

TECH TIPS

Car Radio Latch

A. Miller

When fitting a car radio or cassette player into a car, one problem is deciding which side of the ignition to connect the supply lead. If it's connected to the ignition side, the keys must be in to use the radio, a potential hazard if children are left listening. On the other hand, if it's connected to the battery side you have to remember to turn off the radio every time you leave the car.

The answer is simple — you connect to both using the circuit shown here. Normally the radio is left switched on and it will go on and off with the ignition. But if the ignition is off, switching the radio off and then on again also turns the radio on.

The circuit consists of a latch using Q1 and Q3, which controls a driver stage Q4. The LED indicates the state of the latch and is optional, but it doesn't consume any extra power since without it, the power would only be dissipated in R6. C2 serves to trigger the latch on and off with the ignition, and R4 prevents false triggering during starting. If the radio goes off after starting, R4 should be increased, and if the radio fails to go on and off with the ignition, R4 should be reduced.

When the latch is in the 'off' state, a small current passes through R7 to the radio. While the radio is on, C3 and C4 will remain discharged, but if the radio is off, C3 and C4 charge to the full battery voltage. If the radio is switched on, C4 rapidly discharges through the radio leaving C3 to discharge via Q5 and D1 and produce a current in R8. This turns on Q2, triggering the latch to supply power to the radio. C1 ensures reliable triggering.

Q1,2,3 and 5 are all general-purpose transistors, such as the 2N3904 type, and Q4 is a power Darlington with at least 2 A rated collector current. No heatsink should be necessary for Q4, as it is always either off or in saturation. D1 is a general-purpose diode such as the 1N4148. R4 is the only component with a critical value and may need adjusting as mentioned earlier. All the component values are those used in the prototype and any similar values should work. The quiescent power consumption is either 2 mA or 10 mA depending on the state of the latch, but if the vehicle is to be left standing for longer than two weeks, the unit (or the battery) should be disconnected.

