

Build the "ROADMATE" CB CONVERTER



BY DEAN TODD

Compact converter allows you to listen to all 23 CB channels on any AM radio.

THE NEXT best thing to having a CB transceiver in your car is to be able to listen to any of the 23 CB channels through your car's AM radio. This way, you can keep up with the latest traffic information, know where the jams are and which roads are open and closed, etc. The low-cost "Roadmate" AM-to-CB converter discussed here lets you listen in for less than \$14 in parts.

The Roadmate connects directly between the existing antenna and car radio and only requires hookup to the car's electrical system to complete installation. You can leave the converter permanently connected because a switch allows selection of CB or AM listening.

How It Works. The schematic diagram of the converter is shown in Fig. 1. The converter, installed between the antenna and the radio's r-f input, serves as an added "front-end" for the radio. The antenna plugs into *J1*, while *P1*, located at the end of a length of coaxial cable (the same type used in car radio antenna installations), plugs directly into the antenna jack of the car radio.

When *S1* is set to CB, field-effect

transistor *Q1* is used as a mixer that accepts the incoming 27-MHz CB frequencies from antenna transformer *T1*. It mixes these signals with the 26-MHz third harmonic signal developed by the crystal-controlled *Q2* oscillator to produce an i-f of approximately 1 MHz. Since the car radio tunes from 550 to 1600 kHz, the output of the converter is roughly in the center of the AM broadcast band. This means that the car radio can be used as a "tunable i-f" so that the CB channels appear spotted along the AM band. Oscillator-to-mixer coupling is through *C4*, while r-f decoupling is provided by *L1*, *L2*, *C7*, and *C8*.

With *S1* in the CB mode, *LED1* is energized to give a visual indication of the type of operation.

Setting *S1* to RADIO switches *LED1* out of the circuit. It also completely bypasses the converter circuits and connects the antenna directly to the radio's input connector.

Construction. Best results will be obtained if the converter is assembled on a small printed circuit board, the actual-size etching and drilling guide and components-placement diagram for which are shown in Fig. 2.

Pushbutton switch *S1* and indicator *LED1* should be mounted so that they protrude through holes drilled in the front panel of the box in which the circuit is mounted. (The prototype project was housed in a 4¼" × 3¼" × 1¼"—10.8 × 8.3 × 3.2 cm—metal box.) Suitable mounting holes should also be drilled to allow the pc board to be mounted on spacers inside the box.

Mount antenna jack *J1* on the rear panel of the box, with the coaxial cable to which *P1* is connected exiting the box near the jack. Use red and black stranded hookup wire for the "hot" (+) and ground power leads, respectively. These wires should exit the box through a rubber-grommet-lined hole in the rear panel.

Use a pair of small L brackets or double-sided adhesive foam tape to mount the converter to the underside of the dashboard or wherever you feel it will be convenient to reach.

Installation and Operation. With the converter mounted as desired, connect the black power lead to any metal portion of the car's chassis and the hot (red) lead to any 12-volt line that is "live" when the ignition or car radio is turned on. Unplug the antenna

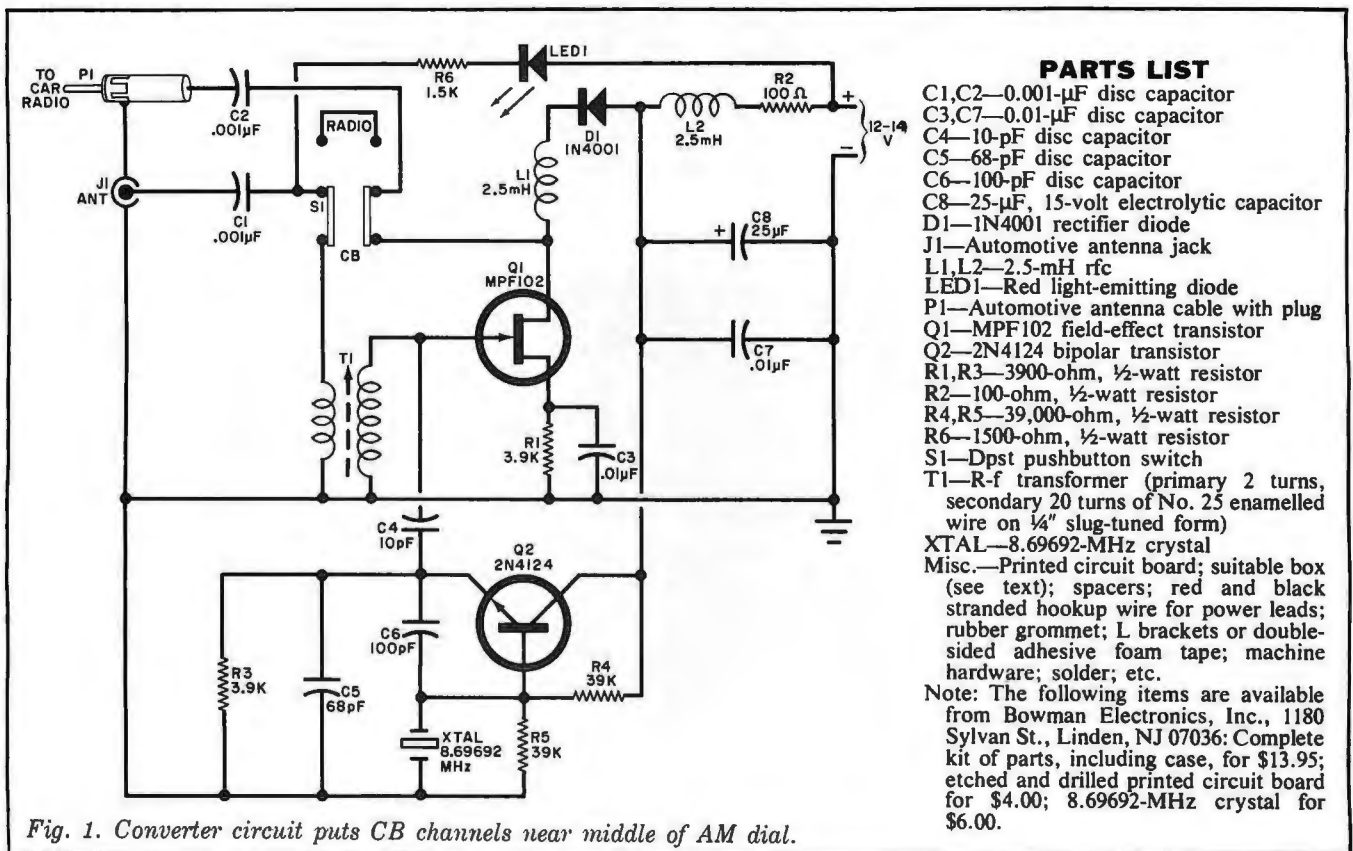


Fig. 1. Converter circuit puts CB channels near middle of AM dial.

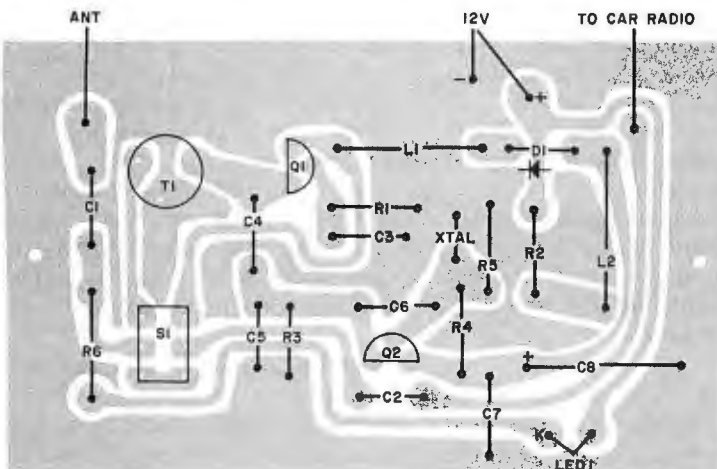
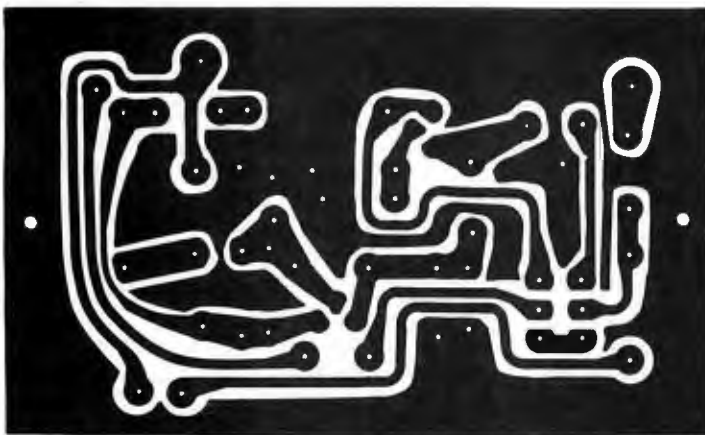


Fig. 2. Etching and drilling guide (top) and component placement for the converter.

from the car radio and plug it into *J1* on the rear of the converter. Then plug *P1* at the end of the converter's coaxial cable into the radio's antenna input jack.

Turn on the car's ignition (or radio) and depress *S1*. This sets the converter up for CB operation. The LED on the front panel should glow. Tune the car radio to about the center of the AM dial (approximately 1000 kHz) until you hear a CB transmission. As you continue tuning, you should be able to pick up all 23 CB channels. You can now "peak" *T1* and the car radio's antenna trimmer capacitor for best reception.

Set *S1* to its alternate (RADIO) position. The LED should extinguish and you should be able to tune standard AM broadcast stations as usual.

Options. By changing the crystal frequency, it will be possible for you to pick up other frequencies near the 27-MHz CB band, such as hams working 10 meters (28 MHz). By changing the windings of *T1* and the crystal frequency, it is possible to tune in some of the popular shortwave bands, including WWV. Of course, you will have to experiment with the windings of *T1*, and you will have to select a crystal so that one of its harmonics falls within 1 MHz of the desired frequency. ♦