ENGINEERING STATEMENT

In Connection With

EVENFLO COMPANY, INC.

Model No. EVF-615

FCC ID: EHK-ETL615TX

Hyak Laboratories, Inc. has been retained to perform radiated and conducted spurious measurements on the Evenflo Company Model EVF-615 transmitter in accordance with the provisions of Section 15.235 of the FCC rules, Part 15.

I am an Electronics Engineer, a principal in the firm of Hyak Laboratories, Inc., Springfield, Virginia. My education and experience are a matter of record with the Federal Communications Commission, having submitted numerous applications for equipment authorization.

All tests were made by me or under my supervision in accordance with the rules and regulations of the Federal Communications Commission.

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Rowland S. Johnson

Dated: April 4, 2000

COMPLIANCE WITH SECTION 15.235 OF PART 15

The procedures of ANSI C63.4 (1992) were used.

15.235(a) The field strength of the radiation emission was measured and found to be less than 10,000 uV/M @ 3m within the 49.82 - 49.90 MHz band. A peak-reading, RMS calibrated, spectrum analyzer was used as the measuring device. (See data of Table 1.) A 100 kHz resolution bandwidth was used.

15.235(b) The field strength of all emissions removed by more than 10 kHz from the band edges did not exceed 500 uV/m @ 3 meters, (26 dBc) or the general limits of 15.209, whichever was the higher emission limit.

All signals exceeding 20 uV/m @ 3 meters are reported in Table 1. The spectrum was scanned from 30 to 1000 MHz.

Emissions were confined within a 20 kHz band centered on the carrier frequency. No provisions for an external input signal exist. (See Figure 1.)

The antenna is permanently attached in the device. (See photographs.)

15.207(a) RF energy fed back into the power lines did not exceed 250 microvolts on any frequency between .45 to 30 MHz. (See plots of Figures 2 and 3.)

DATA

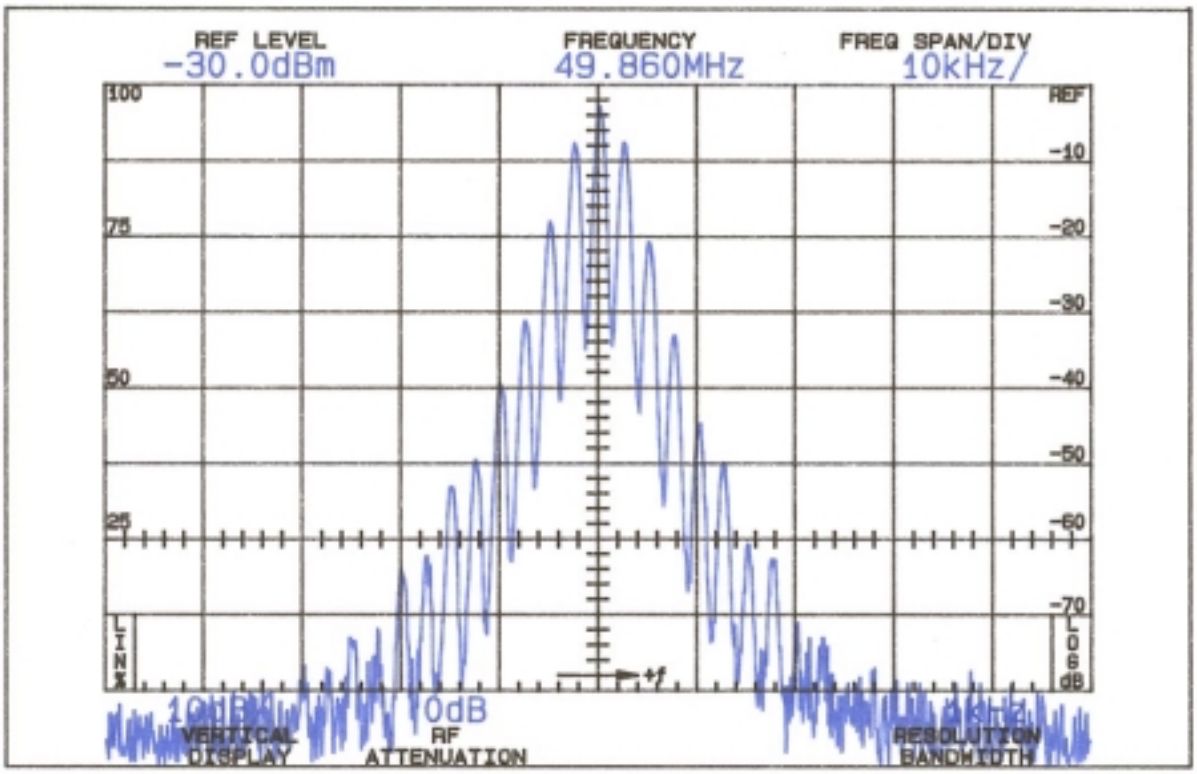
Radiated emissions were measured with the external AC power supply. Data in Table 1 is for worst-case emissions observed when the AC power module was used.

Tables and Figures referenced above follow immediately after this page. Description of measurement procedures and test equipment used in the measurements follow the data pages.

MEASUREMENT FACILITIES

The Hyak Laboratories, Inc. measurement facility is currently listed as an acceptable site.

FIGURE 1a

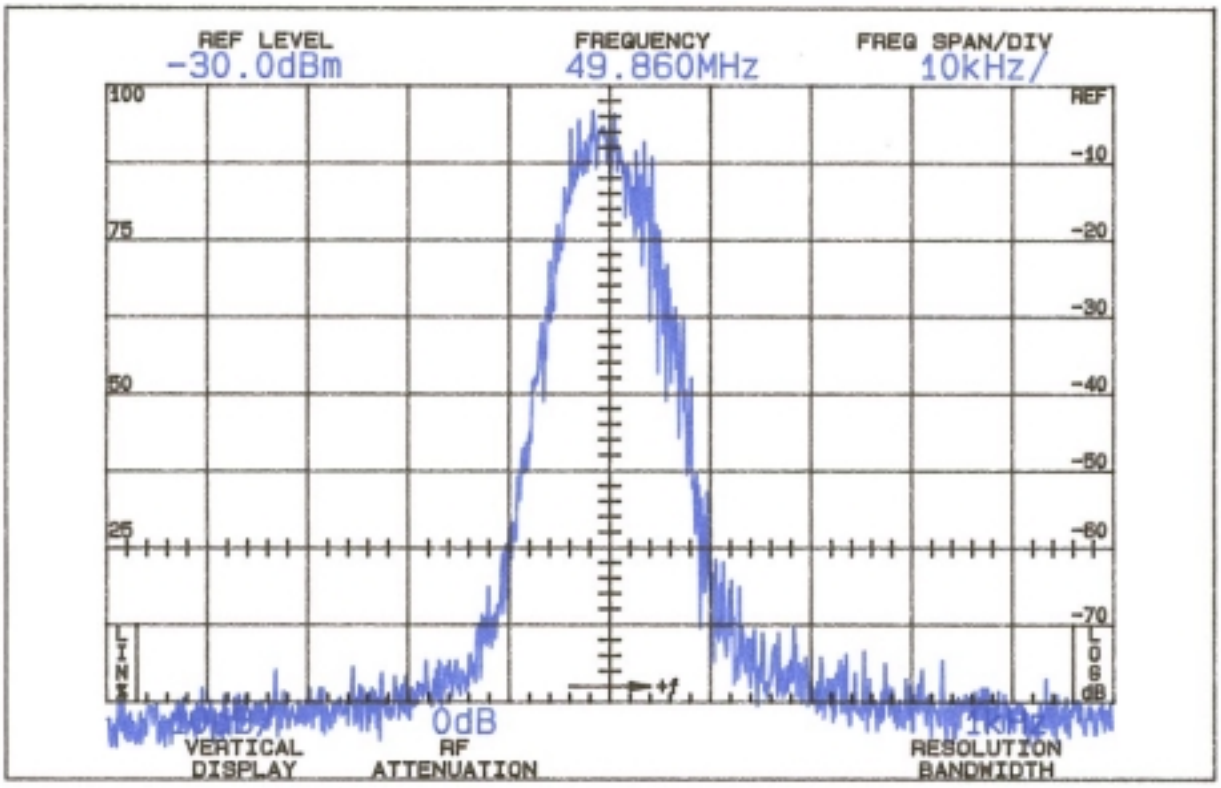


85%, 2500 Hz Modulation

OCCUPIED BANDWIDTH
2500 Hz Modulation
FCC ID: EHK-ETL615TX

FIGURE 1a

FIGURE 1b



Loud Voice Modulation

OCCUPIED BANDWIDTH
Loud Voice Modulation
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FIGURE 1b

TABLE 1

RADIATED SPURIOUS EMISSIONS
FCC Part 15

Frequency To Which Tuned (MHz)	Spurious Frequency (MHz)	Meter Reading (dBm)	Antenna Factor (dB)	Field[1] Intensity uV/m @ 3m	FCC Limit uV/m @ 3m	dB to Limit
49.860	49.859	-32.8	5.1	9226	10000	- .7
49.860	99.722	-93.2	11.2	18	150	- 19
49.860	149.583	-107.2	14.9	5*	150	- 29
49.860	199.444	-110.0	17.5	5*	150	- 29
49.860	249.305	-108.8	19.6	8*	200	- 28
49.860	299.166	-110.0	21.3	8*	200	- 28
49.860	349.027	-110.4	22.8	9*	200	- 27
49.860	398.888	-109.6	24.1	12*	200	- 25
49.860	448.749	-110.0	25.2	13*	200	- 24
49.860	498.610	-108.0	26.2	18*	200	- 21
49.890	49.891	- 32.4	5.1	9661	10000	- .3
49.890	99.782	- 92.0	11.2	20	150	- 17
49.890	149.673	-106.3	14.9	6*	150	- 28
49.890	199.564	-109.6	17.5	6*	150	- 29
49.890	249.455	-109.6	19.6	7*	200	- 29
49.890	299.346	-110.4	21.3	8*	200	- 28
49.890	349.237	-110.8	22.8	9*	200	- 27
49.890	399.128	-106.8	24.1	16*	200	- 22
49.890	449.019	-110.8	25.2	12*	200	- 25
49.890	498.910	-109.6	26.2	15*	200	- 22

Note 1: $uV/m = Log^{-1}\frac{dBu/m}{20}$

dBu = dBm + antenna factor + 107

*Reference data, 20 dB or more below FCC limit.

Occupied Bandwidth

49.860	f_c-10 kHz	(1) -40 dB to f_c	92.3	- 15	
49.860	f_c+10 kHz	(1) -45 dB to f_c	51.9	- 20	

Frequency range of 30 to 499.0 MHz was scanned. No signals exceeded FCC limits and all signals greater than 20 uV/m @ 3m are shown above.

(1) From Figure 1a

RADIATED FIELD INTENSITY
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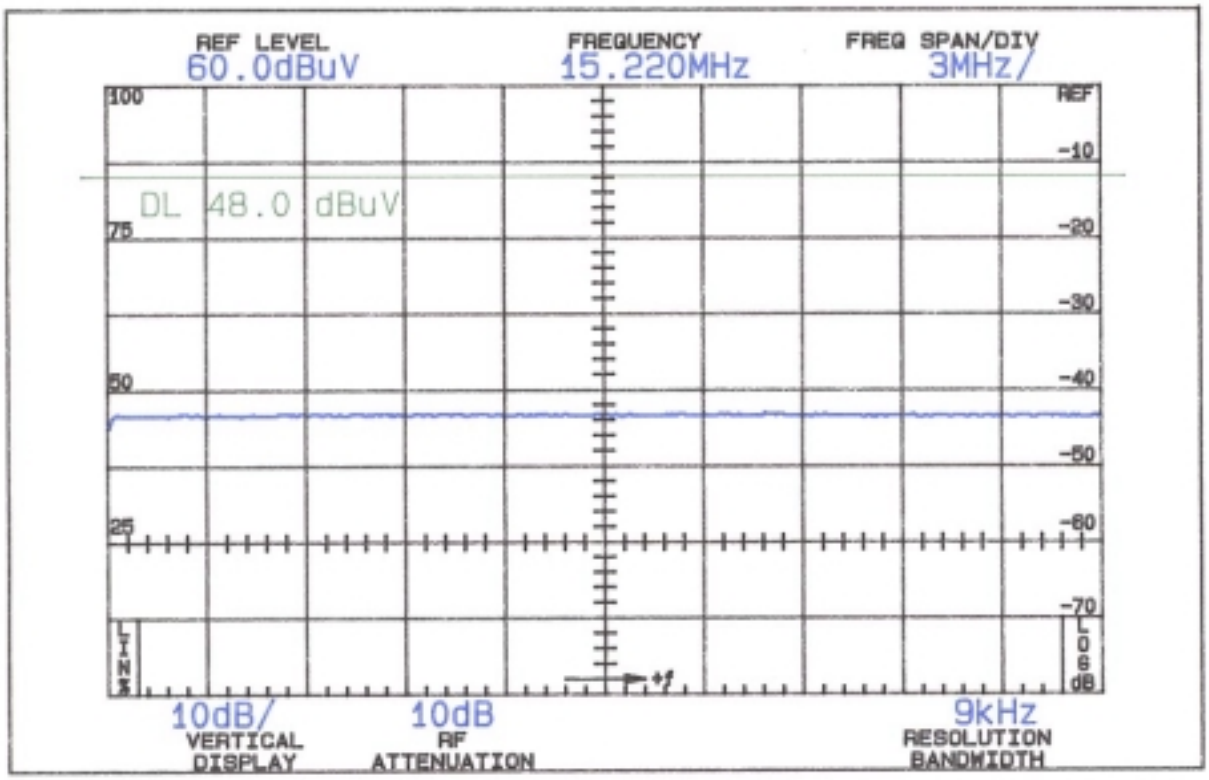
TABLE 1

FIGURE 2



LINE CONDUCTED EMISSIONS
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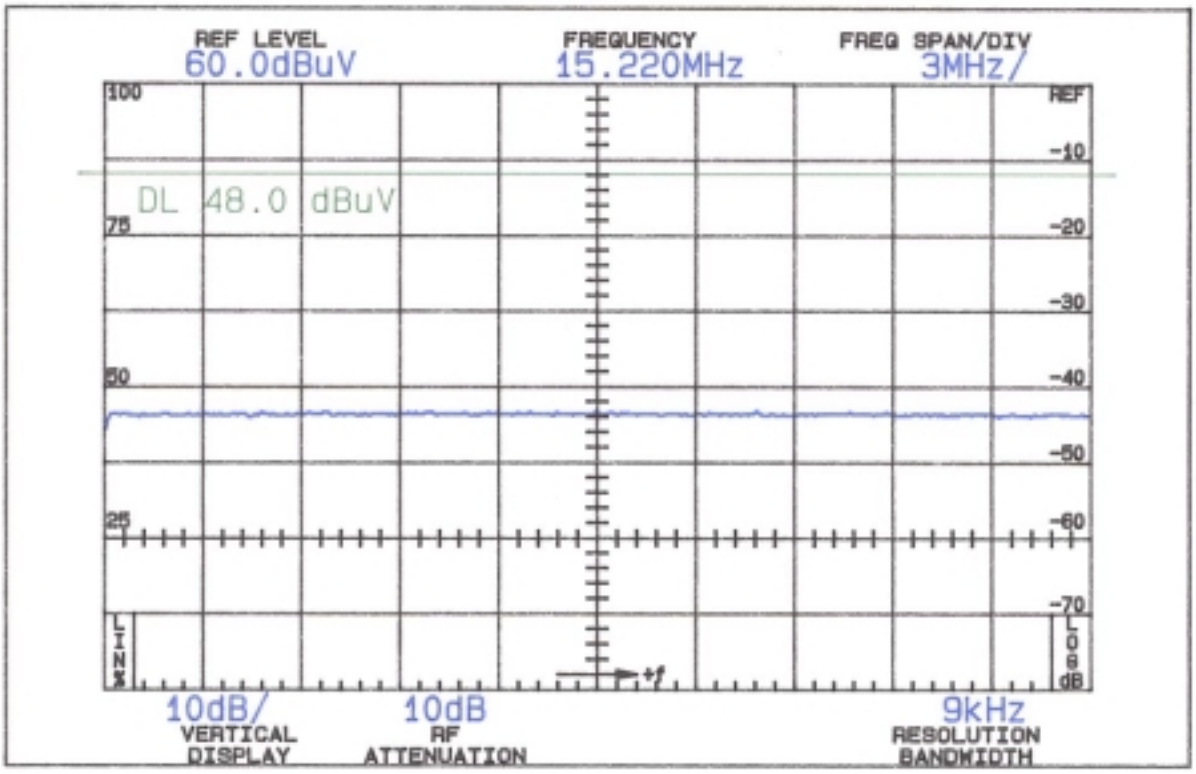
FIGURE 2 (Left LISN)

FIGURE 3



LINE CONDUCTED EMISSIONS
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FIGURE 3 (Right LISN)

PROCEDURES, EMISSION BANDWIDTH

Measurement of emission bandwidth was made with a 2500 Hz tone at a sufficient level to produce 85% of limiting modulation.

The input signal was coupled directly to the audio input stage of the device.

A Tektronix 494P spectrum analyzer was used; input audio signal was from a IEC F-47 function generator; audio level was determined with a Fluke 8920A TRMS voltmeter; modulation was measured with a Boonton 8220 modulation monitor.

A second plot was made with loud voice signal.

PROCEDURES, RADIATED SPURIOUS EMISSIONS

Procedures of ANSI 63.4 - 1992 were followed.

The field strength of the radiated emissions from the device was measured at a distance of 3 meters. The spectrum was scanned from 30 MHz to the tenth harmonic using a TEK 494P spectrum analyzer and HP 8447D low-noise preamplifier.

Measurement procedure included recording the worst-case field strength for receiving test antenna polarization, test antenna height variation from 1 meter to 3 meters and test sample antenna in both vertical and horizontal plane.

The test sample was placed on a rotatable 80 cm high wooden stand. The receiving antenna, placed 3 meters from the test sample, was a Eaton/Singer DM-105 calibrated dipole set. Power supply was the 9 volt plug-in transformer supplied with the test sample.

The test sample was measured in the bottom down, face down, and side down positions.

The spectrum was checked from 30 to 499 MHz. All emissions not reported were less than 20 uV/m @ 3m. Tabulation of the measurements are shown in Table 1.

PROCEDURES, AC LINE CONDUCTED SPURIOUS

Power line conducted spurious were measured from .45 to 30 MHz using an IEEE 213 line impedance stabilization network, (LISN), modified for a 50 uH network.

The device under test was placed on a ground plane, per ANSI 63.4 (1992), on a 80 cm high wooden stand centered in the ground plane. The LISN network was placed in contact with the conductive floor at the base of the test stand.

Coaxial cables to the left and right LISN output ports were connected by RG 55/U coaxial cable to a shielded high-isolation SPDT coaxial relay and then to the spectrum analyzer 50 ohm input port. When measurements were made, the un-used LISN port was terminated in 50 ohms.

The device under test was operated in modes which maximized observed spurious.

An Advantest R3361A spectrum analyzer was the detector, using a 9 kHz resolution bandwidth. The spectrum analyzer was in the CISPR quasi-peak detector mode, with a 120 second scan.

Plots are shown in Figures 2 and 3. The 250 microvolt limit (48 dBu) is shown as a green line.

CIRCUIT DESCRIPTION

The 49 MHz Evenflo Monitor Model EVF-615 is composed of a transmitter unit and receiver unit. Audio from a microphone in the transmitter is used to frequency modulate a carrier. In the receiver, the FM carrier is demodulated into normal audio. The frequency band chosen for this product is the 48.82 - 49.90 MHz band.

The transmitter and receiver units operate on one of two RF channels designated A and B. The channels are at 49.860 MHz and 49.890 MHz respectively. A switch controls the channel selection on both units. The unit is powered by a positive center, 9V 200 mA AC/DC adapter.

A microphone picks up the room sounds and amplifies the signal through a three-stage transistor amplifier. An automatic gain control (AGC) circuit limits the amount of modulation.