FCC PART 15 SUB-PART B & C
EMI TEST REPORT

on

Consumer Video/Audio Sender/Receiver Surveillance Devices

model names

Receiver: RX-01 & Transmitter: TX-01

provided for evaluation by

Tote Vision
969 Thomas Street
Seattle, Washington 98109-5212

tests and evaluation performed by

Rockford Engineering Services Inc.
9959 Calaveras Road, Box 543
Sunol, California 94586-0543
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NVLAP VCI Deutscher Akkreditierungs Rat DAR

EN45001 Accredited Compliance Laboratory [RES-GmbH]
Registration number: TTI-P-G 159/98-00 [RES-GmbH

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This report contains 45 pages

Accepted by the Federal Communications Commission (FCC) for FCC Methods, CISPR Methods and AUSTEL Technical Standards (Ref: NVLAP Lab Code 200172-0)

Approved by the Industry Canada for Telecom Testing

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-01

Date of Test: April 6 through 9, 1999

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. Fundamental /Harmonics Emissions Test in accordance with the FCC test procedure 47 CFR §15.249 and §15.209. Part 4 of this report contains details.

4. Signal Bandwidth requirements. Part 5 of this report contains details

5. Frequency Stability Test requirements in accordance with 47CFR §15.215. 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. Fundamental/Harmonics, Signal Bandwidth and Frequency Stability test requirement limits of, SubPart C.

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-01

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

Equipment Under Test	*Line Conducted*	*Radiated Emissions*	*Fundamental*	*Bandwidth*	*Frequency Stability*
Receiver	♦ Sony TV ♦ Acer Speaker	♦ Sony TV ♦ Acer Speaker	N/A	N/A	N/A
Transmitter	5mm Surveillance Camera	5mm Surveillance Camera	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, on top of LISN to form a 30 cm by 40 cm bundle. 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, and the position of the peripheral devices were interchanged to check for any changes in 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 three phases and neutral current carrying conductors of the EUT power cord compared to the FCC Class B limit.

INDICATED FREQ (MHz)	AMPL dBuV	CABLE LOSS dB	CORR AMPL dBuV	COND - -	GND	CLASS B LIMIT dBuV	MARGIN (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: 

Test Results

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

INDICATED FREQ (MHz)	AMPL dBuV	CABLE LOSS dB	CORR AMPL dBuV	COND - -	GND - -	CLASS B LIMIT dBuV	MARGIN (dB)
21.50	38.0	1.0	39.0	Hot	con	48.0	-9.0
22.30	37.2	1.0	38.2	Neut	con	48.0	-9.8
25.01	34.1	1.0	35.1	Neut	con	48.0	-12.9
25.50	37.2	1.0	38.2	Hot	con	48.0	-9.8
27.10	37.3	1.0	38.3	Neut	con	48.0	-9.7
27.10	36.1	1.0	37.1	Neut	con	48.0	-10.9
28.20	36.3	1.0	37.3	Neut	con	48.0	-10.7
28.20	32.5	1.0	33.5	Hot	con	48.0	-14.5
28.50	34.7	1.0	35.7	Hot	con	48.0	-12.3
29.90	38.8	1.0	39.8	Hot	con	48.0	-8.2
29.90	39.9	1.0	40.9	Neut	con	48.0	-7.1

Table 2.2.3 Power line Conducted Emissions for Transmitter, model TX-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.**

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 and the position of the peripheral devices were interchanged to check for any changes in 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..... 10Hz
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:	Bruce 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 FREQ MHz	AMPL dBuV/m	CORRECTION ANT dB	CAB dB	FACT DIST dB	CORR AMPL dbuV/m	TURNTAB ANG DEG	HT m	ANT POL -	FCC 15A LIMIT dBuV/m	MARG dB	FCC 15B LIMIT dBuV/m	MARG 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: Bruce 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 FREQ MHz	AMPL dBuV/m	CORRECTION ANT dB	CAB dB	FACT DIST dB	CORR AMPL dbuV/m	TURNTAB ANG DEG	HT m	ANT POL -	FCC CLASS B LIMIT dBuV/m	MARGIN dB
219.35	17.1	12.5	4.8	0.0	34.2	180	1.6	HL	46.0	-11.8
219.35	14.6	12.5	4.8	0.0	31.9	180	1.0	VL	46.0	-14.1
228.88	23.0	12.2	5.0	0.0	40.2	180	1.6	HL	46.0	-5.8
238.43	19.7	12.7	5.1	0.0	37.5	180	1.6	HL	46.0	-8.5
267.03	24.8	13.9	5.2	0.0	43.9	180	2.0	HL	46.0	-2.1
267.04	18.7	13.9	5.2	0.0	37.8	180	1.0	VL	46.0	-8.2
276.56	21.3	14.3	5.2	0.0	40.8	180	1.0	VL	46.0	-5.2
276.56	19.5	14.3	5.2	0.0	39.0	180	2.0	HL	46.0	-7.0
314.72	18.2	15.2	5.3	0.0	38.7	180	2.0	HL	46.0	-7.3
314.72	16.3	15.2	5.3	0.0	36.8	180	1.0	VL	46.0	-9.2

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

PART 4 - OPEN FIELD RADIATED EMISSIONS (FUNDAMENTAL/HARMONICS) per FCC PART 15 SUBPART C

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. At frequencies above 1GHz, average measurements, if necessary, were made using the video filter method and quasi peak detector and preselector functions were disabled. EUT was powered by a 12Vdc adapter.

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 strength were monitored at an HP 8566B Spectrum Analyzer, below and above the center frequencies using an appropriate receiving antenna. Maximum emissions was obtained by varying the height of the antennas and then orienting the turntable in 360-degree turns with the analyzer in the manual mode. Unless stated otherwise, the antenna to EUT distance was 3 meters.

Any multiple entries cover the two orientations of the transmitters and cover all three axes due to rotation of the test table and EUT and are the maximum signals resulting from rotation and height search at each frequency. The measurements are peak and/or quasi-peak measurements below 1000MHz and peak and/or average measurements above 1000 MHz.

4.1. CONFIGURATION AND PROCEDURE, CONTD.

4.1.3 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

4.1.4 Spectrum Analyzer Configuration (During Swept Frequency Scans)

Start Frequency	30 MHz
Stop Frequency	40 MHz
Sweep Speed	Manual
RES Bandwidth	100 KHz
Video Bandwidth	100 KHz
Quasi Peak Adapter Mode	Normal
Quasi peak Adapter Bandwidth	120 KHz

4.2. OPEN FIELD RADIATED EMISSIONS (FUNDAMENTAL/HARMONICS) per FCC PART 15 SUBPART C

4.2.1 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

4.2.2 EUT Configuration Summary

See 4.1.1.

4.2.3 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 polarizations, and EUT orientations.

Freq. GHz	Ampl. dBuV	Cable Loss dB	Ant. Loss dB	Corr. Ampl. dBuV	Limit dBuV	Margin dBuV	Pola-rization	Type of Emissions
2.4306	38.00	5.80	30.1	73.90	93.97	-20.07	Vertical	Fundamental
4.8612	-37.52	6.52	34.8	3.80	53.97	-50.17	Vertical	Harmonics
7.2918	-46.00	11.50	37.9	3.4	53.97	-50.57	Vertical	Harmonics
9.7224	-30.0	28.6	37.9	36.5	53.97	-17.47	Vertical	Harmonics
12.1530	-30.0	38.4	39.4	47.8	53.97	-6.17	Vertical	Harmonics
14.5836	-50.0	45.1	41.8	46.7	53.97	-7.27	Vertical	Harmonics
17.0142	-50.0	50.0	44.4	44.4	53.97	-9.57	Vertical	Harmonics

Table 4.2.3 Open Field Radiated Emissions (Fundamental/Harmonics) for Transmitter, model TX-01

No emissions of significant levels were observed between 9KHz 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 17.0142GHz.

Conclusion: **The EUT meets the requirements of the test reference for Radiated Emissions (Fundamental/Harmonics).**

4.2. OPEN FIELD RADIATED EMISSIONS (FUNDAMENTAL/HARMONICS) per FCC PART 15 SUBPART C

4.2.1 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: .....

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 polarizations, and EUT orientations.

Freq. GHz	Ampl. dBuV	Cable Loss dB	Ant. Loss dB	Corr. Ampl. dBuV	Limit dBuV	Margin dBuV	Polarization	Type of Emissions
2.4306	31.60	5.80	30.1	67.50	93.97	-26.47	Horizontal	Fundamental
4.8612	-26.72	6.52	34.8	14.60	53.97	-39.37	Horizontal	Harmonics
7.2918	-51.77	11.50	37.9	-2.37	53.97	-56.34	Horizontal	Harmonics
9.7224	-30.0	28.60	37.9	36.50	53.97	-17.47	Horizontal	Harmonics
12.1530	-30.0	38.4	39.4	47.8	53.97	-6.17	Horizontal	Harmonics
14.5836	-50.0	45.1	41.8	46.7	53.97	-7.27	Horizontal	Harmonics
17.0142	-50.0	50.0	44.4	44.4	53.97	-9.57	Horizontal	Harmonics

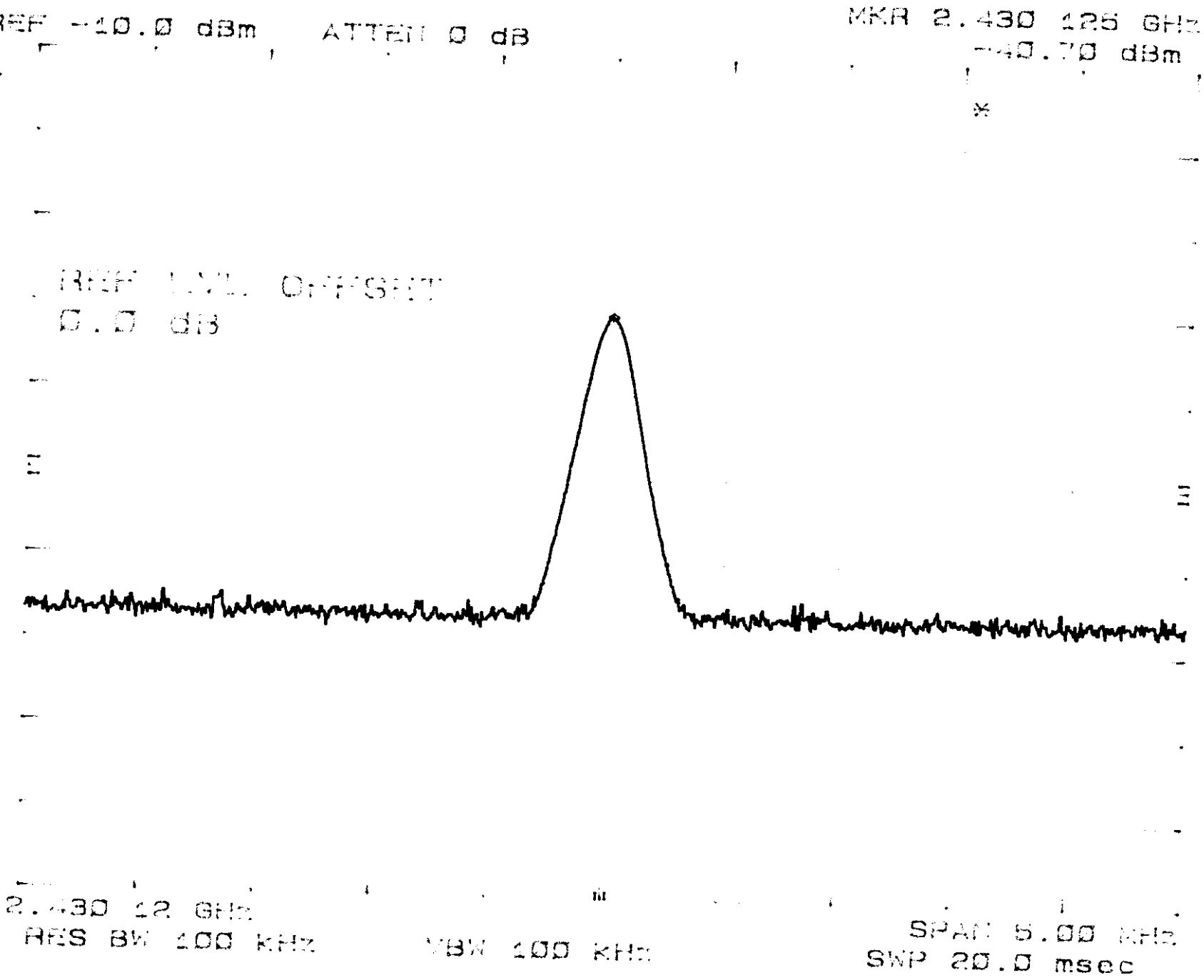
Table 4.2.3 Open Field Radiated Emissions (Fundamental/Harmonics) for Transmitter, model TX-01

No emissions of significant levels were observed between 9KHz 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 17.0142GHz.

Conclusion: **The EUT meets the requirements of the test reference for Radiated Emissions (Fundamental/Harmonics).**

Plot of Transmitter, model TX-01

Output Power at 3m, Horizontal Polarity



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PART 5 - PART 15 SUBPART C BANDWIDTH TESTS

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 12Vdc powered.

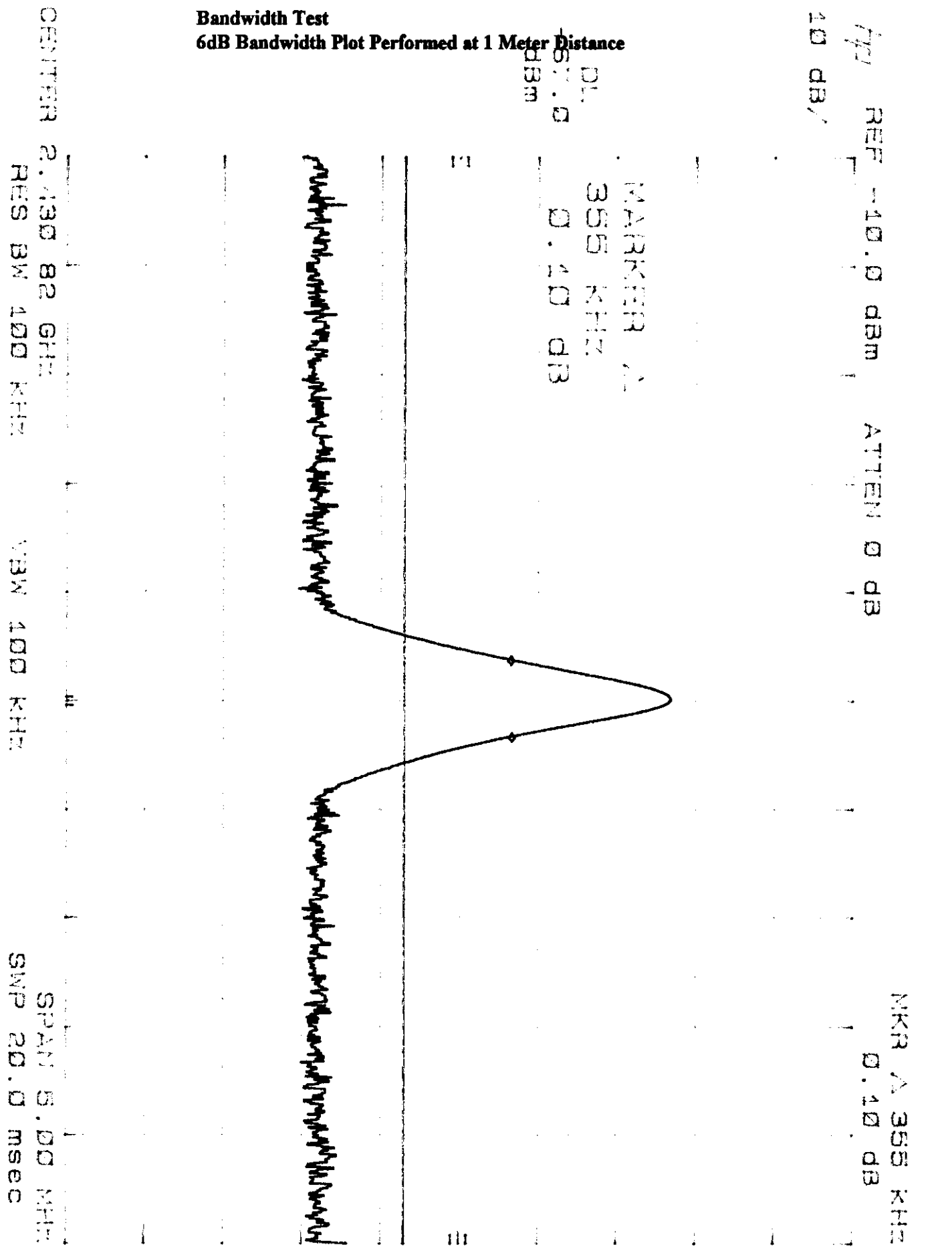
5.1.2 Test Procedure

The Transmitter was placed on the test table. The EUT was configured for maximum response and was s 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.

5.1.3 Spectrum Analyzer Configuration (During Swept Frequency Scans)

Start Frequency 2,427.5MHz
Stop Frequency..... 2,432.5 MHz
Sweep Speed ..... Manual
RES Bandwidth..... 100KHz
Video Bandwidth..... 100KHz
Quasi Peak Adapter Mode ..... Normal
Quasi peak Adapter Bandwidth..... Disabled

Bandwidth Test
6dB Bandwidth Plot Performed at 1 Meter Distance



PART 6 - PART 15 SUBPART C FREQUENCY STABILITY TEST

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. At frequencies above 1GHz, average measurements, if necessary, were made using the video filter method and quasi peak detector and preselector functions were disabled. EUT was powered by a 12Vdc adapter.

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. Frequency stability was monitored with the HP 8566B Spectrum Analyzer, below and above the center frequencies using an appropriate receiving antenna. Procedure was in accordance with ANSI C63.4-1992, CFR 47 Part 15 SubPart C.

6.1.3 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

6.1.4 Spectrum Analyzer Configuration (During Swept Frequency Scans)

Start Frequency	30 MHz
Stop Frequency	40 MHz
Sweep Speed	Manual
RES Bandwidth	100 KHz
Video Bandwidth	100 KHz
Quasi Peak Adapter Mode	Normal
Quasi peak Adapter Bandwidth	120 KHz

6.2. FREQUENCY STABILITY TEST per FCC PART 15 SUBPART C

6.2.1 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

6.2.2 EUT Configuration Summary

See 6.1.1.

6.2.3 Test Results

Temperature	22°C	22°C	22°C	22°C
Time	Start Up	2 minutes	5 minutes	10 minutes
Frequency	2.43050	2.43046	2.43040	2.43029

Table 6.2.3 Stability Test for Transmitter, model TX-01

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

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
Preamp	Hewlett-Packard 8447D	2648A04855
Preamp	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) (200-1000MHz)	EMCO 3146	2075
Log Periodic Antenna (Site 2) (200-1000MHz)	EMCO 3146	9510-4202
Adj. Element Dipole Antenna (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	Kepco 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

EUT Technical Description

Applicant	Tote Vision
EUT	Consumer Video/Audio Sender/Receiver Surveillance Devices
Model Names	Receiver: RX-01 Transmitter: TX-01
FCC ID	OJUTX-01
Description	***Primarily to transmit and receive video signal. Audio signal may also accompany the video signal in some instances***
Technical Specification ♦ Frequency Range ♦ Frequency Tolerance ♦ Output Power ♦ Power Supply/Current ♦ Transmission Power ♦ Channels ♦ Indoor Range ♦ Outdoor Range ♦ Antenna ♦ Video Input ♦ Video Bandwidth ♦ Modulation ♦ Audio Input ♦ Audio Bandwidth ♦ Current ♦ Video ♦ Audio ♦ Size/Weight/IP ♦ Operation Temperature ♦ Maximum Humidity	 2400 MHz (2.4 - 2,4835GHz) 0.1% 0.48mW 12Vdc Adapter 10mW to 500mW (EIRP) 3 to 5 50 bis to 75m (depending on transmission) 800 bis to 2000m (depending on transmission) Standard with omnidirection $\pm$0.1 / 75Ω 50Hz - 5MHz FM 500mV $\geq$ 10KΩ 15Hz - 20KHz Up to 650mA BNC / Camera Integrated Chinch / Microphone Integrated 55 x 35 x 75mm (Aluminum), 130g, IP 30 10°C bis to +55°C 10% - 70% (not condensing)

Plot of Transmitter, model TX-01

Output Power at 3m, Vertical Polarity