



**Nemko Test Report:** 11455RUS1A

**Applicant:** EF Johnson Company  
123 N. State Street  
Waseca, MN 56093

**Equipment Under Test:** 242-536C  
(E.U.T.)

**In Accordance With:** MPE Requirements CFR 47, Part 2.1091

**Tested By:** Nemko USA, Inc.  
802 N. Kealy  
Lewisville, TX 75057-3136

**TESTED BY:**

David Light, Senior Wireless Engineer

**DATE:** 19 May, 2008

**APPROVED BY:**

Mike Cantwell, Frontline Manager

**DATE:** 21 May, 2008

**Total Number of Pages:** 13

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**Section 1.        Summary of Test Results****Test Rationale**

This testing was patterned after testing done in FCC/OET document ASD-9601, "Measurements of Environmental Electromagnetic Fields at Amateur Radio Stations" and OET Bulletin 65 Edition 97-01, "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields.

Emissions were measured using an isotropic field probe.

The probe reads directly in mW/cm<sup>2</sup>.

<b>Description</b>	<b>Mfgr</b>	<b>Model</b>	<b>Asset</b>	<b>Cal'd</b>	<b>Due</b>
Radiation Monitor	Narda	8116	2061	7/30/2007	7/30/2009

**Conclusion**

In the configuration tested, the E.U.T. [complies](#) with the requirements of MPE Requirements of the FCC Part 2.1091 and 1.1310.

THIS TEST REPORT RELATES ONLY TO THE ITEM(S) TESTED.

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**Section 2.        Equipment Under Test (E.U.T.)**

Manufacturer:        EF Johnson Company

Model No.:            242-536C

Serial No.:            Prototype



Production Unit



Pre-Production Unit

**Description of E.U.T.**

400 MHz Land Mobile Radio transceiver, 45 Watts

Antenna Type	Gain	Installation Type
¼ wave dipole	3 dBi	Magnetic mount - Automotive

The test data in this report is intended to demonstrate that the Occupational/Controlled Exposure RF Exposure limits of FCC 1.1310 are not exceeded with this antenna. This is the only antenna to be used with the radio.

## **Description of Installation**

- Install antennas at the center of the roof or the center of the trunk deck taking into account the bystander exposure conditions of backseat passengers and the recommended minimum lateral distances. These mobile antenna installation guidelines are limited to metal body motor vehicles or vehicles with appropriate ground planes. The antenna installation should additionally be in accordance with: •

The requirements of the antenna manufacturer/supplier. •

Instructions in the Radio Installation Manual, including minimum antenna cable lengths.

•

The installation manual should provide specific information of how to install the antennas to facilitate recommended operating distances to all potentially exposed persons.

- Use only EFJohnson-approved supplied antenna or EFJohnson-approved replacement antenna. Unauthorized antennas, modifications, or attachments could damage the radio and may violate FCC regulations.

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**Section 3. Equipment Configuration****Equipment Configuration List:**

<b>Item</b>	<b>Description</b>	<b>Model No.</b>	<b>Serial.</b>	<b>Rev.</b>
(A)	Radio transceiver	242-536C	Prototype	
(B)	Antenna Specialists Antenna	ASPE1615KM220	None	
(C)				
(D)				
(E)				
(F)				
(G)				

**Inter-connection Cables:**

There are no interconnecting cables. The antenna coax is integrated into the antenna assembly.

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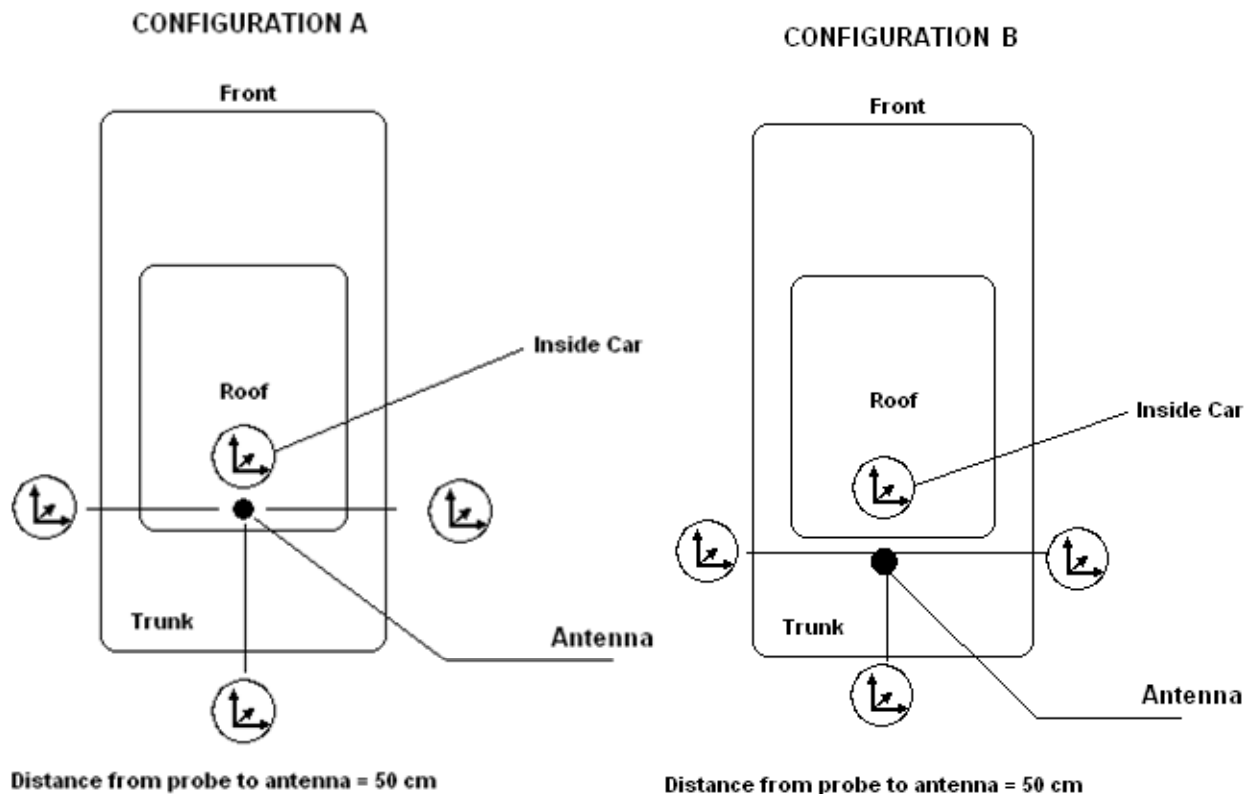
**Configuration of the Equipment Under Test (E.U.T)**

The 242-536C radio is set to to maximum RF output (45 watts) continuous transmission.

Configuration A is with the transmit antenna mounted at the center rear of the automobile roof.

Configuration B is with the transmit antenna mounted at the center of the trunk lid, closest to the rear window.

Measurements were made at positions 50 cm to each side of the antenna as well as to the rear and inside the automobile.



## Section 4. Test Results

**Transmit antenna:** Antenna Specialists model ASPE1615KM220

Configuration	Measurement Distance (cm)	Maximum Measured Power Density (mW/cm <sup>2</sup> )	Maximum Allowable Exposure Time (minutes)	FCC Exposure Power Density Limits (mW/cm <sup>2</sup> )	Averaging Time (minutes)
A	50	0.6	Not limited	1.415	No averaging
B	50(outside vehicle)	0.40	Not limited	1.415	No averaging
B	50(back seat)	0.20	Not limited	General Pop. Limit is 0.283	50% duty cycle
B	100(outside vehicle)	Not measureable	Not limited	1.415	No averaging

In both configurations, the worst case reading inside the vehicle (back seat) was 0.200 mW/cm<sup>2</sup> at 50 cm distance. Measurements taken at 75 cm distance measured 0 mW/cm<sup>2</sup> (<0.01 mW/cm<sup>2</sup> sensitivity threshold of the probe), demonstrating that power density is reduced immediately upon clearing the ground plane produced by the trunk or roof of the vehicle.

### Limits

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm <sup>2</sup> )	Averaging Time (minutes)
<b>(A) Limits for Occupational/Controlled Exposures</b>				
0.3-3.0	614	1.63	*(100)	6
3.0-30	1842/f	4.89/f	*(900/f <sup>2</sup> )	6
30-300	61.4	0.163	1.0	6
300-1500	---	---	f/300	6
1500-100,000	---	---	5	6
<b>(B) Limits for General Population/Uncontrolled Exposure</b>				
0.3-3.0	614	1.63	*(100)	30
3.0-30	824/f	2.19/f	*(180/f <sup>2</sup> )	30
30-300	27.5	0.073	0.2	30
300-1500	---	---	f/1500	30
1500-100,000	---	---	1.0	30

f = Frequency in MHz

\* = Plane-wave equivalent power density

Measurement made at 424.525 MHz.

A Limit =  $424.525/300 = 1.415 \text{ mW/cm}^2$

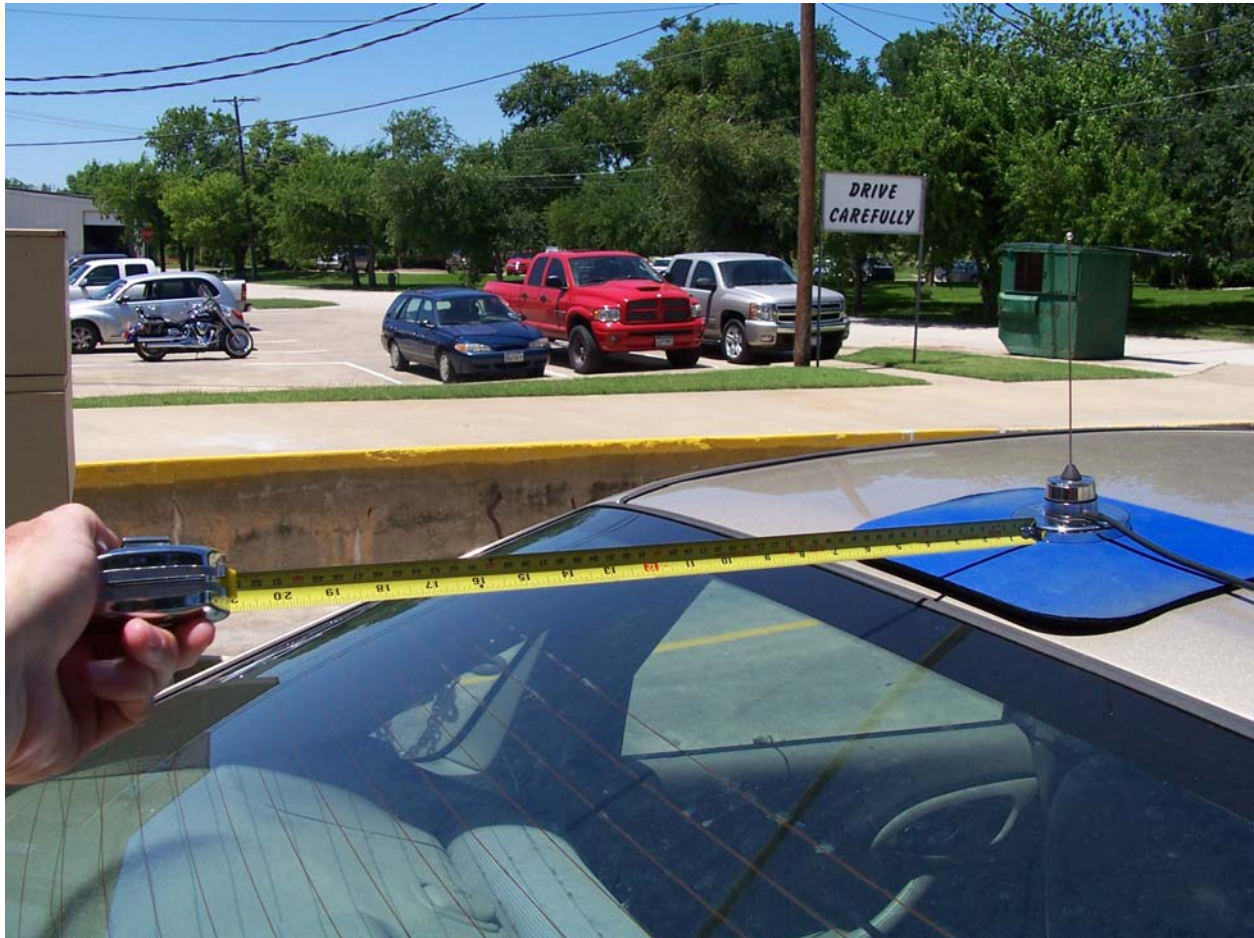
B Limit =  $424.525/1500 = 0.283 \text{ mW/cm}^2$

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## **Section 5.        Photographs**

Configuration A



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Configuration A



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Configuration B



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Configuration B



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Measurements were made at the 50 cm mark.

