

## Pyrometer nulling

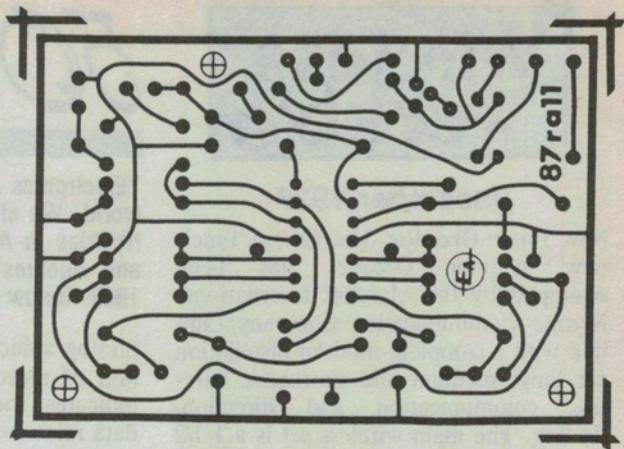
With regard to your article on "Thermocouples Without Tears" in the October issue, I believe that the method you suggest for offset nulling is incorrect. It does not allow for the effects of input bias current and input resistance.

To offset null the amplifier correctly, it must be presented with a source resistance about equal to the resistance of the thermocouple — a short circuit would probably do. If this is not done, then the input bias current (approx 80nA) flowing in the 47k resistor (R2) will produce an offset of nearly 4mV. Compared to the maximum input (full scale input) of 50mV this represents an error of about 8%, which would swamp

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## Oops!

The PCB artwork for the Voice Operated Relay on page 66 of the November 1987 issue was reproduced double size instead of actual size. For people wishing to construct this project here it is again, actual size!



## Notes & Errata

**UHF DOWN CONVERTER** (April 1986, File: 6/TVT/6): The connections to VR3 are shown reversed in both the wiring diagram of page 26 and the inside photo of page 27. The bias voltage fed to the tuner module should increase with clockwise rotation, and this will occur if the connections to the ends of the pot are transposed.

**SIMPLE PYROMETER** (October 1987, File: 3/MS/131): When adjusting the offset nulling using preset pot VR1, the thermocouple probe input socket should be short circuited to closely simulate the input bias current conditions when the probe is connected.

**UHF REMOTE CONTROLLED KEY** (January 1987, File: 3/MS/126): Some readers have commented that sometimes the system fails to operate, but operation can be restored by touching the copper side of the transmitter board. Soldering a 100k ohm resistor across the LED in the transmitter solves this problem, providing a DC return between supply and ground.

**ULTRASONIC BURGLAR ALARM** (April 1987, File: 3/AU/51): A 4.7k resistor should be added across the frequency adjustment potentiometer (VR2). This reduces the frequency range of the transmitter and greatly simplifies the frequency adjustment procedure. The transmitter frequency will be approximately 40kHz with VR2 set to its mechanical centre adjustment. Also the alarm has a tendency to trigger from a drop in supply voltage. This was initially considered an advantage but in practice proved a disadvantage. The problem can be solved by supplying the alarm from a simple 9V voltage regulator circuit. Note that a kit for a suitable regulator (including small PCB) is available from Oatley electronics for \$4 including postage and packing.

If for any reason readers find that sensitivity of this project is insufficient it can be easily increased. This is done by reducing the value of R2 from 47k to 27k. A further increase in gain is possible by also reducing the value of R5 to 27k ohm.

EA

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the 3% to 5% error of the meter. If the amplifier is worse than "typical" then this error may be ten times greater!

This is a small point but important if the accuracy of the instrument is important, particularly if this error is "eliminated" by tweaking VR2, the calibration control. This would result in scale factor and offset errors of significant values particularly at the low end of the instrument.

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*Comment: Thanks for pointing out the error, Phil. What can I have been thinking of? My face is red (blood red, that is, I don't need a pyrometer to check!)*

## Black & white video

Your article in the August issue on old black and white video recorders by Jim Lawler has given me new hope.

Having had video recordings done on a black and white Akai VT100 1/4" reel to reel back in 1973, I am desperate to re-record these tapes onto VHS.

I have tried all avenues as far as transfer studios are concerned but to no avail. If anyone has the facilities or machine to duplicate these tapes I would be very grateful if they could phone me on (02) 631 4683 or write to the address below.

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19 Vernon Street,  
Greystanes NSW 2145.