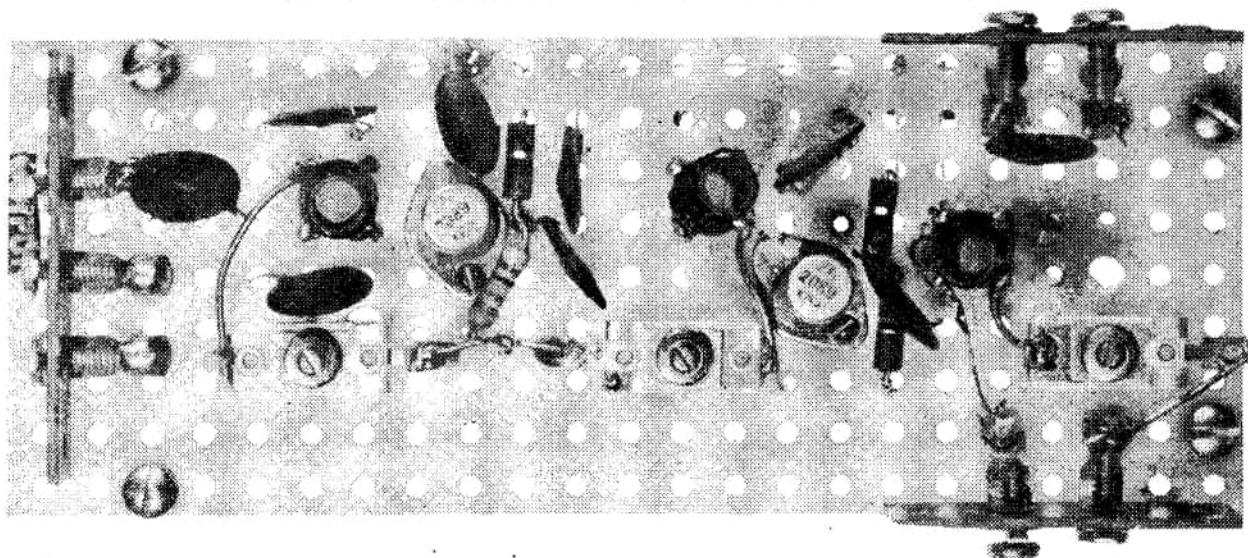


CB SIGNAL BOOSTER



Transistorized unit achieves up to 24 db boost in reception.

By Kevin Redmond, K2HTZ (Head, Semiconductor Applications Laboratory, Amperex Electronics)

YOU can add greater sensitivity, lower cross-modulation, and quieter operation to your rig with the twenty-four db of gain provided by this versatile CB Signal Booster. Low sensitivity receivers use its high gain to improve sensitivity while high sensitivity receivers can use the gain to permit higher squelch settings and therefore quieter reception. Output impedance taps on the booster allow matching to a variety of antennas and receiver input stages. Satisfactory performance is delivered with a DC supply range of six to twelve volts assuring adaptability to various supply systems.

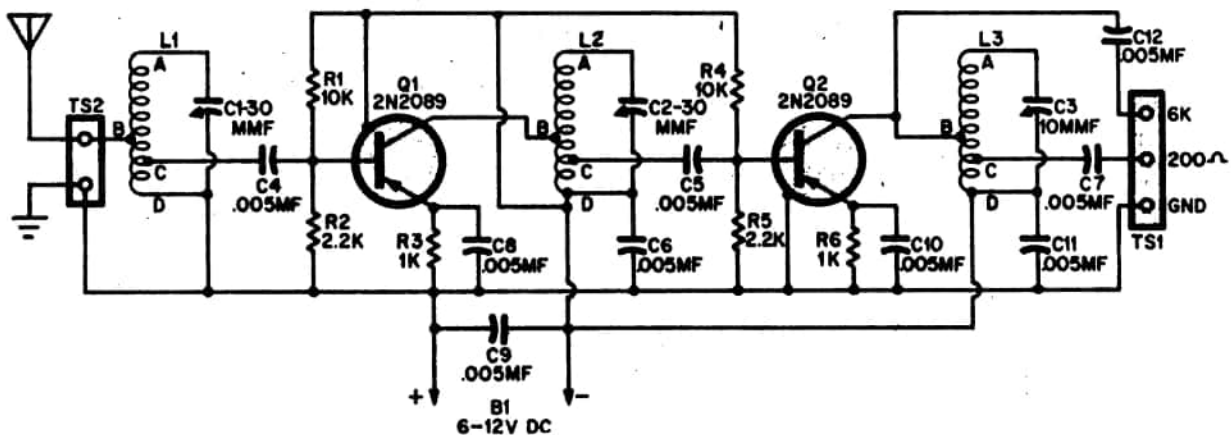
Construction has been simplified by mounting all parts on a perforated board. When completed, the board can be used as a subchassis mounted inside a CB rig or in a Minibox using stand-offs as mounting supports. The three coils are closewound on paper coil forms with the taps at the end of the coil nearest the mounting. Be careful not to bend the lugs too much when mounting the coil as the form may separate from its mounting base. The layout shown in the pictorial should be followed closely, except that the socket of transistor Q1 should actually be installed between L1 and L2 for the shortest possible leads. It's important that the "ground side" of trimmer capacitors C1, C2 and C3 be connected to the bottom end (D) of coils L1, L2 and L3. See photo. If this is not done hand capacitance effects will make tuning difficult.

Coupling capacitors C4 and C5 carry RF and must be kept away from ground leads and RF circuitry or coupling from the capacitor body will reduce gain or cause oscillation.

DC Check. Once the unit has been completed, check the DC operating point first. This can be done by measuring the DC

Photo of author's prototype of Booster differs slightly from pictorial below. Most wires are run on reverse side of perforated board and transistor Q1 is located between L1 and L2. The photo should be followed, particularly in the placement of trimmers C1, C2 and C3.

In the pictorial below, for the sake of clarity the component and other interconnecting leads are shown longer than required. In this unit, as in all RF devices, leads should be short and run direct as possible. The taps on the coils should be connected to the lettered lugs.

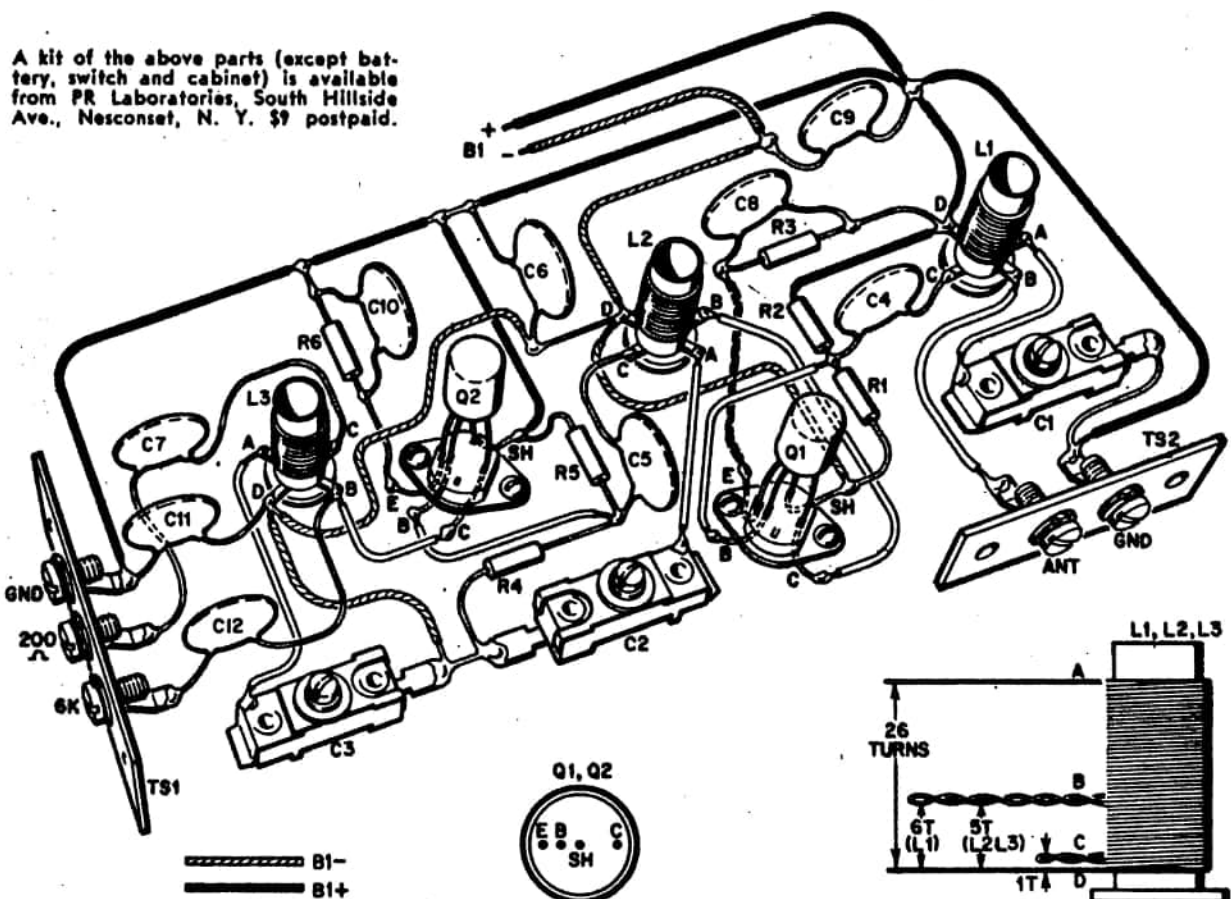


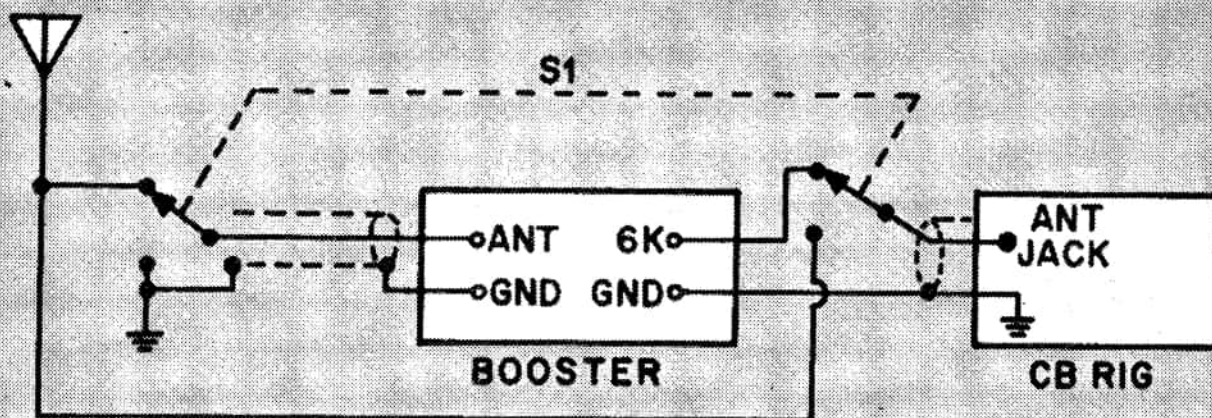
R1, R4—10,000 ohms resistor, $\frac{1}{2}$ watt, 10%
 R2, R5—2,200 ohms resistor, $\frac{1}{2}$ watt, 10%
 R3, R6—1,000 ohms resistor, $\frac{1}{2}$ watt, 10%
 C1, C2, C3—2-30 mmf trimmer capacitor
 C4 to C12—.005 mf low-voltage ceramic discs or .0047 mf tubular types

PARTS LIST
 Q1, Q2—2N2089 transistor (AmpereX)
 L1—26S" dia. Cambion coil form, SPC-2J4L, slug removed; 26 turns closewound #28 enam. wire tapped at 1 and 5 turns
 L2, L3—Same form as L1; 26 turns

tapped at 1 and 5 turns
 TS1—3-screw terminal strip
 TS2—3-screw terminal strip
 Misc. — Perforated board (approx. $8\frac{1}{2} \times 2\frac{1}{2}$ "); flea clips; plastic cabinet two 4-lead transistor sockets, hardware, etc.

A kit of the above parts (except battery, switch and cabinet) is available from PR Laboratories, South Hillside Ave., Nesconset, N. Y. \$9 postpaid.





To protect the Booster during transmission periods, a double-pole, double-throw slide switch is required in addition to the transceiver's normal P-T-T switch. See text for specific details.

voltage across R3 and R6. At a supply voltage of 6 volts, the voltage across each of these resistors should be approximately 1 volt. Or, with a supply voltage of 12 volts, the reading will be about 2 volts. The voltages across R2 and R5 should be .25 volts higher than those across R3 and R6.

Tuning the Booster. To adjust the tuning capacitors (C1, C2, C3) connect the Booster's 6K output and Gnd terminals to a short length of coax cable fitted with a plug to match the antenna input jack of the CB receiver. The receiver should be tuned to a center band channel. A transmitter on the same channel can be used as the signal source if it is kept at least 10 feet away from the Booster. No antenna should be used for the booster at this step. Capacitors C1, C2 and C3 should be now adjusted for maximum signal as determined audibly or read by the receiver's S-meter.

If a signal generator is used as the signal source, an 18,000 ohm resistor should be used between the generator's hot lead and antenna terminal of the Booster. In addition, a 12 mmf capacitor should be installed across the antenna and ground terminal of TS2.

Using the Booster. With transceivers, special precautions must be taken not to damage the booster's transistors when transmitting. The simplest solution is to connect a DPDT switch as shown in the diagram. This switching arrangement will work with practically

all receiving systems. The booster input is shorted during transmission when the DPDT switch is thrown to the *xmit* position. Use a DPDT slide switch or other low capacitance type as both the RF input and output of the booster go through it. S1 is shown set for *receive*.

Standard antennas, including whips, are connected to TS2. An antenna with a loading coil or one which reflects a low impedance because of mismatch or overlong transmission line is connected directly to tap C on L1. Either connection is made via the slide switch mentioned above.

If your rig is transistorized, the 200-ohm output terminal on the Booster can connect directly to the base of the RF input transistor. As an alternative on a handi-talkie type rig, the 6K output of the Booster can be connected directly to the whip antenna. Gnd on the Booster connects to the ground of the CB unit. Super-regen receivers will probably only be able to operate with the direct antenna connection.

There are several inexpensive handi-talkies which use the super-regen receiver stage as their transmitter. Don't expect the Booster to be of much help.

When receiving strong stations, the Booster may provide excessive amplification and cause blocking in the CB rig's input stage. This problem is easily solved by reducing antenna length or by dropping the voltage feeding the Booster. —●—