ABOUT VARIABLE CONDENSERS

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Some Valuable Information Concerning a Component which is Often Taken for Granted.

I t is really surprising how a chance remark or action will open up a train of thought the germ of which was quite outside the realm of the original subject. This was exemplified when I was talking over with two or three radio men the question of laying out wireless receiving sets for the commercial broadcasting stations. It seemed to me a foolish and unnecessary futility to have to change the condenser settings. The range of wavelengths covered by the limited panel space available was not sufficient to make this a serious matter. One company then passed before my notice. It was the first implementation of a wireless receiving set which, on the whole, seemed to have been a failure, as far as the ordinary listener was concerned. However, the engineer in charge of the wireless sets was quite unaware of the phases of development and was working rather with the idea that a larger wavelength than that of the broadcast station would be obtained. This type of condenser was, therefore, a square-law condenser. The plates were not semi-circular but shaped more like a heart cut in two so that the condenser capacity increased more rapidly towards the end of the wavelength than it did at the beginning. The graphical relation between capacity and wavelength then became approximately a straight line, and everyone was happy for a time. I say approximately because of the allowance that still had to be made for stray external capacities introduced by the wiring and components. With wireless increasing in popularity, however, and more and more transmitting stations of high power being erected, the heads of the various national broadcasting concerns found it necessary to get together and suggest a solution to avoid chaos as a result of stations overlapping one another.

Square-law Condensers
This type of condenser was, therefore, superseded by the straight-line wavelength condenser, or as it was more popularly termed, the square-law condenser. The plates were not semi-circular but shaped more like a heart cut in two so that the straight line, and everyone was happy for a time. I say approximately because of the allowance that still had to be made for stray external capacities introduced by the wiring and components. With wireless increasing in popularity, however, and more and more transmitting stations of high power being erected, the heads of the various national broadcasting concerns found it necessary to get together and suggest a solution to avoid chaos as a result of stations overlapping one another.

Finally a definite frequency separation was decided upon between the various stations at home and abroad. When this scheme was put into operation it was noticed by listeners that there was a certain crowding of the stations logged at the bottom end of the condenser tuning dial. The explanation was simple, for with a given frequency difference the wavelength difference is less on the shorter wavelengths than it is on the longer wavelengths, hence crowding.

Straight-line Frequency Condensers
Condenser manufacturers bowed to popular demand for a cure of this new trouble by introducing the straight-line frequency condenser with long narrow plates somewhat like an elongated heart cut in halves. There was only a very small capacity increase per degree reading at the lower end of the scale, and in consequence calibrations were frequently upset by the increased relative importance of the stray capacities to which we have alluded previously. Furthermore, when unmeshed, the distance between the ends of the fixed and moving plates was large compared to the other types and in consequence necessitated greater panel space when working, while to crown the woes of the manufacturer:

DO YOU KNOW?

- That a larger value of grid leak than usual is often found advantageous on the short waves. Values as high as 5 megohms may be used.
- That the valves should be shielded from the sound waves from the speaker if very loud signals are obtained, in order to avoid micro-phonic troubles.
- That all leads carrying H.F. currents should be kept as short as possible.
- That all metal miniatures screening should be "earthed" if it is to act as a screen.
- That reaction control is smoother if a small condenser is connected between the anode of the detector, and the earth.
- That all by-pass condensers in a screen grid range should be of the non-inductive type to ensure stability and safety in greater stage gain.
- That in mains-operated sets all leads carrying alternating current should consist of twisted wire (ordinary electric lighting wire variety) to reduce the risk of induced hum.

Wiring Chokes
These are sometimes used to suppress hum in the output leads of a receiver working on a.c. mains, and are often used as a means of securing a certain amount of screening of the output stages of the receiver.