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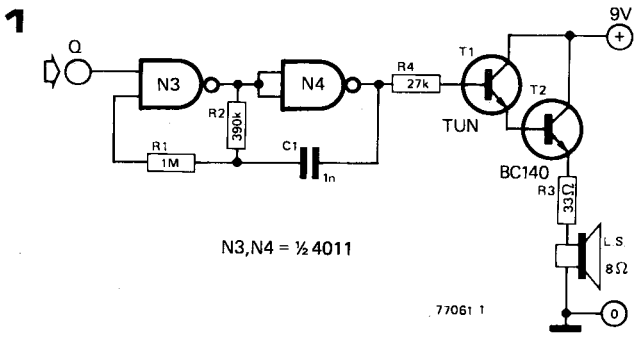
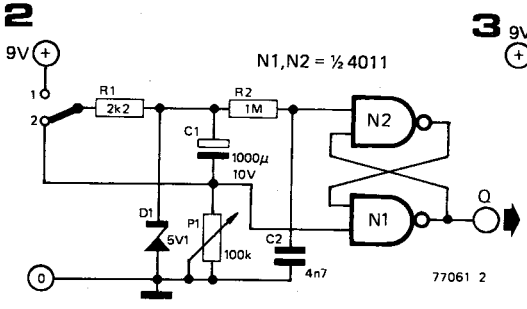
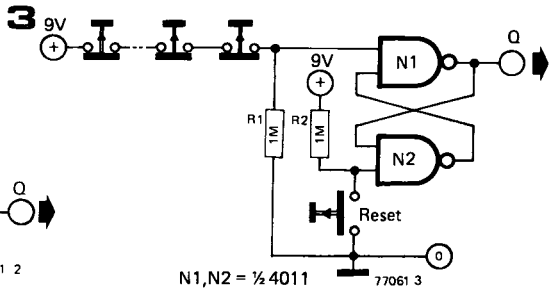
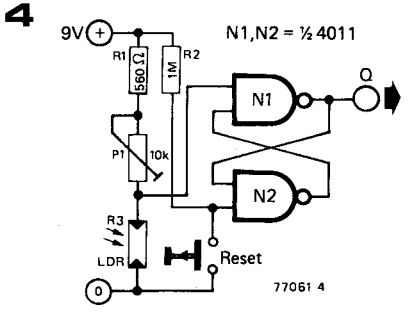
CMOS alarm circuits









Because of their low cost, high input resistance, good noise immunity and wide supply voltage range CMOS logic circuits lend themselves to the construction of cheap and reliable alarm circuits for various applications.

Figure 1 shows a basic alarm oscillator constructed around two CMOS NAND gates. As long as input Q is low the circuit remains inactive. When input Q goes high the circuit begins to oscillate, switching T1 and T2 on and off and producing an alarm signal from the loudspeaker.

Figure 2 shows a circuit for triggering the alarm after a preset time delay that can be varied between one second and one minute. On switch-on the input of N2 is briefly held low by C2, so the flip-flop is reset and the Q output is low. C1 now charges via P1 so that the input voltage of N1 falls until the flip-flop is set and the Q output goes high.

Figure 3 is an alarm circuit that is triggered when a circuit is broken, this is particularly useful in burglar alarm systems where several switches can be connected in series. The input of N1 is normally pulled high via the switches, but if a switch is opened the input of N1 will be pulled down by the resistor, setting the flip-flop and triggering the alarm. If the resistor is connected up to + supply and the switches are connected in parallel down to ground then the alarm can be triggered by closing a switch.

Figure 4 shows an alarm circuit that responds to light. In darkness the resistance of the LDR is high and the input of N1 is pulled high by R1 and P1. If light falls on the LDR the resistance falls and the input of N1 is pulled down, setting the flip-flop and triggering the alarm.