

**ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT
CERTIFICATION TO FCC PART 15 REQUIREMENTS**

for

INTENTIONAL RADIATOR

27.145MHZ RC TRANSMITTER

MODEL NO: 91496

BRAND NAME: TYCO RC-WHIPLASH

FCC ID NO: APB91496-02A2T

REPORT NO: 02U1437-3

ISSUE DATE: AUGUST 12, 2002

Prepared for

**MATTEL MT. LAUREL
6000 MIDLANTIC DRIVE
MT. LAUREL, NEW JERSEY 08054
USA**

Prepared by

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1. VERIFICATION OF COMPLIANCE

COMPANY NAME : MATTEL MT. LAUREL
6000 MIDLANTIC DRIVE
MT. LAUREL, NEW JERSEY 08054
USA

CONTACT PERSON : FRANK WINKLER/SENIOR ELECTRONICS ENGINEER

TELEPHONE NO. : 856-840-1259

EUT DESCRIPTION : 27.145MHz RC TRANSMITTER

MODEL NAME/NUMBER : 91496

BRAND NAME : TYCO RC-WHIPLASH

SERIAL NUMBER : N/A

FCC ID : APB91496-02A2T

DATE TESTED : AUGUST 8, 2002

REPORT NUMBER : 02U1437-3

TYPE OF EQUIPMENT	RADIO CONTROL
EQUIPMENT TYPE	27 MHz TRANSMITTER
MEASUREMENT PROCEDURE	ANSI 63.4 / 1992
LIMIT TYPE	CERTIFICATION
FCC RULE	CFR 47, PART 15 SUBPART C

The above equipment was tested by Compliance Engineering Services, Inc. for compliance with the requirements set forth in CFR 47, PART 15 SUBPART C. This said equipment in the configuration described in this report shows that maximum emission levels emanating from equipment are within the compliance requirements. **Warning** : This document reports conditions under which testing was conducted and results of tests performed. This document may not be altered or revised in any way unless done so by Compliance Certification Services and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Compliance Certification will constitute fraud and shall nullify the document.

Approved & Released For CCS By:



STEVE CHENG
EMC ENGINEERING MANAGER
COMPLIANCE CERTIFICATION SERVICES

Tested By:



THU CHAN
SENIOR EMC ENGINEER
COMPLIANCE CERTIFICATION SERVICES

2. PRODUCT DESCRIPTION

CHASSIS TYPE	Plastic
Fundamental Frequency	27.145 MHz
Power Requirement	9VDC
Power Derived From	9V Battery
Type of Transmission	Data/Continuous
Rated RF Output (mW)	Less than 30uW (average)
Type of Modulation	On Off Keying of a fixed frequency carrier wave- OOK AM
Duty Cycle of Transmitter	4 start bits @ 75% Duty Cycle followed by N data bits @ 50% Duty Cycle
Antenna Type(s) and Number of Each	~8" long, permanently attached whip antenna
Antenna Gain, dBi (for each Antenna)	Single Antenna, Permanently affixed
Intended Use	RC transmitter for controlling a toy boat
Antenna Requirement	Permanently Affixed
Local Osc.	27.145MHz
Describe Intended Use	RC transmitter for controlling a toy vehicle

3. TEST FACILITY

The 3/10/30 meter open area test site and conducted measurement facility used to collect the radiated data is located at 561F Monterey Road, Morgan Hill, California, U.S.A. A detailed description of the test facility was submitted to the Commission on May 27,1994.

4. MEASUREMENT STANDARDS

The site is constructed and calibrated in conformance with the requirements of ANSI C63.4/1992.

5. TEST METHODOLOGY

For an intentional radiator, the spectrum shall be investigated from the lowest radio frequency signal generated in the device, without going below 9 KHz, up to at least the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower. (CFR 47 Section 15.33)

6. MEASUREMENT EQUIPMENT USED

TEST EQUIPMENTS LIST				
Name of Equipment	Manufacturer	Model No.	Serial No.	Due Date
Active Loop Antenna, (10K - 30MHz)	EMCO	6502	9202-2722	4/20/03
Spectrum Analyzer	HP 0.1K - 1.5GHz	8568B	2732A03661	5/16/03
Spectrum Display	HP	85662A	2816A16696	5/16/03
Quasi Peak Adapter	HP9K - 1GHz	85650A	2811A01155	5/16/03
Pre-Amplifier, 25 dB	HP 0.1 - 1300MHz	8447D (P_1M)	2944A06833	8/21/03
Antenna, Bilog	Schaffner-Chase30M-2GHz	CBL6112B	2586	3/30/03

7. POWERLINE RFI LIMIT

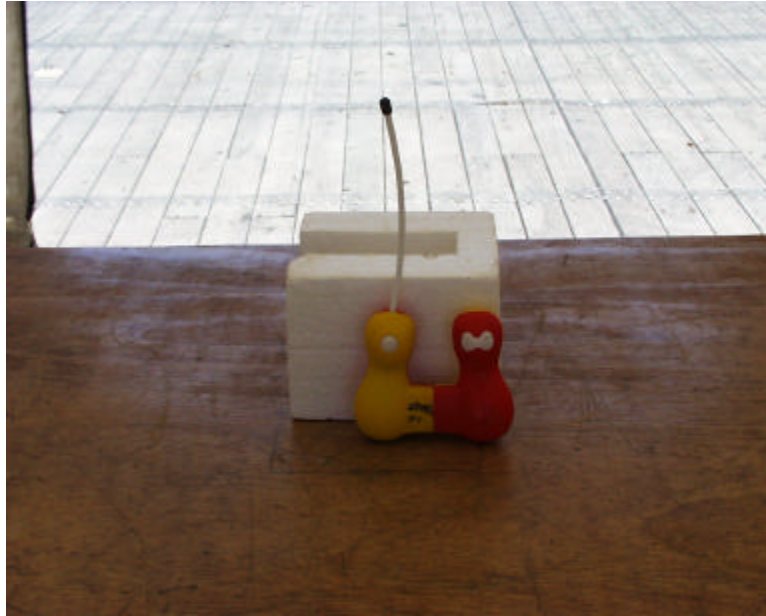
CONNECTED TO AC POWER LINE	SECTION 15.207
BATTERY POWER	NOT REQUIRED.

8. RADIATED EMISSION LIMITS

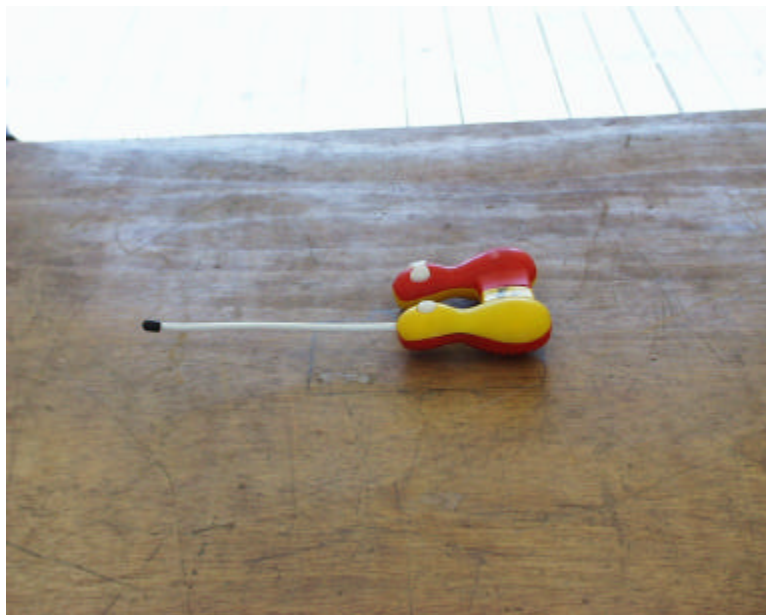
GENERAL REQUIREMENTS	SECTION 15.209
RESTRICTED BANDS OF OPERATION	SECTION 15.205
OPERATION WITHIN THE BAND 26.96 - 27.28 MHZ	SECTION 15.227

9. SYSTEM TEST CONFIGURATION

The EUT was configured for testing in a typical fashion (as a customer would normally use it).



X-POSITION



Y-POSITION



Z-POSTION

Radiated Open Site Test Set-up

10. EQUIPMENT MODIFICATION

To achieve compliance to FCC Section 15.227 technical limits, the following change(s) were made during compliance testing:


No changes were required in order to achieve compliance to FCC Section 15.227.

11. TEST PROCEDURE AND RESULT

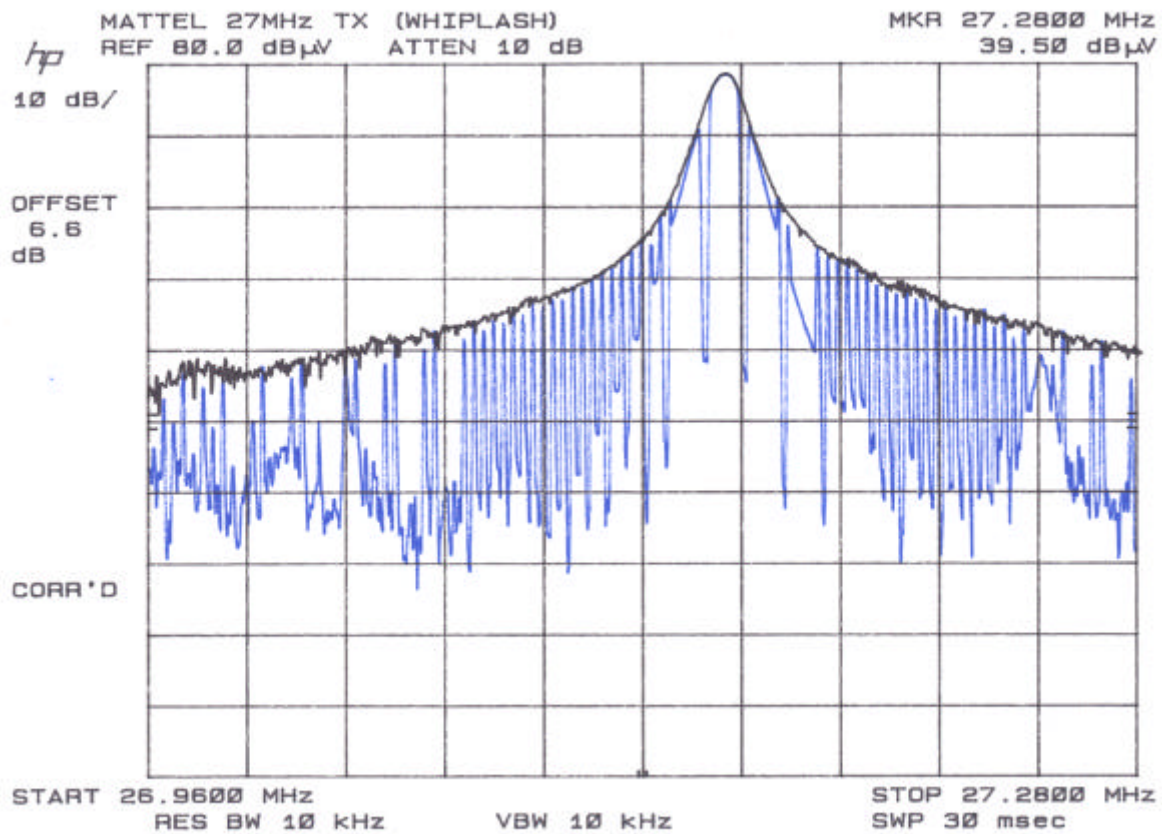
Powerline RFI Limits	Eut	Radiated Emission Limits	Eut
SECTION 15.207		SECTION 15.209	x
SECTION 15.205, 15.209, 15.221, 15.223, x 15.225 OR 15.227		SECTION 15.205	x
BATTERY POWER	X	SECTION 15.227	X

11.1 Radiated Emission Test Procedure and Result

1. The EUT was placed on a wooden table on the outdoor ground plane. The search antenna was placed 3 meter from the EUT. The EUT antenna was mounted vertically as per normal installation.
2. The turntable was slowly rotated to locate the direction of maximum emission at each emission falling in the restricted bands of 15.205.
3. Once maximum direction was determined, the search antenna was raised and lowered in both vertical and horizontal polarizations. The readings so obtained are recorded in the data listed below.

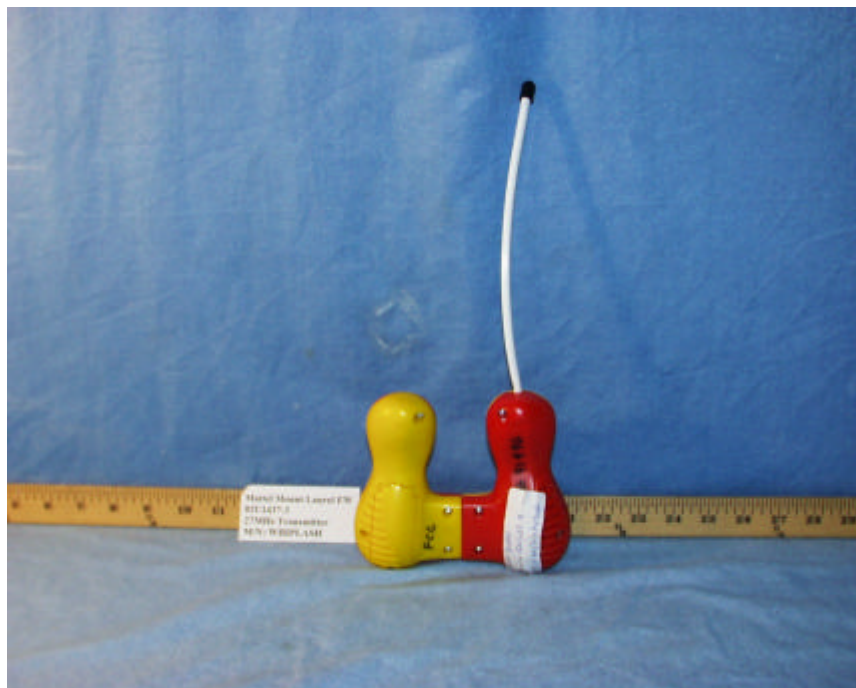
		Project #: 02U1437-3 Report #: 020808C1 Date & Time: 08/08/02 9:27 AM Test Engr: Thu Chan	
		FCC, VCCI, CISPR, CE, AUSTEL, NZ UL, CSA, TUV, BSMI, DHHS, NVLAP 561F MONTEREY ROAD, SAN JOSE, CA 95037-9001 PHONE: (408) 463-0885 FAX: (408) 463-0888	
Company: Mattel Mount Laurel FW EUT Description: 27MHz Transmitter (M/N: Whiplash) Test Configuration: EUT only Type of Test: FCC 15.227 Mode of Operation: Transmitting			
<input type="radio"/> A-Site <input type="radio"/> B-Site <input checked="" type="radio"/> C-Site <input type="radio"/> F-Site <input type="button" value="6 Worst Data"/> <input type="button" value="Descending"/>			

Freq. (MHz)	Reading (dBuV)	AF (dB)	Closs (dB)	Pre-amp (dB)	Level (dBuV/m)	Limit FCC_B	Margin (dB)	Pol (H/V)	Az (Deg)	Height (Meter)	Mark (P/Q/A)
Loop Antenna were using to take a measurement below 30MHz:											
X-Position, Standup:											
27.15	72.10	5.80	0.76	0.00	78.66	100.00	-21.34	3mV	0.00	1.00	P
27.15	67.50	5.80	0.76	0.00	74.06	100.00	-25.94	3mH	0.00	1.00	P
Y-Position, Back Lay Down:											
27.15	60.00	5.80	0.76	0.00	66.56	100.00	-33.44	3mV	0.00	1.00	P
27.15	64.00	5.80	0.76	0.00	70.56	100.00	-29.44	3mH	0.00	1.00	P
Z-Position, Side Lay Down:											
27.15	65.00	5.80	0.76	0.00	71.56	100.00	-28.44	3mH	0.00	1.00	P
27.15	61.50	5.80	0.76	0.00	68.06	100.00	-31.94	3mV	0.00	1.00	P
Below data were taken from X-Position (Worst Position):											
27.15	62.00	5.80	0.76	0.00	68.56	80.00	-11.44	3mV	0.00	1.00	Av
Band Edges:											
26.96	31.00	5.80	0.76	0.00	37.56	49.50	-11.94	3mV	0.00	1.00	P
27.28	33.10	5.80	0.76	0.00	39.66	49.50	-9.84	3mV	0.00	1.00	P
26.96	30.00	5.80	0.76	0.00	36.56	49.50	-12.94	3mH	0.00	1.00	P
27.28	32.00	5.80	0.76	0.00	38.56	49.50	-10.94	3mH	0.00	1.00	P
Spurious & Harmonics:											
54.30	40.00	9.44	0.89	27.48	22.85	40.00	-17.15	3mV	0.00	1.00	P
81.40	40.00	7.83	1.09	27.40	21.51	40.00	-18.49	3mV	0.00	1.00	P
135.69	40.00	13.90	1.53	27.18	28.25	43.50	-15.25	3mV	0.00	1.00	P
32.93	43.00	12.78	0.79	27.55	29.02	40.00	-10.98	3mV	0.00	1.00	P
39.16	46.00	12.84	0.83	27.54	32.14	40.00	-7.86	3mV	0.00	1.00	P
41.37	42.00	12.63	0.85	27.53	27.94	40.00	-12.06	3mV	0.00	1.00	P
65.15	47.00	6.62	0.96	27.44	27.13	40.00	-12.87	3mV	0.00	1.00	P
67.36	51.00	6.24	0.98	27.44	30.78	40.00	-9.22	3mV	0.00	1.00	P
73.16	48.00	6.32	1.03	27.42	27.93	40.00	-12.07	3mV	0.00	1.00	P
79.36	50.00	7.37	1.08	27.41	31.04	40.00	-8.96	3mV	0.00	1.00	P
119.45	49.00	10.66	1.39	27.26	33.78	43.50	-9.72	3mV	0.00	1.00	P
121.65	52.00	10.92	1.41	27.25	37.08	43.50	-6.42	3mV	0.00	1.00	P
127.45	47.00	12.02	1.46	27.21	33.27	43.50	-10.23	3mV	0.00	1.00	P
133.65	51.00	13.43	1.51	27.19	38.76	43.50	-4.74	3mV	0.00	1.00	P
167.67	43.00	16.34	1.72	27.05	34.00	43.50	-9.50	3mV	0.00	1.00	P
171.65	43.00	15.97	1.75	27.04	33.68	43.50	-9.82	3mV	0.00	1.00	P
173.87	45.00	15.76	1.76	27.03	35.50	43.50	-8.00	3mV	0.00	1.00	P
No other emissions were found with 20dB under the limits up to 1GHz.											
Total data #: 28											
V.2c											

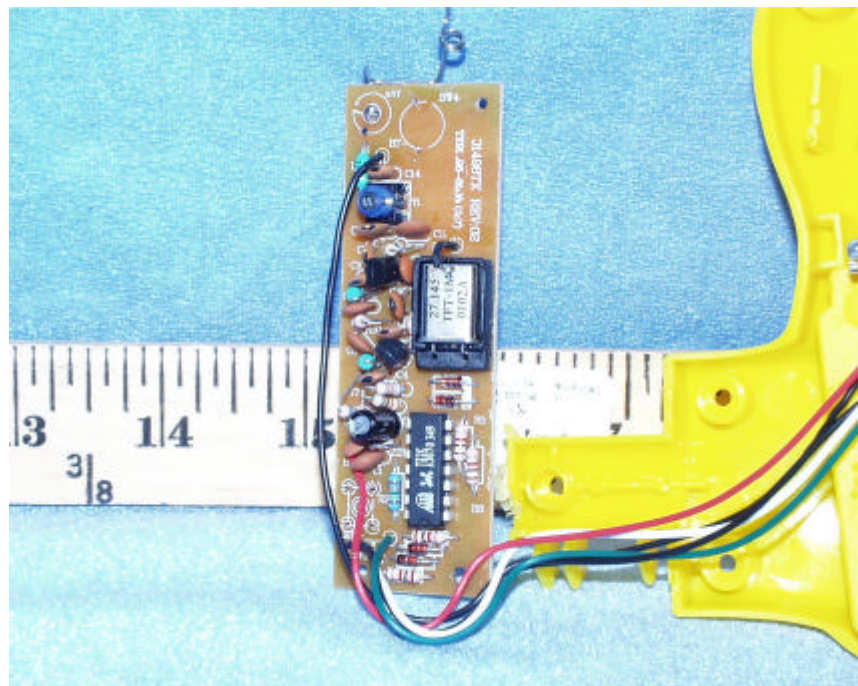
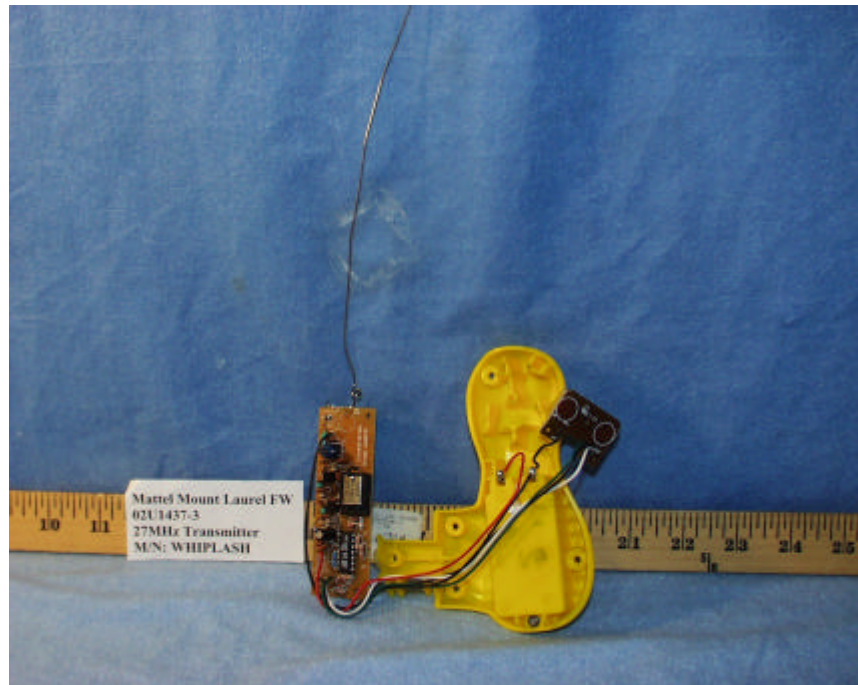


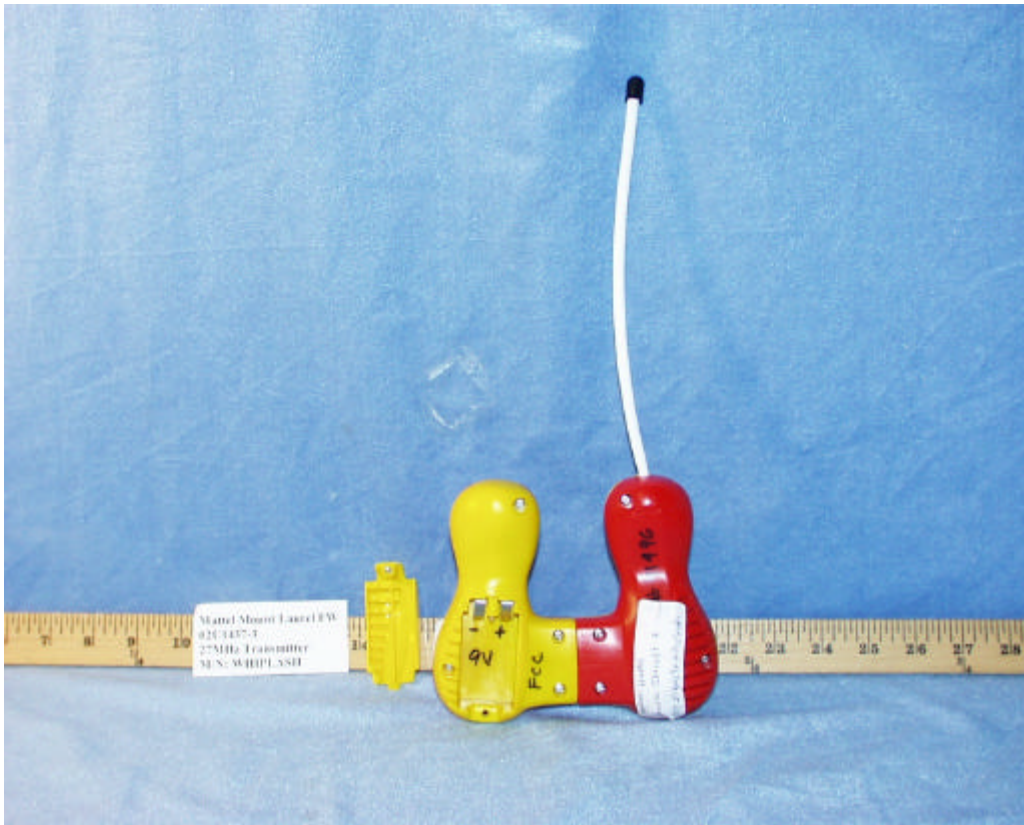
12. Appendix

External & Internal Photos









Schematics

Please refer to attached sheets.

Block Diagram

Please refer to attached sheets.

User Manual

Please refer to attached sheets.

END OF REPORT