MEMORANDUM

TO   **:** Joe Dichoso

FROM   **:** Dan O'Sullivan

SUBJECT : **CFS7722TX**   Correspondence Reference # 12167

DATE   **:** 2/28/00

Item 1:

The heading of the last column should be "uV/m". Refer to resubmitted data . The limits were determined as follows as measured on an FCC approved 3 meter site:

Fundamental Power
(on Spectrum Analyzer) = -18.75 dBm

Cable Loss   = -4.2 dB

Antenna Factor   = 25.07 dB

This results in an effective radiated power of 117.52 dBuV or 751,622 uV/m. Since the second harmonic frequencies (1.804 to 1.856 GHz) are not in the frequency bands indicated 15.205, the limit for harmonics in this band must be at least 20 dB below the fundamental. Hence, the limit for 1.8GHz is 97.52 dBuV or 75,162 uV/m.

The remaining harmonics <u>do</u> fall into bands covered in 15.205 and are limited to 500 uV/m average, 5000 uV/m peak. Since the transmitter radiates for 25 milliseconds every 2 seconds, worst case, a duty cycle reduction of spurious emissions of 4:1 is allowed, making the average limit 2000 uV/m. All peak power measurements meet the 5,000 uV/m requirement.

For measurements from 5.4 GHz to 9.1 GHz, radiated harmonics were too low to measure at 3 meters, so the turntable was moved to 1 meter from the receiving antenna. The new limit is calculated to be 15,000 uV/m.

Data sheets showing the appropriate limits are included for your review.

Item # 2:

Output power for this product was obtained by disconnecting the antenna and installing a connector to the pc board. The PN sequence was disabled, producing a single tone at 911.36MHz. A spectrum analyzer was used with a 100 kHz resolution bandwidth to measure the peak amplitude. The process was repeated at 918.537 MHz and the larger of the two signals was reported.

Item # 3:

Compliance with the requirements of 15.247 (b)4 are detailed below:

At the fundamental, RF output measured at 3 meters was found to be

751,622.9 uV/m => 0.751623 V/m

Equivalently,

$P_D = V^2 / Z = (0.751623)^2 / 120(pi)$

$$= 1.49854 \text{ mW/m}^2 \qquad \text{measured at 3 meters}$$

Since
$$P_T = P_D * 4(pi) R^2 \quad => \quad P_T = 169.48 \text{ mW}$$

Where
P_D = Detected Power
P_T = Transmitted Power

The limit was chosen from Table 1 (B) because it is the most stringent for the 902 – 928 MHz frequency band. The limit for MPE from 1.1310 Table 1 (B) is:

$$\text{Limit}_{MPE} = \text{frequency} / 1500 = 0.601 \text{ mW/cm}^2$$

Determining the actual exposure is as follows:

$$P_D \text{ @ 20 cm} = P_T / 4(pi)(20cm)^2$$

$$= 0.0337 \text{ mW/cm}^2 \qquad \text{measured at 20 cm.}$$

The distance at which the limit from Table 1 (B) is met can be derived as follows:

$$R = [P_T / 4(pi)(0.61 \text{ mW/cm}^2)]^{0.5}$$

$$= [169.48 \text{ mW} / 4*pi*0.61]^{0.5}$$

$$= 4.7 \text{ cm}$$

In addition, the nominal duty for the device is 0.2 %. Hence, the device complies with the requirements set forth in 15.247 (b)4.

ALARM DEVICE MANUFACTURING COMPANY
160 Eileen Way   Syosset, NY 11791

TABULAR DATA SHEET

TEST METHOD :	RADIATED EMISSIONS
TEST SAMPLE :	902-928 MHz DIRECT SEQUENCE SPREAD SPECTRUM TRANSMITTER S/N = 101

MODEL No.:	7722TX	SERIAL No.:	FCC ID: CFS 7722TX
TEST SPECIFICATION :	FCC PART 15, SUB C	PARAGRAPH :	247

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OPERATING	TRANSMITTING WITH MODULATION