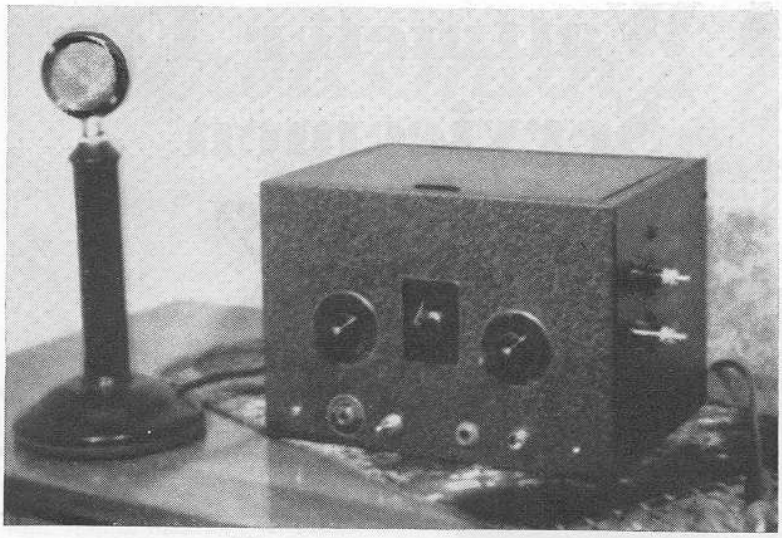


The little transmitter set up ready for action.

For a QRR rig that any ham should have in his shack, this flea-powered rig will do surprisingly well. Uses few parts.

by PAUL V. TRICE, W8QHS

Sharon, Pennsylvania

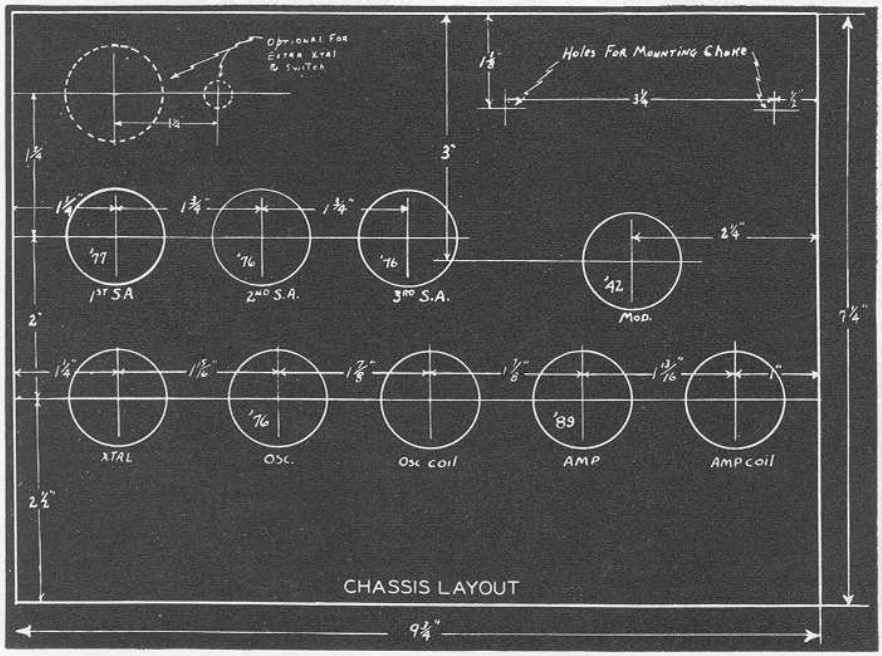
Flea Power on 160 Meters

THE primary purpose of the author trying flea power phone on 160 meters, was to see what comparison there was, if any, between that band and five meters, for local contacts. The local referring to contacts up to 25 miles.

The results were quite convincing, in that they proved, without doubt, that with a given low power input, the all around results are definitely in favor of the low frequency band. These include general coverage and signal strength, ease of construction and operation, adaptability to both phone and c.w. operation and quality of signal. The latter two are noticeably better on 160 meters due, no doubt, to the fact that the broad-tuning, noisy super-regenerative receiver is so extensively used on the high frequencies.

With the recent changes in Amateur Regulations, requiring, among other things, a stable signal on five meters, many amateurs will probably be inclined to transfer their attention to the low frequency bands for local contacts. For such persons, the rig here described will provide a means of continuing their contacts on phone with other local stations.

In this age of high powered transmitters, the ability of QRP rigs to work out is generally questioned. With that same doubt in mind, an experimental flea-powered rig, modelled after several in radio publications, was literally "thrown" together, breadboard style. The only available antenna, a 40 meter Zepp, was used as a Marconi and on many occasions only the dead feeder was used with very good results. These included contacting a station about 50 miles distant and receiving an R7 report during the ensuing QSO, and also being reported by a station over a hundred miles distant. This, with an input not exceeding 3 watts. Reliable contacts up to 30 miles were common and with a larger antenna, this range could probably be extended considerably. This refers to day time contacts as the QRM from high power stations limits the operation after dark. However, even then reliable operation up to 5 or 6 miles can be had.



Since the experimental model gave such gratifying results, it was decided to build a new rig on the same lines as the first except that better parts would be used throughout, in order that, when finished, it would fit in with the rest of the station equipment. It was also decided to use a crystal mike as quality reports on the first rig, using a single button carbon mike, had been discouraging.

Accordingly, a crackle-finished box 10 x 7¼ x 7 and the metal chassis to fit it were procured and the latter punched as shown in the sketch. The placement of parts on the chassis, as shown, leaves considerable space between the speech tubes and the back of the chassis. This space can be used if desired for mounting an extra crystal socket and crystal switch. If this is included, the operator has a choice of either of two crystals at the flip of the switch. This proves advantageous when QRM is particularly bad

on one of the frequencies used. It is desirable to have the extra hole punched for the crystal socket, even though it may not be used at the time, as it will be very difficult to add it later due to the wiring under the chassis. In the rig here described, the socket hole was not punched with the rest and as a result, it will be necessary to remove part of the wiring, in order to have it punched.

After the chassis has been punched, the metal box can be drilled for the variable condensers, gain control, jacks and switches. As there is plenty of room for mounting these, the builder can place them to suit himself or follow the design used here. As can be seen in the front view of the rig, the knob on the left side is for the oscillator and that on the right for the amplifier while the gain control is mounted between the two. The left hand jack is for the crystal mike and the other is for a key, for c.w. operation. The left hand switch is the power switch and the other is used to cut off the filaments of the speech and modulator tubes during c.w. operation. The switches and jacks mount through both the chassis and the metal box and help to brace them together. Two holes can also be drilled or punched on the right side of the box, as shown in the photograph, to take the feed-through insulators for the antenna and ground connections. A small hole is also drilled at the rear of the chassis and box to take the power cable.

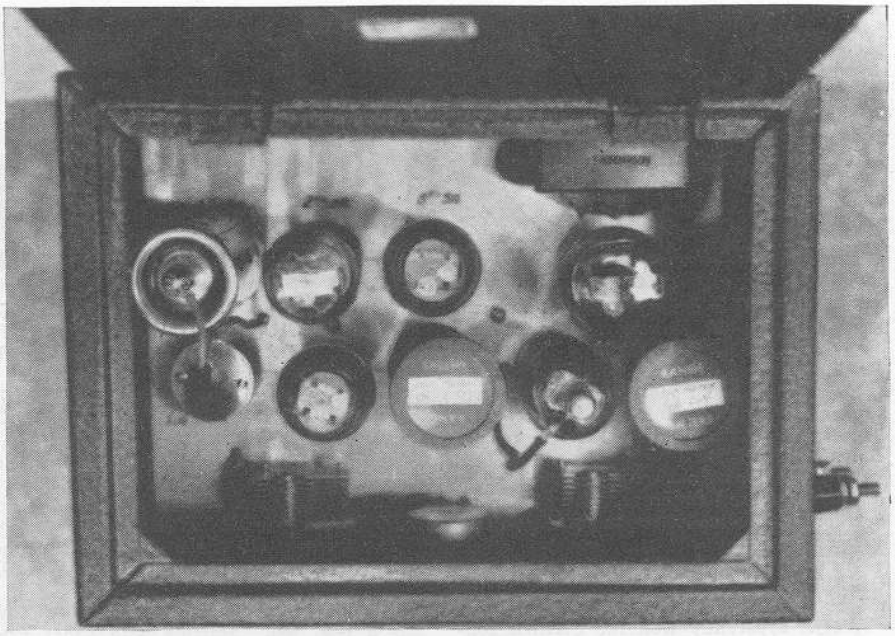
Once the punching and drilling have been completed and the parts placed, the wiring can be started. It is a good idea to wire the filaments first as the heavy wire used is then flat against the chassis and it will also aid in making the proper connections to the other points on the sockets. The remainder of the wiring is conventional and will not be discussed here, except that one point should be given attention. All connections should be mechanically strong before being soldered, especially if the rig is to be used for portable work. It makes an ideal portable rig and can readily be adapted to 75 meters.

Although blocking condensers from the plate tank coil are used to couple the rig to the antenna, in the diagram, inductive coupling can be used if desired. A 2" form wound with 10 turns of No. 18 wire can be slipped over the tank coil and tuned as shown, by a variable condenser in the ground lead. Experiments with a loading coil in the antenna proved of little value in local contacts.

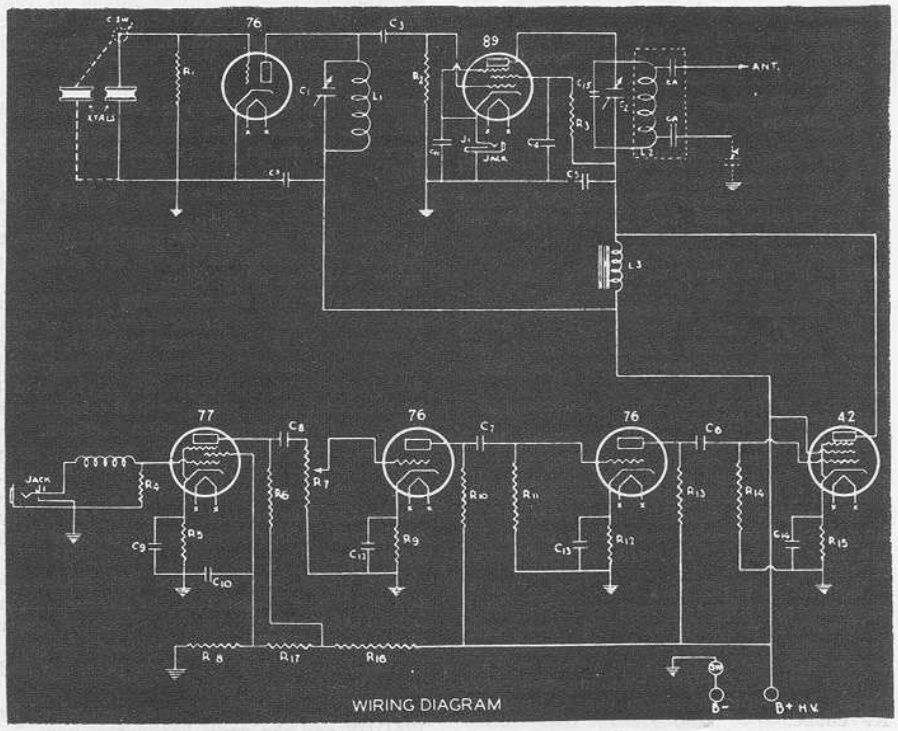
The power supply for the rig should be capable of furnishing 6.3 volts for the filaments and a plate voltage of about 250 volts under load. The one used here was taken from an old broadcast receiver and furnishes both filament and plate voltages. The receiver used 71-As (5 volt filament) and 26s (1½ volt filament) and by connecting these in series 6½ volts can be obtained. This will drop to the 6.3 volts required due to the number of tubes used.

The speech amplifier provides more than sufficient gain and full modulation capability can be obtained with the gain control half way on.

When the rig is completed, it can be checked by placing a single turn of wire in series with a flash light bulb over the oscillator and amplifier coils and tuning till the bulb lights to maximum brilliancy. —30—



Looking down on the QRR flea-powered rig.



WIRING DIAGRAM

R_1—50,000 ohms
R_2—50,000 ohms
R_3—20,000 ohms
R_4—2 megohms
R_5—3500 ohms
R_6—250,000 ohms
R_7—500,000 ohm pot.
R_8—50,000 ohms
R_9—3000 ohms
R_{10}—100,000 ohms
R_{11}—500,000 ohms
R_{12}—3000 ohms
R_{13}—250,000 ohms
R_{14}—500,000 ohms
R_{15}—1500 ohms
R_{16}—50,000 ohms
R_{17}—250,000 ohms
CA—.002 mfd.
C_1—.0001 mfd. (Bud)
C_2—.0001 mfd. (Bud)
C_3—.00005 mfd.
C_4—.001 mfd.
C_5—.001 mfd.
C_6—.1 mfd.
C_7—.1 mfd.
C_8—.1 mfd.
C_9—5 mfd., 25 v.
C_{10}—2 mfd., 400 v.
C_{11}—.1 mfd.
C_{12}—2 mfd., 200 v.
C_{13}—2 mfd., 200 v.
C_{14}—10 mfd. 25 v.
C_{15}—.0001 mfd.
L_1—52 turns No. 18 wire on 1½" form
L_2—42 turns No. 18 wire on 1½" form
L_3—Mod. choke (Thordarson No. T—1892)
SW—Off-on switches
CSW—Crystal switch (optional)