

**TEST REPORT
FOR
MODEL SRB-406 EMERGENCY LOCATOR TRANSMITTER
PN P3-03-0041 Series
ANTENNA SEALING**

Y3-02-0531

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REVISIONS

Revision	Date	Change Description	Approval
-	3/17/03	ECO #13695	T. Cohen

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1.0 PURPOSE AND OBJECTIVE

This test plan describes the inspections and tests performed to demonstrate that the antenna sealing difficulties discovered during Model SRB-406 Emergency Locator Transmitter qualification testing program have been corrected by the supplier, Myers Engineering International, Inc.

2.0 SCOPE

These inspections and tests apply to Myers Engineering International, Inc. antenna PN UL-4060-T111, revision C (DME Corporation PN P3-03-0040-001, revision (-)).

3.0 REFERENCE DOCUMENTS

3.1 Federal Aviation Administration

Technical Standard Order TSO-C91a, Emergency Locator Transmitter (ELT) Equipment

Technical Standard Order TSO C126, 406 MHz Emergency Locator Transmitter (ELT)

3.2 DME Corporation

Engineering Drawing P3-03-0040, Revision (-), Antenna Assembly, Triple Frequency, SRB-406.

Engineering Drawing P3-03-0041, Revision (-), Single/Dual Antenna, SRB-406 Beacon

Engineering Test Procedure Y1-02-1054, Revision (-), Aliveness Test Procedure for the SRB, Model 406

4.0 DESCRIPTION AND DISPOSITION OF TEST SPECIMENS

4.1 Test Specimen Description

Two each PN UL-4060-T111, revision C antennas were selected from a production lot and subjected to the tests specified herein. The antennas selected for testing were mounted to an operational Model SRB-406 beacon per DME Corporation drawing P3-03-0041-002.

4.2 Disposition of Test Items and Test Specimens

Unless otherwise specified, test specimen will be held for a minimum of one year after release of the test report.

5.0 TEST PROCEDURES AND RESULTS

5.1 Test Procedure

The antennas and beacon were subjected to a salt spray test per RTCA DO-204, paragraph 2.3.12.

5.2 Test Results

The antennas passed the salt spray test. The test laboratory test report is provided as Attachment A. The aliveness test results are provided as Attachment B.

6.0 CONCLUSIONS

Based on this testing, the antenna manufacturer has developed a sealing process that is effective at sealing the antenna circuitry from the moisture and water developed during a salt spray test.

ATTACHMENT A

Qualtest, Inc. Salt Spray Test Report
Report No. 03917

Notice is hereby given that all data contained in, revealed by, or shown in this document are
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Report Date: 18 February 2003

Customer P.O.: 55242

Test Period: 14 through 18 February 2003

Security Classification: NA

TEST REPORT

FOR

ENVIRONMENTAL TESTING OF THE P/N MODEL SRB-406

SURVIVAL RESCUE BEACON (RAFT MOUNTED) AND ANTENNA

TESTING PERFORMED BY:

FOR:

QUALTEST, INC.

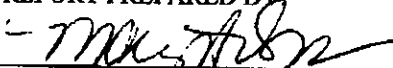
5325 Old Winter Garden Road
Orlando, Florida 32811-1520

DME CORPORATION

6830 NW 16th Terrace
Ft. Lauderdale, FL 33309

Website: www.qualtest.com

TEST REPORT PREPARED BY:


Mary Webb, Technical Documentation Specialist

QUALITY ASSURANCE:


Mike McCord, Quality Assurance Manager

"CQA Performed IAW One Book"

Not Required

Bill Kennedy, DCM Orlando QAS, S1002A

APPROVED BY:


Todd Scarborough, General Manager

being duly sworn, deposes and says that the information contained in this report is the result of complete and carefully conducted tests and is to the best of his knowledge true and correct in all respects. Subscribed and sworn to before me,


Susan Kingdon Fields, Notary Public in and for the State of Florida at large, this

20th day of February, 2003.

State of Florida, County of Orange

 Susan Kingdon Fields
My Commission CC885940
Expires August 24, 2003

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REPORT REVISION RECORD

REVISION DESCRIPTION OF CHANGE

INITIAL RELEASE

TABLE OF CONTENTS

<u>TITLE</u>	<u>PAGE</u>
FOREWORD	2
SECTION 1	2
SALT SPRAY TEST SUMMARY	2
1-1 TEST HARDWARE	2
2-1 TEST REQUIREMENTS	2
3-1 TEST SETUP	2
4-1 TEST DESCRIPTION	2
5-1 TEST RESULTS	2
Figure 1-1. Test setup for salt spray.	2
Figure 2-1. Condition of test items following salt exposure.	2
Figure 3-1. Condition of Antenna S/N 0109 following salt exposure.	2
Figure 4-1. Condition of Antenna S/N 0099 following salt exposure.	2
Figure 5-1. Condition of Model SRB-406 Survival Rescue Beacon following salt exposure.	2

This laboratory maintains A2LA accreditation to ISO/IEC 17025 for the specific tests listed in A2LA Certificate #1805.01 and meets the relevant quality systems requirements of ISO 9001:1994. The test results included in this report, however, are not covered by this accreditation.

FOREWORD

The objective of this test program was to subject customer provided test hardware to environmental simulation in compliance with customer stated specifications, including any authorized modifications, deviations or concessions to the original requirements. Test hardware consisted of items identified in the appropriate sections of this report. In addition to test hardware identification, each section contains information that describes the associated test setup and performance, and the resulting data. Qualtest measuring instruments used in testing were calibrated according to the requirements of ANSI/NCSL Z540-1-1994 and are NIST traceable. Calibration records are on file and available for inspection by request. Because the test methods are well established and are qualitative or semi-quantitative in nature, Qualtest does not apply measurement uncertainty unless obligated by contract. Measured value related to the corresponding tolerance requirement is used to decide whether a test meets the requirements of the specification. Any test hardware operational setups and resulting evaluations or inspections performed by the customer are not included in this report, unless they were explicitly requested. While observations and/or specification compliance statements may be reported, no interpretations or opinions regarding customer product performance are intended. Unless otherwise indicated in the appropriate report section, all contract obligations were met and the test objective achieved.

SECTION 1

SALT SPRAY TEST SUMMARY

Test Start-Finish Dates: 14 through 18 February 2003

Responsible Test Technician: Ross Blanco

1-1 TEST HARDWARE

One (1) Model SRB-406 Survival Rescue Beacon (Raft Mounted) [also referred to as Emergency Locator Transmitter (ELT)], S/N 2008

Two (2) unmarked Model SRB-406 Survival Rescue Beacon (Raft Mounted) [also referred to as Emergency Locator Transmitter (ELT)] Antennae, S/N 0099 and 0109

2-1 TEST REQUIREMENTS

2.1-1 Test Specification:

Primary: Table 1 "Environmental Tests-ELT Product" of the DME Corporation document titled "Test Summary Model 406 Triple Frequency ELT Certification and Qualification Testing"

Reference:

C91a, Section 2.3.11 of RTCA/DO-183, and Section 14 of RTCA/DO-160A

TSO-C126, Section 2.3.12 of RTCA/DO-204, and Section 14 of RTCA/DO-160C

2.2-1 Limitations or Departures from the Test Requirements and Authorizing Source:

None

2.3-1 Test Parameters with Tolerances:**SALT SPRAY**

Chamber Temperature	Salt Solution	Total Exposure Period
35±2°C	5±1%	48-hours

Tolerance Reference: Qualtest Default

Standard Ambient: 25±10°C, 20 – 80% Relative Humidity, Site Pressure

Elapsed Time: ±5 minutes of specified duration > 8 hours

Recommended Water Purity:

pH range of 6.5 to 7.2; resistivity range of 150,000 ohm cm to 250,000 ohm cm

(Qualtest uses distilled water for salt fog to comply with this)

Salt Fog Fallout: 0.5 to 3.0 ml/80cm²/hr

Salt Fog pH: 6.5 to 7.2

Specific Gravity: 1.0255 to 1.0400

3-1 TEST SETUP**QUALTEST FURNISHED MEASUREMENT AND TEST EQUIPMENT**

QTI #	Item	Manufacturer	Model Number	Calibration Due
100002	Thermo/Hygrometer	Amprobe	TH-2	5/6/2003
100036	Salt Fog Cabinet	Harshaw/Filtrol	GS SCH #22	NA
100136	Scale	Setra	EL410D	9/13/2003
100140	pH Meter	Denver Instrument	Accumet Basic	Before Use
100185	Gauge	Ashcroft	Durlife	Not required
100191	Chart Recorder	Honeywell	DR450T-1000-00	6/17/2003

SALT SOLUTION COMPONENTS

Solution Ingredients	Manufacturer	Lot Number
Sodium Hydroxide	LabChem	226315
Distilled Water	Crystal Springs Water	NA
Sodium Chloride	Fisher Scientific	25206

The salt solution was prepared using 95 parts (by weight) of distilled water and 5 parts (by weight) of sodium chloride. The sodium chloride had a minimum purity of 99.8% and contained less than 0.002% sodium iodide, as certified by the manufacturer. The pH was maintained between 6.5 and 7.2 using, as needed sodium hydroxide. Chamber operation to specification was verified prior to installing the test items.

4-1 TEST DESCRIPTION

4.1-1 Laboratory Ambient Conditions:

Temperature (°C): 20 to 22
Relative Humidity (%): 45 to 65
Atmospheric Pressure: Site Ambient

4.2-1 Non-Qualtest Personnel, Including Organization, Present for All or Part of the Test:

None

4.3-1 Powered/Operational State of the Hardware and by Whom:

The test items were not operating.

4.4-1 Test Activities and Resulting Measurements from Observed/Recorded Data:

Samples of the salt solution were collected, measured, and tested daily to ensure conformance to the specification requirements for fallout rate, pH, and specific gravity.

Date	Collection Rate (ml/hr) Nearest to Atomizer	Collection Rate (ml/hr) Furthest from Atomizer	pH	Specific Gravity
02/15/03	1.180	1.140	6.64	1.031
02/16/03	1.210	1.070	6.69	1.031

Following salt exposure, the test items were removed from the salt spray chamber and stored at laboratory ambient conditions for forty-eight (48) hours.

Antenna S/N 0109 exhibited signs of rust corrosion at the base of the antenna stem.

Antenna S/N 0099 did not show any signs of rust corrosion.

The Model SRB-406 Survival Rescue Beacon exhibited signs of rust corrosion on the beacon initiator.

5-1 TEST RESULTS

The customer retained any results related to functional tests. The test items were returned to the customer following the completion of the test. Environmental test data are located after Figure 7-1.

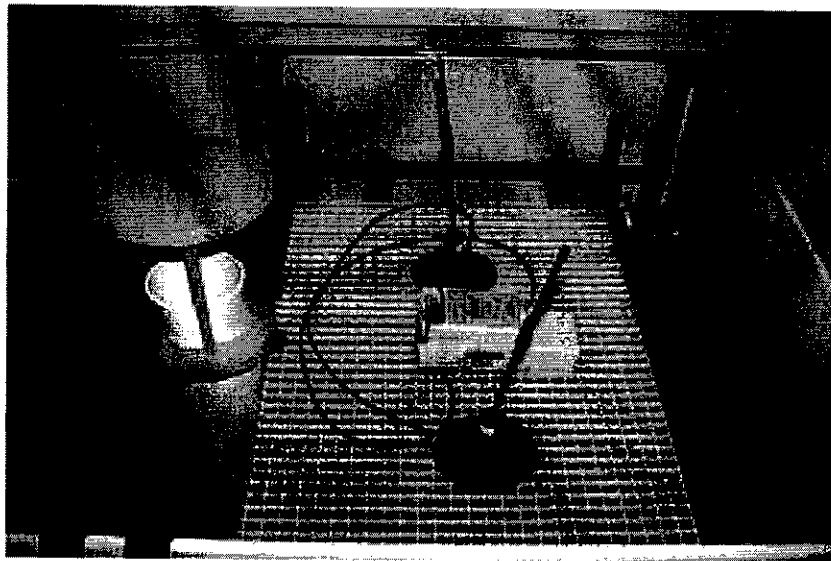


Figure 1-1. Test setup for salt spray.

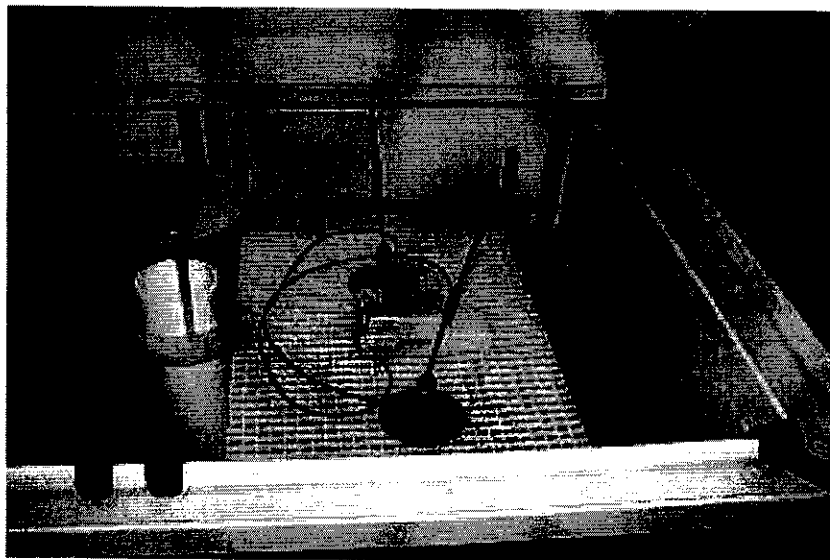


Figure 2-1. Condition of test items following salt exposure.

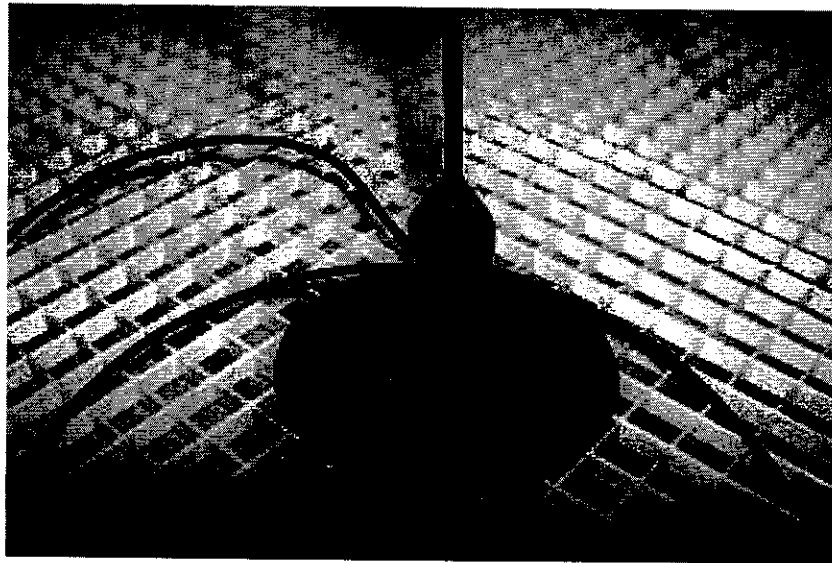


Figure 3-1. Condition of Antenna S/N 0109 following salt exposure.

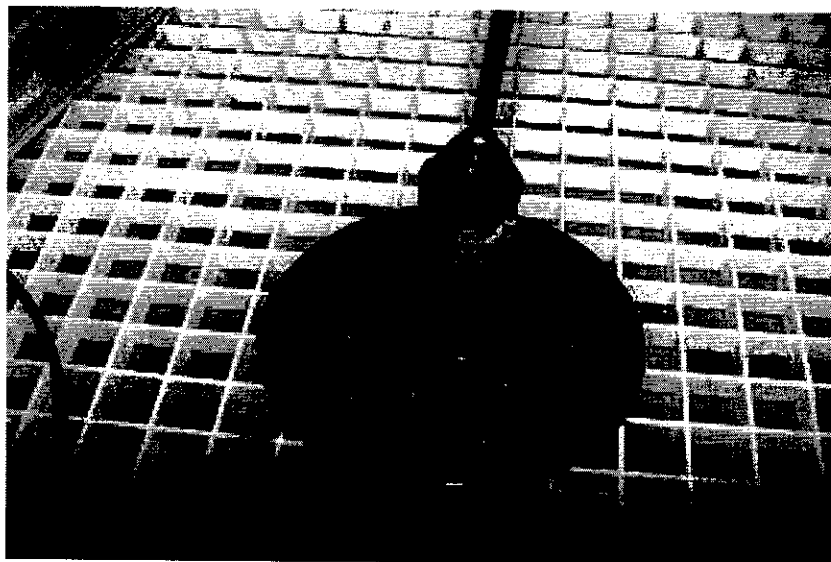


Figure 4-1. Condition of Antenna S/N 0099 following salt exposure.

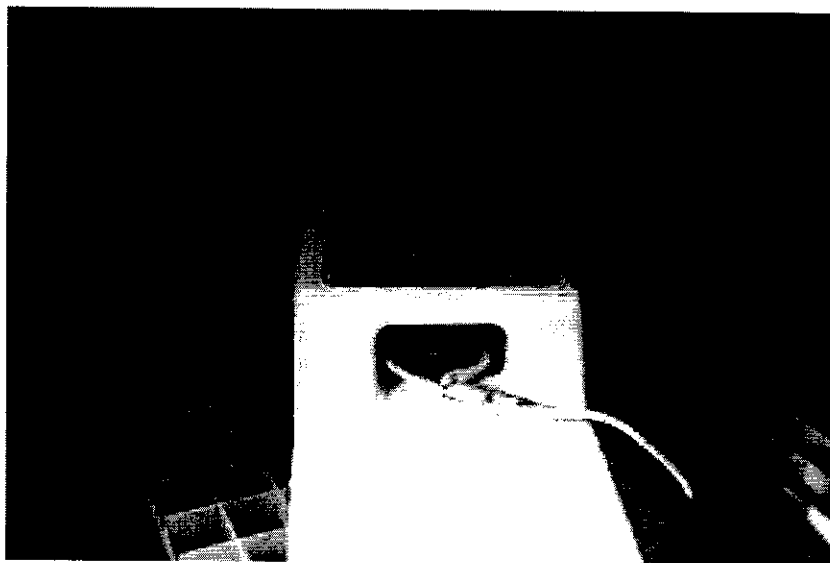
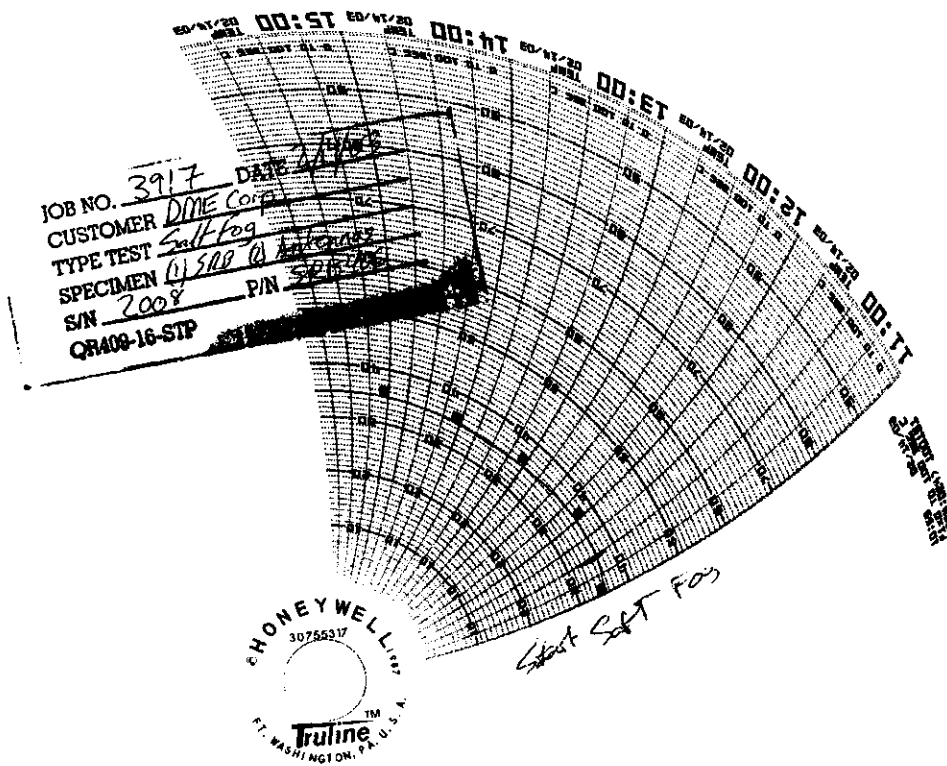
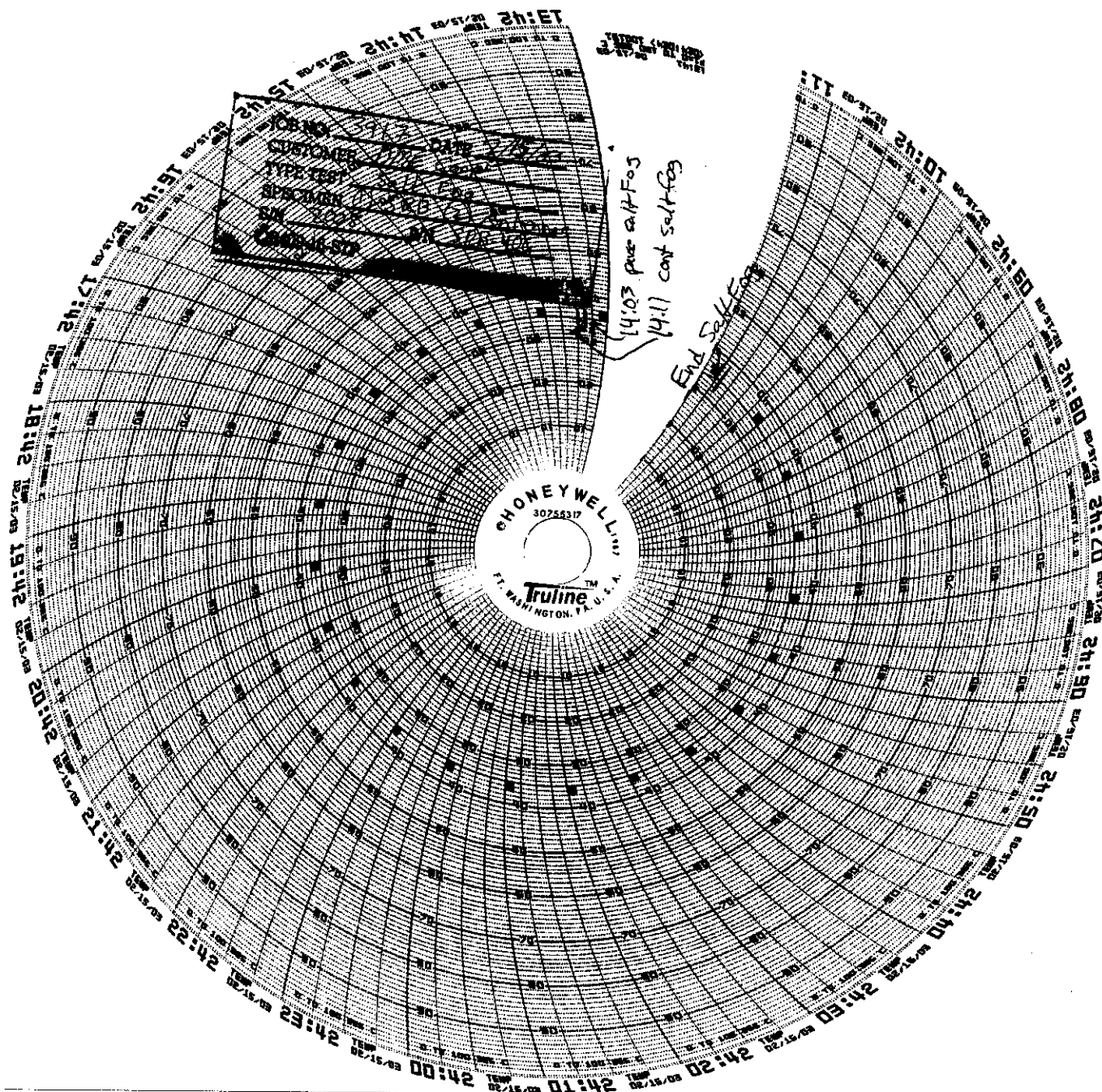


Figure 5-1. Condition of Model SRB-406 Survival Rescue Beacon following salt exposure.





ATTACHMENT B

Beacon Assembly Aliveness Test Results

Qualification Data Sheet

Date: <u>2/18/03</u>	Test: <u>POST SALT FOG</u>
Test Unit Description	SRB-406 ELT, PN P3-03-0041-001, revision 05, Serial # <u>2008</u>
Test Unit Configuration	Antenna "A" PN A3-06-2053-001 rev 02 SN <u>99</u> Antenna "B" PN A3-06-2053-001 rev 02 SN <u>109</u> Digital CCA PN A3-07-0038-800 rev 07 SN <u>0022</u> RF CCA PN A3-07-0039-800 rev 07 SN <u>0018</u> Battery pack A3-03-1006-001 rev 04 SN <u>020141</u> Lanyard PN A3-05-0099-001 rev 03.
Description of Test Method (ex: Eurocae ED-62, para x.x)	<u>DO 2.3, 2.3.12</u> <u>204</u>
Pass/Fail Criteria	<u>DO - 2.3, 2.3.12</u> <u>204</u>
Authorized Deviations	<u>N/A</u>
Test Location	<u>DME, ORLANDO</u>
Purchase Order #	<u>—</u>
Test Equipment Arrangement (if necessary)	<u>N/A</u>
List of Calibrated Equipment	<u>N/A</u>
DME Test Engineer	<u>KEN HEPPT</u>
DME QA Representative	<u>KEN KOTYK</u>
Lab Test Engineer/Technician	<u>N/A</u>
Other Witness	<u>—</u>
Test Unit Authorized Deviations	<u>N/A</u>
Test Data	1. press self test switch → <u>PASSES</u> self test. 2. pull pin... no activation. 3. WET ANT 'A' → unit activates. (<u>PASS</u>) 4. Replace pin, dry off antenna... <u>REPEAT W/ANT 'B' → PASS</u>
Data Reduction/Calculations	<u>PASS</u>
Test Deviations	<u>N/A</u>
Test Performed Prior to this Test	<u>N/A</u>
Next Test to be Performed	<u>N/A</u>
Test Engineer Signature	<u>[Signature]</u> <u>2/18/03</u>
QA Signature	<u>KEN KOTYK</u> <u>2/18/03</u>
Other Witness Signature	<u>N/A</u>
NMR #	<u>N/A</u>
Notes	<u>N/A</u>

POST SALT GROUND/FOG

Y1-02-1054 Rev. -
September 12, 2002

TEST DATA SHEETS
RF BEACON ASSEMBLY
P3-03-0041-001

Tested By: ALHANT

DATE: 2/28/03

Beacon P3-03-0041-001 Serial Number: 2008

AUT A = 0099

AUT B = 0109

RF = 0018

DIG = 0022

BATT 020141

Test Equipment	Model	Serial No. or Control No.	Cal. Due
SPECAW	HP 8568B	OR3063	9/18/03
GENERATOR	HP 8656B	OR1091	5/18/03
MODAWA #1	HP 8901B	OR1093	2/30/03
SLOPE	HP 54510B	OR0627	8/29/03
MODAWA #2 (for source)	HP 8901B	71N 3704A05771	12/11/03
POWER SENSOR	HP 8481A	OR092	2/29/03



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TEST DATA SHEETS
RF BEACON ASSEMBLY
P3-03-0041-001

SPECTRUM ANALYZER OFFSET DETERMINATION AND PRETEST					
Para.	Description	Min.	Results	Max.	Pass / Fail (circle one)
3.3	HP8656 setting for 121.5MHZ	-0.5	<u>0.3</u> dBm	+0.5	<u>P</u> F
3.4	HP8656 setting for 243 MHZ	-0.5	<u>0.3</u> dBm	+0.5	<u>P</u> F
3.5	HP8656 setting for 406.028 MHZ	-0.5	<u>0.3</u> dBm	+0.5	<u>P</u> F

Pass

BIST and turn on tests					
Para.	Description	Min.	Results	Max.	Pass / Fail (circle one)
4.1.1	Beacon passes self test and goes off	N/A	<u>✓</u> chk	N/A	<u>P</u> F
4.1.2	Beacon stays off	N/A	<u>✓</u> chk	N/A	<u>P</u> F
4.1.3	Beacon transmits when .B antenna is touched.	N/A	<u>✓</u> chk	N/A	<u>P</u> F
4.1.4	Beacon goes off when magnet is installed.	N/A	<u>✓</u> chk	N/A	<u>P</u> F
4.1.5	Beacon transmits when A antenna is touched.	N/A	<u>✓</u> chk	N/A	<u>P</u> F
4.1.6	Beacon goes off when magnet is installed.	N/A	<u>✓</u> chk	N/A	<u>P</u> F

Pass

ORL
SC01
DME
CK

TEST DATA SHEETS
RF BEACON ASSEMBLY
P3-03-0041-001

RF beacon 121.5/243 Mhz Tests					
Para.	Description	Min.	Results	Max.	Pass / Fail (circle one)
4.2.1	Peak Power at 121.5 MHZ	17.0dBm	<u>20.6</u> dBm	N/A	(P) F
	Antenna gain including feeder and mismatch losses for 121.5 Mhz obtained from antenna field tests.	N/A	<u>-1.0</u> dB	N/A	N/A
	Peak power + antenna gain= EIRP	20dbm EIRP	<u>19.6</u> dBm	N/A	(P) F
4.2.2	Frequency 121.5 MHz $\pm$ 6 kHz	121.494	<u>121.501</u> MHz	121.506	(P) F
4.2.3	Peak Power at 243 MHZ	17.0dBm	<u>20.4</u> dBm	N/A	(P) F
	Antenna gain including feeder and mismatch losses for 243 Mhz obtained from antenna field tests.	N/A	<u>3.7</u> dB	N/A	N/A
	Peak power + antenna gain= EIRP	20dbm EIRP	<u>24.1</u> dBm	N/A	(P) F
4.2.4	Frequency 243 MHz $\pm$ 12 kHz	242.988	<u>243.0024</u> MHz	243.012	(P) F
4.2.5	121.5 Mhz Modulation depth	N/A	<u>-47.6</u> dBc	-22dBc	(P) F
4.2.6	121.5 /243 Mhz Duty cycle	45%	<u>61%</u>	67%	(P) F
4.2.7	Max audio frequency	N/A	<u>1498</u> Hz	1600	(P) F
	Min audio frequency	300	<u>363</u> Hz	N/A	(P) F
	Max - Min	100 N/A	<u>1135</u> Hz	700 N/A	(P) F
4.2.8	Sweeps in 10 seconds	20	<u>30</u> count	40	(P) F



ISO 9001 CERTIFIED



TEST DATA SHEETS
RF BEACON ASSEMBLY
P3-03-0041-001

RF beacon 406.028 Mhz Tests					
Para.	Description	Min.	Results	Max.	Pass / Fail (circle one)
4.3.1	Peak Power at 406.028 MHZ	35.0dBm	36.00 dBm	N/A	(P) F
	Antenna gain including feeder and mismatch losses for 406.028 Mhz obtained from antenna field tests.	N/A	0.15 dB	N/A	N/A
	Peak power + antenna gain= EIRP	32.0dbm EIRP	36.15 dBm	N/A	(P) F
4.3.2	Frequency Accuracy 406.028 MHz $\pm$ 1 kHz	406.0270	406.02803 MHz	406.0290	(P) F

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[Circular stamp: OK 9001 DME]
[Handwritten initials: KP]