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ELECTROMAGNETIC EMISSION COMPLIANCE REPORT

Test report file number : E012R-015

Applicant : HANTEL CO., LTD.

Address : #518-8, You Jin B/D, Dogok-Dong, Kangnam-Ku, Seoul, 135-270, Korea

Manufacturer : HANTEL CO., LTD.

Address : #518-8, You Jin B/D, Dogok-Dong, Kangnam-Ku, Seoul, 135-270, Korea

Type of Equipment : PAGER

FCC ID : ODGTITANII

Model / Type No. : TITAN II

Serial number : N/A

Total page of Report : 10 pages (including this page)

Date of Incoming : February 01, 2001

Date of Issuing : February 14, 2001

SUMMARY

The equipment complies with the regulation; FCC PART 15 SUBPART B, SECTION 15.101

This test report contains only the result 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
1. VERIFICATION OF COMPLIANCE.....	3
2. GENERAL INFORMATION.....	4
2.1 PRODUCT DESCRIPTION.....	4
2.2 RELATED SUBMITTAL(S) / GRANT(S).....	4
2.3 TEST SYSTEM DETAILS.....	4
2.4 TEST METHODOLOGY	4
2.5 TEST FACILITY	4
3. SYSTEM TEST CONFIGURATION.....	5
3.1 JUSTIFICATION.....	5
3.2 EUT EXERCISE SOFTWARE	5
3.3 CABLE DESCRIPTION	5
3.4 NOISE SUPPRESSION PARTS ON CABLE	5
3.5 EQUIPMENT MODIFICATIONS	5
3.6 CONFIGURATION OF TEST SYSTEM.....	5
4. PRELIMINARY TEST.....	6
4.1 AC POWER LINE CONDUCTED EMISSIONS TESTS	6
4.2 RADIATED EMISSION TEST	6
5. FINAL RESULT OF MEASUREMENT.....	7
7. LIST OF TEST EQUIPMENT	11



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1. VERIFICATION OF COMPLIANCE

APPLICANT : HANTEL CO., LTD.
ADDRESS : #518-8, You Jin B/D, Dogok-Dong, Kangnam-Ku, Seoul, 135-270, Korea
CONTACT PERSON : Kyoung-Kwon, Ko
TELEPHONE NO : +82-2-571-4430
FCC ID : ODGTITANII
MODEL NO/NAME : TITAN II
SERIAL NUMBER : N/A
DATE : February 14, 2001

DEVICE TYPE	Unintentional Radiator
E.U.T. DESCRIPTION	PAGER
THIS REPORT CONCERNS	ORIGINAL GRANT
MEASUREMENT PROCEDURES	ANSI C63.4/1992
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 15.101
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 HANTEL CO., LTD., Model TITANII(referred to as the EUT in this report) is a FLEX Alpha-Numeric Display Pager which using a microcomputer to control radio frequency(RF) circuits and other customized decoding hardware to receive, decode, store. 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.>=1MHz)	12.8MHz, 20.945MHz on the main board
POWER REQUIREMENT	DC1.5V Battery
NUMBER OF LAYERS	4Layers : Main and LCD Board
TUNING FREQUENCY	929MHz ~ 931MHz
DETECT METHOD	Superheterodyne Detector
LOCAL OSCILLATOR	1 st Local Osc. Frequency = Tuning Frequency – 21.4MHz (1 st IF)

Model Differences:

-. The difference(s) compared to the EUT is as follows: none

2.2 Related Submittal(s) / Grant(s)

Original submittal only

2.3 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
TITAN II	HANTEL CO., LTD.	N/A	PAGER (EUT)	N/A
TC-1101A	TESCOM	N/A	SIGNAL GENERATOR	N/A

2.4 Test Methodology

Both conducted and radiated testing was performed according to the procedures in ANSI C63.4/1992. Radiated testing was performed at a distance of 3 meters from EUT to the antenna.

2.5 Test Facility

The open area test site and conducted measurement facilities are located on at 426-1 Daessangryung-Ri, Chowol-Myun, Kwangju-Kun, Kyunggi-Do 464-080 Korea. Description details of test facilities were submitted to the Commission on January 12, 1999. (Registration Number: 92819)



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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	HANTEL CO., LTD.	BFT3ESA1_RF	N/A
LCD BOARD	HANTEL CO., LTD.	BFT3ESA1_LG	N/A

3.2 EUT exercise Software

During Radiated Emission Tests, TESCOM signal generator model no: TC-1101A was used to radiate an unmodulated CW signal to EUT at 1 near top and 1 near bottom frequency in order to stabilize the local oscillator of the EUT.

3.3 Cable Description: Not applicable

3.4 Noise Suppression Parts on Cable: Not applicable

3.5 Equipment Modifications

To achieve compliance to CLASS B levels, the following change(s) was made by ONETECH Corp. during compliance testing:

“There was no Modified items during EMI test”

3.6 Configuration of Test System

Line Conducted Test: It does not need to test this requirement, because of the power of the EUT is supplied from a DC battery.

Radiated Emission Test: Preliminary radiated emission test was conducted using the procedure in ANSI C63.4/1992 8.3.1.1 to determine the worse operating conditions. Final radiated emission test was conducted at 3 meters open area test site.



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4. PRELIMINARY TEST

4.1 AC Power line Conducted Emissions Tests

During Preliminary Tests, the following operating mode was investigated

Operation Mode	The Worse operating condition (Please check one only)
N/A	N/A
It does not need to test this requirement, because of the power of the EUT is supplied from a DC 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)
Receiving	X



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5. FINAL RESULT OF MEASUREMENT

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

5.1 Radiated Emission Test

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

Humidity Level : 45 % Temperature: 17 °C
Limits apply to : FCC CFR 47, PART 15, SUBPART B, SECTION 15.109
Type of Test : ALL OTHER RECEIVERS SUBJECT TO PART 15
Result : PASSED BY -7.77 dB at 950.42 MHz

EUT : PAGER Date: February 01, 2001
Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)
Distance : 3 Meter
Operating Condition : Receiving mode: Bottom frequency(Operating frequency: 929.0125 MHz)

Radiated Emission		Ant	Correction Factors		Total		
Freq. (MHz)	Amp. (dBuV)	Pol.	Ant. (dBuV/m)	Cable (dB)	Amp. (dBuV/m)	Limit (dBuV/m)	Margin (dB)
237.62	10.80	H	12.16	1.77	24.73	46.00	-21.27
939.22	5.23	H	23.22	4.07	32.52	46.00	-13.48
945.23	5.69	V	23.34	4.09	33.12	46.00	-12.88
950.42	10.70	H	23.43	4.10	38.23	46.00	-7.77
965.22	5.88	H	23.53	4.12	33.53	54.00	-20.47
970.23	5.46	H	23.56	4.13	33.15	54.00	-20.85
980.12	5.53	H	23.62	4.16	33.31	54.00	-20.69
990~5000	*	-	-	-	-	54.00	-

Radiated Emission Tabulated Data

Remark : * means equal or less than 5dB



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Operating Condition : Receiving mode: Top frequency(Operating frequency: 931.9875 MHz)

Radiated Emission		Ant	Correction Factors		Total		
Freq. (MHz)	Amp. (dBuV)	Pol.	Ant. (dBuV/m)	Cable (dB)	Amp. (dBuV/m)	Limit (dBuV/m)	Margin (dB)
238.00	10.60	H	12.17	1.77	24.54	46.00	-21.46
922.56	5.66	H	22.89	4.02	32.57	46.00	-13.43
936.29	5.75	H	23.16	4.06	32.97	46.00	-13.03
953.39	9.50	H	23.45	4.11	37.06	46.00	-8.94
958.47	5.85	H	23.48	4.11	33.44	46.00	-12.56
965.55	5.63	H	23.53	4.12	33.28	54.00	-20.72
972.72	5.47	H	23.58	4.14	33.19	54.00	-20.81
980~5000	*	-	-	-	-	54.00	-

Radiated Emission Tabulated Data

Remark : * means equal or less than 5dB



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Tested by: Young-Min, Choi / Project Engineer



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6. FIELD STRENGTH CALCULATION

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

+ Meter reading (dBuV)

+ Cable Loss (dB)

+ Antenna Factor (Loss) (dB/meter)

= Corrected Reading (dBuV/meter)

- Specification Limit (dBuV/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	ESVS 10	827864/005	SEP/00	12MONTH	■
2.	Test receiver	R/S	ESHS10	834467/007	APRIL/00	12MONTH	■
3.	Spectrum analyzer	HP	8568B	3026A0226	SEP/00	12MONTH	■
4.	RF preselector	HP	85685A	3107A01264	SEP/00	12MONTH	■
5.	Quasi-Peak Adapter	HP	85650A	3107A01542	SEP/00	12MONTH	■
6.	Dipole Antenna	EMCO	3121C	9107-745	JUN/00	12MONTH	
7.	Biconical antenna	EMCO	3104C	9109-4441 9109-4443 9109-4444	MAR/00	12MONTH	■
8.	Log Periodic antenna	EMCO	3146	9109-3213 9109-3214 9109-3217	MAR/00	12MONTH	■
9.	Horn Antenna	EMCO	3115	9509-4563	MAR/00	12MONTH	■
10.	LISN	EMCO	3825/2	9109-1867 9109-1869	FEB/00	12MONTH	■
11.	RF Amplifier	HP	8447F	3113A04554	JUN/00	N/A	
12.	Spectrum Analyzer	HP	8591A	3131A02312	APR/00	12MONTH	
13.	Spectrum Analyzer	HP	8561E	3350A00546	SEP/00	12MONTH	■
14.	Computer System	HP	98581C	98543A	N/A	N/A	■
	Hard disk drive		9153C	CMC762Z9153	N/A	N/A	■
15.	Plotter	HP	7475A	30052 22986	N/A	N/A	■
16.	Position Controller	EMCO	1090	9107-1038	N/A	N/A	■
17.	Turn Table	EMCO	1080-1.21	9109-1576	N/A	N/A	■
18.	Antenna Master	EMCO	1070-1	9109-1624	N/A	N/A	■