

### Fast switching solid state relay

In some applications a solid-state relay can replace a conventional electromagnetic one to provide a faster switching response. It must be kept in mind, though, that the contacts are not isolated from the control circuit, but rather are voltage-referenced to it. However, where miniaturisation is desired — as in radio controlled models — the solid-state relay can save space and weight.

This circuit contains one make and one break contact; although a changeover configuration could be obtained by connecting contact points 1 and 3 together

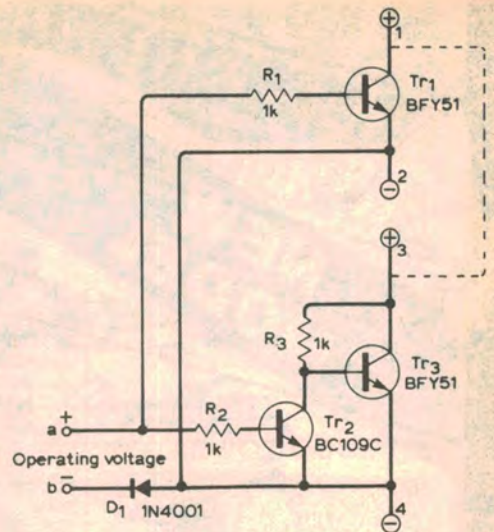
(as indicated by the dashed line).

With no control voltage applied, Tr1 is turned off and acts as an open contact. Tr2 is also turned off, but Tr3 is turned on via R3 and acts as a closed contact.

When a control voltage is applied to inputs "a" and "b", the "relay" operates, reversing the status of the contact pairs. D1 prevents damage to Tr1 and Tr2 should the wrong polarity be applied.

Current rating of Tr1 and Tr3 is 750mA at 20V.

From "Wireless World", November, 1980.



### Recycling etchant solution

Spent ferric chloride solution may be regenerated electrochemically and the dissolved copper recovered. The etching reaction is reversed by applying voltage to a cell consisting of a carbon electrode (from an exhausted D-size carbon-zinc cell) and a copper electrode. The carbon electrode is connected to the positive side of the DC supply and the copper electrode connected to the negative side. Copper plates out onto the copper electrode and the ferric chloride solution

is regenerated. The cell voltage is 2.6 volts so a dropping resistor will be required to limit the current if a battery charger is used as the DC supply. 10 amps applied for an hour plates out about 60 grams of copper. Hydrogen chloride gas is liberated by the reaction so good ventilation is essential.

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### Customised keytops

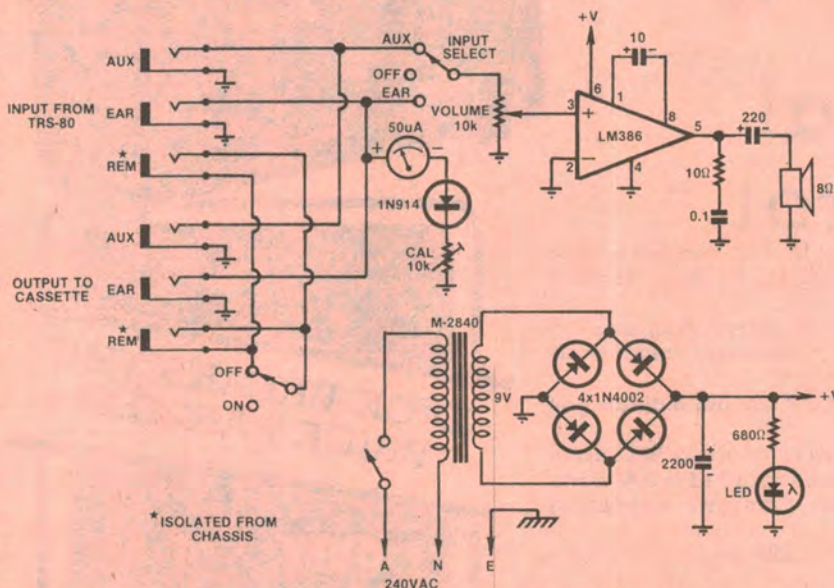
Many keyboards for computer or RTTY work are supplied with blank keys for special functions, or have keys with functions that can be altered. A quick and professional means of altering the character on the keycap would be useful. One easy way to do this is to use Letraset rub-on lettering. The characters are available in a large range of colours and sizes, and stick easily to the plastic. Errors can be fixed simply by lifting the lettering off with a small scraper.

However, once applied the letters have to be protected. Mat varnish is ideal for the job, and the dished surface of most keycaps makes it easy to obtain a perfectly smooth finish. Simply thin the varnish down and place a drop onto the keycap. Move the keycap around to distribute a thin film of varnish all over the surface then leave to dry. The varnish will be slightly thicker towards the centre of the keycap, but as long as only a small drop is used the effect will be unnoticeable.

A similar "painting" technique can be used to change the colour of the keycap, or to blank out an existing character before applying a new one. In this case plastic model paint is the best, as it comes in a wide range of colours in tiny tins.

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### TRS-80 Cassette Control



This circuit allows the operator to have full control of the cassette storage system. It assists in loading programs and has an amplifier (LM386) for sound effects or program monitoring.

The input select switch is a DPDT "centre-off" type which monitors

signals from the earphone or Aux socket. The "centre-off" position allows peace and quiet.

The level meter is calibrated by the 10kΩ trimpot when loading tapes which are known to be reliable.

P. Wakim,  
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### Circuit ideas wanted

**PSST!** Got any neat circuit ideas? We pay between \$5 and \$20 per item, depending on how much work we have to do to publish it. Send your idea to "Electronics Australia," PO Box 163, Chipendale 2008.