OPERATION MANUAL

Part No. Z1-003-870, IA003902
Jan. 2014

TEST LOOP
SA100

This instrument is a coil to generate the test electric field to be used for testing a receiver with a built-in loop antenna. It conforms with JIS C6102-1988 "Methods of Measurement on Receivers for Amplitude Modulated Sound-Broadcasting Emissions". The instrument consists of a one-turn coil and a matching fixed resistor built in a round shield tube whose diameter is 250 mm. Using a signal generator as high frequency power source, the coil can induce the required equivalent electric field at a specific position.

NOTE

· The coil is designed to be used with the signal generator that has the output impedance of 50 Ω and that indicates voltage with an open circuit. If the coil is used with a different signal generator, it may cause errors; so, check the output impedance and voltage indication method before using the coil.
The Kikusui Signal Generators that can be applied to the coil are KSG4000, KSG4100, KSG4110, KSG4200, KSG4300, KSG4310, KSG4500, KSG4500T and KSG4700.

Precautions for Use

■ **If the signal generator that indicates voltage with a loaded is connected to the coil directly, an open-circuit voltage is input to the loop antenna. Therefore, in this case, the voltage input to the loop antenna is 6 dB higher than the voltage indicated on the signal generator.**

■ **For connecting the coil to the signal generator, use the provided cable.**

· If the cable is too long, the frequency characteristics may be deteriorated and the electric field strength will be unstable because it can be affected by the surrounding conditions easily.
If the cable is too short, on the other hand, the electric field can be disturbed easily because of the short distance from the signal generator and that will cause errors.

■ **Do not place any objects that may disturb the electric field near the coil and tested receiver.**

· Set the coil and tested receiver at least 120 cm apart from the wall of the shield room.

■ **If the coil and the tested receiver are placed in a confined space, a measurement error may arise.**

· In such a case, calibrate the coil as reference in "Section 3.2, (2) Calibration of JIS C6102-1988".

■ **Before measuring the gain, check for the existence of interference. When too much interference is found, choose the frequency that is not affected by it.**

Setting

Place the coil and the tested receiver in parallel with the ground, and match their central axes to each other as shown in Fig. 1. The coil can be fixed at any desired height and to any desired direction.

Connect one end of the input coaxial cable to the output terminal of a signal generator and the other end to the connector of the coil.

When the coil is connected to the signal generator whose output impedance is 50 Ω and if a loop antenna is set on the central axis of the coil 60 cm apart from it as shown in Fig. 1, the coil induces in the air-loop antenna the equivalent electric field whose strength is -20 dB (1/10) of the output of the signal generator (open circuit).

Receiver Having Air-Loop Antenna

Adjust the height of the coil so that the central axis of the coil may match that of the loop antenna in the tested receiver, set the coil to the direction which makes its center parallel the plane of the loop antenna, and fix the distance between the center of the coil and the outer fringe of the loop antenna at 60 cm as shown in Fig. 1. Then, activate the signal generator, and the equivalent electric field whose strength is -20 dB (1/10) of the value specified on the signal generator is induced in the loop antenna.

If the output of the signal generator is 100 dBμ (100 mV), for example, the equivalent electric field strength will be 10 mV/m as indicated by the following equation:

100 dB - 20 dB = 80 dB (10 mV)

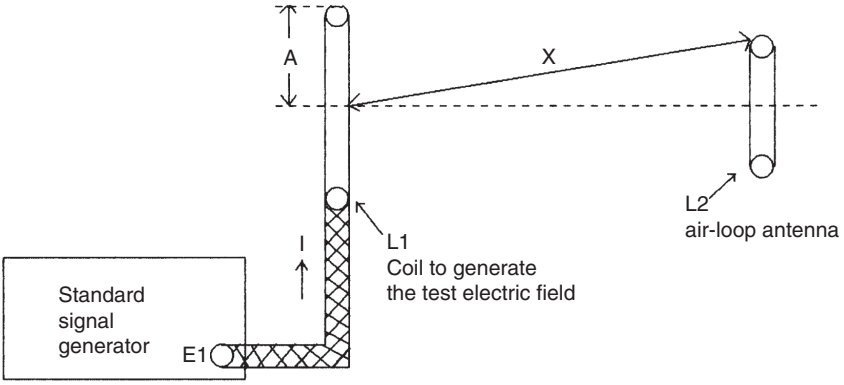

Fig. 1 Test setup for receiver having air-loop antenna

Radio Receiver Having Bar Antenna

Adjust the height of the coil so that the central axis of the coil may match that of the bar antenna in the radio receiver, set the coil to the direction which makes its axis line and bar antenna cross at right angles, and fix the distance between the center of the bar antenna and that of the coil at 60 cm as shown in Fig. 2. Then, activate the signal generator, and equivalent electric field whose strength is -26 dB (1/20) of the value specified on the signal generator is induced in the bar antenna.

If the output of the signal generator is 100 dBμ (100 mV), for example, the equivalent electric field strength will be 5 mV/m as indicated by the following equation:

100 dB - 26 dB = 74 dB (5 mV)

If the output of the signal generator is in sufficient, change the distance and calculate the equivalent electric field strength by the following formula:

$$E = Eo \ \frac{0.6^3}{X^3}$$

where Eo = Equivalent electric field strength obtained when the distance is X meter (mV/m)
Eo = Equivalent electric field strength obtained when the distance is 60 cm (mV/m)
X = Distance between the center of bar antenna and that of coil (m)

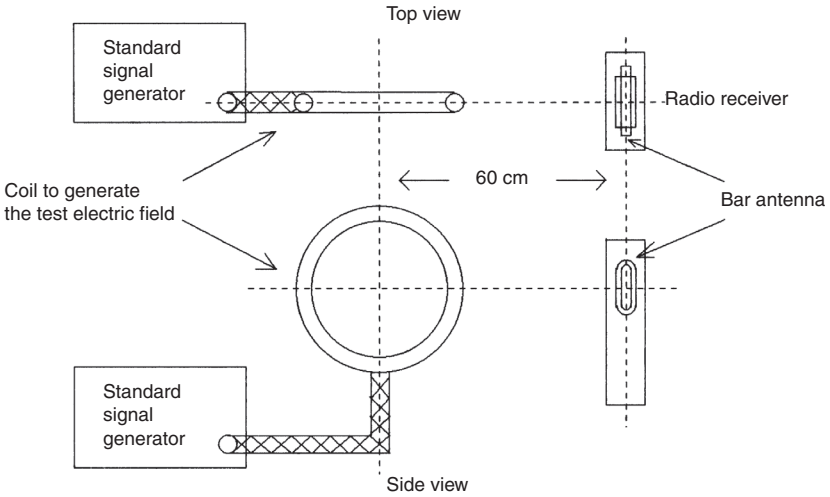

Fig. 2 Test setup for radio receiver having bar antenna

Specifications

Standard		Conformity to JIS C6102-1988
Frequency range		531 kHz to 26.1 MHz
Migration length		Vertical: Approx. 250 mm Horizontal: 360°
Input cable		Coaxial 50 Ω
Coil to generate the test electric field		Diameter 250 mm, 0.8 ϕ, 1 turn
Operating temperature range		0 °C to 40 °C
Accessories	Input cable	1 (SA 550), 1m
	Operation manual	1

KIKUSUI ELECTRONICS CORP.

1-1-3 Higashiyamata, Tsuzuki-ku, Yokohama, 224-0023, Japan
Tel: +81-45-593-7570 Fax: +81-45-593-7571

Website http://www.kikusui.co.jp/en

Printed in Japan