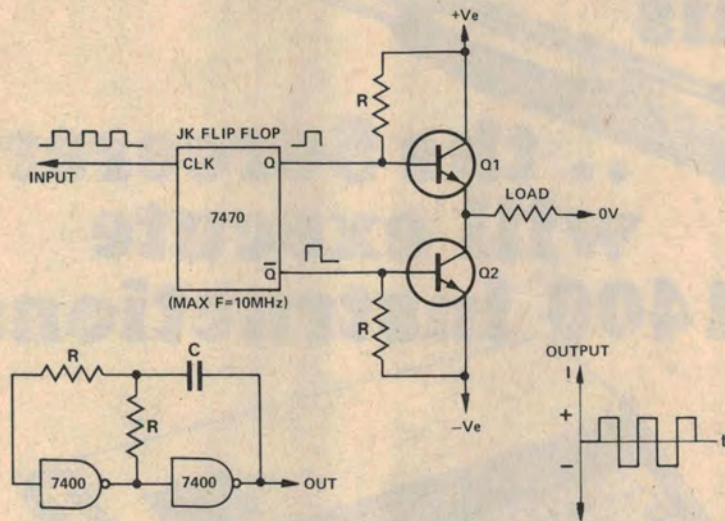


# Ideas for Experimenters



## TTL squarewave generator has 5 watt output

Although many square wave generators have been designed in the past many have two inherent disadvantages; namely, low power and pulses offset above 0V.

This square wave generator, from William Carson of Mt Waverly Victoria, gives a power output of 5 W with a  $\pm 5$  V supply in an 8 ohm load. Transition between levels is fast and no ringing occurs on the edges.

The transistors should be fast switching types such as 2N3563 or 2N3564. The input to the flip flop can be a TTL or unijunction oscillator.

## Battery state indicator

A flashing LED can be used to give an accurate indication of the state of a battery, without using a lot of battery power. The circuit shown can be adapted to batteries from 4V to 16V by selecting R1 to limit the LED current to about 20 mA and choosing ZD1 about 1V lower than the voltage of a flat battery.

RV1 sets an upper voltage, below

which the LED flashes; the flash rate increasing as the voltage drops. RV2 sets a lower voltage, below which the LED is continuously lit, and this should be used to indicate the need for immediate battery charging or replacement.

If a stable reference voltage is available elsewhere in the equipment, this may be used instead of R3 and ZD1.

Now that's quite a cunning idea, from F. Gillespie of Findon W.A.

