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APPLICANT: SB TECHNOLOGY CO., LTD

FCC ID: OTVSBTFR580-2CH

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2.1033(c)(1)(2)SB TECHNOLOGY CO., LTDwill manufacture the  
FCCID: OTVSBTFR580-2CH FAMILY RADIO SERVICES 14 CHANNEL  
TRANSCEIVER in quantity, for use under FCC RULES  
PART 95. The UUT is a PTT Radio with a maximum duty  
cycle of 50%.

2.1033 (c) TECHNICAL\_DESCRIPTION

2.1033(c) (4) Type of Emission: 10K6F3E  
95.631

Authorized Bandwidth 12.5KHz

2.1033(c)(6)(7) Power Output shall not exceed 0.500Watts effective  
95.639 radiated power. There can be no provisions for  
95.649 increasing the power or varing the power. The Maximum  
Output Power Rating: 300 milliWatts  
effective radiated power.

2.1033(c)(8) DC Voltages and Current into Final Amplifier:  
FINAL AMPLIFIER ONLY  
Vce = 6.0 Volts DC Ice = 0.25A.  
Pin = 1.5 Watts

2.1033(c)(9) Tune-up procedure. The tune-up procedure is included as Exhibit #: 8A-8B.

2.1033(c)(10) Complete Circuit Diagrams: The circuit diagram is included as EXHIBIT 5 of this report. The block diagram is included as EXHIBIT 4 of this report.

2.1033(c)(11) A photograph or a drawing of the equipment identification label is included as exhibit No. 2.

2.1033(c)(12) Photographs(8"X10") of the equipment of sufficient clarity to reveal equipment construction and layout, including meters, labels for controls, including any view under shields - See EXHIBIT 3A-3G.

2.1033(c)(13) Digital modulation is not allowed.

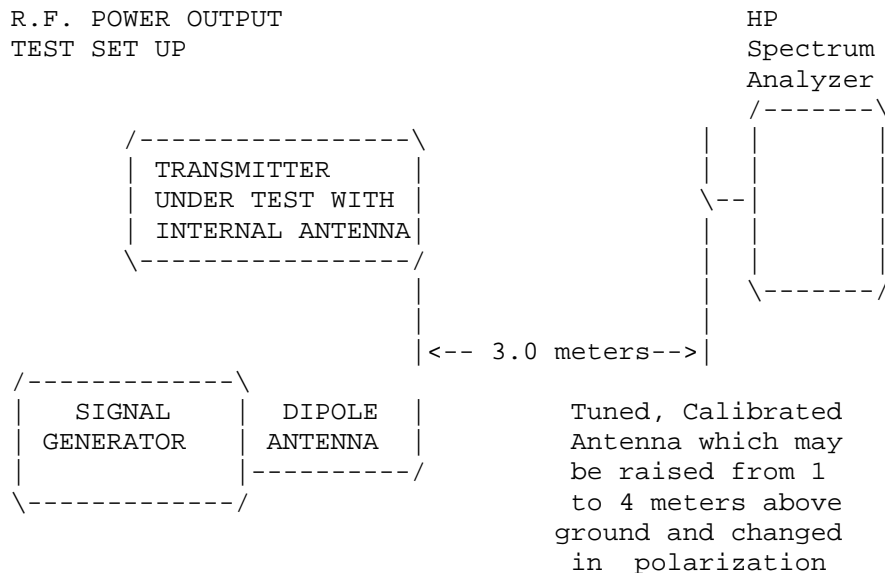
2.1033(c)(14) The data required by 2.1046 through 2.1057 is submitted below.

2.1046(a) RF\_power\_output.

95.639 RF power is measured by measuring the radiated power at 3 meters and then replacing the transmitter with a signal generator to determine the effective radiated power. The ERP shall not exceed 0.500 Watts.

MEASURED POWER OUTPUT = 500 milliWatts ERP

R.F. POWER OUTPUT  
TEST SET UP



Equipment placed 80cm above ground on a rotatable platform.

2.1047(a)(b)      Modulation\_characteristics:

AUDIO\_FREQUENCY\_RESPONSE

The audio frequency response was measured in accordance with TIA/EIA Specification 603. The audio frequency response curve is shown in exhibit 9. The audio signal was fed into a dummy microphone circuit and into the microphone connector. The input required to produce 30 percent modulation level was measured.

2.1047(b)      Audio\_input\_versus\_modulation

The audio input level needed for a particular percentage of modulation was measured in accordance with TIA/EIA Specification 603. The audio input curves versus modulation are shown in exhibits 10A - 10C. Curves are provided for audio input frequencies of 300, 1000, and 3000 Hz.

95.637(b)      Post Limiter Filter The filter must be between the modulation limiter and the modulated stage. At any frequency between 3 & 20KHz the filter must have an attenuation of  $60\log(f/3)$  greater than the attenuation at 1KHz. See the plot; exhibit 11.

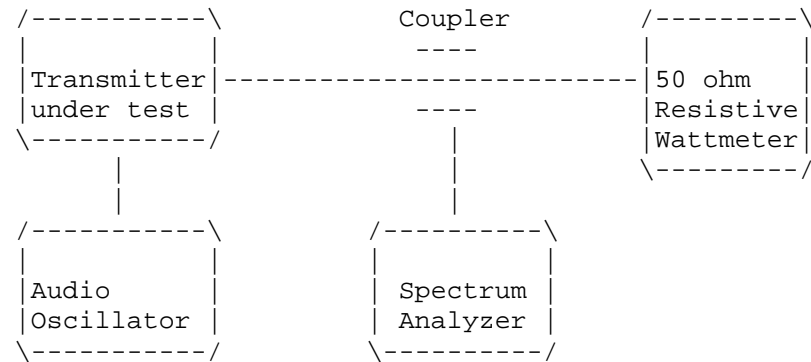
2.989(c)      EMISSION\_BANDWIDTH:  
95.633(c)

Data in the plots shows that the sidebands from greater than 50% to 100% of the authorized bandwidth must be attenuated by at least 25dB and from 100 to 250% the sidebands must be attenuated by at least 35dB. Beyond 250% the sidebands must be attenuated by at least  $43 + \log_{10}(TP)$ . The transmitter was modulated with 2500 Hz, 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 follows. See the occupied bandwidth plots; exhibits 12A-12B.

Radiotelephone transmitter with modulation limiter.

Test procedure diagram

OCCUPIED BANDWIDTH MEASUREMENT



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2.1051 Not Applicable, no antenna terminal allowed.

2.1053 UNWANTED\_RADIATION:  
95.635(b)(4)

REQUIREMENTS: Emissions must be attenuated by at least the following below the output of the transmitter.

$$43 + 10\log(TP) = 43 + 10\log(0.50) = 39.99 \text{ dB}$$

TEST DATA:

Emission Frequency MHz	Attenuation dB	Margin dB
462.7	0.0	0.0
925.4	-54.24	14.14
1388.0	-48.04	8.04
1850.6	-56.93	16.93
2313.3	-57.38	17.38
2776.0	-64.93	24.93
3238.6	-56.48	16.48
3701.3	-64.53	24.53
4163.9	-70.27	30.27
4626.6	-66.00	26.00

MARGIN = (Field strength of Fund - 39.99dB) - FS OF EMISSION

METHOD OF MEASUREMENT: The procedure used was TIA/EIA 603. The spectrum was scanned from 30 to at least the tenth harmonic of the fundamental using a HP model 8566B spectrum analyzer, and an appropriate antenna - see test equipment list. Measurements were made at the open field test site of TIMCO ENGINEERING INC. located at 849 N.W. State Road 45, Newberry, FL 32669.

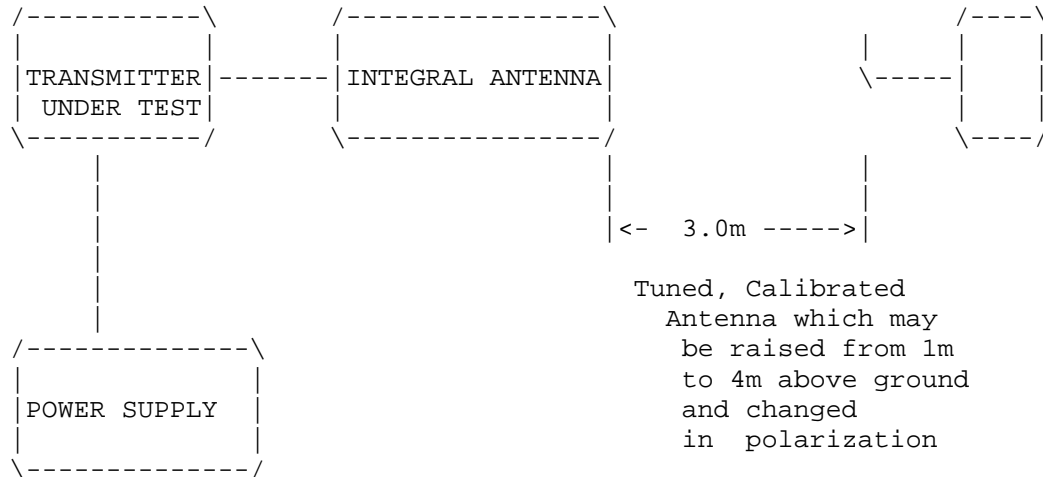
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2.1053  
95.635

UNWANTED\_RADIATION:

Method of Measuring Radiated Spurious Emissions

Hewlett Packard  
Spectrum  
Analyzer  
HP8566B



Equipment placed 80cm above ground  
on a rotatable platform.

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2.1055

Frequency stability :

Temperature and voltage tests were performed to verify that the frequency remains within the 0.00025%, 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 and minus 15% of the battery voltage of 6 VDC.

MEASUREMENT DATA:

Assigned Frequency (Ref. Frequency): 467.612 500

TEMPERATURE C	FREQUENCY MHz	PPM
REFERENCE_____	462.662 500	00.00
-20_____	462.662 734	-0.82
-10_____	462.662 980	0.51
0_____	462.663 043	1.04
+10_____	462.662 875	1.18
+20_____	462.662 775	0.81
+30_____	462.662 703	0.60
+40_____	462.662 703	0.44
+50_____	462.662 864	0.79
BATT. End-Point 5.1V/dc	462.662 813	0.68
BATT. End-Point 6.9V/dc	462.662 866	0.79

RESULTS OF MEASUREMENTS: The maximum frequency variation over the temperature range was -0.82 to 1.18 ppm. The maximum frequency variation with voltage was +0.36 ppm.

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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 85650A, S/N 3303A01690 & Preamplifier HP 8449B-OPT H02,  
S/N 3008A00372 Cal. 1/19/01
- 2.\_X\_Biconnical Antenna: Eaton Model 94455-1, S/N 1057, Cal 3/15/00
- 3.\_\_\_Biconnical Antenna: Electro-Metrics Model BIA-25, S/N 1171  
Cal. 3/16/01
- 4.\_X\_Log-Periodic Antenna: Electro-Metrics Model EM-6950, S/N 632  
Cal. 3/15/00
- 5.\_\_\_Log-Periodic Antenna: Electro-Metrics Model LPA-30, S/N 409  
Cal. 3/15/00
- 6.\_X\_Double-Ridged Horn Antenna: Electro-Metrics Model RGA-180,  
1-18 GHz, S/N 2319
- 7.\_\_\_18-26.3GHz Systron Donner Standard Gain Horn #DBE-520-20
- 8.\_\_\_Horn 40-60GHz: ATM Part #19-443-6R
- 9.\_\_\_Line Impedance Stabilization Network: Electro-Metrics Model  
ANS-25/2, S/N 2604 Cal. 2/9/00
- 10.\_\_\_Temperature Chamber: Tenney Engineering Model TTRC, S/N 11717-7  
Cal. 1/21/01
- 11.\_\_\_Frequency Counter: HP Model 5385A, S/N 3242A07460 Cal 11/20/00
- 12.\_\_\_Peak Power Meter: HP Model 8900C, S/N 2131A00545, Cal. 1/26/01
- 13.\_X\_Open Area Test Site #1-3meters Cal. 12/22/99
- 14.\_\_\_Signal Generator: HP 8640B, S/N 2308A21464 Cal. 11/21/00
- 15.\_\_\_Signal Generator: HP 8614A, S/N 2015A07428
- 16.\_\_\_Passive Loop Antenna: EMCO Model 6512, 9KHz to 30MHz, S/N  
9706-1211 Cal. 6/10/00
- 17.\_\_\_Dipole Antenna Kit: Electro-Metrics Model TDA-30/1-4, S/N 153  
Cal. 11/24/00
- 18.\_\_\_AC Voltmeter: HP Model 400FL, S/N 2213A14499 Cal. 2/1/01
- 19.\_\_\_Digital Multimeter: Fluke Model 8012A, S/N 4810047 Cal 9/21/99
- 20.\_\_\_Digital Multimeter: Fluke Model 77, S/N 43850817 Cal 11/16/00
- 21.\_\_\_Oscilloscope: Tektronix Model 2230, S/N 300572 Cal 2/1/01

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