APPLICANT	MANUFACTURER
X-10 USA, Inc. 19823, 58th Place S. Kent, WA 98032	X-10 Electronics Shenzhen Co. Ltd. X-10 Building Labour Industrial District Shenzhen, Xixiang, Bao An Guang Dong, China, 518102

TEST SPECIFICATION: FCC Rules and Regulations Part 15, Subpart C, Para. 15.231

TEST PROCEDURE: ANSI C63.4:2000

TEST SAMPLE DESCRIPTION

BRANDNAME: X-10 USA **Model Number: UR91A**

TYPE: Pulsed Transmitter

POWER REQUIREMENTS: 4 "AAA" Batteries

FREQUENCY OF OPERATION: 433.92 MHz

TESTS PERFORMED

Para. 15.231(b),	**Radiated Emissions, Fundamental and Harmonics**
Para. 15.231(b),	**Radiated Emissions, Spurious Case**
Para. 15.35,	**Duty Cycle Determination**
Para. 15.231(c),	**Occupied Bandwidth**

REPORT OF MEASUREMENTS

Applicant: **X-10 (USA), Inc.**

Brand Name: **GE Universal**

Device: **Pulsed Transmitter**

FCC ID: **B4SUR91A**

Power Requirements: **4 “AAA” Batteries**

Applicable Rule Section: **Part 15, Subpart C, Section 15.231**

REPORT OF MEASUREMENTS (continued)

TEST RESULTS

15.231 (a): **This device is used as a remote control transmitter.**

15.231 (a)(1) & 15.231(a)(2): **The transmitter is manually operated and ceases transmission within 5 seconds after deactivation.**

15.231 (a)(3): **The transmitter does not perform periodic transmissions.**

15.231 (b): **The fundamental field strength did not exceed 10,996.7 µV/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 1,099.7 µV/M (AVERAGE).

DETERMINATION OF FIELD STRENGTH LIMITS

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

Frequency					Limit
F1	=	260	3750	=	L1
Fo	=	433.92		Lo	
F2	=	470	12500	=	L2

REPORT OF MEASUREMENTS (continued)

The formula below was utilized to determine the limits:

Limit = L1 + [(Fo-F1)(L2-L1)/(F2-F1)]

Solving yields:

Fundamental Limit = 10,996.7 µV/M (AVERAGE) @ 3 Meters

Harmonic Limit = 1,099.7 µV/M (AVERAGE) @ 3 Meters

DUTY CYCLE DETERMINATION

The unit's RF output was directly coupled to the input of the spectrum analyzer. The analyzer was set for a frequency span of 0Hz. The sweep time was then adjusted in order to display one full pulse train. The transmitter on time was then summed and compared to the time for one full cycle in order to obtain the duty cycle.

Transmitter On Time = 26.02 milliseconds (maximum)

Transmitter Cycle Time = >100 milliseconds

Transmitter Duty Cycle = 26.02 %

See separate e-file for plots named dutycycle.pdf for additional information.

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 520 μs yields a minimum required bandwidth of 1,282.10 Hz. FCC specified bandwidths of 100kHz and 1MHz were utilized below and above 1GHz, respectively.

GENERAL NOTES

All readings were taken utilizing a peak detector function at a test distance of 3 meters.

The duty cycle was applied to the peak readings in order to determine the average value of the emissions.

The frequency range was scanned from 30 MHz to 4.3392 GHz. All emissions not reported were more than 20 dB below the specified limit.

EQUIPMENT LIST

FCC Part 15 Subpart C Fundamental & Harmonics

EN	Type	Manufacturer	Description	Model No.	Cal Date	Due Date
067	Open Area Test Site	Retlif	3 Meter	RNY	09/20/2000	09/20/2003
128	Double Ridged Guide	Electro-Mechanics	1 GHz - 18 GHz	3105	06/07/2002	06/07/2003
133	Broadband Pre-Amplifier	Electro-Metrics	10 kHz - 1 GHz, 26dB	BPA-1000	06/11/2002	06/11/2003
141	Spectrum Analyzer	Hewlett Packard	100 Hz - 40 GHz	8566B	01/23/2003	07/23/2003
141A	Graphics Plotter	Hewlett Packard	N/A	7470A	03/05/2003	03/05/2004
141B	Quasi-Peak Adaptor	Hewlett Packard	100 Hz - 1 GHz	85650A	01/23/2003	07/23/2003
206B	6.0 dB Attenuator	Texscan	0 - 1.0 GHz	FP-50 - 6 dB	06/11/2002	06/11/2003
543	Preamplifier	Hewlett Packard	1.0 GHz - 26.5 GHz	8449B	07/11/2002	07/11/2003
617	Interference Analyzer	Electro-Metrics	10 kHz - 1 GHz	EMC-30	08/23/2002	08/23/2003
767	Biconilog	EMCO	26 - 2000 MHz	3142B	09/03/2002	09/03/2003

FCC 15.231(b)

RADIATED EMISSIONS, FUNDAMENTAL & SPURIOUS CASE

(See separate e-file named Refundharm & REspur.pdf)

FCC 15.231(c)

OCCUPIED BANDWIDTH

(See separate e-file named occbw.pdf)

FCC 15.231(c)

DUTY CYCLE

(See separate e-file named dutycycle.pdf)

Test Setup Photographs