CERTIFICATION MEASUREMENT REPORT

I. INTRODUCTION

This measurement report is submitted in support of an Application for Certification in accordance with Part 2, Subpart J and Part 15, Subpart C (effective 6/23/89) of the Federal Communications Commission's Rules and Regulations.

The equipment under test (EUT) is a low power pulsed RF transmitter. This transmitter operates at a fixed frequency within the band from 26.99 MHz to 27.28 MHz and is powered by one 9.6 Volt battery pack. It is identified as THE TYPHOON, (FCC ID: AEKA00227). Operation under the transition provisions of Paragraph 15.37 is not requested for this device. The measurements contained in this report demonstrate compliance with the limitations in effect since 6/23/89.

II. INFORMATION REQUIRED FOR CERTIFICATION

Paragraph(s)

2.1033(a) This Application for Certification is filed on FCC Form 731 with all questions answered. An application fee of $940 was submitted.

2.1033(b)(1) The full name and mailing address of the manufacturer of the device and applicant for certification is:

Taiyo Kogyo Co., Ltd.
No. 1-23-17, Higashiyotsugi
Katsushika-ku, Tokyo 124
Japan

(2) The FCC Identifier of the device is AEKA00227.

(3) A copy of the installation and operating instructions to be furnished to the user is included in the exhibits section of this application.

(4) The transmitter is a hand-held unit and is powered by one 9.6 Volt battery. It is designed to operate on one of the following fixed frequencies: 26.995 MHz, 27.045 MHz, 27.095 MHz, 27.145 MHz, and 27.195 MHz. Complete circuit schematics are provided in the exhibits section.

(5) A block diagram of the device is included in Exhibits.

(6) A report of measurements is included in this report.

(7) Photographs of this device showing the FCC label placement

(actual label sample photograph included), chassis assembly, and circuit layout are included as Exhibits in this application.

(8) This equipment is a stand-alone unit. No peripherals or accessories are involved.

(9) Certification under the transition provisions of Paragraph 15.37 is not being requested for this device.

(10) N/A.

III. GENERAL TEST CONDITIONS AND PROCEDURES

Measurement procedures were used as outlined in MP-1 as specified in Part 15.31, *except as noted herein*. The open-field tests were performed on a three-meter range maintained by Carl T. Jones Corporation at the Springfield facility. Complete description and measurement data for the site have been placed on file with the Commission. Carl T. Jones Corporation is listed by the FCC as a facility available to do measurement work for others on a contract basis. Prior to open-field testing, the equipment was placed in a shielded enclosure and scanned at a close distance to determine its emission characteristics.

IV. RADIATED EMISSION MEASUREMENTS

The transmitter was assembled on a rotatable wooden test stand 0.8 meters in height. The transmitter's antenna was fully extended. The emission spectrum was examined up to 1000 MHz using a Hewlett-Packard 8568B spectrum analyzer and Compliance Design "Roberts" tuned dipole antennas.

At each emission frequency, the EUT was rotated 360 degrees, and the antenna was raised and lowered from one to four meters to determine the maximum emission levels. Measurements were taken using both horizontal and vertical antenna polarizations. The spectrum analyzer's 6 dB bandwidth was set to 100 kHz. The analyzer was operated using its *peak detection* mode for measurements of emissions less than 1000 MHz. No post-detector video filters were used. The EUT was investigated in three orthogonal planes. The highest emission amplitudes relative to the appropriate limit were measured and have been recorded in Table 1.

The actual field intensity in decibels above one microvolt per meter (dBuV/m) is determined by algebraically adding the measured level in dBuV, the antenna factor (dB), and the cable loss (dB) at the appropriate frequency.

$$FI_a \text{ (dBuV/m)} = FI_m \text{ (dBuV)} + AF \text{ (dB)} + CL \text{ (dB)}$$

FI_a = Actual Field Intensity
FI_m = Measured Field Intensity
AF = Antenna Factor
CL = Cable Loss

As a sample calculation, assume a particular device emits a signal with a frequency of 27.145 MHz. The received signal level is measured as 62.9 dBuV. The total attenuation factor (antenna factor plus cable loss) for 27.145 MHz is 0 dB. The actual radiated field is calculated as follows:

64.8 dBμV + (0 dB) = 64.8 dBμV/m @ 3 meters, or 2754.2 μV/m @ 3 meters

The field strength of the fundamental did not exceed 10,000 μV/m (80 dBμV/m) at 3 meters, as specified in Paragraph 15.227.

As per the requirements defined in 15.209, the radiated emission limit at the band edges is 49.5 dBμV/m at 3 meters. As per the occupied bandwidth spectral plot, the highest emission level below the lower band edge is 39 dB below the modulated carrier. At the upper band edge the highest emission recorded is 39 dB below the modulated carrier. **Note: because the EUT complies using *peak detection* (worst case), quasi-peak detection was not used.** Based on the maximized *peak* radiation measurements of the carrier, these emission levels are:

Lower Band Edge

64.8 dBμV/m - 39 dB = **25.8 dBμV/m** (peak) at 3 meters

(*FCC Limit = 49.5 dBμV/m, quasi-peak*)

Upper Band Edge

64.8 dBμV/m - 39 dB = **25.8 dBμV/m** (peak) at 3 meters

(FCC Limit = 49.5 dBμV/m, quasi-peak)

Radiated measurements to the EUT's 10th harmonic are included in this report as Table 1. All other emissions were found to be in compliance with the restrictions of Paragraph 15.209(a) of the Commission's Rules. Because the emissions were below the limits using *peak* detection, average to peak ratio's were not calculated.

V. OCCUPIED BANDWIDTH MEASUREMENTS

In order to demonstrate that the EUT's fundamental frequency is within the 26.96 to 27.28 MHz frequency band an occupied bandwidth spectral plots of the EUT's fundamental frequency are included, one plot using 1 kHz RBw and another using 10 kHz RBw. Paragraph 15.227(b) specifies that all emissions which fall outside the frequency range of 26.96 - 27.28 MHz must be under the general radiation limitations of Paragraph 15.209. Although the actual measurements were performed on a transmitter operating at the frequency of 27.145 MHz, the lowest frequency at which this device will operate is 26.995 MHz, and the highest frequency is 27.195 MHz.

VI. POWER LINE CONDUCTED EMISSIONS MEASUREMENTS

Measurements of the power line conducted emissions were not performed since the EUT has no means for connection to the public power utility grid.