ECONOMY (Hakataramea): I wish to use a "B" eliminator for my set. Would an electrolytic one be satisfactory?

A.: We think the better plan would be to use an eliminator employing valves or dry rectification. You will want one that will supply at least 20 mamps. at a maximum of 150 volts.

SHORT-WAVE (Ruotoria): I wish to buy a short-wave set, but do not know anything about them. Would it be possible to get a set like your Super-Six?

A.: Your best plan would be to buy a commercially made short-wave adapter, and suggest your writing to one of the better-known firms and asking their advice, as it is impossible for us to recommend any particular make. We have tested one only—the "Add-a-phone"—made by Mack's Radio, Wellington.

AUSSIE (Wanganui): We think it would be inadvisable for you to shorten your earth. Shorten the lead, if you like, but do not take away any of the actual connections with the ground.

TINY (P.N.): We suggest your using A209 1st radio, A615 detector, B605 audio. We do not happen to know the agents for your eliminator, but suggest your writing Abel, Smeeton, Ltd., Auckland, whom we think may know something about it. Any good radiotrician should be able to put it right for you.

2. Regarding your last question, it is impossible to diagnose this without further particulars. It seems that the coils are slightly out of balance or the condensers not quite of the same capacity.

STATIC (Denniston): I find that by disconnecting the earth the volume becomes 50 per cent. stronger. Is it injurious to the set to work it in this manner?

A.: By disconnecting the earth you are working your set nearer the oscillation point, and so long as it does not squeal it is quite satisfactory worked in this manner.

2. From 15 to 20 degrees on my set the stations become very congested.

Would shortening the aerial help to remedy this?

A.: It is doubtful. That part of the ether is very congested. Try the effect of a midget condenser in your aerial. You can take this out if the loss in volume offsets any gain in selectivity.

J.B.H. (Auckland): How should the copper sulphate solution of a Daniells cells charger be made up?

A.: Take sufficient water to half fill the vessels in which the porous pots are to be placed. Add to this ordinary bluestone until no more can be absorbed by the water, i.e., it will not dissolve. The solution is now saturated and ready for use.

2. How often should the sulphuric acid solution be renewed?

A.: When the voltage drops off, but often the addition of a little fresh sulphuric acid to the solution will bring it back to normal strength.

SIMPLEX (Waikanae): I cannot get 2YA as strongly on three valves as on two.

A.: Although you have had the valves and transformers tested, we still suspect the transformer. Are you quite certain you do not have it connected round the wrong way, or that there is a breakdown between the installation of the primary and secondary? You need not worry about matching the valves.

2. How many turns should I have on the tickler?

A.: About 25 turns. It should not be necessary to use the rheostat to cut down the whistle, which should be controllable by your condenser. Try reversing the connections to the tickler.

3. Does it make any difference which ends of the rheostat are connected to the battery and set respectively.—No.

ATTIC (Dunedin): What would kill the 245 valves in my commercial set. They go blue and squeal when starting up from the cold, and the set is generally poor until I replace them?

A.: If this happens with one set of valves, we would say the valves themselves were gaseous and at fault. If it happens regularly with all valves you put in the circuit, we should imagine the 800 ohms bias resistance between the centre tap of the 245 filament and the ground to be at fault.

2. Could I put an s.g. valve in the first stage?

A.: It would be possible to do so the way you suggest, but you would take a big risk. Do not forget that the grid is now on the top of the valve, and you would have to break the connections in your set. You might, too, throw your condensers out of alignment and so lose all you would gain and perhaps a little more. The same applies to the s.g. valve used as a detector.

KAREHANA (Kelburn): We suggest you adding the anode coil. Just offhand we cannot tell you the number of turns to use, but try half the number on the grid coil to start with. If the set oscillates too readily—you will detect that it is oscillating, because it will squeal—take off some of the turns until the oscillation is controllable by the variable condenser across that particular coil.

A.C.C. (Wanganui).—I have had little success with the "Sparrow Hawk" one on shortwave, the only coil working being the 40-metres one.

A.: You have not described your symptoms, so we cannot help you. Try reversing the tickler, and adding more turns to this coil.

2. Results on the broadcast band were at first unsatisfactory, 2YA taking up half the dial, so I connected a .0005 condenser in the aerial, and results were very much improved.

A.: Such a set as the "Sparrow Hawk" is very unselective, and it is not surprising that 2YA should come in over half the dial. Using a midget in the aerial will always have the effect of improving selectivity.

3. How would I use two 45-volts batteries with the "Sparrow Hawk" one so that I could break the voltage down to 60?

A.: Use a 10,000 ohms variable resistance in the "B" lead which you wish to break down. Otherwise take a tapping off the battery.

W.J.C. (Wanganui): What circuits do you recommend to use in the shortwave adapter with my three-valve electric set?

A.: It is difficult to make a shortwave adapter. As for a battery one we can recommend none better than the "Sparrow Hawk," described in the 1931 Guide. It will cost approximately £3/10/-, the batteries being extra.

AERIAL (Thames): We think you will get better results by using a commercial shortwave adapter.

2. Recently I extended my aerial to nearly twice its original length, this increasing the volume but making no difference to the selectivity. The length is now approx. 65 feet and 30 feet high. Do you think a further 30 feet to the length would make any difference?

A.: You have brought your aerial nearer the ideal, consequently you would not expect that the increased length and height would make an appreciable difference to selectivity. It is doubtful whether your proposed extension would be any improvement. We are writing "Digger" asking him to get in touch with you.

LIP (Auckland): How is the voltage divider resistance calculated?

A.: By Ohms law in the following manner:—A voltage dividing system should pass from 10 to 20 on constant drain, and, by knowing the drain at each point, the total resistance in the divider can be calculated by Ohms law. First set out exactly what must be supplied, say, 30 mamps are required at 260, 10 mamps at 150, 5 at 100, and 2 at 50. This makes a total of 47 mamps, and to this must be added the constant drain, say 15 mamps, making a total of 62, which is the output the system must be capable of delivering. If the power pack delivers voltage at the highest potential desired (in this instance 260), it will not require a resistance. This is desirable because of the heavy current which would have otherwise to be passed though such a resistance. The voltage divider will then be called upon to break down 260 to 150 passing 10 mamps, 150 to 100 passing 5 mamps, and 100 to 50 passing 2, but to each must be added the "bleeder" of 15 mamps and the current to be supplied taps further down. Then through the first section will pass 32 mamps (10 + 5 + 2 + 15). Through the second 22 mamps (5 + 2 + 15), through the third 17, and through the final section, which will reduce the 50 volts to zero, 15. The resistance values can now be computed by formula: $R = \frac{E}{I}$ for the first section this equals $110 \div 32 \times 1000 = 3450$ ohms. For the second, $50 \div 22 \times 1000 = 2280$ ohms. For the third, $50 \div 17 \times 1000 = 3400$. For the fourth 3340, making a total of 12,470 ohms. (Note: The figures are approximate only.)

2. How can capacity be measured other than by using a capacity bridge?

A.: There is a method by using a neon lamp. For full details see "Television," Vol. 4, Nos. 37 and 38.

3. What are the winding specifications for a microphone transformer?

A.: A microphone transformer has a ratio of 100 — 1. It is not advisable to attempt to make one yourself as very fine wire must be used on the primary.

QUILP (Te Aroha): I have a battery set with an eliminator, and when the set is turned on a noise like static is heard.

A.: This sounds like condenser trouble. Probably one of the smoothing condensers in the power pack is at fault. Your best plan would be to take your eliminator in to a dealer and as him to put it on a set and see if it is all right. Failing this, it would be necessary to get somebody who knows something about radio to go over your set, as it is possible there may be

(Concluded on page 30.)

FOR SALE OR EXCHANGE

The rate for small advertisements under this heading is 1/6 cash for 20 words, and twopence for every other word thereafter.

WANTED to Buy, a good Short-wave Set, battery operated; must be in good order; cheap for cash; state make, valves, etc., and price. Apply "Short-wave," c/o "Radio Record."