

hance of reproduction will be lost. If the low notes are sufficiently amplified, they will be heard in true relation without suppressing the higher frequencies.

It should be noted that "Blue Spot" units have a condenser of small value connected across the windings and built into the unit, so that any addition to this capacity should not be large.

#### Baffle-boards and Cabinets.

VERY often an improved speaker is more necessary than an improve-

ment in the amplifier, and if a more sensitive speaker is obtained, a given volume is obtainable with a smaller output, and thus the quality is improved simply through the normal volume being further from distortion point than previously. This condition gives more "reserve," and so reduces the tendency to "blast" on heavy notes.

Having procured a sensitive unit, a cone must be constructed, unless it is purchased ready-made. In either case a baffle-board or cabinet of some kind must be constructed, because if this is

not done, the air waves which are set up simultaneously by both the front and back of the cone would alternately neutralise and reinforce each other and seriously affect the volume. Thus in order to obtain sufficient volume to produce the low notes, we must provide either a plain baffle, box-baffle, or cabinet for the unit and cone. A plain baffle for a unit such as 66R is a piece of strong 3-ply or heavier material 40in. square, with a hole in the centre 13in. in diameter.

To strengthen this, a couple of stiffeners about 3 x 1 should be attached to the back with small brads driven in from the front, glue being also used. Feet shaped somewhat as in the diagram are cut from 1in. rimu. Heavier material than 3-ply may be used with advantage— $\frac{1}{2}$ in. board glued together without air gaps. Instead of the plain circular hole, the "grille" as shown on the cabinet may be used with advantage.

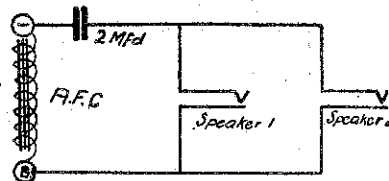
A flat baffle 40in. square, although the most effective, will not suit everybody's ideas of bulk, and where it is found more convenient to house the speaker under a table, where it will be out of the way, the baffle may be of 3-ply, 2 feet square, with sides of 1in. rimu, 8 inches deep. This is known as a "box-baffle," but the breadth of the sides should not be made larger than the dimensions given—it is better to increase the area of the front board. A diagram shows how to measure the effective size of a baffle. Increasing the distance from X to Y improves the low note reproduction. Shellac or stain will give a suitable finish. Either may be carefully applied with a piece of cotton rag, going over the surface several times until the desired

the centre to allow the adjusting knob to protrude at the back. Attach the back with screws, to be easily removable. Spacing for the grille is shown in a diagram. Mark the centre space first, then measure outwards each way. The small outside slots will be about  $\frac{1}{4}$ in. wide.

#### Cone Construction.

THOSE who wish to construct the cone should procure from a printer a sheet of heavy "cover paper" not less than 17 $\frac{1}{2}$ in. the shortest dimension, and of soft texture. Take a narrow strip of cardboard not less than 9 inches long, and make two small holes  $\frac{1}{8}$ in. apart. With a pin through one hole, and pencil point through the other, describe a circle on the paper. From the centre draw the line A, then measure 12 inches across to another position of the edge, and draw line B, then draw line C  $\frac{1}{4}$ in. from B, sloping off at centre as shown. After cutting out the segment, which is almost a quarter of the circle, glue the  $\frac{1}{4}$ in. strip, and bring edge A flush with B, and pin to a strip of wood to set. Cut out a circle of the paper  $\frac{1}{4}$ in. diameter, cut out a segment nearly a right-angle, similar to the large cone, and stick on back centre of cone to strengthen it. Next, take a piece of wood about  $\frac{1}{4}$ in. x  $\frac{1}{4}$ in. and saw a narrow cut  $\frac{1}{4}$ in. deep in one end. Go all round the edge of cone with this, bending the paper over to form a bend, leaving a flat rim  $\frac{1}{4}$ in. wide. Now prepare a strip or strips totalling about 42 inches and 1-1.8 inches wide, of material for the "surround."

Many kinds of material have been used for this. Rubber is good, but must be very thin, and has the disadvantage of perishing in time. Thin felt may be used, and so may serge, etc., but any woven material must be cut "on the bias." The strip is glued all round to the back of the  $\frac{1}{4}$ in. flange, and no holes must appear at joins in the strip. Now a ring of thick cardboard is cut, the hole in centre of a diameter half-an-inch all round larger than the edge of the paper cone. Glue the surround to this, avoiding puckers, but not drawing very tight. The cardboard ring may be lightly tacked, using plenty of tacks, but not letting them show at front of 3-ply. Glue may be used instead of tacks and has the advantage of preventing any chance of "buzzing" caused by crevices between the cardboard and 3-ply. The unit is attached to a wooden cross-piece and fixed in correct position.



Another version of the output filter.

depth of colour is attained. This method gives more even results than using a brush.

The "grille" effect looks much better than a plain circular hole in the baffle, and to many constructors will prove a simpler task. The end of each aperture is first cut with a bit of suitable size, or slightly smaller than the width of slot. Then the corners A and B are cut out with a sharp knife, to give room for the saw. A fine hack-saw with projecting end served well for the original, but a fine keyhole saw would suit. Coarse and then fine glass-paper round a small block of wood takes away any unevenness from all parts that are to be finished. No fewer than six fine brads along each side will secure the 3-ply to the frame.

The smallest cabinet that may be used with the 66R type measures 18 inches each way inside, and is 9-1.8 inches inside, back to front, as illustrated. The front may be shaped as desired, but a neat effect is secured by allowing it to project at least 1.8in. at the sides. The box may be of  $\frac{3}{4}$  or 1in. rimu, and front and back of 3-ply. The back is shown lying down, and must have about one-third its area cut away by piercing with holes of any shape, round or square, one being near

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