Capacitance and resistance

Q. Please give me the proper method for calculating the results of (1) wiring two or more resistors in parallel, (2) wiring two or more resistors in series, (3) wiring two or more capacitors in parallel, and (4) wiring two or more capacitors in series. Boyd H. Redner, Battle Creek, Mich.

A. The sum of two resistors wired in parallel can be found by the following formula: Total resistance equals the product of the resistances divided by their sum. This formula applies to capacitors wired in series, also. Example: Two 5-ohm resistors are connected in parallel. What is the resultant resistance? The product of the two resistances is 25 ohms, which must be divided by their sum, 10 ohms. The resistance of this parallel combination is, therefore, 2.5 ohms. This formula does not hold where two or more resistances or capacitors are involved. In such instance, proceed as follows: Invert each of the re-

* *3420 Newkirk Ave., Brooklyn 3, N.Y.*

sistance values, add the resulting fractions, and invert the result. This final inversion will give you the answer. This method may be used for any number of units, including two. Example: Three resistances having values of 3, 4, and 5 ohms are connected in parallel. What is the resistance of the network? Solution: First, invert the fractions, and obtain ⅓, ¼ and ⅕. The least common denominator for these fractions is 60, so we must add 20/60, 15/60, and 12/60. This totals 47/60, which, when inverted, becomes 60/47, which equals approximately 1.27 ohms.

The total resistance of resistors wired in series or the total capacitance of capacitors wired in parallel is equal to the sum of the individual values. Example: Resistances of 5, 10, and 20 ohms are wired in series. What is the resistance of the network? Add 5, 10, and 20, and obtain 35 ohms.

Be sure that all resistances and capacitances are computed in the same values. Do not work with 1000 ohms and 1 megohm without converting both into ohms or into megohms. 1000 ohms equals 0.001 megohm, and 1 megohm equal 1,000,000 ohms. Don't add micromicrofarad with microfarad values. 1 micromicrofardad equals 1/1,000,000 of one microfarad.