

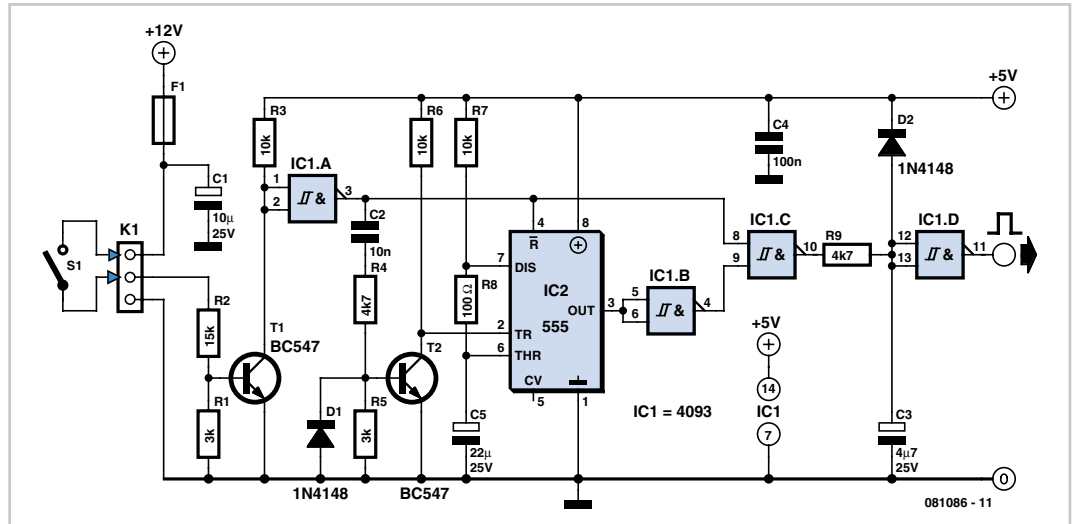
Switching Delay



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The circuit described here was designed as an addition to a remotely-controlled garage door opener. The problem was that a brief burst of interference, arising from a thunderstorm or a mains spike, was enough to trigger the mechanism, and the author found this a nuisance. The effect of the circuit is to enable the output from the receiver module only when a relatively long pulse (more than about 0.5 s) is received. The circuit can of course also be used in other similar situations, such as electrically-powered shutters, alarms and the like.

At the heart of the circuit is NAND gate IC1.C. The output of the circuit (after inverter IC1.D) only goes high when both inputs to IC1.C are at a high level. When the circuit is triggered



T1 conducts, and the output of inverter IC1.A, and hence also pin 8 of IC1.C, go high. If we now arrange things so that for a preset time the other input to IC1.C remains low, the trigger signal will not be propagated to the output until this period has elapsed. In the case

of the author's garage door opener, this will only happen if the button on the transmitter is held down.

The 555 timer is used to generate the delayed gating signal for IC1.C. It is wired as a monostable multivibrator in a similar

fashion to the arrangement in the 'Economy Timer' circuit elsewhere in this issue. When the circuit is triggered T2 will briefly conduct as a result of the positive edge at the output of IC1.A. This triggers the 555 timer: its output will go high, and thus pin 9 of IC1.C will go low. Because of the propagation delays through the components a very short low pulse will appear at the output of IC1.C when

the circuit is triggered. The RC combination at the input to IC1.D ensures that this does not affect the output.

When the period of timer IC2, as determined by R7 and C5, expires its output returns low. This allows the input signal to pass through IC1.C. If the button on the remote control has been released before the timer expires, no signal will pass to the output.

When the trigger signal is removed the output of IC1.A goes low, which resets the timer: the 555's reset input, like its trigger input, is active low. The circuit is now again in its quiescent state.