going better without it your set is not taking harm.

2. The stations on the lower wavelength came in when the tuning condenser was at its maximum capacity and vice versa on the higher wavelengths, while the reaction condenser seemed to have no effect whatever.

A.: Do you mean that the set will not oscillate when that condenser is taken out of the circuit? If so try a few more turns on the reaction coil, and if possible change your crystal. The trouble, however, seems to be in the condenser, as it is very critical. As remarked in the article you need a very small capacity, and this is difficult to obtain.

3. Would it be possible to describe at some later date an r.f. stage for this receiver?

A.: We will not promise to bring out the extra valve, as, after all, the set is only an experimental one. You could use the hook-up with an ordinary r.f. circuit, such as that to be described for the "Ranger Three."

P.W.F. (Christchurch): The subject of pick-up adjustment is a rather long one and we refer you to the "Radio Guide," 1931, where the subject has been dealt with very fully. You are right in deciding that axis AB must make a tangent to the circle, particularly near the centre of the record. Shorten your pickup until you get it near the ideal, but look up the "Guide"—that will help you greatly.

COUNTERPOISE (Feilding).—Which is the most economical method of running the "Night Hawk" Two, dry batteries or accumulators?

A.: That would depend upon the valves. If you use the .06 filament consumption type, then the dry batteries are the better. It is advisable to make a bank in series-parallel.

2. How long would the dry batteries last, using a 230 type valve?

A.: That we cannot answer for you. Probably three months or more, depending upon the length of time you use it.

3. Is the set an efficient one-valve set on shortwave?

A.: Yet, it is quite efficient.

L.P.H. (Dunedin): I have recently bought a six-valve battery set and would like to know if my valves are correct. The first radio A609, 2nd Cossor vale, 3rd R.C.A. 201A, the detector, a Cossor, first audio 201A, second audio 201A.

A.: Your first valve is right, but your second we cannot say because you have not given us what type of Cossor. There are about half a dozen of them. The third one is correct, but with the detector again we cannot help you. It should be either a 201A or a 221. The first audio is correct, the second audio should be a power valve of the 605 type. You will find that best results will be obtained by using R.C.A.'s 221 in all stages except the last, where you use a B603 type valve biased with about 15 volts—that is if you are using 90 to 100 volts on the plate.

2. What are the capabilities of the set, and is it a good one for DX competition?

A.: The set is quite a standard model and will give you good results. You should be able to collect quite a good log for the DX competition.

NEGATIVE (Canterbury): I have just renewed my valves with 201A's, but the "A" battery which used to last five weeks now lasts 10 days. Is this the fault of the valves?

A.: You are putting a tremendous load upon it. Still, if your accumulator is good, it should last far longer than 10 days. Better send it to your battery house and ask them to test it for you.

2. Is my aerial, 55 feet by 20 feet passing partly over a roof, better than one, 20 feet by 18 feet?

A.: Ever so much depends upon the situation of the latter; probably there will be little difference.

L.T. (Luston): I have decided to build an eliminator. Could a vibrator battery charger be employed in a battery eliminator?

A.: You could use the transformer and the type of rectifier is dependent upon whether it is full or half-wave rectification. If it is a full-wave type, you can employ the 280 type valve, or for half-wave, a 280 type with the plate and grid connected together. You can compute voltage, etc., knowing the output of the various terminals, which are generally tappings of the main secondary coil. You will use the maximum voltage by taking out any resistances that are in the vibrator charger, and connect this in the approved full-wave style, or half-wave, as the case may be. For the "A" battery eliminator we suggest 1010 rectifier.

2. I take it I will require another winding for the filament?

A.: Yes, although you could use the Raytheon type of valve which does not have a filament. It is a full-wave rectifier, and unless you have a centre tapping in your transformer, you cannot use it. You can put on a filament winding quite easily, only an a.c. voltmeter would be needed to measure the output. You will have difficulty in computing the number of turns per volt without dismantling your transformer.

TWIN (Auckland): I am intending to make a full-wave crystal set. Could you please supply me with a diagram or let me know where I could obtain one?

A.: A diagram was published in these columns a week or so ago, and you could find full information in the 1929 "Radio Guide."

LISTENER-IN (Alfredton): Would the jolting that an "A" battery, through being carried at the back of a service car for over 30 miles, harm the battery?

A.: It is quite possible. If the road were rough the plates would become damaged. Your best plan in a case like this is to use a car battery, not a radio battery. These are more robust, and are better suited for the rough treatment.

2. I find my "B" batteries run down very quickly.

A.: This is possibly due to a broken-down by-pass condenser, aged valves, a short circuit somewhere in the set, unbiased valves. Check up grid bias, and if this is correct, shut off the "A" supply from your battery. Now take off "B—" and flick it against the terminal. See if there is a spark, and if there is you have a short-circuit somewhere in the set. You must take it down and pull out the offending part. If your set is as old as you say, you may be sure that it is a broken-down by-pass condenser. Sometimes dust between the moving and fixed vanes of the condenser will cause a battery to run down, but this would cause a certain amount of crackling when you are tuning your set.

T.M.C. (Taranaki): Where could I obtain a circuit for my five-valve "Natela" battery set?

A.: The Natela Radio Company, Leinster Chambers, Grey Street, Wellington.

T.C. (Auckland): Sorry, O.M., but we do not happen to have either of those two issues. If we can locate them for you, however, we shall send them along.

W.B.L. (Auckland): I have built the "Night Hawk Two," adding a stage of audio and a.f. amplification. The tuning is very broad. How can I sharpen it?

A.: You will find that the tuning on any set, such as this, will be extremely broad. Your only hope of sharpening it up is by the use of a wavetrap.

ECONOMIC Three (Gisborne): I was greatly disappointed with the "Kestrel Three," for I thought it would be an ordinary r.f. in the first stage. However, at some later date I hope you will oblige with a description of the ordinary triode r.f. stage.

A.: The triode r.f. stage is quite out of date. Not only is it less sensitive than the screen grid valve, but there is the difficulty of neutralisation. However, we shall, in the near future, be describing a three-valve set with one stage of balanced r.f., and this should meet with your approval.

RADIO (Tokomaru Bay): What capacity of fixed variable condenser would I require when building a wavetrap to separate 2ZW and 1ZR?

A.: You should use two formodensers, as you will need a very nice adjustment of capacity.

DX23W (Masterton): I operate a five-valve commercial set, but the two original transformers have burnt out. What make do you advise for replacement?

A.: We cannot undertake to recommend any definite make. Your best plan would be to use one of the better-known types. Ask any reliable dealer.

L.A.A. (Kilinshy): I am intending to alter my grid leak detector circuit to power grid detection followed by r.c.c. amplification, but have not sufficient confidence to make it up from the sketch on page 33 of the "Radio Guide." Will you kindly mark the alterations to the accompanying sketch.

A.: In the first place, we do not advise you to interfere with your present set. Changing over a commercial set is always a difficult proposition. Secondly, we do not undertake to answer queries such as this. In any case, it was a postal one, and should have been accompanied by a fee.

UNCERTAIN (Christchurch): I am intending to make the "Kestrel Three," but wish to use an aluminium panel as base. This means that the moving plates of the condensers and the arm of the rheostat are earthed. How can I overcome this?

A.: By regarding the aluminium panel as a negative. The moving vanes of the r.f. three and differential condensers will be connected to A—, which is as in the circuit. The rheostat and the det. condenser presents a problem. The best plan is to insulate the moving vane and leave the wiring as it is at present, other-