

TABLE OF CONTENTS

APPLICANT: SCIENTIFIC TOYS LTD.

FCC ID: BY3E889

TEST REPORT CONTAINING:

PAGE 1.....TEST EQUIPMENT LIST AND TEST PROCEDURE  
PAGE 2.....TEST PROCEDURE CONTD. AND CIRCUIT DESCRIPTION  
PAGE 3.....RADIATION INTERFERENCE TEST DATA  
PAGE 4.....OCCUPIED BANDWIDTH TEST DATA

EXHIBITS CONTAINING:

EXHIBIT 1.....POWER OF ATTORNEY LETTER  
EXHIBIT 2.....BLOCK DIAGRAM  
EXHIBIT 3.....SCHEMATIC  
EXHIBIT 4.....INSTRUCTION MANUAL  
EXHIBIT 5.....SAMPLE OF FCC ID LABEL AND LOCATION  
EXHIBIT 6.....EXTERNAL PHOTO - FRONT SIDE  
EXHIBIT 7.....EXTERNAL PHOTO - BACK SIDE  
EXHIBIT 8.....INTERNAL PHOTO - COMPONENT SIDE  
EXHIBIT 9.....INTERNAL PHOTO - COPPER SIDE  
EXHIBIT 10.....OCCUPIED BANDWIDTH PLOT

APPLICANT: SCIENTIFIC TOYS LTD.

FCC ID: BY3E889

REPORT #: T:\CUS\S\SCIENTIF\121ZH0\SCI121Z0.RPT

PAGE: TABLE OF CONTENTS LIST

APPLICANT: SCIENTIFIC TOYS LTD.  
FCC ID: BY3E889

TEST EQUIPMENT LIST

1. X Spectrum Analyzer: HP 8566B-Opt 462, S/N 3138A07786, w/  
preselector HP 85685A, S/N 3221A01400, Quasi-Peak Adapter  
HP 85650A, S/N 3303A01690 & Preamplifier HP 8449B-OPT H02,  
S/N 3008A00372 Cal. 10/17/99
2. X Biconnical Antenna: Eaton Model 94455-1, S/N 1057
3. X Log-Periodic Antenna: Electro-Metrics Model EM-6950, S/N 632
4.    Double-Ridged Horn Antenna: Electro-Metrics Model RGA-180,  
1-18 GHz, S/N 2319 Cal. 4/27/99
5.    Horn 40-60GHz: ATM Part #19-443-6R
6.    Line Impedance Stabilization Network: Electro-Metrics Model  
ANS-25/2, S/N 2604 Cal. 2/9/00
7.    Temperature Chamber: Tenney Engineering Model TTRC, S/N 11717-7
8.    Frequency Counter: HP Model 5385A, S/N 3242A07460 Cal 10/6/99
9.    Peak Power Meter: HP Model 8900C, S/N 2131A00545 Cal 7/19/99
10.    Open Area Test Site #1-3meters Cal. 12/22/99
11.    Signal Generator: HP 8640B, S/N 2308A21464 Cal. 9/23/99
12.    Signal Generator: HP 8614A, S/N 2015A07428 Cal. 5/29/99
13.    Passive Loop Antenna: EMCO Model 6512, 9KHz to 30MHz, S/N  
9706-1211 Cal. 6/23/97
14.    Dipole Antenna Kit: Electro-Metrics Model TDA-30/1-4, S/N 153  
Cal. 11/24/99
15.    AC Voltmeter: HP Model 400FL, S/N 2213A14499 Cal. 9/21/99
16.    Digital Multimeter: Fluke Model 8012A, S/N 4810047 Cal 9/21/99
17.    Digital Multimeter: Fluke Model 77, S/N 43850817 Cal 9/21/99
18.    Oscilloscope: Tektronix Model 2230, S/N 300572 Cal 9/23/99

TEST PROCEDURE

GENERAL: This report shall NOT be reproduced except in full without  
the written approval of TIMCO ENGINEERING, INC.

RADIATION INTERFERENCE: The test procedure used was ANSI STANDARD  
C63.4-1992 using a HEWLETT PACKARD spectrum analyzer with a prese-  
lector. The bandwidth of the spectrum analyzer was 100 kHz with an  
appropriate sweep speed. The analyzer was calibrated in dB above a  
microvolt at the output of the antenna. The resolution bandwidth was  
100KHz and the video bandwidth was 300KHz. The ambient temperature of  
the UUT was 72o with a humidity of 75%.

APPLICANT: SCIENTIFIC TOYS LTD.  
FCC ID: BY3E889  
REPORT #: T:\CUS\S\SCIENTIF\121ZH0\SCI121Z0.RPT  
PAGE #: 1

APPLICANT: SCIENTIFIC TOYS LTD.  
FCC ID: BY3E889

FORMULA OF CONVERSION FACTORS: The Field Strength at 3m was established by adding the meter reading of the spectrum analyzer (which is set to read in units of dBuV) to the antenna correction factor supplied by the antenna manufacturer. The antenna correction factors are stated in terms of dB. The gain of the Preselector was accounted for in the Spectrum Analyzer Meter Reading.

Example:

Freq (MHz) METER READING + ACF = FS  
33 20 dBuV + 10.36 dB = 30.36 dBuV/m @ 3m

#### CIRCUIT DESCRIPTION:

In the transmit mode the momentary switches SW-L, SW-R, SW-B, & SW-F provide input to the encoder intergrated circuit U1. The output of U1 modulated the RF oscillator Q1 by varing the emitter current of that stage. The RF frequency is determined by the crystal Y1. The output of Q1 is coupled through C10 to the base of the RF amplifier Q2. From Q2 the signal is fed into the tuned circuit made up of L3/C5 & then to the low pass filter made up of C7/L2/C8 and is then fed to the antenna.

#### ANTENNA AND GROUND CIRCUITRY

This unit makes use of a short, antenna. The antenna is inductively coupled. The antenna is self contained, no provision is made for an external antenna. This unit is powered from a 9.0V battery.

No ground connection is provided. The unit relies on the ground tract of the printed circuit board.

APPLICANT: SCIENTIFIC TOYS LTD.  
FCC ID: BY3E889  
REPORT #: T:\CUS\S\SCIENTIF\121ZH0\SCI121Z0.RPT  
PAGE #: 2

APPLICANT: SCIENTIFIC TOYS LTD.  
 FCC ID: BY3E889  
 NAME OF TEST: RADIATION INTERFERENCE  
 RULES PART NO.: 15.227  
 REQUIREMENTS: CARRIER FREQUENCY WILL NOT EXCEED 80 dBuV/m AT 3M.  
 OUT-OF-BAND EMISSIONS SHALL NOT EXCEED:

30 - 88 MHz 40.0 dBuV/M MEASURED AT 3 METERS  
 88 - 216 MHz 43.5 dBuV/M  
 216 - 960 MHz 46.0 dBuV/M  
 ABOVE 960 MHz 54.0 dBuV/M

TEST DATA:

EMISSION FREQUENCY MHz	METER READING AT 3 METERS dBuV	COAX LOSS dB	ANTENNA CORRECTION FACTOR dB	FIELD STRENGTH dBuV/m@3m	MARGIN dB	ANT. POL.
27.15	62.60	0.20	11.75	74.55	5.45	V
54.29	22.60	0.80	9.61	33.01	6.99	V
81.44	21.10	0.80	12.13	34.03	5.97	V
108.58	12.90	0.80	8.38	22.08	21.42	V
135.73	6.80	0.80	15.32	22.92	20.58	V
162.87	15.60	0.90	17.17	33.67	9.83	V
217.16	21.50	1.20	12.42	35.12	10.88	V
244.31	18.10	1.20	13.21	32.51	13.49	V
271.45	22.20	1.40	14.00	37.60	8.40	V

SAMPLE CALCULATION:  $FSdBuV/m = MR(dBuV) + ACFdB.$

TEST PROCEDURE: The procedure used was ANSI STANDARD C63.4-1992. The spectrum was scanned from 30 MHz to 1000 MHz. When an emission was found, the table was rotated to produce the maximum signal strength. The antenna was placed in both the horizontal and vertical planes and the worse case emissions were reported. The UUT was tested in 3 orthogonal planes.

TEST RESULTS: THE UNIT DOES MEET THE FCC REQUIREMENTS.

PERFORMED BY: \_\_\_\_\_ S. S. SANDERS \_\_\_\_\_ DATE: MAY 9, 2000

APPLICANT: SCIENTIFIC TOYS LTD.  
 FCC ID: BY3E889  
 REPORT #: T:\CUS\S\SCIENTIF\121ZH0\SCI121Z0.RPT  
 PAGE #: 3

APPLICANT: SCIENTIFIC TOYS LTD.  
FCC ID: BY3E889  
NAME OF TEST: Occupied Bandwidth  
RULES PART NO.: 15.227  
REQUIREMENTS: The field strength of any emissions appearing outside the 26.96-27.28 MHz band shall not exceed 100 uV/m (15.209).

THE GRAPH IN EXHIBIT 10 REPRESENTS THE WORSE CASE OCCUPIED BANDWIDTH EMISSIONS FOR THIS DEVICE.

METHOD OF MEASUREMENT: A small sample of the transmitter output was fed into the spectrum analyzer and the attached plot was taken. The vertical scale is set to -10 dBm per division. The horizontal scale is set to 5 kHz per division.

TEST RESULTS: The unit DOES meet the FCC requirements.

PERFORMED BY: S. S. SANDERS MAY 9, 2000

APPLICANT: SCIENTIFIC TOYS LTD.  
FCC ID: BY3E889  
REPORT #: T:\CUS\S\SCIENTIF\121ZH0\SCI121Z0.RPT  
PAGE #: 4