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APPLICANT: KP ELECTRONIC SYSTEMS LTD.
FCC ID: H78KPBSRU100

TEST REPORT:

EXHIBITS CONTAINING:

GENERAL INFORMATION REQUIRED
FOR TYPE ACCEPTANCE

2.1033 (C)(1)(2) KP ELECTRONIC SYSTEMS LTD. will sell the FCCID: H78KPBSRU100 UHF transciever in quantity, for use under FCC RULES PART 22, 90, 95,

2.1033 (C) TECHNICAL DESCRIPTION

(1) ALLOWED AUTHORIZED BANDWIDTH = 11.25KHz.
90.209(b)(5)

Bn = 2M + 2DK
M = 3000
D = 0.6 K (Peak Deviation)
K = 1
Bn = 2(1.5K) + 2(0.6K)(1) = 3.0K + 1.2K =4.2 K

Type of Emission: 4K2F2E
ALLOWED AUTHORIZED BANDWIDTH = 20.0KHz.
90.209(b)(5)

Bn = 2M + 2DK
M = 1500
D = 2.4 K
K = 1
Bn = 2(2.4K) + 2(1.5)(1) = 4.8 + 3.0 = 7.8

Type of Emission: 7K8F2E

2.1033(C)(5) Frequency Range: 450-470 MHz

(3) Power Range and Controls: This UUT has one power range.

(4) 2.1033(c)(b) Maximum Output Power Rating: 10.0Watts into a 50 ohm resistive load.

(8) DC Voltages and Current into Final Amplifier:

POWER INPUT	FINAL AMPLIFIER ONLY
POWER OUT	10.0 WATTS
Vce Volts	13.6V
Ice Amps(hi)	3.1
Pin Watts	42.6 Ice Amps

2.1033(c)(8) DC Voltages and Current into Final Amplifier:

POWER INPUT	FINAL AMPLIFIER ONLY
POWER OUT	10.0 Watts
Vce Volts	13.6V
Ice Amps(hi)	3.1
Pin Watts	42.16

2.1033(c)(9) The tune-up procedure is NA.

2.1033(c)(10) A schematic is included in Exhibit 5A-5E.

2.1033(c)(11) Photograph or drawing of the label showing the FCC ID is included in Exhibit 2 and the location of the label is shown in Exhibit 2.

2.1033(c)(12) Photographs completely documenting the radio are included in Exhibit 3A-3E.

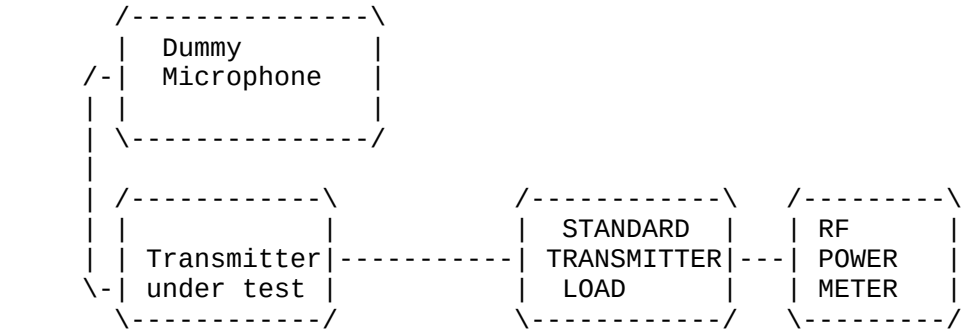
2.1033(c)(13) N/A This is for devices that use digital modulation.

2.1033(c)(14) The data required by 2.1046 through 2.1057 follows;

2.1046(a) RF power output. The test procedure used was TIA/EIA-603 S2.2.1. RF power is measured by connecting a 50 ohm, resistive wattmeter to the RF output connector. With a nominal battery voltage of 7.2V, and the transmitter properly adjusted the RF output measures:

OUTPUT POWER: (12.5V)(3.1A) = 10.00 Watts
INPUT POWER: 42.16Watts Efficiency: 24.8%

2.1046(a) RF power output. The test procedure used was TIA/EIA-603 S2.2.1.

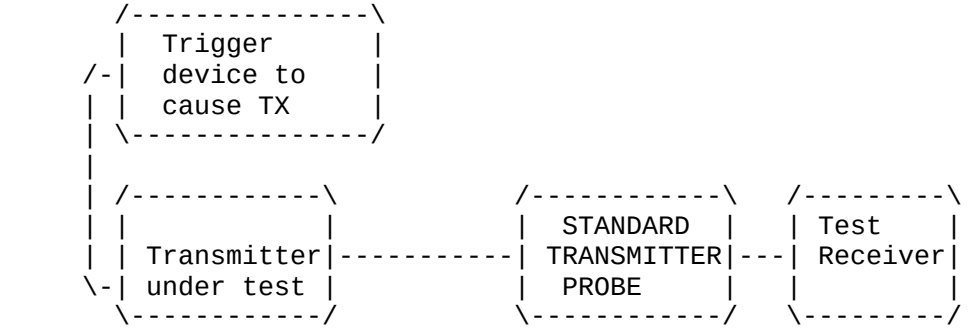


2.1047(a) Modulation characteristics:

AUDIO FREQUENCY RESPONSE The audio frequency response was measured in accordance with TIA/EIA Specification TIA/EIA-603 S2.2.6.2.1. The audio frequency response curve is shown in Exhibits .

2.1049 AUDIO LOW PASS FILTER Transmitters utilizing analog emissions and meets the requirements of paragraph 90.210(b)&(c) therefore no low-pass filter response in included.

2.1049 AUDIO INPUT VERSUS MODULATION Not applicable because the tones are generated internally by the MPU based on the data input. The only tones generated are the F2 tones.



1.The test receiver audio bandwidth was <50Hz to >20,000Hz.

2.1049 Occupied bandwidth:

90.210 (b)

(1) On any frequency removed from the assigned frequency by more than 50% of the authorized bandwidth: At least 25 dB.

(2) On any frequency removed from the assigned frequency by more than 100%, but not more than 250% of the authorized bandwidth: At least 35dB.

(3) On any frequency removed from the assigned frequency by more than 250% of the authorized bandwidth: At least 43 + 10 log(P) dB.

90.210 (d) 2

Requirement For 12.5KHz channel bandwidth equipment, 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: Zero dB.

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

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

See Exhibit 7A-7E.

2.1049 Occupied bandwidth: Using TIA/EIA 2.2.11 sideband

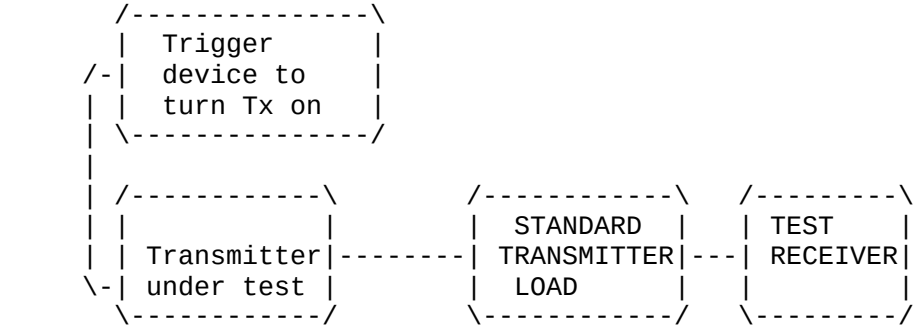
Spectrum TIA/EIA-603 S2.2.11 was used to measure the occupied bandwidth. Plots were made of the highest frequency and at 2500Hz. Data in the plots show that all sidebands beyond the authorized bandwidth are less than 0.5% of the unmodulated carrier. The plots show the transmitter modulation with;

For 12.5KHz spacing no modulation, 2500Hz, 3000Hz Tones
For 25.0KHz Channel spacing no modulation, 2500Hz, 3000Hz

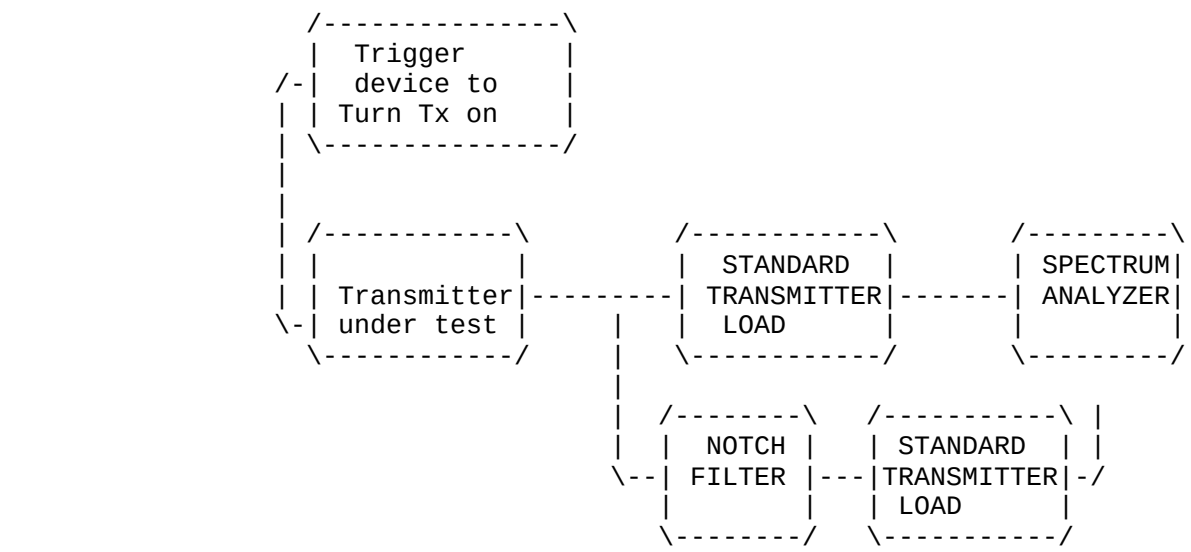
At each of the tone input was adjusted for 50% modulation plus 16 dB. The spectrum analyzer was set with the unmodulated carrier at the top of the screen. The test procedure diagram and occupied bandwidth plots follow.

Test procedure diagram

OCCUPIED BANDWIDTH MEASUREMENT



2.1051 Spurious emissions at antenna terminals(conducted): The following data shows the level of conducted spurious responses at the antenna terminal. The test procedure used was TIA/EIA 603 S2.2.13 with the exception that the emissions were recorded in dBc. The spectrum was scanned from 0.4 to at least the 10th harmonic of the fundamental.



Method of Measuring Conducted Spurious Emissions

NAME OF TEST: SPURIOUS EMISSIONS AT ANTENNA TERMINALS

REQUIREMENTS: Emissions must be 50 +10log(Po) dB below the mean power output of the transmitter.

POWER 50 + 10log(12.0) = 60.79dB OR 70dB Whichever is the lessor

EMISSION FREQUENCY MHz	dB BELOW CARRIER
460.00	00.00
920.00	79.00
1380.00	61.10
1840.00	69.80
2300.00	74.40
2760.00	95.10
3220.00	84.00
3680.00	99.90
4140.00	58.70
4600.00	81.90

2.1053 (b) Field strength of spurious emissions:

The tabulated Data shows the results of the radiated field strength emissions test. The spectrum was scanned from 30 to 4.7 GHz. This test was conducted per ANSI C63.4-1992 with the exception of briefly connecting the transmitter to a half wave dipole for the purpose of establishing a reference.

NAME OF TEST: RADIATED SPURIOUS EMISSIONS

REQUIREMENTS:

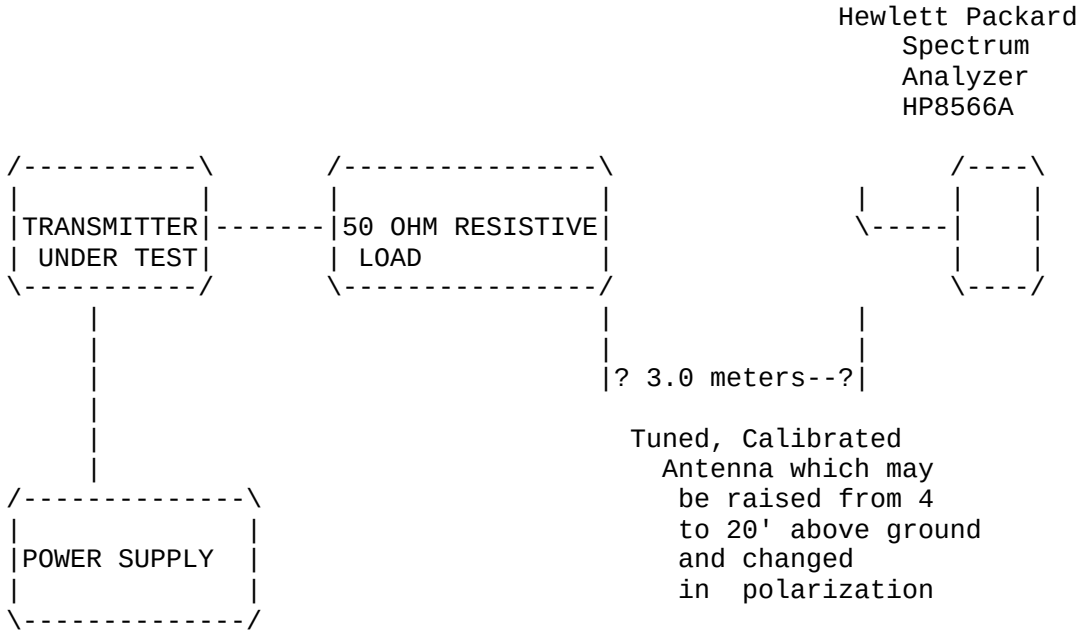
POWER 50 + 10log(12.0) = 60.79dB OR 70dB Whichever is the lessor

TEST DATA:

EMISSION FREQUENCY MHz	ATT. LEVEL dB	MARGIN dB
460.00	0.00	0.00
920.00	105.20	44.41
1380.00	81.20	20.41
1840.00	92.70	31.91
2300.00	81.70	20.91
2760.00	96.20	35.41
3220.00	99.30	38.51
3679.00	108.40	47.61
4140.00	98.10	37.31
4600.00	109.30	48.51

METHOD OF MEASUREMENT: The procedure used was ANSI STANDARD C63.4-1992 with the following exception: the unit was operated into a dipole antenna with the antenna at a height of 1.5 meters in order to establish a reference, then connected to a dummy load. The spectrum was scanned from 30MHz to at least the tenth harmonic of the fundamental using a HP model 8566B spectrum analyzer, an Eaton model 94455-1 Biconical Antenna, a 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 849 N.W. State Road 45, Newberry, Florida 32669.

Method of Measuring Radiated Spurious Emissions



Equipment placed 4' above ground
on a rotatable platform.

2.1055 Frequency stability:
90.213

Temperature and voltage tests were performed to verify that the frequency remains within the .00025%, 2.5 ppm specification limit. 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 plus & minus 15% of the supply voltage of 13.6VDC.

MEASUREMENT DATA:

Assigned Frequency (Ref. Frequency): 460.000258 MHz

TEMPERATURE_C	FREQUENCY_MHz	PPM
REFERENCE	460.000 258	0.00
-30	460.000 244	-0.03
-20	460.000 299	+0.09
-10	460.000 498	+0.52
0	460.000 570	+0.68
+10	460.000 507	+0.54
+20	460.000 325	+0.15
+30	460.000 015	-0.23
+40	460.000 006	-0.55
+50	460.000 012	-0.53
The battery end point Voltage 12.0 VDC		+0.15

RESULTS OF MEASUREMENTS: The maximum frequency variation over the temperature range was -0.55 to +0.68ppm. The maximum frequency variation over battery endpoint voltage range was +0.15 ppm.

2.1055 Frequency stability:

90.214 Transient Frequency Behavior

REQUIREMENTS:In the 450-500MHz frequency band, transient frequencies must be within the maximum frequency difference limits during the time interval indicated below for 25kHz Channels:

Time Interval	Maximum Frequency	Portable Radios 450-500Mhz
t1	+25kHz	10.0ms
t2	+12.5kHz	25.0ms
t3	+25.0kHz	10.0ms

REQUIREMENTS:In the 450-500MHz 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 450-500Mhz
t1	+12.5kHz	10.0ms
t2	+6.25kHz	25.0ms
t3	+12.5kHz	10.0ms

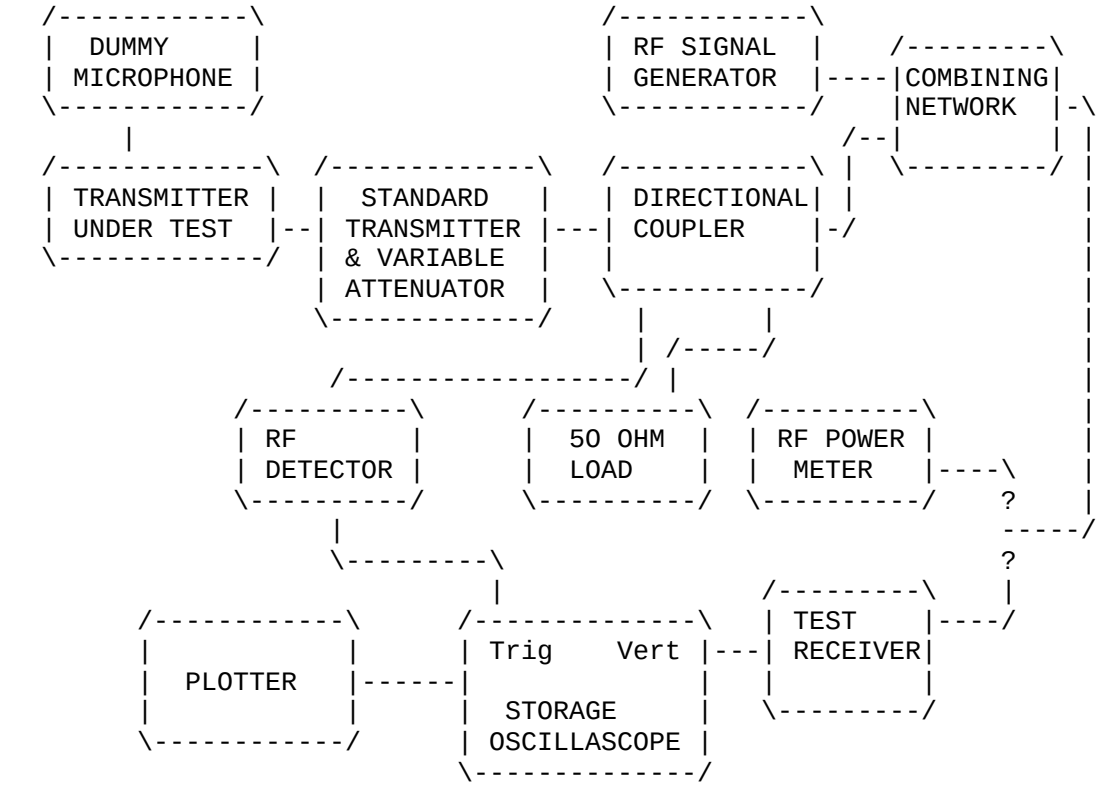
TEST PROCEEDURE: TIA/EIA TS603 PARA 2.2.19, the levels were set as follows;

1. Using the varible attenuator the transmitter level was set to 40dB below the test recievers 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.

2.995(a)(b)(d) Frequency stability:

90.214 Transient Frequency Behavior

(Continued)



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_Biconnical Antenna: Eaton Model 94455-1, S/N 1057
3.___Biconnical Antenna: Electro-Metrics Model BIA-25, S/N 1171
4._X_Log-Periodic Antenna: Electro-Metrics Model EM-6950, S/N 632
5.___Log-Periodic Antenna: Electro-Metrics Model LPA-30, S/N 409
6.___Double-Ridged Horn Antenna: Electro-Metrics Model RGA-180, 1-18 GHz, S/N 2319
7.___Horn 40-60GHz: ATM Part #19-443-6R
8.___Line Impedance Stabilization Network: Electro-Metrics Model ANS-25/2, S/N 2604 Cal. 2/9/00
9.___Temperature Chamber: Tenney Engineering Model TTRC, S/N 11717-7
10.___Frequency Counter: HP Model 5385A, S/N 3242A07460 Cal 10/6/99
11.___Peak Power Meter: HP Model 8900C, S/N 2131A00545
12._X_Open Area Test FCC # 95517 Site #1-3meters Cal. 12/22/99
13.___Signal Generator: HP 8640B, S/N 2308A21464 Cal. 9/23/99
14.___Signal Generator: HP 8614A, S/N 2015A07428
15.___Passive Loop Antenna: EMCO Model 6512, 9KHz to 30MHz, S/N 9706-1211 Cal. 6/10/00
16.___Dipole Antenna Kit: Electro-Metrics Model TDA-30/1-4, S/N 153 Cal. 11/24/99
17.___AC Voltmeter: HP Model 400FL, S/N 2213A14499 Cal. 9/21/99
18.___Digital Multimeter: Fluke Model 8012A, S/N 4810047 Cal 9/21/99
19.___Digital Multimeter: Fluke Model 77, S/N 43850817 Cal 9/21/99
20.___Oscilloscope: Tektronix Model 2230, S/N 300572 Cal 9/23/99