

## Square-wave generator with single frequency-adjustment resistor

When the circuit shown is switched on C is uncharged and  $Tr_1$  is non-conducting. Transistor  $Tr_2$  is therefore fully on and its emitter is at a potential near  $V_{cc}$ . Capacitor C therefore charges until  $Tr_1$  begins to conduct which causes  $Tr_2$  to rapidly cut-off, by regenerative action. The emitter of  $Tr_2$  falls to a level determined by the ratio of  $R_1$  to  $R_3$ , and C discharges through  $R_4$  until  $Tr_1$  cuts-off and the cycle repeats.

The transition times of the circuit are rapid and it will work with small-signal silicon transistors up to at least 0.5MHz, and down to a frequency determined by CR. The output is almost an equal mark-to-space ratio over a wide frequency range, though this can be trimmed if required by the ratio of  $R_2$  to  $R_3$ , or by a small resistor in  $Tr_1$  base.

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