Rockford Engineering Services Inc.

over 20 years experience in compliance testing and engineering consulting services
9959 Calaveras Road Box 543, Sunol, CA 94586-0543
phone: (925) 862-2944 • fax: (925) 862-9013 • internet: www.resemc.com
EN 45001, NVLAP and VCCI Accredited Laboratory
Certified by Rockford Engineering Services GmbH (A Competent Body)

Date: Friday July 16, 1999

Mr. Joe Dichoso
FCC Application Processing Branch
7435 Oakland Mills Road
Columbia, Maryland 21046

Please scan into EA# 94478

Subject: *FCC ID OJUTX-01*

Dear Mr. Dichoso,

Answers to Questions

Re: **FCC ID: OJUTX-01**
Applicant: ~~Tote Vision~~
731 Confirmation No.: **EA94478**

Thank you for your emails of June 23 and July 2. Please find hereunder and attached response to questions contained in those mails.

Response to Email of June 23, 1999

1. Please find attached, the photograph you requested
2. Compliance to Section 15.203 is contained in page 7 of attached report
3. Antenna gain is 22dB 2.2
(This information is provided by applicant, see attached)
4. There is one channel at the frequency of 2.430GHz

USA Facilities

9959 Calaveras Road, PO Box 543
Sunol, CA 94586-0543
Tel: (925) 862-2944
Fax: (925) 862-9013

4750 Williams Wharf Road, PO Box 7
St. Leonard, MD 20685
Tel: (301) 855-1375
Fax: (410) 586-1460

Europe Facility

Robert-Bosch-Straße 2-4
61184 Karben, Germany
Tel: (011) 49-6039-9182-0
Fax: (011) 49-6039-9182-29

Date: Friday July 16, 1999

Mr. Joe Dichoso
FCC Application Processing Branch

Re: **FCC ID: OJUTX-01**
Applicant: **Tote Vision**
731 Confirmation No.: **EA94478**

5. Additional frequencies is found on page 14 of attached report, copy listed below:

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	
2402.00	-31.3	28.7	20.2	0.0	17.6	0	1.0	VH	54.0	-36.4	Avg
2481.00	-33.3	33.8	24.8	0.0	25.3	0	1.0	VH	54.0	-28.7	Avg

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

No emissions of significant levels were observed between 2.4GHz 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 2.4835GHz.

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

6. The manual indicates transmission power of 10mW and 500mW, because the field strength level is low compared to what is expected with a transmitter with the listed 10mW and 500mW EIRP transmitter Power:

Amplitude	+	Cable Factor	+	Antenna Factor	+	Distance		
-33.1dBm	+	6.8dB	+	33.1dB	+	20dB	=	26.8dBm

500mW = 27dBm
(See the Vertical Polarity Plot of Transmitter already forwarded to you with original application)

For Output Power at 3m, Horizontal Polarity:

The field strength level is low compared to what is expected with a transmitter with the listed 10mW and 500mW EIRP transmitter Power:

Amplitude	+	Cable Factor	+	Antenna Factor	+	Distance		
-40.7dBm	+	6.8dB	+	33.1dB	+	20dB	=	19.2dBm

500mW = 27dBm
(See the Horizontal Polarity Plot of Transmitter already forwarded to you with original application)
Date: Friday July 16, 1999

Mr. Joe Dichoso
FCC Application Processing Branch

Re: **FCC ID: OJUTX-01**
Applicant: **Tote Vision**
731 Confirmation No.: **EA94478**

7. The field strength levels are Quasi-Peak and Average. These measurements are in the data tables indicated on pages: 10, 13, 14, 15, 17 and 18 of attached report.

Response to Email of July 2, 1999

1. The application is hereby revised and approval is being sought for Transmitter with FCC ID: OJUTX-01. Attached report has been revised to reflect application for approval for Transmitter, model TX-01 under FCC Part 15 Subpart C.

You may contact Bruce Gordon at 925-862-2944 for additional technical questions or concerns. Thank you.

Sincerely,

Miss. Funke Aderibigbe
Documentation/Publication
Rockford Engineering Services Incorporated

USA Facilities
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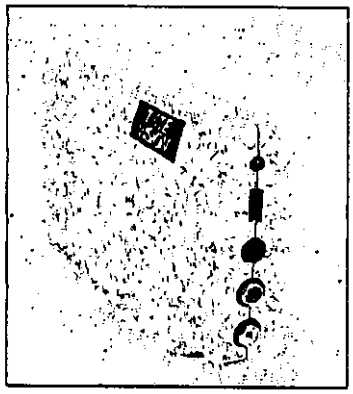
Europe Facility
Robert-Bosch-Straße 2-4
61184 Karben, Germany
Tel: (011) 49-6039-9182-0
Fax: (011) 49-6039-9182-29

The Biggest thing in Little Wireless Transmitters

Transmitter Board TX-01/01H

← *Actual Size*

TX-01H



Receiver RX-01

World's Smallest Transmitter Board

- Small, compact and light weight for easy installation
- Easily concealed in small objects

Frequency:	2.430 GHz
TX-01:Transmission Power:	0.48mW (EIRP)
TX-01H:Transmission Power:	250mW(EIRP)
TX-01 :Range (indoor/outdoor):	20m (approx.)-depends on wall construction/150m (approx.)-L.O.S.
TX-01H:Range (indoor/outdoor):	60m (approx.)-depends on wall construction/2000m (approx.)-L.O.S.
Antenna:	Omnidirectional
Antenna gain:	2.2 dB
Channels:	1
Power Requirements:	5~12 VDC/240mA
Operating Temperature:	-10°~55°C
TX-01 Dimensions:	59 x 20 x 7.5 mm (LWH)
TX-01H Dimensions:	? x ? x ? mm (LWH)
TX-01 Weight:	150g
Recommended Receiver:	RX-01 (1 channel)
Video IN/OUT:	1Vpp/75ohm
Dimensions:	150x40x88mm (LWH)
Weight:	170g

Specifications subject to change without notice

TX-01

TX-01H RX-01

969 Thomas Street • Seattle, WA 98109
Tel: 206-623-6000 • FAX: 206-623-6609
Email: totevision@accessone.com
http://www.accessone.com/~tote

TOTE VISION

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

(2)

on

Consumer Video/Audio Sender

model name

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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Fax: (925) 862-9013
Email: service@rockfordengr.com
Web Site: http://www.resemc.com

NVLAP VCI Deutscher Akkreditierungs Rat DAR

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

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

on

Consumer Video/Audio Sender Transmitter: TX-01

provided for evaluation by

Tote Vision
969 Thomas Street
Seattle, Washington 98109-5212

This report contains 31 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

TABLE OF CONTENTS

Part 1 General 6
1.1 Test Methodology 6
1.1.1 Test Facility 6
1.1.2 Accuracy of Test Data 6-7
1.2 Summary 8
1.2.1 Description of EUT 8
1.2.2 Support Equipment Included in Tests 8

FCC Part 15 SubPart B

Part 2 Power line Conducted Emissions 9
2.1 Configuration and Procedure 9
2.1.1 EUT Configuration 9
2.1.2 Test Procedure 9
2.1.3 Field Strength Calculation 9
2.1.4 Spectrum Analyzer Configuration 9
2.2 Power line Conducted Emissions 10
2.2.1 Administrative Details 10
2.2.2 EUT Configuration Summary 10
2.2.3 Powerline Conducted Emissions Test Results 10

FCC Part 15 SubPart B

Part 3 Open Field Radiated Emissions 11
3.1 Configuration and Procedure 11
3.1.1 EUT Configuration 11
3.1.2 Test Procedure 11
3.1.3 Field Strength Calculation 12
3.1.4 Spectrum Analyzer Configuration 12
3.2 Open Field Radiated Emissions 13
3.2.1 Administrative Detail 13
3.2.2 EUT Configuration Summary 13
3.2.3 Open Field Radiated Emissions Test Results 13

TABLE OF CONTENTS, CONTD.

FCC Part 15 SubPart C

Part 4 Fundamental/Harmonics Tests 15
4.1 Configuration and Procedure 15
4.1.1 EUT Configuration 15
4.1.2 Test Procedure 16
4.1.3 Field Strength Calculation 16
4.1.4 Spectrum Analyzer Configuration 17
4.2 Bandwidth Tests 17
4.2.1 Administrative Detail 17
4.2.2 EUT Configuration Summary 17
4.2.3 Fundamental & Harmonics Test Results 17

FCC Part 15 SubPart C

Part 5 Bandwidth Tests 21
5.1 Configuration and Procedure 21
5.1.1 EUT Configuration 21
5.1.2 Test Procedure 21
5.1.3 Spectrum Analyzer Configuration 22
5.2 Bandwidth Plot 23

FCC Part 15 SubPart C

Part 6 Frequency Stability Tests 23
6.1 Configuration and Procedure 23
6.1.1 EUT Configuration 23
6.1.2 Test Procedure 23
6.1.3 Field Strength Calculation 23
6.1.4 Spectrum Analyzer Configuration 24
6.2 Frequency Stability Test 24
6.2.1 Administrative Detail 24
6.2.2 EUT Configuration Summary 24
6.2.3 Test Results 24

TABLE OF CONTENTS, CONTD.

TABLES

2.2.3 Powerline Conducted Emissions for Transmitter, model TX-01 10
3.2.3 Open Field Radiated Emissions Transmitter, model TX-01 13-14
4.2.3 Fundamental & Harmonics for Transmitter, model TX-01 17-18
6.2.3 Frequency Stability Test for Transmitter, model TX-01 24

PLOTS

4.2.4 Fundamental Plot on Output Power at 3m, Vertical Polarity 19
4.2.5 Fundamental Plot on Output Power at 3m, Horizontal Polarity 20
5.2 6dB Bandwidth Plot at 1m Distance 22

APPENDICES

A: Measurement Procedures 25
B: Description of Open Field Test Site 26
C: Test Equipment 27-28
D: Description of Support Equipment 29
E: EUT Specifications 30
Modification 31

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
Model: Transmitter: TX-01
FCC ID: OJUTX-01

Date of Test: April 6 through 9, 1999

1.1. TEST METHODOLOGY, CONTD.

Antenna Requirement: The equipment meets the requirement of FCC test procedure 47 CFR §15.203, because it will be professionally installed. In addition, only typos of antenna submitted for testing will be marketed to be used with the transmitter.

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 and §15.31(m). 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 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*
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 was 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 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 EUT was set up as described above, in live functional modes. 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.

2.1.3 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 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	QP
22.30	37.2	1.0	38.2	Neut	con	48.0	-9.8	QP
25.01	34.1	1.0	35.1	Neut	con	48.0	-12.9	QP
25.50	37.2	1.0	38.2	Hot	con	48.0	-9.8	QP
27.10	37.3	1.0	38.3	Neut	con	48.0	-9.7	QP
27.10	36.1	1.0	37.1	Neut	con	48.0	-10.9	QP
28.20	36.3	1.0	37.3	Neut	con	48.0	-10.7	QP
28.20	32.5	1.0	33.5	Hot	con	48.0	-14.5	QP
28.50	34.7	1.0	35.7	Hot	con	48.0	-12.3	QP
29.90	38.8	1.0	39.8	Hot	con	48.0	-8.2	QP
29.90	39.9	1.0	40.9	Neut	con	48.0	-7.1	QP

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 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 was set up as described above, in live functional modes. 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.

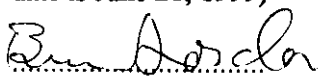
3.1.4 Spectrum Analyzer Configuration (during swept frequency scans)

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: 

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 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	QP
219.35	14.6	12.5	4.8	0.0	31.9	180	1.0	VL	46.0	-14.1	QP
228.88	23.0	12.2	5.0	0.0	40.2	180	1.6	HL	46.0	-5.8	QP
238.43	19.7	12.7	5.1	0.0	37.5	180	1.6	HL	46.0	-8.5	QP
267.03	24.8	13.9	5.2	0.0	43.9	180	2.0	HL	46.0	-2.1	QP
267.04	18.7	13.9	5.2	0.0	37.8	180	1.0	VL	46.0	-8.2	QP
276.56	21.3	14.3	5.2	0.0	40.8	180	1.0	VL	46.0	-5.2	QP
276.56	19.5	14.3	5.2	0.0	39.0	180	2.0	HL	46.0	-7.0	QP
314.72	18.2	15.2	5.3	0.0	38.7	180	2.0	HL	46.0	-7.3	QP
314.72	16.3	15.2	5.3	0.0	36.8	180	1.0	VL	46.0	-9.2	QP

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.**

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

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	AMPL	CORRECTION ANT	CAB	FACT DIST	CORR AMPL	TURNTAB ANG	HT	ANT POL	FCC CLASS B LIMIT	MARGIN	
MHz	dBuV/m	dB	dB	dB	dbuV/m	DEG	m	-	dBuV/m	dB	
2402.00	-31.3	28.7	20.2	0.0	17.6	0	1.0	VH	54.0	-36.4	Avg
2481.00	-33.3	33.8	24.8	0.0	25.3	0	1.0	VH	54.0	-28.7	Avg

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

No emissions of significant levels were observed between 2.4GHz 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 2.4835GHz.

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 quasi-peak measurements below 1000MHz and 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: 

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	Measure-ment
2.4306	38.00	5.80	30.1	73.90	93.97	-20.07	Vertical	Fundamental	Avg.
4.8612	-37.52	6.52	34.8	3.80	53.97	-50.17	Vertical	Harmonics	Avg.
7.2918	-46.00	11.50	37.9	3.4	53.97	-50.57	Vertical	Harmonics	Avg.
9.7224	-30.0	28.6	37.9	36.5	53.97	-17.47	Vertical	Harmonics	Avg.
12.1530	-30.0	38.4	39.4	47.8	53.97	-6.17	Vertical	Harmonics	Avg.
14.5836	-50.0	45.1	41.8	46.7	53.97	-7.27	Vertical	Harmonics	Avg.
17.0142	-50.0	50.0	44.4	44.4	53.97	-9.57	Vertical	Harmonics	Avg.

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

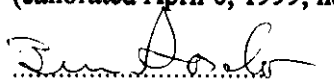
No emissions of significant levels were observed between 9KHz and the lowest frequencies shown in the above data. No emissions of significant levels were observed between the highest frequency shown in the above data and 17.0142GHz.

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	Pola-rization	Type of Emissions	Measure-ment
2.4306	31.60	5.80	30.1	67.50	93.97	-26.47	Horizontal	Fundamental	Avg.
4.8612	-26.72	6.52	34.8	14.60	53.97	-39.37	Horizontal	Harmonics	Avg.
7.2918	-51.77	11.50	37.9	-2.37	53.97	-56.34	Horizontal	Harmonics	Avg.
9.7224	-30.0	28.60	37.9	36.50	53.97	-17.47	Horizontal	Harmonics	Avg.
12.1530	-30.0	38.4	39.4	47.8	53.97	-6.17	Horizontal	Harmonics	Avg.
14.5836	-50.0	45.1	41.8	46.7	53.97	-7.27	Horizontal	Harmonics	Avg.
17.0142	-50.0	50.0	44.4	44.4	53.97	-9.57	Horizontal	Harmonics	Avg.

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, Vertical Polarity

The field strength level is low compared to what is expected with a transmitter with the listed 10mW and 500mW EIRP transmitter Power:

Amplitude	+	Cable Factor	+	Antenna Factor	+	Distance		
-33.1dBm	+	6.8dB	+	33.1dB	+	20dB	=	26.8dBm

500mW = 27dBm

(See the plot, filed with original application)

Plot of Transmitter, model TX-01

Output Power at 3m, Horizontal Polarity

The field strength level is low compared to what is expected with a transmitter with the listed 10mW and 500mW EIRP transmitter Power:

Amplitude	+	Cable Factor	+	Antenna Factor	+	Distance		
-40.7dBm	+	6.8dB	+	33.1dB	+	20dB	=	19.2dBm

500mW = 27dBm

(See the plot, filed with original application)

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 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.

5.1.3 Spectrum Analyzer Configuration (During Swept Frequency Scans)

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

5.2. BANDWIDTH TEST per FCC PART 15 SUB-PART C, SECTION §15.247

6dB Bandwidth Plot Performed at 1 Meter Distance

(See the plot, filed with original application)

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. 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.

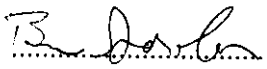
A	=	Average
P	=	Peak
Q	=	Quasi Peak

6.1.4 Spectrum Analyzer Configuration (During Swept Frequency Scans)

Start Frequency 2.43055MHz
Stop Frequency..... 2.43025 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:	

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

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

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

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

Support Equipment #1

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

Applicant	Tote Vision
EUT	Consumer Video/Audio Sender
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***	2400 MHz (2.4 - 2.4835GHz)
♦ ***Frequency Tolerance***	0.1%
♦ ***Output Power***	0.48mW
♦ ***Power Supply/Current***	12Vdc Adapter
♦ ***Transmission Power***	10mW to 500mW (EIRP)
♦ ***Channel(s)***	1
♦ ***Indoor Range***	50 bis to 75m (depending on transmission)
♦ ***Outdoor Range***	800 bis to 2000m (depending on transmission)
♦ ***Antenna***	Standard with omnidirection
♦ ***Video Input***	$\pm$0.1 / 75Ω
♦ ***Video Bandwidth***	50Hz - 5MHz
♦ ***Modulation***	FM
♦ ***Audio Input***	500mV $\geq$ 10KΩ
♦ ***Audio Bandwidth***	15Hz - 20KHz
♦ ***Current***	Up to 650mA
♦ ***Video***	BNC / Camera Integrated
♦ ***Audio***	Chinch / Microphone Integrated
♦ ***Size/Weight/IP***	55 x 35 x 75mm (Aluminum), 130g, IP 30
♦ ***Operation Temp.***	10^0C bis to +55^0C
♦ ***Antenna Gain***	22dB
♦ ***Maximum Humidity***	10% - 70% (not condensing)

MODIFICATION LETTER

TO WHOM IT MAY CONCERN:

This is to certify that no modifications were necessary for:

Consumer Video/Audio Sender, model TX-01

FCC ID: OJUTX-01

To comply with conducted and radiated emissions and bandwidth limits of FCC Rules Part 15, SubPart B & C.

For further inquiries, please contact:

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