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TEST REPORT

Fusion MS-AL300
Audio Receiver / Processor / Amplifier

tested to

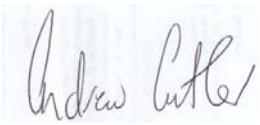
47 Code of Federal Regulations

Part 15 - Radio Frequency Devices

Subpart A + B

for

Fusion Electronics Ltd



This Test Report is issued with the authority of: _____
Andrew Cutler - General Manager

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1. STATEMENT OF COMPLIANCE

The **Fusion MS-AL300 Audio Receiver / Processor / Amplifier** complies with FCC Part 15 Subpart A + B as a Class B Computing Peripheral Device when the methods as described in ANSI C63.4 - 2003 are applied.

2. RESULTS SUMMARY

The results of testing carried out in July and August 2013 are summarised below.

Clause	Parameter	Result
15.101	Equipment authorisation requirement.	Certification required as the device would be categorised as a "Class B computer peripheral".
15.103	Exempted devices.	Device is not exempt as it contains a digital device.
15.107	Conducted Emissions 0.15 - 30 MHz	Not applicable. Device is a marine device that would not normally be operated when it could be directly or indirectly connected to the public AC mains supply.
15.109	Radiated Emissions 30 - 1000 MHz	Complies. No emissions detected.
15.111	Antenna Terminal Disturbance 30 – 950 MHz	Not applicable. Device is not a receiver.

3. INTRODUCTION

This report describes the tests and measurements performed for the purpose of determining compliance with the specification.

The client selected the test sample.

This report relates only to the sample tested.

This report contains no corrections or erasures.

Measurement uncertainties with statistical confidence intervals of 95% are shown below test results. Both Class A and Class B uncertainties have been accounted for, as well as influence uncertainties where appropriate.

4. CLIENT INFORMATION

Company Name	Fusion Electronics Ltd
Address	Level 1, 111 Franklin Road Freemans Bay, 1011
City	Auckland
Country	New Zealand
Contact	Mr Phill Cauty

5. DESCRIPTION OF TEST SYSTEM

Brand Name	Fusion
Model Number	MS-AL300
Product	Audio receiver, processor, amplifier
Manufacturer	Forth Corporation Public Company Ltd
Country of Origin	Thailand
Serial Number	Sample not serialized
FCC ID	V5TMS-AL300

The device that was tested is marine stereo system that contains and AM/FM receiver, an audio processor and a power amplifier along with a 2.4 GHz Bluetooth transceiver.

6. RESULTS

Standard

The sample was tested in accordance with 47 CFR Part 15 Subpart A and B.

Methods and Procedures

The following measurement methods and procedures have been applied:

- ANSI C63.4 – 2003

Section 15.101: Equipment authorisation requirement

Certification as detailed in Subpart J of Part 2 is required for this device as it would be classed as a Class B computer peripheral.

Section 15.107: Conducted limits

The device is powered using an external dc supply which is typically a 12 Vdc lead acid battery.

This device cannot be directly or indirectly connected to the public AC mains power supply in normal operations.

Typically this device would be used on board a boat.

Result: Complies.

Section 15.109 – Radiated emissions

Radiated emission testing was carried out over the frequency range of 30 to 1000 MHz as the highest digital device frequency is less than 108 MHz.

The client has declared that the digital device in this device operates using frequencies of 16 MHz and 26 MHz

Testing was carried out at the laboratory's open area test site - located at 670 Kawakawa Orere Rd, RD3, Papakura, New Zealand.

This site conforms to the requirements of CISPR 16 and ANSI C63.4 - 2003.

Before testing was carried out, a receiver Self Test and Internal Calibration was undertaken along with a check of all connecting cables and programmed antenna factors.

The device was placed on the test tabletop, which was a total of 0.8 m above the test site ground plane.

Pre testing of the device was carried out with the device positioned in all three axis (X, Y and Z) with the cables locations being varied to give the worst case emission levels.

Final testing was carried out when the device was placed horizontally (Y axis) in the centre of the test table at a height of 80 cm above the ground plane with the final results recorded being reported in this test report.

Measurements of the radiated field were attempted at 3 metres from the device with no emissions being detected from the digital device within a 20 dB margin of the applicable limit.

Measurements below 1000 MHz were made using a Quasi Peak Detector with a bandwidth of 120 kHz.

When an emission is located, it is positively identified and its maximum level is found by rotating the automated turntable, and by varying the antenna height with an automated antenna tower.

All emissions were measured in both vertical and horizontal antenna polarisations.

The emission level is determined in field strength by taking the following into consideration:

Level (dBμV/m) = Receiver Reading (dBμV) + Antenna Factor (dB) + Coax Loss (dB) – Amplifier Gain (dB)

Result: Complies.
Measurement uncertainty: ± 4.1 dB

7. TEST EQUIPMENT USED

Instrument	Manufacturer	Model	Serial No	Asset Ref	Cal Due
Aerial Controller	EMCO	1090	9112-1062	RFS 3710	Not applic
Aerial Mast	EMCO	1070-1	9203-1661	RFS 3708	Not applic
Turntable	EMCO	1080-1-2.1	9109-1578	RFS 3709	Not applic
Receiver	R & S	ESIB 40	100171	R-27-1	10 Oct 2013
VHF Balun	Schwarzbeck	VHA 9103	-	RFS 3603	30 Jan 2014
Biconical Antenna	Schwarzbeck	BBA 9106	-	RFS 3612	30 Jan 2014
Log Periodic	Schwarzbeck	VUSLP 9111	9111-228	3785	30 Jan 2014

8. ACCREDITATIONS

Testing was carried out in accordance with EMC Technologies Ltd registration with the Federal Communications Commission as a listed facility, registration number: 90838, which was updated in July 2013.

All testing was carried out in accordance with the terms of EMC Technologies (NZ) Ltd International Accreditation New Zealand (IANZ) Accreditation to NZS/ISO/IEC 17025, 2005.

All measurement equipment has been calibrated in accordance with the terms of the EMC Technologies (NZ) Ltd International Accreditation New Zealand (IANZ) Accreditation to NZS/ISO/IEC 17025, 2005.

International Accreditation New Zealand has Mutual Recognition Arrangements for testing and calibration with various accreditation bodies in a number of economies. This includes NATA (Australia), UKAS (UK), SANAS (South Africa), NVLAP (USA), A2LA (USA), SWEDAC (Sweden). Further details can be supplied on request.

9. PHOTOGRAPHS

External Views

Radiated emissions – Worst case test set up