



FCC CLASS B COMPLIANCE TEST REPORT

for

Electromagnetic Emissions

of

GARAGE DOOR OPENER AND GARAGE DOOR TRANSMITTER

Model Number: GR-300M AND CT-300

Serial Number: Prototype

FCC ID: NUQ-CT300

PROJECT #: 01SC02507

Prepared for:

MIKADO TECHNOLOGY COMPANY

1435 Huntington Avenue #C
South San Francisco, CA 94080

Prepared by:

Underwriters Laboratories, Incorporated

11825 Niles Canyon Road
Sunol, CA 94586
(925) 862-9051

REPORT DATE: FEBRUARY 19, 2001



**FCC CLASS B
COMPLIANCE TEST REPORT**

FOR

**GARAGE DOOR OPENER AND GARAGE DOOR TRANSMITTER
MODEL GR-300M AND CT-300**

Prepared for:

MIKADO TECHNOLOGY CO.
South San Francisco, CA 94080

Prepared by: Underwriters Laboratories, Inc.

Signature

Date

TEST TECHNICIAN



Wayne Fisher

4-12-01

TEST SUPERVISOR



Daryl Smith

4-12-01



LIST OF REVISIONS

**REVISION
NUMBER
AND DATE**

**PAGE
CHANGED**

**PAGE
SUBSTITUTED**

**PAGE
ADDED**



REPRODUCTION CLAUSE

Any reproduction of this document must be done in full. No single part of this document may be reproduced without written permission of Underwriters Laboratories, Inc., 11825 Niles Canyon Road, Sunol, CA 94586.



TABLE OF CONTENTS

<u>TITLE</u>	<u>PAGE</u>
TITLE PAGE.....	1
SIGNATURE PAGE.....	2
LIST OF REVISIONS.....	3
REPRODUCTION CLAUSE	4
TABLE OF CONTENTS	5
VERIFICATION OF COMPLIANCE	7
GENERAL INFORMATION	8
DEVIATIONS	8
TEST RESULTS.....	8
LETTER OF AUTHORIZATION	10
SYSTEM DESCRIPTION.....	12
PRODUCT INFORMATION	14
FCC ID LABEL	15
FCC LABEL PLACEMENT	17
BLOCK DIAGRAMS OF EUT	19
SCHEMATICS	21
OPERATION MANUAL	26
PRODUCT CABLING INFORMATION	29
SUMMARY.....	34



TABLE OF CONTENTS (continued)

<u>SECTION</u>	<u>TITLE</u>	<u>PAGE</u>
APPENDIX A	PHOTOGRAPHS	36
APPENDIX B	TEST FACILITY	47
APPENDIX C	TEST EQUIPMENT.....	49
APPENDIX D	TEST METHODS	52
APPENDIX E	CLASS TYPES	55
APPENDIX F	LABELING REQUIREMENTS	57
APPENDIX G	DATA READINGS.....	59
APPENDIX H	TEST PROCEDURES.....	66



VERIFICATION OF COMPLIANCE

Equipment Under Test: Garage Door Opener and Garage Door Transmitter

Model Numbers: GR-300M and CT-300

Serial Number: Prototype

Company: Mikado Technology Co.
1435 Huntington Ave. #C
S. San Francisco, CA 94080

Test Specification: FCC Class B (ANSI C63.4, 1992)

Type of Test: Conducted 450 kHz - 30 MHz
Radiated 30 MHz - 1 GHz

Performance Criteria:

- Garage Door Opener**
For Line Conducted test, emissions must not exceed the limits stated in CFR 47 Part 15, Subpart B, Section 107-(a).
- Garage Door Transmitter**
For Radiated test, emissions must not exceed the limits stated in CFR 47 Part 15, Subpart C, Section 15.231.
- Garage Door Opener**
For Radiated test, emissions must not exceed the limits stated in CFR 47 Part 15, Subpart B, Section 109-(a).

Date Tested: January 31, 2001

Tested By: Wayne Fisher

The above equipment was tested by Underwriters Laboratories, Inc., for compliance with the requirements set forth in the FCC Class B Rules and Regulations. This said equipment in the configuration described in the report, shows that maximum emission levels emanating from the equipment are within the compliance requirements.



GENERAL INFORMATION

Customer: Mikado Technology Co.
1435 Huntington Ave. #C
S. San Francisco, CA 94080

Contact Person: Sammy Wu

Phone Number: (650) 615-9466

Equipment Under Test: Garage Door Opener and Garage Door Transmitter

Model Number: GR-300M and CT-300

Serial Number: Prototype

FCC ID Number: NUQ-CT300

Test Standard: CFR 47 Part 15, Subpart B 1999 (ANSI C63.4-1992), Class B
CFR 47 Part 15, Subpart C 1999

Type of Test: Conducted 450 kHz - 30 MHz
Radiated 30 MHz - 1 GHz

Performance Criteria: **Garage Door Opener**
For Line Conducted test, emissions must not exceed the limits stated in CFR 47 Part 15, Subpart B, Section 107-(a).
Garage Door Transmitter
For Radiated test, emissions must not exceed the limits stated in CFR 47 Part 15, Subpart C, Section 15.231.
Garage Door Opener
For Radiated test, emissions must not exceed the limits stated in CFR 47 Part 15, Subpart B, Section 109-(a).

Deviation: None



GENERAL INFORMATION (continued)

Test Results:

Line Conducted--Line conducted scans for the Garage Door Opener ranged from 450 kHz to 30 MHz on both Line 1 (hot side) and Line 2 (neutral side) in accordance with FCC Class B test standard. All line conducted emissions were within the FCC Class B requirements for compliance. (See Data)

Radiated--Radiated scans for the Garage Door Opener ranged from 30 MHz to 1 GHz in both the horizontal and vertical antenna polarization. All emissions observed were within FCC class B requirements for compliance.

Radiated--Radiated scans for Garage Door Transmitter the ranged from 30 MHz to 1 GHz in both the horizontal and the vertical antenna polarization. All spurious emissions were within the FCC subpart C section 15.231 (b)(3) requirements for compliance. (See Data)

Radiated--Radiated scans for the Garage Door Transmitter at fundamental frequency 391.16MHz to 391.26MHz were performed in both the horizontal and the vertical antenna polarization. The fundamental emissions were within the FCC subpart C section 15.231 (b)(2) and requirements for compliance. (See Data)

Radiated--Radiated scans for the Garage Door Transmitter at fundamental frequency 391.16MHz were performed to determine "On time of transmitter after deactivating 'on' switch". The fundamental emissions were within the FCC subpart C section 15.231 (a)(1) and requirements for compliance. (See Plot)

Radiated--Radiated scans for the Garage Door Transmitter at fundamental frequency 391.12MHz were performed to determine the fundamental bandwidth for Center Frequency. The fundamental emissions were within the FCC subpart C section 15.231 (c) and requirements for compliance. (See Plot)



LETTER OF AUTHORIZATION



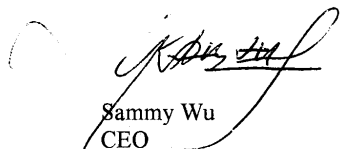
Federal Communications Commission
Authorization and Evaluation Division
7435 Oakland Mills Road
Columbia, MD 21046

Gentlemen :

We, the undersigned, hereby authorize Underwriters Laboratories, Inc. to act on our behalf in all matters relating to applications for equipment authorizations, including the signing of all documents relating to these matters. Any and all acts carried out by Underwriters Laboratories, Inc. on our behalf shall have the same effect as acts of our own.

The applicant certifies that, in the case of an individual applicant is not subject to a denial of federal benefits, that includes FCC benefits, pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C. 853(a), or, in the case of a non-individual applicant (e.g. corporation, partnership or other unincorporated association), no party to the application is subject to a denial of federal benefits, that includes FCC benefits, pursuant to that section.

Sincerely,



Sammy Wu
CEO



SYSTEM DESCRIPTION

Equipment Under Test

Garage Door Opener and Garage Door Transmitter

Support Equipment

None

EUT Test Program: EUT was operated in transmit/receive and idle modes.



FUNCTIONAL DESCRIPTION

The Garage Door Opener (receiver) and Garage Door Transmitter, models GR-300M and CT-300

The receiver (GR-300M) is typically mounted inside the user's garage and is connected to the manual switch wires of garage door openers. The GR-300M has a stranded wire for an antenna.

The transmitter (CT-300) is capable of sending three different signals to activate up to three separate garage door openers, via the receiving unit. It's designed to be either mounted in the dashboard of an automobile, or carried as on a key chain. The user selects which door to activate 1, 2 or 3 by depressing either button 1, for door one, or 2 for door two. Door three is selected by depressing buttons 1 and 2 simultaneously. The CT-300 sends different digital codes on singular frequency depending on what buttons are depressed. The antenna for the transmitter is a spiral integral to the printed circuit board. The CT-300 had a fresh battery installed for testing.



PRODUCT INFORMATION

Description of Equipment Under Test: Garage Door Opener and Garage Door Transmitter Model GR-300M and CT-300 are capable of sending three different signals to activate up to three different garage door openers via the receiving unit.

The EUT and/or support equipment was received at Underwriters Laboratories, Inc. on January 31, 2001 in good condition.

Housing Type: Plastic

Power Supply: External

AC Power Requirements: 120 VAC / 60 Hz 12 VDC

Power Supply Manufacturer: Motorola

Model Number: 481609003NT

Serial Number: 9715

Power Line Cord From External Supply to EUT: Unshielded

Length: 2 Meters

OSC./Clock Frequency: 391 MHz

<u>I/O PORT TYPE</u>	<u>QTY</u>	<u>TESTED WITH</u>
Door Opener	3	3



FCC ID LABEL



Federal Communications Commission
Authorization and Evaluation Division
7435 Oakland Mills Road
Columbia, MD 21046

RE: FCC ID: NUQ-CT300

Gentlemen:

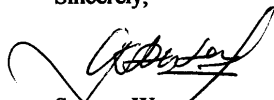
The FCC identification number for the NUQ-CT300 is engraved on the outside of the housing of the transmitter.

FCC ID:	<u>NUQ-CT300</u>
COMPANY NAME:	<u>Mikado Technology Company</u>
EQUIPMENT NAME:	<u>Panel-Mounted Garage Door Transmitter</u>
MATERIAL TYPE:	<u>Plastic</u>
COLOR OF DECAL:	<u>Same Color as Plastic Housing</u>
DECAL SIZE:	<u>25mm W x 7mm H</u>

Note: The device shall bear the following statement in a conspicuous location on the device:

Operation is subject to the following two conditions: (1) This device may not cause; harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Sincerely,


Sammy Wu
CEO
Jan. 31, 2001



FCC ID LABEL PLACEMENT



Federal Communications Commission
Authorization and Evaluation Division
7435 Oakland Mills Road
Columbia, MD 21046

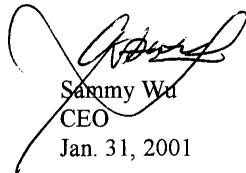
RE : FCC ID: NUQ-CT300

Gentlemen :

See Figure A-2 on Page 28
(CD Page 38)

The above drawing is an illustration of the FCC label placement on our product upon
grant of this application.

Sincerely,



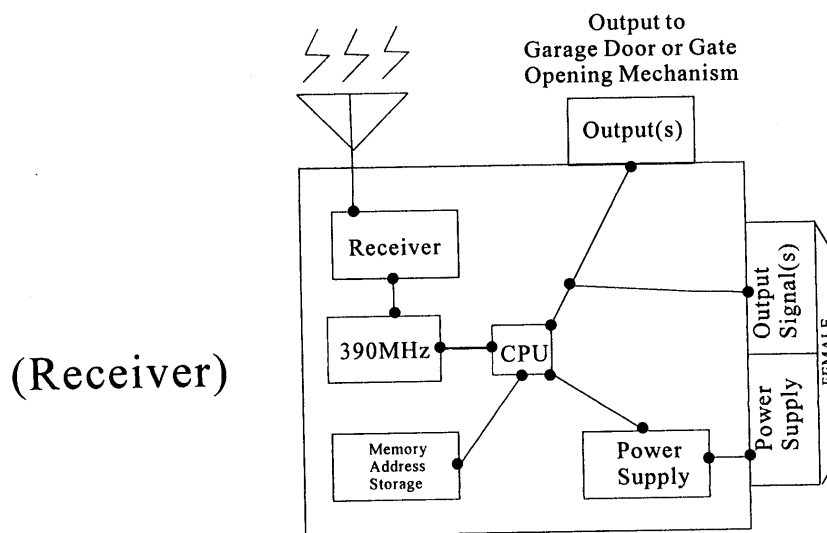
Sammy Wu
CEO
Jan. 31, 2001



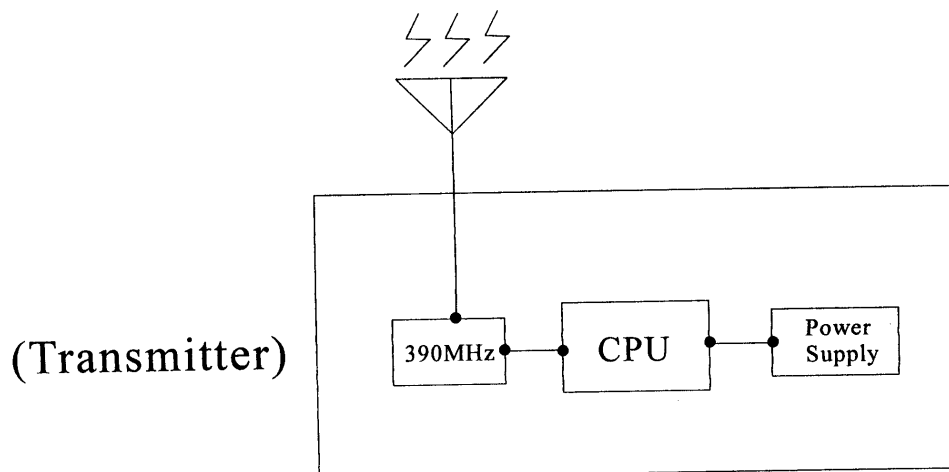
BLOCK DIAGRAM(S)

FCC:NUQ-CT300

Model:GR-300M

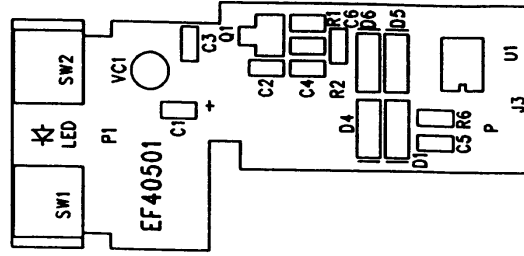


Model:CT-300

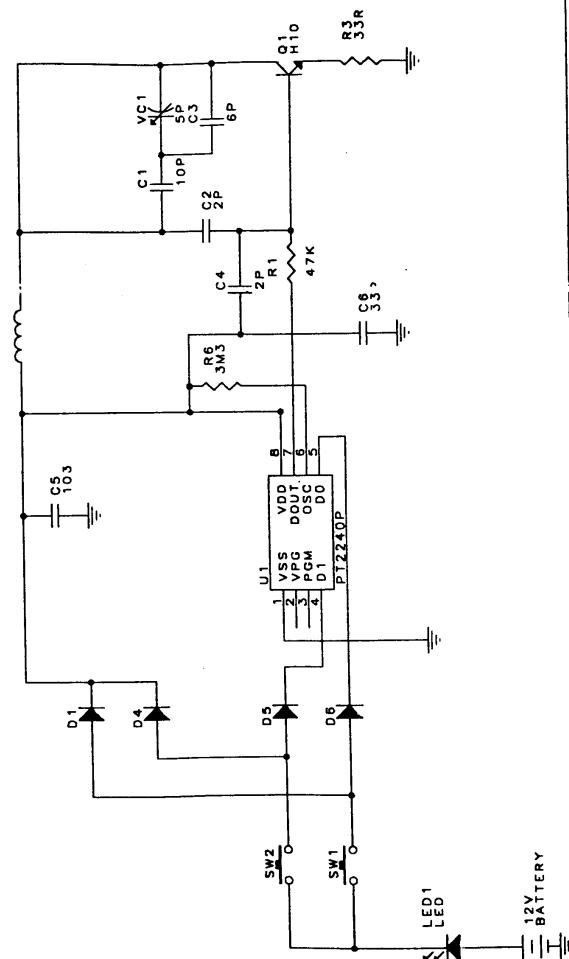




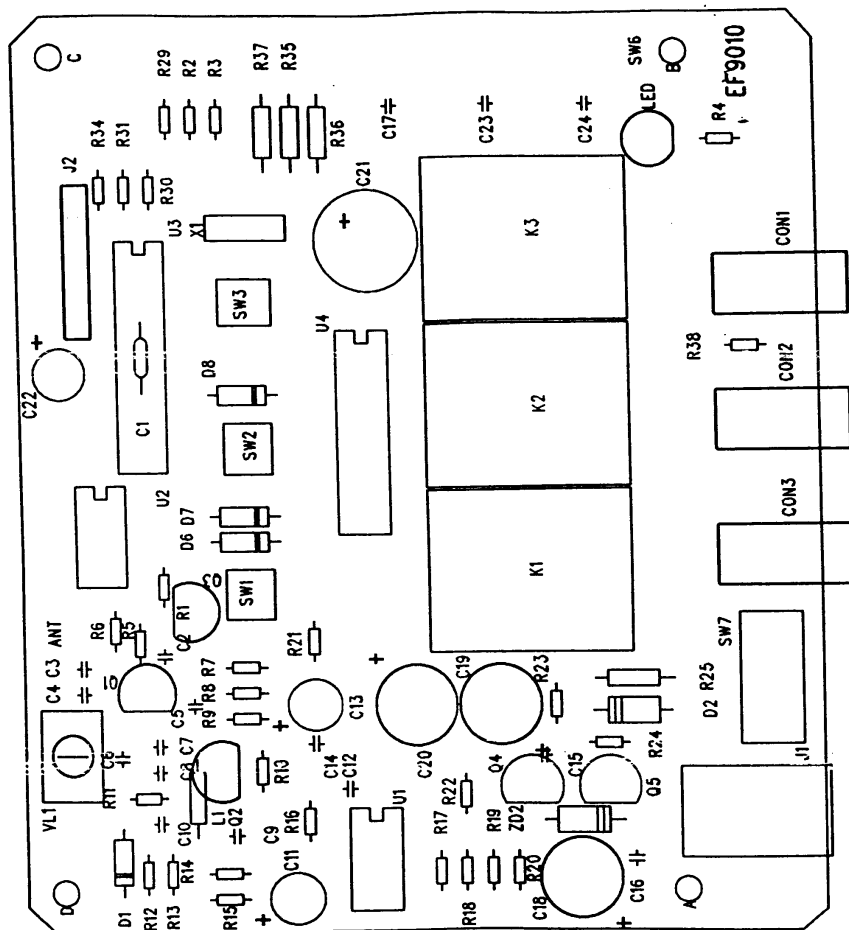
SCHEMATICS



Transmitter
CT-300



REV	EF40501	Document Number
	A	Sheet
Q.D.S.: December 18, 2005		



3mm
1mm

Receiver Opener
GR-300M



OPERATION MANUAL

* SEE SEPARATE ENCLOSURE FOR THE OPERATION MANUAL.

The enclosed manual is for the EUT name. As you will notice on Page 1 of this manual is the FCC WARNING about radio and television interference as per the requirement set forth in Part 15 of the FCC Rules.

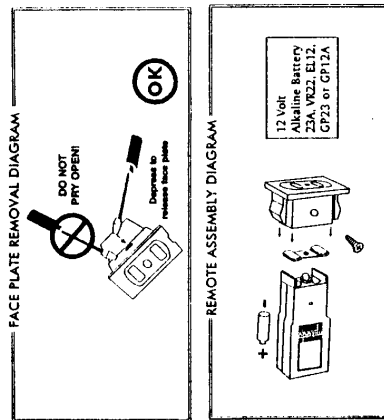


Owner's Manual

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions : (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

Universal Garage Door Remote Control

FCC ID : NUQ-CT300
Receiver
Model : GR-300M
Transmitter
Model : CT-300



WARNING

- ⚠ Electrical shock can cause serious injury or death. Before installing or making any changes, please make sure you unplug the garage door unit(s) and the Mikado receiver's AC Adapter from the electrical socket.
- ⚠ Garage door(s) can cause serious injury or death. Before you open or close the garage door(s), make sure people are away from the garage door(s).
- ⚠ Do not allow children to operate the Mikado receiver or IDT.
- ⚠ Do not allow children to play near the garage door(s).
- ⚠ Please contact a trained professional if you need help installing the unit.

LIMITED WARRANTY

What Is and Is Not Covered: This warranty covers all defects in workmanship or materials in your Mikado Programmable Remote unit ("Unit"). This warranty does not cover any previously altered, repaired, or serviced Unit. If performed by anyone other than Mikado International, Inc. ("Mikado"), any Unit on which the serial number has been altered or removed any Unit damaged by accident, misuse, abuse, intentional or negligent use, or any other cause not covered by this warranty. This warranty is void if the Unit is not used in accordance with the instructions provided with the Unit. This warranty also does not cover battery, battery replacement, removal of the Unit. This warranty is void if the Unit is not used in accordance with the instructions provided with the Unit.

Except to the extent prohibited by applicable law, this shall be the exclusive written warranty and neither this warranty nor any other warranty, express or implied, including a warranty of merchantability and fitness for a particular purpose, shall extend beyond the period of coverage stated in this warranty. Mikado shall not be liable for any loss or damage, incidental, direct, including, or consequential, arising out of the use of, or inability to use, this product. As used in this warranty, incidental damage includes, but is not limited to, damages consequential with transportation to and from the dealer or manufacturer to get warranty service, loss of time, loss of use, or other such damages associated with property. This warranty is not limited to the cost of repairing or replacing other property which is damaged when this appliance does not work properly. This warranty is only valid in the US and Canada.

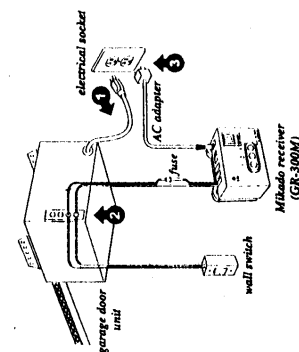
For New Long: This warranty coverage runs for three (3) year on purchase one (1) year on later from the original date of purchase of the Unit. **What Mikado Will Do:** Mikado will, at its option, repair the defective Unit at no cost to you, or replace the defective Unit with a new or re-manufactured functionally equivalent Unit of equal value.

How to Get Service: Ship the Unit, freight prepaid to Mikado International, Inc., 1435 Huntington Ave., Ste. C, South San Francisco, CA 94107. The Unit must be packaged in such a way as to reasonably protect it from possible shipping damage. In many instances, the carton in which the dealer sells the Unit is not adequate, and additional packaging is required. Evidence of proof of purchase in the form of the bill of sale or invoice must be included. Please specify the problem in detail to insure expedient service. Call Customer Service at 1-888-9-MIKADO for further information.

Your Rights under State Law: Some states do not allow limitations on how long an implied warranty lasts, or the exclusion or limitation of incidental or consequential damages, so the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

©2000 Mikado International, Inc. All rights reserved. US & Canada Patent Pending.

Installation



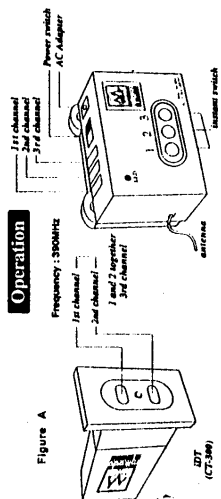
Step 1

Unplug the garage door unit(s) from the electrical socket. (see figure A) Use the two 15cm white releasable tie straps to secure the Mikado receiver on or near the garage door unit(s). (see figure B) If you have three garage doors, secure the Mikado receiver on or near the center garage door unit in order for the two 6 meter output wires to reach the other two garage door units.

Step 2

Connect the red output wire from the Mikado receiver to either one of the two garage door wall switch terminals on the garage door unit. Connect the white output wire to the other wall switch terminal on the garage door unit. (see figure C) Because the Mikado receiver and the iDT are **pre-set to match**, you must

Operation



connect the wiring harness to the appropriate terminal on the receiver. For example, if you want to use channel one on the iDT, you must connect the wiring harness to channel one on the receiver. (see figure A)

Step 3

Connect the AC adapter to the Mikado receiver and plug the AC adapter and the garage door unit(s) back into the electrical socket. (see figure B) If your electrical socket is on the ceiling, please use the 30cm white releasable tie strap to secure the AC adapter onto the electrical socket cover to prevent the adapter from falling down. (see figure C)

Operation

After installing the Mikado receiver, the LED light on the receiver should start to flash, which means the receiver is working. If the LED light is not flashing, make sure the power switch is switched to the right. (see figure D) If the LED light is flashing, press the Mikado receiver's instant switch and the garage door motor should start to work. If the garage door motor does not work, check the fuse on the connecting wire. If the fuse is okay, go back to step 2 in the Installation Instructions and check your connections.

Make sure you have connected the red and white output wires from the Mikado receiver to the wall switch terminals on the garage door unit. Before making any changes, please make sure you unplug the garage door unit(s) and the Mikado receiver's AC Adapter from the electrical socket.

Test the reception of the Mikado receiver by pressing the button on the iDT to open the garage door. If necessary, change the location of the Mikado receiver to increase the reception of the unit. The 15cm white tie straps are releasable.

Please contact a trained professional if you need help installing the unit.

OR

For additional information contact us at :
1-888-9-MIKADO
www.mikadotech.com



TEST SUMMARY

Equipment Under Test: Garage Door Opener GR-300M and Garage Door Transmitter CT-300

Requirements: FCC CFR 15.0

Modifications Made to EUT: No

Test Results:

<u>Requirement</u>	<u>Results</u>
15.231(a)	Passed
15.231(a)(1)	Passed
15.231(a)(2)	N/A
15.231(a)(3)	N/A
15.231(a)(4)	N/A
15.231(b)(1)	N/A
15.231(b)(2)	Passed
15.231(b)(3)	Passed
15.231(c)	Passed
15.231(d)	N/A
15.231(e)	N/A
15.107(b)	Passed
15.109(b)	Passed

Part 15, subpart B for receiver requirements.



TEST RESULTS

FCC 47 CFR Part 15 Subpart C

CT-300 Garage Door Opener/Transmitter

15.231(a) Periodic operation in the band 40.66-40.70 MHz and above 70MHz

CT-300 operates at 391.16MHz

Transmission signal types: Control signals (See Manual)

15.231(a)(1) A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

The CT-300 unit was triggered hand and its output signal was measured using a spectrum analyzer.

CT-300 unit on time = 2.5 seconds. (See Page 51)

The remote unit was triggered by hand using the push button and its output was measured using a spectrum analyzer

CT-300 unit on time after release = 37.5 milliseconds (See Page 53)

15.231(a)(2) N/A EUT is not automatically activated

15.231(a)(3) N/A EUT does not operate at regular predetermined intervals

15.231(a)(4) N/A EUT is not for emergency use



TEST RESULTS (Continued)

15.231(b)(1)(2) Emission field strength limit of fundamental frequency

CT-300 Unit

The CT-300 unit was handheld 3 meters from the antenna and was triggered by hand using the 1 and 2 buttons. This was done many time in order to capture the signal.

15.231(b)(3) Emission Field Strength of Spurious Emissions

GR-300M and CT-300 Units

The GR-300M unit was placed on a wooden table 0.8 meters high located on a 3 meter open field test site.

A wiring harness was connected to the GR-300M unit

The hand held remote unit was used to activate the GR-300M unit

The GR-300M and CT-300 units were found to be within the limits. (See Pages 56 and 57)

15.231(c) Bandwidth shall be no wider than 0.25% of the center frequency at the 20dB down points

Center frequency = 391.16 MHz

0.25% = 0.9779MHz

Transmitter = 490.0 kHz (See Page 50)

The CT-300 was within the 0.25% BW limit



TEST RESULTS (Continued)

- 15.231(d) N/A EUT Operates at 391.16 MHz
- 15.231(e) N/A EUT does not operate at a periodic rate exceeding that specified in paragraph (a)

FCC 47 CFR Part 15, Subpart B

15.107 Conducted Emissions (Class B)

GR-300M Garage Door Opener Receiver

15.109 Field Strength of Radiated Emission (Class B)

The base unit was placed on a wooden table 0.8 meters high, located on a 3 meter open field test site.

A wiring harness was connected to the base unit



SUMMARY

Company: Mikado Technology Co.

Equipment Under Test: Garage Door Receiver

Model Number: GR-300M

Test Specification: FCC Class B

Test Type: Line Conducted

Location: Lab #2

Tested By: Wayne Fisher

EUT was scanned in the following setup(s): Mode: Receiving Configuration: Standard

The highest emissions recorded were in test setup #1 above.

Support Equipment: None

EUT Power: 120 VAC / 60 Hz

Power Cord: Unshielded

Modification(s) made to EUT: None

Test Results: Passed

(The chart below shows the six highest readings taken from the final data)

FREQ MHz	CORR'D dBµV	SITE CF	LIMIT		MARGIN		LINE
			QP	AVG	QP	AVG	
0.454	25.8PK	6.0	48.0		-22.2		Line 1
0.583	21.8PK	6.0	48.0		-26.2		Line 1
0.460	24.0PK	6.0	48.0		-24.0		Line 1
0.519	20.0PK	6.0	48.0		-28.0		Line 2
0.660	17.4PK	6.0	48.0		-30.6		Line 2
28.110	19.5PK	6.0	48.0		-28.5		Line 2

L1 = Line One (hot side)/L2 = Line Two (neutral side)



SUMMARY

Company: Mikado Technology Co.

Equipment Under Test: Garage Door Transmitter

Model Number: CT-300

Test Specification: FCC Class B

Test Type: Radiated

Location: 3 Meter Test Site #1

Tested By: Wayne Fisher

EUT was scanned in the following setup(s): **Mode:** Receiving **Configuration:** Standard

The highest emissions recorded were in test setup #1 above.

Support Equipment: None

EUT Power: 120 VAC / 60 Hz

Power Cord: Unshielded

Modification(s) made to EUT: None

Test Results: Passed

Note: See Final Test Data



APPENDIX A

PHOTOGRAPHS



CT-300 Logo View



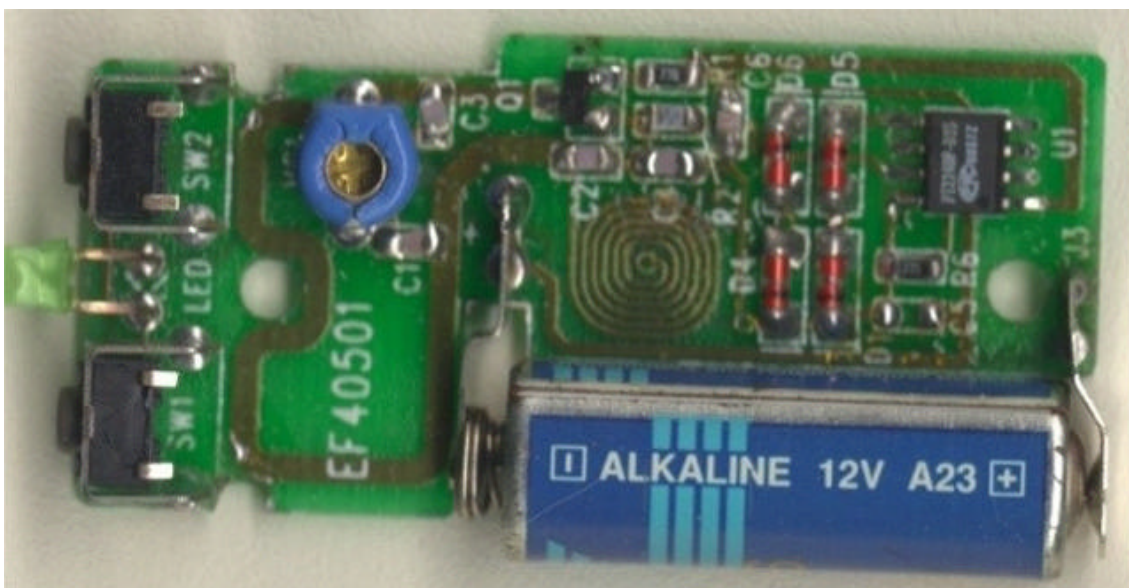
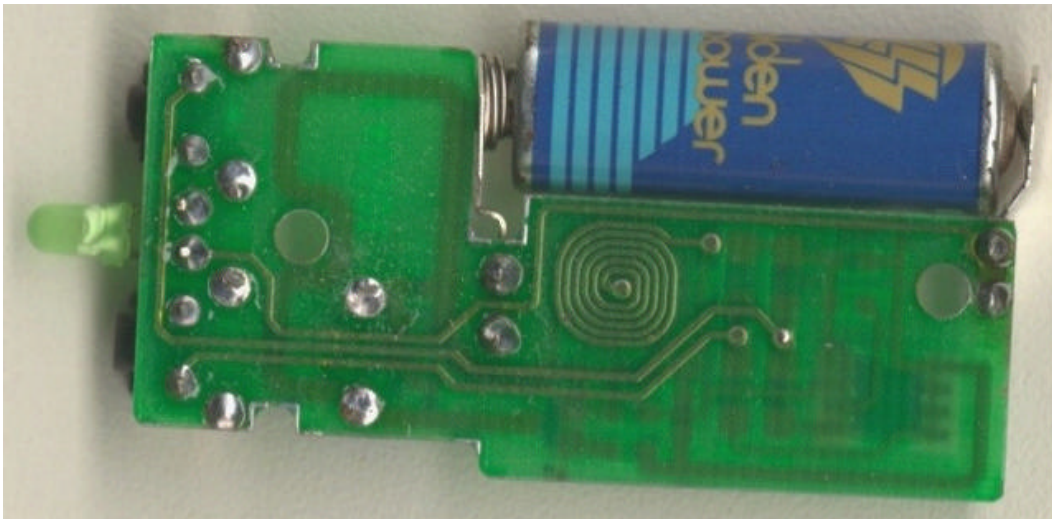


CT-300 FCC ID Label View



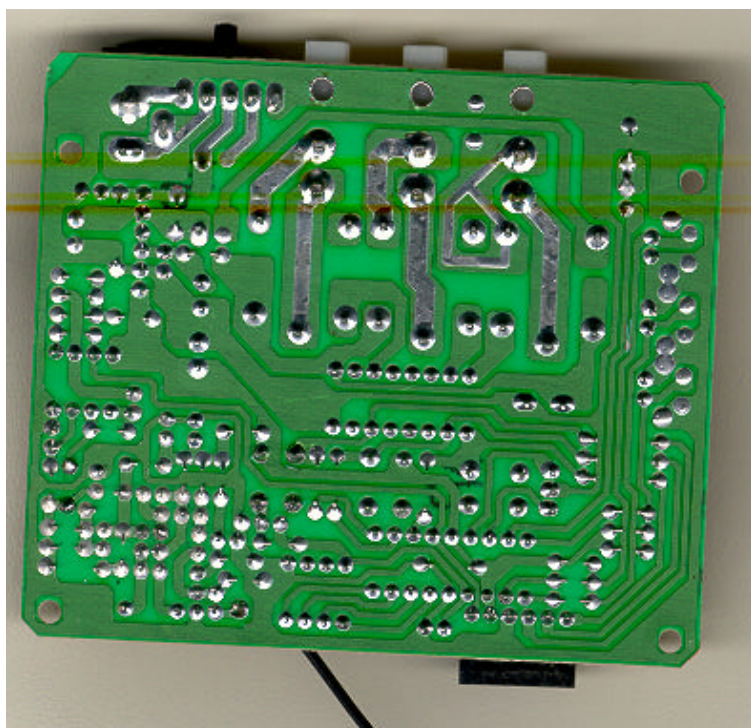
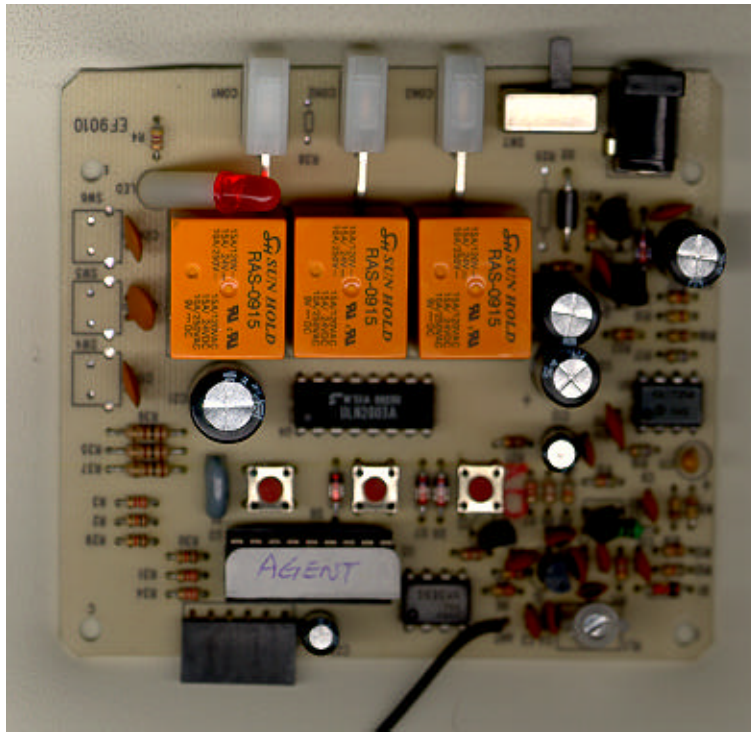


**CT-300 Component View
and Solder View**





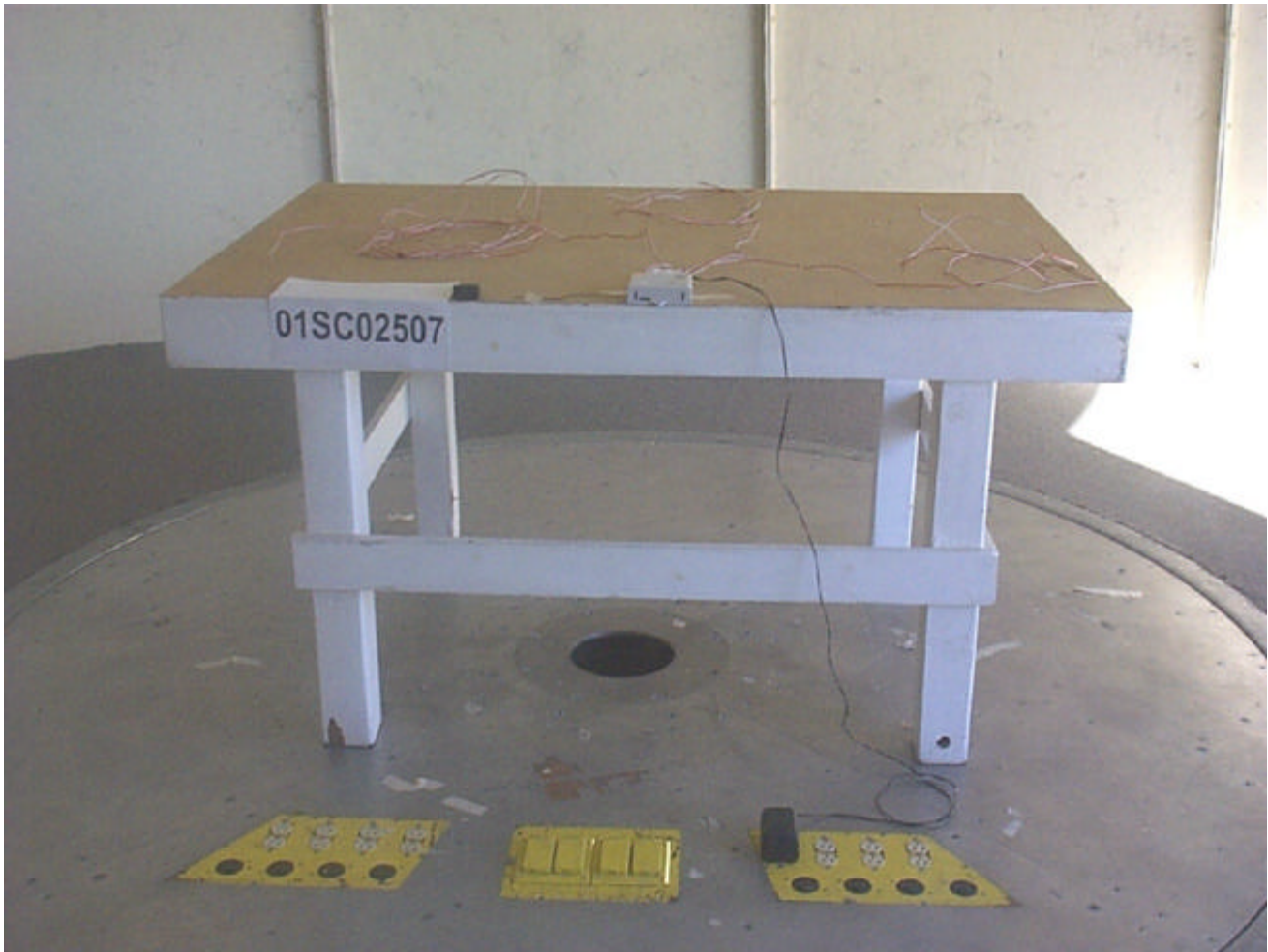
GR-300M Component Side
GR-300M Solder Side

















APPENDIX B

TEST FACILITY



TEST FACILITY

Location: 11825 Niles Canyon Road
Sunol, CA 94586

Description: At the Sunol facility, there are four 3/10 m open area test sites, two line conducted labs and two indoor conducted/radiated engineering labs. The OATS and the LC labs are constructed and calibrated to meet the FCC requirements in documents OST-55/MP-4 and ANSI C63.4 1992.

FCC has also accepted Underwriters Laboratories, Inc., facility site for filing applications for certification and notification.

NVLAP Accreditation: Recognized under the National Voluntary Laboratory Accreditation Program (NVLAP) for satisfactory compliance with criteria established in Title 15, Part 285 Code of Federal Regulations. These criteria encompass the requirements of ISO/IEC Guide 25 and the relevant requirements of ISO 9002 (ANSI/ASQC Q92-1987) as suppliers of calibration or test results. The specific scope includes IEC/CISPR 22:1993, Amendment 1:1995, Amendment 2:1996, CNS 13438:1997, FCC Method - 47 CFR Part 15, and AS/NZS 3548 testing. NVLAP Lab code: 200252-0.

Certification: Underwriters Laboratories, Inc., has the following test/lab sites certified by VCCI and Industry Canada (IC):

Open Area Test Site #1: VCCI No. R-802 and IC 2816-1

Open Area Test Site #2: VCCI No. R-376 and IC 2816-2

Open Area Test Site #3: VCCI No. R-377 and IC 2816-3

Open Area Test Site #4: VCCI No. R-378 and IC 2816-4

Line Conducted Lab #1: VCCI No. C-392

Line Conducted Lab #2: VCCI No. C-427



APPENDIX C

TEST EQUIPMENT



MEASURING INSTRUMENT SETTINGS

TEST TYPE	DETECTOR	FREQUENCY RANGE	RESOLUTION BANDWIDTH	VIDEO BANDWIDTH
Conducted	Peak/Avg	10 kHz-150 kHz	300 Hz/3 kHz	100 kHz/3 kHz
Conducted	Peak/QP/Avg	150 kHz-30 MHz	10 kHz/100 kHz	100 kHz
Radiated	Peak/Avg	60 Hz-1 kHz	10 Hz	100 kHz
Radiated	Peak/Avg	1 kHz-10 kHz	100 Hz	100 kHz
Radiated	Peak/Avg	10 kHz-150 kHz	300 Hz	100 kHz/300 Hz
Radiated	Peak/QP/Avg	150 kHz-30 MHz	10 kHz	100 kHz/10 kHz
Radiated	Peak/QP/Avg	30 MHz-1 GHz	100 kHz	100 kHz/10 kHz
Radiated	Peak/Avg	Above 1 GHz	1 MHz	1 MHz/300 kHz

Note: All readings on data pages are taken with the detector in peak mode unless otherwise stated.



TEST EQUIPMENT LIST

EQUIPMENT TYPE	* MFR	MODEL NUMBER	SERIAL NUMBER	LAST ** CAL.	CAL. DUE
Biconical Antenna	EMCO	3110	9210-1581	09-05-00	09-05-01
LISN	FCC	LISN-2	VDE 5/FCC 5	06-06-00	06-06-01
Log Periodic Antenna	Schwarzbeck	UHALP 9107	9107384	10-10-00	10-10-01
RF Filter Section	HP	85460A	3704A00417	06-26-00	06-26-01
Spectrum Analyzer Display	HP	85662A	2403A06604	06-26-00	06-26-01

* **MFR** = Manufacturer

** **CAL.** = Calibration



APPENDIX D

TEST METHODS



TEST METHODS (LINE CONDUCTED TEST)

- 1) The equipment will be set up according to the test specification to simulate typical actual usage. When the EUT is a table-top system, a wooden table with a height of 0.8 meters is used which is placed on the ground plane according to the test specification. When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm covering to insulate the EUT from the ground plane.
- 2) Support equipment, if needed, will be placed according to the test specification.
- 3) All I/O cables are positioned to simulate typical actual usage according to the test specification.
- 4) The EUT receives AC power through a Line Impedance Stabilization Network (LISN) which is grounded to the ground plane.
- 5) Support equipment, if used, will receive AC power through a second LISN.
- 6) Emissions are measured on each current carrying line of the EUT using a spectrum analyzer connected to the LISN powering the EUT.
- 7) During the emission measurement, the I/O cable placement position is adjusted in order to maximize the emission measurement level.
- 8) Emission frequency and amplitude are recorded into a computer in which correction factors are used to calculate the emission level and compare the reading to the applicable limit.

Data Sample:

Freq. MHz	Corr'd dBμV	Site CF	Limit dBμV	Margin dBμV	Line
2.47	46.0	6.0	48.0	-2.0	L1

Freq. = Emission frequency in MHz
Corr'd dBμV = RAW reading converted to dBμV and CF added
Site CF = Correction Factors for pad/cable losses
Limit dBμV = Limit stated in standard
Margin dBμV = Reading in reference to limit
Note = Current carrying line of reading



TEST METHODS (RADIATED TEST)

- 1) The equipment will be set up according to the test specification to simulate typical actual usage. When the EUT is a table-top system, a wooden table with a height of 0.8 meters is used which is placed on the ground plane according to the test specification. When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm covering to insulate the EUT from the ground plane.
- 2) Support equipment, if needed, will be placed according to the test specification.
- 3) All I/O cables are positioned to simulate typical actual usage according to the test specification.
- 4) The antenna is placed at some given distance away from the EUT as stated in the test specification. The antenna connects to the analyzer via a cable and at times a preamp is used.
- 5) Emissions are scanned and measured rotating the EUT to 360 degrees, positioning cable placement, and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarizations in order to maximize the emission reading level.
- 6) Emission frequency, amplitude, antenna position, polarization, and table position are recorded into a computer in which correction factors are used to calculate the emission level and compare the reading to the applicable limit.

Data Sample:

Freq. MHz	Corr'd dB μ V	Site CF	Limit dB μ V	Margin dB μ V	Table Pos.	Ant Pos.
76.57	44.2	-12.8	40.0	-5.3	180	1.5V

Freq.	= Emission frequency in MHz
Corr'd dB μ V	= RAW reading converted to dB μ V and CF added
Site CF	= Correction Factors for pad/cable losses
Limit dB μ V	= Limit stated in standard
Margin dB μ V	= Reading in reference to limit
Table Position	= EUT placement in reference to antenna
Antenna Position	= Antenna polarization and height above ground plane



APPENDIX E

CLASS TYPES



FCC CLASS TYPES

CLASS A COMPUTING DEVICE

A computing device which is marketed for use in a commercial or business environment; exclusive of a device which is marketed for use by the general public, or which is intended to be used in the home. Reference: Section 15.3 (h).

CLASS B COMPUTING DEVICE

A computing device that is marketed for use in a residential environment notwithstanding use in a commercial, business, or industrial environment. Examples of such devices include, but are not limited to: electronic games, personal computers, calculators, and similar devices that are marketed for the general public. Reference: Section 15.3 (i).

NOTE: A manufacturer may also qualify a device intended to be marketed in a commercial, business, or industrial environment as a Class B computing device, and in fact is encouraged to do so, provided the device complies with the technical specifications for a Class B computing device. In the event that a particular type of device has been found to repeatedly cause harmful interference to radio communications, the Commission may classify such a computing device as a Class B computing device, regardless of its intended use.



APPENDIX F

LABELING REQUIREMENTS



FCC CLASS B LABELING REQUIREMENT

Section 15.19 of the Code of Federal Regulation

- A) The Class B computing device subject to **certification** by the Commission shall be identified pursuant to par. 2.925 et seq of this Chapter. In addition, the label shall include the following statement:

FCC ID: NUQ-CT300
THIS DEVICE COMPLIES WITH PART 15 OF THE
FCC RULES. OPERATION IS SUBJECT TO THE
FOLLOWING TWO CONDITIONS:
(1) THIS DEVICE MAY NOT CAUSE HARMFUL
INTERFERENCE, AND (2) THIS DEVICE MUST
ACCEPT ANY INTERFERENCE RECEIVED,
INCLUDING INTERFERENCE THAT MAY CAUSE
UNDESIRE OPERATION.

- B) Where a device is constructed in two or more sections connected by wires and marketed together, the statement specified in this Section is required to be affixed only to the main control unit.
- C) When the device is so small or for such use that it is not practicable to place the statement specified in this Section on it, the information required by these paragraphs shall be placed in a prominent location in the instruction manual or pamphlet supplied to the user or, alternatively, shall be placed on the container in which the device is marketed. However, the FCC identifier or the unique identifier, as appropriate, must be displayed on the device.
- D) The label shall not be a stick-on paper label. The label on these products shall be permanently affixed to the product and shall be readily visible to the purchaser at the time of purchase. "Permanently affixed" means that the label is etched, engraved, stamped, silkscreened, indelibly printed, or otherwise permanently marked on a permanently attached part of the equipment or a nameplate of metal, plastic, or other material fastened to the equipment by welding, riveting, or use of a permanent adhesive. The label must be designed to last the expected lifetime of the equipment in the environment in which the equipment may be operated and must not be readily detachable.



APPENDIX G

DATA READINGS



**FCC CLASS B
LINE CONDUCTED DATA**

COMPANY: Mikado Technology
EQUIP. UNDER TEST: Garage Door Receiver

MODEL NUMBER: GR-300M
TEST PROCEDURE: FCC Part 15 Class B
MEASUREMENT SETUP: LISN #942 120Vac 60Hz
SUPPORT EQUIPMENT: None

TEST SITE: LC#2
TESTED BY: Wayne Fisher
DATE: January 31 2001 16:23

Control Rm Temp: 80 Deg.F Humidity: 20 %RH
EUT Room Temp: 80 Deg.F Humidity: 20 %RH

FREQ MHz	RAW dBuV	SITE CF	CORR'D dBuV	LIMIT		EUT MARGIN		NOTE
				A	B	A	B	
0.454	+19.8PK	6.0	25.8	60.0	48.0	-34.2	-22.2	L1
0.583	+15.8PK	6.0	21.8	60.0	48.0	-38.2	-26.2	L1
0.727	+11.0PK	6.0	17.0	60.0	48.0	-43.0	-31.0	L1
0.460	+18.0PK	6.0	24.0	60.0	48.0	-36.0	-24.0	L2
0.519	+14.0PK	6.0	20.0	60.0	48.0	-40.0	-28.0	L2
0.660	+11.4PK	6.0	17.4	60.0	48.0	-42.6	-30.6	L2
28.110	+13.5PK	6.0	19.5	69.5	48.0	-50.0	-28.5	L2

L1 = LINE ONE (HOT SIDE)
L2 = LINE TWO (NEUTRAL SIDE)

=====
===== END OF CONDUCTED TEST =====
=====



FCC CLASS B
RADIATED EMISSION DATA

COMPANY: Mikado
EQUIP. UNDER TEST: Garage Door Reciever
Garage Door Car Transmitter
MODEL NUMBER: GR-300M / CT-300
TEST PROCEDURE: FCC Part 15 Spurious Emissions
SUPPORT EQUIPMENT: None

TESTED BY: Wayne Fisher TEST SITE 1
DATE: January 31 2001

TIME: 09:34 Control RM Temp: 72 Deg.F Humidity: 20 %RH
EUT Room Temp: 54 Deg.F Humidity: 23 %RH

30MHz TO 300MHz Biconical Antenna at 3 meters Horz.

FREQ MHz	RAW dBuV	SITE CF	CORR'D dBuV/m	LIMIT A B	EUT MARGIN A B	POSITION TBL ANT
Receive Mode						
30.00	+4.0PK	+12.3	16.3	49.5 40.0	-33.2 -23.7	0 1.50
300MHz to 1000MHz Log Periodic Antenna at 3 meters Vert.						
381.96	+26.8PK	+18.4	45.2	50.4	-5.2	297 1.40
379.01	+24.7PK	+18.3	42.9	50.4	-7.5	264 1.50
325.88	+13.0PK	+17.1	30.1	50.4	-20.3	260 1.41
300MHz to 1000MHz Log Periodic Antenna at 3 meters Horz.						
314.26	+21.8PK	+16.9	38.7	50.4	-11.7	222 1.00
384.77	+33.3PK	+18.4	51.7	50.4	1.3	15 1.00
384.77	+31.1QP	+18.4	49.5	50.4	-0.9	15 1.00
382.89	+31.8PK	+18.4	50.2	50.4	-0.2	357 1.00
382.89	+30.4QP	+18.4	48.8	50.4	-1.6	357 1.00
325.20	+23.8PK	+17.1	40.9	50.4	-9.5	350 1.00

=====

===== END OF RADIATED TEST =====

=====



RADIATED EMISSION DATA

COMPANY: Mikado
EQUIP. UNDER TEST: Garage Door Reciever
Garage Door Car Transmitter
MODEL NUMBER: GR-300M / CT-300
TEST PROCEDURE: FCC Part 15 Transmit Fundamental
SUPPORT EQUIPMENT: None

TESTED BY: Wayne Fisher TEST SITE 1
DATE: January 31 2001

TIME: 2:00pm Control RM Temp: 72 Deg.F Humidity: 20 %RH
EUT Room Temp: 54 Deg.F Humidity: 23 %RH

300MHz to 1000MHz Log Periodic Antenna at 3 meters Horz.

FREQ MHz	RAW dBuV	SITE CF	CORR'D dBuV/m	LIMIT dBuV/m	EUT MARGIN dBuV	POSITION TBL ANT
Transmitting Door #1 Signal						
391.16	+70.0PK	+18.6	88.6	79.3	9.3	217 1.00
391.16	+69.8QP	+18.6	88.4	79.3	9.1	217 1.00
391.16	+58.5VA	+18.6	77.1	79.3	-2.2	217 1.00

300MHz to 1000MHz Log Periodic Antenna at 3 meters Vert.
391.11 +51.9PK +18.6 70.5 79.3 -8.8 304 1.30

Transmitting Door #2 Signal

300MHz to 1000MHz Log Periodic Antenna at 3 meters Horz.

391.26	+69.2PK	+18.6	87.8	79.3	8.5	227 1.00
391.26	+58.0VA	+18.6	76.6	79.3	-2.7	227 1.00

300MHz to 1000MHz Log Periodic Antenna at 3 meters Vert.
391.26 +55.0PK +18.6 73.6 79.3 -5.7 70 3.10

Transmitting Door #3 Signal

300MHz to 1000MHz Log Periodic Antenna at 3 meters Horz.

391.17	+69.2PK	+18.6	87.8	79.3	8.5	208 1.00
391.17	+58.5VA	+18.6	77.1	79.3	-2.2	208 1.00



RADIATED EMISSION DATA

COMPANY: Mikado
EQUIP. UNDER TEST: Garage Door Reciever
Garage Door Car Transmitter
MODEL NUMBER: GR-300M / CT-300
TEST PROCEDURE: FCC Part 15 Transmit Fundamental
SUPPORT EQUIPMENT: None

TESTED BY: Wayne Fisher TEST SITE 1
DATE: January 31 2001

TIME: 2:50pm Control RM Temp: 72 Deg.F Humidity: 20 %RH
EUT Room Temp: 54 Deg.F Humidity: 23 %RH

300MHz to 1000MHz Log Periodic Antenna at 3 meters Vert.

FREQ MHz	RAW dBuV	SITE CF	CORR'D dBuV/m	LIMIT dBuV/m	EUT MARGIN dBuV	POSITION TBL ANT
391.16	+53.9PK	+18.6	72.5	79.3	-6.8	183 2.70

=====
===== END OF RADIATED TEST =====
=====

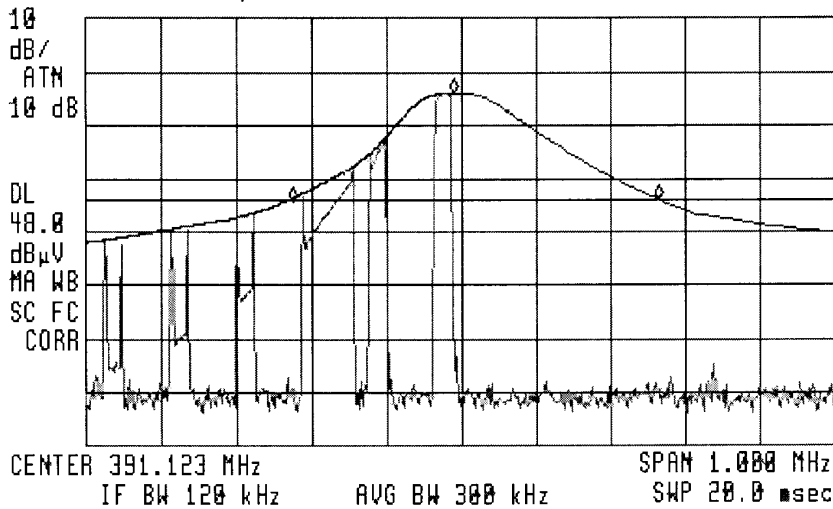


15.231 (c) fundamental bandwidth for Center Frequency 391.12MHz
Bandwidth allowed = 977.8kHz
Measured Bandwidth = 490.0kHz

15:56:17 JAN 31, 2001
01SC02507 15.231(A)(1)

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKRΔ 490 kHz
.17 dB

LOG REF B2.0 dBμV





15.231(a)(1) On time of transmitter after deactivating on switch.

1st Marker = transmit on

2nd Marker = on switch deactivated

3rd Marker = signal gone into noise floor

Delta shown between 2nd and 3rd markers

15:38:42 JAN 31, 2001
01SC02507 15.231(A)(1)

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR Δ 37.500 msec
-34.00 dB

LOG REF 92.0 dB μ V

10
dB/
ATN
10 dB

MA WB
SC FC
CORR

CENTER 391.160 MHz SPAN 0 Hz
IF BW 120 kHz AVG BW 300 kHz #SWP 5.00 sec



APPENDIX H

TEST PROCEDURES

For a Copy Contact:

MIKADO TECHNOLOGY COMPANY

1435 Huntington Avenue #C
South San Francisco, CA 94080