ELECTROMAGNETIC EMISSION COMPLIANCE REPORT FOR LOW POWER, NON-LICENSED TRANSMITTER

Test Report No.	**: E097R-043**
AGR No.	**: A096A-112**
Applicant	**: Gaon-Int Co., LTD.**
Address	**: Daelim Bldg., Suite 1501, 592-5, Dohwa1-dong, Nam-gu, Incheon, Korea**
Manufacturer	**: RUIHUA ELECTRONICS FACTORY**
Address	**: Xianxi Industrial Zone, Shatou Village, Changan Town, Dongguan City, Guangdong Province, China**
Type of Equipment	**: FM Transmitter**
FCC ID.	**: UP4-GWT-500**
Model Name	**: GWT-500**
Serial number	**: N/A**
Total page of Report	**: 15 pages (including this page)**
Date of Incoming	**: July 03, 2009**
Date of Issuing	**: July 15, 2009**

SUMMARY

The equipment complies with the regulation of ***FCC CRF 47 PART 15, SUBPART C, SECTION 15.239***.

This test report contains only the results of a single test of the sample supplied for the examination. It is not a general valid assessment of the features of the respective products of the mass-production.

Prepared by:
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CONTENTS

Page

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1. VERIFICATION OF COMPLIANCE

-. APPLICANT : Gaon-Int Co., LTD.

-. ADDRESS : Daelim Bldg., Suite 1501, 592-5, Dohwa1-dong, Nam-gu, Incheon, Korea

-. CONTACT PERSON : Mr. Taejun, Kim / Director

-. TELEPHONE NO : +82-32-246-1800

-. BRAND NAME : Sound-Fly SD

-. FCC ID : UP4-GWT-500

-. MODEL NAME : GWT-500

-. SERIAL NUMBER : N/A

-. DATE : July 15, 2009

DEVICE TYPE	DXX – Part 15 Low Power Communication Device Transmitter
E.U.T. DESCRIPTION	FM Transmitter
THIS REPORT CONCERNS	ORIGINAL GRANT
MEASUREMENT PROCEDURES	Charter 7 and 13 of ANSI C63.4: 2003
TYPE OF EQUIPMENT TESTED	PRE-PRODUCTION
KIND OF EQUIPMENT AUTHORIZATION REQUESTED	CERTIFICATION
EQUIPMENT WILL BE OPERATED UNDER FCC RULES PART(S)	FCC PART 15 SECTION 15.239
MODIFICATIONS ON THE EQUIPMENT TO ACHIEVE COMPLIANCE	No
FINAL TEST WAS CONDUCTED ON	3 METER OPEN AREA TEST SITE

-. The above equipment was tested by ONETECH Corp. for compliance with the requirement set forth in the FCC Rules and Regulations. This said equipment in the configuration described in this report, shows the maximum emission levels emanating from equipment are within the compliance requirements.

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2. GENERAL INFORMATION

2.1 Product Description

The Gaon-Int Co., LTD., Model GWT-500 (referred to as the EUT in this report) is a FM Transmitter which threads sound sources such as MP3P, CDP, MDP, PMP, and PDA into radio frequency, allowing the enjoyment of portable audio device music via car audio system or home audio equipment without the need for earphones or headsets. Product specification described herein was obtained from product data sheet or user's manual.

CHASSIS TYPE	Plastic
LIST OF EACH OSC. OR CRY. FREQ.(FREQ.>=1 MHz)	12 MHz
FREQUENCY RANGE	88.1 MHz ~ 107.9 MHz (range into 100 kHz Step)
USED ANTENNA	Integral Antenna (No Antenna Socket)
NUMBER OF LAYER	2 Layers: RF board and Power Board, 4 Layers: Main board
EXTERNAL CONNECTOR	Audio Input, USB, SD Card

2.2 Model Differences

-. None

2.3 Related Submittal(s) / Grant(s)

-. Original submittal only

2.4 Test System Details

The model numbers for all the equipments which were used in the tested system is:

Model	Manufacturer	FCC ID	Description	Connected to
GWT-500	Gaon-Int Co., LTD.	UP4-GWT-500	FM Transmitter (EUT)	-
ORC-200(B)	ORACOM	DoC	MP3 Player	EUT
GPF-100	Pcfly	DoC	USB Memory	EUT
N/A	SanDisk	N/A	SD Card	EUT
N/A	N/A	N/A	Battery	EUT

2.5 Test Methodology

The radiated testing was performed according to the procedures in chapter 7, 13 of ANSI C63.4: 2003 and performed at a distance of 3 meters from EUT to the antenna.

2.6 Test Facility

The open area test site and conducted measurement facilities are located on at 307-51 Daessangryung-ri, Chowol-eup, Gwangju-si, Gyeonggi-do, 464-862, Korea. Description details of test facilities were submitted to the Commission on August 21, 2008. (Registration Number: 340658)

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3. SYSTEM TEST CONFIGURATION

3.1 Justification

This device was configured for testing in a typical way as a normal customer is supposed to be used. During the test, the following components were installed inside of the EUT.

DEVICE TYPE	MANUFACTURER	MODEL/PART NUMBER	FCC ID
Main Board	N/A	GWT-500 Main_A	N/A
RF Board	N/A	GWT-500 RF Rev_C	N/A
Power Board	N/A	N/A	N/A

3.2 EUT exercise Software

-. The Model, GWT-500 is included a FM transmitter designed to operate on function in the 88.1 MHz ~ 107.9 MHz. The EUT has an audio input port, so the input ports were connected to mp3 player and than the EUT was transmitted MP3 music files which was saved in MP3 player with maximum audio output level during the test.

3.3 Cable Description

Ports Name	Shielded	Ferrite Bead	Metal Hood	Length (m)	Connected to
Audio In	N	EUT END	BOTH END	0.15	MP3 Player
USB	-	-	-	Direct Inserted	USB Memory
SD Card	-	-	-	Direct Inserted	SD Card

3.4 Equipment Modifications

-. None

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3.5 Configuration of Test System

Line Conducted Test: It is not need to test this requirement, because the EUT shall be operated by car battery.

Radiated Emission Test: Preliminary radiated emissions test were conducted using the procedure in ANSI C63.4: 2003 8.3.1.1 and 13.1.4.1 to determine the worse operating conditions. Final radiated emission tests were conducted at 3 meter open area test site.

Occupied Bandwidth Measurement:

This measurement is performed with the antenna located close enough to give a full-scale deflection of the modulated carrier on the spectrum analyzer. The EUT has an audio input port, so the input ports were connected to mp3 player and than the EUT was transmitted MP3 music files which was saved in MP3 player with maximum audio output level during the test.

3.6 Antenna Requirement

According to section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

Antenna Construction:

FM transmitter antenna of the EUT is fixed inside the EUT, no consideration of replacement by the user.

4. PRELIMINARY TEST

4.1 AC Power line Conducted Emission Test

During Preliminary Test, the following operating mode was investigated

Operation Mode	The Worse operating condition (Please check one only)
It is not need to test this requirement, because the EUT shall be operated by car battery.	

4.2 Radiated Emission Test

During Preliminary Test, the following operating mode was investigated

Operation Mode	The Worse operating condition (Please check one only)
Transmit the RF Signal continuously	X

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5. FINAL RESULT OF MEASURMENT

Preliminary test was done in normal operation mode. And the final measurement was selected for the maximized emission level

5.1 Radiated Emission Test (Within the permitted 200 kHz band)

The following table shows the highest levels of radiated emission on both polarizations of horizontal and vertical.

Humidity Level : 43 %R.H. Temperature: 23 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.239 (b)

Type of Test : Low Power Communication Device Transmitter

Result : PASSED BY –1.48 dB at 107.90 MHz under average mode

EUT : FM Transmitter Date: July 06, 2009

Distance : 3 Meter

Radiated Emission			Ant		Angle	Correction Factors		Total	Limit	Margin
Freq. (MHz)	Amp. (dBμV)	Detect Mode	Pol.	Height (m)	(°)	Ant. (dBμV/m)	Cable (dB)	Amp. (dBμV/m)	(dBμV/m)	(dB)
88.10	35.10	Quasi-Peak	H	3.70	200.0	8.14	2.06	45.30	68.00	-22.70
	28.00	Quasi-Peak	V	1.70	360.0	8.14	2.06	38.20	68.00	-29.80
	33.20	Average	H	3.70	200.0	8.14	2.06	43.40	48.00	-4.60
	26.40	Average	V	1.70	360.0	8.14	2.06	36.60	48.00	-11.40
97.90	33.00	Quasi-Peak	H	3.20	200.0	10.00	2.10	45.10	68.00	-22.90
	28.50	Quasi-Peak	V	1.00	360.0	10.00	2.10	40.60	68.00	-27.40
	31.20	Average	H	3.20	200.0	10.00	2.10	43.30	48.00	-4.70
	26.90	Average	V	1.00	360.0	10.00	2.10	39.00	48.00	-9.00
107.90	34.60	Quasi-Peak	H	2.70	200.0	11.46	2.26	48.32	68.00	-19.68
	29.20	Quasi-Peak	V	1.00	360.0	11.46	2.26	42.92	68.00	-25.08
	32.80	Average	H	2.70	200.0	11.46	2.26	46.52	48.00	-1.48
	27.20	Average	V	1.00	360.0	11.46	2.26	40.92	48.00	-7.08

Radiated Emission Tabulated Data

Tested by: In-Sub, Youn / Project Engineer

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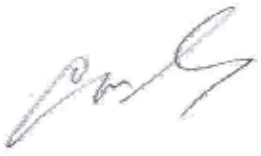
5.2 Radiated Emission Test (Outside of the specified 200 kHz band)

The following table shows the highest levels of radiated emission on both polarizations of horizontal and vertical.

Humidity Level : 43 %R.H. Temperature: 23 °C
Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.239 (a)
Type of Test : Low Power Communication Device Transmitter
Result : PASSED BY –13.01 dB at 119.99 MHz

EUT : FM Transmitter Date: July 06, 2009
Frequency range : 30 MHz ~ 1 000 MHz
Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)
Distance : 3 Meter
Remark : Other emissions

Radiated Emission		Ant		Angle	Correction Factors		Total	Limit	Margin
Freq. (MHz)	Amp. (dBμV)	Pol.	Height (m)	(°)	Ant. (dBμV/m)	Cable (dB)	Amp. (dBμV/m)	(dBμV/m)	(dB)
119.99	15.10	H	2.80	160.00	13.01	2.40	30.51	43.52	-13.01
335.98	7.90	H	1.20	20.00	15.30	3.60	26.80	46.02	-19.22
359.98	7.70	H	1.70	120.00	16.16	3.68	27.54	46.02	-18.48
384.01	6.80	H	2.10	140.00	16.78	3.87	27.45	46.02	-18.57
431.99	6.40	H	2.00	190.00	18.15	4.19	28.74	46.02	-17.28
468.01	6.30	H	1.80	150.00	18.96	4.41	29.67	46.02	-16.35



Tested by: In-Sub, Youn / Project Engineer

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5.3 Bandwidth of the operating frequency

Humidity Level : 43 %R.H. Temperature: 23 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.239 (a)

Result : PASSED

EUT : FM Transmitter Date: July 06, 2009

Operating Condition : Transmit the RF signal.

Minimum Resolution Bandwidth : 10 kHz

Remark : Refer to test data in next page.

Frequency (MHz)	Measured Value (kHz)	Limit (kHz)	Margin (kHz)
88.10	187.5	200	-12.5
97.90	180.0		-20.0
107.90	187.5		-12.5

Tested by: In-Sub, Youn / Project Engineer

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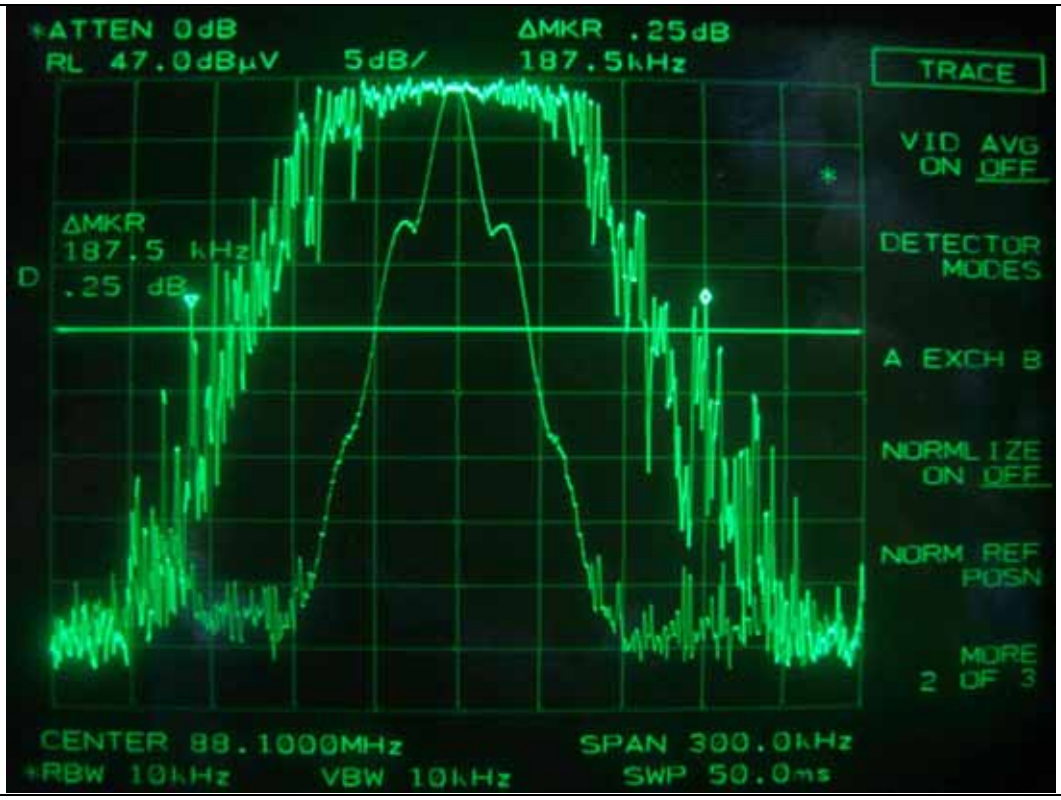
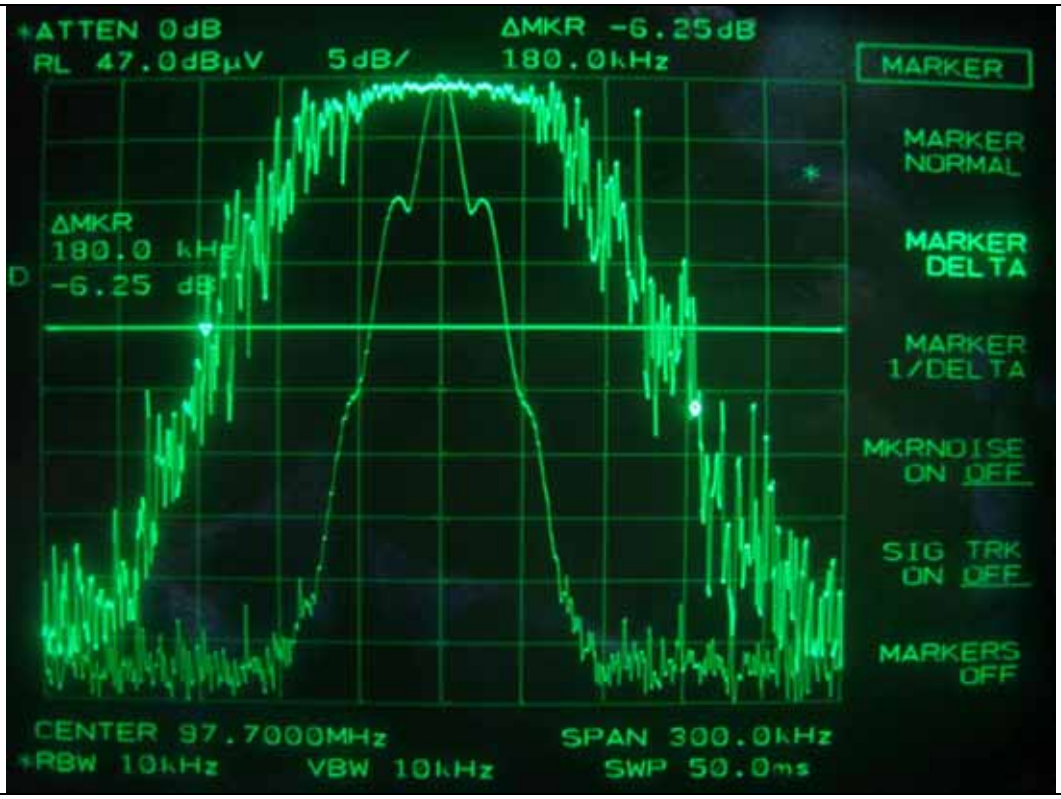


Bottom Frequency (88.10 MHz)



Middle Frequency (97.90 MHz)

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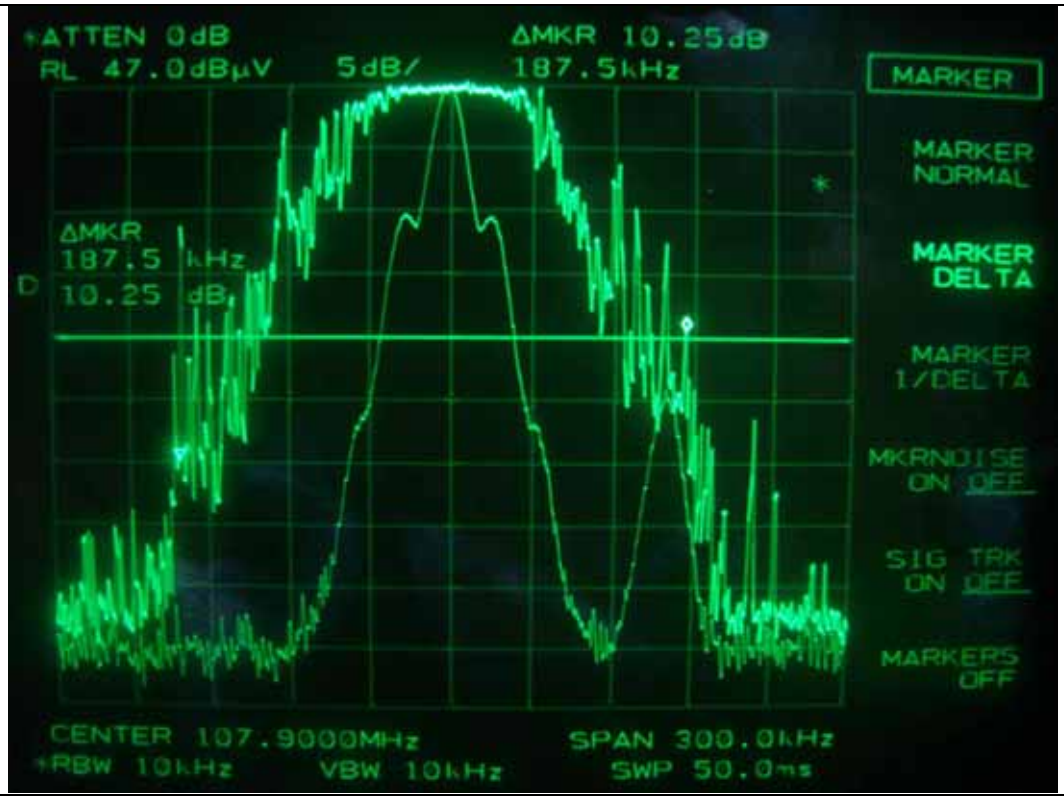

Top Frequency(107.90 MHz)

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5.4 Tuning Range of the operating frequency

Humidity Level	: 43 %R.H.	Temperature: 23 °C
Limits apply to	: FCC CFR 47, PART 15, SUBPART C, SECTION 15.239 (a)	
Result	: PASSED	

EUT	: FM Transmitter	Date: July 06, 2009
Operating Condition	: The lowest and highest frequency was adjusted by manual using up/down button on the EUT and the spectrum was in max hold mode for capturing the spectrum.	
Test Result	: Met the requirement. Refer to test data in next page.	

Tested by: In-Sub, Youn / Project Engineer

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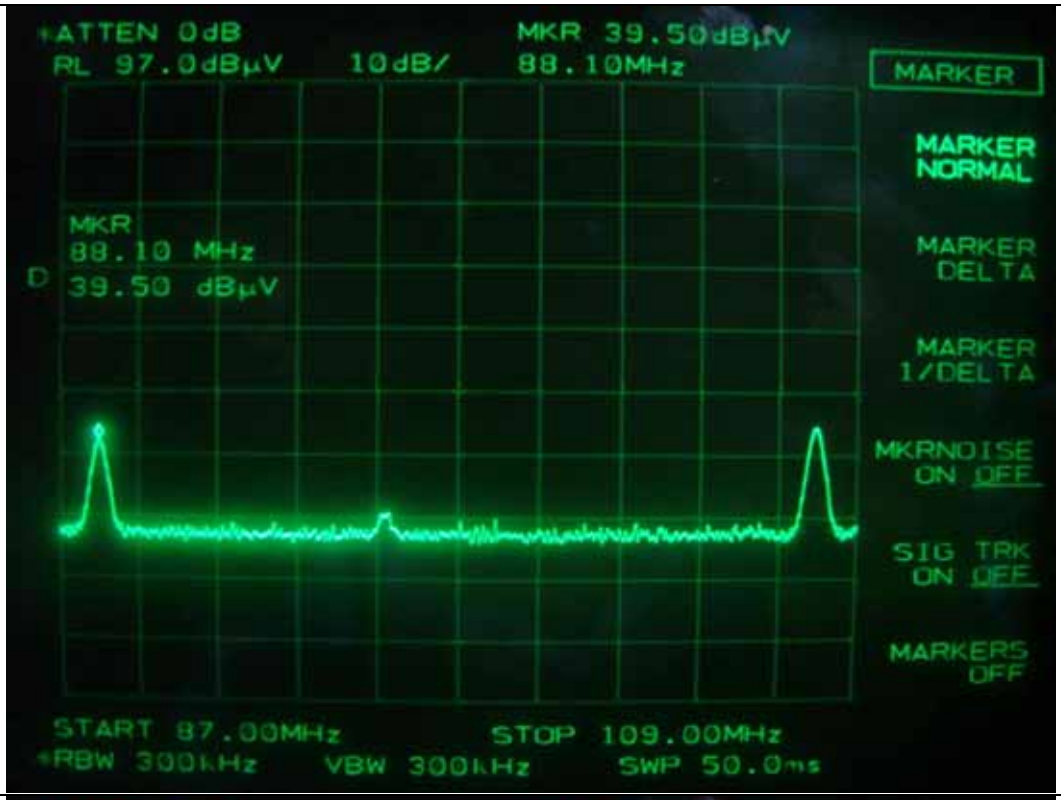

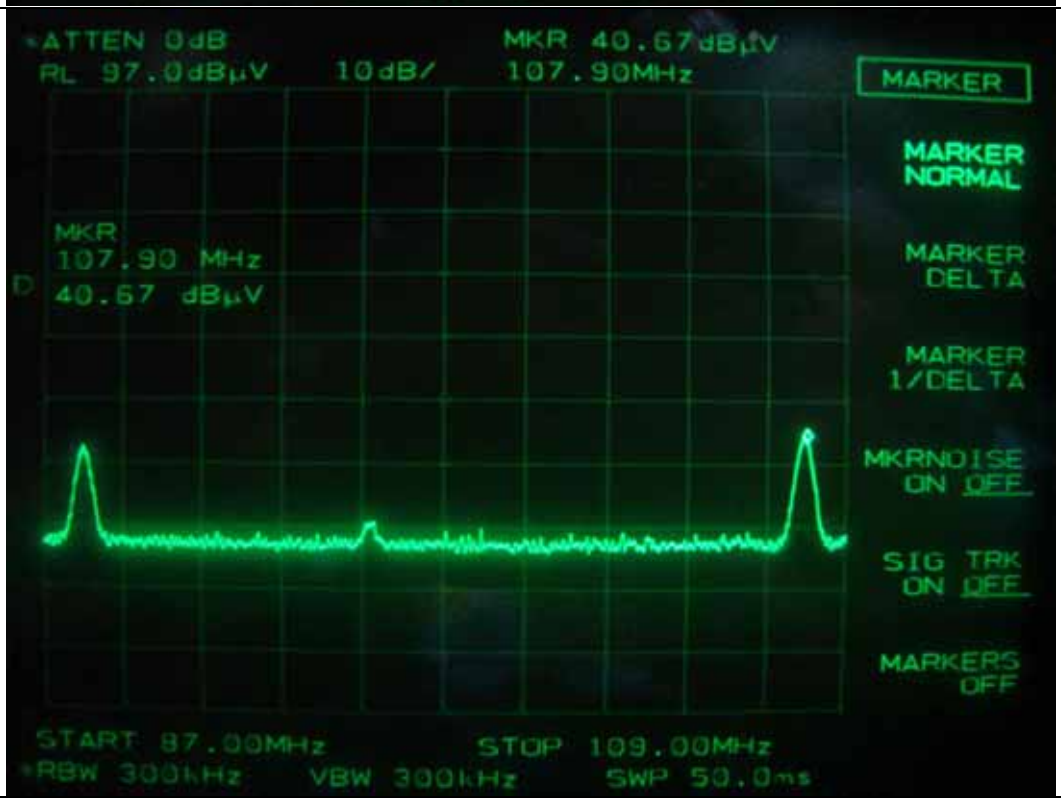

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6. FIELD STRENGTH CALCULATION

Meter readings are compared to the specification limit correcting for antenna and cable losses

+	Meter reading	(dBμV)
+	Cable Loss	(dB)
+	Antenna Factor (Loss)	(dB/meter)
=	Corrected Reading	(dBμV/meter)
-	Specification Limit	(dBμV/meter)
=	dB Relative to Spec	(+/- dB)

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7. LIST OF TEST EQUIPMENT

No.	EQUIPMENTS	MFR.	MODEL	SER. NO.	LAST CAL	DUE CAL	USE
1.	Test receiver	R/S	ESVD	838453/018	NOV/08	12MONTH	■
2.	Test receiver	R/S	ESHS 10	834467/007	MAY/09	12MONTH	
3.	Spectrum analyzer	HP	8566B	2516A01677	JUN/09	12MONTH	■
4.	TRILOG Broadband Antenna	Schwarzbeck	VULB9163	VULB9163 202	APR/08	24MONTH	
5.	Biconical antenna	EMCO	3110	9003-1121	JAN/08	24MONTH	
		Schwarzbeck	VHA9103	91031852	FEB/08		■
6.	Log Periodic antenna	EMCO	3146	9001-2614	JAN/08	24MONTH	
		Schwarzbeck	9108-A(494)	62281001	FEB/08		■
7.	LISN	EMCO	3825/2	9109-1867	JUN/09	12MONTH	
				9109-1869	JUN/09		
		Schwarzbeck	NSLK 8126	8126-404	JUN/09		
8.	Position Controller	HD GmbH	HD100	N/A	N/A	N/A	■
9.	Turn Table	HD GmbH	DS420S	N/A	N/A	N/A	■
10.	Antenna Master	HD GmbH	MA240	N/A	N/A	N/A	■

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