

# **EXHIBIT C**

## **EMI TEST REPORT**

# **FCC PART 15 SUB-PART B & PART 90 EMI TEST REPORT**

*on*  
**Consumer Video/Audio Sender/Receiver Surveillance Devices**

*model names*  
**Receiver: RX-01 & Transmitter: TX-01H**

*provided for evaluation by*  
**Tote Vision  
969 Thomas Street  
Seattle, Washington 98109-5212**

*tests and evaluation performed by*  
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**EN45001 Accredited Compliance Laboratory [RES-GmbH]  
Registration number: TTI-P-G 159/98-00 [RES-GmbH]**

# **FCC PART 15 SUB-PART B & PART 90 EMI TEST REPORT**

*on*

## **Consumer Video/Audio Sender/Receiver Surveillance Devices Receiver: RX-01 & Transmitter: TX-01H**

*provided for evaluation by*

**Tote Vision  
969 Thomas Street  
Seattle, Washington 98109-5212**

This report contains 41 pages

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AUSTEL Technical Standards (Ref: NVLAP Lab Code 200172-0)**

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**Certified by Rockford Engineering Services GmbH for EMC Testing according to the European EMC  
Directive 89/336/EEC per EN45001**

**Certified by Reg. TP for EMC Testing according to the European EMC Directive 89/336/EEC per EN45001  
For RES GmbH (DAR-Registration number: TTI-P-G 159/98-00)**

**Certified by the Voluntary Control Council for Interference by Information Technology Equipment (VCCI)  
For EMC testing, in accordance with the Regulations for Voluntary Control Measures, Article 8,  
Registration Numbers- Site 1: C-714 & R-696 and Site 2: C-715 & R-697**

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## PART 1 - GENERAL

### 1.1. TEST METHODOLOGY

The electromagnetic interference tests which this report describes were performed by an independent electromagnetic compatibility consultant, Rockford Engineering Services Inc., in accordance with the FCC test procedure ANSI C63.4-1992.

#### 1.1.1 Test Facility

The open area test site, the conducted measurement facility, and the test equipment used to collect the emissions data is located in Sunol, California, and is fully described in site attenuation report. The approved site attenuation description is on file at the Federal Communications Commission.

#### 1.1.2 Accuracy of Test Data

The test results contained in this report accurately represent the radiated, powerline conducted electromagnetic emissions, bandwidth and stability tests generated by the sample equipment under test.

Equipment Tested: Consumer Video/Audio Sender/Receiver Surveillance Devices

Models: Receiver: RX-01 & Transmitter: TX-01H

Date of Test: April 6 through 9, 1999

**1.1. TEST METHODOLOGY, CONTD.****Tests Performed:**

1. Power Line Conducted Emissions in a shielded room utilizing two LISN's in accordance with the FCC test procedure 47 CFR §15.207. Part 2 of this report contains details.
2. Radiated Emissions in a 3-meter open area site in accordance with the FCC test procedure 47 CFR §15.209. Part 3 of this report contains details.
3. Bandwidth Limitations in accordance with the FCC test procedure 47 CFR §90.209. Part 4 of this report contains details.
4. Frequency Stability Test requirements in accordance with 47CFR §90.213. Part 5 of this report contains details
5. Transmitter Measurements in accordance with 47CFR §90.215. Part 6 of this report contains details.

The results show that the sample equipment tested as described in this report is in compliance with the FCC Rules Part 15, SubPart B conducted and radiated emissions. Bandwidth Limitations, Frequency Stability and Transmitter Measurement test requirement limits of, Part 90-I.



Michael Gbadebo, PE  
Chief Engineer/Principal Consultant



## GENERAL CONTD.

### 1.2. SUMMARY

#### 1.2.1 Description of Equipment Under Test (EUT)

See Appendix E for more information

#### Model Name(s):

For Receiver: RX-01  
For Transmitter: TX-01H

#### Applicant:

Tote Vision

#### Address:

969 Thomas Street  
Seattle, Washington 98109-5212  
Tel: (206) 623-6000  
Fax: (206) 623-6609

#### Client Contact:

William S. Taraday

#### Test Technicians:

Lanre Owoborode & Bruce Gordon

#### Test Number:

5990304-1

#### 1.2.2 Support Equipment Included in Tests for Part 15 SubPart B

| <i>Equipment Under Test</i> | <i>Line Conducted</i>       | <i>Radiated Emissions</i>   |
|-----------------------------|-----------------------------|-----------------------------|
| <i>Receiver, RX-01</i>      | ♦ Sony TV<br>♦ Acer Speaker | ♦ Sony TV<br>♦ Acer Speaker |
| <i>Transmitter, TX-01H</i>  | 5mm Surveillance Camera     | 5mm Surveillance Camera     |

#### Support Equipment Included in Tests for Part 90

| <i>Equipment Under Test</i> | <i>Bandwidth Limitations</i> | <i>Frequency Stability</i> | <i>Transmitter Measurement</i> |
|-----------------------------|------------------------------|----------------------------|--------------------------------|
| <i>Receiver, RX-01</i>      | N/A                          | N/A                        | N/A                            |
| <i>Transmitter, TX-01H</i>  | N/A                          | N/A                        | N/A                            |

Details of support equipment contained in appendix D

## **PART 2 – POWER LINE CONDUCTED EMISSIONS**

### **Per FCC PART 15 SUB-PART B**

#### **2.1. CONFIGURATION AND PROCEDURE**

##### **2.1.1 EUT Configuration**

Pre-scan measurements are first performed by collecting data with a spectrum analyzer. Significant peaks are marked and then quasi-peaked. Measurement range investigated was from 450KHz to 30MHz. The EUT were set up in accordance with the suggested configuration given in FCC Measurement Procedure ANSI C63.4-1992. The measurement instrumentation used was a receiver with bandwidth parameters as stipulated in ANSI C63.4-1992.

The Receiver was set up on a wooden non conductive table top, 80 cm above the ground reference plane, in a shielded room. The dimension of the table was 1.5m x 1.0m. It was supported with peripherals as listed in 1.2.2. Excess cords of the peripherals were folded back and forth, to form a 30 cm by 40 cm bundle in the center of the cable. EUT was powered by a 12Vdc adapter.

The Transmitter was set up on a wooden non conductive table top, 80 cm above the ground reference plane, in a shielded room. The dimension of the table was 1.5m x 1.0m. It was supported with a 5mm Camera. An RCA Cable (1 meter long) was used to connect the EUT and the Camera. EUT was powered by a 12Vdc adapter.

##### **2.1.2 Test Procedure**

The Consumer Video/Audio Sender/Receiver Surveillance Devices consists of a Receiver (model RX-01) and a Transmitter (model TX-01). These were set up as described above, in live functional modes. The Receiver was receiving visual images from the Transmitter. The Transmitter was sending visual images from the Camera to the Receiver. Data with the EUT operating in live functional mode was considered worst case and is recorded in the report as representative of the system. The powerline conducted EMI tests were run on the 12Vdc power supply current carrying conductors of the power cords of the EUT and the peripheral devices. The highest emissions were also analyzed in detail by operating the spectrum analyzer in fixed tuned mode to determine the precise amplitude of the emissions. While doing so, interconnecting cables were moved around to maximize the emissions.

**2.1. CONFIGURATION AND PROCEDURE, CONTD.****2.1.3 Data Table Legend and Field Strength Calculation**

'Margin' indicates the degree of compliance with the applicable limit. For example, a margin of -8 dB means that the emission is 8 dB below the limit (in compliance). A margin of +4 dB means that the emission is 4 dB over the limit (out of compliance). The margin is calculated as follows:

Margin = Corrected Amplitude - Limit;

where Corrected Amplitude = Amplitude + Cable Loss - Distance Factor,  
the amplitude measured in a quasi peak mode.

**2.1.4 Spectrum Analyzer Configuration (during swept frequency scans)**

|                                   |         |
|-----------------------------------|---------|
| Start Frequency .....             | 450 KHz |
| Stop Frequency.....               | 30MHz   |
| Sweep Speed .....                 | Manual  |
| Resolution Bandwidth.....         | 10KHz   |
| Video Bandwidth .....             | 10KHz   |
| Quasi Peak Adapter Bandwidth..... | 9KHz    |
| Quasi Peak Adapter Mode .....     | Normal  |

## 2.2. POWER LINE CONDUCTED EMISSIONS Per FCC PART 15 SUB-PART B

### 2.2.1 Administrative Details

Date(s) of Test: April 6, 1999  
 Emission Limits: Class B  
 Temperature/Humidity: 19.9°C / 63%  
 Test Technician(s): Lanre Owoborode

Technician's Signature: 

### 2.2.2 EUT Configuration Summary

See 2.1.1.

### 2.2.3 Test Results

The table below shows a summary of the highest conducted emissions on all current carrying conductors of the EUT power cord compared to the FCC Class B limit.

| INDICATED<br>FREQ<br>(MHz) | AMPL<br>dBuV | CABLE<br>LOSS<br>dB | CORR<br>AMPL<br>dBuV | COND<br>- | GND<br>- | CLASS B<br>LIMIT<br>dBuV | B<br>MARGIN<br>(dB) |
|----------------------------|--------------|---------------------|----------------------|-----------|----------|--------------------------|---------------------|
| 22.00                      | 37.5         | 1.0                 | 38.5                 | Hot       | con      | 48.0                     | -9.5                |
| 22.50                      | 35.6         | 1.0                 | 36.6                 | Neut      | con      | 48.0                     | -11.4               |
| 25.01                      | 32.7         | 1.0                 | 33.7                 | Hot       | con      | 48.0                     | -14.3               |
| 25.01                      | 34.1         | 1.0                 | 35.1                 | Neut      | con      | 48.0                     | -12.9               |
| 27.79                      | 36.6         | 1.0                 | 37.6                 | Neut      | con      | 48.0                     | -10.4               |
| 27.79                      | 34.9         | 1.0                 | 35.9                 | Neut      | con      | 48.0                     | -12.1               |
| 28.91                      | 34.8         | 1.0                 | 35.8                 | Neut      | con      | 48.0                     | -12.2               |
| 29.50                      | 30.5         | 1.0                 | 31.5                 | Hot       | con      | 48.0                     | -16.5               |
| 29.60                      | 33.0         | 1.0                 | 34.0                 | Hot       | con      | 48.0                     | -14.0               |
| 30.00                      | 38.7         | 1.0                 | 39.7                 | Hot       | con      | 48.0                     | -8.3                |
| 30.00                      | 39.8         | 1.0                 | 40.8                 | Neut      | con      | 48.0                     | -7.2                |

Table 2.2.3 Power line Conducted Emissions for Receiver, model RX-01

No emissions of significant levels were observed between 450 KHz and the lowest frequencies shown in the above data. No emissions of significant levels were observed between the highest frequencies shown in the above data and 30 MHz.

**Conclusion:** The EUT meets the requirements of the test reference for Power line Conducted Emissions.

## 2.2. POWER LINE CONDUCTED EMISSIONS Per FCC PART 15 SUB-PART B, CONTD.

### 2.2.1 Administrative Details

Date(s) of Test: April 6, 1999  
 Emission Limits: Class B  
 Temperature/Humidity: 19.9°C / 63%  
 Test Technician(s): Lanre Owoborode

Technician's Signature: *Lanre Owoborode*

### Test Results

The table below shows a summary of the highest conducted emissions on all current carrying conductors of the EUT power cord compared to the FCC Class B limit.

| INDICATED |      | CABLE CORR |      | COND | GND | CLASS B |        |
|-----------|------|------------|------|------|-----|---------|--------|
| FREQ      | AMPL | LOSS       | AMPL | -    | -   | LIMIT   | MARGIN |
| (MHz)     | dBuV | dB         | dBuV | -    | -   | dBuV    | (dB)   |
| 10.20     | 37.5 | 1.0        | 38.5 | Hot  | con | 48.0    | -9.5   |
| 13.10     | 33.8 | 1.0        | 34.8 | Neut | con | 48.0    | -13.2  |
| 15.80     | 38.3 | 1.0        | 39.3 | Hot  | con | 48.0    | -8.7   |
| 22.90     | 39.1 | 1.0        | 40.1 | Neut | con | 48.0    | -7.9   |
| 25.50     | 36.6 | 1.0        | 37.6 | Hot  | con | 48.0    | -10.4  |
| 29.10     | 40.2 | 1.0        | 41.2 | Neut | con | 48.0    | -6.8   |

Table 2.2.3 Power line Conducted Emissions for Transmitter, model TX-01H

No emissions of significant levels were observed between 450 KHz and the lowest frequencies shown in the above data. No emissions of significant levels were observed between the highest frequencies shown in the above data and 30 MHz.

**Conclusion:** The EUT meets the requirements of the test reference for Power line Conducted Emissions.

## **PART 3 - OPEN FIELD RADIATED EMISSIONS per FCC PART 15 SUB-PART B**

### **3.1. CONFIGURATION AND PROCEDURE**

#### **3.1.1 EUT Configuration**

The EUT were set up in accordance with the suggested configuration given in FCC Measurement Procedure ANSI C63.4-1992. The measurement instrumentation used was a Hewlett Packard 8566B Spectrum Analyzer with detector and bandwidth parameters as stipulated in ANSI C63.4-1992, §15.209.

The Receiver was set up on a wooden non conductive table top, 80 cm above the ground reference plane, in an open field. The table dimension was 1.5m x 1.0m. It was supported with peripherals as listed in 1.2.2. Excess cords of the peripherals were folded back and forth, and left hanging in the middle distance above the ground plane. Frequency measurement was taken from 30MHz to 1000MHz. EUT was powered by a 12Vdc adapter.

The Transmitter was set up on a wooden non conductive table top, 80 cm above the ground reference plane, in an open field. The dimension of the table was 1.5m x 1.0m. It was supported with a 5mm Camera. An RCA Cable (1 meter long) was used to connect the EUT and the Camera. EUT was powered by a 12Vdc adapter.

#### **3.1.2 Test Procedure**

The EUT consists of a Receiver (model RX-01) and a Transmitter (model TX-01). These were set up as described above, in live functional modes. The Receiver was receiving visual images from the Transmitter. The Transmitter was sending visual images from the Camera to the Receiver. Data with the EUT operating in live functional mode was considered worst case and is recorded in the report as representative of the system. Maximum emissions were obtained by varying the height of the antennas and then orienting the turntable in 360-degree turns with the analyzer in the manual mode. The highest emissions were also analyzed in detail by operating the spectrum analyzer in fixed tuned quasi-peak mode to determine the precise amplitude of the emissions. While doing so, the interconnecting cables were moved around; the antenna height was varied between one and four meters, and polarization was changed between vertical and horizontal. The turntable was rotated to maximize emissions.

### 3.1. CONFIGURATION AND PROCEDURE, CONTD.

#### 3.1.3 Data Table Legend and Field Strength Calculation

'Margin' indicates the degree of compliance with the applicable limit. For example, a margin of -8 dB means that the emissions are 8 dB below the limit (in compliance); +a margin of +4 dB means that the emission is 4 dB over the limit (out of compliance).

The margin calculated as follows:

Margin = Corrected Amplitude - Limit,

where Corrected Amplitude = Amplitude + Antenna Correction Factor + Cable Loss - Distance Factor, measured in quasi peak mode.

#### 3.1.4 Spectrum Analyzer Configuration (during swept frequency scans)

|   |              |
|---|--------------|
| Start Frequency .....                             | 30MHz        |
| Stop Frequency.....                               | 1000MHz      |
| Sweep Speed .....                                 | Manual       |
| Measurements below .....                          | 1GHz         |
| RES Bandwidth.....                                | 100 KHz      |
| Video Bandwidth.....                              | 100 KHz      |
| Quasi Peak Adapter Mode.....                      | Normal       |
| Quasi peak Adapter Bandwidth.....                 | 120 KHz      |
| Measurements above 1GHz (unless stated otherwise) |              |
| Analyzer Mode.....                                | Video Filter |
| RES Bandwidth.....                                | 1MHz         |
| Video Bandwidth.....                              | 1MHz         |
| Freq. Span.....                                   | 3MHz         |
| Offset.....                                       | 0dB          |
| Quasi Peak Adapter Mode .....                     | Disabled     |

### 3.2. OPEN FIELD RADIATED EMISSIONS per FCC PART 15 SUB-PART B

#### 3.2.1 Administrative Details

Date(s) of Test: April 8, 1999  
 Emission Limits: Class B  
 Temperature/Humidity: 19.2°C / 63%  
 ATM Pressure: 1015 Mbar  
 Test Technician(s): Bruce Gordon  
 Antenna Used: Biconical Antenna, model # 3104, S/N 3459 and  
 Log Periodic Antenna, model # 3146, S/N 2075  
 (calibrated June 29, 1998, next calibration due date is June 28, 1999)

Technician's Signature: *B. Gordon*

#### 3.2.2 EUT Configuration Summary

See 3.1.1.

#### 3.2.3 Test Results

The table below shows a summary of the highest amplitudes of the radiated emissions from the equipment under test at various antenna heights, antenna polarization, and EUT orientations.

| INDICATED |        | CORRECTION |     | FACT CORR |        | TURNTAB |     | ANT FCC 15A |            | FCC 15B    |  |
|-----------|--------|------------|-----|-----------|--------|---------|-----|-------------|------------|------------|--|
| FREQ      | AMPL   | ANT        | CAB | DIST      | AMPL   | ANG     | HT  | POL         | LIMIT MARG | LIMIT MARG |  |
| MHz       | dBuV/m | dB         | dB  | dB        | dBuV/m | DEG     | m   | -           | dBuV/m dB  | dBuV/m dB  |  |
| 40.96     | 17.3   | 10.7       | 2.6 | 0.0       | 30.6   | 180     | 1.0 | VB          | 49.5 -18.9 | 40.0 -9.4  |  |
| 70.45     | 14.9   | 7.6        | 3.7 | 0.0       | 26.2   | 45      | 2.0 | HB          | 49.5 -23.3 | 40.0 -13.8 |  |
| 70.98     | 21.6   | 7.5        | 3.7 | 0.0       | 32.8   | 45      | 1.0 | VB          | 49.5 -16.8 | 40.0 -7.2  |  |
| 389.65    | 1.0    | 16.2       | 5.8 | 0.0       | 23.0   | 180     | 1.0 | VL          | 56.9 -33.9 | 46.0 -23.0 |  |
| 436.12    | 4.4    | 17.8       | 6.1 | 0.0       | 28.3   | 0       | 2.0 | HL          | 56.9 -28.6 | 46.0 -17.7 |  |
| 530.40    | 6.2    | 19.6       | 6.6 | 0.0       | 32.4   | 0       | 2.0 | HL          | 56.9 -24.5 | 46.0 -13.6 |  |

**Table 3.2.3 Open Field Radiated Emissions for Receiver, model RX-01**

No emissions of significant levels were observed between 30 MHz and the lowest frequencies shown in the above data. No emissions of significant levels were observed between the highest frequency shown in the above data and 1000MHz.

**Conclusion:** The EUT meets the requirements of the test reference for Open Field Radiated Emissions.



### 3.2. OPEN FIELD RADIATED EMISSIONS per FCC PART 15 SUB-PART B, CONTD.

#### 3.2.1 Administrative Details

**Date(s) of Test:** April 8, 1999  
**Emission Limits:** Class B  
**Temperature/Humidity:** 19.2°C / 63%  
**ATM Pressure:** 1015 Mbar  
**Test Technician(s):** Bruce Gordon  
**Antenna Used:** Biconical Antenna, model # 3104, S/N 3459 and  
 Log Periodic Antenna, model # 3146, S/N 2075  
 (calibrated June 29, 1998, next calibration due date is June 28, 1999)

**Technician's Signature:** B. Gordon

#### Test Results

The table below shows a summary of the highest amplitudes of the radiated emissions from the equipment under test at various antenna heights, antenna polarization, and EUT orientations.

| INDICATED |        | CORRECTION |     | FACT CORR |        | TURNTAB |     | ANT FCC 15A |              | FCC 15B      |  |
|-----------|--------|------------|-----|-----------|--------|---------|-----|-------------|--------------|--------------|--|
| FREQ      | AMPL   | ANT        | CAB | DIST      | AMPL   | ANG     | HT  | POL         | LIMIT MARGIN | LIMIT MARGIN |  |
| MHz       | dBuV/m | dB         | dB  | dB        | dBuV/m | DEG     | m   | -           | dBuV/m dB    | dBuV/m dB    |  |
| 95.37     | 21.8   | 10.6       | 3.9 | 0.0       | 36.2   | 45      | 3.0 | HB          | 54.0 -17.7   | 43.5 -7.3    |  |
| 123.99    | 25.2   | 13.6       | 3.9 | 0.0       | 42.7   | 45      | 3.0 | HB          | 54.0 -11.3   | 43.5 -0.8    |  |
| 133.53    | 24.4   | 12.9       | 4.0 | 0.0       | 41.3   | 45      | 3.0 | HB          | 54.0 -12.7   | 43.5 -2.2    |  |
| 200.30    | 24.1   | 14.0       | 4.7 | 0.0       | 42.8   | 45      | 1.0 | VL          | 54.0 -11.2   | 43.5 -0.7    |  |
| 200.31    | 23.5   | 14.0       | 4.7 | 0.0       | 42.2   | 180     | 2.0 | HL          | 54.0 -11.8   | 43.5 -1.3    |  |
| 209.83    | 23.6   | 13.3       | 4.7 | 0.0       | 41.6   | 180     | 2.0 | HL          | 54.0 -12.4   | 43.5 -2.0    |  |
| 209.84    | 23.5   | 13.2       | 4.7 | 0.0       | 41.4   | 45      | 1.0 | VL          | 54.0 -12.5   | 43.5 -2.1    |  |
| 228.92    | 20.7   | 12.2       | 5.0 | 0.0       | 38.0   | 45      | 1.0 | VL          | 56.9 -18.9   | 46.0 -8.0    |  |
| 247.98    | 17.4   | 13.1       | 5.2 | 0.0       | 35.7   | 45      | 1.0 | VL          | 56.9 -21.2   | 46.0 -10.3   |  |
| 267.06    | 25.0   | 13.9       | 5.2 | 0.0       | 44.1   | 45      | 1.0 | VL          | 56.9 -12.8   | 46.0 -1.9    |  |
| 267.06    | 26.6   | 13.9       | 5.2 | 0.0       | 45.7   | 180     | 2.0 | HL          | 56.9 -11.2   | 46.0 -0.3    |  |
| 276.58    | 18.1   | 14.3       | 5.2 | 0.0       | 37.6   | 45      | 1.0 | VL          | 56.9 -19.3   | 46.0 -8.4    |  |
| 305.25    | 14.3   | 14.9       | 5.3 | 0.0       | 34.5   | 45      | 1.0 | VL          | 56.9 -22.4   | 46.0 -11.5   |  |
| 314.76    | 12.4   | 15.2       | 5.3 | 0.0       | 32.9   | 45      | 1.0 | VL          | 56.9 -24.0   | 46.0 -13.1   |  |

**Table 3.2.3 Open Field Radiated Emissions for Transmitter, model TX-01H**

No emissions of significant levels were observed between 30 MHz and the lowest frequencies shown in the above data. No emissions of significant levels were observed between the highest frequency shown in the above data and 1000MHz.

**Conclusion:** The EUT meets the requirements of the test reference for Open Field Radiated Emissions.

## **PART 4 - BANDWIDTH LIMITATIONS**

### **per FCC PART 90, SECTION 47 CFR §90.209**

#### **4.1. CONFIGURATION AND PROCEDURE**

##### **4.1.1 EUT Configuration**

The EUT is set up in accordance with the suggested configuration given in FCC Measurement Procedure ANSI C63.4-1992. The measurement instrumentation used was an Hewlett Packard 8566B Spectrum Analyzer with detector and bandwidth parameters as stipulated in C63.4-1992. EUT was 12Vdc powered.

##### **4.1.2 Test Procedure**

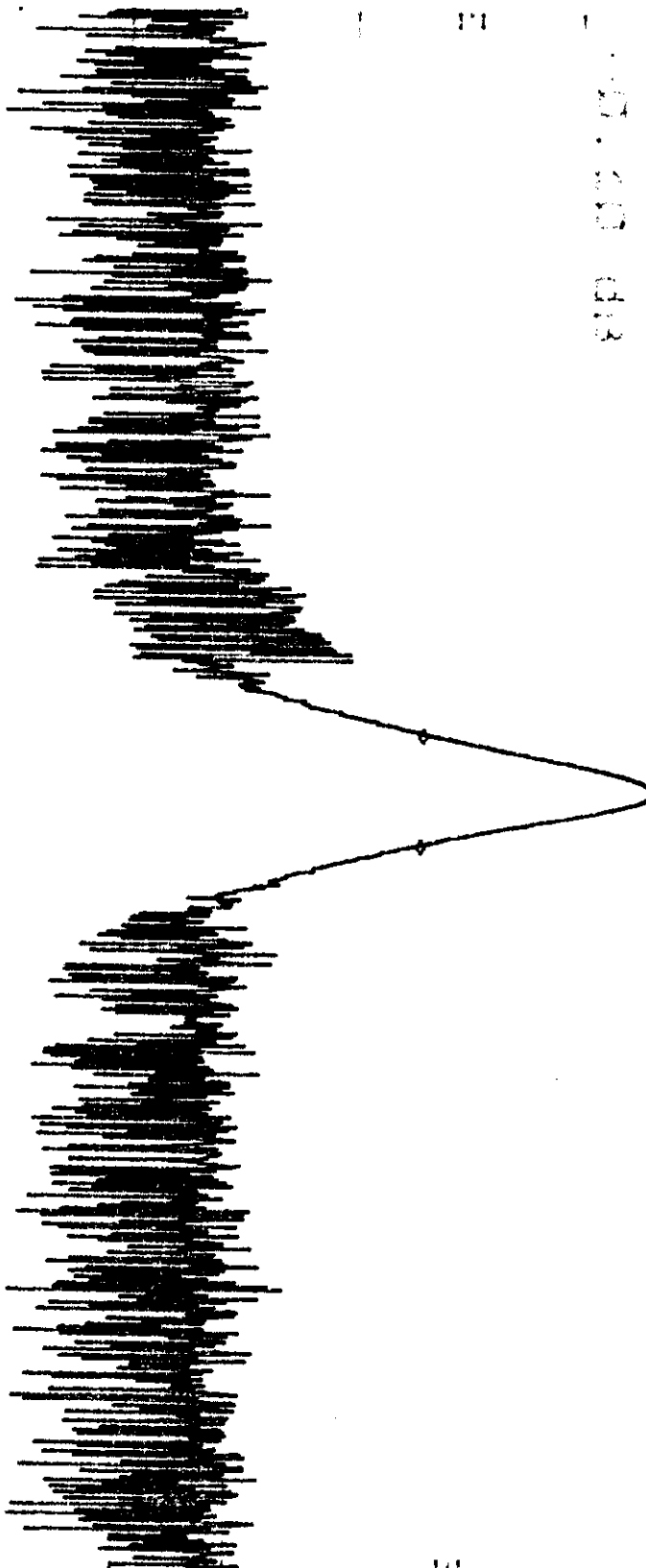
The Transmitter was placed on the test table. The EUT was configured for maximum response and was set up as described above and configured to transmit continuously. Signal was monitored with an HP 8566B Spectrum Analyzer, using the EMCO Horn Antenna, model # 3115. Unless stated otherwise, the antenna to EUT distance was 1 meter.

##### **4.1.3 Spectrum Analyzer Configuration (During Swept Frequency Scans)**

|                                   |          |
|-----------------------------------|----------|
| Start Frequency .....             | 2,425MHz |
| Stop Frequency.....               | 2,430MHz |
| Sweep Speed .....                 | Manual   |
| RES Bandwidth.....                | 100KHz   |
| Video Bandwidth .....             | 100KHz   |
| Quasi Peak Adapter Mode .....     | Bypass   |
| Quasi Peak Adapter Bandwidth..... | Disabled |

4.2. BANDWIDTH TEST  
per FCC PART 90, SECTION §90.209

20dB Bandwidth Plot Performed at 1 Meter Distance



REF -10.0 dBm  
ATTEN 0 dB

REF 0.355 kHz  
-10.00 dB

CH1 2.42 GHz  
RES BW 400 kHz  
SPAN 20.0 msec

## PART 5 - FREQUENCY STABILITY TEST

### per FCC PART 90, SECTION 47 CFR §90.213

#### 5.1. CONFIGURATION AND PROCEDURE

##### 5.1.1 EUT Configuration

The EUT is set up in accordance with the suggested configuration given in FCC Measurement Procedure ANSI C63.4-1992. The measurement instrumentation used was an Hewlett Packard 8566B Spectrum Analyzer with detector and bandwidth parameters as stipulated in C63.4-1992. EUT was powered by a 12Vdc adapter.

##### 5.1.2 Test Procedure

The Transmitter was placed on the test table. The EUT was configured for maximum response and was set up as described above and configured to transmit continuously. Frequency stability was monitored with the HP 8566B Spectrum Analyzer, below and above the center frequencies using an appropriate receiving antenna.

##### 5.1.3 Data Table Legend and Field Strength Calculation

'Margin' indicates the degree of compliance with the applicable limit. For example, a margin of -8 dB means that the emissions is 8 dB below the limit (in compliance); a margin of +4 dB means that the emission is 4 dB over the limit (out of compliance).

The margin calculated as follows:

Margin = Corrected Amplitude - Limit

where Corrected Amplitude = Amplitude + Antenna Correction Factor + Cable Loss - Distance Factor, measured in quasi peak mode.

A = Average  
P = Peak  
Q = Quasi Peak

##### 5.1.4 Spectrum Analyzer Configuration (During Swept Frequency Scans)

Start Frequency .....2,4370MHz  
Stop Frequency.....2,4374MHz  
Sweep Speed .....Manual  
RES Bandwidth..... 100 KHz  
Video Bandwidth..... 100 KHz  
Quasi Peak Adapter Mode ..... Bypass  
Quasi peak Adapter Bandwidth..... 120 KHz

## 5.2. FREQUENCY STABILITY TEST

### per FCC PART 90, SECTION 47 CFR §90.213

#### 5.2.1 Administrative Details

**Date(s) of Test:** April 9, 1999  
**Emission Limits:** FCC Part 15 SubPart C  
**Temperature/Humidity:** 19.2°C / 63%  
**ATM Pressure:** 1015 Mbar  
**Test Technician(s):** Bruce Gordon  
**Antenna Used:** Horn Antenna, model # EMCO 3115, S/N 8812-3050  
 (calibrated April 6, 1999, next calibration due date is April 6, 2000)

**Technician's Signature:** Bruce Gordon

#### 5.2.2 EUT Configuration Summary

See 5.1.1.

#### 5.2.3 Test Results

| Temperature     | 22°C     | 22°C      | 22°C      | 22°C       |
|-----------------|----------|-----------|-----------|------------|
| Time            | Start Up | 2 minutes | 5 minutes | 10 minutes |
| Frequency (GHz) | 2.4373   | 2.4372    | 2.4371    | 2.43709    |

Table 5.2.3 Stability Test for Transmitter, model TX-01H

**Conclusion:** The EUT meets the requirements of the test reference for Frequency Stability

## **PART 6 - TRANSMITTER MEASUREMENTS**

### **per FCC PART 90, SECTION 47 CFR §90.215**

#### **6.1. CONFIGURATION AND PROCEDURE**

##### **6.1.1 EUT Configuration**

The EUT is set up in accordance with the suggested configuration given in FCC Measurement Procedure ANSI C63.4-1992. The measurement instrumentation used was an Hewlett Packard 8566B Spectrum Analyzer with detector and bandwidth parameters as stipulated in C63.4-1992. EUT was 12Vdc powered.

##### **6.1.2 Test Procedure**

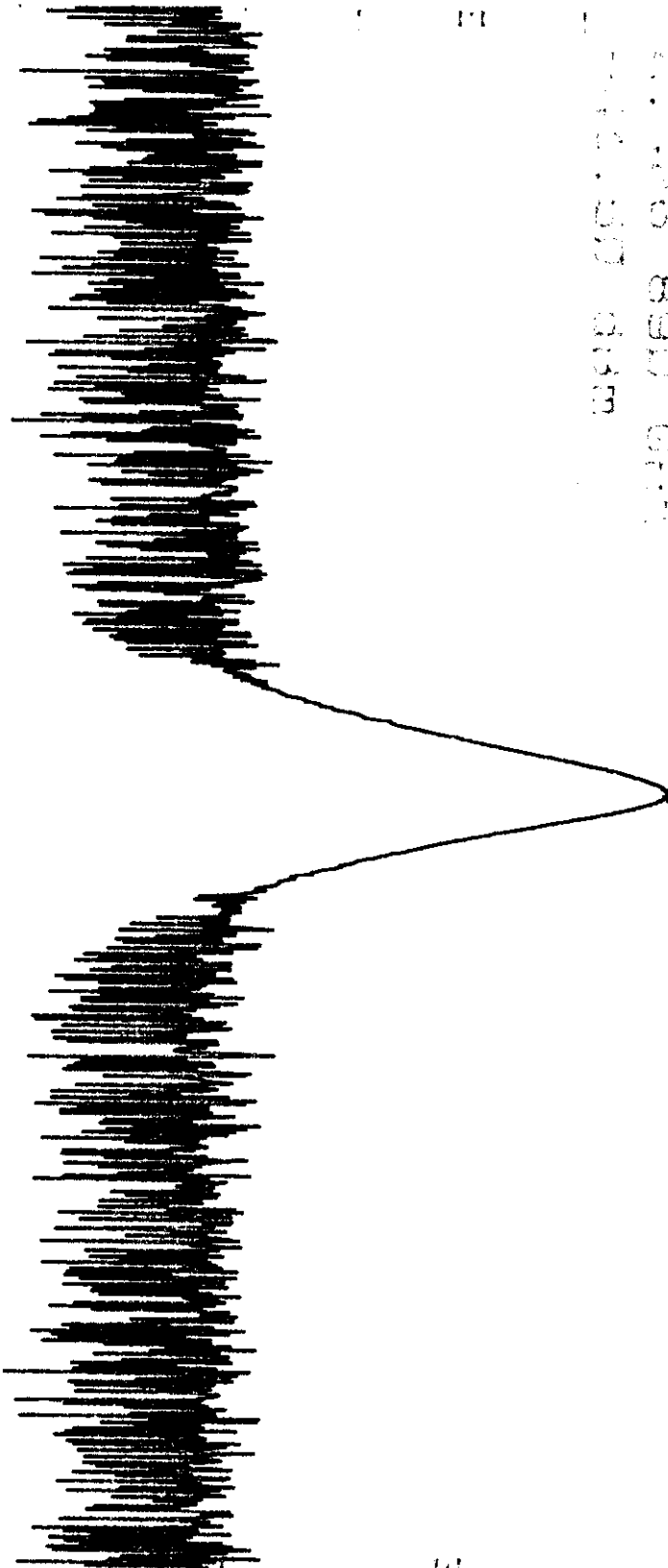
The Transmitter was placed on the test table. The EUT was configured for maximum response and was set up as described above and configured to transmit continuously. Signal was monitored with an HP 8566B Spectrum Analyzer, using the EMCO Horn Antenna, model # 3115. Unless stated otherwise, the antenna to EUT distance was 1 meter.

##### **6.1.3 Spectrum Analyzer Configuration (During Swept Frequency Scans)**

|                                   |            |
|-----------------------------------|------------|
| Start Frequency .....             | 2,424.4MHz |
| Stop Frequency.....               | 2,429.4MHz |
| Sweep Speed .....                 | Manual     |
| RES Bandwidth.....                | 100KHz     |
| Video Bandwidth.....              | 100KHz     |
| Quasi Peak Adapter Mode .....     | Bypass     |
| Quasi peak Adapter Bandwidth..... | Disabled   |

6.2. TRANSMITTER MEASUREMENT  
per FCC PART 90, SECTION §90.215

Transmitter Measurement Plot



Channel 2, 26.89 GHz

FES BW 200 MHz

VBI 200 MHz

Span 5.00 GHz  
Sweep 20.0 msec

Time 20.0 dBm  
Attenu 0 dB

Time 2, 26.89 GHz  
FES BW 200 MHz

## **APPENDIX A**

# **MEASUREMENT PROCEDURES**



## **MEASUREMENT PROCEDURES**

### **POWERLINE CONDUCTED EMISSIONS**

The measurements are performed in a 21' x 14' x 9' shielded room. A wooden bench 80 cm in height is located at the center of the shielded room; desktop EUT are placed on top of this bench. The rear of the EUT and bench are placed 40 cm from the shielded room wall. All items on the table (or test-table) are placed at least 10 cm apart. Excess EUT power cord is folded back and forth to form a 30-cm by 40 cm long bundle, hanging approximately in the middle between the ground plane and table. The EUT power cord is plugged into a LISN 80 cm away, while all other devices are plugged into a second LISN, also 80 cm away from the closest part of the EUT.

The highest emissions are also analyzed in detail by operating the spectrum analyzer in fixed tuned mode to determine the precise amplitude of the emissions. While doing so, the interconnecting cables are moved around to maximize the emissions, and the position of the peripheral devices are interchanged to check for any changes in emissions.

### **RADIATED EMISSIONS**

The EUT is set up in accordance with the suggested configuration given in FCC Measurement Procedure ANSI C63.4-1992.

The EUT and support equipment are set up on the turntable of an open field site. Desktop EUT are set up on a wooden stand (test table), 80 cm above the ground plane. All items on the table are placed at least 10 cm apart. Interconnecting cables which hang closer than 40 cm to the ground plane are folded back and forth to form a 30 cm by 40 cm long bundle, hanging approximately between the ground plane and table.

The highest emissions are also analyzed, in detail, by operating the spectrum analyzer in fixed tuned quasi-peak mode to determine the precise amplitude of the emissions. While doing so, the interconnecting cables are moved around and at the highest amplitudes observed, the EUT is rotated in the horizontal plane while changing the antenna polarization in the vertical plane to maximize the reading. Once the maximum reading is obtained, the antenna elevation and polarization will be varied between specified limits to maximize the readings. The position of the peripheral devices are interchanged to check for any changes in emissions.

## **APPENDIX B**

### **DESCRIPTION OF OPEN FIELD TEST SITE**

## **DESCRIPTION OF OPEN FIELD TEST SITE**

The open field test site is located on a 5.5 acre parcel, in the agriculturally zoned section of the City of Sunol, California. It is situated adjacent to Highway 680 on the West side, and adjacent to Calaveras Road in the South East. Distance of the site to each of these roads is a minimum of 200 feet. The north end of the site is surrounded by hills measuring up to 150 ft. high. The distance of the site to the hills is approximately 200 ft.

Supporting structures used to support device being measured and test instrumentation include the following:

- a. Test Platform measuring 50 ft by 100 ft. The platform is located on top of a very large ground screen, to enhance a homogeneous reflective surface.
- b. Test Site building measures approx. 5000 Sq. ft. This building houses the test laboratory, the shielded room, for performing Line Conducted test, test personnel and other support staff. The test building is an all-wooden building, constructed using 2 by 4-inch studs. It also contains all necessary electrical wiring and utilities.

The Rockford Engineering Services RFI test site described above has been approved for conducting contract RFI measurement work for client companies following the procedures stated in FCC/OET ANSI C63.4-1992, EN 55011, EN 55022 Vfg. 243/1991 and VDE-0877. The site attenuation characteristics are routinely measured and recorded every three months.

Test site approved by VDE, File # F-R HF-MK.

Test site approved by FCC, Registration # 31010/SIT/ Rockford.

Test site approved by VCCI, Membership # 242.

Test site approved by the Industry Canada, Registration # DEB 5072-7, DEB 90-3008.

## **APPENDIX C**

## **TEST EQUIPMENT**

## TEST EQUIPMENT

Some or all of the following test equipment is currently used to measure the conducted and/or radiated emissions from the equipment under test:

| TEST EQUIPMENT                                 | MODEL                    | S/N         |
|--|--------------------------|-------------|
| Spectrum Analyzer                              | Hewlett Packard 8590A    | 2752 A02715 |
| Spectrum Monitor                               | Rhode & Schwarz EZM      | 881 334/025 |
| Test Receiver (9KHz-30MHz)                     | Rhode & Schwarz ESH3     | RES 0753    |
| Test Receiver (20-1300MHz)                     | Rhode & Schwarz ESVP     | RES 0749    |
| Spectrum Analyzer                              | Hewlett-Packard 8566B    | 2618A02909  |
| Spectrum Analyzer                              | Hewlett-Packard 8567A    | 2602A00239  |
| Spectrum Analyzer Display (Site 1)             | Hewlett-Packard 8590A    | 2542A11954  |
| Spectrum Analyzer Display (Site 2)             | Hewlett-Packard 85662A   | 2542A12593  |
| Quasi Peak Adapter (Site 1)                    | Hewlett-Packard 85650    | 2521A00871  |
| Quasi Peak Adapter (Site 2)                    | Hewlett-Packard 85650A   | 2521A00737  |
| Preselector (Site 1)                           | Hewlett-Packard 85685A   | 2620A00265  |
| Preselector (Site 2)                           | Hewlett-Packard 85685A   | 2648A00462  |
| Preamplifier                                   | Hewlett-Packard 8447D    | 2648A04855  |
| Preamplifier                                   | Hewlett-Packard 8449B    | 3008A00101  |
| Computer                                       | Hewlett-Packard 9000/300 | RES 449     |
| Absorbing Clamp                                | MDS21                    | 891 092/025 |
| Antenna Cable (OPTK45)                         | RG8/u                    |             |
| Antenna System                                 | EMCO 3230                |             |
| Biconical Antenna (Site 1)                     | EMCO 3104                | 3549        |
| Biconical Antenna (Site 2)                     | EMCO 3104C               | 9111-4463   |
| Log Periodic Antenna (Site 1)<br>(200-1000MHz) | EMCO 3146                | 2075        |
| Log Periodic Antenna (Site 2)<br>(200-1000MHz) | EMCO 3146                | 9510-4202   |
| Adj. Element Dipole Antenna<br>(28 MHz-1GHz)   | EMCO 3120                |             |
| Horn Antenna                                   | Eaton 96001              | 2632        |
| Horn Antenna                                   | EMCO 3115                | 8812-3050   |
| LISN (25 Amp)                                  | EMCO 38825/2             | 9210-2008   |
| LISN (100 Amp)                                 | Solar 8610-50-TS-100N    |             |
| LISN   | EMCO 3825/2R             | 1188/1001   |

**TEST EQUIPMENT CONTD.**

| TEST EQUIPMENT                         | MODEL                            | S/N       |
|--|----------------------------------|-----------|
| Remote Controlled 8 ft Rotating Table  | RES RT1                          |           |
| Remote Controlled 25 ft Rotating Table | RES RT2                          |           |
| Remote Controlled 4 ft Rotating Table  | RES RT3, RT4, RT5                |           |
| Remote Controlled 4 m Antenna Mast     | RES AM1                          |           |
| Remote Controlled 6 m Antenna Mast     | RES AM2, RES AM3                 |           |
| Generator                              | 3 Phase 220Vac/50Hz              | DB7130B40 |
| Oscilloscope (300MHz)                  | Tektronix 2465                   |           |
| Digital Scope                          | Hitachi VC-6075                  | 8110016   |
| Power Analyzer                         | Valhalla Scientific/2101 RES 574 |           |
| Digital Thermometer                    | Omega 440                        |           |
| DC Power Supply                        | Kepeco JQE 150-1.5m              | H177085   |

The spectrum analyzers are self-calibrated before every shift and are calibrated to NIST standards annually

## **APPENDIX D**

### **DESCRIPTION OF SUPPORT EQUIPMENT**

## Description of Support Equipment

### *Support Equipment #1*

|                   |                                    |
|-------------------|------------------------------------|
| Description       | Television                         |
| Manufacturer      | Sony Trinitron Color Video Monitor |
| Model             | PVM-1271Q                          |
| Part Number       | Not Provided                       |
| Serial Number     | 2004815                            |
| Power Supply Type | Closed Frame Switching             |
|                   | 120V @ 50/60Hz 105W max.           |
| Power Cord        | Not Shielded                       |
| Data Cable        | Not Shielded, 1.5m long            |
| FCC ID            | AK896APVM-1271Q                    |

### *Support Equipment #2*

|               |                     |
|---------------|---------------------|
| Description   | Speaker             |
| Manufacturer  | Acer                |
| Model         | Not Provided        |
| Part Number   | 840216              |
| Serial Number | Not Provided        |
| Power Supply  | From Television     |
| Power Cord    | N/A                 |
| Data Cable    | Unshielded, 1m long |
| FCC ID        | N/A                 |

### *Support Equipment #3*

|               |                     |
|---------------|---------------------|
| Description   | 5mm Camera          |
| Manufacturer  | Acer                |
| Model         | Not Provided        |
| Part Number   | 840216              |
| Serial Number | Not Provided        |
| Power Supply  | From Adapter        |
| Power Cord    | N/A                 |
| Data Cable    | Unshielded, 1m long |
| FCC ID        | N/A                 |



## **APPENDIX E**

### **EUT TECHNICAL DESCRIPTION**

# EUT Technical Description

|                    |   |
|--------------------|---|
| <b>Applicant</b>   | Tote Vision   |
| <b>EUT</b>         | Consumer Video/Audio Sender/Receiver Surveillance Devices   |
| <b>Model Names</b> | Receiver: RX-01<br>Transmitter: TX-01H  |
| <b>FCC ID</b>      | OJUTX-01H   |
| <b>Description</b> | <i>Primarily to transmit and receive video signal. Audio signal may also accompany the video signal in some instances</i> |

## Technical Specification

|                               |  |
|-------------------------------|--|
| ♦ <b>Frequency Range</b>      | 2400 MHz (2.4 - 2.4835GHz)                   |
| ♦ <b>Frequency Tolerance</b>  | 0.1%   |
| ♦ <b>Output Power</b>         | 0.48mW                                       |
| ♦ <b>Power Supply/Current</b> | 12Vdc Adapter                                |
| ♦ <b>Transmission Power</b>   | 10mW to 500mW (EIRP)                         |
| ♦ <b>Channels</b>             | 3 to 5                                       |
| ♦ <b>Indoor Range</b>         | 50 bis to 75m (depending on transmission)    |
| ♦ <b>Outdoor Range</b>        | 800 bis to 2000m (depending on transmission) |
| ♦ <b>Antenna</b>              | Standard with omnidirection                  |
| ♦ <b>Video Input</b>          | +0.1 / 75Ω                                   |
| ♦ <b>Video Bandwidth</b>      | 50Hz - 5MHz                                  |
| ♦ <b>Modulation</b>           | FM   |
| ♦ <b>Audio Input</b>          | 500mV $\geq$ 10KΩ                            |
| ♦ <b>Audio Bandwidth</b>      | 15Hz - 20KHz                                 |
| ♦ <b>Current</b>              | Up to 650mA                                  |
| ♦ <b>Video</b>                | BNC / Camera Integrated                      |
| ♦ <b>Audio</b>                | Chinch / Microphone Integrated               |
| ♦ <b>Size/Weight/IP</b>       | 55 x 35 x 75mm (Aluminum), 130g, IP 30       |
| ♦ <b>Operation Temp.</b>      | 10°C bis to +55°C                            |
| ♦ <b>Maximum Humidity</b>     | 10% - 70% (not condensing)                   |