

to some point to the right. For our example let the voltage drop be equal to about 30 volts, thus for this half-cycle the valve would be working on the point marked X.

On the other half-cycle the current flowing through the transformer would be decreasing and, due to the dynamic effect of this component, anode voltages would be built up on the plate exceeding the normal B battery voltage. Thus the valve would operate on a slightly different curve, represented by the point X2. The difference between characteristic curves obtained by the tests made on the bench and the working curve actually made use of when a load is included in the plate circuit is now quite apparent.

Across the Zero Line.

It has been asked often, why, as the characteristic curve is straight on both sides of the zero grid point, cannot the grid swing be allowed to run over the other side to the positive even slightly? Reference to the characteristic curves on the graph make it seem that even if the grid worked at zero potential then the variations in the plate circuit would be in direct proportion as the line runs quite straight on either side for a considerable difference. This is so for characteristic curves only. If the grid becomes positive, then grid currents would flow. As a resistance or impedance is included in the grid circuit of any working valve, this would interfere with any current flowing in the grid circuit. It has been shown before that a voltage drop occurs across the anode impedance or resistance and the same would occur across the grid impedance if current was allowed to flow and alter altogether the straightness of the working curve. These currents certainly would be comparatively small, but being in the grid circuit would be amplified by the valve itself.

Another point that is made apparent is that the correct operating point of a valve is obtained by biasing the grid at a point to the left of the middle of the straight portion of the characteristic curve.

New Australian Stations

A WRITER in the Sydney "Wireless Weekly" says regarding the new broadcast stations which are to be on the air in Australia in July: "The Press reports of the tender conditions mention the fact that the power of the stations required by the Commonwealth Government is set down as three kilowatts and five kilowatts. What strikes the radio fan, of course, of special interest, is the fact that the method of rating the stations is different from that usually adopted by the Commonwealth Postal Department. In the regulations, which are all familiar with, the power is mentioned as the wattage in the 'high frequency generator circuit'; that is the power, stated in watts, in the plate circuit of the main oscillator, and excluding the modulator power. In these tenders the power is to be the watts in the aerial. This is probably adopted as following the lead of the Americans; it is a better system to follow anyhow, as it is a better indication of the transmitting capacity of the station than the other method of specifying the plate power of the oscillator alone."

The Combination Receiver

Adding an Extra Stage

CORRESPONDENTS have been successful with this receiver, and we have been asked how another stage may be added. This is quite a simple operation, but to make a first-class job the receiver should be dismantled and made up after the layout of the two-valve receiver. If, however, this is not intended, the following short description will be of value to those who want merely to add another stage to the existing set.

All that is necessary in the way of components is a transformer, a valve socket (and valve), another "B" and a "C" battery, 9 volts or two 4½ volt C's. Take a baseboard measuring 6in. x 4in., and place the transformer and the valve socket close to one another. Place this board at the back of the existing set. Arrange the transformer so that it will be almost opposite the valve socket of the "Combination" set, but with its axis at right angles to the axis of the transformer now in use. Turn it round so that "B" plus and "P" are facing the assembled receiver. The valve socket is to the left of this, with "P" and "G" facing the transformer. Screw these into position. Extend the terminal strip to allow three more terminals, "C-1" and "C-2" and "B plus 2." Disconnect the "T" terminal of the valve socket, which is connected to the jack, connecting it (the terminal) instead to "A" plus. The wire so disconnected is taken to "T" plus of the new valve socket. Take the other "T" terminal of this socket to the terminal of the rheostat which connects directly with the valve. If the valve is inserted now (with the plug in) and the rheostat turned on, it should light, indicating that the connections with the filament, at least, are correct.

Lift the connection between the R.F.C. and jack number 2, taking the lead from the choke instead to "P" of the new transformer. Connect the vacancy so made at the jack to "P" of the new valve socket. Connect to "B" of the transformer to the voltage now applied to the jack. This point of the jack now is joined to the highest "B" plus voltage available. Connect negative of one "B" battery to the positive of the other and the free negative to the binding post "B-." The "B" of the transformer will require from 22½-45 volts. The last stage (to jack) about 90 for satisfactory volume and quality, though it may be reduced to 45.

Connect "G" of the new transformer to "G" of the new valve socket.

Remove the connection existing between the rheostat and "C-" of the transformer in the original "Combination" set. Take this instead to "C-" 4½ (a new battery) (or to C-1 and thus to the battery), and connect its positive to "B-." Take another 4½ battery, connect the positive to the negative of the "C-1" battery, and its negative to "C-2" on the terminal strip. Connect this with "C-" on the new transformer.

For Sale or Exchange.

See page 32 for column of casual advertisements.

Crystal Corner

The Crystal and Valve.

"E.T.D." (Lower Hutt) has constructed this receiver, and has had good results on the loudspeaker 2YA, and on phones 1YA, 3YA, 4YA, 2ZT, 2ZM, 2FC, 2BL, 3AR, and 2GB, and many others whose call-signs are difficult to catch. Now, however, he states, the receiver will oscillate for a few seconds and only on a small portion of the dial. Both the "A" and "B" batteries are only three months old, and with the last "B" battery the set would oscillate freely with 8 volts on the plate.

A.: The "A" batteries are, no doubt, run down, for a detector will oscillate with very low voltage on the plate, but the filament voltage must be up to full strength, or thereabouts. Try new "A" batteries, and see the result.

My valve has been in use for nine months. Is it falling off in efficiency? If so, what make of 2-volt valve do you recommend for this circuit?

A.: It is unlikely that the efficiency of the valve is impaired through its use. In any case, it should be tested by a dealer. The make of valve is a good one, and we could not recommend a better.

Can two 1½-volt batteries be used with a 2-volt valve, controlled by a 3 ohm resistance?

A.: Yes, but when the batteries are new, do not turn the rheostat on full.

What is the cause of "blind spots" on a part of the dial, and what is the remedy?

A.: The cause is that the aerial, which has its own natural frequency, becomes tuned in resonance with the set and alters its tuning. The batteries, too, may have an effect in this direction. Try a small fixed condenser—.00025, say, in the aerial circuit, but see "Questions and Answers."

ANOTHER correspondent, "W.B." has had difficulty with the three-in-one. When the output of the crystal is joined to P, of the transformer, he can hear nothing. He asserts that the wiring has been tested by a radio dealer, and no mistakes found. He asks how another stage may be added.

A.: It is extremely difficult to state through the columns where a mistake may be found, when the receiver itself has been checked by a dealer and said to be O.K. One can only suggest that the valve is at fault, or may be the transformer. These should be tested. Another stage may be added as described for the "Combination" receiver this week.

Failure of Carborundum.

"E.A.C. (Christchurch) has not had satisfaction with the carborundum. It would not work on his set, while when tested on a neighbouring set it proved O.K. Tried again on his own set, it refused to function.

A.: This type of crystal sometimes requires rough treatment. Give it a sharp jar and then try. Also try reversing it in the holder.

DX News

Was It 70Z?

I WOULD be very pleased if you could supply me with the information regarding a station I heard last Wednesday, 10th inst. This particular station was operating right on 3YA's wavelength, 8 p.m. during the children's session. The strength was fairly good, but was inclined to fade. The announcer, who had a very cheery voice, seemed to be very interested in the "movies." He was talking about different actors and pictures in particular "The Trail of '98." He mentioned Launceston, Tasmania, a great deal. Could this have been 70Z? I think it was the same station I had on the previous Wednesday when a church service was being relayed. This seemed like Stainer's "Crucifixion."—D.G., Wellington.

3DB Identified.

I NOTICE in this week's "Radio Record" a correspondent, Mr. A. Stanley, of Khandallah, asking the identity of station he presumed to be 3DB, Melbourne, which he heard on Thursday night, April 11, on a wavelength of 250 metres. I heard this station a little earlier than my southern friend, on two valves at fair 'phone strength. I heard the call sign 3DB, Melbourne, very clearly. This is a 500 watt station (Australian rating), and is situated in Capitol House, Melbourne, broadcasting nightly on a wavelength of 252 metres. Another Australian heard the Monday evening of the same week was 3UZ, Melbourne, on 319 metres; volume was exceptionally good for two valves. Mr. Stanley mentions having heard another station a degree or so above 3DB. This would probably be our local station, 1ZQ, which broadcasts on 253 metres, on both Monday and Thursday from 8 till 10.30 p.m. the last half-hour after being devoted to dance music.

On Monday night the 15th instant, I located a station at approximately 9.30 p.m. talking in a foreign language about 4 degrees below 4QG, Brisbane; and as no announcement was made in English I am somewhat puzzled, as to who my foreign friend is. The talk was fairly quick and I had it at good 'phone strength. Who is he?—N. D. Campbell (Auckland).

[The station is most likely JOGK, Japan, on 380 metres.]

Japs Conversing.

ON a recent Sunday I heard two Japanese stations conversing with each other. The dials were set on 39, 43, 45 and 37, 40, 42. The latter I hear every night after 8 o'clock. Will you kindly enlighten me who they are?—"Gilfillan" (Eketakuna).

[Probably JOAK (375 metres) and JOGK (380 metres).]

"FROTHING" of an accumulator is generally a sign that faulty or unsuitable material has been employed in the construction of the celluloid case.

WHY?

Kingsford Smith uses Burgess Batteries. Commander Byrd uses Burgess. More Burgess Batteries are sold in New Zealand than any other make. Why?

BURGESS RADIO BATTERIES