

A Little Appreciation.

MANY thanks for your kindness in dealing with my queries as set out in this week's "Radio Record," also for the fullness of the information given. Wishing yourself and the "Corner" every success.—"Sonora" (Lower Hutt).

Voltage on A Battery.

MY set is a two-valve; I use one cell, a dry battery to light both valves. Is this sufficient, or should each valve have a separate battery and rheostat. Would two or three of these A batteries connected in series be better or would you advise a different type of a battery.—Beginner (Palmerston North).

As with all A batteries, the most important question is, "What is the voltage and consumption of the valves in use?" With regard to the first great care should be exercised to ensure that the current on the filament is not at a voltage higher than that recommended by the makers. As the correspondent does not state the valves he is using it is impossible to answer his first question; he should find out what voltage his valves require, then reckon each dry cell as $1\frac{1}{2}$ volts. Valves except in certain circuits are connected in parallel with one rheostat. Where a valve requires a lower voltage than the rest it should be supplied with a separate rheostat of a high resistance.

Where more than two valves are in use, it is not wise to use dry cells. Even in circuits of one or two valves dry cells should not be used if the total consumption is greater than about .12 amperes per hour. When consumption exceeds this an accumulator should be employed preferably with a trickle charger.

There are two important points for the beginner to keep in view:

1. Valves requiring different filament voltages should not be used unless adequate precautions are taken to protect the filament of the valves requiring the lesser voltage. The voltage required is that of the valve requiring the highest voltage, not their sum.

2. The consumption is that of the sum of each valve added together.

Types of Aerials.

A CORRESPONDENT, M.W.Y. (Wellington), who has not read our rules, sends the following queries to "Pentode," who answers only those questions referred by "Observer," to whom all technical correspondence must be addressed:—

"Which of the following aerials is the most efficient—given that gauge of wire and other considerations remain constant:

"1. One length of 100 feet.

"2. Two parallel lengths of 50 feet —(a) 6 feet apart, (b) 3 feet apart.

"3. Four parallel lengths of 25 feet, 3 feet apart."

Many beginners no doubt ask themselves this question, and finally arrive at some solution, whether right or wrong. Here is the accepted solution. The two wire aerial of a given length will always bring in stronger signals than the single wire, other things being equal. Three wires would bring in stronger signals than the two-wire aerial, but there is no semblance of proportion, e.g., two wires would not

suitable than wires six feet apart. Four parallel lengths of twenty-five feet would be the least efficient.

Loose Coupling.

A CORRESPONDENT has asked the meaning of the term "loose coupled," and as it is one of the most common of radio terms, it may be worth a little explanation.

The term refers to the proximity of coils, not to the method of connection with the terminal, as our correspondent suggested. Around every conductor, charged with electricity, there exists a field

A Corner for Crystal Owners

NEXT week will see the institution of a corner devoted to the crystal owner. Crystal circuits are necessarily limited, but every effort will be made to place before the beginner as many adaptations as possible. These will be interspersed with descriptions of easily-made amplifiers for the crystal. All possible aspects of crystal use will be discussed. The direction of the aerial, the type of aerial, earth systems, leads, joints, types of crystals, coils, the value of the condenser, the resistance of the 'phones, systems of house wiring, and a thousand other problems confront the beginner and he is at a loss to know what to do for the best. These will be discussed as opportunity offers. Questions from the crystal user will be welcomed and will be used whenever possible. The corner will be conducted by "Galena," to whom correspondence relative to the page should be directed:—"Galena," Radio Record, P.O. Box 1032, Wellington.

give anything like twice the volume of one wire, although an increase in length would give rapidly increasing signal strength. That is to say, it is preferable to increase length than to introduce more wires.

Wires too close together serve no purpose, the optimum distance being six feet. Above this nothing is to be gained, while, when the wires are not separated by six feet, little is to be gained by the extra wires. Applying these facts to the questions asked: One wire 100 feet is preferable to two 50 feet. Wires separated by 3 feet are less

of magnetism, through which signals can be passed as through the conductor. The extent of this field is not very great. Coils or any other conductor placed in this field will pick up the signals from the other conductor. In this manner a connection exists between them, i.e., they are loosely coupled.

Coils placed very close to one another are said to be tightly coupled and strongly influence one another. This magnetic induction, as it is termed, may, if not properly controlled, seriously interfere with other conductors in the set and cause distortion. This explains shielding and space winding, and the separation of certain components such as transformers, coils, and condensers.

Valves Failing to Light.

I HAVE a factory-made wireless set, and it has given every satisfaction up till lately, but about four weeks ago, while moving the volume control towards soft, signals stopped, and I found that a valve had gone out and wouldn't light for some time, but trying the set next evening everything worked all right, though if I touch the volume control out goes the same valves every time, or if it does not go out it flickers down very low and stops reception. Now, sir, knowing nothing

about grid bias and such things, I can't give you such information, but I would be very pleased if I could get to know more about the set I am using, as I hardly know anything about the valves, so I might be mistaken in saying it is the power valve that is causing the trouble, but I will give the positions of them. [From the diagram it is the radio or high-frequency valve at fault.]

Last night I noted a new kind of static, so I tested the 3 B batteries, and they read 29 volts, 39 volts, 50 volts or more. Could you tell me how this happened? Don't the B batteries drain alike? How did the 45-volt block get to 50 or more when I tested them separately?

I bound the ends of the A battery terminals with fine sand-papered copper wire, for about an inch and I never get any of the fine strands of the leads broken or jammed when screwing on the top of the terminal.—F.H. (Westport).

THIS is just the type of letter we want—no matter how elementary the problem is, we welcome it. In this particular receiver the high frequency valve is controlled by a separate rheostat, or dial on the receiver. If for some reason this valve refused to light, one of three things may be suspected:

(1) That the A battery was too low.
(2) That the rheostat was not working properly.

(3) That the valve was broken. From what our correspondent says, it appears as if the rheostat is faulty. Perhaps it has worked loose, and does not make a good connection. "Observer" has had that happen often to his set. Maybe there is a loose or broken connection between the rheostat and the valve or between the valve and the A battery.

F.H. would be advised to proceed as follows:—Disconnect the batteries, examine carefully the rheostat to see that there is nothing loose, likewise examine the wires coming to and from the valve and rheostat. Anything loose should be tightened.

Artificial Static.

REGARDING the second question, artificial static. A short time back we spoke of this being an indication that the B battery was low. On putting a voltmeter across his batteries F.H. finds this to be the case. Twenty-nine volts is too low and should be replaced. As the different blocks supply different valves, requiring varying amounts of battery, they run down at different rates.

Grid bias supplied by a small battery within the set is applied to the grid of the valve to regulate the flow to the plate. If this battery becomes too low it should be replaced. A grid bias registering 25 per cent. below normal should be replaced. The cost is trifling, but the effect is the reverse.

Some batteries certainly register above their rating, but these are uncommon.

The suggestion about binding the ends of the wires is a good one—we commend it to all readers.

Directional Effect.

2FB, Northland, writes:—I have tried two indoor aerials, one consisting of talking tape strung across the room and passing over another which consists of four copper wires separated at each end by a wooden cross and the lead taken from the middle. The result was that the talking tape worked

FADA RADIO

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