ENGINEERING STATEMENT IN REGARD TO

MEASUREMENTS OF TRANSMITTER SPURIOUS EMISSION

SECURICOR WIRELESS
FCC ID: O6E710150B
MODEL 71-0150B

1.0 Introduction

Hyak Laboratories, Inc. has been authorized by Securicor Wireless to perform measurements on the 71-0150B transmitter to determine spurious emissions compliance with FCC Rules, Paragraph 2.993(a)(b,1).

The Model 71-0150B, a VHF base station/repeater, is electrically similar to the Model 71-0150C, FCC ID: O6E710150C, but covers the 35 to 42 MHz range.

2.0 RF_Power_Output_(Paragraph_2.985)

Conducted RF power output was measured with a Bird Model 4421 RF power meter and a Bird 8325 50 ohm power attenuator as a dummy load.

TABLE 1
RF Power Output vs Supply Voltage

Supply, Volts	Power, Watts	
	L	H
13.8	25	60

3.0 Occupied_Bandwidth_(Paragraphs_2.989(c)_and_90.209(c))

Figures 1a and 1b show plots of the sideband envelope of the transmitter operating at 25 or 60 watts respectively taken with a HP 7550 Plotter from the display unit of a Tektronix 494P spectrum analyzer.

3.0 Occupied Bandwidth (Paragraphs 2.989(c), 90.209(c)),

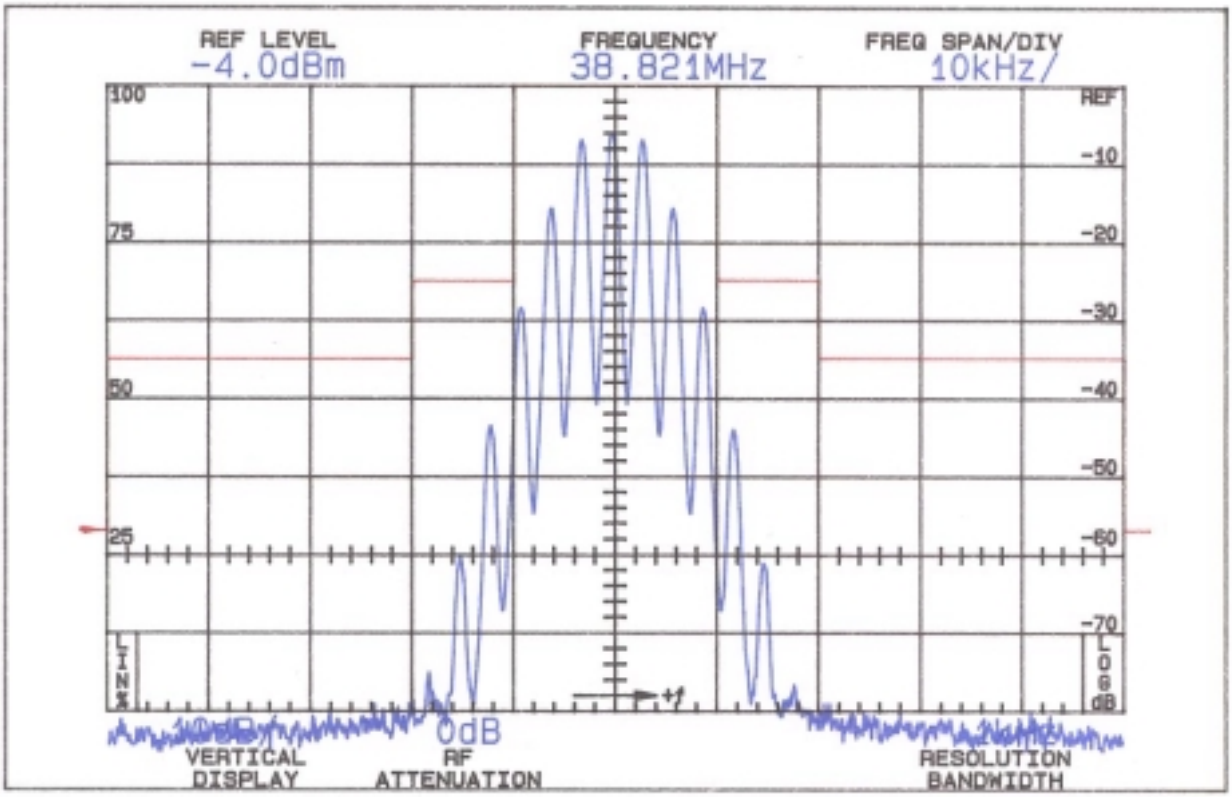
and 90.210 (Continued)

Modulation corresponded to conditions of Paragraph 2.989(c)(1) and consisted of a 2500 Hz tone at an input level 16 dB greater than that necessary to produce 50% modulation at 2957 Hz, the frequency of maximum response.

The plots are within the limits imposed by Paragraph 90.209(c) for frequency modulation. The horizontal scale (frequency) is 10 kHz per division and the vertical scale (amplitude) is a logarithmic presentation equal to 10 dB per division.

FIGURE 1a

OCCUPIED BANDWIDTH



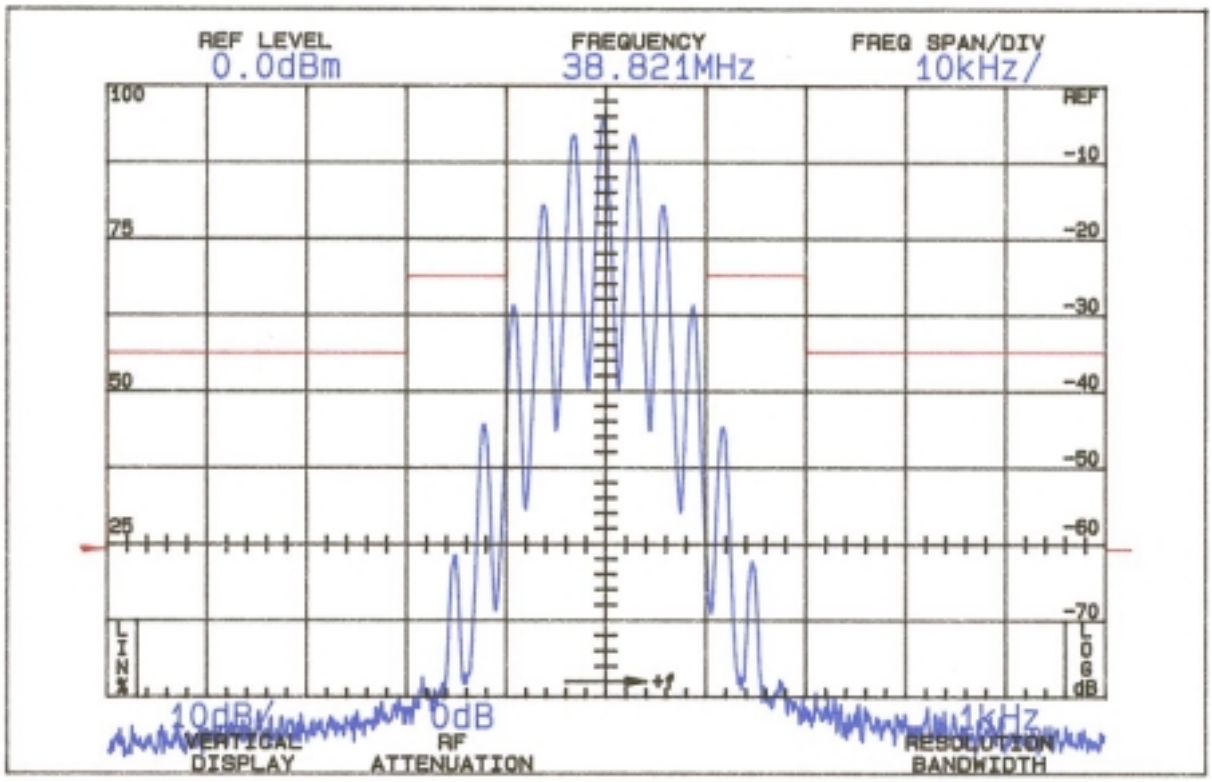
	REQUIRED ATTENUATION IN dB BELOW MEAN POWER OUTPUT Required
On any frequency more than 50%, up to and including 100% of the authorized bandwidth, 20 kHz (10 - 20 kHz)	25
On any frequency more than 100% up to and including 250% of the authorized bandwidth (20 - 50 kHz)	35
On any frequency removed from the assigned frequency by more than 250% of the authorized bandwidth (over 50 kHz)	43+10 LogP = 57 (P = 25W)

Occupied Bandwidth (25W)
FCC ID: O6E710150B

FIGURE 1a

FIGURE 1b

OCCUPIED BANDWIDTH



	REQUIRED ATTENUATION IN dB BELOW MEAN POWER OUTPUT Required
On any frequency more than 50%, up to and including 100% of the authorized bandwidth, 20 kHz (10 - 20 kHz)	25
On any frequency more than 100% up to and including 250% of the authorized bandwidth (20 - 50 kHz)	35
On any frequency removed from the assigned frequency by more than 250% of the authorized bandwidth (over 50 kHz)	43+10 LogP = 61 (P = 60W)

Occupied Bandwidth (60W)
FCC ID: O6E710150B

FIGURE 1b

4.0 Spurious_Emissions_at_the_Antenna_Terminals

Paragraph 2.991 of the Rules)

The 71-0150B transmitter was tested for spurious emissions at the antenna terminals while the equipment was modulated with a 2500 Hz signal, 16 dB above minimum input signal for 50% (2.5 kHz deviation) modulation at 2957 Hz, the frequency of highest sensitivity.

Measurements were made with a Tektronix 494P spectrum analyzer coupled to the transmitter output terminal through a Bird 8325 50 ohm power attenuator.

During the tests, the transmitter was terminated in the Narda attenuator; carrier was notched. Power was monitored on a Bird 4421 RF power meter; dc supply was 13.8 throughout the tests.

Spurious emissions were measured throughout the RF spectrum from 6 (Lowest frequency generated in the transmitter is 12.8 MHz) to 390 MHz. Any emissions that were between the required attenuation and the noise floor of the spectrum analyzer were recorded. Data are shown in Table 2, following.

TABLE 2

TRANSMITTER CONDUCTED SPURIOUS
38.821 MHz, 13.8 Vdc

Frequency, MHz		dB Below Carrier_Reference L 25W	H 60W
77.642		96	93
116.463		96	93
155.284		>100	>100
194.105		>100	>100
232.926		>100	>100
271.747		>100	>100
310.568		>100	>100
349.389		>100	>100
388.210		>100	>100
Required:	43+10 Log(P)	57	61

All other spurious were 20 dB or more below FCC limit from 12.8 MHz to the 10th harmonic.

Carrier attenuated with notch filter.

5.0 Description_of_Measurement_Facilities

A description of the Hyak Laboratories' radiation test facility is a matter of record with the FCC. The facility is currently listed as an acceptable site.

6.0 Field_Strength_Measurements_of_Spurious_Radiation (Paragraph 2.993(a)(b,2) of the Rules)

Field intensity measurements of radiated spurious emissions were made with a Tektronix 494P spectrum analyzer using Singer DM-105A or Emco 8221 calibrated test antennae for the measurements to l GHz. The transmitter and attached antenna were located in an open field 3 meters from the test antenna. Supply voltage was a power supply with a terminal voltage under load of 13.8 Vdc. Conducted output power was 60 watts at the 38.821 MHz operating frequency. The transmitter and test antennae were arranged to maximize pickup. Both vertical and horizontal test antenna polarization were employed.

Reference level for the spurious radiation was taken as an ideal dipole excited by 60 watts, based on antenna substitution. Emissions less than 20 dB below the 60 watts reference were determined by substituting signal source and antenna.

Measurements were made from the lowest frequency generated within the unit, 12.8 MHz, to 10 times operating frequency. Data are shown in Table 3.

TABLE 3
TRANSMITTER CABINET RADIATED SPURIOUS
38.821 MHz, 13.8 Vdc, 60 watts

Frequency MHz	dB Below Carrier Reference[1]
77.642	>81
116.463	>81
155.284	>81
194.105	>81
232.926	>81
271.747	>81
310.568	>81
349.389	>81
388.210	>81
427.031	>81
Required: 43+10 Log(60)	61

All other spurious from 12.8 MHz to the tenth harmonic were 20 dB or more below FCC limit.

7.0 Statement

Technical test data herein 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: December 12, 2000