

Anode Bend Detector Unit

Local Reception with Minimum Distortion

(By "MEGOHM")

LISTENERS who are situated in close proximity to a main broadcast station have a problem forced upon them that is unknown to those who operate at a considerable distance. This problem is the one of avoiding overloading of the broadcast detector valve by the powerful signals from the local station. It is quite possible to detune a multi-valve set so that good local reception is the result, but on the other hand some receivers do not oper-

two or three valves are cut out for local reception. The reduction in valves will almost invariably result in improved reception.

The most usual method of adapting a receiver for the local station is to provide a crystal detector in place of the usual grid-leak detector, the rectified signals being fed to the audio amplifier. This system has met with considerable success, though it is by no means so near perfection as many suppose. Much depends upon the state of the crystal, and it must be remembered that slight distortion of any kind that might pass unnoticed when listening to crystal reception with headphones, would be very evident when amplified.

Anode Bend for Clarity.

WITH a view to obtaining, if possible, better reception than is obtained under certain conditions with a crystal, or too many valves, in cases where heavy volume is required from the local station—and there are few valve-set owners who do not want it—the writer has experimented with anode bend detection, and now presents a detector unit that can be absolutely relied upon to give flawless reception of the local station, and which may also be used in conjunction with a gramophone pick-up to give high amplification and quality music. It is, of course, understood that the amplifier to follow the detector is capable of

giving the required volume without distortion.

The present space will not permit the theory of the anode bend detector being dealt with, but it suffices to say

register, an aerial of not less than 30 feet is recommended. This will bring in more volume than is required, but is reduced by means of the variable resistance across aerial and earth, the value to be not less than 10,000 ohms. A good value is 200,000.

The number of turns in the primary coil is not critical in any way, and may be regulated according to the constructor's judgment. Six turns near to the station with a long aerial, and perhaps eight or nine with short aerial. Up to twelve turns or more, as distance from the station is increased, say over ten miles. It is not possible just now to give the range of this unit, but probably up to 20 miles heavy volume will be obtainable with a good aerial and two good stages of audio amplification.

Construction.

AS there is no necessity for making the unit selective, any variable condenser that will tune the coil may be used, and the shape of the plates is immaterial. Constructors will have many of the parts on hand, the total list comprising variable condenser, tuning coil, rheostat, potentiometer, resistance, half-microfarad condenser, valve holder, terminals, and connecting wire. A vernier dial is not required.

The minimum size to accommodate the components comfortably will be 8½ by 5½ in. for the panel and 7 by 5½ in. for the baseboard.

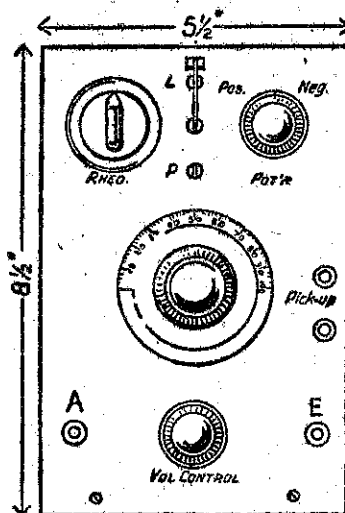
The small primary or aerial coil of six or more turns, should be of a slightly less diameter than the secondary or main tuning coil, so that it will slip inside the top end. This coil may be of 18's or 20's d.c.c., and may be wound upon a 1-inch collar of celluloid or cardboard, and secured to it with celluloid cement. It is convenient to cut the ends close to the coil and solder to each one, a length of flexible connecting wire to run to the aerial and earth terminals respectively. It should be noted that this is the only part of the circuit directly earthed. The secondary coil is only earthed by its connection to the A battery.

The condenser and 3in. coil to work together are as follows:—.0005 condenser and 56 turns, .00035 and 67 turns, .00025 and 78 turns. The coil should not be space wound. The above turns are for 20's wire, but thinner wire will require fewer turns, particulars of such being obtainable on page 136 of the "Listeners' Guide." Fewer turns will bring in 1YA and 2YA.

Wiring is clearly shown in the diagrams, only two filament leads being placed under the base. Outside leads are shown as continuous wires, which may be cabled together, or provided with terminals at suitable positions.

The potentiometer actually used was a 2000-ohm variable resistance, altered to provide a connection at each end of the resistance strip, but a lower value could be used. The valve-socket must be the usual side-grip pattern, and on no account the old American flat-spring type. The rheostat is to suit the valve and battery voltage—a 30-ohm is a good all-round value.

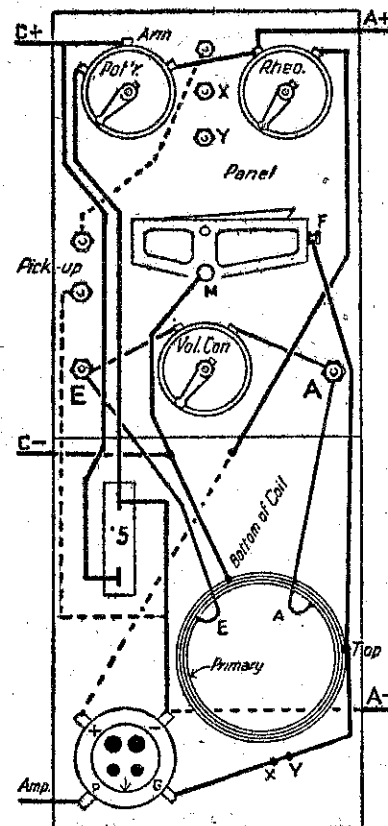
In use, note which side of the potentiometer (the right in diagram) is connected to A negative. The correct position for grid bias must be found upon



Front Panel

ate satisfactorily under such conditions.

Moreover, the local station being the one upon which the average receiver operates for a much longer period than any other, there is considerable economy with battery-operated sets when



Baseboard and Back of Panel

that this system of detection dispenses with the usual grid leak and condenser, and in their stead a negative bias is imparted to the grid of the valve. Such a detector is less sensitive than the leaky-grid type, and therefore requires stronger signals, but there is no lack of these near the transmitter. On the other hand, this detector has the desirable property of being able to handle greater volume without distortion than can the leaky variety. Reaction is not required for local reception.

The detector is presented in unit form for convenience of description, but may easily be adapted for incorporation in any receiver if necessary. Bias is applied to the grid of the valve by a 4½-volt dry C battery, the bias being regulated to a nicety by a potentiometer connected across the filament battery, the arm connecting to the positive pole of the C battery.

Aerial and Volume Control.

A SHORT aerial of only two or three feet of wire may be used, but to get full effect of the lower musical

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