CKC LABORATORIES, INC. Testing the Future

MOV-A-LOAD CORP. TEST REPORT

FOR THE

HAND-HELD REMOTE CONTROL, PROJACK M1 TRANSMITTER BOARD

FCC PART 15 SUBPART C SECTIONS 15.209 & 15.249, SUBPART B SECTION 15.109 CLASS B AND RSS-210

COMPLIANCE

DATE OF ISSUE: JUNE 19, 2006

PREPARED FOR:

Mov-A-Load Corp.
2245 Industrial Road
Dyersburg, TN 38024

W.O. No.: 84961

PREPARED BY:

Mary Ellen Clayton
CKC Laboratories, Inc.
5046 Sierra Pines Drive
Mariposa, CA 95338

Date of test: June 5-14, 2006

Report No.: FC06-037

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ADMINISTRATIVE INFORMATION

DATE OF TEST:	June 5-14, 2006
DATE OF RECEIPT:	June 5, 2006
MANUFACTURER:	Mov-A-Load Corp. 2245 Industrial Road Dyersburg, TN 38024
REPRESENTATIVE:	Sandy Hutcherson
TEST LOCATION:	CKC Laboratories, Inc. 1120 Fulton Place Fremont, CA 94539
TEST METHOD:	ANSI C63.4 (2003), RSS-210 and RSS GEN
PURPOSE OF TEST:	To demonstrate the compliance of the Hand-Held Remote Control, ProJack M1 Transmitter Board with the requirements for FCC Part 15 Subpart C Sections 15.209 & 15.249 and Subpart B Section 15.109 Class B and RSS-210 devices.

FCC TO CANADA STANDARD CORRELATION MATRIX

Canadian Standard	Canadian Section	FCC Standard	FCC Section	Test Description
RSS 210	6.2.1	47CFR	15.209	General Radiated Emissions Requirement
RSS 210	6.3	47CFR	15.205	Restricted Bands of Operation
RSS 210	6.4	47CFR	15.215(c)	Frequency Stability Recommendation
RSS 210	6.5	47CFR	15.35(c)	Pulsed Operation
RSS 210	6.6	47CFR	15.207	AC Mains Conducted Emissions Requirement
RSS 210	6.2.2(m1)(1)	47 CFR	15.249(a)	Field Strength Limitations
N/A	N/A	47 CFR	15.249(b)	Point-to-Point Operations Limitations
RSS 210	6.2.2(m1)(2)	47 CFR	15.249(c)	Test Distance Requirement
RSS 210	6.2.2(m1)(3)	47 CFR	15.249(d)	Spurious Emissions Attenuation Requirement
RSS 210	6.2.2(m1)(4)	47 CFR	15.249(e)	Detector Functions
N/A	N/A	47 CFR	15.249(e)	Peak to Average Limit Requirement
RSS 210	6.2.2(m1)(5)	N/A	N/A	Cross Reference
RSS 210	5.9.1	N/A	N/A	99% Emissions Bandwidth Requirement
RSS 210	5.9.2	N/A	N/A	Emissions Designator
	IC 5933		958979	Site File No.

CONDITIONS FOR COMPLIANCE

No modifications to the EUT were necessary to comply. Conducted emissions not required for this device.

APPROVALS

Steve Behm, Director of Engineering Services

QUALITY ASSURANCE:

Joyce Walker, Quality Assurance Administrative Manager

TEST PERSONNEL:

Art Rice, EMC Test Engineer

Christine Nicklas, Project Manager & Principal Consultant

Norberto Gamez Jr., EMC Test Technologist

FCC 15.31(e) Voltage Variations
Testing was performed with a new battery.

FCC 15.31(m) Number Of Channels
This device was tested on three channels.

FCC 15.33(a) Frequency Ranges Tested
15.109 Radiated Emissions: 30 MHz – 5 GHz
15.209/15.249 Radiated Emissions: 3 MHz – 10 GHz

FCC SECTION 15.35: ANALYZER BANDWIDTH SETTINGS PER FREQUENCY RANGE			
TEST	BEGINNING FREQUENCY	ENDING FREQUENCY	BANDWIDTH SETTING
RADIATED EMISSIONS	3 MHz	30 MHz	9 kHz
RADIATED EMISSIONS	30 MHz	1000 MHz	120 kHz
RADIATED EMISSIONS	1000 MHz	10 GHz	1 MHz

FCC 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.

EUT Operating Frequency
The EUT was operating at 902-928 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 (EUT) DESCRIPTION

The customer declares the EUT tested by CKC Laboratories was representative of a production unit.

EQUIPMENT UNDER TEST

Hand-Held Remote Control

Manuf:	Mov-A-Load Corp.
Model:	ProJack M1 Transmitter Board
Serial:	8
FCC ID:	pending

PERIPHERAL DEVICES

The EUT was not tested with peripheral devices.

REPORT OF MEASUREMENTS

The following tables report the worst case emissions levels recorded during the tests performed on the EUT. 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: FCC 15.109 Highest Radiated Emission Levels: 30-1000 MHz

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
926.464	29.5	23.0	-26.7	2.9		28.7	46.0	-17.3	V
926.683	29.3	23.0	-26.7	2.9		28.5	46.0	-17.5	H
936.142	29.7	23.2	-26.5	2.9		29.3	46.0	-16.7	V
939.241	30.1	23.3	-26.5	3.0		29.9	46.0	-16.1	V
951.590	29.3	23.6	-26.4	3.0		29.5	46.0	-16.5	H

Test Method: ANSI C63.4 (2003)
Spec Limit: FCC Part 15 Subpart B Section 15.109 Class B
Test Distance: 3 Meters

NOTES: H = Horizontal Polarization
V = Vertical Polarization

COMMENTS: Hand Held Remote Control located at the center of the turntable. Board is ProJack M1, Assembly Number: ASY-00003-REVB. Customer states this is representative of a production unit. The EUT is in the worst case position. The EUT has the shorter narrow edge resting on the table, with the longer narrow edge vertical. Transmitter receiving. Radiated emissions 30-1000 MHz.

Table 2: FCC 15.109 Highest Radiated Emission Levels: 1-5 GHz

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
3950.472	38.5	31.8	-37.5	6.7		39.5	54.0	-14.5	H
3985.098	37.4	31.9	-37.5	6.5		38.3	54.0	-15.7	V
4036.390	38.0	31.9	-37.5	6.2		38.6	54.0	-15.4	H
4824.490	36.3	32.4	-37.1	5.8		37.4	54.0	-16.6	H

Test Method: ANSI C63.4 (2003)
Spec Limit: FCC Part 15 Subpart B Section 15.109 Class B
Test Distance: 3 Meters

NOTES: H = Horizontal Polarization
V = Vertical Polarization

COMMENTS: Hand Held Remote Control located at the center of the turntable. Board is ProJack M1, Assembly Number: ASY-00003-REVB. Customer states this is representative of a production unit. Handheld unit is placed in the worst case position for the receive LO signal. This is with the shorter narrow edge resting on the table, with the longer narrow edge vertical. NOTES: 1) Transmitter in receiving mode. 2) NOT using 1.5 GHz Hi Pass Filter. Measurements above 1 GHz used RBW=1 MHz, VBW=100 kHz for initial peak readings.

Table 3: FCC 15.209 Six Highest Radiated Emission Levels: 3-30 MHz

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
3.220	25.5	10.0		0.2		35.7	49.5	-13.8	V
3.250	25.3	10.0		0.2		35.5	49.5	-14.0	H
3.367	25.7	10.0		0.2		35.9	49.5	-13.6	H
3.557	25.9	10.0		0.2		36.1	49.5	-13.4	V
4.154	25.3	10.0		0.2		35.5	49.5	-14.0	V
5.768	26.3	9.8		0.3		36.4	49.5	-13.1	V

Test Method: ANSI C63.4 (2003)
Spec Limit: FCC Part 15 Subpart C Section 15.209
Test Distance: 3 Meters

NOTES: H = Horizontal Polarization
V = Vertical Polarization

COMMENTS: Hand Held Remote Control located at the center of the turntable. Board is ProJack M1, Assembly Number: ASY-00003-REVB. Customer states this is representative of a production unit. The EUT is in the worst case position. The EUT has the longer narrow edge resting on the table, with the shorter narrow edge vertical. Transmitter transmitting. Signals tested are worst case for LO, MID, and HI channels. Radiated emissions 3-30 MHz.

Table 4: FCC 15.209 Six Highest Radiated Emission Levels: 30-1000 MHz									
	METER	CORRECTION FACTORS				CORRECTED	SPEC		
FREQUENCY MHz	READING dBµV	Ant dB	Amp dB	Cable dB	Dist dB	READING dBµV/m	LIMIT dBµV/m	MARGIN dB	NOTES
899.000	37.3	22.3	-26.6	2.9		35.9	46.0	-10.1	H
899.049	41.9	22.3	-26.6	2.9		40.5	46.0	-5.5	VQ
928.630	37.5	23.1	-26.6	2.9		36.9	46.0	-9.1	VQ
929.830	35.3	23.1	-26.6	2.9		34.7	46.0	-11.3	V
930.910	38.2	23.1	-26.6	2.9		37.6	46.0	-8.4	H
930.946	40.9	23.1	-26.6	2.9		40.3	46.0	-5.7	V

Test Method: ANSI C63.4 (2003)
Spec Limit: FCC Part 15 Subpart C Section 15.209
Test Distance: 3 Meters

NOTES: H = Horizontal Polarization
V = Vertical Polarization
Q = Quasi Peak Reading

COMMENTS: Hand Held Remote Control located at the center of the turntable. Board is ProJack M1, Assembly Number: ASY-00003-REVB. Customer states this is representative of a production unit. The EUT is in the worst case position. The EUT has the longer narrow edge resting on the table, with the shorter narrow edge vertical. Transmitter transmitting LO, MID, or HI channel. Radiated emissions 30-1000 MHz.

Table 5: FCC 15.209 Six Highest Radiated Emission Levels: 1-10 GHz									
	METER	CORRECTION FACTORS				CORRECTED	SPEC		
FREQUENCY MHz	READING dBµV	Ant dB	Amp dB	Cable dB	HPF dB	READING dBµV/m	LIMIT dBµV/m	MARGIN dB	NOTES
2706.825	57.7	28.9	-37.7	4.4	0.2	53.5	54.0	-0.5	HA
2745.285	57.4	29.1	-37.7	4.4	0.2	53.4	54.0	-0.6	HA
2745.285	54.1	29.1	-37.7	4.4	0.2	50.1	54.0	-3.9	VA
2782.990	56.6	29.2	-37.7	4.5	0.2	52.8	54.0	-1.2	HA
2782.990	54.4	29.2	-37.7	4.5	0.2	50.6	54.0	-3.4	VA
5490.700	46.3	33.0	-36.8	6.4	0.2	50.0	54.0	-4.0	V

Test Method: ANSI C63.4 (2003)
Spec Limit: FCC Part 15 Subpart C Section 15.209
Test Distance: 3 Meters

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

COMMENTS: Hand Held Remote Control located at the center of the turntable. Board is ProJack M1, Assembly Number: ASY-00003-REVB. Customer states this is representative of a production unit. Handheld unit is placed in the worst case position for the fundamental signal. This is with the longer narrow edge resting on the table, with the shorter narrow edge vertical. NOTES: 1) Reduced transmit power 2.5 dBm to pass on 3rd harmonic. 2) No spurious signals other than transmitter harmonics were noted. Maximized data is for strongest signals/harmonics noted on the 6 scans V+H 1-10 GHz. Transmitting on LO, MID, or HI channel as noted. Measurements above 1 GHz used RBW=1 MHz, VBW=1 MHz for initial peak readings.

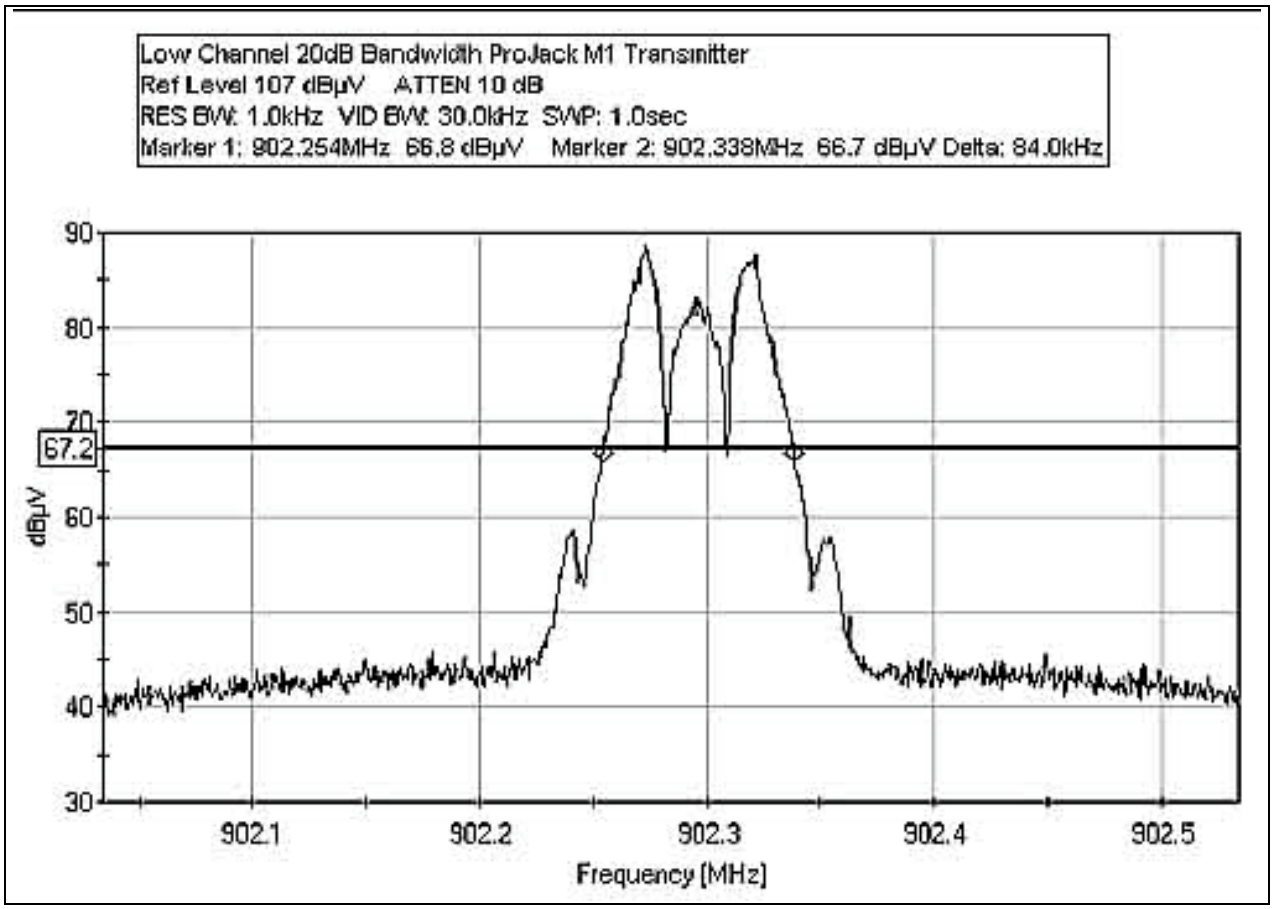
Table 6: FCC 15.249 Fundamental Emission Levels									
	METER	CORRECTION FACTORS				CORRECTED	SPEC		
FREQUENCY MHz	READING dBµV	Ant dB	Amp dB	Cable dB	Dist dB	READING dBµV/m	LIMIT dBµV/m	MARGIN dB	NOTES
902.266	92.3	22.4	-26.6	2.9		91.0	94.0	-3.0	L
902.272	87.6	22.4	-26.6	2.9		86.3	94.0	-7.7	L
915.059	91.1	22.7	-26.7	2.8		89.9	94.0	-4.1	V-M
915.071	87.8	22.7	-26.7	2.8		86.6	94.0	-7.4	H-M
927.662	89.6	23.0	-26.6	2.9		88.9	94.0	-5.1	V-H
927.662	87.3	23.0	-26.6	2.9		86.6	94.0	-7.4	H-H

Test Method: ANSI C63.4 (2003)
Spec Limit: FCC Part 15 Subpart C Section 15.249
Test Distance: 3 Meters

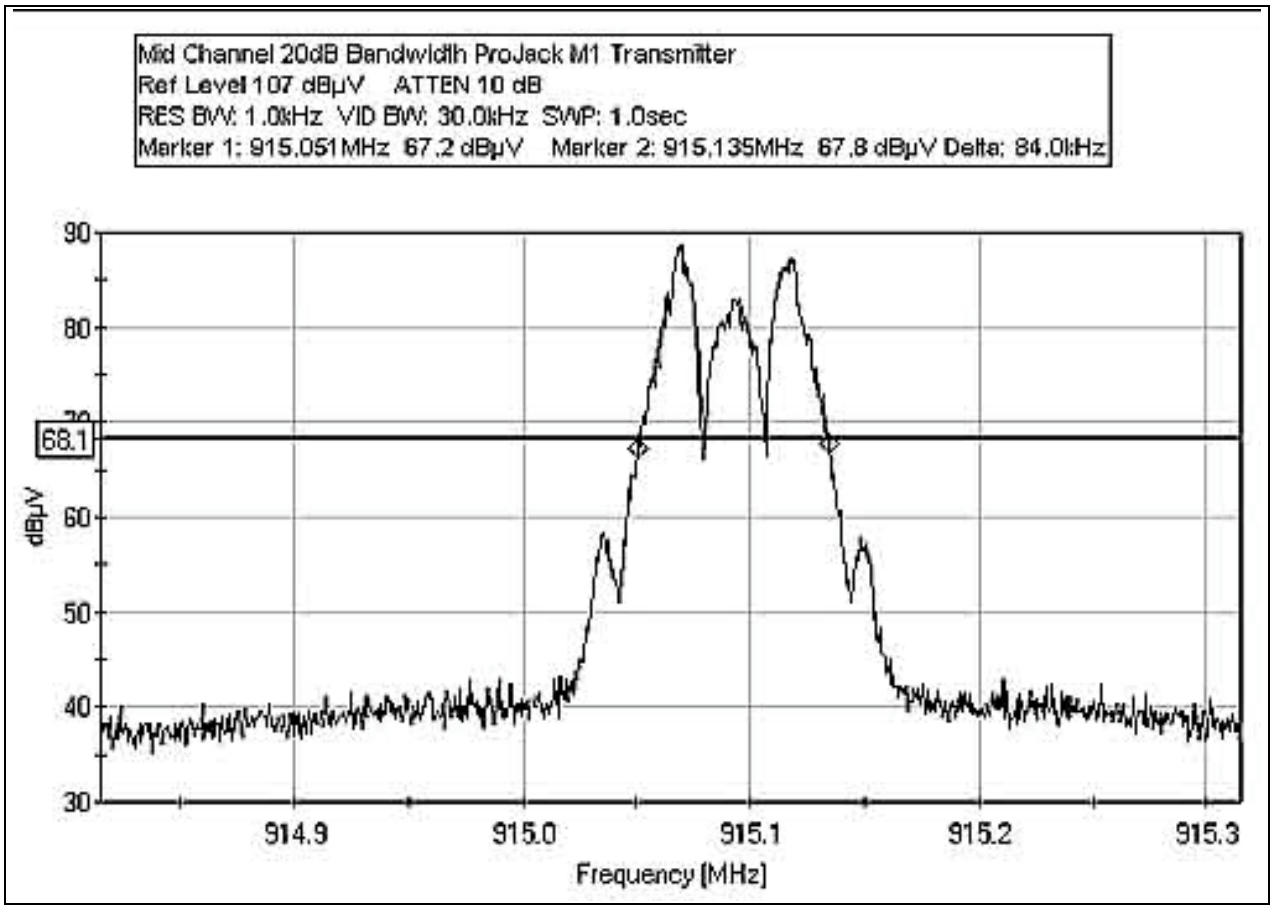
NOTES:
H = Horizontal Polarization
V = Vertical Polarization
N = No Polarization
L = Low Channel
M = Mid Channel
H = High Channel

COMMENTS: Hand Held Remote Control located at the center of the turntable. Board is ProJack M1, Assembly Number: ASY-00003-REVB. Customer states this is representative of a production unit. Fundamental was previously investigated at each of the three orthogonal planes. The data represents the worst case maximized signal. The EUT has the longer narrow edge resting on the table, with the shorter narrow edge vertical.

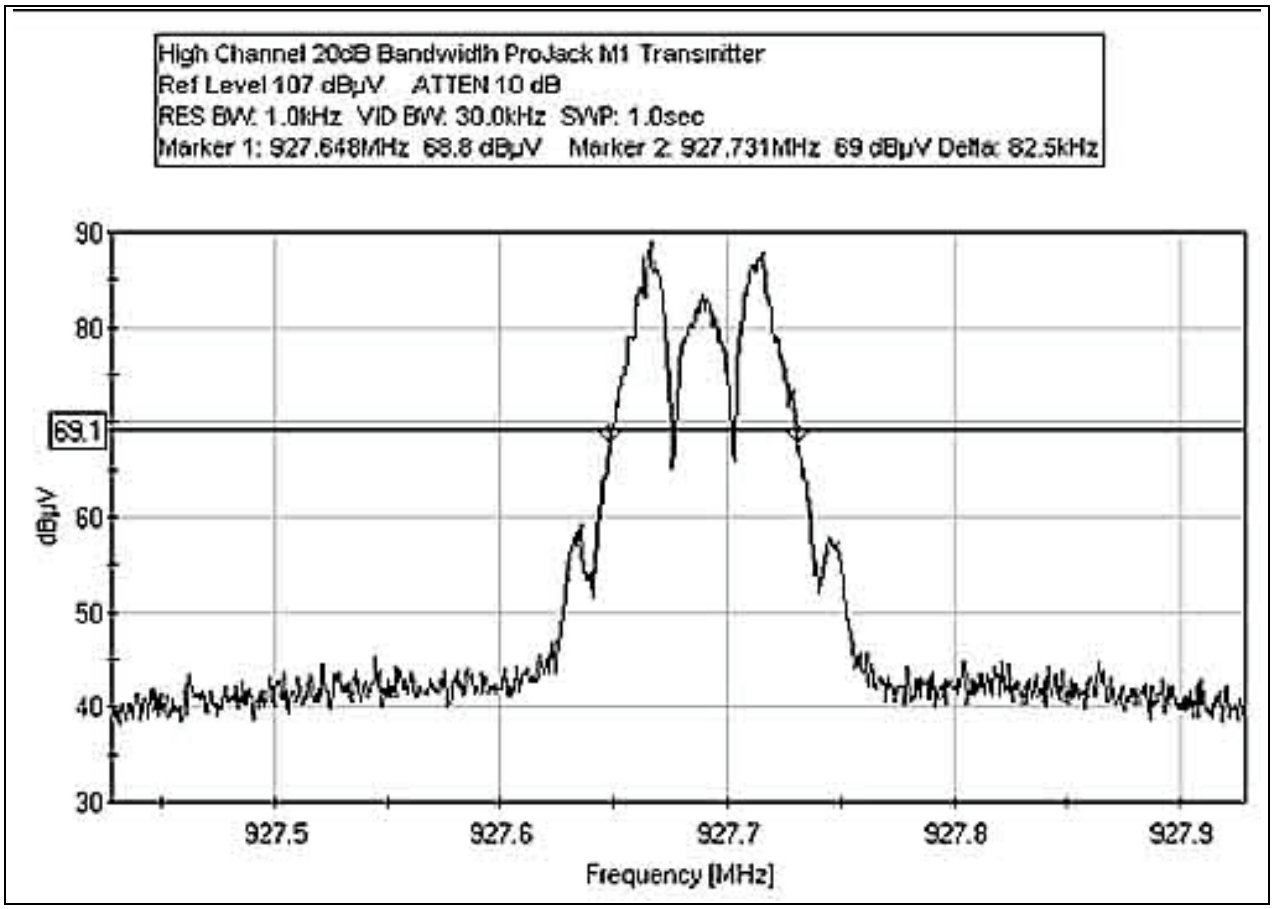
20dB BANDWIDTH - LOW CHANNEL



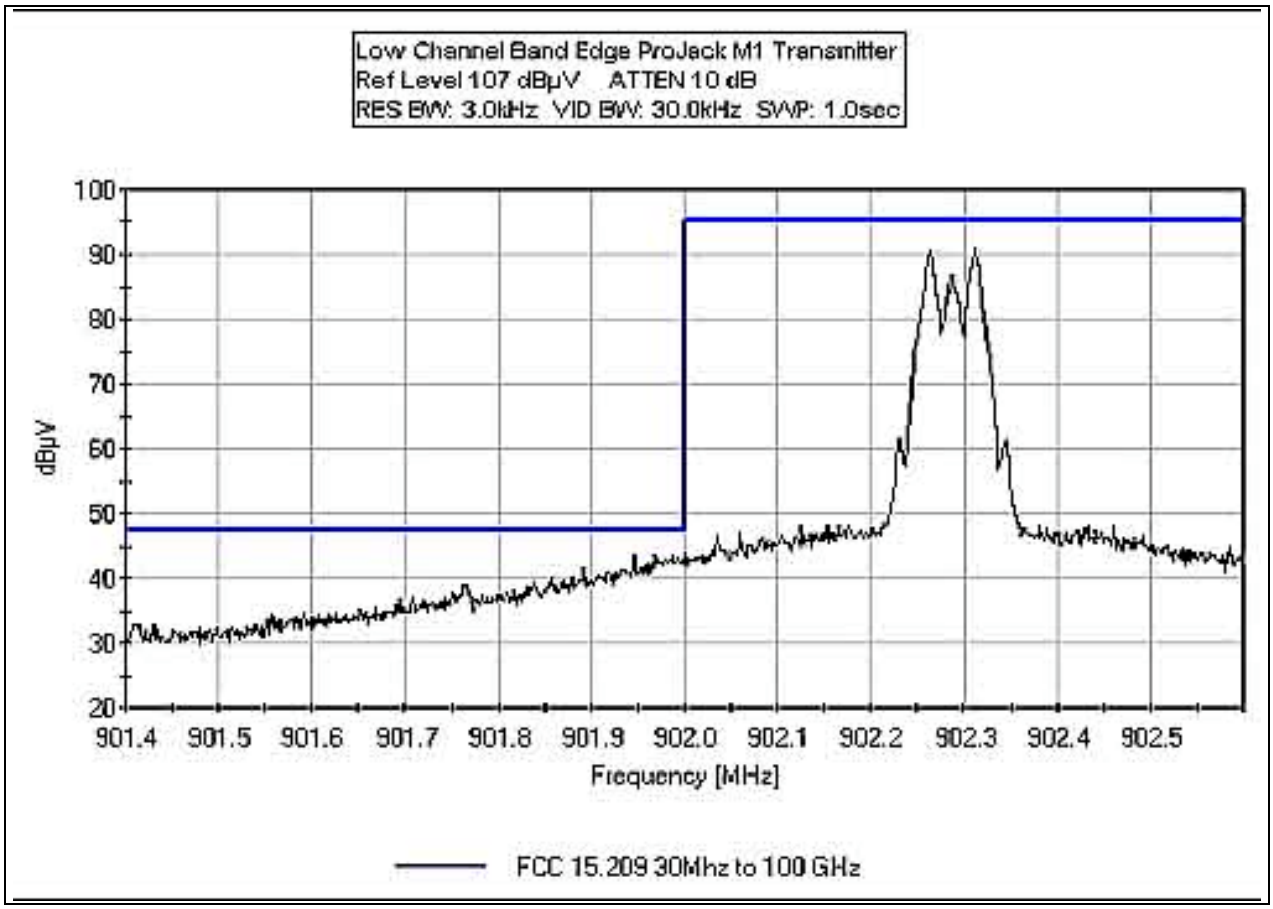
20dB BANDWIDTH - MID CHANNEL



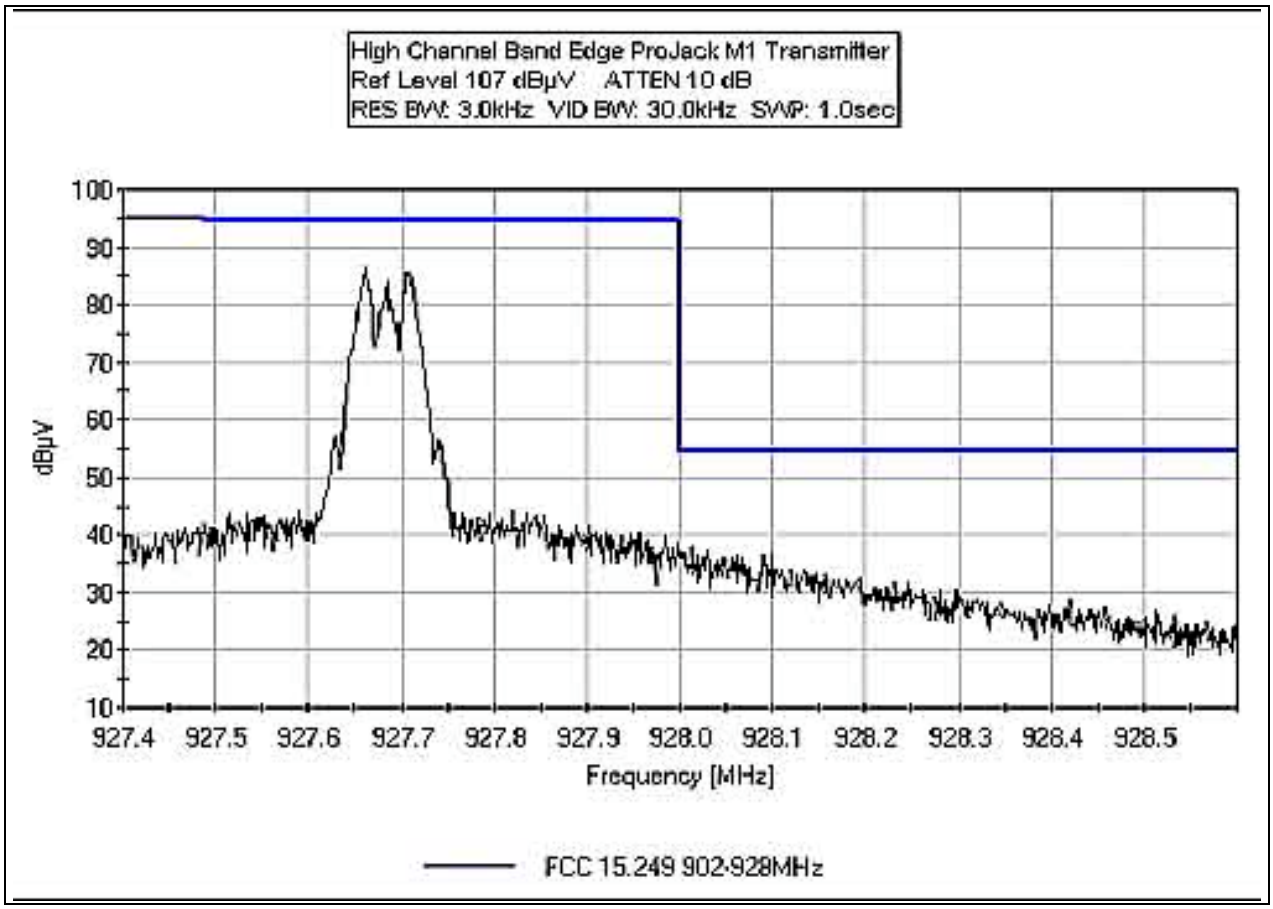
20dB BANDWIDTH - HIGH CHANNEL



BAND EDGE - LOW CHANNEL



BAND EDGE - HIGH CHANNEL



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 emissions data of the EUT 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 emissions data. For radiated measurements from 3 to 30 MHz, the magnetic loop antenna was used. For frequencies from 30 to 1000 MHz, the biconilog antenna was used. The horn antenna was used for frequencies above 1000 MHz.

The HP spectrum analyzer was used for all measurements. Table B shows the analyzer bandwidth settings that were used in designated frequency bands. 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.

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

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 3 to 30 MHz, the magnetic loop antenna was used. The frequency range of 30 MHz to 1000 MHz was scanned with the biconilog antenna located about 1.5 meter above the ground plane in the vertical polarity. During this scan, the turntable was rotated and all peaks at or near the limit were recorded. A scan of the FM band from 88 to 110 MHz was then made using a reduced resolution bandwidth and frequency span. The biconilog antenna was changed to the horizontal polarity and the above steps were repeated. 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.

A thorough scan of all frequencies was made manually using a small frequency span, rotating the turntable and raising and lowering the antenna from one to four meters 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

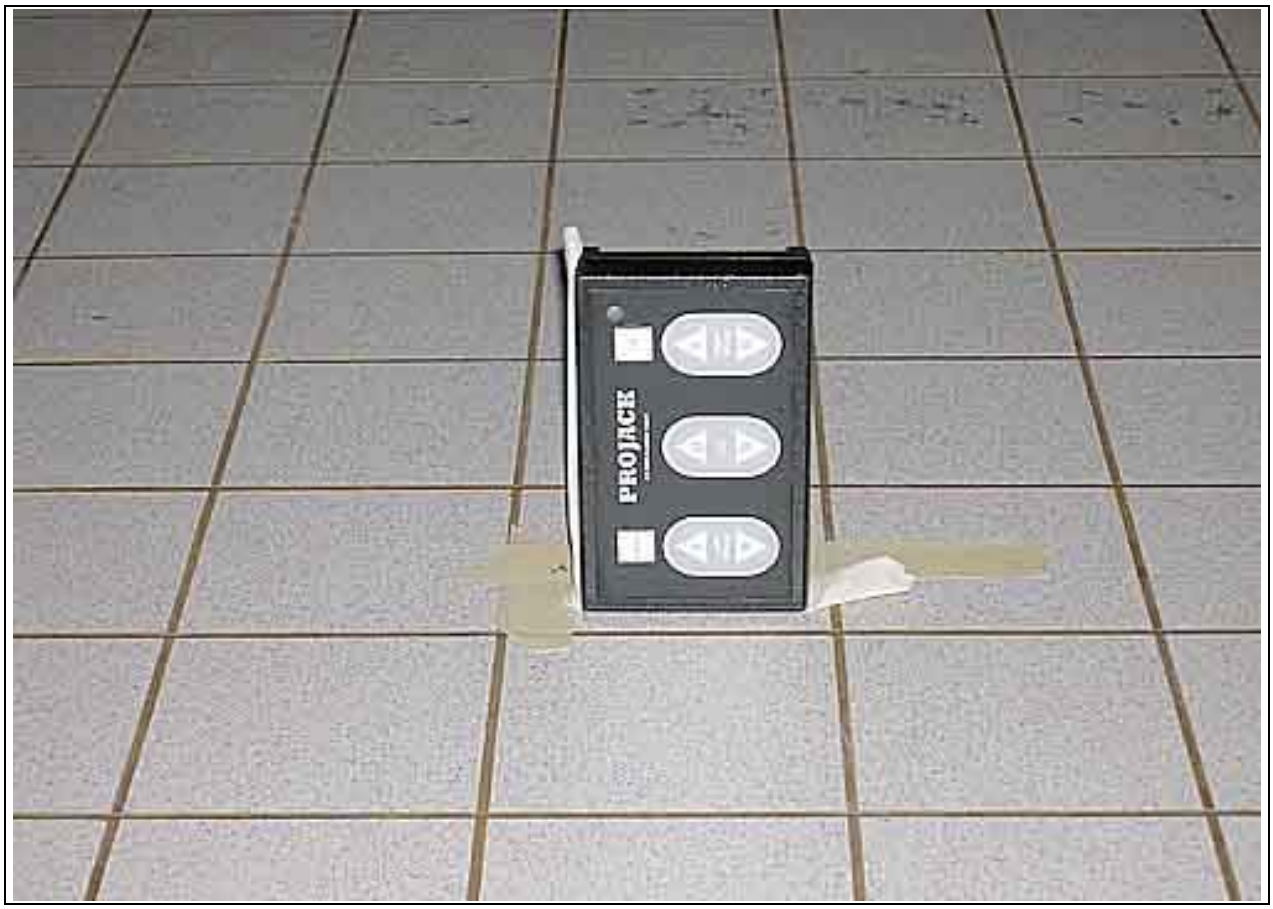
PHOTOGRAPH SHOWING TRANSMITTER TRANSMITTING

Front View

PHOTOGRAPH SHOWING TRANSMITTER TRANSMITTING

Back View

PHOTOGRAPH SHOWING TRANSMITTER RECEIVING



Front View

PHOTOGRAPH SHOWING TRANSMITTER RECEIVING

Back View

APPENDIX B

TEST EQUIPMENT LIST

FCC 15.109

Function	S/N	Calibration Date	Cal Due Date	Asset #
S.A., Display HP-85662A	2542A12169	11/28/2005	11/28/2007	02662
S.A., RF Section HP-8568B	2601A02492	11/28/2005	11/28/2007	02663
HP8447F opt H64 preamp	2944A03850	03/05/2005	03/05/2007	00501
QP Adapter HP-85650A	2043A00188	10/23/2004	10/23/2006	01508
Cable	None	06/21/2005	06/21/2007	P05299
Cable	None	06/21/2005	06/21/2007	P05300
Cable	None	06/21/2005	06/21/2007	P05296
Chase Bilog CBL6111C	2630	01/24/2005	01/24/2007	00852

FCC 15.109 and 15.209: >1 GHz

Function	S/N	Calibration Date	Cal Due Date	Asset #
HF-Cable FSJ1P-50A-4A		02/20/2006	02/20/2008	P05138
Antenna, Horn	1064	03/08/2005	03/08/2007	02061
S.A. HP 8593EM	3624A00159	10/31/2004	10/31/2006	02111
Preamp, HP83017A	3123A00283	05/09/2005	05/09/2007	00785
Cable, HF 36"	n/a	02/08/2005	02/08/2007	P05200
Cable, 6'	n/a	06/07/2006	06/07/2008	P04241

FCC 15.209: 3-30MHz

Function	S/N	Calibration Date	Cal Due Date	Asset #
S.A., Display HP-85662A	2542A12169	11/28/2005	11/28/2007	02662
S.A., RF Section HP-8568B	2601A02492	11/28/2005	11/28/2007	02663
QP Adapter HP-85650A	2043A00188	10/23/2004	10/23/2006	01508
Cable	None	06/21/2005	06/21/2007	P05300
Cable	None	06/21/2005	06/21/2007	P05296
Antenna-Mag Loop-6502	2078	05/13/2005	05/13/2007	00432

FCC 15.209/15.249: 30-1000 MHz

Function	S/N	Calibration Date	Cal Due Date	Asset #
S.A., Display HP-85662A	2542A12169	11/28/2005	11/28/2007	02662
S.A., RF Section HP-8568B	2601A02492	11/28/2005	11/28/2007	02663
HP8447F opt H64 preamp	2944A03850	03/05/2005	03/05/2007	00501
QP Adapter HP-85650A	2043A00188	10/23/2004	10/23/2006	01508
Cable	None	06/21/2005	06/21/2007	P05299
Cable	None	06/21/2005	06/21/2007	P05300
Cable	None	06/21/2005	06/21/2007	P05296
Chase Bilog CBL6111C	2630	01/24/2005	01/24/2007	00852

APPENDIX C:

MEASUREMENT DATA SHEETS

Test Location: CKC Laboratories, Inc. •1120 Fulton Place • Fremont, CA 94539 • 510-249-1170

Customer: **Mov-A-Load Corp.**
Specification: **FCC 15.109 Class B Radiated**
Work Order #: **84961** Date: 6/14/2006
Test Type: **Maximized Emissions** Time: 14:01:40
Equipment: **Hand-Held Remote Control** Sequence#: 38
Manufacturer: Mov-A-Load Corp. Tested By: Art Rice
Model: ProJack M1 Transmitter Board
S/N: 8

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

Function	Manufacturer	Model #	S/N
Hand-Held Remote Control*	Mov-A-Load Corp.	ProJack M1 Transmitter Board	8

Support Devices:

Function	Manufacturer	Model #	S/N

Test Conditions / Notes:

Hand Held Remote Control located at the center of the turntable. Board is ProJack M1, Assembly Number: ASY-00003-REVB. Customer states this is representative of a production unit. The EUT is in the worst case position. The EUT has the shorter narrow edge resting on the table, with the longer narrow edge vertical. Transmitter receiving. Radiated emissions 30-1000 MHz.

Transducer Legend:

T1=0852-Bi-Log Antenna	T2=Cable P05296 25' RG214 N-N
T3=Cable P05299 2' RG214 N-N	T4=Cable P05300 12' RG214 N-N
T5=Amp Cal.HP-8447F OPT H64- AN 00501	

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

#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	939.241M	30.1	+23.3 -26.5	+1.8	+0.2	+1.0	+0.0 370	29.9	46.0	-16.1	Vert 130
2	951.590M	29.3	+23.6 -26.4	+1.8	+0.2	+1.0	+0.0 -9	29.5	46.0	-16.5	Horiz 130
3	936.142M	29.7	+23.2 -26.5	+1.8	+0.2	+0.9	+0.0 -10	29.3	46.0	-16.7	Vert 130
4	926.464M	29.5	+23.0 -26.7	+1.8	+0.2	+0.9	+0.0 -10	28.7	46.0	-17.3	Vert 130
5	926.683M	29.3	+23.0 -26.7	+1.8	+0.2	+0.9	+0.0 370	28.5	46.0	-17.5	Horiz 130

Test Location: CKC Laboratories, Inc. •1120 Fulton Place • Fremont, CA 94539 • 510-249-1170

Customer: **Mov-A-Load Corp.**
Specification: **FCC 15.109 Class B Radiated**
Work Order #: **84961** Date: 6/13/2006
Test Type: **Maximized Emissions** Time: 15:49:04
Equipment: **Hand-Held Remote Control** Sequence#: 24
Manufacturer: Mov-A-Load Corp. Tested By: Art Rice
Model: ProJack M1 Transmitter Board
S/N: 8

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

Function	Manufacturer	Model #	S/N
Hand-Held Remote Control*	Mov-A-Load Corp.	ProJack M1 Transmitter Board	8

Support Devices:

Function	Manufacturer	Model #	S/N

Test Conditions / Notes:

Hand Held Remote Control located at the center of the turntable. Board is ProJack M1, Assembly Number: ASY-00003-REVB. Customer states this is representative of a production unit. Handheld unit is placed in the worst case position for the receive LO signal. This is with the shorter narrow edge resting on the table, with the longer narrow edge vertical. NOTES: 1) Transmitter in receiving mode. 2) NOT using 1.5 GHz Hi Pass Filter. Measurements above 1 GHz used RBW=1 MHz, VBW=100 kHz for initial peak readings.

Transducer Legend:

T1=Horn Antenna AN02061 sn1064 (Fremont) T2=P05138 HF Cable 25ft
T3=HP-83017A, A/N 00785 T4=ANP05200 1-40GHz
T5=ANP04241 HF-Heliax Cable

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

#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	3950.472M	38.5	+31.8 +1.2	+3.9	-37.5	+1.6	+0.0 370	39.5	54.0 Noise floor.	-14.5	Horiz 100
2	4036.390M	38.0	+31.9 +1.1	+3.5	-37.5	+1.6	+0.0 370	38.6	54.0 Noise floor.	-15.4	Horiz 100
3	3985.098M	37.4	+31.9 +1.2	+3.7	-37.5	+1.6	+0.0	38.3	54.0 Noise floor.	-15.7	Vert 100
4	4824.490M	36.3	+32.4 +0.7	+3.4	-37.1	+1.7	+0.0 -10	37.4	54.0 Noise floor.	-16.6	Horiz 100

Test Location: CKC Laboratories, Inc. •1120 Fulton Place • Fremont, CA 94539 • 510-249-1170

Customer: **Mov-A-Load Corp.**
Specification: **FCC 15.209 3-30MHz**
Work Order #: **84961** Date: 6/14/2006
Test Type: **Maximized Emissions** Time: 15:10:01
Equipment: **Hand-Held Remote Control** Sequence#: 41
Manufacturer: Mov-A-Load Corp. Tested By: Art Rice
Model: ProJack M1 Transmitter Board
S/N: 8

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

Function	Manufacturer	Model #	S/N
Hand-Held Remote Control*	Mov-A-Load Corp.	ProJack M1 Transmitter Board	8

Support Devices:

Function	Manufacturer	Model #	S/N

Test Conditions / Notes:

Hand Held Remote Control located at the center of the turntable. Board is ProJack M1, Assembly Number: ASY-00003-REVB. Customer states this is representative of a production unit. The EUT is in the worst case position. The EUT has the longer narrow edge resting on the table, with the shorter narrow edge vertical. Transmitter transmitting. Signals tested are worst case for LO, MID, and HI channels. Radiated emissions 3-30 MHz.

Transducer Legend:

T1=Cable P05296 25' RG214 N-N T2=Cable P05300 12' RG214 N-N
T3=Mag Loop A/N 00432, S/N 2078

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

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	5.768M	26.3	+0.2	+0.1	+9.8		+0.0 -10	36.4	49.5	-13.1	Vert 100
2	3.557M	25.9	+0.1	+0.1	+10.0		+0.0 370	36.1	49.5	-13.4	Vert 100
3	3.367M	25.7	+0.1	+0.1	+10.0		+0.0 370	35.9	49.5	-13.6	Horiz 100
4	3.220M	25.5	+0.1	+0.1	+10.0		+0.0 -10	35.7	49.5	-13.8	Vert 100
5	4.154M	25.3	+0.1	+0.1	+10.0		+0.0 -10	35.5	49.5	-14.0	Vert 100
6	3.250M	25.3	+0.1	+0.1	+10.0		+0.0 370	35.5	49.5	-14.0	Horiz 100
7	4.672M	25.0	+0.2	+0.1	+10.0		+0.0 -10	35.3	49.5	-14.2	Horiz 100
8	6.161M	25.2	+0.2	+0.1	+9.7		+0.0 370	35.2	49.5	-14.3	Horiz 100

Test Location: CKC Laboratories, Inc. •1120 Fulton Place • Fremont, CA 94539 • 510-249-1170

Customer: **Mov-A-Load Corp.**
Specification: **FCC 15.209/15.249 30MHz to 1000 MHz**
Work Order #: **84961** Date: 6/14/2006
Test Type: **Maximized Emissions** Time: 12:13:14
Equipment: **Hand-Held Remote Control** Sequence#: 35
Manufacturer: Mov-A-Load Corp. Tested By: Art Rice
Model: ProJack M1 Transmitter Board
S/N: 8

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

Function	Manufacturer	Model #	S/N
Hand-Held Remote Control*	Mov-A-Load Corp.	ProJack M1 Transmitter Board	8

Support Devices:

Function	Manufacturer	Model #	S/N

Test Conditions / Notes:

Hand Held Remote Control located at the center of the turntable. Board is ProJack M1, Assembly Number: ASY-00003-REVB. Customer states this is representative of a production unit. The EUT is in the worst case position. The EUT has the longer narrow edge resting on the table, with the shorter narrow edge vertical. Transmitter transmitting LO, MID, or HI channel. Radiated emissions 30-1000 MHz.

Transducer Legend:

T1=0852-Bi-Log Antenna	T2=Cable P05296 25' RG214 N-N
T3=Cable P05299 2' RG214 N-N	T4=Cable P05300 12' RG214 N-N
T5=Amp Cal.HP-8447F OPT H64- AN 00501	

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

#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	899.049M	41.9	+22.3	+1.6	+0.3	+1.0	+0.0	40.5	46.0	-5.5	Vert
	QP		-26.6				149		LOW		117
^	899.008M	44.2	+22.3	+1.6	+0.3	+1.0	+0.0	42.8	46.0	-3.2	Vert
			-26.6				149		LOW		117
3	930.946M	40.9	+23.1	+1.8	+0.2	+0.9	+0.0	40.3	46.0	-5.7	Vert
			-26.6				342		HI		113
4	930.910M	38.2	+23.1	+1.8	+0.2	+0.9	+0.0	37.6	46.0	-8.4	Horiz
			-26.6				50		HI		223
5	928.630M	37.5	+23.1	+1.8	+0.2	+0.9	+0.0	36.9	46.0	-9.1	Vert
	QP		-26.6				293		HI		100
^	928.620M	42.1	+23.1	+1.8	+0.2	+0.9	+0.0	41.5	46.0	-4.5	Vert
			-26.6				293		HI		100
7	899.000M	37.3	+22.3	+1.6	+0.3	+1.0	+0.0	35.9	46.0	-10.1	Horiz
			-26.6				352		LOW		100
8	929.830M	35.3	+23.1	+1.8	+0.2	+0.9	+0.0	34.7	46.0	-11.3	Vert
			-26.6				293		HI		100
9	899.308M	32.5	+22.3	+1.6	+0.3	+1.0	+0.0	31.1	46.0	-14.9	Horiz
			-26.6				352		LOW		100

Test Location: CKC Laboratories, Inc. •1120 Fulton Place • Fremont, CA 94539 • 510-249-1170

Customer: **Mov-A-Load Corp.**
Specification: **FCC 15.209 1-10 GHz**
Work Order #: **84961** Date: 6/13/2006
Test Type: **Maximized Emissions** Time: 11:17:12
Equipment: **Hand-Held Remote Control** Sequence#: 20
Manufacturer: Mov-A-Load Corp. Tested By: Art Rice
Model: ProJack M1 Transmitter Board
S/N: 8

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

Function	Manufacturer	Model #	S/N
Hand-Held Remote Control*	Mov-A-Load Corp.	ProJack M1 Transmitter Board	8

Support Devices:

Function	Manufacturer	Model #	S/N

Test Conditions / Notes:

Hand Held Remote Control located at the center of the turntable. Board is ProJack M1, Assembly Number: ASY-00003-REVB. Customer states this is representative of a production unit. Handheld unit is placed in the worst case position for the fundamental signal. This is with the longer narrow edge resting on the table, with the shorter narrow edge vertical. NOTES: 1) Reduced transmit power 2.5 dBm to pass on 3rd harmonic. 2) No spurious signals other than transmitter harmonics were noted. Maximized data is for strongest signals/harmonics noted on the 6 scans V+H 1-10 GHz. Transmitting on LO, MID, or HI channel as noted. Measurements above 1 GHz used RBW=1 MHz, VBW=1 MHz for initial peak readings.

Transducer Legend:

T1=Horn Antenna AN02061 sn1064 (Fremont)	T2=P05138 HF Cable 25ft
T3=HP-83017A, A/N 00785	T4=HPF AN01415 1.5GHz
T5=ANP05200 1-40GHz	T6=ANP04241 HF-Heliax Cable

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	2706.825M	57.7	+28.9	+2.5	-37.7	+0.2	+0.0	53.5	54.0	-0.5	Horiz
	Ave		+1.3	+0.6			317		LO		184
^	2706.840M	58.8	+28.9	+2.5	-37.7	+0.2	+0.0	54.6	54.0	+0.6	Horiz
			+1.3	+0.6			317		LO		184
3	2745.285M	57.4	+29.1	+2.5	-37.7	+0.2	+0.0	53.4	54.0	-0.6	Horiz
	Ave		+1.3	+0.6			318		MID		180
^	2745.258M	58.2	+29.1	+2.5	-37.7	+0.2	+0.0	54.2	54.0	+0.2	Horiz
			+1.3	+0.6			318		MID		180
5	2782.990M	56.6	+29.2	+2.6	-37.7	+0.2	+0.0	52.7	54.0	-1.2	Horiz
	Ave		+1.3	+0.6			315		HI		179
^	2782.990M	57.6	+29.2	+2.6	-37.7	+0.2	+0.0	53.8	54.0	-0.2	Horiz
			+1.3	+0.6			315		HI		179
7	2782.990M	54.4	+29.2	+2.6	-37.7	+0.2	+0.0	50.6	54.0	-3.4	Vert
	Ave		+1.3	+0.6			1		HI		166
^	2782.965M	55.9	+29.2	+2.6	-37.7	+0.2	+0.0	52.1	54.0	-1.9	Vert
			+1.3	+0.6			1		HI		166

9	2745.285M Ave	54.1	+29.1 +1.3	+2.5 +0.6	-37.7	+0.2	+0.0 324	50.1	54.0 MID	-3.9	Vert 137
^	2745.230M	55.5	+29.1 +1.3	+2.5 +0.6	-37.7	+0.2	+0.0 324	51.5	54.0 MID	-2.5	Vert 137
11	5490.700M	46.3	+33.9 +1.8	+3.8 +0.8	-36.8	+0.2	+0.0 96	50.0	54.0 MID	-4.0	Vert 106
12	3660.300M Ave	50.6	+31.2 +1.5	+3.5 +0.6	-37.7	+0.1	+0.0 352	49.8	54.0 MID	-4.2	Vert 157
^	3660.335M	52.0	+31.2 +1.5	+3.5 +0.6	-37.7	+0.1	+0.0 352	51.2	54.0 MID	-2.8	Vert 157
14	2706.825M Ave	53.9	+28.9 +1.3	+2.5 +0.6	-37.7	+0.2	+0.0 1	49.7	54.0 LO	-4.3	Vert 173
^	2706.770M	55.2	+28.9 +1.3	+2.5 +0.6	-37.7	+0.2	+0.0 1	51.0	54.0 LO	-3.0	Vert 173
16	3609.120M	50.4	+31.1 +1.5	+3.3 +0.7	-37.7	+0.1	+0.0 331	49.4	54.0 LO	-4.6	Vert 114
17	5566.155M Ave	45.4	+33.9 +1.8	+3.8 +0.8	-36.9	+0.1	+0.0 28	48.9	54.0 HI	-5.1	Horiz 170
^	5566.155M	47.6	+33.9 +1.8	+3.8 +0.8	-36.9	+0.1	+0.0 28	51.1	54.0 HI	-2.9	Horiz 170
19	3710.710M Ave	49.2	+31.3 +1.5	+3.5 +0.8	-37.7	+0.1	+0.0 366	48.7	54.0 HI	-5.3	Vert 149
^	3710.705M	51.4	+31.3 +1.5	+3.5 +0.8	-37.7	+0.1	+0.0	50.9	54.0 HI	-3.1	Vert 149
21	5413.875M	45.0	+33.7 +1.8	+3.7 +0.9	-36.8	+0.2	+0.0 370	48.5	54.0 LO	-5.5	Vert 115
22	5490.450M Ave	44.7	+33.9 +1.8	+3.8 +0.8	-36.8	+0.2	+0.0 352	48.4	54.0 MID	-5.6	Horiz 169
^	5490.455M	47.8	+33.9 +1.8	+3.8 +0.8	-36.8	+0.2	+0.0 352	51.5	54.0 MID	-2.5	Horiz 169
24	5566.275M Ave	44.7	+33.9 +1.8	+3.8 +0.8	-36.9	+0.1	+0.0 106	48.2	54.0 HI	-5.8	Vert 112
^	5566.275M	47.5	+33.9 +1.8	+3.8 +0.8	-36.9	+0.1	+0.0 106	51.0	54.0 HI	-3.0	Vert 112
26	5413.750M Ave	43.9	+33.7 +1.8	+3.7 +0.9	-36.8	+0.2	+0.0 3	47.4	54.0 LO	-6.6	Horiz 173
^	5413.745M	47.0	+33.7 +1.8	+3.7 +0.9	-36.8	+0.2	+0.0 3	50.5	54.0 LO	-3.5	Horiz 173
28	4575.385M	46.8	+31.7 +1.7	+3.4 +0.9	-37.3	+0.1	+0.0 47	47.3	54.0 MID	-6.7	Horiz 130
29	6316.000M Ave	42.2	+34.7 +2.0	+4.1 +1.2	-37.2	+0.1	+0.0 -3	47.1	54.0 LO	-6.9	Vert 107
^	6316.070M	45.6	+34.7 +2.0	+4.1 +1.2	-37.2	+0.1	+0.0 -3	50.5	54.0 LO	-3.5	Vert 107
31	3710.605M	47.6	+31.3 +1.5	+3.5 +0.8	-37.7	+0.1	+0.0 15	47.1	54.0 HI	-6.9	Horiz 168
32	4511.420M	46.6	+31.5 +1.7	+3.3 +1.0	-37.3	+0.1	+0.0 -10	46.9	54.0	-7.1	Vert 134
33	4511.420M	46.2	+31.5 +1.7	+3.3 +1.0	-37.3	+0.1	+0.0 69	46.5	54.0	-7.5	Horiz 139

Test Location: CKC Laboratories, Inc. •1120 Fulton Place • Fremont, CA 94539 • 510-249-1170

Customer: **Mov-A-Load Corp.**
Specification: **FCC 15.249 902-928MHz**
Work Order #: **84961** Date: 6/14/2006
Test Type: **Maximized Emissions** Time: 08:55:17
Equipment: **Hand-Held Remote Control** Sequence#: 28
Manufacturer: Mov-A-Load Corp. Tested By: Art Rice
Model: ProJack M1 Transmitter Board
S/N: 8

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

Function	Manufacturer	Model #	S/N
Hand-Held Remote Control*	Mov-A-Load Corp.	ProJack M1 Transmitter Board	8

Support Devices:

Function	Manufacturer	Model #	S/N

Test Conditions / Notes:

Hand Held Remote Control located at the center of the turntable. Board is ProJack M1, Assembly Number: ASY-00003-REVB. Customer states this is representative of a production unit. Fundamental was previously investigated at each of the three orthogonal planes. The data represents the worst case maximized signal. The EUT has the longer narrow edge resting on the table, with the shorter narrow edge vertical.

Transducer Legend:

T1=0852-Bi-Log Antenna	T2=Cable P05296 25' RG214 N-N
T3=Cable P05299 2' RG214 N-N	T4=Cable P05300 12' RG214 N-N
T5=Amp Cal.HP-8447F OPT H64- AN 00501	

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

#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	902.266M	92.3	+22.4 -26.6	+1.6	+0.3	+1.0	+0.0 361	91.0	94.0 LOW channel	-3.0	Vert 103
2	915.059M	91.1	+22.7 -26.7	+1.7	+0.2	+0.9	+0.0 362	89.9	94.0 MID channel	-4.1	Vert 104
3	927.662M	89.6	+23.0 -26.6	+1.8	+0.2	+0.9	+0.0 292	88.9	94.0 HI channel	-5.1	Vert 104
4	927.662M	87.3	+23.0 -26.6	+1.8	+0.2	+0.9	+0.0 24	86.6	94.0 HI channel	-7.4	Horiz 243
5	915.071M	87.8	+22.7 -26.7	+1.7	+0.2	+0.9	+0.0 354	86.6	94.0 MID channel	-7.4	Horiz 240
6	902.272M	87.6	+22.4 -26.6	+1.6	+0.3	+1.0	+0.0 16	86.3	94.0 LOW channel	-7.7	Horiz 241