

Jim Hewson
is this month's
winner of a
Peak Atlas Test
Instrument

Solar panel tracker uses LED sensors

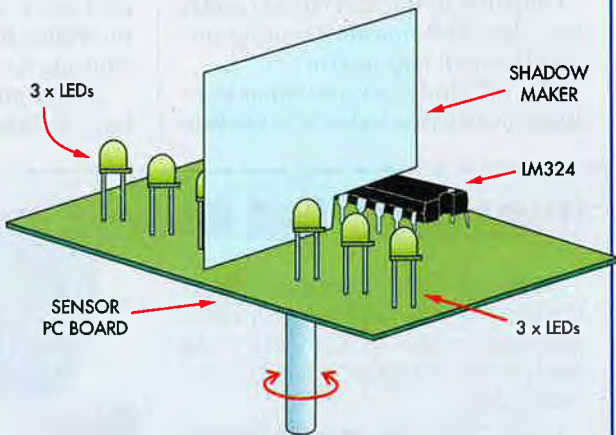
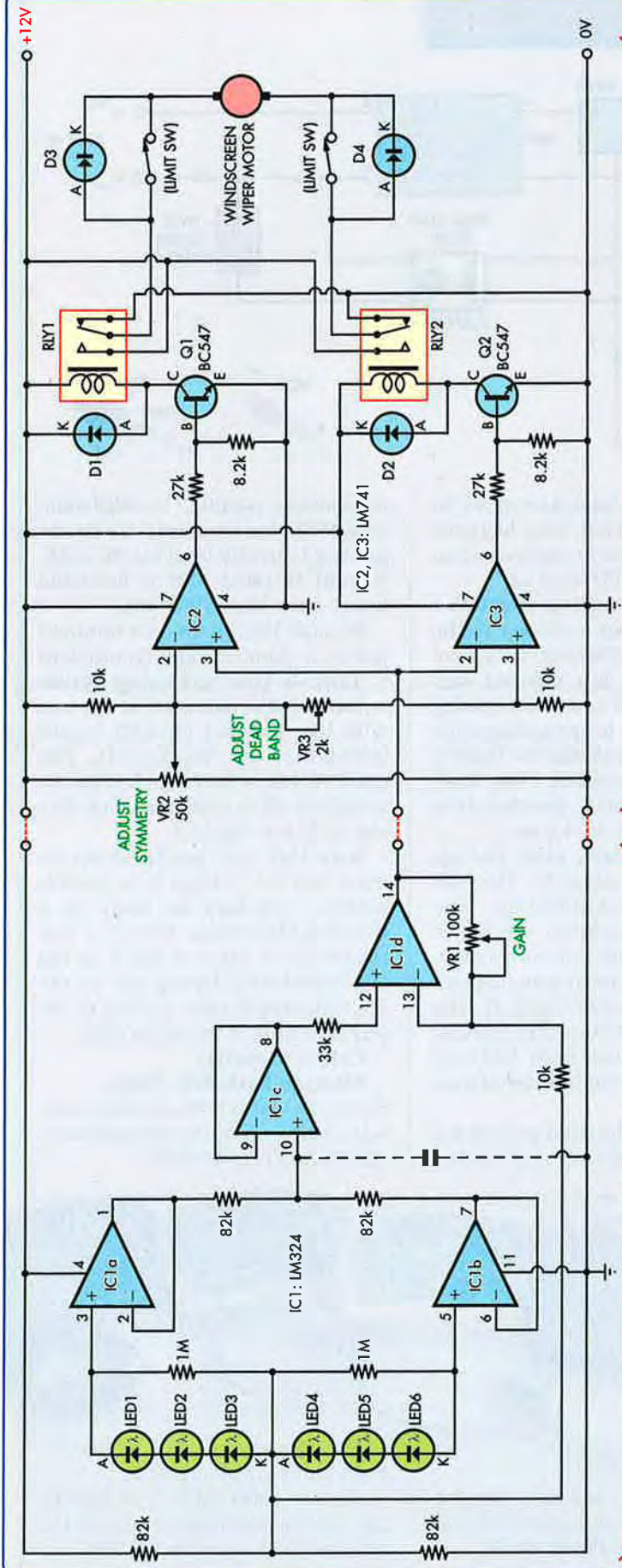
You may have seen solar-panel tracking circuits which used light-dependent resistors (LDRs) or opto-transistors but this circuit uses ordinary LEDs as the optical sensors. In this case, green LEDs were found to be the most sensitive to sunlight and those with a wider viewing angle were most suited to this application.

A string of six green LEDs has its centre point referenced to half the 12V supply by a voltage divider consisting of two 82kΩ resistors. The top and bottom outputs of the LED string are buffered by unity gain op amps IC1a & IC1b and then fed to a mixer stage involving op amp IC1c followed by variable gain stage IC1d which is again referenced to the half-supply voltage divider.

The output of IC1d is fed to a window comparator comprising two 741 op amps. Trimpot VR3 adjusts the dead band between the two comparators both of which drive a transistor and relay to operate the windscreen motor which drives the panel.

The LEDs were protected from ultra-violet with sunglass lenses while the PC board was coated with epoxy resin to protect it from the rain.

Jim Hewson,
Kyneton, Vic.



Above: this diagram shows how the tracker panel is made. It uses two groups of three green LEDs separated by an opaque sheet (or "shadow maker"). In operation, the panel adjusts to keep both sets of LEDs evenly lit.