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APPLICANT: KP ELECTRONIC SYSTEMS LTD.

FCC ID: H78KPMT150

TEST REPORT:

EXHIBITS CONTAINING:

GENERAL INFORMATION REQUIRED
FOR TYPE ACCEPTANCE

2.1033 (c)(1)(2) KP ELECTRONIC SYSTEMS LTD. will sell the MODEL NO. H78KPMT150 VHF transceiver in quantity, for use under FCC RULES PART 22 & 90.

2.1033 (c) TECHNICAL DESCRIPTION
2.1033 (3) User Manual SEE Exhibit 9

2.1033 (4) Type of Emission: 20K0F2D For 25KHz
10K0F2D For 12.5KHz

For 25KHz
Bn = 2M + 2DK
M = 19,200 Bits per second
D = 0.4KHz (Peak Deviation)
K = 1
Bn = 2(19,200/2) + 2(0.4K)(1) = 19.2K + 0.8K = 20.0K
ALLOWED AUTHORIZED BANDWIDTH = 20.00KHz.

For 12.5KHz
Bn = 2M + 2DK
M = 9600Bits per second
D = 0.825kHz (Peak Deviation)
K = 1
Bn = 2(9.6/2)k + 2(0.825)K(1) = 9.6K + 1.65K = 11.25K
ALLOWED AUTHORIZED BANDWIDTH = 11.25KHz.
90.209(b)(5)

2.1033 (5) Frequency Range: 148-174 MHz

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

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

(8) DC Voltages and Current into Final Amplifier:

POWER INPUT
FINAL AMPLIFIER ONLY
Vce = 13.6 Volts
Ice = 0.50 A.

Pin = 6.8 Watts

(9) Tune-up procedure. The tune-up procedure is given in EXHIBIT #8.

2.1033 (10) Complete Circuit Diagrams: The circuit diagram is included as EXHIBIT 6A-6D. The block diagram is included as EXHIBIT 5.

(11) Function of each electron tube or semiconductor device or other active circuit device: -SEE EXHIBIT 6.

(8) Instruction book. The instruction manual is included as EXHIBIT #9.

(10) Description of all circuitry and devices provided for determining and stabilizing frequency is included in the circuit description in the instruction manual.

2.1033(c)(11) A photograph or drawing of the equipment identification label is shown in Exhibit 2.

2.1033(c)(12) Photographs of the equipment of sufficient clarity to reveal equipment construction and layout and label location are shown in Exhibit 4.

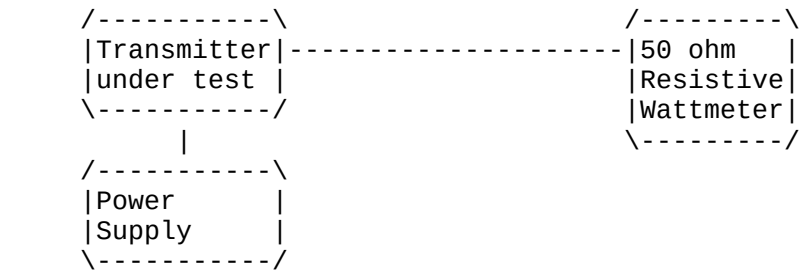
2.1033(c)(13) For equipment employing digital modulation, a detail description of the modulation technique. This UUT uses FSK to modulate the transmitter.

2.1033(c)(14)
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 13.6VDC, and the transmitter properly adjusted the RF output measures:

POWER OUTPUT
INPUT POWER: (13.5V)(0.52A) = 6.8 Watts
OUTPUT POWER: 2.1 Watts Efficiency: 30%

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,)
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 ba a displacement frequency(fd in kHz) of more than 5kHz but not more than10KHz: At least 83 log(fd/5)dB; (2)ON any frequency removed from the center of the authorized bandwidth b y 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 bandwidth 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 authorized 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.

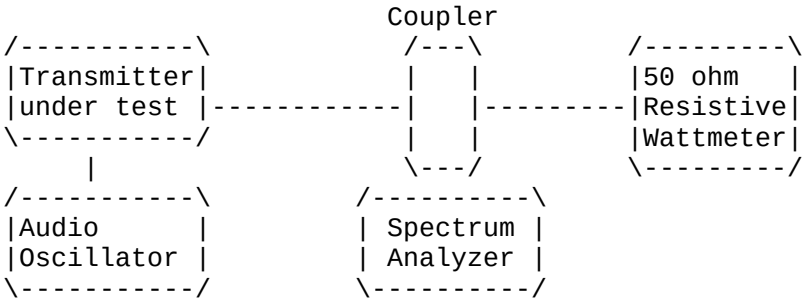
Data in the plots shows that on any frequency removed from the assigned frequency by more than 50%, but not more than 100%: At least 25dB. On any frequency removed from the assigned frequency by more than 100%, but not more than 250%: At least 35dB. On any frequency removed from the assigned frequency 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.

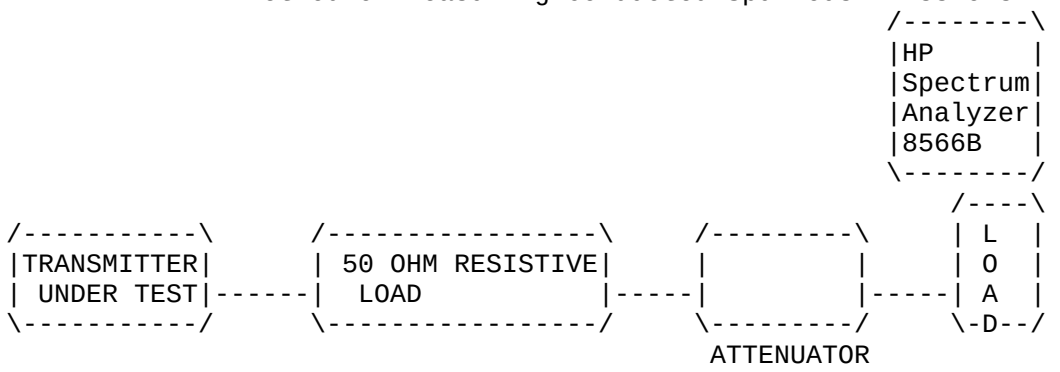
Test procedure diagram

OCCUPIED BANDWIDTH MEASUREMENT



2.1051 Spurious emissions at antenna terminals(conducted): 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



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

For 25KHz 43 + 10log(5.5) = 43+ 7.4 = 50.4dB

For 12.5KHz 50 + 10log(Po) = 50 + 6.63 = 56.63

EMISSION FREQUENCY MHz	dB BELOW CARRIER
162.50	-142.00
325.00	-69.00
487.50	-52.40
650.00	-47.80
1137.00	-41.00
1300.00	-48.80
1462.00	-31.30
1625.00	-54.00

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:

NAME OF TEST: RADIATED SPURIOUS EMISSIONS

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

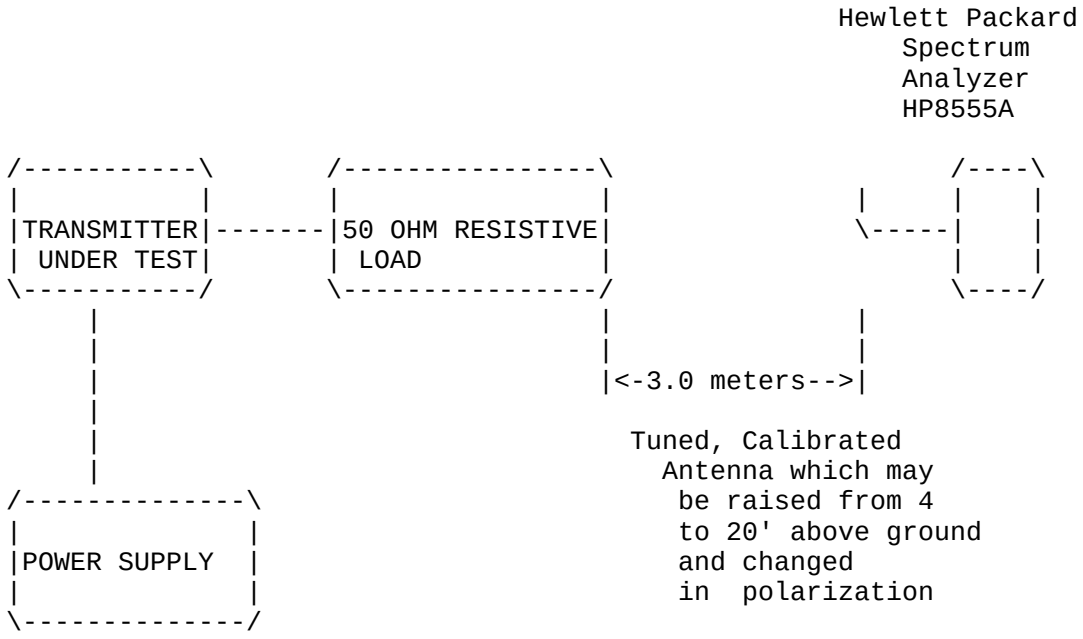
50 + 10log(2.1) = 53.2 dB

EMISSION FREQUENCY MHz	ATT. dBc	FCC LIMIT. dBc	
162.50	0.00	0.00	H
325.00	66.58	13.38	
487.00	56.60	3.4	
650.00	73.65	20.45	
812.50	73.85	20.65	
975.00	82.10	28.90	
1137.50	77.15	23.95	
1300.00	61.20	8.00	
1462.00	74.75	21.55	
1625.00	73.30	20.10	

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 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, FL 32669.

2.1053 Continued Field strength of spurious emissions:

Method of Measuring Radiated Spurious Emissions



Equipment placed 4' above ground
on a rotatable platform.

2.1055 Frequency stability:
90.213(a)(1)

Temperature and voltage tests were performed to verify that the frequency remains within the .0005%, 5.0 ppm specification limit, for 25KHz spacing & 0.0005% for 12.5KHz spacing for Mobile stations. 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 minus 25% of the battery voltage of 5.4VDC, which we estimate to be the battery endpoint.

MEASUREMENT DATA:

Assigned Frequency (Ref. Frequency): 162.500 480 MHz

TEMPERATURE C	FREQUENCY MHz	PPM
REFERENCE_____	162.500 480	00.0
-30_____	162.499 700	-04.80
-20_____	162.500 905	-02.60
-10_____	162.499 800	- 4.18
0_____	162.499 700	- 3.73
+10_____	162.501 056	+03.56
+20_____	162.501 000	+03.21
+30_____	162.500 506	+00.16
+40_____	162.500 000	+02.97
+50_____	162.499 955	+03.24

RESULTS OF MEASUREMENTS: The maximum frequency variation over the temperature range was -4.80 to + 3.56 ppm.

2.1055(a)(1) Frequency stability:
90.214 Transient Frequency Behavior

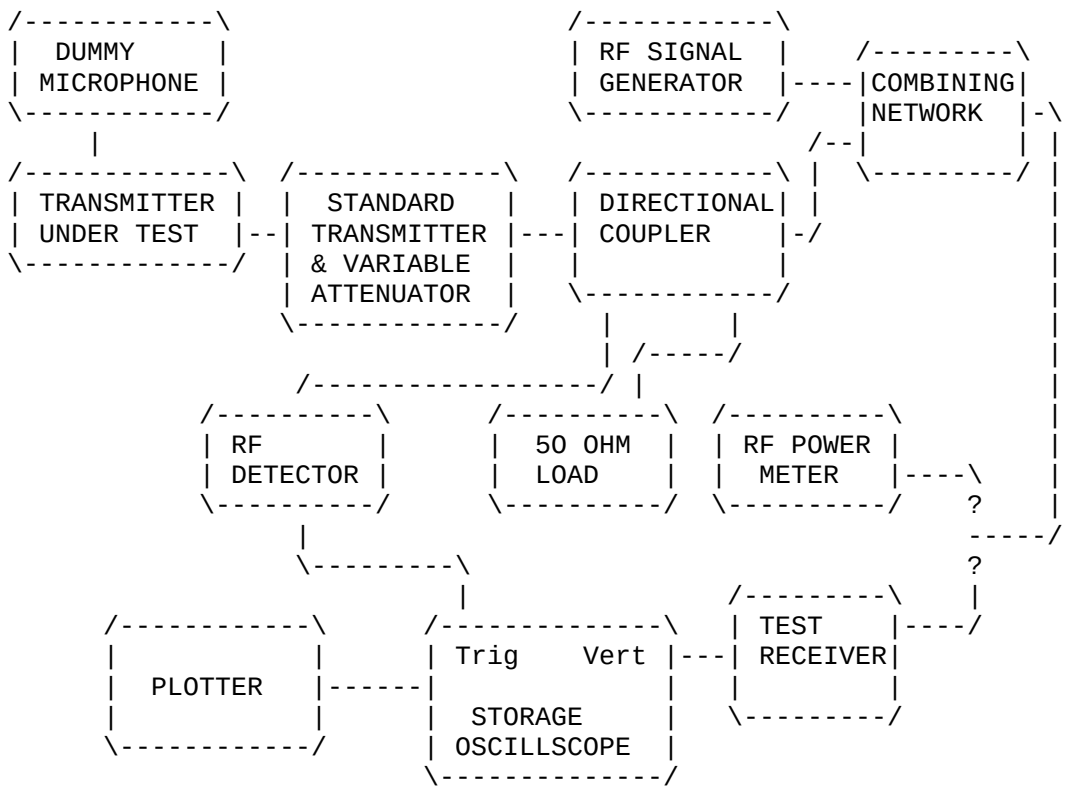
REQUIREMENTS: In the 150-174MHz frequency band, transient frequencies must be within the maximum frequency difference limits during the time interval indicated below for 12.5kHz Channels:

Time Interval	Maximum Frequency	Portable Radios 150-174Mhz
t1	+12.5kHz	5.0ms
t2	+6.25kHz	20.0ms
t3,t4	+12.5kHz	5.0mS

TEST PROCEEDURE: TIA/EIA TS603 PARA 2.2.19, the levels were set as follows;

1. Using the variable attenuator the transmitter level was set to 40dB below the test receivers maximum input level, then the transmitter was turned off.
2. With the Transmitter off the signal generator was set 20dB below the level of the transmitter in the above step, this level will be maintained with the signal generator through-out the test.
3. Reduce the attenuation between the transmitter and the RF detector by 30dB.
4. With the levels set as above the transient frequency behavior was observed & recorded.

2.1055 Frequency stability:
90.214 Transient Frequency Behavior
(Continued)



2.10Measurement Procedures for Type Acceptance:

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. 10/17/99
2._X_Signal Generator: HP 8640B, S/N 2308A21464 Cal. 9/23/99
3.___Signal Generator: HP 8614A, S/N 2015A07428 Cal. 5/29/99
4.___Passive Loop Antenna: EMCO Model 6512, 9KHz to 30MHz, S/N 9706-1211 Cal. 6/23/97
5._X_Biconnical Antenna: Eaton Model 94455-1, S/N 1057
6._X_Log-Periodic Antenna: Electro-Metrics Model EM-6950, S/N 632
7.___Dipole Antenna Kit: Electro-Metrics Model TDA-30/1-4, S/N 153 Cal. 11/24/99
8._X_Double-Ridged Horn Antenna: Electro-Metrics Model RGA-180, 1-18 GHz, S/N 2319 Cal. 4/27/99
9.___Horn 40-60GHz: ATM Part #19-443-6R
10.___Line Impedance Stabilization Network: Electro-Metrics Model ANS-25/2, S/N 2604 Cal. 11/30/99
11.___Line Impedance Stabilization Network: Electro-Metrics Model EM-7820, S/N 2682 Cal. 12/1/99
12._X_Temperature Chamber: Tenney Engineering Model TTRC, S/N 11717-7
13._X_AC Voltmeter: HP Model 400FL, S/N 2213A14499 Cal. 9/21/99
14._X_Digital Multimeter: Fluke Model 8012A, S/N 4810047 Cal 9/21/99
15.___Digital Multimeter: Fluke Model 77, S/N 43850817 Cal 9/21/99
16._X_Oscilloscope: Tektronix Model 2230, S/N 300572 Cal 9/23/99
17._X_Frequency Counter: HP Model 5385A, S/N 3242A07460 Cal 10/6/99