

Hasbro Far East Ltd.

Application
For
Certification

900MHz 3 Channel Analog Modulation Walkie Talkie

(FCC ID: RS471091)

0404803
TL/ Sandy Lee
April 8, 2004

- The test results reported in this report shall refer only to the sample actually tested and shall not refer or be deemed to refer to bulk from which such a sample may be said to have been obtained.
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FCC ID: RS471091

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Hasbro Far East Ltd. - MODEL: 71091
FCC ID: RS471091

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List of attached file

Exhibit type	File Description	filename
Test Report	Test Report	report.pdf
Operation Description	Technical Description	descri.pdf
Test Setup Photo	Radiated Emission	config photos.doc
Test Report	Emission Plot	emission.pdf
External Photo	External Photo	external photos.doc
Internal Photo	Internal Photo	internal photos.doc
Block Diagram	Block Diagram	block.pdf
Schematics	Circuit Diagram	circuit.pdf
ID Label/Location	Label Artwork and Location	label.pdf
User Manual	User Manual	manual.pdf
User Manual	FCC Information	fcc information.pdf

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EXHIBIT 1 GENERAL DESCRIPTION

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1.0 **General Description**

1.1 Product Description

The 71091 is a 900MHz 3 Channel Analog Modulation Walkie Talkie . The unit is a low power transceiver operating at 926MHz, 926.5MHz, and 927MHz, and it is powered by a 9VDC alkaline battery. During the normal use, it transmits voice signal to another Walkie Talkie with the same channel selection by pressing "Talk" button.

The antenna used in the unit is integral, and the tested sample is a prototype.

The circuit description is saved with filename: descri.pdf

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1.2 Related Submittal(s) Grants

This is an Application for Certification of a low power transceiver. A transmitter is included in this Application. This specific report details the emission characteristics of the transmitter. The receivers are subject to the verification authorization process, in accordance with 15.101(b). A verification report has been prepared for the receiver sections of the device.

1.3 Test Methodology

Radiated emission measurements were performed according to the procedures in ANSI C63.4 (2001). All measurements were performed in Open Area Test Sites. Preliminary scans were performed in the Open Area Test Sites only to determine worst case modes. All Radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "**Justification Section**" of this Application.

1.4 Test Facility

The open area test site facility used to collect the radiated data is located at Garment Centre, 576 Castle Peak Road, Kowloon, Hong Kong. This test facility and site measurement data have been fully placed on file with the FCC.

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**EXHIBIT 2
SYSTEM TEST CONFIGURATION**

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2.0 System Test Configuration

2.1 Justification

For emission testing, the equipment under test (EUT) was configured for testing in a typical fashion (as a customer would normally use it). During testing, all cables were manipulated to produce worst case emissions. The EUT was powered by a new 9VDC alkaline battery.

For the measurement, the EUT is attached to a plastic stand if necessary and placed on a wooden turntable which is four feet in diameter and approximately one meter in height above the ground plane. During the radiated emissions test, the turntable is rotated and any cables leaving the EUT are manipulated to find the configuration resulting in maximum emissions. The EUT is adjusted through all three orthogonal axes to obtain maximum emission levels. The antenna height and polarization are varied during the testing to search for maximum signal levels. The height of the antenna is varied from one to four meters. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance.

All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance. Analyzer resolution is 100 kHz or greater. The spurious emissions more than 20 dB below the permissible value are not reported.

2.2 EUT Exercising Software

The EUT exercise program used during radiated testing was designed to exercise the various system components in a manner similar to a typical use.

For emissions testing, the units were setup to transmit continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing.

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2.3 Support Equipment List and Description

The FCC ID's for all equipment, plus descriptions of all cables used in the tested system are:

HARDWARE:

The unit was operated standalone. A new 9VDC alkaline battery was used to power the device.

CABLES:

- (1) There are no cables necessary for compliance of this product.

OTHERS:

- (1) A headset (provided with the unit) with 20cm unshielded cable permanently affixed.

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2.4 Measurement Uncertainty

When determining of the test conclusion, the Measurement Uncertainty of test has been considered.

2.5 Equipment Modification

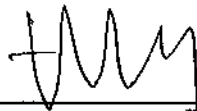
Any modifications installed previous to testing by Hasbro Far East Ltd. will be incorporated in each production model sold/leased in the United States.

No modifications were installed by ETL Division, Intertek Testing Services Hong Kong Ltd.

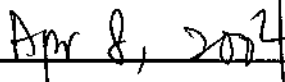
All the items listed under section 2.0 of this report are confirmed by:

Confirmed by:

*Tommy Leung
Supervisor
Intertek Testing Services
Agent for Hasbro Far East Ltd.*



Signature



Date

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**EXHIBIT 3
EMISSION RESULTS**

3.0 **Emission Results**

Data is included of the worst case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included.

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3.1 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CF - AG$$

where FS = Field Strength in $\text{dB } \mu\text{V/m}$
 RA = Receiver Amplitude (including preamplifier) in $\text{dB } \mu\text{V}$
 CF = Cable Attenuation Factor in dB
 AF = Antenna Factor in dB
 AG = Amplifier Gain in dB

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows:-

$$FS = RR + LF$$

where FS = Field Strength in $\text{dB } \mu\text{V/m}$
 $RR = RA - AG$ in $\text{dB } \mu\text{V}$
 $LF = CF + AF$ in dB

Assume a receiver reading of $52.0 \text{ dB } \mu\text{V}$ is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted, giving a field strength of $32 \text{ dB } \mu\text{V/m}$. This value in $\text{dB } \mu\text{V/m}$ was converted to its corresponding level in $\mu\text{V/m}$.

$$RA = 52.0 \text{ dB } \mu\text{V/m}$$

$$AF = 7.4 \text{ dB}$$

$$CF = 1.6 \text{ dB}$$

$$AG = 29.0 \text{ dB}$$

$$FS = RR + LF$$

$$FS = 23 + 9 = 32 \text{ dB } \mu\text{V/m}$$

$$RR = 23.0 \text{ dB } \mu\text{V}$$

$$LF = 9.0 \text{ dB}$$

$$\text{Level in } \mu\text{V/m} = \text{Common Antilogarithm } [(32 \text{ dB } \mu\text{V/m})/20] = 39.8 \mu\text{V/m}$$

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3.2 Radiated Emission Configuration Photograph - Base Unit

Worst Case Radiated Emission

at 463.250 MHz

For electronic filing, the worst case radiated emission configuration photographs are saved with filename: config photos.doc

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3.3 Radiated Emission Data - Base Unit

The data on the following pages list the significant emission frequencies, the limit and the margin of compliance.

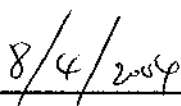
Judgement : Passed by 1.6 dB

TEST PERSONNEL:



Tester Signature

Ben W. K. Ho, Assistant Supervisor
Typed/Printed Name



Date

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Company: Hasbro Far East Ltd.
Model: 71091
Mode : TX-Channel 2

Date of Test: March 23 - April 2, 2004

Table 1

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBμV)	Pre- Amp (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
V	926.500	70.5	16	33.0	87.5	94.0	-6.5
V	463.250	34.4	16	26.0	44.4	46.0	-1.6
V	*1389.750	54.9	34	26.1	47.0	54.0	-7.0
V	1853.000	52.8	34	27.2	46.0	54.0	-8.0
H	*2316.250	52.6	34	29.4	48.0	54.0	-6.0
H	*2779.500	51.3	34	30.4	47.7	54.0	-6.3
V	3242.750	47.7	34	31.9	45.6	54.0	-8.4
H	*3706.000	44.7	34	33.3	44.0	54.0	-10.0
V	*4169.250	37.9	34	34.8	38.7	54.0	-15.3
V	*4632.500	37.6	34	34.9	38.5	54.0	-15.5

- NOTES: 1. Quasi-peak detector is used for the emission below or equal to 1000MHz.
2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. Horn antenna and average detector are used for the emission over 1000MHz.
5. Radiated emission measurement were performed the lowest radio frequency signal generated in the device which is greater than 9kHz to 10GHz.
- * Emission within the restricted band meets the requirement of part 15.205. The corresponding limit as per 15.209 is based on Quasi peak detector data for frequencies below 1000 MHz and average detector data for frequencies over 1000 MHz. The radio frequency emissions above 1000MHz also meet corresponding 20 dB permitted peak limit with a peak detector function.

Test Engineer: Ben W. K. Ho

3.4 Radiated Emission on the bandedge

From the following plots, they show the fundamental emission when modulated with 1 kHz and 100 dBSPL, 10 cm from the Microphone of EUT and unmodulated. The field strength of any emissions appearing between the band edges and up to 10 kHz above and below the band edges are attenuated at least 50dB below the level of the unmodulated carrier. It fulfil the requirement of 15.249(d).

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Emission Plot

For electronic filing, the emission plots are saved with filename: emission.pdf

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**EXHIBIT 4
EQUIPMENT PHOTOGRAPHS**

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4.0 **Equipment Photographs**

For electronic filing, the photographs are saved with filename: external photos.doc & internal photos.doc

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**EXHIBIT 5
PRODUCT LABELLING**

5.0 **Product Labelling**

For electronic filing, the FCC ID label artwork and location is saved with filename:
label.pdf

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**EXHIBIT 6
TECHNICAL SPECIFICATIONS**

6.0 **Technical Specifications**

For electronic filing, the block diagram and circuit diagram are saved with filename: block.pdf and circuit.pdf respectively.

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EXHIBIT 7 INSTRUCTION MANUAL

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7.0 Instruction Manual

For electronic filing, a preliminary copy of the Instruction Manual is saved with filename: manual.pdf

Please note that the required FCC Information to the User is saved with filename: fcc information.pdf.

This manual will be provided to the end-user with each unit sold/leased in the United States.