

TABLE OF CONTENTS LIST

APPLICANT: WELL TOUCH ELECTRONIC LTD.

FCC ID: P5C29010864H

TEST REPORT:

PAGE	1.....COVER SHEET - GENERAL INFORMATION & TECHNICAL DESCR.
PAGE	2.....TECHNICAL DESCRIPTION CONTINUED & RF POWER OUTPUT
PAGE	3.....MODULATION CHARACTERISTICS AND OCCUPIED BANDWIDTH
PAGE	4.....AUDIO FREQUENCY RESPONSE GRAPH
PAGE	5.....MODULATION LIMITING GRAPH - 300Hz
PAGE	6.....MODULATION LIMITING GRAPH - 1000Hz
PAGE	7.....MODULATION LIMITING GRAPH - 3000Hz
PAGE	8.....AUDIO LOW PASS FILTER GRAPH
PAGE	9.....METHOD OF MEASURING OCCUPIED BANDWIDTH
PAGE	10.....OCCUPIED BANDWIDTH PLOT
PAGE	11.....OCCUPIED BANDWIDTH PLOT - CW
PAGE	12.....FIELD STRENGTH OF SPURIOUS EMISSIONS
PAGE	13.....METHOD OF MEASURING RADIATED SPURIOUS EMISSIONS
PAGE	14.....FREQUENCY STABILITY
PAGE	15.....LIST OF TEST EQUIPMENT

EXHIBITS CONTAINING:

EXHIBIT	1.....FCC ID LABEL SAMPLE
EXHIBIT	2.....SKETCH OF FCC ID LABEL LOCATION
EXHIBIT	3.....BLOCK DIAGRAM
EXHIBIT	4.....SCHEMATIC
EXHIBIT	5.....USERS MANUAL
EXHIBIT	6A.....EXTERNAL PHOTO - FRONT VIEW
EXHIBIT	6B.....EXTERNAL PHOTO - REAR VIEW
EXHIBIT	6C.....INTERNAL PHOTO - COMPONENT & COPPER VIEW - 1
EXHIBIT	6D.....INTERNAL PHOTO - COMPONENT & COPPER VIEW - 2
EXHIBIT	6E.....EXTERNAL PHOTO - TOP VIEW
EXHIBIT	7.....TUNING PROCEDURE
EXHIBIT	8.....CIRCUIT DESCRIPTION
EXHIBIT	9.....TEST SET UP PHOTO

APPLICANT: WELL TOUCH ELECTRONIC LTD.

FCC ID: P5C29010864H

REPORT #: W\WTOUCH\610AVH01\610AVH01RPT.doc

PAGE: TABLE OF CONTENTS

GENERAL_INFORMATION_REQUIRED
FOR_TYPE_ACCEPTANCE

2.1033(c)(1)(2)WELL TOUCH ELECTRONIC LTD.will manufacture the
FCCID: P5C29010864H FAMILY RADIO SERVICES 14 CHANNEL
TRANSCIEVER in quantity, for use under FCC RULES
PART 95. The UUT is a PTT Radio with a maximum duty
cycle of 50%.

WELL TOUCH ELECTRONIC LTD.
BLOCK I, 13/F., HING WIN FACTORY BUILDING
110 HOW MING ST., KWUN TONG KOWLOON HONG KONG

2.1033 (c) TECHNICAL_DESCRIPTION

2.1033(c)(3) Instruction book. A draft copy of the instruction manual is included as EXHIBIT 5 .

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

$$\begin{aligned} B_n &= 2M + 2DK \\ M &= 3000 \\ D &= 2.0K \\ B_n &= 2(3.0) + 2(3.0) = 12.0K \end{aligned}$$

Authorized Bandwidth 12.5kHz

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 0.500 watts effective
95.639 radiated power. There can be no provisions for
95.649 increasing the power or varing the power.

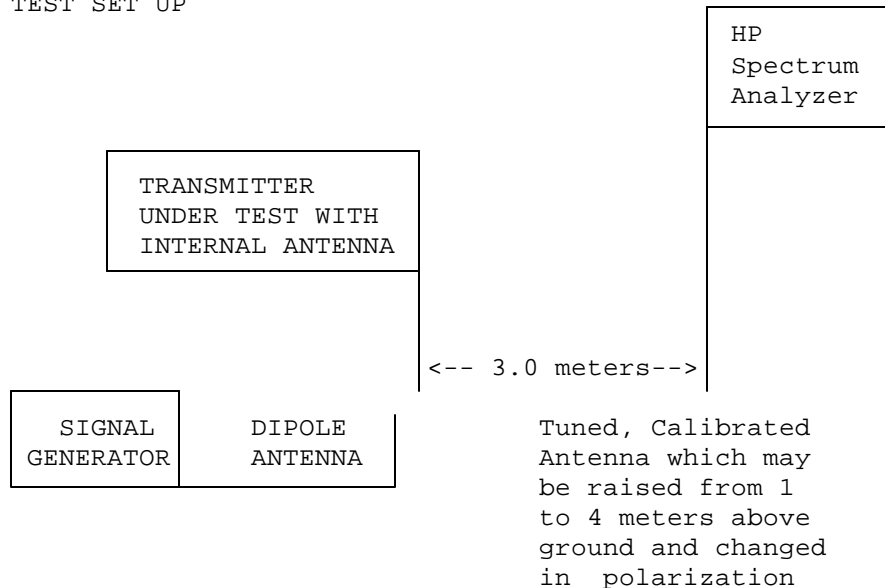
95.647 The antenna is an intergral part to the unit, it cannot be removed without rendering the unit inoperative. In order to remove the antenna the case must unscrewed, then the PCB assemblies must be removed then the antenna can be removed.

2.1033(c)(8) DC Voltages and Current into Final Amplifier:
FINAL AMPLIFIER ONLY
Vce = 6.0 Volts DC Ice = 0.190A.
Pin = 1.14 Watts

- 2.1033(c)(9) Tune-up procedure. The tune-up procedure is included as Exhibit # 7.
- 2.1033(c)(10) Complete Circuit Diagrams: The circuit diagram is included as EXHIBIT 4 of this report. The block diagram is included as EXHIBIT 3.
- 2.1033(c)(11) A photograph or a drawing of the equipment identification label is included as EXHIBIT 1.
- 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 6A-6D.
- 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 = 36 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 as page 4 of the report. 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

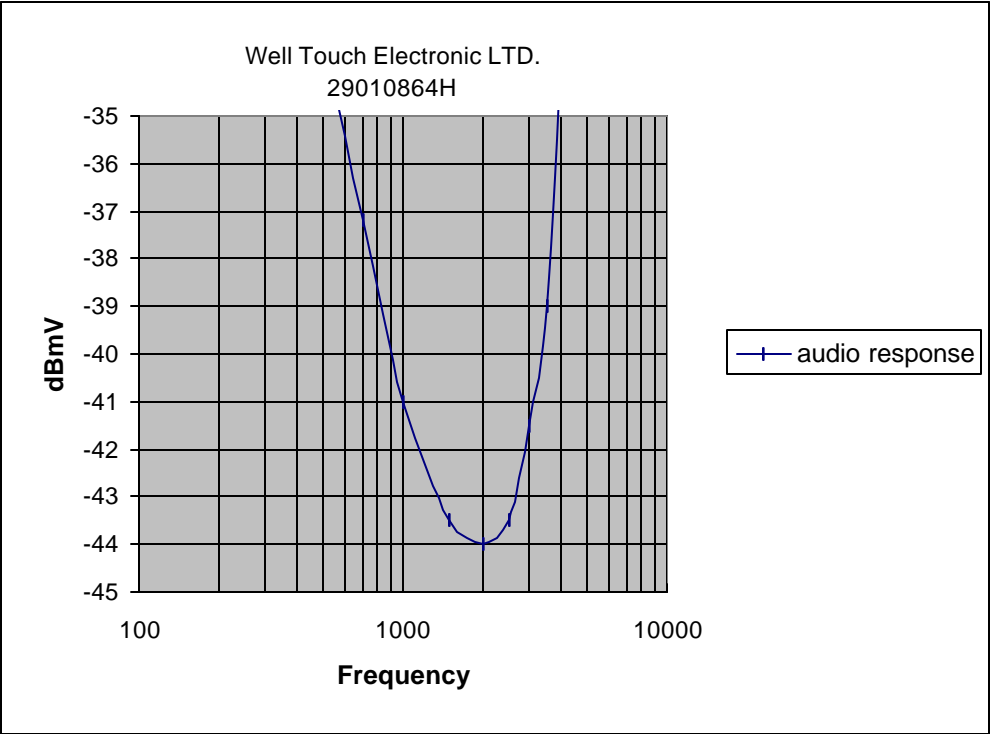
The audio input level needed for a particular percentage of modulation was measured in accordance with TIA/EIA Specification 603. The audio input curves versus modulation are shown as pages 5-7 of the report. Curves are provided for audio input frequencies of 300, 1000, and 3000 Hz.

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 as page 8 of the report.

2.989(c) EMISSION BANDWIDTH:
95.633(c)

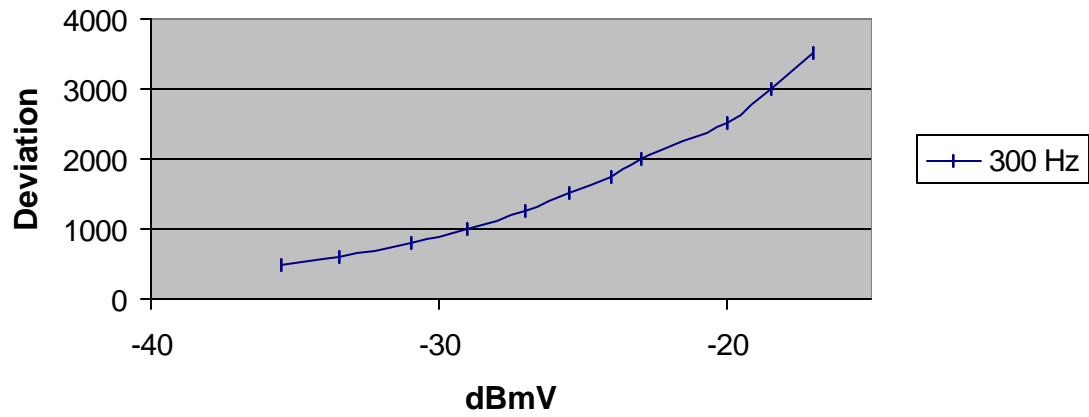
Data in the plots shows that the sidebands from greater than 50% to 100% of the authorized bandwidth must be attenuated by at least 25dB and from 100 to 250% the sidebands must be attenuated by at least 35dB. Beyond 250% the sidebands must be attenuated by at least $43 + \log_{10}(TP)$. The transmitter 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 as page 10-11 of the report.

APPLICANT: WELL TOUCH ELECTRONIC LTD.
FCC ID: P5C29010864H
REPORT #: W\WTOUCH\610AVH01\610AVH01RPT.doc
PAGE #: 3



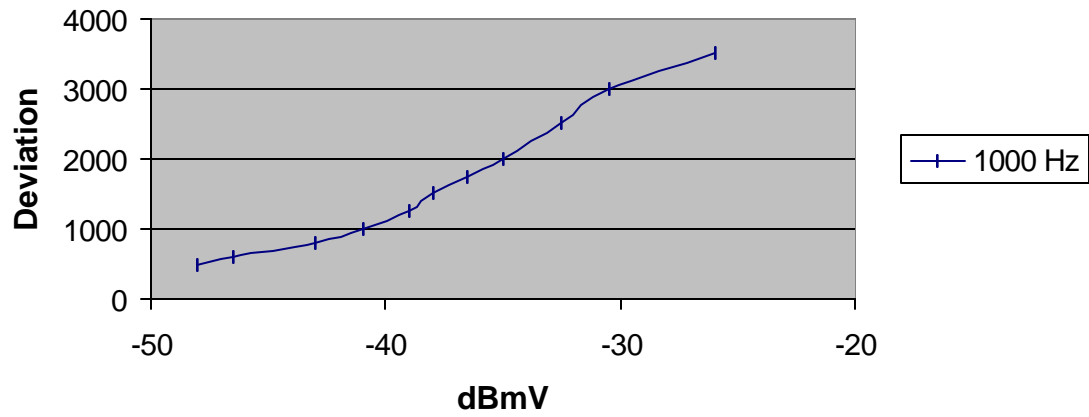
WELLTOUCH ELECTRONIC
FCC ID : P5C29010864H
JOB : 610AVH01

Modulation Limiting
Well Touch Electronic LTD.
29010864H



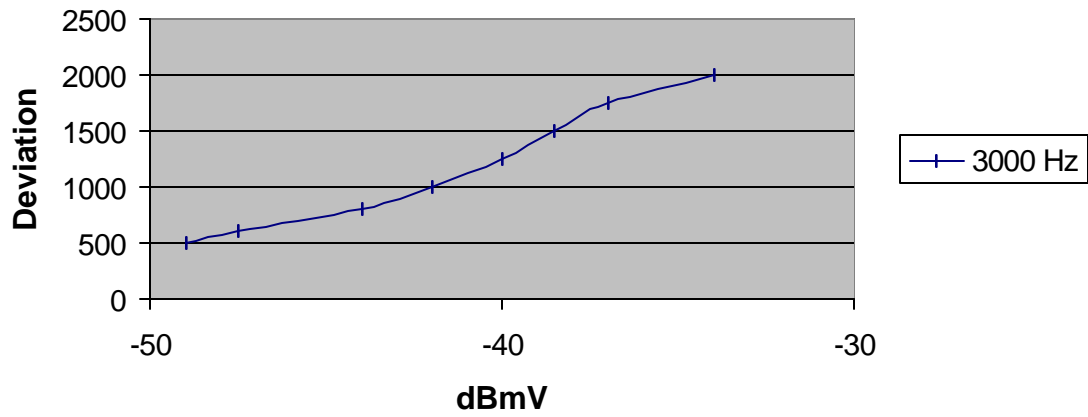
WELLTOUCH ELECTRONIC
FCC ID : P5C29010864H
JOB : 610AVH01

Modulation Limiting
Well Touch Electronic LTD.
29010864H



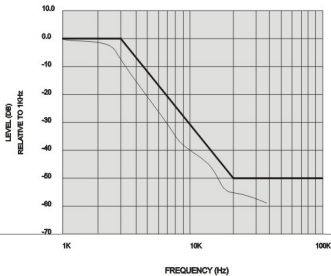
WELLTOUCH ELECTRONIC
FCC ID : P5C29010864H
JOB : 610AVH01

Modulation Limiting
Well Touch Electronic LTD.
29010864H



WELLTOUCH ELECTRONIC
FCC ID : P5C29010864H
JOB : 610AVH01

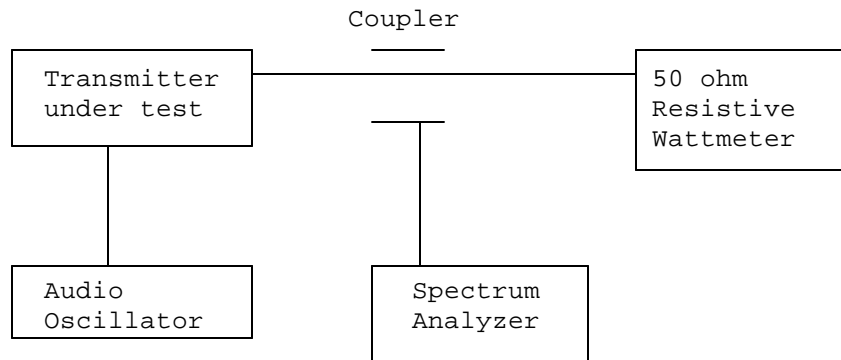
FREQUENCY RESPONSE OF AUDIO LOW PASS FILTER



Radiotelephone transmitter with modulation limiter.

Test procedure diagram

OCCUPIED BANDWIDTH MEASUREMENT

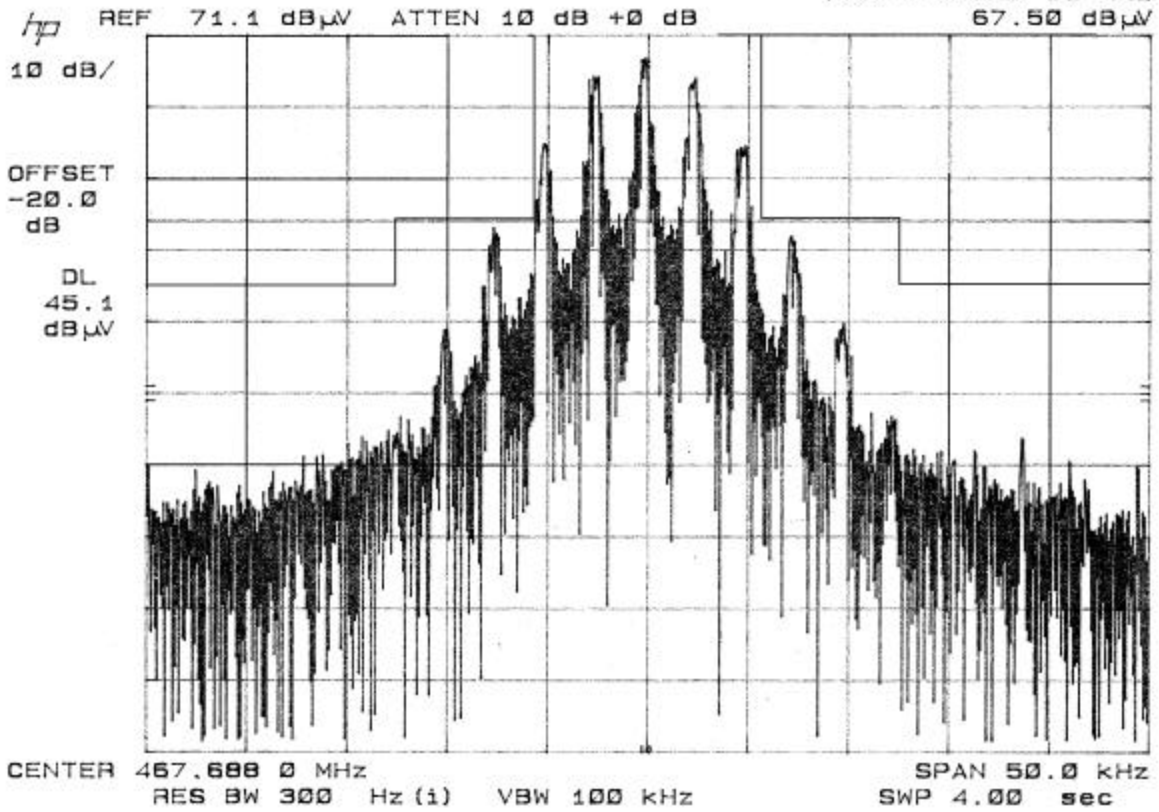


APPLICANT: WELL TOUCH ELECTRONIC LTD.
FCC ID: P5C29010864H
REPORT #: W\WTOUCH\610AVH01\610AVH01RPT.doc
PAGE #: 9

WELLTOUCH ELECTRONIC
FCC ID : P5C29010864H
JOB : 610AVH01
PAGE # : 10

WELLTOUCH ELECTRONIC OCCUPIED BANDWIDTH PLOT

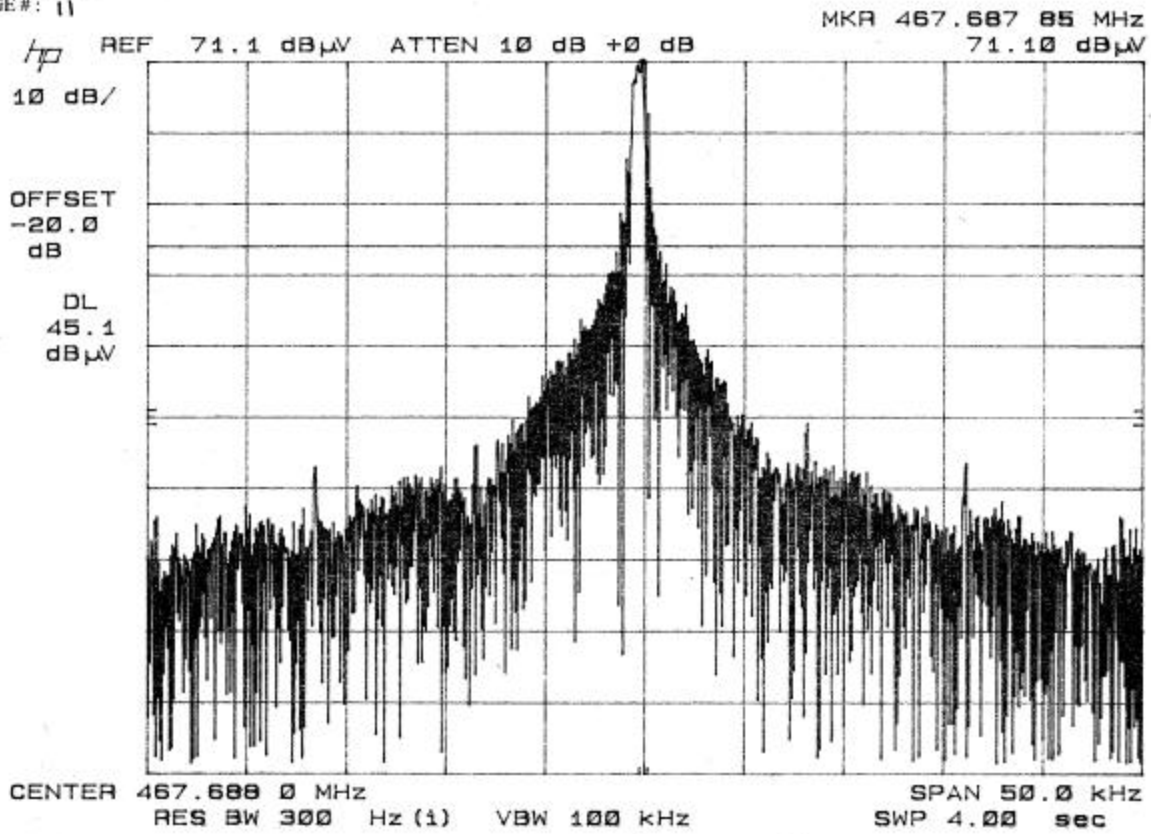
MKR 467.687 85 MHz
67.50 dB μ V



WELLTOUCH ELECTRONIC
FCC ID: P5C29010864H
JOB: 610AVH01
PAGE#: 11

WELLTOUCH ELECTRONIC

OCCUPIED BANDWIDTH PLOT - CW



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.

$$43 + 10\log(TP) = 43 + 10\log(.036) = 28.60 \text{ dB}$$

TEST DATA:

Tuned Frequency MHz	Emission Frequency MHz	Attn. dBc	Margin dB
462.6	462.60	00.00	00.00
462.6	925.30	44.51	15.91
462.6	1,388.00	38.27	9.67
462.6	1,850.60	44.10	15.50
462.6	2,313.30	46.72	18.12
462.6	2,775.90	63.50	34.90
462.6	3,238.60	63.26	34.66
462.6	3,701.30	56.78	28.18
462.6	4,163.90	58.13	29.53
462.6	4,626.60	59.17	30.57

$$\text{MARGIN} = (\text{Field strength of Fund} - 28.60\text{dB}) - \text{FS OF EMISSION}$$

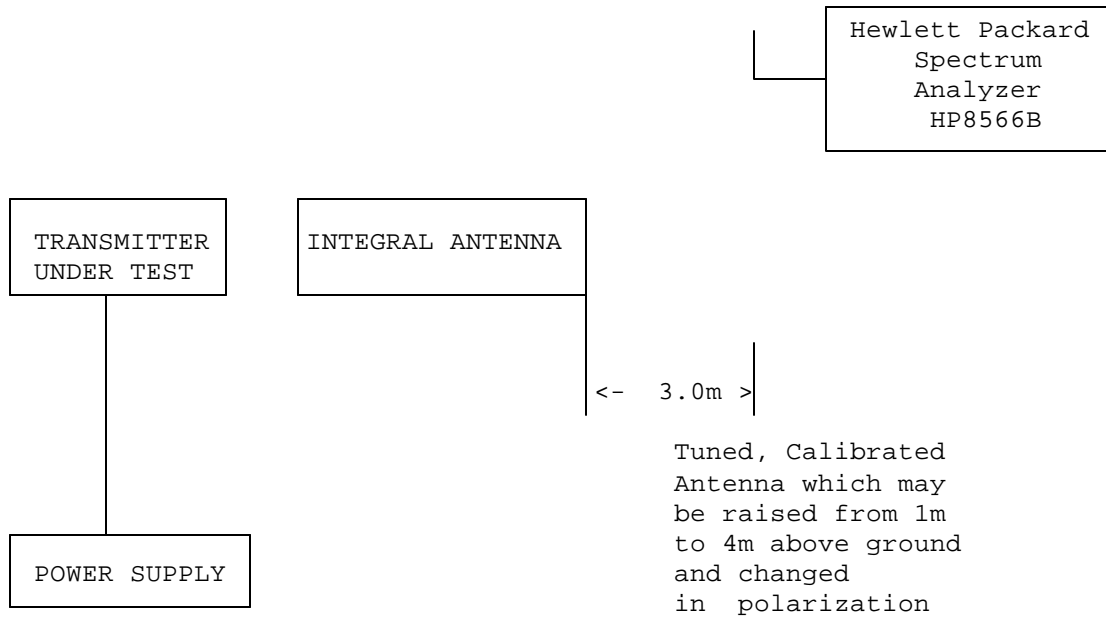
METHOD OF MEASUREMENT: The tabulated data shows the results of the radiated field strength of emissions test. The spectrum was scanned from 30 to at least the tenth harmonic of the fundamental. This test was conducted per TIA/EIA STANDARD 603 using the substitution method. Measurements were made at the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

APPLICANT: WELL TOUCH ELECTRONIC LTD.
FCC ID: P5C29010864H
REPORT #: W\WTOUCH\610AVH01\610AVH01RPT.doc
PAGE #: 12

2.1053
95.635

UNWANTED_RADIATION:

Method of Measuring Radiated Spurious Emissions



Equipment placed 80cm above ground
on a rotatable platform.

APPLICANT: WELL TOUCH ELECTRONIC LTD.
FCC ID: P5C29010864H
REPORT #: W\WTOUCH\610AVH01\610AVH01RPT.doc
PAGE #: 13

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 plus and minus 15% of the battery voltage of 6 VDC.

MEASUREMENT DATA:

Assigned Frequency (Ref. Frequency): 467.562 786

TEMPERATURE_C	FREQUENCY_MHz	PPM
REFERENCE_____	462.562 768	00.00
-20_____	462.561 721	-2.26
-10_____	462.563 208	0.95
0_____	462.563 843	2.32
+10_____	462.563 836	2.31
+20_____	462.563 432	1.44
+30_____	462.562 862	0.20
+40_____	462.562 385	-0.83
+50_____	462.562 325	-0.96
BATT. End-Point 5.1V/dc	462.562 786	0.04
BATT. 6.9V/dc	462.562 740	-0.06

RESULTS OF MEASUREMENTS: The maximum frequency variation over the temperature range was -2.26 to 2.32 ppm. The maximum frequency variation with voltage was -0.06 ppm.

APPLICANT: WELL TOUCH ELECTRONIC LTD.
FCC ID: P5C29010864H
REPORT #: W\WTOUCH\610AVH01\610AVH01RPT.doc
PAGE #: 14

APPLICANT: WELL TOUCH ELECTRONIC LTD.

FCC ID: P5C29010864H

TEST EQUIPMENT LIST

1. 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. 8/31/01 Due 8/31/02
2. 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. X 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. 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. 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. 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

APPLICANT: WELL TOUCH ELECTRONIC LTD.

FCC ID: P5C29010864H

REPORT #: W\WTOUCH\610AVH01\610AVH01RPT.doc

PAGE #: 15

