Measurement Is Changing from

to "Frequencies"

commonly used terms are calculated and the exists between them? questions—and the chart you to determine imme- length corresponds to a frequency.

505 kilocycles (500+ 5), known as the upper side band.

In terms of wavelength, this means that instead of the station radiating a 600 meter wave, it would radiate wavelengths ranging from 606 to 594.

For all broadcasting, therefore, we need a range of frequencies rather than a single frequency and for "high quality" broadcasting this range of frequencies should be at least 10 kilocycles. In any particular locality each broadcasting station must have an ether channel of at least 10 kilocycles for its exclusive use.

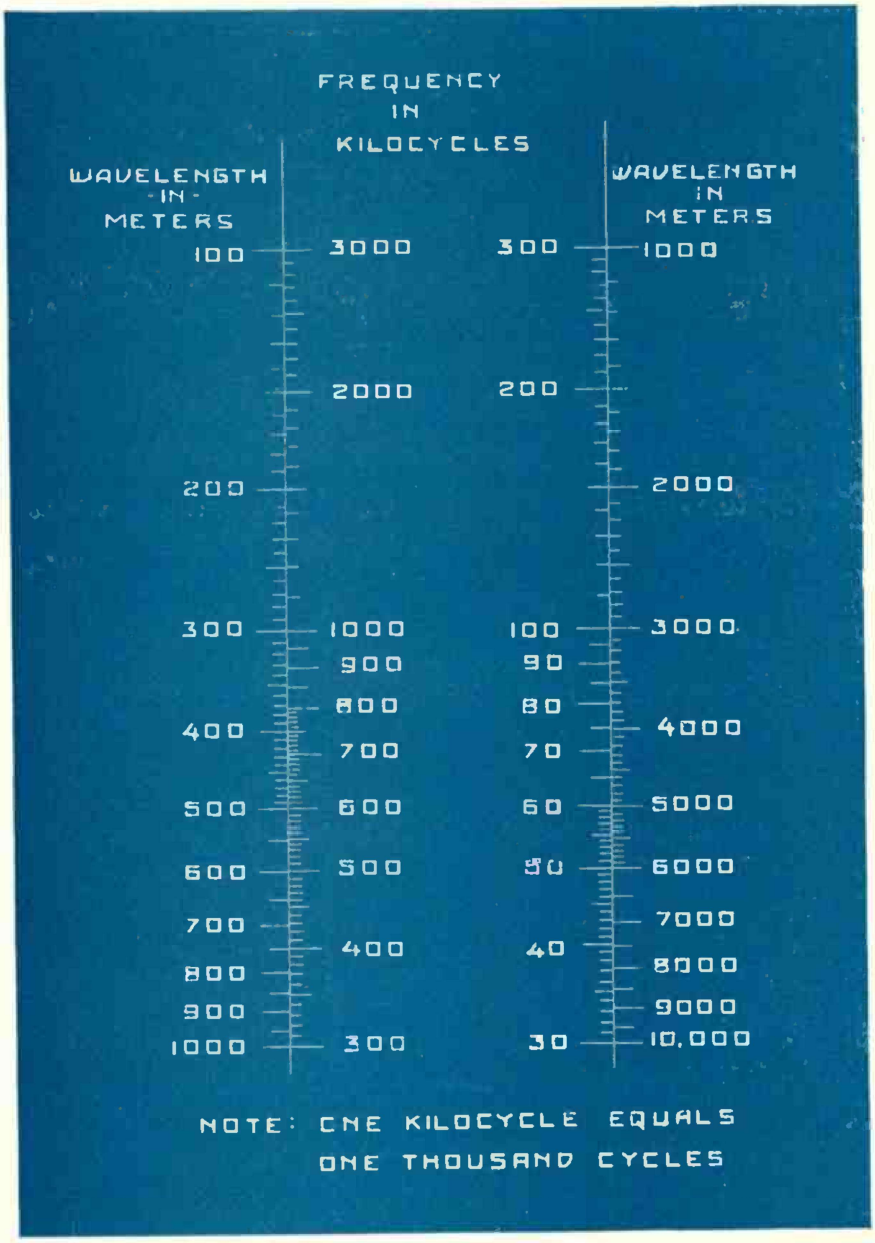
It does not follow that the wavelength requirements of a broadcasting station can be so simply stated because wavelength and frequency are related in a reciprocal manner. A simple equation applicable to all wave phenomena states that the velocity of propagation equals the product of wavelength and frequency.

Putting it a different way, frequency equals the velocity divided by wavelength. This statement connotes the reciprocal relation.

In the accompanying chart (Figure 1), the radio frequencies have been plotted on the vertical axis and wavelengths on the horizontal axis. Curiously enough, instead of the resulting line being a straight line it is a curved line; in fact, using the language of the geometrician, it is a hyperbola. It is in this curved line that we will find the answer to the problem before us.

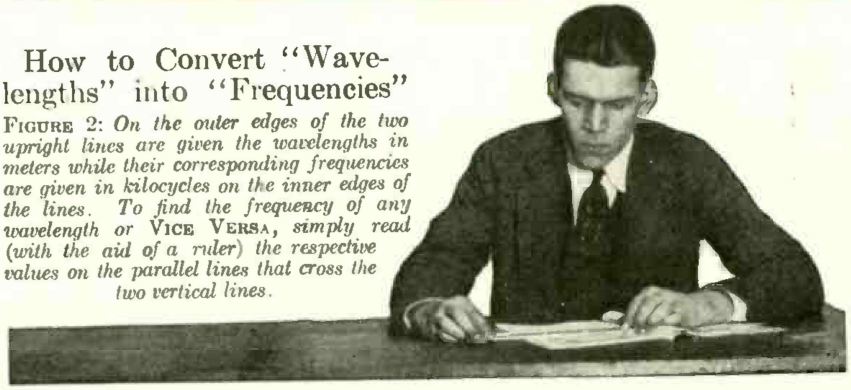
The reciprocal relation means in the first place that high frequencies correspond to short wavelengths and low frequencies to long wavelengths, and in the second place, that if the frequencies are changed by a fixed amount, the wavelength changes resulting are not equal.

This point is well illustrated in the accompanying chart which shows that a range of 25 kilocycles from 1,200 to 1,225 (see A) corresponds to a range of wavelengths from 250 meters to 243 meters, only 7 meters different. At 400 kilocycles (see B) a range of 25



How to Convert "Wavelengths" into "Frequencies"

FIGURE 2: *On the outer edges of the two upright lines are given the wavelengths in meters while their corresponding frequencies are given in kilocycles on the inner edges of the lines. To find the frequency of any wavelength or* VICE VERSA, *simply read (with the aid of a ruler) the respective values on the parallel lines that cross the two vertical lines.*



kilocycles means a range from 750 meters to 705, a difference of 45 meters. A 25 kilocycle range at a particular carrier frequency corresponds to an entirely different range of wavelengths than at some other carrier frequency.

Contrary to popular impression, there are actually fewer radio broadcasting channels at long wavelengths than at short wavelengths. There is a greater range of wavelengths, to be sure, but wave range is not the real criterion; frequency range is the real criterion.

In other words, the ether channel requirements of all broadcasting stations

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