

ELECTROSTATIC DISCHARGE AND LOW FREQUENCY VOLTAGE NOISE RELATED ISSUES TO THE IMPROVED EM MICROPHONE

Due to the new FET design used in the high performance Improved EM microphone, certain additional precautions must be taken when testing and using these devices.

There are two concerns:

electrostatic discharge (ESD) damage and low frequency output voltage noise.

1.0 ESD

1.1 Definition

The Improved EM exhibits greater sensitivity to ESD than the standard EM microphone. At present, the Improved EM is rated as a Class 1 sensitive device for ESD damage according to MIL-STD-750.

1.2 Handling

To minimize problems when handling the Improved EM, standard industry practices for ESD protection such as the following are recommended.

- Grounded wrist straps, heel straps, dissipative benchtops and floor mats should be installed in all work areas which handle the device including final assembly.
- Use of all plastics and other non-conductors should be avoided. Use of an ionized air stream and anti-static spray coating of non-conductors is recommended.
- Use of properly grounded soldering irons is mandatory.
- Static generating objects (ex. plastic report covers, plastic parts bins, CRT displays, etc.) should be kept at least one meter away from these devices.
- Anti-static lab coats and finger cots are recommended.

- Power should be applied to the hearing aid during the polishing and buffing operation to minimize electrostatic discharge to the microphone.

- Periodic audits of the work environment are recommended.

Refer to MIL-HDBK-263B and JEDEC 42 for further information on ESD protected areas, ESD protected area checks, and ESD program audits.

2.0 LOW FREQUENCY OUTPUT VOLTAGE NOISE

2.1 Definition

The Improved EM produces a large noise signal at approximately 1Hz. This signal is inaudible and will be a problem only if it is allowed to pass through the preamplifier unattenuated.

2.2 Solution

In practice, an AC coupling capacitor is used between the microphone and next stage electronics. Choice of a capacitor that results in a 100Hz high pass electrical filter between the microphone output and the preamplifier input will attenuate this signal to an insignificant voltage.

