

**FCC PART 15 SUBPART C  
CERTIFICATION REPORT**

**FOR**

**315 MHz WIRELESS REMOTE CONTROL DEVICE (TX)**

**MODEL NAME: HP-208**

**FCC ID: QMDHP208T**

*Prepared For*

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## REPORT REVISION HISTORY

Date	Revision	Page No

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## SECTION 1: LABORATORY INFORMATION

### 1.1 General Condition:

This report contains an assessment of an apparatus against Electromagnetic Interference Technical Requirements based upon tests carried out on the samples submitted.

With regard to this assessment, the following points should be noted:

- a) The results of testing in this report apply to the product/system which was tested only. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties. ent reports conditions under which testing was conducted and results of tests performed. This document may not be altered or revised in any way unless done so by Compliance Certification Services and all revisions are duly noted in the revisions section.
- b) The apparatus was set up and exercised using the configurations, modes of operation and arrangements defined in this report only.
- c) Where relevant, the apparatus was only assessed using the susceptibility criteria defined in this report .
- d) All testing was performed under the following environmental conditions:
  - Temperature 15°C to 35°C (54°F to 95°F)
  - Atmospheric Pressure 860mbar to 1060mbar (25.4" to 31.3")
  - Humidity 10% to 75\*%

### 1.2 Measurement Facilities

Compliance Certification Services  
561F Monterey Road  
Morgan Hill CA 95037  
USA  
Tel: (408)463-0885, Fax: (408)463-0888

### 1.3 Laboratory Accreditations and Listings

Country	Agency	Scope of Accreditation	Logo
USA	NVLAP*	FCC Part 15, CISPR 22, AS/NZS 3548, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11, CNS 13438	 200065-0
USA	FCC	3/10 meter Open Area Test Sites to perform FCC Part 15/18 measurements	 1300
Japan	VCCI	CISPR 22 Two OATS and one conducted Site	 R-1014, R-619, C-640
Norway	NEMKO	EN50081-1, EN50081-2, EN50082-1, EN50082-2, IEC61000-6-1, IEC61000-6-2, EN50083-2, EN50091-2, EN50130-4, EN55011, EN55013, EN55014-1, EN55104, EN55015, EN61547, EN55022, EN55024, EN61000-3-2, EN61000-3-3, EN60945, EN61326-1	 ELA 117
Norway	NEMKO	EN60601-1-2 and IEC 60601-1-2, the Collateral Standards for Electro-Medical Products. MDD, 93/42/EEC, AIMD 90/385/EEC	 ELA-171
Taiwan	BSMI	CNS 13438	 SL2-IN-E-1012
Canada	Industry Canada	RSS210 Low Power Transmitter and Receiver	 IC2324 A,B,C, and F

\*No part of this report may be used to claim or imply product endorsement by NVLAP or any agency of the US Government

## 1.4 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Radiated Emission	
30MHz – 200 MHz	+/- 3.3dB
200MHz – 1000MHz	+4.5/-2.9dB
1000MHz – 2000MHz	+4.6/-2.2dB
Power Line Conducted Emission	
150kHz – 30MHz	+/-2.9

Any results falling within the above values are deemed to be marginal.

## 1.5 Deviation from measurement specification

Not Applicable

## 1.6 Measurement Instrument Calibration

The measuring equipment which was utilized in performing the tests documented herein has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment which is traceable to recognized national standards.

## SECTION 2: PRODUCT INFORMATION

### 2.1 Product Description:

**315MHZ Wireless RF Control Device (Transmitter)**

### 2.2 Power Requirements

AC	N/A
DC	N/A
Battery Power	3Vdc (1 x CR2032)
AC-DC Adaptor	N/A

### 2.3 Local Osc. Or Crystal:

Board Name	Local Osc. / Crystal ( MHz)
Main	315 MHz

### 2.4 Serial Number

N/A

## SECTION 3. TEST SUMMARY

### 3.1 Applicable Electromagnetic Interference Requirements:

Radiated Emission Technical Requirements		
Frequency (MHz)	Field Strength (Microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

### 3.2 Engineering Justification:

1. Increased R1 to 4700 ohms.
2. Increased C12 to 10pf.

### 3.3 Sample Received date and Test Period

Sample received date	07/08/02
Test Period	From 7/10/02 To 8/28/02



## **SECTION 4      ELECTROMAGNETIC INTERFERENCE TEST**

### **Test Peripherals**

Not applicable, EUT only.

### **Test Configuration Diagram**



### **I/O Cable Configuration**

Not applicable, EUT only.

## 4.1 Radiated Emission Test Procedures

The EUT and all other support equipment were placed on a wooden table 80 cm above the ground screen. The antenna to EUT distance was 3 meters. During the test, the table was rotated 360 degrees to maximize emissions and the antenna was positioned from 1 to 4 meters above the ground screen to further maximize emissions. Measurements were made with the antenna polarized in both the vertical and the horizontal positions.

The EUT test configuration was according to Section 8 of ANSI C63.4/1992.

The following procedure was used to make the measurements: The frequency range of interest was monitored at a fixed antenna height and EUT azimuth. The Frequency span was set small enough to easily differentiate between broadcast stations, intermittent ambient signals and EUT emissions. The EUT was rotated through 360 degrees to maximize emissions received. During the rotation if emission increased by more than 1 dB, or if another emission appeared that was greater by 1 dB, the EUT was returned to the azimuth where the maximum occurred, and additional cable manipulation was performed to further maximize received emissions.

The antenna was moved up and down to further maximize the suspected highest amplitude signal. If the emission increased by 1 dB or more, or if another emission appeared that was greater by 1dB or more, the antenna was returned to the height where maximum signal was observed, and, cables were manipulated to produce highest emissions, noting frequency and amplitude.

### 4.1.1 Instrument Setting

Frequency Range	Instrument	Detector Function	Resolution Bandwidth	Video Bandwidth
30 - 1000 MHz	EMI Receiver	Quasi-Peak	120kHz	N/A
30 – 1000 MHz	Spectrum Analyzer	Peak	100kHz	100kHz
Above 1000 MHz	Spectrum Analyzer	Peak	1 MHz	1 MHz

#### 4.1.2 Measurement Instrument Configuration

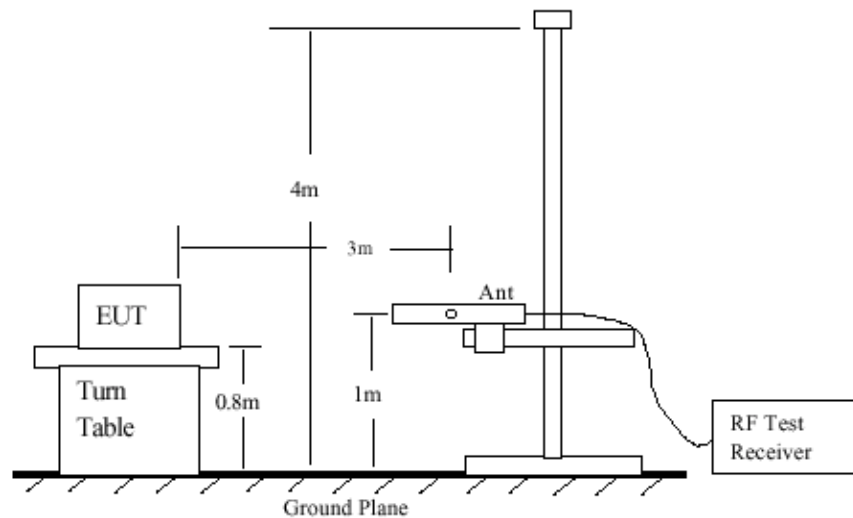


Fig 1: Radiated Emission Measurement 30 to 1000 MHz

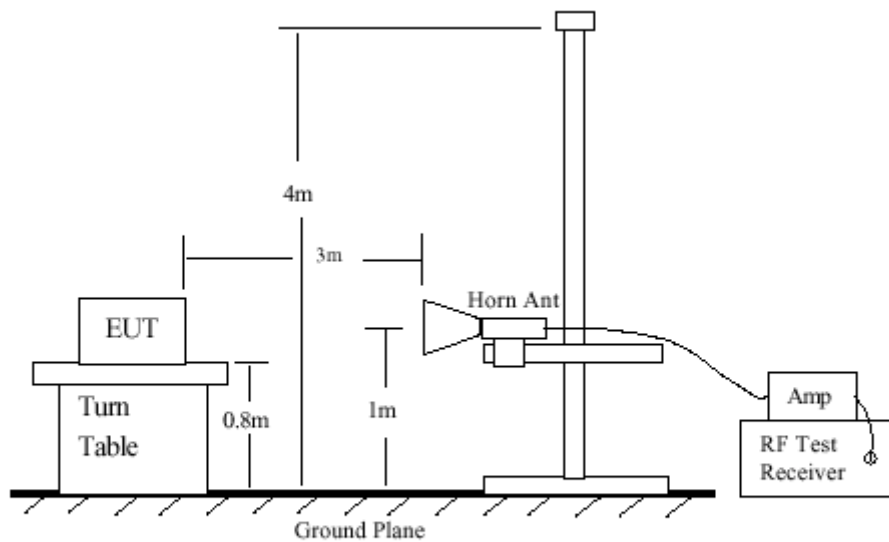


Fig 2: Radiated Emission Above 1000 MHz

**4.1.3 Measurement Equipment Used**

<b>TEST EQUIPMENTS LIST</b>				
<b>Name of Equipment</b>	<b>Manufacturer</b>	<b>Model No.</b>	<b>Serial No.</b>	<b>Due Date</b>
<b>Spectrum Analyzer</b>	<b>HP 0.1K - 1.5GHz</b>	<b>8568B</b>	<b>2732A03661</b>	<b>5/16/03</b>
<b>Spectrum Display</b>	<b>HP</b>	<b>85662A</b>	<b>2816A16696</b>	<b>5/16/03</b>
<b>Quasi Peak Adapter</b>	<b>HP9K - 1GHz</b>	<b>85650A</b>	<b>2811A01155</b>	<b>5/16/03</b>
<b>Pre-Amplifier,25 dB</b>	<b>HP0.1 - 1300MHz</b>	<b>8447D (P5)</b>	<b>2944A06550</b>	<b>8/22/03</b>
<b>Antenna, Bicon</b>	<b>Eaton30 - 200MHz</b>	<b>94455-1</b>	<b>1214</b>	<b>3/30/03</b>
<b>Antenna, LP</b>	<b>EMCO200 - 2000MHz</b>	<b>3146</b>	<b>9107-3163</b>	<b>3/30/03</b>
<b>EMC Receiver (9K-26.5GHz)</b>	<b>HP</b>	<b>8593EM</b>	<b>3710A00205</b>	<b>6/11/03</b>
<b>Horn Antenna(1 - 18GHz)</b>	<b>EMCO</b>	<b>3115</b>	<b>6739</b>	<b>1/31/03</b>
<b>Pre-Amplifier</b>	<b>MITEQ1-26GHz</b>	<b>NSP2600-44</b>	<b>646456</b>	<b>4/26/03</b>

#### 4.1.4 Radiated Emission Test Setup Photos



X-Position




Y-

Position



Z-Position

#### 4.1.5 Radiated Emission Test Result

		<b>Project #:</b> 02C1416-1 <b>Report #:</b> 020828C1 <b>Date &amp; Time:</b> 08/28/02 9:15 AM <b>Test Engr:</b> Thu	
FCC, VCCI, CISPR, CE, AUSTEL, UL, CSA, TUV, BSMI, DHHS, NVLAP			
561F MONTEREY ROAD, SAN JOSE, CA 95037-90 PHONE: (408) 463-0888 FAX: (408) 463-0888			
<b>Company:</b> Casil Research & Development Co., Ltd. <b>EUT Description:</b> 315MHz Wireless Remote Control Device (Transmitter) <b>Test Configuration :</b> EUT ONLY <b>Type of Test:</b> FCC 15.209 <b>Mode of Operation:</b> TX			
<a href="#">&lt;&lt; Main Sheet</a>			

Freq.	Reading	AF	Closs	Pre-amp	Level	Limit	Margin	Pol	Az	Height	Mark
(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	FCC_B	(dB)	(H/V)	(Deg)	(Meter)	(P/Q/A)
Y-Position for worst readings:											
315.02	54.50	14.78	2.64	26.75	45.18	46.00	-0.82	3mH	0.00	1.00	P
315.02	49.50	14.78	2.64	26.75	40.18	46.00	-5.82	3mV	0.00	1.00	P
630.04	42.00	19.61	3.97	28.09	37.50	46.00	-8.50	3mV	0.00	1.00	P
630.04	43.00	19.61	3.97	28.09	38.50	46.00	-7.50	3mH	0.00	1.00	P
945.06	41.00	23.24	5.03	27.36	41.91	46.00	-4.09	3mV	0.00	1.00	P
945.06	42.00	23.24	5.03	27.36	42.91	46.00	-3.09	3mH	0.00	1.00	P
Total data #: 6											

## 4.2 Conducted Emission Test Procedures

Not applicable due to battery operating only.

**END OF REPORT**