THE GREAT HIFI SCANDAL
HOW ELECTRIC SHOCK KILLS
NEW INDOOR TV ANTENNAS

Build:
- All-Band SWL Antenna
- Budget Battery Charger
- CB Adaptor for SWL Sets
- Calibrator for Oscilloscopes
  - One-Tube Radio
  - Stereo Watt Indicator
  - Wireless CPO
- $3.08 Stereo Mixer

$5 BUILDS THIS
10-WATT HAM TRANSMITTER!
Being a 2-band ham rig you can lash up for as little as 5 clams!

By HERB FRIEDMAN, W2ZLF

REAL CHALLENGE used to be ham radio's keynote. No one in the early days ever thought of flipping through a catalog, ordering gear galore and then going on the air the same day the stuff arrived. Most everyone rolled his own in those days.

Today, this kind of fun is pretty much gone with the wind. But not quite: build EI's Scrounger, and you're in for all the thrills and satisfactions that can only come from building your own equipment. Whether you're a new General, a Novice or an old timer, the Scrounger can put real enjoyment into amateur-radio construction and operation. And what's the Scrounger? Why, a crystal-controlled 80- and 40-meter CW transmitter with an input power of up to 10 watts—more than enough to enable the sharp operator to paper his walls with QSL's.

It's designed as a junk-box project and most of the parts can be swiped from old TVs, radios or scrapped home-brew projects. If there's an electronic schlock house (surplus dealer) in the neighborhood, you probably can bargain the components for a buck or two. On the chance you don't have a junk box everything can be bought new for less than $25.

Construction. We built our Scrounger on a 9x9x2-inch cake pan. Power transformer T1 can be just about any type as long as it has a 400- to 600-volt center-tapped secondary that can deliver at least 40 ma. T1 also must have 5- and 6.3-volt secondary windings. Rectifier V2 can be most any 5-volt rectifier you've got around—a 5U4, a 5Y3 or even an old four-pin type 80.

Almost any junk-box choke will work. If you've got an old AC/DC radio, use the output-transformer primary. If there's nothing that resembles a choke, use a 100- to 200-ohm ten-watt resistor for L5. Similarly, C9 and C10 can be anything from 8 mf up (be sure they're rated at at least 450 V).

A special RF tube socket isn't needed for V1—simply use any octal socket you have handy. And, while we specify a 6V6 for V1, a 6F6 or a 6K6 also
Use a 9x9x2-inch cake pan and follow our open layout and you won't have any construction problems. Mount the power transformer last to keep it from bending the pan. We've shown the pan cut away under C6 and L3/L4 so you can see the connections. Terminal strips are used at each end of L3/L4 to support the coil about ¼ inch above the pan and to provide a tie point at the left end and a ground point at the right end. Remember that both lugs on P1's socket are insulated from ground. Mount C1 and the crystal socket above the pan. A keying monitor, described on the last page of this story, plugs into J3 to enable you to hear your own flat when sending.

**THE SCROUNGER...**

There's so little in the Scrounger that you should be able to get it on the air in an evening—even if you spend time rummaging through a junkbox.

will work, though the input power will be lower.

Tuning capacitor C6 is the RF section (the large one) of a scrapped superhet tuning capacitor. Modify it for the transmitter by removing the trimmer screw and the trimmer capacitor strip. RF chokes L1 and L2 (2.5 mh) can be the same type, though if you purchase these we suggest the miniature type for L1. The value of keying-adjust trimmer capacitor C1 isn't critical as long as its range is at least 7-35 mmf.

The critical parts are L3 and L4, but even here there's some leeway. Their form is a cardboard tube from a roll of bathroom tissue. Place a pencil mark about ¼ inch from one end and a second mark 3 inches from the first. Then punch a small hole through each mark. For L3 you can use #18, #20 or #22 enameled, hookup or bell wire—just be sure it's insulated. Pull the wire through one hole from inside the form and wind 22 evenly spaced turns between the two holes. Then cement the wire in place with airplane glue or household cement. When the cement
L4’s construction and location depend on how you plan to feed the Scrounger to the antenna system. If you use an antenna coupler (see 250-WATT ANTENNA TUNER, Sept. ‘63 EI), which we recommend, L4 should be five turns of #22 plastic insulated hookup wire wound adjacent to L3 as shown in the coil diagram.

To provide an RF sample for our keying monitor (described on the last page of this story), tap L4 at the second turn from the ground end.

We do not recommend that the Scrounger's
THE SCROUNGER...

Output at J2 be fed into an antenna directly, since the overall efficiency will be low. If you don't have or don't want to build an antenna coupler, close-wind L4 (five turns of #22 plastic-insulated hookup wire) over L3, starting at L3's grounded end. L4's ground connection must be the end closer to the center of L3. If the transmitter doesn't load properly, increase the number of L4's turns—anywhere from two to eight more turns may be required. However, if you find you need as many as 12 turns, use a coupler.

P1 is both a pilot light and a tuning indicator so don't change its circuit connection or substitute a different bulb for the one specified. Since P1 is connected in the B+ circuit, make certain both its socket lugs are insulated from ground (some holders use the frame for a ground connection). When the wiring is completed, double-check for a short by measuring the resistance from both socket lugs to ground. The resistance should be several hundred thousand ohms. If you get a reading of only a few ohms, get rid of the short before you turn the power on.

Tune-up. Whether or not you use an antenna coupler, an antenna must be connected during tune-up.

An 80-meter crystal is used for both 80- and 40-meter operation. Plug in the crystal and set C6's plates to full mesh. Turn on power and allow a minute or so for warmup. P1 lights when the key is closed. Hold the key down, and slowly open C6's plates until P1 dims, indicating plate current dip. The transmitter now is tuned for 80 meters. Continue to open C5's plates and P1 will light up again and then dim a second time. The second dip is C6's tuning for the 40-meter band. If P1 suddenly flashes as you tune C6, it means that C1 is not set correctly—don't worry about this now.

If you use an antenna coupler adjust its controls to increase P1's brilliance and then dip again with C6. Repeat this procedure several times to insure maximum transmitter loading. If you have an 0-100 ma. meter it can be used as a more precise tuning indicator. Plug it into jack J1 and it will key the transmitter and indicate V1's cathode current. Tuned but unloaded, the current should be about 33 ma. (with a B+ of 250V). Loaded, the current is nearly 40 ma.

Another way to tune up the Scrounger is to place a field strength meter near the antenna and then tune for maximum indication. C1 must be adjusted now for best keying. While monitoring the Scrounger's signal in your receiver, adjust C1 for a clean and sharp

[Continued on page 118]
Calibrated Bandspread for CB

Continued from page 30

this is the width of just one sideband. Conventional rigs create two identical sidebands, and a 2-kc tone doubles out to 4 kc in transmission.

Just how much bandwidth you can occupy is stated in FCC rules; they allow an 8-kc spread (4 kc above and below the carrier). Say a word like “sassafras” and those “s” sounds may hit close to 4 kc, then fatten out nearly to the 8-kc limit.

Now run a single-sideband rig onto the channel. Since it rams everything into one sideband, a gaping hole some 4-kc wide exists on the channel. Another sideband station can slide into that unused pocket and jabber away with no interference. Result: two SSB rigs can share, say Channel 7, at the same time.

Such split-channel operation requires that one transmitter be on upper sideband, the other on lower. Happily, the new Mark rig provides a sideband selector switch to give the operator a choice. Equipped with five transmit crystals, the rig therefore can work on the split-level channels.

This kind of wizardry comes at a price, of course. The SSB-27 hits you for just under $300 and contains circuits considerably more complex than usual gear. Some 17 tubes, nine diodes, crystals inside ovens and special filters make the unit an elaborate (yet amazingly compact) package. But with it, the CBer enters the other-world of SSB—replete with socko signals and twice as many channels.

Stereo FM Receiver

Continued from page 71

This causes diode action in the multiplex adaptor’s input tube, which loaded down the ratio detector (to which the multiplex adaptor is always connected). This was the cause of the high distortion. EICO has prepared an addenda sheet modifying the circuit to keep the B+ on when the mode switch is in the mono FM mode. We suggest you obtain a copy of this correction sheet before starting your kit, or to modify earlier models. After these changes were incorporated in our unit, performance improved significantly and the 2536 met or exceeded the claimed specs. Performance of the amplifier section of the 2536 is quite good and essentially the same as EICO claims. Specs appear in the table.

With all corrections incorporated, you’ll find the 2536 a good performer.