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Date: October 4, 2005

Federal Communications Commission
Via: Electronic Filing

Attention: Authorization & Evaluation Division

Applicant: UniKit Electronics Corporation
Equipment: UX400
FCC ID: SCSUX400
FCC Rules: 15.239, Confidentiality

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.

Filing fees are attached.

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,

David E. Lee, Quality Assurance Manager

enclosure(s)
cc: Applicant
DEL/cva



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Transmitter Certification

of

FCC ID: SCSUX400

Model: UX400

to

Federal Communications Commission

Rule Parts 15.239, Confidentiality

Date of report: April 28, 2005

On the Behalf of the Applicant:

UniKit Electronics Corporation

At the Request of:

P.O. Deposit Check #228458

UniKit Electronics Corporation
#121 - 3823 Henning Drive
Burnaby, BC V5C6P3 Canada

Supervised By:

David E. Lee, Quality Assurance Manager

The Applicant Has Been Cautioned As To The Following:

15.21 Information to 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.

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Required information per ISO/IEC Guide 25-1990, paragraph 13.2:

a) **Test Report**

b) Laboratory: M. Flom Associates, Inc.
(FCC: 31040/SIT) 3356 N. San Marcos Place, Suite 107
(Canada: IC 2044) Chandler, AZ 85225

c) Report Number: d05a0006

d) Client: UniKit Electronics Corporation
#121 - 3823 Henning Drive
Burnaby, BC V5C6P3 Canada

e) Identification: UX400
FCC ID: SCSUX400
Description: FM Announcement System

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

g) Report Date: October 4, 2005
EUT Received: March 4, 2004

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

i) Sampling method: No sampling procedure used.

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

m) Supervised by:



David E. Lee, Quality Assurance Manager

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.

List of General Information Required for Certification

**In Accordance with FCC Rules and Regulations,
Volume II, Part 2, 15.239 and Confidentiality**

2.1033(b):

Name and Address of Applicant:

UniKit Electronics Corporation
#121 - 3823 Henning Drive
Burnaby, BC V5C6P3 Canada

(b)(1)

Manufacturer:

Applicant

(b)(2)

FCC ID:

SCSUX400

Model Number:

UX400

(b)(3) to
(b)(8)

Accompanying Information:

See List Of Exhibits

(b)(9)

Regarding 15.37:

This device has shown compliance with new rules adopted under Docket 87-389
and is not affected by Section 15.37, transition rule.

Expository Statement (Transmitter)

Type Of Emission: FM Voice

FREQUENCY RANGE, MHz: 106.7 to 107.9

Power Rating, mV/m @ 3m: 241.55uV/m @ 3m
☐ Switchable ☐ Variable ☒ N/A

Maximum Permissible Power: 250uV/m @ 3m

Voltages & currents in all elements in final RF Stage, including final transistor or solid-state device:

Collector Current, A	=	per manual
Collector Voltage, Vdc	=	per manual
Supply Voltage, Vdc	=	9.0

15.203: Antenna Requirement:

- ☒ The antenna is permanently attached to the EUT
- ☐ The antenna uses a unique coupling
- ☐ The EUT must be professionally installed
- ☐ The antenna requirement does not apply

Sub-part
2.1033(b):

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 2.1031, 2.1033, 2.1035, 2.1041, 2.1043, 2.1045, and the following individual Parts:

☐	15.209	Radiated emission limits; general requirements
☐	15.211	Tunnel radio systems
☐	15.213	Cable locating equipment
☐	15.214	Cordless telephones
☐	15.217	Operation in the band 160-190 kHz
☐	15.219	Operation in the band 510-1705 kHz
☐	15.221	Operation in the band 525-1705 kHz (leaky coax)
☐	15.223	Operation in the band 1.705-10 MHz
☐	15.225	Operation in the band 13.553-13.567 MHz
☐	15.227	Operation in the band 26-27.28 MHz (remote control)
☐	15.229	Operation in the band 40.66-40.70 MHz
☐	15.231	Periodic operation in the band 40.66-40.70 MHz and above 70 MHz
☐	15.233	Operation within the bands 43.71-44.49, 46.60-46.98 MHz 48.75-49.51 MHz and 49.66-50.0 MHz
☐	15.235	Operation within the band 49.82-49.90 MHz
☐	15.237	Operation within the bands 72.0-73.0 MHz, 74.6-74.8 MHz and 75.2-76.0 MHz (auditory assistance)
☒	15.239	Operation in band 88-108 MHz
☐	15.241	Operation in the band 174-216 MHz (biomedical)
☐	15.243	Operation in the band 890-940 MHz (materials)
☐	15.245	Operation within the bands 902-928 MHz, 2435-2465 MHz, 5785-5815 MHz, 10500-10550 MHz, and 24075-24175 MHz (filed disturbance sensors)
☐	15.247	Operation within bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz (spread spectrum)
☐	15.249	Operation within the bands 902-928 MHz, 2400-2483.5 MHz, 5725-5875 MHz, and 24.0- 24.25 GHz
☐	15.251	Operation within the bands 2.9-3.26 GHz, 3.267-3.332 GHz, 3.339-3.3458 GHz, and 3.358- 3.6 GHz (vehicle identification systems)
☐	15.321	Specific requirements for asynchronous devices operating in the 1910-1920 MHz and 2390- 2400 MHz bands (Unlicensed PCS)
☐	15.323	Specific requirements for isochronous devices operating in the 1920-1930 MHz sub-band (Unlicensed PCS)

Standard Test Conditions And Engineering Practices

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

In accordance with ANSI C63.4-1992/2000, section 6.1.9, 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.

Prior to testing, the EUT was tuned up in accordance with the manufacturer's alignment procedures. All external gain controls were maintained at the position of maximum and/or optimum gain throughout the testing.

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



A2LA

"A2LA has accredited M. Flom Associates, 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/IEC 17025 - 1999 'General Requirements for the Competence of Testing and Calibration Laboratories' and any additional program requirements in the identified field of testing."

Certificate Number: **2152-01**

Name of Test: Emission Masks (Occupied Bandwidth)
Specification: 47 CFR 15.237(b)
Test Equipment: As per attached page

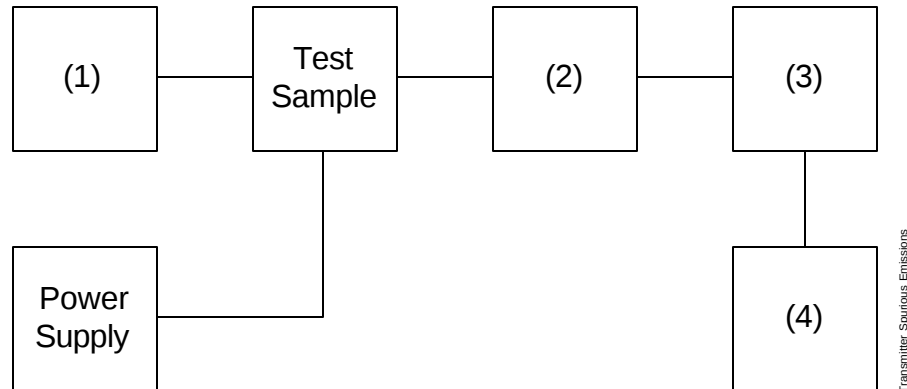
Measurement Procedure

1. The EUT and test equipment were set up as shown on the following page, with the Spectrum Analyzer connected.
2. For EUTs supporting audio modulation, the audio signal generator was adjusted to the frequency of maximum response and with output level set for 50% modulation. With level constant, the signal level was increased 20 dB.
3. The Occupied Bandwidth was measured with the Spectrum Analyzer controls set as shown on the test results.
4. Measurement Results: Attached

Transmitter Spurious Emission

Test A. Occupied Bandwidth (In-Band Spurious)

Test B. Out-of-Band Spurious



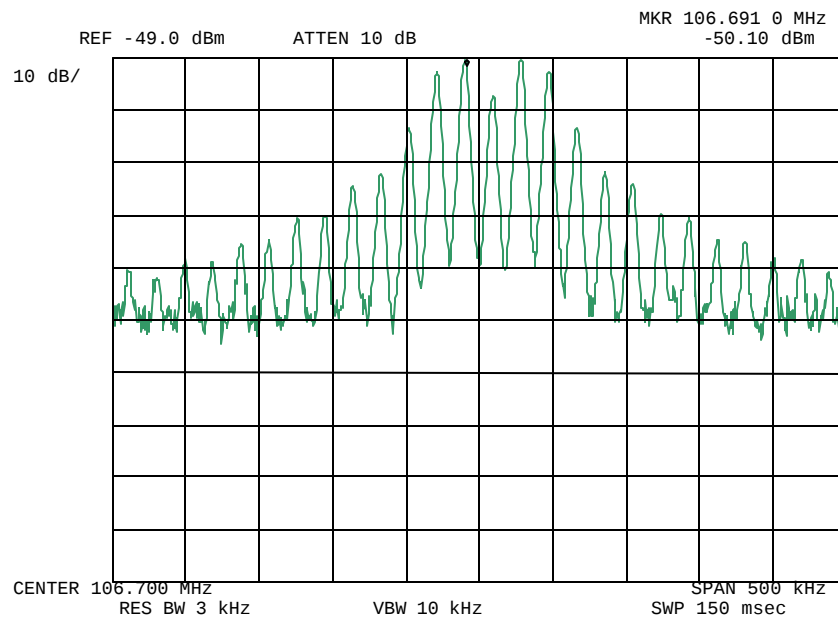
Asset (as applicable)	Description	s/n	Cycle	Last Cal
(1) Audio Oscillator/Generator				
X i00017	HP 8903A Modulation Meter	2216A01753	12 mo.	Apr-05
(2) Coaxial Attenuator				
X i00231/2	PASTERNAK PE7021-30 (30 dB)	231 or 232	NCR	
i00123	NARDA 766 (10 dB)	7802A	NCR	
(3) Interface				
X i00021	HP 8954A Transceiver Interface	2146A00159	NCR	
(4) Spectrum Analyzer				
X i00048	HP 8566B Spectrum Analyzer	2511A01467	12 mo.	Oct-04
i00029	HP 8563E Spectrum Analyzer	3213A00104	12 mo.	May-05

Name of Test: Emission Masks (Occupied Bandwidth)

Measurement Results

g0530043: 2005-Mar-30 Wed 14:22:00
State: 2:High Power

Ambient Temperature: 23°C ± 3°C



Power:
Modulation:

Loose Coupled
Stereo
Low Channel

Fred Chastain

Performed By:

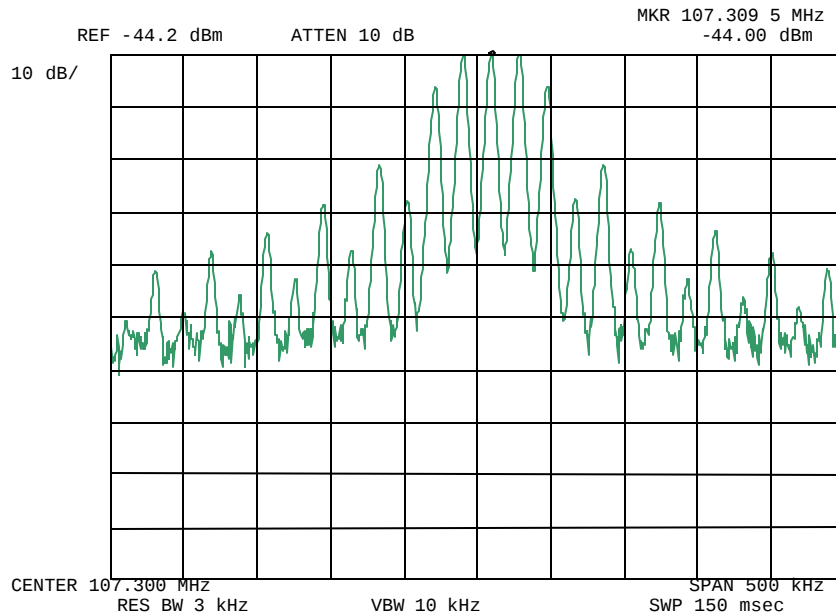
Fred Chastain, Test Technician

Name of Test: Emission Masks (Occupied Bandwidth)

Measurement Results

g0530044: 2005-Mar-30 Wed 14:30:00
State: 2:High Power

Ambient Temperature: 23°C ± 3°C



Power:
Modulation:

Loose Coupled
Stereo
Mid Channel



Performed By:

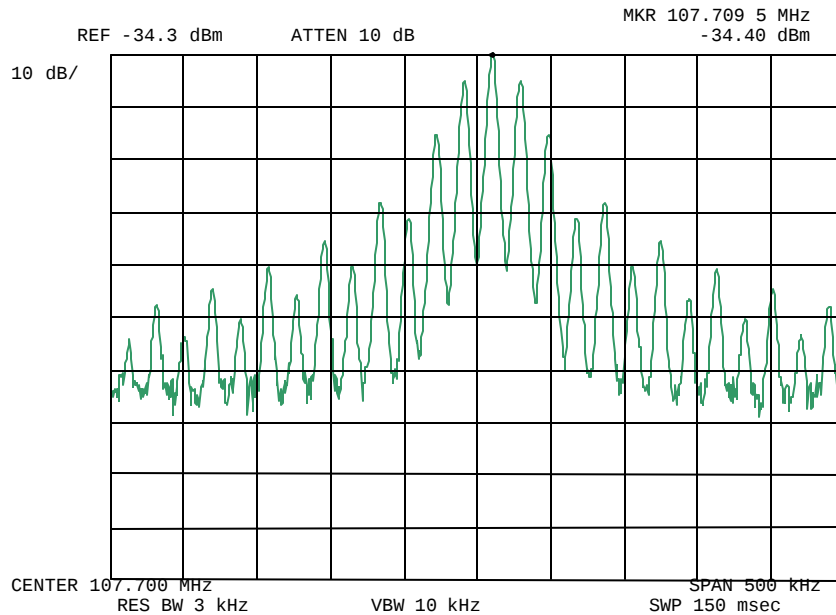
Fred Chastain, Test Technician

Name of Test: Emission Masks (Occupied Bandwidth)

Measurement Results

g0530045: 2005-Mar-30 Wed 14:32:00
State: 2:High Power

Ambient Temperature: 23°C ± 3°C



Power:
Modulation:

Loose Coupled
Stereo
High Channel



Performed By:

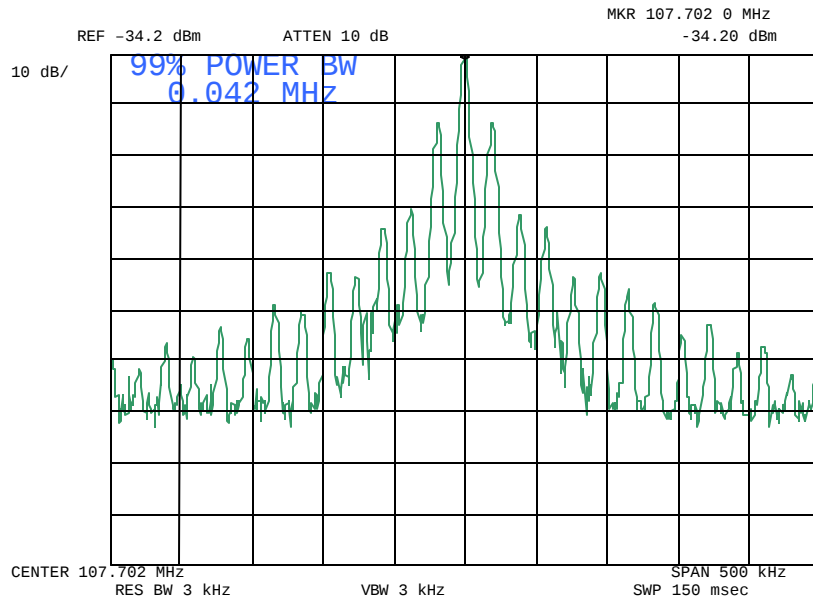
Fred Chastain, Test Technician

Name of Test: Emission Masks (Occupied Bandwidth)

Measurement Results

g0530048: 2005-Mar-30 Wed 15:32:00
State: 2:High Power

Ambient Temperature: 23°C ± 3°C



Power:
Modulation:

Loose Coupled
Stereo
99% Power Bandwidth = 42kHz



Performed By:

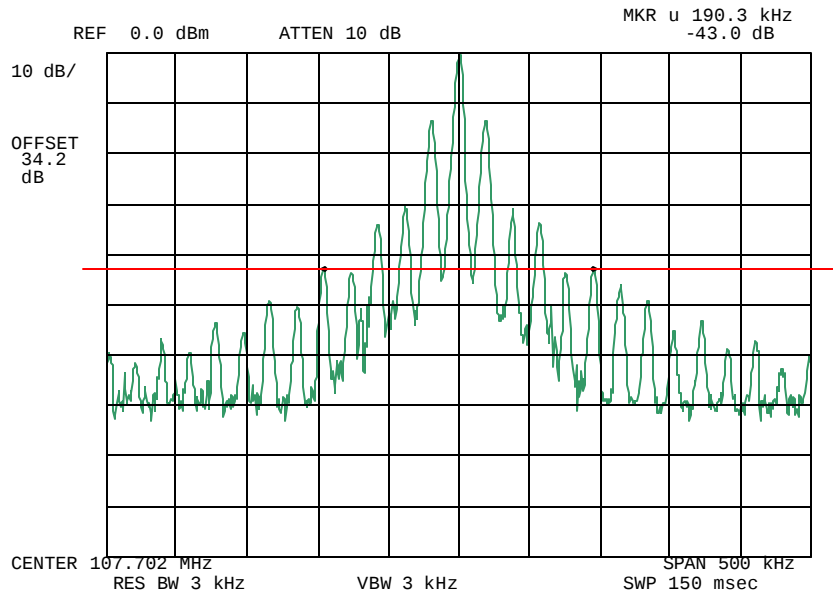
Fred Chastain, Test Technician

Name of Test: Emission Masks (Occupied Bandwidth)

Measurement Results

g0530049: 2005-Mar-30 Wed 15:44:00
State: 2:High Power

Ambient Temperature: 23°C ± 3°C



Power:
Modulation:

Loose Coupled (Normalized to 0dBm)
Stereo
190.3 kHz at 43dB down



Performed By:

Fred Chastain, Test Technician

Name of Test: Field Strength of Spurious Radiation

Specification: 47 CFR 2.1053(a)

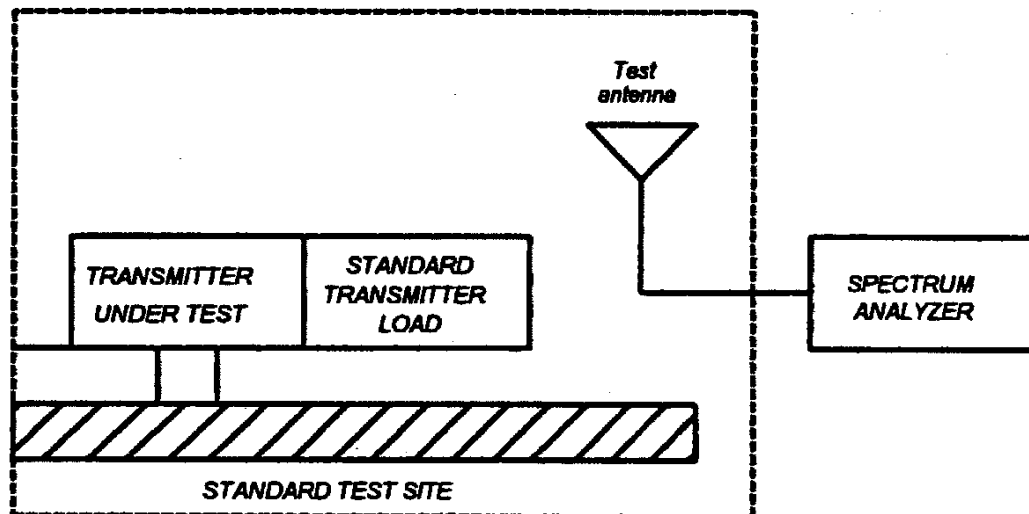
Guide: ANSI/TIA/EIA-603-1992/2001, Paragraph 1.2.12 and Table 16, 47 CFR 22.917

Measurement Procedure

1.2.12.1 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.

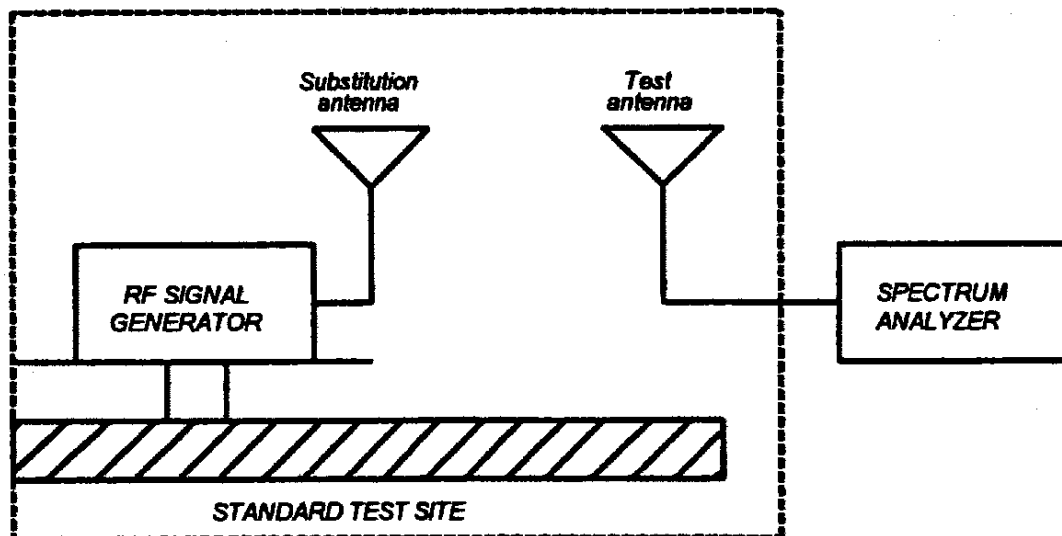
1.2.12.2 Method of Measurement

- 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 which is placed on the turntable. The RF cable to this load should be of minimum length.



Name of Test: Field Strength of Spurious Radiation (Cont.)

- 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.

Name of Test: Field Strength of Spurious Radiation (Cont.)

- 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:

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

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

Test Equipment:

Asset	Description	s/n	Cycle	Last Cal
(as applicable)			Per ANSI C63.4-1992/2000 Draft, 10.1.4	
Transducer				
X	i00088	EMCO 3109-B 25MHz-300MHz	2336	24 mo. Sep-03
	i00065	EMCO 3301-B Active Monopole	2635	24 mo. Sep-03
X	i00089	Apriel 2001 200MHz-1GHz	001500	24 mo. Sep-03
	i00103	EMCO 3115 1GHz-18GHz	9208-3925	24 mo. Jan-04
Amplifier				
	i00028	HP 8449A	2749A00121	12 mo. Mar-05
Spectrum Analyzer				
	i00029	HP 8563E	3213A00104	12 mo. May-05
X	i00033	HP 85462A	3625A00357	12 mo. Sep-04
	i00048	HP 8566B	2511AD1467	12 mo. Jun-05

Name of Test: Field Strength of Emissions (In Band)

g0540041: 2005-Apr-15 Fri 13:33:00

STATE: 2:High Power

Limit is 250uV/m at 3m

Frequency Tuned, MHz	Frequency Emission, MHz	Meter, dBuV	CF, dB	uV/m @ 3m
106.700000	106.704300	34.64	13.02	241.55
107.300000	107.313800	34.33	13.08	234.69
107.500000	* 107.514500	33.47	13.09	212.81

- High Power local FM Broadcast Station on 107.9

Name of Test: Field Strength of Emissions (Spurious)

g0530005: 2005-Mar-15 Tue 15:39:00

State: 2:High Power

Limit is 150uV/m at 3m

Frequency Tuned, MHz	Frequency Emission, MHz	Meter, dBuV	CF, dB	dBuV	uV/m @ 3m
106.700000	213.395800	7.81	32.57	40.38	104.47
107.300000	214.627600	13.34	18.51	31.85	39.13
107.500000	214.995800	9.69	32.59	42.28	130.02
106.700000	320.095800	12.51	20.28	32.79	43.60
107.300000	321.923400	21.02	20.34	41.36	116.95
107.500000	322.495800	8.42	20.36	28.78	27.48
106.700000	426.795800	7.19	23.28	30.47	33.38
107.300000	429.199000	9.95	23.34	33.29	46.18
107.500000	429.995800	9.35	23.36	32.71	43.20
106.700000	533.495800	15.23	27.04	42.27	129.87
107.300000	536.513000	9.33	27.22	36.55	67.22
107.500000	537.495800	7.18	27.29	34.47	52.91
106.700000	640.195800	8.60	31.88	40.48	105.68
107.300000	643.864800	7.57	31.95	39.52	94.62
107.500000	644.995800	9.97	31.97	41.94	125.03
106.700000	746.895800	2.74	32.76	35.50	59.57
107.300000	751.178600	7.69	32.73	40.42	104.95
107.500000	752.495800	7.14	32.72	39.86	98.40
106.700000	853.595800	4.03	33.20	37.23	72.69
107.300000	858.492400	9.50	33.28	42.78	137.72
107.500000	859.995800	4.63	33.30	37.93	78.80
106.700000	960.295800	2.04	36.51	38.55	84.63
107.300000	965.802000	3.75	36.74	40.49	105.80
107.500000	967.495800	4.82	36.81	41.63	120.64
106.700000	1066.995800	7.78	10.75	18.53	8.44
107.300000	1073.120000	5.70	10.79	16.49	6.68
107.500000	1074.995800	10.64	10.80	40.38	11.80



Performed By:

Fred Chastain, Test Technician

Name of Test: A/C Powerline Conducted Emissions

Specification: FCC: 47 CFR 15.207

Guide: IEEE Standard 213

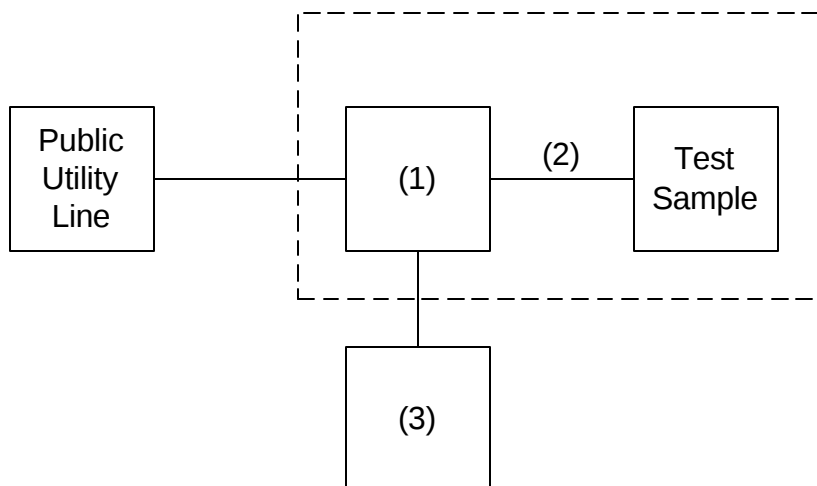
Test Conditions: S. T. & H.

Test Equipment: As per attached page

Measurement Procedure

1. A test sample was connected to the Public Utility lines through a LISN (50 μ H).
2. A reference level of 250 μ V was set on the Spectrum Analyzer. The spectrum was searched over the range of 150 kHz to 30 MHz.
3. All other emissions were 20 dB or more below limit.
4. ☐ The test sample used a charger.
☒ The test sample does not use a charger.
5. Measurement Results: Attached.

AC Powerline Conducted Measurements



Asset	Description	s/n	Cycle	Last Cal
Per ANSI C63.4-1992/2000 Draft, 10.1.4				
(1)	Line Impedance Stabilization Network			
X	i00244	Fischer 50-20-2-01	2047	NCR
(2)	Screen Room			
X	i00170	Lindgren LG170	4999	NCR
(3)	Spectrum Analyzer			
X	i00033	HP 85462A	3625A00357	12 mo.
	i00048	HP 8566B	2511AD1467	12 mo.
				Sep-04
				May-05

Results:

A/C Powerline Conducted Emissions

g0530041: 2005-Mar-29 Tue 10:41:00

State: 0: Line Side

Frequency Tuned, MHz	Frequency Emission, MHz	Level, dBuV	C.F., dB	$\mu\text{V}/\text{m}$
107.100000	0.210000	38.18	0.91	90.05
107.100000	0.320000	39.10	0.60	96.61
107.100000	0.860000	36.16	0.59	68.79
107.100000	2.030000	42.12	0.58	136.46
107.100000	13.350000	35.71	1.11	69.34
107.100000	28.310000	36.50	1.66	80.91

g0530042: 2005-Mar-29 Tue 10:43:00

State: 0: Neutral Side

Frequency Tuned, MHz	Frequency Emission, MHz	Level, dBuV	C.F., dB	$\mu\text{V}/\text{m}$
107.100000	0.210000	41.41	0.94	131.07
107.100000	0.320000	36.63	0.60	72.69
107.100000	0.640000	36.46	0.56	70.96
107.100000	2.030000	42.08	0.51	134.74
107.100000	11.930000	35.97	1.08	71.20
107.100000	28.310000	34.82	1.92	68.71



Performed By:

Fred Chastain, Test Technician

Radiated Measurements For Part 15 Transmitters W/ Integral Antennas

Radiated Measurements

Range of Measurement	Specification	Resolution B/W	Video B/A
30 to 1000 MHz	CISPR	=100 kHz	=100 kHz
>1000 MHz	FCC, 15.37(b)	1 MHz	=1 MHz
(if averaging)	FCC, 15.37(b)	1 MHz	10 Hz

Measuring Equipment

a. Antennas:

EMCO 3109	20 - 300 MHz
APREL AALP2001	200 - 1000 MHz
APREL AAB20200	20 - 200 MHz
APREL AAH118	1 - 18 GHz

b. Instruments:

HP8566B	Spectrum Analyzer
HP85685A	Preselector, w/ preamp below 2 GHz
HP85650A	Quasi Peak Adapter
HP8449	Preamp, above 2 GHz

Occupied Bandwidth

Occupied Bandwidth is measured as a radiated signal without attenuators and/or filter. RBW, VBW and scan settings as shown were set to produce a meaningful result in accordance with ANSI C63.4, Section 13.1.7.

Part 15.21, Information to User

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

§ 15.205 Restricted Bands of Operation

(a) Except as shown in paragraph (b) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.25
0.495-0.505	16.69475-16.69625	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2655-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-339.4	3600-4400	
13.36-13.41			

**Testimonial
And
Statement Of Certification**

This is to certify that:

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:

David E. Lee, Quality Assurance Manager