Lead Free Soldering Notes for ECM Microphones

Electret Condenser Microphones can suffer from heat and/or electrostatic damage if not handled properly. The internal JFET should be treated with the same respect as an electrostatic-sensitive IC.

A properly grounded soldering iron, and ESD protected workstation, is required. Proper solder dwell time and a heat sink are also imperative. Not only is the internal JFET heat sensitive, but the microphone's diaphragm and internal plastic chassis are sensitive to heat damage. This damage results in mechanical fatigue, causing a change in sensitivity, an increase in audio distortion, or even complete failure.

Recommendations for Soldering:

• Soldering Iron: 25 to 60-Watt ESD safe soldering iron, such as a Hakko 936 solder station

• Solder Iron Tip: R0.2 mm for T-series mics with a 4 to 4.5 mm diameter
R0.5 mm for A, D, P, and R-series mics

• Solder: Lead free solder (i.e. Sn/Ag/Cu) such RMA98 Super Solder with a diameter of 0.4 mm for T series mics and 0.5 mm A, D, P, and R series mics

Note: Care should be taken with the use of flux, flux which leaks into the microphone will cause damage.

• Soldering Temperatures:

D, P, R, and T-series mics:	330 ±20°C (620 ±30°F) for negative pad
	270 ±20°C (520 ±30°F) for positive pad
A-series mics:	350 ±20°C (660+/-30 Degrees F)

• Soldering Time: Less than 2 seconds total from initial soldering iron contact to removal. Alternating soldering from one pad to the other should be performed within 10 seconds.

• Heat Sink: A proper heat sink should be constructed from a material with good thermal conduction, such as brass, aluminum or copper, and fabricated with diameters matching the microphone to be soldered. Holes should be drilled through the assembly for ventilation and to prevent pressure to form on the diaphragm.

Clean up: Not necessary if above solder is used. If cleaning is a requirement, care must be taken not to allow any cleaning liquid to contact the front of the unit (diaphragm end). This can saturate the internal electrical components, causing them to completely short out.

Even after drying, residue can prevent the diaphragm's free movement. Aerosols of any kind should not be used. Cements i.e. cyanoacrylate need to properly vent when used to assemble microphones to housings or rubber boots.