
13.8 dB
RBW
100 Hz
VBW
100 Hz
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CENTER 121.50100 MHz
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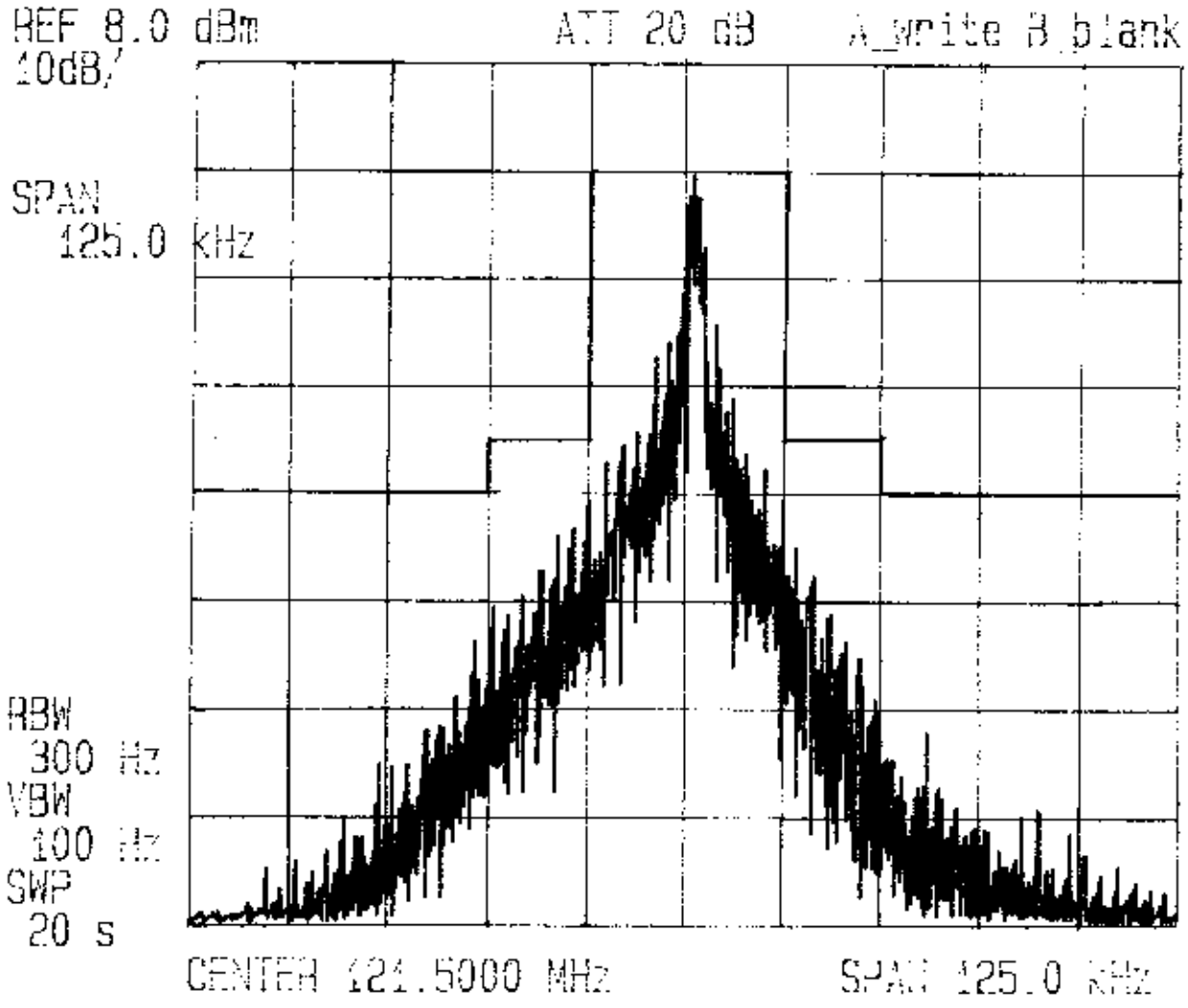
REF 8.0 dBm
ATT 20 dB
A_Write B_blank
10dB/
SPAN
125.0 kHz
RBW
300 Hz
VBW
100 Hz
SWP
20 s
CENTER 121.5000 MHz
SPAN 125.0 kHz

SUMMARY OF TEST RESULTS

PARAMETERS TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS			COMMENTS
			$T_{min.}$ (____°C)	$T_{amb.}$ (25 °C)	$T_{max.}$ (____°C)	
Auxiliary Radio-locating Device Transmitter Test						
• Peak Effective Radiated Power						
- Pattern	Omnidirectional	✓		✓		
- Polarization	Vertical	✓		✓		
- Median PERP (of 12)	25 – 100	mW		48.37		
- Maximum – minimum (of 11)	≤ 6	dB		1.96		