

APPLICATION FOR CERTIFICATION

On Behalf of

Marasst Inc.

Wireless Security System (Camera/Transmitter)

Product Name : Guardian Angel

Model : GA-251

FCC ID : Q8603010

Prepared for : Marasst Inc.

104, 8F., No. 49, Sec. 3, Minsheng E. Rd.,  
Taipei, Taiwan, R.O.C.

Prepared By : Audix Corporation

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File Number : EM-G920330

Report Number : TTEMC-F92122

Date of Test : Apr. 17 ~ May 12, 2003

Date of Report : Jun. 16, 2003

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# TEST REPORT CERTIFICATION

|                 |                   |                                               |
|-----------------|-------------------|-----------------------------------------------|
| Applicant       | :                 | Marasst Inc.                                  |
| Manufacturer    | :                 | Marasst Inc.                                  |
| EUT Description | :                 | Wireless Security System (Camera/Transmitter) |
|                 | (A) PRODUCT NAME. | : Guardian Angel                              |
|                 | (B) MODEL NO.     | : GA-251                                      |
|                 | (C) POWER SUPPLY  | : DC 10V (via Adapter)<br>DC 2.4V (Battery)   |
|                 | (D) TEST VOLTAGE  | : AC 120V/60Hz (via Adapter)                  |

Measurement Procedure Used:

FCC RULES AND REGULATIONS PART 15 SUBPART C Section 15.249, MAY 2002  
AND ANSI C63.4/1992

The device described above was tested by Audix Corporation to determine the maximum emission levels emanating from the device. The maximum emission levels were compared to the FCC Part 15 subpart C limits both radiated and conducted emissions.

The measurement results are contained in this test report and Audix Corporation is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliant with the FCC official limits.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Audix Corporation.

Date of Test : Apr. 17 ~ May 12, 2003

Prepared by: Monica Chang Jun. 24. 2003  
(Monica Chang/Assistant)

Test Engineer : Ben Cheng Jun, 20.2023  
(Ben Cheng/Assistant Manager)

Approve & Authorized Signer : Leon Liu Jun. 24 2003  
(Leon Liu/Manager)

## 1. GENERAL INFORMATION

### 1.1. Description of Device (EUT)

|                           |   |                                                                                                                                                                              |
|---------------------------|---|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description               | : | Wireless Security System<br>(Camera/Transmitter)                                                                                                                             |
| Product Name              | : | Guardian Angel                                                                                                                                                               |
| Model Number              | : | GA-251                                                                                                                                                                       |
| FCC ID                    | : | Q8603010                                                                                                                                                                     |
| Applicant                 | : | Marasst Inc.<br>104, 8F., No. 49, Sec. 3, Minsheng E. Rd.,<br>Taipei, Taiwan, R.O.C.                                                                                         |
| Manufacturer              | : | Marasst Inc.<br>104, 8F., No. 49, Sec. 3, Minsheng E. Rd.,<br>Taipei, Taiwan, R.O.C.                                                                                         |
| Radio Technology          | : | FM Modulation                                                                                                                                                                |
| Fundamental Range         | : | 2410MHz ~ 2470MHz                                                                                                                                                            |
| Channel Selection         | : | 4 Channels<br>CH1 : 2410MHz<br>CH2 : 2430MHz<br>CH3 : 2450MHz<br>CH4 : 2470MHz                                                                                               |
| Bandwidth of Each Channel | : | 20MHz                                                                                                                                                                        |
| Output Power              | : | 1mW/10mW                                                                                                                                                                     |
| Power Supply              | : | DC 10V (via Adapter)<br>DC 2.4V (Battery)                                                                                                                                    |
| Power Adapter             | : | Deer Computer Co., Ltd. M/N AD1609CF<br>Input 100-240V~ 47~63Hz, 0.8A<br>Output 8.0~10.5V, 1.6~1.24A<br>Power Cord: Non-Shielded, Undetachable, 1.8m<br>Boned a ferrite core |
| Data Cable (AV/S-Video)   | : | Non-Shielded, Detachable, 1m<br>Boned a ferrite core                                                                                                                         |

Date of Receipt of Sample : Mar. 25, 2003

Date of Test : Apr. 17 ~ May 12, 2003

Wireless Security System (Video Monitor/Receiver)

Model No.: GA-251

FCC ID : By DoC

**Remark:**

Antenna requirement: This EUT's transmitter antenna is soldered to a printed circuit board, comply with §15.203 and inform to user that any change and modify is prohibited.

## 1.2. Tested Supporting System Details

### 1.2.1. Color TV Pattern Generator

Model Number : PM 5415TX+Y/C  
 Serial Number : LO732610  
 Manufacturer : Fluke  
 Cal. Date : Apr. 18, 2003  
 Power Cord : Non-Shielded, Detachable 1.8m

## 1.3. Description of Test Facility

Site Description : May 16, 2003 Re-File on  
 (Semi-Anechoic Chamber) Federal Communication Commission  
 Registration Number: 90993

Test Site : No. 2 Shielded Room & Semi-Anechoic Chamber

Name of Firm : Audix Corporation  
 Technical Division EMC Department  
 No. 53-11, Tin-Fu Tsun, Lin-Kou,  
 Taipei Hsien, Taiwan, R.O.C.

Site Location : No. 53-11, Tin-Fu Tsun, Lin-Kou,  
 Taipei Hsien, Taiwan, R.O.C.

NVLAP Lab. Code : 200077-0  
 (NVLAP is a NATA accredited body under Mutual Recognition Agreement)

## 1.4. Measurement Uncertainty

| Test Item                        | Frequency Range | Uncertainty (dB)  |
|----------------------------------|-----------------|-------------------|
| Conduction Test                  | 150KHz~30MHz    | ±2.66dB           |
| Radiation Test<br>(Distance: 3m) | 30MHz~300MHz    | +4.26dB / -4.22dB |
|                                  | 300MHz~1000MHz  | +5.28dB / -4.0dB  |

Remark : Uncertainty =  $K\mu c(y)$

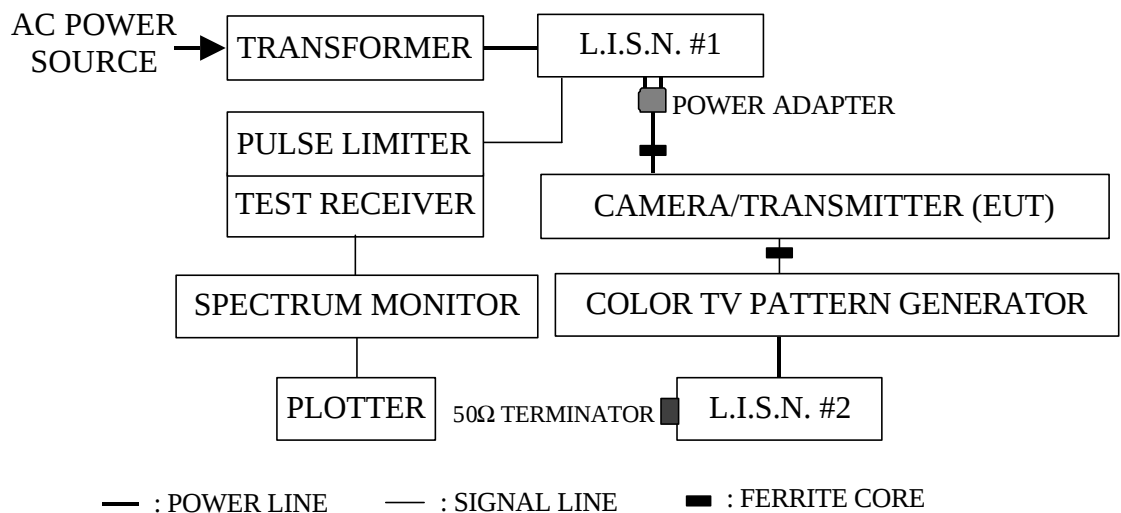
## 2. POWERLINE CONDUCTED EMISSION MEASUREMENT

### 2.1. Test Equipment

The following test equipment is used during the power line conducted measurement :

| Item | Type          | Manufacturer    | Model No. | Serial No. | Last Cal.    | Next Cal.    |
|------|---------------|-----------------|-----------|------------|--------------|--------------|
| 1.   | Test Receiver | Rohde & Schwarz | ESH3      | 893044/015 | Jul. 08, 02' | Jul. 07, 03' |
| 2.   | L.I.S.N. # 1  | Kyoritsu        | KNW-407   | 8-881-13   | Apr. 16, 03' | Apr. 15, 04' |
| 3.   | L.I.S.N. # 2  | Kyoritsu        | KNW-407   | 8-855-9    | Apr. 16, 03' | Apr. 15, 04' |
| 4.   | Pulse Limiter | Rohde & Schwarz | ESH3-Z2   | 002        | Aug. 21, 02' | Aug. 20, 03' |

### 2.2. Block Diagram of Test Setup



### 2.3. AC Power Line Conducted Limits ((§15.207, Class B)

| Frequency       | Maximum RF Line Voltage |               |
|-----------------|-------------------------|---------------|
|                 | Quasi-Peak Level        | Average Level |
| 150KHz ~ 500KHz | 66 ~ 56 dB *            | 56 ~ 46 dB *  |
| 500KHz ~ 5MHz   | 56 dB                   | 46 dB         |
| 5MHz ~ 30MHz    | 60 dB                   | 50 dB         |

- Remarks:
- \* Decreases with the logarithm of the frequency.
  - If the average limit is met when using a Quasi-Peak detector, the EUT shall be deemed to meet both limits and measurement with the average detector is unnecessary.
  - The lower limit applies at the band edges.

## 2.4. EUT's Configuration during Compliance Measurement

The following equipment was installed on RF LINE VOLTAGE measurement to meet the Commission requirement and operating in a manner which tended to maximize its emission characteristics in a normal application.

### 2.4.1. Wireless Security System (Camera/Transmitter) (EUT)

|                           |   |                                                                                                                                                                              |
|---------------------------|---|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Product Number            | : | Guardian Angel                                                                                                                                                               |
| Model Number              | : | GA-251                                                                                                                                                                       |
| Manufacturer              | : | Marasst Inc.                                                                                                                                                                 |
| Radio Technology          | : | FM Modulation                                                                                                                                                                |
| Fundamental Range         | : | 2410MHz ~ 2470MHz                                                                                                                                                            |
| Channel Selection         | : | 4 Channels<br>CH1 : 2410MHz<br>CH2 : 2430MHz<br>CH3 : 2450MHz<br>CH4 : 2470MHz                                                                                               |
| Bandwidth of Each Channel | : | 20MHz                                                                                                                                                                        |
| Output Power              | : | 1mW/10mW                                                                                                                                                                     |
| Power Supply              | : | DC 10V (via Adapter)<br>DC 2.4V (Battery)                                                                                                                                    |
| Power Adapter             | : | Deer Computer Co., Ltd. M/N AD1609CF<br>Input 100-240V~ 47~63Hz, 0.8A<br>Output 8.0~10.5V, 1.6~1.24A<br>Power Cord: Non-Shielded, Undetachable, 1.8m<br>Boned a ferrite core |
| Data Cable (AV/S-Video)   | : | Non-Shielded, Detachable, 1m<br>Boned a ferrite core                                                                                                                         |

### 2.4.2. Supporting System : As in Section 1.2

## 2.5. Operating Condition of EUT

2.5.1. Setup the EUT and simulator as shown on 2.2.

2.5.2. Turned on the power of all equipment.

2.5.3. The EUT [Wireless Security System (Camera/Transmitter)] was set to channel 1 for conducted measurement and channel 1 & channel 4 for radiated measurement.

2.5.4. The color TV pattern generator sent the color bars to the EUT and then the EUT transmitted the color bars to the receiver.

## 2.6. Test Procedure

The EUT's power adapter was connected to the power mains through a line impedance stabilization network (L.I.S.N. #1) and the other peripheral devices power cord were connected to the power mains through a line impedance stabilization network (L.I.S.N. #2) This provided a 50 ohm coupling impedance for the measuring equipment. (Please refer to the block diagram of the test setup and photographs.) Both sides of A.C. line were checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables were changed according to FCC ANSI C63.4-1992 on conducted measurement.

The bandwidth of R&S Test Receiver ESH3 was set at 10KHz.

The frequency range from 150KHz to 30MHz is checked.

All the test results are listed in the following pages.

## 2.7. Line Conducted RF Voltage Measurement Results

**PASSED.** All emissions not reported below are too low against the prescribed limits.

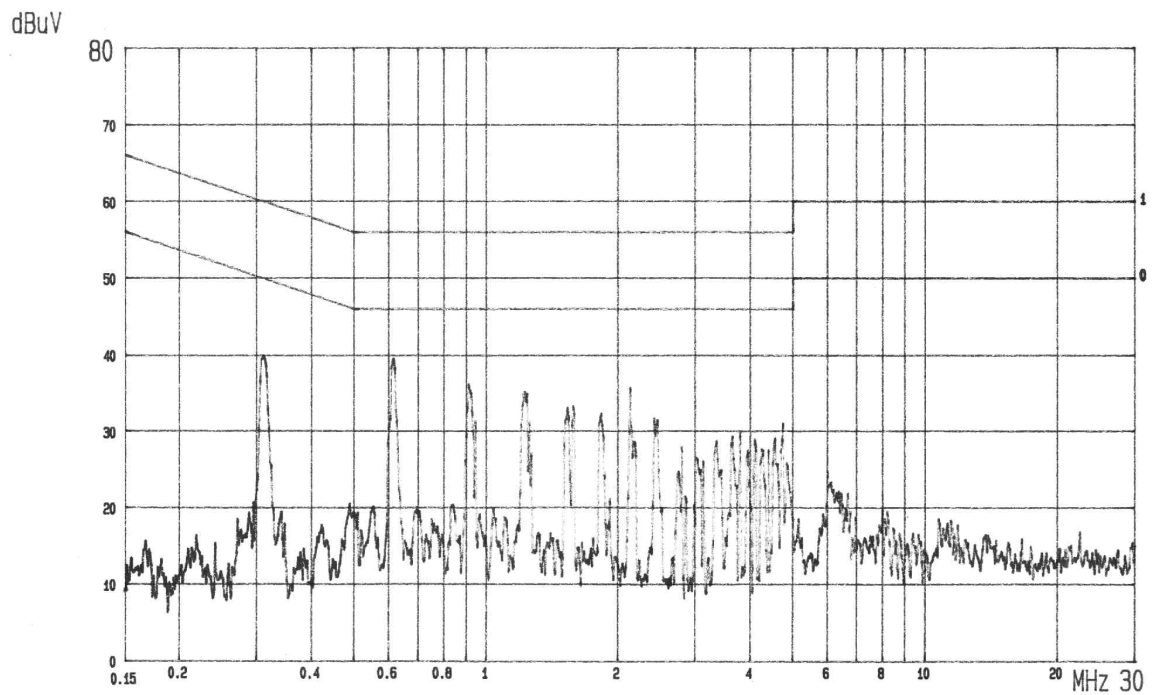
Date of Test : May 12, 2003 Temperature : 24

EUT : Wireless Security System Humidity : 59 %  
(Camera/Transmitter)

| Frequency<br><br>(MHz) | Factor<br><br>dB | Reading (dBμV) |    | Measurement<br>(dBμV) |    | Limits |      | Margin |    |
|------------------------|------------------|----------------|----|-----------------------|----|--------|------|--------|----|
|                        |                  | Phase VA       |    |                       |    | (dBμV) |      | dB     |    |
|                        |                  | Q.P.           | AV | Q.P.                  | AV | Q.P.   | AV   | Q.P.   | AV |
| 0.3094                 | 0.4              | 39.2           | *  | 39.6                  | *  | 59.9   | 49.9 | 20.3   | *  |
| 0.6125                 | 0.5              | 38.4           | *  | 38.9                  | *  | 56.0   | 46.0 | 17.1   | *  |
| 0.9082                 | 0.5              | 35.6           | *  | 36.1                  | *  | 56.0   | 46.0 | 19.9   | *  |
| 1.2194                 | 0.5              | 34.7           | *  | 35.2                  | *  | 56.0   | 46.0 | 20.8   | *  |
| 1.5711                 | 0.5              | 32.8           | *  | 33.3                  | *  | 56.0   | 46.0 | 22.7   | *  |
| 2.1211                 | 0.5              | 34.7           | *  | 35.2                  | *  | 56.0   | 46.0 | 20.8   | *  |

| Frequency<br><br>(MHz) | Factor<br><br>dB | Reading (dBμV) |    | Measurement<br>(dBμV) |    | Limits      |      | Margin      |    |
|------------------------|------------------|----------------|----|-----------------------|----|-------------|------|-------------|----|
|                        |                  | Phase VB       |    |                       |    | (dBμV)      |      | dB          |    |
|                        |                  | Q.P.           | AV | Q.P.                  | AV | Q.P.        | AV   | Q.P.        | AV |
| 0.3130                 | 0.4              | 41.7           | *  | 42.1                  | *  | 59.8        | 49.8 | 17.7        | *  |
| <b>0.6125</b>          | <b>0.5</b>       | <b>39.4</b>    | *  | <b>39.9</b>           | *  | <b>56.0</b> | 46.0 | <b>16.1</b> | *  |
| 0.9087                 | 0.5              | 36.4           | *  | 36.9                  | *  | 56.0        | 46.0 | 19.1        | *  |
| 1.2126                 | 0.5              | 36.5           | *  | 37.0                  | *  | 56.0        | 46.0 | 19.0        | *  |
| 1.5167                 | 0.5              | 31.7           | *  | 32.2                  | *  | 56.0        | 46.0 | 23.8        | *  |
| 2.4146                 | 0.5              | 35.4           | *  | 35.9                  | *  | 56.0        | 46.0 | 20.1        | *  |

- Remark :
1. All readings are Quasi-Peak values.
  2. Factor = Insertion Loss + Cable Loss
  3. Measurement = Factor + Reading
  4. The worst emission was detected at 0.6125MHz with corrected signal level of 39.4dBuV (limit was 56.0dBuV) when the VB side of the EUT was connected to L.I.S.N.
  5. "\*" means that the Quasi-Peak values have met Average limits, it's unnecessary to measure with Average detector.

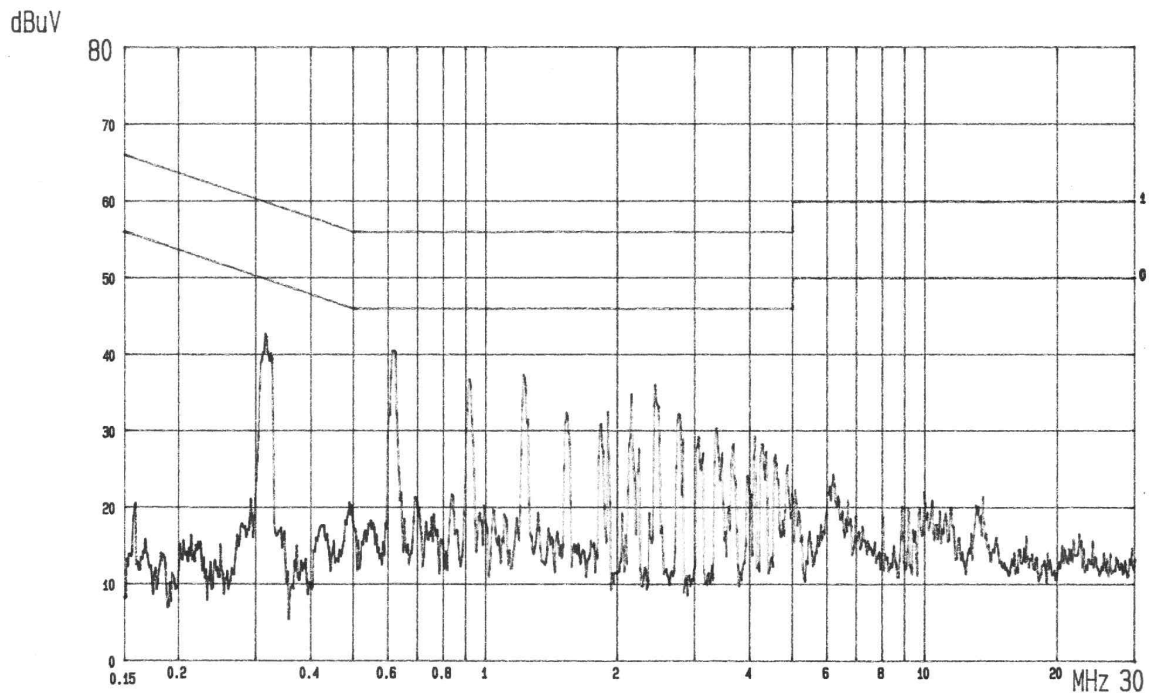


MARASST  
LINE: Va

EUT: GUARDIAN ANGEL  
MEMO: TX (S.G)

M/N: GA251

120V/60Hz PAGE: 01  
(PEAK VALUE) AUDIX



MARASST  
LINE: Vb

EUT: GUARDIAN ANGEL  
MEMO: TX (S.G)

M/N: GA251

120V/60Hz PAGE: 02  
(PEAK VALUE) AUDIX

### 3. RADIATED EMISSION MEASUREMENT

#### 3.1. Test Equipment

The following test equipment is used during the radiated emission measurement :

##### 3.1.1. For 30MHz~1000MHz Frequency (at Semi-Anechoic Chamber)

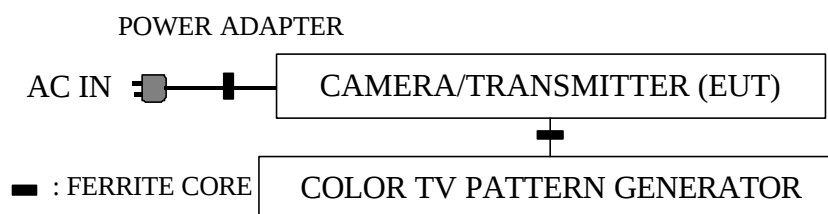
| Item | Type              | Manufacturer | Model No.   | Serial No. | Last Cal.    | Next Cal.    |
|------|-------------------|--------------|-------------|------------|--------------|--------------|
| 1.   | Spectrum Analyzer | HP           | 8593EM      | 3826A00248 | Sep. 23, 02' | Sep. 22, 03' |
| 2.   | Test Receiver     | R&S          | ESVP        | 879691/036 | Jul. 09, 02' | Jul. 08, 03' |
| 3.   | Pre-Amplifier     | HP           | 8447D       | 2944A06305 | Mar. 13, 03' | Mar. 12, 04' |
| 4.   | Broadband Antenna | Schwarzbeck  | BBA 9106    | A3L        | Feb. 23, 03' | Feb. 22, 04' |
| 5.   | Broadband Antenna | Schwarzbeck  | UHALP9108-A | 0138       | Feb. 23, 03' | Feb. 22, 04' |

##### 3.1.2. For above 1GHz Frequency (at Semi-Anechoic Chamber)

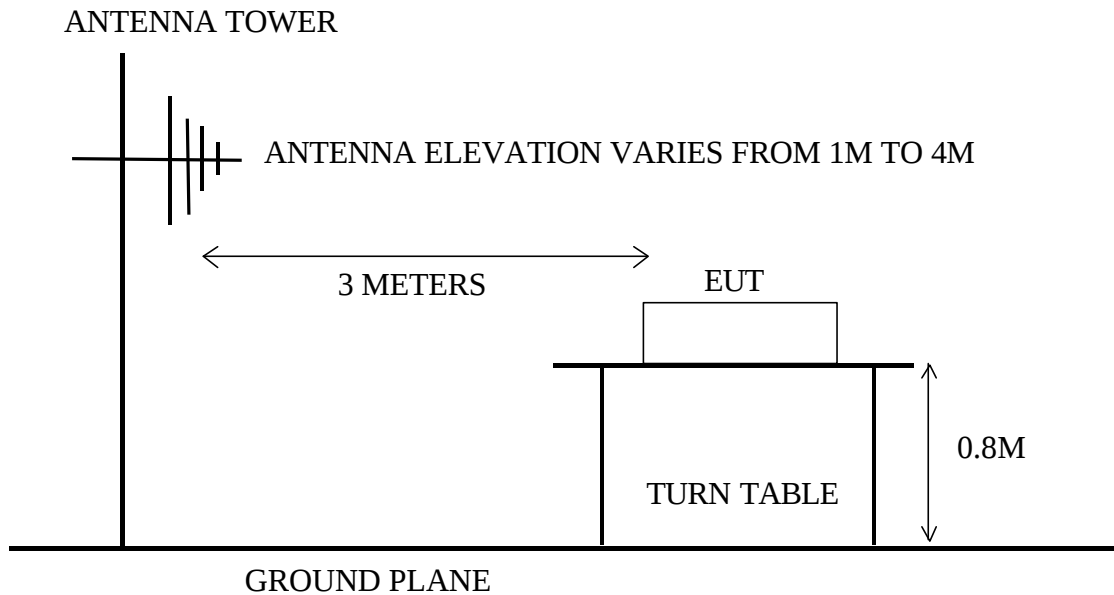
| Item | Type              | Manufacturer | Model No. | Serial No. | Last Cal.    | Next Cal.    |
|------|-------------------|--------------|-----------|------------|--------------|--------------|
| 1.   | Spectrum Analyzer | HP           | 8593EM    | 3826A00248 | Sep. 23, 02' | Sep. 22, 03' |
| 2.   | Pre-Amplifier     | HP           | 8449B     | 3008A00529 | Jan. 07, 03' | Jan. 06, 04' |
| 3.   | Horn Antenna      | EMCO         | 3115      | 9112-3775  | Apr. 21, 03' | Apr. 22, 04' |

#### 3.2. Block Diagram of Test Setup

##### 3.2.1. Block Diagram of connection between EUT and simulators



### 3.2.2. Semi-Anechoic Chamber (3M) Setup Diagram



### 3.3. Radiated Emission Limits [§15.249 (d)]

| Frequency<br>MHz | Distance<br>Meters | Field Strength  |                          |
|------------------|--------------------|-----------------|--------------------------|
|                  |                    | $\mu\text{V/m}$ | $\text{dB}\mu\text{V/m}$ |
| 30 ~ 88          | 3                  | 100             | 40.0                     |
| 88 ~ 216         | 3                  | 150             | 43.5                     |
| 216 ~ 960        | 3                  | 200             | 46.0                     |
| Above 960        | 3                  | 500             | 54.0                     |

- Remarks :
- (1) Emission level ( $\text{dB}\mu\text{V/m}$ ) =  $20 \log$  Emission level ( $\mu\text{V/m}$ )
  - (2) The tighter limit applies at the band edges.
  - (3) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.
  - (4) The limits shown in the above table is under §15.209.

### 3.4. Radiated Emission Limits [§15.249 (a)]

| Frequency<br>MHz | Field Strength of Fundamental |                          | Field Strength of Harmonicas |                          |
|------------------|-------------------------------|--------------------------|------------------------------|--------------------------|
|                  | $\text{mV/m}$                 | $\text{dB}\mu\text{V/m}$ | $\mu\text{V/m}$              | $\text{dB}\mu\text{V/m}$ |
| 902 ~ 928        | 50                            | 94 (114)                 | 500                          | 54 (74)                  |
| 2400 ~ 2483.5    | 50                            | 94 (114)                 | 500                          | 54 (74)                  |
| 5725 ~ 5875      | 50                            | 94 (114)                 | 500                          | 54 (74)                  |
| 24.0 ~ 24.25     | 250                           | 108 (128)                | 2500                         | 68 (88)                  |

- Remarks :
- (1) Emission level ( $\text{dB}\mu\text{V/m}$ ) =  $20 \log$  Emission level ( $\mu\text{V/m}$ )
  - (2) Field strength limits are specified at a distance of 3 meters.
  - (3) Brackets ( ) are peak limits.

### 3.5. EUT's Configuration during Compliance Measurement

The configuration of EUT and its simulators are same as those used in conducted measurement. Please refer to 2.4.

### 3.6. Operating Condition of EUT

Same as conducted measurement which is listed in 2.5.

### 3.7. Test Procedure

The EUT and its simulators were placed on a turn table which was 0.8 meter above ground. The turn table rotate 360 degrees to determine the position of the maximum emission level. EUT was set 3 meters away from the receiving antenna which were mounted on a antenna tower. The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated biconical and log periodical antenna) and dipole antenna were used as receiving antenna. Both horizontal and vertical polarization of the antenna were set on measurement. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.4-1992 on radiated measurement.

The bandwidth of the R&S Test Receiver ESVP was set at 120KHz for frequency range 30MHz~1000MHz.

The bandwidth of the Spectrum Analyzer 8593EM was set at 1MHz for frequency range above 1GHz.

Two test modes (channel 1 & channel 4) were tested during radiated testing and all the test results are listed in section 3.7.

### 3.8. Radiated Emission Measurement Results

**PASSED.** All emissions not reported below are too low against the prescribed limits.

#### 3.8.1. Frequency range 30MHz to 1000MHz

Date of Test : Apr. 17, 2003 Temperature : 22

EUT : Wireless Security System Humidity : 70%  
(Camera/Transmitter)

Test Mode : Channel 1

| Frequency<br>MHz | Antenna<br>Factor<br>dB/m | Cable<br>Loss<br>dB | Meter Reading<br>Horizontal<br>dBμV | Emission Level<br>Horizontal<br>dBμV/m | Limits<br>dBμV/m | Margin<br>dB |
|------------------|---------------------------|---------------------|-------------------------------------|----------------------------------------|------------------|--------------|
| 32.430           | 22.19                     | 1.10                | -0.52                               | 22.77                                  | 40.00            | 17.23        |
| 114.510          | 18.55                     | 2.30                | 0.50                                | 21.35                                  | 43.50            | 22.15        |
| 233.310          | 23.98                     | 3.30                | 1.45                                | 28.73                                  | 46.00            | 17.27        |
| 297.840          | 26.78                     | 3.98                | -0.08                               | 30.68                                  | 46.00            | 15.32        |
| 397.300          | 16.84                     | 4.79                | 0.56                                | 22.19                                  | 46.00            | 23.81        |
| 472.900          | 17.80                     | 5.80                | 1.92                                | 25.52                                  | 46.00            | 20.48        |
| 505.800          | 18.40                     | 6.70                | 3.54                                | 28.64                                  | 46.00            | 17.36        |

| Frequency<br>MHz | Antenna<br>Factor<br>dB/m | Cable<br>Loss<br>dB | Meter Reading<br>Vertical<br>dBμV | Emission Level<br>Vertical<br>dBμV/m | Limits<br>dBμV/m | Margin<br>dB |
|------------------|---------------------------|---------------------|-----------------------------------|--------------------------------------|------------------|--------------|
| 36.480           | 21.00                     | 1.20                | 2.33                              | 24.53                                | 40.00            | 15.47        |
| 157.980          | 21.19                     | 2.70                | 0.47                              | 24.36                                | 43.50            | 19.14        |
| 294.060          | 26.90                     | 3.96                | -1.08                             | 29.78                                | 46.00            | 16.22        |
| 505.800          | 17.90                     | 6.70                | 3.55                              | 28.15                                | 46.00            | 17.85        |
| 549.200          | 19.06                     | 6.80                | 1.03                              | 26.89                                | 46.00            | 19.11        |
| 714.400          | 21.48                     | 6.60                | 0.96                              | 29.04                                | 46.00            | 16.96        |

- Remarks : 1. All readings are Quasi-Peak values.  
 2. Emission Level = Meter Reading + Antenna Factor + Cable Loss.

Date of Test : Apr. 17, 2003 Temperature : 22

EUT : Wireless Security System  
(Camera/Transmitter) Humidity : 70%

Test Mode : Channel 4

| Frequency<br>MHz | Antenna<br>Factor<br>dB/m | Cable<br>Loss<br>dB | Meter Reading            |  | Emission Level             |                        | Margin<br>dB |
|------------------|---------------------------|---------------------|--------------------------|--|----------------------------|------------------------|--------------|
|                  |                           |                     | Horizontal<br>dB $\mu$ V |  | Horizontal<br>dB $\mu$ V/m | Limits<br>dB $\mu$ V/m |              |
| 92.100           | 15.41                     | 2.00                | 0.14                     |  | 17.55                      | 43.50                  | 25.95        |
| 101.280          | 16.96                     | 2.10                | 1.84                     |  | 20.90                      | 43.50                  | 22.60        |
| 117.750          | 18.78                     | 2.30                | 2.55                     |  | 23.63                      | 43.50                  | 19.87        |
| 282.990          | 25.80                     | 3.80                | 2.13                     |  | 31.73                      | 46.00                  | 14.27        |
| 311.200          | 14.60                     | 4.00                | 1.67                     |  | 20.27                      | 46.00                  | 25.73        |
| 821.500          | 22.15                     | 7.00                | 2.08                     |  | 31.23                      | 46.00                  | 14.77        |

| Frequency<br>MHz | Antenna<br>Factor<br>dB/m | Cable<br>Loss<br>dB | Meter Reading          |  | Emission Level           |                        | Margin<br>dB |
|------------------|---------------------------|---------------------|------------------------|--|--------------------------|------------------------|--------------|
|                  |                           |                     | Vertical<br>dB $\mu$ V |  | Vertical<br>dB $\mu$ V/m | Limits<br>dB $\mu$ V/m |              |
| 36.480           | 21.00                     | 1.20                | 2.73                   |  | 24.93                    | 40.00                  | 15.07        |
| 58.080           | 15.54                     | 1.60                | 4.12                   |  | 21.26                    | 40.00                  | 18.74        |
| 236.280          | 24.44                     | 3.40                | 2.16                   |  | 30.00                    | 46.00                  | 16.00        |
| 505.100          | 17.83                     | 6.62                | 3.52                   |  | 27.97                    | 46.00                  | 18.03        |
| 549.900          | 19.06                     | 6.80                | 1.54                   |  | 27.40                    | 46.00                  | 18.60        |
| 714.400          | 21.48                     | 6.60                | 0.52                   |  | 28.60                    | 46.00                  | 17.40        |

- Remarks : 1. All readings are Quasi-Peak values.  
2. Emission Level = Meter Reading + Antenna Factor + Cable Loss.

## 3.8.2. Frequency range above 1GHz

Date of Test : Apr. 17, 2003 Temperature : 22

EUT : Wireless Security System  
(Camera/Transmitter) Humidity : 70%

Test Mode : Channel 1

| Frequency<br>MHz                  | Antenna<br>Factor<br>dB/m | Cable<br>Loss<br>dB | Meter Reading<br>Horizontal<br>dBμV | Emission Level<br>Horizontal<br>dBμV/m | Limits<br>dBμV/m | Margin<br>dB |
|-----------------------------------|---------------------------|---------------------|-------------------------------------|----------------------------------------|------------------|--------------|
| Fundamental Freq. (Average Value) |                           |                     |                                     |                                        |                  |              |
| 2410.640                          | 28.61                     | 6.34                | 33.67                               | 68.62                                  | 94.00            | 25.38        |
| Fundamental Freq. (Peak Value)    |                           |                     |                                     |                                        |                  |              |
| 2410.640                          | 28.61                     | 6.34                | 39.31                               | 74.26                                  | 114.00           | 39.74        |
| Harmonic Freq. (Average Value)    |                           |                     |                                     |                                        |                  |              |
| 4820.380                          | 33.61                     | 9.14                | -6.65                               | 36.10                                  | 54.00            | 17.90        |
| 7230.000                          | 36.75                     | 11.25               | -13.99                              | 34.01                                  | 54.00            | 19.99        |
| 9640.000                          | 38.27                     | 13.02               | -16.48                              | 34.81                                  | 54.00            | 19.19        |
| 12050.850                         | 38.73                     | 14.96               | -20.22                              | 33.47                                  | 54.00            | 20.53        |
| Harmonic Freq. (Peak Value)       |                           |                     |                                     |                                        |                  |              |
| 4820.380                          | 33.61                     | 9.14                | -0.65                               | 42.10                                  | 74.00            | 31.90        |
| 7230.000                          | 36.75                     | 11.25               | -12.99                              | 35.01                                  | 74.00            | 38.99        |
| 9640.000                          | 38.27                     | 13.02               | -16.48                              | 34.81                                  | 74.00            | 39.19        |
| 12050.850                         | 38.73                     | 14.96               | -20.22                              | 33.47                                  | 74.00            | 40.53        |

| Frequency<br>MHz                  | Antenna<br>Factor<br>dB/m | Cable<br>Loss<br>dB | Meter Reading<br>Vertical<br>dBμV | Emission Level<br>Vertical<br>dBμV/m | Limits<br>dBμV/m | Margin<br>dB |
|-----------------------------------|---------------------------|---------------------|-----------------------------------|--------------------------------------|------------------|--------------|
| Fundamental Freq. (Average Value) |                           |                     |                                   |                                      |                  |              |
| 2410.080                          | 28.61                     | 6.34                | 32.30                             | 67.25                                | 94.00            | 26.75        |
| Fundamental Freq. (Peak Value)    |                           |                     |                                   |                                      |                  |              |
| 2410.080                          | 28.61                     | 6.34                | 37.38                             | 72.33                                | 114.00           | 41.67        |
| Harmonic Freq. (Average Value)    |                           |                     |                                   |                                      |                  |              |
| 4820.380                          | 33.61                     | 9.14                | -6.00                             | 36.75                                | 54.00            | 17.25        |
| 7230.000                          | 36.75                     | 11.25               | -13.62                            | 34.38                                | 54.00            | 19.62        |
| 9640.000                          | 38.27                     | 13.02               | -16.85                            | 34.44                                | 54.00            | 19.56        |
| 12050.850                         | 38.73                     | 14.96               | -20.63                            | 33.06                                | 54.00            | 20.94        |
| Harmonic Freq. (Peak Value)       |                           |                     |                                   |                                      |                  |              |
| 4820.380                          | 33.61                     | 9.14                | -1.00                             | 41.75                                | 74.00            | 32.25        |
| 7230.000                          | 36.75                     | 11.25               | -12.62                            | 35.38                                | 74.00            | 38.62        |
| 9640.000                          | 38.27                     | 13.02               | -16.85                            | 34.44                                | 74.00            | 39.56        |
| 12050.850                         | 38.73                     | 14.96               | -20.63                            | 33.06                                | 74.00            | 40.94        |

Remarks : 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.  
 2. Measurement is up to the 10th harmonic, the other harmonics not in the report is that the noise is too low to be measured.

Date of Test : Apr. 17, 2003 Temperature : 22

EUT : Wireless Security System  
(Camera/Transmitter) Humidity : 70%

Test Mode : Channel 4

| Frequency<br>MHz                  | Antenna<br>Factor<br>dB/m | Cable<br>Loss<br>dB | Meter Reading<br>Horizontal<br>dBμV | Emission Level<br>Horizontal<br>dBμV/m | Peak<br>Limits<br>dBμV/m | Margin<br>dB |
|-----------------------------------|---------------------------|---------------------|-------------------------------------|----------------------------------------|--------------------------|--------------|
| Fundamental Freq. (Average Value) |                           |                     |                                     |                                        |                          |              |
| 2470.236                          | 28.74                     | 6.42                | 31.11                               | 66.27                                  | 94.00                    | 27.73        |
| Fundamental Freq. (Peak Value)    |                           |                     |                                     |                                        |                          |              |
| 2470.236                          | 26.77                     | 7.16                | 38.88                               | 72.81                                  | 114.00                   | 41.19        |
| Harmonic Freq. (Average Value)    |                           |                     |                                     |                                        |                          |              |
| 4940.442                          | 33.92                     | 9.13                | -9.21                               | 33.84                                  | 54.00                    | 20.16        |
| 7410.347                          | 37.20                     | 11.58               | -16.14                              | 32.64                                  | 54.00                    | 21.36        |
| Harmonic Freq. (Peak Value)       |                           |                     |                                     |                                        |                          |              |
| 4940.442                          | 33.92                     | 9.13                | -3.21                               | 39.84                                  | 74.00                    | 34.16        |
| 7410.347                          | 37.20                     | 11.58               | -14.14                              | 34.64                                  | 74.00                    | 39.36        |

| Frequency<br>MHz                  | Antenna<br>Factor<br>dB/m | Cable<br>Loss<br>dB | Meter Reading<br>Vertical<br>dBμV | Emission Level<br>Vertical<br>dBμV/m | Peak<br>Limits<br>dBμV/m | Margin<br>dB |
|-----------------------------------|---------------------------|---------------------|-----------------------------------|--------------------------------------|--------------------------|--------------|
| Fundamental Freq. (Average Value) |                           |                     |                                   |                                      |                          |              |
| 2470.566                          | 28.14                     | 6.05                | 28.13                             | 62.32                                | 94.00                    | 31.68        |
| Fundamental Freq. (Peak Value)    |                           |                     |                                   |                                      |                          |              |
| 2470.566                          | 28.14                     | 6.05                | 33.23                             | 67.42                                | 114.00                   | 46.58        |
| Harmonic Freq. (Average Value)    |                           |                     |                                   |                                      |                          |              |
| 4940.442                          | 33.92                     | 9.13                | -9.90                             | 33.15                                | 54.00                    | 20.85        |
| 7410.347                          | 37.20                     | 11.58               | -15.89                            | 32.89                                | 54.00                    | 21.11        |
| Harmonic Freq. (Peak Value)       |                           |                     |                                   |                                      |                          |              |
| 4940.442                          | 33.92                     | 9.13                | -4.90                             | 38.15                                | 74.00                    | 35.85        |
| 7410.347                          | 37.20                     | 11.58               | -13.89                            | 34.89                                | 74.00                    | 39.11        |

Remarks : 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.  
2. Measurement is up to the 10th harmonic, the other harmonics not in the report is that the noise is too low to be measured.

#### **4. DEVIATION TO TEST SPECIFICATIONS**

**【NONE】**

## **5. MODIFICATON TO EUT**

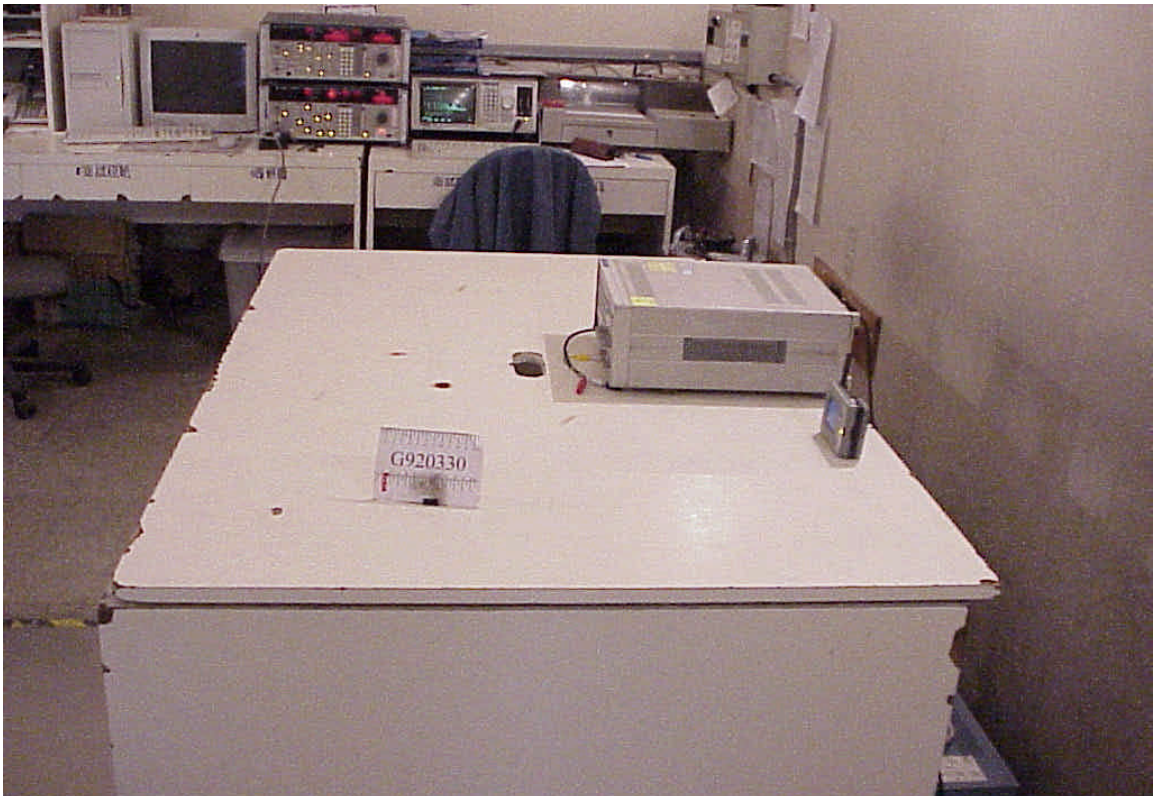
1. Add a ferrite core with one turn on the power cord.
2. Add a ferrite core with one turn on the data cable (AV/S-Video).

## 6. PHOTOGRAPHS

### 6.1. Photos of Powerline Conducted Measurement



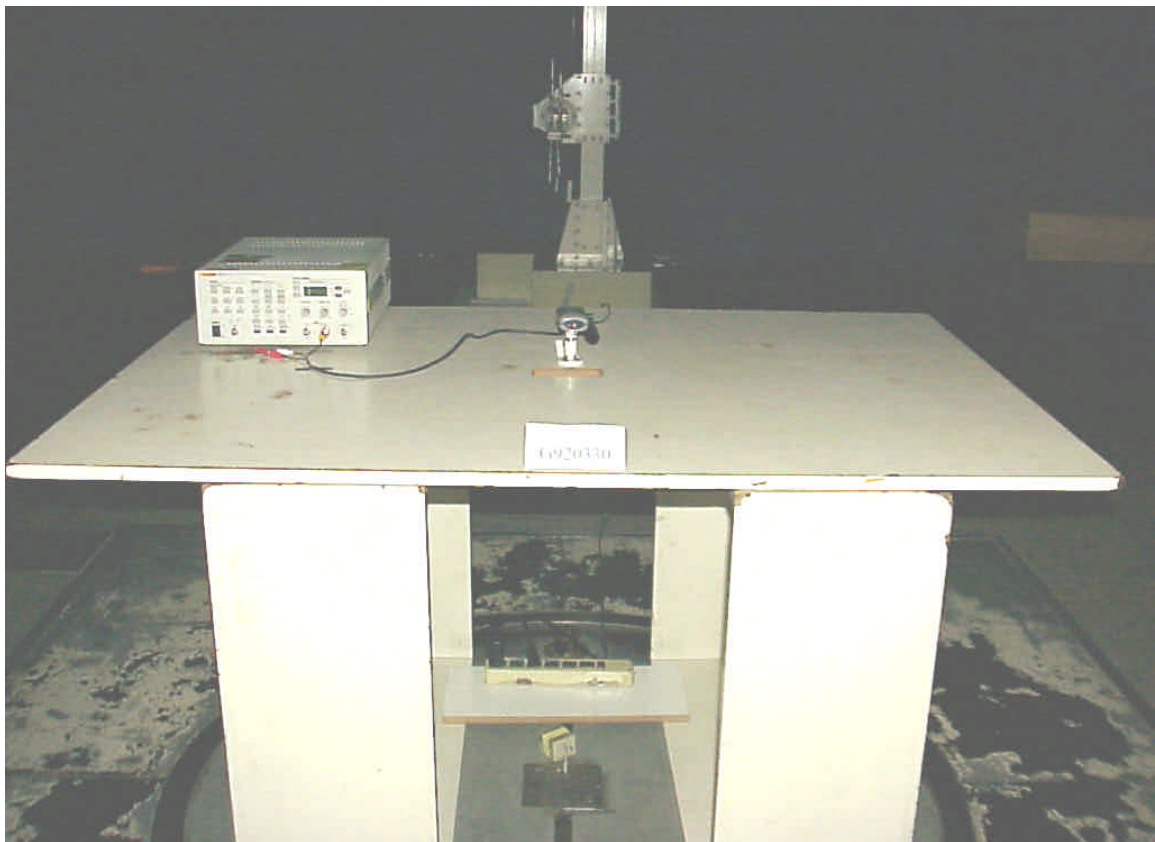
FRONT VIEW OF CONDUCTED MEASUREMENT



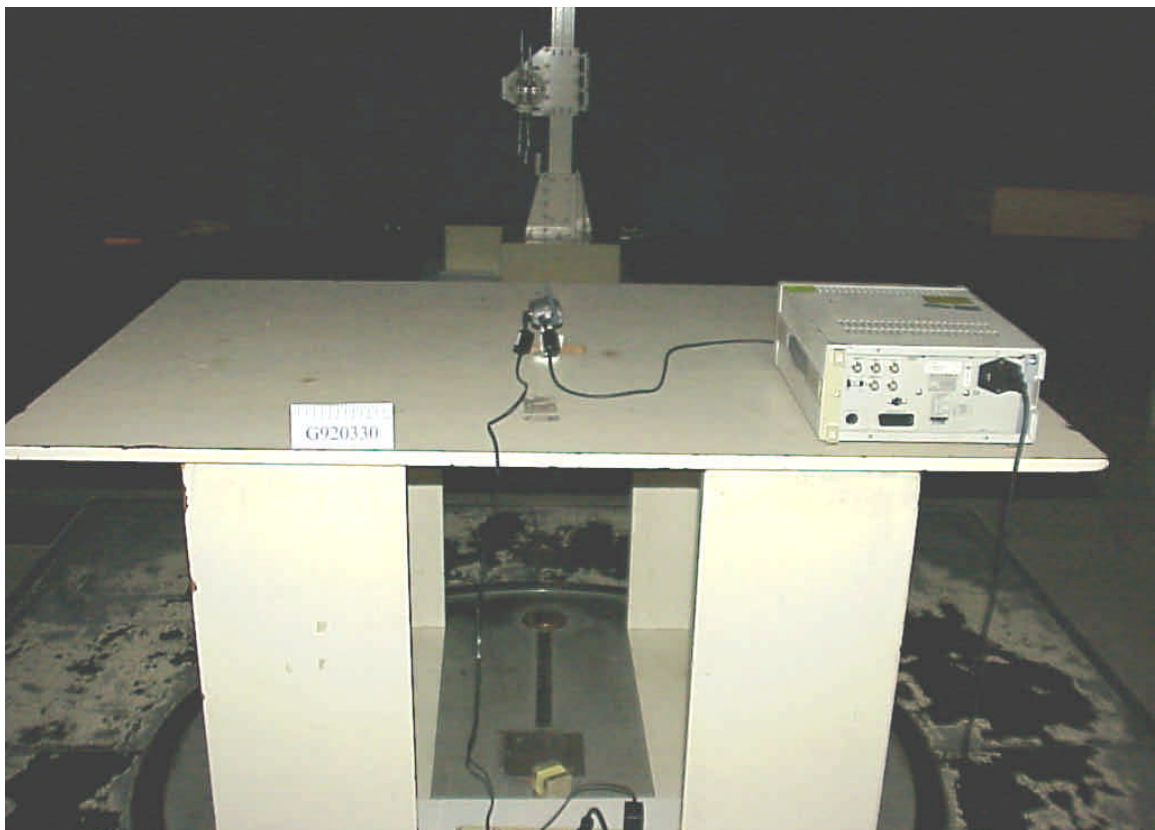
SIDE VIEW OF CONDUCTED MEASUREMENT

## 6.2. Photos of Radiated Measurement at Semi-Anechoic Chamber

### 6.2.1. Frequency range 30MHz to 1000MHz



FRONT VIEW OF RADIATED MEASUREMENT

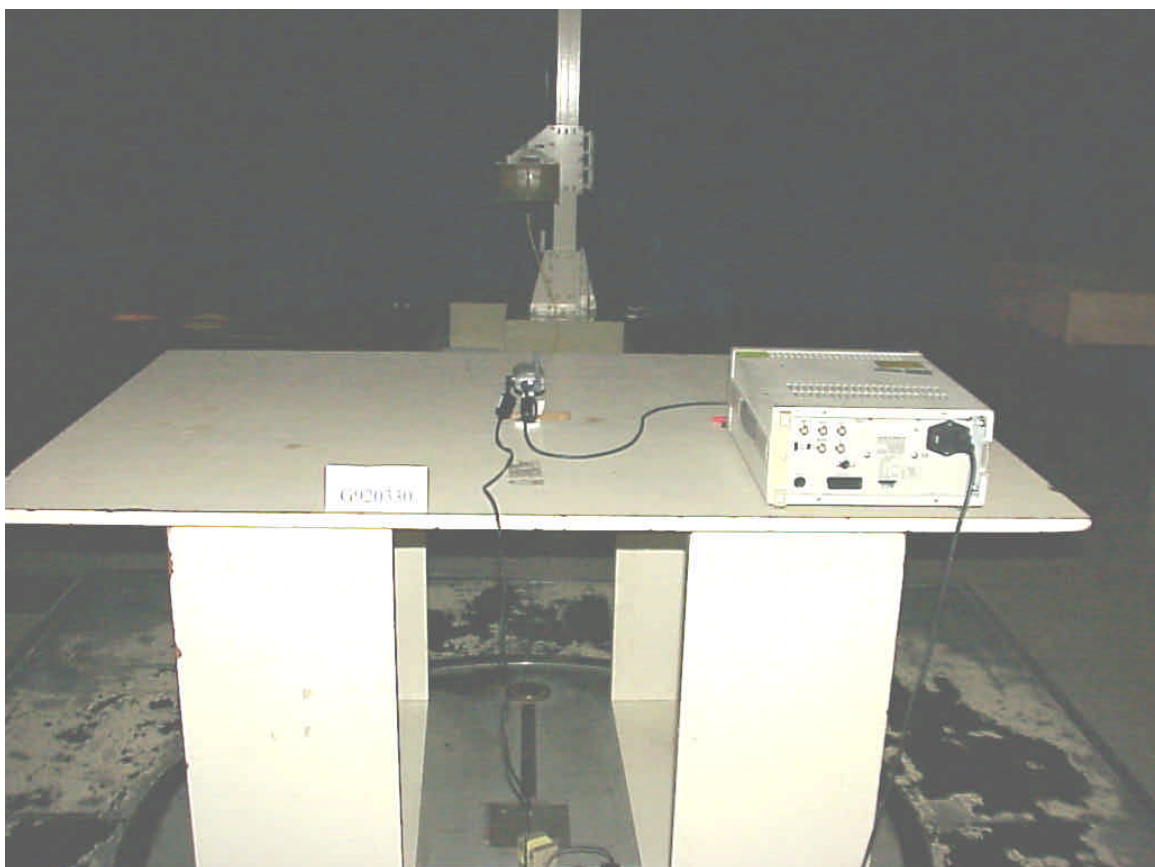


BACK VIEW OF RADIATED MEASUREMENT

### 6.2.2. Frequency range above 1GHz



FRONT VIEW OF RADIATED MEASUREMENT



BACK VIEW OF RADIATED MEASUREMENT

## Supplementary Data (Middle Channel Test Data)

Frequency range 30MHz to 1000MHz

Date of Test : Jul. 09, 2003 Temperature : 24

EUT : Wireless Security System Humidity : 62%  
(Camera/Transmitter)

Test Mode : Channel 2

| Frequency<br>MHz | Antenna        | Cable      | Meter Reading      | Emission Level       |                  | Margin |
|------------------|----------------|------------|--------------------|----------------------|------------------|--------|
|                  | Factor<br>dB/m | Loss<br>dB | Horizontal<br>dBμV | Horizontal<br>dBμV/m | Limits<br>dBμV/m |        |
| 32.430           | 22.19          | 1.10       | -0.47              | 22.82                | 40.00            | 17.18  |
| 114.510          | 18.55          | 2.30       | 0.58               | 21.43                | 43.50            | 22.07  |
| 233.310          | 23.98          | 3.30       | 1.49               | 28.77                | 46.00            | 17.23  |
| 297.840          | 26.78          | 3.98       | -0.03              | 30.73                | 46.00            | 15.27  |
| 397.300          | 16.84          | 4.79       | 1.10               | 22.73                | 46.00            | 23.27  |
| 472.900          | 17.80          | 5.80       | 1.59               | 25.19                | 46.00            | 20.81  |
| 505.800          | 18.40          | 6.70       | 3.58               | 28.68                | 46.00            | 17.32  |

| Frequency<br>MHz | Antenna        | Cable      | Meter Reading    | Emission Level     |                  | Margin |
|------------------|----------------|------------|------------------|--------------------|------------------|--------|
|                  | Factor<br>dB/m | Loss<br>dB | Vertical<br>dBμV | Vertical<br>dBμV/m | Limits<br>dBμV/m |        |
| 36.480           | 21.00          | 1.20       | 2.73             | 24.93              | 40.00            | 15.07  |
| 157.980          | 21.19          | 2.70       | 0.28             | 24.17              | 43.50            | 19.33  |
| 294.060          | 26.90          | 3.96       | -0.87            | 29.99              | 46.00            | 16.01  |
| 505.800          | 17.90          | 6.70       | 3.85             | 28.45              | 46.00            | 17.55  |
| 549.200          | 19.06          | 6.80       | 1.03             | 26.89              | 46.00            | 19.11  |
| 714.400          | 21.48          | 6.60       | 0.52             | 28.60              | 46.00            | 17.40  |

Remarks : 1. All readings are Quasi-Peak values.  
2. Emission Level = Meter Reading + Antenna Factor + Cable Loss.

Frequency range above 1GHz

Date of Test : Jul. 09, 2003 Temperature : 24

EUT : Wireless Security System  
(Camera/Transmitter) Humidity : 62%

Test Mode : Channel 2

| Frequency<br>MHz | Antenna<br>Factor<br>dB/m | Cable<br>Loss<br>dB | Meter Reading<br>Horizontal<br>dBμV | Emission Level<br>Horizontal<br>dBμV/m | Limits<br>dBμV/m | Margin<br>dB |
|------------------|---------------------------|---------------------|-------------------------------------|----------------------------------------|------------------|--------------|
|------------------|---------------------------|---------------------|-------------------------------------|----------------------------------------|------------------|--------------|

Fundamental Freq. (Average Value)

|          |       |      |       |       |       |       |
|----------|-------|------|-------|-------|-------|-------|
| 2430.690 | 28.67 | 6.38 | 32.65 | 67.70 | 94.00 | 26.30 |
|----------|-------|------|-------|-------|-------|-------|

Fundamental Freq. (Peak Value)

|          |       |      |       |       |        |       |
|----------|-------|------|-------|-------|--------|-------|
| 2430.690 | 28.67 | 6.38 | 37.65 | 72.70 | 114.00 | 41.30 |
|----------|-------|------|-------|-------|--------|-------|

Harmonic Freq. (Average Value)

|          |       |      |       |       |       |       |
|----------|-------|------|-------|-------|-------|-------|
| 4860.633 | 33.75 | 9.15 | -7.07 | 35.83 | 54.00 | 18.17 |
|----------|-------|------|-------|-------|-------|-------|

|          |       |       |        |       |       |       |
|----------|-------|-------|--------|-------|-------|-------|
| 7290.357 | 36.90 | 11.36 | -13.89 | 34.37 | 54.00 | 19.63 |
|----------|-------|-------|--------|-------|-------|-------|

Harmonic Freq. (Peak Value)

|          |       |      |       |       |       |       |
|----------|-------|------|-------|-------|-------|-------|
| 4860.633 | 33.75 | 9.15 | -0.07 | 42.83 | 74.00 | 31.17 |
|----------|-------|------|-------|-------|-------|-------|

|          |       |       |        |       |       |       |
|----------|-------|-------|--------|-------|-------|-------|
| 7290.357 | 36.90 | 11.36 | -11.29 | 36.97 | 74.00 | 37.03 |
|----------|-------|-------|--------|-------|-------|-------|

| Frequency<br>MHz | Antenna<br>Factor<br>dB/m | Cable<br>Loss<br>dB | Meter Reading<br>Vertical<br>dBμV | Emission Level<br>Vertical<br>dBμV/m | Limits<br>dBμV/m | Margin<br>dB |
|------------------|---------------------------|---------------------|-----------------------------------|--------------------------------------|------------------|--------------|
|------------------|---------------------------|---------------------|-----------------------------------|--------------------------------------|------------------|--------------|

Fundamental Freq. (Average Value)

|          |       |      |       |       |       |       |
|----------|-------|------|-------|-------|-------|-------|
| 2430.690 | 28.67 | 6.38 | 31.33 | 66.38 | 94.00 | 27.62 |
|----------|-------|------|-------|-------|-------|-------|

Fundamental Freq. (Peak Value)

|          |       |      |       |       |        |       |
|----------|-------|------|-------|-------|--------|-------|
| 2430.690 | 28.67 | 6.38 | 34.83 | 69.88 | 114.00 | 44.12 |
|----------|-------|------|-------|-------|--------|-------|

Harmonic Freq. (Average Value)

|          |       |      |       |       |       |       |
|----------|-------|------|-------|-------|-------|-------|
| 4860.633 | 33.75 | 9.15 | -7.81 | 35.09 | 54.00 | 18.91 |
|----------|-------|------|-------|-------|-------|-------|

|          |       |       |        |       |       |       |
|----------|-------|-------|--------|-------|-------|-------|
| 7290.357 | 36.90 | 11.36 | -14.17 | 34.09 | 54.00 | 19.91 |
|----------|-------|-------|--------|-------|-------|-------|

Harmonic Freq. (Peak Value)

|          |       |      |       |       |       |       |
|----------|-------|------|-------|-------|-------|-------|
| 4860.633 | 33.75 | 9.15 | -1.81 | 41.09 | 74.00 | 32.91 |
|----------|-------|------|-------|-------|-------|-------|

|          |       |       |        |       |       |       |
|----------|-------|-------|--------|-------|-------|-------|
| 7290.357 | 36.88 | 11.34 | -13.83 | 34.39 | 74.00 | 39.61 |
|----------|-------|-------|--------|-------|-------|-------|

Remarks : 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.  
2. Measurement is up to the 10th harmonic, the other harmonics not in the report is that the noise is too low to be measured.