

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

for

INTENTIONAL RADIATOR

27.145MHz RC TRANSMITTER

MODEL NO: 91556

BRAND NAME: TYCO RC-ROBOT SHOWDOWN

FCC ID NO: APB91556-02A2T

REPORT NO: 02U1252-1

ISSUE DATE: APRIL 12, 2002

Prepared for

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

Prepared by

**COMPLIANCE CERTIFICATION SERVICES
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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 ELECTRONIC ENGINEER

TELEPHONE NO. : 856-840-1259

EUT DESCRIPTION : 27MHz RC TRANSMITTER

MODEL NAME/NUMBER : 91556

BRAND NAME : TYCO RC-ROBOT SHOWDOWN

SERIAL NUMBER : N/A

FCC ID : APB91553-02A2T

DATE TESTED : APRIL 9, 2002

REPORT NUMBER : 02U1252-1

| | |
|-----------------------|---------------------------|
| 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:

Approved & Released For CCS By:



THU CHAN
SENIOR EMC ENGINEER
COMPLIANCE CERTIFICATION SERVICES

MIKE HECKROTTE
CHIEF ENGINEER
COMPLIANCE CERTIFICATION SERVICES

2. PRODUCT DESCRIPTION

| | |
|----------------------------|---|
| CHASSIS TYPE | Plastic |
| Fundamental Frequency | 27.145 MHz |
| Power Requirement | One 9VDC |
| Power Derived From | 9V Battery |
| Type of Transmission | Continuous |
| Intended Use | RC Transmitter for Controlling a Toy Vehicle |
| Type of antenna | 12" long, Permanently Attached Wire Whip |
| Antenna Requirement | Permanently Affixed |
| Duty Cycle of Trnansmitter | 4 start bits @75% duty cycle followed by N data bits @ 50% duty cycle |
| Type of Modulation | On/Off Keying of a Fixed Carrier Wave |
| Local Osc. | 27.145MHz |

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 |
| Pre-Amplifier,25 dB | HP0.1 - 1300MHz | 8447D (P5) | 2944A06550 | 9/19/02 |
| Antenna, Bicon | Eaton30 - 200MHz | 94455-1 | 1214 | 8/10/02 |
| Antenna, LP | EMCO200 - 2000MHz | 3146 | 9107-3163 | 8/10/02 |
| Spectrum Analyzer | HP100Hz - 22GHz | 8566B | 3014A06685 | 6/28/02 |
| Spectrum Display | HP | 85662A | 3026A19146 | 6/28/02 |
| Quasi-Peak Detector | HP9K - 1GHz | 85650A | 3145A01654 | 6/28/02 |
| RF Preselector | HP20Hz - 2GHz | 85685A | 2817A00756 | 5/4/02 |
| Antenna Loop (10K-30MHz) | EMCO | 6502 | 9202-2722 | 2/23/03 |

7. POWERLINE RFI LIMIT

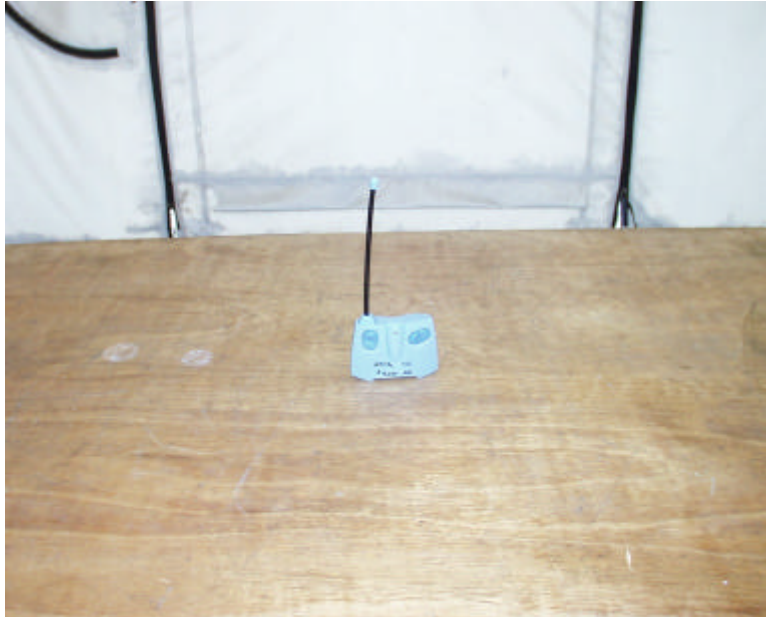
| | |
|---------------|----------------|
| BATTERY POWER | NOT APPLCABLE. |
|---------------|----------------|

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).



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.



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

Project #: 02U1252-1
Report #: 020409C2
Date & Time: 04/09/02 2:09 PM
Test Engr: Thu Chan

Company: Mattel Mount Laurel FW
EUT Description: 27MHz RC Transmitter
Test Configuration: EUT only
Type of Test: FCC 15.227
Mode of Operation: Transmitting Mode

☒ A-Site

☐ B-Site

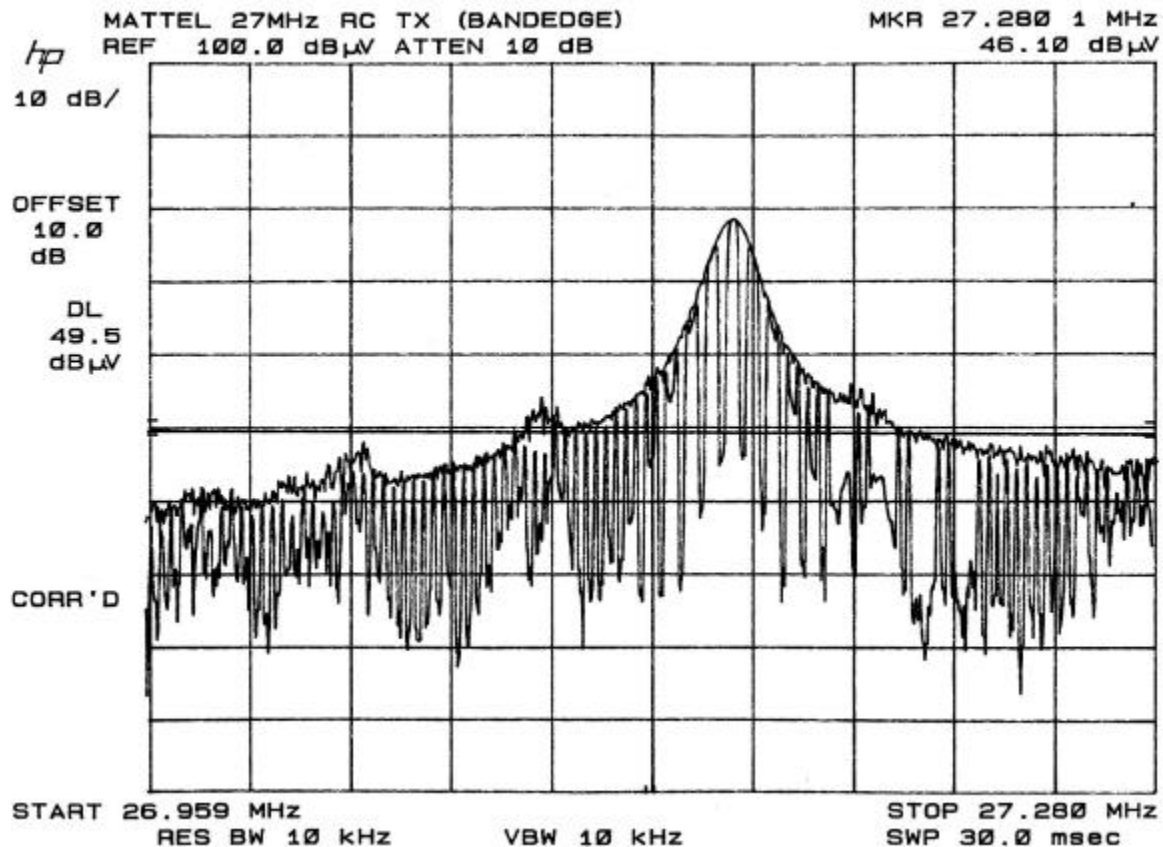
☒ C-Site

☐ F-Site

☐ 6 Worst Data

☐ Descending

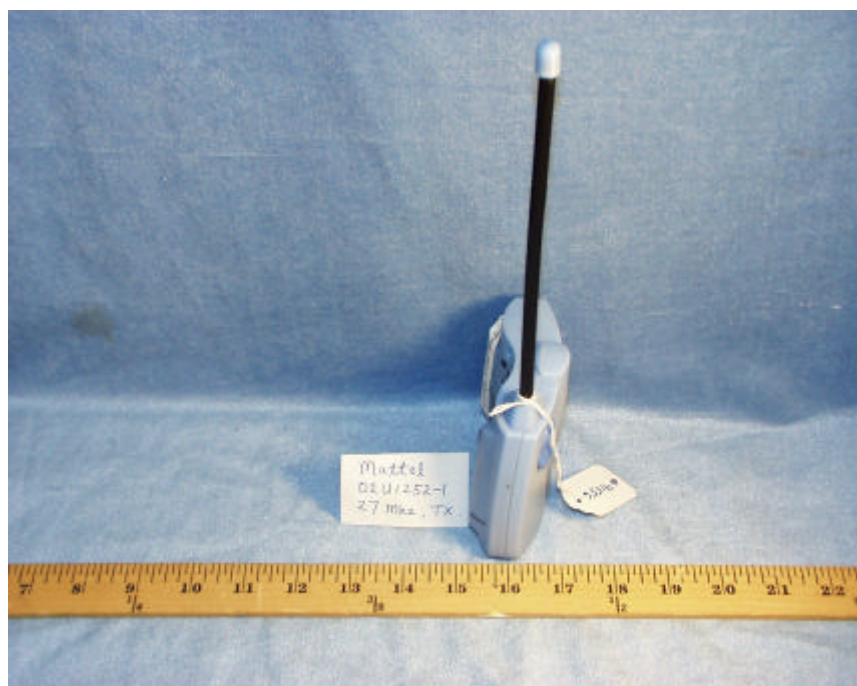
| Freq. | Reading | AF | Closs | Pre-amp | Level | Limit | Margin | Pol | Az | Height | Mark |
|--|---------|-------|-------|---------|----------|--------|--------|-------|--------|---------|---------|
| (MHz) | (dBuV) | (dB) | (dB) | (dB) | (dBuV/m) | FCC_B | (dB) | (H/V) | (Deg) | (Meter) | (P/Q/A) |
| Using loop antenna for below 30MHz measurements (Fundamental & Bandedges): | | | | | | | | | | | |
| Fundamental: | | | | | | | | | | | |
| 27.15 | 69.50 | 9.00 | 0.76 | 0.00 | 79.26 | 100.00 | -20.74 | 3mV | 180.00 | 1.00 | P |
| 27.15 | 58.00 | 9.00 | 0.76 | 0.00 | 67.76 | 80.00 | -12.24 | 3mV | 180.00 | 1.00 | Av |
| 27.15 | 61.80 | 9.00 | 0.76 | 0.00 | 71.56 | 100.00 | -28.44 | 3mH | 180.00 | 3.00 | P |
| Bandedges (Limit @ 3m = 20*log(30/3) + 20*log(30) = 49.5dB) : | | | | | | | | | | | |
| 26.96 | 27.00 | 9.00 | 0.76 | 0.00 | 36.76 | 49.50 | -12.74 | 3mV | 180.00 | 1.00 | P |
| 27.28 | 36.30 | 9.00 | 0.76 | 0.00 | 46.06 | 49.50 | -3.44 | 3mV | 180.00 | 1.00 | P |
| 26.96 | 26.00 | 9.00 | 0.76 | 0.00 | 35.76 | 49.50 | -13.74 | 3mH | 180.00 | 3.00 | P |
| 27.28 | 31.00 | 9.00 | 0.76 | 0.00 | 40.76 | 49.50 | -8.74 | 3mH | 180.00 | 3.00 | P |
| Harmonics & Spurious Emissions: | | | | | | | | | | | |
| 54.28 | 40.50 | 9.44 | 0.89 | 27.48 | 23.36 | 40.00 | -16.64 | 3mV | 180.00 | 1.00 | P |
| 65.16 | 46.00 | 6.62 | 0.96 | 27.44 | 26.13 | 40.00 | -13.87 | 3mV | 180.00 | 1.00 | P |
| 39.13 | 44.00 | 12.84 | 0.83 | 27.54 | 30.14 | 40.00 | -9.86 | 3mV | 180.00 | 1.00 | P |
| 41.35 | 42.00 | 12.63 | 0.85 | 27.53 | 27.95 | 40.00 | -12.05 | 3mV | 180.00 | 1.00 | P |
| 73.15 | 45.00 | 6.32 | 1.03 | 27.42 | 24.93 | 40.00 | -15.07 | 3mV | 180.00 | 1.00 | P |
| 79.35 | 49.00 | 7.37 | 1.08 | 27.41 | 30.03 | 40.00 | -9.97 | 3mV | 180.00 | 1.00 | P |
| 121.65 | 49.00 | 10.92 | 1.41 | 27.25 | 34.08 | 43.50 | -9.42 | 3mV | 180.00 | 1.00 | P |
| 127.43 | 45.00 | 12.01 | 1.46 | 27.21 | 31.26 | 43.50 | -12.24 | 3mV | 180.00 | 1.00 | P |
| 133.63 | 48.50 | 13.43 | 1.51 | 27.19 | 36.26 | 43.50 | -7.24 | 3mV | 180.00 | 1.00 | P |
| 159.66 | 43.00 | 17.03 | 1.66 | 27.09 | 34.60 | 43.50 | -8.90 | 3mV | 180.00 | 1.00 | P |
| 171.64 | 43.00 | 15.97 | 1.75 | 27.04 | 33.68 | 43.50 | -9.82 | 3mV | 180.00 | 1.00 | P |
| 173.86 | 45.00 | 15.77 | 1.76 | 27.03 | 35.50 | 43.50 | -8.00 | 3mV | 180.00 | 1.00 | P |
| Total data #: 19 | | | | | | | | | | | |
| V.2c | | | | | | | | | | | |

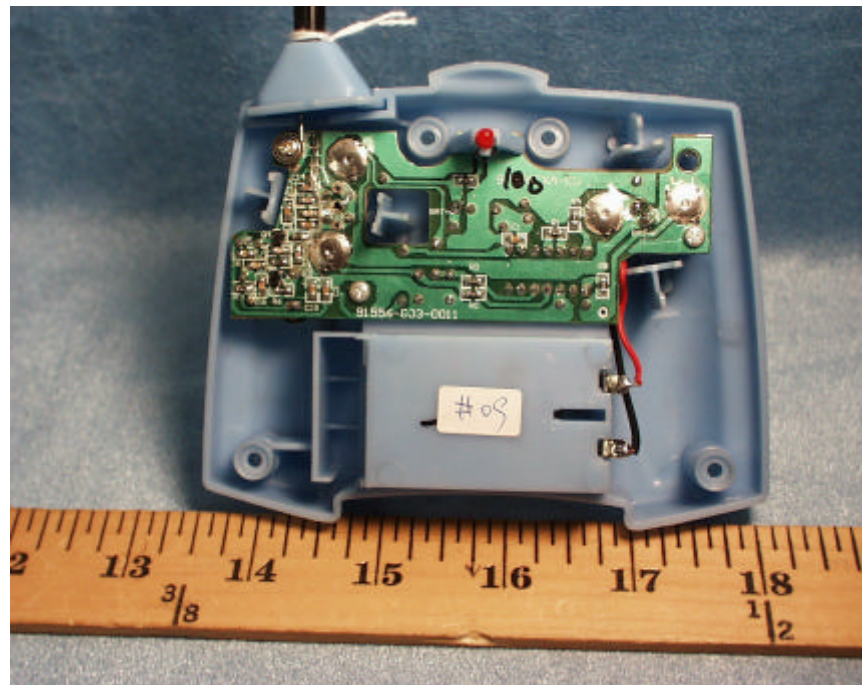
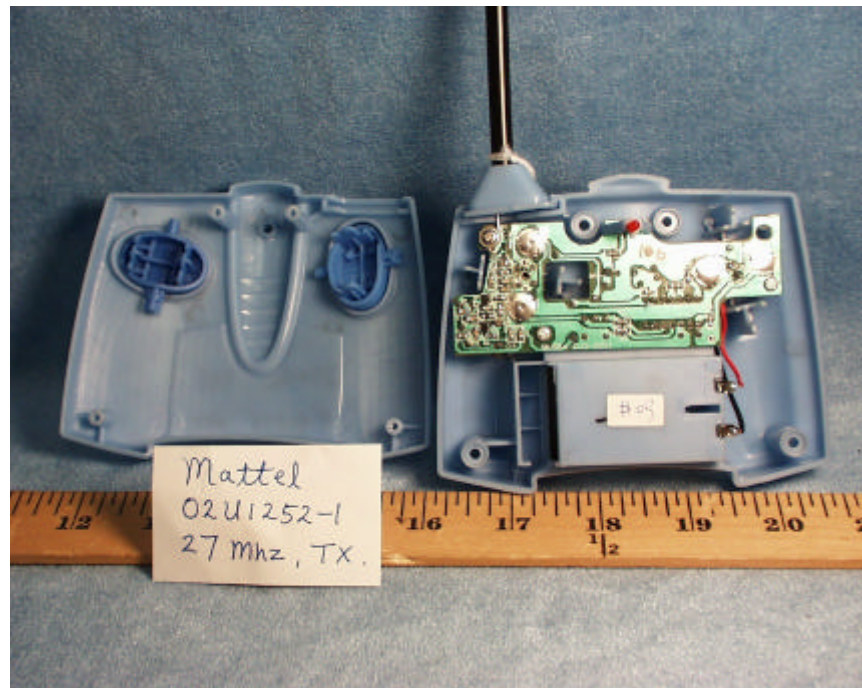


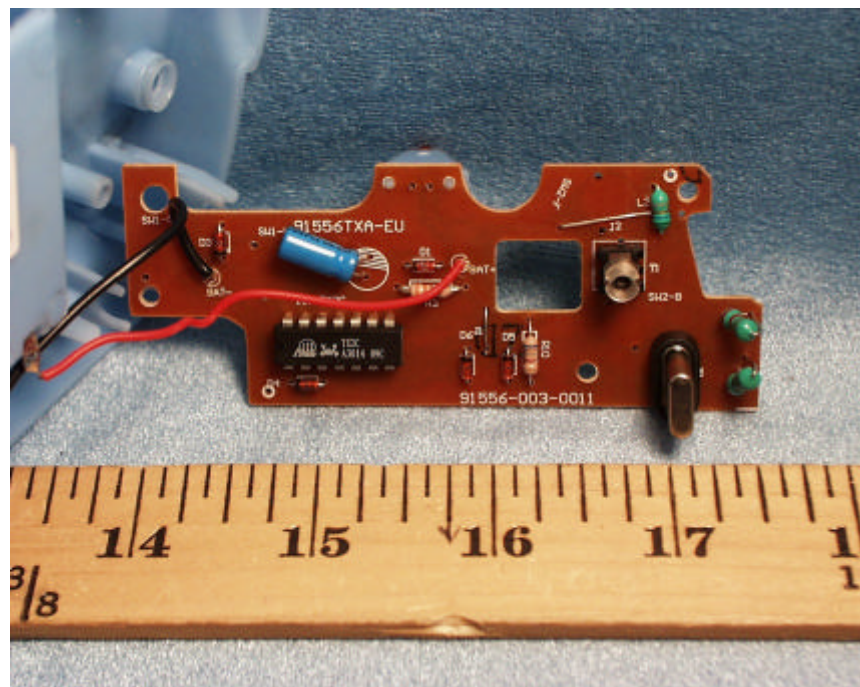
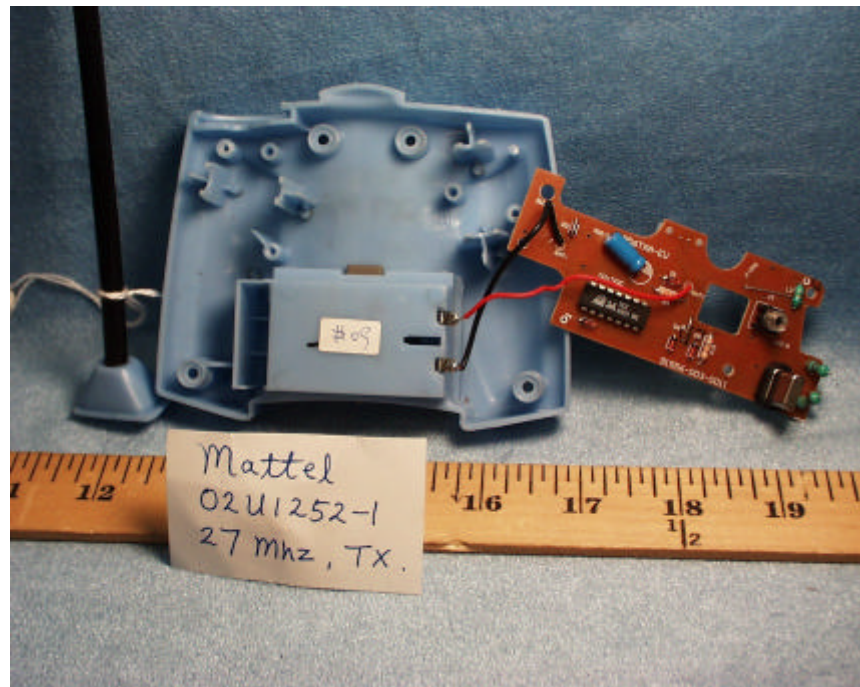
12. Appendix

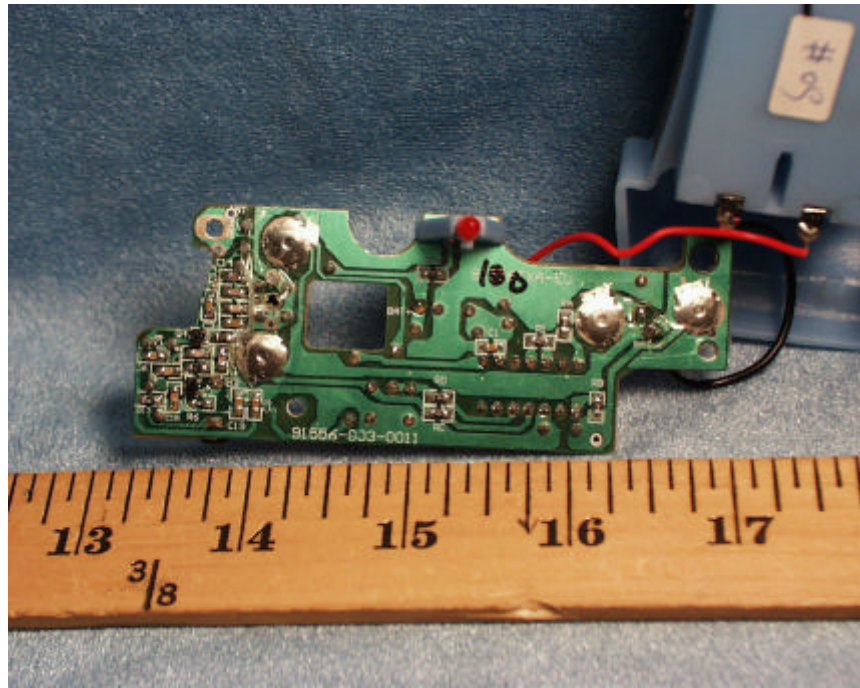
External & Internal Photos











Schematics

Please refer to attached sheets.

Block Diagram

Please refer to attached sheets.

User Manual

Please refer to attached sheets.

END OF REPORT