RMS

Q. What is RMS? Name withheld.

A. Measurements on the a.c. supply voltage used for home illumination shows it to be 115 volts, approximately. But this voltage is constantly varying from zero to a maximum value, back to zero, to an equal maximum of opposite sign, then back to zero, to begin the cycle over again. Since the maximum values of a.c. voltage are instantaneous, the *effective* voltage is less than this maximum. While the maximum voltage appearing across your house wiring system may be 150 volts, it is no more effective in doing work than an equivalent d.c. voltage of 115 volts. Most a.c. voltmeters are calibrated to indicate this effective value. It can be shown that this effective value is 0.707 of the maximum value (with a sine wave), while the maximum value is 1.414 times the effective value. This is arrived at in the following manner: As many instantaneous voltages along a cycle as practical are first squared, then added up, divided by the number of points involved, and the square root is extracted. It is from this process that we get the term RMS, *root mean square.* All we are doing is taking an average but, because of the sinusoidal nature of the alternating voltages, we must use squares and square roots as well as the standard means of taking an average.