Eagletron Telecommunications Ltd.

Application
For
Certification
(FCC ID: DRW0188M)

Transmitter

WO# 01119891
WL/at Agnes
December 13, 2001

- The test results reported in this test 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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MEASUREMENT/TECHNICAL REPORT

Eagletron Telecommunications Ltd. - MODEL: Gakken 0188
FCC ID: DRW0188M

December 13, 2001

This report concerns (check one:) Original Grant X Class II Change_____

Equipment Type: Low Power Transmitter (example: computer, printer, modem, etc.)

Deferred grant requested per 47 CFR 0.457(d)(1)(ii)? Yes___ No X_____

If yes, defer until: _____
date

Company Name agrees to notify the Commission by: _____
date

of the intended date of announcement of the product so that the grant can be issued on that date.

Transition Rules Request per 15.37? Yes_____ No X_____

If no, assumed Part 15, Subpart C for intentional radiator - the new 47 CFR [5-24-01 Edition] provision.

Report prepared by:

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Intertek Testing Services
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Exhibit type	File Description	filename
Test Report	Test Report	report.doc
Operation Description	Technical Description	descri.pdf
Test Setup Photo	Radiated Emission	Rconfig photos.doc
Test Report	Bandwidth Plot	bw.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

EXHIBIT 1

GENERAL DESCRIPTION

1.0 General Description

1.1 Product Description

The Equipment Under Test (EUT) is a Walkie Talkie operating from 925.60 to 927.55MHz. The EUT is powered by 4.8Vd.c. (4.8V 700mA Ni-Cd rechargeable battery). It is a FM duplex Communication System, it sends and receives messages concurrently utilizing two different frequencies, this unique mode of operating allows partners to talk of the same time without push-to-talk buttons. The number of channels can be selected by channel select switch is two and the dip switch can allow 128 type of combinations of dual channels.

For electronic filing, the brief circuit description is saved with filename: descri.pdf

1.2 Related Submittal(s) Grants

This is a single application for certification of a transmitter portion. The receiver portion associated with EUT is subject to verification procedure.

1.3 Test Methodology

Radiated emission measurements were performed according to the procedures in ANSI C63.4 (1992). 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. For each scan, the procedure for maximizing emissions in Appendices D and E were followed. 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 and conducted measurement facility used to collect the emission 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.

EXHIBIT 2

SYSTEM TEST CONFIGURATION

2.0 System Test Configuration

2.1 Justification

The system was configured for testing in a typical fashion (as a customer would normally use it), and in the confines as outlined in ANSI C63.4 (1992).

The EUT was powered from 1 x fully charged 4.8V "700mA Ni-Cd rechargeable battery".

For maximizing emissions, the EUT was rotated through 360°, the antenna height was varied from 1 meter to 4 meters above the ground plane, and the antenna polarization was changed. This step by step procedure for maximizing emissions led to the data reported in Exhibit 3.0.

The unit was operated standalone and placed in the center of the turntable.

The equipment under test (EUT) was configured for testing in a typical fashion (as a customer would normally use it). The EUT was placed on turntable, which enabled the engineer to maximize emissions through its placement in the three orthogonal axes.

The frequency range from 30 MHz to 9 GHz was searched for radiated emissions from the device. Only those emissions reported were detected. All other emission were at least 20 dB below the applicable limits.

For simplicity of testing, the unit was wired to transmit continuously.

2.2 EUT Exercising Software

There was no special software to exercise the device. Once the button is depressed, the unit transmits the typical signal. For simplicity of testing, the unit was wired to transmit continuously.

2.3 Special Accessories

There are special headset necessary for compliance of this product.

2.4 Equipment Modification

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

No modifications were installed by Intertek Testing Services.

2.5 Support Equipment List and Description

This product was tested in a standalone configuration.

All the items listed under section 2.0 of this report are

Confirmed by:

Wilson Loke
Manager
Intertek Testing Services Hong Kong Ltd.
Agent for Eagletron Telecommunications Ltd.

Signature

December 13, 2001 Date

EXHIBIT 3

EMISSION RESULTS

3.0 Emission Results

Data is included 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.

3.1 Field Strength Calculation

The field strength is calculated by adding the reading on the Spectrum Analyzer to the factors associated with preamplifiers (if any), antennas, cables, pulse desensitization and average factors (when specified limit is in average and measurements are made with peak detectors). A sample calculation is included below.

FS = RA + AF + CF - AG + PD + AV

where FS = Field Strength in dBμV/m
RA = Receiver Amplitude (including preamplifier) in dBμV
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB
AG = Amplifier Gain in dB
PD = Pulse Desensitization in dB
AV = Average Factor in -dB

In the radiated emission table which follows, the reading shown on the data table may reflect the preamplifier gain. An example of the calculations, where the reading does not reflect the preamplifier gain, follows:

FS = RA + AF + CF - AG + PD + AV

3.1 Field Strength Calculation (cont'd)

Example

Assume a receiver reading of 62.0 dBμV 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. The pulse desensitization factor of the spectrum analyzer was 0 dB, and the resultant average factor was -10 dB. The net field strength for comparison to the appropriate emission limit is 32 dBμV/m. This value in dBμV/m was converted to its corresponding level in μV/m.

RA = 62.0 dBμV
AF = 7.4 dB
CF = 1.6 dB
AG = 29.0 dB
PD = 0 dB

AV = -10 dB

FS = 62 + 7.4 + 1.6 - 29 + 0 + (-10) = 32 dBμV/m

Level in mV/m = Common Antilogarithm [(32 dBμV/m)/20] = 39.8 μV/m

3.2 Radiated Emission Configuration Photograph

Worst Case Radiated Emission
at
231.449 MHz

For electronic filing, the worst case radiated emission configuration photograph is saved with filename: Rconfig photos.doc

3.3 Radiated Emission Data

The data on the following page lists the significant emission frequencies, the limit and the margin of compliance. Numbers with a minus sign are below the limit.

Judgement: Passed by 3.2 dB

TEST PERSONNEL:

_____
Signature

Ben W. K. Ho, Compliance Engineer
Typed/Printed Name

December 13, 2001
_____
Date

Company: Eagletron Telecommunications Ltd. Date of Test: October 29, 2001
Model: Gakken 0188
Mode: Channel A (near to the upper edge of frequency Band)

Table 1

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Antenna Factor (dB)	Pre-Amp Gain (dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
V	231.449 [1]	47.4	11.4	16	42.8	46	-3.2
H	462.898 [1]	32.8	16.8	16	33.6	46	-12.4
V	925.797 [1]	82.2	22.8	16	89.0	94	-5.0
V	1157.248 [4]	52.3	24.2	34	42.5	54	-11.5
V	1157.248 [1]	54.8	24.2	34	45.0	74	-29.0
H	1388.705 [4]	58.4	24.2	34	48.6	54	-5.4
H	1388.705 [1]	60.4	24.2	34	50.6	74	-23.4
V	1620.154 [4]	50.6	26.5	34	43.1	54	-10.9
V	1620.154 [1]	53.6	26.5	34	46.1	74	-27.9
H	1851.594 [4]	48.1	26.5	34	40.6	54	-13.4
H	1851.594 [1]	50.2	26.5	34	42.7	74	-31.3
V	2314.493 [4]	45.8	29.1	34	40.9	54	-13.1
V	2314.493 [1]	48.1	29.1	34	43.2	74	-30.8
V	2777.391 [4]	42.5	29.1	34	37.6	54	-16.4
V	2777.391 [1]	45.5	29.1	34	40.6	74	-33.4

Notes:
1. Peak Detector Data unless otherwise stated.
2. All measurements were made at 3 meter. Harmonic emissions not detected at the 3-meter 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.

* Emission within the restricted band meets the requirement of Section 6.3. The corresponding limit as Section 6.2.1 is based on Quasi peak detector data for frequencies below 1000 MHz and average detector data for frequencies over 1000 MHz.

Test Engineer: Ben W. K. Ho

Company: Eagletron Telecommunications Ltd. Date of Test: October 29, 2001
Model: Gakken 0188
Mode: Channel A (near to the lower edge of frequency Band)

Table 2

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Antenna Factor (dB)	Pre-Amp Gain (dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
V	231.899 [1]	46.2	11.4	16	41.6	46	-4.4
H	463.798 [1]	32.7	16.8	16	33.5	46	-12.5
V	927.596 [1]	78.6	22.8	16	85.4	94	-8.6
V	1159.451 [4]	52.4	24.2	34	42.6	54	-11.4
V	1159.451 [1]	55.8	24.2	34	46.0	74	-28.0
H	1391.404 [4]	57.7	24.2	34	47.9	54	-6.1
H	1391.404 [1]	60.0	24.2	34	50.2	74	-23.8
V	1623.393 [4]	50.3	26.5	34	42.8	54	-11.2
V	1623.393 [1]	53.3	26.5	34	45.8	74	-28.2
H	1855.692 [4]	47.4	26.5	34	39.9	54	-14.1
H	1855.692 [1]	48.6	26.5	34	41.1	74	-32.9
V	2318.991 [4]	45.4	29.1	34	40.5	54	-13.5
V	2318.991 [1]	47.6	29.1	34	42.7	74	-31.3
V	2782.798 [4]	43.0	29.1	34	38.1	54	-15.9
V	2782.798 [1]	45.9	29.1	34	41.0	74	-33.0

Notes: 1. Peak Detector Data unless otherwise stated.

2. All measurements were made at 3 meter. Harmonic emissions not detected at the 3-meter 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.

4. Negative value in the margin column shows emission below limit.

4. Horn antenna and average detector are used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of Section 6.3. The corresponding limit as Section 6.2.1 is based on Quasi peak detector data for frequencies below 1000 MHz and average detector data for frequencies over 1000 MHz.

Test Engineer: Ben W. K. Ho

EXHIBIT 4

EQUIPMENT PHOTOGRAPHS

4.0 Equipment Photographs

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

EXHIBIT 5

PRODUCT LABELLING

5.0 Product Labelling

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

EXHIBIT 6

TECHNICAL SPECIFICATIONS

6.0 Technical Specifications

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

EXHIBIT 7

INSTRUCTION MANUAL

7.0 Instruction Manual

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

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

EXHIBIT 8

MISCELLANEOUS INFORMATION

8.0 Miscellaneous Information

This miscellaneous information includes details of the bandedge plot, the test procedure and calculation of factors such as pulse desensitization.

8.1 Bandedge Plot

For electronic filing, the plot shows the fundamental emission is saved with filename:bw.pdf. From the plot, the field strength of any emissions appearing outside of the specified frequency bands are attenuated by at least 50 dB below the level of the fundamental. It fulfils the requirement of 15.249(c).

8.2 Discussion of Pulse Desensitization

The determination of pulse desensitivity was made in accordance with Hewlett Packard Application Note 150-2, *Spectrum Analysis … Pulsed RF*.

Pulse desensitivity was not applicable for this device.

8.3 Emissions Test Procedures

The following is a description of the test procedure used by Intertek Testing Services in the measurements of transmitters operating under Part 15, Subpart C rules.

The test set-up and procedures described below are designed to meet the requirements of ANSI C63.4 - 1992.

The transmitting equipment under test (EUT) is 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.

Detector function for radiated emissions is in peak mode. Average readings, when required, are taken by measuring the duty cycle of the equipment under test and subtracting the corresponding amount in dB from the measured peak readings. A detailed description for the calculation of the average factor can be found in Exhibit 8.3.

The frequency range scanned is from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or 40 GHz, whichever is lower. For line conducted emissions, the range scanned is 450 kHz to 30 MHz.

8.3 Emissions Test Procedures (cont'd)

The EUT is warmed up for 15 minutes prior to the test.

AC power to the unit is varied from 85% to 115% nominal and variation in the fundamental emission field strength is recorded. If battery powered, a new, fully charged battery is used.

Conducted measurements are made as described in ANSI C63.4 - 1992.

The IF bandwidth used for measurement of radiated signal strength was 100 kHz or greater when frequency is below 1000 MHz. Where pulsed transmissions of short enough pulse duration warrant, a greater bandwidth is selected according to the recommendations of Hewlett Packard Application Note 150-2. A discussion of whether pulse desensitivity is applicable to this unit is included in this report (See Exhibit 8.2). Above 1000 MHz, a resolution bandwidth of 1 MHz is used.

Transmitter measurements are normally conducted at a measurement distance of three meters. However, to assure low enough noise floor in the forbidden bands and above 1 GHz, signals are acquired at a distance of one meter or less. All measurements are extrapolated to three meters using inverse scaling, unless otherwise reported. Measurements taken at a closer distance are so marked.

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