

*FCC PART 15, SUBPART B and C
TEST REPORT*

for

REMOTE GUIDANCE SYSTEM-TX

MODEL: TX600-845D

Prepared for

KANGAROO PRODUCTS COMPANY
111 KANGAROO DRIVE
COLUMBUS, NORTH CAROLINA 28722

Prepared by: *Kyle Fujimoto*

KYLE FUJIMOTO

Approved by: *James Ross*

JAMES ROSS

COMPATIBLE ELECTRONICS INC.
114 OLINDA DRIVE
BREA, CALIFORNIA 92823
(714) 579-0500

DATE: May 19, 2014

	REPORT BODY	APPENDICES					TOTAL
		A	B	C	D	E	
PAGES	16	2	2	2	12	24	58

This report shall not be reproduced except in full, without the written approval of Compatible Electronics.

TABLE OF CONTENTS

Section / Title	PAGE
GENERAL REPORT SUMMARY	4
SUMMARY OF TEST RESULTS	5
1. PURPOSE	6
2. ADMINISTRATIVE DATA	7
2.1 Location of Testing	7
2.2 Traceability Statement	7
2.3 Cognizant Personnel	7
2.4 Date Test Sample was Received	7
2.5 Disposition of the Test Sample	7
2.6 Abbreviations and Acronyms	7
3. APPLICABLE DOCUMENTS	8
4. DESCRIPTION OF TEST CONFIGURATION	9
4.1 Description of Test Configuration - Emissions	9
5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT	10
5.1 EUT and Accessory List	10
6. TEST SITE DESCRIPTION	11
6.1 Test Facility Description	11
6.2 EUT Mounting, Bonding and Grounding	11
7. TEST PROCEDURES	12
7.1 RF Emissions	12
7.1.1 Radiated Emissions (Spurious and Harmonics) Test – Lab B	12
7.1.2 Radiated Emissions (Spurious and Harmonics) Test – Lab D	14
7.1.3 RF Emissions Test Results	15
8. CONCLUSIONS	16

LIST OF APPENDICES

APPENDIX	TITLE
A	Laboratory Accreditations and Recognitions
B	Modifications to the EUT
C	Additional Models Covered Under This Report
D	Diagrams and Charts • Test Setup Diagrams • Antenna and Effective Gain Factors
E	Data Sheets

LIST OF FIGURES

FIGURE	TITLE
1	Plot Map And Layout of Test Site
2	Layout of the Semi-Anechoic Test Chamber

GENERAL REPORT SUMMARY

This electromagnetic emission test report is generated by Compatible Electronics Inc., which is an independent testing and consulting firm. The test report is based on testing performed by Compatible Electronics personnel according to the measurement procedures described in the test specifications given below and in the "Test Procedures" section of this report.

The measurement data and conclusions appearing herein relate only to the sample tested and this report may not be reproduced without the written permission of Compatible Electronics, unless done so in full.

This report must not be used to claim product certification, approval or endorsement by NVLAP, NIST or any agency of the federal government.

Device Tested: Remote Guidance System-Tx
Model: TX600-845D
S/N: N/A

Product Description: See Expository Statement.

Modifications: The EUT was modified during the testing by replacing the resistors at R1 with a 68K Ohm resistor.

Customer: Kangaroo Products Company
111 Kangaroo Drive
Columbus, North Carolina 28722

Test Date: May 14, 2014

Test Specifications: EMI requirements
CFR Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.209, and 15.249

Test Procedure: ANSI C63.4

Test Deviations: The test procedure was not deviated from during the testing.

SUMMARY OF TEST RESULTS

TEST	DESCRIPTION	RESULTS
1	Spurious Radiated RF Emissions, 10 kHz – 9300 MHz (Transmitter and Digital portion)	Complies with the Class B limits of CFR Title 47, Part 15 Subpart B; and the limits of CFR Title 47, Part 15, Subpart C, section 15.205, 15.209 and 15.249
2	Conducted RF Emissions, 150 kHz to 30 MHz	This test was not performed because the EUT operates on battery power and does not connect to the AC mains.

1. PURPOSE

This document is a qualification test report based on the emissions tests performed on the Remote Guidance System-Tx, Model: TX600-845D. The EMI measurements were performed according to the measurement procedure described in ANSI C63.4. The tests were performed in order to determine whether the electromagnetic emissions from the equipment under test, referred to as EUT hereafter, are within the Class B specification limits defined by CFR Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.209, and 15.249.

Note: For the unintentional radiator portion of the test, the EUT was within the **Class B** specification limits defined by CFR Title 47, Part 15, Subpart B.

2. ADMINISTRATIVE DATA

2.1 Location of Testing

The EMI tests described herein were performed at the test facility of Compatible Electronics, 114 Olinda Drive, Brea, California 92823.

2.2 Traceability Statement

The calibration certificates of all test equipment used during the test are on file at the location of the test. The calibration is traceable to the National Institute of Standards and Technology (NIST).

2.3 Cognizant Personnel

Kangaroo Products Company

Timothy Pope Sr. Vice President

Compatible Electronics Inc.

Kyle Fujimoto Test Engineer
James Ross Lab Engineer

2.4 Date Test Sample was Received

The test sample was received prior to the date of testing.

2.5 Disposition of the Test Sample

The test sample has not been returned to Kangaroo Products Company as of the date of this test report.

2.6 Abbreviations and Acronyms

The following abbreviations and acronyms may be used in this document.

RF	Radio Frequency
EMI	Electromagnetic Interference
EUT	Equipment Under Test
P/N	Part Number
S/N	Serial Number
HP	Hewlett Packard
ITE	Information Technology Equipment
CML	Corrected Meter Limit
LISN	Line Impedance Stabilization Network
N/A	Not Applicable

3. APPLICABLE DOCUMENTS

The following documents are referenced or used in the preparation of this EMI Test Report.

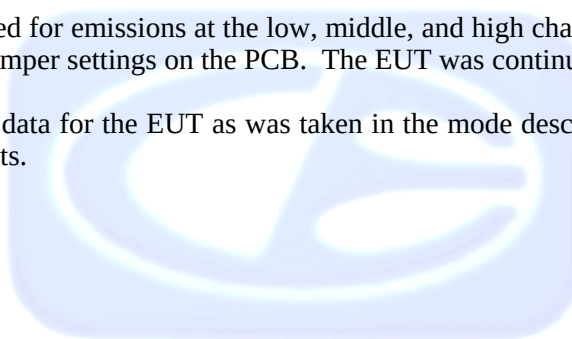
SPEC	TITLE
FCC Title 47, Part 15 Subpart C	FCC Rules - Radio frequency devices (including digital devices) – Intentional Radiators
FCC Title 47, Part 15 Subpart B	FCC Rules - Radio frequency devices (including digital devices) – Unintentional Radiators
ANSI C63.4 2009	Methods of measurement of radio-noise emissions from low-voltage electrical and electronic equipment in the range of 9 kHz to 40 GHz

4. DESCRIPTION OF TEST CONFIGURATION**4.1 Description of Test Configuration - Emissions**

The Remote Guidance System-Tx, Model: TX600-845D (EUT) is a remote control that is powered by a 9-volt battery.

The EUT was tested for emissions at the low, middle, and high channels. The channels were changed by changing the jumper settings on the PCB. The EUT was continuously transmitting.

The final radiated data for the EUT as was taken in the mode described above. Please see Appendix E for the data sheets.



5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT

5.1 EUT and Accessory List

EQUIPMENT	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	FCC ID
REMOTE GUIANDCE SYSTEM-TX	KANGAROO PRODUCTS COMPANY	TX600-845D	N/A	OVPTX600-845D

5.2 EMI Test Equipment

EQUIPMENT TYPE	MANU-FACTURER	MODEL NUMBER	SERIAL NUMBER	CALIBRATION DATE	CAL. CYCLE
GENERAL TEST EQUIPMENT					
Computer	Hewlett Packard	p6716f	MXX1030PX0	N/A	N/A
LCD Monitor	Hewlett Packard	52031a	3CQ046N3MG	N/A	N/A
EMI Receiver	Rohde & Schwarz	ESIB40	100194	November 19, 2012	2 Year
RF RADIATED EMISSIONS TEST EQUIPMENT					
CombiLog Antenna	Com-Power	AC-220	61060	May 29, 2013	1 Year
Preamplifier	Com-Power	PA-118	181656	January 13, 2014	1 Year
Loop Antenna	Com-Power	AL-130	17089	January 29, 2014	2 Year
Horn Antenna	Com-Power	AH-118	071175	February 26, 2014	2 Year
System Controller	Sunol Sciences Corporation	SC110V	112213-1	N/A	N/A
Turntable	Sunol Sciences Corporation	2011VS	N/A	N/A	N/A
Antenna-Mast	Sunol Sciences Corporation	TWR95-4	112213-3	N/A	N/A

6. TEST SITE DESCRIPTION

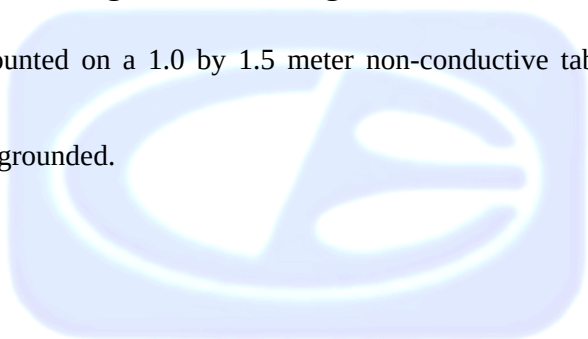
6.1 Test Facility Description

Please refer to section 2.1 and 7.1 of this report for EMI test location.

6.2 EUT Mounting, Bonding and Grounding

The EUT was mounted on a 1.0 by 1.5 meter non-conductive table 0.8 meters above the ground plane.

The EUT was not grounded.



7. TEST PROCEDURES

The following sections describe the test methods and the specifications for the tests. Test results are also included in this section.

7.1 RF Emissions

7.1.1 Radiated Emissions (Spurious and Harmonics) Test – Lab B

The EMI Receiver was used as a measuring meter. A preamplifier was used to increase the sensitivity of the instrument. The Com Power Microwave Preamplifier Model: PA-118 was used for frequencies above 1 GHz. The EMI Receiver was used in the peak detect mode with the "Max Hold" feature activated. In this mode, the EMI Receiver records the highest measured reading over all the sweeps.

The frequencies above 1 GHz were averaged by reducing the VBW down to 10 Hz.

The measurement bandwidths and transducers used for the radiated emissions test were:

FREQUENCY RANGE	EFFECTIVE MEASUREMENT BANDWIDTH	TRANSDUCER
1 GHz to 9.3 GHz	1 MHz	Horn Antenna

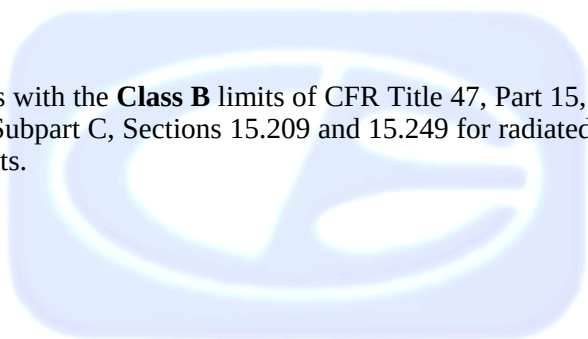
The open field test site of Compatible Electronics, Inc. was used for radiated emission testing. This test site is set up according to ANSI C63.4: 2009. Please see section 6.2 of this report for mounting, bonding and grounding of the EUT. The turntable supporting the EUT is remote controlled using a motor. The turntable permits EUT rotation of 360 degrees in order to maximize emissions. Also, the antenna mast allows height variation of the antenna from 1 meter to 4 meters. Data was collected in the worst case (highest emission) configuration of the EUT by the Radiated Emission Manual Test software. At each reading, the EUT was rotated 360 degrees and the antenna height was varied from 1 to 4 meters (for E field radiated field strength). The gunsight method was used when measuring with the horn antenna in order to ensure accurate results.

Radiated Emissions (Spurious and Harmonics) Test – Lab B (con't)

The presence of ambient signals was verified by turning the EUT off. In case an ambient signal was detected, the measurement bandwidth was reduced temporarily and verification was made that an additional adjacent peak did not exist. This ensures that the ambient signal does not hide any emissions from the EUT. The EUT was tested at a 3 meter test distance from 1 GHz to 9.3 GHz to obtain the final test data.

Test Results:

The EUT complies with the **Class B** limits of CFR Title 47, Part 15, Subpart B; and the limits of CFR Title 47, Part 15, Subpart C, Sections 15.209 and 15.249 for radiated emissions. Please see Appendix E for the data sheets.



7.1.2 Radiated Emissions (Spurious and Harmonics) Test – Lab D

The EMI Receiver was used as the measuring meter. A built-in, internal preamplifier was used to increase the sensitivity of the instrument. The EMI Receiver was initially used in the Analyzer mode feature activated. In this mode, the EMI receiver can then record the actual frequency to be measured. This final reading is then taken accurately in the EMI Receiver mode, which takes into account the cable loss, amplifier gain and antenna factors, so that a true reading is compared to the true limit. A quasi-peak reading was taken only for those readings, which are marked accordingly on the data sheets.

The EMI test chamber of Compatible Electronics, Inc. was used for radiated emissions testing. This test site is set up according to ANSI C63.4: 2009. Please see section 6.2 of this report for mounting, bonding and grounding of the EUT.

The turntable supporting the EUT is remote controlled using a motor. The turntable permits EUT rotation of 360 degrees in order to maximize emissions. Also, the antenna mast allows height variation of the antenna from 1 meter to 4 meters. Data was collected in the worst case (highest emission) configuration of the EUT. At each reading, the EUT was rotated 360 degrees and the antenna height was varied from 1 to 4 meters (for E field radiated field strength).

The measurement bandwidths and transducers used for the radiated emissions test were:

FREQUENCY RANGE	EFFECTIVE MEASUREMENT BANDWIDTH	TRANSDUCER
10 kHz to 150 kHz	200 Hz	Active Loop Antenna
150 kHz to 30 MHz	9 kHz	Active Loop Antenna
30 MHz to 1 GHz	120 kHz	CombiLog Antenna

The EUT was tested at a 3-meter test distance. The six highest emissions are listed in Table 1.0.

Test Results:

The EUT complies with the **Class B** limits of CFR Title 47, Part 15, Subpart B; and the limits of CFR Title 47, Part 15, Subpart C, Sections 15.209 and 15.249 (d) for radiated emissions. Please see Appendix E for the data sheets.

7.1.3 RF Emissions Test ResultsTable 1.0 RADIATED EMISSION RESULTS
Remote Guidance System-Tx, Model: TX600-845D

Frequency MHz	Quasi Peak Corrected Reading* dBuV	Specification Limit dBuV	Delta (Cor. Reading – Spec. Limit) dB
912.4 (X-Axis-H)	92.96	93.98	-1.02
921.4 (X-Axis-H)	92.27	93.98	-1.71
912.4 (Z-Axis-H)	91.87	93.98	-2.11
921.4 (Z-Axis-H)	91.79	93.98	-2.19
921.4 (Y-Axis-V)	91.27	93.98	-2.71
903.4 (X-Axis-V)	91.09	93.98	-2.89

Notes:

(H) Horizontal

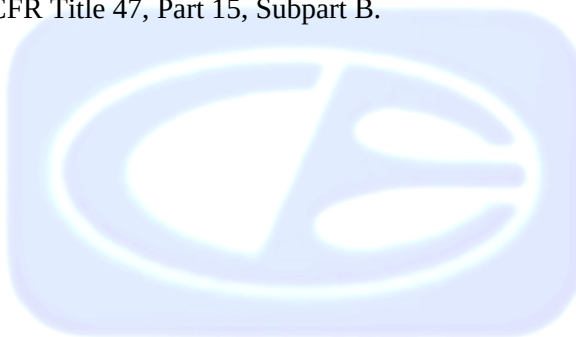
(V) Vertical

* The complete emissions data is given in Appendix E of this report.

8. CONCLUSIONS

The Remote Guidance System-Tx, Model: TX600-845D meets all of the specification limits defined in FCC Title 47, Part 15, Subpart C, sections 15.205, 15.209, and 15.249.

Note: For the unintentional radiator portion of the test, the EUT was within the **Class B** specification limits defined by CFR Title 47, Part 15, Subpart B.



APPENDIX A

LABORATORY ACCREDITATIONS AND RECOGNITIONS

Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500

Agoura Division
2337 Troutdale Drive
Agoura, CA 91301
(818) 597-0600

Silverado Division
19121 El Toro Road
Silverado, CA 92676
(949) 589-0700

Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400

LABORATORY ACCREDITATIONS AND RECOGNITIONS

NVLAP LAB CODES 200063-0,
200528-0, 200527-0

For US, Canada, Australia/New Zealand, Japan, Taiwan, Korea, and the European Union, Compatible Electronics is currently accredited by NVLAP to ISO/IEC 17025. Please follow the link to the NIST/NVLAP site for each of our facilities' NVLAP certificate and scope of accreditation

NVLAP listing links[Agoura Division](#) / [Brea Division](#) / [Silverado/Lake Forest Division](#)

.Quote from ISO-ILAC-IAF Communiqué on 17025:

"A laboratory's fulfilment of the requirements of ISO/IEC 17025:2005 means the laboratory meets both the technical competence requirements and management system requirements that are necessary for it to consistently deliver technically valid test results and calibrations. The management system requirements in ISO/IEC 17025:2005 (Section 4) are written in language relevant to laboratory operations and meet the principles of ISO 9001:2008 Quality Management Systems — Requirements."

**ANSI listing** [CETCB](#)

Compatible Electronics has been nominated as a Conformity Assessment Body (CAB) for EMC under the US/EU Mutual Recognition Agreement (MRA).

US/EU MRA list [NIST MRA site](#)

Compatible Electronics has been nominated as a Conformity Assessment Body (CAB) for Taiwan/BSMI under the US/APEC (Asia-Pacific Economic Cooperation) Mutual Recognition Agreement (MRA).

APEC MRA list [NIST MRA site](#)

We are also listed for IT products by the following country/agency:

**VCCI Support member:** Please visit http://www.vcci.jp/vcci_e/**FCC Listing, from FCC OET site**[FCC test lab search](#) <https://fjallfoss.fcc.gov/oetcf/eas/reports/TestFirmSearch.cfm>

Compatible Electronics IC listing can be found at:

<http://www.ic.gc.ca/eic/site/ic1.nsf/eng/home>

Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500

Agoura Division
2337 Troutdale Drive
Agoura, CA 91301
(818) 597-0600

Silverado Division
19121 El Toro Road
Silverado, CA 92676
(949) 589-0700

Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400

APPENDIX B

MODIFICATIONS TO THE EUT

MODIFICATIONS TO THE EUT

The modifications listed below were made to the EUT to pass FCC Subpart B and FCC 15.249 specifications.

All the rework described below was implemented during the test in a method that could be reproduced in all the units by the manufacturer.

The only modification to the EUT was resistor at R1 was changed to a 68K Ohm resistor.



APPENDIX C

***ADDITIONAL MODELS COVERED
UNDER THIS REPORT***

ADDITIONAL MODELS COVERED UNDER THIS REPORT

USED FOR THE PRIMARY TEST

Remote Guidance System-Tx
Model: TX600-845D
S/N: N/A

There were no additional models covered under this report.



APPENDIX D

DIAGRAMS AND CHARTS

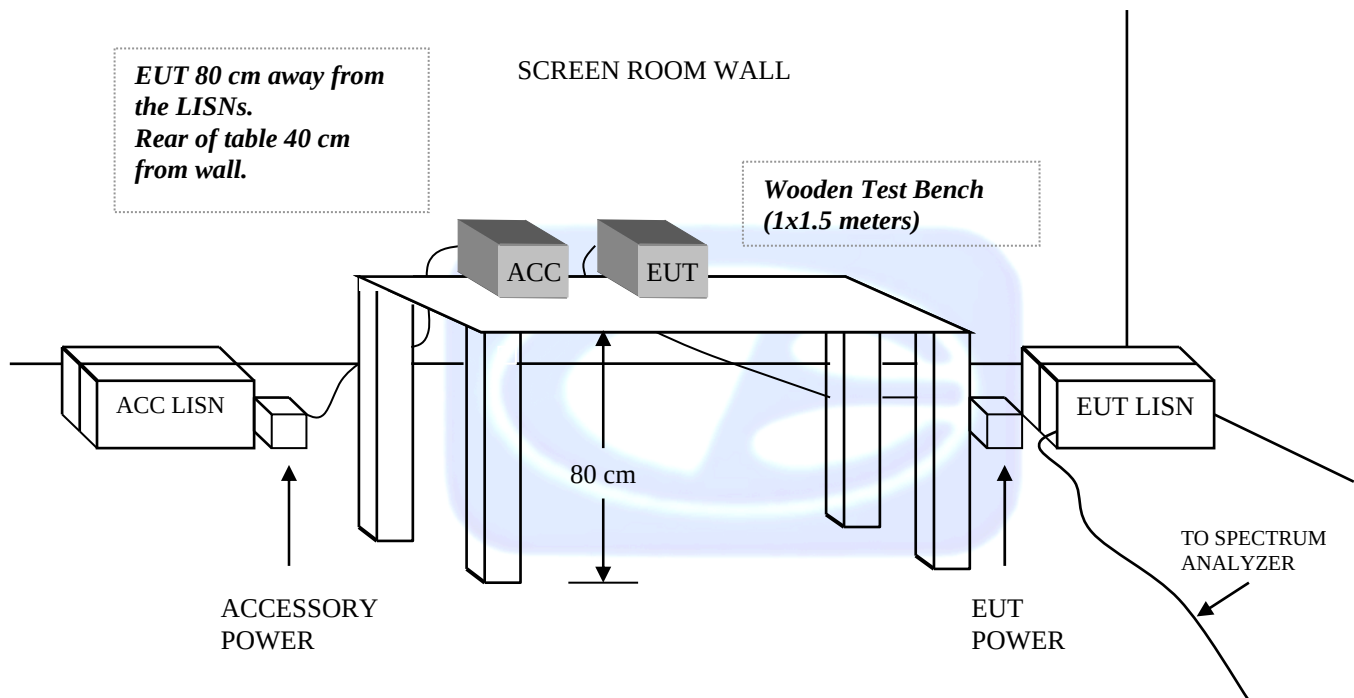
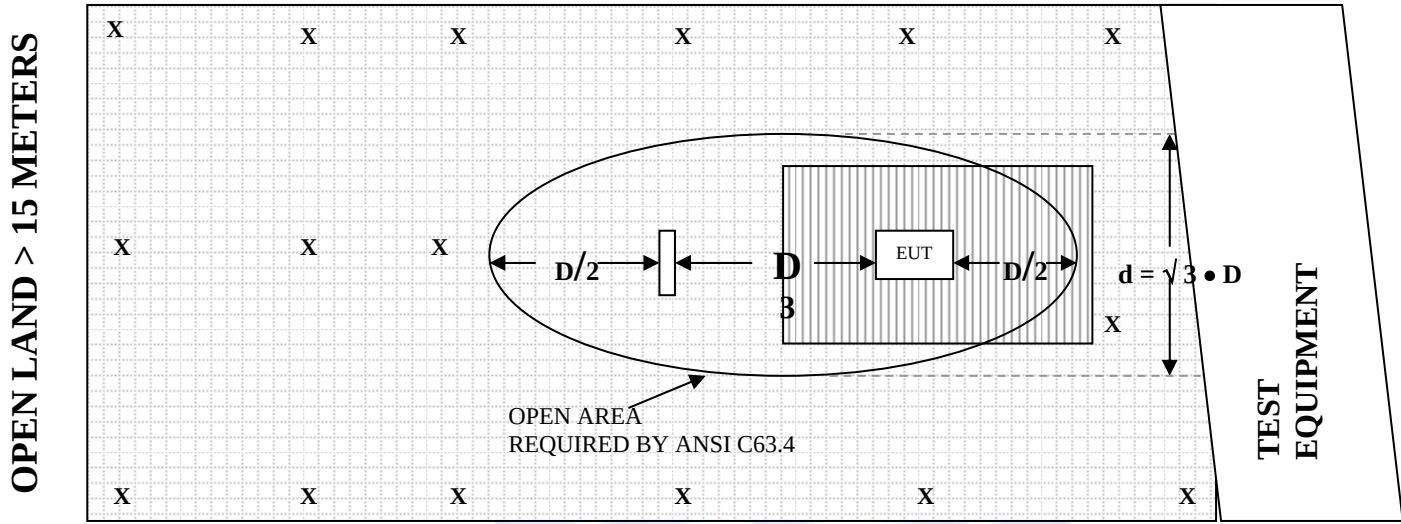
FIGURE 1: CONDUCTED EMISSIONS TEST SETUP

FIGURE 2: PLOT MAP AND LAYOUT OF RADIATED SITE

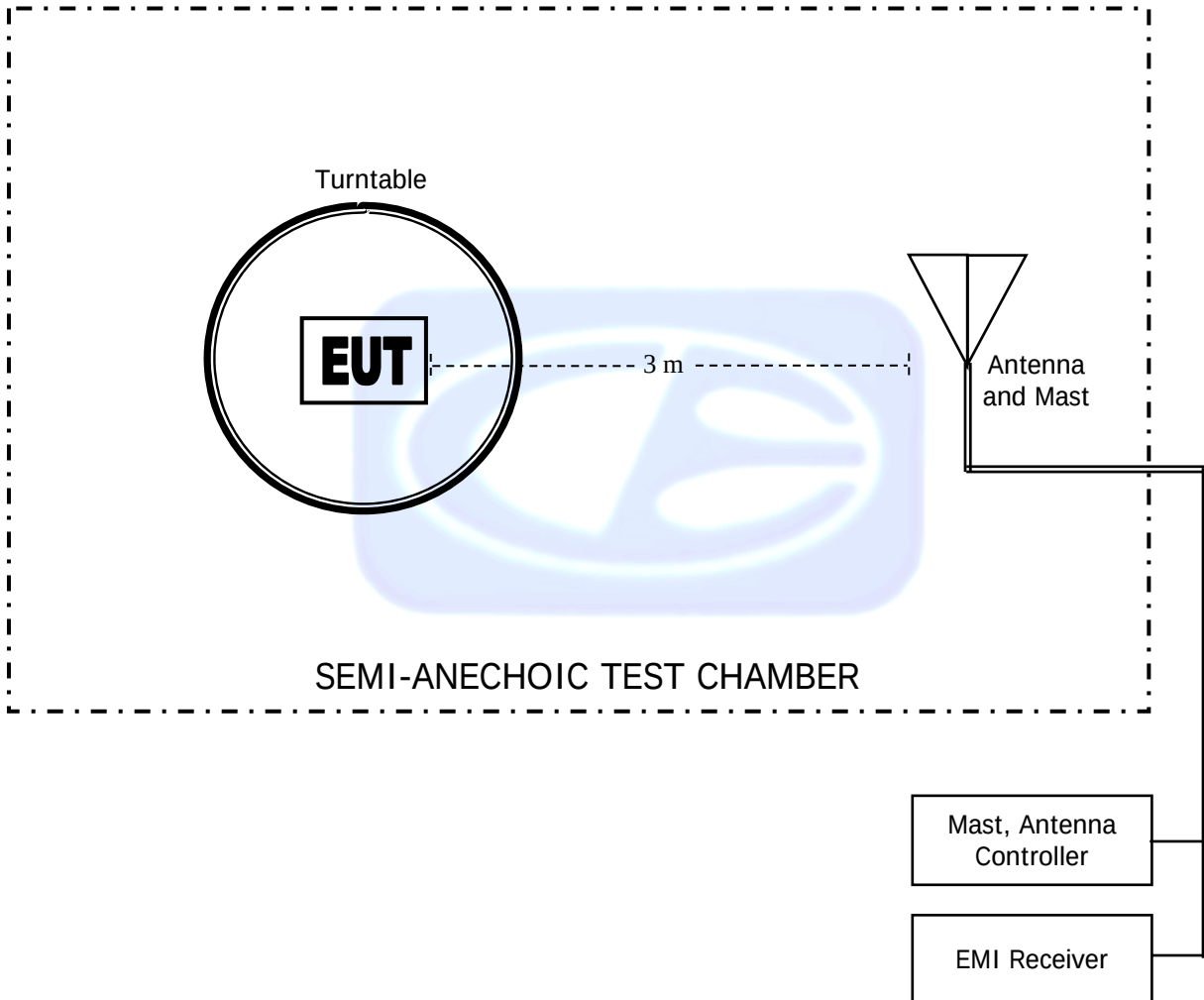
OPEN LAND > 15 METERS



OPEN LAND > 15 METERS

X	= GROUND RODS		= GROUND SCREEN
D	= TEST DISTANCE (meters)		= WOOD COVER

FIGURE 3: LAYOUT OF THE SEMI-ANECHOIC TEST CHAMBER



COM-POWER AL-130**LOOP ANTENNA****S/N: 17089****CALIBRATION DATE: JANUARY 29, 2014**

FREQUENCY (MHz)	MAGNETIC (dB/m)	ELECTRIC (dB/m)
0.009	-42.5	9
0.01	-42.3	9.2
0.02	-42.1	9.4
0.03	-41.4	10.1
0.04	-41.8	9.7
0.05	-42.4	9.1
0.06	-42.3	9.2
0.07	-42.5	9
0.08	-42.4	9.1
0.09	-42.5	9
0.1	-42.5	9
0.2	-42.7	8.8
0.3	-42.6	8.9
0.4	-42.5	9
0.5	-42.7	8.8
0.6	-42.7	8.8
0.7	-42.5	9
0.8	-42.3	9.2
0.9	-42.2	9.3
1	-42.2	9.3
2	-41.8	9.7
3	-41.7	9.8
4	-41.7	9.8
5	-41.5	10
6	-41.6	9.9
7	-41.4	10.1
8	-41	10.5
9	-40.8	10.7
10	-41.3	10.2
15	-41.4	10.1
20	-41.2	10.3
25	-42.6	8.9
30	-41.7	9.8

COM-POWER AC-220**COMBILOG ANTENNA****S/N: 61060****CALIBRATION DATE: MAY 29, 2013**

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	19.40	200	9.10
35	19.10	250	11.40
40	19.70	300	11.90
45	18.00	350	14.20
50	16.80	400	15.20
60	12.50	450	16.50
70	7.30	500	17.10
80	4.40	550	16.20
90	8.00	600	17.70
100	8.80	650	19.10
120	10.50	700	20.00
125	10.60	750	21.50
140	8.60	800	21.50
150	11.20	850	21.70
160	8.90	900	22.70
175	9.60	950	22.10
180	8.50	1000	22.90

COM POWER AH-118**HORN ANTENNA****S/N: 071175****CALIBRATION DATE: FEBRUARY 26, 2014**

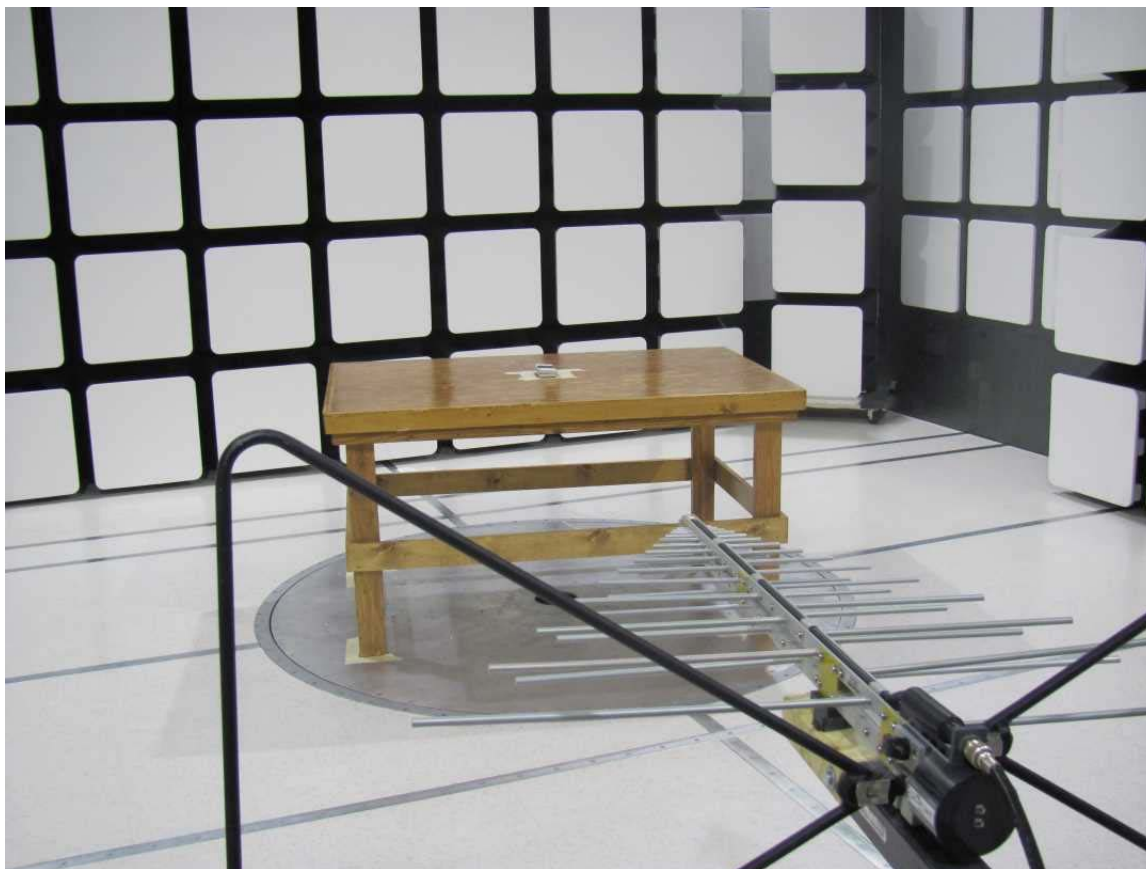
FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	24.23	10.0	38.43
1.5	25.84	10.5	40.19
2.0	28.14	11.0	40.49
2.5	29.51	11.5	41.39
3.0	31.20	12.0	42.02
3.5	32.17	12.5	43.30
4.0	31.40	13.0	42.77
4.5	31.86	13.5	40.18
5.0	34.82	14.0	42.59
5.5	34.38	14.5	41.74
6.0	36.31	15.0	41.84
6.5	34.81	15.5	38.48
7.0	37.48	16.0	39.52
7.5	36.98	16.5	37.85
8.0	36.66	17.0	41.33
8.5	38.47	17.5	44.96
9.0	37.22	18.0	48.50
9.5	37.86		

COM-POWER PA-118**PREAMPLIFIER**

S/N: 181656

CALIBRATION DATE: JANUARY 13, 2014

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	24.90	6.0	25.40
1.1	25.30	6.5	25.20
1.2	26.00	7.0	24.40
1.3	26.20	7.5	24.00
1.4	26.30	8.0	23.90
1.5	26.40	8.5	24.50
1.6	26.50	9.0	25.20
1.7	26.60	9.5	24.80
1.8	26.50	10.0	24.90
1.9	26.60	11.0	25.40
2.0	26.70	12.0	24.50
2.5	26.90	13.0	24.30
3.0	27.00	14.0	25.20
3.5	27.10	15.0	25.90
4.0	26.60	16.0	25.60
4.5	26.10	17.0	23.70
5.0	26.40	18.0	25.80
5.5	25.80		



FRONT VIEW

KANGAROO PRODUCTS COMPANY
REMOTE GUIDANCE SYSTEM-TX
MODEL: TX600-845D

FCC SUBPART B AND C – RADIATED EMISSIONS – BELOW 1 GHz

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**



REAR VIEW

KANGAROO PRODUCTS COMPANY
REMOTE GUIDANCE SYSTEM-TX
MODEL: TX600-845D

FCC SUBPART B AND C – RADIATED EMISSIONS – BELOW 1 GHz

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**



FRONT VIEW

KANGAROO PRODUCTS COMPANY
REMOTE GUIDANCE SYSTEM-TX
MODEL: TX600-845D

FCC SUBPART B AND C – RADIATED EMISSIONS – ABOVE 1 GHz

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**



REAR VIEW

KANGAROO PRODUCTS COMPANY
REMOTE GUIDANCE SYSTEM-TX
MODEL: TX600-845D

FCC SUBPART B AND C – RADIATED EMISSIONS – ABOVE 1 GHz

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**

APPENDIX E

DATA SHEETS

RADIATED EMISSIONS

DATA SHEETS

FCC 15.249Kangaroo Products
Remote Guidance System - Tx
Model: TX600-845D
With 68K Ohm Resistor on R1Date: 05/14/2014
Lab: B
Tested By: Kyle Fujimoto**Low Channel****Transmit Mode - X-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1806.8	33.53	V	53.98	-20.45	Peak	1.25	155	
2710.2	41.38	V	53.98	-12.6	Peak	1.25	155	
3613.6	40.95	V	53.98	-13.03	Peak	1.05	135	
4517	42.17	V	53.98	-11.81	Peak	1.15	145	
5420.4	43.03	V	53.98	-10.95	Peak	1.25	155	
6323.8								No Emissions Detected
7227.2								No Emissions Detected
8130.6								No Emissions Detected
9034								No Emissions Detected

FCC 15.249

Kangaroo Products
Remote Guidance System - Tx
Model: TX600-845D
With 68K Ohm Resistor on R1

Date: 05/14/2014
Lab: B
Tested By: Kyle Fujimoto

Low Channel**Transmit Mode - Y-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1806.8	36.95	V	53.89	-16.94	Peak	1.25	155	
2710.2	43.01	V	53.98	-10.97	Peak	1.25	135	
3613.6	40.91	V	53.98	-13.07	Peak	1.15	125	
4517	43.25	V	53.98	-10.73	Peak	1.15	125	
5420.4	42.34	V	53.98	-11.64	Peak	1.15	125	
6323.8								No Emissions Detected
7227.2								No Emissions Detected
8130.6								No Emissions Detected
9034								No Emissions Detected

FCC 15.249Kangaroo Products
Remote Guidance System - Tx
Model: TX600-845D
With 68K Ohm Resistor on R1Date: 05/14/2014
Lab: B
Tested By: Kyle Fujimoto**Low Channel****Transmit Mode - Z-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1806.8	35.74	V	53.98	-18.24	Peak	1.25	155	
2710.2	41.41	V	53.98	-12.57	Peak	1.35	165	
3613.6	39.07	V	53.98	-14.91	Peak	1.25	145	
4517	42.21	V	53.98	-11.77	Peak	1.25	145	
5420.4	43.01	V	53.98	-10.97	Peak	1.25	145	
6323.8								No Emissions Detected
7227.2								No Emissions Detected
8130.6								No Emissions Detected
9034								No Emissions Detected

FCC 15.249

Kangaroo Products
Remote Guidance System - Tx
Model: TX600-845D
With 68K Ohm Resistor on R1

Date: 05/14/2014
Lab: B
Tested By: Kyle Fujimoto

Low Channel**Transmit Mode - X-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1806.8	37.42	H	53.98	-16.56	Peak	1.25	155	
2710.2	44.22	H	53.98	-9.76	Peak	1.25	135	
3613.6	42.69	H	53.98	-11.29	Peak	1.35	135	
4517	41.69	H	53.98	-12.29	Peak	1.5	225	
5420.4	42.99	H	53.98	-10.99	Peak	1.5	225	
6323.8								No Emissions Detected
7227.2								No Emissions Detected
8130.6								No Emissions Detected
9034								No Emissions Detected

FCC 15.249

Kangaroo Products
Remote Guidance System - Tx
Model: TX600-845D
With 68K Ohm Resistor on R1

Date: 05/14/2014
Lab: B
Tested By: Kyle Fujimoto

Low Channel**Transmit Mode - Y-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1806.8	34.74	H	53.98	-19.24	Peak	1.25	155	
2710.2	42.76	H	53.98	-11.22	Peak	1.35	165	
3613.6	40.48	H	53.98	-13.5	Peak	1.25	175	
4517	40.57	H	53.98	-13.41	Peak	1.35	185	
5420.4	43.42	H	53.98	-10.56	Peak	1.25	165	
6323.8								No Emissions Detected
7227.2								No Emissions Detected
8130.6								No Emissions Detected
9034								No Emissions Detected

FCC 15.249

Kangaroo Products
Remote Guidance System - Tx
Model: TX600-845D
With 68K Ohm Resistor on R1

Date: 05/14/2014
Lab: B
Tested By: Kyle Fujimoto

Low Channel**Transmit Mode - Z-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1806.8	36.83	H	53.98	-17.15	Peak	1.25	155	
2710.2	44.43	H	53.98	-9.55	Peak	1.25	165	
3613.6	42.96	H	53.98	-11.02	Peak	1.25	135	
4517	44.88	H	53.98	-9.1	Peak	1.25	135	
5420.4	42.78	H	53.98	-11.2	Peak	1.25	155	
6323.8								No Emissions Detected
7227.2								No Emissions Detected
8130.6								No Emissions Detected
9034								No Emissions Detected

FCC 15.249

Kangaroo Products
 Remote Guidance System - Tx
 Model: TX600-845D
 With 68K Ohm Resistor on R1

Date: 05/14/2014
 Lab: B
 Tested By: Kyle Fujimoto

Middle Channel

Transmit Mode - X-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1824.8	42.58	V	53.98	-11.4	Peak	1.25	180	
2737.2	41.36	V	53.98	-12.62	Peak	1.25	180	
3649.6	39.72	V	53.98	-14.26	Peak	1.25	270	
4562	41.26	V	53.98	-12.72	Peak	1.25	90	
5474.4	42.58	V	53.98	-11.4	Peak	1.25	45	
6386.8								No Emissions Detected
7299.2								No Emissions Detected
8211.6								No Emissions Detected
9124								No Emissions Detected

FCC 15.249Kangaroo Products
Remote Guidance System - Tx
Model: TX600-845D
With 68K Ohm Resistor on R1Date: 05/14/2014
Lab: B
Tested By: Kyle Fujimoto**Middle Channel****Transmit Mode - Y-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1824.8	39.84	V	53.98	-14.14	Peak	1.25	90	
2737.2	34.59	V	53.98	-19.39	Peak	1.25	180	
3649.6	37.86	V	53.98	-16.12	Peak	1.25	225	
4562	40.58	V	53.98	-13.4	Peak	1.25	315	
5474.4	41.39	V	53.98	-12.59	Peak	1.25	45	
6386.8								No Emissions Detected
7299.2								No Emissions Detected
8211.6								No Emissions Detected
9124								No Emissions Detected

FCC 15.249Kangaroo Products
Remote Guidance System - Tx
Model: TX600-845D
With 68K Ohm Resistor on R1Date: 05/14/2014
Lab: B
Tested By: Kyle Fujimoto**Middle Channel****Transmit Mode - Z-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1824.8	35.98	V	53.98	-18	Peak	1.35	225	
2737.2	41.28	V	53.98	-12.7	Peak	1.35	135	
3649.6	37.15	V	53.98	-16.83	Peak	1.35	90	
4562	40.19	V	53.98	-13.79	Peak	1.35	270	
5474.4	35.84	V	53.98	-18.14	Peak	1.35	125	
6386.8								No Emissions Detected
7299.2								No Emissions Detected
8211.6								No Emissions Detected
9124								No Emissions Detected

FCC 15.249Kangaroo Products
Remote Guidance System - Tx
Model: TX600-845D
With 68K Ohm Resistor on R1Date: 05/14/2014
Lab: B
Tested By: Kyle Fujimoto**Middle Channel****Transmit Mode - X-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1824.8	40.55	H	53.98	-13.43	Peak	1.25	155	
2737.2	36.31	H	53.98	-17.67	Peak	1.25	165	
3649.6	38.63	H	53.98	-15.35	Peak	1.55	175	
4562	40.01	H	53.98	-13.97	Peak	1.65	185	
5474.4	43.49	H	53.98	-10.49	Peak	1.35	155	
6386.8	48.32	H	53.98	-5.66	Peak	1.45	165	
7299.2								No Emissions Detected
8211.6								No Emissions Detected
9124								No Emissions Detected

FCC 15.249

Kangaroo Products
Remote Guidance System - Tx
Model: TX600-845D
With 68K Ohm Resistor on R1

Date: 05/14/2014
Lab: B
Tested By: Kyle Fujimoto

Middle Channel
Transmit Mode - Y-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1824.8	34.14	H	53.98	-19.84	Peak	1.35	125	
2737.2	40.65	H	53.98	-13.33	Peak	1.25	165	
3649.6	40.11	H	53.98	-13.87	Peak	1.25	175	
4562	42.21	H	53.98	-11.77	Peak	1.15	185	
5474.4	42.75	H	53.98	-11.23	Peak	1.25	165	
6386.8								No Emissions Detected
7299.2								No Emissions Detected
8211.6								No Emissions Detected
9124								No Emissions Detected

FCC 15.249

Kangaroo Products
Remote Guidance System - Tx
Model: TX600-845D
With 68K Ohm Resistor on R1

Date: 05/14/2014
Lab: B
Tested By: Kyle Fujimoto

Middle Channel**Transmit Mode - Z-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1824.8	36.21	H	53.98	-17.77	Peak	1.35	155	
2737.2	41.18	H	53.98	-12.8	Peak	1.25	165	
3649.6	39.96	H	53.98	-14.02	Peak	1.55	135	
4562	44.97	H	53.98	-9.01	Peak	1.25	155	
5474.4	43.43	H	53.98	-10.55	Peak	1.25	155	
6386.8								No Emissions Detected
7299.2								No Emissions Detected
8211.6								No Emissions Detected
9124								No Emissions Detected

FCC 15.249Kangaroo Products
Remote Guidance System - Tx
Model: TX600-845D
With 68K Ohm Resistor on R1Date: 05/14/2014
Lab: B
Tested By: Kyle Fujimoto**High Channel****Transmit Mode - X-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1842.8	34.58	V	53.98	-19.4	Peak	1.25	155	
2764.2	41.64	V	53.98	-12.34	Peak	1.35	165	
3685.6	38.87	V	53.98	-15.11	Peak	1.25	175	
4607	40.27	V	53.98	-13.71	Peak	1.35	185	
5528.4	46.17	V	53.98	-7.81	Peak	1.25	195	
6449.8								No Emissions Detected
7371.2								No Emissions Detected
8292.6								No Emissions Detected
9214								No Emissions Detected

FCC 15.249

Kangaroo Products
Remote Guidance System - Tx
Model: TX600-845D
With 68K Ohm Resistor on R1

Date: 05/14/2014
Lab: B
Tested By: Kyle Fujimoto

High Channel**Transmit Mode - Y-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1842.8	35.23	V	53.98	-18.75	Peak	1.25	155	
2764.2	45.28	V	53.98	-8.7	Peak	1.35	165	
3685.6	43.59	V	53.98	-10.39	Peak	1.25	175	
4607	43.73	V	53.98	-10.25	Peak	1.35	185	
5528.4	44.81	V	53.98	-9.17	Peak	1.25	175	
6449.8								No Emissions Detected
7371.2								No Emissions Detected
8292.6								No Emissions Detected
9214								No Emissions Detected

FCC 15.249Kangaroo Products
Remote Guidance System - Tx
Model: TX600-845D
With 68K Ohm Resistor on R1Date: 05/14/2014
Lab: B
Tested By: Kyle Fujimoto**High Channel****Transmit Mode - Z-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1842.8	34.95	V	53.98	-19.03	Peak	1.25	155	
2764.2	42.63	V	53.98	-11.35	Peak	1.35	165	
3685.6	42.41	V	53.98	-11.57	Peak	1.25	175	
4607	43.02	V	53.98	-10.96	Peak	1.35	185	
5528.4	43.27	V	53.98	-10.71	Peak	1.45	195	
6449.8								No Emissions Detected
7371.2								No Emissions Detected
8292.6								No Emissions Detected
9214								No Emissions Detected

FCC 15.249

Kangaroo Products
 Remote Guidance System - Tx
 Model: TX600-845D
 With 68K Ohm Resistor on R1

Date: 05/14/2014
 Lab: B
 Tested By: Kyle Fujimoto

High Channel

Transmit Mode - X-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1842.8	38.64	H	53.98	-15.34	Peak	1.25	155	
2764.2	37.15	H	53.98	-16.83	Peak	1.35	145	
3685.6	42.76	H	53.68	-10.92	Peak	1.25	155	
4607	42.93	H	53.98	-11.05	Peak	1.35	165	
5528.4	40.41	H	53.98	-13.57	Peak	1.55	225	
6449.8								No Emissions Detected
7371.2								No Emissions Detected
8292.6								No Emissions Detected
9214								No Emissions Detected

FCC 15.249Kangaroo Products
Remote Guidance System - Tx
Model: TX600-845D
With 68K Ohm Resistor on R1Date: 05/14/2014
Lab: B
Tested By: Kyle Fujimoto**High Channel****Transmit Mode - Y-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1842.8	40.85	H	53.98	-13.13	Peak	1.25	155	
2764.2	38.54	H	53.98	-15.44	Peak	1.25	155	
3685.6	35.54	H	53.98	-18.44	Peak	1.25	155	
4607	36.41	H	53.98	-17.57	Peak	1.25	155	
5528.4	38.25	H	53.98	-15.73	Peak	1.25	155	
6449.8								No Emissions Detected
7371.2								No Emissions Detected
8292.6								No Emissions Detected
9214								No Emissions Detected

FCC 15.249

Kangaroo Products
Remote Guidance System - Tx
Model: TX600-845D
With 68K Ohm Resistor on R1

Date: 05/14/2014
Lab: B
Tested By: Kyle Fujimoto

**High Channel
Transmit Mode - Z-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1842.8	43.51	H	53.98	-10.47	Peak	1.25	155	
2764.2	40.41	H	53.98	-13.57	Peak	1.15	145	
3685.6	39.51	H	53.98	-14.47	Peak	1.15	315	
4607	35.10	H	53.98	-18.88	Peak	1.25	155	
5528.4	41.25	H	53.98	-12.73	Peak	1.45	235	
6449.8								No Emissions Detected
7371.2								No Emissions Detected
8292.6								No Emissions Detected
9214								No Emissions Detected

FCC 15.249

Kangaroo Products
 Remote Guidance System - Tx
 Model: TX600-845D
 With 68K Ohm Resistor on R1

Date: 05/14/2014
 Labs: B and D
 Tested By: Kyle Fujimoto

Non Harmonic Emissions from the Tx, Band Edges and Digital Portion

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
								No Emissions Found for the
								Digital Portion
								from 10 kHz to 9300 MHz
								for both Vertical and Horizontal
								Polarizations
								No Non Harmonic Emissions Found
								for the Tx Mode
								from 10 kHz to 9300 MHz
								for both Vertical and Horizontal
								Polarizations
								Investigated in the X-Axis,
								Y-Axis, and Z-Axis
								No Emissions Detected at the
								Lower Band Edge at 902 MHz when
								The EUT was at the Low Channel
								No Emissions Detected at the
								Upper Band Edge at 928 MHz when
								The EUT was at the High Channel