

Report No.	M1215945
Specifications	FCC Part 15 - Notification
Test Method	ANSI C63.4 1992
Applicant address	NO. 85, CHANG HSING FIRST STREET, TAI-TZU VILLAGE JEN-TE HSIAN, TAINAN HSIEN , TAIWAN
Applicant Items tested	WA-GOL INDUSTRIAL CO., LTD WIRELESS MICROPHONE RECEIVER
Model No.	MR-H12A
Results	As detailed within this report
Sample received date	02 / 26 /1998 (month / day / year )
Prepared by	<u>Stephen Chen</u> project engineer
Authorized by	<u>Jacob Lin</u> Vice General Manager (Jacob Lin )
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Tested by	Training Research Co., Ltd.
Office at	2F, No. 571, Chung Hsiao E. Road, Sec.7, Taipei, Taiwan
Open site at	No. 5-3, Lane 21, Yen Chiu Yuan Rd., Sec.4, Taipei Taiwan

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★ FCC ID : JEBMR-H12B

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## ***Chapter 1 Introduction***

### ***Description of EUT :***

These products are professionally designed wireless microphone and receiver system made-up of diverse circuit. They can receive two frequencies between 174 MHz and 216 MHz. It is a dual channel receiver and worn by a performer and other participants in a program, filming , reporting .....etc.

### ***Connection of EUT :***

- (1)Connect the EUT's audio output to guitar amplifier by an audio cable .
- (2)Plug the adapter into the EUT.
- (3)Pull out the antenna vertically .

### ***Test method :***

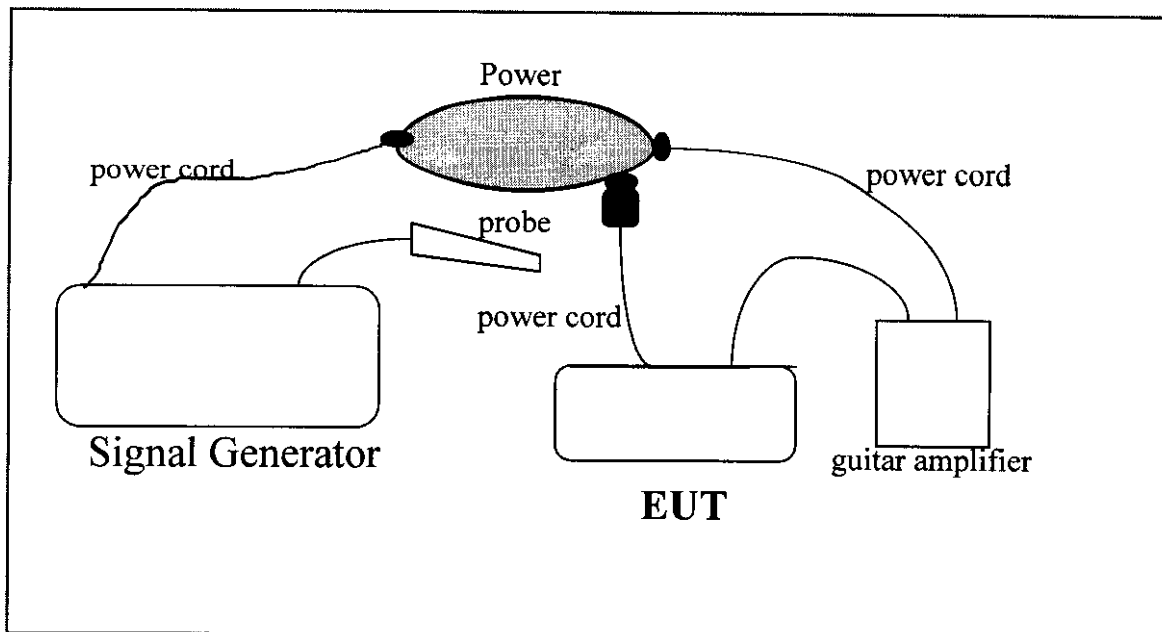
There were two EUTs tested which are operated at 174.6/195.6 and 174.6/215.6 MHz separately .Turn on the receiver and the speaker . There is a signal generator connected with a field probe , which can transmit the receiving frequency , put near the EUT .

(If the emission is close to the ambience, the resolution BW and view resolution will be reduced and the data will be recorded by detection of maximum hold peak mode.)

### ***Statement of transition provision for compliance with the rules***

The EUT receives the signal which only send from the wireless microphone. The EUT won't be influenced by the transition provision , it will be continue to comply with the regulations of the FCC Part 15 . ( The relative wireless microphone FCC ID : JEBMX-66E, JEBMX-66A).

***The testing configuration of test setup is showing in the next page.***

**Configuration of test setup****Connections :**

- \* The Adapter 120Vac/12Vdc,500 mA, 190 cm long, non-shielded.
- \* The Audio cable dual head 6.3 $\emptyset$ , 126 cm, non-shielded.

*List of support equipment*

**Conducted (Radiated) test :**

**PABX** : **King Design**  
Model No. : KD8705-A  
Serial No. : GV101101186  
Power type : 110 VAC 50/60Hz  
Power cord : Non - Shielded

**Guitar Amplifier : Dragon (KIKUTANI MUSIC COL,LTD. )**

Model No. : GA-10 ( RMS-100 )  
Power type : 110vac 60Hz  
Power code : Non-shield , 1.2m long

**Field Probe : HP Field Probe 30MHz~1GHz**

Model No. : HP11940A  
Serial No. : 2650A03038

**Signal Generator : HP 9KHz~4000MHz**

Model No. : 8648D  
Serial No. : 3613A00117  
Power type : 110vac 60Hz  
Power cord : Non - Shielded

**Chapter 2 Conducted emission test**

**Test condition and set up :**

All the equipment is placed and setup according to the ANSI C63.4 - 1992 . The EUT is assembled on a wooden table which is 80 cm high , is placed 40 cm from the back-wall which is a vertical conducting plane . One LISN is for EUT ,the other LISN is for support equipment. They are all placed on the conductive ground .The EUT's LISN is connected to a line switch box for selecting L1 or L2 ,then connect to a preamplifier and spectrum.

The spectrum scans from 450KHz to 30MHz . Conducted emission levels are detected at max. peak mode . But if the max. peak mode failed ,it will be measured by CISPR's quasi-peak detection mode .

While testing, there is a worst-emission plot printed at peak detection mode ,and there are more than 6 highest emissions relative to limit recorded. The plot is kept as the original data, not included in test report .

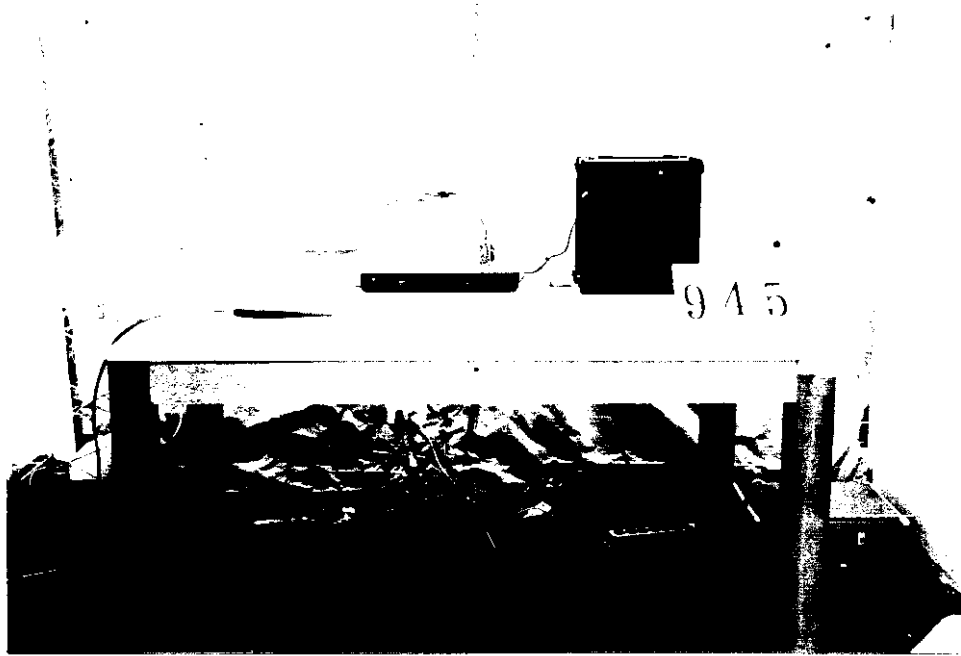
**List of test Instrument :**

Instrument Name	Model No.	Brand	Serial No.	Calibration Date	
				Last time	Next time
Spectrum analyzer	8591EM	H P	3619A00821	08/29/96	08/29/97
LISN (EUT)	3825/2	EMCO	9411-2284	05/15/97	05/15/98
LISN (Support E.)	3825/2	EMCO	9210-2007	05/15/97	05/15/98
Preamplifier	8447F	H P	2944A03706	05/13/97	05/15/98
Line switch box	AC1-003	TRC	-----	05/15/97	05/15/98
Line selector	AC1-002	TRC	-----	05/15/97	05/15/98

The level of confidence of 95% ,the uncertainty of measurement of conducted emission is ± 2.4 dB .

**Test Result : Pass (Appendix A)**

***Conducted Test Placement : (Photographs)***



P/S : Because the space is not large enough for taking photograph of rear side . Please refer to the radiated testing set up .

**Radiated Test Placement : (Photographs)**



**Chapter 3 Radiated emission test**

**Test condition and set up :**

**Pretest :** Prior to the final test (OATS test) ,the EUT is placed in a shielded enclosure ,GTEM, and scan from 30MHz to 1GHz.This is done to ensure the radiation exactly emits form the EUT.

**Final test :** Final radiation measurements is made on a **3 - meter, open-field** test site. The EUT is placed on a nonconductive table which is 0.8 m height, the top surface is 1.0 x 1.5 meter. All the placement is according to ANSI C63.4 - 1992.

The spectrum is examined from 30 MHz to 1000 MHz measured by HP spectrum.

The EMCO whole range Antenna is used to measure frequency from 30 MHz to 1GHz.The final test is used the spectrum HP 8594EM .

Measure more than six top marked frequencies generated form pretest by computer step by step at each frequency . The EUT is rotated 360 degrees, and antenna is raised and lowered from 1 to 4 meter to find the maximum emission levels. The antenna is used with both horizontal and vertical polarization.

Appropriated preamplifier which is made by TRC is used for improving sensitivity and precautions is taken to avoid overloading .The spectrum analyzer's 6dB bandwidth is set to 120 K Hz , and the EUT is measured at quasi-peak mode.

If the emission is close to the frequency band of ambience ,the data will be rechecked by the tester and the corrected data will be written in the test data sheet. If the emission is just within the ambience ,the data from GTEM will be taken as the final data.

**List of test Instrument :**

Instrument name	Model No.	Brand	Serial No.	Calibration Date	
				Last	Next
Spectrum analyzer	8568B	H P	3004A18617	05/15/97	05/15/98
Quasi-peak Adapter	85650A	H P	2521A00984	05/15/97	05/15/98



## Appendix A

### Conducted Emission Test Result ( Frequency 174.6 , 195.6MHz )

Testing room : Temperature : 24 ° C      Humidity : 40 % RH

#### *Line 1*

<i>Frequency (MHz)</i>	<i>Amplitude (dBuV)</i>	<i>Limit (dBuV/m)</i>	<i>Margin (dB)</i>
0.450	41.10	48	-6.9
1.189	26.48	48	-21.52
16.996	17.61	48	-30.39
22.113	18.90	48	-29.1
22.988	24.59	48	-23.41
24.155	25.03	48	-22.97
25.394	18.89	48	-29.11
26.341	21.14	48	-26.86
28.960	20.00	48	-28
29.033	20.56	48	-27.44

#### *Line 2*

<i>Frequency (MHz)</i>	<i>Amplitude (dBuV)</i>	<i>Limit (dBuV)</i>	<i>Margin (dB)</i>
0.45	40.50	48	-7.5
1.189	24.36	48	-23.64
6.129	16.15	48	-31.85
16.776	17.17	48	-30.83
20.068	18.05	48	-29.95
22.405	18.00	48	-30
22.915	21.30	48	-26.7
23.280	23.76	48	-24.24
24.082	23.03	48	-24.97

( Frequency 174.6, 215.6 MHz )

**Line 1**

<i>Frequency (MHz)</i>	<i>Amplitude (dBuV)</i>	<i>Limit (dBuV/m)</i>	<i>Margin (dB)</i>
0.450	36.45	48	-11.55
1.189	18.72	48	-29.28
15.151	16.43	48	-31.57
17.072	17.40	48	-30.60
19.953	16.56	48	-31.44
23.794	17.08	48	-30.92
24.681	18.74	48	-29.26
26.232	18.30	48	-29.70
28.744	16.70	48	-31.30
***			

**Line 2**

<i>Frequency (MHz)</i>	<i>Amplitude (dBuV)</i>	<i>Limit (dBuV)</i>	<i>Margin (dB)</i>
0.450	37.30	48	-10.70
1.189	21.00	48	-27.00
3.848	19.30	48	-28.70
21.874	17.15	48	-30.85
22.686	17.52	48	-30.48
24.238	21.80	48	-26.20
24.829	18.47	48	-29.53
26.676	18.02	48	-29.98
27.045	17.20	48	-30.80

**Appendix B**

**Radiated Emission Test Result :( Frequency 174.6, 195.6 MH Horizontal)**

Test Conditions:

Testing room : Temperature : 19° C Humidity : 36% RH  
 Testing site : Temperature : 16° C Humidity : 76 % RH

Frequency	Reading Amplitude	Ant. Height	Table	Correction Factors	Corrected Amplitude	Class B limit	Margin
MHz	DBuV	m	degree	dB/m	dBuV/m	dBuV/m	DB

163.214	38.66	1	48	-11.42	27.24	43.50	-16.26
174.654	43.42	1	310	-10.86	32.56	43.5	-10.94
181.904	37.94	1	300	-10.48	27.46	43.5	-16.04
349.116	53.51	1	340	-18.23	35.28	46	-10.72
385.115	54.13	1	283	-16.93	37.20	46	-8.80
577.821	50.90	1	245	-11.26	39.64	46	-6.36
***							

Note:

1. Margin = Amplitude - limit, *if margin is minus means under limit.*
2. Corrected Amplitude = Reading Amplitude - Correction Factors
3. Correction factor = Antenna factor + ( Cable Loss - Amplitude gain)  
 (For example : 30MHz correction factor = 15.5 + (-15.26) = 0.24 dB/m)

***Radiated Emission Test Result :(Vertical)***

<b>Frequency</b>	<b>Reading Amplitude</b>	<b>Ant. Height</b>	<b>Table</b>	<b>Correction Factors</b>	<b>Corrected Amplitude</b>	<b>Class B limit</b>	<b>Margin</b>
MHz	DBuV	m	degree	dB/m	dBuV/m	dBuV/m	DB

163.214	43.38	1	269	-11.42	31.96	43.50	-11.54
174.654	41.86	1	349	-10.86	31.00	43.5	-12.5
181.904	39.05	1	252	-10.48	28.57	43.5	-14.93
349.116	43.67	4	190	-18.23	25.44	46	-20.56
385.115	43.88	4	181	-16.93	26.95	46	-19.05
577.821	43.93	1	117	-11.26	32.67	46	-13.33
***							

**Radiated Emission Test Result :( Frequency 174.6, 215.6 MH Horizontal)**

<b>Frequency</b>	<b>Reading Amplitude</b>	<b>Ant. Height</b>	<b>Table</b>	<b>Correction Factors</b>	<b>Corrected Amplitude</b>	<b>Class B limit</b>	<b>Margin</b>
MHz	DBuV	m	Degre	dB/m	DBuV/m	dBuV/m	DB

163.900	45.39	1.00	0	-11.63	33.76	43.50	-9.74
205.016	42.40	4.01	53	-9.58	32.82	43.50	-10.68
315.041	53.79	1.00	99	-19.03	34.76	46	-11.24
364.981	49.67	1.00	327	-17.69	31.98	46	-14.02
439.153	45.24	2.51	281	-16.63	28.61	46	-17.39
469.396	43.71	1.00	260	-15.63	28.08	46	-17.92
609.251	39.10	1.00	318	-9.53	29.57	46	-16.43
639.252	45.47	1.00	349	-9.14	36.33	46	-9.67

**Radiated Emission Test Result :(Vertical)**

<b>Frequency</b>	<b>Reading Amplitude</b>	<b>Ant. Height</b>	<b>Table</b>	<b>Correction Factors</b>	<b>Corrected Amplitude</b>	<b>Class B limit</b>	<b>Margin</b>
MHz	DBuV	M	Degre	dB/m	dBuV/m	dBuV/m	Db

163.900	40.69	2.50	70	-11.63	29.06	43.50	-14.44
205.016	44.70	1.00	143	-9.58	35.12	43.50	-8.38
315.041	44.26	2.50	105	-19.03	25.23	46	-20.77
364.981	42.77	2.50	270	-17.69	25.08	46	-20.92
439.153	44.34	2.50	0	-16.63	27.71	46	-18.39
469.396	40.88	4.00	237	-15.63	25.25	46	-20.75
609.251	39.27	2.50	132	-9.53	29.74	46	-16.26
639.252	48.34	1.00	0	-9.14	39.20	46	-6.80

**Final statement :**

***This test report, measurements made by TRC are traceable to the NIST.***