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APPLICANT: MIDIAN ELECTRONICS INC.

FCC ID: NOWSPVD-2

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GENERAL_INFORMATION_REQUIRED FOR_TYPE_ACCEPTANCE

2.1033 (c)(1)(2) MIDIAN ELECTRONICS INC. will sell the FCC ID: NOWSPVD-2 VHF transceiver in quantity, for use under FCC RULES PART 90.

(3) Instruction book. The instruction manual is included as EXHIBIT 6A-6C.

2.1033 (c) TECHNICAL DESCRIPTION

2.1033 (4) Type of Emission: 7K3F2D For 25 kHz
7K3F2D For 12.5 kHz
For 25kHz and 12 kHz
90.209(b)(5) Bn = 2M + 2DK
M = 4,000 Bits per second
D = 1.65KHz (Peak Deviation)
K = 1
Bn = 2(4000/2) + 2(1.65K)(1) = 4.0K + 3.3K = 7.3K

ALLOWED AUTHORIZED BANDWIDTH = 20.0 kHz

FOR 12.5Khz
ALLOWED AUTHORIZED BANDWIDTH = 11.25 kHZ

2.1033 (5) Frequency Range: 30-50 MHz

(6) Power Range and Controls:There are NO user Power controls.

(7) Maximum Output Power Rating:
0.1 Watts ,
into a 50 ohm resistive load.

(8) DC Voltages and Current into Final Amplifier:

DC POWER INPUT
FINAL AMPLIFIER ONLY
Vce = 7.8 Volts
Ic = .55 A

(9) Tune-up procedure. The tune-up procedure is given in EXHIBIT 6A-6C.

2.1033 (10) Complete Circuit Diagrams: The circuit diagram is included as EXHIBIT 3. The block diagram is included as EXHIBIT 4.

2.1033(c)(10) Description of all circuitry and devices provided for determining and stabilizing frequency is included in the circuit description in EXHIBIT 5.

2.1033(c)(11) A photograph or drawing of the equipment identification label is shown in Exhibit 1.

2.1033(c)(12) Photographs of the equipment of sufficient clarity to reveal equipment construction and layout and label location are shown in Exhibit 7-11.

2.1033(c)(13) For equipment employing digital modulation, a detail description of the modulation technique. This UUT uses FSK to modulate the transmitter.

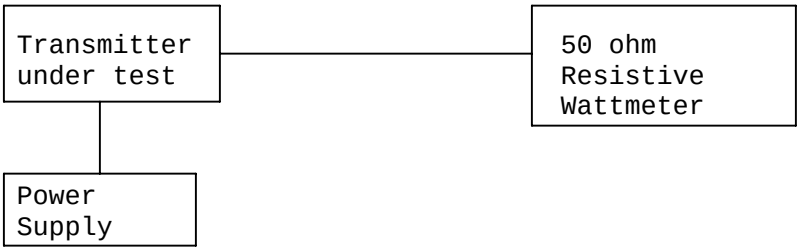
2.1033(c)(14) data required for 2.1046 to 2.1057 See Below

2.1046(a) RF_power_output.
RF power is measured by connecting a 50 ohm, resistive wattmeter to the RF output connector. With a nominal battery voltage of 7.8 VDC, and the transmitter properly adjusted the RF output measures :

POWER MEASUREMENTS:
INPUT POWER – HIGH: (7.8V)(0.550A) = 4.29 Watts
INPUT POWER – LOW: (7.8V)(0.2A) = 1.56 Watts

OUTPUT POWER: HIGH: .10 Watts
LOW: .038 Watts

METHOD OF MEASURING RF POWER OUTPUT



2.1047(a) Voice Modulation_characteristics:
NOT APPLICABLE, F2 type of emission.

2.1049 Audio Low Pass Filter
This UUT does not have a low pass filter.

2.1049 Occupied_bandwidth:
90.210(c,) (Emission Mack C)
For transmitters that are not equipped with an audio low pass filter pursuant to S90.211(b), the power of any emission must be attenuated below the unmodulated carrier output power as follows; (1) On any frequency removed from the center of the authorized bandwidth by a displacement frequency(fd in kHz) of more than 5kHz but not more Than10 kHz: At least 83 log(fd/5)dB; (2)ON any frequency removed from the center of the authorized bandwidth by a displacement frequency(fd in kHz) of more than 10kHz, but not more than 250% of the authorized bandwidth: At least 29 log(fd2/11)dB or 50dB, whichever is the lesser attenuation; (3) On any frequency removed from the center of the authorized bandwidth by more than 250% of the authorized bandwidth: At least 43+10 log(Po)dB.

90.210(d) Emission Mask D - 12.5 kHz channel bandwidth equipment. For transmitters designed to operate with a 12.5 kHz channel bandwidth, any emission must be attenuated below the power (P) of the highest emission contained within the authorized bandwidth as follows:

(1) On any frequency from the center of the authorized bandwidth f0 to 5.625 kHz removed from f0: Zero dB.

(2) On any frequency from the center of the authorized bandwdith by a displacement frequency (fd in kHz) of more than 5.625 kHz but no more than 12.5 kHz: At least 7.27 (fd - 2.88 kHz) dB.

(3) On any frequency removed from the center of the authroized bandwidth by a displacement frequency (fd in kHz) of more than 12.5 kHz: At least 50 + 10 log (P) dB or 70 dB, whichever is the lesser attenuation.

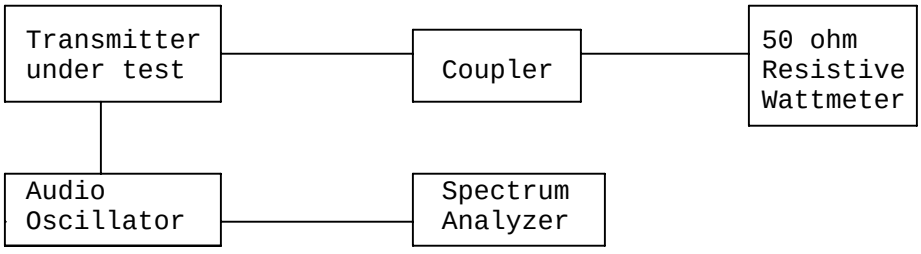
Data in the plots shows that on any frequency removed from the assigned frequency by more than 50%, but not more than 100%: At least 25dB. On any frequency removed from the assigned frequency by more than 100%, but not more than 250%: At least 35dB. On any frequency removed from the assigned frequency by more than 250%, of the authorized bandwidth: At least 43+log(P)dB.

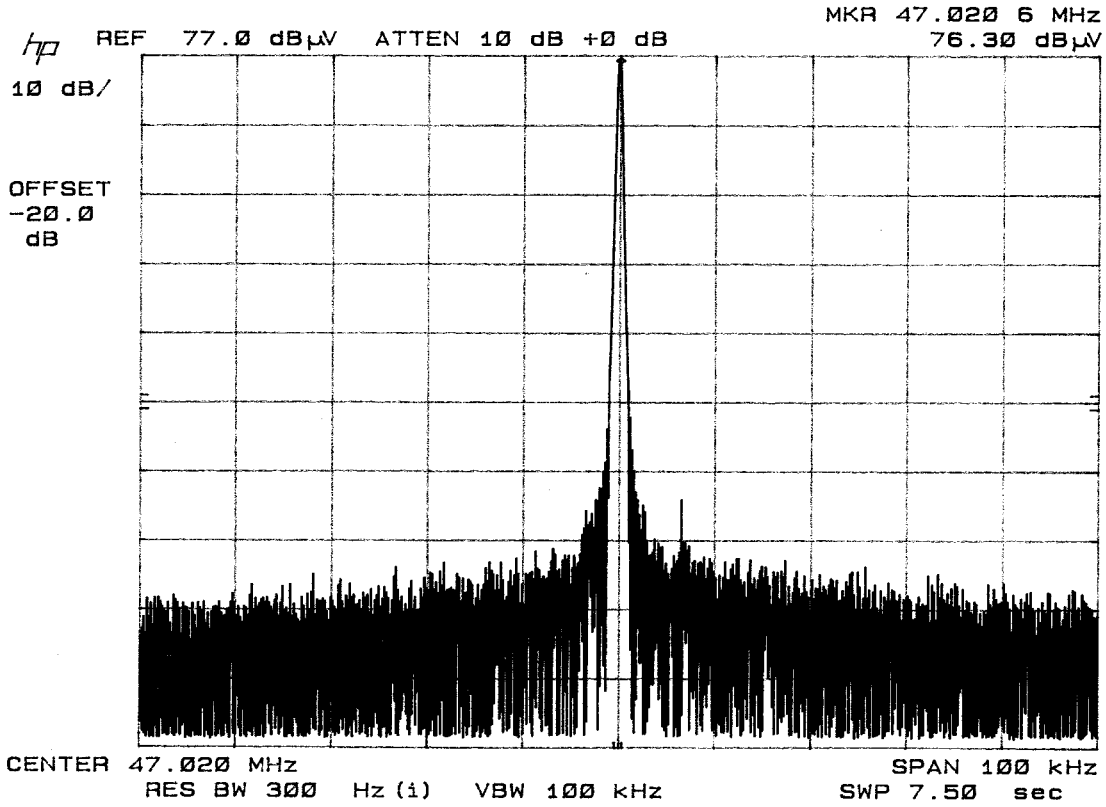
Radiotelephone transmitter with modulation limiter.

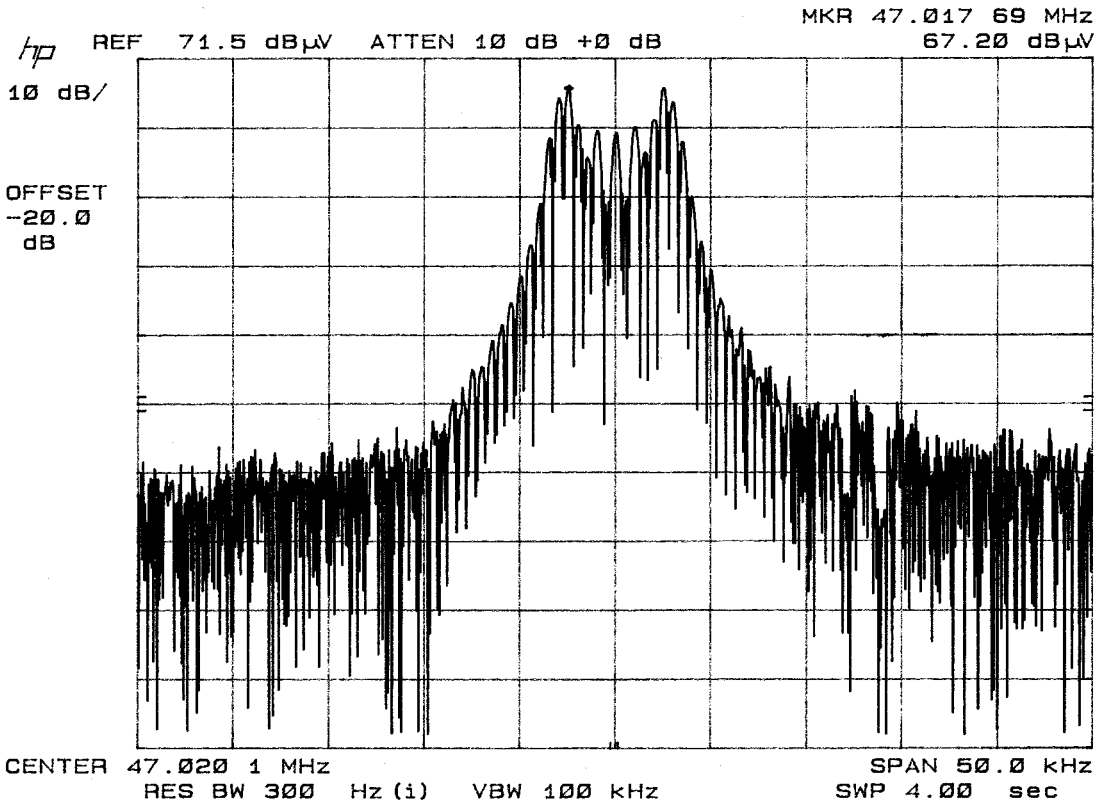
Test procedure: TIA/EIA-603 para 2.2.11 , with the exception that various tones were used.

Test procedure diagram

OCCUPIED BANDWIDTH MEASUREMENT




MKR 47.020 6 MHz
REF 77.0 dBµV ATTEN 10 dB +0 dB
76.30 dBµV
10 dB/
OFFSET
-20.0
dB
CENTER 47.020 MHz
SPAN 100 kHz
RES BW 300 Hz (i) VBW 100 kHz
SWP 7.50 sec


MKR 47.017 69 MHz
REF 71.5 dBµV ATTEN 10 dB +0 dB
67.20 dBµV
10 dB/
OFFSET
-20.0
dB
CENTER 47.020 1 MHz
SPAN 50.0 kHz
RES BW 300 Hz (i) VBW 100 kHz
SWP 4.00 sec

2.1051 Spurious emissions at antenna terminals(conducted):

2.1052 Data on the following page shows the level of conducted spurious responses. The carrier was modulated 100% using a 2500Hz tone. The spectrum was scanned from 0.4 to at least the 10th harmonic of the fundamental. The measurements were made in accordance with standard TIA/EIA-603.

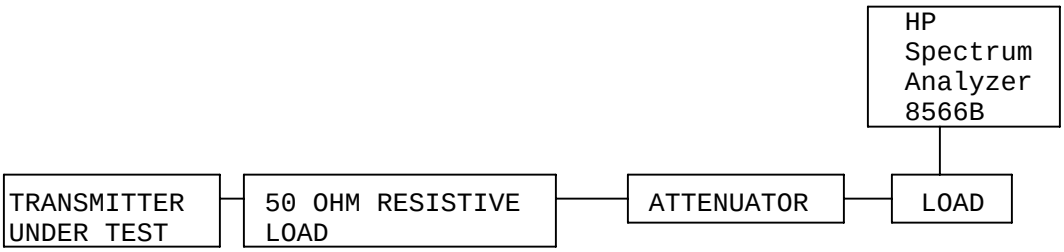
Method of Measuring Conducted Spurious Emissions (conducted)

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

For 25 kHz 43 + 10log(0.1) = 43-10.0 = 33.0dB

EMISSION FREQUENCY MHz	DB BELOW CARRIER
47.00	00.0
94.00	52.9
141.00	39.4
188.00	45.2
235.10	53.9
282.10	64.4
329.10	79.3
376.10	78.8
423.10	82.6
470.20	79.7

Method of Measuring Conducted Spurious Emissions



METHOD OF MEASUREMENT: The procedure used was TIA/EIA-603 STANDARD without any exceptions. An audio generator was connected to the UUT through a dummy microphone circuit and the output of the transmitter connected to a standard load and from the standard load through a pre-selector filter of the spectrum analyzer. The spectrum was scanned from 400KHz to at least the tenth harmonic of the fundamental using a HP model 8566B spectrum analyzer. The measurements were made using the shielded room located at TIMCO ENGINEERING INC. 849 N.W. State Road 45, Newberry, Florida 32669.

2.1053 Field strength of spurious emissions:
90.210(c)(3)
NAME OF TEST: RADIATED SPURIOUS EMISSIONS

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

43 + 10log(0.10) = 33.0 dB
43 + 10log(0.038) = 28.8 dB

TEST DATA:

Low Power

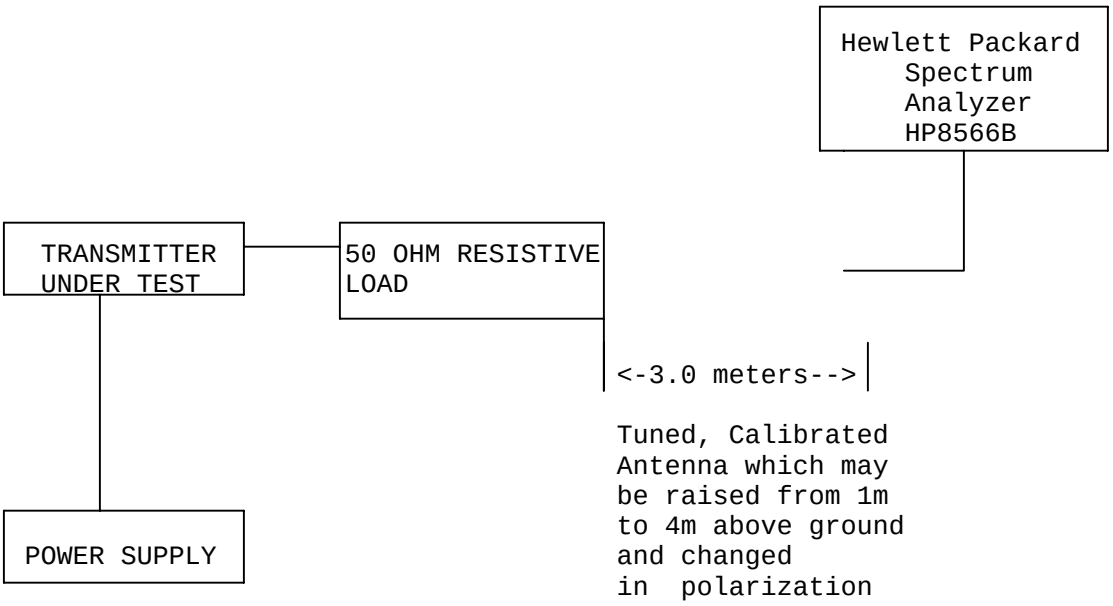
Emission Frequency MHz	Attenuation dBc	Margin dB
47.10	0.0	0.0
94.00	37.08	8.28
141.00	37.80	9.00
188.00	49.71	20.91
235.00	31.50	2.70
282.00	50.56	21.76
329.10	43.13	14.33
376.10	51.88	23.08
423.10	51.97	23.17
470.20	56.94	28.14

High Power

Emission Frequency MHz	Attenuation dBc	Margin dB
47.20	0.0	0.0
94.0	36.48	3.48
141.00	36.90	3.90
188.00	47.81	14.81
235.00	37.60	4.60
282.10	52.16	19.16
329.10	43.03	10.03
376.10	51.82	18.82
423.10	51.77	18.77
470.20	52.10	19.10

METHOD OF MEASUREMENT: The tabulated Data shows the results of the radiated field strength emissions and attenuation calculated per TIA/EIA 603. The spectrum was scanned from 30 MHz to at least the Tenth harmonic of the fundamental. This test was conducted per TIA/EIA 603. Measurements were made at the open field test site of TIMCO ENGINEERING, INC. located at 849 N.W. STATE ROAD 45, NEWBERRY, FLA. 32669.

Method of Measuring Radiated Spurious Emissions



Equipment placed 80 cm above ground
on a rotatable platform.

2.1055 Frequency stability:
90.213(a)(1)

Temperature and voltage tests were performed. The test was conducted as follows:

The transmitter was placed in the temperature chamber at 25 degrees C and allowed to stabilize for one hour. The transmitter was keyed ON for one minute during which four frequency readings were recorded at 15 second intervals. The worse case number was taken for temperature plotting. The assigned channel frequency was considered to be the reference frequency. The temperature was then reduced to -30 degrees C after which the transmitter was again allowed to stabilize for one hour. The transmitter was keyed ON for one minute, and again frequency readings were noted at 15 second intervals. The worst case number was recorded for temperature plotting. This procedure was repeated in 10 degree increments up to + 50 degrees C.

Readings were also taken at 85% and 115% of the supply voltage.

MEASUREMENT DATA:

Assigned Frequency (Ref. Frequency): 47.017 226 MHz

TEMPERATURE_°C	FREQUENCY_MHz	PPM
REFERENCE_____	47.017 226	0.00
-30_____	47.018 3517	23.95
-20_____	47.018 360	23.13
-10_____	47.018 3794	24.54
0_____	47.018 152	19.71
+10_____	47.017 866	13.62
+20_____	47.017 3669	3.01
+30_____	47.016 9199	-6.50
+40_____	47.016 5128	-15.16
+50_____	47.016 0745	-24.48
-15% 11.05 End-Point VDC	47.017 2209	-0.10
+15% 14.95 End-Point VDC	47.017 2076	-0.38

RESULTS OF MEASUREMENTS: The maximum frequency variation over the temperature range was 24.54 ppm.

Measurement Procedures:

Measurement techniques have been in accordance with TIA/EIA STD 603-1992.

TEST EQUIPMENT LIST

1._X_Spectrum Analyzer: HP 8566B-Opt 462, S/N 3138A07786, w/ preselector HP 85685A, S/N 3221A01400, Quasi-Peak Adapter HP 8565OA, S/N 3303A01690 & Preamplifier HP 8449B-OPT H02, S/N 3008A00372 Cal. 8/31/01 Due 8/31/02
2._X_Biconnical Antenna: Eaton Model 94455-1, S/N 1057, Cal. 10/1/01 Due 10/1/02
3.__ Biconnical Antenna: Electro-Metrics Model BIA-25, S/N 1171 Cal. 4/26/01 Due 4/26/03
4.__ Log-Periodic Antenna: Electro-Metrics Model EM-6950, S/N 632 Char. 3/15/00 Due 3/15/01
5._X_Log-Periodic Antenna: Electro-Metrics Model LPA-30, S/N 409 Char. 3/15/00 Due 3/15/01
6.__ Double-Ridged Horn Antenna: Electro-Metrics Model RGA-180, 1-18 GHz, S/N 2319 Cal. 4/27/99 Due 4/27/00
7.__ 18-26.3GHz Systron Donner Standard Gain Horn #DBE-520-20 No Cal Required
8.__ Horn 40-60GHz: ATM Part #19-443-6R No Cal Required
9.__ Line Impedance Stabilization Network: Electro-Metrics Model EM-7820, w/NEMA Adapter S/N 2682 Cal. 3/16/01 Due 3/16/02
10._X_Temperature Chamber: Tenney Engineering Model TTRC, S/N 11717-7 Char. 1/27/01 Due 1/27/02
11._X_Frequency Counter: HP Model 5385A, S/N 3242A07460 Char. 11/20/00 Due 11/20/01
12.__ Peak Power Meter: HP Model 8900C, S/N 2131A00545 Char. 1/26/01 Due 1/26/02
13._X_Open Area Test Site #1-3meters Cal. 12/22/99
14.__ Signal Generator: HP 8640B, S/N 2308A21464 Cal. 11/15/01 Due 11/15/02
15.__ Passive Loop Antenna: EMCO Model 6512, 9KHz to 30MHz, S/N 9706-1211 Char. 6/10/00 Due 6/10/01
16.__ Dipole Antenna Kit: Electro-Metrics Model TDA-30/1-4, S/N 153 Char. 11/24/00 Due 11/24/01
17.__ AC Voltmeter: HP Model 400FL, S/N 2213A14499 Cal. 10/9/01 Due 10/09/02
18._X_Digital Multimeter: Fluke Model 77, S/N 43850817 Cal. 11/16/00 Due 11/16/01
19.__ Oscilloscope: Tektronix Model 2230, S/N 300572 Char. 2/1/01 Due 2/1/02