A Wavetrap for Long and Short Waves

By "MEGOHM"

THE following is the result of experiments made with the object of producing a wave-trap for use with all-wave or other receivers, enabling them to receive distant stations when the local station is on the air, and also enabling them after the local has closed down to be used for DX without interference from nearby 80-metre phone transmission.

This combination trap has been designed specially to increase the utility of the "Advance" a.c. short-wave receiver (described in the 1931 "Radio Guide"), when used to receive broadcast, but may equally well be applied to any other receiver for the purposes mentioned. When listening on the 80-metre band the trap may be used to reduce local phone or c.w. interference, and thus one may receive stations that otherwise could not be received.

A wave-trap of this type will function best when the resistance is kept low, and as the coil offers more r.f. resistance than the condenser a condenser of large capacity is employed. Thus the coil may have few turns, and with heavy gauge wire, low r.f. resistance will be secured.

Shielding is not always necessary, but where the interfering station is close at hand it is advisable. The construction of a copper shield is described for the benefit of advanced constructors and those wishing maximum efficiency, but for economy a tin box of similar dimensions, and having a close-fitting lid at the top, may be used. With a coat of duco enamel this looks very neat.

The Shielding.

COPPER sheet of 26 gauge is used, the dimensions being shown on the diagrams. The bottom and two sides are bent from one piece, as being more economical of copper. The two ends are then soldered in, leaving 1-16in. of the bottom and sides projecting. Most of the soldering can be done inside unless the constructor is a practised hand, in which case it may be done outside. The secret of a neat joint is to use killed acid and ordinary solder, with a clean, hot iron. Use only as much solder as can be picked up by the iron, and then spread in both directions along the joint. Clean off any roughness with coarse carborundum paper on a small block of wood.

Before soldering the front panel in place, it should be drilled and the switch and condenser mounted in place. After soldering in, the coils are placed and connected up, and then the back is soldered in. The top may be permanently soldered or not, as desired.

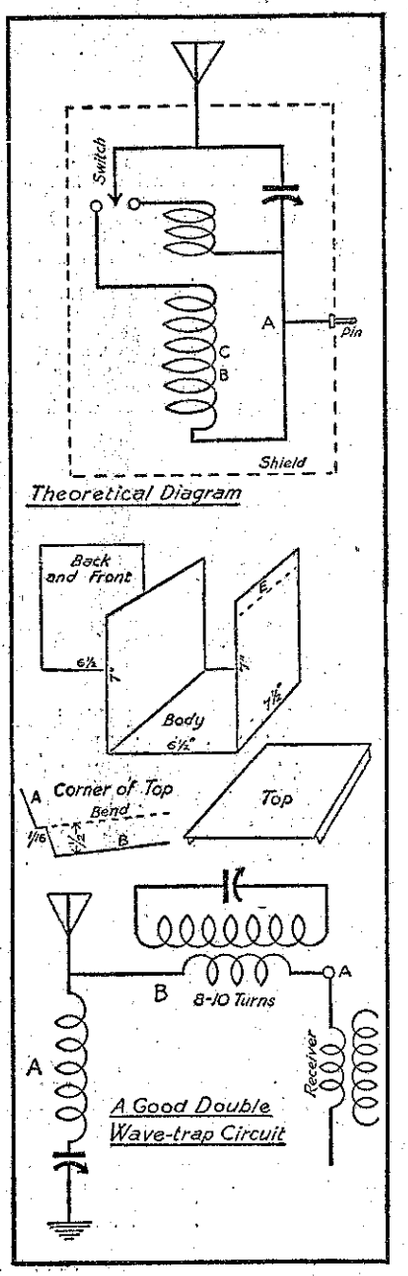
The top is cut the exact length of body from back to front, and sideways, the width of the inside plus one inch, which forms a half-inch flange down at each side. A is the front edge, projecting 1-16in.

The body is a sheet 20¾ by 7½, bent as shown, which leaves about ¼in. extra at E, to be finally cut off to make both sides of equal height.

An earth wire is soldered to the back of the shield, and run round the back of the receiver to the earth terminal.

The Tuning Condenser.

THE most suitable capacity is .0005, though .001 or .00035 may be used, altering coil turns to suit. Note that no part of the circuit is connected to the shielding. Therefore, the condenser must be insulated by mounting on a strip of 3-16 ebonite 4½ by 2 inches, or to suit the condenser, and providing a space for the aerial connection which may be either a socket or a terminal.



A large hole will be required in the front panel to clear the nut of the one-hole fixing condenser, and another to clear the aerial connection. See that nuts and screws to hold the ebonite are placed so that they will not touch the condenser frame. Drill the ebonite first, then mark positions of holes on the copper, using the ebonite as a templet. Arrange the height of the condenser so that the moving plates are never less than ½in. from the top of shield. A vernier dial is best, but a plain dial is quite practicable.

The Switch.

UNLESS the trap is to be used on two bands the switch is not required. Any two-way switch, if insulated, is suitable, and requires that only the spindle is to project outside the shield, a hole being made to give 1-8in. clearance all round.

If it is desired to construct a suitable switch, the diagrams give necessary particulars. The minimum size of the ebonite is 2 1-8in. by 1½in. The spindle is a piece of ¼in. brass rod not less than 1½in. long. The top portion of the switch consists of three layers of ¼in. ebonite drilled to take the spindle and form a bearing. Two bolts at each end hold the switch to the panel. At the contact end, a narrow slip of ebonite holds the main portion clear of the panel.

The arm of 18 brass should be short, drilled ¼in. and slipped over the end of the spindle and soldered on. Between it and the ebonite is a 24 brass washer cut like a solder tag. At the other side of the ebonite a narrow washer or turn of 24 wire is soldered to the spindle to prevent end play.

Bending of the arm to fit well down to contacts is left to the constructor's discretion. A stop each side is a 1-8in. screw and nut projecting outwards. A pigtail of 26 wire may be placed across the arm and its washer.

The arm connects to fixed plates of condenser and aerial input.

Output Connection.

FOR the "Advance" short-waver the trap shield is intended to push close against the left-hand end of receiver with the output pin engaged in the aerial socket, the height being accurately adjusted. The output pin is fixed in a piece of ebonite about 2in. square, bolted to the shield in correct position with a ¼in. hole for clearance.

For other receivers a terminal may replace the pin, but it must be remembered that pick-up of the unwanted transmission must be avoided at this point, or the usefulness of the trap will be nullified. A one-inch metal collar soldered round the output would allow of connection being made with a short rubber-covered wire and the trap then pushed up close to the shielded receiver with the spare wire inside the circular collar.

The Coils.

THE 80-metre coil consists of ten turns of 18 enamelled or d.c.c. wire on a 3in. former, held together by four strips of celluloid, each projecting one inch on one side to act as feet. The turns are spaced to occupy exactly 5-8in.

The broadcast coil should have sufficient turns to tune a little above the wavelength of the local station. The