MEASUREMENT/TECHNICAL REPORT

SAFETY 1st

SENSITIVE SOUND NURSERY MONITOR

FCC ID: MNJ49260T

APPLICATION FOR CERTIFICATION

RF Emission Measurements Performed For Determination of Compliance with the US Code of Federal Regulations Title 47, Chapter I, FCC Part 15 Subpart C, Section 15.249 As Required for Intentional Radiators

Issue Date: May 27, 1998

This report concerns: Original grant

Equipment type: UHF Transmitter (Nursery Monitor)

Deferred grant per 47 CFR 0.457(d)(1)(ii) is NOT Requested

Transition Rules per 15.37 are NOT Requested

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1.0 GENERAL INFORMATION

1.1 Product Description

The Model Sensitive Sound Model 49260 (referred to as the EUT in this report) is a transmitter for use in an infant's nursery.

This system is designed to be a high quality, low cost audio nursery monitor for home use. This monitor will transmit audible sounds from the Child Unit (transmitter) and receive the same sounds on the Parent Unit (receiver). The frequency band chosen for this product is the 902-928 MHz ISM band. This frequency band allows for long range reception and good quality audio. This product is part of an ongoing family of nursery monitors provided by Safety 1st and will be sold through department stores nationwide.

This transmitting device operates on one of two RF channels. Channel A is set to transmit at 905.5 MHz and Channel B is set to 906 MHz. A switch controls the channel selection. A microphone picks up the room sounds and amplifies the signal through an audio amplifier. This signal is controlled by an automatic gain control (AGC) circuit to limit the FM modulation. The amplified audio signal is coupled directly into the FM modulator. The FM modulator consists of a direct 900 MHz oscillator tuned by a DC voltage on a varactor diode. A high Q coaxial resonator cut to the desired frequency range establishes frequency stability. The 900 MHz oscillator/modulator is coupled through a buffer stage and then to a final gain stage. The final gain stage is matched to a high Q tuned microstrip filter to diminish harmonics and provide proper impedance matching to the ½ wave antenna. The unit is powered by a single 9V battery or AC/DC power adapter.

1.2 Related Submittals

Safety 1st is submitting the associated receiver as FCC ID: MNJ49260R.

1.3 Tested System Details

The FCC ID's for all equipment, plus descriptions of all cables used in the tested system which have grants, are:

Model & Serial Number	FCC ID	Manufacturer & Description	Cable Description
49260 (EUT) S/N: N/A	NMJ49260T	Safety 1st Nursery Monitor	1.8 meter Power Cord from wall transformer to EUT

1.4 Test Facility

The open area test site used to collect the radiated data is located on 8625 Helmar Road in Newark, Illinois. The open field test site has a metal ground screen. Details of the site characteristics are on file with the FCC. Conducted emission measurements and preliminary radiated emission scans were performed in shielded enclosure number 1 at Radiometrics' Romeoville, Illinois EMC test lab. These sites have been fully described in a report and accepted by the FCC in a letter dated October 1, 1996 (31040/SIT 1300F2).

Conducted emission measurements were performed using an Electrometrics Model FCC/VDE 50/2 Line Impedance Stabilization Network (LISN) as the pick-up device. This device is constructed in accordance with the circuit diagram provided in Figure 3 of ANSI document C63.4-1992.

1.5 Test Equipment

Radiated emission measurements were performed with linearly polarized broadband antennas. The results obtained with these antennas can be correlated with results obtained with a tuned dipole antenna. Below 1 GHz, when a radiated emission is detected approaching the specification limit, the measurement of the emission is repeated using a tuned dipole antenna with a Roberts Balun.

The radiated emission measurements were performed with a spectrum analyzer. The bandwidths of the spectrum analyzers are adjusted to the correct bandwidths as specified by the FCC Rules. The bandwidth used from 450 kHz to 30 MHz is 10 kHz and the bandwidth from 30 MHz to 1000 MHz is 100 or 120 kHz. From 1 to 10 GHz a 1 MHz bandwidth is used. In order to increase the sensitivity of the spectrum analyzer, a preamplifier was used. For measurements above 1 GHz a high pass filter was connected to the input of the amplifier, which ensured that an overload condition was not present during the tests. When measuring the transmitter signals above 2000 MHz, a preselector was used.

1.6 Test Methodology

The test procedures used are in accordance with the ANSI document C63.4-1992, (July 17, 1992) "Methods of Measurement of Radio Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz". There were no deviations from this standard.

3.0 SYSTEM TEST CONFIGURATION

3.1 Justification

The EUT was tested in a typical configuration. The EUT has no ports for external cabling except for the DC input. The antenna is permanently attached.

The tests were performed at one frequency since the EUT operates in over a 500 kHz band, in accordance with FCC section 15.31(m).

3.2 EUT Test Configurations

The EUT was transmitting at 905.5 MHz during the tests.

3.3 Special Accessories

No special accessories were used to achieve compliance.

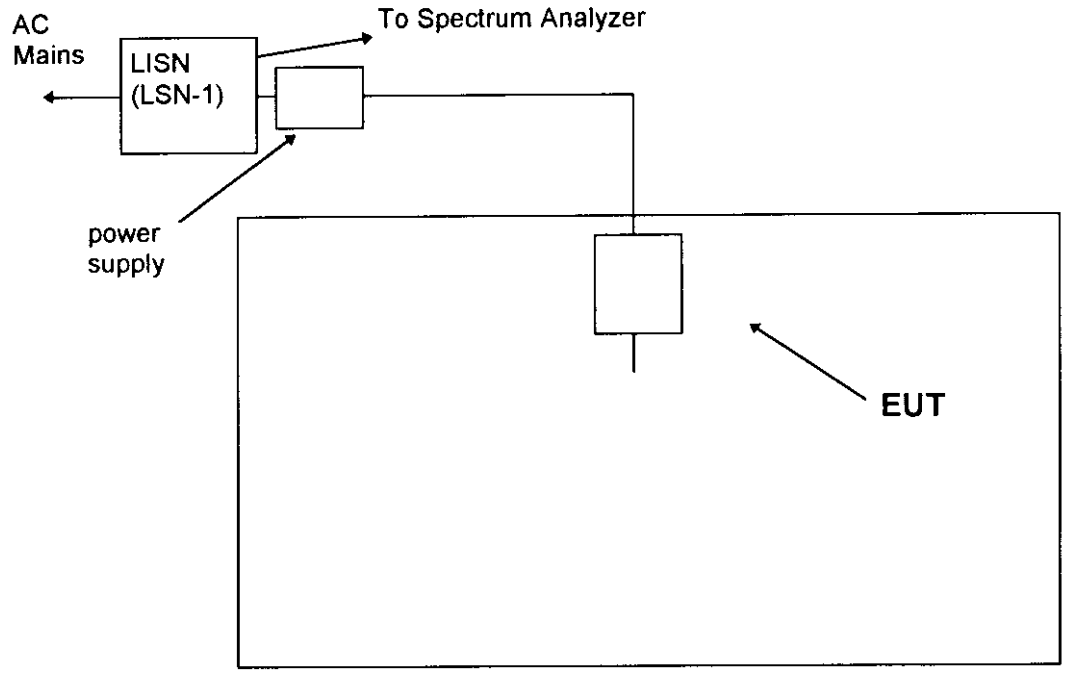
3.4 Equipment Modifications

No modifications were made to the EUT at Radiometrics facilities in order to achieve compliance with FCC regulations.

Figure 3.1 Configuration of Tested System

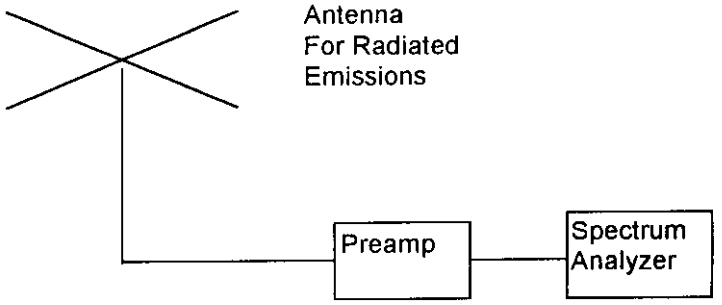
Conducted Emissions:
- LISN's at least 80 cm from EUT chassis
- Vertical conductive plane 40 cm from rear of table top
- EUT power cord bundled
- Test platform is not rotated

Radiated Emissions:
- LISN's not used
- AC outlet with low-pass filter at the base of the turntable
- No vertical conductive wall



Notes:
- Not to Scale
- Antenna height varied 1-4 mtrs
- Distance from antenna to tested system is 3 meters
- LISN=Line Impedance Stablization Network

Rotating Platform:
1x1.5m surface above GND plane



4.0 EUT CIRCUIT DIAGRAMS

Figure 4.1 EUT Circuit Diagrams

As Per 47 CFR 0.457 and 47 CFR 0.459 (Request For Confidentially) Materials are in the Envelope Marked:

CONFIDENTIAL
Safety 1st
FCC ID: MNJ49260T

Figure 4.2 EUT Circuit Diagrams

As Per 47 CFR 0.457 and 47 CFR 0.459 (Request For Confidentially) Materials are in the Envelope Marked:

CONFIDENTIAL
Safety 1st
FCC ID: MNJ49260T

6.0 AC CONDUCTED EMISSION DATA

The initial step in collecting conducted data is a spectrum analyzer peak scan and plotting the measurement range. The emissions are then maximized by moving all cables in relation to each other and the EUT. The emissions were then plotted using the peak detector. The highest emissions were also measured using a quasi-peak detector. The worst case emissions from the different configurations and operating modes are presented below. All reading are quasi-peak with a 9 kHz bandwidth and no video filter

The data below shows compliance to FCC section 15.207(a).

Model : Sensitive Sound 49260 Transmitter
Test Date : 5/19/98

Line Tested	Freq. MHz	Meter# Reading dBuV	Cable Loss dB	Strength of Signal dBuV	Limit dBuV	Margin Under Limit dB
Neutral	0.46	29.0*	0.1	29.1	48.0	18.9
Neutral	0.95	29.0*	0.1	29.1	48.0	18.9
Neutral	20.07	29.0*	0.3	29.3	48.0	18.7
AC Hot	0.49	29.0*	0.1	29.1	48.0	18.9
AC Hot	0.94	29.0*	0.1	29.1	48.0	18.9
AC Hot	20.08	29.0*	0.3	29.3	48.0	18.7

No emissions were detected from 450 kHz to 30 MHz within 18 dB of the limit.

*-ambient Emission

All reading are quasi-peak with a 9 kHz bandwidth and no video filter.

Changing the frequency of the transmitter did not affect the emissions listed above.
Judgment: Passed by 5.9 dB

Test Personnel: Joseph Strzelecki Date 5/27/98

Joseph Strzelecki
Senior EMC Engineer

7.0 RADIATED EMISSION DATA

This section shows compliance to FCC sections 15.249(a), (b) and (c). All harmonics of the transmitter complied with the 15.209(a) limits. The worst case spurious are reported in this section.

7.1 Radiated Emissions Data (30-10,000MHz)

The following table lists the highest emission frequencies, measured levels, correction factors plus the limit. The following lists the worst case emissions up to the 10th harmonic. Above, 1 GHz, the analyzer was set with a RBW of 1 MHz with a 10 Hz VBW.

Model : 49260
Test Date : May 20, 1998
Test Distance : 3 Meters
Notes: Pol = Antenna Polarization; V = Vertical; H = Horizontal
LP = Log Periodic; HN = Double Ridged Guide Horn Antenna
Corr. Factors = cable loss + high pass filter loss - preamp gain

Freq MHz	Analyzer Reading dBuV	Antenna Factor dB	Antenna Polarity/ Type	Correction Factors dB	Field Strength of Signal dBuV/m	Limit Field Strength dBuV/m	Margin Under Limit dB
905.5	64.5	23.4	V/LP	0.8	88.7	94.0	5.3
1811.0	40.1	27.6	V/HN	-23.6	44.1	54.0	9.9
2716.5	41.3	30.3	V/HN	-23.2	48.4	54.0	5.6
3622.0	40.6	32.8	V/HN	-22.7	50.7	54.0	3.3
4527.5	35.9	33.4	V/HN	-22.2	47.1	54.0	6.9
5433.0	37.8	35.0	V/HN	-21.8	51.0	54.0	3.0
6338.5	31.5	35.6	V/HN	-21.4	45.7	54.0	8.3
7244.0	28.0*	36.9	V/HN	-21.2	43.7	54.0	10.3
8149.5	28.0*	37.7	V/HN	-21	44.7	54.0	9.3
9055.0	28.0*	38.1	V/HN	-20.8	45.3	54.0	8.7
905.5	62.6	23.4	H/LP	0.8	86.8	94.0	7.2
1811.0	40.6	27.6	H/HN	-23.6	44.6	54.0	9.4
2716.5	39.5	30.3	H/HN	-23.2	46.6	54.0	7.4
3622.0	39.4	32.8	H/HN	-22.7	49.5	54.0	4.5
4527.5	34.5	33.4	H/HN	-22.2	45.7	54.0	8.3
5433.0	31.5	35.0	H/HN	-21.8	44.7	54.0	9.3
6338.5	30.6	35.6	H/HN	-21.4	44.8	54.0	9.2
7244.0	28.0*	36.9	H/HN	-21.2	43.7	54.0	10.3
8149.5	28.0*	37.7	H/HN	-21	44.7	54.0	9.3
9055.0	28.0*	38.1	H/HN	-20.8	45.3	54.0	8.7

*-ambient emission
No emissions were detected from 30 to 905 MHz within 12 dB of the limit.
Judgment: Passed by 3 dB

Test Personnel: Joseph Strzelecki Date 5/27/98

Joseph Strzelecki
Senior EMC Engineer

7.3 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CF - AG
Where: FS = Field Strength
RA = Receiver Amplitude
AF = Antenna Factor
CF = Cable Attenuation Factor
AG = Amplifier Gain

Assume a receiver reading of 49.5 dBuV is obtained. The Antenna Factor of 8.1 and a Cable Factor of 1.7 is added. The Amplifier Gain of 23.3 dB is subtracted, giving a field strength of 36 dBuV/m. The 36 dBuV/m can be mathematically converted to its corresponding level in uV/m.

FS = 49.5 + 8.1 + 1.7 - 23.3 = 36.0 dBuV/m

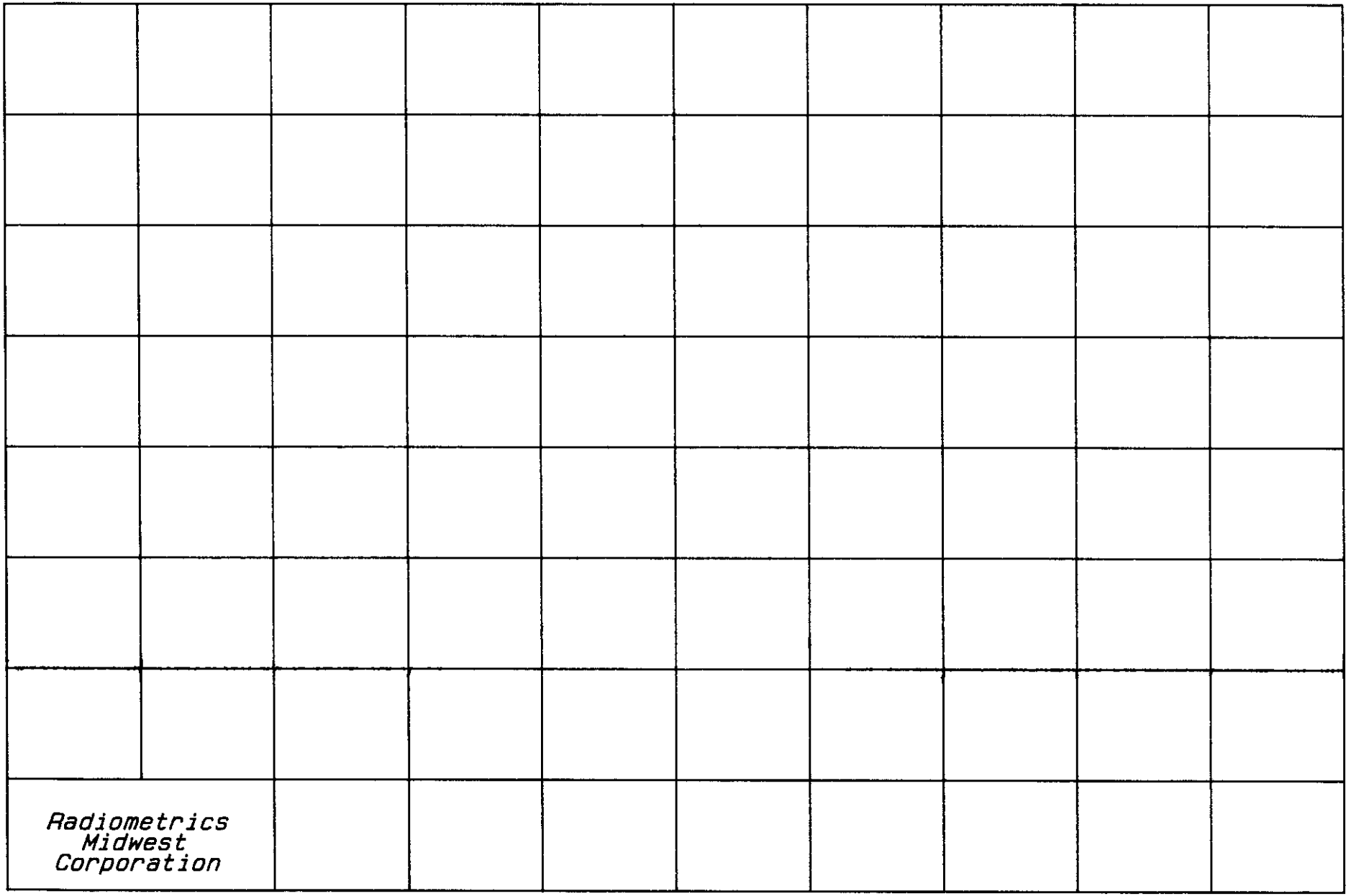
Level in uV/m = Common Antilogarithm [(36 dBuV/m)/20] = 63.1 uV/m

8.0 Occupied Bandwidth Test

The occupied bandwidth of the RF output was measured using a spectrum analyzer. The bandwidth was measured using the peak detector function. This test also demonstrates the modulation limiting characteristics of the EUT.

A broadband antenna was used to receive the modulated signal. The spectrum analyzer was set to the "MAX HOLD" mode to record the worst case of the modulation with a very loud voice spoken into the transmitter's microphone. The spectrum analyzer display was digitized and plotted. A limit was drawn on the plot based on the level of the modulated carrier. Plots of the occupied bandwidth is supplied on page 15.

Figure 8.1 Occupied Bandwidth Plot



COMPANY : Safety 1st
START FREQ. = 905.25 MHz
RBW = 10 kHz
10 dB/div
NOTES : Occupied Bandwidth, and Modulation Limiting Test

ITEM : 49260 TX
REF. LEVEL = 090.0 dBuV
VBW = 100 kHz
TIME = 19:57

DATE : 05-25-1998
SPAN = .5 MHz
ATTEN = 20 dB
SWP TIME = 5 mSec
PAGE: RP-3778A

FCC ID: MNL49260T

9.0 PHOTOS OF TESTED EUT

The following photos are attached:

Figure 9.1 Front View

Figure 9.2 Inside Covers

Figure 9.3 RF PCB (Component Side)

Figure 9.4 RF PCB (Foil Side)

Figure 9.5 RF & Controller PCB Assembled

Figure 9.6 Controller PCB (Component Side)

Figure 9.7 Controller PCB (Foil Side)

Figure 9.8 Power Supply

Figure 9.9 Bottom of Power Supply Board

Figure 9.10 Top of Power Supply and Transformer