ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT
CERTIFICATION TO FCC PART 15 REQUIREMENTS

for

INTENTIONAL RADIATOR

27.145MHZ RC TRANSMITTER

MODEL NO: 90883

BRAND NAME: TYCO RC – EASY DRIVERS CAR

FCC ID NO: APB90883-02A2T

REPORT NO: 02U1304-1

ISSUE DATE: MAY 16, 2002

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

Prepared by
COMPLIANCE CERTIFICATION SERVICES
561F MONTEREY ROAD
MORGAN HILL, CA 95037, USA
TEL: (408) 463-0885
FAX: (408) 463-0888

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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	:	90883
BRAND NAME	:	TYCO RC-EASY DRIVERS CAR
SERIAL NUMBER	:	N/A
FCC ID	:	APB90883-02A2T
DATE TESTED	:	MAY 16, 2002
REPORT NUMBER	:	02U1304-1

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.

Tested By:

FRANK IBRAHIM
EMC ENGINEER
COMPLIANCE CERTIFICATION SERVICES

Approved & Released For CCS By:

MIKE HECKROTTE
CHIEF ENGINEER
COMPLIANCE CERTIFICATION SERVICES

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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**
Necessary Channel Bandwidth	**3KHz**
Emission Designator (ITU)	**2K00A1D**
Channel Bandwidth & Number of Channels	**Single Channel in the 26.96 to 27.28MHz Band**
Channel Access Method and Duplex Distance	**Not Applicable-Simple Transmission**
Duty Cycle of Transmitter	**50% Duty Cycle**
Antenna Type(s) and Number of Each	**~5" long, permanently attached whip antenna**
Intended Use	**RC transmitter for controlling a toy vehicle**
Antenna Requirement	**Permanently Affixed**
Local Osc.	**27.145MHz**
Usage	**Toy**

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)

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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**	**5/10/02**
Spectrum Display	**HP**	**85662A**	**2816A16696**	**5/4/02**
Quasi Peak Adapter	**HP9K - 1GHz**	**85650A**	**2811A01155**	**5/4/02**
Pre-Amplifier,25 dB	**HP0.1 - 1300MHz**	**8447D (P5)**	**2944A06550**	**8/10/02**
Antenna, Bicon	**Eaton30 - 200MHz**	**94455-1**	**1214**	**8/2/02**
Antenna, LP	**EMCO200 - 2000MHz**	**3146**	**9107-3163**	**8/2/02**

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

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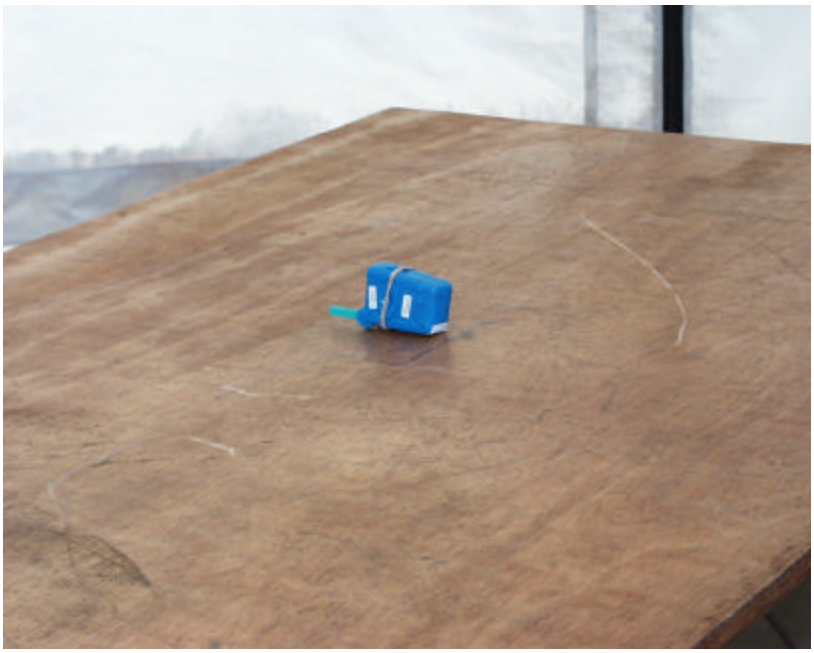
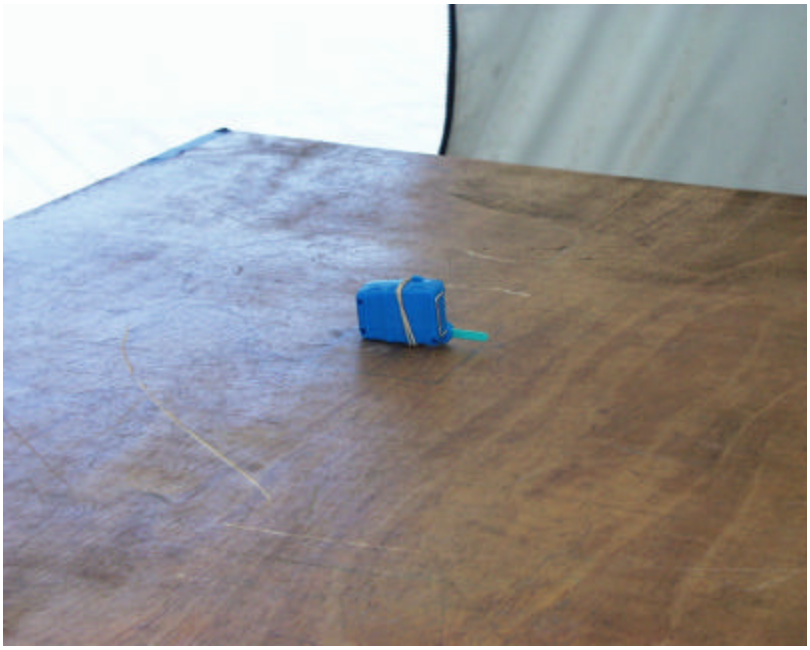
9. SYSTEM TEST CONFIGURATION

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





Radiated Open Site Test Set-up

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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

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.

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Project #: 02U1304-1
Report #: 020513C02
Date& Time: 05/13/02 11:26 AM
Test Engr: Frank Ibrahim

Company: Mattel
EUT Description: 27MHz Transmitter for RC toys, Easy Drivers Car, model: 90883
Test Configuration : Stand Alone EUT
Type of Test: FCC 15.227
Mode of Operation: EUT transmitting at 27.175 MHz

<< Main Sheet

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)
54.35	39.20	9.42	0.89	27.48	22.03	40.00	-17.97	3mV	0.00	1.00	P
81.53	40.20	7.86	1.09	27.40	21.74	40.00	-18.26	3mV	0.00	1.00	P
135.88	39.80	13.94	1.53	27.18	28.10	43.50	-15.40	3mV	0.00	1.00	P
54.35	41.20	9.42	0.89	27.48	24.03	40.00	-15.97	3mH	0.00	1.00	P
81.53	40.60	7.86	1.09	27.40	22.14	40.00	-17.86	3mH	0.00	1.00	P
108.70	40.60	10.65	1.31	27.31	25.25	43.50	-18.25	3mH	0.00	1.00	P
Total data #: 6											

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02U1304-1
020513C01
05/13/02 9:53 AM
Frank Ibrahim

Company: Mattel
EUT Description: 27MHz Transmitter for RC toys, Easy Drivers Car, model: 90883
Test Configuration : Stand Alone EUT
Type of Test: FCC 15.227
Mode of Operation: EUT transmitting at 27.175 MHz

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)
Y-Axis, Loop antenna at 270 degrees, Fund Feq											
27.18	82.80	5.85	0.76	27.54	61.87	100.00	-38.13	3mV	0.00	1.00	P
27.18	59.40	5.85	0.76	27.54	38.47	80.00	-41.53	3mV	0.00	1.00	Av
Low Bandedge, (Noise Floor):											
26.96	37.70	5.85	0.76	27.54	-23.23	29.54	-52.77	3mV	0.00	1.00	P
High Bandedge, (Noise Floor):											
27.28	48.60	5.85	0.76	27.54	-12.33	29.54	-41.87	3mV	0.00	1.00	P

Notes:
There were no signals from the EUT between 27.175 and 30MHz
Distance Correction factor of -40dB was added to High and Low bandedges readings

Note:
The fundamental limit is at 3m distance, the limit of bandedge and out of band emissions is at 30m distance, therefore 40 dB distance correction factor, (40 dB / decade) is applied for bandedge readings.

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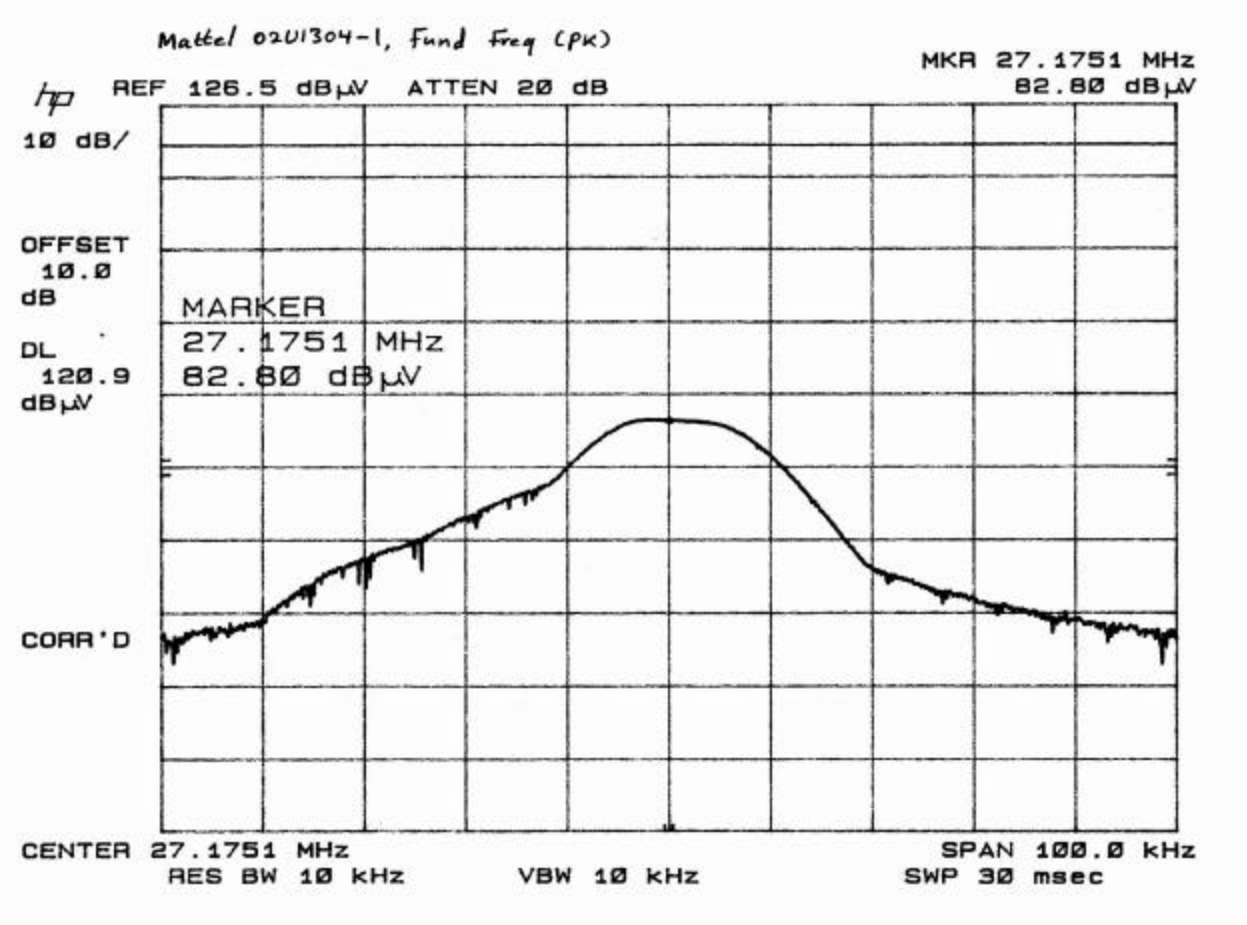

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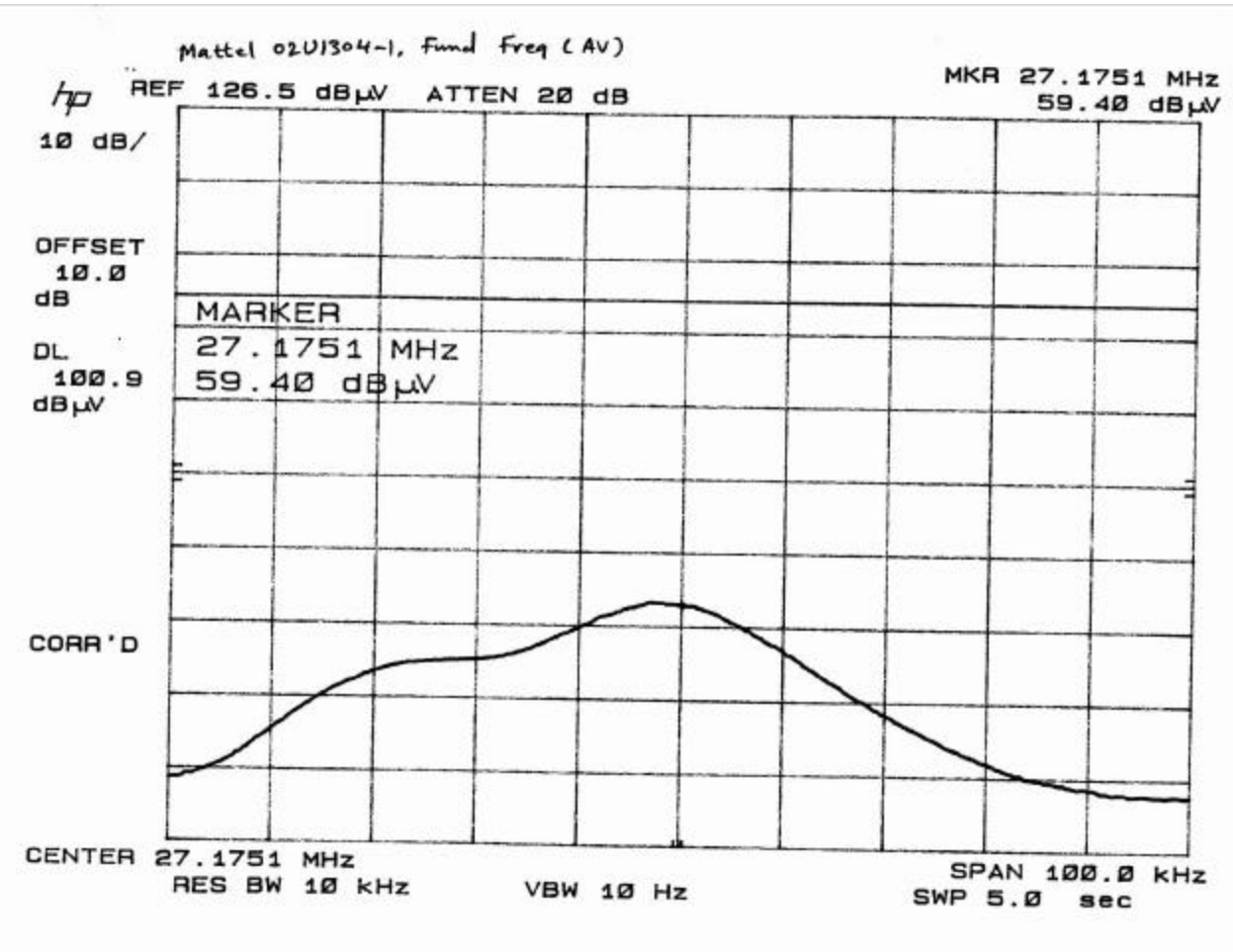

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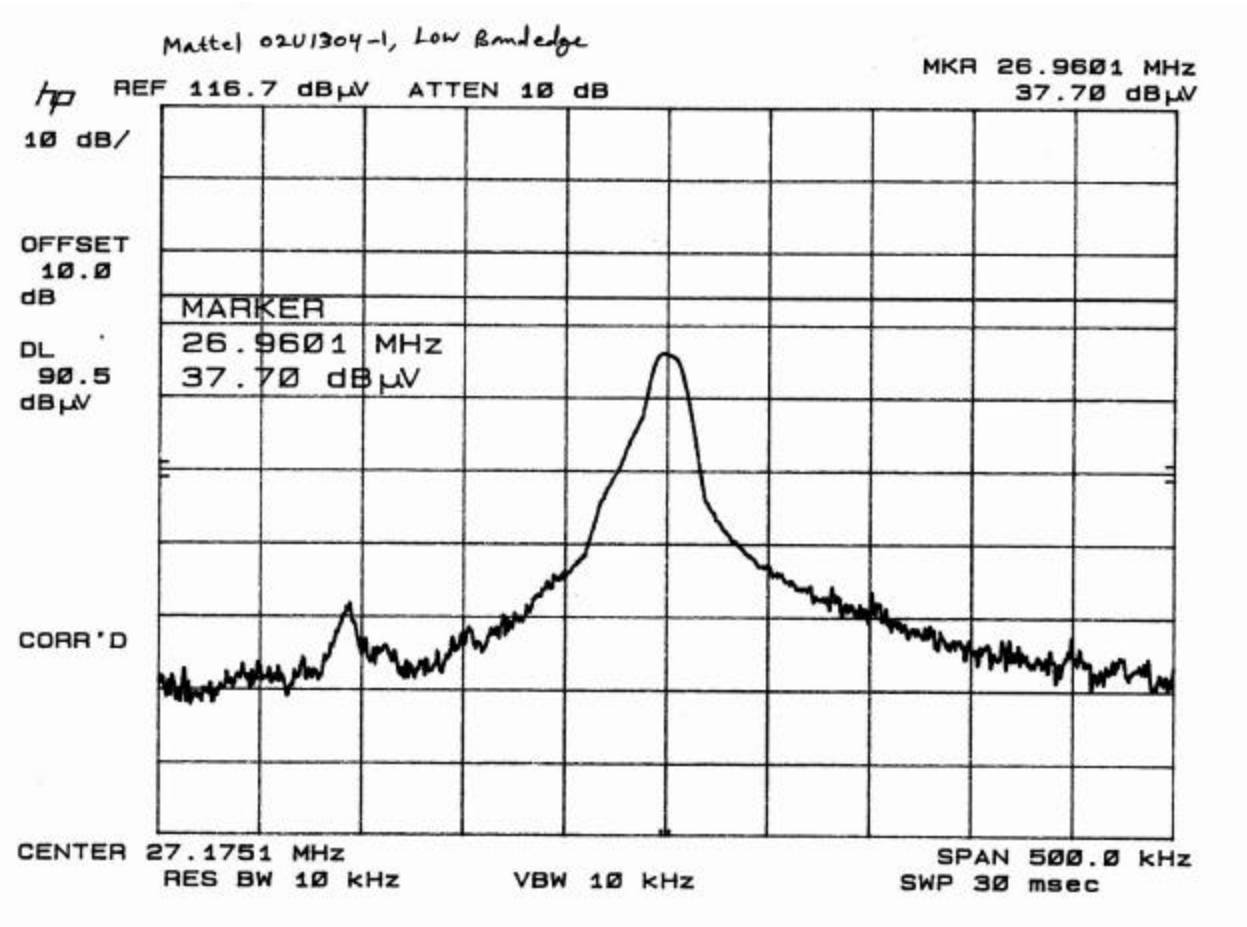

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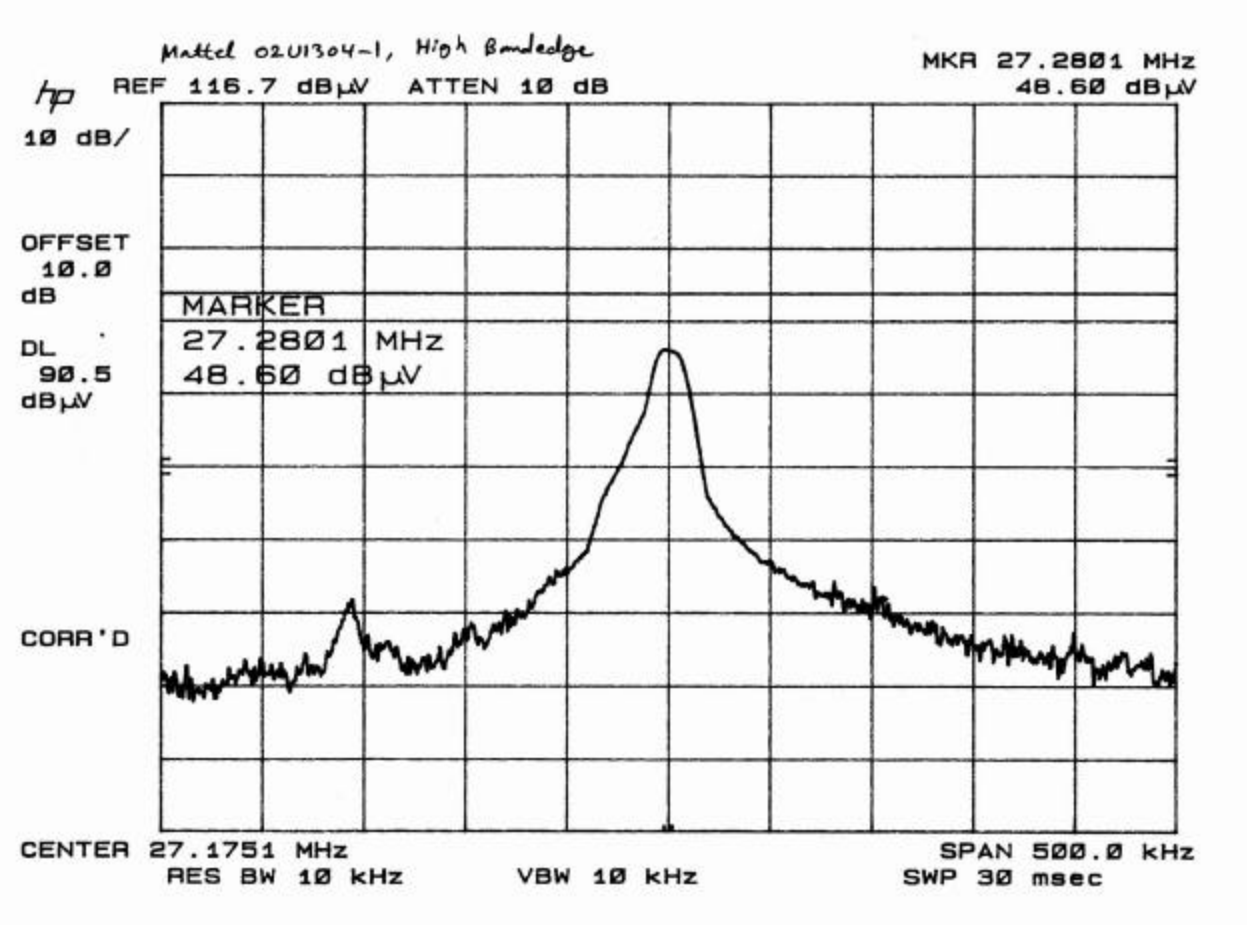

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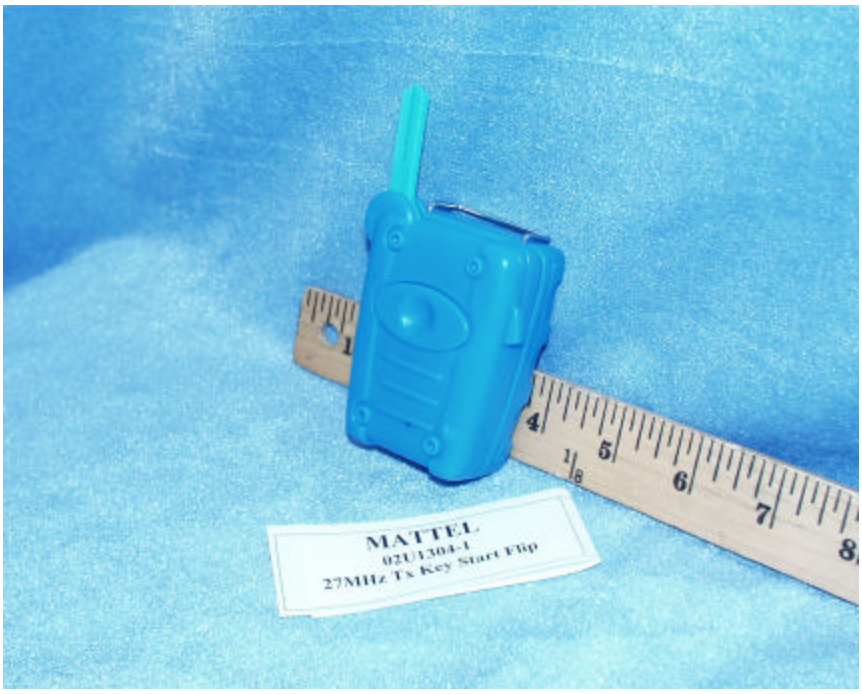
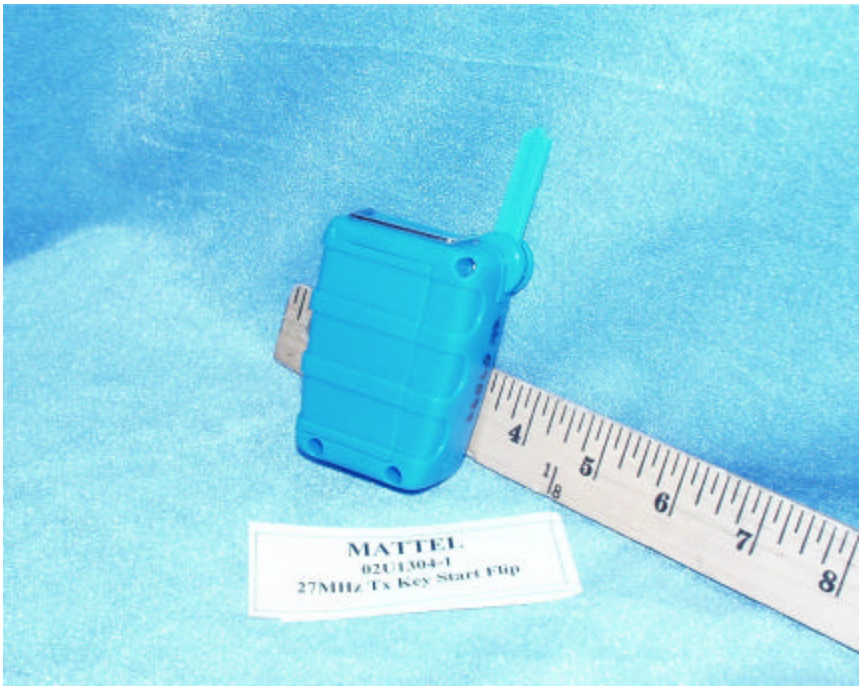
12. Appendix

External & Internal Photos





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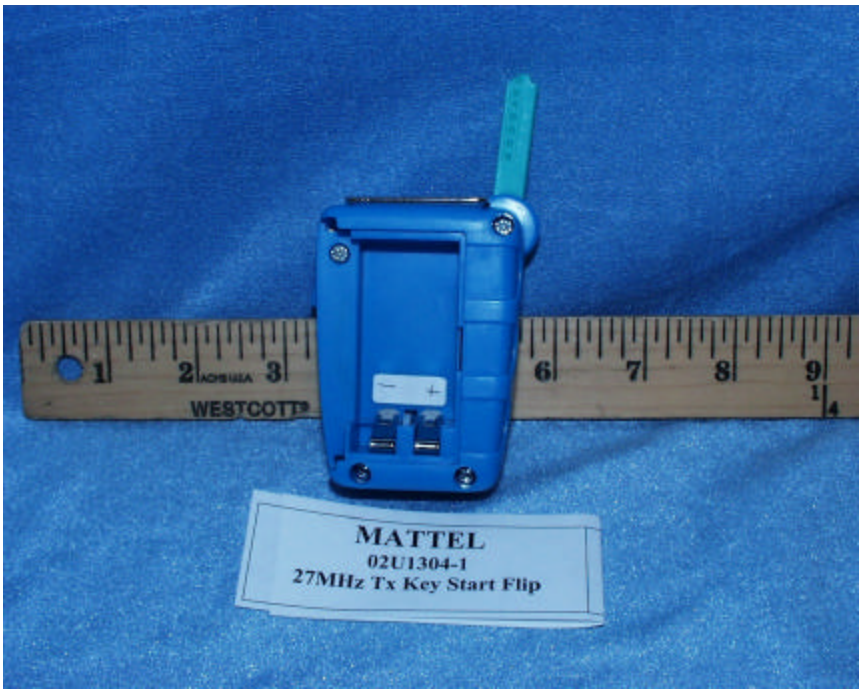

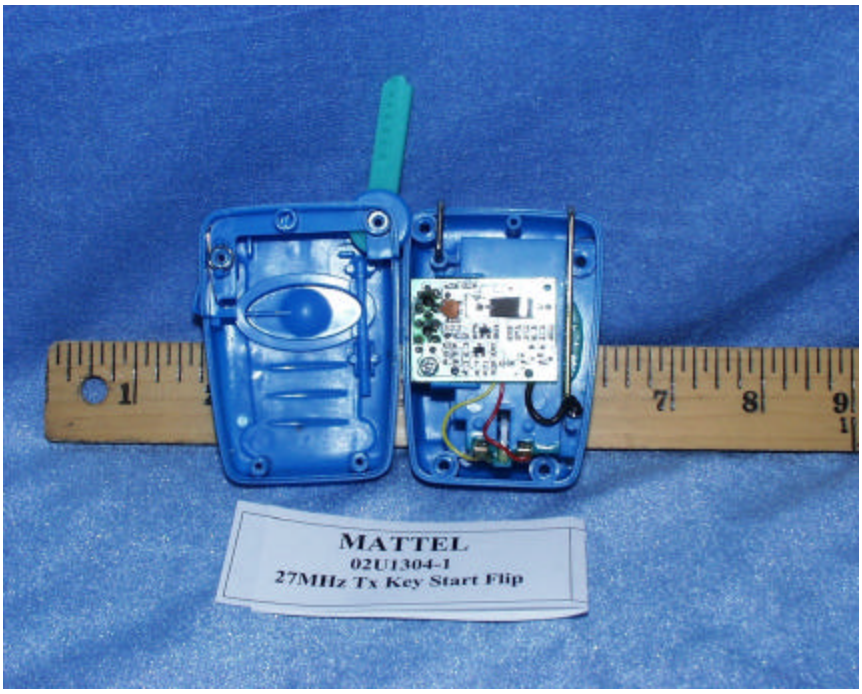

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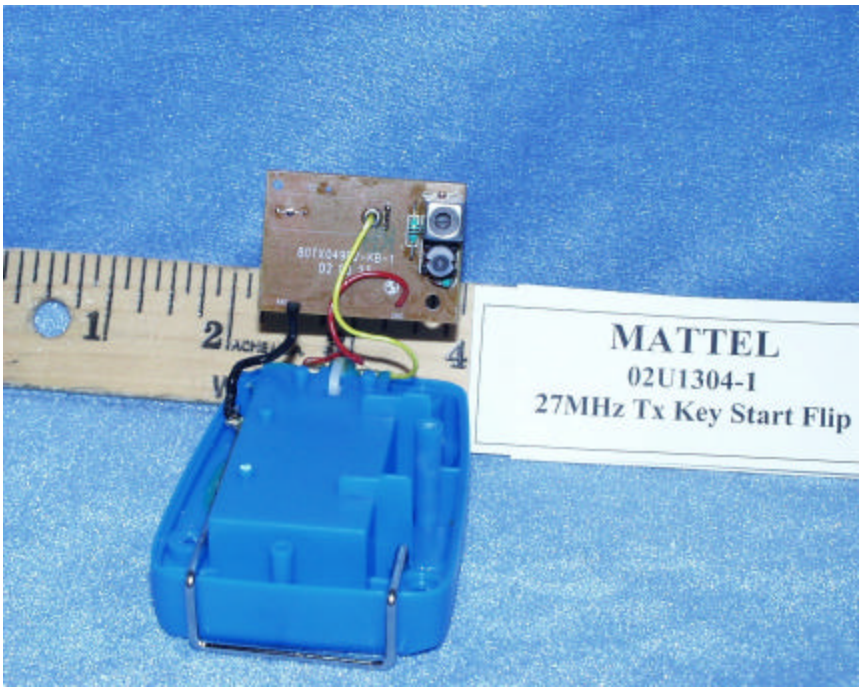

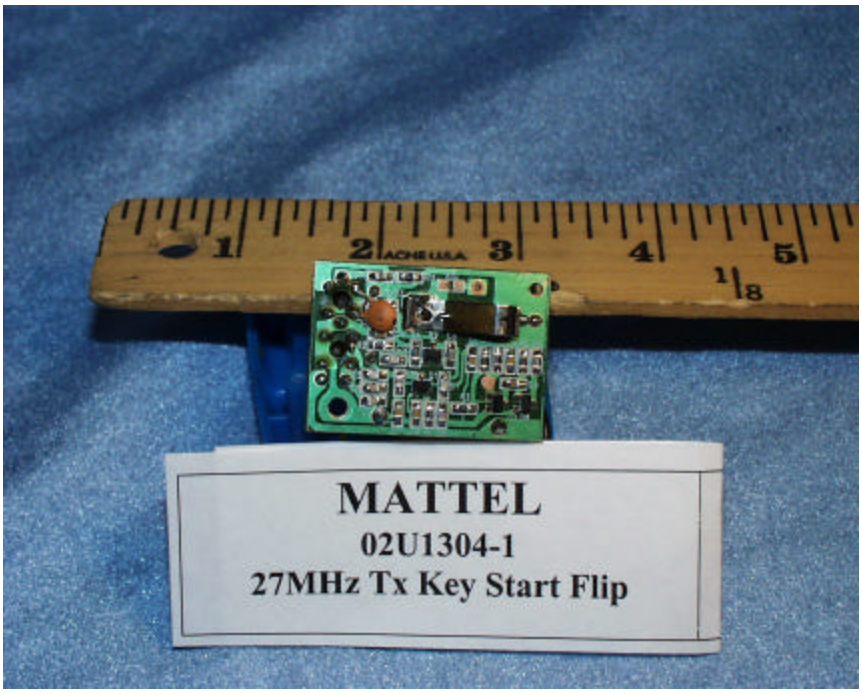

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Schematics

Please refer to attached sheets.

Block Diagram

Please refer to attached sheets.

User Manual

Please refer to attached sheets.

END OF REPORT

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