



HE design of a portable receiver is a difficult task. To really justify the term "portable" it must be a receiver of small dimensions and weight, yet it is invariably expected to provide genuine loudspeaker

strength on a small inbuilt frame aerial—and that at considerable distances from a broadcasting station. Byery summer beach has its dancing parties for which the portable must provide stimulus for the light fantastic foe.

Generally speaking, the difficulty of keeping the weight down results in the degeneration of the portable into a type which has come to be known by the term "transportable." This type of receiver may have four or five valves with a correspondingly good performance; the cabinet has ample room for even large "B" batteries and an accumulator of considerable capacity. But such a receiver is definitely not portable. It can be carried from house to lawn at the expense of much personal effort. It can even form part of a motor party if the motor is large and uncrowded. But as part of one's personal baggage it is awkward; in a midget car it is an unmitigated nuis

In developing the present design the m thod of approach adopted was this: It was first sought to find the smallest and most easily built receiver which could be relied upon to give speaker strength on a small frame aerial up to 30 or 40 miles from a broadcasting station. The conclusion arrived at during this process was that a three-valver was the absolute minimum. It

was furthermore found that with the limited space available much more success was obtained by amplifying at low frequency than by employing one of the valves as a radio-frequency amplifier, even though a screen-grid valve was employed. The fact that maximum amplification was desired prompted the use of two transformer-coupled stages in preference to resistance-capacity coupling, instability being prevented by certain precautionary measures which will be described later.

Having reduced the receiver itself to the smallest possible proportions, it was next sought to reduce the bulk and weight of its appurtenances. Here, of course, we encountered a difficulty which is usually regarded as insurmountable. A three-valver takes a fair amount of current. The set is sure to receive regular use at home as well as abroad. Therefore the batteries must be of considerable capacity if they are to last any time at all. And largecapacity batteries are very heavy. Well, that does look like a bit of a hurdle, doesn't it?

The solution is to equip the set with the very smallest size of batteries and reserve them purely for portable use. An ingenious and novel piece of design permits the plugging in of a small mains unit when the receiver is used in the home circle, the battery being automatically disconnected when this is done. That disposes of any difficulty as regards the weight of super "B" butteries.

NOW as to the "A" battery or accumulator. There is no doubt that a two-volt accumulator is much better than dry cells for filament supply, but it must be a small one or weight will be increased too much. Small accumulators must be charged fairly frequently, so that a home charger would be a great convenience. Very well, we will incorporate a charger in the mains unit which is to supply the "B" current. It can be done very easily; and by using the same system of plugging-in the charger as is used for the "B" eliminafor, the process of charging is freed from any vestige of inconvenience.

Although a great deal has been done

Atthough a great deal has been done in the cause of weight reduction, performance has definitely not been sacrificed. The frame circuit employed is a particularly efficient version of the Hartley circuit, and this is backed up by an extremely powerful audio amplifier. Almost any amplifier employing two transformers will give considerable "lift," but in this set the system of filters in the plate leads ensure that each stage is operating under ideal conditions, so that the overall magnification is something exceptional.

The filter circuits comprise: (1) A combination of series resistance and

## The "Home and Country" P

by-pass condenser in the plate lead to the detector valve, (2) an output filter for the loudspeaker, and (3) an arrangement of radio-frequency choke and by-pass condenser in the plate lead to the output valve. The last is intended to prevent any radio-frequency component which may be present in the plate circuit of the last valve from feeding back via the loudspeaker to the frame aerial and causing instability. The net result of the three filters is that the receiver as a whole is quite stable and perfectly easy to operate, notwithstanding that it has two transformer-coupled amplifiers and will normally be operated without any earth connection.

The quality of reproduction is of quite a high standard and more than

A light receiver for home or holiday use

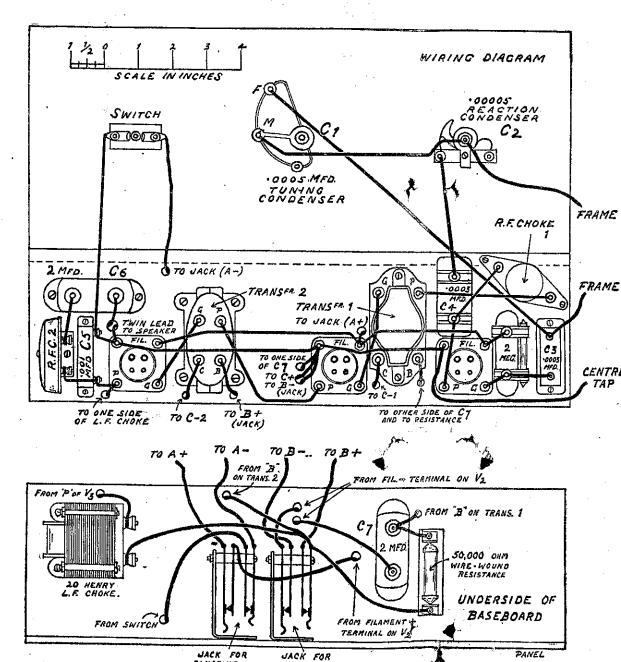
By "Cathode"

justifies our making the receiver suitable for use in the home.

## The Carrying Case.

The overall dimensions of the cabinet or carrying case are: Height 183 inches; width, 163 inches; and kepth, 63 inches. The top bottom and sides of the case should be made of half inch stock, and as this portion of the construction carries practically the

whole of the weight it is advisable dovetail the corners. If this operatis beyond the constructor, equivalent strength may be secured by reinforce the corners with thin sheet aluming the same well screwed to the wood; strips of the same metals may be talright round the case, leaving the enseparated an inch or so so as not impair the efficiency of the frame aer by coupling to it.



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PLUGGING-IN

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