Car Radio Aerial Preamplifier
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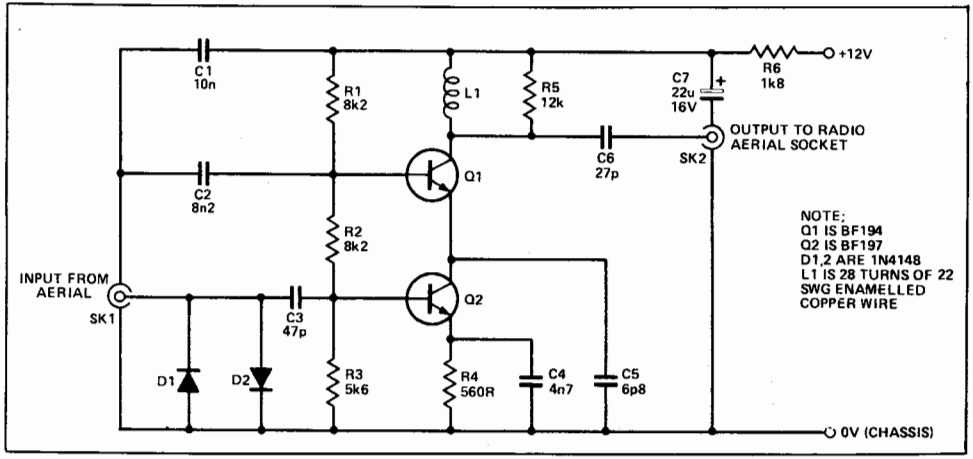
This circuit is a very high gain, high frequency amplifier using two NPN transistors in cascode. The input is taken via SK1 and C3 to the base of Q2. The amplified signal (between 200 kHz and 200 MHz) is passed to the emitter of Q1, which is connected in the common base mode, giving a very good gain at high frequencies. R1-3 set the bias voltages for the two transistors, while R4 and C4 provide negative feedback and help increase the bandwidth of the stage.

Capacitor C1 and C7, along with R6, are the supply decoupling components and also help to filter out any noise generated by the engine. Note that L1 is a radio frequency choke, which can be made by winding 28 turns of 22 swg copper wire on resistor R5; this will give a lower gain on long and medium wave, but as the desired frequency increases the reactance of L1 will increase, allowing more of the amplified signal to pass through capacitor C6.



The two diodes connected across the input socket are to protect the transistors against static discharges and overloading. If it is found that the gain is too high, then by changing C4 to, say, 500pF, the gain can be reduced to a lower level.

The amplifier has been in use for over five months now and has proven to be very stable and surprisingly quiet as regards adding any noise to signals in low signal-strength areas.