FCC SUBPART C
TEST REPORT

for

LOW POWER
COMMUNICATION DEVICE - TRANSMITTER

TX045-27

Prepared for:

KIN YAT INDUSTRIAL CO., LTD.
BLK A, 7/F, GALAXY FACTORY BUILDING
25-27 LUK HOP ST.
SAN PO KONG, KOWLOON, HONG KONG

Prepared by: _____
Jesse Metoyer

Approved by: _____
Victor Ratinoff

COMPATIBLE ELECTRONICS INC.
19121 EL TORO RD.
SILVERADO, CALIFORNIA 92676
(714) 589-0700

DATE: July 14, 1998

	REPORT	APPENDICES			TOTAL
	BODY	***A***	***B***	***C***	
PAGES	18	4	4	3	**27**

TABLE OF CONTENTS

LIST OF APPENDICES

APPENDIX	TITLE
A	Test Setup Diagrams and Photos
B	Antenna and Effective Gain Factors
C	Modifications to the EUT

LIST OF FIGURES

FIGURE	TITLE
1	Plot Map And Layout of Test Site

GENERAL REPORT SUMMARY

This electromagnetic emission test report is generated by Compatible Electronics Inc., which is an independent testing and consulting firm. The test report is based on testing performed by Compatible Electronics personnel according to the measurement procedures described in the test specifications given below and in the "Test Procedures" section of this report.

The measurement data and conclusions appearing herein relate only to the sample tested and this report may not be reproduced in any form unless done so in full.

This report must not be used to claim product endorsement by NVLAP or any other agency of the U.S. Government.

Device Tested:	Low Power Communication Device - Transmitter TX045-27 S/N: N/A
Device Description:	The EUT is a 27 MHz radio transmitter for a toy.
Modifications:	The EUT was modified in order to meet the specifications. Please see list in Appendix C.
Manufacturer:	Kin Yat Industrial Co., Ltd. Blk A, 7/F, Galaxy Factory Building 25-27 Luk Hop St. San Po Kong, Kowloon, Hong Kong
Test Dates:	July 9 and 10, 1998.
Test Deviations:	The test procedure was not deviated from during the testing.

SUMMARY OF TEST RESULTS

TEST	DESCRIPTION	RESULTS
1	Radiated RF Emissions, 10 kHz - 272 MHz.	Complies with the limits of sections **15.205, 15.209** and **15.227** of FCC Title 47, Part 15, Subpart C
2	Conducted RF emissions, 450 kHz - 30 MHz	This test is not applicable. The EUT is powered by a 9 volt battery.

1. PURPOSE

This document is a qualification test report based on the Electromagnetic Interference (EMI) tests performed on the Low Power Communication Device – Transmitter, model: TX045-27. The EMI measurements were performed according to the measurement procedure described in ANSI C63.4: 1992. The tests were performed in order to determine whether the electromagnetic emissions from the Low Power Communication Device - Transmitter, referred to as EUT hereafter, are within the specification limits defined by FCC Title 47, Part 15, Subpart C, sections **15.205**, **15.209**, and **15.227.**

2. ADMINISTRATIVE DATA

2.1 Location of Testing

The EMI/EMC tests described herein were performed at the test facility of Compatible Electronics, 19121 El Toro Rd., Silverado, California.

2.2 Traceability Statement

The calibration certificates of all test equipment used during the test are on file at the location of the test. The calibration is traceable to the National Institute of Standards and Technology (NIST).

2.3 Cognizant Personnel

Kin Yat Industrial Co., Ltd.

Andy Chan	Engineering

Compatible Electronics, Inc.

Jesse A. Metoyer	Test Engineer
Victor Ratinoff	Lab Manager

2.4 Date Test Sample was Received

The test sample was received on July 9, 1998.

2.5 Disposition of the Test Sample

The test sample has not yet been returned to Kin Yat Industrial Co., Ltd.

2.6 Abbreviations and Acronyms

The following abbreviations and acronyms may be used in this document.

HP	Hewlett Packard	RF	Radio Frequency
P/N	Part Number	EMI	Electromagnetic Interference
LISN	Line Impedance Stabilization Network	S/N	Serial Number
ITE	Information Technology Equipment	EUT	Equipment Under Test

3. APPLICABLE DOCUMENTS

The following documents are referenced or used in the preparation of this EMI Test Report.

SPEC	TITLE
FCC Title 47, Part 15 1997	FCC Rules - Radio frequency devices (including digital devices).
ANSI C63.4 1992	Methods of measurement of radio-noise emissions from low-voltage electrical and electronic equipment in the range of 9 kHz to 40 GHz.

4. DESCRIPTION OF TEST CONFIGURATION

4.1 Description of Test Configuration - EMI

Specifics of the EUT being tested:

The EUT was placed in the center of the test table. It was transmitting constantly during all tests, and was tested in three orthogonal axis. The EUT is a stand-alone device with no cables.

All initial investigations were performed with the EMI receiver in manual mode scanning the frequency range continuously.

4.1.1 Cable Construction and Termination

HANDSET BEING TESTED

There are no cables on the device.

5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT

5.1 EUT and Accessory List

EQUIPMENT	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	FCC ID
LOW POWER COMMUNICATION DEVICE - TRANSMITTER (EUT)	Kin Yat Industrial Co., Ltd.	TX045-27	N/A	HDTTX045-27

5.2 Test Equipment

EQUIPMENT TYPE	MANU-FACTURER	MODEL NUMBER	SERIAL NUMBER	CAL. DATE	CAL. CYCLE
Spectrum Analyzer-RF	Hewlett Packard	8568B	2503A01174	April 27, 1998	1 Year
Spectrum Analyzer-Disp.	Hewlett Packard	85662A	2403A09009	April 27, 1998	1 Year
Quasi-Peak Adapter	Hewlett Packard	85650A	2811A01081	April 27, 1998	1 Year
Preamplifier	Com Power	PA-102	1223	April 11, 1998	1 Year
Biconical Antenna	Com Power	AB-100	1523	April 11, 1998	1 Year
Antenna Mast	Com Power	AM-100	N/A	N/A	N/A
Turntable	Com Power	TT-100	N/A	N/A	N/A
Loop Antenna	Com Power	AL-130	25310	April 9, 1998	1 Year

6. TEST SITE DESCRIPTION

6.1 Test Facility Description

Please refer to section 2.1 of this report for EMI test location.

6.2 EUT Mounting, Bonding and Grounding

For all tests, the EUT was mounted on a 1.0 by 1.5 by 0.8 meter high non-conductive table, which was placed on the ground plane.

The EUT was not grounded.

7. TEST PROCEDURES

The following sections describe the test methods and the specifications for the tests. Test results are also included in this section.

7.1 Emissions Tests

7.1.1 Radiated Emissions Test

The spectrum analyzer was used as a measuring meter along with the quasi-peak adapter. Amplifiers were used to increase the sensitivity of the instrument. The Com Power Preamplifier Model: PA-102 was used for frequencies above 30 MHz. The spectrum analyzer was used in the peak detect mode with the "Max Hold" feature activated. In this mode, the spectrum analyzer records the highest measured reading over all the sweeps. The quasi-peak adapter was used only for those readings which are marked accordingly on the data sheets. The measurement bandwidths and transducers used for the radiated emissions test were:

FREQUENCY RANGE	EFFECTIVE MEASUREMENT BANDWIDTH	TRANSDUCER
10 kHz to 150 kHz	200 Hz	Active Loop Antenna
150 kHz to 30 MHz	9 kHz	Active Loop Antenna
30 MHz to 300 MHz	120 kHz	Biconical Antenna

The open field test site of Compatible Electronics, Inc. was used for radiated emission testing. This test site is set up according to ANSI C63.4: 1992. Please see section 6.2 of this report for mounting, bonding and grounding of the EUT. The turntable supporting the EUT is remote controlled using a motor. The turntable permits EUT rotation of 360 degrees in order to maximize emissions. Also, the antenna mast allows height variation of the antenna from 1 meter to 4 meters. Data was collected in the worst case (highest emission) configuration of the EUT. At each reading, the EUT was rotated 360 degrees and for frequencies above 30 MHz, the antenna height was varied from 1 to 4 meters (for E field radiated field strength). For measurements with the loop antenna, the loop was mounted with its center one meter above the ground plane, and was rotated along its axis in an effort to maximize the emissions.

The presence of ambient signals was verified by turning the EUT off. In case an ambient signal was detected, the measurement bandwidth was reduced temporarily and verification was made that an additional adjacent peak did not exist. This ensures that the ambient signal does not hide any emissions from the EUT. The EUT was tested at a 3 meter test distance to obtain final test data.

SECTION 7.1.1.1

RADIATED EMISSIONS DATA

RADIATED EMISSIONS

COMPANY NAME: KIN YAT INDUSTRIAL CO., LTD. DATE: 7/10/98

EUT: LOW POWER COMMUNICATION DEVICE EUT S/N: PROTOTYPE

EUT MODEL: TX045-27 LOCATION: ☐ BREA ■ SILVERADO ☐ AGOURA

SPECIFICATION: FCC CLASS: B TEST DISTANCE: 3 METER LAB: M

ANTENNA: ■ LOOP ☐ BICONICAL ☐ LOG ☐ HORN POLARIZATION: ☐ VERT ☐ HORIZ

■ QUALIFICATION ☐ ENGINEERING ☐ MFG. AUDIT ENGINEER: JESSE METOYER

NOTES: 27.145 MHz X-TAL

CABLE LOSS = 0.8
ANT FACTOR dB = 7.6

Frequency (MHz)	Peak Reading (dBuV/m)	Quasi-Peak (dBuV/m)	Antenna Height (meters)	Azimuth (degrees)	Delta * (dB)	Corrected Limit (dBuV/m)	Comments SPEC LIMIT (dBuV)
27.13	67.5		1.0	90°	-5.7	74.3	80.0
27.16	67.2		1.0	0°	-6.0	74.0	80.0

* DELTA = METER READING - CORRECTED LIMIT

Test location: Compatible Electronics
Customer : Andy Chan
Manufacturer : Kin Yat Industrial Co., LTD.
EUT name : Low Power Communication Device - Transmitter
Specification: Fcc_B Test distance: 3.0 mtrs
Distance correction factor (20*log(test/spec))
Test Mode : 27.145 MHz X-tal

Date : 7/10/1998
Time : 15.20
Model: TX045-27

Lab: M
: 0.00

one 6.8 uH axial lead choke between pcb and antenna (in series)

Pol	Freq MHz	Rdng dBuV	Cable loss dB	Ant factor dB	Amp gain dB	Cor'd rdg = R dBuV	Limit = L dBuV	Delta R - L dB
1V	54.32	59.00	0.99	10.20	36.30	33.89	40.00	-6.11
2V	81.47	51.80	1.33	8.37	36.20	25.30	40.00	-14.70
3V	190.02	40.70	2.06	15.10	36.14	21.72	43.50	-21.78
4V	217.18	46.50	2.10	16.63	36.03	29.20	46.00	-16.80
5V	244.32	47.00	2.33	16.83	36.08	30.09	46.00	-15.91
6V	271.44	40.30	2.40	19.39	36.01	26.07	46.00	-19.93
7H	54.31	50.50	0.99	10.20	36.30	25.39	40.00	-14.61
8H	81.46	57.30	1.33	8.37	36.20	30.80	40.00	-9.20
9H	108.63	50.60	1.47	6.44	36.20	22.31	43.50	-21.19
10H	162.89	50.00	1.85	9.21	36.20	24.87	43.50	-18.63

8. CONCLUSIONS

The Low Power Communication Device - Transmitter TX045-27 meets all of the specification limits defined in FCC Title 47, Part 15, Subpart C, sections **15.205, 15.209,** and **15.227** specification limits defined in FCC Title 47, Part 15, Subpart C.

APPENDIX A

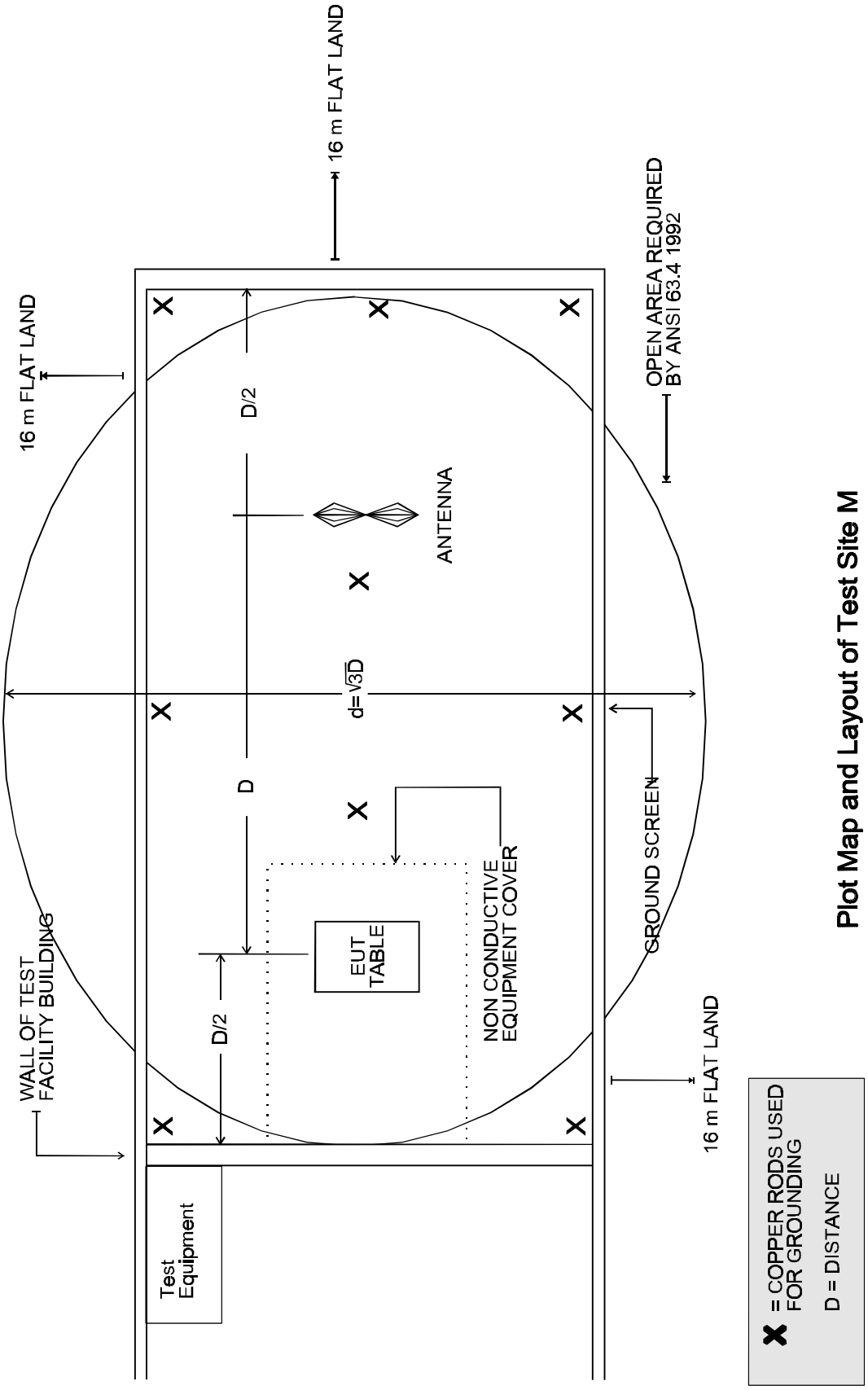
TEST SETUP DIAGRAMS AND PHOTOS

KIN YAT INDUSTRIAL CO., LTD..
LOW POWER COMMUNICATION DEVICE - TRANSMITTER
TX045-27
FCC SUBPART C - RADIATED EMISSIONS (10 kHz to 30 MHz) – 7-10-98

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

KIN YAT INDUSTRIAL CO., LTD..
LOW POWER COMMUNICATION DEVICE - TRANSMITTER
TX045-27
FCC SUBPART C - RADIATED EMISSIONS (30 MHz to 272 MHz) – 7-10-98

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

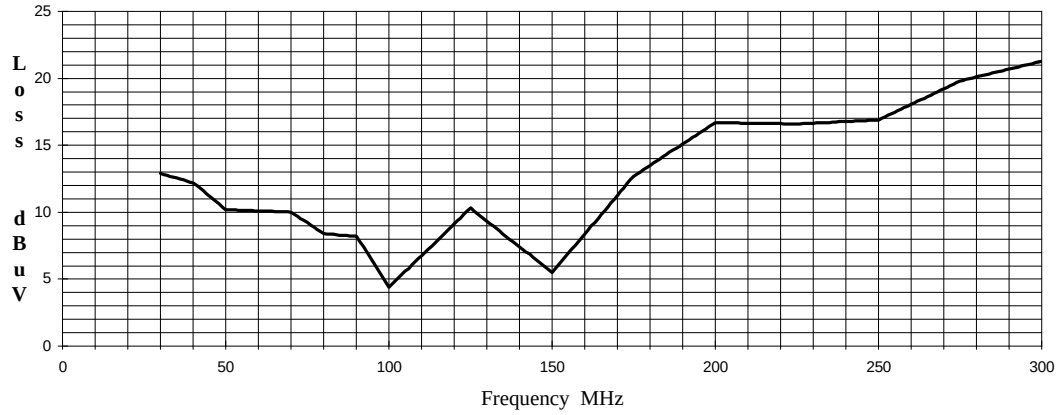


Plot Map and Layout of Test Site M

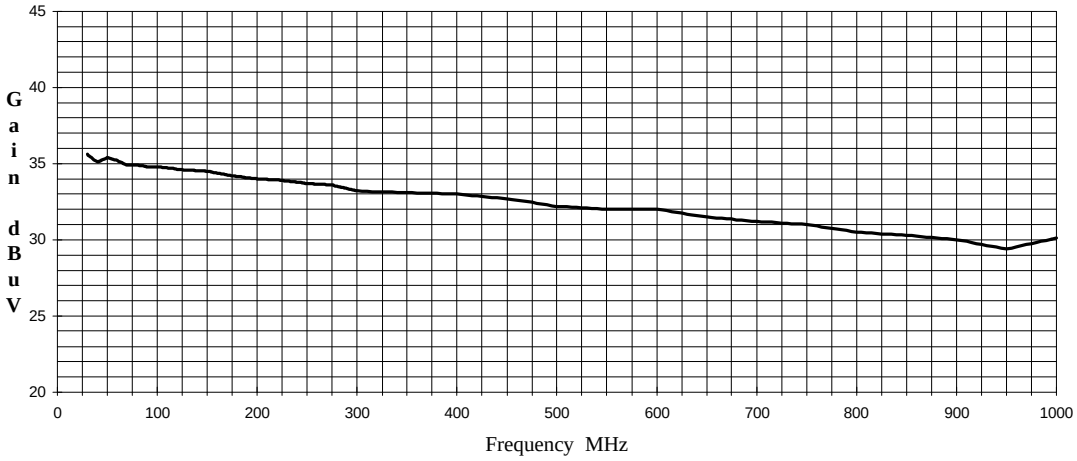
APPENDIX B

ANTENNA FACTORS AND EFFECTIVE GAIN FACTORS

Antenna Factors Biconical Antenna Model: AB-100 S/N: 01523



Preamplifier Effective Gain at 3m. Model: CPPA-102 S/N: 01223



APPENDIX C

MODIFICATIONS TO THE EUT

MODIFICATIONS TO THE EUT

The modification listed below were made to the EUT to pass FCC Subpart C specifications.

All the rework described below was implemented during the test in a method that could be reproduced in all the units by the manufacturer.

Modifications:

1) Added one 6.8 μH axial lead choke inductors in series with C1 and the antenna.

FCC ID: HDTTX045-27

KIN YAT INDUSTRIAL COMPANY LIMITED
建溢實業有限公司
(Subsidiary of Kin Yat Holdings Limited)

14 July 98

Federal Communications Commission
Common Carrier Domestic Services
P.O. Box 358145
Pittsburgh, PA 15251-5145

Dear Commission,

We, KIN YAT INDUSTRIAL CO. LTD., will implement the modifications listed below into all devices manufactured under this approval. These changes were implemented to meet the requirement of FCC Part 15.

1. Added one 6.8uH axial choke in series with the antenna.

Sincerely.

Mr. Tony Fan

7th Floor, Galaxy Factory Building, 25-27 Luk Hop Street, San Po Kong, Kowloon, Hong Kong.
香港九龍新蒲崗六合街25-27號嘉時工業大廈7字樓
Tel: (852) 2352 2041 Fax: (852) 2351 1867 , 2351 7677 Internet Homepage: www.kinyat.com.hk