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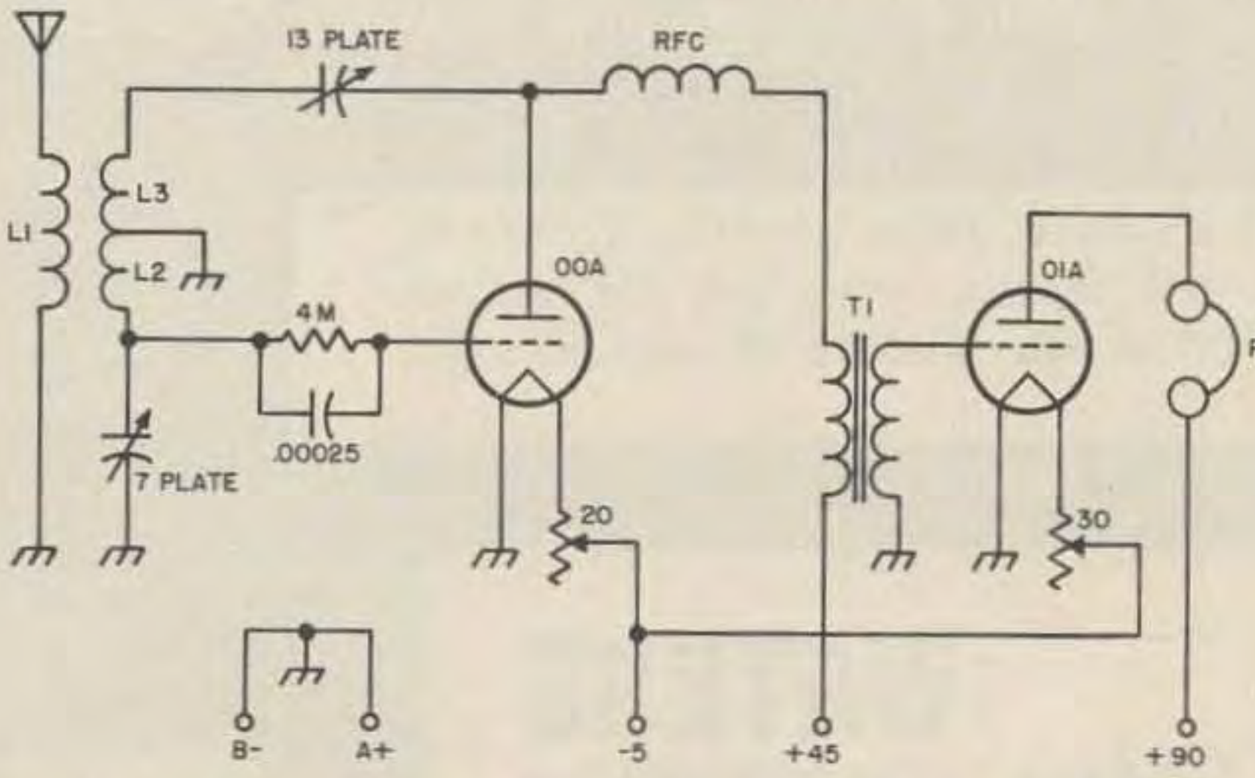
The Super Duper Super

When my ticket arrived from the FCC, I was really up against it–I had to have a good receiver. I was all set in the transmitter department; one of my good buddies from across town donated a slick crystal controlled job with a pair of 199's in the final. I couldn't come up with any home-brew receivers that matched the goodies I had in the junk box after searching through the current ham magazines, so I decided to use a little ingenuity and the parts that I had on hand.

I'll have to admit that this design is not completely my own; it evolved from several of the articles that I read before starting this project°. Here again my good buddy was a big help–he gave me a whole carload of ham literature. After drooling over the Marconi loose couplers, Grebe receivers and REL transmitter kits in the ads, I did a lot of reading about receivers. With the helpful hints of these articles under my belt, and a lot of sweat over the kitchen table, I came up with the two tube super duper super shown here. It may not be quite up to par with the Colland's Super Century or the Crutchcrafter's SD-150, but it runs a very close second. And besides, it didn't cost

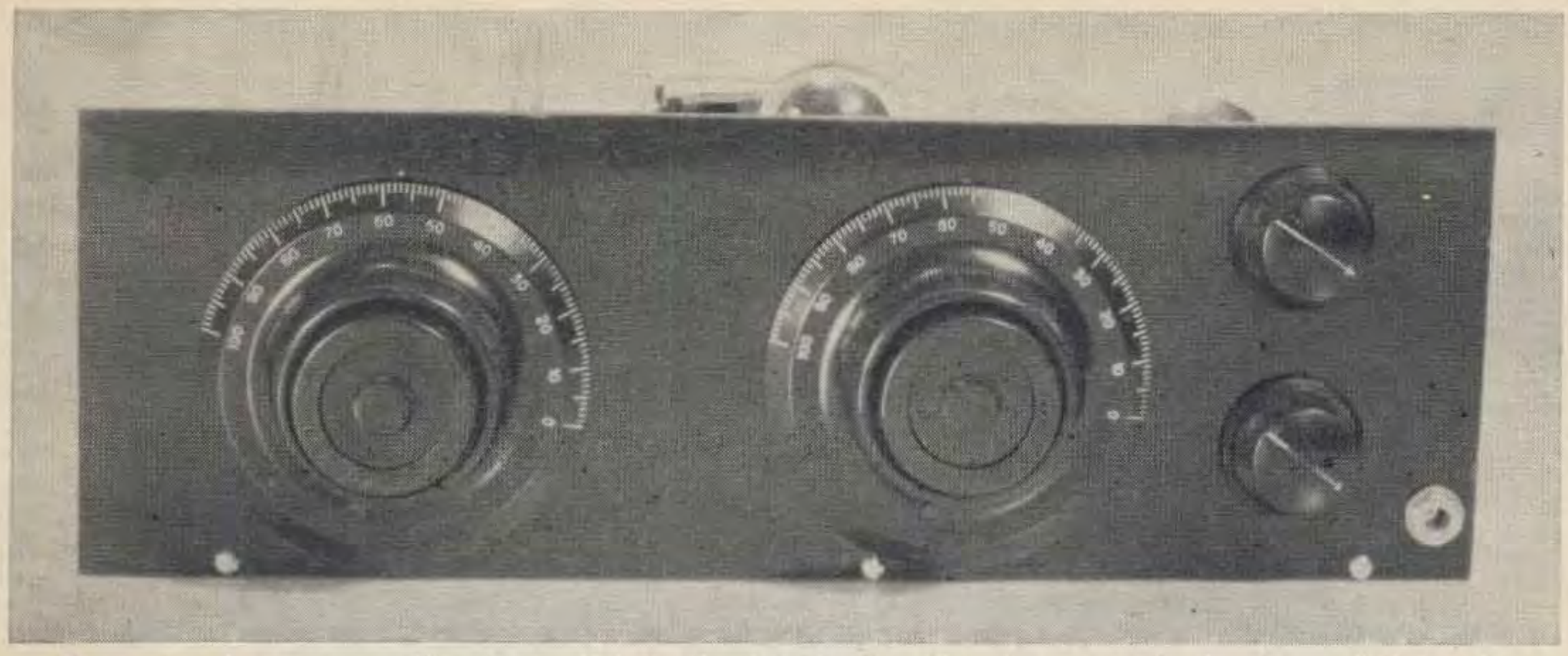


METERS	L1	L2	L3
100-50	10	23	12
60-30	5	12	6
45-23	3	6	3

ALL COILS ARE LOW LOSS AIR WOUND BASKET-WEAVE CONSTRUCTION OF NO. 16 D.S.C.

RFC 205 TURNS NO. 30 D.S.C.
T1 3:1 AMPLIFYING TRANSFORMER

Fig. 1. Note the stark simplicity of the super duper super. Only two tubes, three condensers, three resistors, an amplifying transformer and some wire are required. For details on how to wind the coils and the rf choke, consult the text.



The super duper super. The large dial to the left is the rf tuning control; the large dial to the right controls regeneration. For best results these two knobs must be worked together. The two knobs on the far right control the amplification of the detector and audio stages.

1/10 as much.

The basic plan I had in mind was to come up with a receiver that was simple to build and use and that could be duplicated by other hams with a junk box like mine. I opined that there must be a lot of fellows in the same boat as me—lots of parts but no circuit that they'll fit. And then too, I didn't have a whole lot of goodies; in fact, at times I wondered if I would be able to come up with a workable receiver with the things that I had. As you can see from the schematic, this little job only uses two tubes, three condensers, three resistors, one transformer and some wire; you can't get much simpler than that!

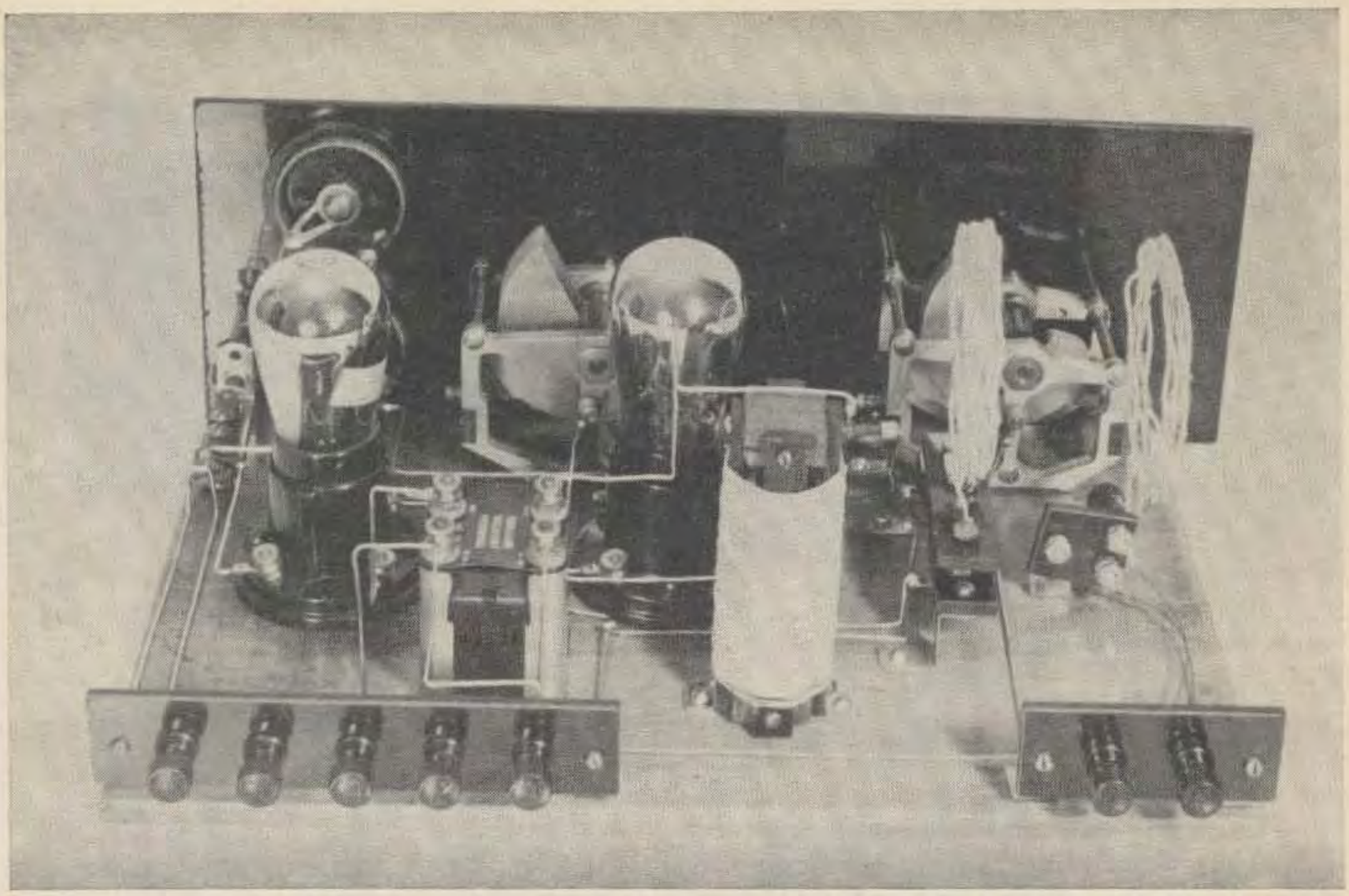
Basically the super duper super consists of a regenerative detector and an audio amplifier. I experimented with various methods of controlling the regeneration in the detector, but finally decided that the Weagent capacitive regeneration control gave the best results. The circuit seemed to be the easiest to tune and didn't move too far off frequency when I pulled my hand away from the dial.

I heard someone say once that much of a receving set's performance depends upon the correct choice of the grid leak and my experimenting bears this out. It must be quiet and must have a resistance of four or five megs for CW work. For phone work (after I get my general ticket), values as low as 1.5 megs seem to work quite well. The grid condenser was also determined by cut and try. I found that a grid condenser capacity of a micromicrofarad per meter is not too far wrong for the 00A detector. I didn't use this value however because all I had in the junk box was a 0.00025 unit.

The tuning condensers are just as they came out of the junk box. There are no markings on them so I don't know what their capacity is, but the rf condenser has 7 plates and the regeneration control has 13. Actually, almost anything will work here; all you'll have to do is change the number of turns in the coils.

And the coils—they are the most unique part of this whole design. After scanning the ads and the ill gotten gains of my broken piggy bank, I decided that I'd have to use air wound coils and forego the nicety of coil forms. From what I have heard since, this was probably a good decision; most of the bakelite and hard rubber forms are pretty lossy on the short waves. I managed to glom on to a couple of rolls of D.S.C. (double silk covered to the uninitiated) annunciator wire and decided to use that for the coils. By evenly spacing 13 large finishing nails around the perimeter of a 3 inch circle, I formed a jig for winding my basket-weave coils. By weaving the wire around the circle of nails, I ended up with a strong coil that was easy to handle. A raid on mother's sewing basket provided some heavy cotton thread to tie the turns together.

To cover the various wavelengths that I am interested in I had to have some method of plugging in different coils. A home made plug in coil arrangement was made by mounting banana plugs and jacks on a



The working parts of the super duper super. The antenna coil is on the far right with the rf and tickler coil to the left. The large upright object in the foreground is the Newham special rf choke. The two terminal strips on the back edge of the apple crate provide connections to the batteries and antenna. Note the geometric layout of the wiring which contributes so much to the set's performance.

couple of bakelite strips. At first I laid out the strips nice and even with the center tap right in the center of the jack bar, but this led to some quick shuffling when changing coils—you couldn't tell when the tickler was plugged into the right two holes. A modification moved the center tap a little off center so I didn't have to count turns every time I changed wavelengths.

The antenna coil was mounted on another chunk of bakelite which pivots on a brass angle support. With this arrangement I can vary the coupling between the antenna and rf coil for best results. This is a little ticklish until you get used to it because when you put your hand over the panel to move the antenna coil, everything changes frequency. However, with a little practice you can almost tell ahead of time which way the tuning is going to go.

The rf choke was a pure stroke of genius if I do say so myself. The first efforts resulted in a whole bunch of dead spots in the tuning range. That is, spots where the detector refuses to give out with nary a whistle. I don't quite understand all the ramifications of these dead spots, but I'm working on it. Anyway, the most suitable rf choke I found consisted of 205 turns of number 30 S.S.C. (single silk covered) lump wound on a home made form. Losses are apparently not too important in an rf choke so I made a form by screwing four four inch strips of bakelite to one inch squares of orange crate wood.

After building the complete receiver on the kitchen table, I had to come up with some more portable way of building the finished product. Mother didn't take too lightly to the screw holes and soldering iron burns in the table top, and besides, how was I going to get the table into my shack? The family had to have someplace to eat. Except for a little spilled soup in one of the condensers, the super duper super made it through this crucial period with flying colors. I can't say the same for its originator—for a while I thought ham radio would be banned forever from the Newham household.

A couple of raids on the city dump yielded the rest of the material I needed to build

the super duper super into one compact table top package. The side of an old apple crate served as the bottom and a piece of bakelite from an old Army surplus aeroplane spark transmitter (Mark II) was used for the front panel. All the parts were carefully laid out on the apple crate and then wired together with solid number 16 bus wire. I took great care to make sure that all the wires were parallel to the sides of the apple crate and to make sharp 90 degree bends when turns were necessary. This layout works pretty well down to wavelengths of 23 meters, but below that performance is not so hot. My good buddy said something about lead length? I don't understand this at all because everyone knows that the shortest distance between two points is a straight line, and all my wires are perfectly straight. I am usually a pretty modest fellow, but the wiring job is magnificant in its geometric beauty, even if it doesn't work on the ultra highs below 20 meters.

The super duper super is a real dream to use. It only has four controls and *only* two of these have to be tuned at any one time. It only takes about eleventeen hours to get the proper technique down pat. Almost everyone who has had a chance to use the super duper super has been surprised at its performance. It doesn't surprise me at all, I knew it would work all along. After all, it is based on many proven designs. It has surprised some hams so much that they went away mumbling to themselves. Naturally all this pleases me very much because this was my very first ham project.

Now that I have been on the air several months with my twin 199's and super duper super, the junk box is starting to fill up again. I now have lots of tubes, amplifying transformers, condensers and even a couple of little doodads marked 2N384. My good buddy claims that these miniscule little gadgets will replace the tubes in the super duper super, but I don't hardly see how—they only have three connections. Anyway, I'm working on it and I'll have a full report for all you readers in a subsequent article.

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*"A One Control Neutrodyne," J. MaLaughlin, QST, August 1924.
"Short Wave, Plug-In-Coil, Receiver Design," F. Marco, QST, February 1926.
"Short Wave Receiving Sets," L. Hatry, QST, July 1926.
"A Simple 1750-and 3500 kc Receiver," B. Dudley, QST, November 1929.