



 **Dynamic Sciences International, Inc.**

## Application Note

LISN

DSI-600 EMI Test Measurement Receiver System

Application No. 2.01:

## **Conducted Emissions Measurement using an LISN**

Measurement of power line conducted Voltage Emissions according to commercial and military standard, require some sort of apparatus for standardizing the power line impedance as seen by the EUT, so that measurements will be repeatable and not open to interpretation.

This Apparatus is a passive network, which simulates standard frequency dependent power line impedance on one hand, and provides an interface to the measuring equipment-receiver or spectrum analyzer.

These apparatus may be found under different names and construction details.

They are known as Line Impedance Stabilization Networks (LISN), for military use, as defined by Mil Std 461/462, and Artificial Mains Network, in the commercial and European EMC standards.

The Military Requirements are for measurements of common mode noise voltages, between Power lines, and Common Ground or Chassis, and are designed for a 50 Ohm Impedance, while some commercial standards require measurements also between the power lines, in the Differential Mode, and are designed for other impedances, such as 100 Ohms.

In all cases, these Apparatus come with a calibrated correction factor, which translates the measured voltage to the actual noise voltage at the power terminals.

All typical receivers for EMI applications are designed for an input impedance of 50Ohms, Common Mode, and work well with LISN and apparatus designed for common mode, 50Ohm systems. When operating an LISN for differential mode, non 50Ohm system impedance, the manufacturer of the LISN should be consulted on the application of his apparatus in a 50Ohm common mode measuring receiver. Most vendors can supply a matching network for these applications, with an appropriate calibrated correction factor.