

## Short Wave Reception

### Its Present Simplicity

NOT many wireless enthusiasts realise how exceedingly simple long-distance reception upon the higher frequencies is at the present time. Five or six years ago, when short-wave circuits were still in their infancy, and when the components available were not particularly suitable for the work, it was difficult to tune in to any station with a wave-length much below 100 metres.

Body capacity effects were so pronounced that those who were then attracted by short-wave reception were commonly believed to do their coarse tuning by means of extension handles several feet in length and to make their fine adjustments by the simple, if not very restful, process of moving from point to point in the room in which the set was installed.

Matters are very different to-day, due largely to the introduction of the Reinartz circuit, which in one form or another is used in nearly all short-wave sets. In this circuit one set of vanes in both the grid tuning condenser and that which controls reaction is at earth potential. By so arranging the circuit that the low potential vanes are those connected to the spindles of the condensers body capacity effects may be entirely eliminated, at any rate on wave-lengths down to 20 metres. Below this limit the frequencies involved are of such appalling magnitude that body capacity effects are still apt to manifest themselves to some small extent.

These can, however, be got rid of completely simply by setting the tuning condensers some 6in. back from the panel and by using ebonite connectors between their spindles and the tuning dials. There are actually so many fine transmissions above 20 metres that a set without this particular refinement will enable reception over amazing distances to be obtained without any difficulty.

One factor that has contributed enormously to the present-day simplicity of short-wave reception is the introduction of the slow-motion dial, which enables exceedingly fine adjustments of the variable condensers to be made, even by those who have not what may be termed as "wireless hands." For most ordinary purposes dials with a gear ratio of eight to one or 10 to one will be found excellent, but if finer adjustments are desired either geared

condensers or geared dials can be obtained with ratios up to 200 to 1. For reception down to 12 metres it is not necessary to use anything more delicate than an eight to one slow-motion dial.

The receiving set required for short-wave reception is exceedingly simple. It consists of nothing more than a detector valve, with the previously-mentioned circuit, and two stages of audio-frequency amplification, which should be so arranged that one or both can be used at will. This can be done by means of either switches or jacks. It is best to search for stations with the headphones, using only one audio-frequency stage.

In the modern short-wave set there are only two controls that require simultaneous adjustments; the grid tuning condenser of the detector valve, and the reaction condenser. The former having been set at zero, the reading of the latter is gradually increased until a slight rustling noise indicates that the set is in gentle oscillation. The reading of the grid tuning condenser is then slowly raised, the set being kept gently oscillating by moving when necessary the knob of the reaction condenser. As soon as a carrier wave is heard the reaction coupling is loosened and the grid of the detector valve is re-tuned. The most sensitive condition for the set is just below the point of oscillation. On no account should an attempt be made to tune to the silent point between squeals. Once speech or music has been heard signal strength is brought up by small adjustments of both condensers, care being taken to see that the set is not actually oscillating. If the signal is now of good strength, the second audio-frequency valve may be thrown into circuit and a change made from headphones to loudspeaker.

On the short waves one is seldom bothered by heterodyne or Morse interference. Enormous distances can be spanned and reception from most distant countries obtained. At the present time reception on the broadcast band is to some extent discounted by the prevalence of seasonal interference, the short waves offer a fascinating opportunity of receiving broadcast programmes from almost every country in the world.

## Tips and Jottings

### Stripping Insulated Wires.

WHERE cotton or silk coverings have to be removed so that tappings can be made, the use of a safety razor blade will be found very convenient. The blade should be kept parallel with the wire, or nearly so, to prevent cutting into the conductor. Any fluff which cannot be cut off may be singed off with a match or lighted taper. The covering of very small wires may sometimes be drawn back with the fingers to enable enough wire to be bared to make a joint or other connection. Rubber covering may often be pulled off after a small incision has been made in it, but should this not be possible a slit may be made in the rubber, and the insulation pulled back, when it will be found that the insulation will split easily. This may be continued until enough wire has been bared.

### A Substitute for Ebonite.

IT is not generally appreciated by the average wireless experimenter that sulphur is an excellent insulator, rivalled only by porcelain and amber. Among its advantages may be mentioned the fact that it does not absorb moisture from the air. In addition, it can be easily melted and cast in position and takes a good polish. Sulphur should have a much wider application than hitherto, one suggestion being for insulating holes when mounting wireless components on a wooden panel in lieu of ebonite. The main disadvantage of sulphur is that it is not as tough as ebonite.

### Defective Grid Leaks.

A GRID leak that varies in value will cause an overlap to appear one day which vanishes again on the next, and will make the set oscillate furiously on one occasion and not at all on another. These are, of course, extreme cases, but a "self-variable" grid leak will be a constant source of trouble. Trouble of this sort will not occur if


care is taken to purchase only reliable makes of grid leaks. Another objectionable effect, also caused by a defective grid leak, is a slight tendency of the set to burst into a "howl" just as it is brought up to the oscillation point. If this occurs it will generally be found that the grid leak value is too high.

### Diaphragm Protection.

VERY often, horn-type loudspeakers, big and small alike, give bad tone owing to dirt having collected upon the diaphragm, or to the latter having become rusty. The remedy for this type of trouble is obvious, and it can be prevented from recurring more or less simply by unscrewing the horn portion of the speaker and gluing a piece of thin but tough paper over the stem. For trial purposes only, the paper may be fastened down by means of a tightly-fitting rubber band, but, as a permanent fitting, it is best glued down. This device entirely prevents dust and dirt from settling upon the diaphragm, and, if any slight diminution in the strength of reception is apparent, it can be removed by pricking a few holes with a needle in the paper cover. In most cases, however, no decrease in the reception of strength will be noticed.

### A Hand-drill Screwdriver.

FOR rapid screwdriving it is an excellent tip to make a screwdriver attachment to fit one's hand-drill. This can be done from a short length of  $\frac{1}{4}$ in. steel rod. One end is filed up or ground into the proper shape for a blade and is subsequently tempered by heating and dipping in oil. Box spanners can also be made in the home workshop to fit the hand-drill. Take a piece of brass or mild steel tube whose internal diameter is such that it will just fit tightly over a nut of the size required. Put a short piece of studding into the nut and insert it into the end of the tube. Now hammer the outside of the tube near the end, shaping it to fit snugly on to the faces of the nut.



**SIEMENS**

**DRY BATTERIES**

Sole N.Z. Agents:

Messrs. **CORY-WRIGHT & SALMON**

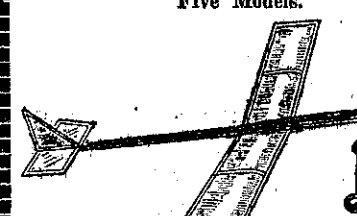
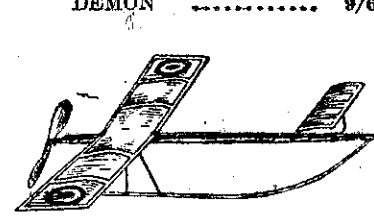
ENGINEERS  
P.O. Box 1050, Auckland.  
P.O. Box 1230, Wellington.

## Southern Cross Model Aeroplanes

NEW STOCK JUST LANDED.

Can be flat packed and posted to any address. No. 0 and Moth, Demon fragile 1/3 extra; Swift, Racer 2/6 extra.

Perfect Flight Guaranteed.	RACER .....	25/-
Scientifically Constructed.	SWIFT .....	15/-
Five Models.	DEMON .....	9/6

MOTH ..... 6/6      No. 0 ..... 7/6

To be procured only from

## F. J. W. FEAR & CO.,

63 WILLIS STREET, WELLINGTON.

Telephone: 41-446.