Comments about Tempmaster Mk2

I have a couple of comments about the Tempmaster Mk2 thermostat project in the February 2009 issue of SILICON CHIP. This is a fantastic project but I want to improve its reliability.

Firstly, the use of a 3.5mm socket and plug for the sensor is definitely a bad idea. I have used these and the 6.5mm version in the past and they are fine for projects where a permanent connection is not wanted, a good connection is not critical and where the plug is removed and refitted often.

Because of bad design though, the earth connection which is the case of the plug (normally) and the mount of the socket (normally) is not a spring connection so they rely on pressure from the tip connection to also put pressure on the barrel of the plug (still a poor connection but if the plug and socket are kept clean, it works – just). However, in the case of the stereo version there is a springy connection on one side for the tip and another on the other side for the ring, thus there is no pressure on the barrel or earth connection.

For their intended use with headphones which are inserted and removed often, this poor connection matters little. I'm sure most people who use headphones know of the poor connection whenever the plug is wriggled. All varieties of the stereo version have the same defect, weather it's 2.5mm, 3:5mm or 6.25mm, but there are versions that do have a springy earth connection.

In the Tempmaster the problem is twofold. First, the signal is low-level DC instead of higher level AC so

the connection is much more critical as AC can still work through a dirty connection via capacitance. The DC signal would also promote electrolysis, making things even worse. Second, once connected, it would rarely be unplugged and thus the self-cleaning action of plugging in and out would not occur.

The solution is to use the ring connection for the earth, as this too is a springy connector. If I was constructing it though, I would solder the sensor permanently to the circuit board. Then there would never be a problem as this project would most likely be built, plugged in and then hidden away, never to be seen again (as long as it behaves itself).

My second comment applies to using the Tempmaster with an inverter. You mentioned Dr Tom Chalko's comment about poor efficiency of the older version because of a high quiescent current. I would have thought any quiescent current would be undesirable, no matter how small, as the inverter would have to run continuously to just feed the device in standby.

If a purely mechanical thermistor were used then the quiescent current would be zero, allowing the inverter to shut down into standby mode and draw little power. However, mechanical thermistors are highly inaccurate and so are not a good solution.

It just doesn't make sense to step a low DC voltage up to 230V AC then back to a low DC voltage (just think of all the inefficiencies involved). If the inverter system is 12V, then a simple solution would be to run the electronics directly from the 12V battery, allowing the inverter to shut down between cooling cycles.

Philip Chugg,
Launceston, Tas.

Comment: we take your point about possible unreliability of the 3.5mm jack connection. Possibly a better solution would be to connect the sensor via a 2-way screw terminal block.

As far as the quiescent current is concerned, our suggested arrangements for connection shown on page 33 of the article should solve that problem. Your suggestion to run the Tempmaster from the main 12V battery is shown in (B) on page 33.

Compact fluorescent lamps don't save much power

Regarding the Publisher's Letter in the February 2009 issue, I agree with