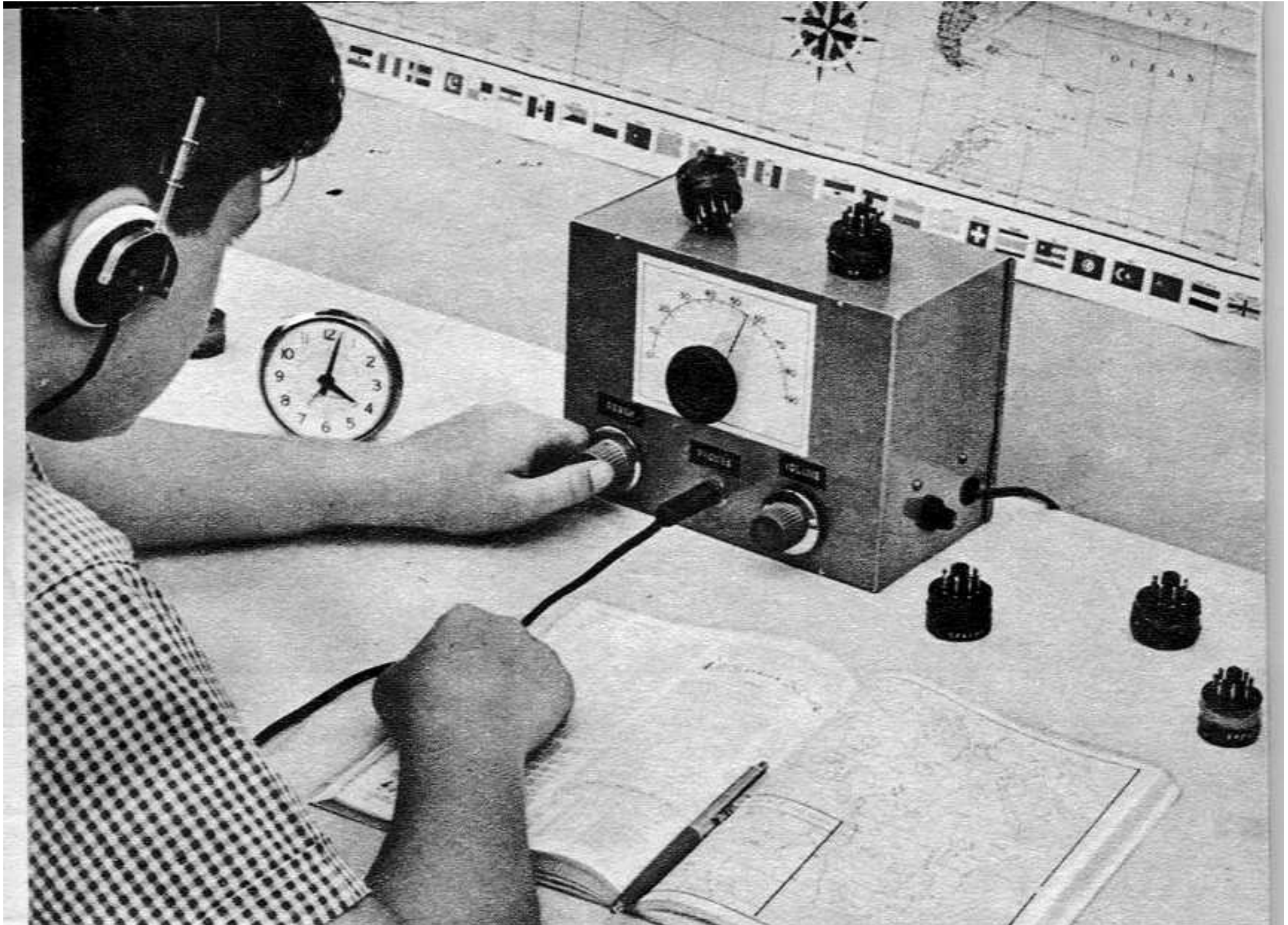


The 12AT7 Regen.



1-Tube All-Bander

A low-cost, high-performance receiver for the listener on a budget.

By DAVID J. GREEN, W6FFK

IT'S not just young folk that must crawl before they can walk. Hams-to-be and short-wave listeners must, too. And a good way to get started in either of these activities is with a receiver that is simple, doesn't put a strain on your wallet yet performs well.

If you really get hooked, you'll have a receiver which will hold you in good stead until the time comes when more cash is available for a larger rig.

On the other hand, if after monitoring the bands your interest wanes, you won't kick yourself for having tied up a lot of money in a receiver that ends up sitting on the shelf.

Our receiver is just what you need to start. It uses a dual triode for the detector and the audio-amplifier stage. Operating frequency is changed by simply plugging in a coil for each of the following bands: 15 meters, 20 meters, 31 meters, 40 meters, 80 meters, 160 meters and the broadcast band.

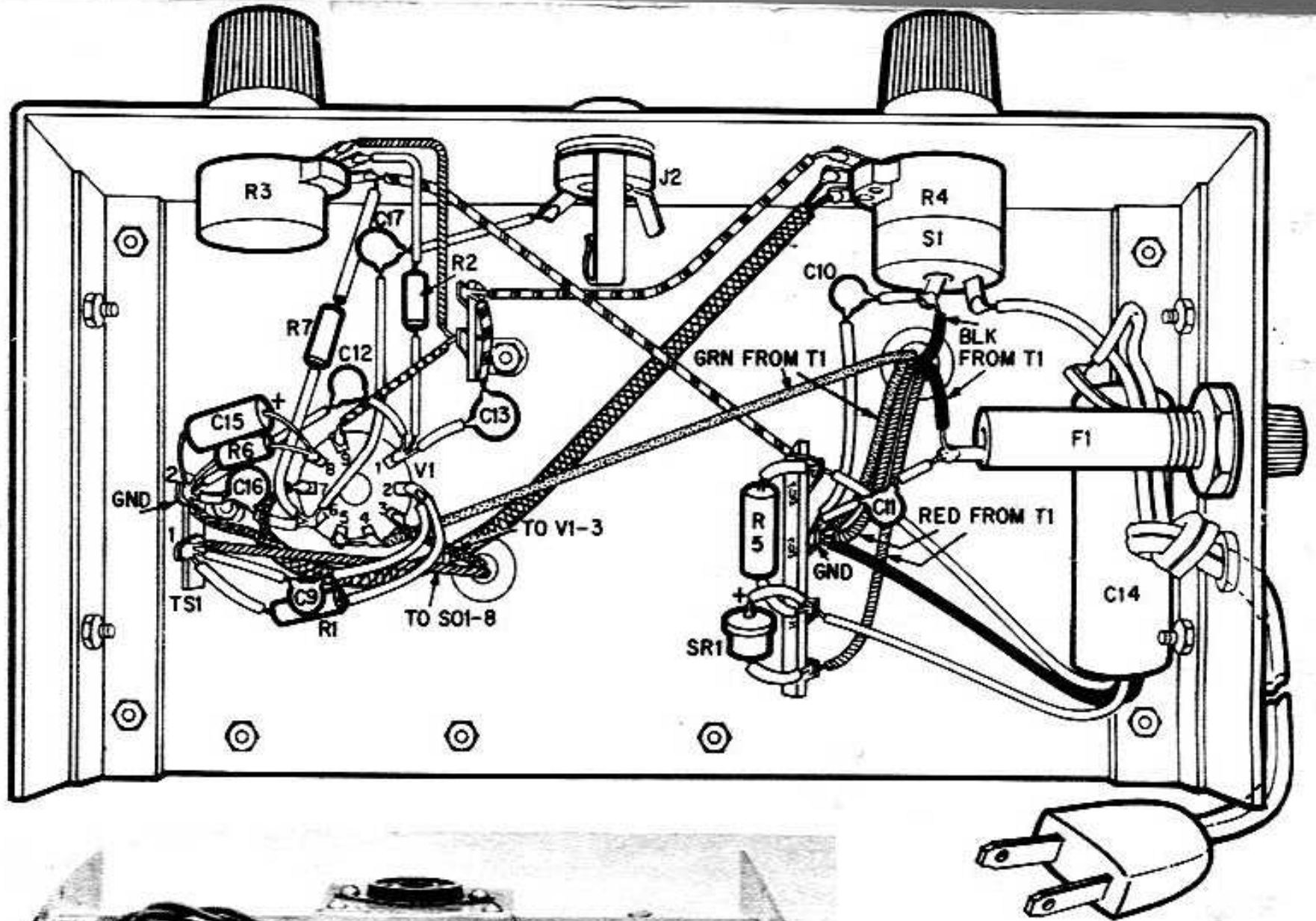
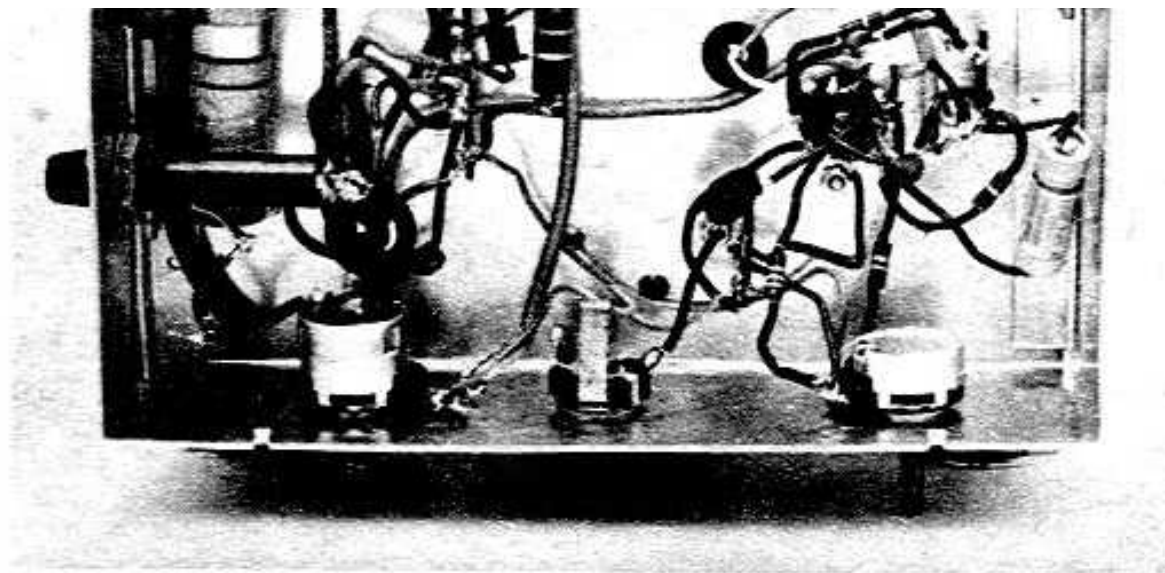


Fig. 1—There is very little under the chassis than the vacuum tube.



the chassis; therefore, you should have no problems fitting everything in place. Keep all leads to and around V1 short and direct. Note how the chassis is installed in the main section of the Minibox with home-brew brackets. Our chassis was installed 2¼ in. above the bottom of the cabinet. Heavy wire from volume control R4 to pin 7 on V1 is shielded.

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The Circuit

Signals to antenna jack J1 are coupled via antenna trimmer capacitor C1 to the tuned circuit consisting of coil L1 (or L2 through L7) and tuning capacitor C8. Bias for the detector stage (V1A) is developed by R1 and C9. To provide regenerative feedback, the cathode of V1A is connected to a tap on each coil. Regeneration is controlled by varying V1A's plate voltage with *regen* control R3.

The detected signal across R2 is coupled

by C13 to *volume* control R4. The signal is then fed to the grid of audio amplifier V1B. Bias for V1B is provided by R6 and C15. The amplified signal which appears across R7 is coupled by C17 to phone-jack J2. The impedance of your phones should be at least 3,000 ohms, or higher. Operating power is furnished by power transformer T1, rectifier SR1 and the R/C filter circuit consisting of C14A, C14B and R5.

Construction

Mount a 7¾ x 3¼-in. piece of aluminum in main section of a 8 x 6 x 3½-in. Minibox. Support the plate approximately 2 in. from the bottom of the cabinet with brackets mounted on the side of the cabinet. Duplicate our parts layout to insure correct operation.

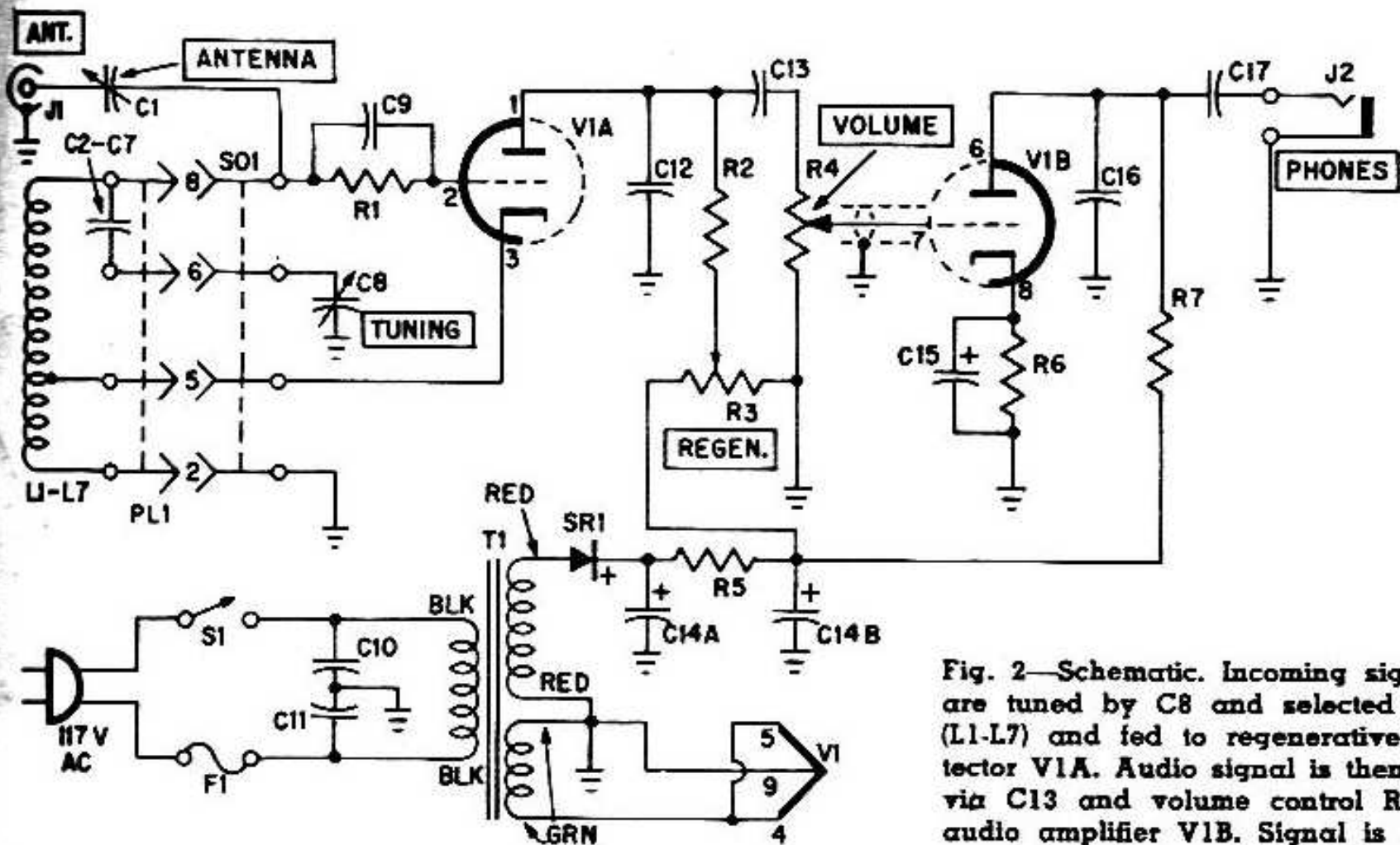


Fig. 2—Schematic. Incoming signals are tuned by C8 and selected coil (L1-L7) and fed to regenerative detector V1A. Audio signal is then fed via C13 and volume control R4 to audio amplifier V1B. Signal is then coupled to phones (high Z) by C17.

PARTS LIST

Capacitors: 1,000 V ceramic disc unless otherwise indicated

C1—4-30 μf trimmer (Allied 11 U 651 or equiv.)

C2-C7—See coil chart

C8—10-365 μf variable (Lafayette 32 R 1103)

C9—100 μf

C10,C11—.005 μf

C12—470 μf

C13,C17—.01 μf

C14A,C14B—20/20 μf , 150 V electrolytic

C15—10 μf , 25 V electrolytic

C16—.001 μf

F1— $\frac{1}{2}$ A fuse and holder

J1—Phono jack

J2—Phone Jack

L1-L7—Coils (see coil chart) wound on octal tube bases

PL1—Octal tube base (7 reqd.)

Resistors: $\frac{1}{2}$ watt, 10% unless otherwise indicated

R1—2.2 megohms

R2—270,000 ohms

R3—50,000 ohm liner-taper potentiometer

R4—1 megohm, audio-taper potentiometer

R5—1,800 ohms, 1 watt

R6—1,000 ohms

R7—100,000 ohms

S1—SPST switch on R4

SO1—Octal tube socket (Amphenol 77MIP8 or equiv.)

SR1—Silicon rectifier: 750 ma, 400 PIV (Lafayette 19 R 5001)

T1—Power transformer; Secondaries: 125 V @ 15 ma, 6.3 V @ 0.6 A (Allied 61 U 410 or equiv.)

V1—12AT7 tube

Misc.—8 x 6 x 3 $\frac{1}{2}$ -in. Minibox, plastic tape kit (Lafayette 99 R 8029), No. 28 enameled wire, 9-pin tube socket, terminal strips, knobs, AC line cord and plug

The octal tube socket (SO1) for the coils should be mounted on a 2 $\frac{1}{2}$ x 2-in. aluminum bracket. Install the bracket 2 $\frac{3}{4}$ in. from the left, and 3 in. from the right sides of the cabinet. The back of the cabinet should have a 1 $\frac{1}{4}$ -in. hole cut in it in front of SO1. At the top of the coil-socket bracket drill a small hole for a sheet metal screw which should be used to hold the back of the cabinet to the bracket.

Trimmer capacitor C1 should be mounted

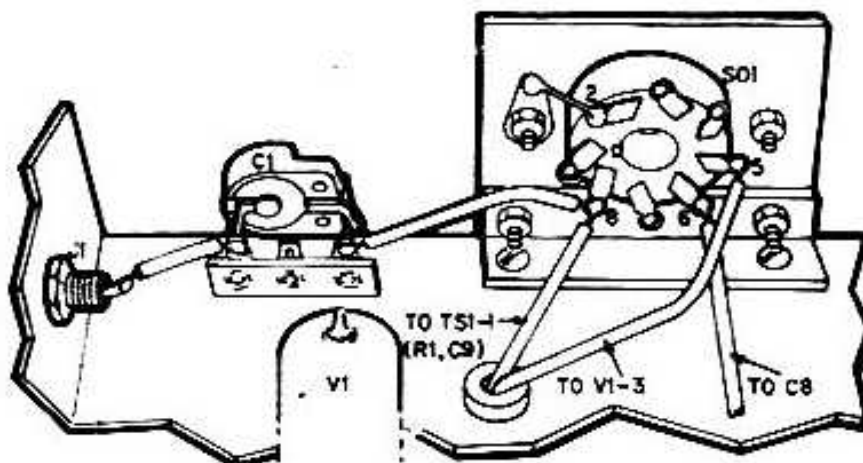


Fig. 3—View of top rear of chassis shows how trimmer capacitor C1 and socket for coils are mounted. Cut holes in back of cabinet for access.

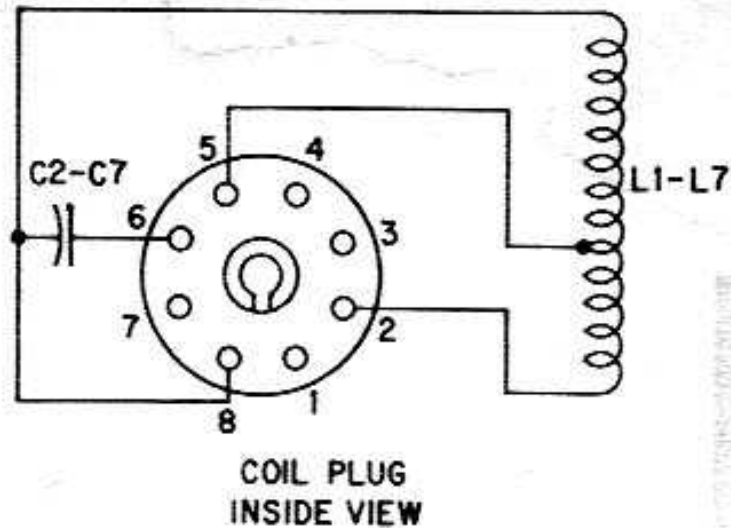
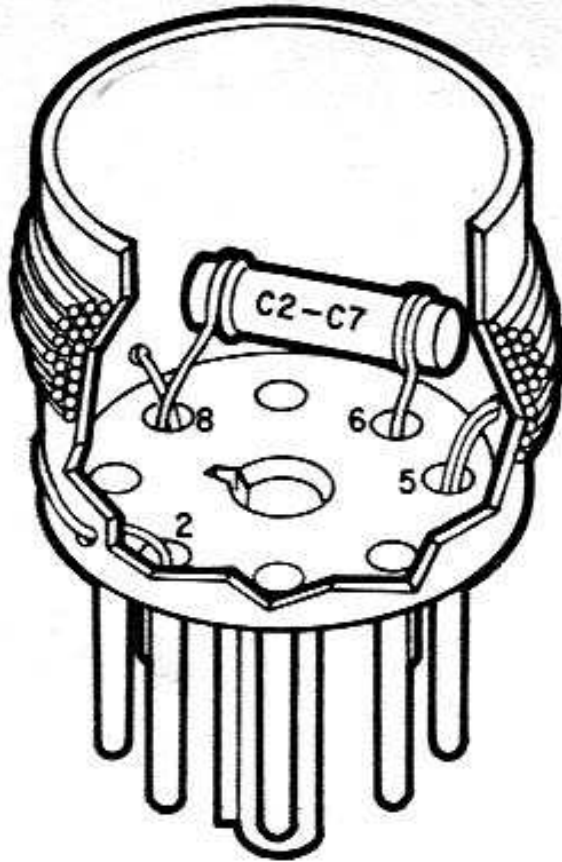
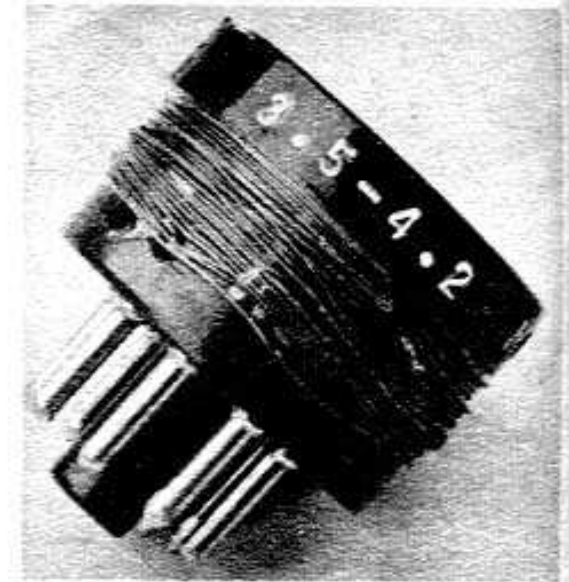


Fig. 4—Coil details. First, drill holes just above pins 2, 5 and 8. Start winding at pin 2, tap goes to pin 5, finish at pin 8. Install capacitor or jumper (see table) before soldering pin 8. An example of scramble winding can be seen in the photo of L3 at the right.



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by soldering its lugs to a three-lug terminal strip as shown in Fig. 3. C1 should be positioned to line with a hole in the back of the

COIL CHART			
Coil	Freq. (mc)	Turns	Capacitor (C2-C7)
L1	.55-1.5 (bdcst.)	80, tap at 20 from gnd.	Jumper
L2	1.65-2 (160 M)	75, tap at 20 from gnd.	47 $\mu\mu\text{f}$
L3	3.5-4.2 (80 M)	29, tap at 8 from and.	47 $\mu\mu\text{f}$

cabinet 1½-in. from the right side.

The Coils

The coils are wound on octal-tube bases. Before winding them, drill holes at the bottom of each base right above pins 2, 5 and 8. Start winding the coil from pin 2, as shown in the coil table. When you reach the number of turns at which you make the tap, break the wire, remove the enamel insulation, push both ends of the wire into pin 5 and solder. Then keep winding the coil the same direction and connect the last turn to pin 8.

Install the capacitor, or a jumper wire in the case of the broadcast-band coil, from pin 8 to pin 6. Keep the wire tight and the capacitor's leads short. After finishing, wrap plastic tape around the coil wire. We used different-colored plastic tape for quick identification of each coil.

Operation

Plug in the broadcast-band coil first. Turn the set on and give it a few moments to warm up. Turn the *volume* control all the way up and adjust the *regen* control until the receiver is just below the point of whistling. Tune for a loud station and then adjust the *regen* control until the station comes in loud and clear. Then adjust the antenna trimmer capacitor for maximum volume.

L4	6.5-8.5 (40 M)	13, tap at 3 from gnd.	47 $\mu\mu\text{f}$
L5	9.5-9.7 (31 M)	12, tap at 3 from gnd.	27 $\mu\mu\text{f}$
L6	14-14.5 (20 M)	8 tap at 4 from gnd.	10 $\mu\mu\text{f}$
L7	21-22 (15 M)	5, tap at 2 from gnd.	10 $\mu\mu\text{f}$
All capacitors ceramic disc or mica. All coils are scatter wound with No. 28 enameled wire.			

Fig. 5—Chart above contains details for all seven coils. Frequency coverage is approximate and depends to a large extent on how coils are wound.

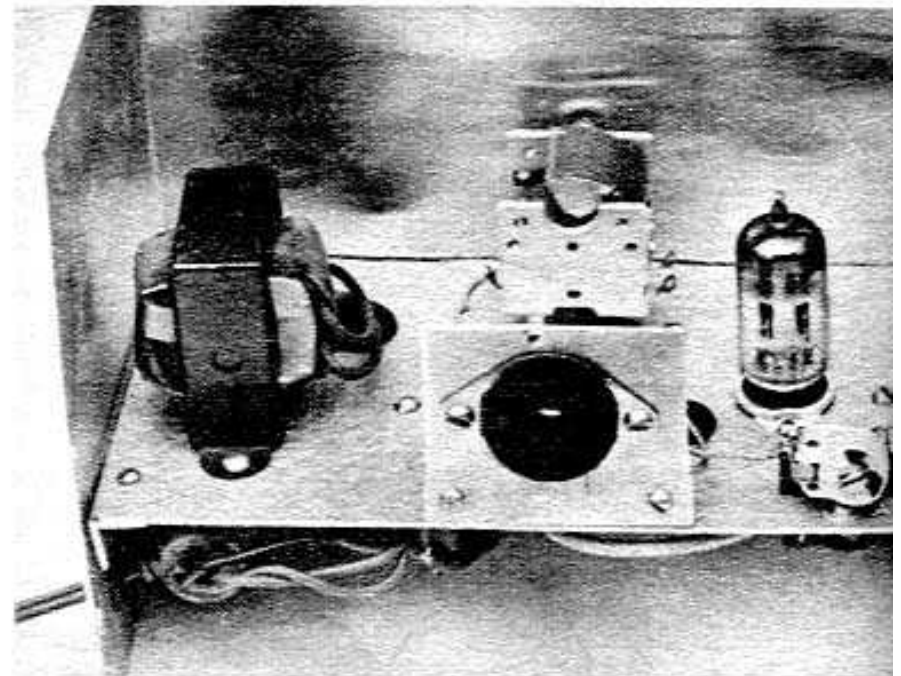


Fig. 6—Note location of antenna jack and trimmer capacitor. Hole above the coil socket is for self-tapping screw installed through back of cabinet.

