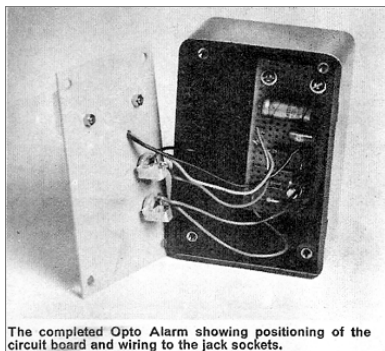


## UNIBOARDS - Simple Transistor Designs

### **#1 Opto Alarm, *Everyday Electronics* November 1979**



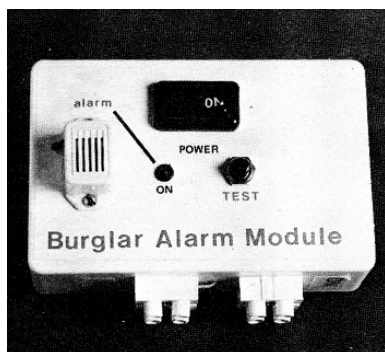
The completed Opto Alarm showing positioning of the circuit board and wiring to the jack sockets.

I followed Editor Fred Bennett's requirement of using a standard size bit of veroboard, 10 strips x 24 holes. This first article to appear (and my first series) was a simple optically-triggered alarm, which used a cadmium-sulphide light dependent resistor type ORP12 (now outlawed) to trigger a thyristor. Again I used the small transistor buzzer and I built the lot into a small ABS box with aluminium panel, lettering the name with white Letraset. I'd used a 3.5mm jack socket for the PSU connection – not such a good

idea because the PSU can short out when the plug's being inserted or withdrawn! I thought it was OK as an introduction and I sat back to watch a procession of projects appearing each month – hopefully.

Sadly the prototype Opto Alarm has long gone but I still recall making it.

### **#2 Burglar Alarm Module, *Everyday Electronics* December 1979**



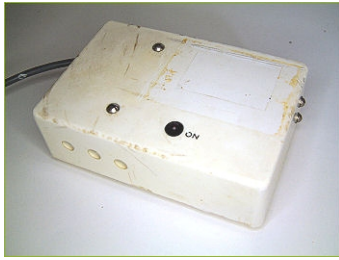
The second Uniboard project was a simple burglar alarm system incorporating both normally-open and normally-closed loops. The trick was to keep the quiescent current as low as possible so I used a high-gain transistor switch to keep  $I_q$  down to  $50\mu\text{A}$ .

Again I used a transistorised buzzer and I'd learned that thyristors can false-trigger in practice ( $dv/dt$ ), so I added a small capacitor on the gate to counter this. I used a basic plastic box (the slightly grotty but popular "PB1" plastic box) to build it, nowhere near as

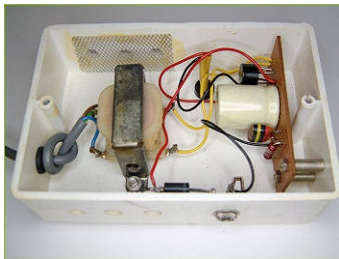
good as a BIMbox, and the standard Hekla rocker switch.

A short while later, I was in my local audio/ PA store and the owner (a very pleasant and helpful character called Bert) remarked on the circuit saying how good it was! And more than three decades later an EPE advertiser still remembered it, so I'd obviously done something right. The prototype itself was scrapped, one of the cruder ones that I built and I was never very happy with it. And that, readers, signalled the end of the 1970's, the decade that fired up my enthusiasm for electronics.

### ***#3 9V Power Supply, Everyday Electronics January 1980***



The year 1980 kicked off with my third project in the Uniboard series, a crude 9V mains power supply, which used a 6.3V valve heater transformer from Tandy/ Radio Shack. I built it into another “PB1” plastic box which were a bit primitive, having an imprecise lid held on by two self tapping screws. I ventilated it by drilling some ¼” holes, and gluing some aluminium mesh (Isopon mesh, from my car bodywork repairs!) inside. I have no idea if the ventilation holes did any good.



Unwisely I used a 3.5mm jack socket as d.c. power sockets didn’t really exist then. The unit had no redeeming features but the basics were there, the transformer and mounting bolts being earthed by a solder tag. This was another primitive-looking project that I wasn’t too happy with, but the magazine managed to enhance its appearance with a sticker (that later fell off the prototype). The original model (shown) was rescued from my junkbox, looking much the worse for wear. For some reason there’s now a large 1N5400 rectifier on the output socket, and the mains cable is knotted as a strain relief. Oh well.

Incidentally this issue of Everyday Electronics was the first one to carry two of my projects together, for my Ferranti ZN1034E-based Extended Range Timer (Mains On-Off Timer) was also published in January 1980 EE. I was quite chuffed and the money was useful to a hungry 21 year old.

### ***#4 Touch Switch, Everyday Electronics March 1980***



Annoyingly, there was a month’s gap in the series with nothing published in February. March 1980 issue contained the Uniboards No. 4: Touch Switch, which for some reason was listed as Uniboards No. 5 in the index!

I used a couple of *n*pn MPSA14 Darlington transistors from Maplin (when they still listed useful transistors and data in their catalogue) to form a d.c. switch that was sensitive to skin resistance. It followed the same style of construction and I reverted to BIMboxes to house the prototype. It was probably developed on a T-Dec breadboard like all the others. The touch pads were formed from screw cups that were a relic of my school woodworking lessons half a dozen years earlier. I still have some.

The circuit was simple and reliable, and the prototype still works today powered from a mains adaptor. It’s shown here in colour for the first time in 30+ years:

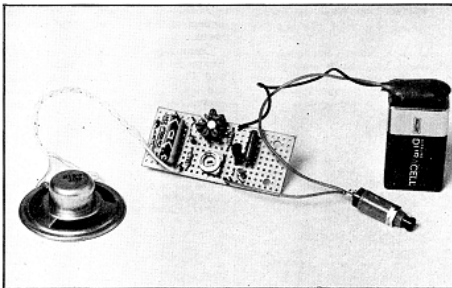


The usual style of construction was used, a standard 10 x 24 piece of Veroboard held up with two pillars and a 3.5mm jack for d.c. input. By now I was getting into the swing of things.

You could easily make it today using ordinary *npn* transistors hard-wired as Darlington's.

BIMboxes are still available to this day in a range of colours. See <http://www.boss-enclosures.co.uk/Home>

### ***#5 Audio Tone Generator, Everyday Electronics May 1980***



The completed Audio Tone Generator. The method of housing the finished unit is left to individual choice.

Another month's gap in production (still, at least the April 1980 issue carried my **Gas Sentinel** constructional project) and May '80 EE saw Uniboards No. 5, a simple Audio Tone Generator. Nothing special to see here, it was just a TIS43 oscillator driving a small loudspeaker. I added an important-looking push-on TO-18 heatsink to the BC108C transistor which maybe doubled its power dissipation rating but was totally unnecessary anyway. I 'overdid' the article by spelling out too much detail: don't forget to put holes in the box to let the sound out! My prototype went to the scrapheap in the sky long ago.

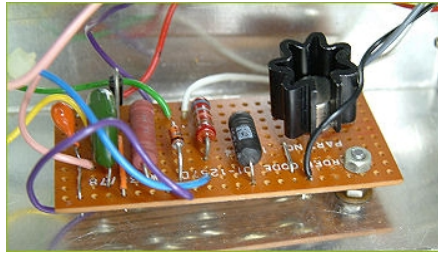
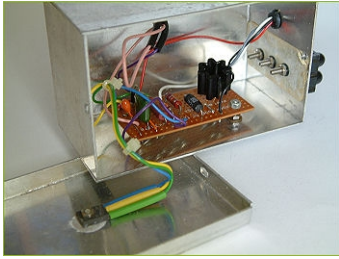
### ***#6 Voltage Converter, Everyday Electronics June/ July 1980***



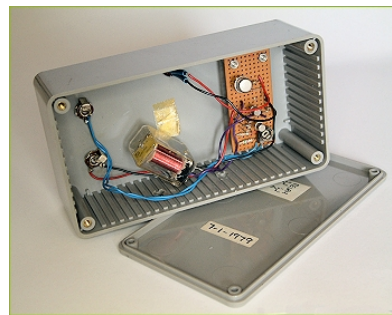
A combined issue spanning two months because of industrial strikes meant that 1980 would only contain 11 months! Uniboards No. 6 was a DC Voltage Converter with a current-limiting feature. It was conceived in 1979 and I'd originally thought it might go in a car to operate a cassette player from the cigar lighter socket (April 1982 EE would see my LM317-based In-Car PSU). I used a BD135 power transistor bolted to a panel, with a Zener diode acting as a reference.

Construction was by now routine, using multicolour hookup wire and I usually sprayed the copper strips with lacquer to preserve them. The prototype was, I see, covered in Evo Stik glue so they'd

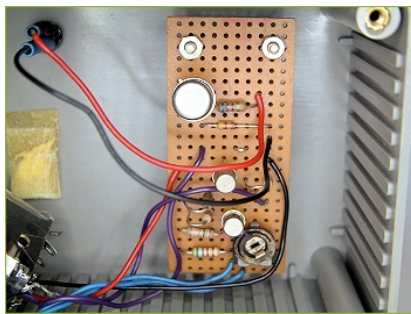
maybe displayed it at a show somewhere. Here's the prototype, revisited for the first time in 32 years, before I return it back to the junk box for ever more.



### ***#7 Dusk-Dawn Relay, Everyday Electronics October 1980***



The turmoil of the erratic publication schedule continued and, disappointingly, my final simple transistor design 'Uniboard' Dusk-Dawn Switch didn't appear until 3 months later in October 1980, when I was 22. It was standard stuff by then – using a BIM plastic box to carry the 24 x 10 stripboard. An ORP12 light-dependent resistor was hooked up separately with a 3.5mm jack. The Schmitt trigger circuit worked well.



~~The prototype didn't make it through the years and has long since been scrapped.~~ I found it a few weeks later!

### ***Closing Notes***

Uniboards was my first series to appear and the experience was quite a trial. It started as a passing enquiry from Fred Bennett in June 1978 looking for some simple transistor designs. It took me a long time to get everything into shape and the correspondence was interminable with letters passing to and fro for 18 months. Sometimes letters and prototypes crossed in the post so the publishers and I were at cross-purposes. In those pre-Email days I'm surprised that anything made it into print at all because communications were so convoluted, not helped by industrial action and major disruption to the publishing timetables through the year. Looking back, it seemed like very hard work and it was (only) moderately rewarding. The money was useful though and it was fairly regular, which as any freelancer knows is itself worth something, but the experience was full of highs and lows, especially the disappointment of not having a clue when anything was going to be published and the lack of any real feedback. Everything dragged on. I just 'fired and forgot', hoping the material would turn out OK in print sometime in the future.



I was also handicapped by shortfalls in my design knowledge as I'd not been trained or educated in electronics, so I had to learn a few things as I went along. I also got the hang of simple project management and lead times, how to source items, assemble and test everything; how to write them up (articles were still typewritten on a manual typewriter, and drawn in pen and ink). Generally, how to organise myself.

I'd established a production line of a hobby, working in the day job at our new address, then during the evenings I'd be seen typing and drawing when I wasn't circuit-breadboarding, soldering or assembling projects. The postman brought a continual flow of little packets of parts to my door as I made myself ever more busy working on my latest ideas for my modest projects.

I left the 1970's behind me and launched into the 1980's doing more of the same. A few slightly more ambitious projects were on the way, decently made and written up (I hoped) if not ambitious electronically. The early days were a blast for a 20-something like me, but the Uniboards series was tinged with disappointment at the solitary nature of the work, the erratic scheduling and the minimal interaction with the publishers apart from the odd polite letter. The workflow became more sporadic in nature due to the turmoil that the industry (if not the whole country) faced at the time.

Onwards and upwards!

You can download reprints of the original Uniboards projects from [www.alanwinstanley.com](http://www.alanwinstanley.com)

ARW April 2012

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