

TABLE OF CONTENTS LIST

APPLICANT: SB TELCOM CO., LTD.

FCC ID: OTVATT701

TEST REPORT:

PAGE	1-2....COVER SHEET - GENERAL INFORMATION & TECHNICAL DESCR.
PAGE	3.....RF POWER OUTPUT
PAGE	4.....MODULATION CHARACTERISTICS
PAGE	5.....AUDIO FREQUENCY RESPONSE PLOT
PAGE	5.....MODULATION LIMITING PLOT - 300 Hz
PAGE	6.....MODULATION LIMITING PLOT - 1000 Hz
PAGE	6.....MODULATION LIMITING PLOT - 3000 Hz
PAGE	7.....AUDIO LOW PASS FILTER PLOT
PAGE	8.....OCCUPIED BANDWIDTH
PAGE	9.....OCCUPIED BANDWIDTH PLOT - CW
PAGE	10.....OCCUPIED BANDWIDTH PLOT
PAGE	11.....METHOD OF MEASURING OCCUPIED BANDWIDTH
PAGE	12.....FIELD STRENGTH OF SPURIOUS EMISSIONS
PAGE	13.....METHOD OF MEASURING RADIATED SPURIOUS EMISSIONS
PAGE	13.....FREQUENCY STABILITY
PAGE	15-19...LIST OF TEST EQUIPMENT

EXHIBITS CONTAINING:

EXHIBIT	1.....FCC ID LABEL SAMPLE
EXHIBIT	2.....SKETCH OF FCC ID LABEL LOCATION
EXHIBIT	3.....EXTERNAL PHOTOS
EXHIBIT	4.....INTERNAL PHOTOS
EXHIBIT	5.....BLOCK DIAGRAM
EXHIBIT	6.....SCHEMATIC
EXHIBIT	7.....USER'S MANUAL
EXHIBIT	8.....CIRCUIT DESCRIPTION
EXHIBIT	9.....TUNING PROCEDURE

APPLICANT: SB TELCOM CO., LTD.

FCC ID: OTVATT701

REPORT #: S\SBTELE\484KT2\484KT2TestReport.doc

TABLE OF CONTENTS LIST

GENERAL INFORMATION REQUIRED  
FOR TYPE ACCEPTANCE

2.1033(c)(1)(2) SB TELCOM CO., LTD. will manufacture the  
FCCID: OTVATT701 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%.

SB TELCOM CO., LTD.  
#25-49, JUAN5-DONG, NAM-KU  
INCHEON KOREA

2.1033 (c) TECHNICAL DESCRIPTION

2.1033(c)(3) Instruction book. A draft copy of the instruction  
manual is included as EXHIBIT 7.

2.1033(c) (4) Type of Emission: 10K4F3E  
95.631

Bn = 2M + 2DK

M = 3000

D = 2200

Bn = 2(3000)+2(1900) = 9.8K

Authorized Bandwidth 12.5 kHz

2.1033(c)(5) Frequency Range: 1. 462.5625 8. 467.5625  
95.627 2. 462.5875 9. 467.5875  
3. 462.6125 10. 467.6125  
4. 462.6375 11. 467.6375  
5. 462.6625 12. 467.6625  
6. 462.6875 13. 467.6875  
7. 462.7125 14. 467.7125 MHz

2.1033(c)(6)(7) Power Output shall not exceed 0.50 Watts effective  
95.639 radiated power. There can be no provisions for  
95.649 increasing the power or varying the power.

95.647 The antenna is an integral part to the unit, it cannot  
be removed without rendering the unit inoperative. In  
order to remove the antenna the case must be unscrewed,  
then the PCB assemblies must be removed then the  
antenna can be removed.

2.1033(c)(8) DC Voltages and Current into Final Amplifier:  
FINAL AMPLIFIER ONLY  
Vce = 4.5 Volts DC Ice = 0.203A.  
Pin = 0.92 Watts

APPLICANT: SB TELCOM CO., LTD.

FCC ID: OTVATT701

REPORT #: S\SBTELE\484KT2\484KT2TestReport.doc

- 2.1033(c)(9) Tune-up procedure. The tune-up procedure is included in the 9.
- 2.1033(c)(10) Complete Circuit Diagrams: The circuit diagram is included as EXHIBIT 6 of this report. The block diagram is included as EXHIBIT 5 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 3-4.
- 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.

APPLICANT: SB TELCOM CO., LTD.

FCC ID: OTVATT701

REPORT #: S\SBTELE\484KT2\484KT2TestReport.doc

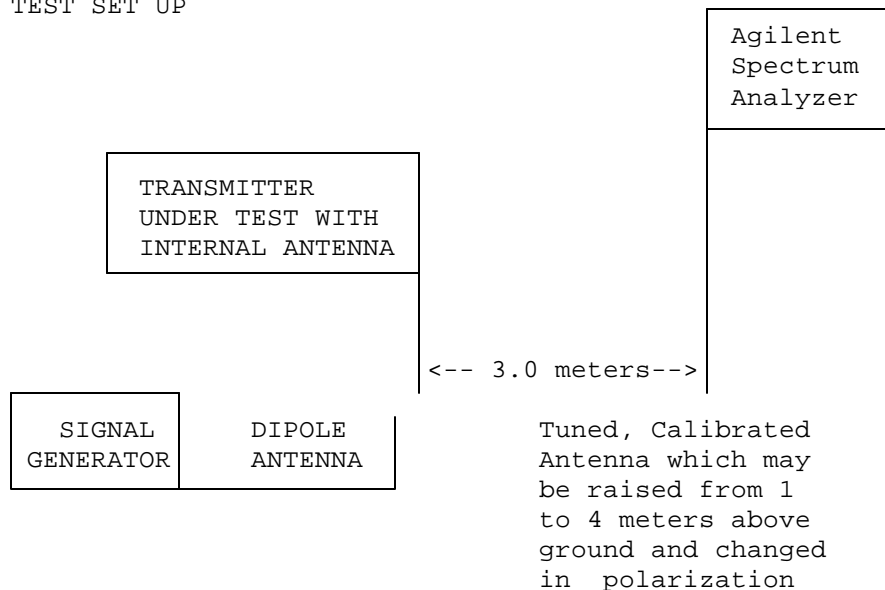
Page 2 of 19

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 = 0.17Watts ERP

R.F. POWER OUTPUT  
TEST SET UP



Equipment placed 80 cm above ground  
on a rotatable platform.

APPLICANT: SB TELCOM CO., LTD.

FCC ID: OTVATT701

REPORT #: S\SBTELE\484KT2\484KT2TestReport.doc

Page 3 of 19

2.1047(a)(b)      Modulation characteristics:

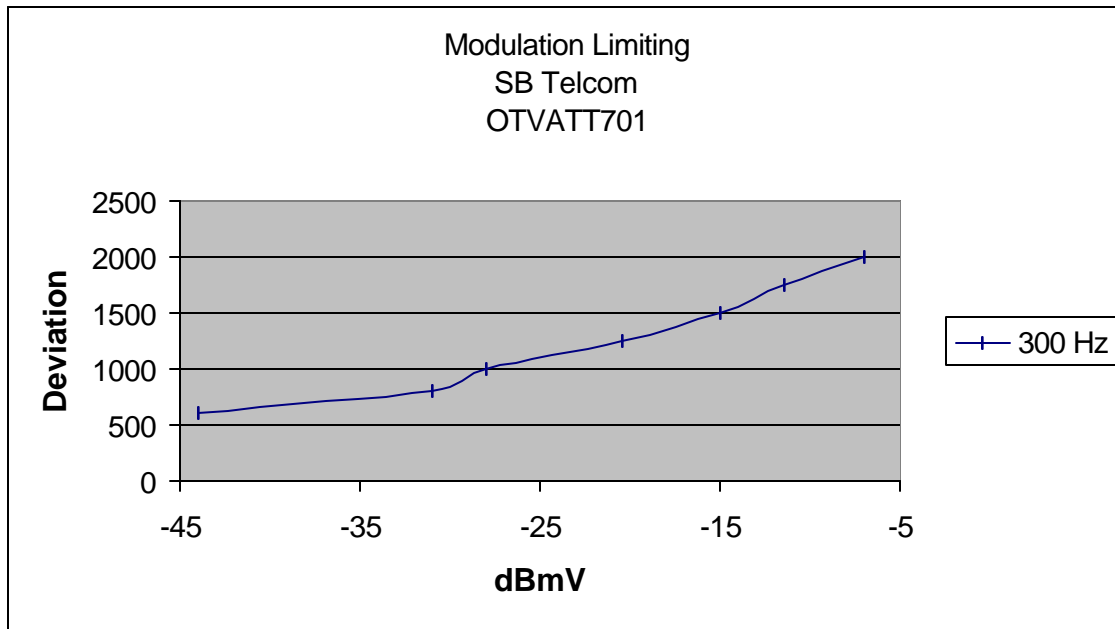
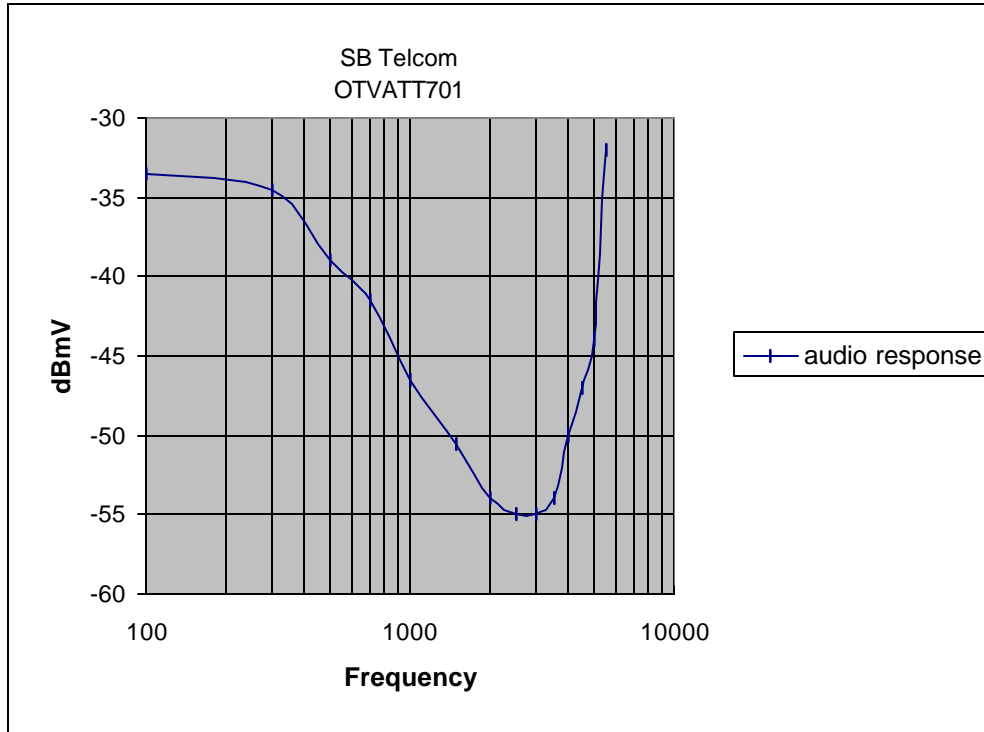
AUDIO FREQUENCY RESPONSE

The audio frequency response was measured in accordance with TIA/EIA Specification 603. The audio frequency response curve is shown on page 5. 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 pages 5-6. 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 & 20 kHz the filter must have an attenuation of  $60\log(f/3)$  greater than the attenuation at 1KHz. See the plot; page 7.

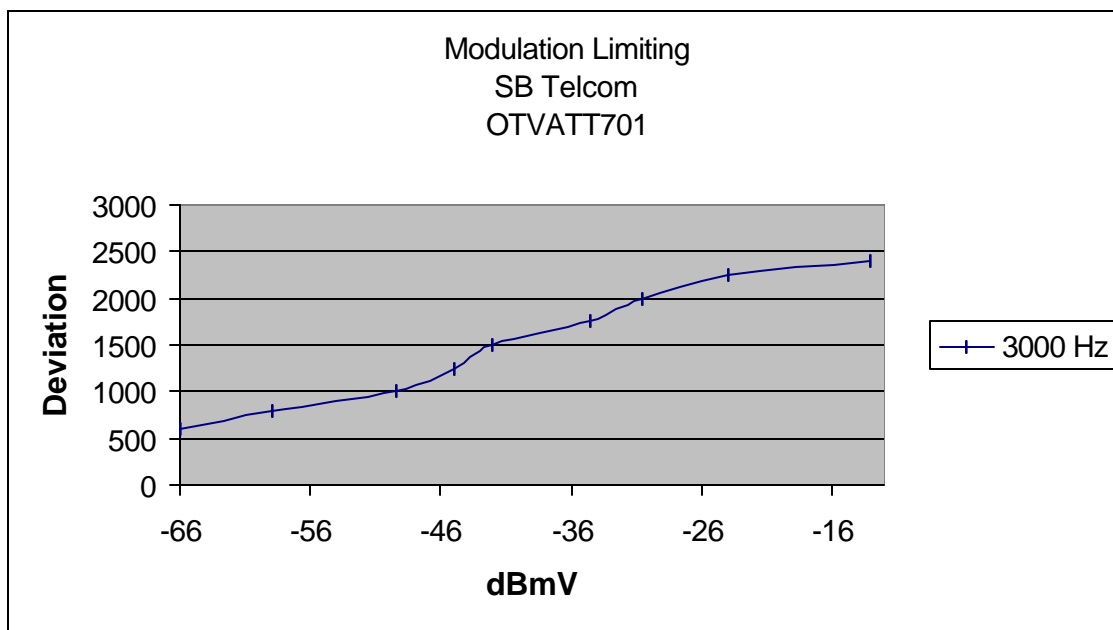
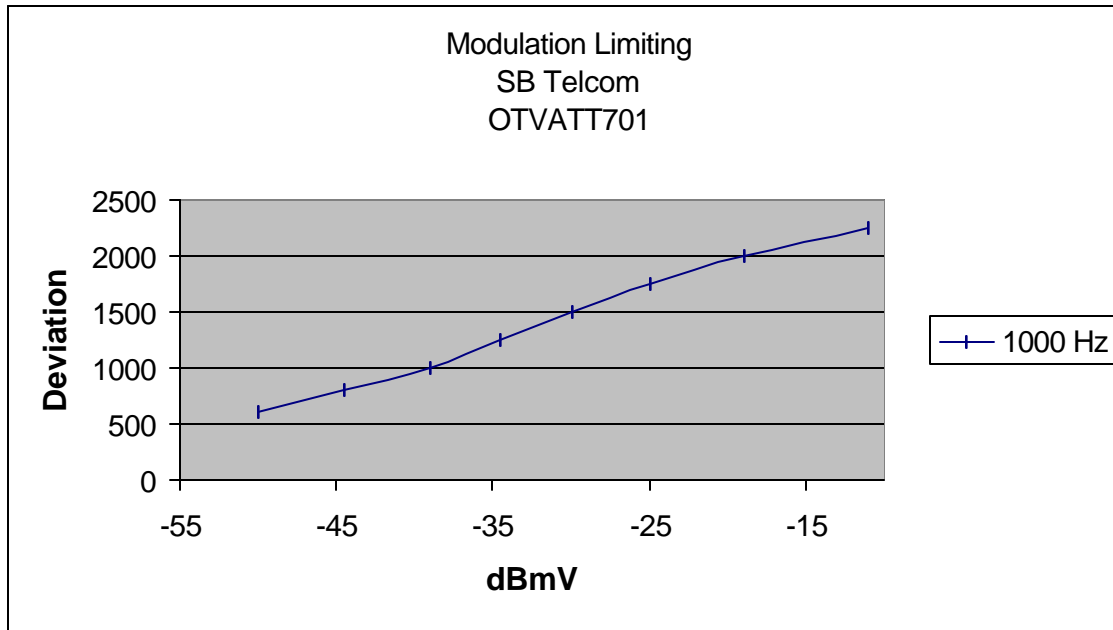


APPLICANT: SB TELCOM CO., LTD.

FCC ID: OTVATT701

REPORT #: S\SBTELE\484KT2\484KT2TestReport.doc

Page 5 of 19



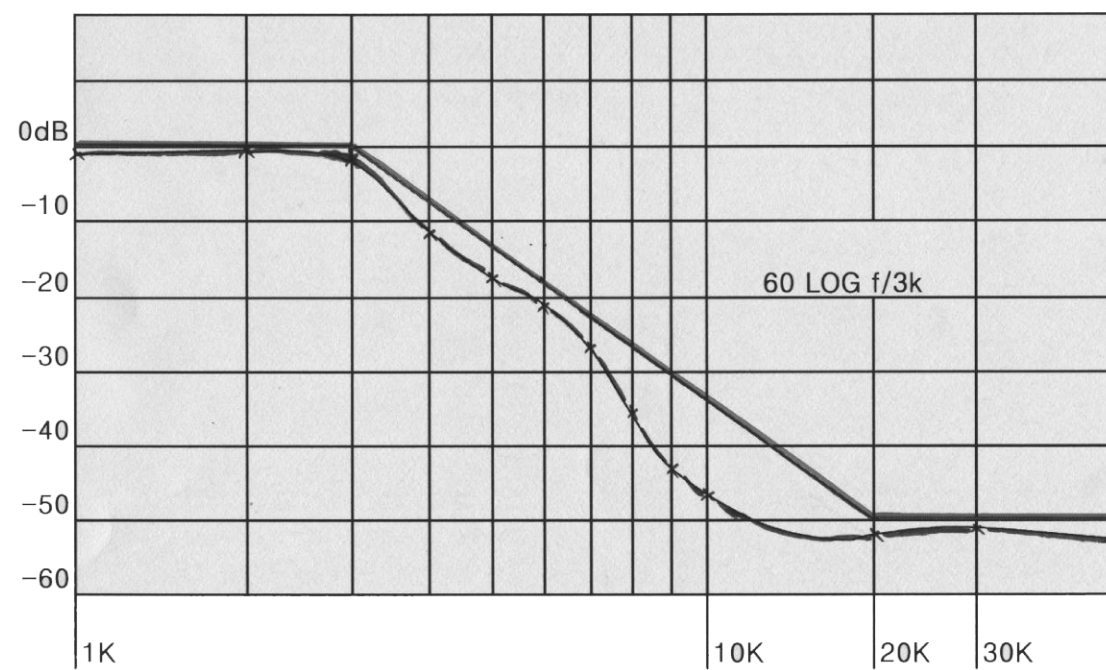
APPLICANT: SB TELCOM CO., LTD.

FCC ID: OTVATT701

REPORT #: S\SBTELE\484KT2\484KT2TestReport.doc

Page 6 of 19

# Frequency Response of the Audio Low Pass Filter ( ATT-701 )





2.1049(c)  
95.633(c)

EMISSION BANDWIDTH:

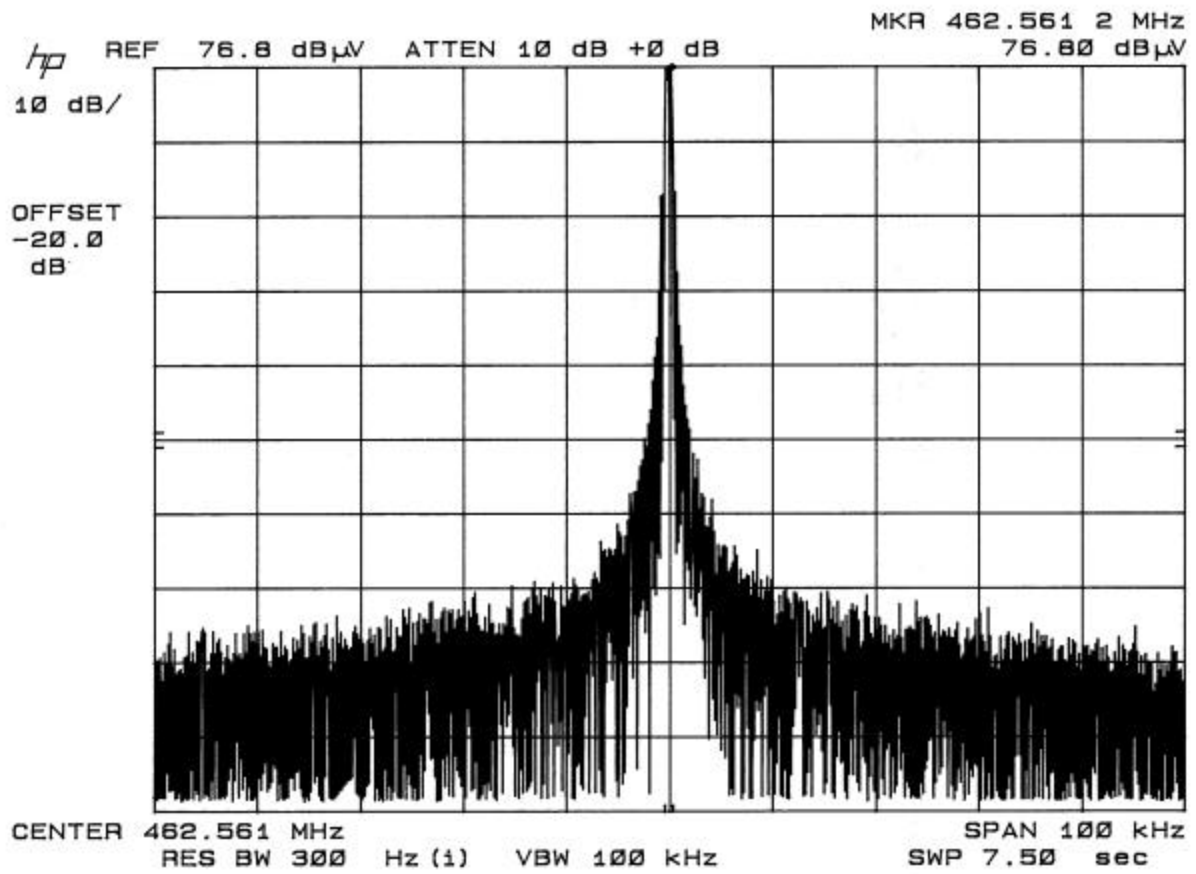
Data in the plots shows that the sidebands from greater than 50% to 100% of the authorized bandwidth must be attenuated by at least 25 dB and from 100 to 250% the sidebands must be attenuated by at least 35 dB. Beyond 250% the sidebands must be attenuated by at least  $43 + \log_{10}(TP)$ . The transmitter 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; pages 9, 10.

APPLICANT: SB TELCOM CO., LTD.

FCC ID: OTVATT701

REPORT #: S\SBTELE\484KT2\484KT2TestReport.doc

Page 8 of 19

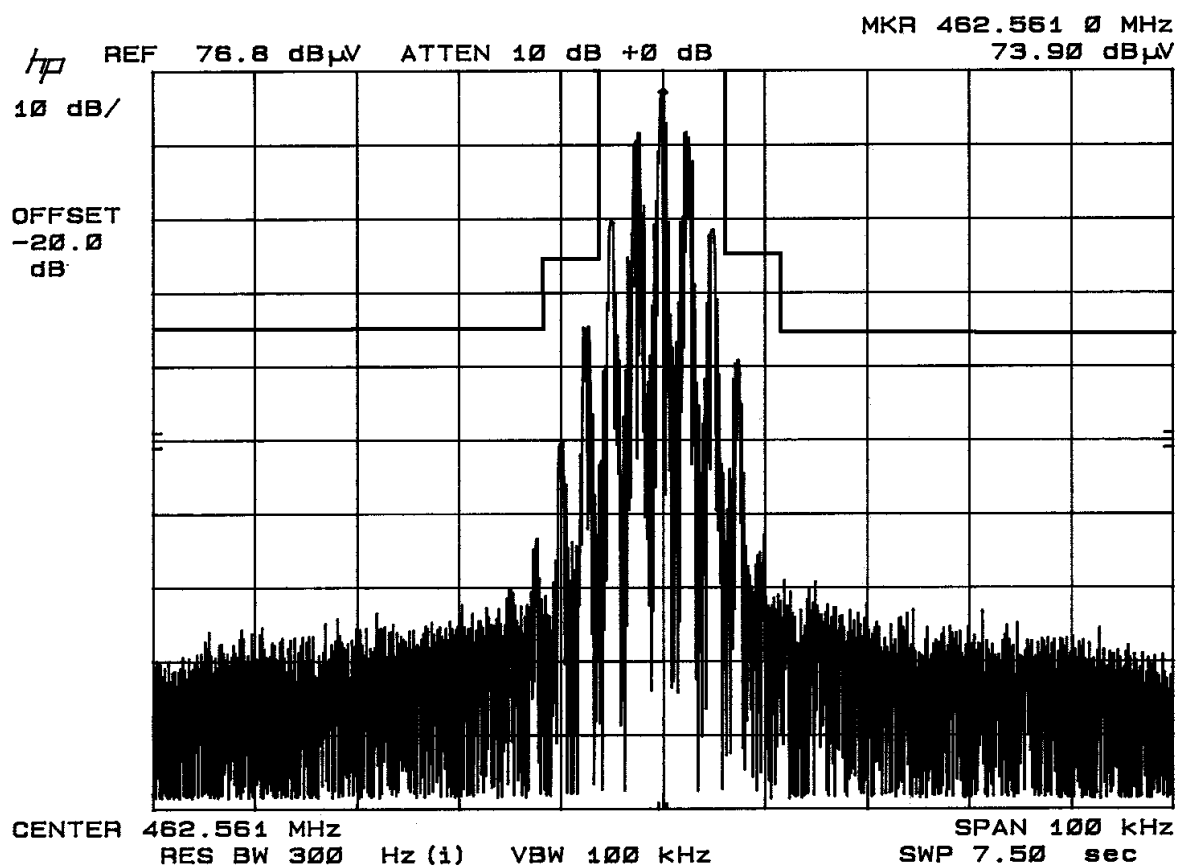


APPLICANT: SB TELCOM CO., LTD.

FCC ID: OTVATT701

REPORT #: S\SBTELE\484KT2\484KT2TestReport.doc

Page 9 of 19



APPLICANT: SB TELCOM CO., LTD.

FCC ID: OTVATT701

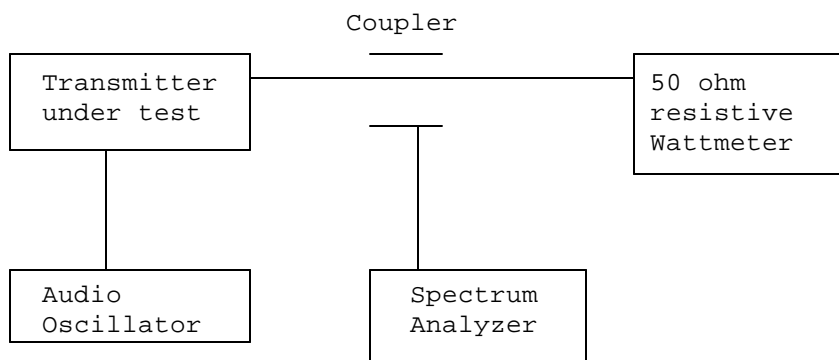
REPORT #: S\SBTELE\484KT2\484KT2TestReport.doc

Page 10 of 19

Radiotelephone transmitter with modulation limiter.

Test procedure diagram

OCCUPIED BANDWIDTH MEASUREMENT



APPLICANT: SB TELCOM CO., LTD.

FCC ID: OTVATT701

REPORT #: S\SBTELE\484KT2\484KT2TestReport.doc

Page 11 of 19

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.

$$43 + 10\log(0.17) = 35.30 \text{ dB}$$

TEST DATA:

<b>Emission Frequency MHz</b>	<b>Attn. dBc</b>	<b>Margin dB</b>
467.50	0.0	0.0
925.13	49.26	13.96
1387.69	**	
1850.36	**	
2312.85	58.36	23.06
2775.37	**	
3238.10	**	
3700.48	**	
4163.05	54.06	18.76
4624.64	46.56	11.26

NOTE: \*\* Below the measurement capabilities. Measurement is >20 dB below FCC limit.

METHOD OF MEASUREMENT: The tabulated data shows the results of the radiated field strength of emissions test. The spectrum was scanned from 30 to at least the tenth harmonic of the fundamental. This test was conducted per TIA/EIA STANDARD 603 using the substitution method. Measurements were made at the open field test site of TIMCO ENGINEERING, INC. located at 849 NW State Road 45, Newberry, FL 32669.

APPLICANT: SB TELCOM CO., LTD.

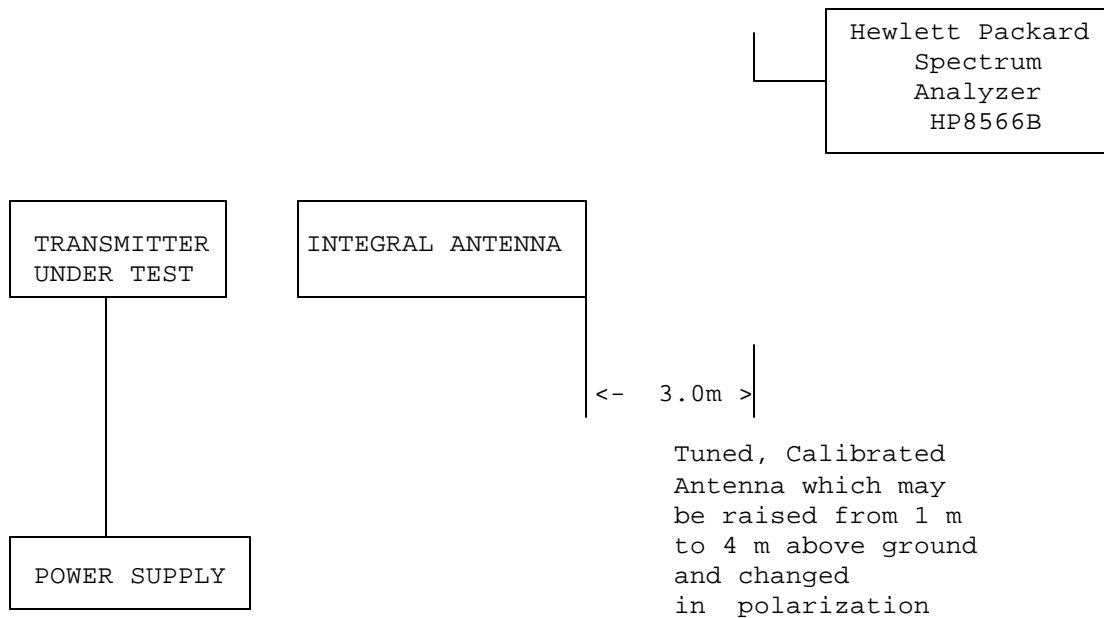
FCC ID: OTVATT701

REPORT #: S\SBTELE\484KT2\484KT2TestReport.doc

2.1053  
95.635

UNWANTED RADIATION:

Method of Measuring Radiated Spurious Emissions



Equipment placed 80 cm above ground  
on a rotatable platform.

APPLICANT: SB TELCOM CO., LTD.

FCC ID: OTVATT701

REPORT #: S\SBTELE\484KT2\484KT2TestReport.doc

## 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 -20 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 and minus 15% of the battery voltage of 3.8 VDC.

### MEASUREMENT DATA:

Assigned Frequency (Ref. Frequency): 462.562 500

TEMPERATURE °C	FREQUENCY MHz	PPM
REFERENCE_____	462.562 500	00.00
-20_____	462.561 500	-2.16
-10_____	462.562 070	-0.93
0_____	462.562 250	-0.54
+10_____	462.562 290	-0.45
+20_____	462.562 270	-0.50
+30_____	462.561 990	-1.10
+40_____	462.561 810	-1.49
+50_____	462.561 900	-1.30
BATT. End-Point 3.8V/dc	462.561 940	-1.21

RESULTS OF MEASUREMENTS: The maximum frequency variation over the temperature range was -0.50 to + -2.16 ppm. The maximum frequency variation with voltage was -1.21 ppm.

APPLICANT: SB TELCOM CO., LTD.

FCC ID: OTVATT701

REPORT #: S\SBTELE\484KT2\484KT2TestReport.doc

Page 14 of 19

## Equipment List

	DEVICE	MFGR	MODEL	SERNO	CAL/CHAR DATE	DUE DATE or STATUS
X	3-Meter OATS	TEI	N/A	N/A	Listed 12/22/99	12/22/02
	3/10-Meter OATS	TEI	N/A	N/A	Listed 3/26/01	3/26/04
X	Receiver, Beige Tower	HP	8566B Opt 462	3138A07786 3144A20661 3221A01400	CAL 8/31/01 CAL 8/31/01 CAL 8/31/01	8/31/02  8/31/02  8/31/02
X	Spectrum Analyzer (Tan)					
X	RF Preselector (Tan)					
X	Quasi-Peak Adapter (Tan)					
	Receiver, Blue Tower	HP	8568B	2928A04729 2848A18049 2926A00983	CHAR 10/22/01 CHAR 10/22/01 CHAR 10/22/01	10/22/02  10/22/02  10/22/02
	Spectrum Analyzer (Blue)					
	RF Preselector (Blue)					
	Quasi-Peak Adapter (Blue)					
	Biconnical Antenna	Electro-Metrics	BIA-25	1171	CAL 4/26/01	4/26/03
X	Biconnical Antenna	Eaton	94455-1	1096	CAL 10/1/01	10/1/02
	Biconnical Antenna	Eaton	94455-1	1057	CHAR 3/15/00	3/15/01
	BiconiLog Antenna	EMCO	3143	9409-1043		
X	Log-Periodic Antenna	Electro-Metrics	LPA-25	1122	CAL 10/2/01	10/2/02
	Log-Periodic Antenna	Electro-Metrics	EM-6950	632	CHAR 10/15/01	10/15/02
	Log-Periodic Antenna	Electro-Metrics	LPA-30	409	CHAR 10/16/01	10/16/02
	Dipole Antenna Kit	Electro-Metrics	TDA-30/1-4	152	CAL 3/21/01	3/21/02
	Dipole Antenna Kit	Electro-Metrics	TDA-30/1-4	153	CHAR 11/24/00	11/24/01

APPLICANT: SB TELCOM CO., LTD.

FCC ID: OTVATT701

REPORT #: S\SBTELE\484KT2\484KT2TestReport.doc



	DEVICE	MFGR	MODEL	SERNO	CAL/CHAR DATE	DUE DATE or STATUS
X	Double-Ridged Horn Antenna	Electro-Metrics	RGA-180	2319	CAL 12/19/01	12/19/02
	Horn Antenna	Electro-Metrics	EM-6961	6246	CAL 3/21/01	3/21/02
	Horn Antenna	ATM	19-443-6R	None	No Cal Required	
	Passive Loop Antenna	EMC Test Systems	EMCO 6512	9706-1211	CHAR 7/10/01	7/10/02
	Line Impedance Stabilization . . .	Electro-Metrics	ANS-25/2	2604	CAL 10/9/01	10/9/02
	Line Impedance Stabilization . . .	Electro-Metrics	EM-7820	2682	CAL 3/16/01	3/16/02
	Termaline Wattmeter	Bird Electronic Corporation	611	16405	CAL 5/25/99	(5/25/00)
	Termaline Wattmeter	Bird Electronic Corporation	6104	1926	CAL 12/12/01	12/12/02
	Oscilloscope	Tektronix	2230	300572	CHAR 2/1/01	2/1/02
X	Temperature Chamber	Tenney Engineering	TTRC	11717-7	CHAR 1/22/02	1/22/03
X	AC Voltmeter	HP	400FL	2213A14499	CAL 10/9/01	10/9/02
	AC Voltmeter	HP	400FL	2213A14261	CHAR 10/15/01	10/15/02
	AC Voltmeter	HP	400FL	2213A14728	CHAR 10/15/01	10/15/02
X	Digital Multimeter	Fluke	77	35053830	CHAR 1/8/02	1/8/03
	Digital Multimeter	Fluke	77	43850817	CHAR 1/8/02	1/8/03
	Digital Multimeter	HP	E2377A	2927J05849	CHAR 1/8/02	1/8/03
	Multimeter	Fluke	FLUKE-77-3	79510405	CAL 9/26/01	9/26/02
	Peak Power Meter	HP	8900C	2131A00545	CHAR 1/26/01	1/26/02
	Digital Thermometer	Fluke	2166A	42032	CAL 1/16/02	1/16/03

APPLICANT: SB TELCOM CO., LTD.

FCC ID: OTVATT701

REPORT #: S\SBTELE\484KT2\484KT2TestReport.doc

Page 16 of 19

	DEVICE	MFGR	MODEL	SERNO	CAL/CHAR DATE	DUE DATE or STATUS
	Thermometer	Traulsen	SK-128		CHAR 1/22/02	1/22/03
X	Temp/Humidity gauge	EXTech	44577F	E000901	CHAR 1/22/02	1/22/03
	Frequency Counter	HP	5352B	2632A00165	CAL 11/28/01	11/28/02
	Power Sensor	Agilent Technologies	84811A	2551A02705	CAL 1/26/01	1/26/02
	Injection Probe	Fischer Custom Communications	F-120-9A	270	CAL 6/1/01	6/1/02
	Service Monitor	IFR	FM/AM 500A	5182	CAL 11/22/00	11/22/01
	Comm. Serv. Monitor	IFR	FM/AM 1200S	6593	CAL 11/12/99	11/12/00
	Signal Generator	HP	8640B	2308A21464	CAL 11/15/01	11/15/02
	Modulation Analyzer	HP	8901A	3435A06868	CAL 9/5/01	9/5/02
	Power Line Coupling/ Decoupling Network	Fischer Custom Communications	FCC-801- M2-16A	01048	CAL 8/29/01	8/29/02
	Power Line Coupling/ Decoupling Network	Fischer Custom Communications	FCC-801- M3-16A	01060	CAL 8/29/01	8/29/02
	VHF/UHF Current Probe	Fischer Custom Communications	F-52	130	CAL 8/30/01	8/30/02
	Passive Impedance Adapter	Fischer Custom Communications	FCC-801- 150-50-CDN	01117 & 01118	CAL 8/29/01	8/29/02
	Radiating Field Coil	Fischer Custom Communications	F-1000-4- 8/9/10-L-1M	9859	CAL 10/15/98	10/15/99
	Near Field Probe	HP	HP11940A	2650A02748	CHAR 2/1/01	2/1/02
	BandReject Filter	Lorch Microwave	5BR4-2400/ 60-N	Z1	CHAR 3/2/01	3/2/02
	BandReject Filter	Lorch Microwave	6BR6-2442/ 300-N	Z1	CHAR 3/2/01	3/2/02
	BandReject Filter	Lorch Microwave	5BR4-10525/ 900-S	Z1	CHAR 3/2/01	3/2/02

APPLICANT: SB TELCOM CO., LTD.

FCC ID: OTVATT701

REPORT #: S\SBTELE\484KT2\484KT2TestReport.doc

Page 17 of 19

	<b>DEVICE</b>	<b>MFGR</b>	<b>MODEL</b>	<b>SERNO</b>	<b>CAL/CHAR DATE</b>	<b>DUE DATE or STATUS</b>
	High Pas Filter	Microlab	HA-10N		CHAR 10/4/01	10/4/02
	Audio Oscillator	HP	653A	832-00260	CHAR 3/1/01	3/1/02
	Frequency Counter	HP	5382A	1620A03535	CHAR 3/2/01	3/2/02
	Frequency Counter	HP	5385A	3242A07460	CHAR 12/11/01	12/11/02
	Preamplifier	HP	8449B-H02	3008A00372	CHAR 3/4/01	3/4/02
	Amplifier	HP	11975A	2738A01969	CHAR 3/1/01	3/1/02
	Egg Timer	Unk			CHAR 2/28/01	2/28/02
	Measuring Tape, 20M	Kraftixx	0631-20		CHAR 2/28/01	2/28/02
	Measuring Tape, 7.5M	Kraftixx	7.5M PROFI		CHAR 2/28/01	2/28/02
	EMC Immunity Test System	Keytek	CEMASTER	9810210		
	AC Power Source	California Instruments	1251RP	L05865		
	AC Power Source	California Instruments	PACS-1	X71484		
	Isotropic Field Probe	Amplifier Research	FP5000	22839		
	Isotropic Field Probe	Amplifier Research	FP5000	300103		
	Capacitor Clamp	Keytek	CM-CCL	9811359	No Cal Required	
	Amplifier	Amplifier Research	10W1000B	23117	No Cal Required	
	Field Monitor	Amplifier Research	FM5004	22288	No Cal Required	
	ELF Meter	F. W. Bell	4060	Not serialized		
	Coaxial Cable #51	Insulated Wire Inc.	NPS 2251- 2880	Timco #51	CHAR 1/23/02	1/23/03

APPLICANT: SB TELCOM CO., LTD.

FCC ID: OTVATT701

REPORT #: S\SBTELE\484KT2\484KT2TestReport.doc

Page 18 of 19

	<b>DEVICE</b>	<b>MFGR</b>	<b>MODEL</b>	<b>SERNO</b>	<b>CAL/CHAR DATE</b>	<b>DUE DATE or STATUS</b>
	Coaxial Cable #64	Semflex Inc.	60637	Timco #64	CHAR 1/24/02	1/24/03
	Coaxial Cable #65	General Cable Co.	E9917 RG233/U	Timco #65	CHAR 1/23/02	1/23/03
	Coaxial Cable #106	Unknown	Unknown	Timco #106	CHAR 1/23/02	1/23/03

APPLICANT: SB TELCOM CO., LTD.

FCC ID: OTVATT701

REPORT #: S\SBTELE\484KT2\484KT2TestReport.doc