Simple Codelock

A simple, secure electronic lock release for cars or other uses.

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t seems that it's a whole lot easier to lock your keys into your car these days. Automobiles with power locks seem to invite you to do so with open(?) arms. Well, I don't like the way my locksmith snickers and I hate to see anyone get rich from my misfortunes. What I needed was a simple electronic codelock that wouldn't take up too much room or money, or destroy the appearance of my vehicle, but

Fig. 1. The schematic of the codelock circuit.
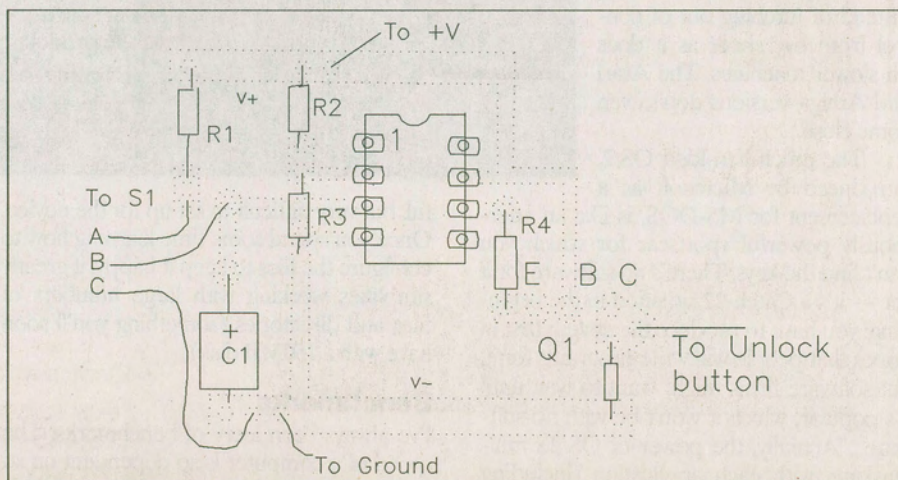
Fig. 2. The parts location, shown enlarged, component side.

PARTS LIST

Resistors
All .25W, 5%
R1 .... 47k
R2 .... 47k
R3 .... 200k
R4 .... 1k

Capacitors
C1 47uF 20V electro.

Semiconductors
D1 .... 1N4001 rectifier diode
IC1 .... 741 opamp
Q1 2N6386 NPN 40V 8A Darlington transistor

Switches
S1 .... SPDT momentary switch

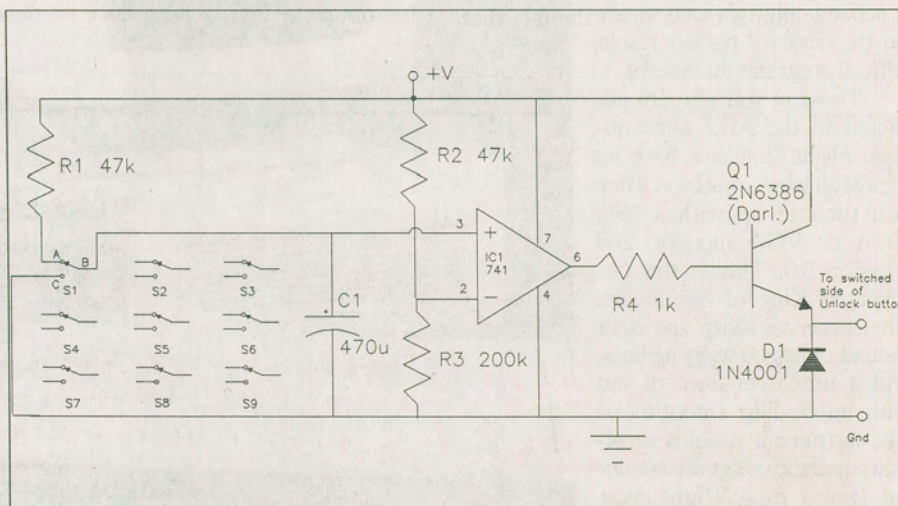### Miscellaneous
Wire, project box, nine momentary switches or keypad

would maintain an adequate amount of security. The circuit described here fits the bill perfectly and can be used in a host of other security applications.

How It Works

The circuit in Fig. 1 compares an RC divider network to a resistor network. When S1 is depressed, C1 charges through R1 and sets the output of IC1 high when the voltage across C1 exceeds the voltage across R3. This takes about 1.5 RC time constants and with the values given comes to about 30 seconds. The timing is unaffected by supply voltage since both the RC divider and the resistor divider reference from +V. This means that as long as the supply voltage is sufficient to operate the op amp, the length of time S1 must remain activated will remain constant. The output of IC1 controls Q1, which parallels the controlled side of the 'UNLOCK' button in the car. The security of the system is based upon the fact that
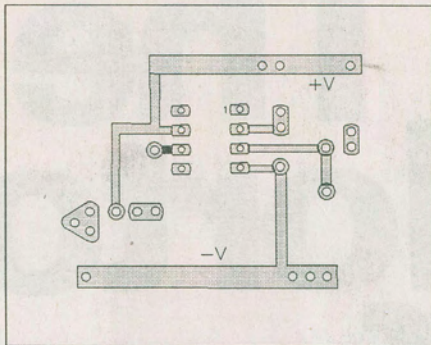

Fig. 3. The printed circuit board, foil side.

anyone seeing a matrix of nine switches will assume it is the front end of sequential-push codelock. Simply pushing any button will do nothing. Pushing the active button for less than the proper time will produce no result, since C1 will discharge when S1 is released. Pushing the active button many times will produce no result

for the same reason. Since the circuit activates on time rather than sequence, hiding the active button in an unlikely place will provide protection against unauthorized entry as well.

Construction

Construction may be by the method of your choice, but either PC board or perfboard is recommended to keep everything neat. See Fig. 2 for the component layout. Be sure of the wiring of S1 or else the lock may activate itself about 30 seconds after power is applied. Remember that if S1 is going to be exposed to the elements, a weatherproof switch should be used and the connections siliconed.

Getting In

So go ahead, lock your keys in your car; it doesn't matter anymore. It will take you less than a minute to get into your vehicle and you don't have to pull out your hair or your wallet to do it. ∎