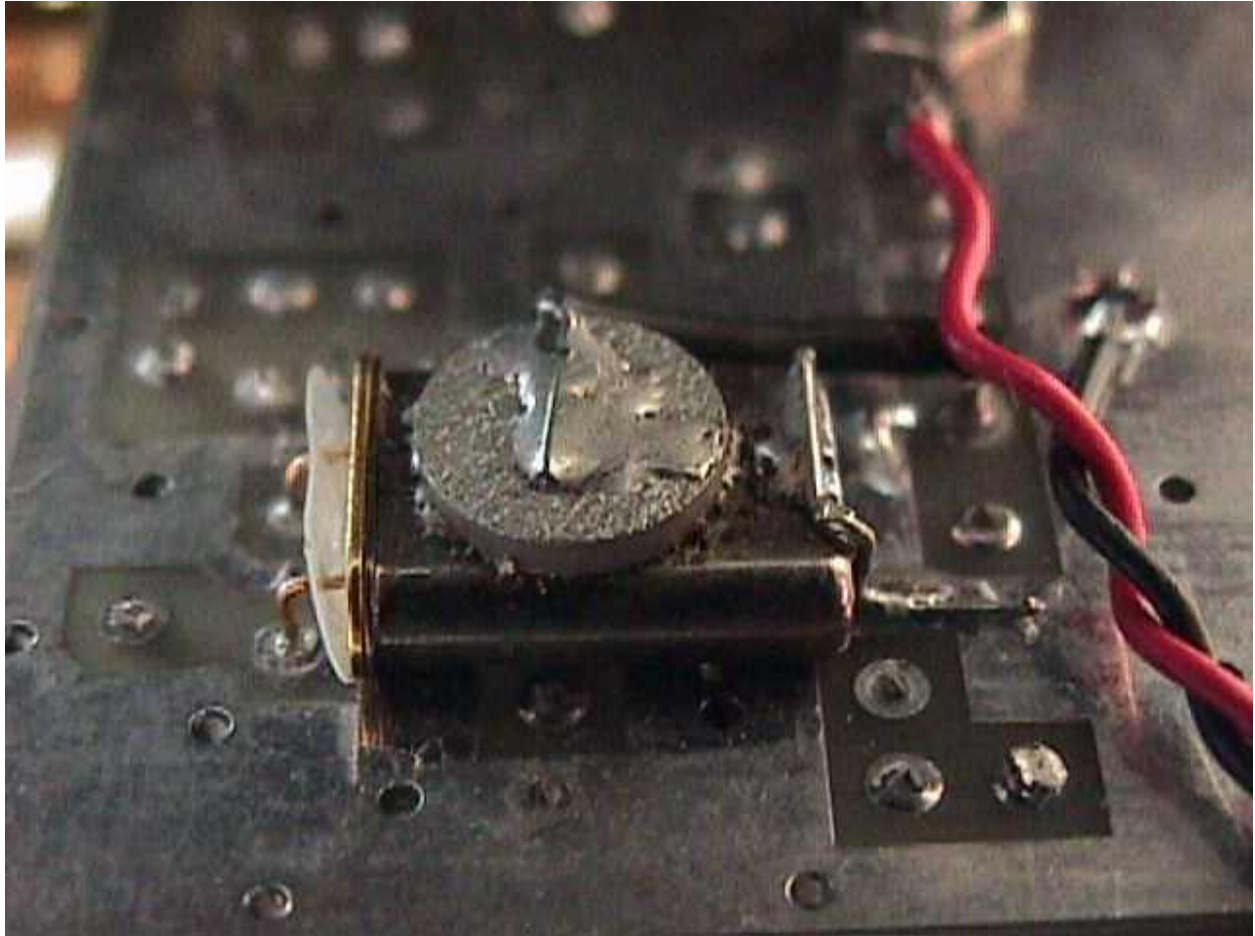


From: <http://www.setileague.org/askdr/xtaloven.htm>

A proportional temperature controller contains three elements: a heat source, a heat sensor, and a feedback element. All three functions can be performed in a single component, and cheaply, by soldering a positive temperature coefficient (PTC) thermistor to the crystal can, and putting 12 VDC across it. See this photo for details: <<http://www.setileague.org/hardware/xtaloven.jpg>>



Steve at DEM sells the PTC thermistors (60 ohms @ room temperature) for something like a buck. The unit functions as a poor man's crystal oven, thus: The thermistor draws current, and heats up (also heating the crystal can). Its resistance goes up, so it draws less current, and cools down somewhat. Now R goes down, the PTC draws more current, heats up, and so on, eventually reaching thermal equilibrium at about 30 Celsius degrees above room temperature. So what you have is a self regulating proportional temperature controller.

The long term solution will eventually be for each Project Argus participant to use a GPS-disciplined master frequency standard. This will give everybody nearly atomic-clock accuracy, and precise time calibration to boot. But for now, a \$1 PTC thermistor will give you an order of magnitude improvement in frequency stability, as compared to running a crystal LO at room temperature.