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KANSAI ELECTRONIC INDUSTRY DEVELOPMENT CENTER

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IKOMA TESTING LABORATORY
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TEST REPORTReport No.A-008-00-R

Date: 21 February 2000

This test report is to certify that the tested device properly complies with the requirements of:

FCC Rules and Regulations Part 15 Subpart B Unintentional Radiators.

All the tests necessary to show compliance to the requirements were performed and these results met the specifications of requirement. The results of this report should not be construed to imply compliance of equipment other than that, which was tested. Unless the laboratory permission, this report should not be copied in part.

1. Applicant

Company Name : Funai Electric Co., Ltd.

Mailing Address : 7-1, 7-Chome, Nakagaito, Daito-City, Osaka, 574-0013 Japan

2. Identification of Tested Device

Type of Device : Super Regenerative Receiver

FCC ID : ADTCCB

Device Name : REMOTE CONTROL LOCATOR (RECEIVER)

Trade Name : Philips

Model Number : NO411UD

Serial Number : 0001 : Prototype : Pre-production : Production

Date of Manufacture : January 2000

3. Test Items and Procedure

: AC Power Line Conducted Emission Measurement

: Radiated Emission Measurement

: Antenna Power Conduction Measurement

: Picture Sensitivity Measurement

: Noise Figure Measurement

: Closed Caption Decoder Requirement For Television Receiver

Above all tests were performed under: ANSI C63.4 – 1992, FCC/OET MP-2

IEEE Std 187-1990, IEEE Std 190 and IEEE Std 213-1987

: without deviation, : with deviation(details are found inside of this report)

4. Date of Test

Receipt of Test Sample : 31 January 2000

Test Completed on : 10 February 2000

Fumitoshi Nagaoka
Associate Director/ Ikoma Testing Laboratory

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1 GENERAL INFORMATION

1.1 Product Description

The Philips Model No. NO411UD (referred to as the EUT in this report) is a REMOTE CONTROL LOCATOR (Receiver).

(1) Technical Specifications

Receiving Frequency Range : 390 MHz
Type of Circuit : Super regenerative
Type of Antenna : Built-in Antenna (unbalanced)

(2) Contained Oscillators : 4.0 MHz (Micro computer clock)

(3) Rated Power Supply : DC 4.5V ("AA" size dry cell battery × 3)

1.2 Description for Equipment Authorization

(1) Type of device	: <input type="checkbox"/> TV/FM Broadcasting Receiver
	: <input checked="" type="checkbox"/> Super regenerative Receiver
(2) Reference Rule and Specification	: FCC Rule Part 15
	<input type="checkbox"/> Section 15.107 (a)
	<input checked="" type="checkbox"/> Section 15.109 (a)(c)(f)
	<input type="checkbox"/> Section 15.111 (a)
	<input type="checkbox"/> Section 15.117 (f) (g)
	<input type="checkbox"/> Section 15.119
(3) Kind of Equipment Authorization	: <input type="checkbox"/> DoC <input checked="" type="checkbox"/> Certification <input type="checkbox"/> Verification
(4) Procedure of Application	: <input checked="" type="checkbox"/> Original Equipment <input type="checkbox"/> Modification
(5) Highest Frequency used in the Device	: 390 MHz (Receiving frequency)
(6) Upper Frequency of Radiated Emission Measurement Range	: <input type="checkbox"/> 1000 MHz <input checked="" type="checkbox"/> 2000 MHz <input type="checkbox"/> 5000 MHz

1.3 Test Facility

All tests described in this report were performed by:	
Name:	KANSAI ELECTRONIC INDUSTRY DEVELOPMENT CENTER (KEC) IKOMA TESTING LABORATORY
Open Area Test Site	<input type="checkbox"/> No.1 <input type="checkbox"/> No.2 <input type="checkbox"/> No.3 <input checked="" type="checkbox"/> No.4
EMC M.C. Anechoic Chamber	<input type="checkbox"/> No.1
Shielded Room	<input type="checkbox"/> No.2 <input type="checkbox"/> No.4 <input type="checkbox"/> EMC M.C. Shielded Room
Address:	12128, Takayama-cho Ikoma-city, Nara, 630-0101 Japan
<p>These test facilities have been filed with the FCC under the criteria of ANSI C63.4-1992. The Open Area Test Site No.4, EMC MC. Anechoic Chamber No.1, Shielded Room No.4 and EMC MC. Shielded Room have been accredited by the NVLAP (Lab. Code: 200207-0) based on ISO/IEC Guide 25.</p> <p>Also the laboratory has been authorized by ITI (Interference Technology International, (UK), TUV Product Service (GER) and TUV Rheinland (GER) based on their criteria for testing laboratory (EN45001).</p>	

2 TESTED SYSTEM

2.1 Test Mode

The compliance test were under two test modes.

The EUT was placed on the test table. Measurements were made for

- (1) Horizontally places
- (2) Vertically places

[Note]

In measurement, the signal generator, not the matching transmitter, was used to radiate an unmodulated continuous wave (CW) signal to a superregenerative receiver at its operating frequency band emission from such a receiver.

2.2 Characterization and condition of EUT System

: normal, : not normal (that is)

3 RADIATED EMISSION MEASUREMENT

3.1. Test Procedure

<p>(1) Configure the EUT System in accordance with ANSI C63.4-1992 section 12.1, IEEE Std 187-1990. <input checked="" type="checkbox"/>: without deviation, <input type="checkbox"/>: with deviation(details are found below)</p> <p>(2) If the EUT system is connected to a public power network, all power cords for the EUT System are connected the receptacle on the turntable.</p> <p>(3) Warm up the EUT System.</p> <p>(4) Activate the EUT System and run the prepared software for the test, if necessary.</p> <p>(5) To find out the emissions of the EUT System, preliminary radiated measurement are performed at a closer distance than that specified for final radiated measurement using the spectrum analyzer (*1) and the broad band antenna. In the frequency above 1 GHz, it is performed using the spectrum analyzer (*2) and the horn antenna.</p> <p>(6) To find out an EUT System condition, which produces the maximum emission, the configuration of EUT System, the position of the cables, and the operation mode, are changed under normal usage of the EUT.</p> <p>(7) The spectrums are scanned from 30 MHz to Upper frequency of measurement range and collect the highest emissions on the spectrum analyzer relative to the limit.</p> <p>(8) In final compliance test, the local oscillator emissions and the highest emissions recorded above are measured by using the test receiver (*3). In the frequency above 1 GHz, the measurements are performed by the horn antenna and <input type="checkbox"/> the test receiver (*4). <input checked="" type="checkbox"/> the spectrum analyzer(*2) with pre-amplifier.</p>	<p>[Note]</p> <p>(*1) Spectrum Analyzer Set Up Conditions Frequency range : 30 – 1000 MHz Resolution bandwidth : 100 kHz Detector function : Peak mode</p> <p>(*2) Spectrum Analyzer Set Up Conditions Frequency range : 1 GHz - Upper frequency of measurement range Resolution bandwidth : 1 MHz Video bandwidth : 1 MHz Attenuator : 10 dB Detector function : Peak mode</p> <p>(*3) Test Receiver Set Up Conditions Frequency range : 30 – 1000 MHz Detector function : Quasi-Peak IF bandwidth : 120 kHz</p> <p>(*4) Test Receiver Set Up Conditions Frequency range : 1 GHz - Upper frequency of measurement range Detector function : Average IF bandwidth : 1 MHz</p>
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3.2 Test Results

Test Mode : Horizontally Places

Measurement Distance : 3m : 10m

Measured Frequency	Antenna Factor	Meter Reading		Maximum Field Strength	Limits	Margin for Limits
		Horizontal	Vertical			
(MHz)	(dB/m)	(dBmV)	(dBmV)	(dBmV/m)	(dBmV/m)	(dB)
393.02	19.0	20.7	12.8	39.7	46.0	6.3
393.89	19.0	20.9	12.9	39.9	46.0	6.1
394.32	19.0	20.8	12.8	39.8	46.0	6.2
796.42	26.8	3.3	3.5	30.3	46.0	15.7
797.24	26.9	4.0	3.4	30.9	46.0	15.1
1089.64	-12.9	58.9	58.9	46.0	54.0	8.0
1192.70	-10.4	53.0	53.0	42.6	54.0	11.4
1455.40	-10.7	54.5	54.5	43.8	54.0	10.2

<p>[Note]</p> <ul style="list-style-type: none"> (1) Antenna Factor includes the cable loss. (2) Receiving Frequency : 390 MHz (3) The emission not reported were loss than 10 dBμV at meter reading. (4) Above 1000 MHz, the antenna factor includes the cable loss and pre-amplifier gain.
<p>[Calculation method]</p> <p>Maximum Field Strength (dBμV/m) = Meter Reading (at maximum level of Horizontal or Vertical) (dBμV) + Antenna Factor (dB/m)</p>

[Environment]

Temperature: 16°C

Humidity: 50%

[Tested Date/ Tester]

10 February, 2000

Signature



Ikuya Minematsu

Test Mode : Vertically Places

Measurement Distance : 3m : 10m

Measured Frequency	Antenna Factor	Meter Reading		Maximum Field Strength	Limits	Margin for Limits
		Horizontal	Vertical			
(MHz)	(dB/m)	(dBmV)	(dBmV)	(dBmV/m)	(dBmV/m)	(dB)
393.03	19.0	11.5	17.6	36.6	46.0	9.4
393.46	19.0	11.4	17.8	36.8	46.0	9.2
393.89	19.0	11.4	17.6	36.6	46.0	9.4
724.48	25.6	2.1	4.2	29.8	46.0	16.2
782.56	26.6	3.5	4.0	30.6	46.0	15.4
1089.70	-12.9	50.6	57.8	44.9	54.0	9.1
1127.50	-10.9	50.1	54.1	43.2	54.0	10.8
1187.77	-10.3	51.4	53.6	43.3	54.0	10.7
1454.06	-10.7	48.9	55.0	44.3	54.0	9.7

[Note]

- (1) Antenna Factor includes the cable loss.
- (2) Receiving Frequency : 390 MHz
- (5) The emission not reported were loss than 10 dB μ V at meter reading.
- (6) Above 1000 MHz, the antenna factor includes the cable loss and pre-amplifier gain.

[Calculation method]

Maximum Field Strength (dB μ V/m)
= Meter Reading (at maximum level of Horizontal or Vertical) (dB μ V) + Antenna Factor (dB/m)

[Environment]

Temperature: 16°C

Humidity: 50%

[Tested Date/ Tester]

10 February, 2000

Signature



Ikuya Minematsu

3.3 Photographs of EUT System Configuration

(1) Horizontally places



(2) Vertically places



4 USED TEST EQUIPMENTS AND CALIBRATION STATUS

Instrument	Manufacturer	Model No	Specifications	KEC Control No.	Test Item (*)	Last Cal.	Next Cal.
Test Receiver	Kyoritsu	KNM-2403	Frequency Range 9 kHz - 30 MHz	FS-70	N/A	1999/4	2000/4
	Rohde & Schwarz	ESVS10	Frequency Range 20 MHz - 1 GHz	FS-82	2	2000/1	2001/1
Spectrum Analyzer	Advantest	TR4172	Frequency Range 50 Hz - 1.8 GHz	SA-23	N/A	2000/1	2001/1
		R3261C	Frequency Range 9 kHz - 2.6 GHz	SA-41	2	1999/8	2000/8
Pre-Amplifier	Hewlett Packard	8449B	Frequency Range 1 GHz - 26.5 GHz	AM-52	2	1999/4	2000/4
Line Impedance Stabilization Network	Kyoritsu	KNW-407	Frequency Range 150 kHz - 30 MHz Impedance 50 Ω / 50 μ H	FL-72	N/A	1999/4	2000/4
Biconical Antenna	Schwarzbeck	BBA9106	Frequency Range 30 MHz - 300 MHz	AN-94	2	1999/2	2000/2
Log-Periodic Antenna	Schwarzbeck	UHALP 9108A	Frequency Range 300 MHz - 1 GHz	AN-217	2	1999/2	2000/2
Tuned Dipole Antenna	Kyoritsu	KBA-511AS	Frequency Range 25 MHz - 500 MHz Used for transmitt antenna	AN-135	2	1999/3	2000/3
		KBA-611S	Frequency Range 500 MHz - 1 GHz	AN-137	N/A	1999/3	2000/3
Horn Antenna	RAVEN	91888-2	Frequency Range 1 GHz - 2 GHz	AN-167	2	1999/11	2001/11

- Continued -

Instrument	Manufacturer	Model No	Specifications	KEC Control No.	Test Item (*)	Last Cal.	Next Cal.
IRE TV Signal Generator	Sibasoku	VG40A	NTSC US 4ch, 13ch	MG-43	N/A	1999/12	2000/12
20dB PAD	Made by KEC		Attenuation 20 dB	MM-39-4	N/A	-	-
Impedance Trans-Former	NMC	MB-009	Frequency Range 10 MHz - 2GHz 50 Ω : 75 Ω	AX-27	N/A	1999/11	2000/11
Oscillo-Scope	Matsushita	VP-5530B	Frequency Range DC - 300 MHz	OS-18	N/A	1999/5	2000/5
Filter	Krohn-Hite	3550	Frequency Range 2 Hz - 200 kHz	FL-32	N/A	1999/3	2000/3
Matching Trans-Former	Anritsu	MP614A	Frequency Range 10 MHz-1.2 GHz 50 Ω : 75 Ω	AX-28-3	N/A	1999/11	2000/11
Standard Signal Generator	Anritsu	MG645A	Frequency Range 100 kHz - 1.04 GHz	SG-30	2	1999/9	2000/9
Noise Figure Meter	Elena	ENF-2005	Frequency Range 10.7MHz - 65 MHz Noise Source 28 Vp-p	MM-30	N/A	1999/6	2000/6
Noise Source	Microwave Semiconductor	MC1100	Frequency Range 5 MHz - 1 GHz Noise Ratio 15 dB - 16 dB	MM-30-2	N/A	1999/6	2000/6

[Note]

Test Item (*): 1 : AC Power Line Conducted Emission Measurement
 2 : Radiated Emission Measurement
 3 : Antenna Power Conduction Measurement
 4 : Picture Sensitivity Measurement
 5 : Noise Figure Measurement
 N/A: Not Applicable

The overall program of calibration and verification of equipment is designed and operated so as to ensure that measurements made by KEC are traceable to national standards of measurement or equivalent abroad.