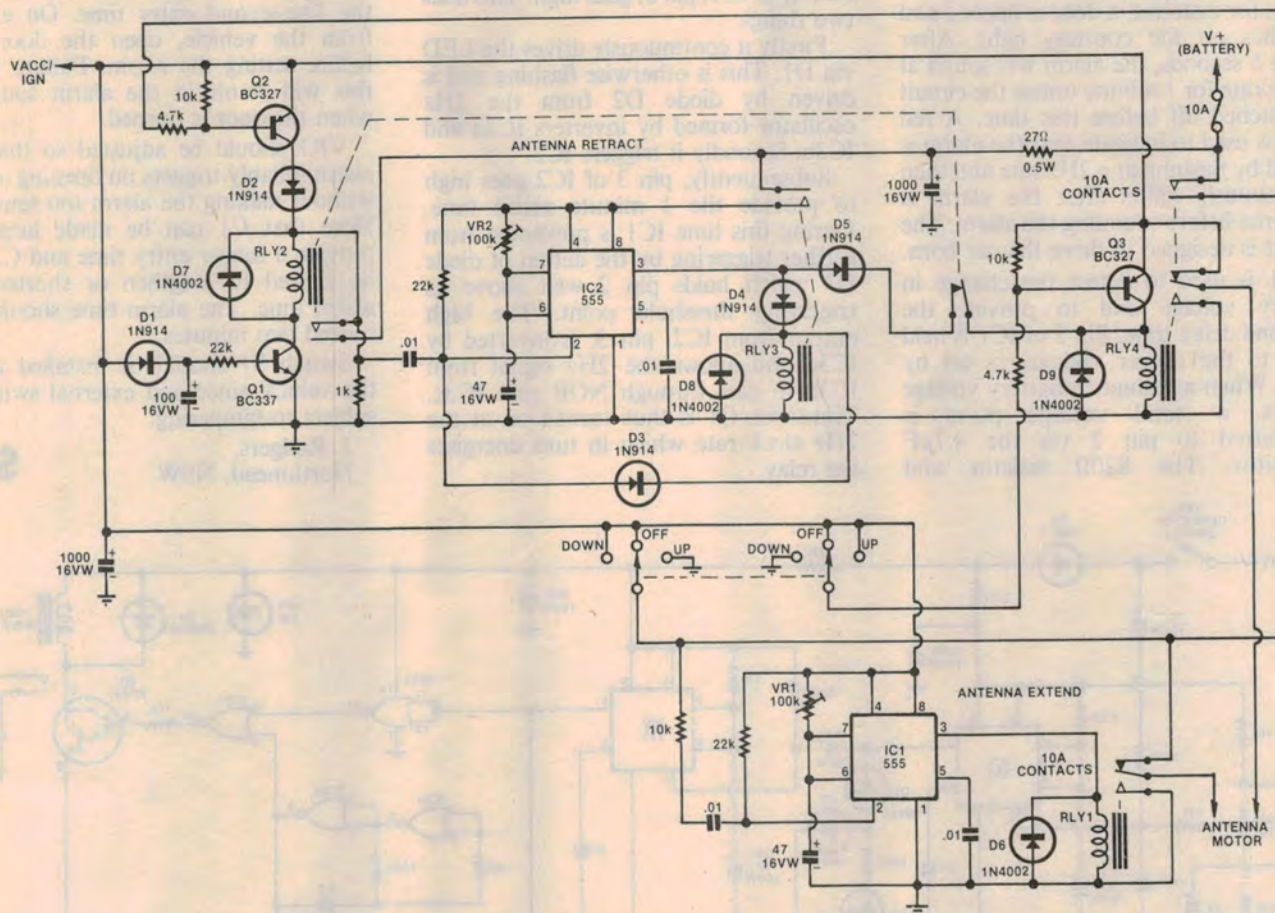


# Circuit & Design Ideas

Interesting circuit ideas from readers and technical literature. While this material has been checked as far as possible for feasibility, the circuits have not been built and tested by us. As a consequence, we cannot accept responsibility, enter into correspondence or provide constructional details.



## Automatic antenna retraction

Many late-model cars are fitted with power antennas but not all automatically retract when the ignition is switched off. This automatic extend and retract circuit is relatively simple, reliable and easy to install.

In the Honda Accord, for example, a 3-position rocker switch, spring-biased to centre off, is used to extend and retract the antenna. The antenna motor has two leads which are reversed by the switch to determine the direction of motor rotation. With the ignition switch on and the switch in the off position, both motor leads are connected to battery positive, so providing an electric brake.

In some cars, however, the off position simply disconnects the antenna motor from the power supply. This has no effect on circuit operation.

To extend the antenna the ignition switch is turned on and the up side of the switch pressed momentarily. This also

arms the retract circuit so that, when the ignition switch is turned off, the antenna automatically retracts after a short delay. The delay is necessary because most modern cars shed the accessory load when the ignition switch is in the start position.

The extend circuitry is quite straightforward. When the rocker switch is closed, pin 2 of 555 monostable IC1 goes low and its output goes high. This energises relay 1 and so current flows to the antenna motor via the normally open contacts. At the end of the monostable period, the relay turns off (pin 3 low) and the motor stops.

IC2, a 555 timer wired as a monostable, forms the heart of the retract circuit. When the ignition switch is turned on, power is applied to the base of Q1 which provides the return for relay 2. When the UP switch is closed, a low is applied to the base of Q2. This low is also used to trigger IC2 (555) in the extend circuit.

When Q2 is turned on, relay 2 will be energised and latched through its normally open (N/O) contacts. Relay 3 is now energised via D3 and V(BAT) is available to IC1. When the ignition switch is turned off, Q1 turns off after a delay of about six seconds, relay 2 is de-energised, and a low is applied to the pin 2 triggered input of IC1 via the 1kΩ resistor and .01μF capacitor.

Relay 3 is now energised via D4 from the pin 3 output of IC1 (ie, the relay remains on), while relay 4 is turned on via D5 and the normally closed (N/C) contacts of relay 2. This supplies power to the antenna motor via the N/O contacts of relay 4 and the N/C contacts of relay 1. Hence the antenna retracts.

Trimpots VR1 and VR2 set the monostable periods and are adjusted so that the antenna fully extends (VR1) and retracts (VR2). Note the 10A fuse in the V(BAT) supply.

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**\$30**