

An IR illuminator for cameras & night viewers

What ever would you use an infrared (IR) illuminator for? To see in the infrared region, that's what for. More precisely, an IR illuminator can be used with CCD video cameras & with IR night viewers such as the model described in the September 1994 issue of **SILICON CHIP**.

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This IR illuminator provides an output of up to 1.4 watts at 880 nanometres. Most CCD cameras will respond, to some extent at least, to infrared light. The CCD modules themselves are quite responsive to infrared light but many cameras include an infrared filter. This is done so that pictures taken in low light conditions do not have unnatural highlights (to

our eyes) due to the pickup of infrared light.

There are two easy ways to check the IR response of your CCD video camera. First, set it up in a darkened room and then use a torch with red cellophane over the glass. The camera should then produce a useable picture of the room. Second, try the same thing but with illumination now pro-

vided by the infrared remote control for your TV, VCR or other appliance. This is also a good way of checking that your IR remote control is working.

Applications

Now that we have established that CCD cameras can work with IR light, why would you want to do it? The most important application is for security. You could light a building, room, or a yard with infrared light and any miscreant would have no way of knowing that his actions were being monitored by a video camera.

You could also use an IR illuminator and CCD video camera for watching wildlife. Perhaps you have possums or other nocturnal visitors in your backyard or at your campsite. Now you can video them without any

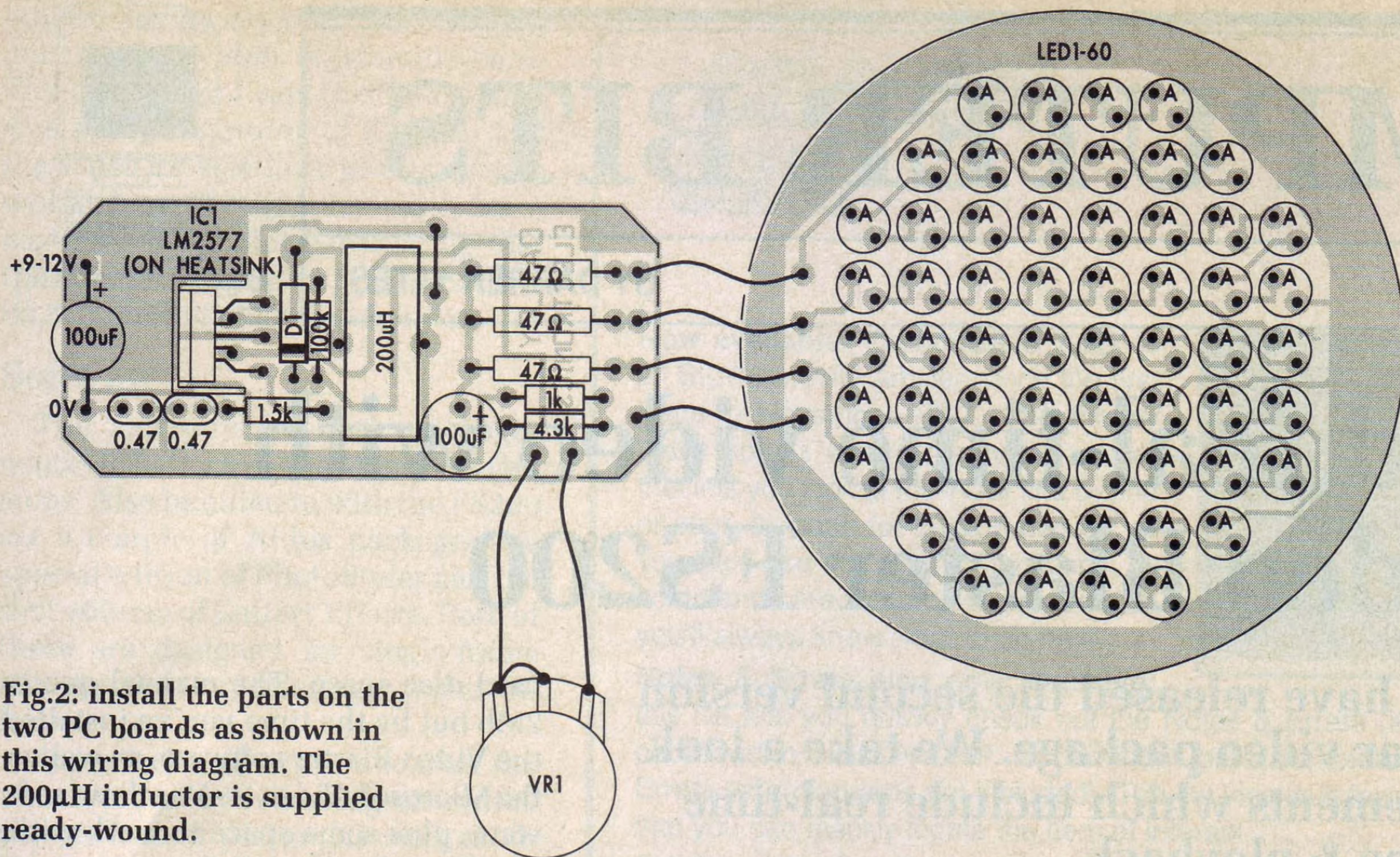


Fig.2: install the parts on the two PC boards as shown in this wiring diagram. The 200µH inductor is supplied ready-wound.

LED array. The photos accompanying this article show the two boards neatly mounted in a short length of PVC tubing but while this is quite an attractive package, we found it doesn't work well in practice because both the LM2577T switching regulator and the LEDs themselves dissipate quite a respectable amount of heat.

However, provided the regulator is fitted with a small heatsink and is not mounted in the same housing as the LEDs, the circuit will function satisfactorily.

On the other hand, if the whole unit

is packed into a short length of tubing as shown, and no heatsink is fitted, the current drawn from the battery will gradually rise and the regulator's temperature will rise to the point where it switches itself off. So you have been warned – don't pack it tightly into a small space and make sure both the regulator and the LEDs are reasonably well ventilated.

Assembly of the boards is quite straightforward. Install all the components on the regulator board first. Note that a 100µF electrolytic capacitor must be connected across the battery

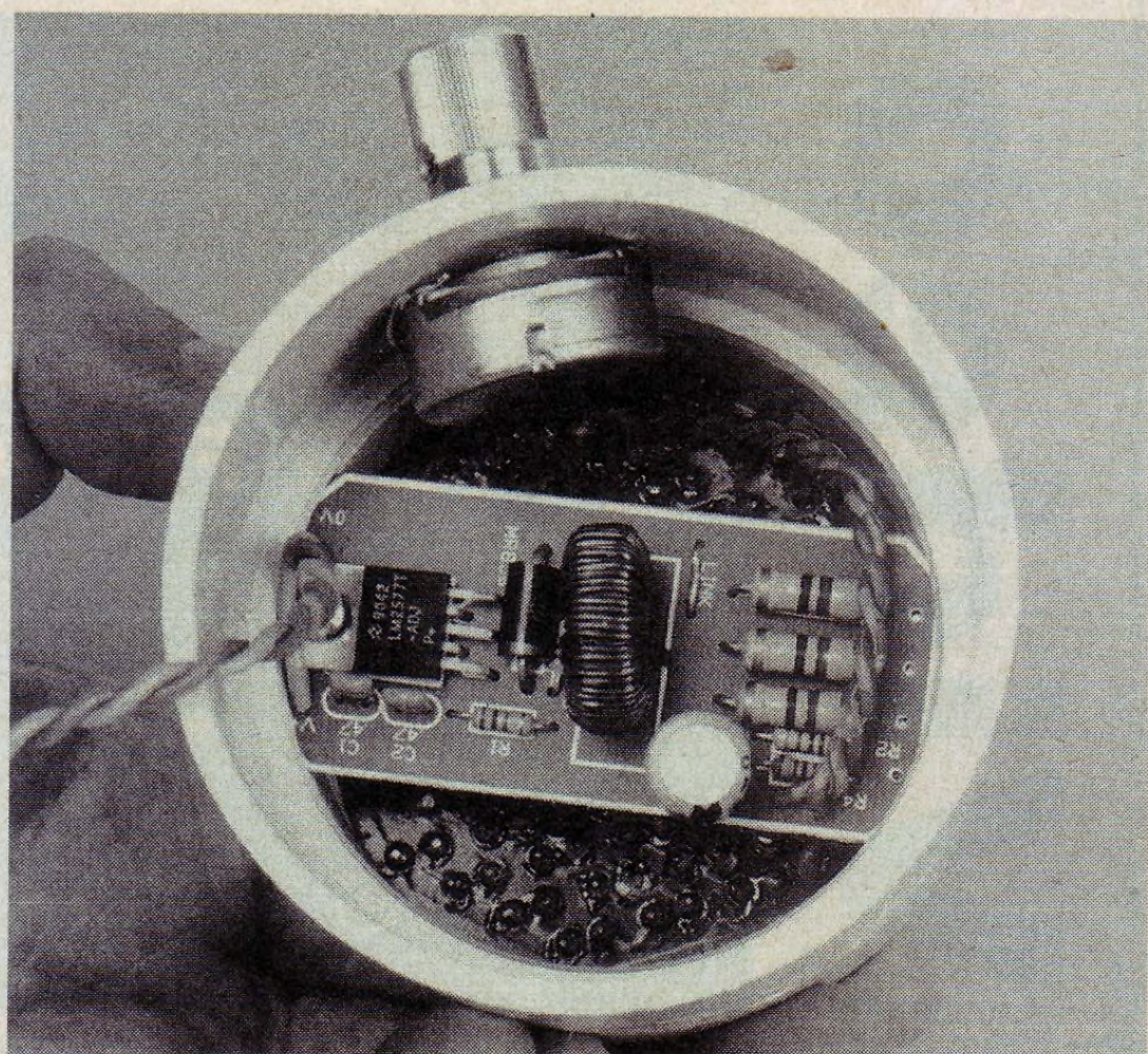
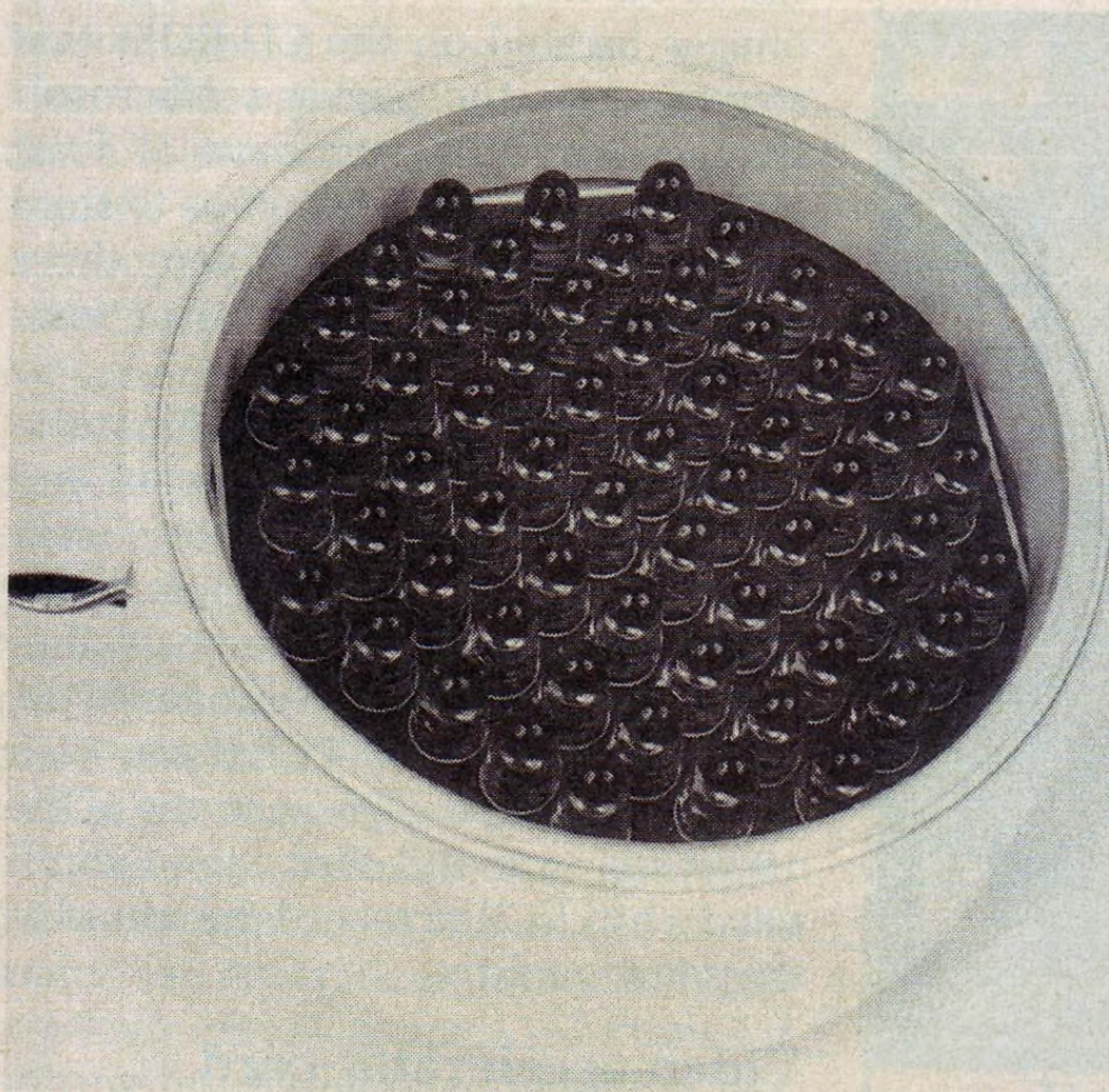
age and the setting of the pot, VR1.

Now assemble the LED board and make sure you connect each LED in the right way around. The longer lead on each LED is the cathode, marked "K" on the PC board.

When complete, connect both PC boards together and power up. Unfortunately, you can't immediately tell whether the LEDs are emitting but after a short while you can easily tell – they radiate heat! As a final check, fire up your video camera in a completely dark room – it will show the illuminator lighting it up brightly. **SC**

inputs to the board. This capacitor is not shown on the screen print overlay on this board although it is shown on Fig.2.

When the regulator board is complete, power it up and check the DC output voltage. The voltage should be able to be varied from about 29.3V to 26.6V. The LM2577 IC runs at close to 50kHz and if you are able to examine the switching waveform on an oscilloscope, you will find that the duty cycle varies depending on the input volt-



The prototype PC boards were built into a short length of PVC tubing but note that this will lead to overheating problems unless the unit is used only in brief bursts (see text). A heatsink should also be fitted to IC1.