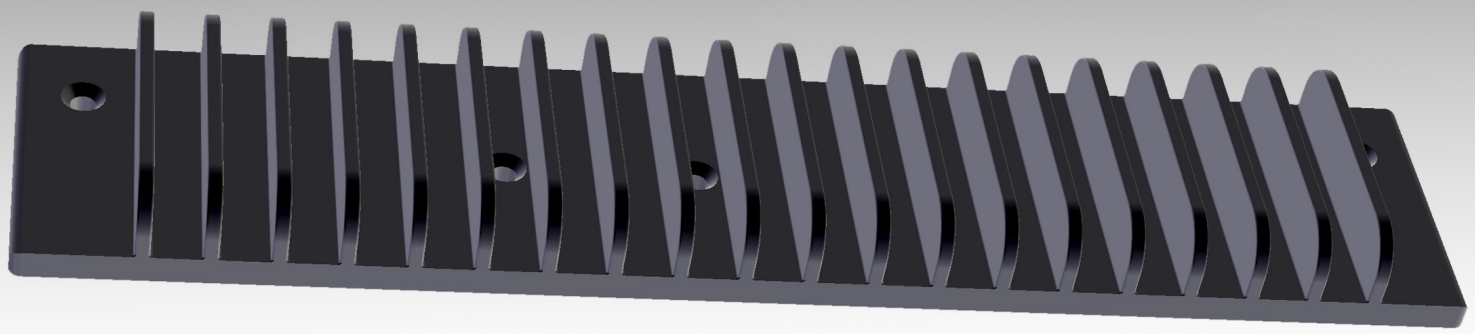
Pro Audio Engineering

PAE-Kx31 Heatsink

for the Elecraft™ KX3 Transceiver



Installation and Owner's Manual

Rev 4.0
February 4, 2015

Thank you for purchasing the PAE-Kx31 Heatsink for the Elecraft™ KX3 Transceiver.

We designed this heatsink to allow extended transmit time at the KX3's full-power settings, especially while using digital modes.

No passive heatsink can currently allow unlimited key-down time on the KX3, however the PAE-Kx31 has been engineered using thermal CAD modeling techniques as well as KX3 transmit testing for maximum performance with a minimum of increase in overall size. For more information on its design and performance capabilities, please visit:
www.proaudioeng.com

We welcome any and all comments regarding the design, installation or performance sent to: info@proaudioeng.com

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IMPORTANT NOTES:

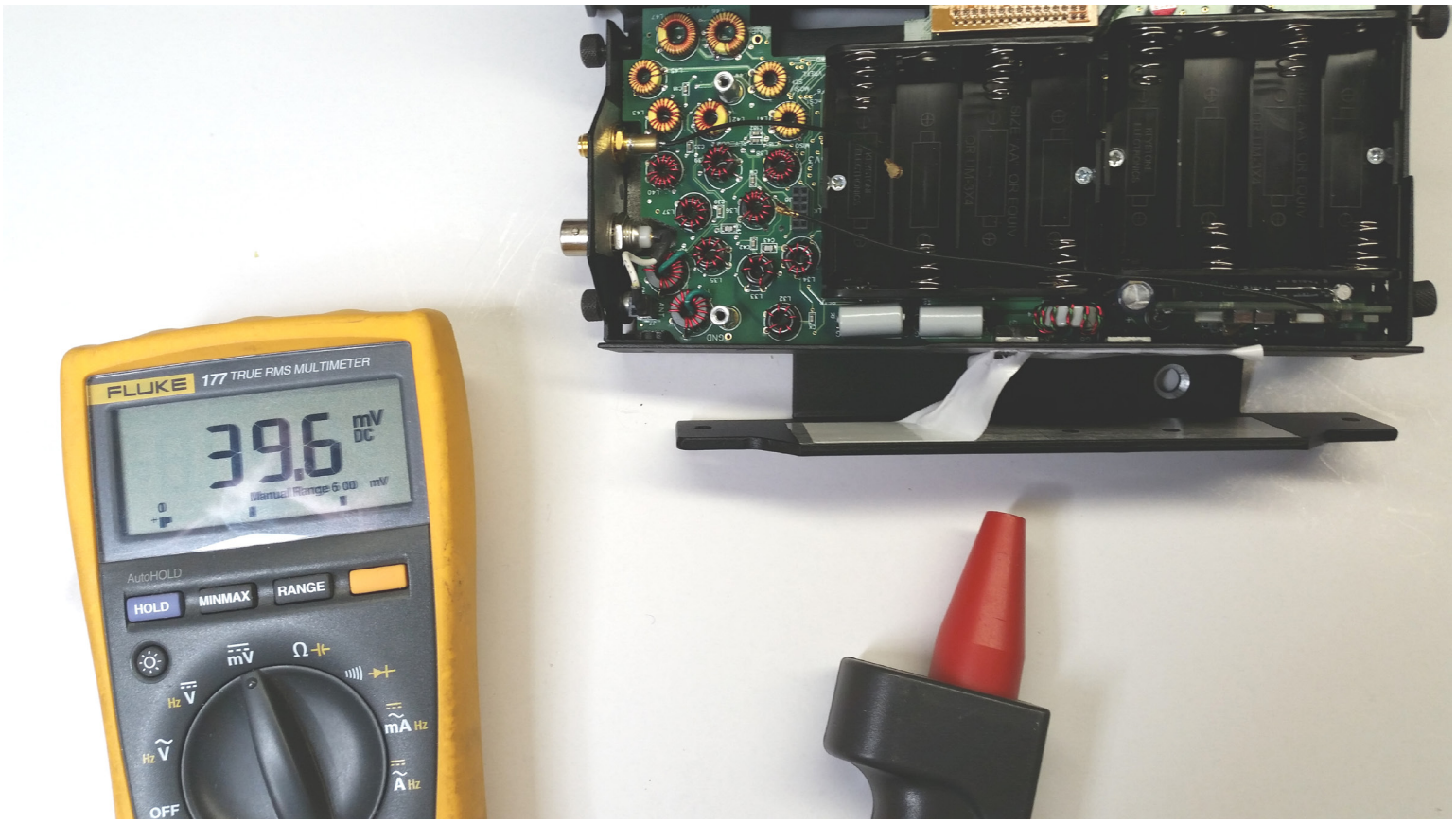
1. The longer 3/4" screw MUST be installed in the left hole closest to the DC Power Jack! Installing this screw in any other position WILL cause damage to the KX3.
2. Refer to the most current Elecraft KX3 assembly manual for any disassembly and reassembly (www.elecraft.com).
3. The KX3 owner is responsible for all modifications and by installing this heatsink agrees to hold Howard Hoyt and Pro Audio Eng., LLC blameless and harmless for any issues which arise as a result.

Installation:

1) Remove the stock factory heatsink plate (see note 2). In all cases it is held on by four #4x40 screws. The center two screws hold the PA transistors against the inside of the case, and have nuts on them. Be careful to hold and remove the nuts with needle-nose pliers so they do not fall into the KX3.

The original heatsink plate is flat, but it was replaced in late 2014 by the "enhanced" heatsink, which is "L" shaped and provided by Elecraft starting with S/N 7292 for kits, and S/N 7255 for factory assembled units.

When the screws are removed, the enhanced heatsink can remain stuck in place by the thermal transfer tape. Simply heating the enhanced heatsink with a hair dryer and pulling up on the bottom part of the "L" with steady pressure is enough to allow it to be removed as shown below (heated to 40°C):



In some cases prying firmly with a thin flat-bladed screwdriver stuck between the heatsink and one side of the case back may be necessary to initiate separation. When properly performed, this procedure poses no potential damage to the KX3 or it's powder coat finish. Thermal fold-back for the KX3 in normal operation is set by Elecraft at 60°C, and a hair dryer outputs air at about 50-60°C (122-140°F). Powder coating begins to soften at around 100°C (212°F), and melts at around 150°C (302°F).

2) Install the Pro Audio Engineering Kx31 Heatsink.

There are three options one can choose from when installing the PAE-Kx31, in order of easiest and most modest performance, to most difficult and highest-performance. Please read each step thoroughly before committing to a plan of action. Before executing any of the three options, the stock Elecraft™ heatsink must be removed and the four screws set aside, referencing the Elecraft KX3 Assembly Manual:

1. **No case modification or heatsink grease.**

The PAE-Kx31 is installed in place of the stock heatsink using the new screws supplied (see notes 1&3).

2. **No case modifications, heatsink grease applied.**

With this install option it is recommended the back case half of the KX3 be removed from the PCB (see note 2). This exposes the PA output transistor heat sinking surfaces so they can be properly coated with the provided thermal transfer compound. Once the PA transistors are exposed, knead the thermal compound packet, then apply a match-head sized (1/8”/3mm^2) drop of compound to each, and using a single-edged razor blade, spread it to a thin even film over the entire back of the transistors. The correct amount will be translucent once spread out. Reassemble the KX3 back case half to the PCB. Apply the remaining compound to the powder-coated surface around the PA transistor holes in a rectangle approximately 1” by 2” (25mm x 50mm). Attach the PAE-Kx31 using the new screws supplied (see notes 1&3).

3. **Case modification and heatsink compound.**

This option requires modification to the KX3 back case half, but provides the highest level of performance. First, disassemble the KX3 back case-half from the PCB (see note 2). Using a marker, lay out a 1” by 2” (25mm x 50mm) rectangle symmetrically around the PA transistor attachment holes on the case half powder coating. Using a sharp tool such as a knife or file, remove the powder coating from ***inside*** this rectangle as shown:

Once the powder coating is removed, take a single-edged razor and scrape the bare area flat and smooth. Alternatively you can mask the area and use paint stripper to remove the powder-coating. Once the coating is removed and the aluminum is flat and bare, knead the thermal compound packet, then apply a match-head sized (1/8”/3mm^2) drop of compound to each PA transistor surface, and using a single-edged razor blade, spread it to a thin even film over the entire back of the transistors. The correct amount will be translucent once spread out. Reassemble the KX3 back case half to the PCB. Apply enough of the remaining compound to thinly cover the rectangular area you scraped to bare aluminum around the PA transistor holes.

Attach the PAE-Kx31 using the screws supplied (see notes 1&3). If done carefully, this case modification will be completely covered, even by the stock heatsink plate, rendering the modification invisible. This will retain the stock appearance if it is desired to remove the PAE-Kx31 and replace it with the stock plate.

Use & Cleaning:

For maximum performance and component life, whenever possible operate and store the KX3/Kx31 in a cool place out of direct sunlight. To clean the PAE-Kx31, use only a dry or damp cloth and cotton swabs. Do NOT use any solvents or cleaners!