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APPLICANT: SEKAKU ELECTRON IND. CO., LTD.

FCC ID: H38WT-201

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GENERAL_INFORMATION_REQUIRED
FOR_TYPE_ACCEPTANCE

2.983 (a,b,c) SEKAKU ELECTRON IND. CO., LTD. will manufacture the H38WT-201 in quantity, for use under FCC RULES PART 74.801, LOW POWER AUXILIARY STATIONS.

2.983 (d) TECHNICAL_DESCRIPTION

(1) Type of Emission: 160K0F3E

Bn = 2M + 2DK

M = 1000

D = 68.0KHz (Peak Deviation)

K = 1

Bn = 2(1K) + 2(68.0K)(1) = 2K +136.0K = 138.0KHz

M = 15,000

D = 65KHz

K = 1

Bn = 2(15K) + 2(65K) = 30 +130 = 160KHz

74.861(e)(5) ALLOWED AUTHORIZED BANDWIDTH = 200KHz.

(2) Frequency Range: Part 74: 161.625-161.775MHz &
174-216MHz

TEST FREQ = 214.84MHz.

(3) Power Range and Controls: UNIT has no power controls.

(4) Maximum Output Power Rating: 1.0 MilliWatts ERP.

(5) DC Voltages and Current into Final Amplifier:

FINAL AMPLIFIER ONLY

1.5V BATTERY

Vce = 3.4 Volts

Ice = 8.0mA.

(6) Function of each electron tube or semiconductor device or other active circuit device:

IC1	LM358N	AUDIO PREAMPLIFIER & LIMITER
IC2	DS2101D	Compressor
TR1	STRS501	Buffer
TR2	2SC241	Multiplier
TR3	RB400D	Multiplier
TR4	XC6373A350PR	Regulator
TR5	XC6373A350PR	POWER AMPLIFIER
TR6	2SC2412K	Regulator
TR7		
TR8	2SC2412K	Buffer
TR9	2SC2412K	Tone Oscillator
TR10	2SC2412K	Buffer

2.983(d) (7) Complete Circuit Diagrams: The circuit diagram is included as EXHIBIT 5A-5B. The block diagram is included as EXHIBIT 4. The part list is included EXHIBIT 6A-6G.

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- 2.983(d) (8) Instruction book. The instruction manual is included as EXHIBIT 7A-7E in this report.
- (9) Tune-up procedure. The tune-up procedure is given in page NA.
- (10) Description of all circuitry and devices provided for determining and stabilizing frequency.

The transmitter frequency is controlled by a crystal, the crystal specifications are included in PAGE 13A-13B.

- (11) Description of any circuits or devices employed for suppression of spurious radiation, for limiting modulation, and for limiting power. There are no devices or circuitry to limit the power, since this is a low power device. The interstage coupling between TR1, TR2, TR3, TR4, and TR6 as well as the low pass filter made up of L2, VC1, C26, L3, VC2, C28, L4, L6, VC3, & C29 suppress the harmonics.

Limiting Modulation:

The transmitter audio circuitry is contained in IC2. The modulation limiting is also provided by IC1B.

Limiting Power:

There is no provision for limiting power.

- (12) Digital modulation. This unit does not use digital modulation.

2.983(e) The data required by 2.985 through 2.997 is submitted below.

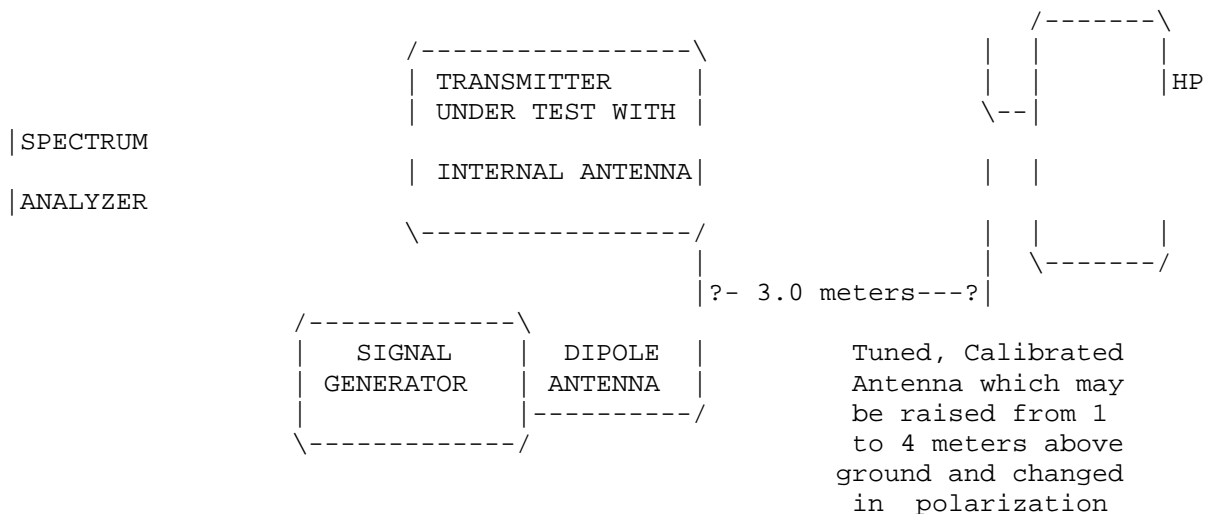
2.985(a) RF_power_output.

ERP was measured by the method described later in this report. The input power to the final stage was measured with a 1.5V supply connected in place of the 1.5V battery.

INPUT POWER: FOR 1.5 V OPERATION
(3.4V)(0.008A) = 27.2milliWatts

OUTPUT POWER: FOR 1.5 V OPERATION
1.0 mWATTS ERP

R.F. POWER OUTPUT

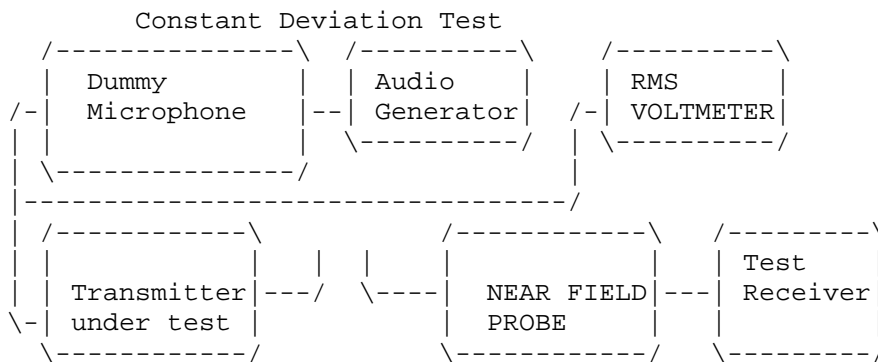


Equipment placed 1 meter above ground on a rotatable platform. The center of the Dipole antenna at the center of the platform and the output of the signal generator adjusted to produce the same meter reading as measured for the fundamental in the radiated emissions test.

2.987(a)(b) Modulation_characteristics:

AUDIO_FREQUENCY_RESPONSE

The audio frequency response was measured in accordance with TIA/EIA Specification 603 S2.2.6.2.1. with the following exceptions;



1. The test receiver audio bandwidth was <50Hz to >20,000Hz.
2. Apply a 1000Hz tone and adjust the audio generator to produce 10% of the rated system deviation.
3. Measure frequency response over the frequency range from 100Hz to 20,000Hz.

The audio frequency response curve is shown in Exhibit 8.

AUDIO_LOW_PASS_FILTER

The audio low pass filter is not required in this unit.

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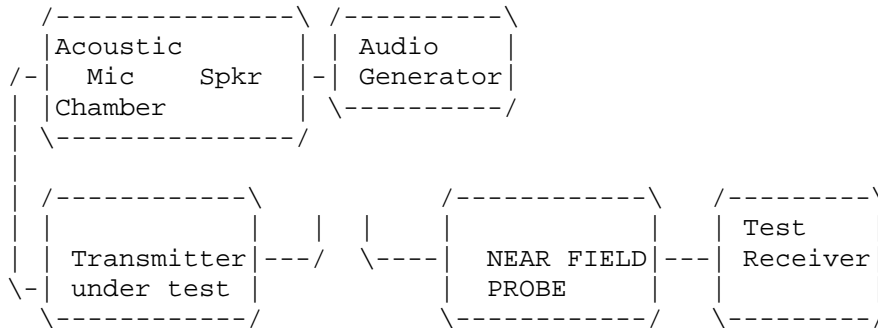
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2.989(c) Occupied_bandwidth: Using TIA/EIA 2.2.10 aAcoustic Microphone Sensitivity test procedure to determine if the UUT could be put into modulation limiting and limiting could not be reached, the maximum deviation was only +40KHz. Using this test procedure the frequency of maximum sensitivity was determined to be 500Hz.

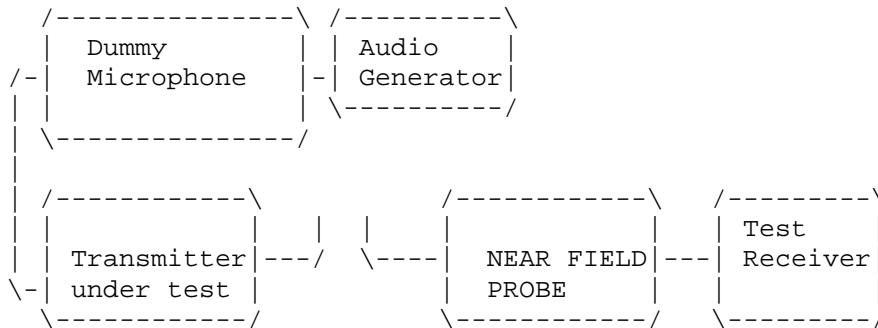
a.

Test procedure diagram
OCCUPIED BANDWIDTH MEASUREMENT



b. Since the UUT could not be put into modulation limiting with an acoustic coupling a dummy microphone was used to connect to the UUT and a test procedure similar to TIA/EIA-603 S2.2.11 was used to measure the occupied bandwidth. Plots were made of the frequency of maximum sensitivity, at 10KHz and at the highest frequency for the UUT. Data in the plots show that all sidebands beyond the authorized bandwidth are less than 0.5% of the unmodulated carrier. The plot show the transmitter modulated with 10,000 Hz(the highest modulation frequency), adjusted for 50% modulation plus 16 dB. The spectrum analyzer was set with the unmodulated carrier at the top of the screen. The test procedure diagram and occupied bandwidth plots follow.

Test procedure diagram
OCCUPIED BANDWIDTH MEASUREMENT



REQUIREMENT: PART 74: 200kHz EMISSION BANDWIDTH.

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2.993(a)(b) Field_strength_of_spurious_emissions:

NAME OF TEST: RADIATED SPURIOUS EMISSIONS

REQUIREMENTS: Emissions must be $43 + 10\log(P_o)$ dB below the mean power output of the transmitter.

$$43 + 10 \log(0.001) = 43 - 10.0 = 30 \text{ dB}$$

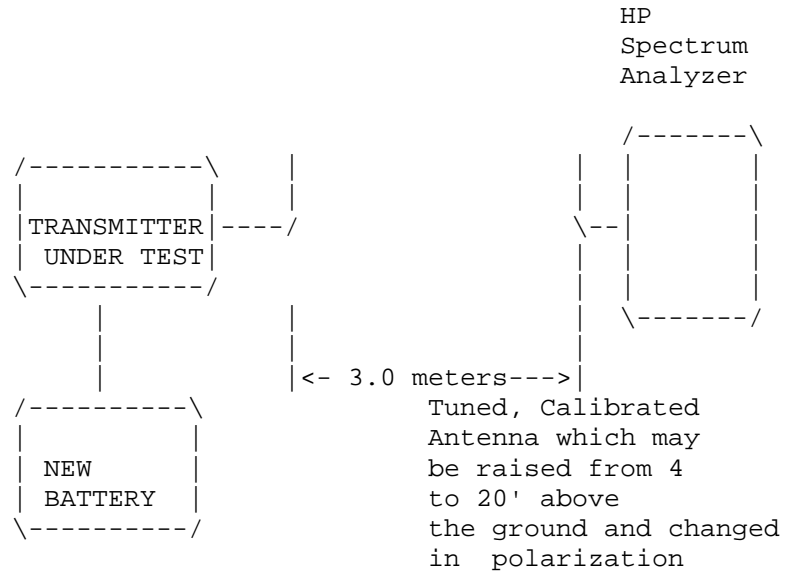
TEST DATA:

EMISSION FREQUENCY MHz	METER READING @ 3m dBuV	COAX LOSS dB	ACF dB	FIELD STRENGTH dBuV/m	ATT. LEVEL dB	MARGIN dB	ANT.
214.84	82.70	1.20	12.35	96.25	0.0	0.0	V
429.68	12.00	1.60	17.68	31.28	64.97	34.97	V
644.50	2.50	1.60	21.08	25.18	71.07	41.07	V
1074.18R	2.70	1.00	24.30	28.00	68.25	38.25	V
1933.54	3.30	1.02	27.73	32.05	64.20	34.20	V

METHOD OF MEASUREMENT: The procedure used was C63.4-1992 operated into its own built-in antenna at a height of 1.5 meters above the ground plane. The spectrum was scanned from 30 to at least the tenth harmonic of the fundamental using a HP model 8566B spectrum analyzer, an Eaton model 94455-1 Biconical Antenna, ElectroMetrics antennas models TDA, TDS-25-1, TDS-25-2 RGA 180. Measurements were made at the open field test site of TIMCO ENGINEERING INC. located at 6051 N.W. 19th LANE, GAINESVILLE, FL. 32605.

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Method of Measuring Radiated Spurious Emissions



Equipment placed 4' above ground on a rotatable platform.

- 2.983(f) Photo_or_Drawing_of_Label:
See Exhibit 2.
- 2.983(g) Photos_of_Equipment:
See Exhibit 3A-3F.
- 2.997 Frequency Spectrum Investigated The Spectrum was investigated from 0.400 to at least the tenth harmonic of the fundamental.
- 2.999 Measurement_Procedures_for_Type_Acceptance:

Measurement techniques have been in accordance with EIA specifications and the FCC requirements.
- 2.909 Certification_of_Technical_Data_by_Engineers

We, the undersigned, certify that the enclosed measurements and enclosed data are true and correct.

S.S. SANDERS
S.S. Sanders
Engineer

TEST EQUIPMENT LIST

1. Spectrum Analyzer: Hewlett Packard 8566B - Opt 462, w/ preselector 85685A, & Quasi-Peak Adapter HP 85650A, & HP 8449B - OPT H02 Cal. 6/26/98
2. Signal Generator, Hewlett Packard 8640B, cal. 10/1/98
3. Eaton Biconnical Antenna Model 94455-1
20-200 MHz Serial No. 0997 Cal. 5/15/98
4. Electro-Metric Dipole Kit, 20-1000 MHz, Model TDA-30 10/15/98
5. Electro-Metric Horn 1-18 GHz, Model RGA-180, Cal. 8/15/98
6. Electro-Metric Antennas Model TDA-30/1-4, Cal. 10/15/98
7. Electro-Metric Line Impedance Stabilization Network Model No. EM-7821, Serial No. 101; 100KHz-30MHz 50uH. Cal. 11/19/98
8. Electro-Metric Line Impedance Stabilization Network Model No. EM-7820, Serial No. 2682; 10KHz-30MHz 50uH. Cal. 11/19/98
9. Special low loss cable was used above 1 GHz
10. Tenney Temperature Chamber

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