CHOMERICS TEST SERVICES

TEST REPORT

for

HASBRO INC.

COMPANY PRODUCT NAME

RADIO CONTROLLED ACTION FIGURE, TRANSMITTER FOR MOTORIZED SCOOTER

FCC PART 15 SUBPART C (TRANSMITTER) RADIATED EMISSIONS ONLY

Submitted to:
Joe Straney
Hasbro Inc.
1027 Newport Avenue
Pawtucket, Rhode Island 02862

Prepared by: Ron Crooker
Date: June 1, 1998
Test Report: TR1600B.98
Purchase Order: HM46338
Number of Pages: 15

I attest to the accuracy of the test data in this report:

Technician/Test Engineer

Test Services Approved Signatory

Official responsible for marketing this equipment

TEST REPORT
NVLAP Accredited Laboratory

Parker Seals

Chomerics, 77 Dragon Court, Woburn, Massachusetts 01888-4014
(617) 935-4850 FAX: (617) 935-2758

DESCRIPTION OF TEST SITE

1. **LOCATION OF TEST SITE:**

84 Dragon Court
Woburn, Massachusetts 01888

2. **PHYSICAL DESCRIPTION OF TEST SITE:**

Chomerics open area test site "A" is located in the parking lot behind the Seeger Building at Chomerics, 84 Dragon Court, Woburn, Massachusetts.

The open area test site "A" is a wooden "A" frame, bounded by Dragon Court, a one story brick building, and a paved area. Photographs of the site and site attenuation data are on file with the Federal Communications Commission.

3. The supporting structure used for support of the equipment under test is a wooden rotatable platform .8 meters high. A similar supporting structure is used for the measuring equipment. The mast supporting the antenna can be adjusted from one to four meters in height.

4. The following equipment was used in performing the tests:

Test Equipment Used	Calibrated	Serial/Model Number
Tektronix 496	01/99	S/N B020852
EMCO 3120 / 3121 Dipoles	01/99	S/N 0477, 0478, 479
Rohde and Schwartz ESV Receiver	09/98	B010201
Hewlett Packard 8447D Pre Amp	01/99	2944A06414

5. Tests were performed by Dennis Hennigan.

ADMINISTRATIVE DATA

Purpose of Test:	FCC Part 15 Subpart C (transmitter) Verification
Test Specification:	FCC Part 15 Subpart C (transmitter)
Manufacturer:	Hasbro Inc.
Manufacturer's Type or Model Number:	Radio Controlled Action Figure, Transmitter for Motorized Scooter
Number of Items Tested:	One Unit
Date of Test:	April 23,1998
Test Observed By:	Ron Crooker
Affiliated With:	Chomerics Test Services
Test Location:	Chomerics Open Area Test SiteA
Tests Conducted By:	Ron Crooker
Condition of Test Equipment Upon Arrival:	Good
Customer's Equipment Returned VIA:	Fedex

TEST RESULTS

The Hasbro Inc. Radio Controlled Action Figure, Transmitter for Motorized Scooter meets the FCC Part 15 Subpart C (transmitter) paragraph 15.227, radiated emissions limits for intentional radiators as configured and operated for testing.

The Hasbro Inc. Radio Controlled Action Figure, Transmitter for Motorized Scooter (Engineering Prototype) is part of a motor driven toy set. Both transmitter and receiver are battery powered. The frequency of operation is 27 MHz.

The transmit mode of operation was used for emissions tests which activates the receiver including the drive motor.

The equipment under test was set up as illustrated on CTS-Form-014.

TEST SERVICES FACILITY INFORMATION

Chomerics Test Facility is recognized under the National Voluntary Laboratory Accreditation (NVLAP) Program for NVLAP Codes 12/C01 and 12/R01. Tests within this report not conforming to 12/C01 and 12/R01 NVLAP Codes are not covered under Chomerics NVLAP accreditation.

Chomerics Test Facility operates under the current revision of Chomerics Quality Assurance Manual Document Number QA002.

The QA manual has been constructed to reflect a quality program in accordance with the requirements of the National Institute of Standards and Technology (NIST), ISO 9002, ISO Guide 25, NIST Handbook 150, EN 45001, MIL-I-45208A, MIL-STD-461D, 462D and Chomerics Quality Assurance Program (QAP).

The QA manual outlines and describes the procedures for establishing and maintaining the quality of analysis, research, inspection, and testing within Chomerics Test Service (CTS).

This test report does not represent an endorsement by the U.S. Government.

The results and/or conclusions within this test report refer and/or apply only to the unit(s) tested as defined by this report.

Measurements performed for this test are traceable to the National Institute of Standards and Technology (NIST) based on the fact that all test equipment used for the measurements were previously calibrated using standards traceable to NIST.

No deviations, additions to, or exclusions from the test specification(s) were made.

The system amplitude accuracy for the measurements made during the radiated emission tests was ±3dB.

TEST SITE DESCRIPTIONS

The following is a description of Test Services Open Field Test Sites. Refer to Administrative Data on page 2, line 9 for the specific test site used for testing.

OPEN AREA TEST SITE A: Chomerics open area test site "A" is located in the parking lot behind the Seeger Building at Chomerics, 77 Dragon Court, Woburn, Massachusetts.

The open area test site "A" is a wooden "A" frame, bounded by Dragon Court, a one story brick building, and a paved area. Photographs of the site and site attenuation data are on file with the Federal Communications Commission.

The supporting structure used for support of the equipment under test is a wooden rotatable platform .8 meters high. A similar supporting structure is used for the measuring equipment. The mast supporting the antenna can be adjusted from one to four meters in height.

OPEN AREA TEST SITE B: Chomerics open area test site "B" is located in the lower parking lot behind the Seeger Building at Chomerics, 77 Dragon Court, Woburn, Massachusetts.

Photographs of the site and site attenuation data are on file with the Federal Communications Commission.

Parking is permitted on one side of test site "B" at a discrete distance from the imaginary ellipse.

The open area site B enclosure is a wooden structure measuring 56 X 30 X 25 feet in size with galvanized steel sheet metal used as the ground plane. The structure is sized to allow both 3 and 10 meter measurements and is heated and/or air conditioned.

The structure used to support equipment under test is a 14 foot diameter motorized turntable. The sheet metal surface is flush with the ground plane. To ground the turntable, 175 copper fingers (1" x 1.5") are mounted around the outer edge of the turntable using machine screws. The spring fingers are equally spaced and provide a uniform interface between the turntable metal surface and ground plane. When needed for table top equipment, a wooden table measuring 3 x 6 feet in size is positioned at the center of the turntable, at the proper height above the ground plane.

The addition at the end of the open area test site is the location for the test personnel and equipment to ensure they are outside the imaginary ellipse.

Both Test Site A and B are listed by the Federal Communications Commission (FCC).

RADIATED EQUIPMENT LIST

	Test Equipment	Asset #	Serial #	Cal
	Tektronix 496 Spectrum Analyzer	1	B010559	10/98
X	Tektronix 496 Spectrum Analyzer	77	B020852	1/99
	Tektronix 496 Spectrum Analyzer	56	B010206	4/99
	Tektronix 494 Spectrum Analyzer	543	B010201	9/98
X	Rhode and Schwartz ESV Test Receiver	15	875931049	9/98
	Rhode and Schwartz ESV Test Receiver	521	979531/031	1/99
	Hewlett Packard 8559A Spectrum Analyzer	472	2019A00461	1/99
	Hewlett Packard 182T Analyzer Main Frame	352	1931A003349	1/99
X	Hewlett Packard 8447D Pre Amp	12	2944A06414	1/99
	Hewlett Packard 8447D Pre Amp	4	2727A06065	1/99
	Electro Metrics ALR-25M Loop Antenna	17	4706	1/99
X	EMCO 3120 Tuned Dipole Antenna B1	477	56	1/99
X	EMCO 3121 Tuned Dipole Antenna B2	478	176	1/99
X	EMCO 3121 Tuned Dipole Antenna B3	479	728	1/99
	EMCO 3120 Tuned Dipole Antenna B1	453	42	1/99
	EMCO 3120 Tuned Dipole Antenna B2	454	65	1/99
	EMCO 3121 Tuned Dipole Antenna B3	455	9501-1101	1/99
	EMCO 3120 Tuned Dipole Antenna B1	474	21	1/99
	EMCO 3121 Tuned Dipole Antenna B2	475	177	1/99
	EMCO 3121 Tuned Dipole Antenna B3	479	728	1/99
	EMCO 3115 Microwave Horn Antenna	376	2796	1/99
	EMCO 3105 Microwave Horn Antenna	78	2118	1/99
	Polarad MDS21 Absorbing Clamp	435	301404/003	NCR

Equipment Calibration: The calibration of Chomerics test facility equipment is controlled under the current revision of Chomerics Laboratory Test Equipment Calibration Manual Document Number QA001.

The test equipment used throughout this test sequence conforms to laboratory calibration standards, MIL-STD-45662A, traceable to the National Institute of Science and Technology. The date of the next due scheduled calibration is listed in the table above for Chomerics Test Services equipment used during testing.

All test equipment is calibrated in one year intervals.

Test Personnel: The test personnel used to perform or supervise the tests are accredited by the National Association of Radio and Telecommunications Engineers, Inc. (NARTE) as Certified Electromagnetic Compatibility Engineers (N.C.E.) and Technicians (N.C.T.).

RADIATED EMISSIONS
30 MHz to 1000 MHz

Test No: **ONE (1)**

Equipment Tested: Hasbro Inc. Radio Controlled Action Figure, Transmitter for Motorized Scooter

Configuration: For small devices, the EUT is set up on a wooden turntable 3 meters from the tunable dipole antenna.

No support equipment was needed to run the Radio Controlled Action Figure, Transmitter for Motorized Scooter in the transmit mode of operation.

Any emissions radiating from the Radio Controlled Action Figure, Transmitter for Motorized Scooter were maximized by rotating the test table.

Test Mode: Transmit Mode

Results: The Hasbro Inc. Radio Controlled Action Figure, Transmitter for Motorized Scooter meets the FCC Part 15 Subpart C (transmitter) paragraph 15.227, radiated emissions limits as configured for testing.

Fixes: None

CABLE CONFIGURATION

There were no cables that were exiting the equipment under test.

SUMMARY OF RECOMMENDATIONS

The Hasbro Inc. Radio Controlled Action Figure, Transmitter for Motorized Scooter will not require any modifications in order to insure compliance with the FCC Part 15 Subpart C (transmitter) paragraph 15.227, radiated emission requirements for intentional radiators.

Please note that if any modifications and or fixes were implemented to the EUT to achieve compliance, that other approaches to solving the problem may exist. In addition, any EMI/EMC shielding products listed in this report may be substituted with an equivalent.

APPENDIX A

TEST DATA

TEST LOG

Customer: HASBRO Program: COMMERCIAL

EUT: RADIO CONTROLLED ACTION FIGURE S/N PROTO

PRE-TEST CHECKLIST

DATE	COMMENTS
4/14/98	Test Plan/Procedure: NONE Test Specification: FCC PART 15, SUBPARTS B & C Chomerics Procedure: CHO TPEC T1 T2 EUT Power Requirement Verified: Voltage 9VDC Frequency ____ Phase ____ Voltage 6VDC Frequency ____ Phase ____ EUT Functional Operational Check: [✓] Pass [ ] Fail Environmental: Ambient Temperature 72 °F Humidity: 43 % Atmospheric Pressure: 27.08" Bonding / Grounding: — Safety Issues: —

IN-PROCESS TEST CHECKLIST

Date	Test Type	Test Equipment Calibrated	Test Performed Properly- Data Accepted	EUT Setup Check / Operational Check	EUT Pass/Fail
4/24/98	SUBPART B	✓	✓	✓	PASS
4/24/98	SUPPART C	✓	✓	✓	PASS

POST TEST CHECKLIST

Date: 4/24/98

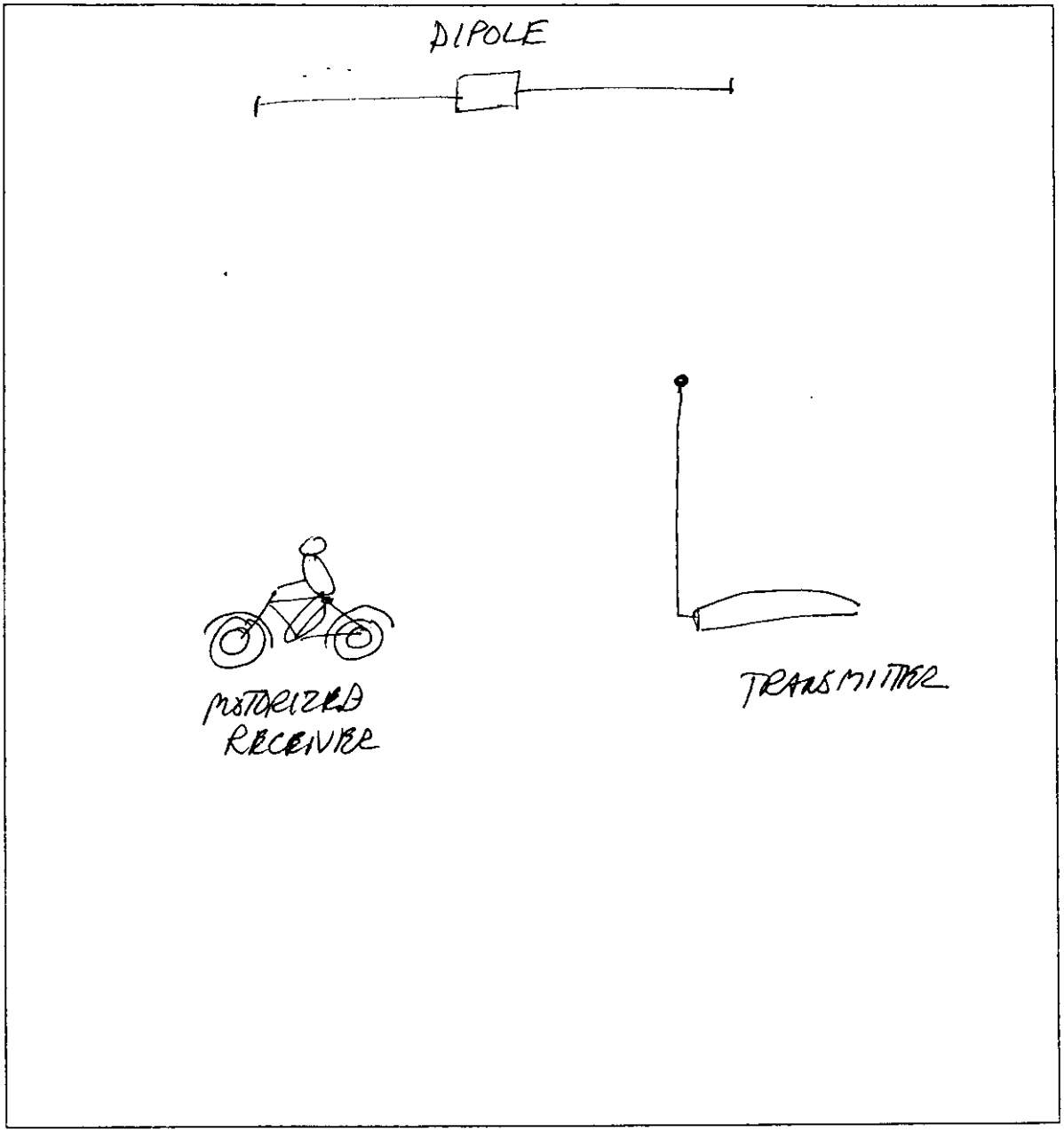
EUT Functional Operational Check: [✓] Pass [ ] Fail

Test Engineer/Tech: [signature] Test Services Mgr

DOCUMENT # TA16006.98

DATE: June 1, 1998

System Configuration Block Diagram- Provide a line drawing identifying the EUT, simulators, support equipment, I/O cables, power cables, and any other pertinent components to be used during testing. Use a dashed line to separate the equipment in the testing field versus equipment outside testing field.



CUSTOMER: HASBO

EUT: RADIO CONTROLLED ACTION FIGURE

DATE: 24 APRIL 98

S/N: PROTO

RADIATED E FIELD EMISSION MEASUREMENTS

CUSTOMER: HASBRO
DATE: 23 APRIL 98
EQUIPMENT: ACTION FIGURE, TRANSMITTER/RECEIVER WITH CARBON BRUSH MOTOR
TEST NUMBER:
TESTED BY: R
OPERATING MODE: TX
BANDWIDTH: [✓] 100 kHz (PEAK) / 120 kHz (QP)
TEST SPEC: PART 15 SUBPART C
OTHER (SPECIFY):
PROCEDURE: ANSI C63.4
FREQUENCY RANGE: [✓] 30MHz - 1GHz
ANTENNA DISTANCE: [✓] 3 METERS [ ] 10 METERS
OTHER (SPECIFY):

TRANSMITTER UNDER TEST

Frequency MHz	Peak Measured Level -dBm	Quasi-Peak Measured Level dBuV	Antenna Height (Meters)	Turntable Azimuth (Degrees)	Antenna H/V	Antenna Fac/Cable Loss dB	Field Level dB uV/m **	Limit dBuV/m (QP)
FUNDAMENTAL (PARAGRAPH 15.227)								
26.96–								
27.28		74	2.5	0°	V	1.9	75.9	80
OUT OF BAND (PARAGRAPH 209)						HARMONICS & SPURS		
54		21	2.5	0°	V	9.0	30	40
81		2	2.0	0°	V	10.3	12.3	40
108		3	2.0	0°	V	15.0	18.0	43.5
135		13	2.0	0°	V	18.0	31.0	43.5
162		—	—	—	—	17.4	NSD	43.5
189		—	—	—	—	19.0	NSD	43.5

** All signals greater than 3dB from the limit are calculated to the nearest whole number.

** Field Level (dBuV/m) = [107 - Measured Level (dBm)] + Antenna Factor/Cable Loss (dB)

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APPENDIX B

SETUP PHOTOGRAPHS