



Flom Test Labs

EMI, EMC, RF Testing Experts Since 1963

toll-free: (866) 311-3268
fax: (480) 926-3598
<http://www.flomlabs.com>
info@flomlabs.com

Date: July 10, 2008

Applicant: Kenwood USA Corporation
Communications Division
2970 Johns Creek Court, Suite 100
Suwanee, GA 30024

Attention of: Joel E. Berger, Research & Development
JBerger@kenwoodusa.com
(678) 474-4722; FAX: -4731

Mailing: Kenwood USA Corporation
Communications Division
2970 Johns Creek Court, Suite 100
Suwanee, GA 30024

Attention of: Joel E. Berger, Research & Development
JBerger@kenwoodusa.com
(678) 474-4722; FAX: -4731

Equipment: TK-2102G-1 FCC ID: ALH30913110
FCC ID: ALH30913110
FCC Rules: Part 22, 74, 90 Class II Permissive Change

Gentlemen:

Enclosed please find your copy of the Engineering Test Report for which you are subject to the restrictions as listed on the attached summary.

As you know, the FCC, after a TCB issues a Grant, still has 30 days to review a submission and request added information. It is your decision whether or not to market the equipment subject to a possible recall before the end of the 30 days.

If your equipment is still retained by us, it will be returned to you 30 days after approval is achieved. Our invoice for services has been directed to your Accounts Payable Department.

Should you need any clarification, just fax or phone. Thank you again for this order - it has been a pleasure to be of service.

Sincerely yours,

Hoosamuddin S. Bandukwala, Lab Director

enclosure(s)
HSB/ms

Flom Test Labs
3356 N. San Marcos Place, Suite 107
Chandler, Arizona 85225-7176
(866) 311-3268 phone, (480) 926-3598 fax

p0850020, d0870012



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Memo

Date: July 10, 2008

Applicant: Kenwood USA Corporation
Communications Division
2970 Johns Creek Court, Suite 100
Suwanee, GA 30024

Equipment: TK-2102G-1 FCC ID: ALH30913110
FCC ID: ALH30913110

Please note that the enclosed Reports reflect the results of tests performed to the currently published Federal Communications Commissions Rules and Regulations.

Should the FCC's Examiners' interpretations request new and unpublished requirements, we will be pleased to provide them. We will invoice you accordingly, i.e. for the time spent on re-testing, providing the amended pages and/or Reports and for the time necessary to be spent on electronic filing. We will of course provide you with copies of any of the additions.

We regret any added expense to the Applicants, but of late the FCC continues to change their requirements without any prior written publication and/or notices.

As in the past, we will continue to provide all liaisons with the FCC necessary for the successful conclusion of your project and the receipt of your Grant of Equipment Authorization.

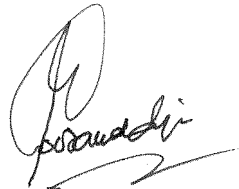
Sincerely yours,

Hoosamuddin S. Bandukwala, Lab Director

Summary of Restrictions

1. All submissions to the FCC are subject to **their** Examiner's interpretation.
2. Please allow from 60 to 90 days before hearing from the FCC with regard to any submission.
3. The FCC can set aside any action; modify or set aside any action, within 30 days. (FCC Rule 1.108, 1.113).
4. Under Rule 2.803, if device is not type accepted/certificated then it must **not** be sold, leased, offered for sale, imported, shipped or distributed or advertised for sale.
5. FCC can revoke its certificates at any time if the equipment does not meet or **continue** to meet their Rules. (Rule Parts 2.927, 2.939).
6. FCC can request a sample at any time (2.936).

M. Flom Associates, Inc.



Hoosamuddin S. Bandukwala, Lab Director



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Date: July 10, 2008

Federal Communications Commission
Via: Electronic Filing

Attention: Authorization & Evaluation Division

Applicant: Kenwood USA Corporation
Equipment: TK-2102G-1 FCC ID: ALH30913110
FCC ID: ALH30913110
FCC Rules: Part 22, 74, 90

Gentlemen:

On behalf of the Applicant, enclosed please find Application Form 731, Engineering Test Report and all pertinent documentation, the whole for approval of the referenced equipment as shown.

We trust the same is in order. Should you need any further information, kindly contact the writer who is authorized to act as agent.

Sincerely yours,

Hoosamuddin S. Bandukwala, Lab Director

enclosure(s)
cc: Applicant
HSB/ms

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Test Report

for

FCC ID: ALH30913110

Model: TK-2102G-1 FCC ID: ALH30913110

to

Federal Communications Commission

Rule Part(s) Part 22, 74, 90 Class II Permissive Change

Date of report: July 10, 2008

On the Behalf of the Applicant:

Kenwood USA Corporation

At the Request of:

Kenwood USA Corporation
Communications Division
2970 Johns Creek Court, Suite 100
Suwanee, GA 30024

Attention of:

Joel E. Berger, Research & Development
JBerger@kenwoodusa.com
(678) 474-4722; FAX: -4731

Supervised by:

Hoosamuddin S. Bandukwala, Lab Director

Revision History

Revision	Date	Revised By	Reason for revision
1.0	July 10, 2008	Mark Sechrist	Original Document
2.0	August 7, 2008	Mark Sechrist	Corrected Power Rating

The Applicant has been cautioned as to the following:

15.21 Information to the User.

The users manual or instruction manual for an intentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

15.27(a) Special Accessories.

Equipment marketed to a consumer must be capable of complying with the necessary regulations in the configuration in which the equipment is marketed. Where special accessories, such as shielded cables and/or special connectors are required to enable an unintentional or intentional radiator to comply with the emission limits in this part, the equipment must be marketed with, i.e. shipped and sold with, those special accessories. However, in lieu of shipping or packaging the special accessories with the unintentional or intentional radiator, the responsible party may employ other methods of ensuring that the special accessories are provided to the consumer, without additional charge.

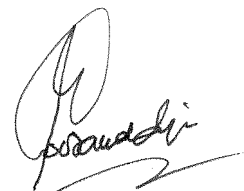
Information detailing any alternative method used to supply the special accessories for a grant of equipment authorization or retained in the verification records, as appropriate. The party responsible for the equipment, as detailed in § 2.909 of this chapter, shall ensure that these special accessories are provided with the equipment. The instruction manual for such devices shall include appropriate instructions on the first page of text concerned with the installation of the device that these special accessories must be used with the device. It is the responsibility of the user to use the needed special accessories supplied with the equipment.

**Testimonial
and
Statement of Certification**

This is to Certify:

1. **That** the application was prepared either by, or under the direct supervision of, the undersigned.
2. **That** the technical data supplied with the application was taken under my direction and supervision.
3. **That** the data was obtained on representative units, randomly selected.
4. **That**, to the best of my knowledge and belief, the facts set forth in the application and accompanying technical data are true and correct.

Certifying Engineer:



Hoosamuddin S. Bandukwala, Lab Director

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Required information per ISO 17025-2005, paragraph 5.10.2:

a) **Test Report**

b) Laboratory: Flom Test Lab
(FCC: 31040/SIT) 3356 N. San Marcos Place, Suite 107
(Canada: IC 2044-A) Chandler, AZ 85225

c) Report Number: d0870012

d) Client: Kenwood USA Corporation
Communications Division
2970 Johns Creek Court, Suite 100
Suwanee, GA 30024

e) Identification: TK-2102G-1 FCC ID: ALH30913110
FCC ID: ALH30913110

EUT Description: Hand held VHF FM Transciever

f) EUT Condition: Not required unless specified in individual tests.

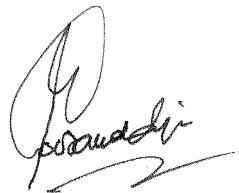
g) Report Date: July 10, 2008
EUT Received:

h, j, k): As indicated in individual tests.

i) Sampling method: No sampling procedure used.

l) Uncertainty: In accordance with FTL internal quality manual.

m) Supervised by:



Hoosamuddin S. Bandukwala, Lab Director

n) Results: The results presented in this report relate only to the item tested.

o) Reproduction: This report must not be reproduced, except in full, without written permission from this laboratory.

Accessories used during testing:

Type	Quantity	Manufacturer	Model	Serial No.	FCC ID
antenna	1	Kenwood	KRA-22M	---	---
antenna	1	Kenwood	KRA-26M	---	---

Sub-part

2.1033(c)(14):

Test and Measurement Data

All tests and measurement data shown were performed in accordance with FCC Rules and Regulations, Volume II; Part 2, Sub-part J, Sections 2.947, 2.1033(c), 2.1041, 2.1046, 2.1047, 2.1079, 2.1051, 2.1053, 2.1055, 2.1057 and the following individual Parts:

- 15 – Radio Frequency Devices (unlicensed)
- 21 – Domestic Public Fixed Radio Services
- 22 – Public Mobile Services
- 22 Subpart H - Cellular Radiotelephone Service
- 22.901(d) - Alternative technologies and auxiliary services
- 23 – International Fixed Public Radiocommunication services
- 24 – Personal Communications Services
- 74 Subpart H - Low Power Auxiliary Stations
- 80 – Stations in the Maritime Services
- 80 Subpart E - General Technical Standards
- 80 Subpart F - Equipment Authorization for Compulsory Ships
- 80 Subpart K - Private Coast Stations and Marine Utility Stations
- 80 Subpart S - Compulsory Radiotelephone Installations for Small Passenger Boats
- 80 Subpart T - Radiotelephone Installation Required for Vessels on the Great Lakes
- 80 Subpart U - Radiotelephone Installations Required by the Bridge-to-Bridge Act
- 80 Subpart V - Emergency Position Indicating Radio Beacons (EPIRB'S)
- 80 Subpart W - Global Maritime Distress and Safety System (GMDSS)
- 80 Subpart X - Voluntary Radio Installations
- 87 – Aviation Services
- 90 – Private Land Mobile Radio Services
- 94 – Private Operational-Fixed Microwave Service
- 95 Subpart A - General Mobile Radio Service (GMRS)
- 95 Subpart C - Radio Control (R/C) Radio Service
- 95 Subpart D - Citizens Band (CB) Radio Service
- 95 Subpart E - Family Radio Service
- 95 Subpart F - Interactive Video and Data Service (IVDS)
- 97 - Amateur Radio Service
- 101 – Fixed Microwave Services

Standard Test Conditions and Engineering Practices

Except as noted herein, the following conditions and procedures were observed during the testing:

In accordance with ANSI/TIA-603-C-2004, and unless otherwise indicated in the specific measurement results, the ambient temperature of the actual EUT was maintained within the range of 10° to 40°C (50° to 104 °F) unless the particular equipment requirements specify testing over a different temperature range. Also, unless otherwise indicated, the humidity levels were in the range of 10% to 90% relative humidity.

Measurement results, unless otherwise noted, are worst-case measurements.

A2LA

“A2LA has accredited Flom Test Labs, Inc. Chandler, AZ for technical competence in the field of Electrical testing. The accreditation covers the specific tests and types of tests listed on the agreed scope of accreditation. This laboratory meets the requirements of ISO 17025:2005 ‘General Requirements for the Competence of Testing and Calibration Laboratories’ and any additional program requirements in the identified field of testing.”

Please refer to www.a2la.org for current scope of accreditation.

Certificate number: 2152.01



IC O.A.T.S. Number: 2044A-1

List of General Information Required for Certification

In Accordance with FCC Rules and Regulations,
Volume II, Part 2 and to

Part 22, 74, 90 Sub-part 2.1033

(c)(1):

Name and Address of Applicant:

Kenwood USA Corporation
Communications Division
2970 Johns Creek Court, Suite 100
Suwanee, GA 30024

Manufacturer:

Kenwood Corporation
14-6, Dogenzaka 1-Chome
Shibuya-ku, Tokyo 150, Japan
OR
Kenwood Electronics Technologies PTE Ltd.
1 Ang Mo Kio Street 63
Singapore 569110

(c)(2): **FCC ID:**

ALH30913110

Model Number:

TK-2102G-1 FCC ID: ALH30913110

(c)(3): **Instruction Manual(s):**

Please see attached exhibits

(c)(4): **Type of Emission:**

16K0F3E, 11K0F3E

(c)(5): **Frequency Range, MHz:**

150-174

(c)(6): **Power Rating, Watts:**

_____ Switchable

_____ Variable
Continuously

1Watt-5 Watts
N/A

FCC Grant Note:

(c)(7): **Maximum Power Rating, Watts:**

300

DUT Results:

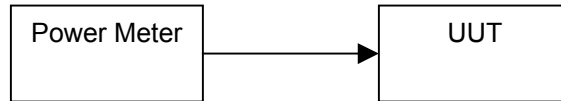
Passes _____ x _____ Fails _____

Name of Test: Carrier Output Power (Conducted)
Specification: 2.1046(a)
Test Equipment Utilized: i00028, i00231

Test Date: July 2, 2008

The UUT was connected directly to a power meter input. The peak readings were taken and the result was then compared to the limit.

Test Setup



Transmitter Peak Output Power

Tuned Frequency MHz	Recorded Measurement	Specification Limit	Result
150.025	37.0 dBm	5 watt	Pass
162.025	37.0 dBm	5 watt	Pass
174.0	37.0 dBm	5 watt	Pass

Performed by:

Mark Sechrist
 Mark Sechrist, EMC technician

Name of Test: Field Strength of Spurious Radiation
Specification: 2.1053(a)
Test Equipment Utilized: i00049, i00088, i00089, i00091, i00103, i00266
Test Date: July 8-9, 2008

Measurement Procedure

Definition:

Radiated spurious emissions are emissions from the equipment when transmitting into a non-radiating load on a frequency or frequencies, which are outside an occupied band sufficient to ensure transmission of information of required quality for the class of communications, desired.

Method of Measurement:

- A) Connect the equipment as illustrated
- B) Adjust the spectrum analyzer for the following settings:
 - 1) Resolution Bandwidth 100 kHz (<1 GHz), 1 MHz (> 1GHz).
 - 2) Video Bandwidth ≥ 3 times Resolution Bandwidth, or 30 kHz (22.917)
 - 3) Sweep Speed ≤ 2000 Hz/second
 - 4) Detector Mode = Mean or Average Power
- C) Place the transmitter to be tested on the turntable in the standard test site. The transmitter is transmitting into a non-radiating load that is placed on the turntable. The RF cable to this load should be of minimum length.
- D) For each spurious measurement the test antenna should be adjusted to the correct length for the frequency involved. This length may be determined from a calibration ruler supplied with the equipment. Measurements shall be made from the lowest radio frequency generated in the equipment to the tenth harmonic of the carrier, except for the region close to the carrier equal to \pm the test bandwidth (see section 1.3.4.4).
- E) For each spurious frequency, raise and lower the test antenna from 1 m to 4 m to obtain a maximum reading on the spectrum analyzer with the test antenna at horizontal polarity. Repeat this procedure to obtain the highest possible reading. Record this maximum reading.
- F) Repeat step E) for each spurious frequency with the test antenna polarized vertically.
- G) Reconnect the equipment as illustrated.
- H) Keep the spectrum analyzer adjusted as in step B).
- I) Remove the transmitter and replace it with a substitution antenna (the antenna should be half-wavelength for each frequency involved). The center of the substitution antenna should be approximately at the same location as the center of the transmitter. At lower frequencies, where the substitution antenna is very long, this will be impossible to achieve when the antenna is polarized vertically. In such case the lower end of the antenna should be 0.3 m above the ground.
- J) Feed the substitution antenna at the transmitter end with a signal generator connected to the antenna by means of a non-radiating cable. With the antennas at both ends horizontally polarized and with the signal generator tuned to a particular spurious frequency, raise and lower the test antenna to obtain a maximum reading at the spectrum analyzer. Adjust the level of the signal generator output until the previously recorded maximum reading for this set of conditions is obtained. This should be done carefully repeating the adjustment of the test antenna and generator output.
- K) Repeat step J) with both antennas vertically polarized for each spurious frequency.
- L) Calculate power in dBm into a reference ideal half-wave dipole antenna by reducing the readings obtained in steps J) and K) by the power loss in the cable between the generator and the antenna

and further corrected for the gain of the substitution antenna used relative to an ideal half-wave dipole antenna.

- M) The levels recorded in step L) are absolute levels of radiated spurious emissions in dBm. The radiated spurious emissions in dB can be calculated by the following:

Radiated spurious emissions dB =

$$10\log_{10}(\text{TX power in watts}/0.001) - \text{the levels in step I)}$$

NOTE: It is permissible that other antennas provided can be referenced to a dipole.

Name of Test: Field Strength of Spurious Radiation

Measurement Results

g0870072: 2008-Jul-08 Tue 10:30:00

STATE: 2:High Power

Ambient Temperature: 23°C ± 3°C

Frequency Tuned, MHz	Frequency Emission, MHz	ERP, dBm	ERP, dBc
162.025	324.072000	-68.6	98.7
162.025	486.108000	-65.6	95.7
162.025	648.144000	-62.9	93.0
162.025	810.180000	-61.4	91.5
162.025	972.216000	-58.5	88.6
162.025	1134.252000	-58.1	88.2
162.025	1296.288000	-57.5	87.6
162.025	1458.324000	-56.8	86.9
162.025	1620.360000	-55.9	86.0

Note: antenna KRA-22M had an ERP of 21.0 dBm.
Antenna KRA-26M had an ERP of 30.1 dBm.



Performed by:

Mark Sechrist, EMC technician

Test Equipment Utilized

Description	MFG	Model Number	FTL Asset Number	Last Cal Date	Cal Due Date
Spectrum analyzer	HP	8566B	i00049	8/18/2007	8/18/2008
Log periodic antenna	Apriel	2001	i00089	10/19/2007	10/19/2009
Biconical antenna	EMCO	3109B	i00088	10/19/2007	10/19/2009
Horn antenna	EMCO	3115	i00103	10/4/2006	10/4/2009
Horn antenna	Apriel	---	i00091	---	NCR
Power meter	HP	E4418B	i00228	9/6/2007	9/6/2008
30dB attenuator(100 Watt)	Pasternak	PE7021	i00231	Verified	-----
Signal generator	Rohde & Schwarz	SMT03	i00266	Verified	----

In addition to the above listed equipment standard RF connectors and cables were utilized in the testing of the described equipment. Prior to testing these components were tested to verify proper operation.

END OF TEST REPORT