ENGINEERING STATEMENT

In Regard to Measurements on

AUDIO-TECHNICA CORPORATION

MODEL: ATW-R310

FCC ID: JFZR310

A. INTRODUCTION

Hyak Laboratories, Inc. has been authorized by Audio Technica to perform measurements on a receiver to determine compliance with FCC rules, Part 15, Subpart B.

The receiver operates in the 655 - 680 MHz band and is intended for use with a wireless microphone.

B. DESCRIPTION OF RECEIVER

The receiver incorporates a dual diversity, dual conversion, super-heterodyne design.

The following information is supplied as requested in FCC Bulletin OCE 24:

1. Service in which the receiver will be used: Part 15. (74).

2. Function of receiver: Wireless Microphone Receiver.

3. Tuning range: 655 - 680 MHz.

4. IF used: 60 MHz, 10.7 MHz.

5. Fundamental frequency of principal oscillators in the receiver.

First local oscillator: (F_o-60) MHz(PLL).

Second local oscillator 49.3 MHz.

C. DESCRIPTION OF MEASUREMENT FACILITIES

Measurements of radiated emissions were made on the Carl T. Jones Corporation OATS.

D. DESCRIPTION OF MEASUREMENT PROCEDURE: RADIATED EMISSIONS

Measurements of receiver radiation field strength were made using ANSI C63.4 (1992) the basic procedure. Measurements were made with 3 meter spacing between the receiver under test and the test equipment antenna. The antenna(s) connected to the receiver under test consisted of vertically polarized, antennas approximately 10 cm long.

The receiver under test was placed on a rotatable table 80 cm in height.

Measurement of field strength was made through use of Tektronix 494P spectrum analyzer in conjunction with Singer DM-105A series or EMCO 3221 calibrated dipoles or EMCO 3115 DRG horn.

For each spurious emission identified between 30 to 2000 MHz, the test sample was rotated for maximum pickup, the test antenna varied in elevation, and the test antenna polarization shifted between horizontal to vertical in order to maximize observed signals.

E. REPORT OF RADIATED EMISSIONS

Table 1 lists the frequency and amplitude of all signals observed from 30 to 2000 MHz that were within 20 dB of the limits of paragraph 15.109 of the FCC Rules for lower, mid and upper operating channels.

TABLE 1

RADIATED SPURIOUS EMISSIONS
Measured at 3 meters
PART 15(B) PARA. 15.109

Frequency To Which Tuned (MHz)	Frequency of Emission (MHz)	Meter Reading (dBm)	Antenna Factor (dB)	Field[1] Intensity uV/m @ 3m	FCC Limit uV/m @ 3m	dB to Limit
655.500	595.500	-96.0	28.0	89	200	-7.0
672.000	612.000	-97.2	28.2	79	200	-8.0
680.000	620.000	-97.2	28.4	81	200	-7.8

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

$dBu = dBm + \text{antenna factor} + 107$

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

F. PROCEDURE - AC LINE CONDUCTED SPURIOUS

The procedures of ANSI 63.4 (1992) were followed.

Power line conducted spurious were measured from .45 to 30 MHz using an IEEE 213 line impedance stabilization network, (LISN), modified for 50 uH network per Paragraph 5.3, of 15.840, Appendix A.

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

An Advantest R3361A spectrum analyzer was used as the detector.

Measurements were made with a 9 kHz bandwidth; quasi-peak (CISPR) detector values are shown. A 120 second scan time was used.

G. DATA - AC LINE CONDUCTED SPURIOUS

Plots of the spectrum analyzer display are shown in Figures 1a and 1b for both operating channels.

All ac-line conducted spurious were within the 48 dBu requirement of Para. 15.107.

Horizontal axis is .45 to 30 MHz centered at 15.22 MHz;

vertical axis is 10 db/div with the top of the screen representing 60 dBu.

(For the 50 ohm system used, the 250 microvolt FCC limit is equivalent to 48 dBu as shown by the green line.)

H. STATEMENT

Technical test data are from tests performed by me or under my supervision. My qualifications are a matter of record with the Federal Communications Commission. I personally attest to the accuracy of the test data submitted as a part of this engineering statement.

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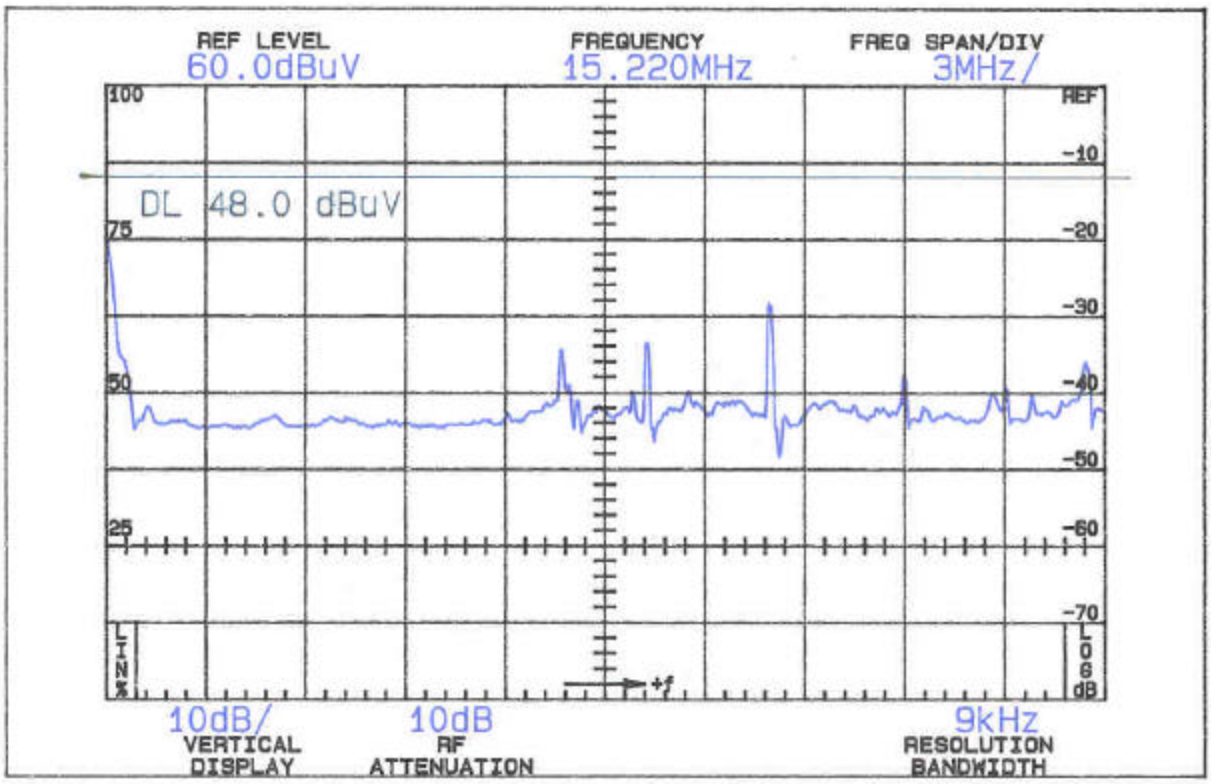
Rowland S. Johnson

Dated: July 9, 2002

FIGURE 1a

AC LINE CONDUCTED SPURIOUS

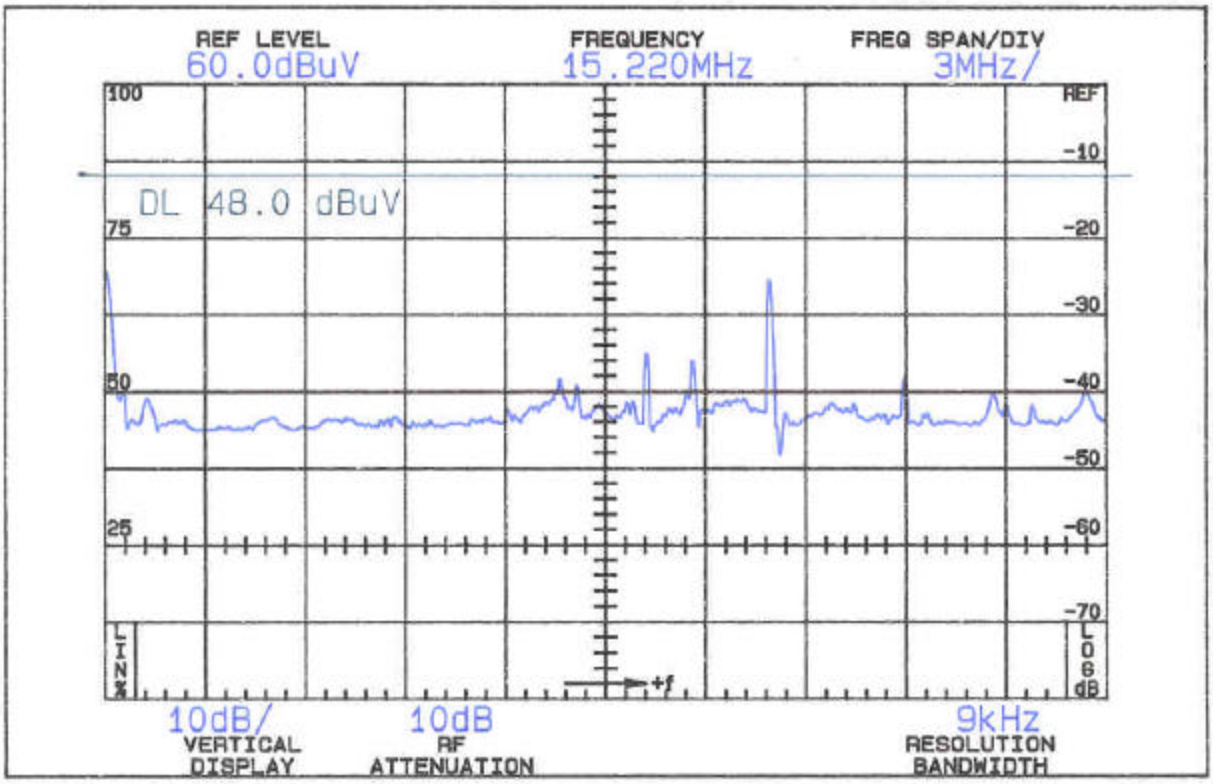


AC LINE CONDUCTED SPURIOUS
FCC ID: JFZR310D

FIGURE 1a (Left LISN)

FIGURE 1b

AC LINE CONDUCTED SPURIOUS



AC LINE CONDUCTED SPURIOUS
FCC ID: JFZR310D

FIGURE 1b (Right LISN)