User's Manual For

PRAXSYM

SEITS

Shielded Enclosure Isolation Test Set

www.praxsym.com 217/897-1744

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SHIELDED ENCLOSURE ISOLATION TEST SET-II (SEITS-II)

USER'S MANUAL

1.0 INTRODUCTION

The Shielded Enclosure Isolation Test Set-II (SEITS-II) 310-010031-001 is a portable system for troubleshooting alternate ground paths between an isolated ground installation and the surrounding building ground network. The SEITS-II consists of the Praxsym 310-010037-001 Tunable Audio Bandpass Filter (Test Receiver), the Praxsym 480-010000-001 Magnetometer Probe, the Praxsym 310-010036-001 Frequency Generator (Test Transmitter), and accessories. The test set operates on the principle that, when an audio frequency current is injected between the isolated ground system and the building ground network, any current carrying conductor will have a proportionally generated magnetic field about it. The Test Transmitter is used as the current source and the Test Receiver and magnetometer are used as the detection system. A set of headphones is provided with the filter/amplifier unit for monitoring the audio tone while probing.

2.0 OPERATIONAL PROCEDURES

2.1 Battery Charging

2.1.1 Remove the Test Receiver and Test Transmitter from the transit case.

2.1.2 Connect the AC/DC adapters (9V) to each of the units. Plug the adapters into a 115V 50/60 Hz power outlet. An internal battery charger will control and terminate the charging of the 4 NiMH cells within each unit. Allow 2 to 3 hours to fully charge the batteries.

Charge cycle description:

a. A new charge cycle is started by:
    1. Connecting the AC/DC adapter.
    2. The battery voltage dropping to 4 volts with the AC/DC adapter already connected.

b. The charge cycle begins in the charge pending phase. The 'CHARGE' LED on the Transmitter, 'BATTERY' LED on the Receiver, will blink during the charge pending phase. The charger will trickle charge during this phase as it prepares the battery for the fast charge phase. If the batteries had previously been discharged below 4 volts, the charge pending phase will continue to trickle charge the batteries until they are charged back up to 4 volts.

c. In the fast charge phase, the batteries are charged at 300mA. The 'CHARGE" LED on the Transmitter, 'BATTERY' LED on the Receiver remain on.

d. Once the batteries are fully charged, the 'CHARGE' LED on the Transmitter, 'BATTERY' LED on the Receiver will be turned off and the battery charger will maintain battery charge using pulse trickle mode.

NOTE

If the Transmitter will be operated at full output power for periods of greater than 6 hours, it is recommended that the AC/DC adapter be connected to the unit.

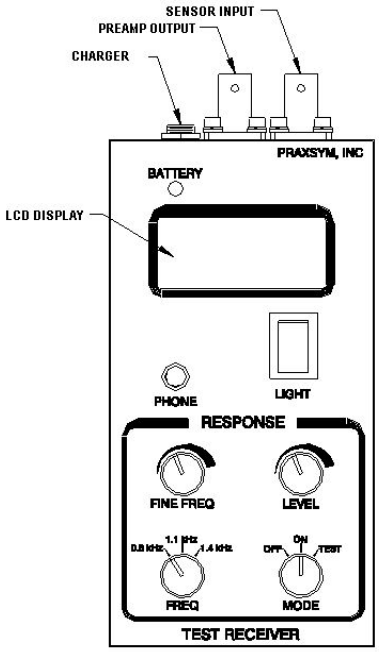
Although the units may be operated during charging, if the AC/DC adapter is connected after the batteries have discharged below 4 volts, the charger will remain in the charge pending phase. The batteries will continue to discharge since the unit's operating current is greater then the pulse trickle charge rate. When this condition occurs, turn the unit off until the batteries charge to the point that the fast charge phase begins. The unit may then be turned back on.

2.2 Preliminary Settings

2.2.1 Praxsym 310-010037-001 Tunable Audio Bandpass Filter (Test Receiver)

Step	Control	Setting
a.	MODE	OFF
b.	FREQ	1.1 kHz
c.	FINE FREQ	MIDRANGE
d.	LEVEL	MIDRANGE
e.	LIGHT	OFF

See the following figure for connections and control locations.



Install the magnetometer on the BNC connector located on the top of the receiver to the far right side.

The BNC connector located between the charging jack and sensor input is the output of the switched filter buffered by an operational amplifier.

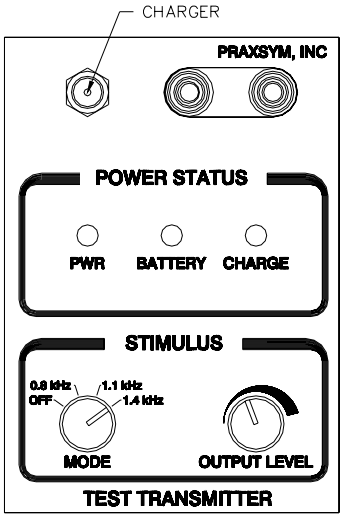
Turn the MODE control to the TEST position to display the current battery voltage.

A battery symbol will appear on the left side of the LCD display when the batteries require recharging.

2.2.2 Praxsym 310-010036-001 Frequency Generator (Test Transmitter)

Step	Control	Setting
a.	MODE	OFF
b.	OUTPUT LEVEL	MIDRANGE

See the following figure for connections and control locations.



2.3 Test Set-Up and Calibration

2.3.1 Using the test leads provided in the transit case, connect the Transmitter as illustrated in Figure 1. The Transmitter contains a 10 ohm resistor and has a sinewave output of approximately 3Vpp when the LEVEL control is rotated to approximately 2/3 it's full clockwise position. To reduce the current during the set-up procedure, insert a resistor (ex. 100 ohms) in the current path. When the Receiver is set-up using a smaller current, it will be more sensitive to higher resistance alternate paths. After the set-up and ground cable test procedures are completed, remove the series resistor. Using this technique, if a low resistance path is detected while testing the shielded enclosure, the detected field will probably overdrive the LCD display and a very loud tone will be heard in the headset. Turn the level control down as needed and then return it to its calibrated position to regain sensitivity and continue the search.

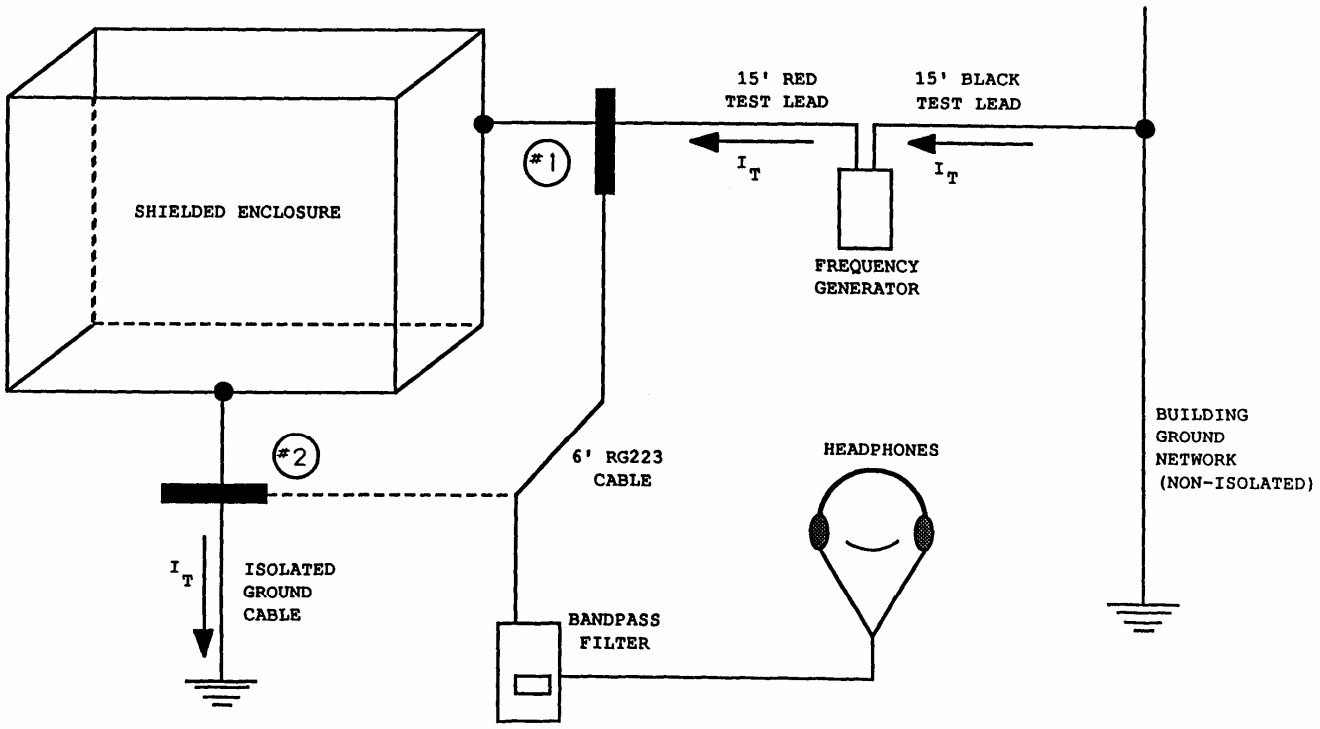


Figure 1

SHIELDED ENCLOSURE ISOLATION TEST SET-UP

NOTES

The isolated ground cable needs to be connected during this procedure.

For maximum magnetic field detection by the magnetometer, the RED test lead should be perpendicular approximately 2 inches from the top of the probe.

2.3.2 Test Transmitter Set-Up

a. Rotate the MODE knob to select the desired operating frequency (e.g. 1.1 kHz).
b. Set the OUTPUT LEVEL control to the desired setting (usually midrange).

2.3.3 Test Receiver Set-Up

a. Position the magnetometer to position #1 as shown in Figure 1.
b. Rotate the MODE knob to ON.
c. Rotate the FREQ knob to the desired receive frequency (e.g. 1.1 kHz).
d. Adjust the FINE FREQ control for a peak indication on the LCD display. An adjustment of the LEVEL control may be necessary to keep the meter reading below 199 (full scale).

2.3.4 Test Set-Up Calibration

a. Move the magnetometer across the RED test lead and note the maximum LCD readout value. Hold the magnetometer about 0.5 inches away from the test lead.
b. Adjust the LEVEL control on the Receiver to achieve a meter reading of 100 on the LCD display.

2.4 Isolated Ground Cable Test

2.4.1 Place the magnetometer to position #2 as shown in Figure 1. The magnetometer should be perpendicular to the isolated ground cable. Note the Receiver meter reading.

2.4.2 If the reading in position #2 is similar to the reading in position #1, the current in the test lead is similar to the current in the ground cable. There are no other low resistance ground leaks.

NOTE

A resistance reading with a VOM is still required with both the Transmitter and isolated ground cable disconnected from the isolated ground to ensure that the proper isolation requirement is satisfied.

If a lower reading is detected in position #2, there is an alternate path for current to flow. Proceed with Alternate Path Probing as described in Para 2.5.

2.5 Alternate Path Probing

2.5.1 If a series resistor was used in the set-up and ground cable test procedure, remove it now and connect the test lead directly to the shielded enclosure.

2.5.2 In a systematic manner, visually inspect the shielded enclosure for possible alternate path connections. This includes ceiling support wires, conduit, signal lines, etc.

2.5.3 Probe the possible alternate paths with the magnetometer. Any increasing meter reading on the Receiver or increase in the audio tone level on the headsets indicates an alternate path.

2.5.4 If an alternate path is found, disconnect the path and verify that the path has been broken, if necessary, by using the magnetometer. Repeat paragraphs 2.3.4 and 2.4.

NOTES