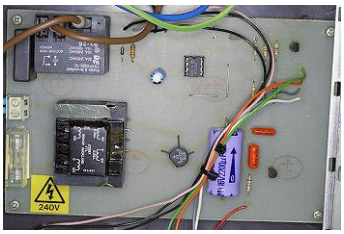
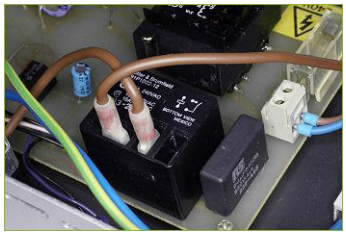
Multi Purpose Thermostat
EPE Magazine March 1995

I hadn't made a thermostat since my ill-fated Digital Temperature Controller which got snarled up in the transition between Electronics Monthly (was, Hobby Electronics) and Everyday Electronics magazines some years earlier (described separately). Time to revisit this, as I wanted to control some electrical propagators and I decided to have another go at a variable thermostat.

It would be rated at a full 13 Amps and I chose to use a simple op.amp set up as a Schmitt trigger for a 'snap action', with a reference voltage provided by a high-stability TL431. A bead thermistor would detect the ambient temperature. I added a variable hysteresis control that allowed the user to compensate for any temperature overshoots, if desired, by changing the difference between the on- and off- switching points. Bit of a gimmick I suppose.

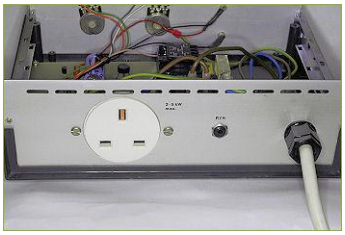


Just like my burst-firing Power Controller (EE Nov. 94), this thermostat was designed for a full 13A output so I paid close attention to the wiring, earthing and interconnections. By now I was building more of a project on a single board, and the man-made PCB carried much of the mains-side circuit with transformer and fuseholder on board. However I did not go as far as mounting the potentiometers and LEDs onboard as well, as that would maybe have been a bit too elaborate and expensive to implement, as well as needing perfect metalwork to align everything on the front panel.



The box was an odd choice of plastic housing with aluminium front and ventilated rear panels. I particularly liked the 16A screw terminal block used on the mains inlet as it had a built-in fuseholder, and also the excellent p.c.b. 30A (!) mains relay by Potter and Brumfield had recessed spade

terminals on top, allowing heavy duty connections to be made (I felt this wasn't a time for soldering thick 13A wires) while being soldered to the board. Another flush-mount 49mm round 13A mains socket was fitted on the rear, my standard preference by now. I admit the thermistor probe housing was a bit ropey.



The published wiring diagrams, incidentally, followed my style closely and I probably helped to influence the magazine style in that respect, using 'line art' wires and dots rather than properly-drawn wires and blobs of solder.

I think the general assembly was workmanlike and up to the job, but the board could have been a lot more compact: not one of my best efforts. I enjoyed photographing this unit as much as designing it, but the magazine repro quality didn't do my photos justice. For some reason I can distinctly remember photographing this unit some 20 years ago.

The prototype, being one of my last designs made, is still in good condition though the thermistor looks a bit sad. I'm sure it would work today.

ARW Oct. 2014