

<b>APPLICANT</b> Lear Corporation 5300 Auto Club Drive Dearborn, MI 48126	<b>MANUFACTURER</b> Lear Corporation 5100 West Waters Avenue Tampa, FL 33634
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TEST SPECIFICATION: ~~FCC Rules and Regulations Part 15, Subpart C, Para. 15.231~~

TEST PROCEDURE: ~~ANSI C63.4:1992~~

**TEST SAMPLE DESCRIPTION**

BRANDNAME: ~~GM Motor Company~~ MODEL: ~~RLC-X~~

TYPE: ~~Pulsed RF Transmitter~~

POWER REQUIREMENTS: ~~3 VDC derived from a CR2032 Battery~~

FREQUENCY OF OPERATION: 315 MHz

TESTS PERFORMED

Para. 15.231(a), Radiated Emissions, Fundamental and Harmonics

Para. 15.231(c), Occupied Bandwidth

Duty Cycle Determination

REPORT OF MEASUREMENTS

Applicant: Lear Corporation  
Device: Pulsed RF Transmitter  
FCC ID: KOBLEAR1XT  
Applicable Rule Section: Part 15, Subpart C, Section 15.231

REPORT OF MEASUREMENTS (continued)

TEST RESULTS

- 15.231 (a) - The device is used as a transmitter for remote control purposes.
- 15.231 (a)(1) & - The transmitter is manually operated and ceases transmission within 5  
15.231(2) seconds after deactivation.
- 15.231 (a)(3) - The transmitter does not perform periodic transmissions.
- 15.231 (a)(4)- The transmitter is employed for RC purposes involving Security.
- 15.231 (b) - The fundamental field strength did not exceed 6040  $\mu\text{V/M}$  (Average) at a test distance of 3 meters. In addition, the requirements of section 15.35 for averaging pulsed emissions and for limiting peak emissions were met.
- The field strength of harmonic and spurious emissions did not exceed 604  $\mu\text{V/M}$  (AVERAGE).
- 15.231 (c) - The device operates at 315 MHz. The bandwidth of emissions did not exceed 0.25% of the operating frequency (787.5 kHz).

DETERMINATION OF FIELD STRENGTH LIMITS

The field strength limits shown below are found in Section 15.231.

Frequency		Limit	
F1	= 260	3750	= L1
Fo	= 315		Lo
F2	= 470	12500	= L2

The formula below was utilized to determine the limits:

$$\text{Limit} = L1 + [(Fo-F1)(L2-L1)/(F2-F1)]$$

Solving yields:

Fundamental Limit = 6,040  $\mu\text{V/M}$  (AVERAGE) @ 3 Meters

Harmonic Limit = 604  $\mu\text{V/M}$  (AVERAGE) @ 3 Meters

## REPORT OF MEASUREMENTS (continued)

### DETERMINATION OF DUTY CYCLE

The following information was supplied by Lear Corp.

Transmitter On Time = 31.6 milliseconds (maximum- worst case in 100 ms)  
Transmitter Cycle Time = > 110.0 milliseconds  
Transmitter Duty Cycle = 31.6 %

Duty Cycle = 31.6 %

Correction Factor =  $20 \log(0.316)$  = -10.0 dB

### SPECTRUM ANALYZER DESENSITIZATION CONSIDERATIONS

Due to the nature of the emissions being measured, care was taken to ensure that the resolution bandwidth of the spectrum analyzer was adequate to provide accurate measurements. The following formula was utilized:

Setting pulse desensitization equal to zero and utilizing the minimum observed pulse width of 200 $\mu$ s yields a minimum required bandwidth of 3333.3 Hz. FCC specified bandwidths of 100kHz and 1 MHz were utilized below and above 1 GHz, respectively.

## REPORT OF MEASUREMENTS (continued)

### GENERAL NOTES

1. All readings were taken utilizing a peak detector function at a test distance of 3 meters.
2. The duty cycle was applied to the peak readings in order to determine the average value of the emissions.
3. All measurements were made with 3 VDC derived from a new CR2032 battery.
4. The frequency range was scanned from 30 MHz to 3.15 GHz. All emissions not reported were more than 20 dB below the specified limit.

**EQUIPMENT LIST**  
**FCC PART 15 SUBPART C**

<b>EN</b>	<b>Type</b>	<b>Manufacturer</b>	<b>Frequency Range</b>	<b>Model No.</b>	<b>Cal Date</b>	<b>Due Date</b>
067	Open Area Test Site	Retlif	3 Meter	RNY	10/15/97	10/15/00
128C	Double Ridge Guide	Eaton Corporation	1 GHz - 18 GHz	96001	9/16/99	9/16/00
133	Broadband Pre-Amplifier	Electro-Metrics	10 kHz - 1 GHz, 26dB	BPA-1000	6/22/99	6/22/00
141	Spectrum Analyzer	Hewlett Packard	100 Hz - 40 GHz	8566B	9/20/99	3/20/00
141A	Graphics Plotter	Hewlett Packard	N/A	7470A	3/5/99	3/5/00
141B	Quasi-Peak Adaptor	Hewlett Packard	100 Hz - 1 GHz	85650A	9/20/99	3/20/00
206B	6.0 dB Attenuator	Texscan	0 - 1.0 GHz	FP-50 - 6 dB	6/22/99	6/22/00
523	Biconilog	Electro-Mechanics	26 - 2000 MHz	3142B	10/22/98	4/22/00
543	Preamplifier	Hewlett Packard	1.0 GHz - 26.5 GHz	8449B	6/16/99	6/16/01

FCC 15.231(b)  
RADIATED EMISSIONS, FUNDAMENTAL & SPURIOUS CASE  
(Please see separate e-file attachments named RedataRFM.doc and REdataMurata.doc)

Test Report No. R-8284-1  
FCC ID: KOBLEAR1XT

FCC 15.231(c)

OCCUPIED BANDWIDTH

(Please see separate e-file attachment named Occbw.pdf)