



FCC ID : AK8TMRRF930

REPORT OF MEASUREMENTS

Date : May 28, 1998
Issue in : Tokyo, Japan

JQA APPLICATION NO.: 80-71174

Applicant : Sony Corporation Shibaura Technology Center
1-7-4 Konan, Minato-ku,
Tokyo 108-0075, Japan

Manufacturer : Sony Corporation
6-7-35 Kitashinagawa,
Shinagawa-ku, Tokyo 141-0001, Japan

Description of Equipment : RF Stereo Transmitter

FCC ID : AK8TMRRF930
Trade Name : SONY
Model No. : TMR-RF930
Operating Frequency : 913 MHz - 915 MHz
Power Supply : 120 VAC 60 Hz

Applicable Rule : FCC Rules & Regulations Part 15
Subpart C (June 23, 1989)

Place of Measurement : JQA EMC Engineering Dept.

Date of Measurement : May 22, 1998 (Completed)

Total Pages of This Report : 12 (including this page)

I certify that I am authorized to sign for the report and that all the statement in this report and in the exhibits hereto are true and correct to the best my knowledge and belief.


Shigeru Osawa, Assistant Manager
Testing Div.
EMC Engineering Dept.

JQA APPLICATION NO.: 80-71174

1. Transmitter Fundamental and Spurious Emission: [§15.249 (a) & (c)]

Measurement Method Employed:

Measurements were made under the conditions specified ANSI C63.4. The transmitter under test was operated continuously in its normal operating mode for the purpose of the measurements. In order to secure the continuous operation of the device under test, rewiring in the circuit was done by the manufacturer so as to affect its intended operation.

The receiving antenna polarized horizontally was varied from 1 to 4 meters and the wooden turntable was rotated 360 degrees to obtain the highest reading on the field strength meter or on the display of the spectrum analyzer. These measurements were repeated with the receiving antenna polarized vertically.

The pre-amplifier was used for above 2000 MHz

Operating Frequency : 913 MHz
 Distance of Measurement : 3.0 m

Frequency (MHz)	Antenna Factor (dB)	Amp. Gain (dB)	Meter Reading		Field Strength		Limits (uV/m)
			Horiz. (dB/uV)	Vert. (dB/uV)	Horiz. (uV/m)	Vert. (uV/m)	
Fundamental							
913.000	36.2	-	46.3	49.0	13335.2	18179.0	50000
Harmonics & the other components							
1826.000	30.7	-	< -10.0	< -10.0	< 10.9	< 10.9	500
2739.000	34.8	46.8	< 25.0	< 25.0	< 4.5	< 4.5	500
3652.000	38.2	46.7	< 25.0	< 25.0	< 6.7	< 6.7	500
4565.000	41.1	45.4	< 25.0	< 25.0	< 10.8	< 10.8	500
5478.000	43.5	45.5	< 25.0	< 25.0	< 14.2	< 14.2	500
6391.000	45.7	45.5	< 25.0	< 25.0	< 18.1	< 18.1	500
7304.000	47.6	45.5	< 25.0	< 25.0	< 22.5	< 22.5	500
8217.000	49.3	39.0	< 25.0	< 25.0	< 58.2	< 58.2	500
9130.000	50.9	39.0	< 25.0	< 25.0	< 69.9	< 69.9	500

Operating Frequency : 915 MHz
 Distance of Measurement : 3.0 m

Frequency (MHz)	Antenna Factor (dB)	Amp. Gain (dB)	Meter Reading		Field Strength		Limits (uV/m)
			Horiz. (dB/uV)	Vert. (dB/uV)	Horiz. (uV/m)	Vert. (uV/m)	
Fundamental							
915.000	36.2	-	47.4	50.8	15135.6	22387.2	50000
Harmonics & the other components							
1830.000	30.8	-	< -10.0	< -10.0	< 10.9	< 10.9	500
2745.000	34.8	46.8	< 25.0	< 25.0	< 4.5	< 4.5	500
3660.000	38.3	46.7	< 25.0	< 25.0	< 6.7	< 6.7	500
4575.000	41.1	45.4	< 25.0	< 25.0	< 10.8	< 10.8	500
5490.000	43.5	45.5	< 25.0	< 25.0	< 14.3	< 14.3	500
6405.000	45.7	45.5	< 25.0	< 25.0	< 18.2	< 18.2	500
7320.000	47.6	45.5	< 25.0	< 25.0	< 22.6	< 22.6	500
8235.000	49.3	39.0	< 25.0	< 25.0	< 58.4	< 58.4	500
9150.000	50.9	39.0	< 25.0	< 25.0	< 70.2	< 70.2	500

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- Note: 1. The spectrum was checked from 30 MHz to 10th harmonics of fundamental frequency component.
All emissions not listed were found to be more than 20 dB below the limits.
2. The symbol of "<" means "or less".
3. The cable loss was included in the antenna factor.
4. Sample calculation :

At 913.000 MHz

$$10(Af+Mr)/20 = 10(36.2+46.3)/20 = 13335.2 \text{ uV/m}$$

Above 2.0 GHz

At 2739.000 MHz

$$10(Af+Mr-Ga)/20 = 10(34.8+25.0-46.8)/20 = 4.5 \text{ uV/m}$$

Where,

Af = Antenna Factor including the cable loss.
Mr = Meter Reading
Ga = Pre-amplifier gain

5. Measuring Instrument Setting:

Below 1000 MHz

Detector function : CISPR quasi-peak ✓
IF Bandwidth : 120 kHz

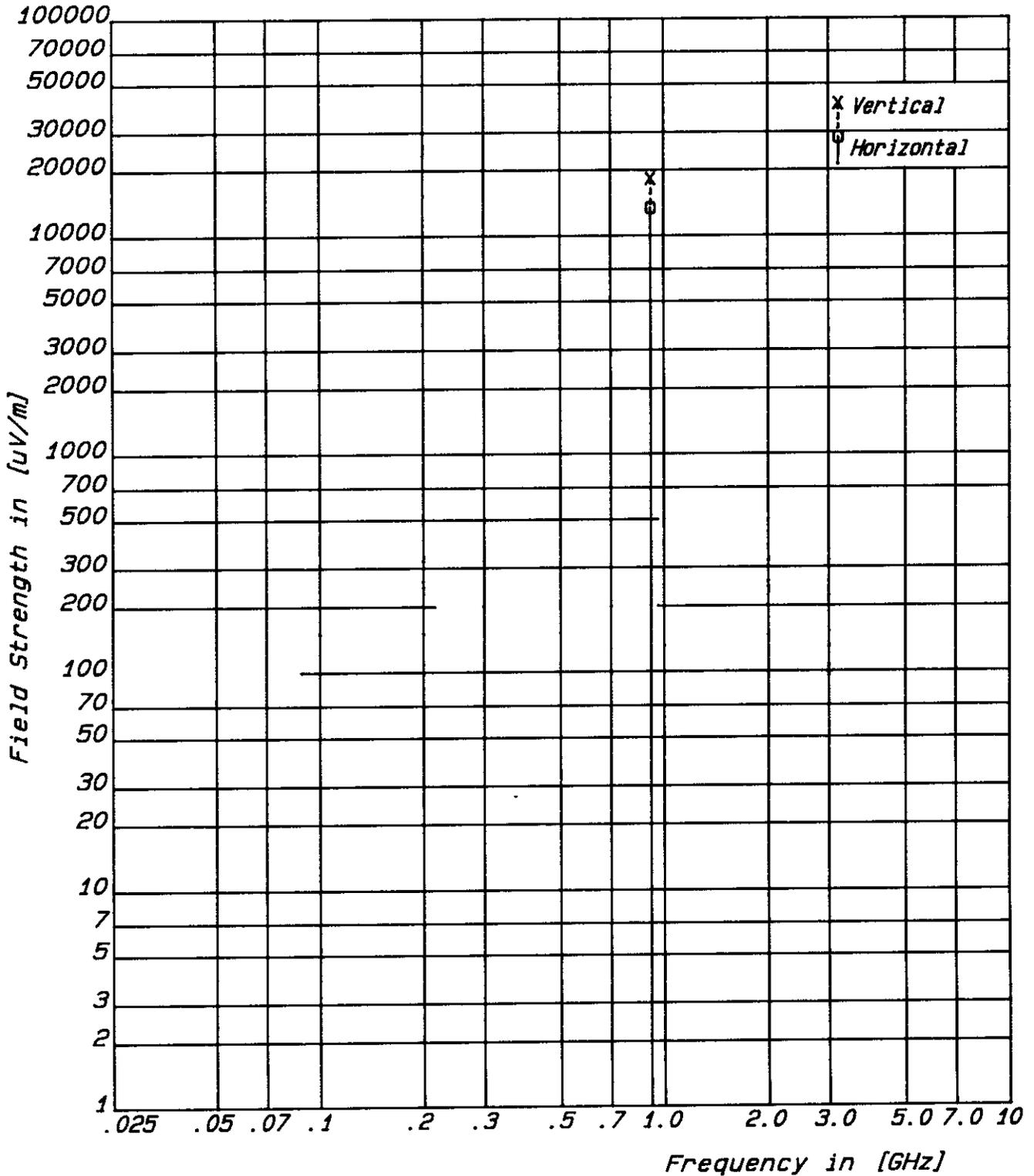
Above 1000 MHz

Detector function : Average
IF Bandwidth : 1 MHz

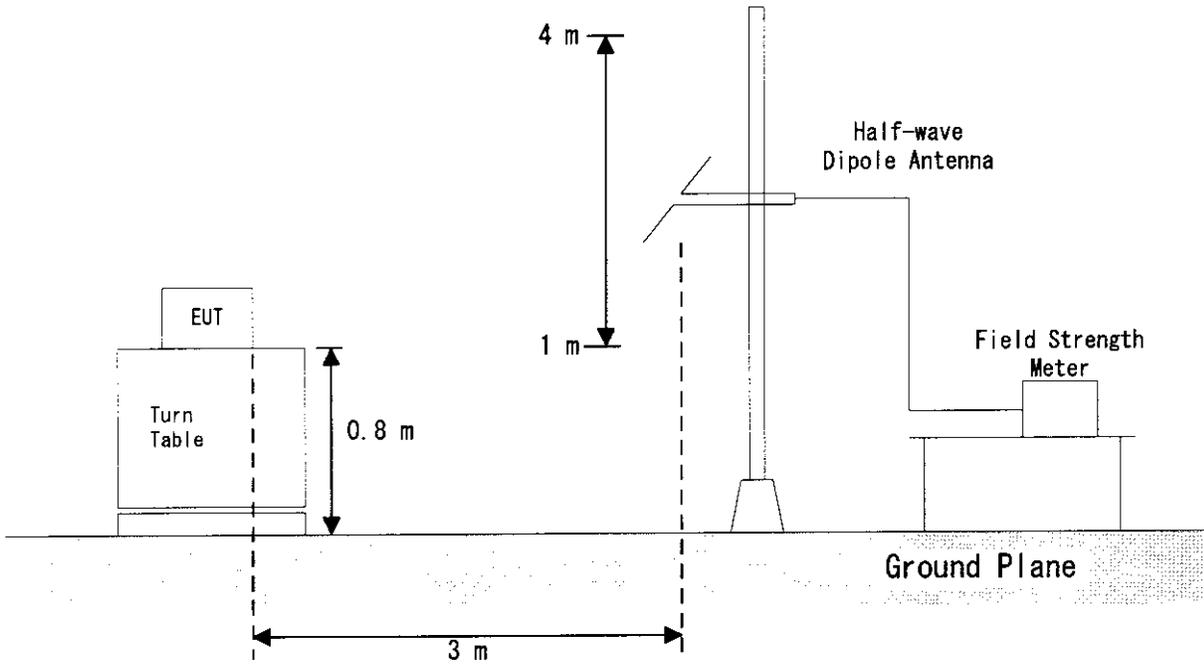
OK FOR FM STEREO

Transmitter Fundamental & Spurious Radiation

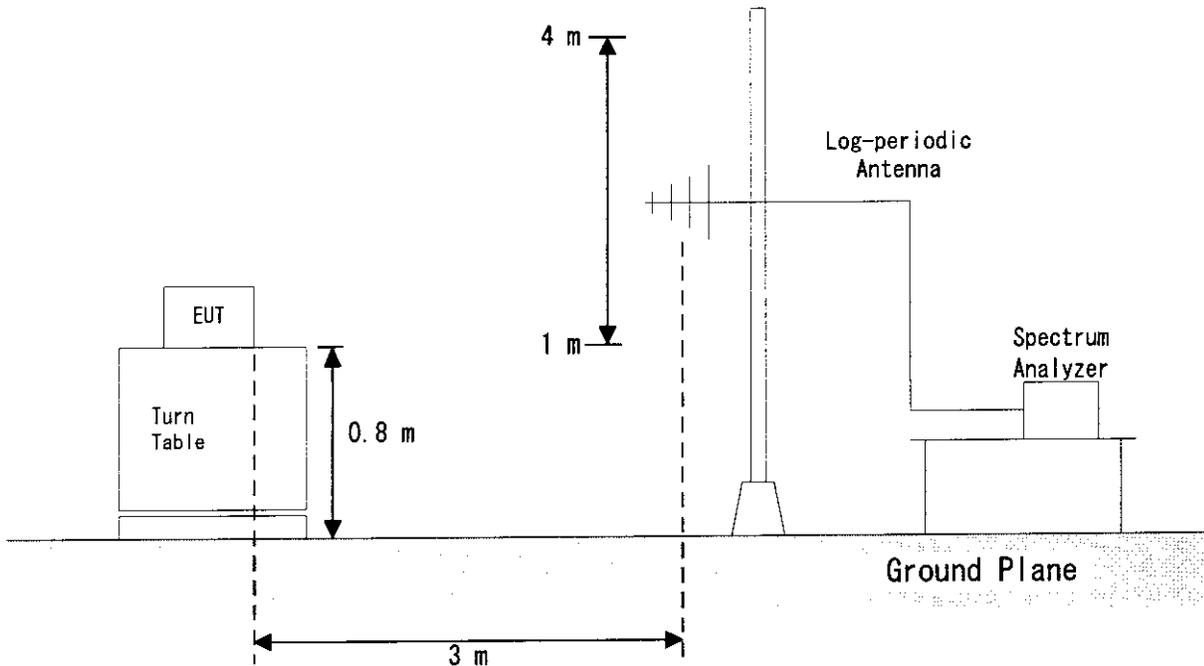
FCC ID : AK8TMRRF930
Operating Frequency: 913.000 MHz



MESUREMENT SET-UP FOR UP TO 1 GHz



MESUREMENT SET-UP FOR ABOVE 1 GHz



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2. Power Line Conducted Interference Voltage : [§15.207]

Frequency (MHz)	LISN Factor (dB)	Meter Reading(dB)		Results (dB/uV)	
		One end & grounded	Other end & Grounded	One end & Grounded	Other end & Grounded
0.45	0.2	23.4	21.5	23.6	21.7
0.50	0.2	24.2	22.4	24.4	22.6
0.60	0.2	18.8	19.3	19.0	19.5
0.70	0.2	17.0	17.5	17.2	17.7
0.80	0.2	19.9	19.2	20.1	19.4
1.10	0.2	12.1	12.6	12.3	12.8
1.50	0.2	< 6.0	< 6.0	< 6.2	< 6.2
2.00	0.2	< 6.0	< 6.0	< 6.2	< 6.2
3.00	0.2	< 6.0	< 6.0	< 6.2	< 6.2
4.00	0.2	< 6.0	< 6.0	< 6.2	< 6.2
6.00	0.2	< 6.0	< 6.0	< 6.2	< 6.2
8.00	0.2	< 6.0	< 6.0	< 6.2	< 6.2
10.00	0.2	< 6.0	< 6.0	< 6.2	< 6.2
12.00	0.3	< 6.0	< 6.0	< 6.2	< 6.2
14.00	0.3	< 6.0	< 6.0	< 6.3	< 6.3
16.00	0.3	< 6.0	< 6.0	< 6.3	< 6.3
18.00	0.4	< 6.0	< 6.0	< 6.4	< 6.4
20.00	0.4	< 6.0	< 6.0	< 6.4	< 6.4
24.00	0.5	< 6.0	< 6.0	< 6.5	< 6.5
27.00	0.5	< 6.0	< 6.0	< 6.5	< 6.5
30.00	0.6	< 6.0	< 6.0	< 6.6	< 6.6

Note: 1. The symbol of "<" means "or less".

2. Sample calculation at 0.45 MHz:

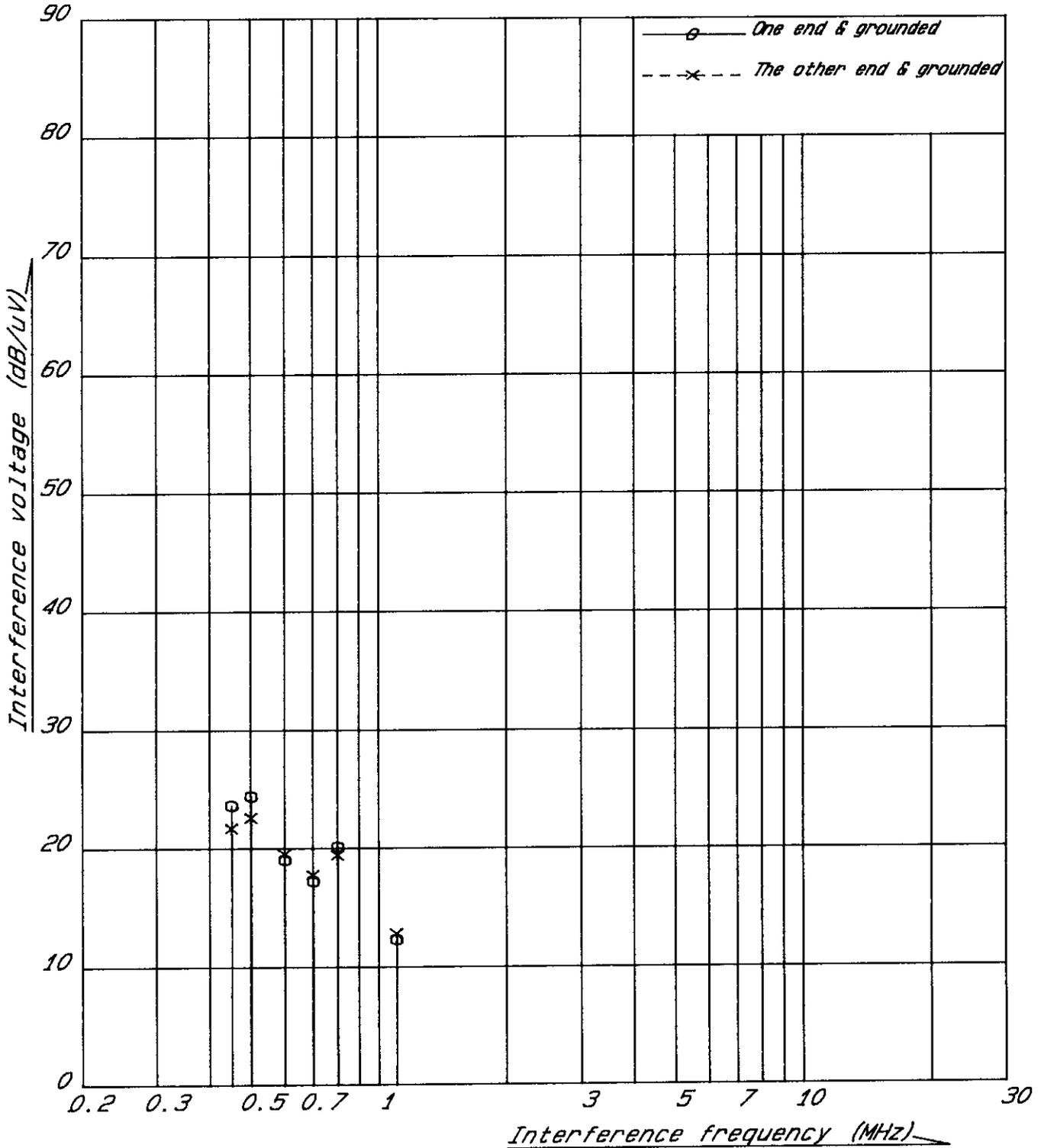
$$\text{Lisn Factor} + \text{Meter Reading} = 0.2 + 23.4 = 23.6 \text{ (dB/uV)}$$

CONDUCTED RADIO NOISE MEASUREMENTS

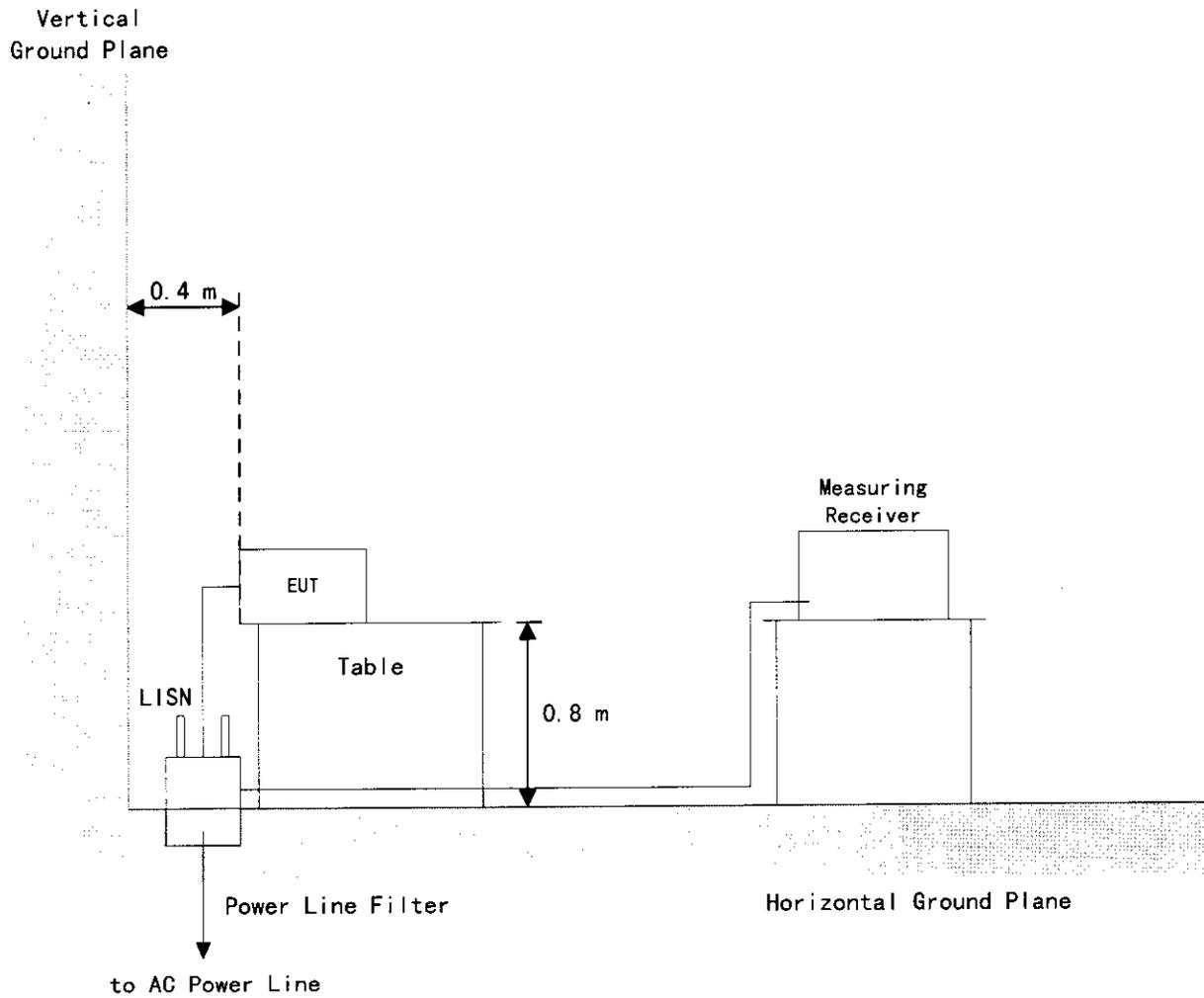
MODEL NO.: TMR-RF930

FCC ID : AK8TMRRF930

Function of EUT : TX



MEASUREMENT SET-UP FOR LINE CONDUCTED RF VOLTAGE



LIST OF MEASUREMENT EQUIPMENT

<u>Equipment (Model No.)</u>	<u>Manufacturer</u>	<u>Date of Cal.</u>
1. Field Strength Meter		
ESVP	Rohde & Schwarz	May 1997
ESH3	Rohde & Schwarz	May 1997
2. Spectrum Analyzer		
8566B	Hewlett Packard	March 1998
3. Tuned Dipole Antenna		
KBA-511	Kyoritsu Electrical Works	November 1997
KBA-611	Kyoritsu Electrical Works	November 1997
4. Log-periodic Antenna		
HL 025	Rohde & Schwarz	November 1997
5. LISN		
KNW-407	Kyoritsu	March 1998
6. Pre-amplifier		
WJ-6882-814	Watkins Johnson	January 1998
WJ-5315-556	Watkins Johnson	January 1998