Glossary of Wireless Terms

UNDER this heading we will give regularly sections of the glossary of wireless terms which is a prominent feature of the N.Z. Radio Listeners' Guide. In that book, although set in the smallest type, it occupies some 13 pages, and is definitely in our opinion the most comprehensve and complete glossary on modern lines which has been made available in the Dominion. For the benefit of our readers the glossary will be reprinted in our columns.

BRUSH DISCHARGE.—A discharge of high-tension electricity, which takes the form of a luminous glow, accompanied by a crackling sound. A brush discharge occurs when the voltage is almost high enough to produce a spark or arc.

BULB RECTIFIER.—In battery charging appliances, a bulb rectifier consisting of a filament and a plate in a glass bulb having a low vacuum or specitl gas is used for the purpose of converting alternating current into impulsive direct current by cutting off the flow of those impulses or currents wvhich flow in the wrong direction.

BUSBAR.—Copper wire, often tinned, used in wiring the circuits of wireless sets. It is manufactured round (diagonally) and square. The object of its use is to enable insulation to be dispensed with as the wires stay where put and will not fall together like flexible leads. The wiring of a radio set must be spaced correctly to achieve the best results, and stiff wire facilitates this. Often insulation (known as spaghetti) is used on the wires as well.

BUZZER.—An instrument consisting of a coil of wire round a soft-iron core, near which is placed a steel reed or armature. Currents flowing in the coil from a small battery magnetise the core and attract the armature, which automatically breaks the circuit, allowing the armature to return to its normal position. This action again closes the circuit, and once more the armature is attracted, and the vibratory action continues as long as the battery is connected in the circuit. The vibration of the armature sets up sound waves, which are heard as a musical note. In wireless it is used for testing crystal detectors, the buzzer being allowed to function while the crystal is being adjusted. When the buzzer sounds at its loudest in the phones the crystal is ready for reception.

"C" BATTERY.—See "Bias."

CAPACITY.—Is the property of a device, or body, to store energy in electrostatic form. It is the property which a condenser has of receiving and storing a charge of electricity. It depends upon the size of plates, the distance between them, and the nature of the substance filling the spaces. Generally referred to in terms of microfarads. Capacity is measured by the quantity of electricity that can be forced into a device, or body, by a pressure of one volt. The unit of capacity is termed a "farad."

CARBORUNDUM.—A carborundum crystal detector has the advantage of great stability, but it is generally recommended that to obtain the best results a small 4½ volt battery and potentiometer should be used with it.

CARRIER WAVE.—See "Continuous W.ves" and "Modulation."

CATHODE.—Sometimes spelt "Kathode." The filament or source of the electron supply in a valve. (The negative electrode.) See "Anode."

CATWHISKER.—Is a fine piece of wire, which may be of various kinds of metal, usually in the form of a spiral coil, used in conjunction with a detector crystal, upon which it rests when in operation.

CELL.—One of the units of a battery of either wet or dry variety.

CHARGE.—Applied to the recharging of an accumulator, and also to the charging up of the plates of a condenser; in the latter application the plates charge and discharge in sympathy with the frequency of the oscillators when inserted in a high-frequency circuit.

CHARGER BATTERY.—See "Rectifier."

CHEMICAL RECTIFIER.—Another name for an electrolytic rectifier.

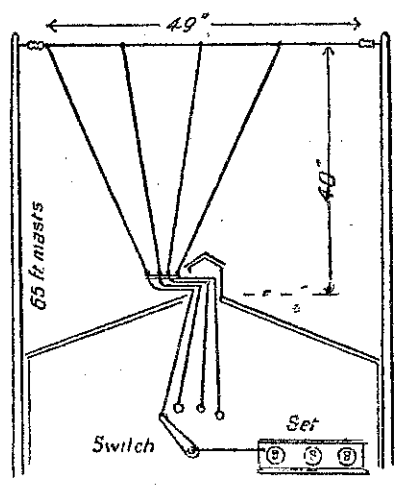
A NOVEL AERIAL SYSTEM

PERMITS RAPID CHANGE-OVER

A DESCRIPTION of a novel aerial system, which has been called the "fan aerial," is sent in by Messrs Gyde and Barringer, of Hawera, and as it will probably interest many experimenters and others, particulars are here reproduced.

It is stated that very great differences are noticeable in reception when the different positions are used on a given station. The letter states that "sometimes, say, 2YA works beautifully on the "T" tapping, then another time it works better on a ¾ "L" or full "L," and so on with other stations. The letter also claims that this aerial with the "fan" earth is ideal. Presumably the "fan" earth, is several earths joined radially at equal distances.

It will scarcely be necessary to adhere to measurements, as the aerial



will be erected to suit available space.

The diagram shows the aerial divided into four equal parts with four separate lead-in wires connected respectively at one end, and at the centre end, and at the centre and quarter and three-quarter positions. These are all led, insulated in proper manner, to 4 contacts of a switch, the arm of which is connected to the aerial terminal of the set. This gives a means of rapidly changing over from one style of aerial to the other, and should provide some interesting facts for experimenters. The aerial in question is erected on 65-foot iron poles above a building, giving 40 feet clear above the roof, the lead-ins being brought to insulators and through a ventilator in the roof.

Construction Continued

lars will be found in the description of the short-wave receiver construction in the "Listeners' Guide."

The coil coupling is varied by means of a knob on the left-hand end of the spindle, which projects through a slot cut in the lower edge of the cover. A brake on the other end of the spindle makes the coil "stay put."

FOR clearness also, the grid-bias cell is not shown, but its position is indicated. One small round cell can be used, laid on its side. The accompanying .006 fixed condenser should be kept on the coil side of the screen, and may be above the bias cell.

Note that where the filament terminals come up from under the baseboard, the negative is connected to an .006, and to the secondary coil via the grid battery (if used). The positive is connected to the shield. At A and B are washers screwed to the base, and under these connecting wires to the shield are held to obviate soldering to the shield, not always an easy operation with a small iron. Flament connections to the 625 are made with a small valve socket on each lead.

The two .006 by-pass condensers are shown without supports, but must be so arranged as not to come in contact with the shield.

If the 222 valve is to be used, the two filament leads will go to the valve socket in the usual way. Some types of UX holder will take the plate and screen grid end of a 625 quite well, so if a suitable holder is used it will take either type of valve.

The small internal copper screen is not shown, but its position is indicated by a dotted line. Sufficient room is left at the sides to give free space for leads to get round. The screen is secured to the base by two screws at the side nearest to the coils.

THE connection to the control grid for either valve is made by means of a small battery clip on the end of the wire. For the 625 it is a good plan to put a small piece of adhesive tape on the clip to present possible contact with a filament prong.

The lead from the screen grid (ordinary grid connection in holder) goes under the board as B45 volts, and above the board is connected through the by-pass condenser to the shield.

Dimensions not already given are baseboard 12 x 6½ x 3-8 and panel 8 x 6½.

PARTS AND MATERIALS REQUIRED.

	s.	d.
Variable condenser	15	0
Vernier Dial, high ratio	9	0
2 Fixed condensers .006, mica	7	6
1 fixed condenser, .002, ...	2	0
UX valve socket	2	3
Copper sheet, 28's	6	0
Rheostat, 30 ohms	3	0
Grid bias cell for S625	0	9
Wire, screws, terminals, bolts, etc.	4	6
	£2	10 0

In addition, there is the UX222, 42s., or the S625, 30s. A shipment of the latter has just been landed, so they will be easily procurable.

QUERIES BY CORRESPONDENCE.

1. Every communication enclosing queries is to be addressed to "Megohm," Box 1032, Wellington, and must be accompanied by a stamped addressed envelope for reply by post.

2. Questions must be written so that a space is left in which the reply may be added.

3. No charge is made for replies.

HEATING POWER-VALVE FILAMENTS

WITH ALTERNATING CURRENT

IT is quite a practicable proposition to heat the filament of the last power-valve with unrectified alternating current of the correct voltage, such as may be obtained from the filament or low-tension winding of an eliminator transformer. In using an ordinary valve in this way, the only important condition is that the filament must be of a thick type rather than a thin one. Thickness of filament is fairly well shown by the amperes taken, so that valves taking less than .25 (¼) amp. could well be ruled out for the purpose.

Bearing this in mind, we find that in the six-volt class the suitable valves are 112, 171, PM256, de Forest DV7 and DL14, and also the UX210, which latter carries exceptional volume, but in order to obtain full benefit from it, more A and B power is required than is available in the average radio installation. In the four-volt class the same conditions would apply.

The writer has run the last power valve in this way for many months, and no harm has been introduced into the receiver on that account, although the grid-bias of 22-volts has been applied in the ordinary way.

BUT there are circumstances connected with a.c. heating of filaments that may cause the appearance of hum until steps are taken to remove the cause. When operating on direct current the negative end of the filament is considered as zero voltage as far as grid and plate are concerned, and if the grid is connected to the negative leg of the filament, it may be said that the grid is positive to no part of the filament. That being so, no grid current will flow. It may here be explained that grid current is an unwanted current set up between grid and filament when the grid becomes positive, and it is such current that causes distortion. If the grid is connected to the positive end of the filament, grid current will flow.

IT is, therefore, seen that the negative end of the filament, which is connected to the grid, must be kept negative continuously. Now, if we apply alternating current to the filament, the end to which the grid is connected will be alternately positive and negative. Grid current will then be produced in step with the positive half of the cycles, and a powerful hum may be heard in the receiver.

IN such a case there is an easy remedy. It consists in providing a point which is equivalent, and this is done by placing a potentiometer across the filament terminals. The grid and B negative leads are then connected to the arm of the potentiometer, and adjustment is made until the hum disappears.

Even after this has been done, there is another point, which is that during each half cycle one end of the filament or the other is negative in respect to the grid by a voltage equal to half the full a.c. voltage applied to the filament. This means that it is necessary to provide a grid bias of sufficient voltage to ensure that half the filament voltage added to the signal voltage will at no time make the grid positive. From this it is clear that rather more than the manufacturers' recommended grid bias must be applied, so that with valves taking 5 to 6 volts on the filament, from 3 to 4½ volts additional bias should be provided over that which would be required when working with direct current.