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APPLICANT: TELSON INFORMATION & COMMUNICATIONS CO., LTD.

FCC ID: OBATF-400

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GENERAL_INFORMATION_REQUIRED
FOR_TYPE_ACCEPTANCE

- 2.983 (a,b,c) TELSON INFORMATION & COMMUNICATIONS CO., LTD.
will manufacture the FCC ID: OBATF-400 FAMILY
RADIO SERVICES FOURTEEN CHANNEL TRANSCEIVER in
quantity, for use under FCC RULES PART 95.
- 2.983 (d) TECHNICAL_DESCRIPTION
- 2.983 (d) (1) Type of Emission: 10K4F3E
95.629
 $B_n = 2M + 2DK$
 $M = 3000$
 $D = 2.4K$
 $B_n = 2(3.0) + 2(2.2) = 10.4K$

Authorized Bandwidth 12.5KHz
- 2.983 (d) (2) 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
- 2.983 (d) (3) Power Output shall not exceed 0.500Watts effective
95.637 radiated power. There can be no provisions for
95.647 increasing the power.
- 2.983 (d) (4) Maximum Output Power Rating: 475 milliWatts
95.637 effective radiated power.
- 95.645 The antenna is an intergral part to the unit, it cannot
be removed without rendering the unit inoperative.
- 2.983 (d) (5) DC Voltages and Current into Final Amplifier:

FINAL AMPLIFIER ONLY
 $V_{ce} = 5.9 \text{ Volts DC}$ $I_{ce} = 0.13A.$
 $P_{in} = 0.79 \text{ Watts}$
- 2.983 (d) (6) Function of each electron tube or
semiconductor device or other active circuit device:

SEE EXHIBIT 6.

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- 2.983(d) (7) Complete Circuit Diagrams: The circuit diagram is included as EXHIBITS 5A-5B of this report. The block diagram is included as EXHIBIT 4 of this report.
- 2.983(d) (8) Instruction book. A draft copy of the instruction manual is included as EXHIBITS 8A-8F.
- 2.983 (d) (9) Tune-up procedure. The tune-up procedure is included INCLUDED IN USER'S MANUAL.
- (10) Description of all circuitry and devices provided for determining and stabilizing frequency is given in INCLUDED IN USER'S MANUAL. The crystal specifications are included as PAGES NA.
- 2.983 (d)(11) Description of any circuits or devices employed for suppression of spurious radiation, for limiting modulation, and for limiting power will be INCLUDED IN USER'S MANUAL.
- (12) Digital modulation. This unit does not use digital modulation.
- 2.983(e) The data required by 2.985 through 2.997 is submitted below.

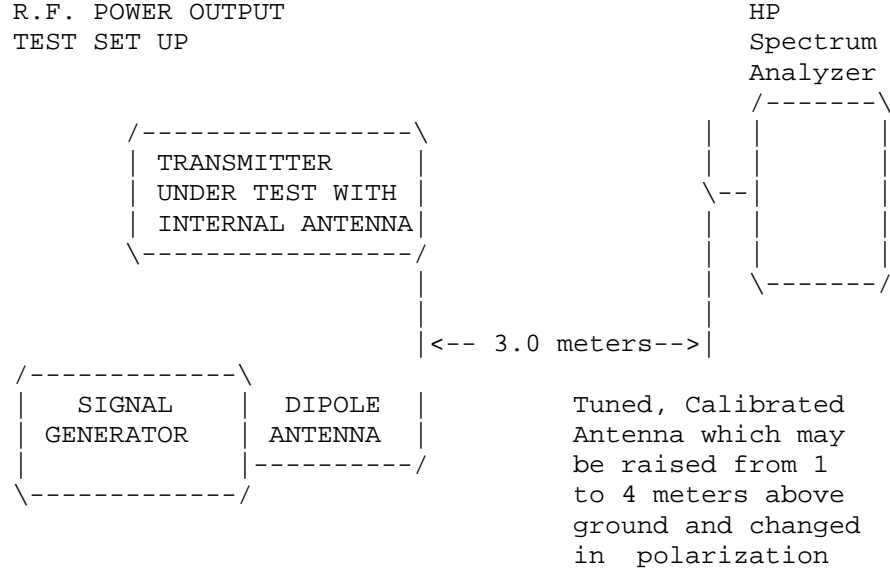
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2.985(a) RF_power_output.

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

MEASURED POWER OUTPUT = 475 milliWatts ERP

R.F. POWER OUTPUT
TEST SET UP



Equipment placed 1 meter above ground
on a rotatable platform.

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2.987(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 the next page. 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.

2.987(b) 1 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 on the following pages. Curves are provided for audio input frequencies of 300, 1000, and 3000 Hz.

95.635(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 Exhibit 11.

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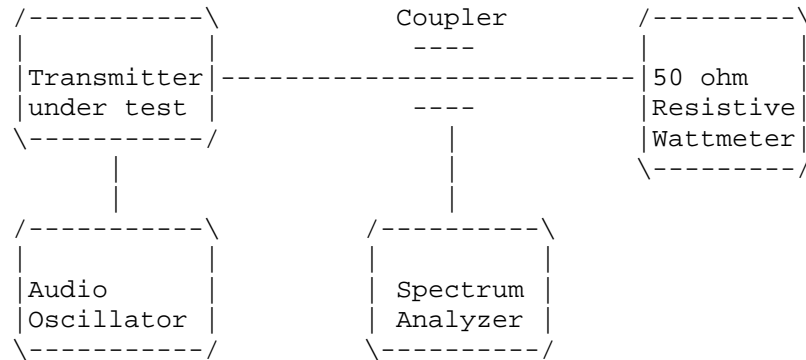
2.989(c) EMISSION BANDWIDTH:
95.633(b)(1)(3)(7)

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 and occupied bandwidth PLOTS follow.

Radiotelephone transmitter with modulation limiter.

Test procedure diagram

OCCUPIED BANDWIDTH MEASUREMENT



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2.991 Not Applicable, no antenna terminal allowed.

2.993(a)(b) UNWANTED_RADIATION:
 95.635(b)(7)

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

$$43 + 10\log(TP) = 43 + 10\log(0.5) = 40.00\text{dB}$$

EMISSION FREQUENCY MHz	METER READING @3m dBuV	COAX LOSS dB	A.C.F. dB	AVERAGE FIELD STRENGTH dBuV/m@3m	ATT. dB	MARGIN dB	ANT. POL.
467.58	104.10	1.60	18.55	124.25	0.00	0.00	V
935.16	40.20	2.90	24.18	67.28	56.97	16.97	V
1402.74R	36.10	1.00	25.61	62.71	61.54	21.54	V
1870.32	28.60	1.01	27.48	57.09	67.16	27.16	V
2337.90R	34.20	1.08	28.84	64.13	60.12	20.12	V
2805.48R	40.40	1.15	30.01	71.56	52.69	12.69	V
3273.06	37.40	1.22	31.18	69.80	54.45	14.45	V
3740.64R	36.80	1.29	32.35	70.44	53.81	13.81	V
4208.22R	31.00	1.36	33.23	65.60	58.65	18.65	V
4675.80R	22.10	1.43	33.76	57.29	66.96	26.96	V

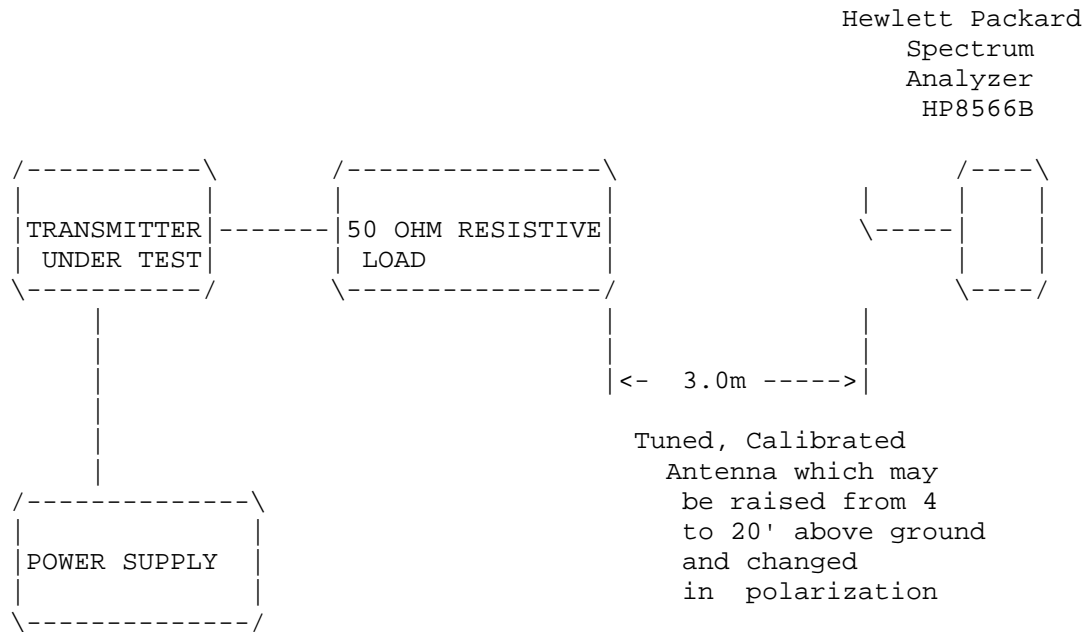
MARGIN = (Field strength of Fund - 40dB) - FS OF EMISSION

METHOD OF MEASUREMENT: The procedure used was C63.4-1992 for inten-
 tional radiators. The spectrum was scanned from 30 to at least the
 tenth harmonic of the fundamental using a HP model 8566B spectrum
 analyzer, an Eaton model 94455-1 Biconical Antenna, ElectroMetrics
 antennas models TDA, TDS-25-1, TDS-25-2 and RGA-180. Measurements were
 made at the open field test site of TIMCO ENGINEERING INC. located at
 6051 N.W. 19th Lane, Gainesville, FL. 32605.

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2.993(a)(b) UNWANTED_RADIATION:
95.631(b)(8)(9)

Method of Measuring Radiated Spurious Emissions



Equipment placed 4' above ground
on a rotatable platform.

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2.995(a)(b)(d) 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 6.0VDC.

MEASUREMENT DATA:

Assigned Frequency (Ref. Frequency): 462.562 500

TEMPERATURE_C	FREQUENCY_MHz	PPM
REFERENCE_____	462.562 500	00.00
-20_____	462.561 670	-1.79
-10_____	462.563 000	+1.08
0_____	462.563 400	+1.95
+10_____	462.563 220	+1.55
+20_____	462.562 890	+0.84
+30_____	462.562 200	-0.65
+40_____	462.562 150	-0.76
+50_____	462.561 890	-0.90
20c BATT. End-Point 4.5V/dc	462.562 100	-0.86

RESULTS OF MEASUREMENTS: The maximum frequency variation over the temperature range was 1.95 to -1.79 ppm. The maximum frequency variation with voltage was -0.86ppm.

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2.983(f) Photo_or_Drawing_of_Label:
See EXHIBIT 2.

2.983(g) Photos_of_Equipment:
See EXHIBITS 3A-3F.

2.999 Measurement_Procedures_for_Type_Acceptance:

Measurement techniques have been in accordance
with EIA specifications and the FCC requirements.

2.909 Certification_of_Technical_Data_by_Engineers

We, the undersigned, certify that the enclosed
measurements and enclosed data are true and
correct.

S.S. Sanders__
S.S. Sanders
Engineer

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LIST_OF_TEST_EQUIPMENT

1. Spectrum Analyzer: Hewlett Packard 8566B - Opt 462, w/
preselector 85685A, & Quasi-Peak Adapter HP 85650A, & HP
8449B - OPT H02 Cal. 6/26/98
2. Signal Generator, Hewlett Packard 8640B, cal. 10/1/98
3. Eaton Biconnical Antenna Model 94455-1
20-200 MHz Serial No. 0997 Cal. 5/15/98
4. Electro-Metric Dipole Kit, 20-1000 MHz, Model TDA-30 10/15/98
5. Electro-Metric Horn 1-18 GHz, Model RGA-180, Cal. 8/15/98
6. Electro-Metric Antennas Model TDS-25-1, TDS-25-2, 5/15/97
7. Electro-Metric Line Impedance Stabilization Network Model
No. EM-7821, Serial No. 101; 100KHz-30MHz 50uH. 12/3/97
8. Electro-Metric Line Impedance Stabilization Network Model
No. EM-7820, Serial No. 2682; 10KHz-30MHz 50uH. 12/3/97
9. Special low loss cable was used above 1 GHz
10. Tenney Temperature Chamber

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