ADDENDUM TO FC02-059

FOR THE

WIRELESS GARAGE DOOR OPENER, TRANSMITTER 101200, RECEIVER 101300 AND SET, 101000

FCC PART 15 SUBPART C SECTION 15.231 & SUBPART B SECTIONS 15.107 AND 15.109 CLASS B

COMPLIANCE

DATE OF ISSUE: JULY 8, 2002

PREPARED FOR:

F2P Electronics
200 W. 12th Street
Waynesboro, VA 22980

P.O. No.: 18
W.O. No.: 79084

PREPARED BY:

Mary Ellen Clayton
CKC Laboratories, Inc.
5473A Clouds Rest
Mariposa, CA 95338

Date of test: June 6-10, 2002

Report No.: FC02-059A

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ADMINISTRATIVE INFORMATION

DATE OF TEST:	June 6-10, 2002
DATE OF RECEIPT:	June 6, 2002
PURPOSE OF TEST:	To demonstrate the compliance of the Wireless Garage Door Opener, Transmitter 101200, Receiver 101300 and Set, 101000 with the requirements for FCC Part 15 Subpart C Section 15.231 & Subpart B Sections 15.107 and 15.109 Class B devices. The purpose of Addendum A is to revise the spec limit for spurious emissions testing.
TEST METHOD:	ANSI C63.4 (1992)
MANUFACTURER:	F2P Electronics 200 W. 12th Street Waynesboro, VA 22980
REPRESENTATIVE:	Chris de Janasz
TEST LOCATION:	CKC Laboratories, Inc. 5473A Clouds Rest Mariposa, CA 95338

SUMMARY OF RESULTS

As received, the F2P Electronics Wireless Garage Door Opener, Transmitter 101200, Receiver 101300 and Set, 101000 was found to be fully compliant with the following standards and specifications:

United States

- FCC Part 15 Subpart B Section 15.107 and 15.109 Class B
- FCC Part 15 Subpart C Section 15.231
- ANSI C63.4 (1992) method

FCC Part 15.231 vs RSS 210 6.1.1

FCC PART 15.231	Canada RSS 210	Notes
15.231 (a)	6.1.1 (a)	Periodic Operation
15.231 (b)	6.1.1 (b)	Field Strength Limitations (RSS 210 Table 1)
15.231 (c)	6.1.1 (c)	Bandwidth Limitation
15.231 (e)	6.1.1 (e)	Reduced Field Strength (RSS 210 Table 4)
15.35 (c)	6.5	Pulsed Emissions Averaging
15.203	5.5	Transmitter Antenna
15.205	6.3	Restricted Bands of Operation (RSS 210 Table 2)

CONDITIONS FOR COMPLIANCE

A 680 Ohm resistor was placed at R1. Conducted emissions is not required for the transmitter because it is battery powered.

APPROVALS

QUALITY ASSURANCE:

Steve Behm, Director of Engineering Services

Joyce Walker, Quality Assurance Administrative Manager

Chuck Kendall, EMC/Lab Manager

TEST PERSONNEL:

Randy Clark, EMC Engineer

EQUIPMENT UNDER TEST (EUT) DESCRIPTION

The Wireless Garage Door Opener tested by CKC Laboratories was a production unit. Wireless garage door opener designed to be vehicle mounted under the hood and is wired to the high beam harness. The receiver section replaces the old push-button within the house.

The model numbers are as follows:

Transmitter: 101200
Receiver: 101300
Set: 101000

15.31(m) Number Of Channels

This device operates on a single channel.

15.33(a) Frequency Ranges Tested

15.231 Radiated Emissions: 9 kHz – 5 GHz
15.107 Conducted Emissions: 450 kHz – 30 MHz
15.109 Radiated Emissions: 30 MHz – 2 GHz

15.35(c) Pulse Emissions Averaging:

The duty cycle of the transmitter is 48%. The duty cycle correction factor calculated thus:
20 LOG (48/100) = -6.375dB

15.203 Antenna Requirements

The antenna is an integral part of the EUT and is non-removable; therefore the EUT complies with Section 15.203 of the FCC rules.

15.205 Restricted Bands

The fundamental operating frequency lies outside the restricted bands and therefore complies with the requirements of Section 15.205 of the FCC rules. Any spurious emission coming from the EUT was investigated to determine if any portion lies inside the restricted band. If any portion of a spurious emissions signal was found to be within a restricted band, investigation was performed to ensure compliance with Section 15.209.

Eut Operating Frequency

The EUT was operating at 418 MHz.

Temperature And Humidity During Testing

The temperature during testing was within +15°C and + 35°C.
The relative humidity was between 20% and 75%.

EQUIPMENT UNDER TEST

The transmitter and receiver system model number is 101000.

Transmitter		**Receiver**	
Manuf:	F2P Electronics	Manuf:	F2P Electronics
Model:	101200	Model:	101300
Serial:	060602T02	Serial:	060602R01
FCC ID:	PPCTX01A (pending)	FCC ID:	DoC

PERIPHERAL DEVICES

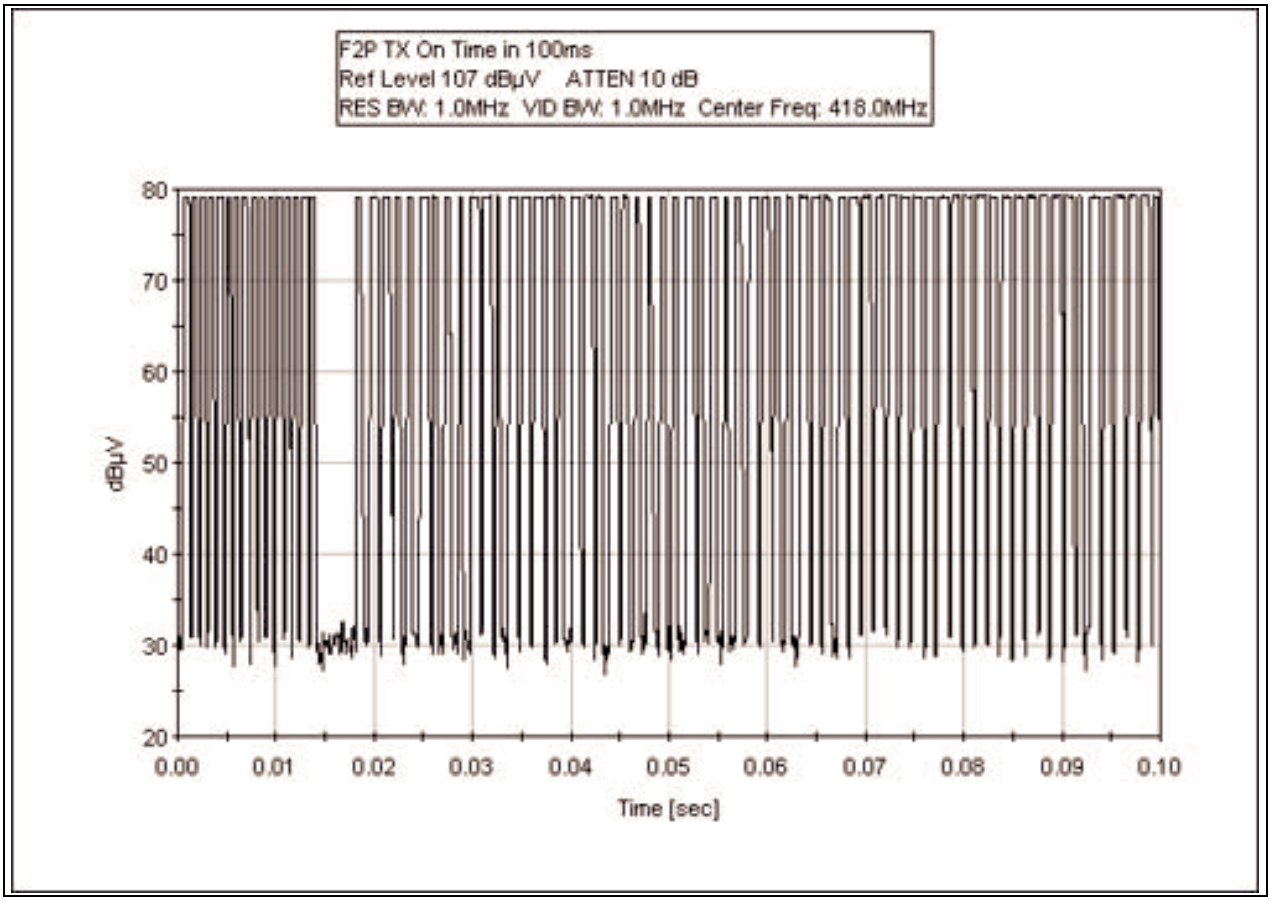
The EUT was tested with the following peripheral device(s):

AC Adapter (Receiver)

Manuf:	Technical Devices
Model:	HD-1225
Serial:	0697
FCC ID:	NA

REPORT OF MEASUREMENTS

15.231(a) Periodic Operation



The following tables report the worst case emissions levels recorded during the tests performed on the Wireless Garage Door Opener, Transmitter 101200, Receiver 101300 and Set, 101000. All readings taken were peak readings unless otherwise stated. The data sheets from which the emissions tables were compiled are contained in Appendix C.

Table 1: 15.231(b) - Fundamental Emission Levels - Transmitter

FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS Ant dB	Amp dB	Cable dB	15.31 dB	CORRECTED READING dBµV/m	SPEC LIMIT dBµV/m	MARGIN dB	NOTES
417.991	87.3	19.2	-26.9	4.4	-6.4	77.6	79.8	-2.2	VA
418.000	85.6	19.2	-26.9	4.4	-6.4	75.9	79.8	-3.9	HA

Test Method: ANSI C63.4 (1992)
Spec Limit: FCC Part 15 Subpart C Section 15.231(b)
Test Distance: 3 Meters

NOTES: H = Horizontal Polarization
V = Vertical Polarization
A = Average Reading

COMMENTS: EUT is a vehicle mounted battery operated periodic transmitter operating on 418MHz. A 680 Ohm Resistor has been placed at R1.

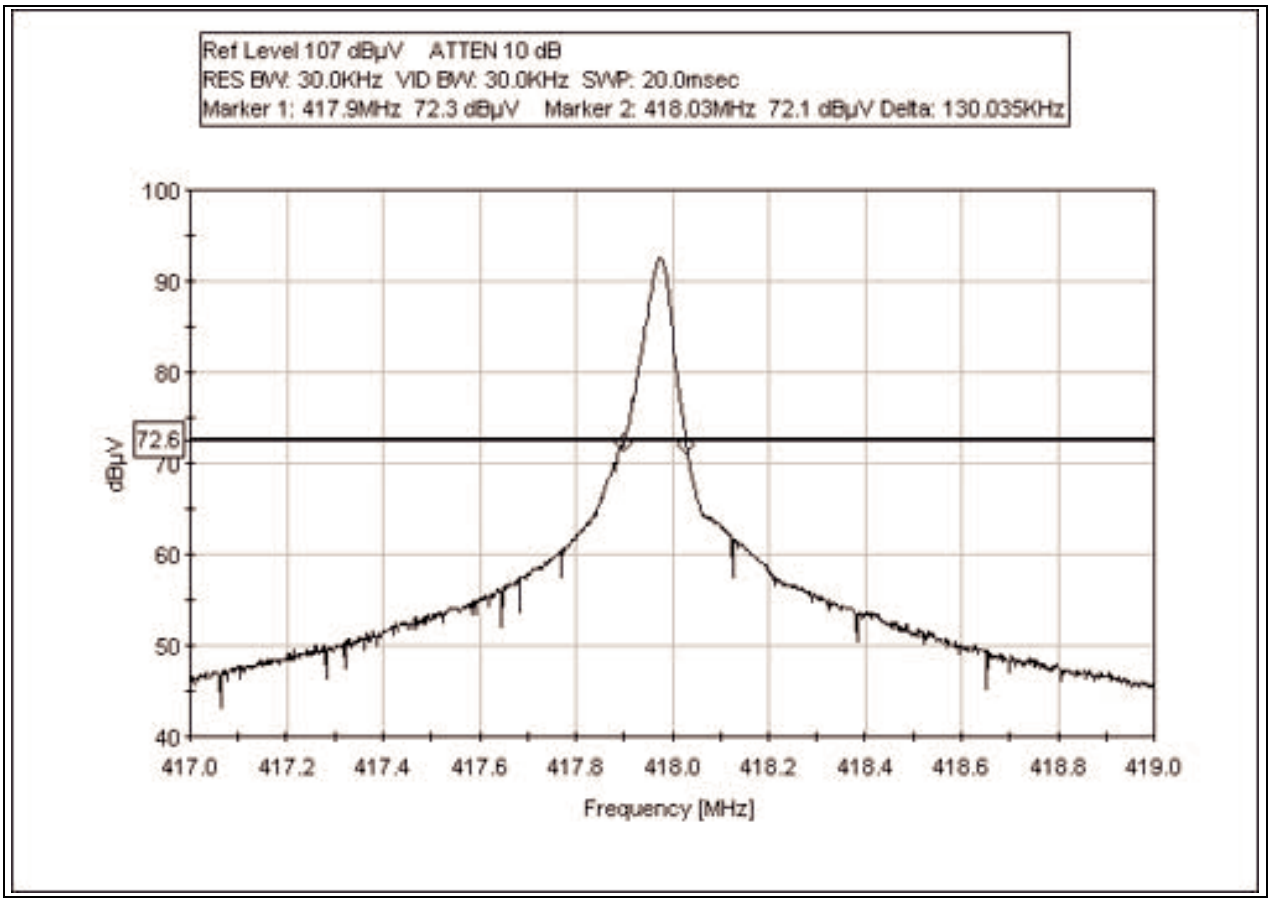
Table 2: 15.231(b) - Six Highest Radiated Emission Levels - Transmitter									
	METER	CORRECTION FACTORS				CORRECTED	SPEC		
FREQUENCY MHz	READING dBµV	Ant dB	Amp dB	Cable dB	dB	READING dBµV/m	LIMIT dBµV/m	MARGIN dB	NOTES
836.010	51.9	21.5	-27.3	6.7		52.8	60.4	-7.6	H
2089.880	55.8	21.6	-34.0	7.9		51.3	60.4	-9.1	V
3761.440	45.0	23.0	-32.0	11.7		47.7	54.0	-6.3	V
3762.120	46.4	23.0	-32.0	11.7		49.1	54.0	-4.9	H
4179.500	44.3	23.6	-32.0	12.3		48.2	54.0	-5.8	H
4179.920	45.0	23.6	-32.0	12.3		48.9	54.0	-5.1	V

Test Method: ANSI C63.4 (1992)
Spec Limit: FCC Part 15 Subpart C Section 15.231(b)
Test Distance: 3 Meters

NOTES: H = Horizontal Polarization
V = Vertical Polarization

COMMENTS: EUT is a vehicle mounted battery operated periodic transmitter operating on 418MHz. Frequency Range Investigated: 9kHz-1000MHz and 1-5 GHz. Note: no emissions found below 30MHz. Frequencies within 15.205 restricted bands are compared to the 15.209 limits, all other frequencies are compared to 15.231(b) limits.

15.231(c) Bandwidth Plot



15.231 (c) and Canadian emissions bandwidth is **130.035kHz**.

Canadian Power Output Calculation:
Average field strength reading at 3 meters is 77.6dBuV
Following the formula $P=(ED)^2/30G$, the power output is **17.2 µW**.

15.231(c) limit is defined as 0.25% of the center frequency, thus 418MHz * 0.0025 = 1.045MHz.The measured emissions bandwidth is 130kHz, which passes the requirement.

Table 3: 15.107 - Six Highest Conducted Emission Levels - Receiver									
	METER	CORRECTION FACTORS				CORRECTED	SPEC		
FREQUENCY MHz	READING dBµV	Lisn dB	dB	Cable dB	dB	READING dBµV	LIMIT dBµV	MARGIN dB	NOTES
0.452748	29.9	0.0		0.1		30.0	48.0	-18.0	B
0.454122	29.1	0.2		0.1		29.4	48.0	-18.6	W
0.491220	34.0	0.2		0.1		34.3	48.0	-13.7	W
0.495342	34.2	0.0		0.1		34.3	48.0	-13.7	B
0.561294	31.3	0.2		0.1		31.6	48.0	-16.4	W
5.959908	29.6	1.0		0.3		30.9	48.0	-17.1	B

Test Method: ANSI C63.4 (1992)
Spec Limit: FCC Part 15 Subpart B Section 15.107 Class B

NOTES: B = Black Lead
W = White Lead

COMMENTS: EUT is a wall mounted receiver operating on 418MHz. EUT is powered through a separate AC power source.

Table 4: 15.109 - Six Highest Radiated Emission Levels - Receiver

FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS Ant dB	Amp dB	Cable dB	Dist dB	CORRECTED READING dBµV/m	SPEC LIMIT dBµV/m	MARGIN dB	NOTES
208.730	37.7	17.6	-26.3	3.0		32.0	43.5	-11.5	H
208.730	29.2	17.6	-26.3	3.0		23.5	43.5	-20.0	V
407.297	25.8	19.4	-26.9	4.3		22.6	46.0	-23.4	H
418.001	26.0	19.2	-26.9	4.4		22.7	46.0	-23.3	H
814.597	25.6	21.3	-27.3	6.5		26.1	46.0	-19.9	H
814.608	22.5	21.3	-27.3	6.5		23.0	46.0	-23.0	V

Test Method: ANSI C63.4 (1992)
Spec Limit: FCC Part 15 Subpart B Section 15.109 Class B
Test Distance: 3 Meters

NOTES: H = Horizontal Polarization
V = Vertical Polarization

COMMENTS: EUT is a wall mounted receiver operating on 418MHz. EUT is powered through a separate AC power source. Frequency Range Investigated: 30MHz - 2000MHz.

MEASUREMENT UNCERTAINTY

Measurement uncertainty associated with data in this report is a ± 2.94dB for radiated and ±1.56dB for conducted emissions.

EUT SETUP

The equipment under test (EUT) was set up in a manner that represented its normal use, as shown in the photographs in Appendix A. Any special conditions required for the EUT to operate normally are identified in the comments that accompany the emissions tables. The corrected data was then compared to the applicable emission limits to determine compliance.

The cables were routed consistent with the typical application by varying the configuration of the test sample. Interface cables were connected to the available I/O ports of the test unit. The effect of varying the position of the cables was investigated to find the configuration that produced maximum emissions. I/O cables were of the type and length specified in the individual requirements. The length of cable that produced maximum emissions was selected.

The radiated and conducted emissions data of the Wireless Garage Door Opener, Transmitter 101200, Receiver 101300 and Set, 101000, was taken with the HP Spectrum Analyzer. Incorporating the applicable correction factors for distance, antenna, cable loss and amplifier gain, the data was reduced as shown in Table A.

Preliminary and final measurements were taken in order to ensure that all emissions from the EUT were found and maximized.

CORRECTION FACTORS

The basic spectrum analyzer reading was converted using correction factors as shown in the highest emissions readings in the tables. For radiated emissions in dBµV/m, the spectrum analyzer reading in dBµV was corrected by using the following formula in Table A. This reading was then compared to the applicable specification limit to determine compliance.

TABLE A: SAMPLE CALCULATIONS

	Meter reading	(dBµV)
+	Antenna Factor	(dB)
+	Cable Loss	(dB)
-	Distance Correction	(dB)
-	Preamplifier Gain	(dB)
=	Corrected Reading	(dBµV/m)

TEST INSTRUMENTATION AND ANALYZER SETTINGS

The test instrumentation and equipment listed in Appendix B were used to collect both the radiated and conducted emissions data. For radiated measurements from 9 kHz to 30 MHz, the magnetic loop antenna was used. For radiated measurements below 300 MHz, the biconical antenna was used. For frequencies from 300 to 1000 MHz, the log periodic antenna was used. The horn antenna was used for frequencies above 1000 MHz. Conducted emissions tests required the use of the FCC type LISNs.

The HP spectrum analyzer was used for all measurements. Table B shows the analyzer bandwidth settings that were used in designated frequency bands. For conducted emissions, an appropriate reference level and a vertical scale size of 10 dB per division were used. A 10 dB external attenuator was also used during conducted tests, with internal offset correction in the analyzer. During radiated testing, the measurements were made with 0 dB of attenuation, a reference level of 97 dBµV, and a vertical scale of 10 dB per division.

FCC SECTION 15.35:
TABLE B: ANALYZER BANDWIDTH SETTINGS PER FREQUENCY RANGE

TEST	BEGINNING FREQUENCY	ENDING FREQUENCY	BANDWIDTH SETTING
CONDUCTED EMISSIONS	450 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	9 kHz	150 kHz	200 Hz
RADIATED EMISSIONS	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	30 MHz	1000 MHz	120 kHz
RADIATED EMISSIONS	1000 MHz	5 GHz	1 MHz

SPECTRUM ANALYZER DETECTOR FUNCTIONS

The notes that accompany the measurements contained in the Tables indicate the type of detector function used to obtain the given readings. Unless otherwise noted, all readings were made in the "Peak" mode. Whenever a "Quasi-Peak" or "Average" reading is listed as one of the six highest readings, this is indicated as a "Q" or an "A" in the appropriate table. The following paragraphs describe in more detail the detector functions and when they were used to obtain the emissions data.

Peak

In this mode, the Spectrum Analyzer or test engineer recorded all emissions at their peak value as the frequency band selected was scanned. By combining this function with another feature of the analyzer called "peak hold," the analyzer had the ability to measure transients or low duty cycle transient emission peak levels. In this mode the analyzer made a slow scan across the frequency band selected and measured the peak emission value found at each frequency across the band.

Quasi-Peak

When the true peak values exceeded or were within 2 dB of the specification limit, quasi-peak measurements were taken using the HP Quasi-Peak Adapter for the HP Spectrum Analyzer. The detailed procedure for making quasi peak measurements contained in the HP Quasi-Peak Adapter manual were followed.

Average

For certain frequencies, average measurements may be made using the spectrum analyzer. To make these measurements, the test engineer reduces the video bandwidth on the analyzer until the modulation of the signal is filtered out. At this point the analyzer is set into the linear mode and the scan time is reduced.

EUT TESTING

Mains Conducted Emissions

During conducted emissions testing, the EUT was located on a wooden table measuring approximately 80 cm high, 1 meter deep, and 1.5 meters in length. One wall of the room where the EUT was located has a minimum 2 meter by 2 meter conductive plane. The EUT was mounted on the wooden table 40 cm away from the conductive plane, and 80 cm from any other conductive surface.

The vertical metal plane used for conducted emissions was grounded to the earth. Power to the EUT was provided through a LISN. The LISN was grounded to the ground plane. All other objects were kept a minimum of 80 cm away from the EUT during the conducted test.

For conducted emissions testing, a 30 to 50 second sweep time was used for automated measurements in the frequency bands of 450 kHz to 1.705 MHz, 1.705 MHz to 3 MHz, and 3 MHz to 30 MHz. All readings within 20 dB of the limit were recorded. At frequencies where the recorded emissions were close to the limit, further investigation was performed manually at a slower sweep rate.

Radiated Emissions

The EUT was mounted on a nonconductive, rotating table 80 cm above the conductive grid. The nonconductive table dimensions were 1 meter by 1.5 meters.

During the preliminary radiated scan, the EUT was powered up and operating in its defined FCC test mode. For radiated measurements from 9 kHz to 30 MHz, the magnetic loop antenna was used. The frequency range of 30 MHz to 88 MHz was scanned with the biconical antenna located about 1.5 meter above the ground plane in the vertical configuration. During this scan, the turntable was rotated and all peaks at or near the limit were recorded. The frequency range of 100 to 300 MHz was then scanned in the same manner using the biconical antenna and the peaks recorded. Lastly, a scan of the FM band from 88 to 110 MHz was made, using a reduced resolution bandwidth and frequency span. The biconical antenna was changed to the horizontal polarity and the above steps were repeated. After changing to the log periodic antenna in the horizontal configuration, the frequency range of 300 to 1000 MHz was scanned. The log periodic antenna was changed to the vertical polarity and the frequency range of 300 to 1000 MHz was again scanned. For frequencies exceeding 1000 MHz, the horn antenna was used. Care was taken to ensure that no frequencies were missed within the FM and TV bands. An analysis was performed to determine if the signals that were at or near the limit were caused by an ambient transmission. If unable to determine by analysis, the equipment was powered down to make the final determination if the EUT was the source of the emission.

A thorough scan of all frequencies was made manually using a small frequency span, rotating the turntable as needed. The test engineer maximized the readings with respect to the table rotation, antenna height, and configuration of EUT. Maximizing of the EUT was achieved by monitoring the spectrum analyzer on a closed circuit television monitor.

APPENDIX A

TEST SETUP PHOTOGRAPHS

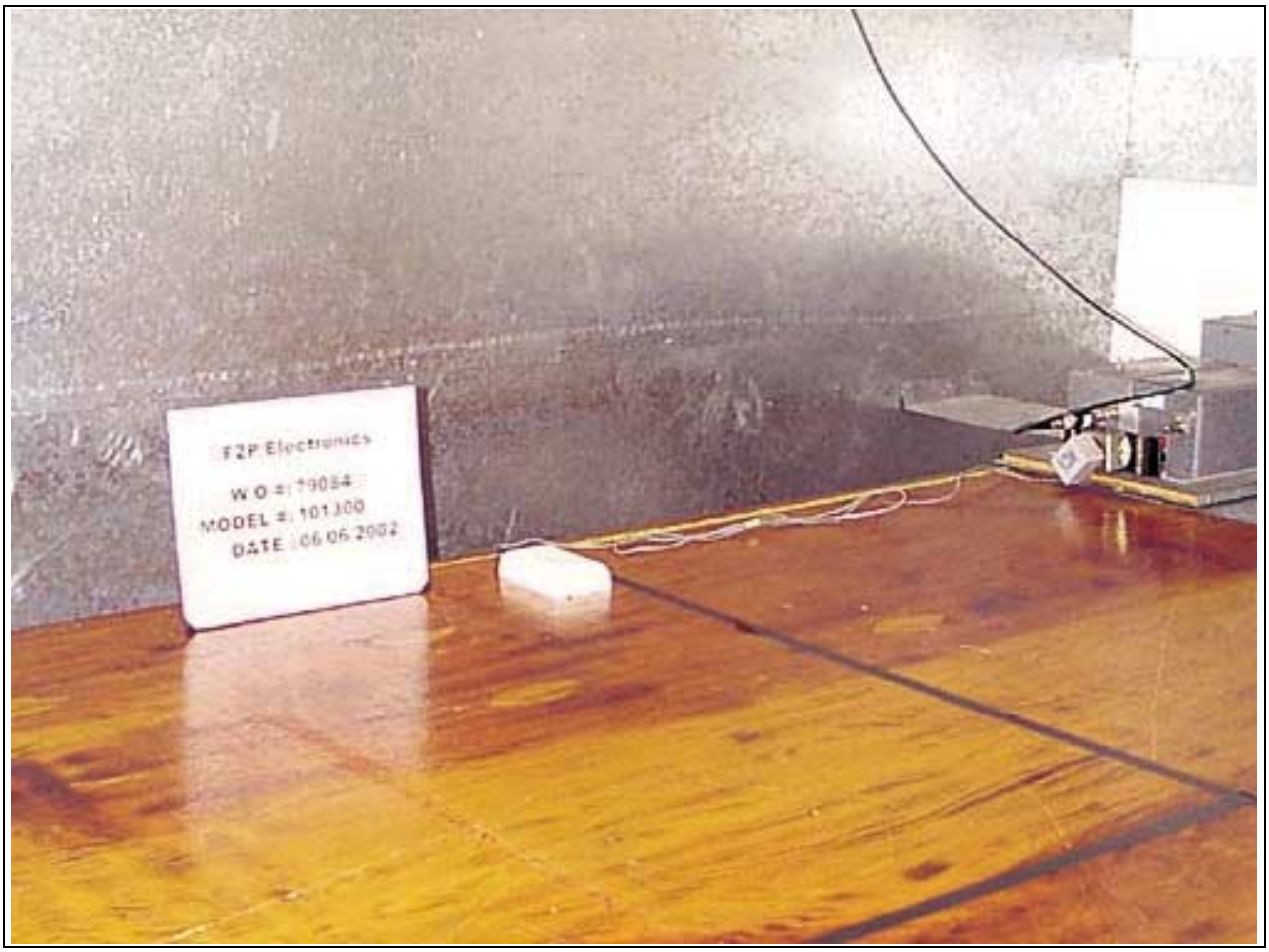
PHOTOGRAPH SHOWING TRANSMITTER RADIATED EMISSIONS

Transmitter Radiated Emissions - Front View

PHOTOGRAPH SHOWING TRANSMITTER RADIATED EMISSIONS

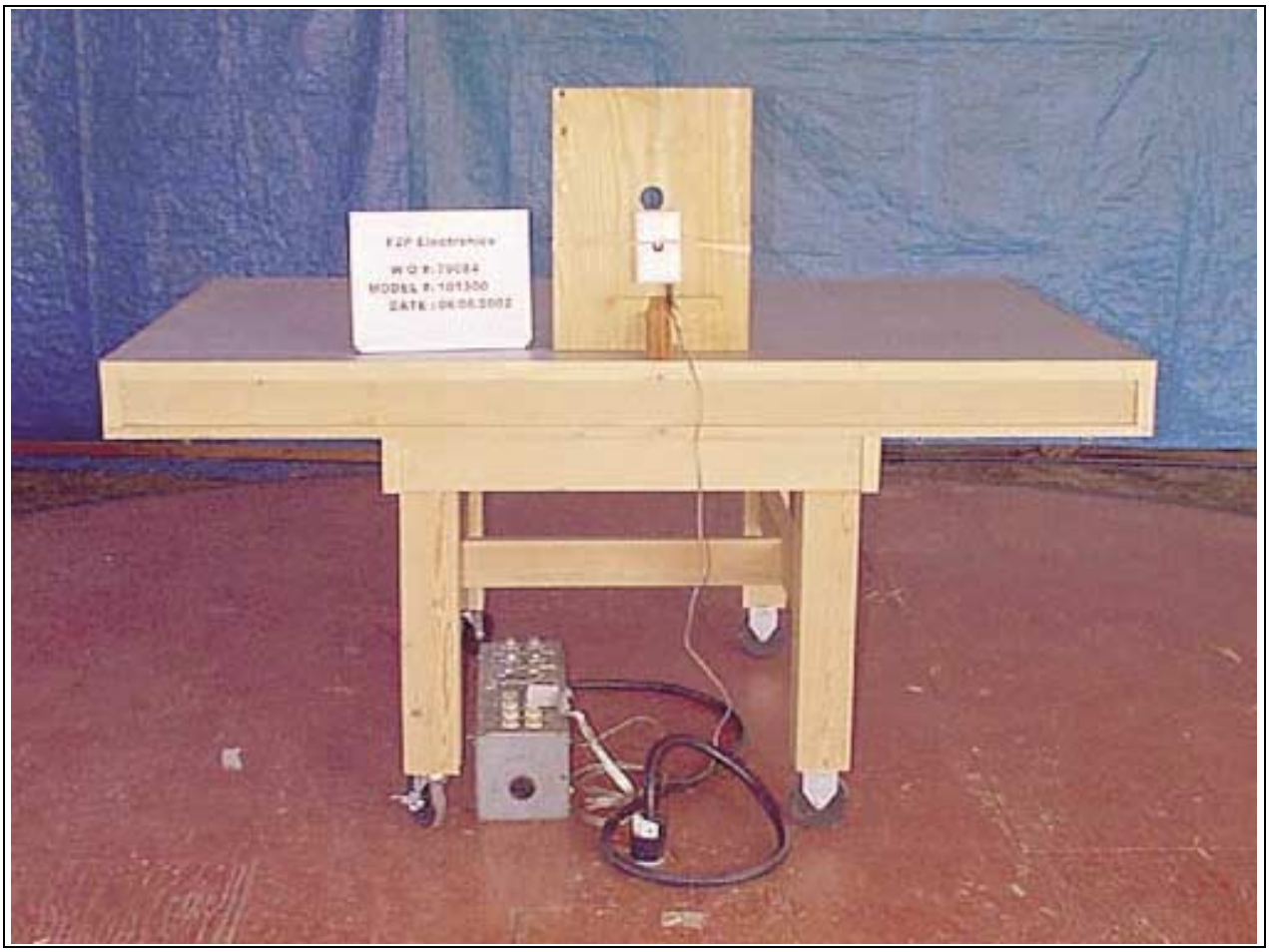
Transmitter Radiated Emissions - Front View Closeup

PHOTOGRAPH SHOWING RECEIVER CONDUCTED EMISSIONS



Receiver Conducted Emissions - Front View

PHOTOGRAPH SHOWING RECEIVER RADIATED EMISSIONS



Receiver Radiated Emissions - Front View

APPENDIX B

TEST EQUIPMENT LIST

Radiated Emissions Testing Including Fundamental, OBW etc,…

Equipment	*Manufacturer*	*Model #*	*Serial #*	*Asset #*	*Cal Date*	*Cal Due*
3/10m & LISN Cable	Andrews	Hardline	N/A	N/A	11/19/01	11/19/02
Antenna, Bicon	A&H	SAS-200/542	156	00225	12/06/01	12/6/02
Antenna, Log Periodic	A & H	SAS -200/512	127	00210	5/2/02	5/2/03
Preamp	HP	8449B	3008A00301	02010	10/19/01	10/19/02
Preamp	HP	8447D	1937A02604	00099	3/21/02	3/21/03
QP Adapter	HP	85650A	2811A01267	00478	1/30/02	1/30/03
S/A Display	HP	8566B	2403A08241	00489	1/30/02	1/30/03
Spectrum Analyzer	HP	8566B	2209A01404	00490	1/30/02	1/30/03
Cable #2 (2')	Andrew	FSJ1-50A	N/A	N/A	4/16/02	4/16/03
Cable #4 (50')	Andrew	FSJ1-50A	N/A	N/A	4/16/02	4/16/03
Cable #1 (30')	Andrew	FSJ1-50A	N/A	N/A	4/16/02	4/16/03
Antenna, Loop	EMCO	6502	1074	00226	6/5/02	6/5/03
Power Supply, DC	HP	6205C	2228A01775	00762	6/5/02	6/5/03
Antenna, Horn 1-18GHz	EMCO	3115	9307-4085	00656	3/29/02	3/19/03

AC Conducted Emissions Testing

Equipment	*Manufacturer*	*Model #*	*Serial #*	*Asset #*	*Cal Date*	*Cal Due*
3/10m & LISN Cable	Andrews	Hardline	N/A	N/A	11/19/01	11/19/02
LISN Set	Solar	8028-50-TS-24-BNC	814493, 474	02056	6/5/02	6/5/03
QP Adapter	HP	85650A	2811A01267	00478	1/30/02	1/30/03
S/A Display	HP	8566B	2403A08241	00489	1/30/02	1/30/03
Spectrum Analyzer	HP	8566B	2209A01404	00490	1/30/02	1/30/03

APPENDIX C: MEASUREMENT DATA SHEETS

Test Location: CKC Laboratories •5473A Clouds Rest • Mariposa CA 95338 • 1-800-500-4EMC (4362)

Customer: **F2P Electronics**
Specification: **FCC 15.231(b) Fundamental**
Work Order #: **79084** Date: 06/10/2002
Test Type: **Maximized Emissions** Time: 15:13:18
Equipment: Transmitter Sequence#: 1
Manufacturer: F2P Electronics Tested By: Randal Clark
Model: 101200
S/N: 060602R01

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Transmitter	F2P Electronics	101200	060602T02

Support Devices:

Function	Manufacturer	Model #	S/N

Test Conditions / Notes:

EUT is a vehicle mounted battery operated periodic transmitter operating on 418MHz. A 680 Ohm Resistor has been placed at R1.

Transducer Legend:

T1=Amp - S/N 604	T2=Log s/n 127
T3=Cable - 10 Meter	T4=15.31 Duty Cycle Correction Factor

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1 Ave	417.991M	87.3	-26.9	+19.2	+4.4	-6.4	+0.0	77.6	79.8	-2.2	Vert
^	418.052M	101.3	-26.9	+19.2	+4.4	-6.4	+0.0	91.6	79.8	+11.8	Vert
3 Ave	418.000M	85.6	-26.9	+19.2	+4.4	-6.4	+0.0	75.9	79.8	-3.9	Horiz
^	417.932M	104.7	-26.9	+19.2	+4.4	-6.4	+0.0	95.0	79.8	+15.2	Horiz

Test Location: CKC Laboratories •5473A Clouds Rest • Mariposa CA 95338 • 1-800-500-4EMC (4362)

Customer: **F2P Electronics**
Specification: **FCC 15.231 (b) Spurious**
Work Order #: **79084** Date: 07/08/2002
Test Type: **Maximized Emissions** Time: 11:58:36
Equipment: **Receiver** Sequence#: 4
Manufacturer: F2P Electronics Tested By: Randal Clark
Model: 101300
S/N: 060602R01

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Transmitter	F2P Electronics	101200	060602T02

Support Devices:

Function	Manufacturer	Model #	S/N

Test Conditions / Notes:

EUT is a vehicle mounted battery operated periodic transmitter operating on 418MHz. Frequency Range Investigated 9kHz-1000MHz. Note: no emissions found below 30MHz.

Transducer Legend:

T1=Amp - S/N 604	T2=Bicon 156
T3=Log s/n 127	T4=Cable - 10 Meter

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	836.010M	51.9	-27.3	+0.0	+21.5	+6.7	+0.0	52.8	60.4	-7.6	Horiz
2	836.036M	47.2	-27.3	+0.0	+21.5	+6.7	+0.0	48.1	60.4	-12.3	Vert
3	208.730M	35.7	-26.3	+17.6	+0.0	+3.0	+0.0	30.0	51.5	-21.5	Horiz
4	208.730M	29.2	-26.3	+17.6	+0.0	+3.0	+0.0	23.5	51.5	-28.0	Vert
5	203.642M	19.2	-26.3	+17.8	+0.0	+2.9	+0.0	13.6	51.5	-37.9	Vert

Test Location: CKC Laboratories •5473A Clouds Rest • Mariposa CA 95338 • 1-800-500-4EMC (4362)

Customer: **F2P Electronics**
Specification: **FCC 15.231 (b) Spurious**
Work Order #: **79084** Date: 06/07/2002
Test Type: **Maximized Emissions** Time: 16:25:09
Equipment: **Receiver** Sequence#: 6
Manufacturer: F2P Electronics Tested By: Randal Clark
Model: 101300
S/N: 060602R01

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Transmitter	F2P Electronics	101200	060602T02

Support Devices:

Function	Manufacturer	Model #	S/N

Test Conditions / Notes:

EUT is a vehicle mounted battery operated periodic transmitter operating on 418MHz. Frequency Range Investigated 1 to 5 GHz. Frequencies within 15.205 restricted bands are compared to the 15.209 limits, all other frequencies are compared to 15.231(b) limits.

Transducer Legend:

T1=Amp - S/N 301	T2=Horn 1-18 GHz (Mariposa)
T3=Cable GHz #1	T4=Cable GHz #2
T5=Cable GHz #4	T6=15.31 Duty Cycle Correction Factor

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq	Rdng	T1 T5	T2 T6	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	3762.120M	46.4	-32.0 +6.4	+29.4 -6.4	+4.2	+1.1	+0.0	49.1	54.0	-4.9	Horiz
2	4179.920M	45.0	-32.0 +6.2	+30.0 -6.4	+4.4	+1.7	+0.0	48.9	54.0	-5.1	Vert
3	4179.500M	44.3	-32.0 +6.2	+30.0 -6.4	+4.4	+1.7	+0.0	48.2	54.0	-5.8	Horiz
4	3761.440M	45.0	-32.0 +6.4	+29.4 -6.4	+4.2	+1.1	+0.0	47.7	54.0	-6.3	Vert
5	2089.880M	55.8	-34.0 +4.6	+28.0 -6.4	+3.0	+0.3	+0.0	51.3	60.4	-9.1	Vert
6	2089.825M	54.3	-34.0 +4.6	+28.0 -6.4	+3.0	+0.3	+0.0	49.8	60.4	-10.6	Horiz
7	1672.060M	51.7	-35.1 +3.6	+26.1 -6.4	+2.3	+0.2	+0.0	42.4	54.0	-11.6	Vert
8	1671.810M	51.0	-35.1 +3.6	+26.1 -6.4	+2.3	+0.2	+0.0	41.7	54.0	-12.3	Horiz

9	3343.688M	44.6	-31.9 +6.9	+28.6 -6.4	+4.6	+0.6	+0.0	47.0	60.4	-13.4	Vert
10	3343.825M	42.8	-31.9 +6.9	+28.6 -6.4	+4.6	+0.6	+0.0	45.2	60.4	-15.2	Horiz
11	1254.055M	55.9	-35.8 +3.1	+23.9 -6.4	+2.0	+0.2	+0.0	42.9	60.4	-17.5	Horiz
12	1253.970M	54.7	-35.8 +3.1	+23.9 -6.4	+2.0	+0.2	+0.0	41.7	60.4	-18.7	Vert

Test Location: CKC Laboratories •5473A Clouds Rest • Mariposa CA 95338 • 1-800-500-4EMC (4362)

Customer: **F2P Electronics**
Specification: **FCC 15.107 Class B**
Work Order #: **79084** Date: 06/06/2002
Test Type: **Conducted Emissions** Time: 3:44:46 PM
Equipment: **Receiver** Sequence#: 2
Manufacturer: F2P Electronics Tested By: Randal Clark
Model: 101300 230V 60Hz
S/N: 060602R01

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Receiver*	F2P Electronics	101300	060602R01

Support Devices:

Function	Manufacturer	Model #	S/N
AC Adapter (Receiver)	Technical Devices	HD-1225	0697

Test Conditions / Notes:

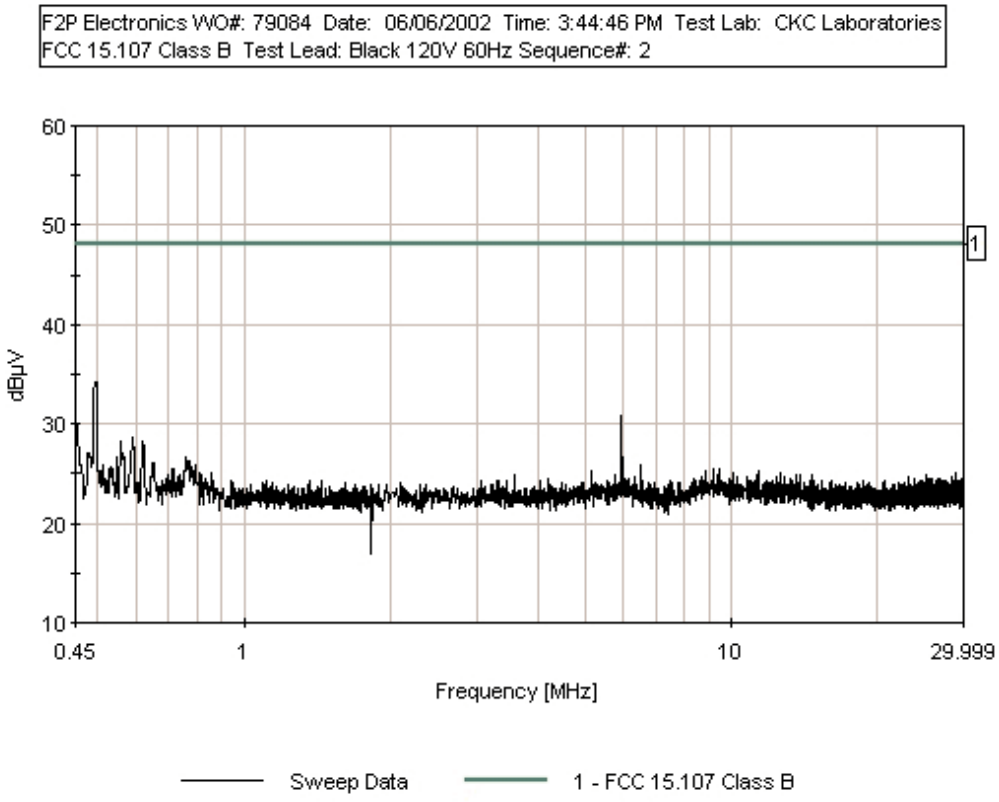
EUT is a wall mounted receiver operating on 418MHz. EUT is powered through a separate AC power source.

Transducer Legend:

T1=Cable & Cap (Bench)	T2=LISN Insertion Loss s/n474

Measurement Data: Reading listed by margin. Test Lead: Black

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	495.342k	34.2	+0.1	+0.0			+0.0	34.3	48.0	-13.7	Black
2	5.960M	29.6	+0.3	+1.0			+0.0	30.9	48.0	-17.1	Black
3	452.748k	29.9	+0.1	+0.0			+0.0	30.0	48.0	-18.0	Black
4	588.774k	28.5	+0.1	+0.1			+0.0	28.7	48.0	-19.3	Black
5	619.002k	28.0	+0.1	+0.1			+0.0	28.2	48.0	-19.8	Black
6	757.776k	26.5	+0.0	+0.1			+0.0	26.6	48.0	-21.4	Black
7	9.218M	24.0	+0.2	+1.3			+0.0	25.5	48.0	-22.5	Black
8	855.330k	25.0	+0.0	+0.1			+0.0	25.1	48.0	-22.9	Black
9	28.803M	24.3	+0.4	+0.3			+0.0	25.0	48.0	-23.0	Black
10	25.128M	24.3	+0.4	+0.2			+0.0	24.9	48.0	-23.1	Black
11	23.047M	24.1	+0.4	+0.1			+0.0	24.6	48.0	-23.4	Black


F2P Electronics WO#: 79084 Date: 06/06/2002 Time: 3:44:46 PM Test Lab: CKC Laboratories
FCC 15.107 Class B Test Lead: Black 120V 60Hz Sequence#: 2
60
50
40
30
20
10
dBµV
1
0.45
1
10
29.999
Frequency [MHz]
Sweep Data
1 - FCC 15.107 Class B

Test Location: CKC Laboratories •5473A Clouds Rest • Mariposa CA 95338 • 1-800-500-4EMC (4362)

Customer: **F2P Electronics**
Specification: **FCC 15.107 Class B**
Work Order #: **79084** Date: 06/06/2002
Test Type: **Conducted Emissions** Time: 3:41:41 PM
Equipment: **Receiver** Sequence#: 3
Manufacturer: F2P Electronics Tested By: Randal Clark
Model: 101300 230V 60Hz
S/N: 060602R01

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Receiver*	F2P Electronics	101300	060602R01

Support Devices:

Function	Manufacturer	Model #	S/N
AC Adapter (Receiver)	Technical Devices	HD-1225	0697

Test Conditions / Notes:

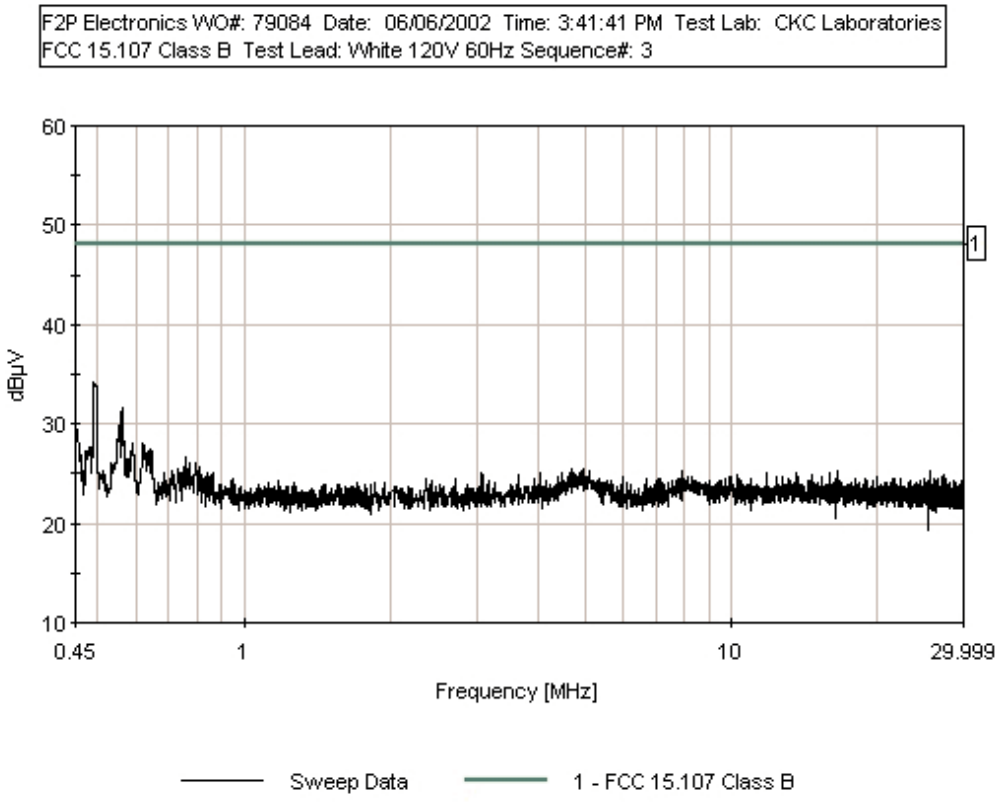
EUT is a wall mounted receiver operating on 418MHz. EUT is powered through a separate AC power source.

Transducer Legend:

T1=Cable & Cap (Bench) T2=LISN Insertion Loss s/n493

Measurement Data: Reading listed by margin. Test Lead: White

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	491.220k	34.0	+0.1	+0.2			+0.0	34.3	48.0	-13.7	White
2	561.294k	31.3	+0.1	+0.2			+0.0	31.6	48.0	-16.4	White
3	454.122k	29.1	+0.1	+0.2			+0.0	29.4	48.0	-18.6	White
4	755.028k	26.5	+0.0	+0.2			+0.0	26.7	48.0	-21.3	White
5	4.683M	23.8	+0.3	+1.4			+0.0	25.5	48.0	-22.5	White
6	731.670k	25.2	+0.0	+0.2			+0.0	25.4	48.0	-22.6	White
7	7.948M	23.8	+0.2	+1.3			+0.0	25.3	48.0	-22.7	White
8	16.551M	24.5	+0.3	+0.5			+0.0	25.3	48.0	-22.7	White
9	711.060k	25.0	+0.0	+0.2			+0.0	25.2	48.0	-22.8	White
10	25.532M	24.6	+0.4	+0.2			+0.0	25.2	48.0	-22.8	White
11	11.803M	24.2	+0.2	+0.6			+0.0	25.0	48.0	-23.0	White


F2P Electronics WO#: 79084 Date: 06/06/2002 Time: 3:41:41 PM Test Lab: CKC Laboratories
FCC 15.107 Class B Test Lead: White 120V 60Hz Sequence#: 3
60
50
40
30
20
10
dBµV
1
0.45
1
10
29.999
Frequency [MHz]
Sweep Data
1 - FCC 15.107 Class B

Test Location: CKC Laboratories •5473A Clouds Rest • Mariposa CA 95338 • 1-800-500-4EMC (4362)

Customer: **F2P Electronics**
Specification: **15.109 CLASS B**
Work Order #: **79084** Date: 06/07/2002
Test Type: **Maximized Emissions** Time: 15:05:11
Equipment: **Receiver** Sequence#: 5
Manufacturer: F2P Electronics Tested By: Randal Clark
Model: 101300
S/N: 060602R01

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Receiver*	F2P Electronics	101300	060602R01

Support Devices:

Function	Manufacturer	Model #	S/N
AC Adapter (Receiver)	Technical Devices	HD-1225	0697

Test Conditions / Notes:

EUT is a wall mounted receiver operating on 418MHz. EUT is powered through a separate AC power source. Frequency Range Investigated: 30MHz - 2000MHz.

Transducer Legend:

T1=Amp - S/N 604	T2=Bicon 156
T3=Log s/n 127	T4=Cable - 10 Meter

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	208.730M	37.7	-26.3	+17.6	+0.0	+3.0	+0.0	32.0	43.5	-11.5	Horiz
2	814.597M	25.6	-27.3	+0.0	+21.3	+6.5	+0.0	26.1	46.0	-19.9	Horiz
3	208.730M	29.2	-26.3	+17.6	+0.0	+3.0	+0.0	23.5	43.5	-20.0	Vert
4	814.608M	22.5	-27.3	+0.0	+21.3	+6.5	+0.0	23.0	46.0	-23.0	Vert
5	418.001M	26.0	-26.9	+0.0	+19.2	+4.4	+0.0	22.7	46.0	-23.3	Horiz
6	407.297M	25.8	-26.9	+0.0	+19.4	+4.3	+0.0	22.6	46.0	-23.4	Horiz
7	418.000M	25.5	-26.9	+0.0	+19.2	+4.4	+0.0	22.2	46.0	-23.8	Vert
8	203.642M	19.2	-26.3	+17.8	+0.0	+2.9	+0.0	13.6	43.5	-29.9	Vert