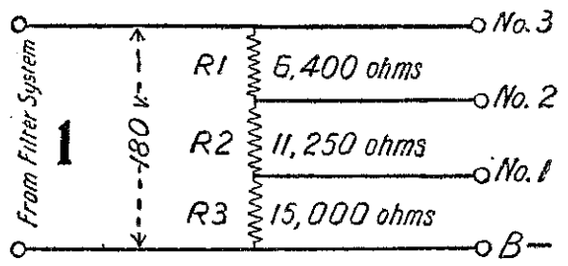
B Eliminator Output Resistances.

How They are Calculated.

THE following method of calculating resistances placed across the positive and negative terminals of a B eliminator will be helpful to constructors. This refers to the "potential divider" type, in which several fixed taps are provided to give the standard voltage for each stage of the receiver.

Diagram 1 shows the resistances of an eliminator, and we will suppose that tap No. 1 is to be 45 volts to operate the detector. The loss current through R3 is usually about 3 milliamps. If tap No. 1 is to give 45 volts, then the drop across R3 must be 45. The resistance of R3 will be equal to the voltage across it divided by the current through it, which is in this case 45 divided by 0.003 (3 mils.), which gives 15,000 ohms as the value of R3.

The voltage at tap No. 2 is to be 90, and as the voltage drop across R3 is 45, the drop across R2 will also be 45.



in order to make the total voltage between negative B and tap No. 2 equal to 90. The current flowing through the resistance R2, will be equal to the loss current of 3 milliamps, plus the current drawn by the detector, 1 milliamp. Therefore the value of R2 will be equal to the voltage (45) across it, divided by the current through it, which is 0.003 plus 0.001, or a total of 0.004 amperes. This gives a value of 11,250 ohms for R2.

SUPPOSE that the total drain from the 90-volt tap is 10 milliamps, the total flowing through R1 will be equal to 10 plus 1 plus 3, or 14 milliamps. If the maximum voltage available from the power unit is 180, and the voltage at terminal No. 2 is to be 90, then the drop across R1 must be 90, and 90 volts divided by 0.014 amps. gives 6400 ohms as the value of R1.

Resistances must be capable of carrying the load without overheating, but the wastage is very small in a B eliminator.

The load in watts being handled by a resistance is determined by multiplying the resistance in ohms by the square of the current in amperes. This gives for the above illustration, watts through R3, 0.135; through R2, 0.18 watts, and through R1, 1.25 watts.

If it is desired to add further resistance externally to the detector supply, in order to reduce voltage to a more suitable value than 45 volts, this can be effected by means of a variable high resistance with 2 mfds. across positive and negative.

The Monitor's Control.

An interesting correspondence is at present proceeding in "Wireless World" concerning the B.B. Co.'s monitoring of musical items from London station, 2LO. One correspondent complains that all the light and shade is taken out of musical items on account of the suppression of "forte" passages and the extra amplification of soft, or "piano" passages, giving a too-even effect over all. This monitoring is, of course, carried out chiefly in the interests of the average listener's receiver. Suppression of the heavy passages prevents unpleasant "blasting" in receivers that are being run to the limit as so many are, and amplification of soft passages prevents undue weakening in distant receivers, so that these portions of the item are not missed. This correspondent states that he would prefer an occasional "blast" to excessive control.

Another correspondent, writing in support of the above views, says:—

"As it stands the gramophone electrically reproduced through a really good amplifier and loudspeaker system seems able to give a truer musical result than is possible from a B.B.C. transmission of the same thing, simply because in the case of the gramophone one finds recorded the full contrasts between fortissimo and pianissimo, with a result that is alive as compared with the deadness or flatness of the 'controlled' and mutilated B.B.C. transmission.

"It would seem almost axiomatic that, the optimum mean modulation adjustment for a given musical transmission having been ascertained, that adjustment should be left severely alone during the performance of the piece."

The above appears to be rather hard criticism of one of the high-grade broadcast stations of the world, but it goes to emphasise the fact that gramophone recitals are now of very high quality, and in many instances more pleasing than studio items.

Remarks on the Amplifier.

COMMENTING on the performance of the moving-coil loud-speaker, a correspondent in a London radio journal, amongst other matter, gives the following remarks which apply very much to all audio amplifiers:—"The push-pull scheme seems to bring out the low notes, though I am beginning to find that one has to go further back, and that the output stage is not the only one to bother about. The detector seems to have a marked effect on the performance, and I am just tackling this point now. It is really remarkable how one can go on improving the performance of the amplifier, and how this leads to discovering notes of which one was previously quite unconscious. An excellent test is the dance music. There is a drum or some such instrument which booms away more or less continuously, and which only begins to be really audible as one gets the amplifier working decently. If the average experimenter is not much more skilled than I am (an unfair suggestion, perhaps), and he perseveres with his amplifier, he will be astonished to discover what a large percentage of the music he has not been hearing. One hears of people obtaining excellent results by the use of one D.E. 5A as an output valve. The only conclusion I can come to is either that there is something very wrong with my equipment or that anyone who is satisfied with D.E. 5A results has never heard a speaker working anything like well." (The D.E. 5 has an impedance of 8000 ohms.)

Tips and Pottings.

A Fine Power-Valve.

AFTER a lengthy trial of the Philips C603 super power-valve in the last three stages of double-impedance, it is quite evident that this is a valve that will give great volume in the last stage, and give high quality at the same time. "Megohm" has run this valve for several weeks with raw A.C. on the filament, and on that account grid-bias is accordingly slightly increased over the stipulated figure. The excellence of this valve is to a great extent on account of the heavy plate current of 18 to 20 mils passed at voltages approaching 150, the maximum normal grid bias being 27 volts. This six-volter is just what many listeners require in the last stage.

"Floating" A Battery Hum.

AN experimenter, testing out the idea of floating dry-cells across an A charger to supply filament current, says:—At first it was found that there was a decided A.C. hum, which became worse as the cells were older. This was corrected by the use of a simple choke, made with 25 feet of wire from the secondary of a Ford coil, wound on an iron core (a common wire nail) and shunted by rheostat. Experiment may be necessary to suit this to a set; beginning with ten feet of wire and gradually increasing the amount. The wire mentioned is 42's.

The Double-Roll Speaker.

A WELLINGTON constructor says this speaker is all that is claimed for it. Good quality wall-paper with a floral pattern was used for the diaphragm.