

FCC TEST REPORT

for

Part 15, Subpart C

Equipment : TRANSMITTER

Model No. : TR-001

FCC ID : PAGTR-001

Filing Type : Original Grant

Applicant : **KAB ENTERPRISE CO., LTD.**
21-1 Fl., No. 33, Sec. 1, Min Sheng Rd., Panchiao City,
Taipei Hsien, Taiwan, 220 R.O.C.

- The test result refers exclusively to the test presented test model / sample.
- Without the written authorization of the test lab., the Test Report may not be copied.
- **Certificate or Test Report must not be used by the applicant to claim the product in this test report endorsement by NVLAP or any agency of U.S. government.**

SPORTON International Inc.

6F, No.106, Sec. 1, Hsin Tai Wu Rd., Hsi Chih, Taipei Hsien, Taiwan, R.O.C.

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CERTIFICATE OF COMPLIANCE

for

FCC Part 15, Subpart C

Equipment : TRANSMITTER

Model No. : TR-001

FCC ID : PAGTR-001

Applicant : **KAB ENTERPRISE CO., LTD.**
21-1 Fl., No. 33, Sec. 1, Min Sheng Rd., Panchiao City,
Taipei Hsien, Taiwan, 220 R.O.C.

I HEREBY CERTIFY THAT :

The measurements shown in this test report were made in accordance with the procedures given in **ANSI C63.4 - 1992** and the energy emitted by this equipment was **passed** both radiated and conducted emission limits. Testing was carried out on Jul. 3, 2000 at **SPORTON International Inc.** LAB. in Lin Kou.

Lenore Chang
President

SPORTON International Inc.

6F, No.106, Sec. 1, Hsin Tai Wu Rd., Hsi Chih, Taipei Hsien, Taiwan, R.O.C.

1. General Description of Equipment under Test0

1.1. Applicant

KAB ENTERPRISE CO., LTD.
21-1 Fl., No. 33, Sec. 1, Min Sheng Rd., Panchiao City,
Taipei Hsien, Taiwan, 220 R.O.C.

1.2. Manufacturer

Same as 1.1.

1.3. Basic Description of Equipment under Test

Equipment	: TRANSMITTER
Model No.	: TR-001
FCC ID	: PAGTR-001
Trade Name	: KAB
Power Supply Type	: from battery
Power Cord	: N/A

1.4. Feature of Equipment under Test

Frequency • 315MHz +/- 1%
Transmitter Power Input • DC 12V Battery

2. Test Configuration of Equipment under Test

2.1. Test Manner

- a. The EUT has been tested pursuant to ANSI C63.4-1992 and configuration operated in a manner which tended to maximize its emission characteristics in a typical application.
- b. The Dummy Load was connected to the Receiver for EMI test.
- c. Frequency range investigated: conduction 450 KHz to 30 MHz, radiation 30 MHz to 3,200 MHz.
- d. The radiated emissions testing was made by rotating three orthogonal axes.(Normal mode, Horizontal mode, Vertical mode) The emission of fundamental frequency for Normal mode is generated the worst one. We made report based on the test data at this mode.
- e. Pursuant to 15.231(c) of Part 15. Subpart C, the bandwidth of the emission at the 20dB point shall be no wider than 0.25% of the center frequency for EUT.

The carrier frequency of EUT is 315MHz
 $315\text{MHz} \times 0.25\% = 787.5\text{KHz}.$

The test result is 535KHz (as shown in section 2.4 of this test report), which is less than 787.5KHz.
The EUT meet the 20dB point bandwidth requirement.

2.2. Description of Test System

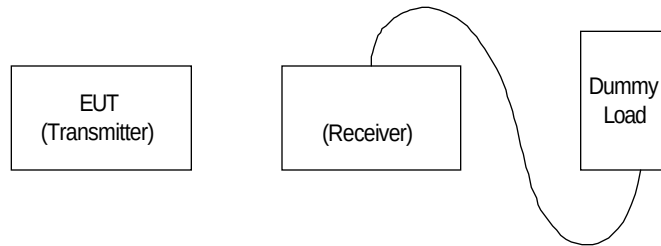
Support Unit 1. -- Dummy Load

Model No. : 1875W•Bulb•

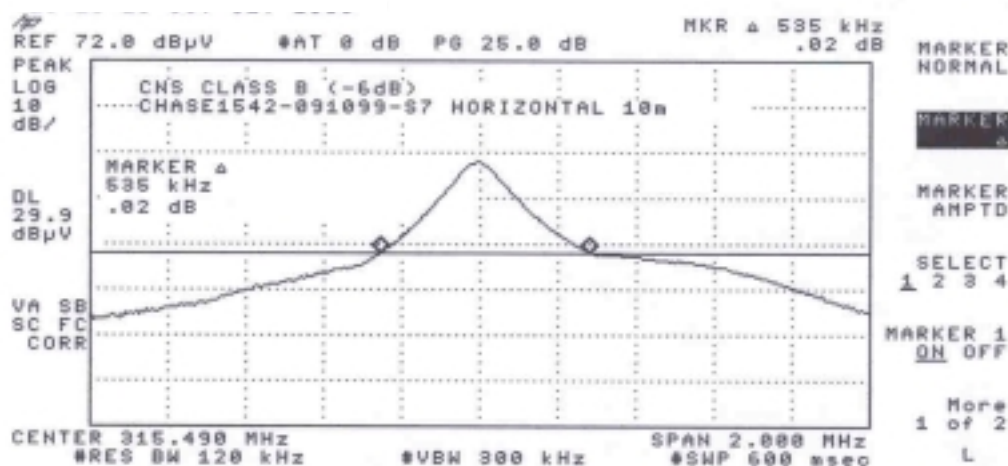
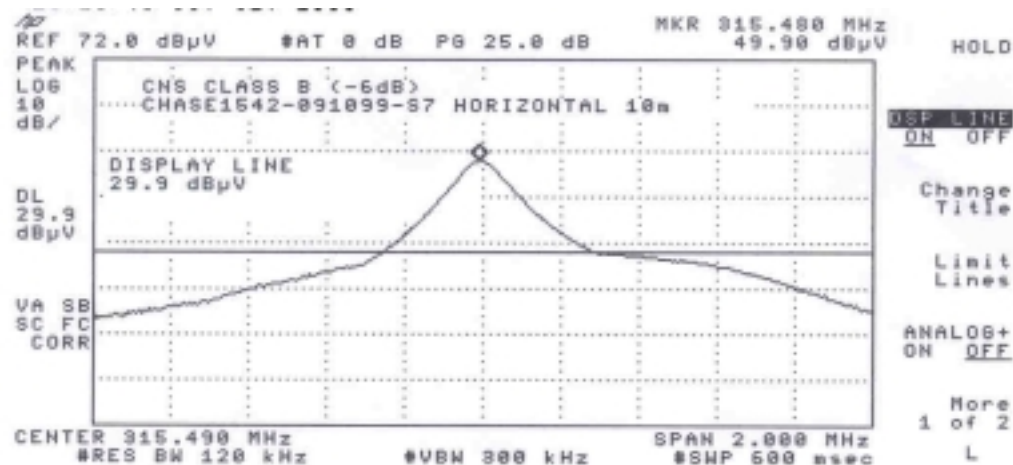
Support Unit 2. – Receiver (KAB)

Model No. : RC-002

2.3. Connection Diagram of Test System



2.4. Connection Diagram of Test System



3. Test Software

No test software was used during testing.

4. General Information of Test

4.1. Test Facility

This test was carried out by SPORTON International Inc.

Test Site Location : No. 30-2, Lin 6, Diing-Fwu Tsuen, Lin-Kou-Hsiang,
Taipei Hsien, Taiwan, R.O.C.

TEL : 886-2-2601-1640

FAX : 886-2-2601-1695

4.2. Standard for Methods of Measurement

ANSI C63.4-1992

4.3. Test in Compliance with

FCC Part 15, Subpart C

4.4. Frequency Range Investigated

- a. Conduction: from 450 kHz to 30 MHz
- b. Radiation : from 30 MHz to 3,200 MHz

4.5. Test Distance

The test distance of radiated emission from antenna to EUT is 3 M.

5. Test of Conducted Powerline

The power supply of the EUT is from battery.

So Conducted Powerline test is not applicable to this equipment.

6. Test of Radiated Emission

Radiated emissions from 30 MHz to 3,200 MHz were measured with a bandwidth of 120 kHz according to the methods defines in ANSI C63.4-1992. The EUT was placed on a nonmetallic stand in the open-field site, 0.8 meter above the ground plane, as shown in section 6.3. The interface cables and equipment positions were varied within limits of reasonable applications to determine the positions producing maximum radiated emissions.

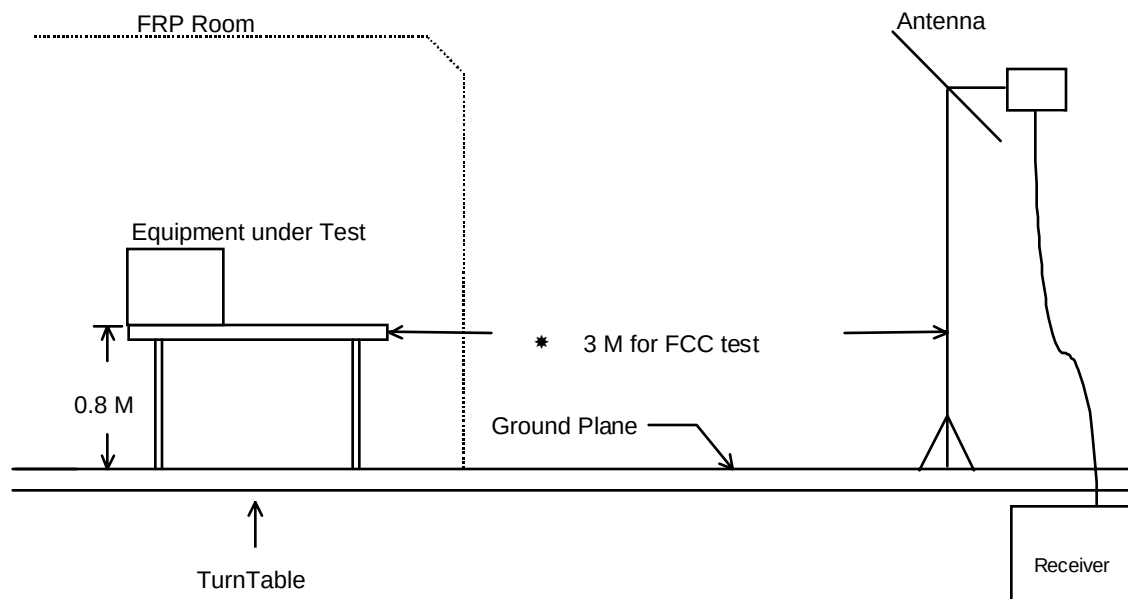
6.1. Major Measuring Instruments

Amplifier	(HP 87405A)
Attenuation	0 dB
RF Gain	25 dB
Signal Input	0.1 MHz to 3 GHz
Spectrum Analyzer	(8560E)
Attenuation	0 dB
Start Frequency	30 MHz
Stop Frequency	1,000 MHz
Resolution Bandwidth	1 MHz
Video Bandwidth	1 MHz
Signal Input	30 KHz to 2.8 GHz
Receiver	(8546A)
Attenuation	0 dB
Start Frequency	30 MHz
Stop Frequency	6,500 MHz
Resolution Bandwidth	1 MHz
Video Bandwidth	1 MHz
Signal Input	9 KHz to 6.5 GHz

6.2. Test Procedures

- a. The EUT was placed on a rotatable table top 0.8 meter above ground.
- b. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
- c. The table was rotated 360 degrees to determine the position of the highest radiation.
- d. The antenna is a half wave dipole and its height is varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna are set to make the measurement.
- e. For each suspected emission the EUT was arranged to its worst case and then tune the antenna tower (from 1 M to 4 M) and turn table (from 0 degree to 360 degrees) to find the maximum reading.
- f. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.
- g. If the emission level of the EUT in peak mode was 6 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 6 dB margin will be repeated one by one using the quasi-peak method and reported.

6.3. Typical Test Setup Layout of Radiated Emission



6.4. Test Result of Radiated Emission

6.4.1. Frequency Range of Test : from 30 MHz to 1,000 MHz

- Test Distance : 3 M
- Temperature : 30°C
- Relative Humidity : 55 %
- Test Date : Jul. 3, 2000
- Test Mode : Normal Mode •see 2.1d for details •
- Emission level (dBuV/m) = 20 log Emission level (uV/m)
- Corrected Reading : Antenna Factor + Cable Loss + Reading = Emission

Pursuant to 15.231 (b) (2) of part 15, Subpart C, the compliance with the limits was based on the use of measurement instrumentation with a CISPR quasi-peak detector.

The Radiated Emission test was passed at minimum margin

302.40 MHz / 42.77 dBuV (HORIZONTAL) Antenna Height 1.2 Meter, Turntable Degree 40 °.

Frequency (MHz)	Antenna Polarity •	Cable Factor (dB/m)	Loss (dB)	Reading (dBuV)	Limits (dBuV/m)	Emission (uV/m)	Level (dBuV/m)	MARGIN (uV/m)	(dB)
47.50	V	12.28	0.83	12.68	40.00	100	25.79	19.48	-14.21
297.60	V	13.78	2.48	21.62	46.00	200	37.88	37.88	-8.12
593.60	V	19.06	3.59	8.68	46.00	200	31.33	36.86	-14.67
302.40	H	13.88	2.50	26.39	46.00	200	42.77	137.56	-3.23
592.80	H	19.06	3.58	9.51	46.00	200	32.15	40.50	-13.85
616.80	H	19.35	3.61	7.34	46.00	200	30.30	32.73	-15.70

Fundamental Frequency and Spurious Emissions :

Frequency (MHz)	Antenna Polarity •	Cable Factor (dB/m)	Loss (dB)	Reading (dBuV)	Limits (dBuV/m)	Emission (uV/m)	Level (dBuV/m)	MARGIN (uV/m)	(dB)	Remarks •
315.00	V	14.37	2.50	22.64	74.22	5140	39.51	94.51	-34.71	Fundamental
630.00	V	19.51	3.56	-9.99	62.00	1259	13.08	4.51	-48.92	Spurious
945.00	V	21.75	4.84	-16.26	62.00	1259	10.33	3.28	-51.67	Spurious
315.00	H	14.37	2.50	37.58	74.22	5140	54.45	527.84	-19.77	Fundamental
630.00	H	19.51	3.56	-6.14	62.00	1259	16.93	7.02	-45.07	Spurious
945.00	H	21.75	4.84	-8.16	62.00	1259	18.43	8.35	-43.57	Spurious

6.4.2. Frequency Range of Test : from 1,000 MHz to 3,200 MHz

Frequency (MHz)	Polarity •	Antenna Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Limits (dBuV/m)	Emission (uV/m)	Level (dBuV/m)	Margin (uV/m)	(dB)
1259.60	H	24.87	4.57	17.47	62.00	1259	46.91	221.56	-15.09
1574.20	H	25.85	5.12	18.84	62.00	1259	49.81	309.39	-12.19
1888.80	H	27.47	5.62	18.33	62.00	1259	51.42	372.39	-10.58
2203.40	H	28.60	6.09	18.87	62.00	1259	53.56	476.43	-8.44
2518.00	H	29.33	6.53	18.13	62.00	1259	53.99	500.61	-8.01
2834.80	H	29.97	6.97	18.81	62.00	1259	55.75	613.06	-6.25
3149.40	H	30.58	7.41	18.40	62.00	1259	56.39	659.93	-5.61

Frequency (MHz)	Polarity •	Antenna Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Limits (dBuV/m)	Emission (uV/m)	Level (dBuV/m)	Margin (uV/m)	(dB)
1264.00	V	24.91	4.58	18.26	62.00	1259	47.75	244.06	-14.25
1574.20	V	25.85	5.12	18.44	62.00	1259	49.41	295.46	-12.59
1888.80	V	27.47	5.62	18.05	62.00	1259	51.14	360.58	-10.86
2205.60	V	28.60	6.09	18.36	62.00	1259	53.05	449.26	-8.95
2520.20	V	29.33	6.53	18.58	62.00	1259	54.44	527.23	-7.56
2834.80	V	29.97	6.97	19.37	62.00	1259	56.31	653.88	-5.69
3151.60	V	30.61	7.41	18.49	62.00	1259	56.51	669.11	-5.49

Test Engineer : _____

Benny Lee

6.5. Photographs of Radiated Emission Test Configuration

- The photographs show the configuration that generates the maximum emission.

FRONT VIEW



REAR VIEW



7. Antenna Factor & Cable Loss

Frequency (Mhz)	Antenna Factor (dB)	Cable Loss (dB)
30	17.8	0.7
35	16.9	0.8
40	16.2	1.0
45	13.2	0.8
50	10.9	0.8
55	9.0	1.2
60	7.2	1.2
65	6.8	1.3
70	6.5	1.3
75	7.1	1.3
80	7.8	1.2
85	9.1	1.2
90	10.4	1.2
95	10.7	1.2
100	11.0	1.3
110	12.3	1.3
120	13.5	1.3
130	12.9	1.4
140	11.6	1.5
150	10.6	1.7
160	9.5	1.8
170	9.6	1.8
180	9.8	1.8
190	9.8	2.0
200	9.8	2.2
220	11.2	1.8
240	12.6	1.9
260	13.5	2.2
280	13.6	2.3
300	13.8	2.5
320	14.5	2.5
340	15.2	2.5
360	15.8	2.6
380	16.1	2.8
400	16.5	3.0
450	16.9	3.2
500	17.7	3.2
550	18.6	3.2
600	19.1	3.7
650	19.8	3.5
700	18.8	3.8
750	18.6	4.0
800	20.3	4.3
850	20.9	4.3
900	19.4	4.8
950	21.9	4.8
1000	20.2	4.8

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8. List of Measuring Equipments Used

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Spectrum Analyzer	HP	8560E	3728A03186	30 KHz – 2.8GHz	Sep. 06, 1999	Radiation
Amplifier	HP	87405A	3207A01437	100K - 3GHz	Aug. 03, 2000	Radiation
Receiver	R&S	ESCS30	847793/003	9 K – 2.75 GHz	Dec. 16, 1999	Radiation
Receiver	HP	8546A	3325A00108	9 K – 6.5 GHz	Dec. 20, 1999	Radiation
Bilog Antenna	CHASE	CBL6112A	2442	30MHz -2GHz	Jun. 23, 2000	Radiation
Half-wave dipole antenna	EMCO	3121C	9705-1285	28 M - 1GHz	May 17, 2000	Radiation
Turn Table	EMCO	2080	9711-2021	0 ~ 360 degree	N/A	Radiation
Antenna Mast	EMCO	2075	9711-2115	1 m- 4 m	N/A	Radiation