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**FCC PART 80**  
**CLASS II PERMISSIVE CHANGE**  
**RADAR TEST REPORT**

|                      |  |
|----------------------|--|
| APPLICANT            | ALPHATRON MARINE USA, INC.   |
|                      | 1205 BUTLER ROAD   |
|                      | LEAGUE CITY TX 77573 USA   |
| FCC ID               | 2ADJKJMA-610   |
| MODEL NUMBER         | JMA-610  |
| PRODUCT DESCRIPTION  | MARINE RADAR   |
| DATE SAMPLE RECEIVED | 7/21/2015  |
| DATE TESTED          | 8/10/2015  |
| TESTED BY            | Sid Sanders  |
| APPROVED BY          | Cory Leverett  |
| TEST RESULTS         | <input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL |

| Report Number            | Version Number | Description   | Issue Date |
|--------------------------|----------------|---------------|------------|
| 1461AUT15TestReport.docx | Rev.1          | Initial Issue | 8/14/2015  |

**THE ATTACHED REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL OF TIMCO ENGINEERING, INC.**

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## GENERAL REMARKS

The attached report shall not be reproduced except in full without the written permission of Timco Engineering Inc.

The test results relate only to the items tested.

## Summary

The device under test does:

- Fulfill the general approval requirements as identified in this test report
- Not fulfill the general approval requirements as identified in this test report

## Attestations

This equipment has been tested in accordance with the standards identified in this test report. To the best of my knowledge and belief, these tests were performed using the measurement procedures described in this report.

All instrumentation and accessories used to test products for compliance to the indicated standards are calibrated regularly in accordance with ISO 17025:2005 requirements.

I attest that the necessary measurements were made, under my supervision, at:

**Timco Engineering Inc.**  
**849 NW State Road 45**  
**Newberry, FL 32669**

**Authorized Signatory Name:**



Sid Sanders  
Engineering Project Manager

**Date:** 14 August 2015

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Applicant: ALPHATRON MARINE USA, INC.  
FCC ID: 2ADJKJMA-610  
Report: a\Alphatron\1461AUT15\1461AUT15TestReport.docx

## EUT SPECIFICATION

|                     |   |
|---------------------|---|
| EUT Description     | MARINE RADARMARINE RADAR                              |
| FCC ID              | 2ADJKJMA-610  |
| Model Number        | JMA-610   |
| Serial Number       | N/A   |
| Operating Frequency | 9400 MHz  |
| No. of Channels     | 1   |
| Type of Emission    | 9300-9500 MHz   |
| Modulation          | PON   |
| EUT Power Source    | <input type="checkbox"/> 110–120Vac/50– 60Hz          |
|                     | <input checked="" type="checkbox"/> DC Power (24 VDC) |
|                     | <input type="checkbox"/> Battery Operated Exclusively |
| Test Item           | <input type="checkbox"/> Prototype                    |
|                     | <input type="checkbox"/> Pre-Production               |
|                     | <input type="checkbox"/> Production                   |
| Type of Equipment   | <input type="checkbox"/> Fixed                        |
|                     | <input type="checkbox"/> Mobile                       |
|                     | <input type="checkbox"/> Portable                     |

## TEST SETUP INFORMATION

|                      |   |
|----------------------|---|
| Test facility        | <b>Timco Engineering, Inc. 849 NW State Road 45, Newberry, FL 32669</b>   |
| Test Condition       | The EUT was tested under normal temperature and humidity. The temperature was 26°C with a relative humidity of 50%. |
| Modifications        | Tested with Magnetron MAF1562R  |
| Test Exercise        | The EUT was operated in a normal mode.  |
| Applicable Standards | ANSI/TIA 603-C;2004 , FCC CFR 47 Part 80/90   |

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## TEST REPORT SUMMARY

| Rule Part No.             | Scope of Work               | Status<br>Pass/Fail/NA |
|---------------------------|-----------------------------|------------------------|
| <a href="#">2.1051(a)</a> | Antenna Conducted Emissions | Pass                   |

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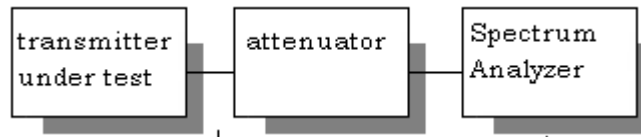
**SPURIOUS EMISSIONS AT ANTENNA TERMINALS (CONDUCTED)**

**Rule Part No.:** Part 2.1051(a) & 80.217

**Requirements:** 43+10log (mean power)  
 43 + 10log (5.7) = 50.55 dB

**Method of Measurement:** The spectrum was scanned from 0.4 to at least the 10th harmonic of the fundamental or 40 GHz. The measurements were made in accordance with standard ANSI/TIA 603 or ANSI 63.4:2009.

The mean power was calculated based on the standard formula for radar systems:  
 $P_a = P_m * T_d * f_r$ . Where  $T_d$  is pulse duration,  $P_m$  is peak power, and  $f_r$  is pulse rep rate.



**Test Data:** Worst case: single pulse mode setting Range 32 (longest pulse)

|              | dBm       | Watts  | Margin |
|--------------|-----------|--------|--------|
| Power Output | Frequency | 5.7    |        |
| LIMIT        | MHz       | 43dBc  |        |
|              |           | dBc    | dB     |
|              | 9400      | 0      |        |
|              | 18800     | 69.04  | 18.49  |
|              | 28200     | 101.20 | 50.65  |
|              | 37600     | 97.37  | 46.82  |
|              | 47000     | 132.96 | 82.41  |
|              | 56400     | 131.06 | 80.51  |
|              | 65800     | 132.77 | 82.22  |
|              | 75200     | 131.04 | 80.49  |
|              | 84600     | 134.76 | 84.21  |
|              | 94000     | 135.19 | 84.64  |
|              |           |        |        |

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**SPURIOUS EMISSIONS AT ANTENNA TERMINALS**

**Test Data:** Worst case: Range 16

|              | dBm       | Watts  | Margin |
|--------------|-----------|--------|--------|
| Power Output | Frequency | 5.7    |        |
| LIMIT        | MHz       | 43dBc  |        |
|              |           | dBc    | dB     |
|              | 9400      | 0      |        |
|              | 18800     | 72.85  | 22.30  |
|              | 28200     | 82.03  | 31.48  |
|              | 37600     | 109.23 | 58.68  |
|              | 47000     | 145.91 | 95.36  |
|              | 56400     | 144.01 | 93.46  |
|              | 65800     | 145.72 | 95.17  |
|              | 75200     | 143.99 | 93.44  |
|              | 84600     | 147.71 | 97.16  |
|              | 94000     | 148.14 | 97.59  |
|              |           |        |        |

Various modes and center frequencies were tested and the worst case presented above. Harmonics were checked to the 10<sup>th</sup> harmonic.

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## EQUIPMENT LIST

| Device                                      | Manufacturer       | Model   | Serial Number | Cal/Char Date | Due Date |
|---|--------------------|---------|---------------|---------------|----------|
| 24 Volt Power Supply                        | Astron             | VLS-25M | 9510040       | 12/12/99      | 12/12/99 |
| Antenna: Log-Periodic Chamber               | Eaton              | 96005   | 1243          | 05/31/13      | 11/30/15 |
| LISN (Primary)                              | Electro-Metrics    | EM-7820 | 2682          | 05/08/15      | 05/08/17 |
| Temperature Chamber LARGE                   | Tenney Engineering | TTRC    | 11717-7       | 08/19/14      | 08/19/16 |
| DC Power Supply                             | HP                 | 6286A   | 2411A09414    | 12/12/99      | 12/12/99 |
| Frequency Counter Large Chamber             | HP                 | 5352B   | 2632A00165    | 07/01/15      | 07/01/17 |
| Frequency Counter Small Chamber             | HP                 | 5385A   | 3242A07460    | 07/01/15      | 07/01/17 |
| 3-Meter Semi-Anechoic Chamber               | Panashield         | N/A     | N/A           | 12/31/13      | 12/31/15 |
| Sweep/Signal Generator                      | Anritsu            | 68369B  | 985112        | 08/29/13      | 08/29/15 |
| Oscilloscope                                | LeCroy             | LT364   | 00414         | 08/22/13      | 08/22/15 |
| EMI Test Receiver R & S ESIB 40 Screen Room | Rohde & Schwarz    | ESIB 40 | 100274        | 08/12/14      | 08/12/16 |
| Software: Field Strength Program            | Timco              | N/A     | Version 4.0   | 12/12/99      | 12/12/99 |
| USB Peak Power Sensor 50 MHz to 18 GHz      | Boonton            | 55318   | 9224          | 11/06/14      | 11/06/16 |
| RF Power Meter                              | Boonton            | 4531    | 11793         | 02/17/15      | 02/17/17 |
| EMI Test Receiver R & S ESU 40 Chamber      | Rohde & Schwarz    | ESU 40  | 100320        | 03/11/14      | 03/11/16 |
| Bi-Directional Coupler                      | HP                 | 778D    | 1144A08107    | 05/06/13      | 05/06/15 |

### \*EMI RECEIVER SOFTWARE VERSION

The receiver firmware used was version 4.43 Service Pack 3

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