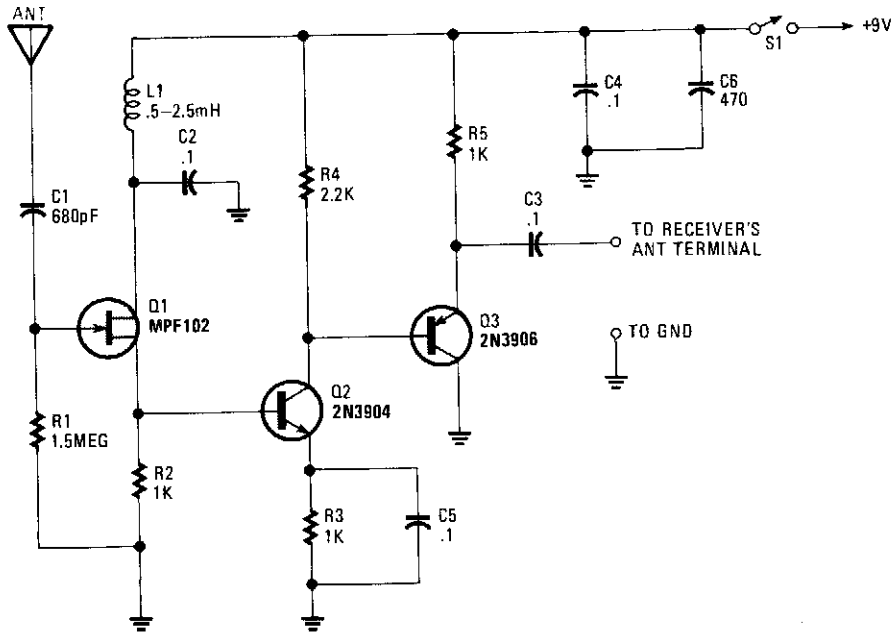
ACTIVE ANTENNA WITH GAIN



POPULAR ELECTRONICS

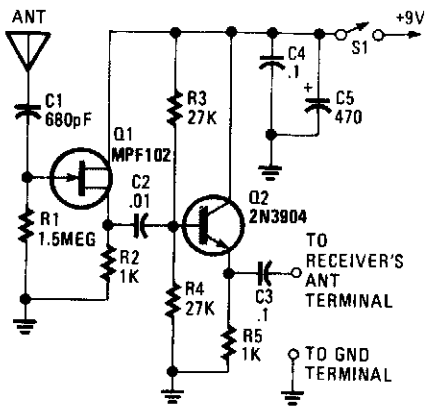
Fig. 1-1

The signal booster, built around a few transistors and support components, offers an RF gain of about 12 to 18 dB (from about 100 kHz to over 30 MHz).

The RF signal is direct-coupled from Q1's source terminal to the base of Q2, which is configured as a voltage amplifier. The output of Q2 is then direct-coupled to the base of Q3 (configured as an emitter-follower amplifier). Transistor Q3 is used to match and isolate the gain stage from the receiver's RF-input circuitry.

Inductor L1 is used to keep any power source noise from reaching the FET (Q1) and any value of RF choke from 0.5 to 2.5 mH will do. The value of R2 sets the Q2 bias at about 2 V. If the voltage is less than 2 V, increase the value of R2 to 1.5 kΩ. To go below 100 kHz (to the bottom of the RF spectrum), increase the value of C1 to 0.002 μF. The antenna is a short pull-up type (42″ to 86″ long).

ACTIVE ANTENNA I

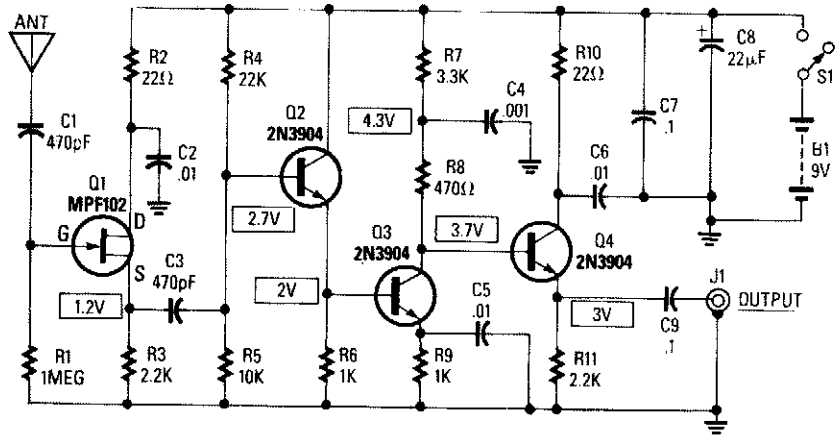


POPULAR ELECTRONICS *Fig. 1-2*

This circuit is designed to make a short pull-up antenna perform like a long wire antenna, while offering no voltage gain. The circuit boosts the receiver's performance only if the signal at the antenna is of sufficient level to begin with.

This circuit takes a short pull-up antenna that has a high output impedance and couples it to the receiver's low input impedance through a two-transistor impedance-matching network. Transistor Q1's high input impedance and high-frequency characteristics make it a good match for the short antenna, and Q2's low output impedance is a close match for the receiver's input. This circuit is usable over the range from 100 kHz to 30 MHz.

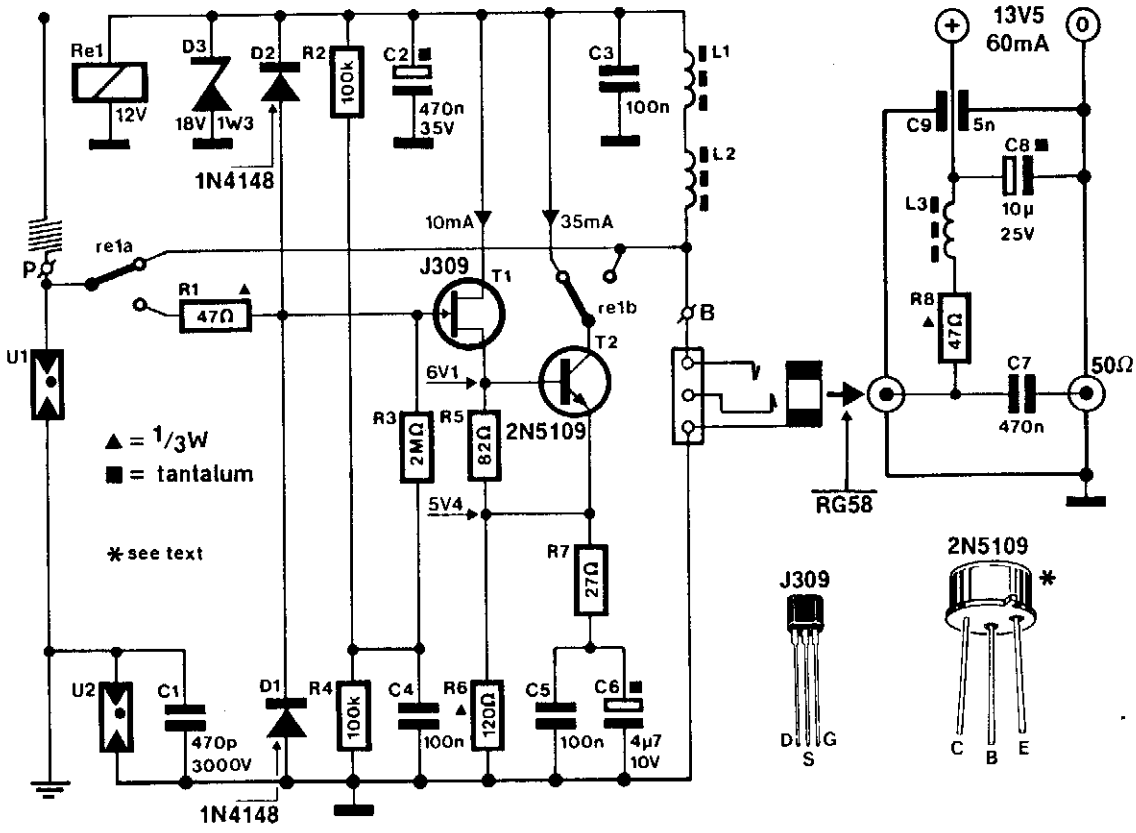
ACTIVE ANTENNA II



RADIO-ELECTRONICS *Fig. 1-3*

This circuit provides 14- to 20-dB gain at frequencies from 10 kHz to 30 MHz. The antenna length can be anything between 5 and 10 feet. A 102-inch CB whip is excellent for this purpose.

WIDEBAND ACTIVE ROD ANTENNA



ELEKTOR ELECTRONICS

Fig. 1-4

A J309 Siliconix FET feeds a 2N5109 in a wideband RF amplifier configuration. A relay is used to bypass the amplifier in the transmit mode (if desired). A 2-m 5/8-wave whip is used as the active antenna element. The amplifier is fed dc via the coax cable, which makes the use of only a single coax lead for both signal and power. U1 is a surge arrester for electrostatic discharge protection.