

## Digital Thermometer & Controller

Developed in 1984 - *unpublished*

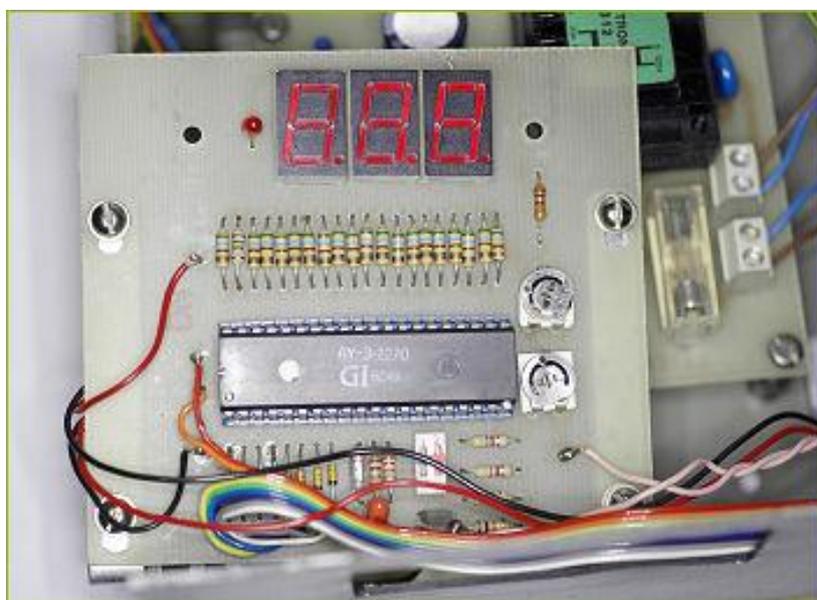


Not every project saw the light of day and my attempt at a temperature controller with digital 7-segment display was particularly challenging. I spent a long time exploring a particular chip (General Instruments' **AY-3-1270**, which I can remember 30 years later) as it seemed to be a deceptively simple chip that looked easy enough to utilise. It was also quite widely advertised.

I'd had an idea to make a digital thermostat possibly for my aquarium or propagator, so I swotted up the data sheet, learned about dual-

slope integration and seven-segment displays, and I breadboarded an impressive-looking prototype. I also figured out how different types of thumbwheel switches worked and other things that were unknown to me at the time.

The Digital Thermometer & Controller was the most complex project that I had on the books, and it offered plenty of scope for making mistakes. It was also very time-consuming and expensive to put together. Remember too that I was building and submitting projects "on spec." so if I couldn't get it published then I would end up wasting lots of time, with a very expensive prototype on my hands.



The controller used two pcbs, one for a combined controller and large l.e.d. display, and the other for the power supply and mains switching side of things.

As far as the construction went, I felt I was finding my stride and (just as importantly) setting a good standard for readers to follow: the mains side was mostly p.c.b. mounted, including mains transformer,

fuses, suppression and relay, and I was using screw terminal blocks for mains connections. The display board used 0.7" leds which I'd not utilised before. Quality ceramic presets were used for calibration. For the first time I used ribbon cable, to connect the thumbwheel switches.

An expensive Verobox with anodized aluminium panels carried the electronics, and typically the box was the most expensive part to buy and probably too good for this project. I was in two minds

whether to spray the front panel matt black, but that's what I did anyway. I found a high-contrast red filter and panel-mounted bezel for the digital display (Verospeed, I think), and everything had to align properly with the p.c.b. that was fitted behind it; even so, I got it wrong as a filter bracket interfered with a resistor and had to be chopped back. In fact the filter bolts could probably have fixed the board to the front panel, and the two p.c.b. mounting brackets visible in the above photo weren't needed. The red filter worked well and the unlit segments were near invisible (not like the main photo, the led's lit by the camera flash). I was quite proud of my first digital display.



As you'll read in my main article, this project passed from pillar to post between three magazines, but component supply problems meant it was cancelled by *Electronics Monthly* just a few weeks prior to going to press and the Digital Thermometer & Controller never made it into print. On the front panel you can just see above the 'D' in Digital where *EM* (was, *EE!*) had been lettered in white. That was the only time I dealt with the 'opposition'.

After a couple of years' use powering a horticultural propagator (its relay 'click' was as regular as clockwork), the prototype was stored away for a day like today. Its glass thermistor probe is still intact. Almost 30 years on, I was thrilled to see that it powered up immediately and instantly displayed 17.4°C room temperature like a good 'un. Maybe I'll run it as a retro digital thermometer, or perhaps restore its tatty box with spray paint, adding a new facet to my interest.

The datasheet can be googled but you won't find any chips anywhere, I can guarantee it!

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