

A. DEVICE UNDER TEST

The product is remote control device used to control the flame level and fan speed of a gas fireplace. It is the second generation of the HS9-RT8220A previously certified. This product is designed to operate under the provisions of Part 15.231 of the FCC rules. The transmit frequency is 303.825 MHz. nominal. The modulation mode is on/off keying. Power for the device is provided by three internal alkaline "AA" cells.

B. MEASUREMENT PROCEDURE: RADIATED EMISSIONS

Testing of this device was conducted at the Hyak Laboratory test facility located in Spotsylvania, Virginia.

Transmitter field strength measurements were conducted according to the procedures set forth in ANSI C63.4 (1992). Testing was conducted with fresh batteries and monitored periodically to insure that the battery voltage (under load) was maintained at 95% of nominal or better.

The device under test was placed on a rotating turntable 0.8 meters high, centered at 3 meters distant from the measurement antenna. The device was placed in the center of the turntable and tested in two positions shown in the test setup photographs.

This product is designed to be hand held but can also become active when left unattended. Therefore the device was tested in the three positions shown in the photographs. For the purpose of testing, the micro-controller in the test sample was programmed with a special subroutine to transmit the code stream continuously.

The field strength measurements were taken using an HP8596E spectrum analyzer, EMCO 3121C dipole set, an EMCO 3115 double ridge guide horn and an Avantek UJ210 preamp. The device was scanned from 30 MHz. to 4.0 GHz. and all emissions were noted. In this case the only emissions detected were those harmonically related to the fundamental transmit frequency.

At each detected frequency of emission, the device was measured by rotating the turntable and adjusting the antenna height over a

range of 1 to 4 meters to obtain the maximum output level. This procedure was performed with both horizontal and vertical antenna polarizations with the device in the positions described above. The peak reading for each frequency was recorded in the second column on the data sheet. Measurement for emissions at the 8th, 9th and 10th harmonics was performed by reducing the distance from the measurement antenna to 1 meter and factoring -9.54dB into the calculation. No emissions were detected above 3.1 GHz.

C. DUTY CYCLE CALCULATIONS

The transmission format for this device is 50% Manchester phase and is described in detail on the data sheet. Measurements were taken at points at least 6dB. down from peak to insure worst case. The duty cycle is calculated as follows:

$$20\log(50\text{mS.}/100\text{mS.}) = -6\text{dB}$$

The duty cycle correction factor used for the calculations on the data sheet is -6.0dB. As provided in Part 15.35 of the FCC rules.