

MEASUREMENT AND TECHNICAL REPORT

PHILIPS INDUSTRIAL ACTIVITIES LOUVAIN
 Interleuvenlaan 74-82
 3001 Leuven
 Belgium

DATE: 12 October 2001

This Report Concerns:	Original Grant: ☒	Class II Change:
Equipment Type:	RC9200, Model 3104 207 1236	
Deferred grant requested per 47 CFR 0.457(d)(1)(ii)?	Yes: ☐ Defer until:	No: ☒
Company Name agrees to notify the Commission by:	N/A	
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: ☒
<i>(*) FCC Part 15, Paragraphs 15.231(c), (e); 15.107(a); 15.209(a)</i>		
Report Prepared by: TÜV PRODUCT SERVICE 10040 Mesa Rim Road San Diego, CA 92121-2912 Phone: 858 546 3999 Fax: 858 546 0364		

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1 GENERAL INFORMATION

1.1 Product Description: IR/RF touch screen remote with docking station and dongle

 EUT Name RC9200

 Model No.: 3104 207 1236

Power Requirements

 Voltage: 4.8V Battery pack

 # of Phases: NA

 Current (Amps/phase(max)): 120mA

Other Special Requirements

The RC9200 will be used in combination of a docking station (DS9200) and a dongle(RX-77).The docking station charges the battery inside the TS5200.The dongle converts the RF power into IR.

The docking station will be connected to an AC adaptor (12 V DC, 400 mA).

The AC adaptor is UL listed

EUT Power Cable

☐ Permanent OR ☐ Removable Length (in meters): _____
☐ Shielded OR ☐ Unshielded
☒ Not Applicable

EUT Interface Ports and Cables

Interface			Shielding									
Type	Analog	Digital	Qty	Yes	No	Type	Termination	Connector Type	Port Termination	Length (in meters)	Removable	Permanent
RS232	☐	☒	1	☒	☐	Shield DE9S with AL-foil shield UL listed 2464		Metallized 9 - pin D-sub female	Compliance to RS232	2	☒	☐
Emmitter Cable	☐	☒	4	☐	☒	standard copper tinned cable		3.5 mm mono pin connector		2	☒	☐

EUT Software.

Description: EMC software
 It sends on a certain interval IR or RF. It turns on the LCD and the backlight.
 It also communicate with the PC via the RS232
 The RX-77 translates the RF signal into IR codes

EUT System Components --			
Description	Model #	Serial #	FCC ID #
Touch screen remote	RC9200	see EUT	
Docking station	DS9200	see EUT	
Serial Cable	RS232		
AC/DC Adaptor	AC/DC adaptor ITE 120V-60Hz- 100 mA Output 12V DC 400 mA.	3104 200 51192	
Dongle RF extender	RX-77	see EUT	

Support Equipment			
<i>Description</i>	<i>Model #</i>	<i>Serial #</i>	<i>FCC ID #</i>
Test PC TUV			

Oscillator Frequencies			
<i>Frequency</i>	<i>Derived Frequency</i>	<i>Component # / Location</i>	<i>Description of Use</i>
16 MHz		Dragon Ball	Main Processor
32.768kHz		Grystal	Used by PLL to generate 16.67 MHZ
418 Mhz		RF module	RF transmitter
416.7 Hz		LCD Unit	Used in EL backlight

Critical EMI Components (Capacitors, ferrites, etc.)				
<i>Description</i>	<i>Manufacturer</i>	<i>Part # or Value</i>	<i>Qty</i>	<i>Component # / Location</i>
ferrit bead	murata	100 Mhz;120R	3	Serial comm. circuit
ferrit bead	murata	100 Mhz;120R	3	Mp;memory - in power supply

1 GENERAL INFORMATION (continued)

1.2 Related Submittal/Grant

None

1.3 Tested System Details

The FCC IDs for all equipment, plus descriptions of all cables used in the tested system are:

None

1.4 Test Methodology

Purpose of Test: To demonstrate compliance with the ANSI C63.4 setup.

TEST	FCC CFR 47 #	PASS/FAIL
Radiated	15.231(e)	Pass
Deactivation	15.231(e)	Pass
Emission Bandwidth	15.231(c)	Pass
Duty Cycle Measurements	ANSI C63.4, Appendix 14, Para. 10	Pass
Conducted Emissions	15.107(a)	Pass
Radiated Emissions	15.109(a)	Pass

Both Conducted and radiated testing were performed according to the procedures in FCC/ANSI C63.4 and CSA 108.8 - M1983. Radiated testing was performed at an antenna-to-EUT distance of 3 meters (1 - 25 GHz).

1.5 Test Facility

The open area test site and conducted measurement data were tested by:

TÜV PRODUCT SERVICE
10040 Mesa Rim Road
San Diego, CA 92121-2912
Phone: 858 546 3999
Fax: 858 546 0364

The Test Site Data and performance comply with ANSI 63.4 and are registered with the FCC, 7435 Oakland Mills Rd, Columbia Maryland 21046. All Measurement Data is acquired according to the content of FCC Measurement Procedure and ANSI C63.4, unless supplemented with additional requirements as noted in the test report.

2. SYSTEM TEST CONFIGURATION

2.1 Justification

The EUT was initially tested for FCC emission in the following configuration:

See Block Diagram.

2.2 EUT Exercise Software

None

2.3 Special Accessories

None

2.4 Modification

None

2.5 Configuration of Tested System

See Block Diagram.

3 RADIATED/DEACTIVATION EMISSION EQUIPMENT/DATA

The following data lists the significant emission frequencies, measured levels, correction factor (which includes cable and antenna corrections), the corrected reading, and the limit.

See following page(s).

Emissions Test Conditions: RADIATED EMISSIONS, FCC Part 15.231(e); 15.109(a)

The <i>RADIATED EMISSIONS</i> measurements were performed at the following test location :
--

☐ - Test not applicable
--

Canyon #1 Open Area Test Site, Carroll Canyon, San Diego
Roof
TR2, Test Room 2

Testing was performed at a test distance of:

■ - 3 meters

Test Equipment Used :

Model No.	Prop. No.	Description	Manufacturer	Serial No.	Cal Date
3115	251	Antenna, Double Ridge Guide	EMCO	2595	10/01
PreAmp 2 - 20 GHz	752	Pre-Amplifier	TUV PS	--	N/A
PreAmp 0.01 – 2 GHz	6360	Pre-Amplifier	TUV PS	--	N/A
Cable 1	733	30' Cable	--	--	N/A
Cable 2	657	6" Cable	--	--	N/A
8566B	823	Spectrum Analyzer	Hewlett Packard	2332A02751	07/02

Remarks: _____

above 1GHz: RBW & VBW 1 MHz for Pk; RBW 1MHz and VBW 10Hz for AVG
below 1GHz: RBW & VBW 100 kHz for Pk; RBW 100kHz and VBW 10Hz for AVG
CF = Antenna Factor + Cable Loss - Preamplifier Gain + Preselector Loss

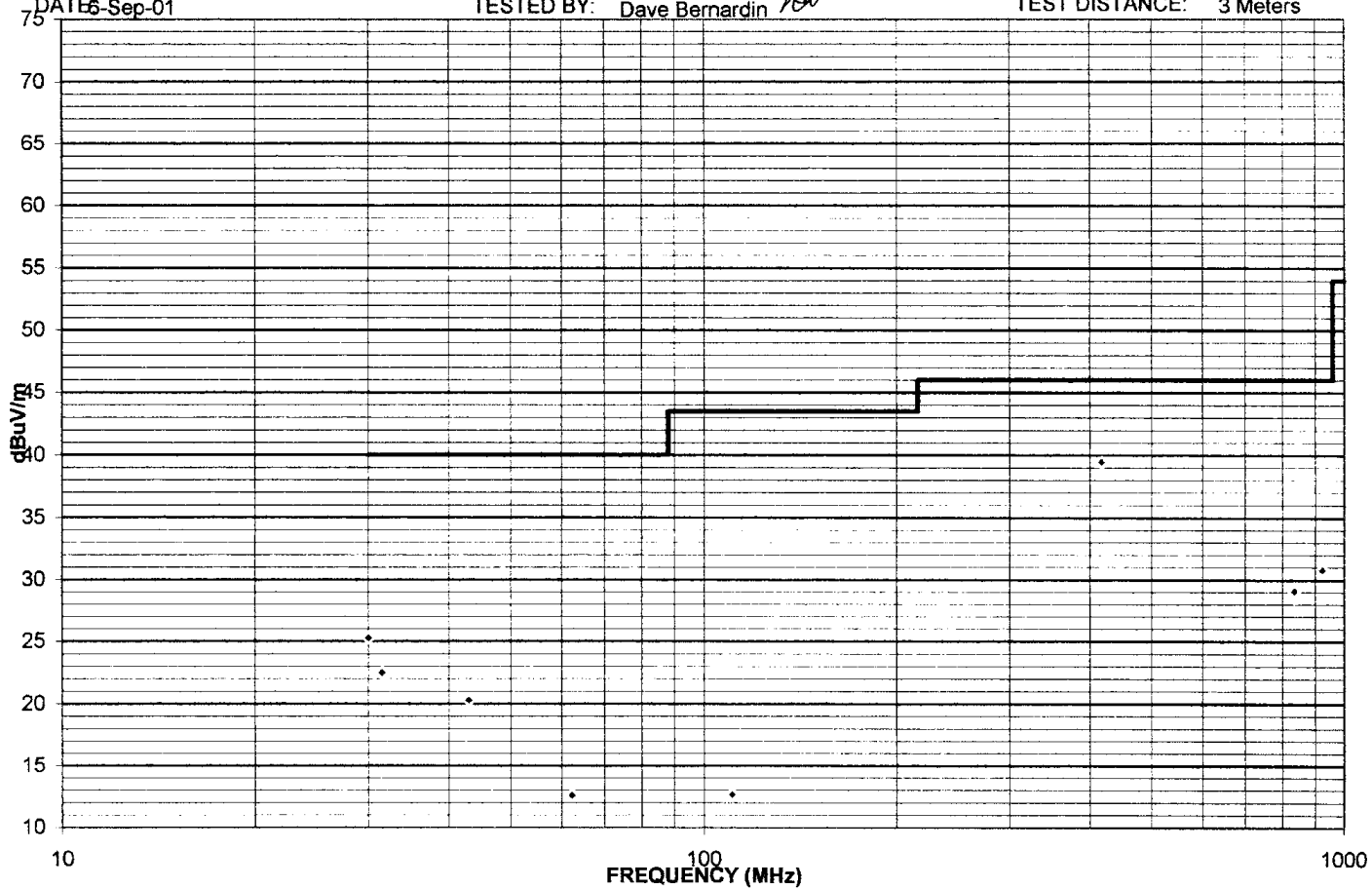
[illegible]

REPORT NO: SC106386a
 COMPANY: Philips Industrial Activities/Philips RCS Leuven
 EUTRC: 9200 + DS9200 Docking Station
 EUT MODE: TRANSMIT
 DATE: 6-Sep-01

SPEC: FCC Part 15 para 15.109(a)

TESTED BY: Dave Bernardin

TEST DISTANCE: 3 Meters



Field Strength Calculation

If a preamplifier was used during the Radiated Emission Testing, it is required that the amplifier gain must be subtracted from the Spectrum Analyzer (Meter) Reading. In addition, a correction factor for the antenna, cable used and a distance factor, if any, must be applied to the Meter Reading before a true field strength reading can be obtained. In the automatic measurement, these considerations are automatically presented as a part of the print out. In the case of manual measurements and for greater efficiency and convenience, instead of using these correlation factors for each meter reading, the specification limit was modified to reflect these correlation factors at each frequency value so that the meter readings can be compared directly to the modified specification limit. This modified specification limit is referred to as the "Corrected Meter Reading Limit" or simply the CMRL, which is the actual field strength present at the antenna. The quantity can be derived in the following manner:

$$\text{Corrected Meter Reading Limit (CMRL)} = \text{SAR} + \text{AF} + \text{CL} - \text{AG} - \text{DC}$$

Where, SAR = Spectrum Analyzer Reading

AF = Antenna Factor

CL = Cable Loss

AG = Amplifier Gain (if any)

DC = Distance Correction (if any)

Assume the following situation: A meter reading of 29.4 dBuV was obtained from a Class A computing device measured at 83 MHz. Assume an antenna factor of 9.2 dB, a cable loss of 1.4 dB and amplifier gain of 20.0 dB at 83 MHz. The final field strength would be determined as follows:

$$\text{CMRL} = 29.4 \text{ dBuV} + 9.2 \text{ dB} - 1.4 \text{ dB} - 20 \text{ dB/M} - 0.0 \text{ dB}$$

$$\text{CMRL} = 20.0 \text{ dBuV/M}$$

This result is well below the FCC and CSA Class A limit of 29.5 dBuV/m at 83 MHz.

For the manual mode of measurement, a table of corrected meter reading limit was used to permit immediate comparison of the meter reading to determine if the measure emission amplitude exceeded the specification limit at that specific frequency.

4 CONDUCTED EMISSION/DUTY CYCLE EQUIPMENT/DATA

See following page(s).

Emissions Test Conditions: CONDUCTED EMISSIONS, FCC Part 15.107(a); 15.231(c); ANSI C63.4

The *RADIATED EMISSIONS* measurements were performed at the following test location :

☐ - Test not applicable

SR-4 Shielded Room, 20' x 28' x 16' Metal Chamber
TR2, Test Room 2

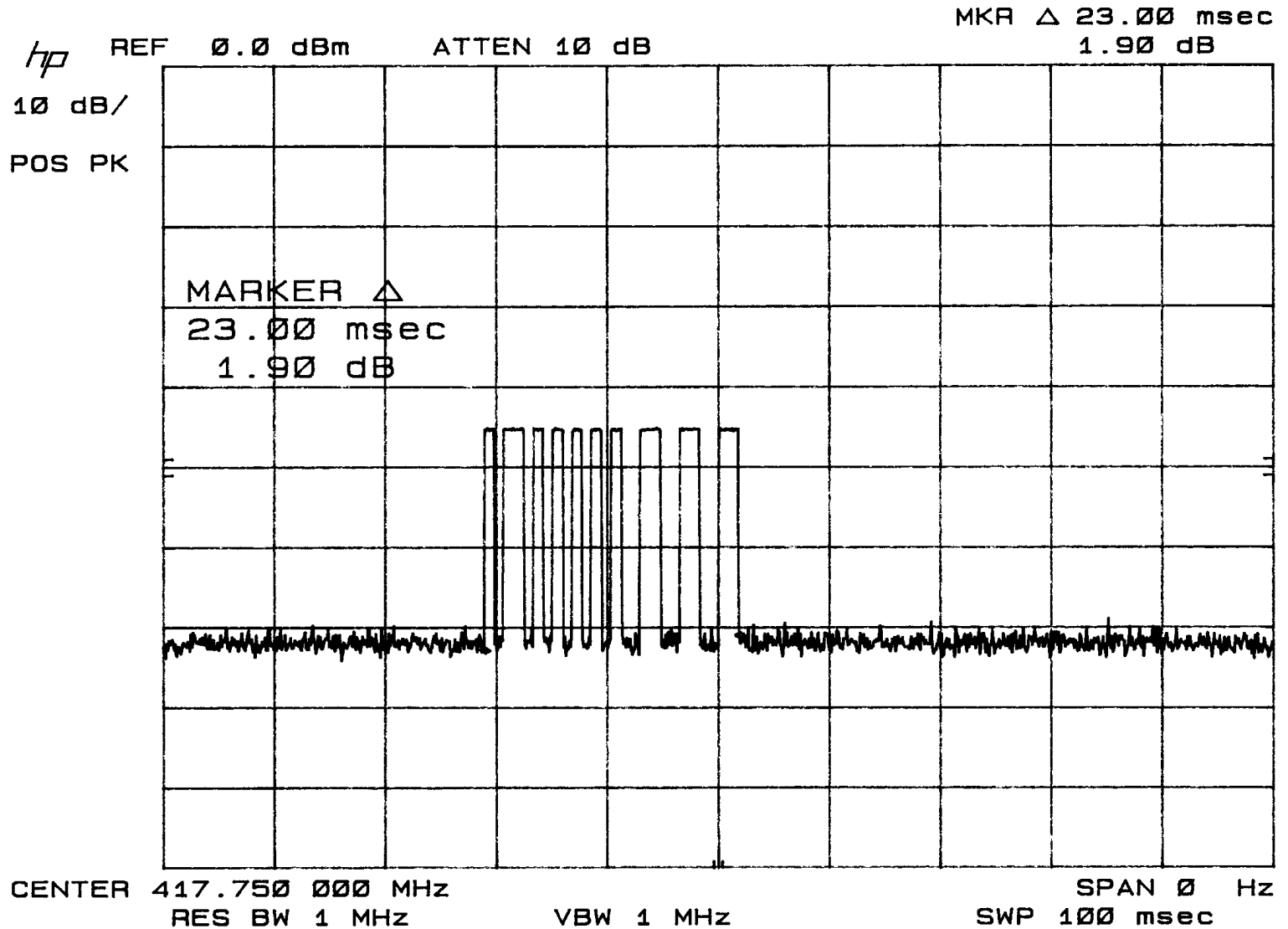
Test Equipment Used :

HP8568B, S/N 2311A02209, P/N 187, Spectrum Analyzer, Hewlett Packard, Cal 11/01

Remarks: Bandwidth measurement: Shall be no wider than 0.25% of center frequency above 70 MHz and below 900 MHz. CF = 417.8 MHz *0.25% = 1.04 MHz. Measured BW = 600 kHz

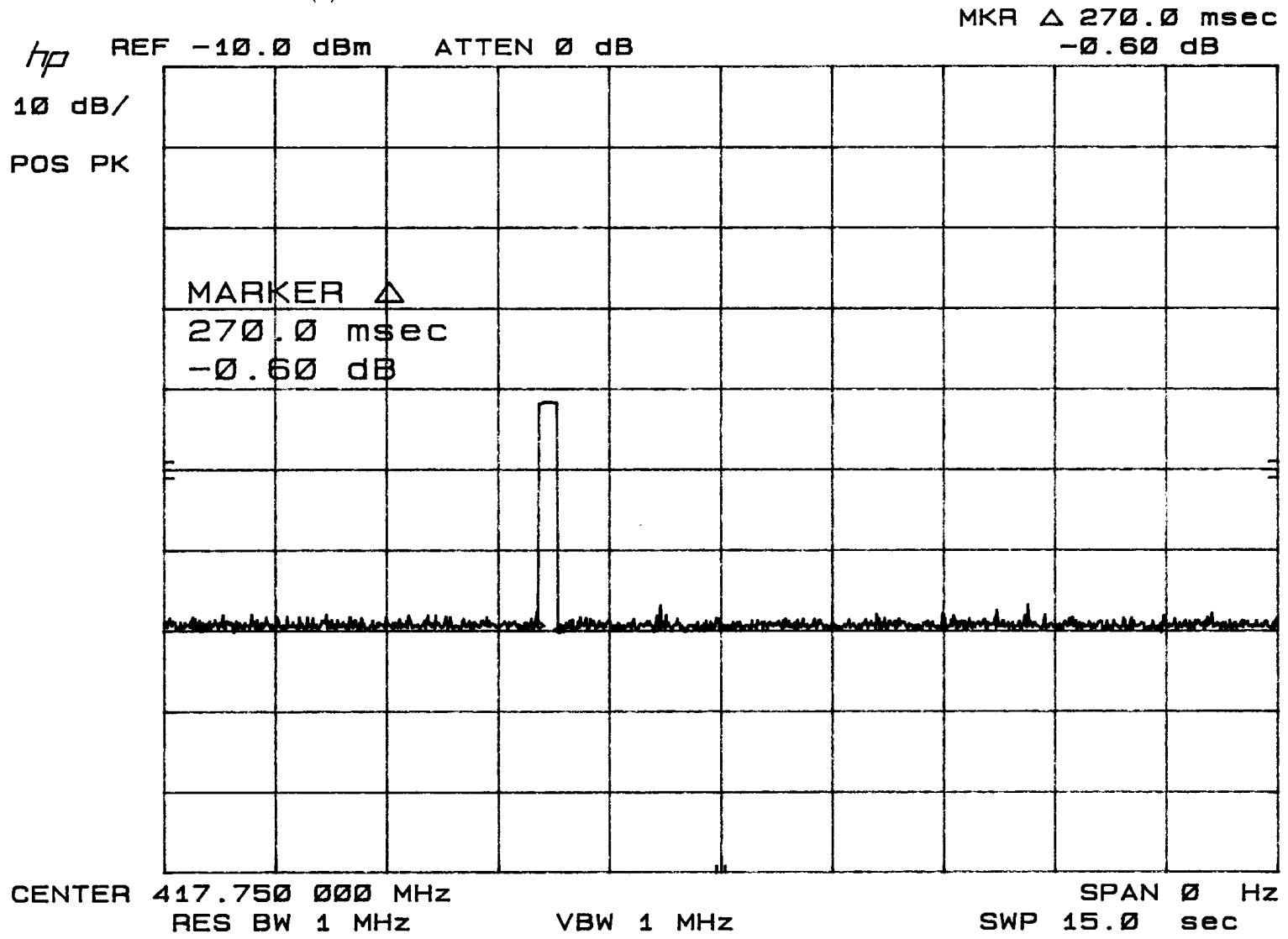
CUSTOMER: PHILIPS INDUSTRIAL
 EUT: Universal Remote Control Model RC9200 + DS9200 Docking Station
 TEST: Deactivation Part 15.231(e)

Sep. 7, 2001
 TECH/ENGR. *[Signature]*



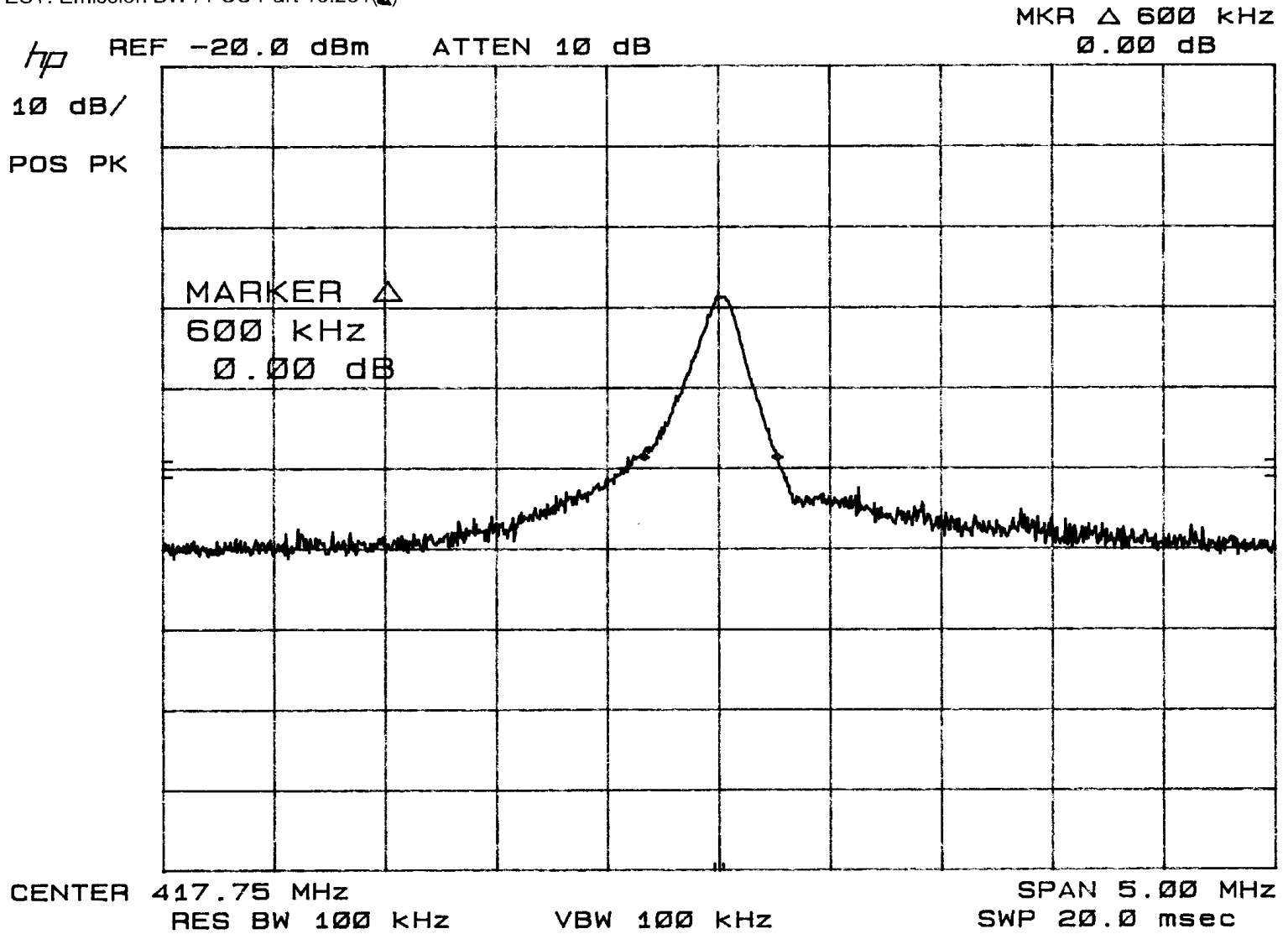
CUSTOMER: PHILIPS INDUSTRIAL
 EUT: Universal Remote Control Model RC9200 + DS9200 Docking Station
 TEST: Deactivation Part 15.231(e)

Sep. 7, 2001
 TECH/ENGR. *SLB*



CUSTOMER: PHILIPS INDUSTRIAL
 EUT: Universal Remote Control Model RC9200 + DS9200 Docking Station
 TEST: Emission BW / FCC Part 15.231(c)

Sep. 7, 2001
 TECH/ENGR. *ASB*



CUSTOMER: PHILIPS INDUSTRIAL Report No.: SC106386
EUT: Universal Remote Control Model RC9200 + DS9200 Docking Station
TEST: Duty Cycle per. ANSI C63.4 / FCC Part 15.231

SEP. 7, 2001
TECH/ENGR.



Duty Cycle Correction for Intentional Radiators
Formula for calculating the duty cycle correction;

dB = 20 log (DC)

Where DC = (Max. time data is on in 100ms / 100ms)(Max. duty cycle)

$$\frac{(23 \text{ ms})}{(100 \text{ ms})} = 0.23$$

$$20 \log (0.23) = -12.77 \text{ dB}$$

**TUV Product Service
Powerline Conducted Emissions**

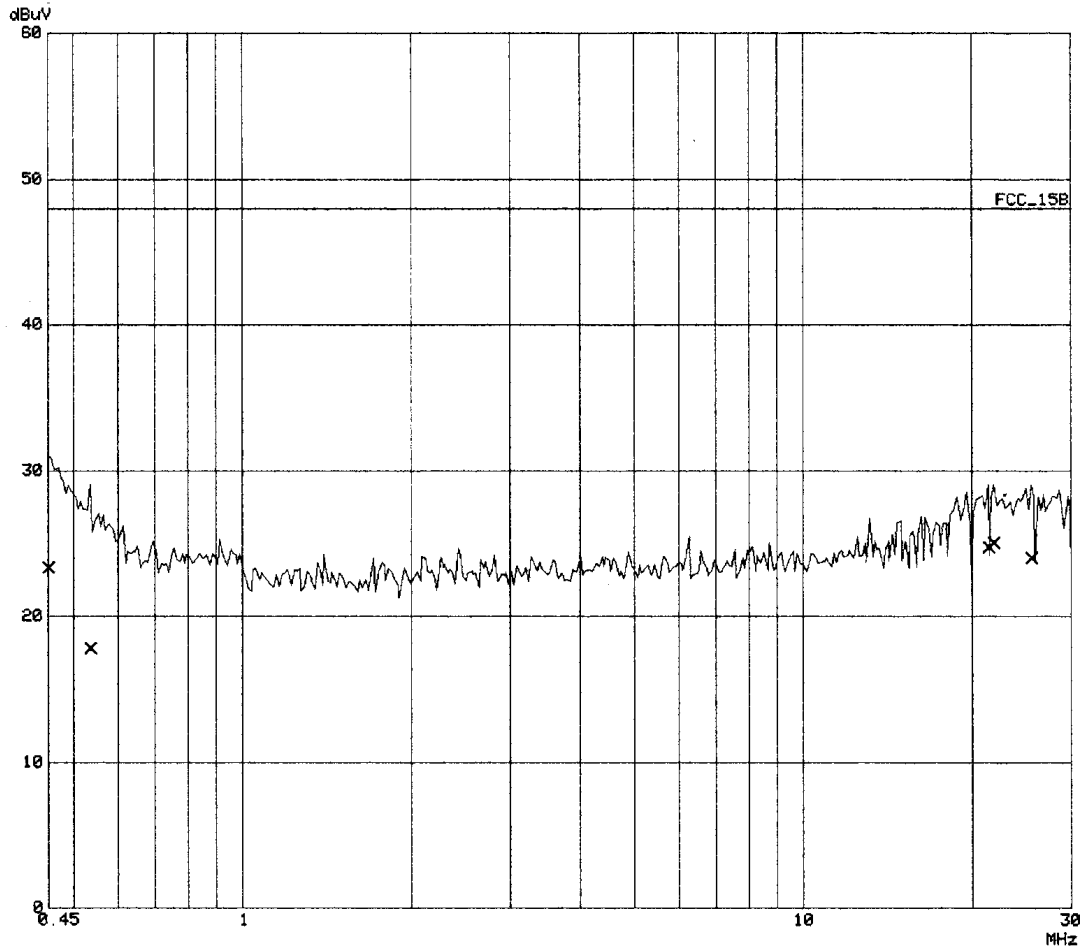
EUT: RC9200 + DS9200 Docking Station
 Manuf: Philips Industrial / RCS Leuven
 Op Cond: Transmit Mode
 Operator: Dave Bernardin
 Test Spec: FCC 107(a)
 Comment: 110VAC 60Hz line 1
 SC106386
 Date: 06. Sep 01 09:45

Scan Settings (2 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
450k	1M	5k	10k	PK	100ms	AUTO	LN OFF	60dB
1M	30M	5k	10k	PK	2ms	AUTO	LN OFF	60dB

Transducer No.	Start	Stop	Name
1	150k	30M	20dBLISN

Final Measurement: x QP
 Meas Time: 1 s
 Subranges: 25
 Acc Margin: 20dB



**TUV Product Service
Powerline Conducted Emissions**

EUT: RC9200 + DS9200 Docking Station
Manuf: Philips Industrial / RCS Leuven
Op Cond: Transmit Mode
Operator: Dave Bernardin
Test Spec: FCC 107(a)
Comment: 110VAC 60Hz line 1
SC106386
Date: 06. Sep 01 09:45

Final Measurement Results:

Frequency MHz	QP Level dBuV	QP Limit dBuV
0.45000	23.4	48.0
0.53500	17.8	48.0
21.42500	24.8	48.0
21.94000	25.1	48.0
25.56000	24.0	48.0

* limit exceeded

**TUV Product Service
Powerline Conducted Emissions**

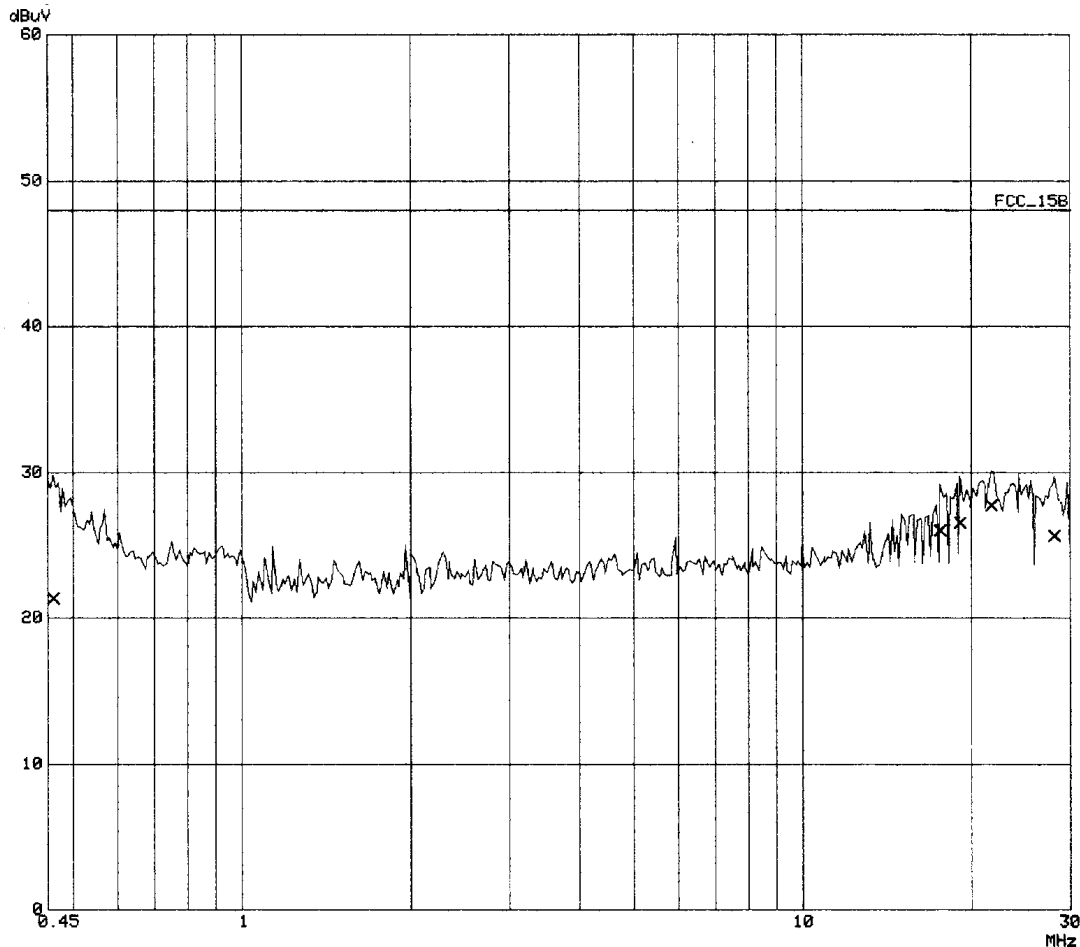
EUT: RC9200 + DS9200 Docking Station
 Manuf: Philips Industrial / RCS Leuven
 Op Cond: Transmit Mode
 Operator: Dave Bernardin
 Test Spec: FCC 107(a)
 Comment: 110VAC 60Hz line 2
 SC106386
 Date: 06. Sep 01 09:26

Scan Settings (2 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
450k	1M	5k	10k	PK	100ms	AUTO	LN OFF	60dB
1M	30M	5k	10k	PK	2ms	AUTO	LN OFF	60dB

Transducer No.	Start	Stop	Name
1	150k	30M	20dBLISN

Final Measurement: x QP
 Meas Time: 1 s
 Subranges: 25
 Acc Margin: 20dB



**TUV Product Service
Powerline Conducted Emissions**

EUT: RC9200 + DS9200 Docking Station
Manuf: Philips Industrial / RCS Leuven
Op Cond: Transmit Mode
Operator: Dave Bernardin
Test Spec: FCC 107(a)
Comment: 110VAC 60Hz line 2
SC106386
Date: 06. Sep 01 09:26

Final Measurement Results:

Frequency MHz	QP Level dBuV	QP Limit dBuV
0.46000	21.3	48.0
17.59500	26.0	48.0
19.14500	26.6	48.0
21.73000	27.7	48.0
28.19500	25.6	48.0

* limit exceeded

ATTESTATION STATEMENT

GENERAL REMARKS:

PHILIPS INDUSTRIAL ACTIVITIES LOUVAIN
Interleuvenlaan 74-82
3001 Leuven
Belgium

RC9200, Model 3104 207 1236

SUMMARY:

All tests were performed per *FCC Part 15, Paragraphs 15.231(c), (e); 15.107(a); 15.109(a)*.

The Equipment Under Test

■ - **Fulfills** the requirements of *FCC Part 15, Paragraphs 15.231(c), (e); 15.107(a); 15.109(a)*.

- TÜV PRODUCT SERVICE, INC. -

Responsible Engineer:



Dave Bernardin
(EMC Engineer)