A-C
CALCULATION
CHARTS

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by

R. LORENZEN

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INTRODUCTION

The series of charts contained in this book are intended for the purpose of making alternating-current circuit calculations with a greater speed than has hitherto been attainable. The charts and the supplementary scales accompanying them were designed with the object of reducing the time consumed in making electric circuit computations to a minimum.

Although special types of reactance charts and improved scales on slide rules had reduced the laboriousness of a-c computations to some extent, it nevertheless remained true that the former were lacking in precision while the speed of computation of the latter was still unsatisfactory.

Accordingly, it was felt that some combination of the reactance-frequency chart and the slide rule, which retained the advantages of both while eliminating their shortcomings, would provide a useful tool for the engineer in the solution of electrical networks.

Arrangement of Charts

The first two charts are intended to serve as an index and the enormous ranges covered by the charts in this book may be seen by an examination of these index charts. They enable the determination of the Plate which should be used in making a given computation. If any two of the four quantities (frequency, inductance, capacitance, and reactance or susceptance) are known, the point of intersection of the two lines corresponding to these two known quantities will lie in the numbered square which is to be utilized in making the computation. However, after becoming more familiar with the charts, this step may frequently be omitted, and the proper Plate may be located by rapidly glancing through them.

Following the two index charts are the impedance and admittance plates. The first 72 plates are used to compute reactance or impedance, while the next 72 plates are employed to calculate susceptance or admittance. These charts are arranged in groups of nine, each group having the same frequency range but with ascending values of reactance or susceptance. Because of this arrangement it is usually unnecessary to consult the index charts in order to determine which numbered plate should be used, for a glance at the edges of the charts gives this information. Since the reactance or susceptance charts alone would not enable the determination of impedances or admittances, supplementary scales are printed on each page to permit such computations to be made.

In order to facilitate the location of points on the charts, they have been printed in two colors, the frequency-resistance logarithmic co-ordinate system is printed in green, while the inductance-capacitance logarithmic co-ordinate system is printed in red. The inductance values appear on the right and left, and the capacitance values appear on the top and bottom. It will be noted that the inductance and capacitance lines are interchanged on the susceptance charts.

The A, D, C, and CI scales, which are found below the charts are similar to those found on a slide rule and serve the same purpose, namely, to evaluate squares, square roots, and reciprocals. It will be found, however, that these scales are correlated with the charts which they accompany, so that for a given circuit it is rarely necessary to turn to another plate in order to complete the computation.

Although the Q chart may be employed to perform the operations of multiplication or division, its main purpose is to enable the determination of the ratio of the reactance to the resistance or the ratio of the susceptance to the conductance. This is the only chart in the book which is not direct reading, but this is of no great importance since the range of the X/R or B/G ratio is so limited that the location of the decimal point is easily determined by inspection.

The phase angle chart is useful when it is necessary to know the phase angle in addition to the absolute value of the impedance or admittance of the circuit.

History of the Charts

The reactance-frequency chart was originally designed by T. Slonczewski in about 1928 and described by him in the *Bell Laboratories Record* of November 1931. This chart covered a wide range of frequency and reactance, but was accurate to only one significant figure. Despite the limited precision, the chart was of great value in rapidly determining the reactance of an inductance or capacitance, or the resonant frequency of a combination of inductance and capacitance. This chart was not, however, suitable for the determination of impedance except when the circuital resistance could be neglected.

Although the applicability of this chart for finding susceptance was mentioned in passing by Slonczewski, its practical determination was first described by J. R. Tolmie in the September 1933 issue of the *Proceedings of the Institute of Radio Engineers.* Tolmie suggested the juxtaposition of an inverted ordinate scale adjacent to the present ordinate scale. Susceptances could then be read on this inverted scale. This modified chart was not suitable for the determination of admittance, except for the case when the conductance was negligible in comparison to the susceptance. In addition, the close proximity of the logarithmic and inverse logarithmic scale at the left margin made for some difficulty in obtaining a reading.

The major disadvantage of the two preceding charts was their lack of precision, so that, in general, a slide rule computation was frequently found to be necessary. In addition, these charts did not permit the computation of impedance and admittance. For this, it was necessary to resort to the slide rule, and although modern slide rules of the log log vector type enabled a-c circuit problems to be more rapidly computed than had been the case in the past, it was felt that this increase in speed was still inadequate. Furthermore, the fact that a slide rule is not direct reading introduces a possible source of error due to the incorrect location of the decimal point.

The present series of charts are an attempt to incorporate the advantages of the original frequency-reactance chart and those of the slide rule, while at the same time eliminating their disadvantages.

Theory Underlying the Charts

Since it was desired to have the reactance as the ordinate and the frequency as abscissa, the equation for inductive reactance was written as

$$X_L = (2\pi L)\ f$$

Taking the logarithm

$$\log X_L = 1 \log f + \log 2\pi L$$

Since this is of the form $y = mx + b$, the equation represents a family of lines having a slope of 1, namely, the lines slope upward to the right making an angle of 45° with the horizontal axis. The intercept on the left axis is given by $\log 2\pi L$, with reference to an origin of 1 cycle and 1 ohm.

Similarly, the equation for the capacitive reactance may be written

$$X_C = \left(\frac{1}{2\pi C}\right) \cdot \frac{1}{f}$$

Then

$$\log X_C = -1 \log f - \log 2\pi C$$

The slope is -1, so that the capacitance lines are at right angles to the inductance lines, and slope upwards to the left making an angle of 45° with the horizontal axis. The intercept on the left axis is given by $-\log 2\pi C$, with reference to an origin of 1 cycle and 1 ohm.

Since the inductive susceptance is given by

$$B_L = -\left(\frac{1}{2\pi L}\right) \cdot \frac{1}{f}$$

and the capacitive susceptance is given by

$$B_C = (2\pi C)\ f$$

it will be seen that on the susceptance charts the inductance and capacitance lines are interchanged with respect to their position on the reactance charts.

The supplementary scales giving squares or square root are similar to the D and A scales on a slide rule and, similarly, the supplementary scales giving reciprocals are also similar to the C and CI scales of a slide rule.

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A-C CALCULATION CHARTS

INDUCTIVE REACTANCE

The inductive reactance of a coil is given by the expression

$$X_L = 2\pi fL$$

where X_L is the inductive reactance in ohms, f is the frequency in cycles per second, and L is the inductance in henrys.

The determination of the inductive reactance of a given inductance is rapidly obtained for any frequency by means of the charts. Given frequency and inductance, to find the inductive reactance: Start from the inductance scales at the right or left margin, and follow the red slanting inductance line and also follow the green vertical frequency line upwards. From the point of intersection of these two lines move leftwards horizontally to the left margin, and read the inductive reactance in ohms. Thus, from Plate 14, it is seen that 0.2 henry at 300 cycles has an inductive reactance of 377 ohms. Similarly, from Plate 50, an inductance of 25 μH at 3.5 megacycles is seen to have an inductive reactance of 550 ohms.

Given frequency and reactance, to find the inductance: Follow the green frequency line upwards. From the given reactance value in the left margin, move horizontally to the right. The intersection of these two lines will lie on the slanting red line which gives the inductance that has the desired reactance at the specified frequency.

Given inductance and reactance to determine the frequency: Follow the slanting red inductance line until it intersects the horizontal green reactance line. From this point drop down to the bottom margin and read the frequency at which the given inductance possesses the specified reactance.

INDUCTIVE SUSCEPTANCE

For a *pure* inductance the inductive susceptance B_L of a coil is the negative reciprocal of the inductive reactance X_L, namely,

$$B_L = -\frac{1}{X_L} = -\frac{1}{2\pi fL}$$

For an inductance the inductive susceptance is negative, and is usually expressed in mhos, or micromhos (1 mho = 10^6 micromhos). There are two methods of finding inductive susceptance by means of the charts, one requiring a single step, the other necessitating two operations.

In the single-step method, the admittance-susceptance charts are employed. The red slanting inductance line intersects with the green vertical frequency line, and the susceptance is read directly at the left margin. Thus, from Plate 85, an inductance of 0.32 henry at 740 cycles will have an inductive susceptance of $-670\ \mu$ mhos.

The two-step method utilizes the impedance-reactance charts. The reactance is first determined in the usual manner from the chart. The red logarithmic scales at the lower part of the page is then used, and opposite the reactance on the C-scale will be found the susceptance on the CI scale. In the case of the example just given, from Plate 15 the inductance of 0.32 henrys at 740 cycles has a reactance of 1490 ohms. Opposite 1490 ohms on the C-scale will be seen $-670\ \mu$ mhos on the CI-scale.

CAPACITIVE REACTANCE

The capacitive reactance X_C (in ohms) of a condenser is given by the expression

$$X_C = -\frac{1}{2\pi fC}$$

where f is the frequency in cycles, and C is the capacitance in farads.

The method of obtaining capacitive reactance by means of the impedance-reactance charts is similar to that used in determining inductive reactance. It will be noticed, however, that the capacitance lines slope in a direction which is perpendicular to that of the inductance lines.

Given the capacitance and the frequency to find the capacitive reactance: Follow the red slanting capacitance line until it intersects the green vertical frequency line. Move horizontally to the left margin and read the capacitive reactance. A condenser of 3.8 microfarads capacitance will have a reactance of 168 ohms at 250 cycles, as determined from Plate 14.

In a similar manner, if any two of the three quantities are known, the third may be found.

CAPACITIVE SUSCEPTANCE

For a *pure* capacitance the capacitive susceptance B_C of a condenser is the reciprocal of the capacitive reactance X_C, namely,

$$B_C = \frac{1}{X_C} = 2\pi fC$$

Capacitive susceptance is positive and is usually expressed in mhos or micromhos. There are two methods of determining capacitive susceptance by means of charts, one utilizing the admittance-susceptance charts, the other employing the impedance-reactance charts.

Using the admittance-susceptance charts, the intersection of the red slanting capacitance line with the green vertical frequency line indicates the magnitude of the susceptance, which will be read in the left margin. For example, from Plate 112, a capacitance of 480 $\mu\mu$f at 240 kc will have a susceptance of 723 μ mhos.

This result could also have been found, but more laboriously, if the impedance-reactance charts were employed. First, the reactance of the condenser is determined by the intersection of the red slanting capacitance line with the green vertical frequency line. Then, opposite this reactance on the C-scale the susceptance will be found on the CI-scale. In the case of the above example, from Plate 42 the reactance is found to be 1380 ohms and its reciprocal is then seen to be 723 μ mhos.

SERIES RESONANCE

Series resonance is defined as the condition for which the total reactance of the circuit is zero. For this condition the inductive reactance is equal to the capacitive reactance, and the charts therefore enable the rapid determination of the resonant frequency.

The point of intersection of an inductance line with a capacitance line determine a point for which the inductive reactance is equal to the capacitive reactance. The resonant frequency of the combination may then be read on the bottom margin. Thus, given an inductance of 0.012 henry and a capacitance of 0.054 microfarad, the point of intersection of these two lines determines the resonant frequency as 6250 cycles, as determined from Plate 23.

On the other hand, had there been given the frequency at which a given inductance was to be resonated, the point of intersection of the inductance line and the frequency line would determine the capacitance line which would bring about the required condition of resonance. Suppose, for example, that it was desired to resonate a 30 microhenry coil at 5 megacycles. An examination of Plate 50 indicates that the intersection of the red 30 microhenry inductance line with the green 5 megacycle frequency line determines the red 33.8 micromicrofarad capacitance line.

PARALLEL RESONANCE AND ANTI-RESONANCE

Parallel resonance is defined as the condition for which the total susceptance or reactance of the circuit is equal to zero, namely, the condition of unity power factor. Since for this condition the inductive susceptance is equal to the capacitive susceptance, and also the inductive reactance equals the capacitive reactance, either the susceptance charts or the reactance charts may be employed to determine parallel resonance in exactly the same manner as was done for series resonance.

Since antiresonance, namely the condition which results in the circuit having a maximum impedance or a minimum line current, generally differs only slightly from the condition of parallel resonance, the charts may usually be employed for determining this condition also.

IMPEDANCE OF SERIES CIRCUIT

One of the many important advantages of the charts resides in the fact that the impedance of a series circuit comprised of resistance, inductance, and capacitance, or any combination of them, can be rapidly solved.

Consider the general case in which a resistance, an inductance, and a capacitance are connected in series. The impedance Z for this circuit is given by the expression

$$Z = R + jX = R + j\,(X_L - X_C) = \sqrt{R^2 + \left(\omega L - \frac{1}{\omega C}\right)^2}$$

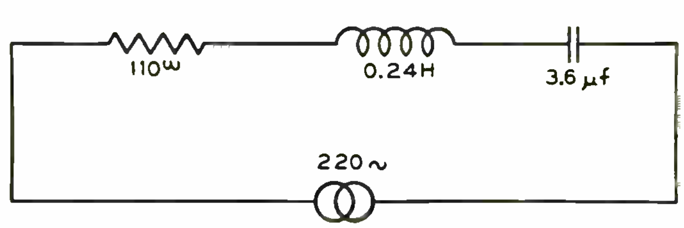
where, Z is the impedance in ohms, R the resistance in ohms, and ω is $2\pi f$, where f is the frequency in cycles, L is the inductance in henrys, and C is the capacitance in farads. The phase angle θ_Z is given by the relation

$$\theta_Z = \text{arc tan}\,\frac{X}{R}$$

In order to show the ease with which the impedance of such a circuit can be computed, an actual example will be taken. Assume the resistance to be 110 ohms, the inductance 0.24 H, the capacitance 3.6 microfarads, and the frequency 220 cycles. The following steps are then performed using Plate 14.

Given

$R = 110$ ohms
$L = 0.24$ henry
$C = 3.6\,\mu f$
$f = 220$ cycles



Find Z

Solution

$R^2 = 12{,}100$	Opposite 110 on the D-scale read 12,100 on the A-scale.
$\omega L = 331$	Read directly from reactance chart.
$\frac{1}{\omega C} = 201$	Read directly from reactance chart.
$\omega L - \frac{1}{\omega C} = 130$	By simple subtraction.

$\left(\omega L - \frac{1}{\omega C}\right)^2 = 16{,}900$ — Opposite 130 on the D-scale read 16,900 on the A-scale.

$R^2 + \left(\omega L - \frac{1}{\omega C}\right)^2 = 29{,}000$ — By simple addition.

$Z = \sqrt{R^2 + \left(\omega L - \frac{1}{\omega C}\right)^2} = 170$ — Opposite 29,000 on the A-scale read 170 on the D-scale.

$\theta_Z = \text{arc tan}\,\frac{130}{110}$ — $\theta_Z = \text{arc tan}\,\frac{X}{R}$

$\theta_Z = \text{arc tan}\,1.18$ — Read from Q chart and locate decimal point.

$\theta_Z = 49.7°$ — Read directly from phase angle chart.

PARALLEL CIRCUITS HAVING PURE ELEMENTS

The general case for a parallel circuit having a single pure parameter in each branch would consist of a resistance, an inductance, and a capacitance in parallel. For this condition

$$Y = G + jB = \sqrt{G^2 + \left(\omega C - \frac{1}{\omega L}\right)^2}$$

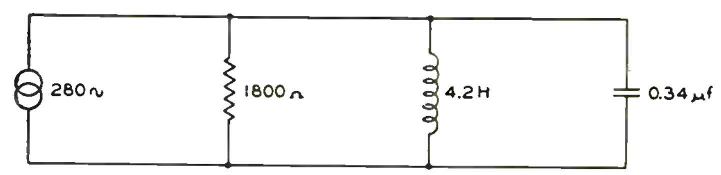
$$\text{where } B = \left(\omega C - \frac{1}{\omega L}\right)$$

Or, more simply,

$$G = \frac{1}{R} \qquad B_C = \omega C \qquad B_L = \frac{-1}{\omega L}$$

The case where one or more of the parallel branches is comprised of two or more of the circuit parameters is more involved and the above relations do not then apply. This more complicated type of circuit is discussed later.

Employment of the charts enable admittance to be rapidly computed. Consider the parallel circuit shown, in which the resistance is 1800 ohms, the inductance is 4.2 henrys, and the capacitance is 0.34 microfarad.



The following steps are then performed with the aid of Plate 85, except where otherwise noted.

Given

$R = 1800$ ohms

$C = 0.34\ \mu f$

$L = 4.2$ H

$f = 280$ cycles

Then

$G = \frac{1}{R} = 556 \times 10^{-6}$ mhos — Opposite 1800 on the C-scale read 556 μ mhos on the CI-scale, namely 556×10^{-6} mhos.

$G^2 = 309000 \times 10^{-12}$ — Opposite 556 on the D-scale read 309000 on the A-scale, and multiply by square of the 10 factor.

$\omega C = 598 \times 10^{-6}$ mhos — Read 598 μ mhos directly from susceptance chart, and convert to mhos.

$\frac{1}{\omega L} = 135 \times 10^{-6}$ mhos — Read 135 μ mhos directly from susceptance chart, and convert to mhos.

$B = \left(\omega C - \frac{1}{\omega L}\right) = 463 \times 10^{-6}$ mhos — By simple subtraction.

$B^2 = 215000 \times 10^{-12}$ — Opposite 463 on the D-scale read 215000 on the A-scale, and multiply by square of the 10 factor.

$G^2 + B^2 = 524000 \times 10^{-12}$ — By simple addition.

$Y = \sqrt{G^2 + B^2} = 724 \times 10^{-6}$ mhos — Opposite 524000 on the A-scale read 724 on the D-scale, and multiply by square root of the 10 factor.

$\frac{B}{G} = 0.832$ — Read significant figures from Q-chart and point off decimal point.

$\theta_Y = \text{arc tan}\,\frac{B}{G} = 39.8°$ — Read directly from phase angle chart.

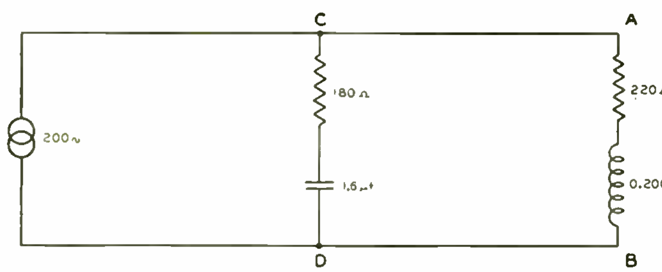
$Z = \frac{1}{724 \times 10^{-6}}$ — Since $Z = \frac{1}{Y}$

$Z = 1380$ ohms — Opposite 724 μ mhos on CI-scale read 1380 on C scale.

$\theta_Z = -39.8°$ — Since $\theta_Z = -\theta_Y$

SERIES-PARALLEL CIRCUITS

When the parallel circuit is comprised of circuits in which the separate parallel branches consist of series connections of the circuit parameters, the computations become somewhat more involved. As an illustrative case the circuit shown will be considered.



Before examining this circuit it will be well to state the various formulas which will be employed in its solution.

The relation $Y = \frac{1}{Z}$ is general in its application, not only for pure parallel circuits, but also for series-parallel circuits.

The various steps in obtaining the solution of a series-parallel circuit are generally made in the following sequence:

(1) The impedance Z of each of the series branches is determined, and the admittance Y of each series branch by the relation $Y = \frac{1}{Z}$.

(2) The real and imaginary components of the admittance function $Y = G + jB$ are found by the relations

$$G = \frac{R}{R^2 + X^2} = \frac{R}{Z^2}$$

$$B = \frac{-X}{R^2 + X^2} = \frac{-X}{Z^2}.$$

It will be observed that these formulas reduce to $G = \frac{1}{R}$ when the reactance of a branch is zero, and to $B = \frac{-1}{X}$ when the resistance of a branch is zero, as would be the case in a pure parallel circuit.

(3) The real components G_1, G_2, G_3, etc. of the admittance functions of the various branches are added algebraicly to obtain the real component of the total admittance function, namely,

$$G = G_1 + G_2 + G_3 + \ldots\ldots$$

Similarly, the imaginary components B_1, B_2, B_3, etc., of the admittance functions of the various branches are added algebraicly to obtain the imaginary component of the total admittance function, namely,

$$B = B_1 + B_2 + B_3 + \ldots\ldots$$

The total admittance function Y is therefore

$$Y = G + jB = (G_1 + G_2 + G_3 + \ldots\ldots) + j\,(B_1 + B_2 + B_3 + \ldots\ldots)$$

(4) The total impedance Z of the circuit is then obtained by the relation $Z = \frac{1}{Y}$.

(5) The phase angle θ_Z of each of the various branches may be obtained either from the relation $\theta_Z = \text{arc tan}\,\frac{X}{R}$ or from the relation $\theta_Y = \text{arc tan}\,\frac{B}{G}$. It will be observed that $\theta_Z = -\theta_Y$. The phase angle of the total circuit is found in a similar manner.

A-B circuit (Plate 14)

$R = 220$ ohms	Given.
$X_L = 251$ ohms	Read directly from chart.
$R^2 = 48400$	Opposite 220 on D-scale read 48400 on A-scale.
$X_L^2 = 63100$	Opposite 251 on D-scale read 63100 on A-scale.
$Z^2 = R^2 + X_L^2 = 112{,}000$	By addition.
$G_{AB} = \frac{R}{Z^2} = 1960\ \mu$ mhos	By division.
$B_{AB} = \frac{-X_L}{Z^2} = -2240\ \mu$ mhos	By division.

C-D circuit (Plate 14)

$R = 180$	Given.
$X_C = -498$	Read directly from chart.
$R^2 = 32400$	Opposite 180 on D-scale read 32400 on A-scale.
$X_C^2 = 248000$	Opposite 498 on D-scale, read 248000 in A-scale.
$Z^2 = R^2 + X_C^2 = 280000$	By addition.
$G_{CD} = \frac{R}{Z^2} = 643\ \mu$ mhos	By division.
$B_{CD} = \frac{-X_C}{Z^2} = 1780\ \mu$ mhos	By division.

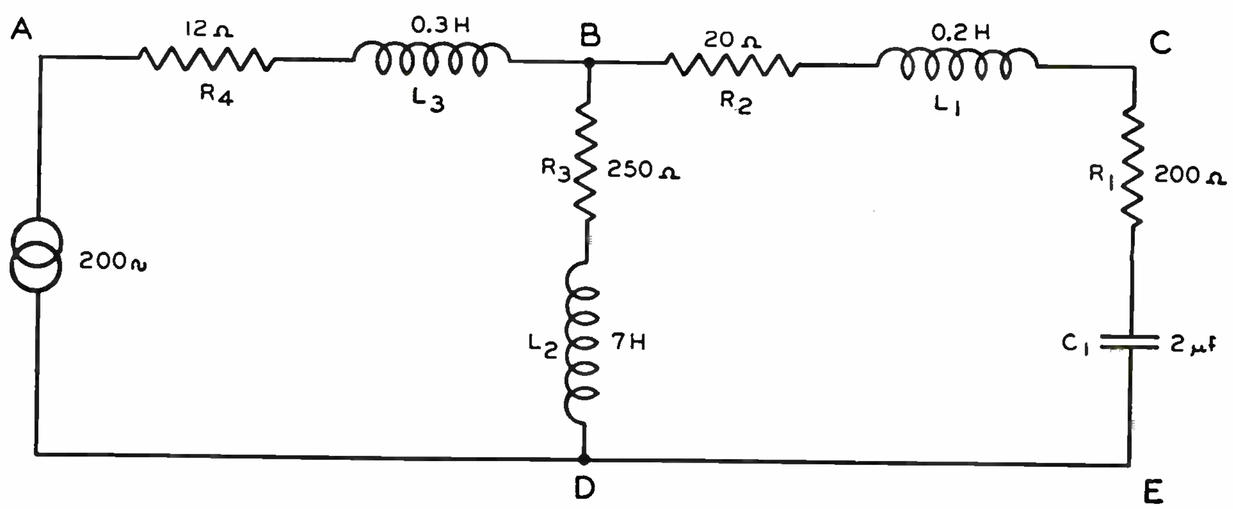
A-B and C-D circuit in parallel

$G = 1960 + 643 = 2600\ \mu$ mhos $= 2600 \times 10^{-6}$ mhos	$G = G_{AB} + G_{CD}$.
$B = -2240 + 1780 = -460\ \mu$ mhos $= -460 \times 10^{-6}$ mhos	$B = B_{AB} + B_{CD}$.
$G^2 = 6.76 \times 10^{-6}$	Opposite 2600 on D-scale, read 6.76×10^6 on A-scale of Plate 6, and multiply by 10^{-12}.
$B^2 = 212000 = 0.212 \times 10^{-6}$	Opposite 460 on D-scale, read 212000 on A-scale of Plate 5, and multiply by 10^{-12}.
$G^2 + B^2 = 6.97 \times 10^{-6}$	By addition.
$Y = \sqrt{G^2 + B^2} = 2640\ \mu$ mhos	Opposite 6.97 on A-scale, read 2.65 on D-scale of Plate 3, and convert to micromhos.
$Z = \frac{1}{Y} = \frac{1}{2650 \times 10^{-6}} = 377$ ohms	By division.
$\theta_Y = \text{arc tan} \frac{-460}{2600}$	$\theta_Y = \text{arc tan} \frac{B}{G}$
$\theta_Y = -\text{arc tan} \frac{460}{2600}$	$\text{arc tan}(-X) = -\text{arc tan}\ X$.
$\theta_Y = -\text{arc tan}\ 0.180$	Read from Q chart, and locate decimal point.
$\theta_Y = -10.2°$	Read directly from phase angle chart.
$\theta_Z = 10.2°$	$\theta_Z = -\theta_Y$.

MESH CIRCUITS

More complicated circuits than the foregoing series-parallel type are frequently encountered, so that it will be well to show the application of the charts to such mesh circuits.

In the two-mesh circuit shown below it is desired that the circuital impedance as viewed from the source be known.



BCE is a series circuit in parallel with circuit BD, so we shall find the BE admittance.

BE circuit (Plate 14)

$R_{BE} = 200 + 20 = 220$ ohms	$R_{BE} = R_1 + R_2$.
$X_{L1} = 251$ ohms	Read directly from Plate 14.
$X_{C1} = -398$ ohms	Read directly from Plate 14.
$X_{BE} = X_{L1} - X_{C1} = -147$ ohms	By subtraction.
$R^2_{BE} = 48400$	Opposite 220 on D-scale, read 48400 on A-scale.
$X^2_{BE} = 21600$	Opposite 147 on D-scale, read 21600 on A-scale.
$Z^2_{BE} = R^2_{BE} + X^2_{BE} = 70000$	By addition.
$G_{BE} = \frac{220}{70000} = 3140\ \mu$ mhos	$G_{BE} = \frac{R_{BE}}{Z^2_{BE}}$

$B_{BE} = \frac{147}{70000} = 2100\ \mu$ mhos — $B_{BE} = \frac{-X}{Z^2}$

$Y_{BE} = 3140 + j\,2100\ \mu$ mhos — $Y = G + jB.$

BD circuit (Plates 14, 15)

$R_{BD} = 250$ ohms — Given.

$X_{L2} = 8820$ ohms — Read directly from Plate 15.

$R^2_{BD} = 62500$ — Opposite 250 on D-scale of Plate 14, read 62500 on A-scale.

$X^2_{L2} = 7.78 \times 10^7$ — Opposite 8820 on D-scale, read 7.78×10^7 on A-scale.

$Z^2_{BD} = R^2_{BD} + X^2_{L2} = 7790 \times 10^4$ — By addition.

$G_{BD} = \frac{250}{77.9 \times 10^6} = 3.21 \times 10^{-6}$ mhos — $G_{BD} = \frac{R_{BD}}{Z^2_{BD}}$

$B_{BD} = \frac{-8820}{7790 \times 10^4} = -113 \times 10^{-6}$ mhos — $B_{BD} = \frac{-X_{L2}}{Z^2_{BD}}$

$Y_{BD} = 3.21 - j\ 113\ \mu$ mhos — $Y = G + jB.$

BE—BD circuit in parallel

$Y_{BE\text{-}BD} = (3140 + 3.21) + j(2100 - 113)\ \mu$ mhos — $Y_{BE\text{-}BD} = Y_{BE} + Y_{BD}.$

$= 3140 + j\ 1990\ \mu$ mhos

$G = 3140 \times 10^{-6}$ — From equation for Y.

$B = 1990 \times 10^{-6}$ — From equation for Y.

$G^2 = 9.87 \times 10^{-6}$ — Opposite 3140×10^{-6} on D-scale, read 9.87×10^{-6} on A-scale.

$B^2 = 3.98 \times 10^{-6}$ — Opposite 1990×10^{-6} on D-scale, read 3.98×10^{-6} on A-scale.

$Y^2 = G^2 + B^2 = 13.9 \times 10^{-6}$ — By addition.

$R_{BE\text{-}BD} = \frac{3140 \times 10^{-6}}{13.9 \times 10^{-6}} = 226$ ohms — $R = \frac{G}{Y^2}$

$X_{BE\text{-}BD} = \frac{-1990 \times 10^{-6}}{13.9 \times 10^{-6}} = -143$ ohms — $X = \frac{-B}{Y^2}$

$Z_{BE\text{-}BD} = 226 - j\ 143$ ohms

AB circuit (Plate 14)

$R_{AB} = 12$ ohms — Given.

$X_{AB} = 378$ ohms — Read directly from Plate 14.

$Z_{AB} = 12 + j\ 378$ ohms — $Z = R + jX.$

AB and BE—BD circuits in series (Plate 14)

$Z = (12 + 226) + j(378 - 143)$ ohms — $Z = (R_{AB} + R_{BE\text{-}BD}) + j(X_{AB} + X_{BE\text{-}BD})$

$= 238 + j\ 235$ ohms

If absolute value of Z is desired, then

$Z^2 = (238)^2 + (235)^2$ — $Z^2 = R^2 + X^2$

$= 56600 + 55100$ — Opposite 238 on D-scale, read 56600 on A-scale, and opposite 235 on D-scale, read 55100 on A-scale.

$= 112000$ — By addition.

$Z = \sqrt{11.2 \times 10^4} = 335$ ohms — Opposite 112000 on A-scale, read 335 on D-scale.

$\theta_Z = \text{arc tan} \frac{235}{238}$ — $\theta_Z = \text{arc tan} \frac{X}{R}$

$= \text{arc tan } 0.987$ — Read from chart and locate decimal point.

$= 44.6°$ — Read directly from chart.

RESISTANCE-CAPACITANCE TUNED OSCILLATOR

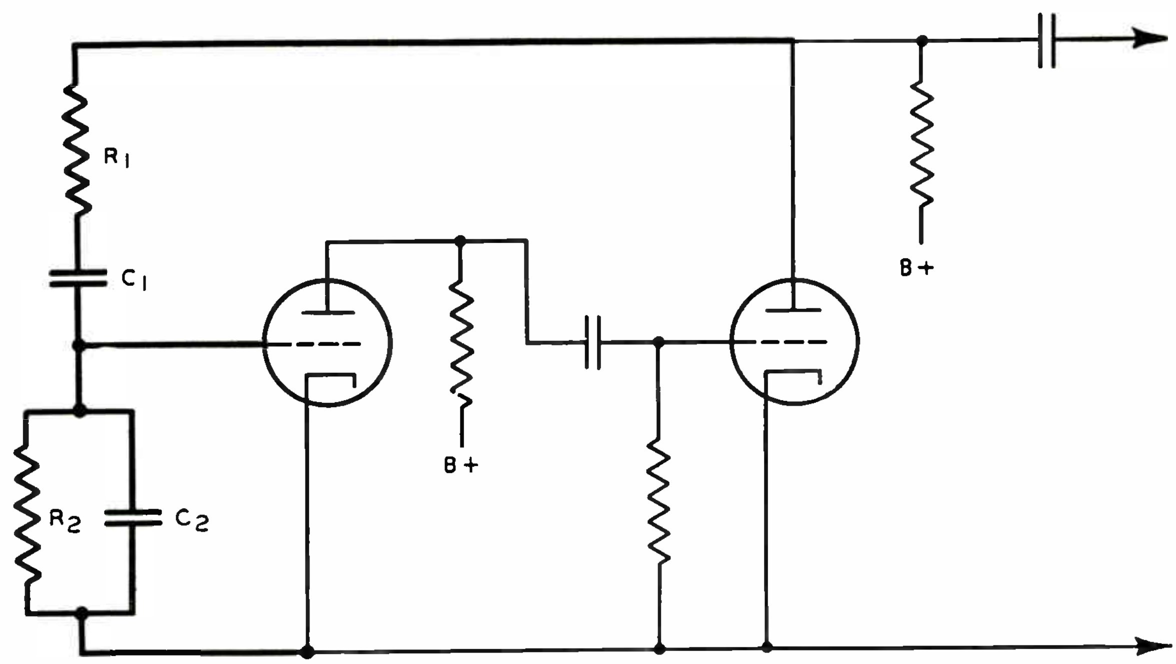
The charts may be used for computing the values of resistance and capacitance in resistance-tuned or capacitance-tuned oscillators. A typical circuit of this type is shown in the figure, where one or more of the elements R_1, R_2, C_1, C_2 may be varied. The frequency of oscillation, assuming that the amplifier has zero phase shift, is given by

$$f = \frac{1}{2\pi \sqrt{R_1 \; R_2 \; C_1 \; C_2}}$$

When the resistors are equal and the capacitors are equal, that is, when $R = R_1 = R_2$ and $C = C_1 = C_2$, the oscillation frequency is

$$f = \frac{1}{2\pi \; R \; C}$$

For this condition, if any two of the three quantities, frequency, resistance, or capacitance, are known, the other may be found directly from the chart.



Thus, to determine the value of the resistance which should be used in conjunction with an 800 $\mu\mu$f condenser in order to obtain a frequency of 40 cycles, on Plate 9, the green 40-cycle line is followed upward until it strikes the red sloping 800 $\mu\mu$f line. The point of intersection indicates that a resistance of 4.97 megohms be employed.

Similarly, at 15,000 cycles an 800 $\mu\mu$f condenser would require a resistance of 13,300 ohms, as determined from Plate 34.

CONDUCTANCE

The conductance G $\left(\text{where } G = \frac{1}{R}\right)$ of a resistor is measured in mhos, or in some multiple thereof, as micromhos (μ mhos), where 1 mho = 1 000 000 μ mho = 10^6 μ mho.

The conductance of a resistor is obtained by referring to the direct-reading C and CI scales which will be found at the bottom of each page. Opposite the resistance on the C-scale will be found the conductance on the CI-scale. Thus, a resistor having a resistance of 200 ohms (C-scale) has a conductance of 0.005 mho (CI-scale). Similarly, a resistance of 4270 ohms is equivalent to a conductance of 234 μ mhos.

Conversely, if the conductance is known the corresponding resistance may be obtained, since opposite the conductance on the CI-scale will be found the resistance on the C-scale. A conductance of 0.00345 mho (CI-scale) therefore corresponds to a resistance of 290 ohms.

RESISTORS IN PARALLEL

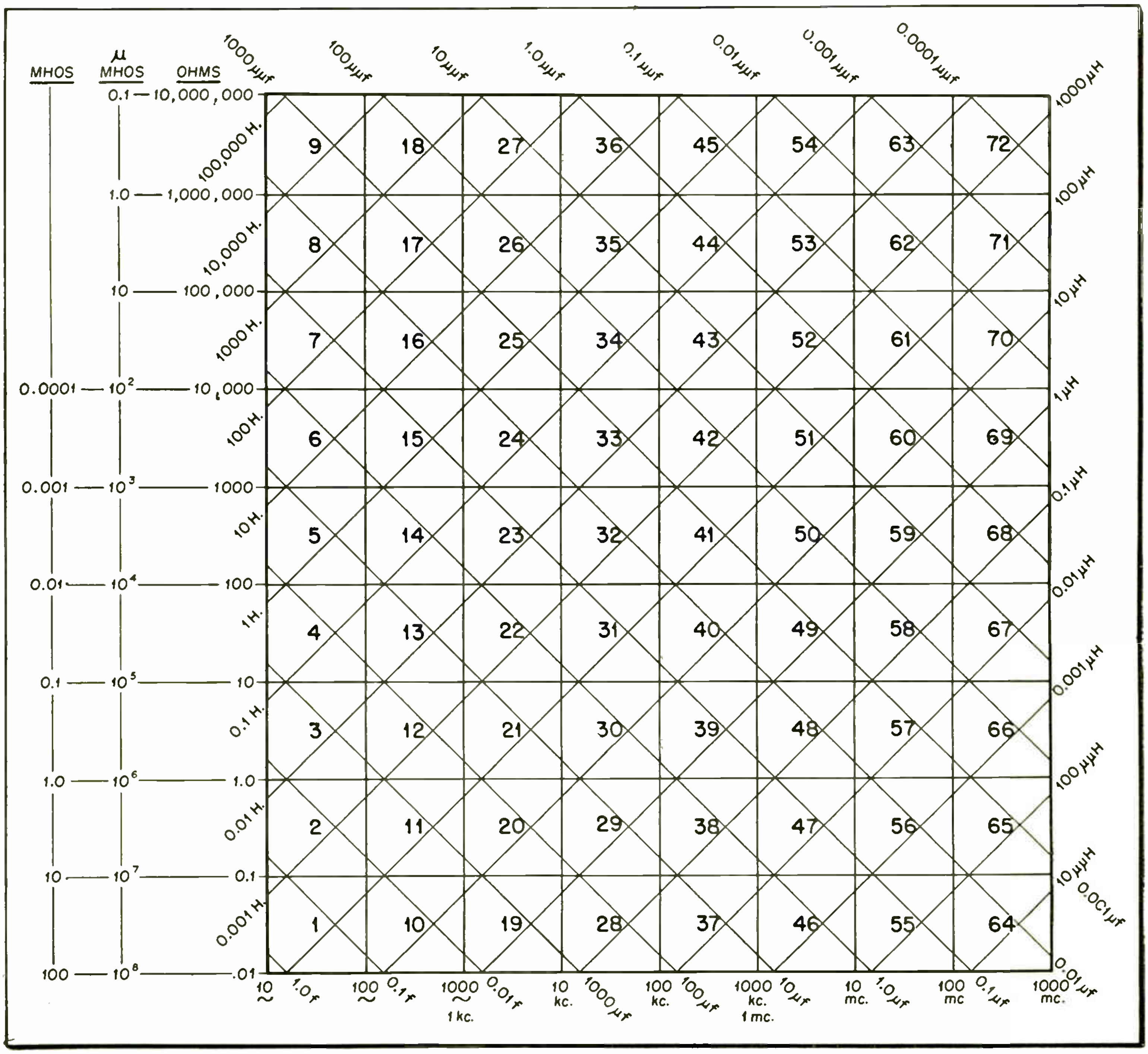
The total conductance G of resistors in parallel is equal to the algebraic sum of the individual conductances, namely, $G = g_1 + g_2 + g_3 + \ldots\ldots$, where g_1, g_2, g_3, etc., are the individual conductances.

The total resistance R of a number of resistors in parallel is equal to the reciprocal of the sum of their separate conductances, namely,

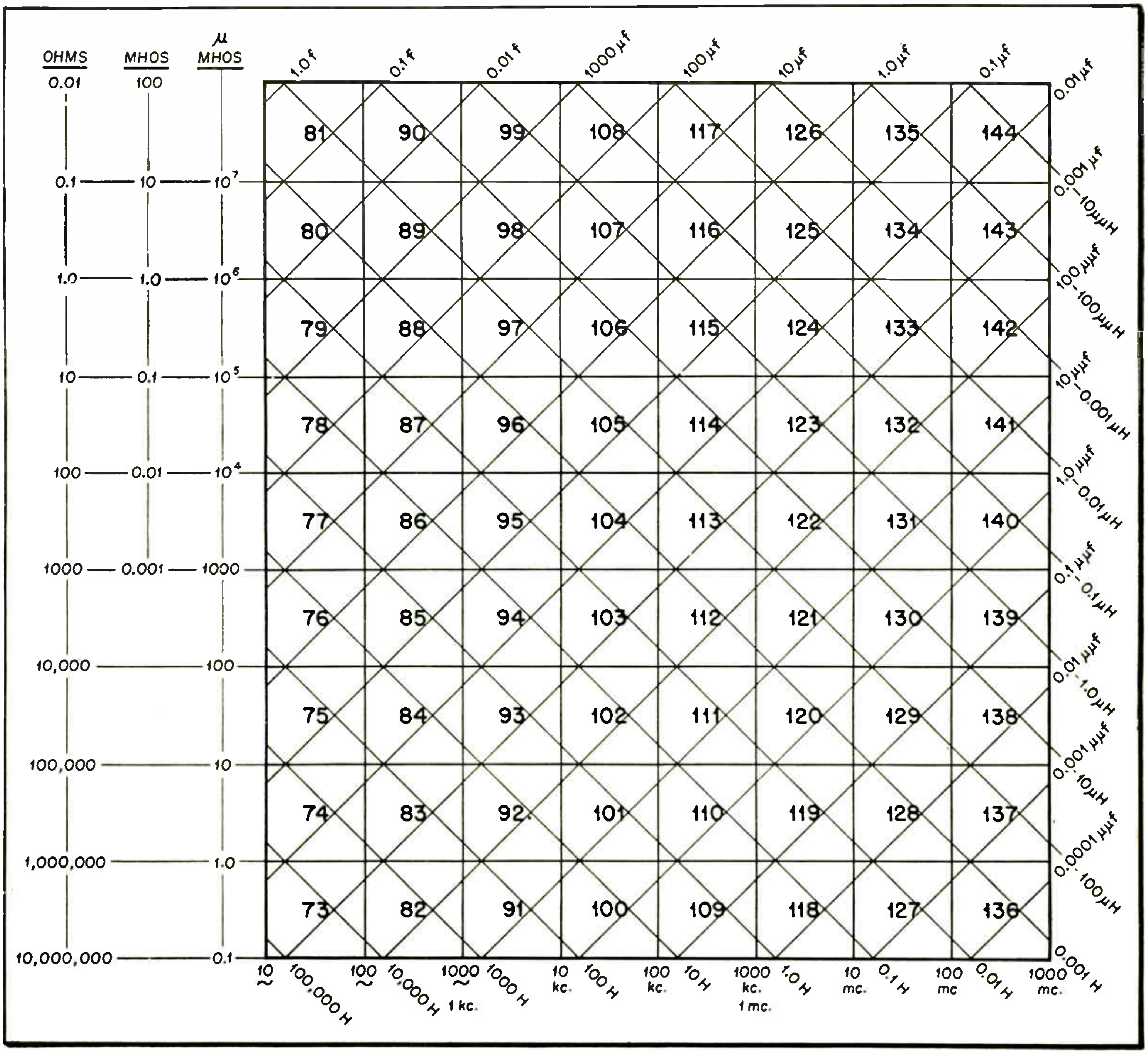
$$R = \frac{1}{g_1 + g_2 + g_3 + \ldots}$$

For example, let us assume that we have three resistors having resistances of 200, 300, and 400 ohms respectively. By the use of the C-scale and CI-scale we obtain conductances of 0.00500, 0.00333, and 0.00250 mhos respectively. The sum of these conductances is 0.0108 mho, and opposite this value on another CI-scale, we obtain the total resistance of 92.6 ohms on the C-scale.

REACTANCE — IMPEDANCE INDEX CHART

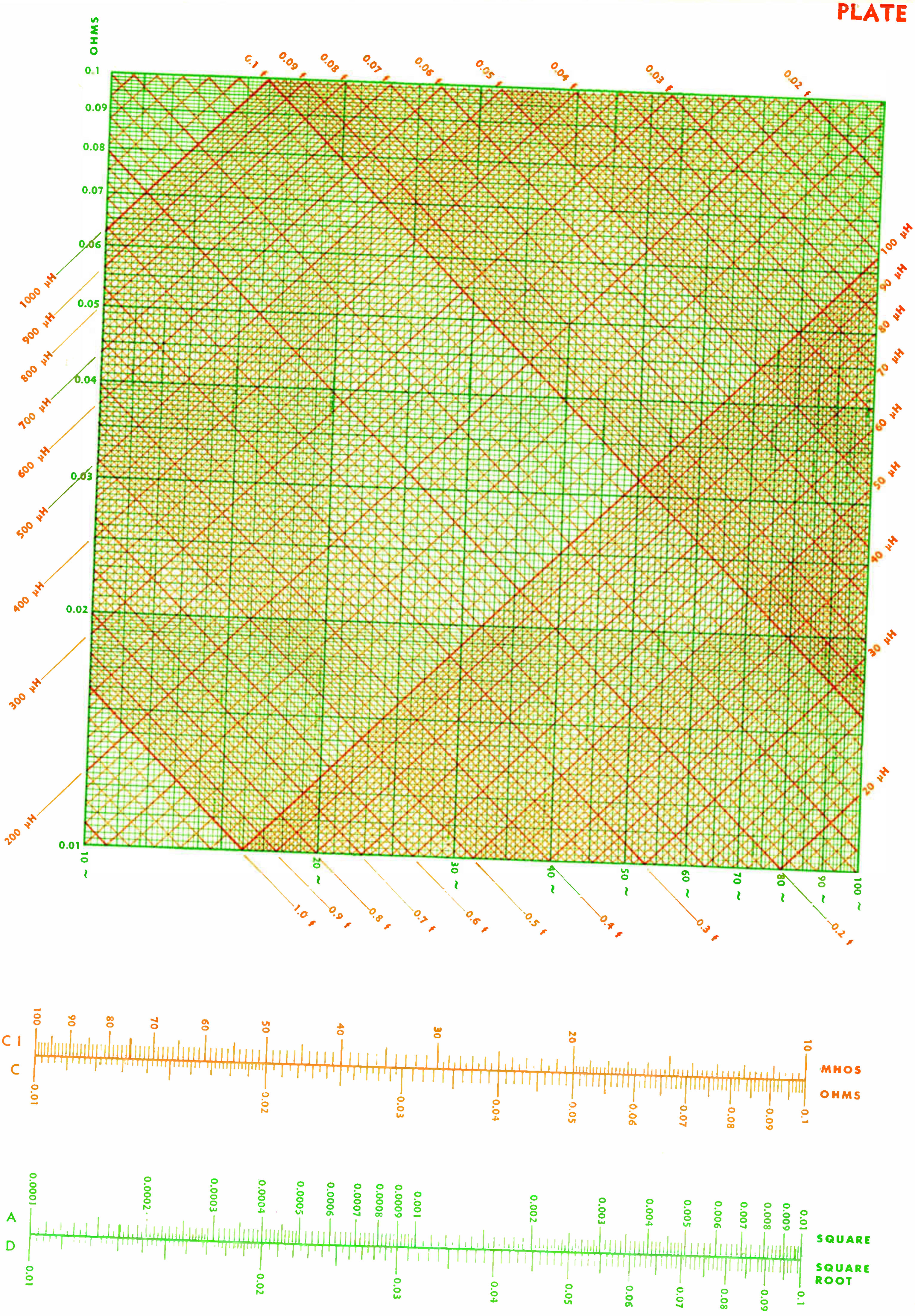


SUSCEPTANCE — ADMITTANCE INDEX CHART



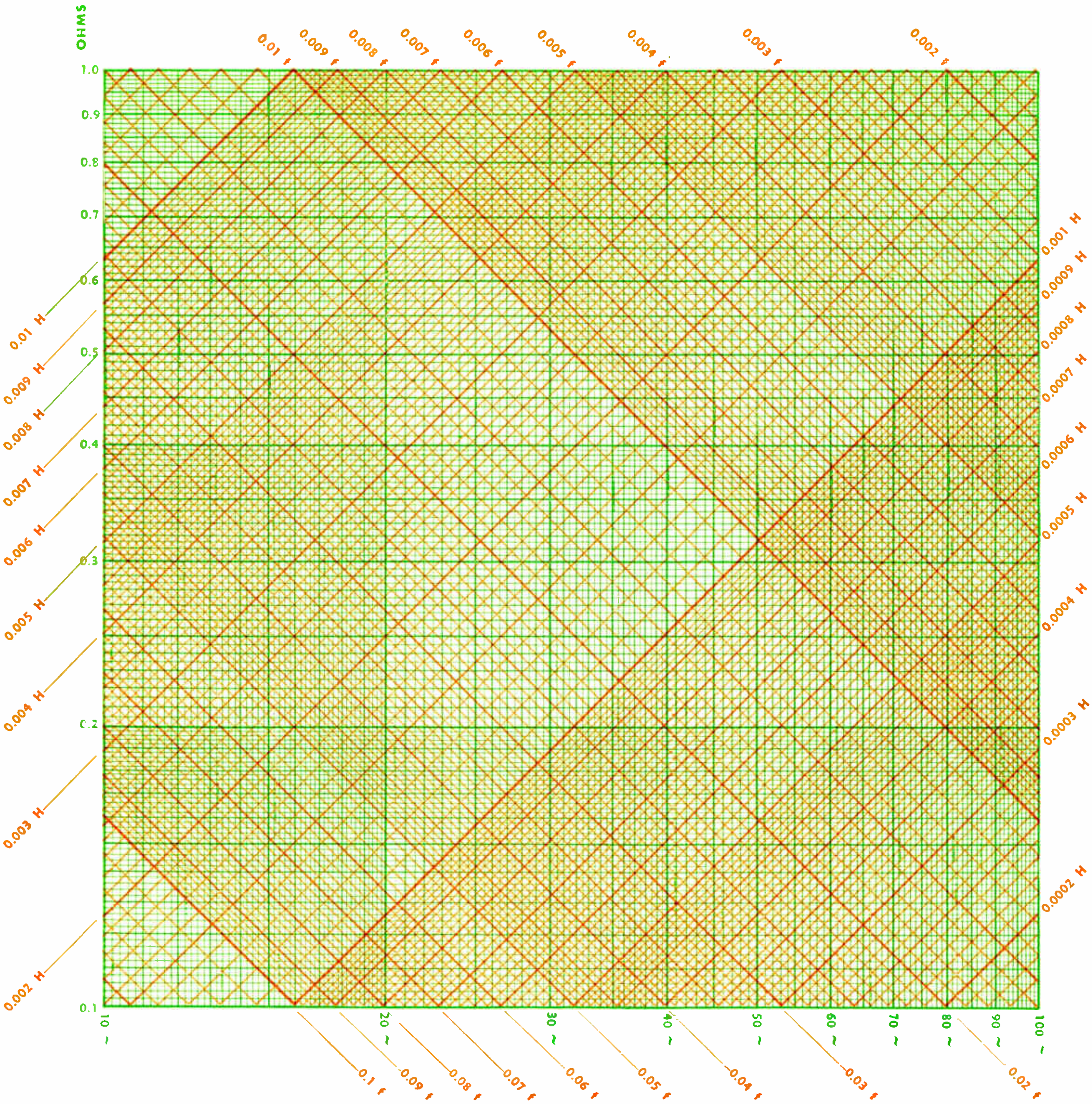
A-C CALCULATION CHARTS

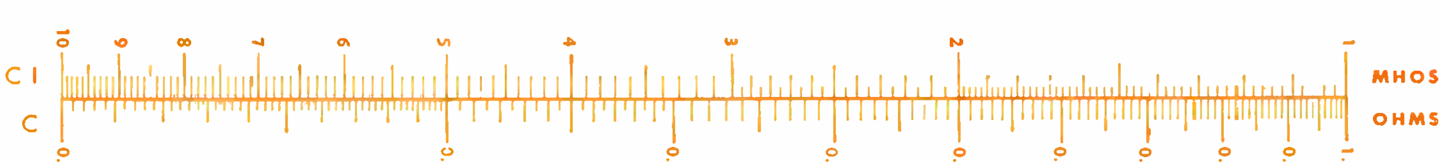
PLATE 1



OHMS
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.1 f
0.09 f
0.08 f
0.07 f
0.06 f
0.05 f
0.04 f
0.03 f
0.02 f
1000 μH
900 μH
800 μH
700 μH
600 μH
500 μH
400 μH
300 μH
200 μH
100 μH
90 μH
80 μH
70 μH
60 μH
50 μH
40 μH
30 μH
20 μH
10 ~
20 ~
30 ~
40 ~
50 ~
60 ~
70 ~
80 ~
90 ~
100 ~
1.0 f
0.9 f
0.8 f
0.7 f
0.6 f
0.5 f
0.4 f
0.3 f
0.2 f
CI
C
MHOS
OHMS
A
D
SQUARE
SQUARE ROOT

PLATE 2


OHMS
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.01 f
0.009 f
0.008 f
0.007 f
0.006 f
0.005 f
0.004 f
0.003 f
0.002 f
0.01 H
0.009 H
0.008 H
0.007 H
0.006 H
0.005 H
0.004 H
0.003 H
0.002 H
0.001 H
0.0009 H
0.0008 H
0.0007 H
0.0006 H
0.0005 H
0.0004 H
0.0003 H
0.0002 H
10 ~
20 ~
30 ~
40 ~
50 ~
60 ~
70 ~
80 ~
90 ~
100 ~
0.1 f
0.09 f
0.08 f
0.07 f
0.06 f
0.05 f
0.04 f
0.03 f
0.02 f


CI
C
10
9
8
7
6
5
4
3
2
1
MHOS
OHMS
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0

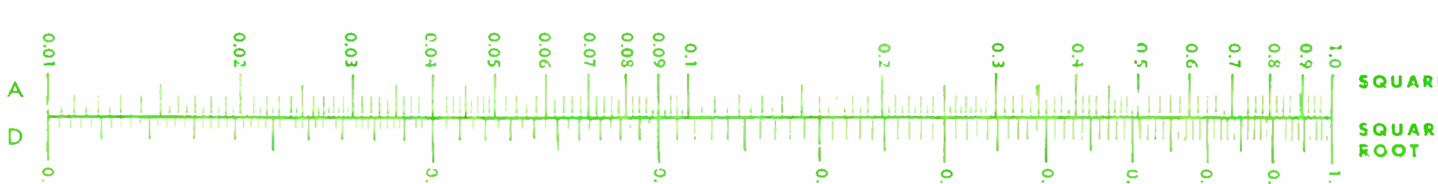

A
D
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
SQUARE
SQUARE ROOT
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0

PLATE 3

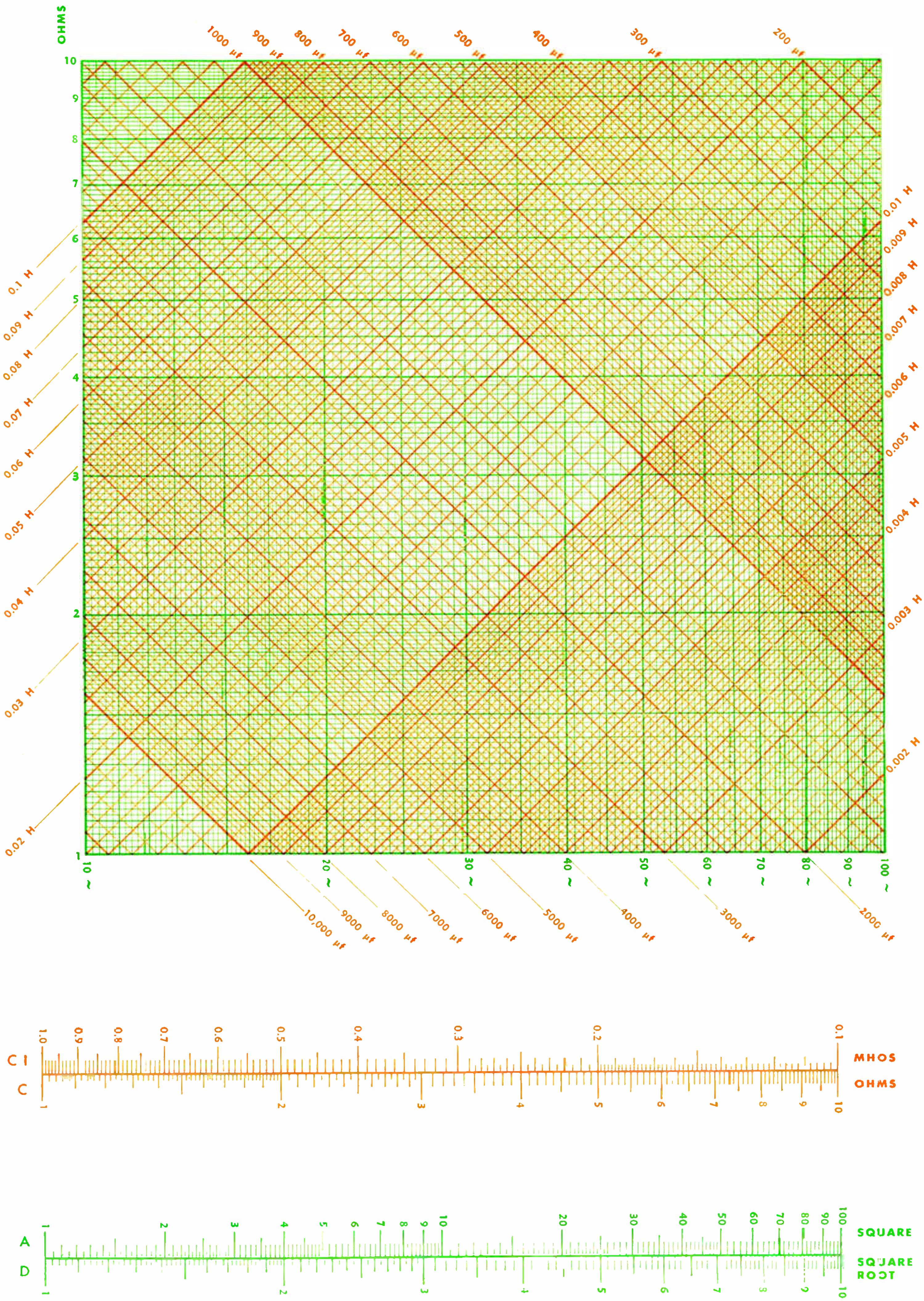
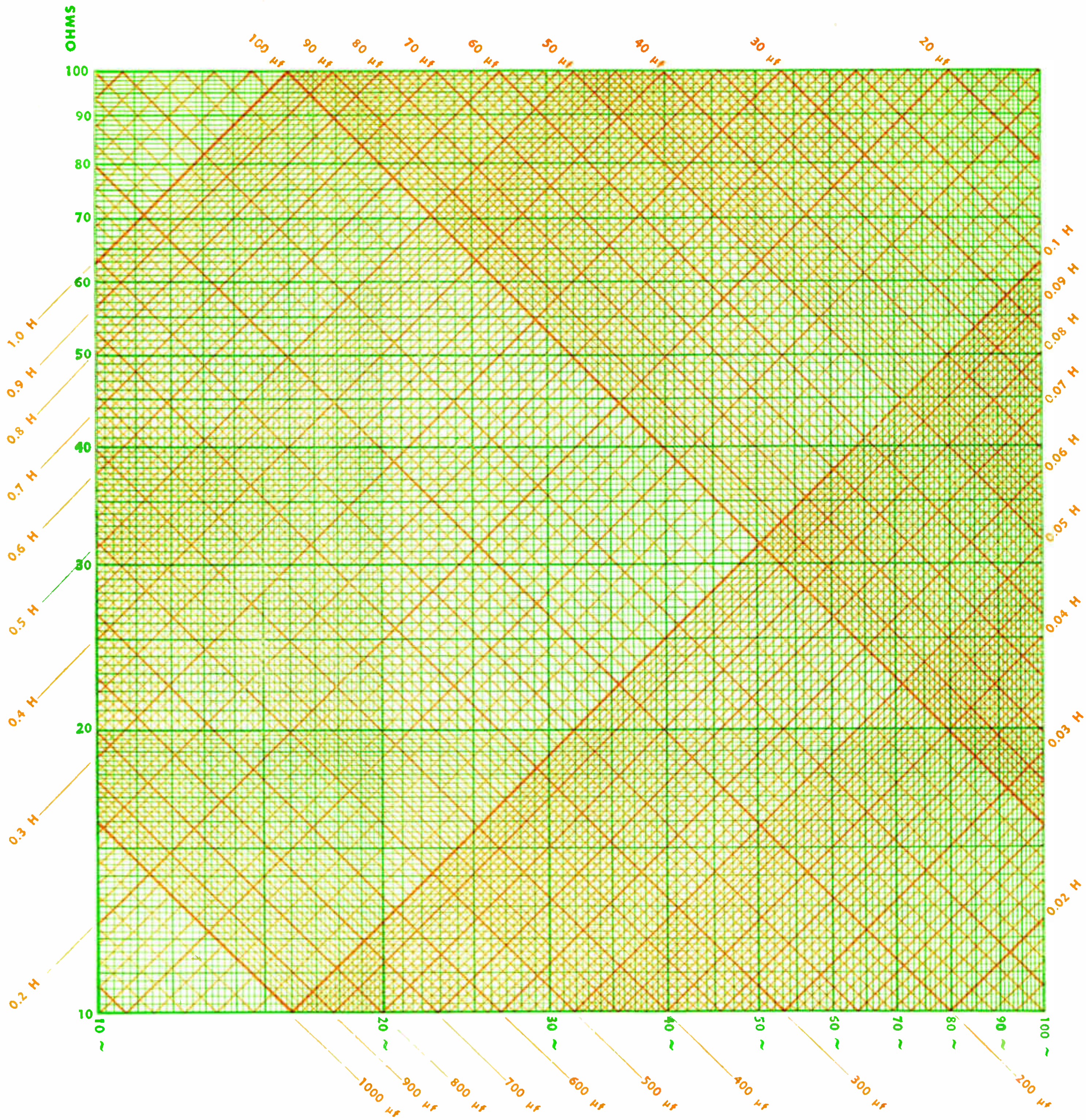
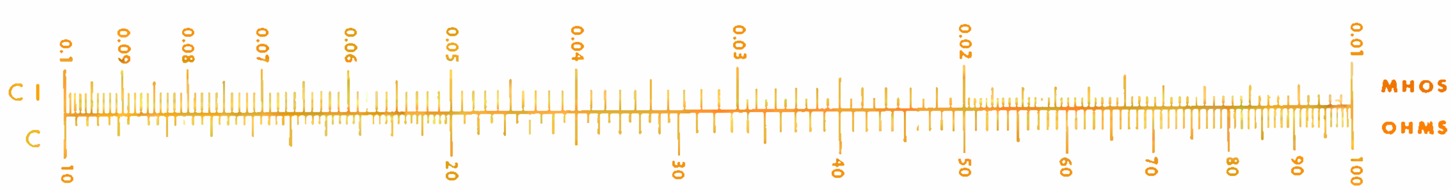

OHMS
10
9
8
7
6
5
4
3
2
1
1000 μf
900 μf
800 μf
700 μf
600 μf
500 μf
400 μf
300 μf
200 μf
0.1 H
0.09 H
0.08 H
0.07 H
0.06 H
0.05 H
0.04 H
0.03 H
0.02 H
0.01 H
0.009 H
0.008 H
0.007 H
0.006 H
0.005 H
0.004 H
0.003 H
0.002 H
10 ~
20 ~
30 ~
40 ~
50 ~
60 ~
70 ~
80 ~
90 ~
100 ~
10,000 μf
9000 μf
8000 μf
7000 μf
6000 μf
5000 μf
4000 μf
3000 μf
2000 μf
CI
C
MHOS
OHMS
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
A
D
SQUARE
SQUARE ROOT

PLATE 4


OHMS
100
90
80
70
60
50
40
30
20
10
100 μf
90 μf
80 μf
70 μf
60 μf
50 μf
40 μf
30 μf
20 μf
1.0 H
0.9 H
0.8 H
0.7 H
0.6 H
0.5 H
0.4 H
0.3 H
0.2 H
0.1 H
0.09 H
0.08 H
0.07 H
0.06 H
0.05 H
0.04 H
0.03 H
0.02 H
10 ~
20 ~
30 ~
40 ~
50 ~
50 ~
70 ~
80 ~
90 ~
100 ~
1000 μf
900 μf
800 μf
700 μf
600 μf
500 μf
400 μf
300 μf
200 μf


CI
C
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
MHOS
OHMS
10
20
30
40
50
60
70
80
90
100

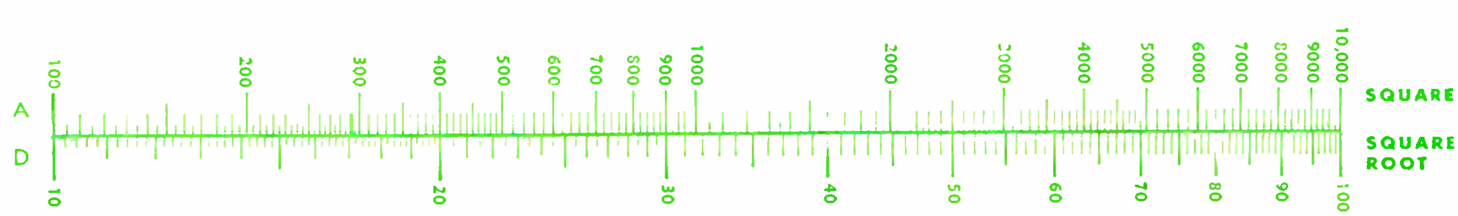
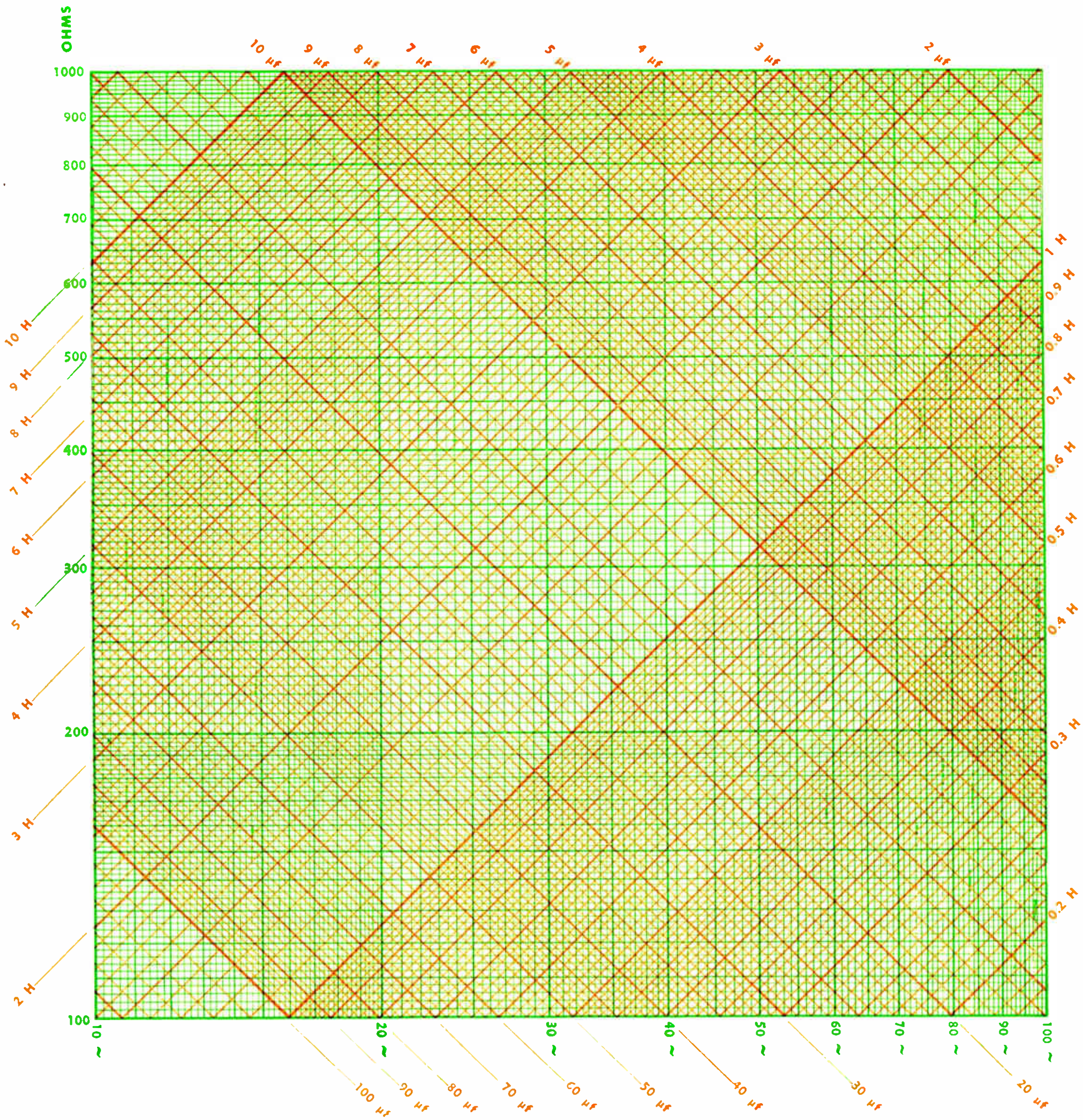
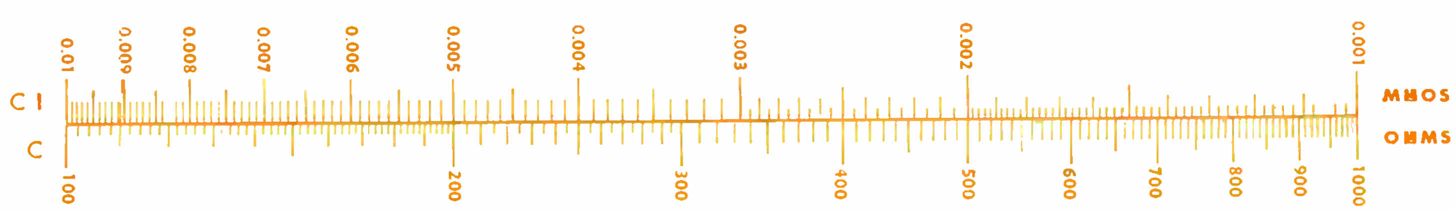

A
D
100
200
300
400
500
600
700
800
900
1000
2000
3000
4000
5000
6000
7000
8000
9000
10,000
SQUARE
SQUARE ROOT
10
20
30
40
50
60
70
80
90
100

PLATE 5


OHMS
1000
900
800
700
600
500
400
300
200
100
10 μf
9 μf
8 μf
7 μf
6 μf
5 μf
4 μf
3 μf
2 μf
10 H
9 H
8 H
7 H
6 H
5 H
4 H
3 H
2 H
1 H
0.9 H
0.8 H
0.7 H
0.6 H
0.5 H
0.4 H
0.3 H
0.2 H
10 ~
20 ~
30 ~
40 ~
50 ~
60 ~
70 ~
80 ~
90 ~
100 ~
100 μf
90 μf
80 μf
70 μf
60 μf
50 μf
40 μf
30 μf
20 μf


CI
C
0.01
0.009
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
MHOS
OHMS
100
200
300
400
500
600
700
800
900
1000

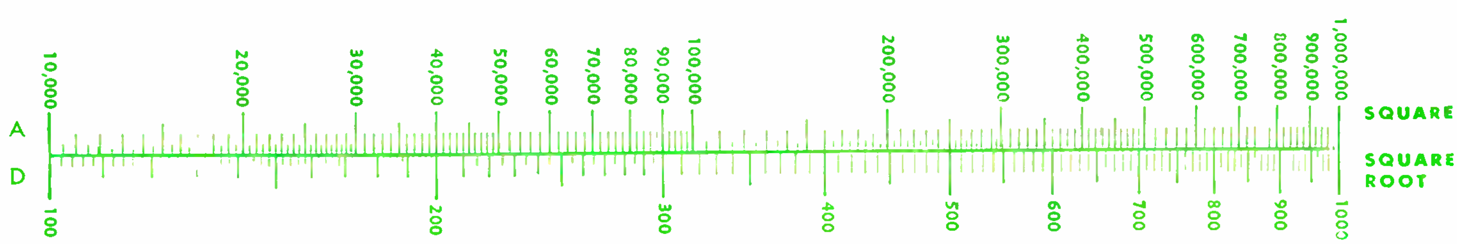
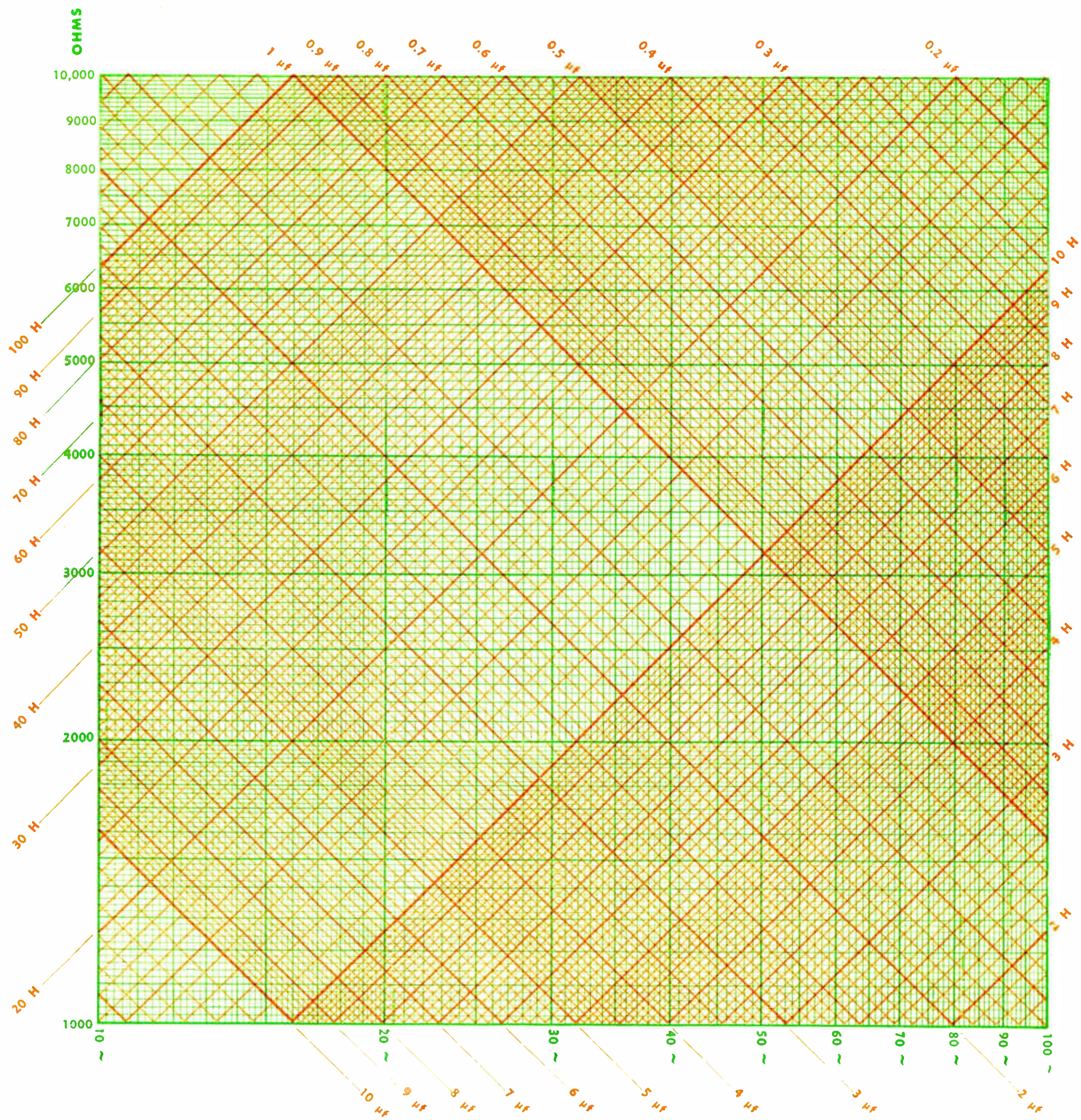
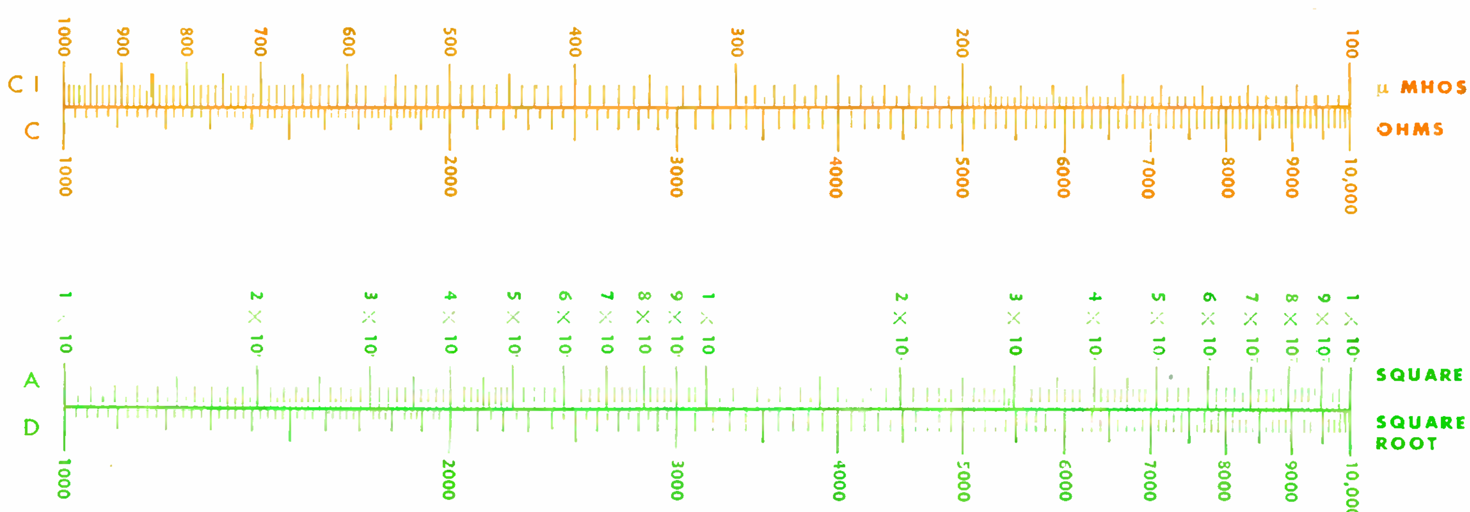

A
D
10,000
20,000
30,000
40,000
50,000
60,000
70,000
80,000
90,000
100,000
200,000
300,000
400,000
500,000
600,000
700,000
800,000
900,000
1,000,000
SQUARE
SQUARE ROOT
100
200
300
400
500
600
700
800
900
1000

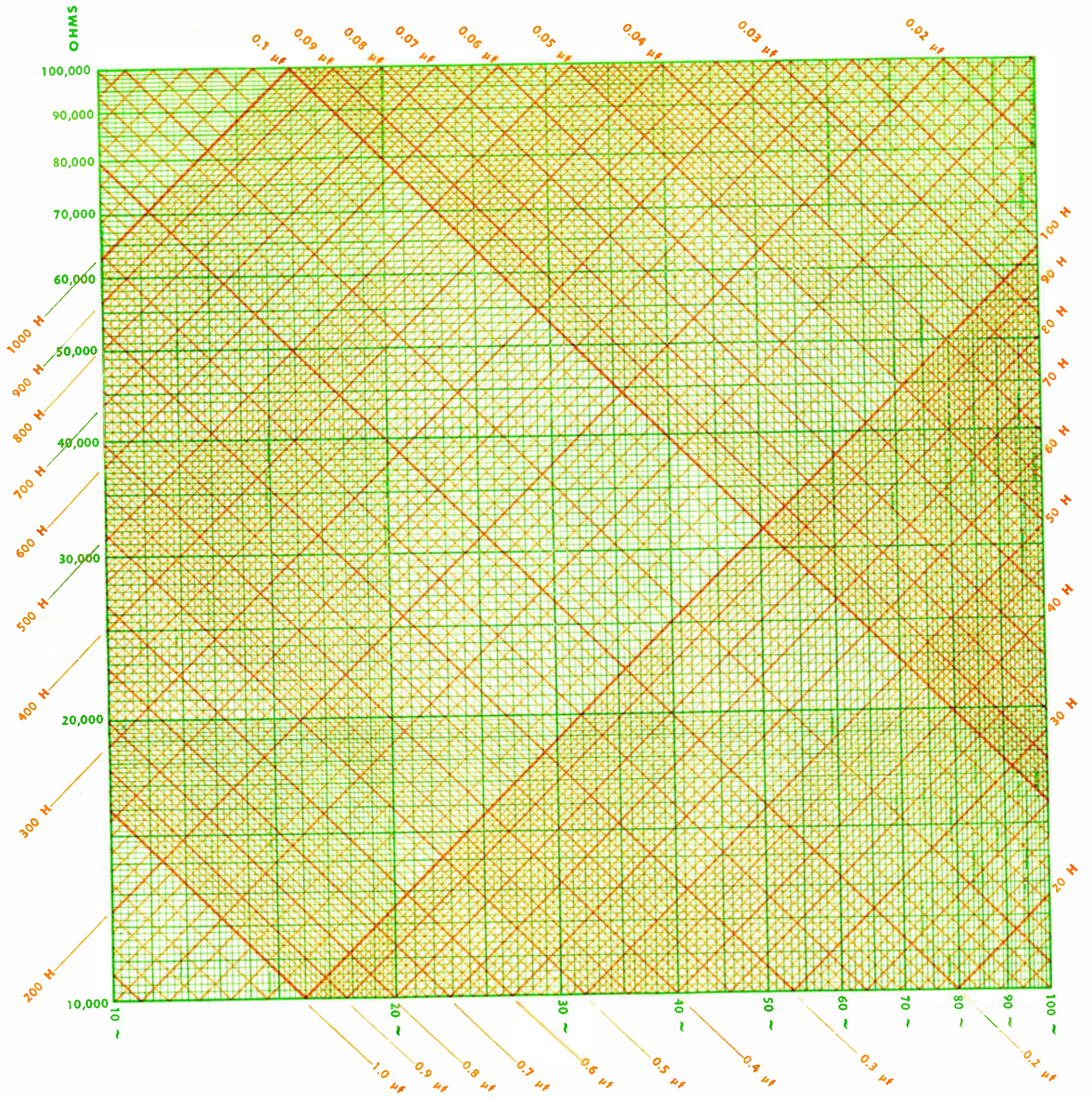
PLATE 6



OHMS
10,000
9000
8000
7000
6000
5000
4000
3000
2000
1000
1 μf
0.9 μf
0.8 μf
0.7 μf
0.6 μf
0.5 μf
0.4 μf
0.3 μf
0.2 μf
100 H
90 H
80 H
70 H
60 H
50 H
40 H
30 H
20 H
10 H
9 H
8 H
7 H
6 H
5 H
4 H
3 H
2 H
10 ~
20 ~
30 ~
40 ~
50 ~
60 ~
70 ~
80 ~
90 ~
100 ~
10 μf
9 μf
8 μf
7 μf
6 μf
5 μf
4 μf
3 μf
2 μf



CI
C
μ MHOS
OHMS
1000
900
800
700
600
500
400
300
200
100
2000
3000
4000
5000
6000
7000
8000
9000
10,000
A
D
SQUARE
SQUARE ROOT


OHMS
100,000
90,000
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
1000 H
900 H
800 H
700 H
600 H
500 H
400 H
300 H
200 H
0.1 μf
0.09 μf
0.08 μf
0.07 μf
0.06 μf
0.05 μf
0.04 μf
0.03 μf
0.02 μf
100 H
90 H
80 H
70 H
60 H
50 H
40 H
30 H
20 H
10 ~
20 ~
30 ~
40 ~
50 ~
60 ~
70 ~
80 ~
90 ~
100 ~
1.0 μf
0.9 μf
0.8 μf
0.7 μf
0.6 μf
0.5 μf
0.4 μf
0.3 μf
0.2 μf

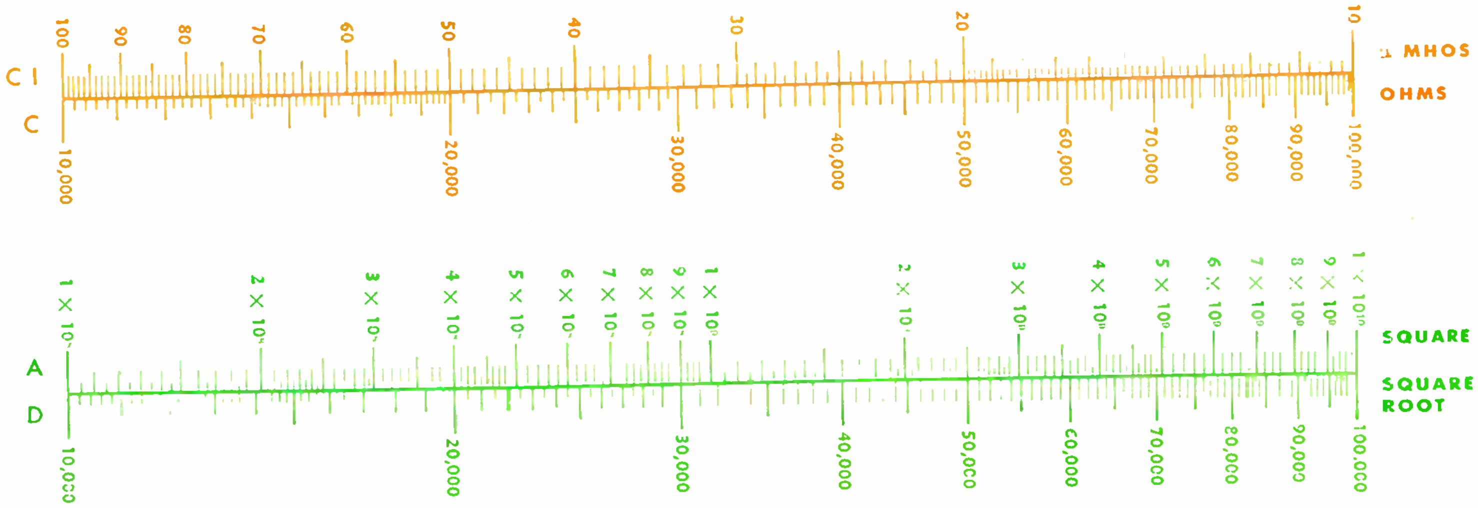

CI
C
MHOS
OHMS
100
90
80
70
60
50
40
30
20
10
10,000
20,000
30,000
40,000
50,000
60,000
70,000
80,000
90,000
100,000
A
D
SQUARE
SQUARE ROOT

PLATE 8

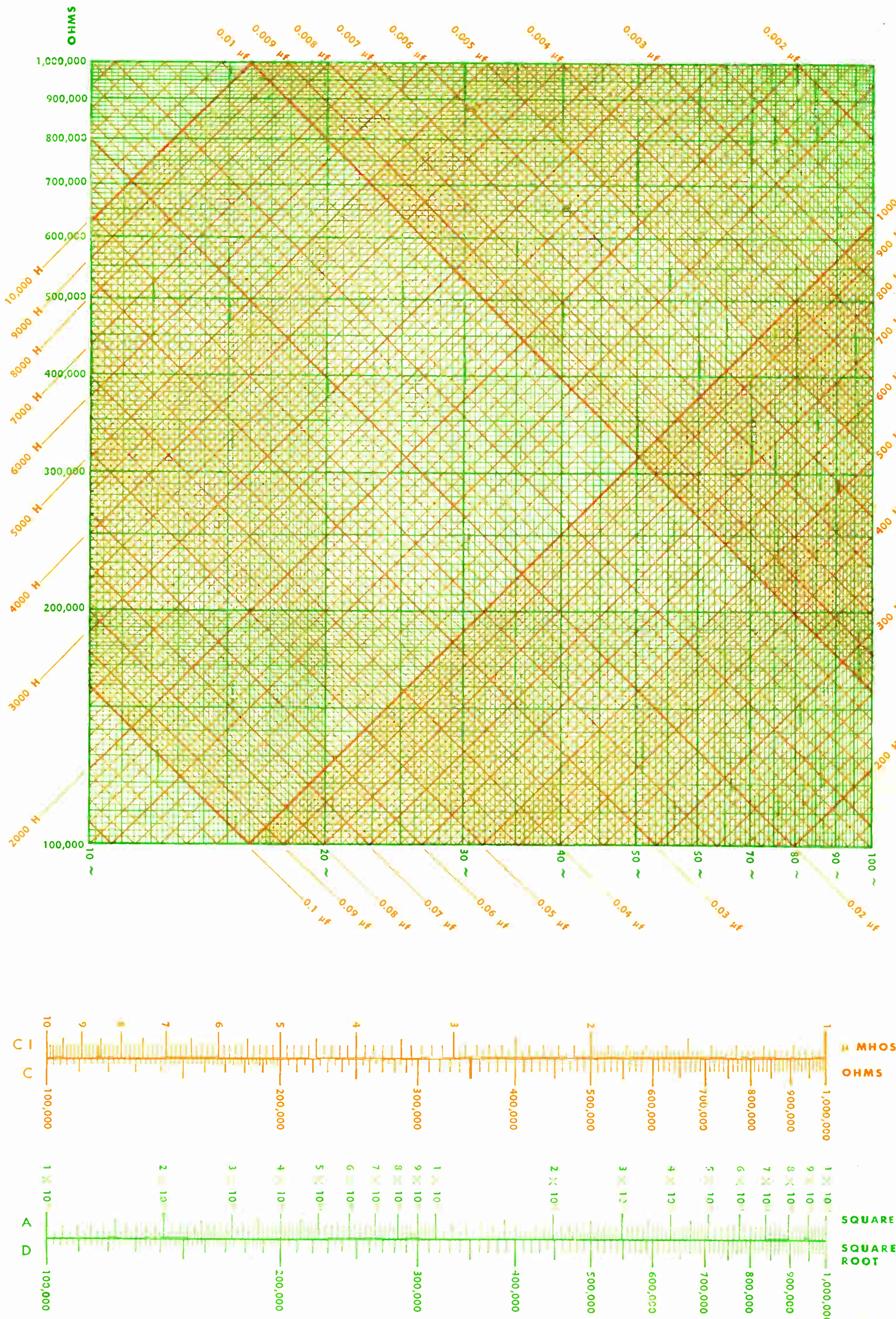
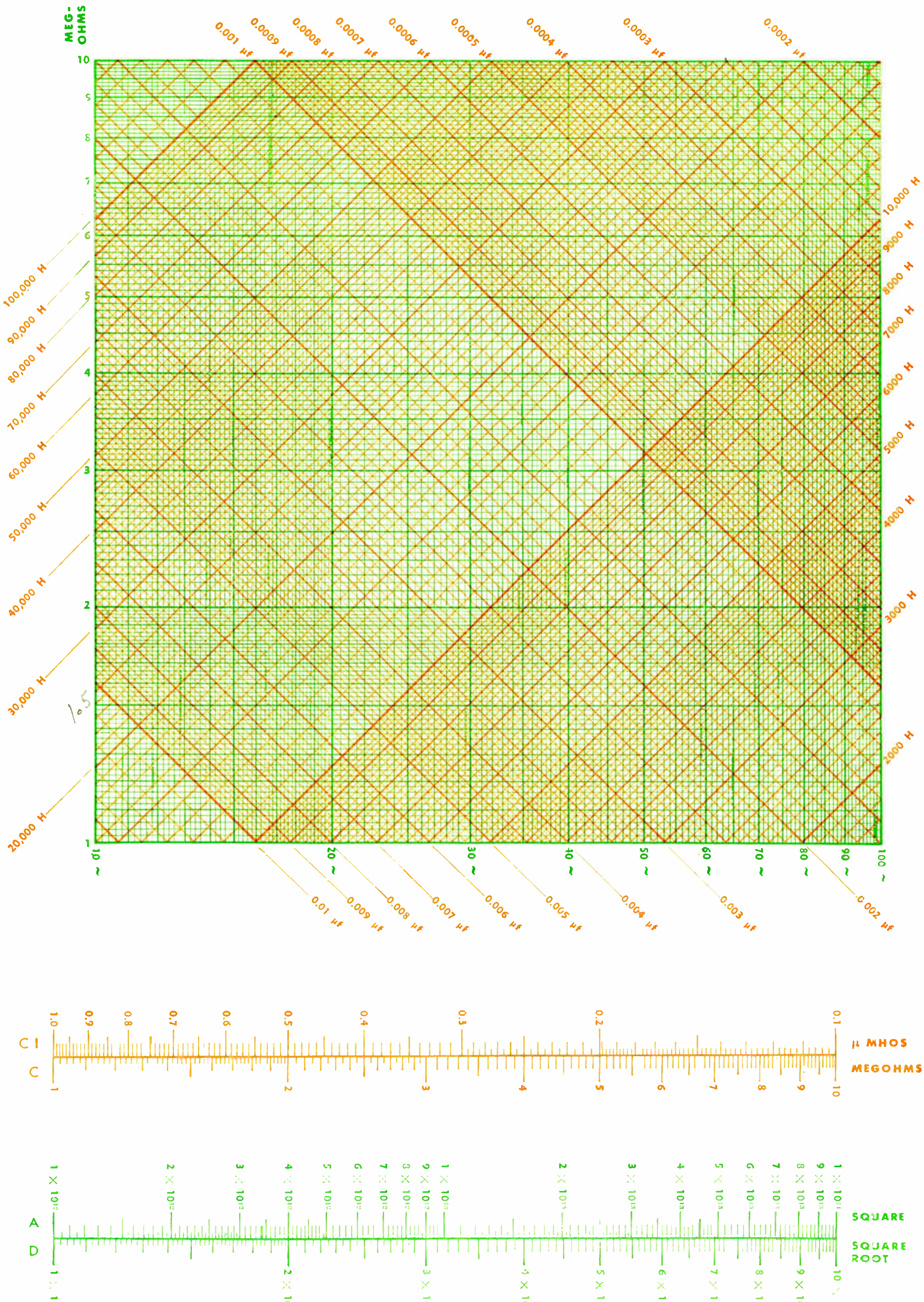
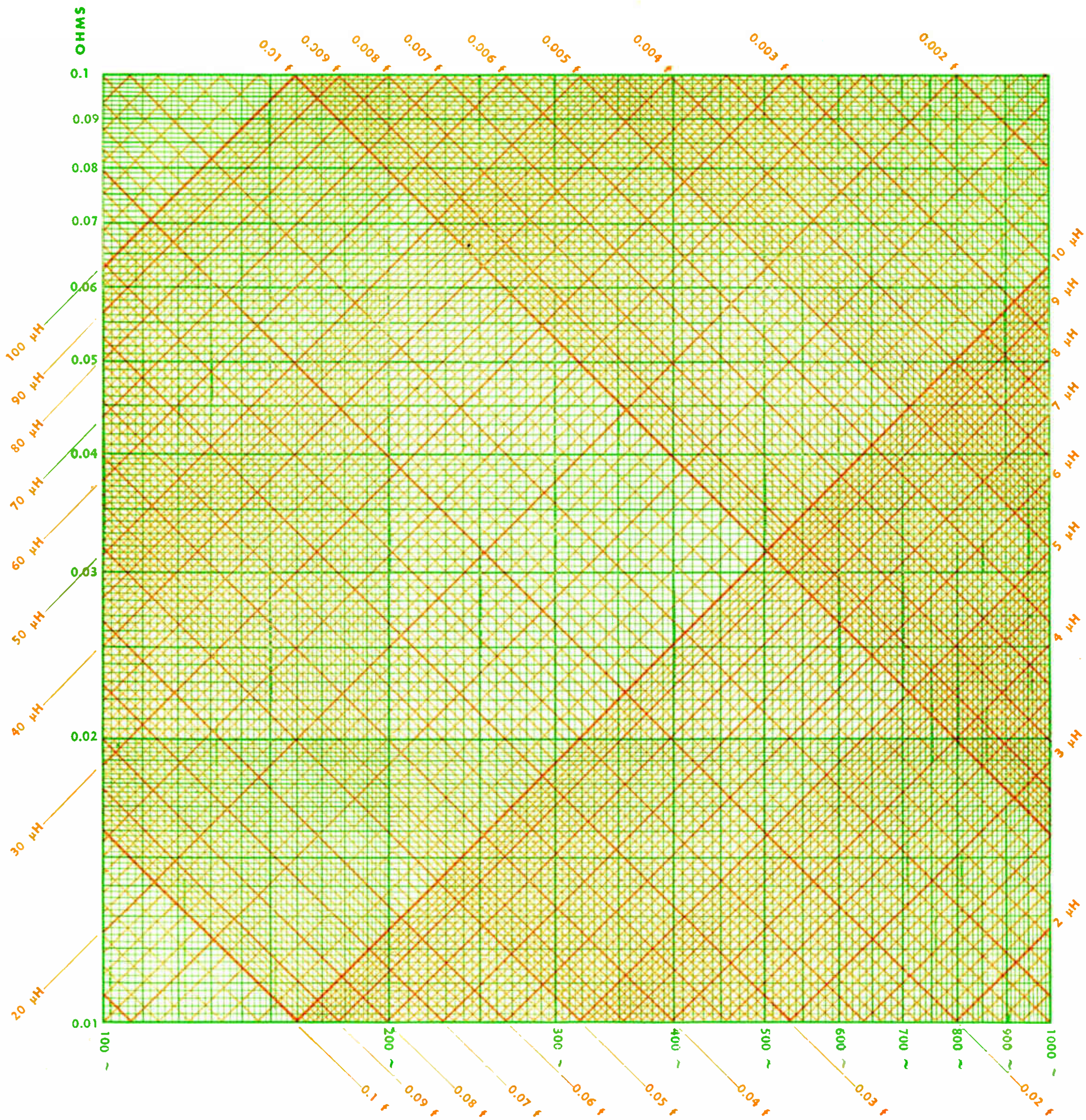

OHMS
1,000,000
900,000
800,000
700,000
600,000
500,000
400,000
300,000
200,000
100,000
0.01 μf
0.009 μf
0.008 μf
0.007 μf
0.006 μf
0.005 μf
0.004 μf
0.003 μf
0.002 μf
10,000 H
9000 H
8000 H
7000 H
6000 H
5000 H
4000 H
3000 H
2000 H
1000 H
900 H
800 H
700 H
600 H
500 H
400 H
300 H
200 H
10 ~
20 ~
30 ~
40 ~
50 ~
60 ~
70 ~
80 ~
90 ~
100 ~
0.1 μf
0.09 μf
0.08 μf
0.07 μf
0.06 μf
0.05 μf
0.04 μf
0.03 μf
0.02 μf
CI
C
μ MHOS
OHMS
A
D
SQUARE
SQUARE ROOT

PLATE 9

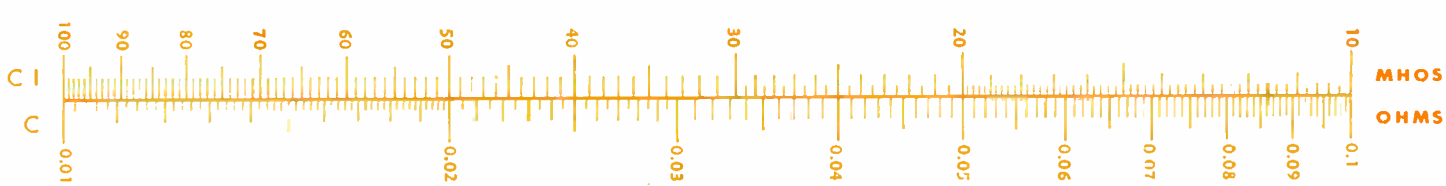


MEG-OHMS
1
2
3
4
5
6
7
8
9
10
0.001 μf
0.0009 μf
0.0008 μf
0.0007 μf
0.0006 μf
0.0005 μf
0.0004 μf
0.0003 μf
0.0002 μf
100,000 H
90,000 H
80,000 H
70,000 H
60,000 H
50,000 H
40,000 H
30,000 H
20,000 H
10,000 H
9000 H
8000 H
7000 H
6000 H
5000 H
4000 H
3000 H
2000 H
10 ~
20 ~
30 ~
40 ~
50 ~
60 ~
70 ~
80 ~
90 ~
100 ~
0.01 μf
0.009 μf
0.008 μf
0.007 μf
0.006 μf
0.005 μf
0.004 μf
0.003 μf
0.002 μf
CI
C
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
μ MHOS
MEGOHMS
A
D
SQUARE
SQUARE ROOT

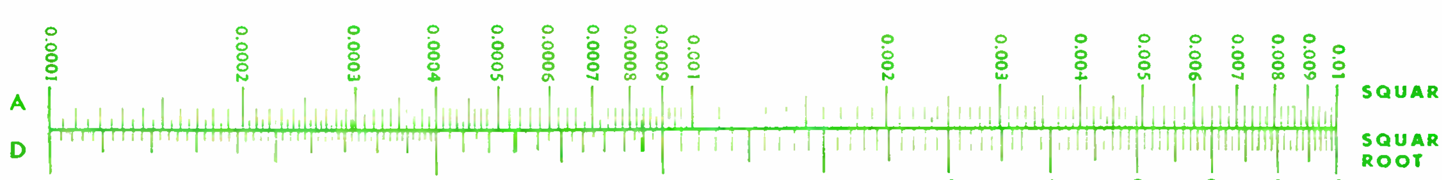
PLATE 10



OHMS
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.01 f
0.009 f
0.008 f
0.007 f
0.006 f
0.005 f
0.004 f
0.003 f
0.002 f
100 µH
90 µH
80 µH
70 µH
60 µH
50 µH
40 µH
30 µH
20 µH
10 µH
9 µH
8 µH
7 µH
6 µH
5 µH
4 µH
3 µH
2 µH
100 ~
200 ~
300 ~
400 ~
500 ~
600 ~
700 ~
800 ~
900 ~
1000 ~
0.1 f
0.09 f
0.08 f
0.07 f
0.06 f
0.05 f
0.04 f
0.03 f
0.02 f



CI
C
100
90
80
70
60
50
40
30
20
10
MHOS
OHMS
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.1



A
D
0.0001
0.0002
0.0003
0.0004
0.0005
0.0006
0.0007
0.0008
0.0009
0.001
0.002
0.003
0.004
0.005
0.006
0.007
0.008
0.009
0.01
SQUARE
SQUARE ROOT
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.1

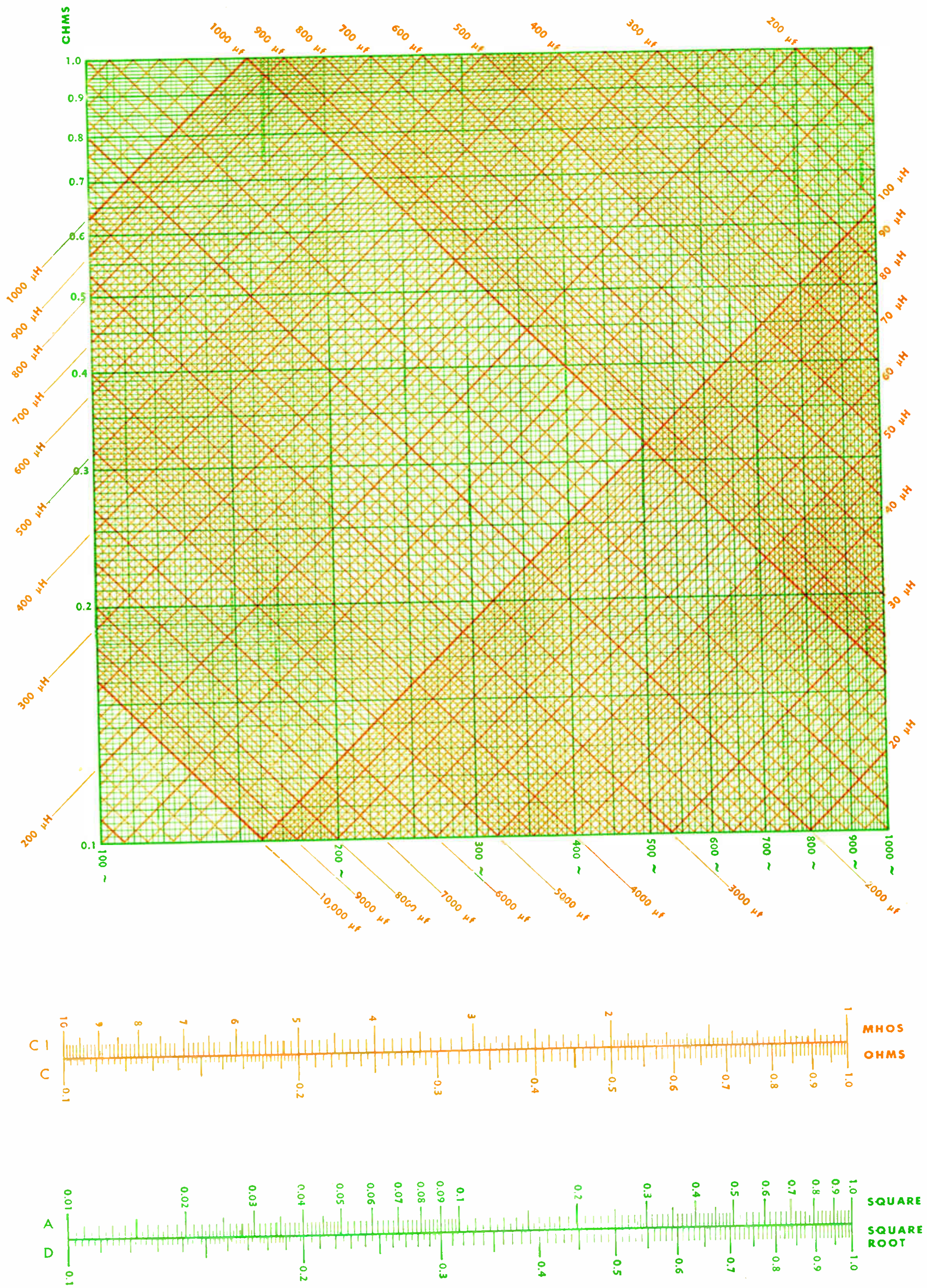
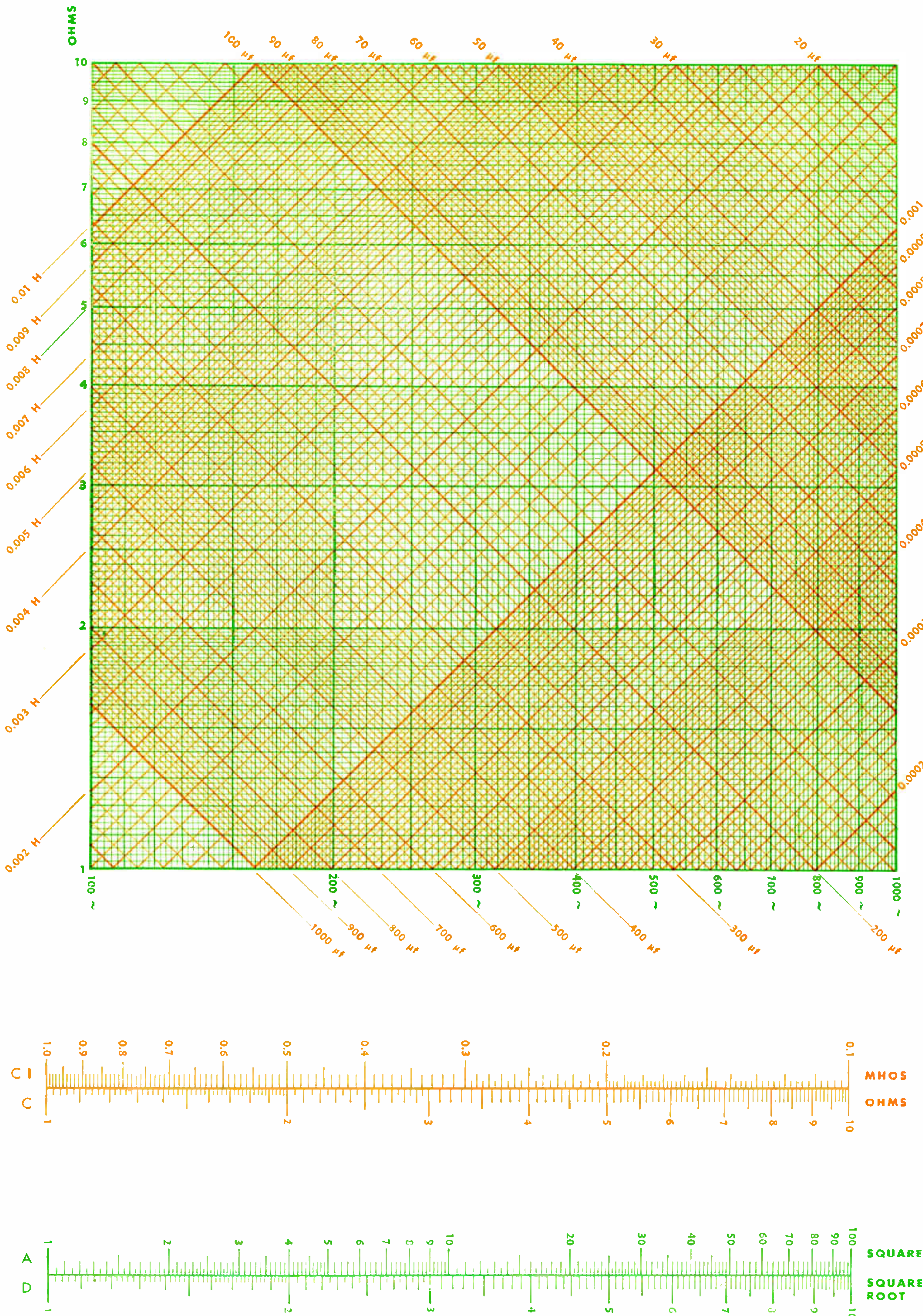

OHMS
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
1000 μf
900 μf
800 μf
700 μf
600 μf
500 μf
400 μf
300 μf
200 μf
1000 μH
900 μH
800 μH
700 μH
600 μH
500 μH
400 μH
300 μH
200 μH
100 μH
90 μH
80 μH
70 μH
60 μH
50 μH
40 μH
30 μH
20 μH
100 ~
200 ~
300 ~
400 ~
500 ~
600 ~
700 ~
800 ~
900 ~
1000 ~
10,000 μf
9000 μf
8000 μf
7000 μf
6000 μf
5000 μf
4000 μf
3000 μf
2000 μf
CI
C
MHOS
OHMS
A
D
SQUARE
SQUARE ROOT

PLATE 12



OHMS
100 μf
90 μf
80 μf
70 μf
60 μf
50 μf
40 μf
30 μf
20 μf
0.01 H
0.009 H
0.008 H
0.007 H
0.006 H
0.005 H
0.004 H
0.003 H
0.002 H
0.001 H
0.0009 H
0.0008 H
0.0007 H
0.0006 H
0.0005 H
0.0004 H
0.0003 H
0.0002 H
100 ~
200 ~
300 ~
400 ~
500 ~
600 ~
700 ~
800 ~
900 ~
1000 ~
1000 μf
900 μf
800 μf
700 μf
600 μf
500 μf
400 μf
300 μf
200 μf
CI
C
MHOS
OHMS
A
D
SQUARE
SQUARE ROOT

PLATE 13

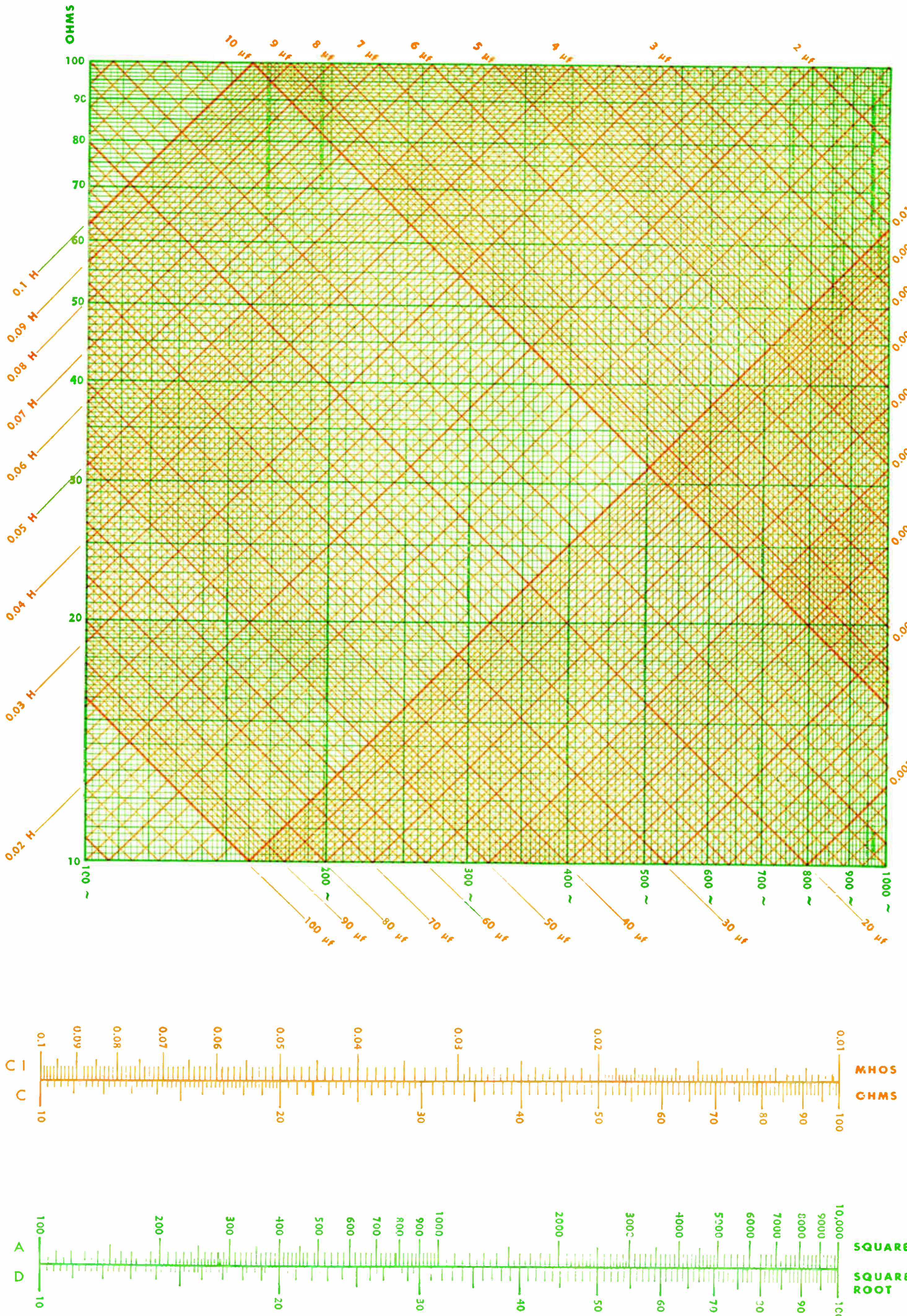
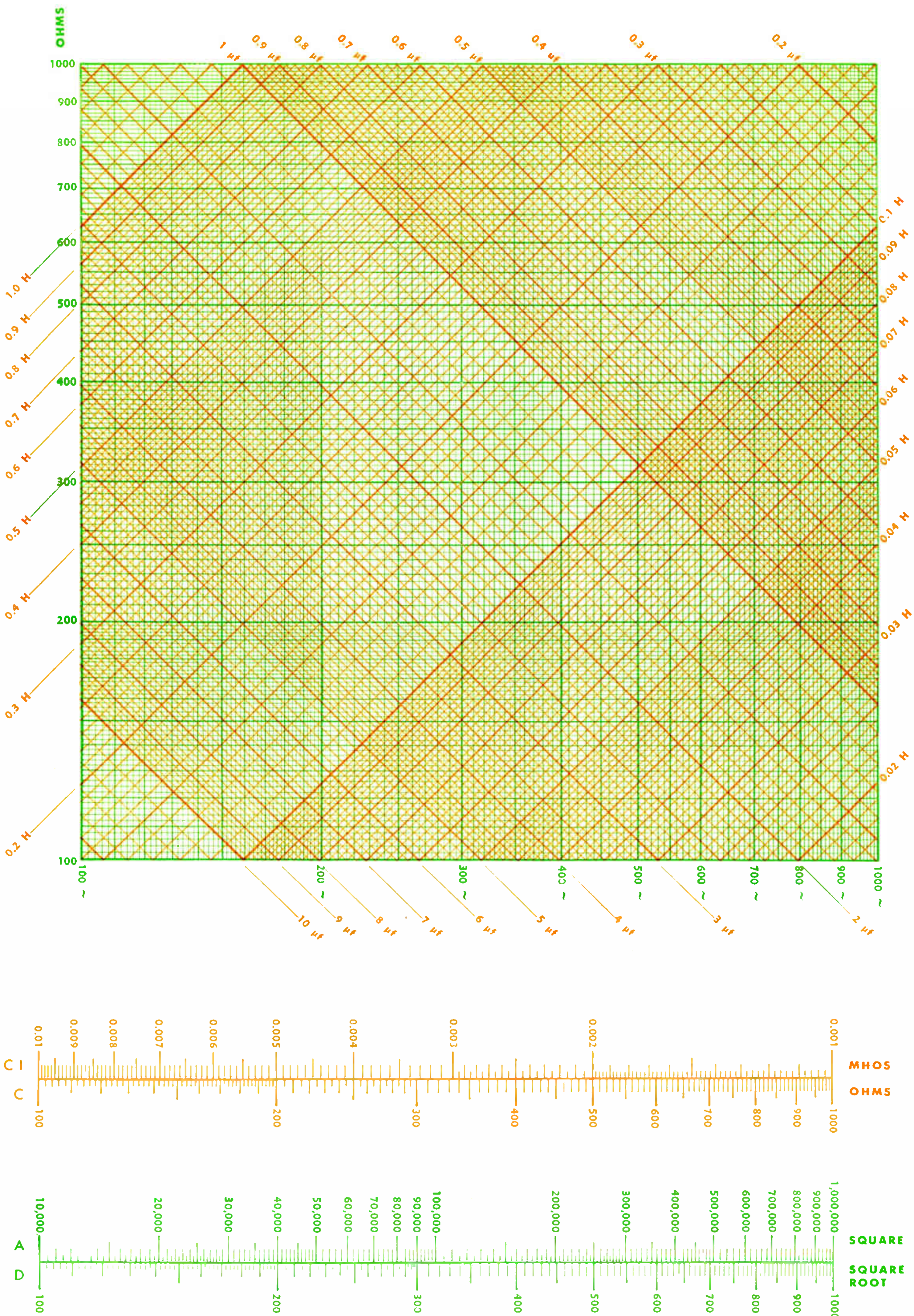

OHMS
100
90
80
70
60
50
40
30
20
10
10 μf
9 μf
8 μf
7 μf
6 μf
5 μf
4 μf
3 μf
2 μf
0.1 H
0.09 H
0.08 H
0.07 H
0.06 H
0.05 H
0.04 H
0.03 H
0.02 H
0.01 H
0.009 H
0.008 H
0.007 H
0.006 H
0.005 H
0.004 H
0.003 H
0.002 H
100 ~
200 ~
300 ~
400 ~
500 ~
600 ~
700 ~
800 ~
900 ~
1000 ~
100 μf
90 μf
80 μf
70 μf
60 μf
50 μf
40 μf
30 μf
20 μf
CI
C
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
MHOS
OHMS
10
20
30
40
50
60
70
80
90
100
A
D
100
200
300
400
500
600
700
800
900
1000
2000
3000
4000
5000
6000
7000
8000
9000
10,000
SQUARE
SQUARE ROOT
10
20
30
40
50
60
70
80
90
100

PLATE 14



OHMS
1000
900
800
700
600
500
400
300
200
100
1 μf
0.9 μf
0.8 μf
0.7 μf
0.6 μf
0.5 μf
0.4 μf
0.3 μf
0.2 μf
1.0 H
0.9 H
0.8 H
0.7 H
0.6 H
0.5 H
0.4 H
0.3 H
0.2 H
0.1 H
0.09 H
0.08 H
0.07 H
0.06 H
0.05 H
0.04 H
0.03 H
0.02 H
100 ~
200 ~
300 ~
400 ~
500 ~
600 ~
700 ~
800 ~
900 ~
1000 ~
10 μf
9 μf
8 μf
7 μf
6 μf
5 μf
4 μf
3 μf
2 μf
CI
C
0.01
0.009
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
MHOS
OHMS
100
200
300
400
500
600
700
800
900
1000
A
D
10,000
20,000
30,000
40,000
50,000
60,000
70,000
80,000
90,000
100,000
200,000
300,000
400,000
500,000
600,000
700,000
800,000
900,000
1,000,000
SQUARE
SQUARE ROOT

PLATE 15

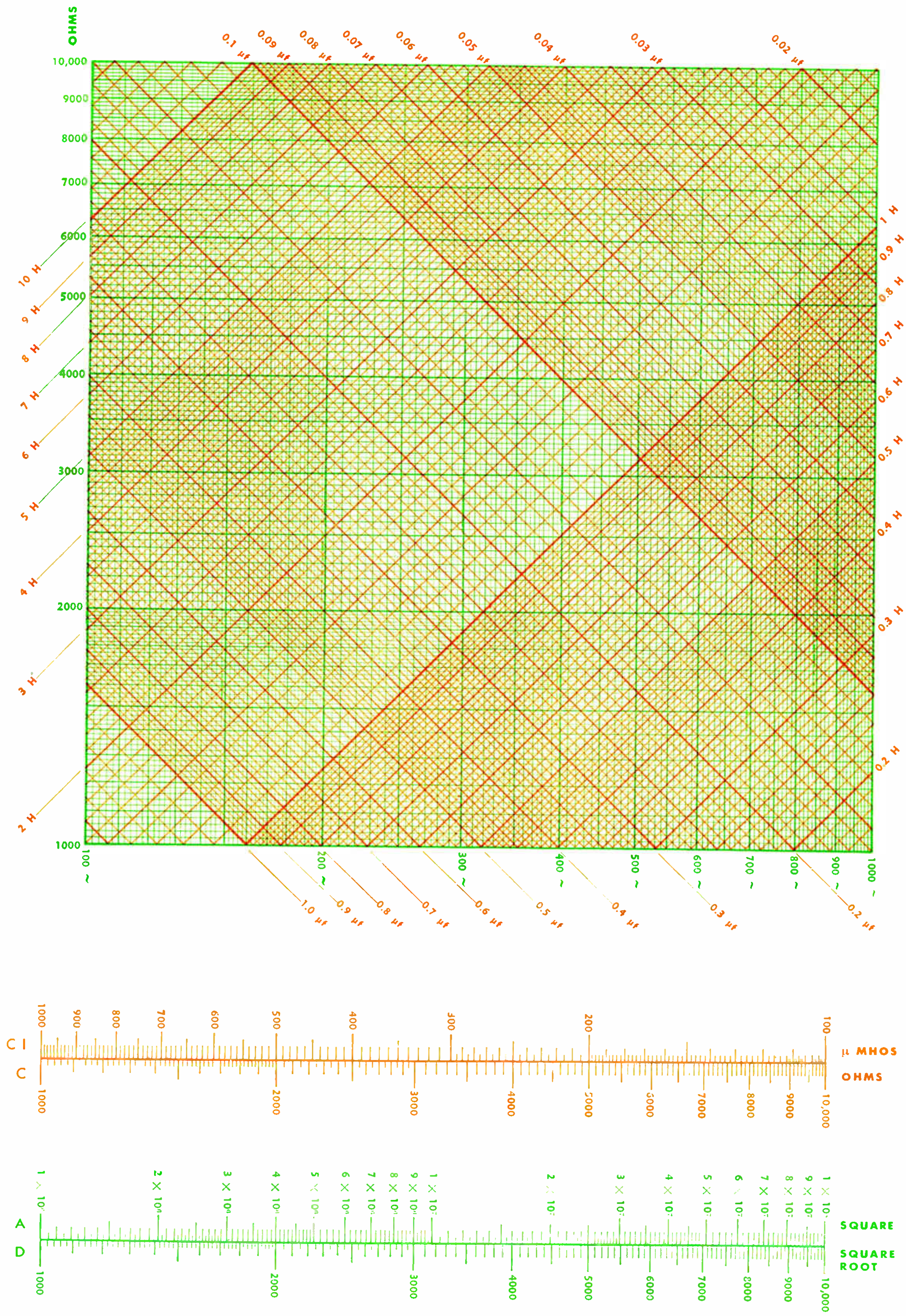
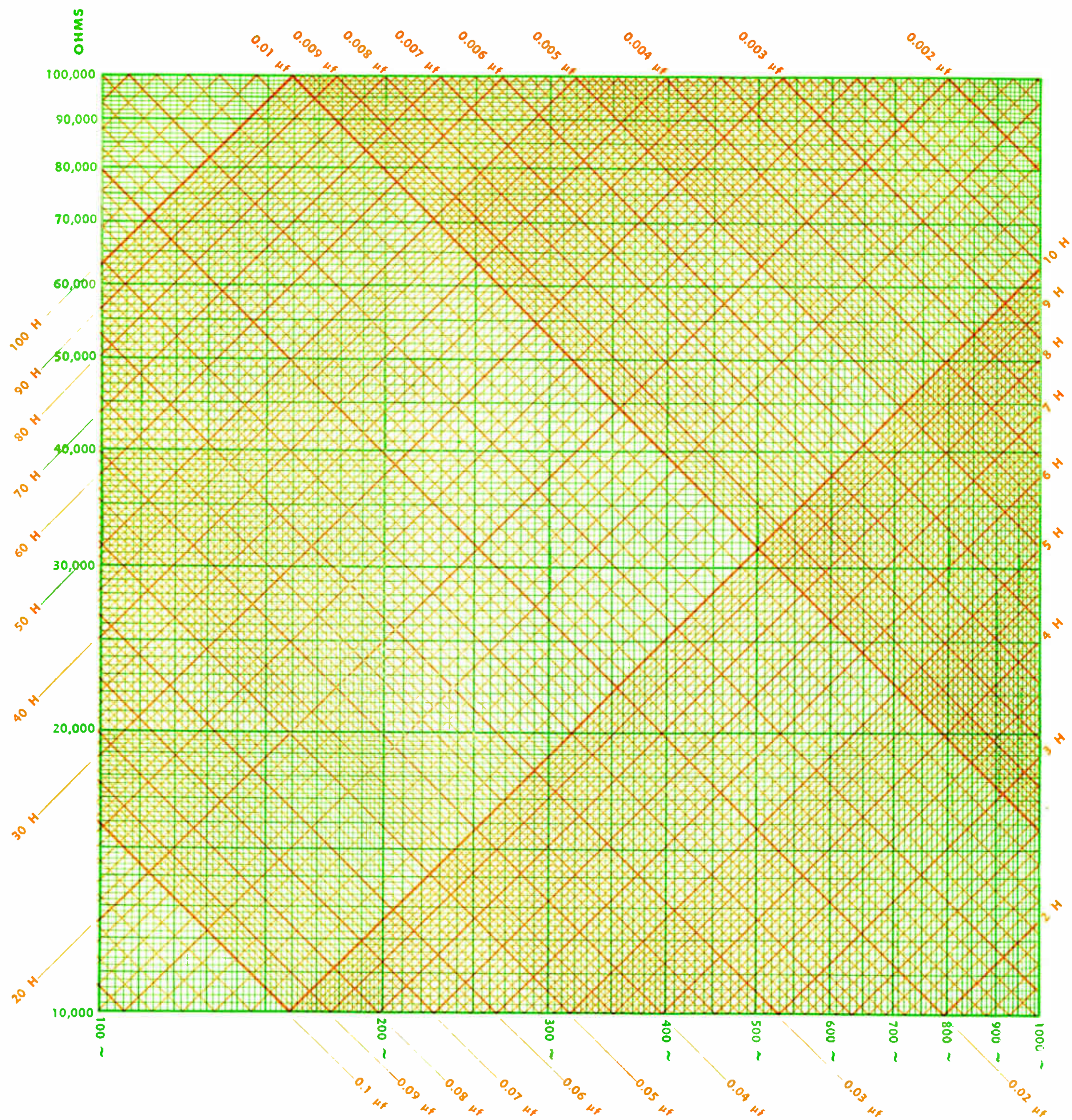
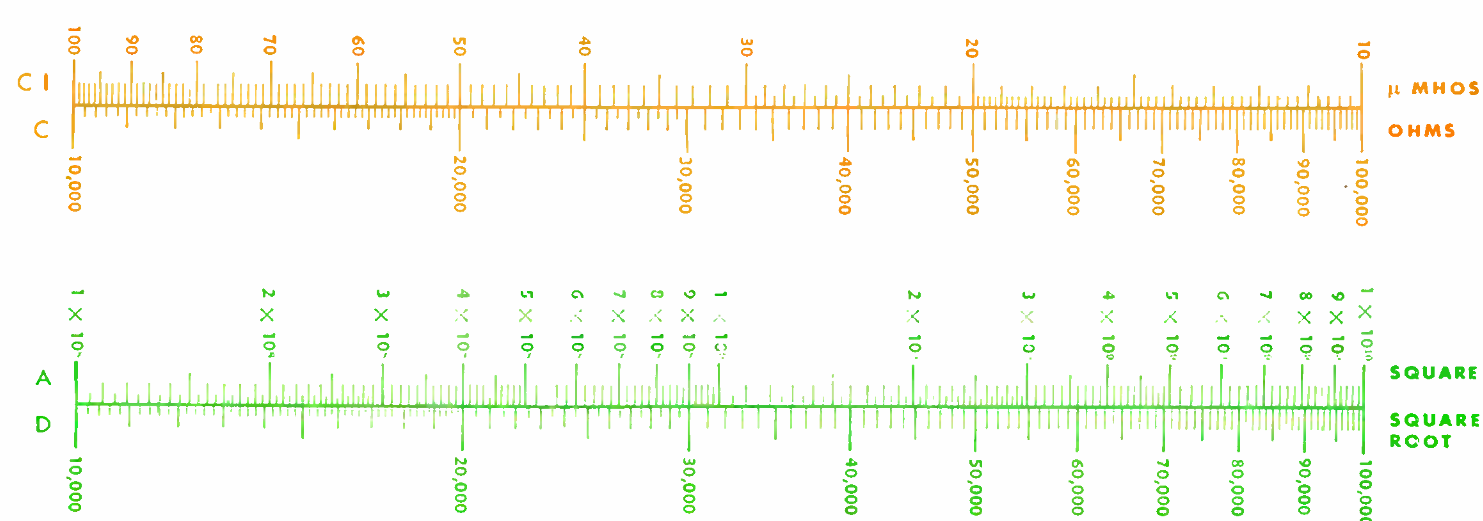


PLATE 16

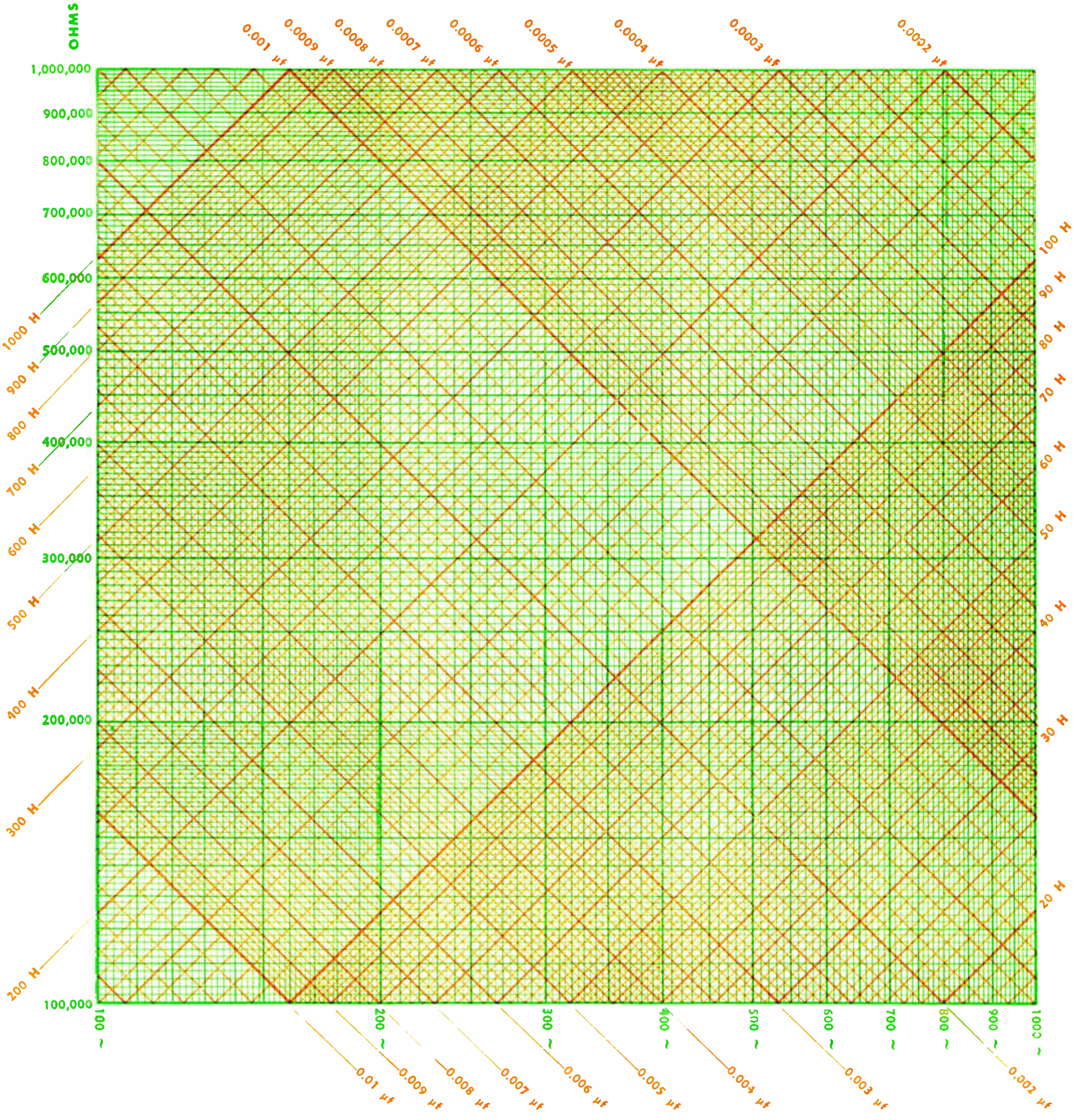


OHMS
100,000
90,000
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0.01 μf
0.009 μf
0.008 μf
0.007 μf
0.006 μf
0.005 μf
0.004 μf
0.003 μf
0.002 μf
0.1 μf
0.09 μf
0.08 μf
0.07 μf
0.06 μf
0.05 μf
0.04 μf
0.03 μf
0.02 μf
100 H
90 H
80 H
70 H
60 H
50 H
40 H
30 H
20 H
10 H
9 H
8 H
7 H
6 H
5 H
4 H
3 H
2 H
100 ~
200 ~
300 ~
400 ~
500 ~
600 ~
700 ~
800 ~
900 ~
1000 ~

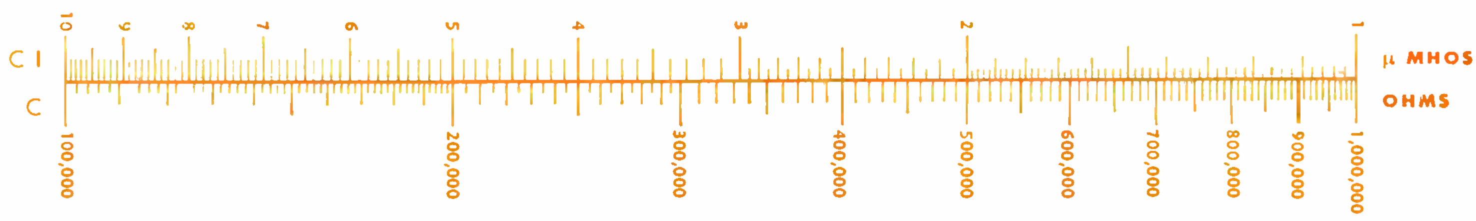


C I
C
μ MHOS
OHMS
A
D
SQUARE
SQUARE ROOT

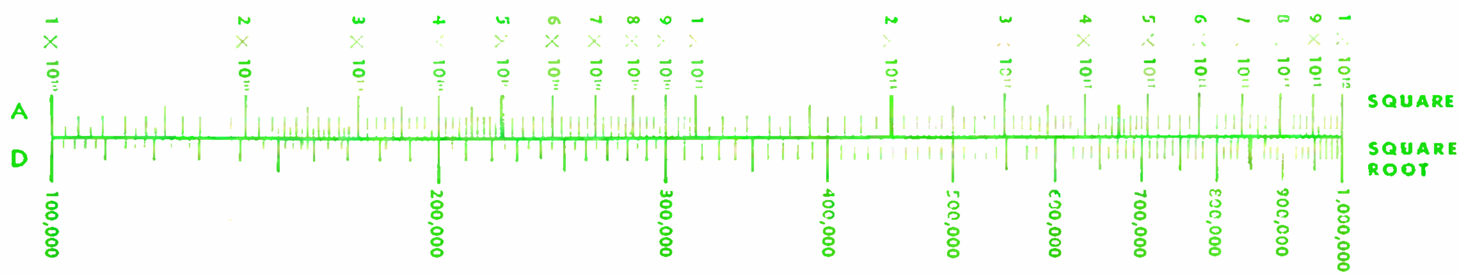
PLATE 17



OHMS
1,000,000
900,000
800,000
700,000
600,000
500,000
400,000
300,000
200,000
100,000
0.001 μf
0.0009 μf
0.0008 μf
0.0007 μf
0.0006 μf
0.0005 μf
0.0004 μf
0.0003 μf
0.0002 μf
1000 H
900 H
800 H
700 H
600 H
500 H
400 H
300 H
200 H
100 H
90 H
80 H
70 H
60 H
50 H
40 H
30 H
20 H
100 ~
200 ~
300 ~
400 ~
500 ~
600 ~
700 ~
800 ~
900 ~
1000 ~
0.01 μf
0.009 μf
0.008 μf
0.007 μf
0.006 μf
0.005 μf
0.004 μf
0.003 μf
0.002 μf

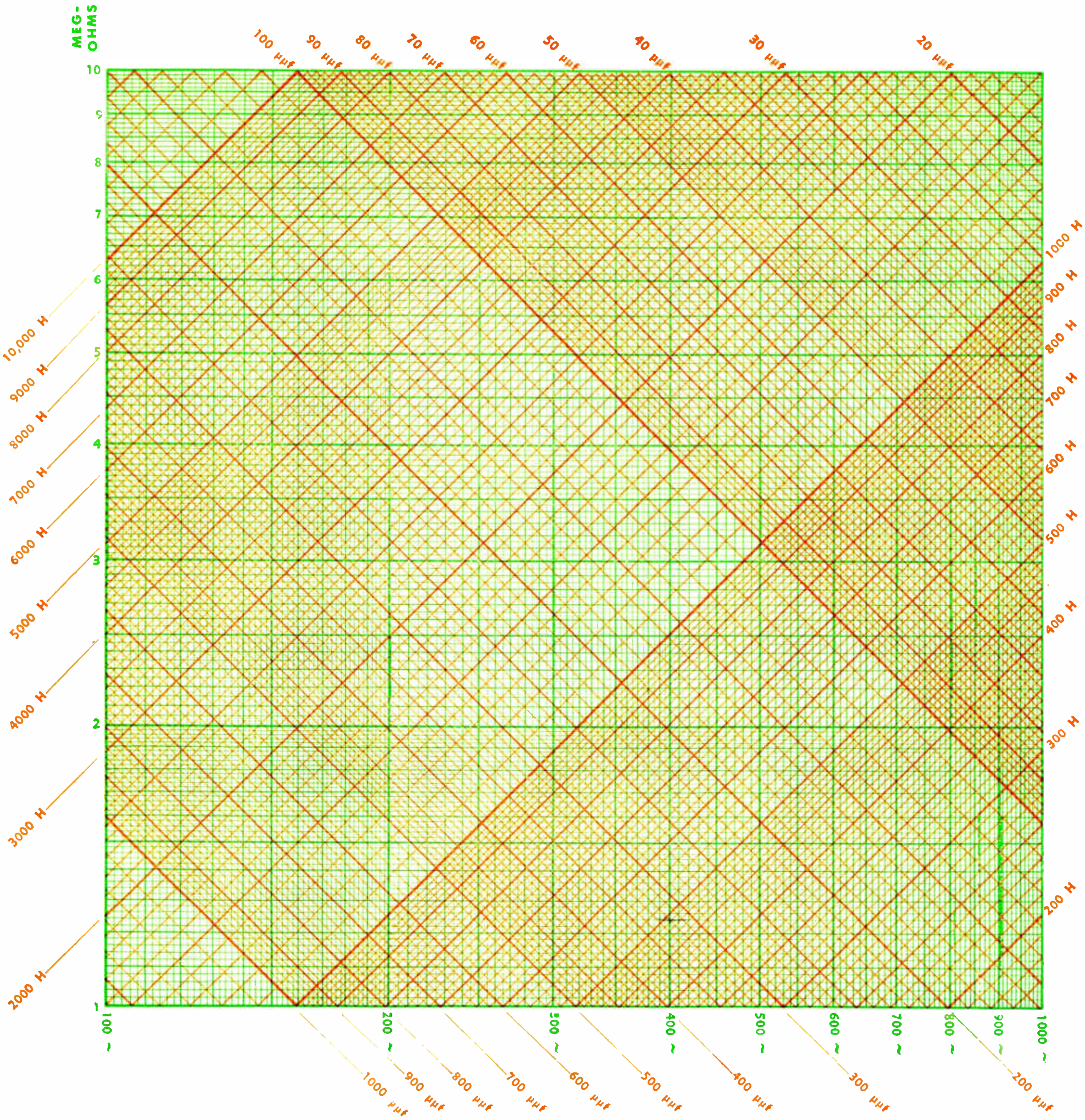


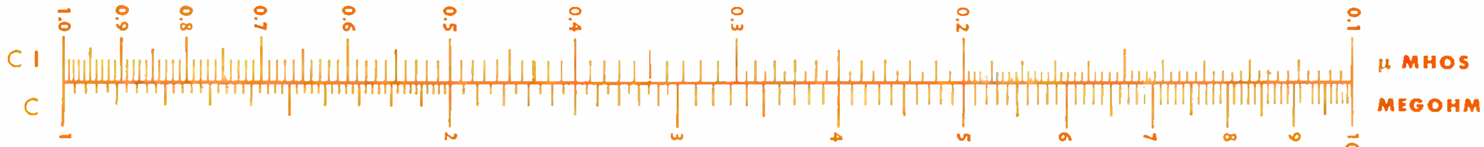
CI
C
μ MHOS
OHMS
100,000
200,000
300,000
400,000
500,000
600,000
700,000
800,000
900,000
1,000,000



A
D
SQUARE
SQUARE ROOT
100,000
200,000
300,000
400,000
700,000
900,000
1,000,000

PLATE 18


MEG-OHMS
100 μμf
90 μμf
80 μμf
70 μμf
60 μμf
50 μμf
40 μμf
30 μμf
20 μμf
10
9
8
7
6
5
4
3
2
1
10,000 H
9000 H
8000 H
7000 H
6000 H
5000 H
4000 H
3000 H
2000 H
1000 H
900 H
800 H
700 H
600 H
500 H
400 H
300 H
200 H
100 ~
200 ~
300 ~
400 ~
500 ~
600 ~
700 ~
800 ~
900 ~
1000 ~
1000 μμf
900 μμf
800 μμf
700 μμf
600 μμf
500 μμf
400 μμf
300 μμf
200 μμf


CI
C
μ MHOS
MEGOHMS
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
1
2
3
4
5
6
7
8
9
10

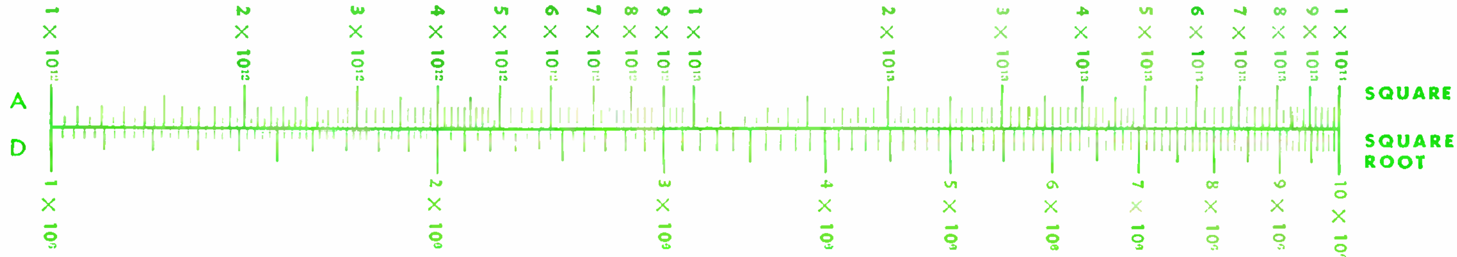
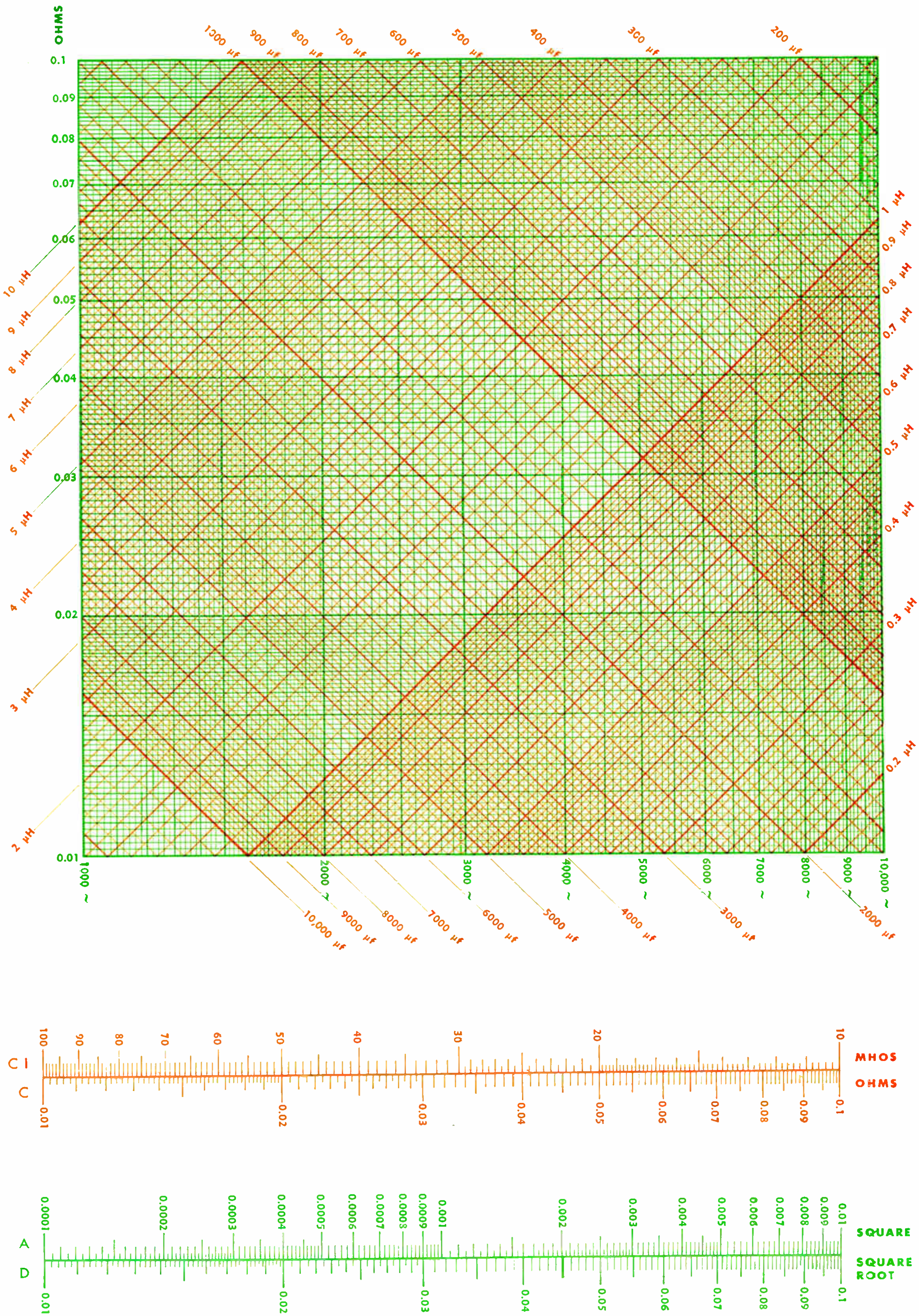
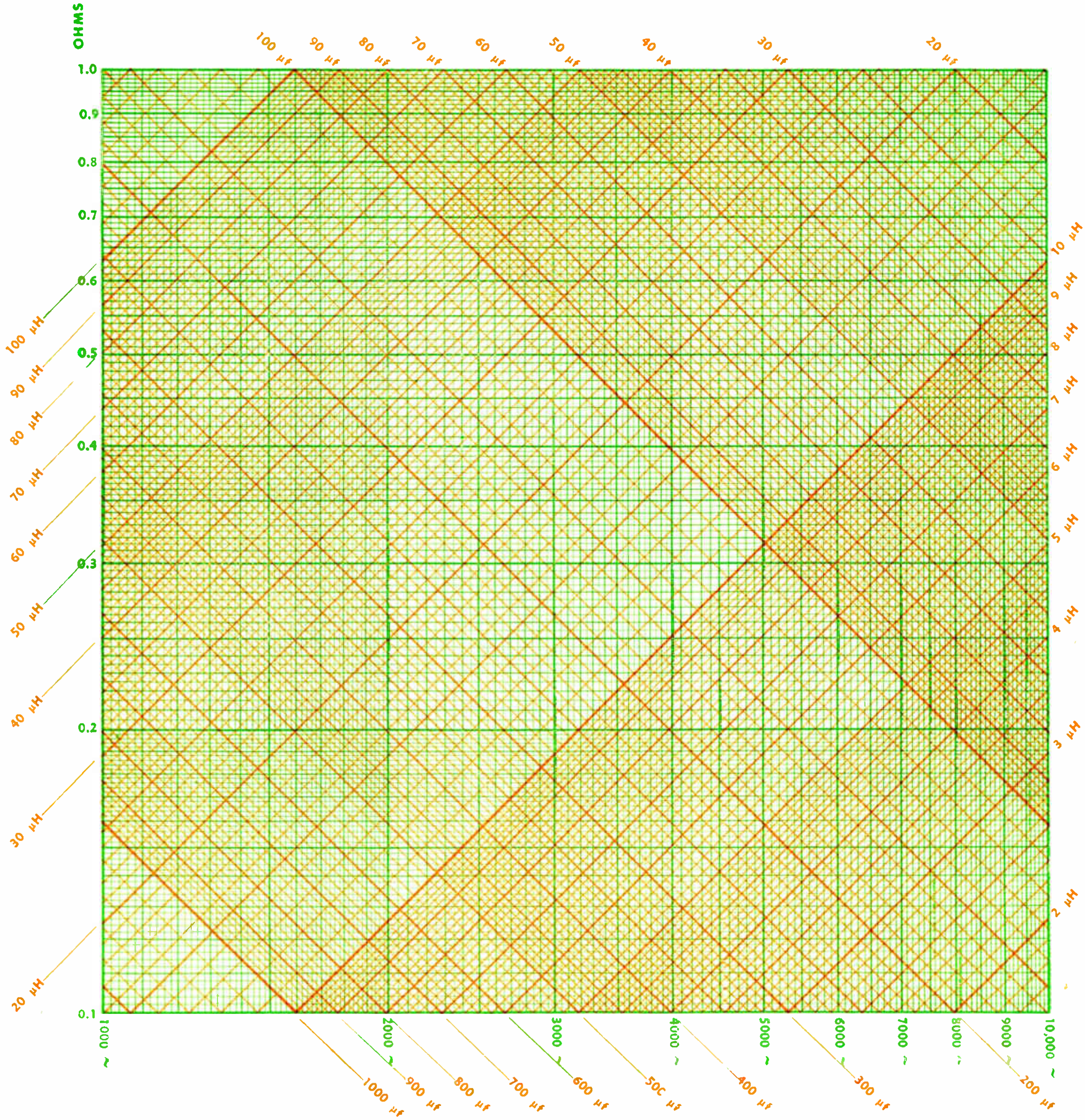

A
D
SQUARE
SQUARE ROOT

PLATE 19

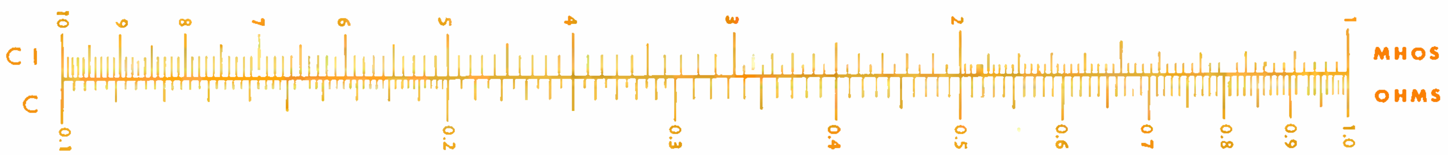


OHMS
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
1000 µf
900 µf
800 µf
700 µf
600 µf
500 µf
400 µf
300 µf
200 µf
10 µH
9 µH
8 µH
7 µH
6 µH
5 µH
4 µH
3 µH
2 µH
1 µH
0.9 µH
0.8 µH
0.7 µH
0.6 µH
0.5 µH
0.4 µH
0.3 µH
0.2 µH
1000 ~
2000 ~
3000 ~
4000 ~
5000 ~
6000 ~
7000 ~
8000 ~
9000 ~
10,000 ~
10,000 µf
9000 µf
8000 µf
7000 µf
6000 µf
5000 µf
4000 µf
3000 µf
2000 µf
CI
C
100 90 80 70 60 50 40 30 20 10
MHOS
OHMS
0.01 0.02 0.03 0.04 0.05 0.06 0.07 0.08 0.09 0.1
A
D
0.0001 0.0002 0.0003 0.0004 0.0005 0.0006 0.0007 0.0008 0.0009 0.001 0.002 0.003 0.004 0.005 0.006 0.007 0.008 0.009 0.01
SQUARE
SQUARE ROOT
0.01 0.02 0.03 0.04 0.05 0.06 0.07 0.08 0.09 0.1

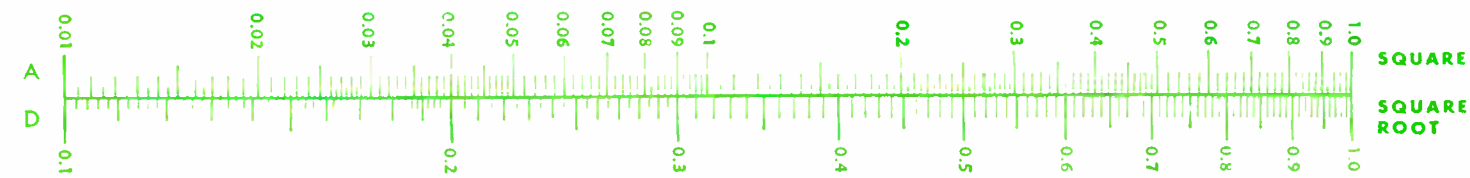
PLATE 20



OHMS
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
100 μf
90 μf
80 μf
70 μf
60 μf
50 μf
40 μf
30 μf
20 μf
100 μH
90 μH
80 μH
70 μH
60 μH
50 μH
40 μH
30 μH
20 μH
10 μH
9 μH
8 μH
7 μH
6 μH
5 μH
4 μH
3 μH
2 μH
1000 ~
2000 ~
3000 ~
4000 ~
5000 ~
6000 ~
7000 ~
8000 ~
9000
10,000 ~
1000 μf
900 μf
800 μf
700 μf
600 μf
500 μf
400 μf
300 μf
200 μf

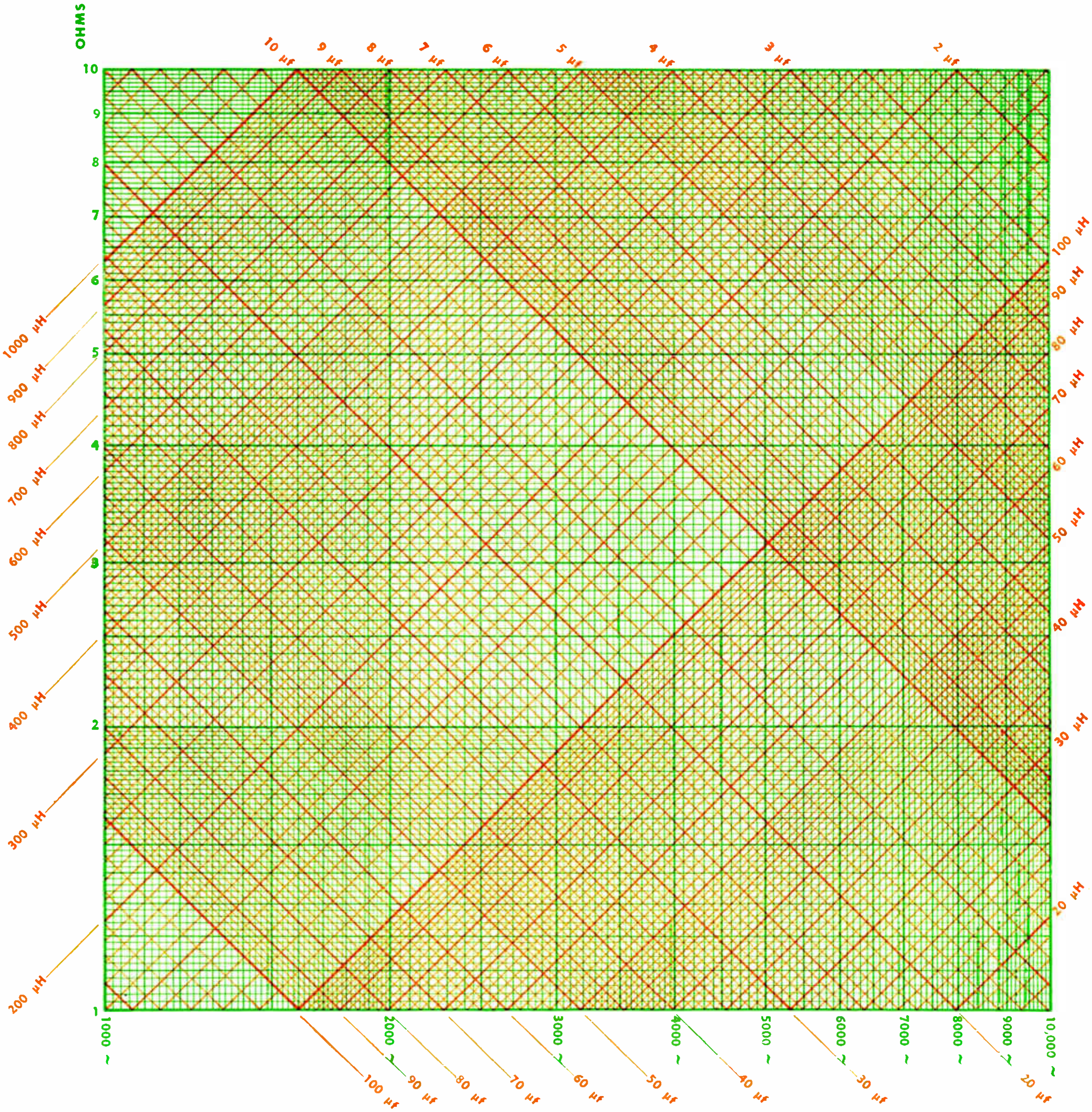


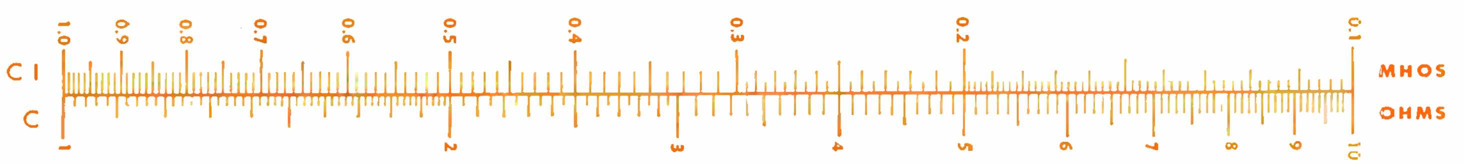
CI
C
MHOS
OHMS
10
9
8
7
6
5
4
3
2
1
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0



A
D
SQUARE
SQUARE ROOT
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0

PLATE 21


OHMS
10
9
8
7
6
5
4
3
2
1
10 μf
9 μf
8 μf
7 μf
6 μf
5 μf
4 μf
3 μf
2 μf
1000 μH
900 μH
800 μH
700 μH
600 μH
500 μH
400 μH
300 μH
200 μH
100 μH
90 μH
80 μH
70 μH
60 μH
50 μH
40 μH
30 μH
20 μH
1000 ~
2000 ~
3000 ~
4000 ~
5000 ~
6000 ~
7000 ~
8000 ~
9000 ~
10,000 ~
100 μf
90 μf
80 μf
70 μf
60 μf
50 μf
40 μf
30 μf
20 μf


CI
C
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
MHOS
OHMS
1
2
3
4
5
6
7
8
9
10

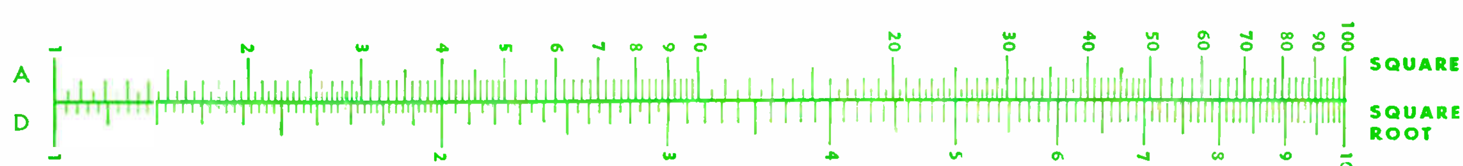
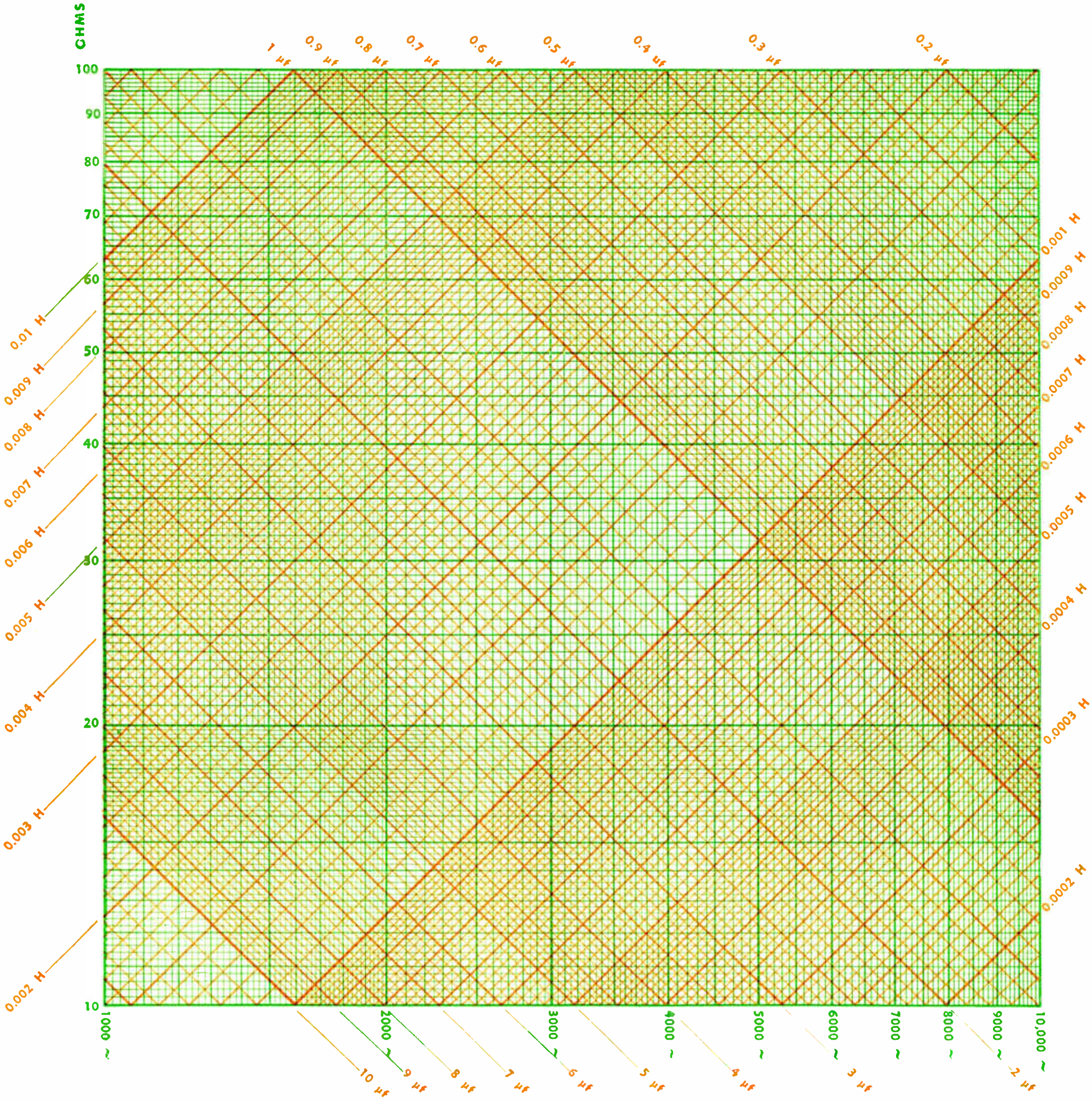
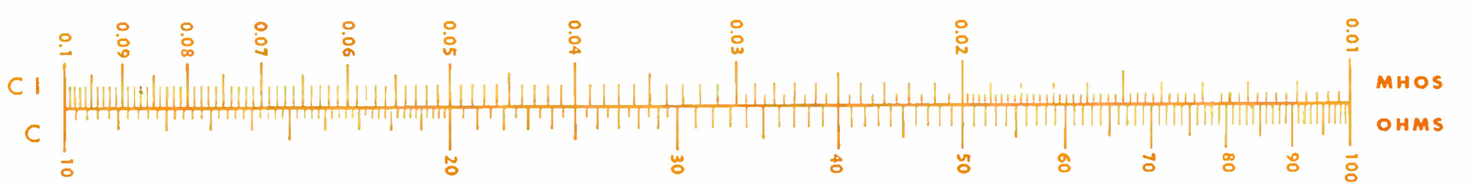

A
D
1
2
3
4
5
6
7
8
9
10
20
30
40
50
60
70
80
90
100
SQUARE
SQUARE ROOT

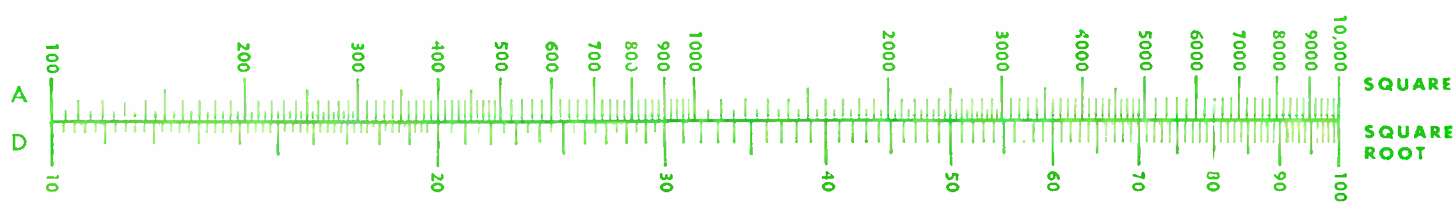
PLATE 22



OHMS
100
90
80
70
60
50
40
30
20
10
1 μf
0.9 μf
0.8 μf
0.7 μf
0.6 μf
0.5 μf
0.4 μf
0.3 μf
0.2 μf
0.01 H
0.009 H
0.008 H
0.007 H
0.006 H
0.005 H
0.004 H
0.003 H
0.002 H
0.001 H
0.0009 H
0.0008 H
0.0007 H
0.0006 H
0.0005 H
0.0004 H
0.0003 H
0.0002 H
1000 ~
2000 ~
3000 ~
4000 ~
5000 ~
6000 ~
7000 ~
8000 ~
9000 ~
10,000 ~
10 μf
9 μf
8 μf
7 μf
6 μf
5 μf
4 μf
3 μf
2 μf



CI
C
MHOS
OHMS
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
10
20
30
40
50
60
70
80
90
100



A
D
SQUARE
SQUARE ROOT
100
200
300
400
500
600
700
800
900
1000
2000
3000
4000
5000
6000
7000
8000
9000
10,000
10
20
30
40
50
60
70
80
90
100

PLATE 23

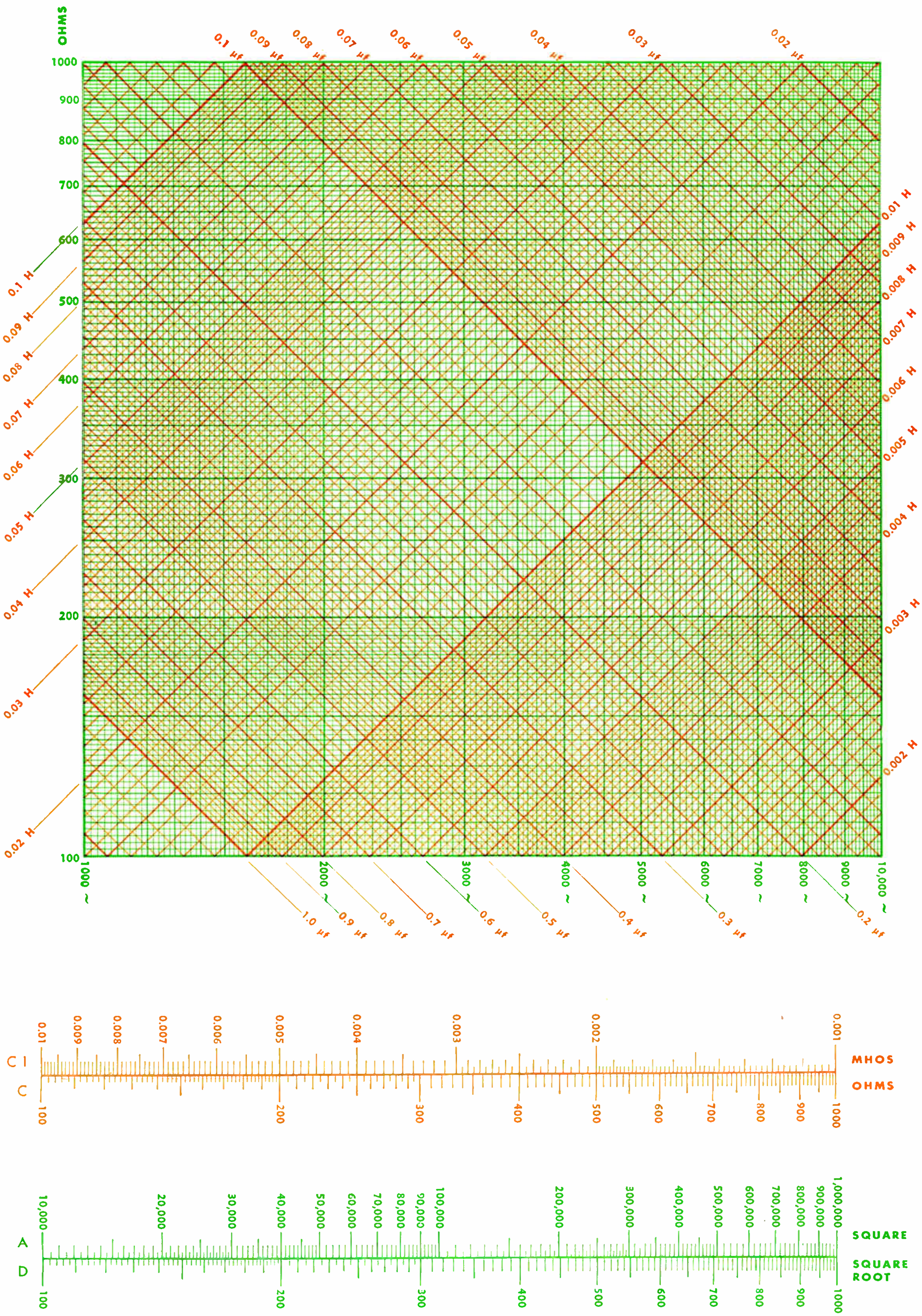
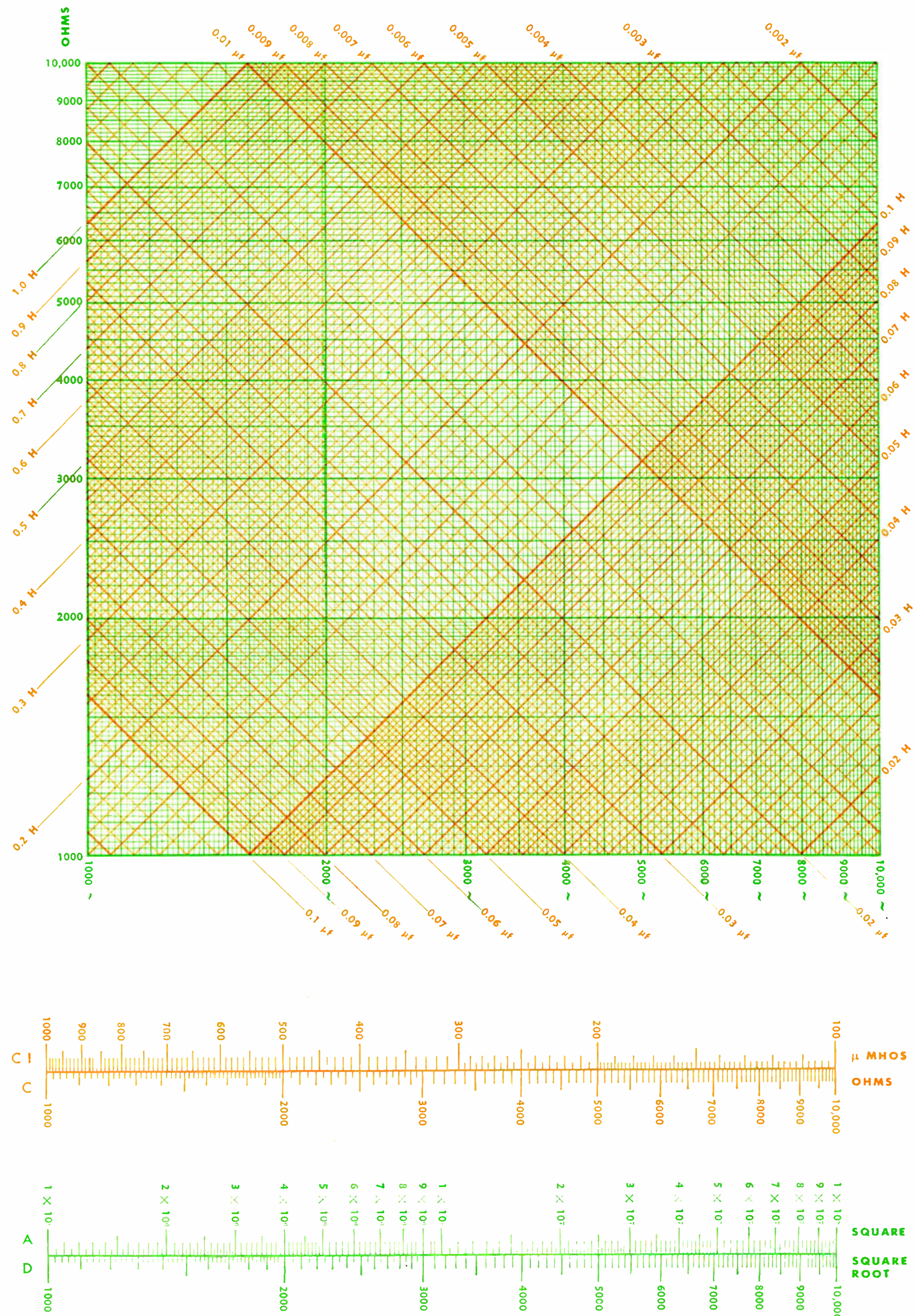

OHMS
1000
900
800
700
600
500
400
300
200
100
0.1 μf
0.09 μf
0.08 μf
0.07 μf
0.06 μf
0.05 μf
0.04 μf
0.03 μf
0.02 μf
0.1 H
0.09 H
0.08 H
0.07 H
0.06 H
0.05 H
0.04 H
0.03 H
0.02 H
0.01 H
0.009 H
0.008 H
0.007 H
0.006 H
0.005 H
0.004 H
0.003 H
0.002 H
1000 ~
2000 ~
3000 ~
4000 ~
5000 ~
6000 ~
7000 ~
8000 ~
9000 ~
10,000 ~
1.0 μf
0.9 μf
0.8 μf
0.7 μf
0.6 μf
0.5 μf
0.4 μf
0.3 μf
0.2 μf
C I
C
MHOS
OHMS
0.01
0.009
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
100
200
300
400
500
600
700
800
900
1000
A
D
SQUARE
SQUARE ROOT
10,000
20,000
30,000
40,000
50,000
60,000
70,000
80,000
90,000
100,000
200,000
300,000
400,000
500,000
600,000
700,000
800,000
900,000
1,000,000
100
200
300
400
500
600
700
800
900
1000

PLATE 24



OHMS
10,000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0.01 μf
0.009 μf
0.008 μf
0.007 μf
0.006 μf
0.005 μf
0.004 μf
0.003 μf
0.002 μf
1.0 H
0.9 H
0.8 H
0.7 H
0.6 H
0.5 H
0.4 H
0.3 H
0.2 H
0.1 H
0.09 H
0.08 H
0.07 H
0.06 H
0.05 H
0.04 H
0.03 H
0.02 H
1000 ~
2000 ~
3000 ~
4000 ~
5000 ~
6000 ~
7000 ~
8000 ~
9000 ~
10,000 ~
0.1 μf
0.09 μf
0.08 μf
0.07 μf
0.06 μf
0.05 μf
0.04 μf
0.03 μf
0.02 μf
CI
C
μ MHOS
OHMS
A
D
SQUARE
SQUARE ROOT

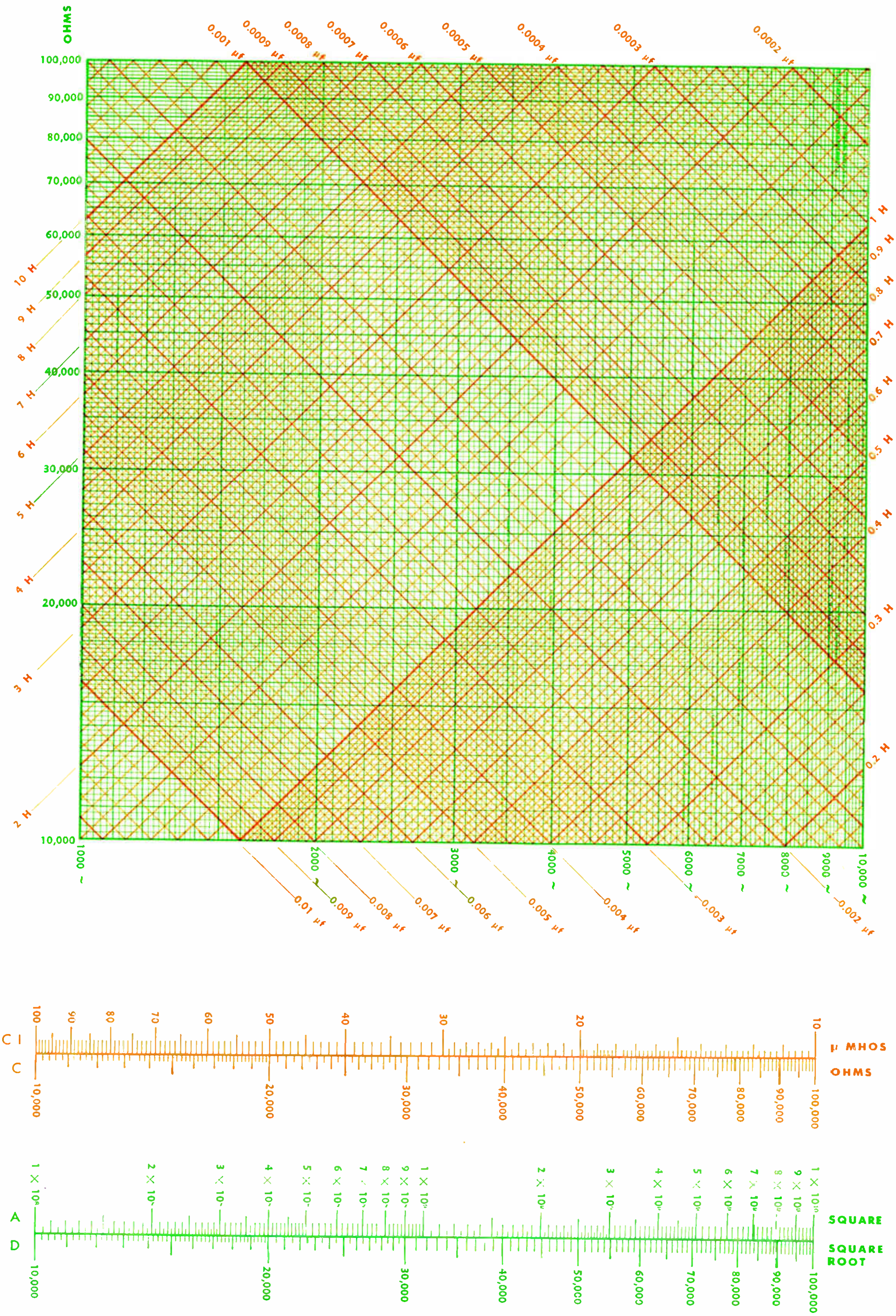
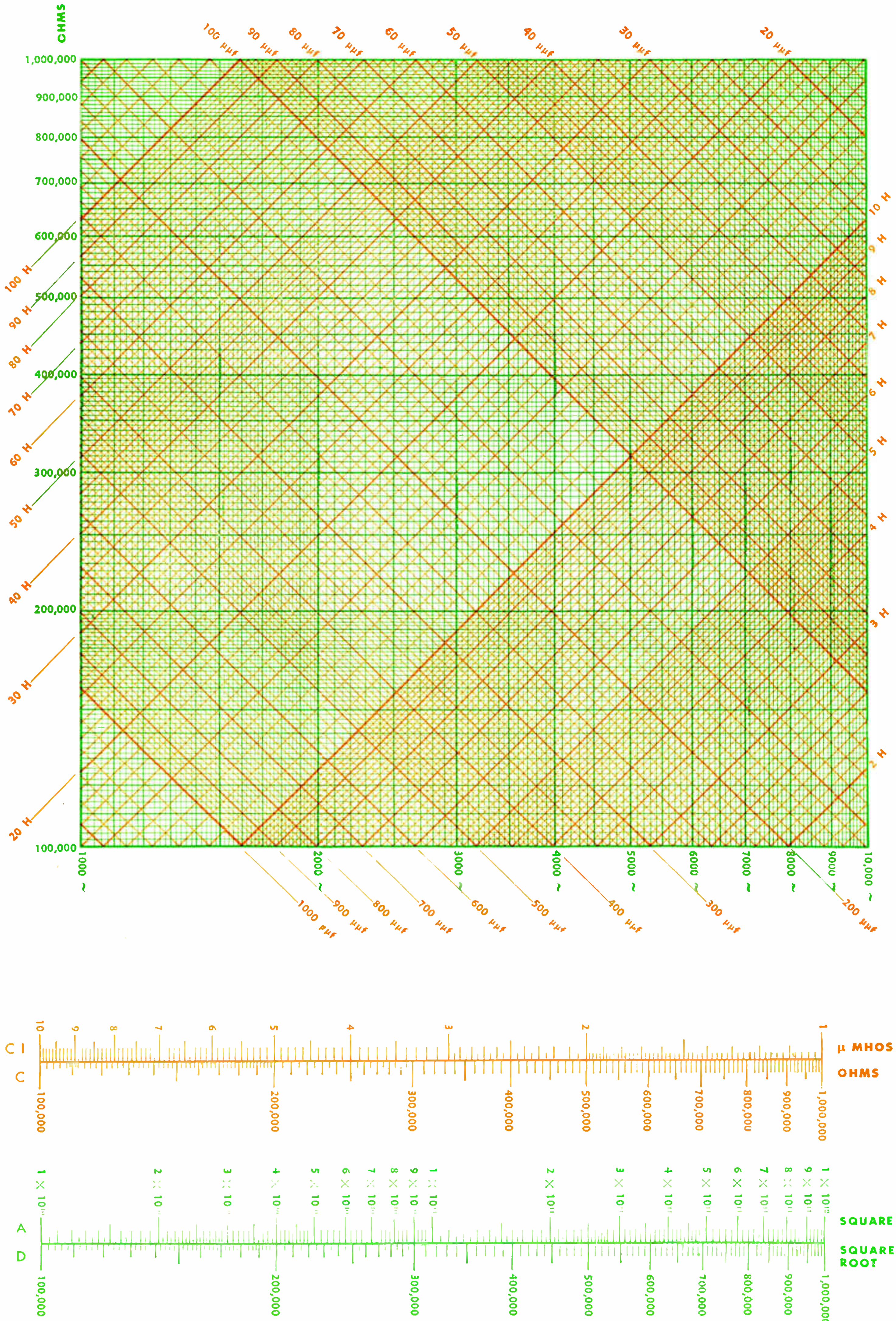
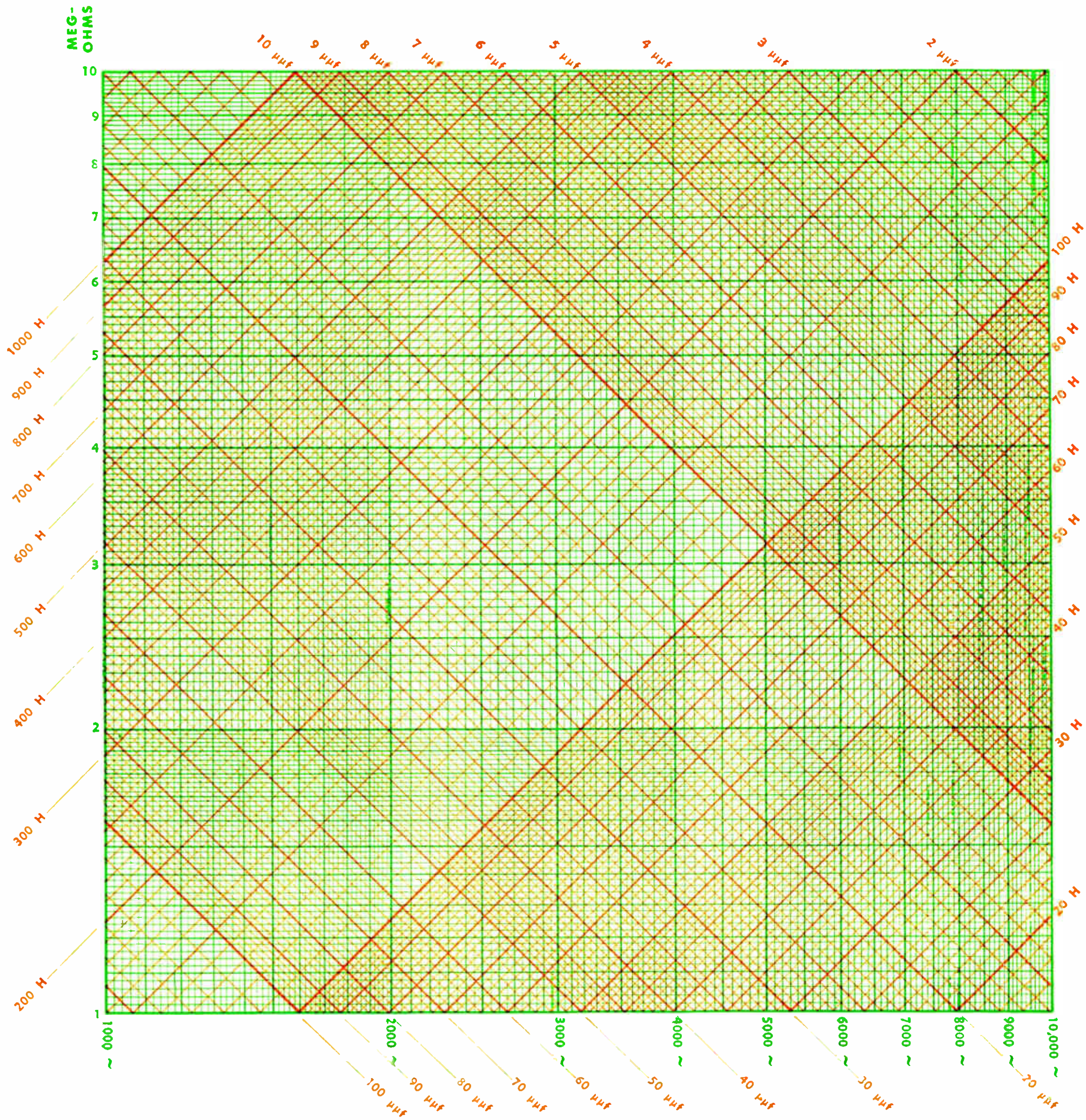
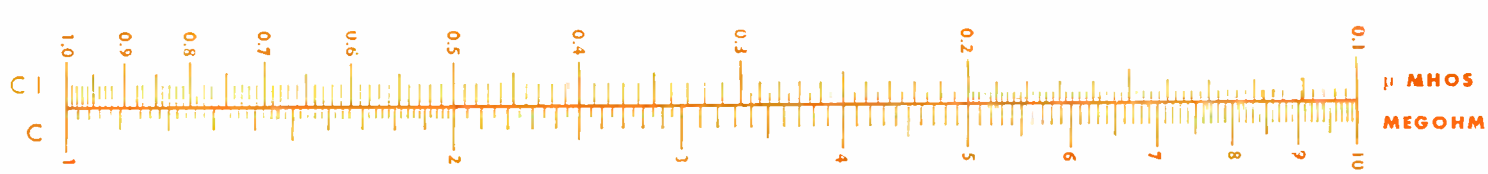

OHMS
100,000
90,000
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0.001 μf
0.0009 μf
0.0008 μf
0.0007 μf
0.0006 μf
0.0005 μf
0.0004 μf
0.0003 μf
0.0002 μf
10 H
9 H
8 H
7 H
6 H
5 H
4 H
3 H
2 H
1 H
0.9 H
0.8 H
0.7 H
0.6 H
0.5 H
0.4 H
0.3 H
0.2 H
1000 ~
2000 ~
3000 ~
4000 ~
5000 ~
6000 ~
7000 ~
8000 ~
9000 ~
10,000 ~
0.01 μf
0.009 μf
0.008 μf
0.007 μf
0.006 μf
0.005 μf
0.004 μf
0.003 μf
0.002 μf
CI
C
μ MHOS
OHMS
100
90
80
70
60
50
40
30
20
10
10,000
20,000
30,000
40,000
50,000
60,000
70,000
80,000
90,000
100,000
A
D
SQUARE
SQUARE ROOT

PLATE 26


OHMS
1,000,000
900,000
800,000
700,000
600,000
500,000
400,000
300,000
200,000
100,000
100 μμf
90 μμf
80 μμf
70 μμf
60 μμf
50 μμf
40 μμf
30 μμf
20 μμf
100 H
90 H
80 H
70 H
60 H
50 H
40 H
30 H
20 H
10 H
9 H
8 H
7 H
6 H
5 H
4 H
3 H
2 H
1000 ~
2000 ~
3000 ~
4000 ~
5000 ~
6000 ~
7000 ~
8000 ~
9000 ~
10,000 ~
1000 μμf
900 μμf
800 μμf
700 μμf
600 μμf
500 μμf
400 μμf
300 μμf
200 μμf
CI
C
μ MHOS
OHMS
A
D
SQUARE
SQUARE ROOT


MEG-OHMS
10
9
8
7
6
5
4
3
2
1
10 μμf
9 μμf
8 μμf
7 μμf
6 μμf
5 μμf
4 μμf
3 μμf
2 μμf
1000 H
900 H
800 H
700 H
600 H
500 H
400 H
300 H
200 H
100 H
90 H
80 H
70 H
60 H
50 H
40 H
30 H
20 H
1000 ~
2000 ~
3000 ~
4000 ~
5000 ~
6000 ~
7000 ~
8000 ~
9000 ~
10,000 ~
100 μμf
90 μμf
80 μμf
70 μμf
60 μμf
50 μμf
40 μμf
30 μμf
20 μμf


CI
C
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
μ MHOS
MEGOHMS
1
2
3
4
5
6
7
8
9
10

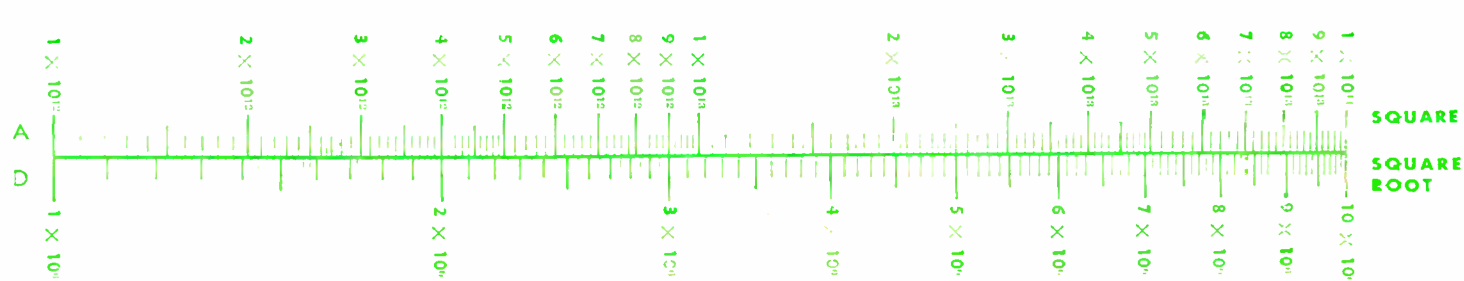
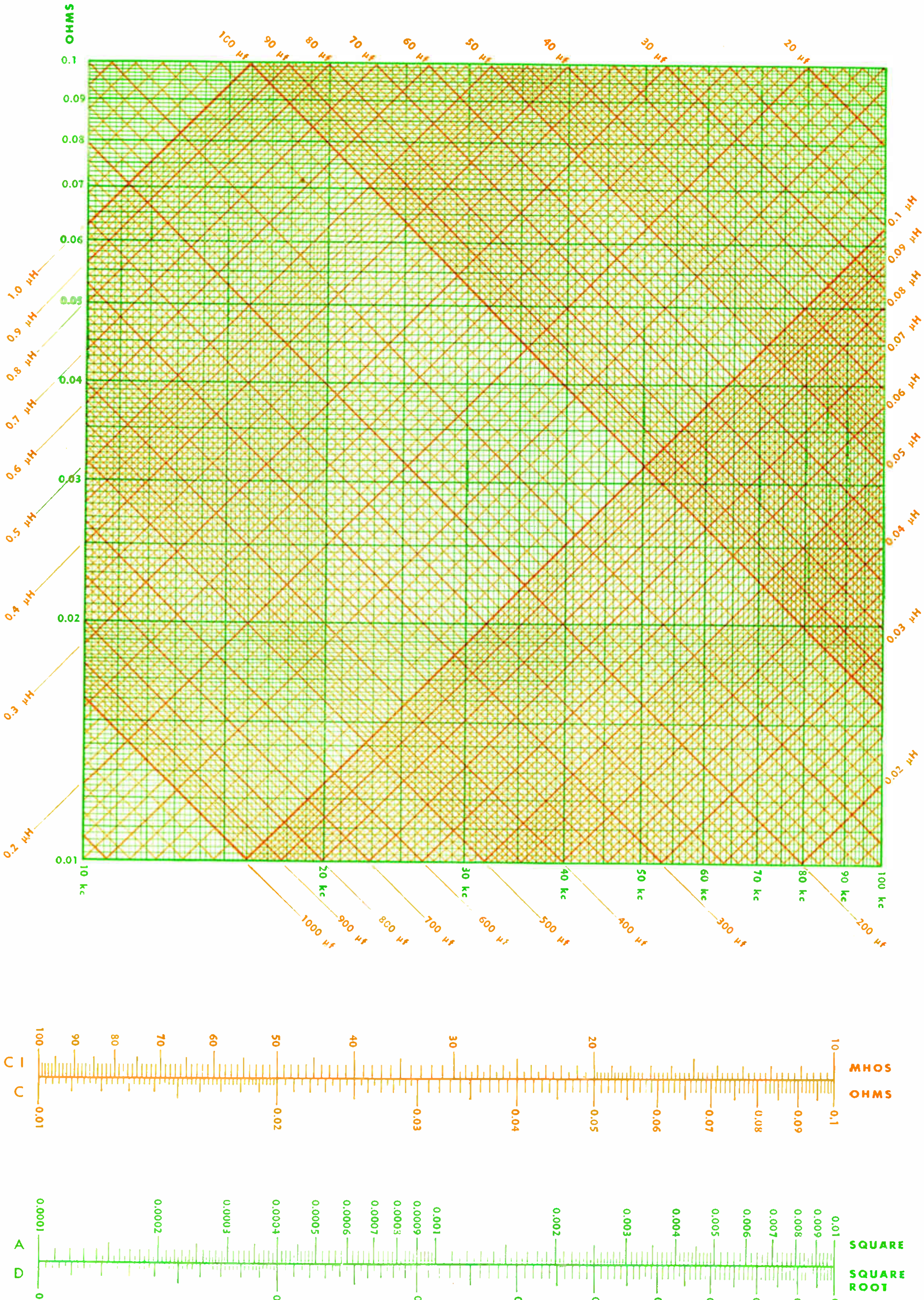
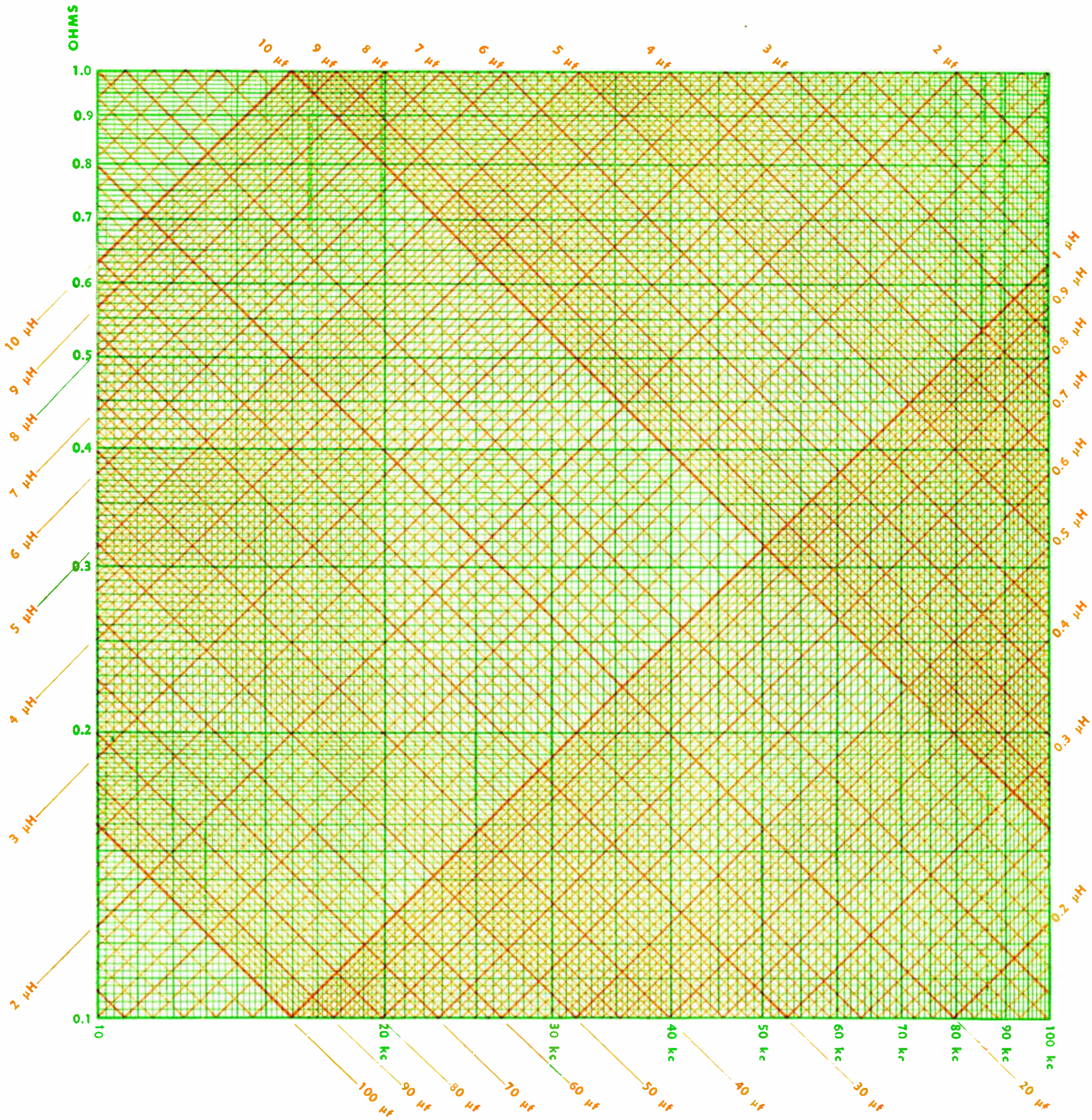
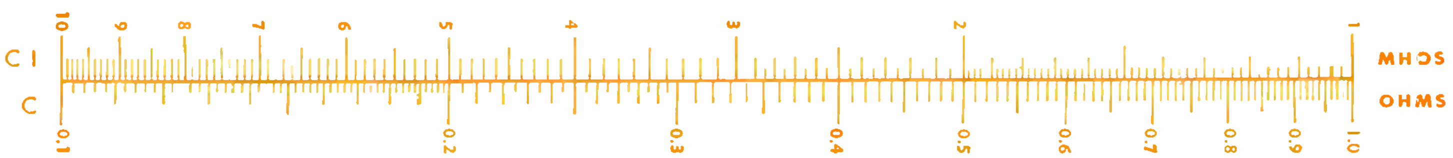

A
D
SQUARE
SQUARE ROOT
1 × 10¹²
2 × 10¹²
3 × 10¹²
4 × 10¹²
5 × 10¹²
6 × 10¹²
7 × 10¹²
8 × 10¹²
9 × 10¹²
1 × 10¹³
2 × 10¹³
3 × 10¹³
4 × 10¹³
5 × 10¹³
6 × 10¹³
7 × 10¹³
8 × 10¹³
9 × 10¹³
1 × 10¹⁴
1 × 10⁶
2 × 10⁶
3 × 10⁶
4 × 10⁶
5 × 10⁶
6 × 10⁶
7 × 10⁶
8 × 10⁶
9 × 10⁶
10 × 10⁶

PLATE 28



OHMS
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
100 μf
90 μf
80 μf
70 μf
60 μf
50 μf
40 μf
30 μf
20 μf
1.0 μH
0.9 μH
0.8 μH
0.7 μH
0.6 μH
0.5 μH
0.4 μH
0.3 μH
0.2 μH
0.1 μH
0.09 μH
0.08 μH
0.07 μH
0.06 μH
0.05 μH
0.04 μH
0.03 μH
0.02 μH
10 kc
20 kc
30 kc
40 kc
50 kc
60 kc
70 kc
80 kc
90 kc
100 kc
1000 μf
900 μf
800 μf
700 μf
600 μf
500 μf
400 μf
300 μf
200 μf
CI
C
MHOS
OHMS
A
D
SQUARE
SQUARE ROOT


OHMS
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
10 μf
9 μf
8 μf
7 μf
6 μf
5 μf
4 μf
3 μf
2 μf
10 μH
9 μH
8 μH
7 μH
6 μH
5 μH
4 μH
3 μH
2 μH
1 μH
0.9 μH
0.8 μH
0.7 μH
0.6 μH
0.5 μH
0.4 μH
0.3 μH
0.2 μH
10
20 kc
30 kc
40 kc
50 kc
60 kc
70 kc
80 kc
90 kc
100 kc
100 μf
90 μf
80 μf
70 μf
60 μf
50 μf
40 μf
30 μf
20 μf


CI
C
MHOS
OHMS

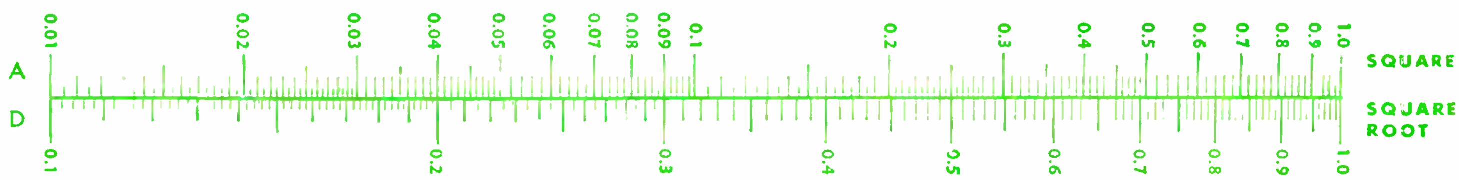
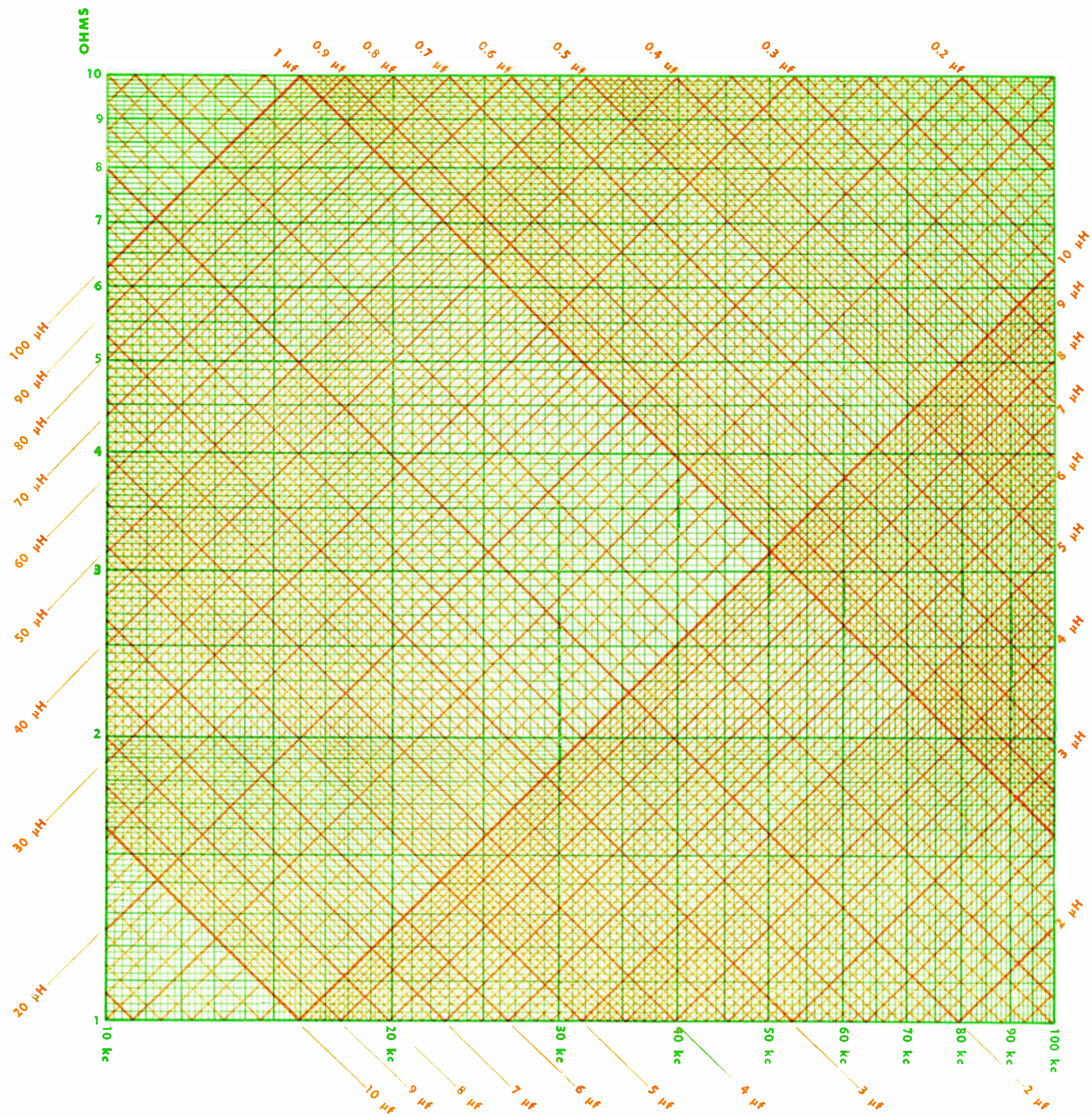
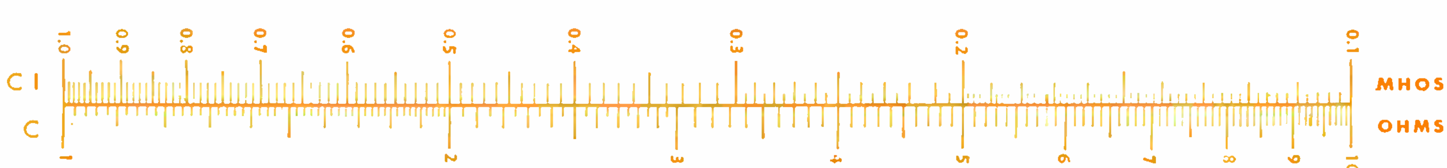

A
D
SQUARE
SQUARE ROOT

PLATE 30


OHMS
1 µf
0.9 µf
0.8 µf
0.7 µf
0.6 µf
0.5 µf
0.4 µf
0.3 µf
0.2 µf
10
9
8
7
6
5
4
3
2
1
100 µH
90 µH
80 µH
70 µH
60 µH
50 µH
40 µH
30 µH
20 µH
10 µH
9 µH
8 µH
7 µH
6 µH
5 µH
4 µH
3 µH
2 µH
10 kc
20 kc
30 kc
40 kc
50 kc
60 kc
70 kc
80 kc
90 kc
100 kc
10 µf
9 µf
8 µf
7 µf
6 µf
5 µf
4 µf
3 µf
2 µf


CI
C
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
MHOS
OHMS
1
2
3
4
5
6
7
8
9
10

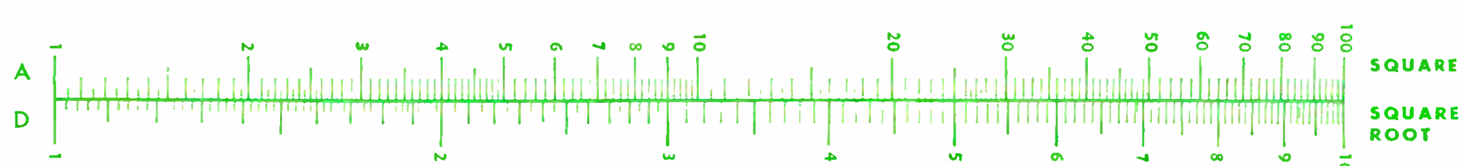
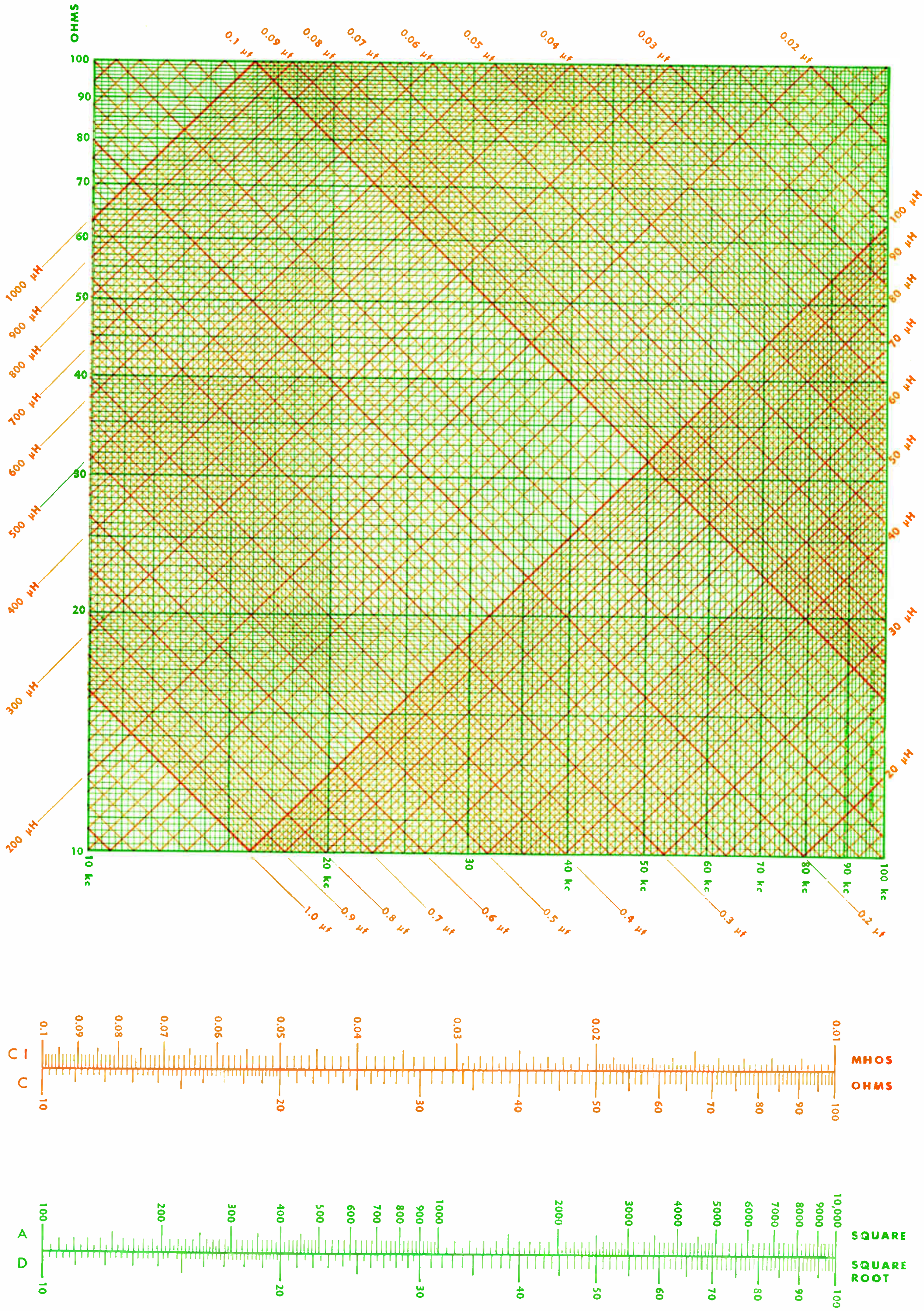
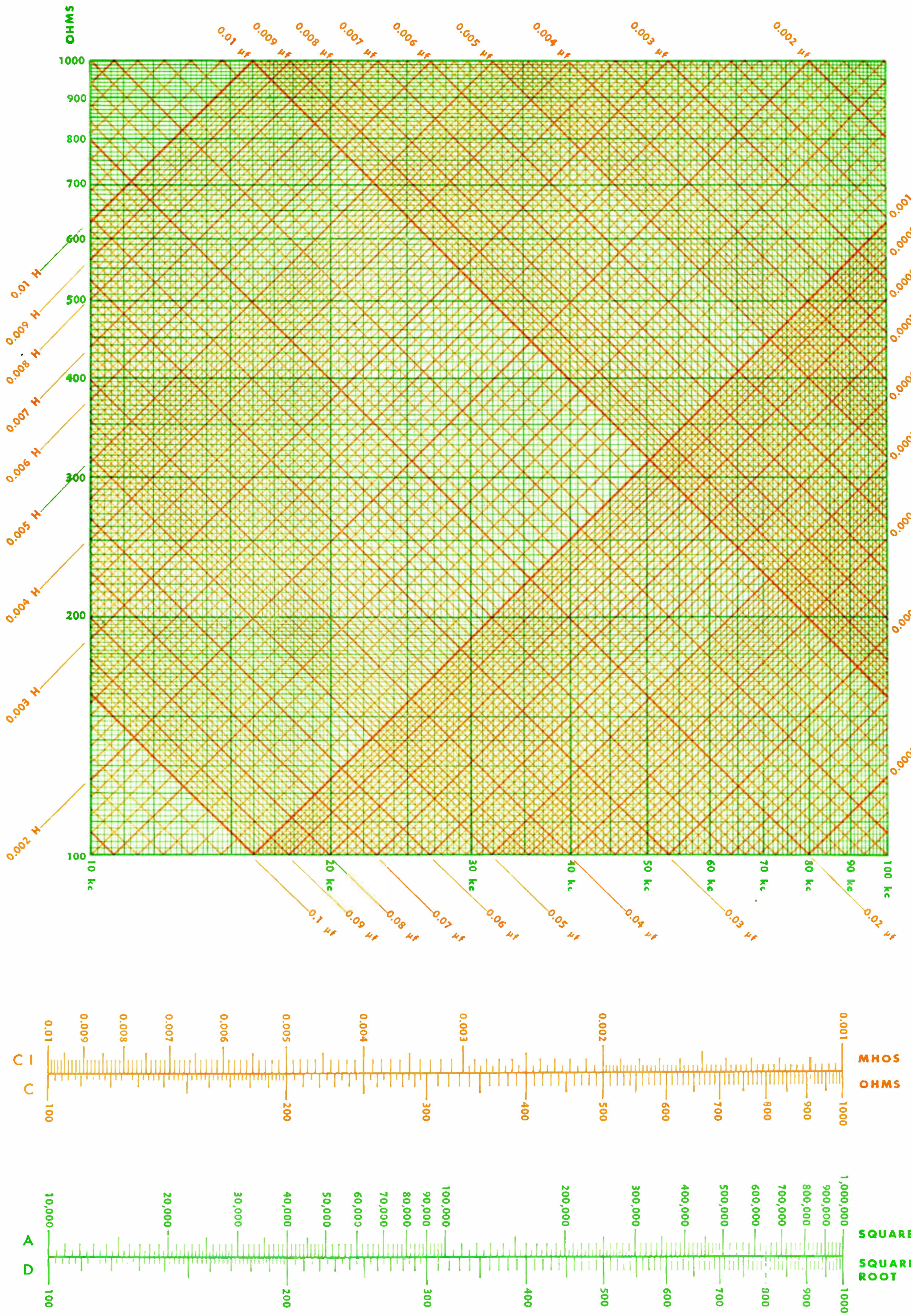

A
D
1
2
3
4
5
6
7
8
9
10
20
30
40
50
60
70
80
90
100
SQUARE
SQUARE ROOT

PLATE 31



OHMS
100
90
80
70
60
50
40
30
20
10
0.1 μf
0.09 μf
0.08 μf
0.07 μf
0.06 μf
0.05 μf
0.04 μf
0.03 μf
0.02 μf
1000 μH
900 μH
800 μH
700 μH
600 μH
500 μH
400 μH
300 μH
200 μH
100 μH
90 μH
80 μH
70 μH
60 μH
50 μH
40 μH
30 μH
20 μH
10 kc
20 kc
30
40 kc
50 kc
60 kc
70 kc
80 kc
90 kc
100 kc
1.0 μf
0.9 μf
0.8 μf
0.7 μf
0.6 μf
0.5 μf
0.4 μf
0.3 μf
0.2 μf
CI
C
MHOS
OHMS
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
10
20
30
40
50
60
70
80
90
100
A
D
SQUARE
SQUARE ROOT
100
200
300
400
500
600
700
800
900
1000
2000
3000
4000
5000
6000
7000
8000
9000
10,000
10
20
30
40
50
60
70
80
90
100

PLATE 32



OHMS
1000
900
800
700
600
500
400
300
200
100
0.01 μf
0.009 μf
0.008 μf
0.007 μf
0.006 μf
0.005 μf
0.004 μf
0.003 μf
0.002 μf
0.01 H
0.009 H
0.008 H
0.007 H
0.006 H
0.005 H
0.004 H
0.003 H
0.002 H
0.001 H
0.0009 H
0.0008 H
0.0007 H
0.0006 H
0.0005 H
0.0004 H
0.0003 H
0.0002 H
10 kc
20 kc
30 kc
40 kc
50 kc
60 kc
70 kc
80 kc
90 kc
100 kc
0.1 μf
0.09 μf
0.08 μf
0.07 μf
0.06 μf
0.05 μf
0.04 μf
0.03 μf
0.02 μf
CI
C
0.01
0.009
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
MHOS
OHMS
100
200
300
400
500
600
700
800
900
1000
A
D
10,000
20,000
30,000
40,000
50,000
60,000
70,000
80,000
90,000
100,000
200,000
300,000
400,000
500,000
600,000
700,000
800,000
900,000
1,000,000
SQUARE
SQUARE ROOT
100
200
300
400
500
600
700
800
900
1000

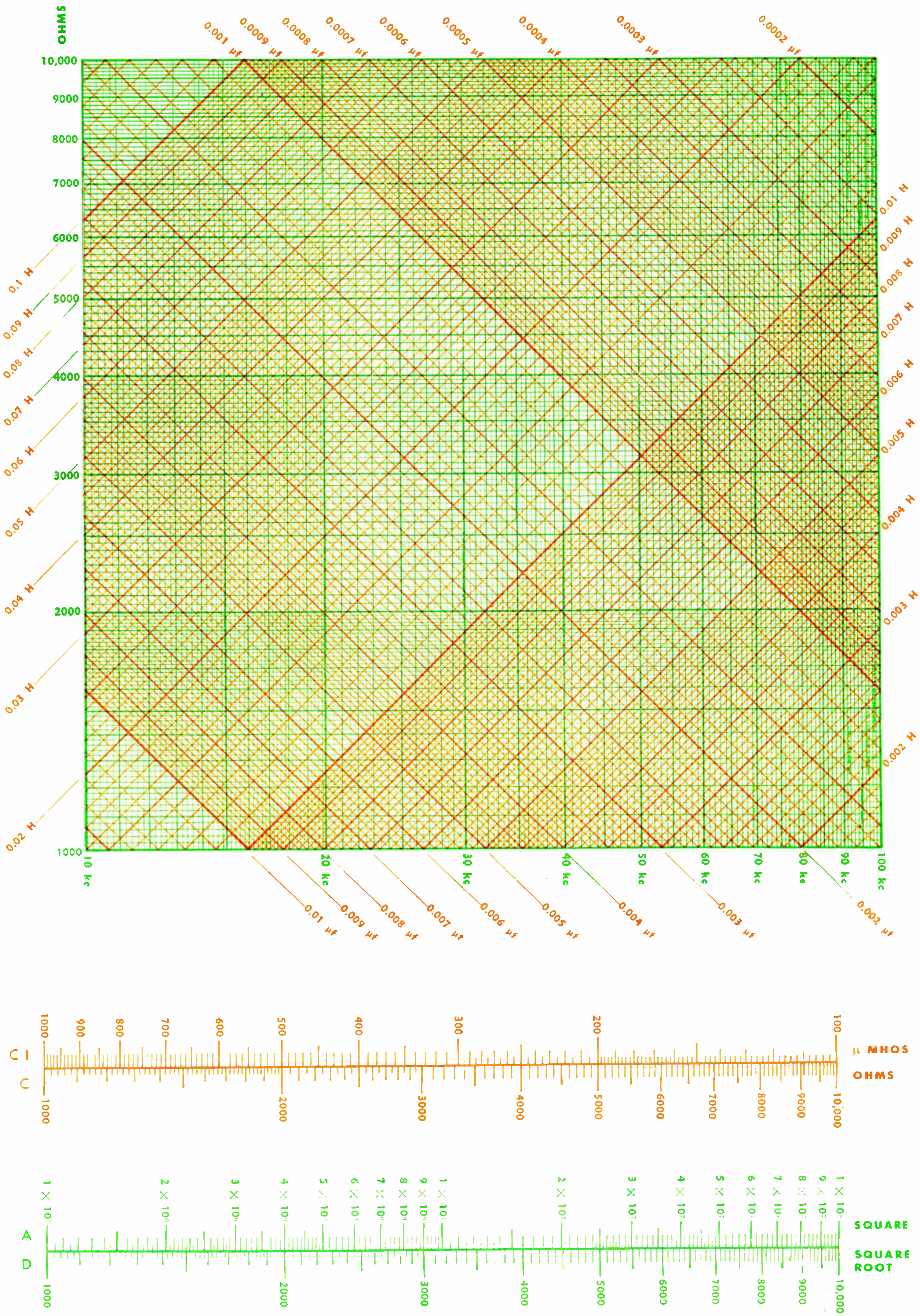
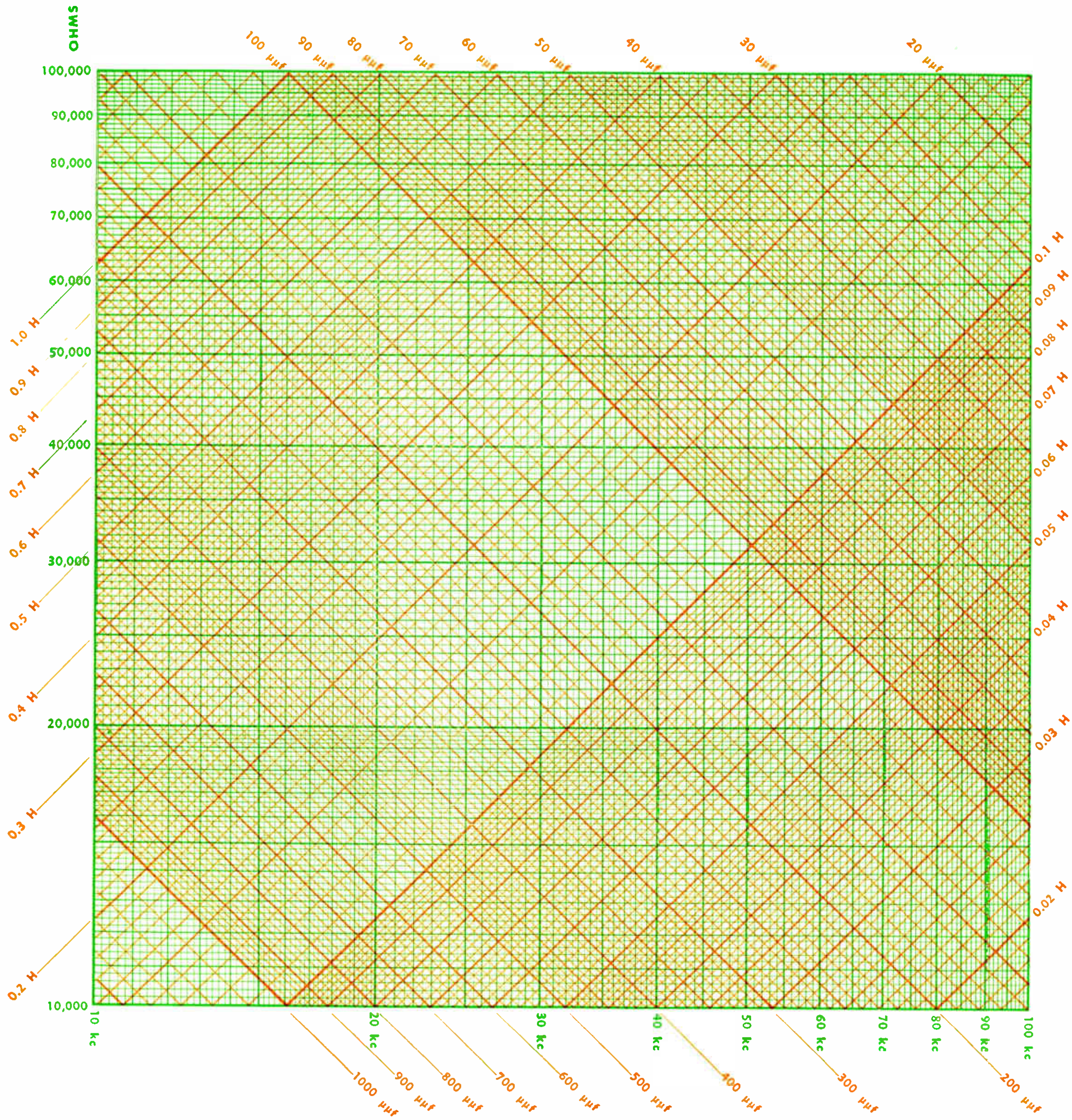
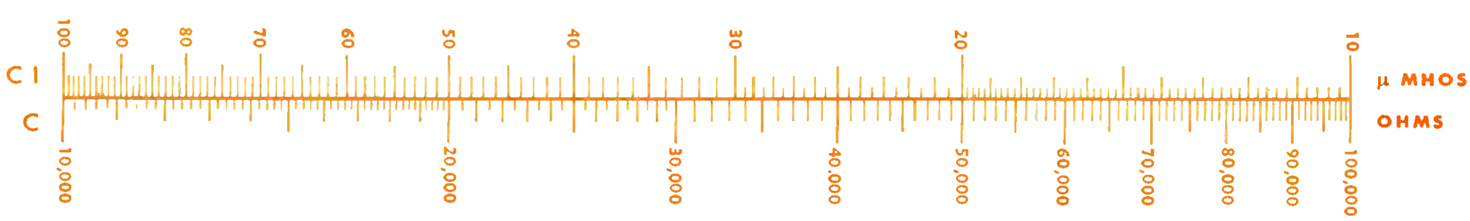
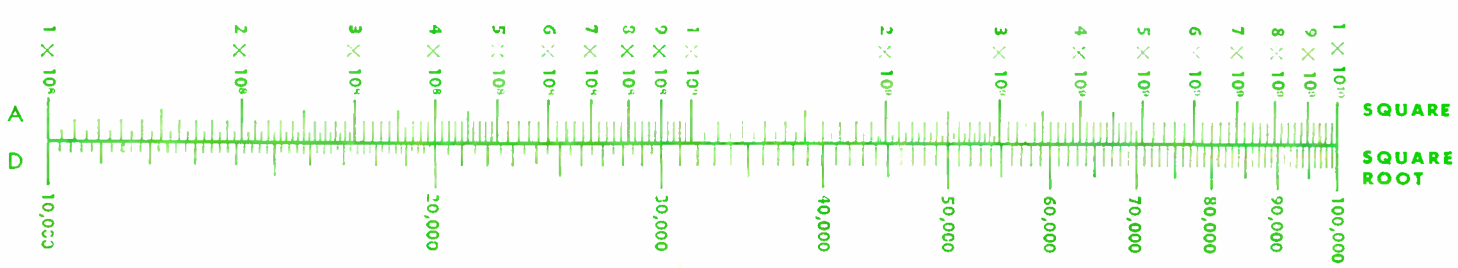

OHMS
10,000
9000
8000
7000
6000
5000
4000
3000
2000
1000
10 kc
20 kc
30 kc
40 kc
50 kc
60 kc
70 kc
80 kc
90 kc
100 kc
0.001 μf
0.0009 μf
0.0008 μf
0.0007 μf
0.0006 μf
0.0005 μf
0.0004 μf
0.0003 μf
0.0002 μf
0.1 H
0.09 H
0.08 H
0.07 H
0.06 H
0.05 H
0.04 H
0.03 H
0.02 H
0.01 H
0.009 H
0.008 H
0.007 H
0.006 H
0.005 H
0.004 H
0.003 H
0.002 H
0.01 μf
0.009 μf
0.008 μf
0.007 μf
0.006 μf
0.005 μf
0.004 μf
0.003 μf
0.002 μf
CI
C
μ MHOS
OHMS
A
D
SQUARE
SQUARE ROOT

PLATE 34


OHMS
100,000
90,000
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
100 μμf
90 μμf
80 μμf
70 μμf
60 μμf
50 μμf
40 μμf
30 μμf
20 μμf
1.0 H
0.9 H
0.8 H
0.7 H
0.6 H
0.5 H
0.4 H
0.3 H
0.2 H
0.1 H
0.09 H
0.08 H
0.07 H
0.06 H
0.05 H
0.04 H
0.03 H
0.02 H
10 kc
20 kc
30 kc
40 kc
50 kc
60 kc
70 kc
80 kc
90 kc
100 kc
1000 μμf
900 μμf
800 μμf
700 μμf
600 μμf
500 μμf
400 μμf
300 μμf
200 μμf


C I
C
100
90
80
70
60
50
40
30
20
10
μ MHOS
OHMS
10,000
20,000
30,000
40,000
50,000
60,000
70,000
80,000
90,000
100,000


A
D
SQUARE
SQUARE ROOT
10,000
20,000
30,000
40,000
50,000
60,000
70,000
80,000
90,000
100,000

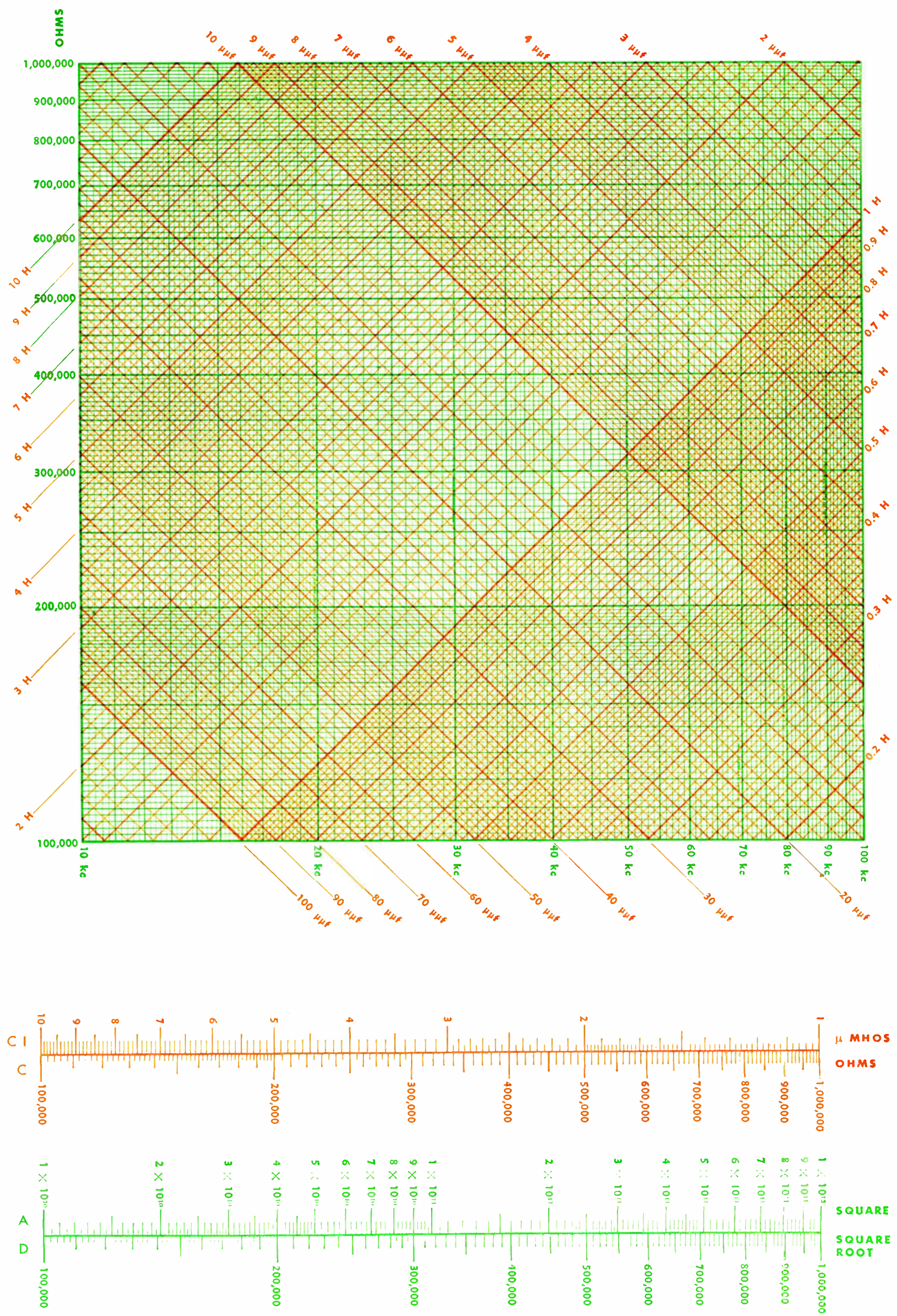
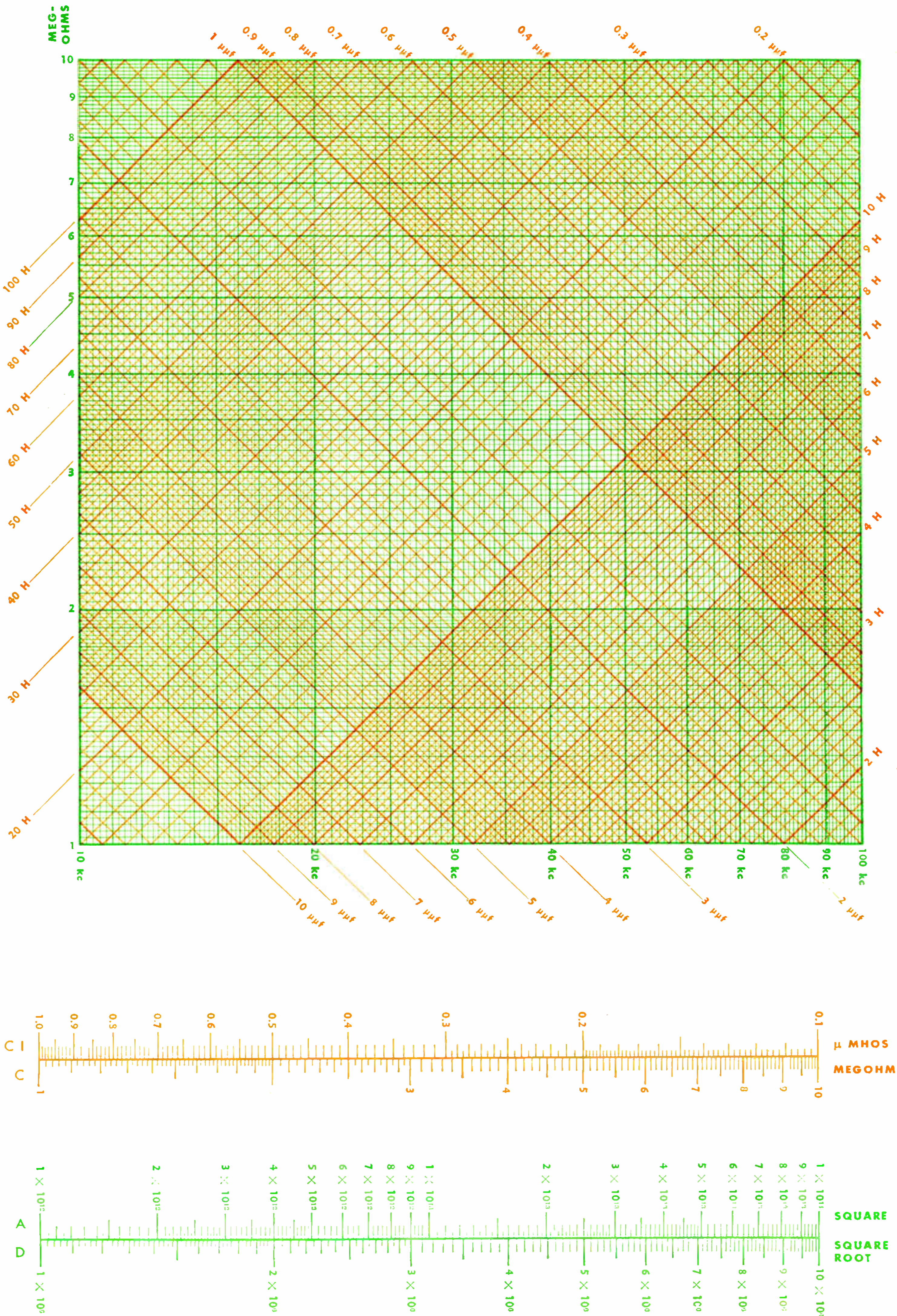
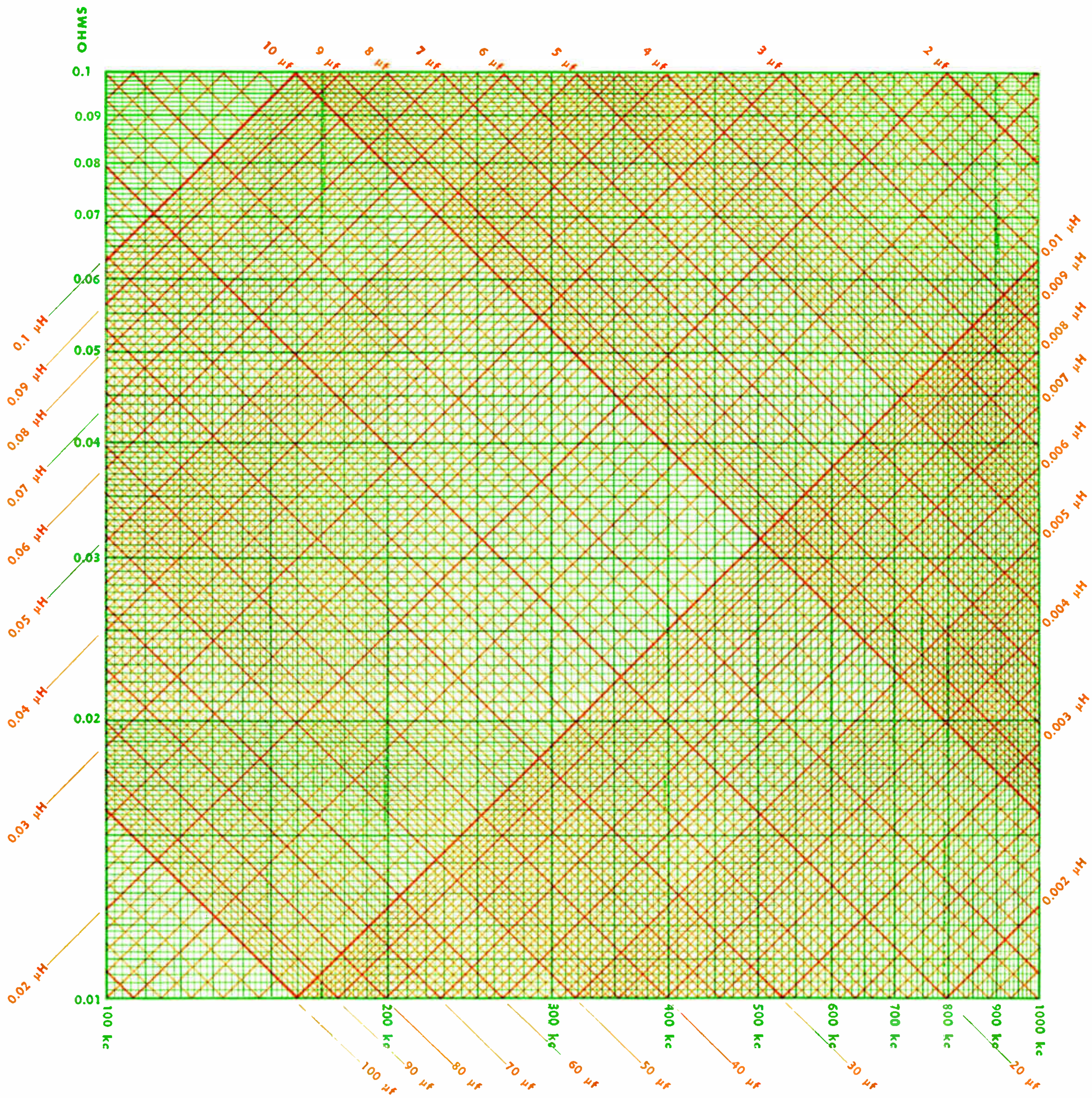
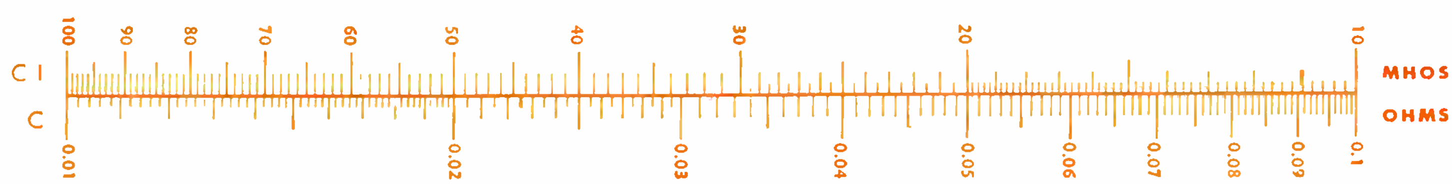

OHMS
1,000,000
900,000
800,000
700,000
600,000
500,000
400,000
300,000
200,000
100,000
10 H
9 H
8 H
7 H
6 H
5 H
4 H
3 H
2 H
1 H
0.9 H
0.8 H
0.7 H
0.6 H
0.5 H
0.4 H
0.3 H
0.2 H
10 μμf
9 μμf
8 μμf
7 μμf
6 μμf
5 μμf
4 μμf
3 μμf
2 μμf
10 kc
20 kc
30 kc
40 kc
50 kc
60 kc
70 kc
80 kc
90 kc
100 kc
100 μμf
90 μμf
80 μμf
70 μμf
60 μμf
50 μμf
40 μμf
30 μμf
20 μμf
CI
C
μ MHOS
OHMS
10 9 8 7 6 5 4 3 2 1
100,000 200,000 300,000 400,000 500,000 600,000 700,000 800,000 900,000 1,000,000
A
D
SQUARE
SQUARE ROOT
1 × 10¹⁰ 2 × 10¹⁰ 3 × 10¹⁰ 4 × 10¹⁰ 5 × 10¹⁰ 6 × 10¹⁰ 7 × 10¹⁰ 8 × 10¹⁰ 9 × 10¹⁰ 1 × 10¹¹
2 × 10¹¹ 3 × 10¹¹ 4 × 10¹¹ 5 × 10¹¹ 6 × 10¹¹ 7 × 10¹¹ 8 × 10¹¹ 9 × 10¹¹ 1 × 10¹²
100,000 200,000 300,000 400,000 500,000 600,000 700,000 800,000 900,000 1,000,000

PLATE 36


MEG-OHMS
10
9
8
7
6
5
4
3
2
1
1 μμf
0.9 μμf
0.8 μμf
0.7 μμf
0.6 μμf
0.5 μμf
0.4 μμf
0.3 μμf
0.2 μμf
100 H
90 H
80 H
70 H
60 H
50 H
40 H
30 H
20 H
10 H
9 H
8 H
7 H
6 H
5 H
4 H
3 H
2 H
10 kc
20 kc
30 kc
40 kc
50 kc
60 kc
70 kc
80 kc
90 kc
100 kc
10 μμf
9 μμf
8 μμf
7 μμf
6 μμf
5 μμf
4 μμf
3 μμf
2 μμf
CI
C
μ MHOS
MEGOHMS
A
D
SQUARE
SQUARE ROOT


OHMS
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
10 µf
9 µf
8 µf
7 µf
6 µf
5 µf
4 µf
3 µf
2 µf
0.1 µH
0.09 µH
0.08 µH
0.07 µH
0.06 µH
0.05 µH
0.04 µH
0.03 µH
0.02 µH
0.01 µH
0.009 µH
0.008 µH
0.007 µH
0.006 µH
0.005 µH
0.004 µH
0.003 µH
0.002 µH
100 kc
200 kc
300 kc
400 kc
500 kc
600 kc
700 kc
800 kc
900 kc
1000 kc
100 µf
90 µf
80 µf
70 µf
60 µf
50 µf
40 µf
30 µf
20 µf


CI
C
MHOS
OHMS
100 90 80 70 60 50 40 30 20 10
0.01 0.02 0.03 0.04 0.05 0.06 0.07 0.08 0.09 0.1

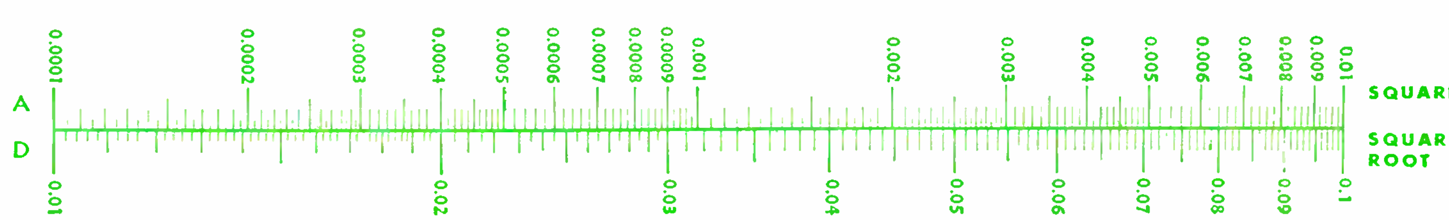
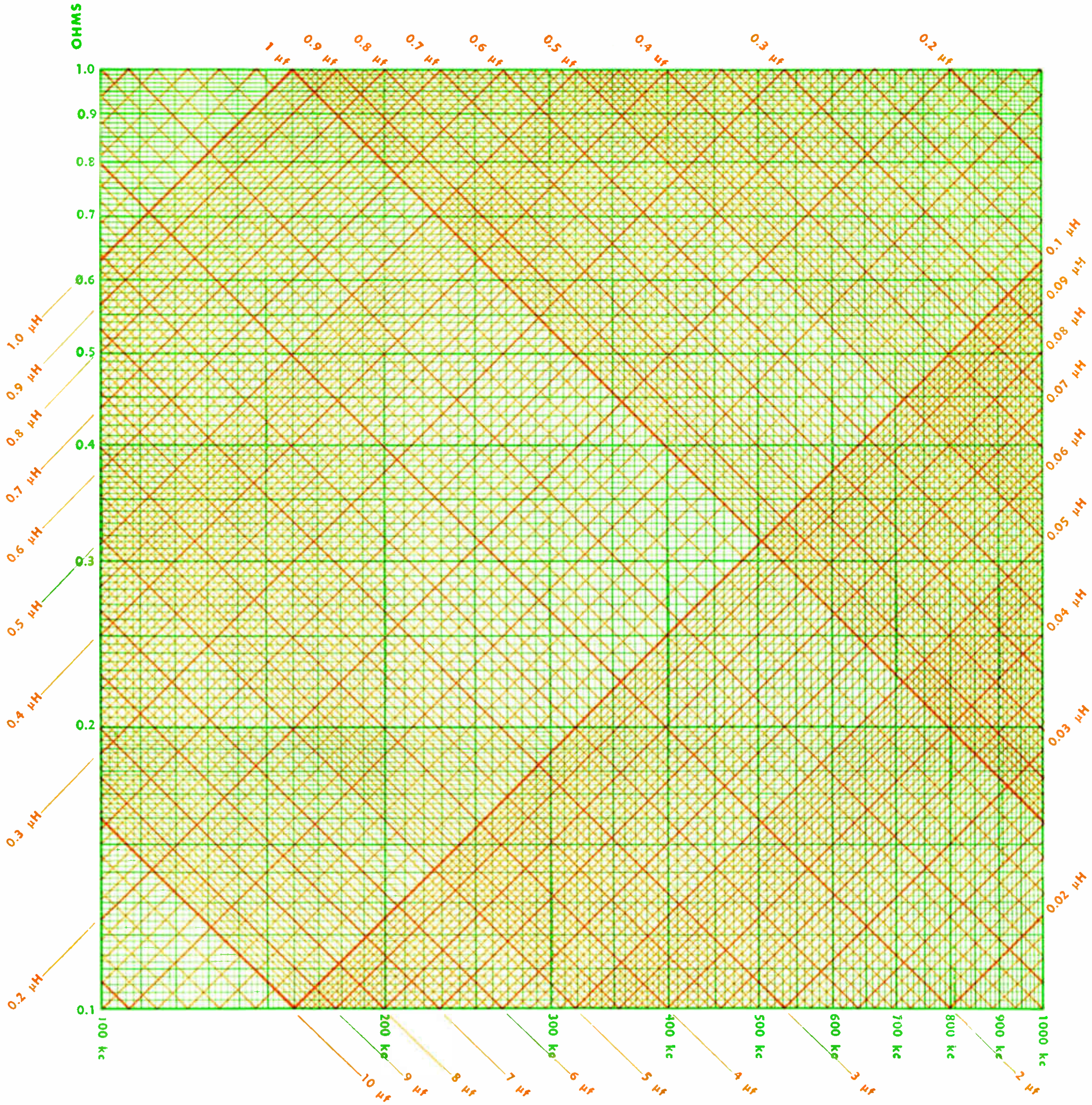
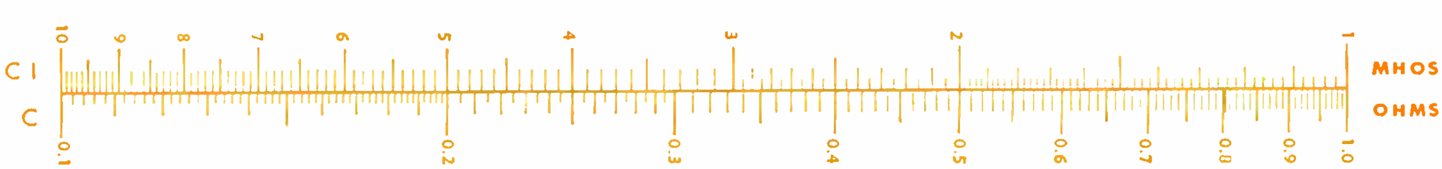

A
D
SQUARE
SQUARE ROOT
0.0001 0.0002 0.0003 0.0004 0.0005 0.0006 0.0007 0.0008 0.0009 0.001 0.002 0.003 0.004 0.005 0.006 0.007 0.008 0.009 0.01
0.01 0.02 0.03 0.04 0.05 0.06 0.07 0.08 0.09 0.1

PLATE 38


OHMS
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
1 μf
0.9 μf
0.8 μf
0.7 μf
0.6 μf
0.5 μf
0.4 μf
0.3 μf
0.2 μf
1.0 μH
0.9 μH
0.8 μH
0.7 μH
0.6 μH
0.5 μH
0.4 μH
0.3 μH
0.2 μH
0.1 μH
0.09 μH
0.08 μH
0.07 μH
0.06 μH
0.05 μH
0.04 μH
0.03 μH
0.02 μH
100 kc
200 kc
300 kc
400 kc
500 kc
600 kc
700 kc
800 kc
900 kc
1000 kc
10 μf
9 μf
8 μf
7 μf
6 μf
5 μf
4 μf
3 μf
2 μf


CI
C
10
9
8
7
6
5
4
3
2
1
MHOS
OHMS
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0

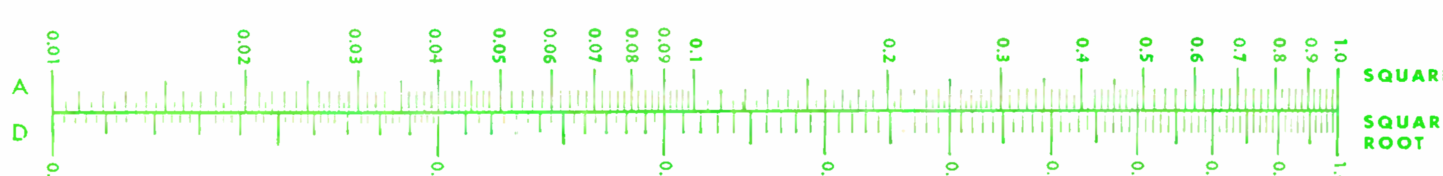
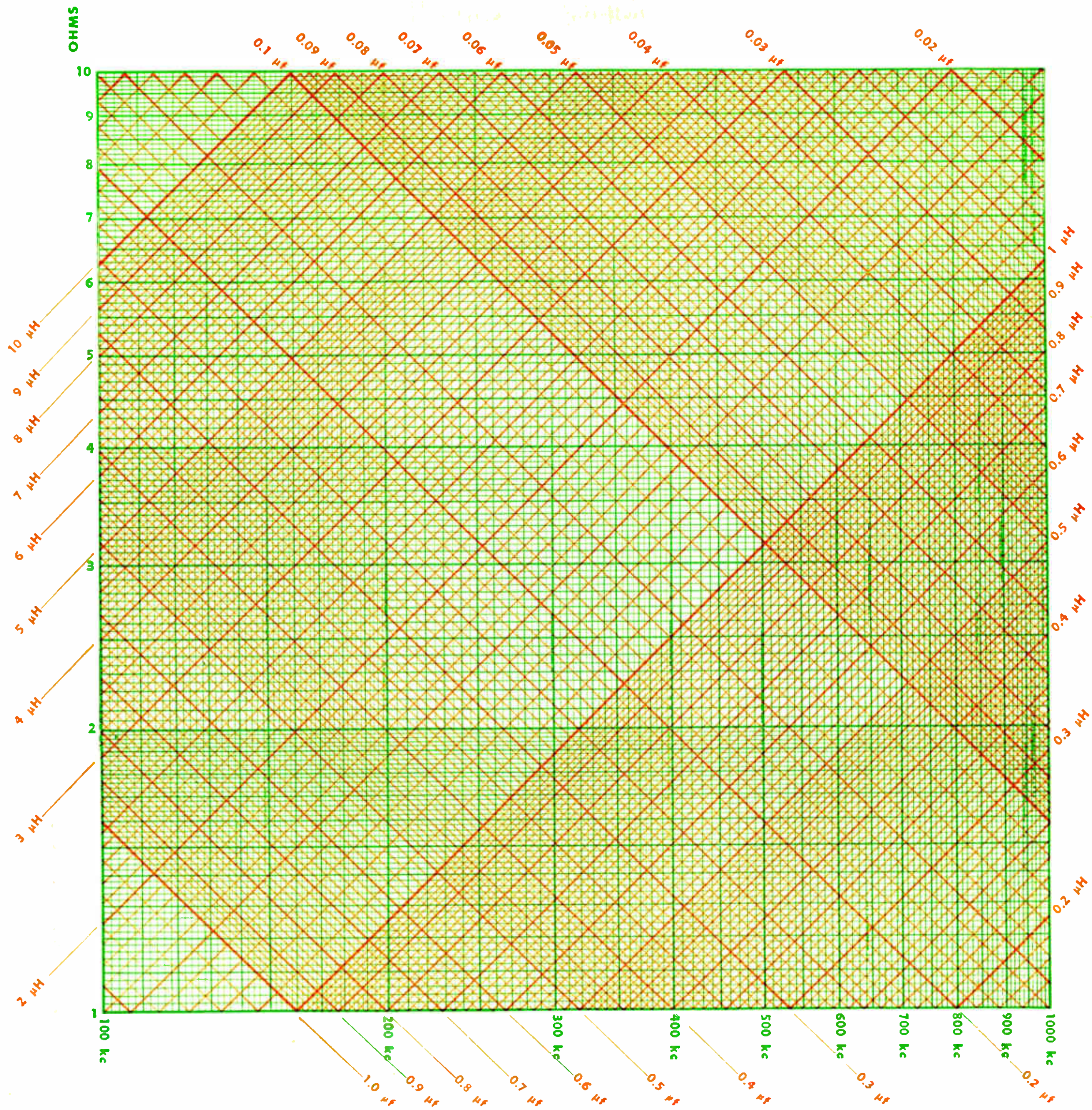
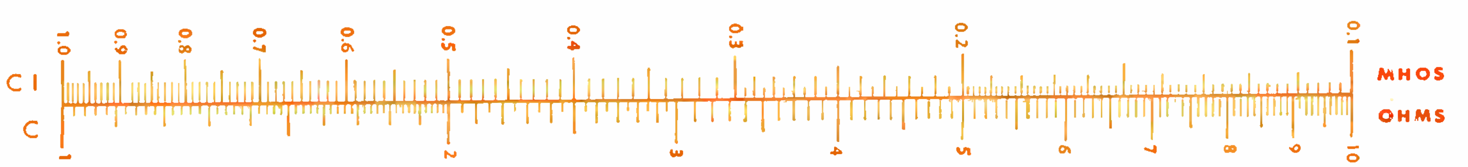

A
D
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
SQUARE
SQUARE ROOT
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0

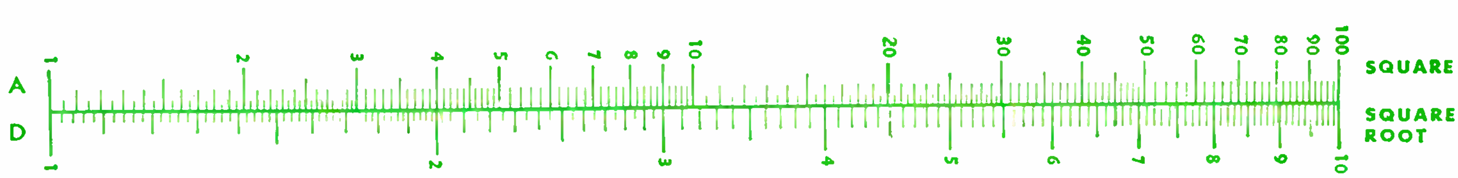
PLATE 39



OHMS
10
9
8
7
6
5
4
3
2
1
0.1 μf
0.09 μf
0.08 μf
0.07 μf
0.06 μf
0.05 μf
0.04 μf
0.03 μf
0.02 μf
10 μH
9 μH
8 μH
7 μH
6 μH
5 μH
4 μH
3 μH
2 μH
1 μH
0.9 μH
0.8 μH
0.7 μH
0.6 μH
0.5 μH
0.4 μH
0.3 μH
0.2 μH
100 kc
200 kc
300 kc
400 kc
500 kc
600 kc
700 kc
800 kc
900 kc
1000 kc
1.0 μf
0.9 μf
0.8 μf
0.7 μf
0.6 μf
0.5 μf
0.4 μf
0.3 μf
0.2 μf

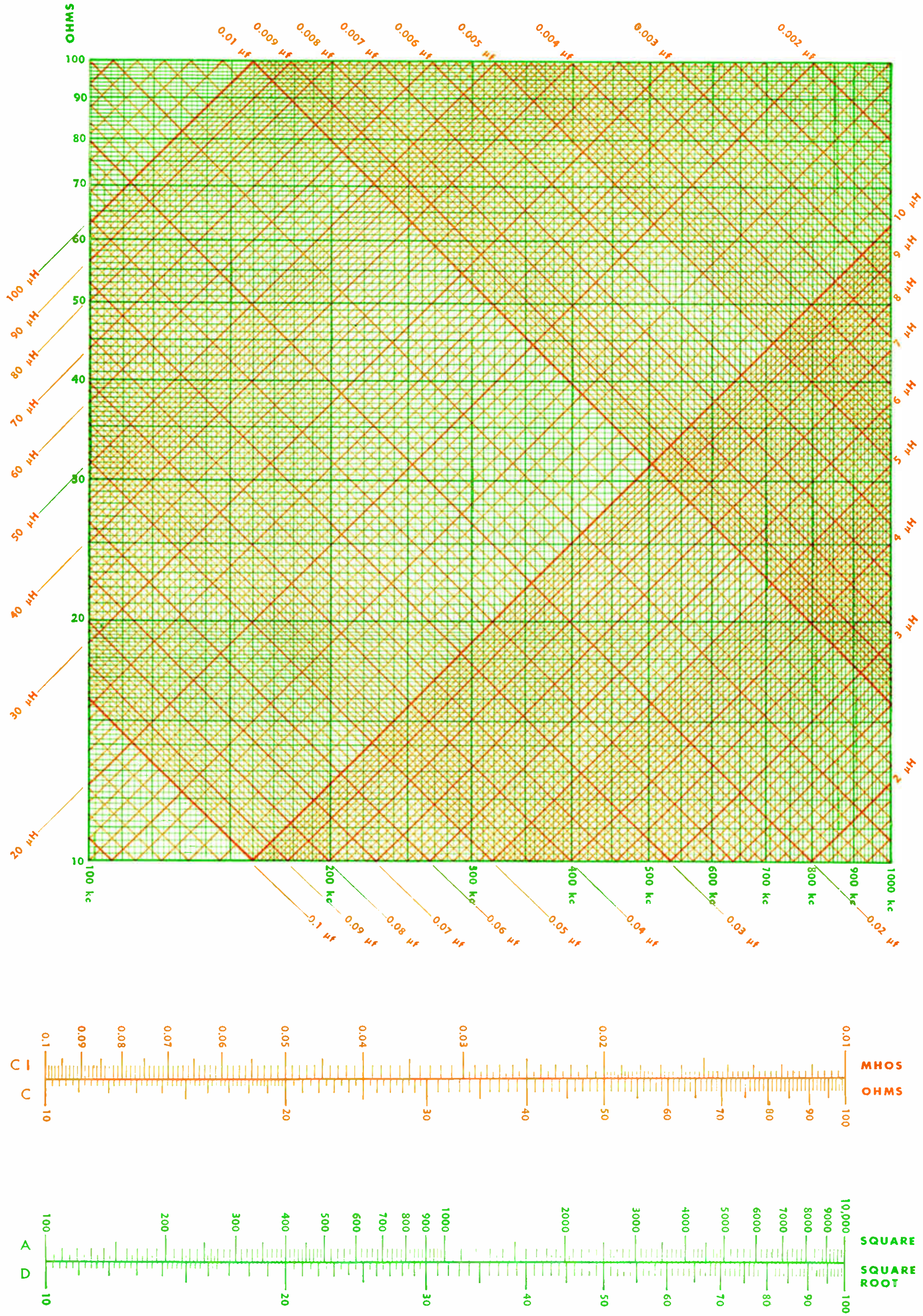


CI
C
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
1
2
3
4
5
6
7
8
9
10
MHOS
OHMS

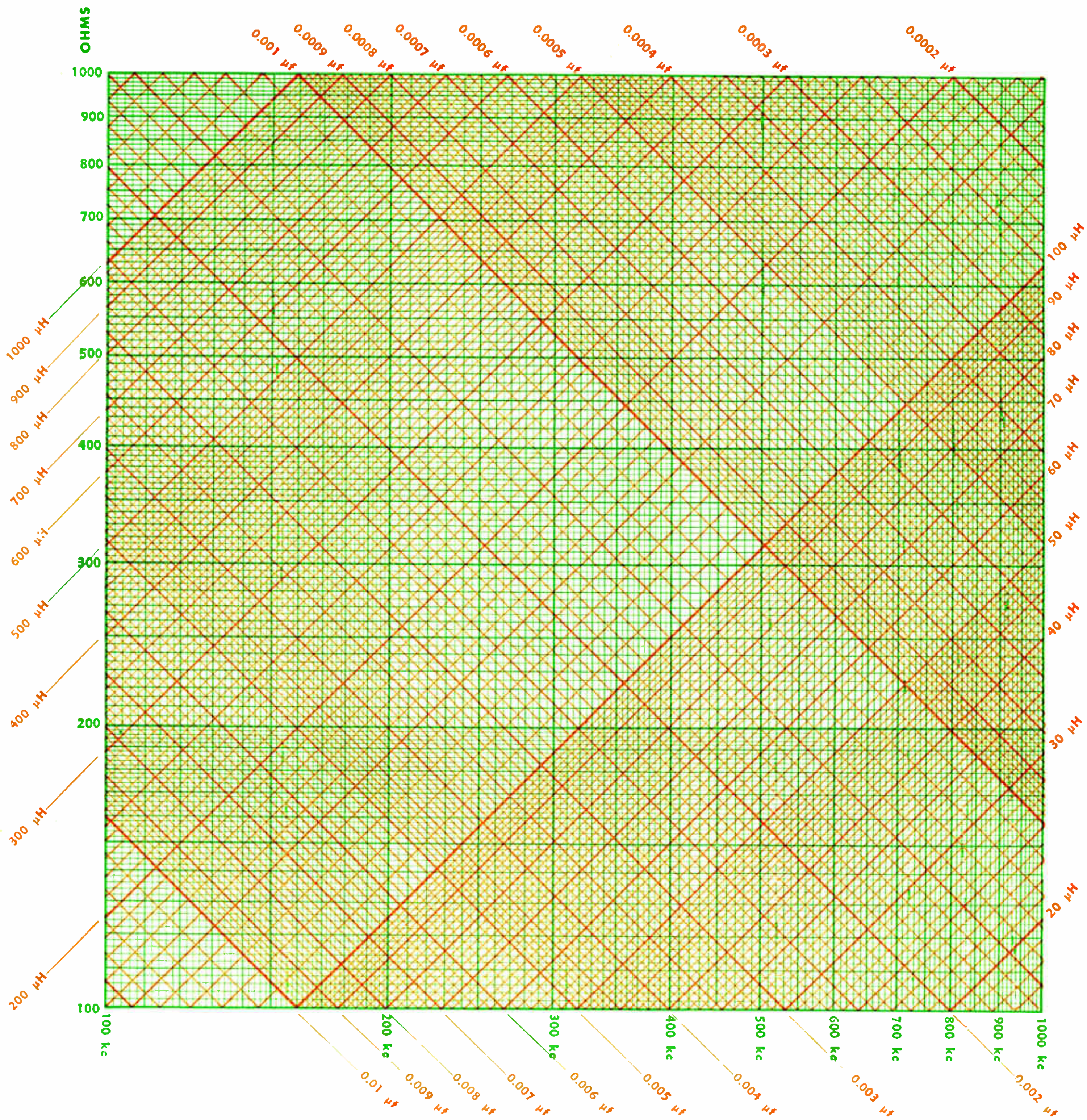


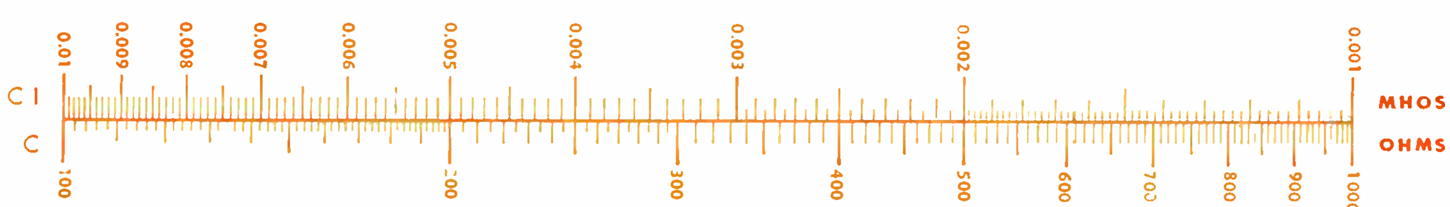
A
D
1
2
3
4
5
6
7
8
9
10
20
30
40
50
60
70
80
90
100
SQUARE
SQUARE ROOT

PLATE 40



OHMS
100
90
80
70
60
50
40
30
20
10
0.01 μf
0.009 μf
0.008 μf
0.007 μf
0.006 μf
0.005 μf
0.004 μf
0.003 μf
0.002 μf
100 μH
90 μH
80 μH
70 μH
60 μH
50 μH
40 μH
30 μH
20 μH
10 μH
9 μH
8 μH
7 μH
6 μH
5 μH
4 μH
3 μH
2 μH
100 kc
200 kc
300 kc
400 kc
500 kc
600 kc
700 kc
800 kc
900 kc
1000 kc
0.1 μf
0.09 μf
0.08 μf
0.07 μf
0.06 μf
0.05 μf
0.04 μf
0.03 μf
0.02 μf
C I
C
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
MHOS
OHMS
10
20
30
40
50
60
70
80
90
100
A
D
100
200
300
400
500
600
700
800
900
1000
2000
3000
4000
5000
6000
7000
8000
9000
10,000
SQUARE
10
20
30
40
50
60
70
80
90
100
SQUARE ROOT


OHMS
1000
900
800
700
600
500
400
300
200
100
0.001 μf
0.0009 μf
0.0008 μf
0.0007 μf
0.0006 μf
0.0005 μf
0.0004 μf
0.0003 μf
0.0002 μf
1000 μH
900 μH
800 μH
700 μH
600 μH
500 μH
400 μH
300 μH
200 μH
100 μH
90 μH
80 μH
70 μH
60 μH
50 μH
40 μH
30 μH
20 μH
100 kc
200 kc
300 kc
400 kc
500 kc
600 kc
700 kc
800 kc
900 kc
1000 kc
0.01 μf
0.009 μf
0.008 μf
0.007 μf
0.006 μf
0.005 μf
0.004 μf
0.003 μf
0.002 μf


CI
C
0.01
0.009
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
MHOS
OHMS
100
200
300
400
500
600
800
900
1000

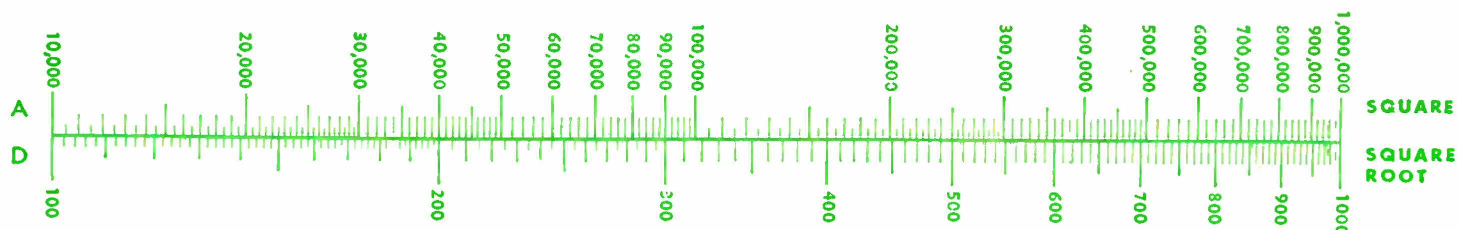
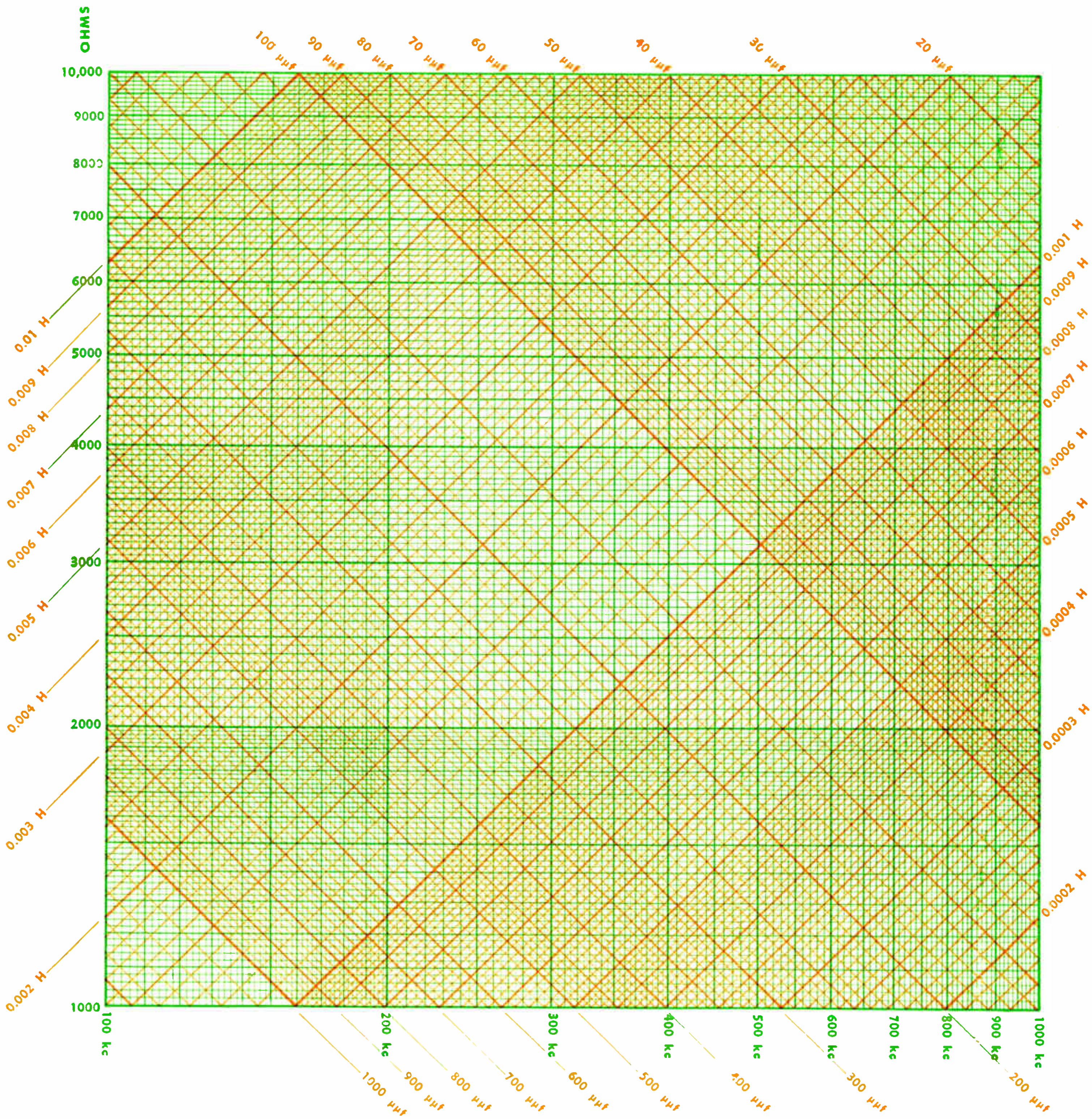
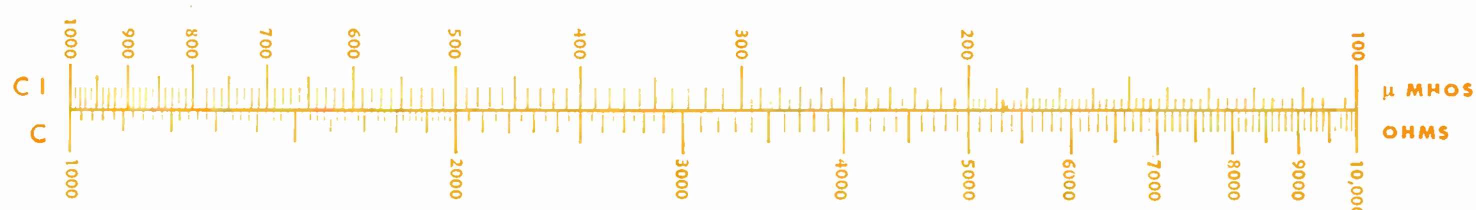

A
D
10,000
20,000
30,000
40,000
50,000
60,000
70,000
80,000
90,000
100,000
300,000
400,000
500,000
600,000
700,000
800,000
900,000
1,000,000
SQUARE
SQUARE ROOT
100
200
400
500
600
700
800
900
1000

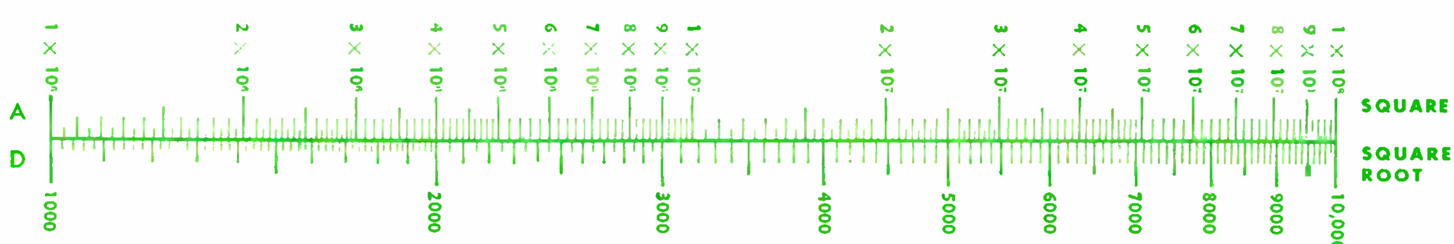
PLATE 42



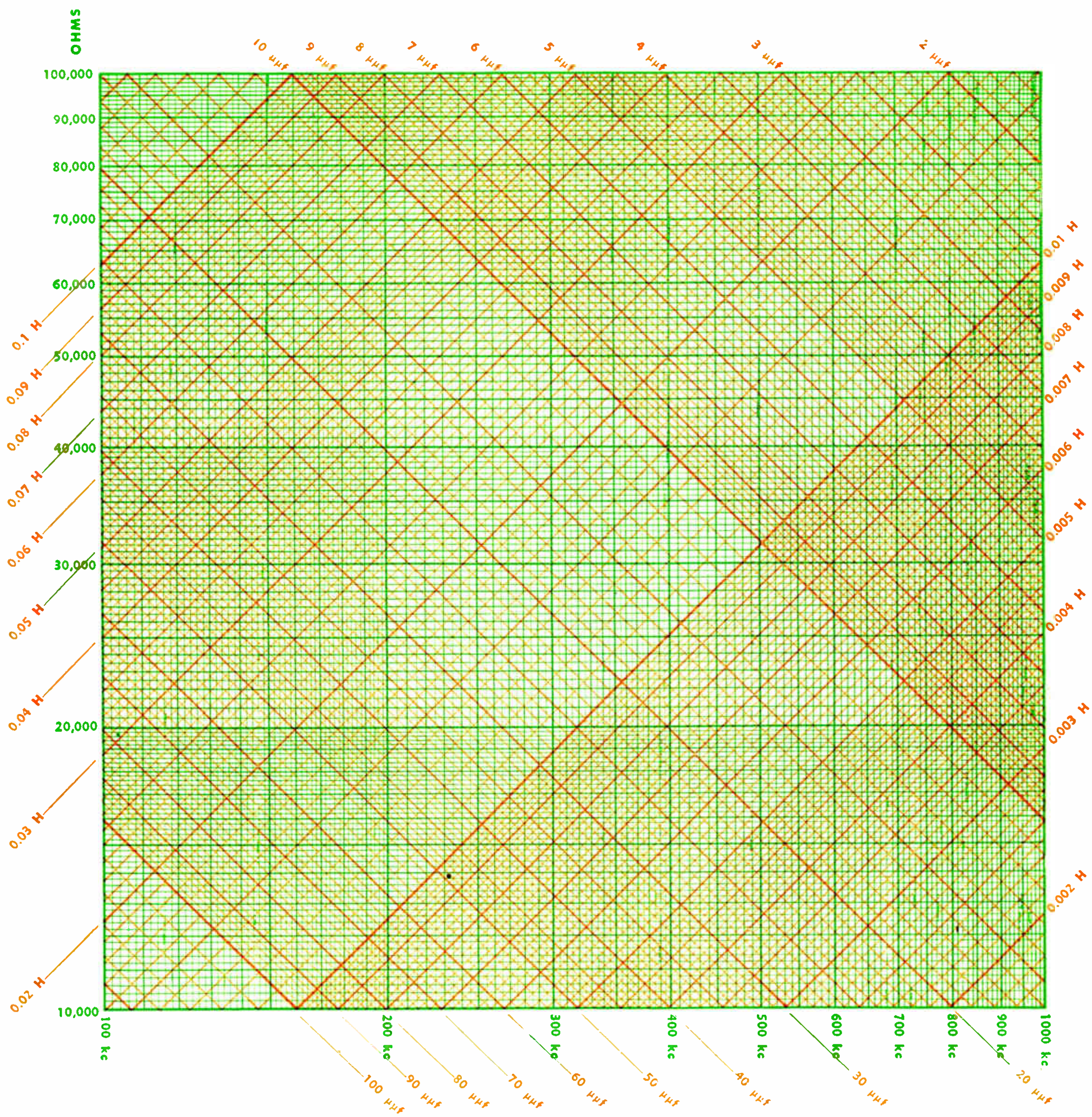
OHMS
10,000
9000
8000
7000
6000
5000
4000
3000
2000
1000
100 μμf
90 μμf
80 μμf
70 μμf
60 μμf
50 μμf
40 μμf
30 μμf
20 μμf
0.01 H
0.009 H
0.008 H
0.007 H
0.006 H
0.005 H
0.004 H
0.003 H
0.002 H
0.001 H
0.0009 H
0.0008 H
0.0007 H
0.0006 H
0.0005 H
0.0004 H
0.0003 H
0.0002 H
100 kc
200 kc
300 kc
400 kc
500 kc
600 kc
700 kc
800 kc
900 kc
1000 kc
1000 μμf
900 μμf
800 μμf
700 μμf
600 μμf
500 μμf
400 μμf
300 μμf
200 μμf



CI
C
1000 900 800 700 600 500 400 300 200 100
μ MHOS
OHMS
1000 2000 3000 4000 5000 6000 7000 8000 9000 10,000



A
D
1 × 10⁶ 2 × 10⁶ 3 × 10⁶ 4 × 10⁶ 5 × 10⁶ 6 × 10⁶ 7 × 10⁶ 8 × 10⁶ 9 × 10⁶ 1 × 10⁷ 2 × 10⁷ 3 × 10⁷ 4 × 10⁷ 5 × 10⁷ 6 × 10⁷ 7 × 10⁷ 8 × 10⁷ 9 × 10⁷ 1 × 10⁸
SQUARE
SQUARE ROOT
1000 2000 3000 4000 5000 6000 7000 8000 9000 10,000


OHMS
100,000
90,000
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0.1 H
0.09 H
0.08 H
0.07 H
0.06 H
0.05 H
0.04 H
0.03 H
0.02 H
10 μμf
9 μμf
8 μμf
7 μμf
6 μμf
5 μμf
4 μμf
3 μμf
2 μμf
0.01 H
0.009 H
0.008 H
0.007 H
0.006 H
0.005 H
0.004 H
0.003 H
0.002 H
100 kc
200 kc
300 kc
400 kc
500 kc
600 kc
700 kc
800 kc
900 kc
1000 kc
100 μμf
90 μμf
80 μμf
70 μμf
60 μμf
50 μμf
40 μμf
30 μμf
20 μμf

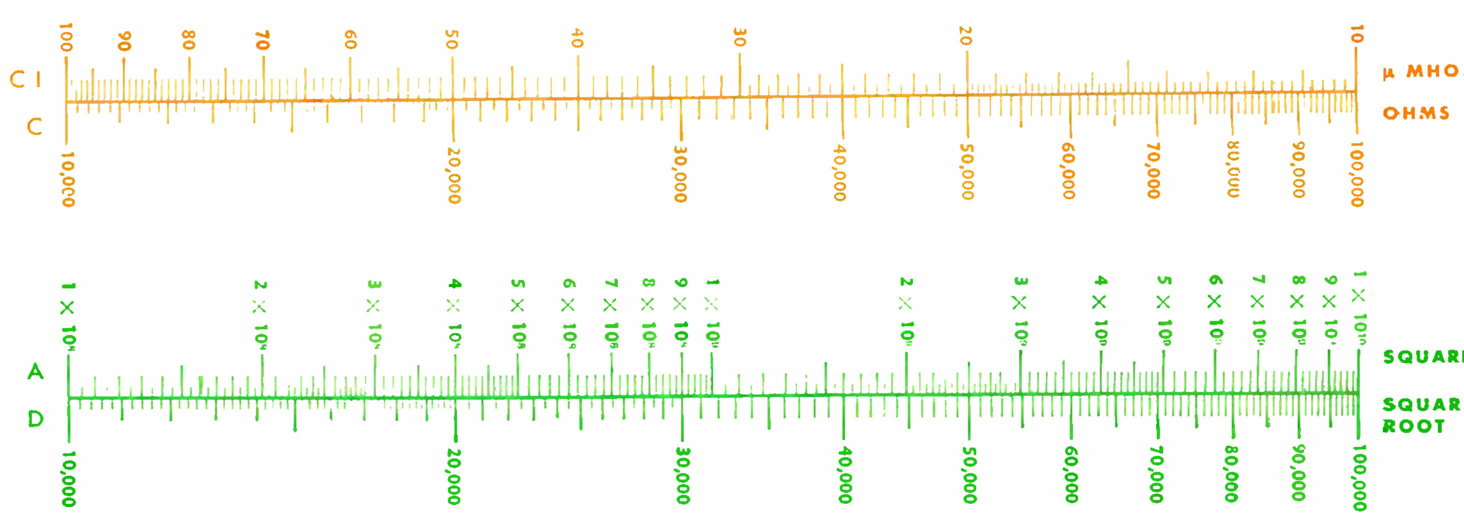

CI
C
μ MHOS
OHMS
100 90 80 70 60 50 40 30 20 10
10,000 20,000 30,000 40,000 50,000 60,000 70,000 80,000 90,000 100,000
A
D
SQUARE
SQUARE ROOT
1 × 10⁸ 2 × 10⁸ 3 × 10⁸ 4 × 10⁸ 5 × 10⁸ 6 × 10⁸ 7 × 10⁸ 8 × 10⁸ 9 × 10⁸ 1 × 10⁹ 2 × 10⁹ 3 × 10⁹ 4 × 10⁹ 5 × 10⁹ 6 × 10⁹ 7 × 10⁹ 8 × 10⁹ 9 × 10⁹ 1 × 10¹⁰
10,000 20,000 30,000 40,000 50,000 60,000 70,000 80,000 90,000 100,000

PLATE 44

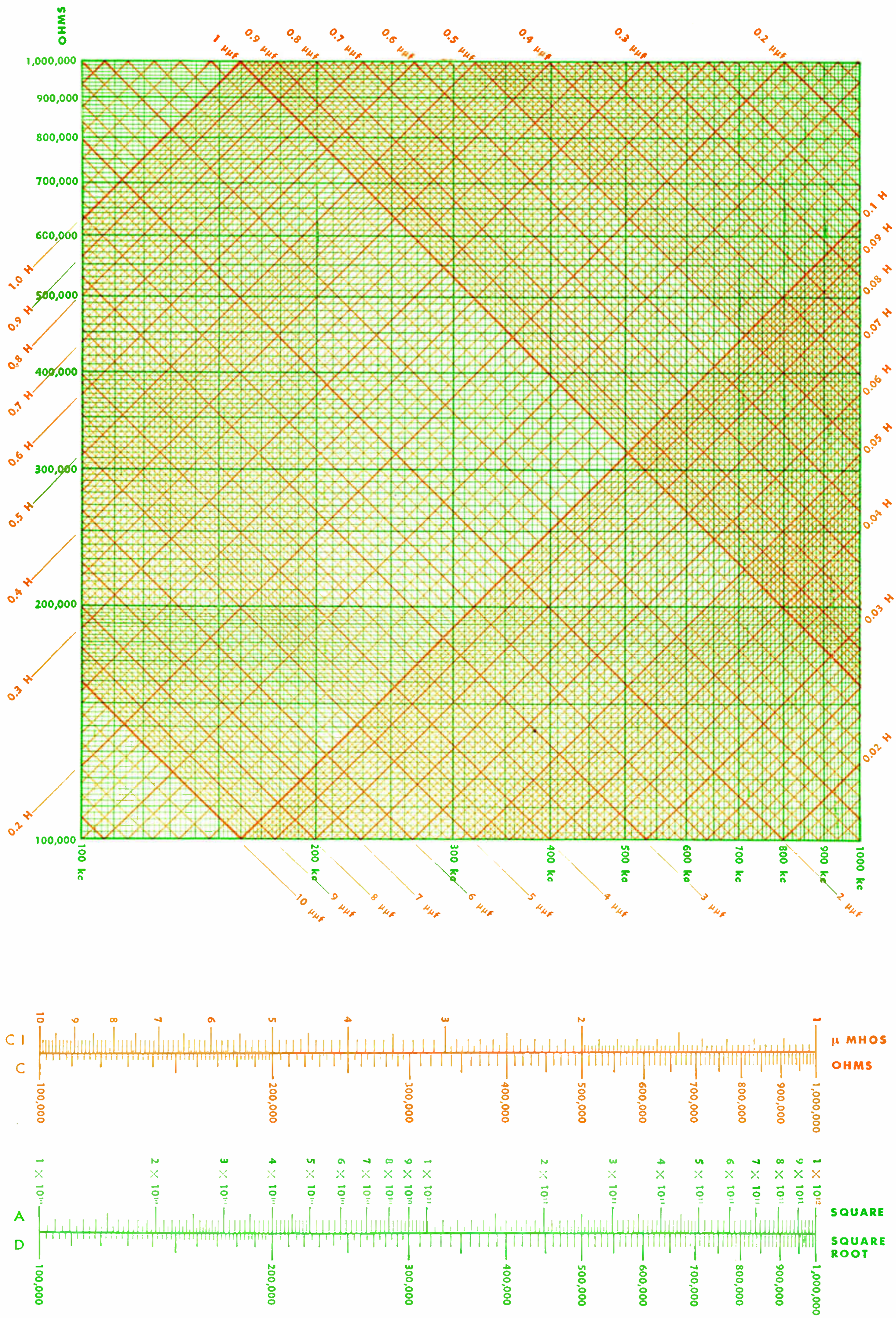
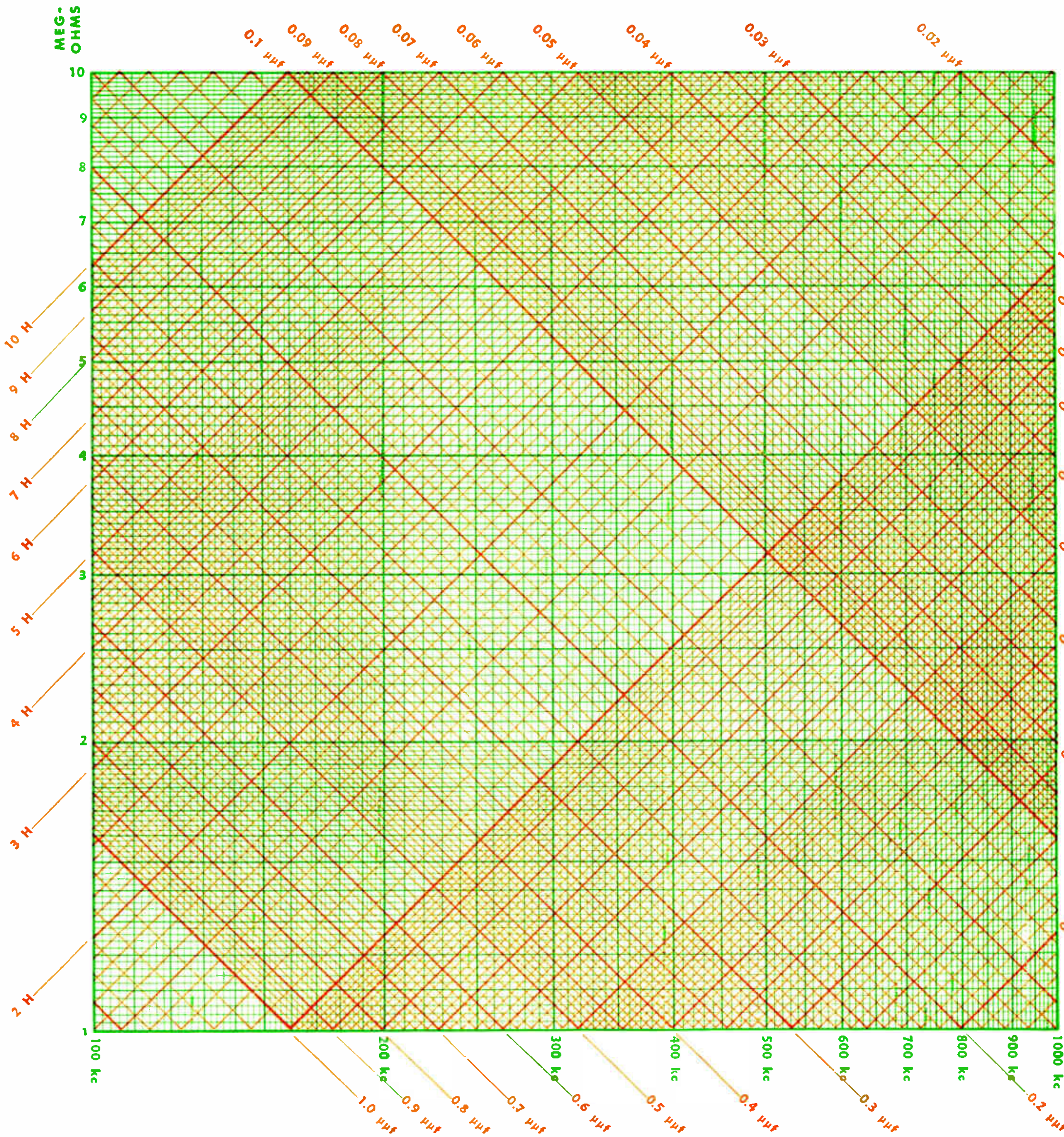
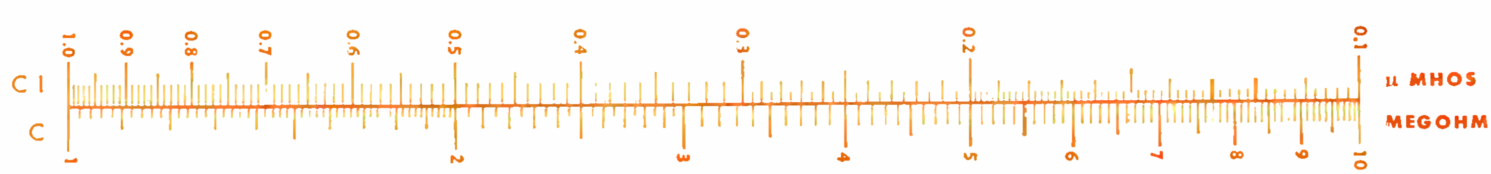

OHMS
1,000,000
900,000
800,000
700,000
600,000
500,000
400,000
300,000
200,000
100,000
1 μμf
0.9 μμf
0.8 μμf
0.7 μμf
0.6 μμf
0.5 μμf
0.4 μμf
0.3 μμf
0.2 μμf
1.0 H
0.9 H
0.8 H
0.7 H
0.6 H
0.5 H
0.4 H
0.3 H
0.2 H
0.1 H
0.09 H
0.08 H
0.07 H
0.06 H
0.05 H
0.04 H
0.03 H
0.02 H
100 kc
200 kc
300 kc
400 kc
500 kc
600 kc
700 kc
800 kc
900 kc
1000 kc
10 μμf
9 μμf
8 μμf
7 μμf
6 μμf
5 μμf
4 μμf
3 μμf
2 μμf
CI
C
10 9 8 7 6 5 4 3 2 1
μ MHOS
OHMS
100,000 200,000 300,000 400,000 500,000 600,000 700,000 800,000 900,000 1,000,000
A
D
SQUARE
SQUARE ROOT
100,000 200,000 300,000 400,000 500,000 600,000 700,000 800,000 900,000 1,000,000

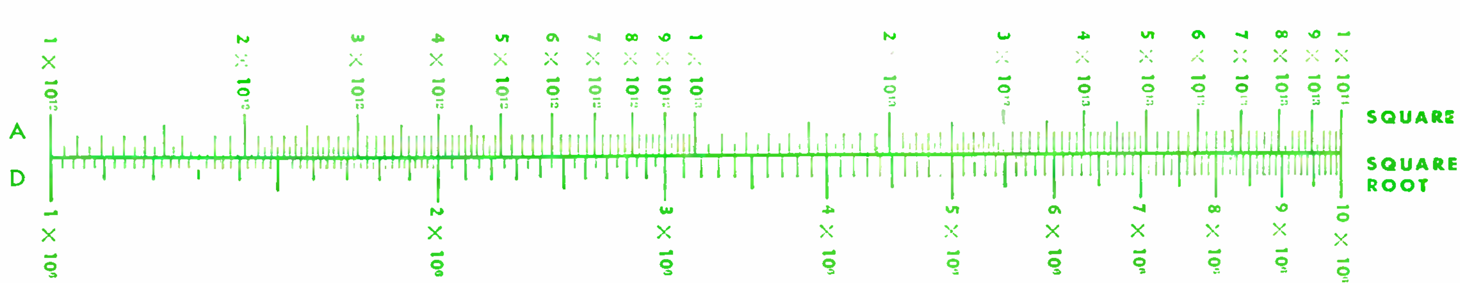
PLATE 45



MEG-OHMS
0.1 μμf
0.09 μμf
0.08 μμf
0.07 μμf
0.06 μμf
0.05 μμf
0.04 μμf
0.03 μμf
0.02 μμf
10 H
9 H
8 H
7 H
6 H
5 H
4 H
3 H
2 H
1 H
0.9 H
0.8 H
0.7 H
0.6 H
0.5 H
0.4 H
0.3 H
0.2 H
100 kc
200 kc
300 kc
400 kc
500 kc
600 kc
700 kc
800 kc
900 kc
1000 kc
1.0 μμf
0.9 μμf
0.8 μμf
0.7 μμf
0.6 μμf
0.5 μμf
0.4 μμf
0.3 μμf
0.2 μμf

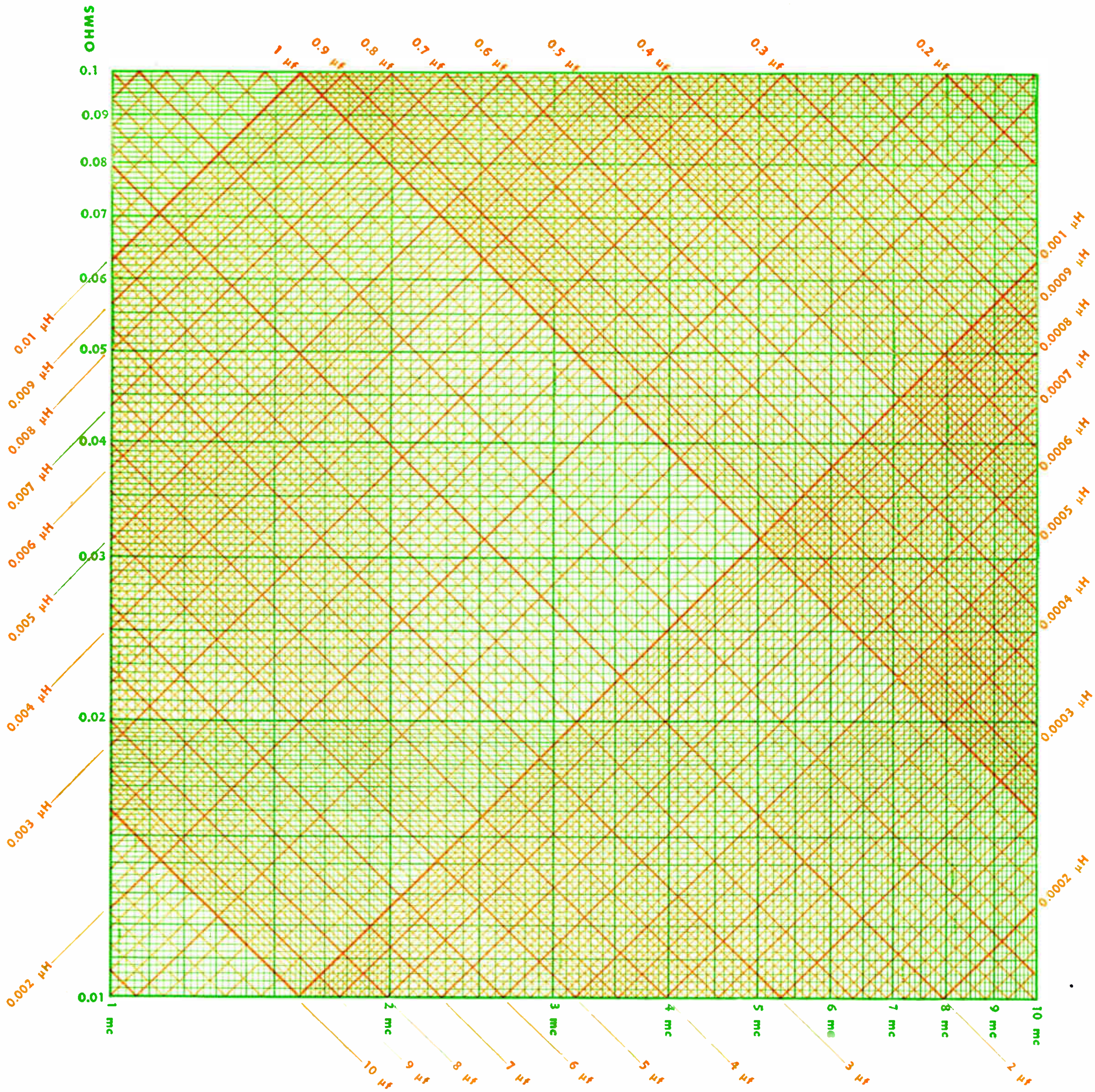


CI
C
μ MHOS
MEGOHMS

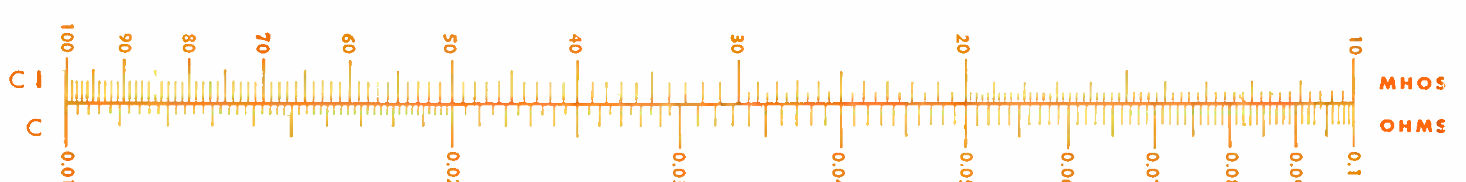


A
D
SQUARE
SQUARE ROOT

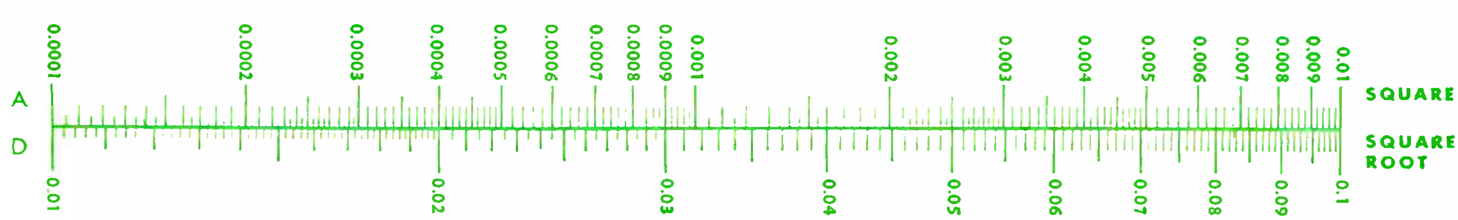
PLATE 46



OHMS
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
1 μf
0.9 μf
0.8 μf
0.7 μf
0.6 μf
0.5 μf
0.4 μf
0.3 μf
0.2 μf
0.01 μH
0.009 μH
0.008 μH
0.007 μH
0.006 μH
0.005 μH
0.004 μH
0.003 μH
0.002 μH
0.001 μH
0.0009 μH
0.0008 μH
0.0007 μH
0.0006 μH
0.0005 μH
0.0004 μH
0.0003 μH
0.0002 μH
1 mc
2 mc
3 mc
4 mc
5 mc
6 mc
7 mc
8 mc
9 mc
10 mc
10 μf
9 μf
8 μf
7 μf
6 μf
5 μf
4 μf
3 μf
2 μf



CI
C
100
90
80
70
60
50
40
30
20
10
MHOS
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.1
OHMS



A
D
0.0001
0.0002
0.0003
0.0004
0.0005
0.0006
0.0007
0.0008
0.0009
0.001
0.002
0.003
0.004
0.005
0.006
0.007
0.008
0.009
0.01
SQUARE
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.1
SQUARE ROOT

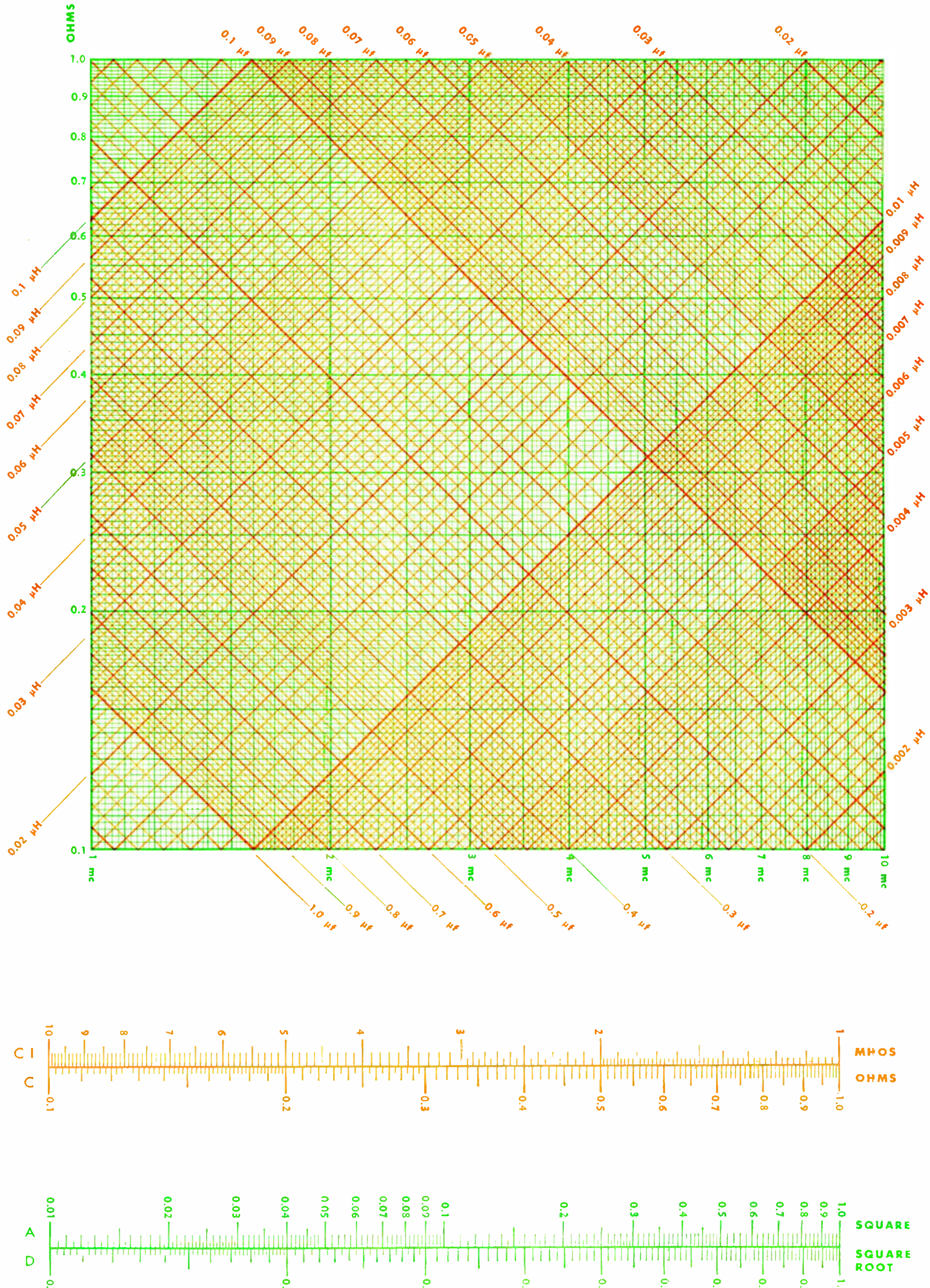
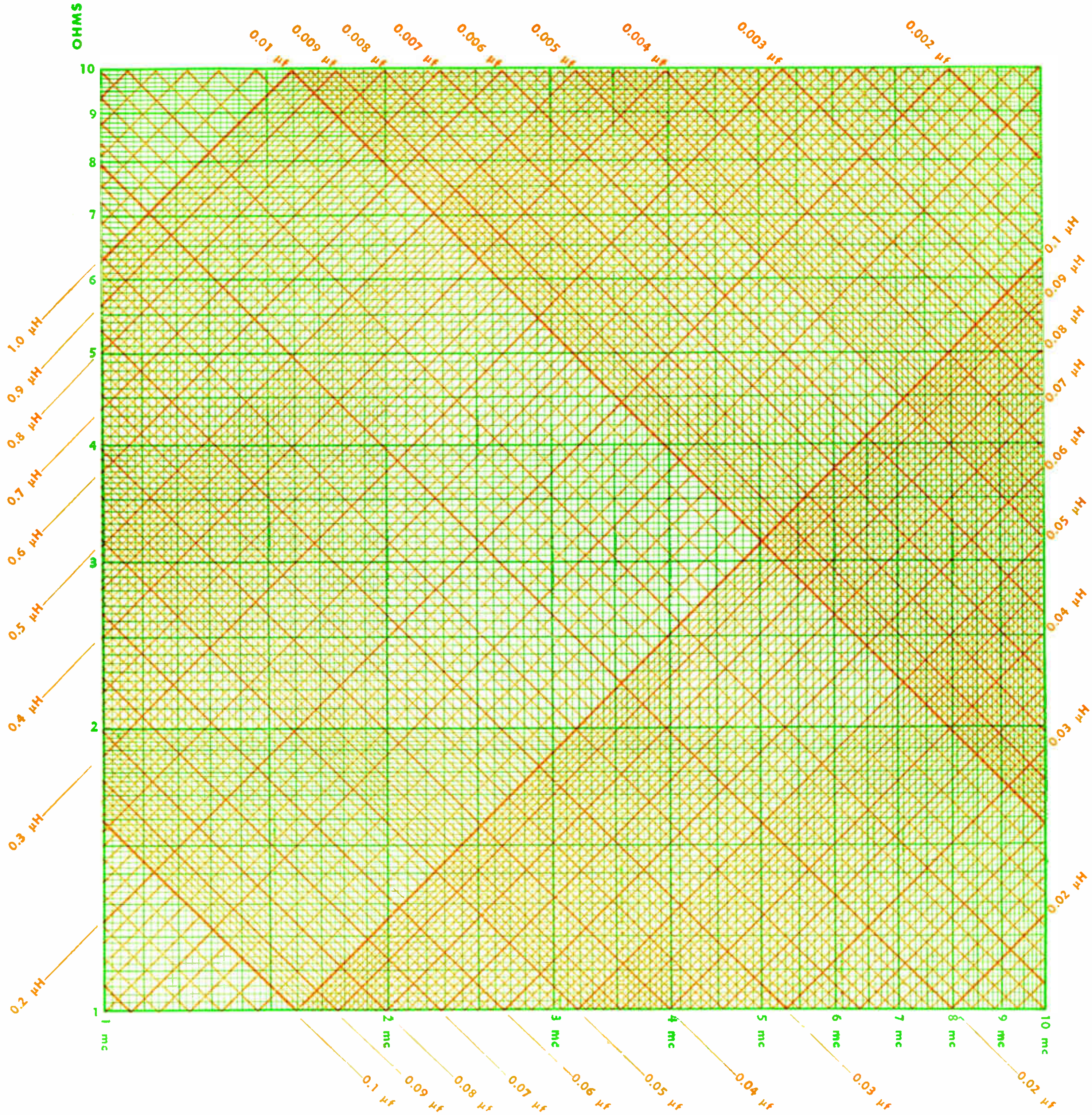
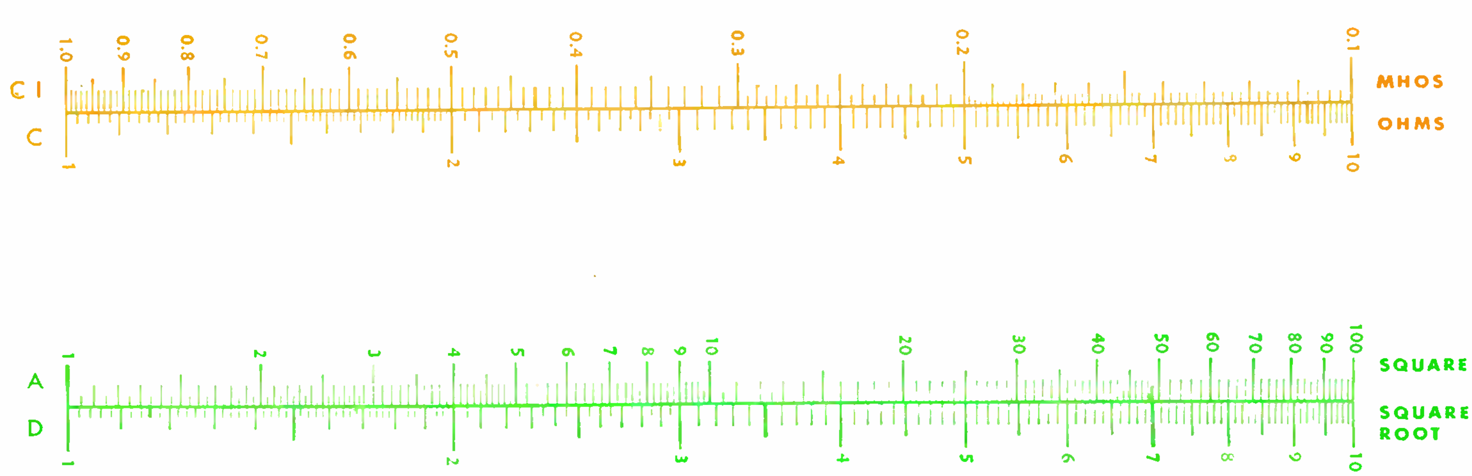

OHMS
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.1 μf
0.09 μf
0.08 μf
0.07 μf
0.06 μf
0.05 μf
0.04 μf
0.03 μf
0.02 μf
0.1 μH
0.09 μH
0.08 μH
0.07 μH
0.06 μH
0.05 μH
0.04 μH
0.03 μH
0.02 μH
0.01 μH
0.009 μH
0.008 μH
0.007 μH
0.006 μH
0.005 μH
0.004 μH
0.003 μH
0.002 μH
1 mc
2 mc
3 mc
4 mc
5 mc
6 mc
7 mc
8 mc
9 mc
10 mc
1.0 μf
0.9 μf
0.8 μf
0.7 μf
0.6 μf
0.5 μf
0.4 μf
0.3 μf
0.2 μf
CI
C
MHOS
OHMS
10
9
8
7
6
5
4
3
2
1
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
A
D
SQUARE
SQUARE ROOT
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0

PLATE 48



OHMS
0.01 µf
0.009 µf
0.008 µf
0.007 µf
0.006 µf
0.005 µf
0.004 µf
0.003 µf
0.002 µf
1.0 µH
0.9 µH
0.8 µH
0.7 µH
0.6 µH
0.5 µH
0.4 µH
0.3 µH
0.2 µH
0.1 µH
0.09 µH
0.08 µH
0.07 µH
0.06 µH
0.05 µH
0.04 µH
0.03 µH
0.02 µH
1 mc
2 mc
3 mc
4 mc
5 mc
6 mc
7 mc
8 mc
9 mc
10 mc
0.1 µf
0.09 µf
0.08 µf
0.07 µf
0.06 µf
0.05 µf
0.04 µf
0.03 µf
0.02 µf



CI
C
MHOS
OHMS
A
D
SQUARE
SQUARE ROOT

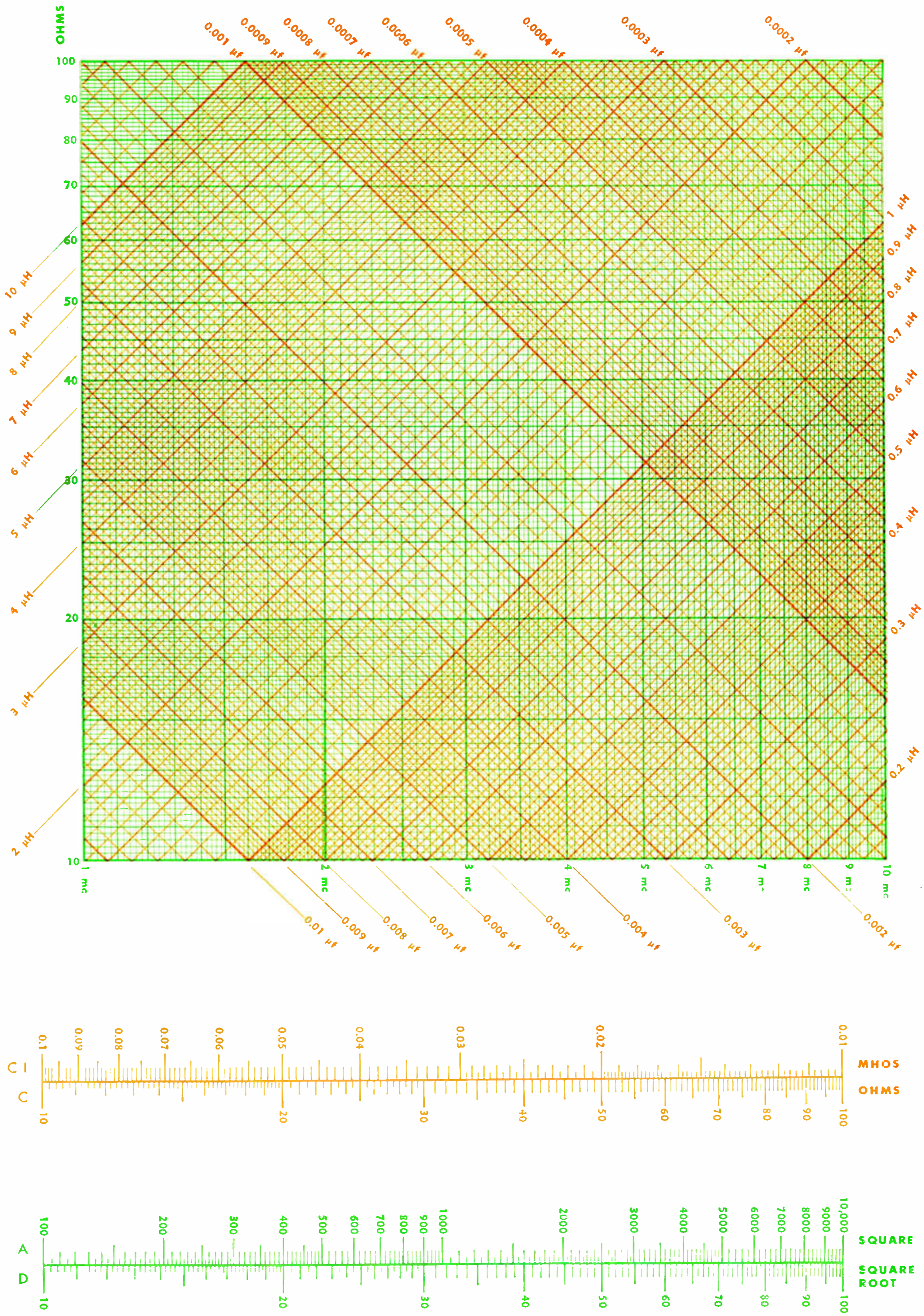

OHMS
100
90
80
70
60
50
40
30
20
10
0.001 μf
0.0009 μf
0.0008 μf
0.0007 μf
0.0006 μf
0.0005 μf
0.0004 μf
0.0003 μf
0.0002 μf
10 μH
9 μH
8 μH
7 μH
6 μH
5 μH
4 μH
3 μH
2 μH
1 μH
0.9 μH
0.8 μH
0.7 μH
0.6 μH
0.5 μH
0.4 μH
0.3 μH
0.2 μH
1 mc
2 mc
3 mc
4 mc
5 mc
6 mc
8 mc
10 mc
0.01 μf
0.009 μf
0.008 μf
0.007 μf
0.006 μf
0.005 μf
0.004 μf
0.003 μf
0.002 μf
CI
C
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
MHOS
OHMS
10
20
30
40
50
60
70
80
90
100
A
D
100
200
300
400
500
600
700
800
900
1000
2000
3000
4000
5000
6000
7000
8000
9000
10,000
SQUARE
SQUARE ROOT
10
20
30
40
50
60
70
80
90
100

PLATE 50

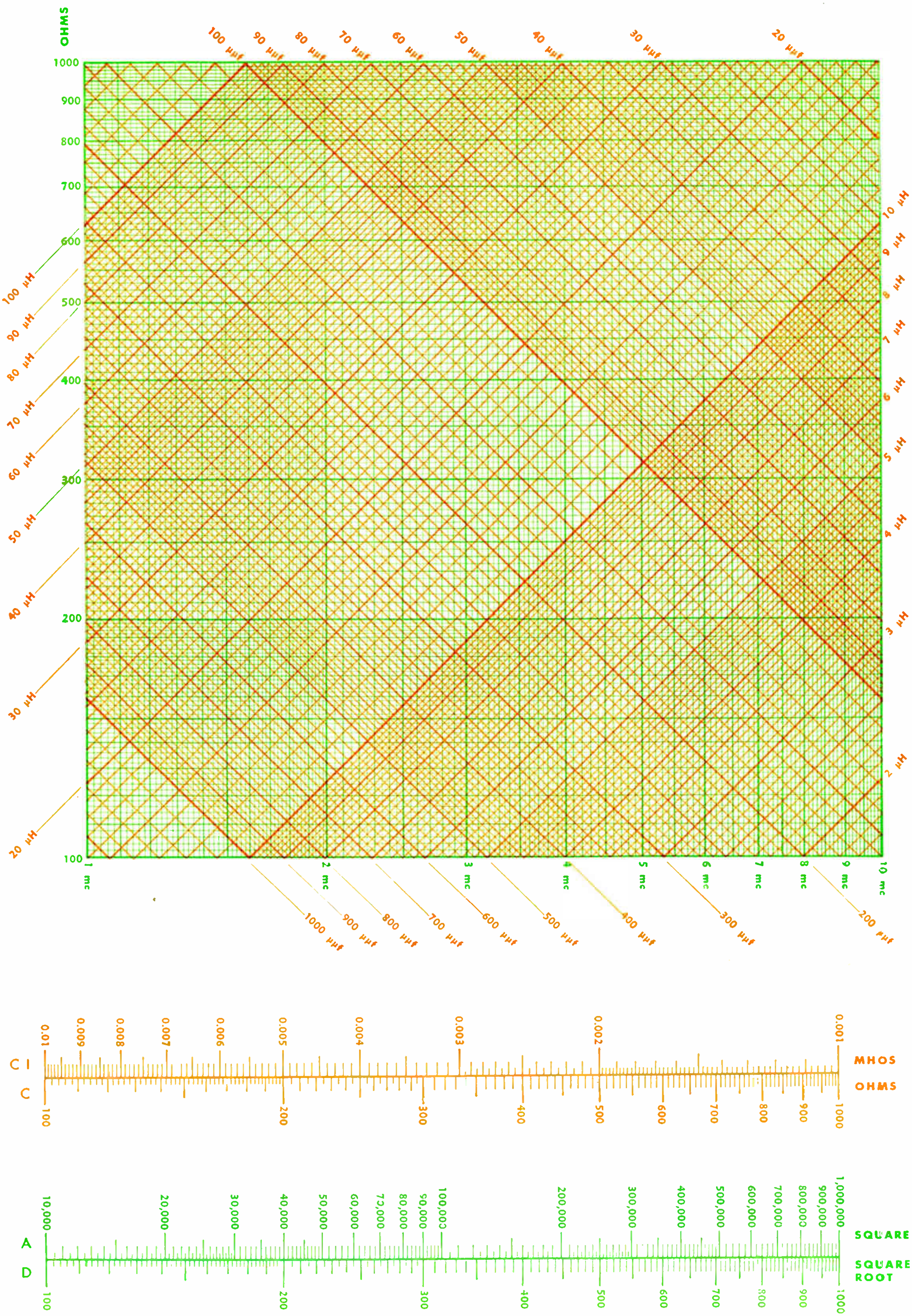

OHMS
1000
900
800
700
600
500
400
300
200
100
100 μH
90 μH
80 μH
70 μH
60 μH
50 μH
40 μH
30 μH
20 μH
100 μμf
90 μμf
80 μμf
70 μμf
60 μμf
50 μμf
40 μμf
30 μμf
20 μμf
10 μH
9 μH
8 μH
7 μH
6 μH
5 μH
4 μH
3 μH
2 μH
1 mc
2 mc
3 mc
4 mc
5 mc
6 mc
7 mc
8 mc
9 mc
10 mc
1000 μμf
900 μμf
800 μμf
700 μμf
600 μμf
500 μμf
400 μμf
300 μμf
200 μμf
CI
C
MHOS
OHMS
0.01
0.009
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
100
200
300
400
500
600
700
800
900
1000
A
D
SQUARE
SQUARE ROOT
10,000
20,000
30,000
40,000
50,000
60,000
70,000
80,000
90,000
100,000
200,000
300,000
400,000
500,000
600,000
700,000
800,000
900,000
1,000,000
100
200
300
400
500
600
700
800
900
1000

PLATE 51

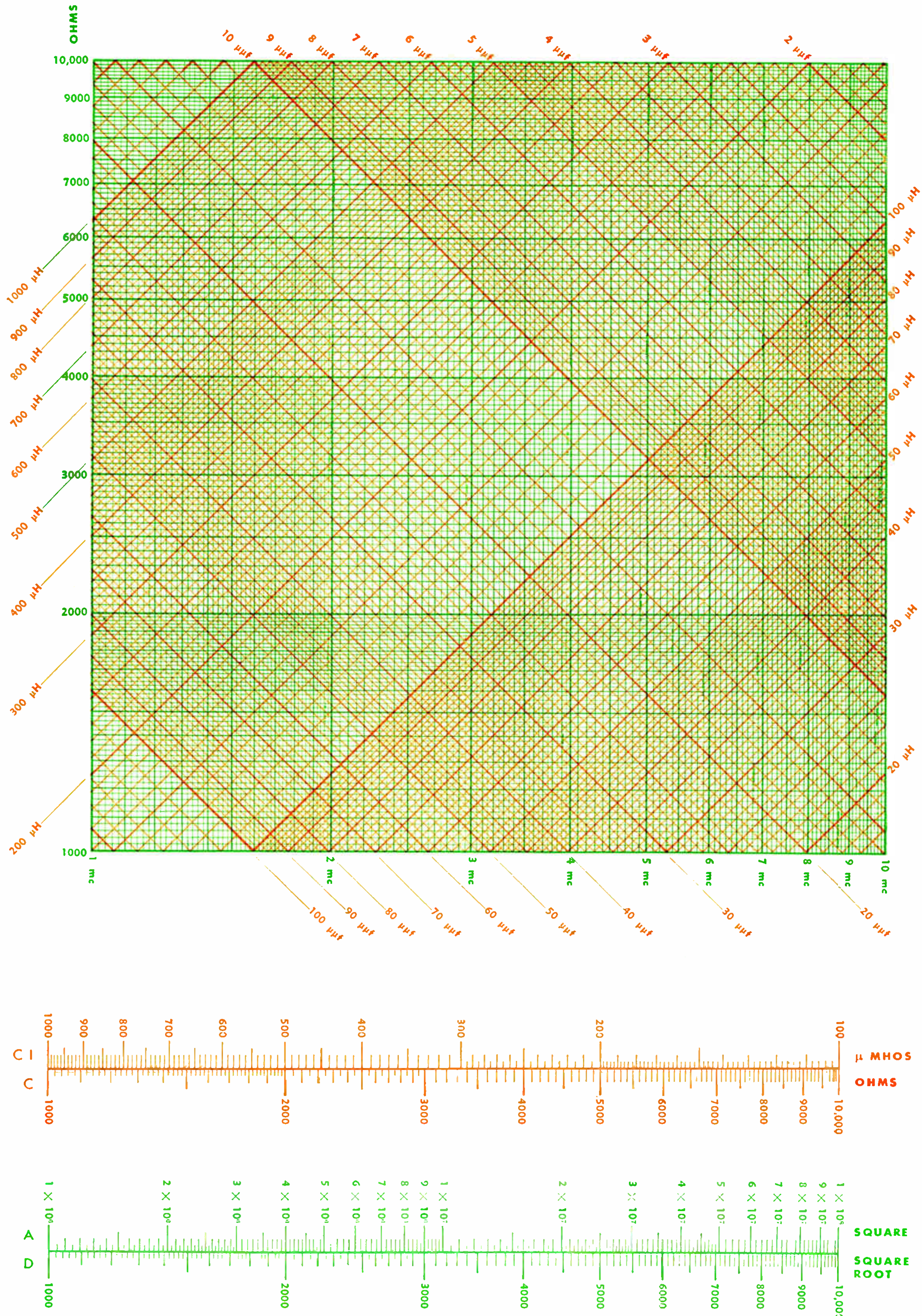
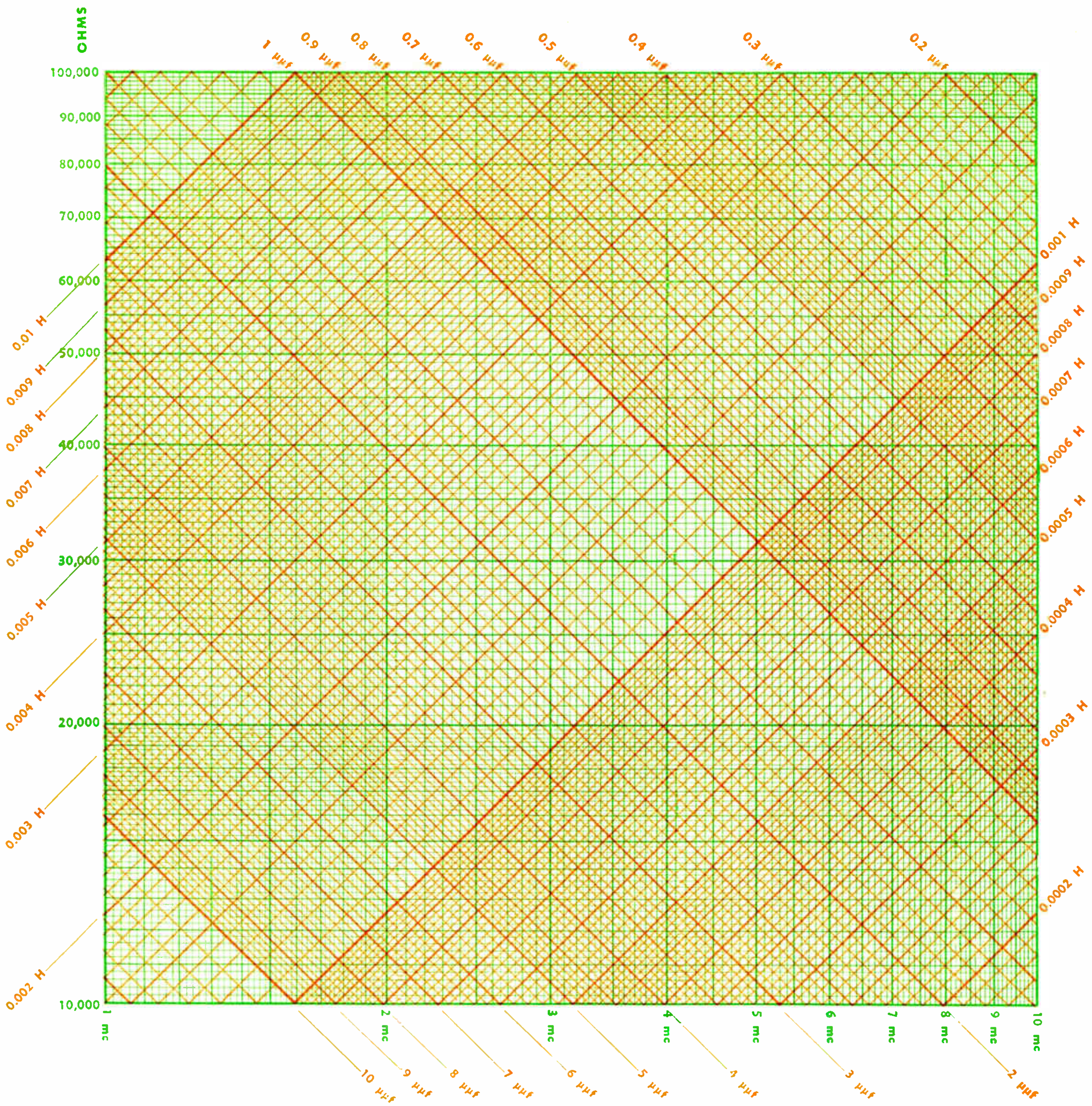
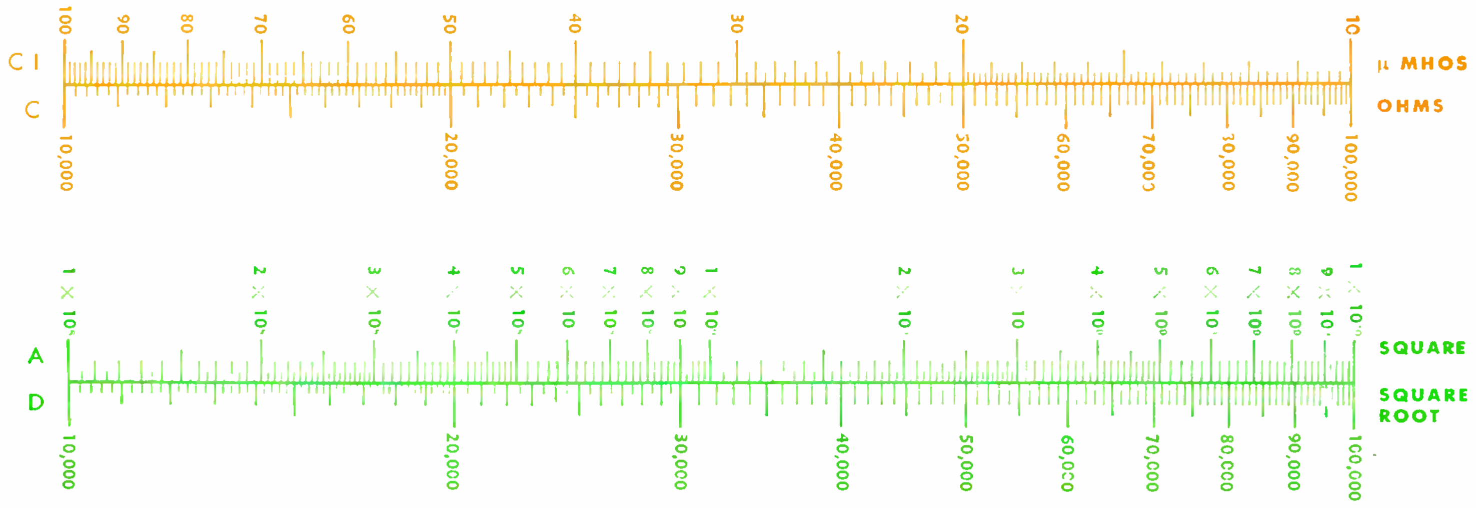

OHMS
10,000
9000
8000
7000
6000
5000
4000
3000
2000
1000
10 µµf
9 µµf
8 µµf
7 µµf
6 µµf
5 µµf
4 µµf
3 µµf
2 µµf
1000 µH
900 µH
800 µH
700 µH
600 µH
500 µH
400 µH
300 µH
200 µH
100 µH
90 µH
80 µH
70 µH
60 µH
50 µH
40 µH
30 µH
20 µH
1 mc
2 mc
3 mc
4 mc
5 mc
6 mc
7 mc
8 mc
9 mc
10 mc
100 µµf
90 µµf
80 µµf
70 µµf
60 µµf
50 µµf
40 µµf
30 µµf
20 µµf
CI
C
µ MHOS
OHMS
1000
900
800
700
600
500
400
300
200
100
1000
2000
3000
4000
5000
6000
7000
8000
9000
10,000
A
D
SQUARE
SQUARE ROOT

PLATE 52

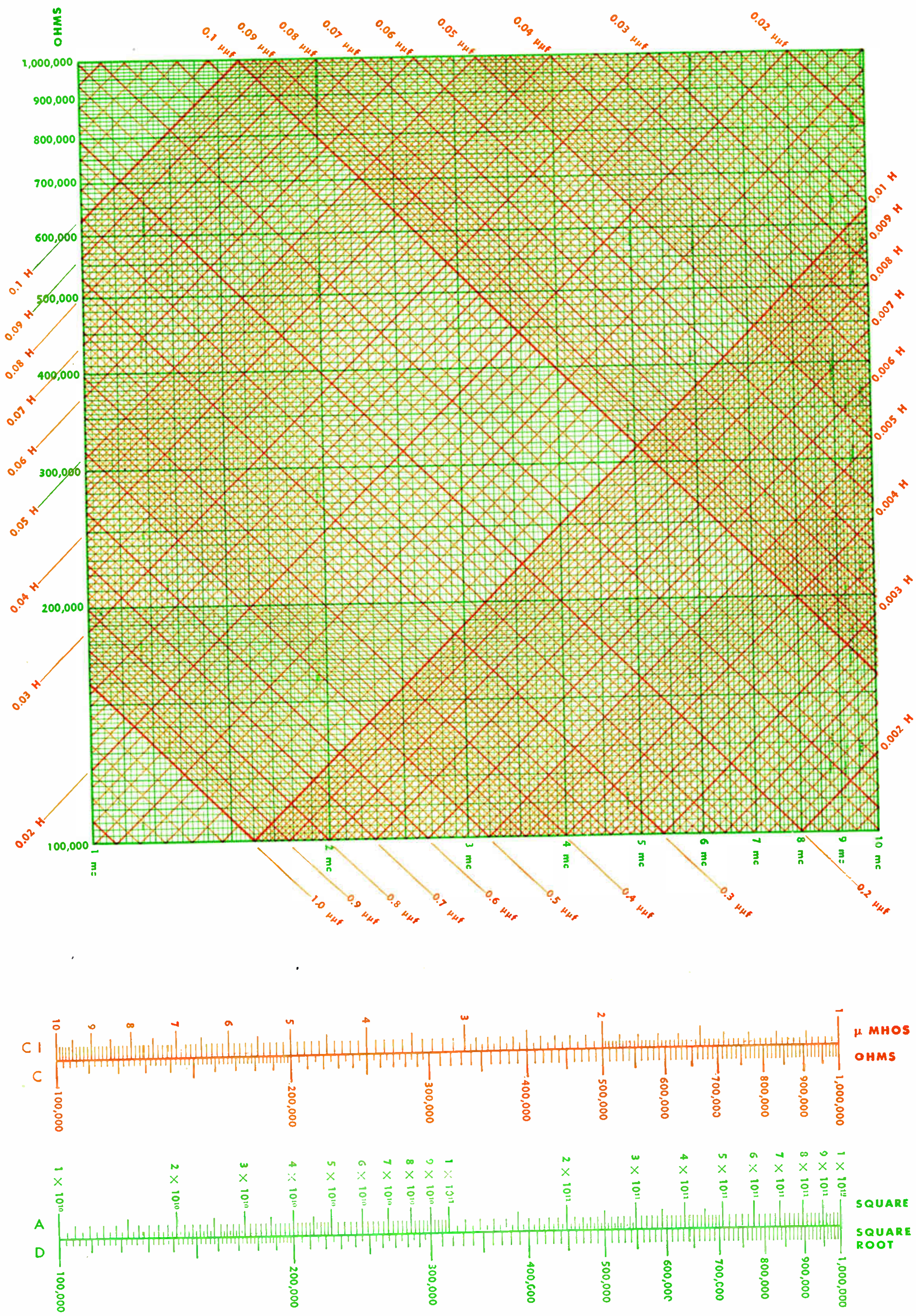


OHMS
100,000
90,000
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
1 μμf
0.9 μμf
0.8 μμf
0.7 μμf
0.6 μμf
0.5 μμf
0.4 μμf
0.3 μμf
0.2 μμf
0.001 H
0.0009 H
0.0008 H
0.0007 H
0.0006 H
0.0005 H
0.0004 H
0.0003 H
0.0002 H
0.01 H
0.009 H
0.008 H
0.007 H
0.006 H
0.005 H
0.004 H
0.003 H
0.002 H
1 mc
2 mc
3 mc
4 mc
5 mc
6 mc
7 mc
8 mc
9 mc
10 mc
10 μμf
9 μμf
8 μμf
7 μμf
6 μμf
5 μμf
4 μμf
3 μμf
2 μμf



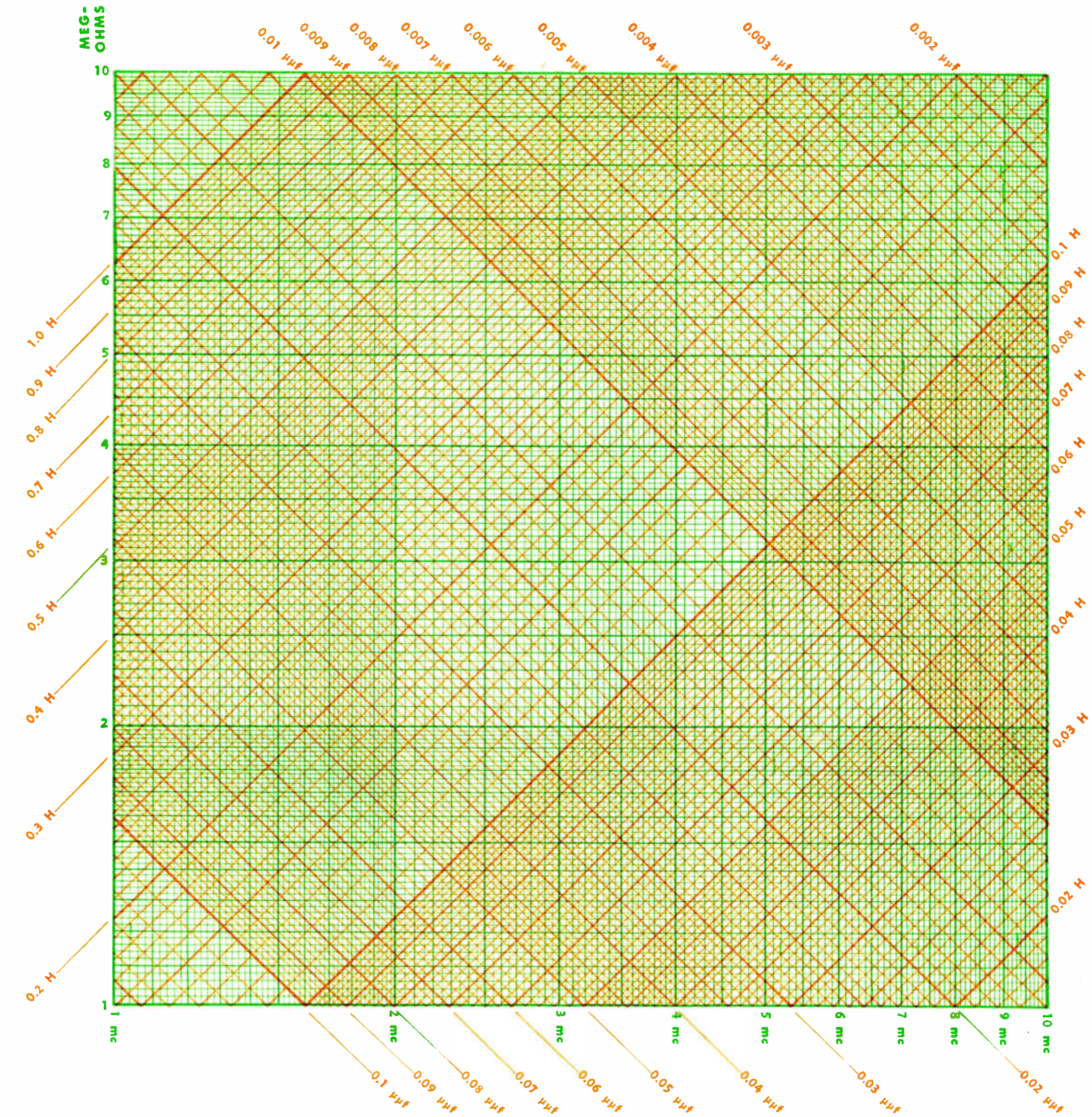
CI
C
100
90
80
70
60
50
40
30
20
10
μ MHOS
OHMS
10,000
20,000
30,000
40,000
50,000
60,000
70,000
80,000
90,000
100,000
A
D
SQUARE
SQUARE ROOT

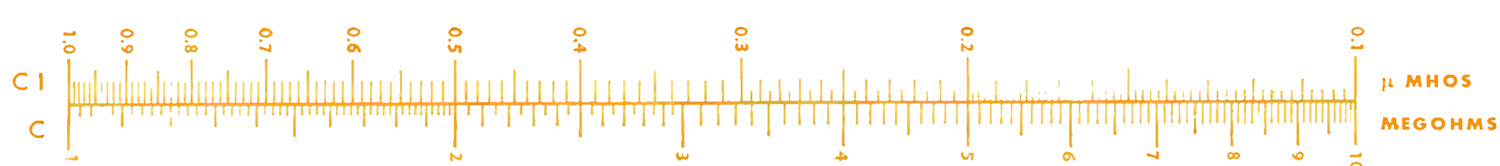
PLATE 53



OHMS
1,000,000
900,000
800,000
700,000
600,000
500,000
400,000
300,000
200,000
100,000
0.1 μμf
0.09 μμf
0.08 μμf
0.07 μμf
0.06 μμf
0.05 μμf
0.04 μμf
0.03 μμf
0.02 μμf
0.1 H
0.09 H
0.08 H
0.07 H
0.06 H
0.05 H
0.04 H
0.03 H
0.02 H
0.01 H
0.009 H
0.008 H
0.007 H
0.006 H
0.005 H
0.004 H
0.003 H
0.002 H
1 mc
2 mc
3 mc
4 mc
5 mc
6 mc
7 mc
8 mc
9 mc
10 mc
1.0 μμf
0.9 μμf
0.8 μμf
0.7 μμf
0.6 μμf
0.5 μμf
0.4 μμf
0.3 μμf
0.2 μμf
C I
C
10
9
8
7
6
5
4
3
2
1
μ MHOS
OHMS
100,000
200,000
300,000
400,000
500,000
600,000
700,000
800,000
900,000
1,000,000
A
D
1 × 10¹⁰
2 × 10¹⁰
3 × 10¹⁰
4 × 10¹⁰
5 × 10¹⁰
6 × 10¹⁰
7 × 10¹⁰
8 × 10¹⁰
9 × 10¹⁰
1 × 10¹¹
2 × 10¹¹
3 × 10¹¹
4 × 10¹¹
5 × 10¹¹
6 × 10¹¹
7 × 10¹¹
8 × 10¹¹
9 × 10¹¹
1 × 10¹²
SQUARE
SQUARE ROOT
100,000
200,000
300,000
400,000
500,000
600,000
700,000
800,000
900,000
1,000,000

PLATE 54


MEG-OHMS
10
9
8
7
6
5
4
3
2
1
0.01 μμf
0.009 μμf
0.008 μμf
0.007 μμf
0.006 μμf
0.005 μμf
0.004 μμf
0.003 μμf
0.002 μμf
1.0 H
0.9 H
0.8 H
0.7 H
0.6 H
0.5 H
0.4 H
0.3 H
0.2 H
0.1 H
0.09 H
0.08 H
0.07 H
0.06 H
0.05 H
0.04 H
0.03 H
0.02 H
1 mc
2 mc
3 mc
4 mc
5 mc
6 mc
7 mc
8 mc
9 mc
10 mc
0.1 μμf
0.09 μμf
0.08 μμf
0.07 μμf
0.06 μμf
0.05 μμf
0.04 μμf
0.03 μμf
0.02 μμf


CI
C
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
μ MHOS
MEGOHMS
1
2
3
4
5
6
7
8
9
10

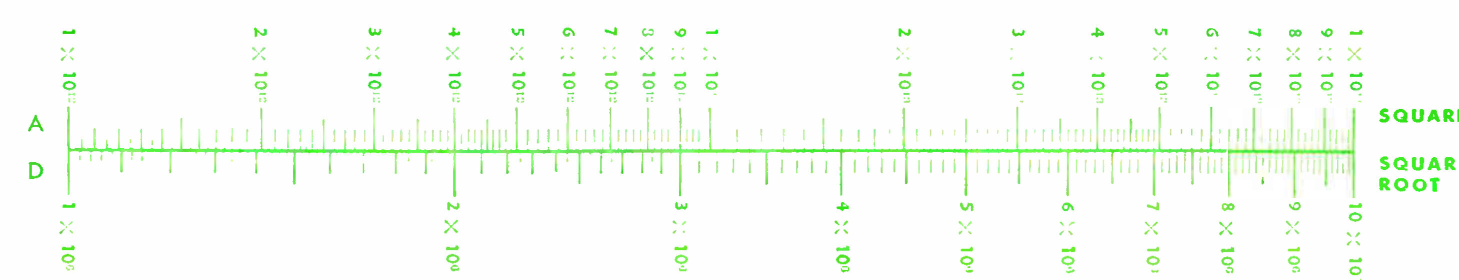

A
D
SQUARE
SQUARE ROOT

PLATE 55

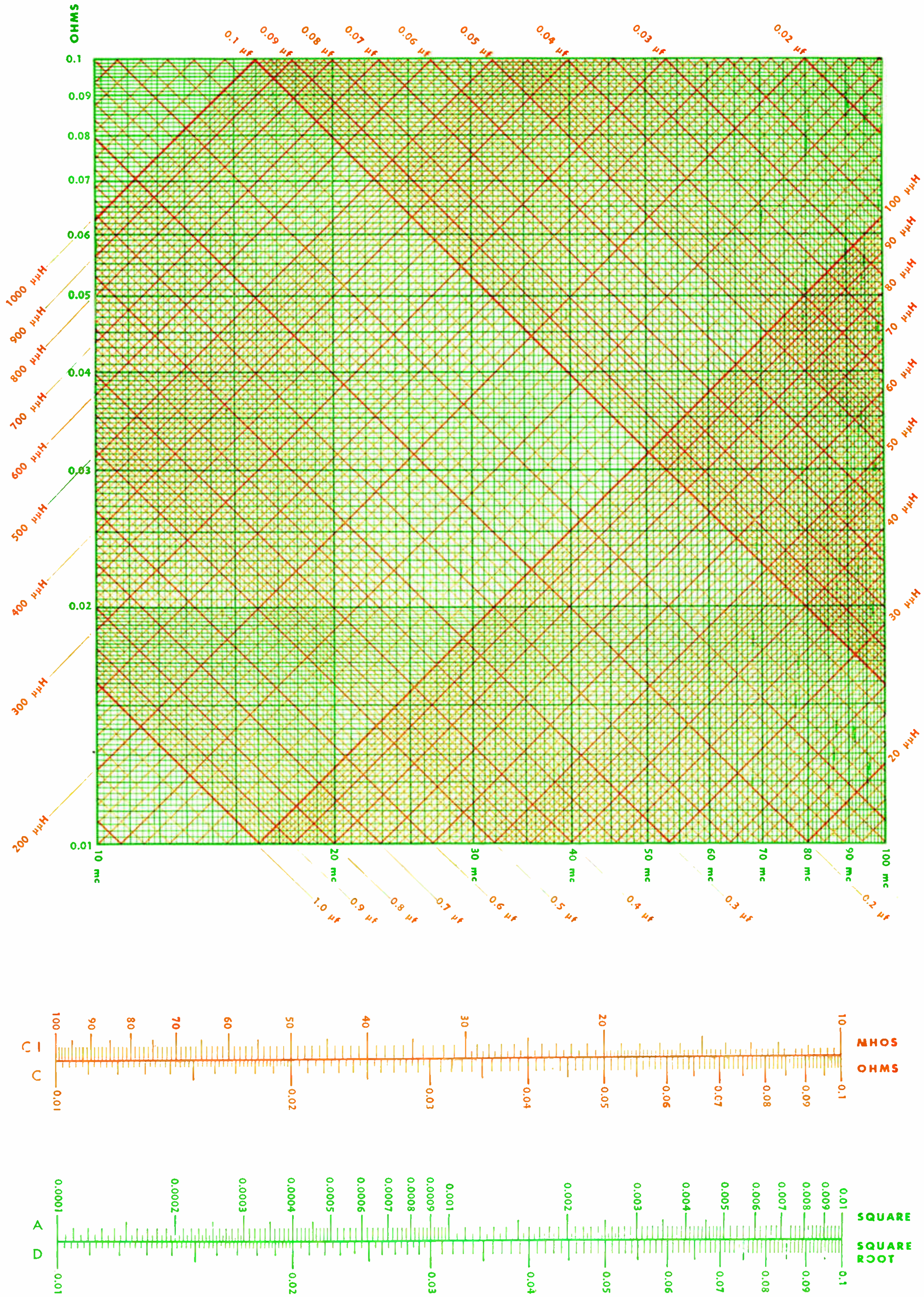
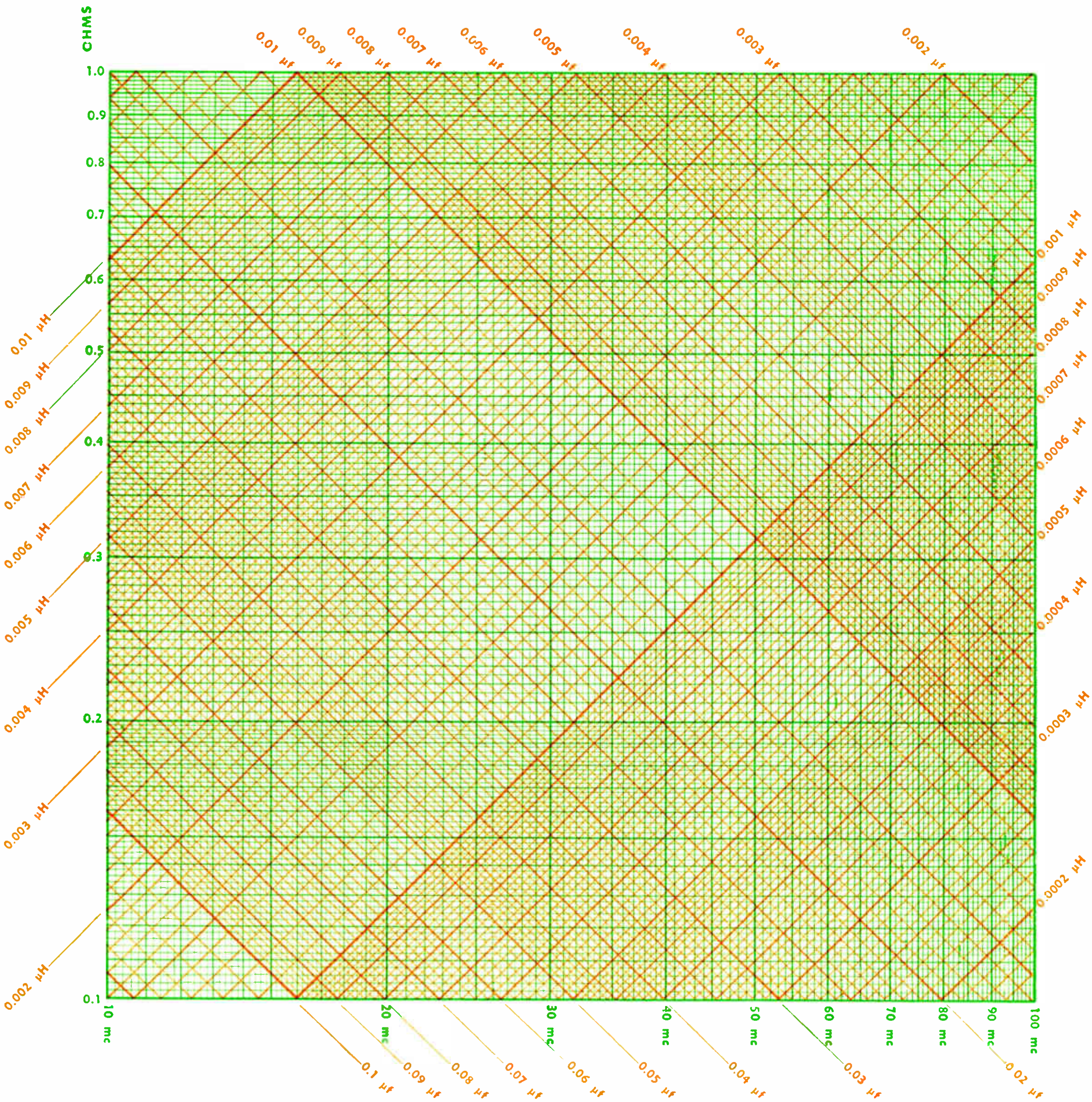
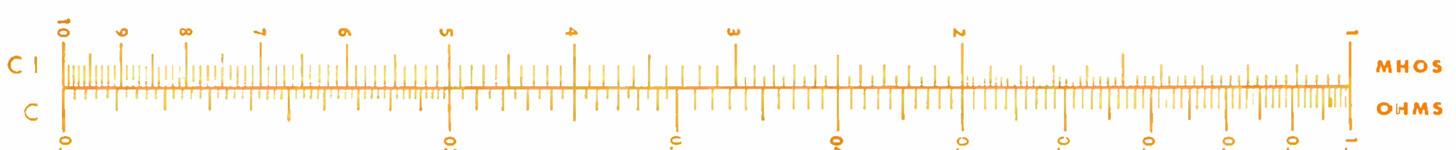

OHMS
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.1 μf
0.09 μf
0.08 μf
0.07 μf
0.06 μf
0.05 μf
0.04 μf
0.03 μf
0.02 μf
1000 μμH
900 μμH
800 μμH
700 μμH
600 μμH
500 μμH
400 μμH
300 μμH
200 μμH
100 μμH
90 μμH
80 μμH
70 μμH
60 μμH
50 μμH
40 μμH
30 μμH
20 μμH
10 mc
20 mc
30 mc
40 mc
50 mc
60 mc
70 mc
80 mc
90 mc
100 mc
1.0 μf
0.9 μf
0.8 μf
0.7 μf
0.6 μf
0.5 μf
0.4 μf
0.3 μf
0.2 μf
CI
C
MHOS
OHMS
A
D
SQUARE
SQUARE ROOT

PLATE 56


OHMS
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.01 μf
0.009 μf
0.008 μf
0.007 μf
0.006 μf
0.005 μf
0.004 μf
0.003 μf
0.002 μf
0.01 μH
0.009 μH
0.008 μH
0.007 μH
0.006 μH
0.005 μH
0.004 μH
0.003 μH
0.002 μH
0.001 μH
0.0009 μH
0.0008 μH
0.0007 μH
0.0006 μH
0.0005 μH
0.0004 μH
0.0003 μH
0.0002 μH
10 mc
20 mc
30 mc
40 mc
50 mc
60 mc
70 mc
80 mc
90 mc
100 mc
0.1 μf
0.09 μf
0.08 μf
0.07 μf
0.06 μf
0.05 μf
0.04 μf
0.03 μf
0.02 μf


10 9 8 7 6 5 4 3 2 1
CI
C
MHOS
OHMS
0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0

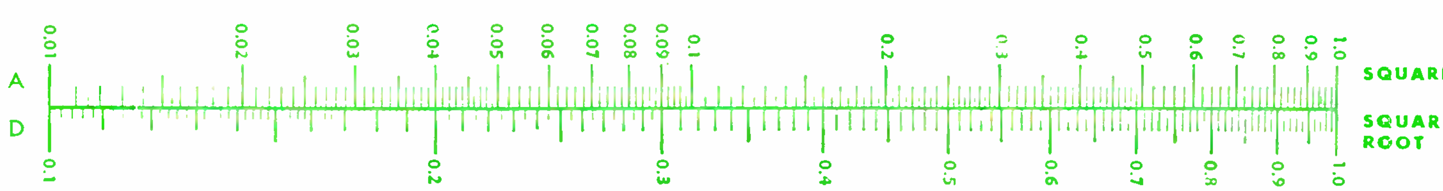
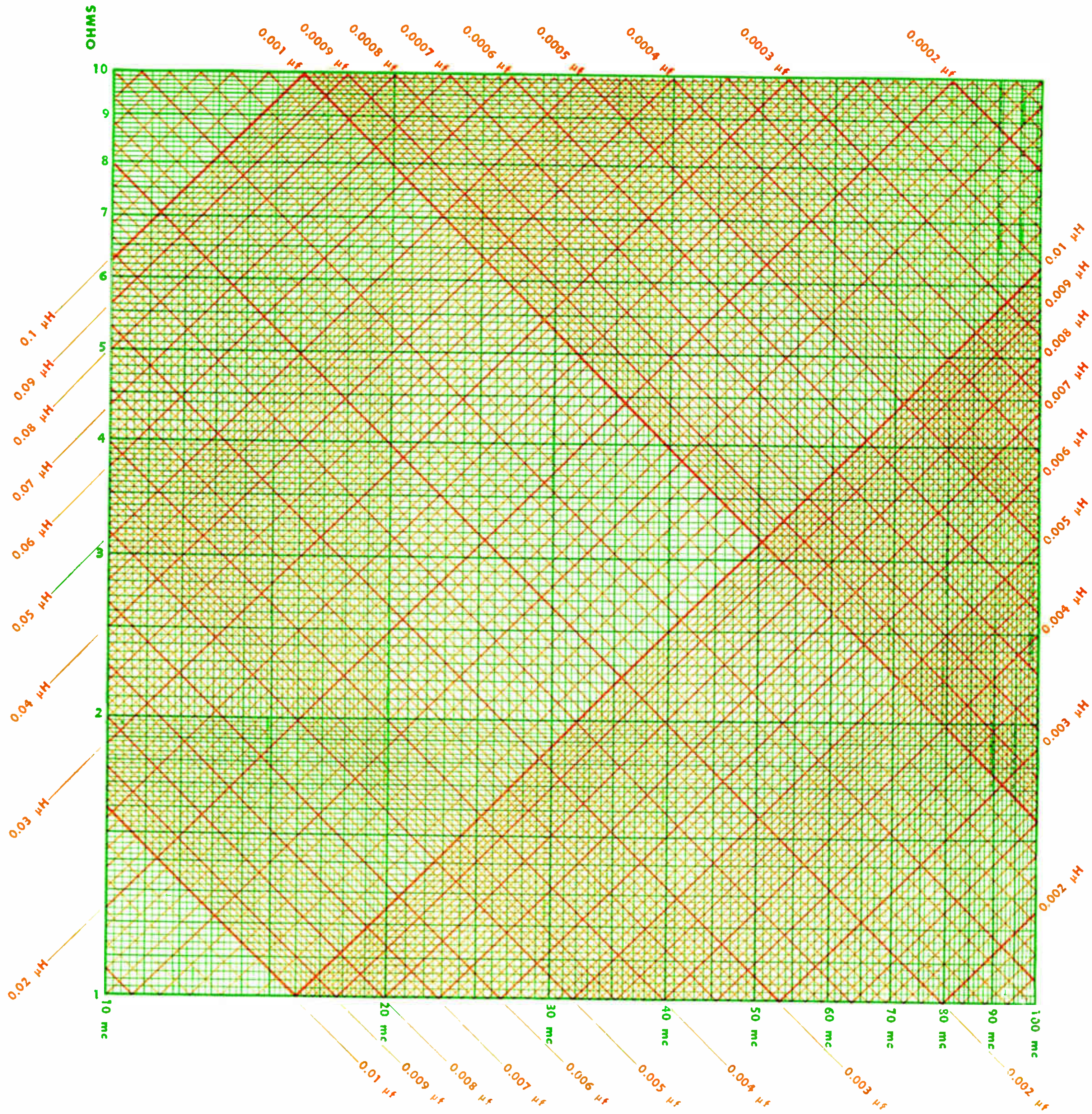
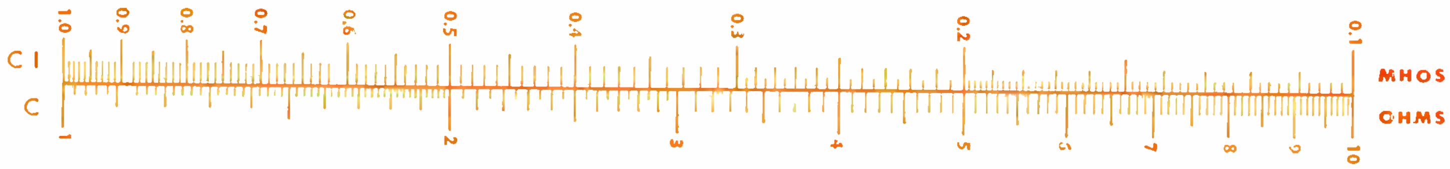

0.01 0.02 0.03 0.04 0.05 0.06 0.07 0.08 0.09 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
A
D
SQUARE
SQUARE ROOT
0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0

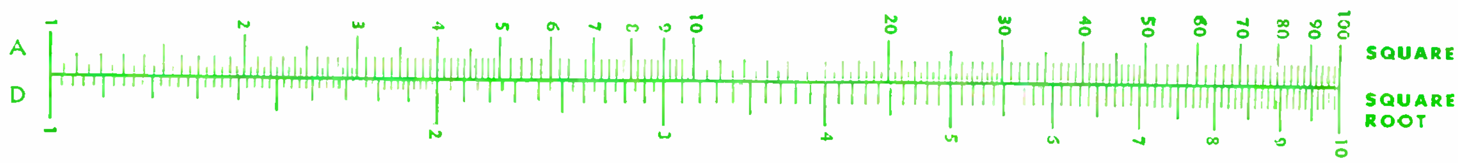
PLATE 57



OHMS
0.001 μf
0.0009 μf
0.0008 μf
0.0007 μf
0.0006 μf
0.0005 μf
0.0004 μf
0.0003 μf
0.0002 μf
0.1 μH
0.09 μH
0.08 μH
0.07 μH
0.06 μH
0.05 μH
0.04 μH
0.03 μH
0.02 μH
0.01 μH
0.009 μH
0.008 μH
0.007 μH
0.006 μH
0.005 μH
0.004 μH
0.003 μH
0.002 μH
10 mc
20 mc
30 mc
40 mc
50 mc
60 mc
70 mc
80 mc
90 mc
100 mc
0.01 μf
0.009 μf
0.008 μf
0.007 μf
0.006 μf
0.005 μf
0.004 μf
0.003 μf
0.002 μf

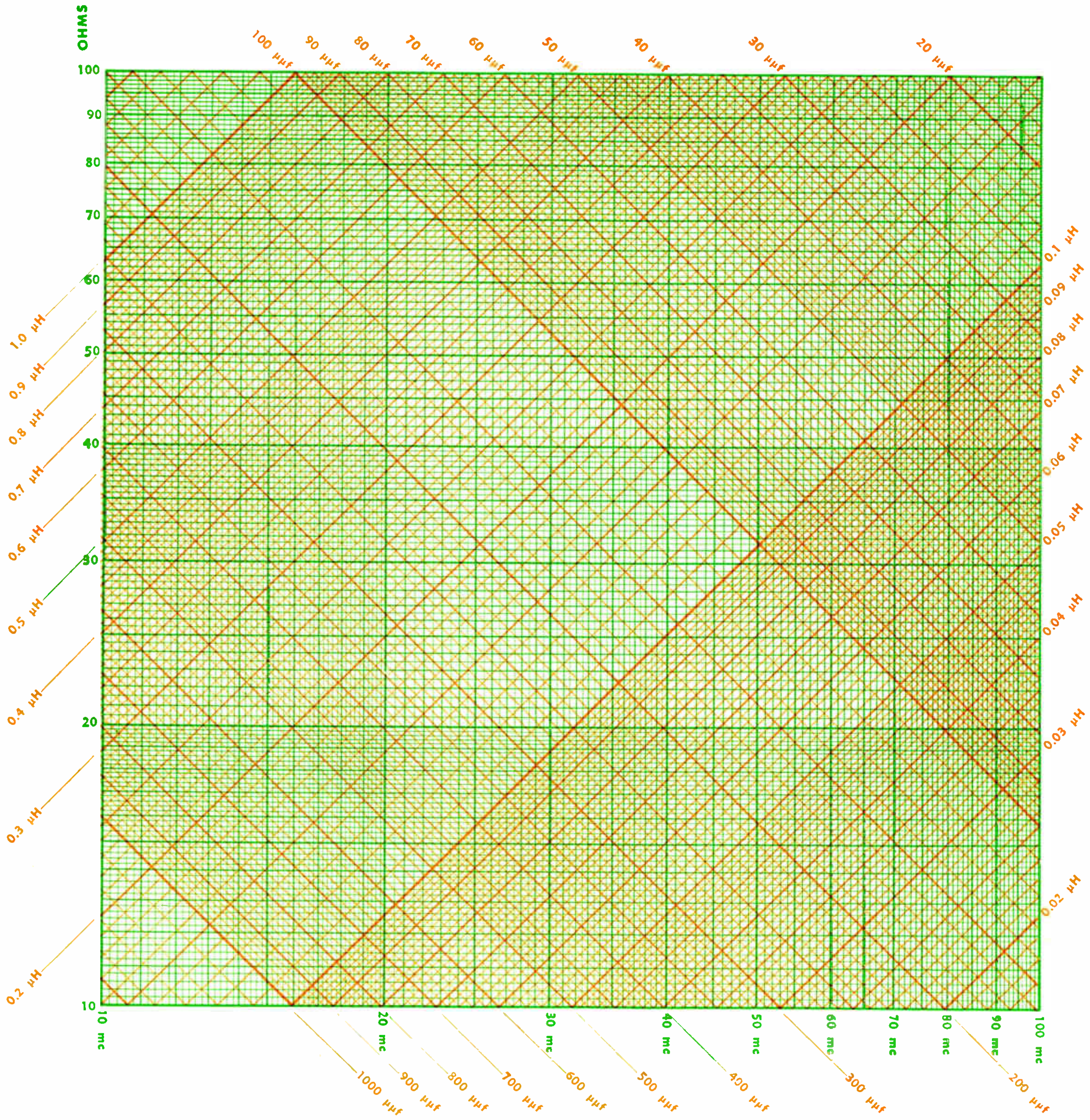


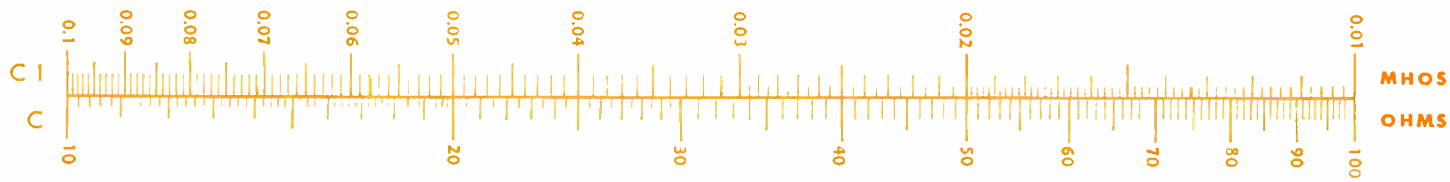
CI
C
MHOS
OHMS

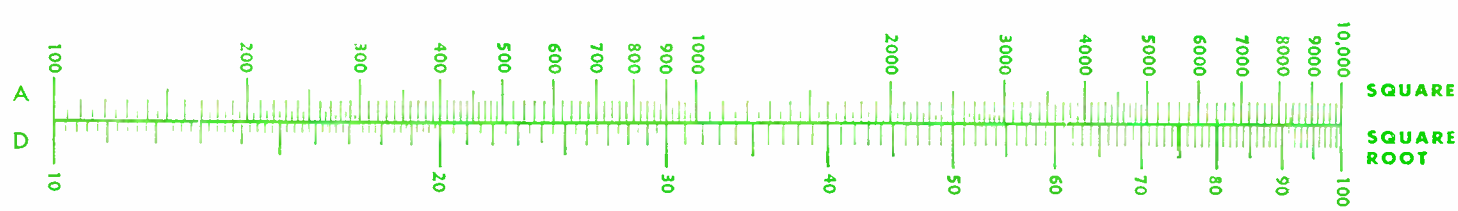


A
D
SQUARE
SQUARE ROOT

PLATE 58


OHMS
100
90
80
70
60
50
40
30
20
10
100 µµf
90 µµf
80 µµf
70 µµf
60 µµf
50 µµf
40 µµf
30 µµf
20 µµf
1.0 µH
0.9 µH
0.8 µH
0.7 µH
0.6 µH
0.5 µH
0.4 µH
0.3 µH
0.2 µH
0.1 µH
0.09 µH
0.08 µH
0.07 µH
0.06 µH
0.05 µH
0.04 µH
0.03 µH
0.02 µH
10 mc
20 mc
30 mc
40 mc
50 mc
60 mc
70 mc
80 mc
90 mc
100 mc
1000 µµf
900 µµf
800 µµf
700 µµf
600 µµf
500 µµf
400 µµf
300 µµf
200 µµf


CI
C
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
MHOS
OHMS
10
20
30
40
50
60
70
80
90
100


A
D
100
200
300
400
500
600
700
800
900
1000
2000
3000
4000
5000
6000
7000
8000
9000
10,000
SQUARE
SQUARE ROOT
10
20
30
40
50
60
70
80
90
100

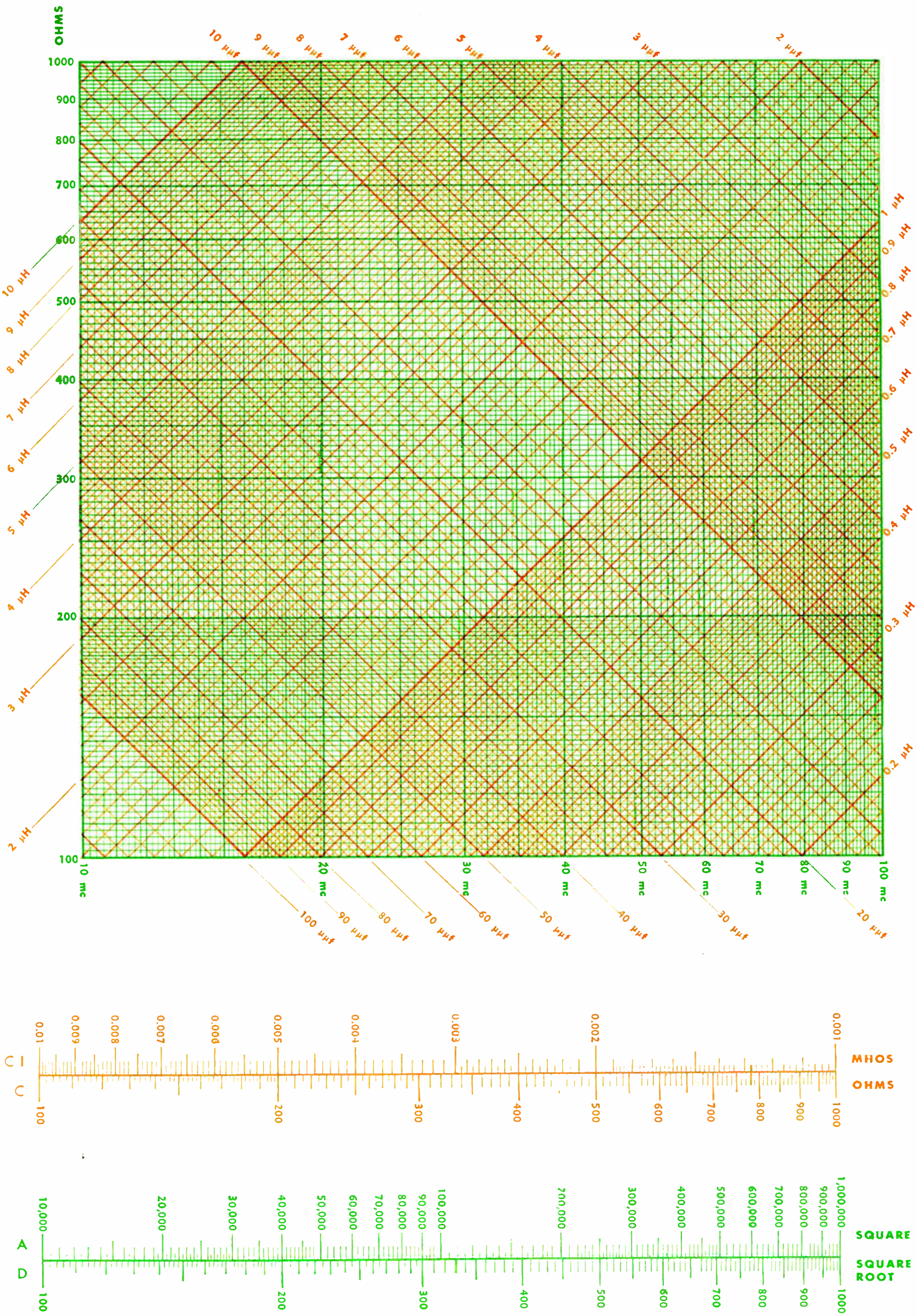
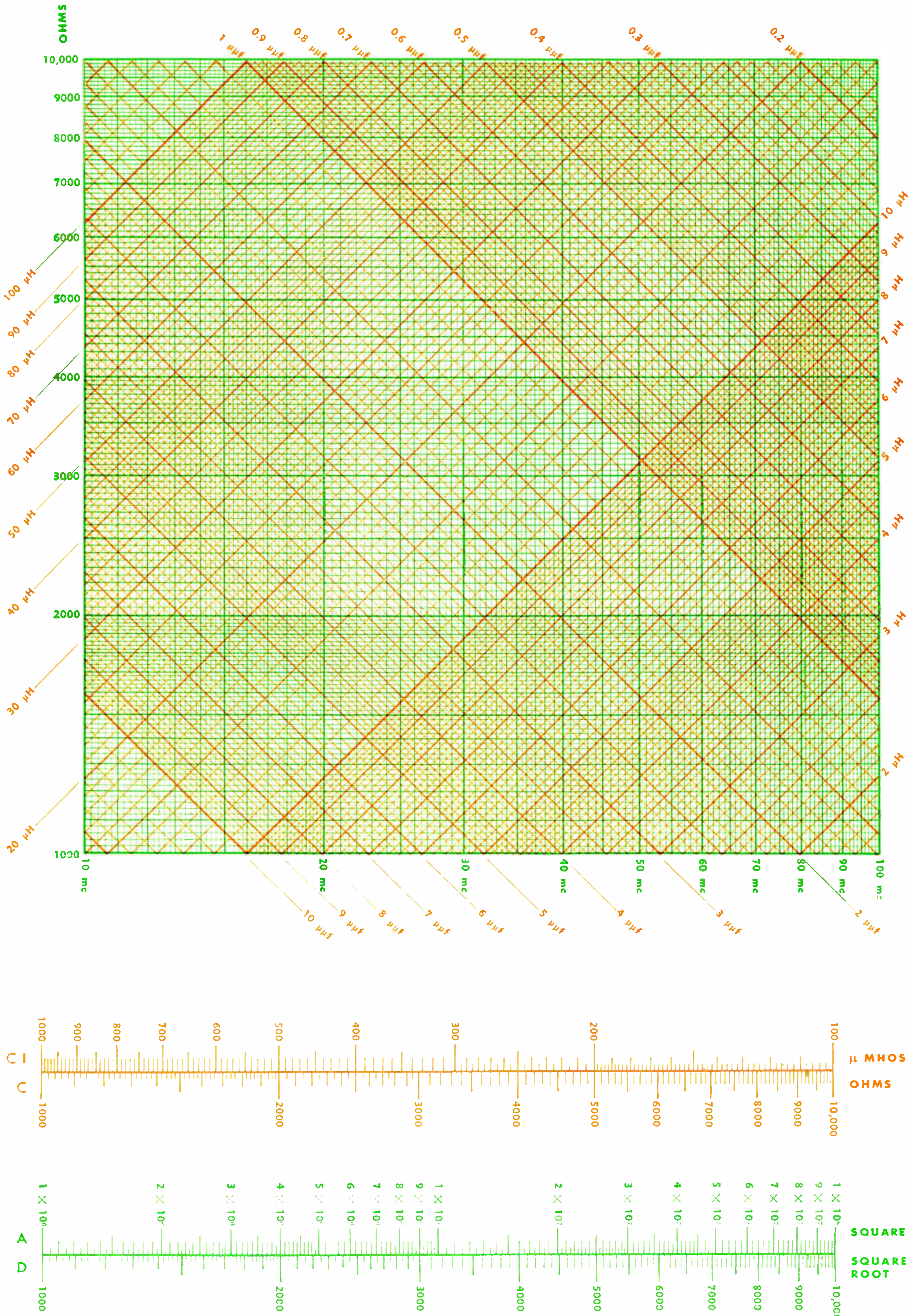

OHMS
1000
900
800
700
600
500
400
300
200
100
10 μμf
9 μμf
8 μμf
7 μμf
6 μμf
5 μμf
4 μμf
3 μμf
2 μμf
10 μH
9 μH
8 μH
7 μH
6 μH
5 μH
4 μH
3 μH
2 μH
1 μH
0.9 μH
0.8 μH
0.7 μH
0.6 μH
0.5 μH
0.4 μH
0.3 μH
0.2 μH
10 mc
20 mc
30 mc
40 mc
50 mc
60 mc
70 mc
80 mc
90 mc
100 mc
100 μμf
90 μμf
80 μμf
70 μμf
60 μμf
50 μμf
40 μμf
30 μμf
20 μμf
CI
C
0.01
0.009
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
MHOS
OHMS
100
200
300
400
500
600
700
800
900
1000
A
D
10,000
20,000
30,000
40,000
50,000
60,000
70,000
80,000
90,000
100,000
200,000
300,000
400,000
500,000
600,000
700,000
800,000
900,000
1,000,000
SQUARE
SQUARE ROOT
100
200
300
400
500
600
700
800
900
1000

PLATE 60



OHMS
10,000
9000
8000
7000
6000
5000
4000
3000
2000
1000
1 μμf
0.9 μμf
0.8 μμf
0.7 μμf
0.6 μμf
0.5 μμf
0.4 μμf
0.3 μμf
0.2 μμf
100 μH
90 μH
80 μH
70 μH
60 μH
50 μH
40 μH
30 μH
20 μH
10 μH
9 μH
8 μH
7 μH
6 μH
5 μH
4 μH
3 μH
2 μH
10 mc
20 mc
30 mc
40 mc
50 mc
60 mc
70 mc
80 mc
90 mc
100 mc
10 μμf
9 μμf
8 μμf
7 μμf
6 μμf
5 μμf
4 μμf
3 μμf
2 μμf
CI
C
μ MHOS
OHMS
1000
900
800
700
600
500
400
300
200
100
2000
3000
4000
5000
6000
7000
8000
9000
10,000
A
D
SQUARE
SQUARE ROOT

PLATE 61

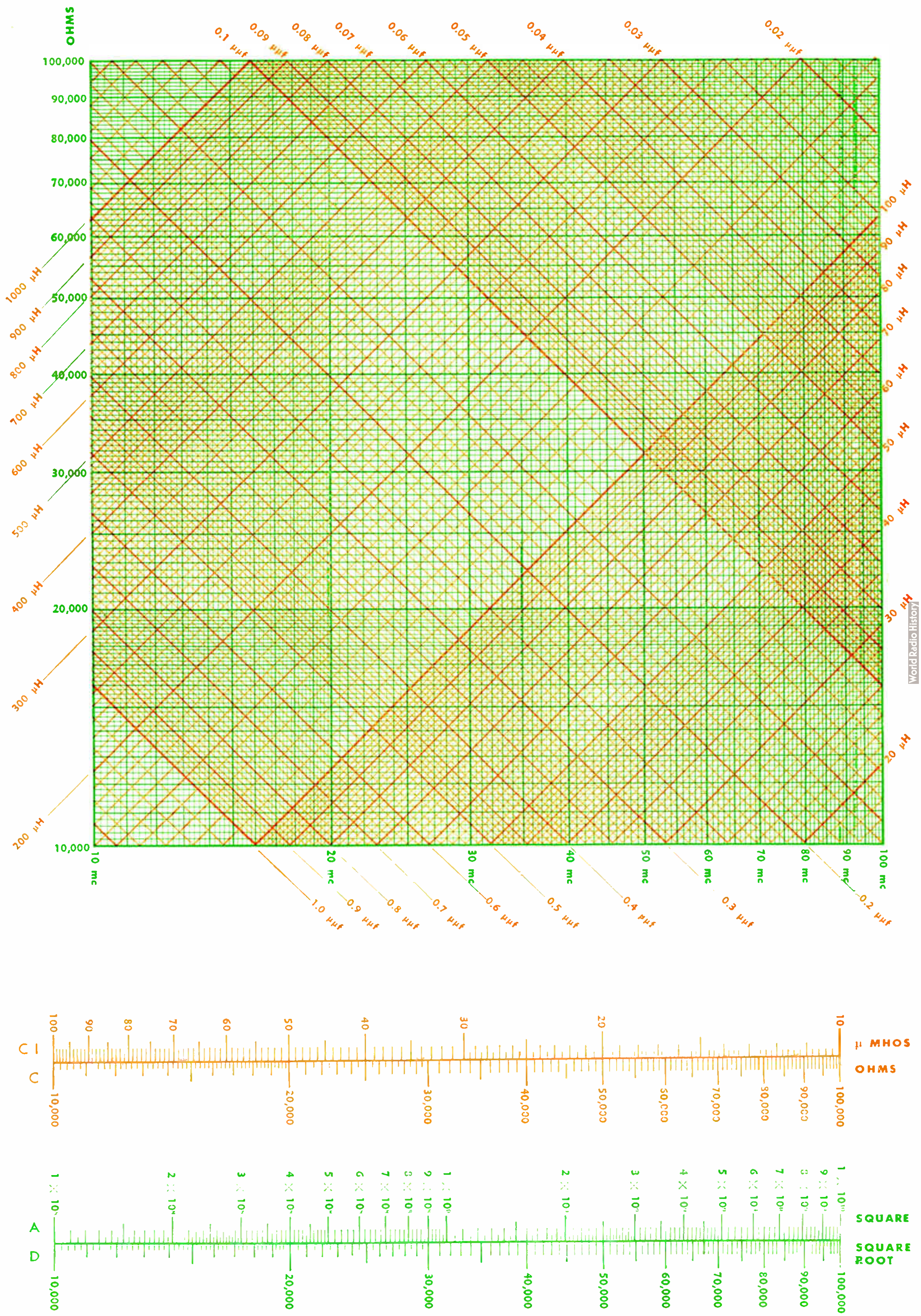
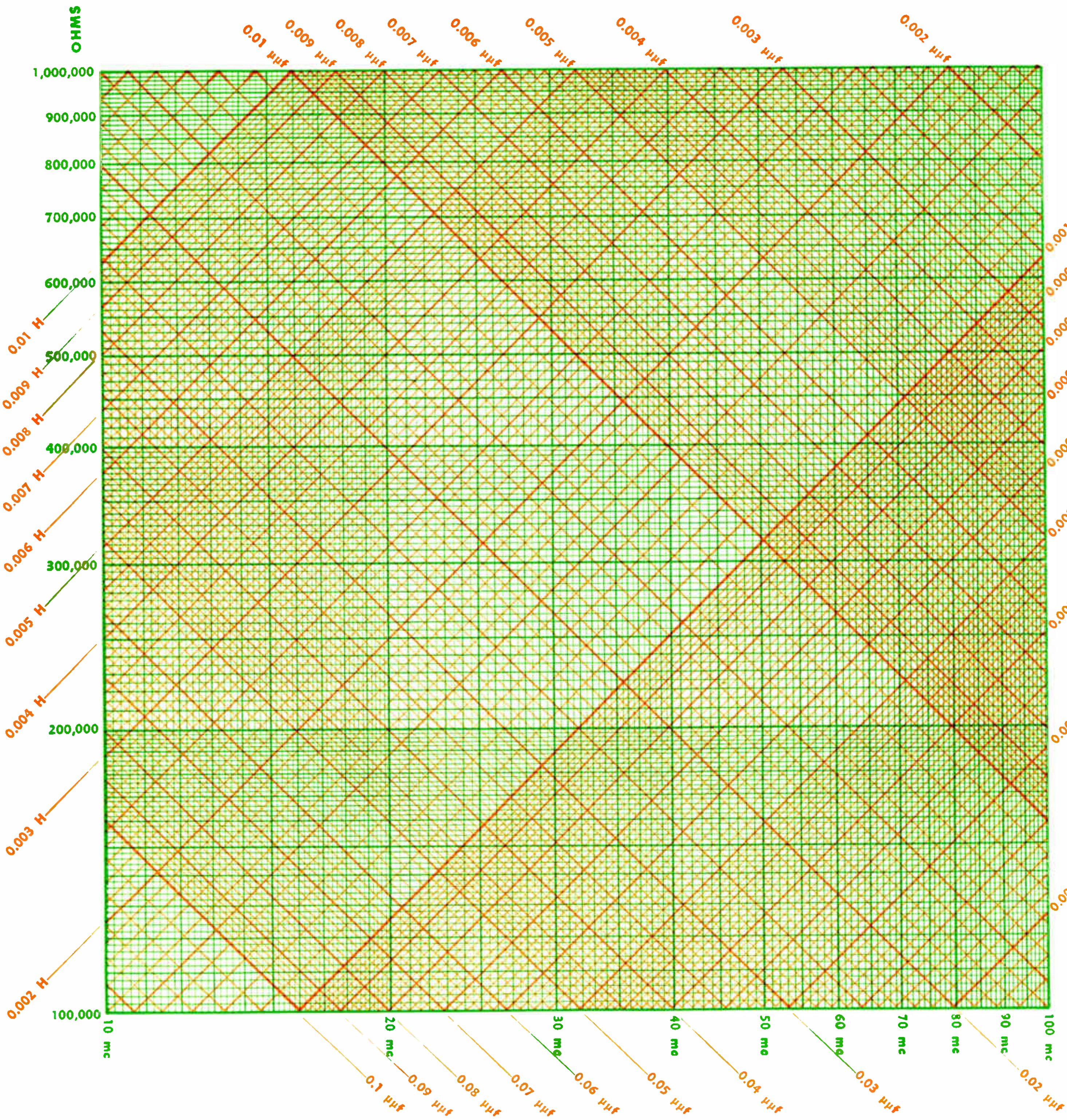
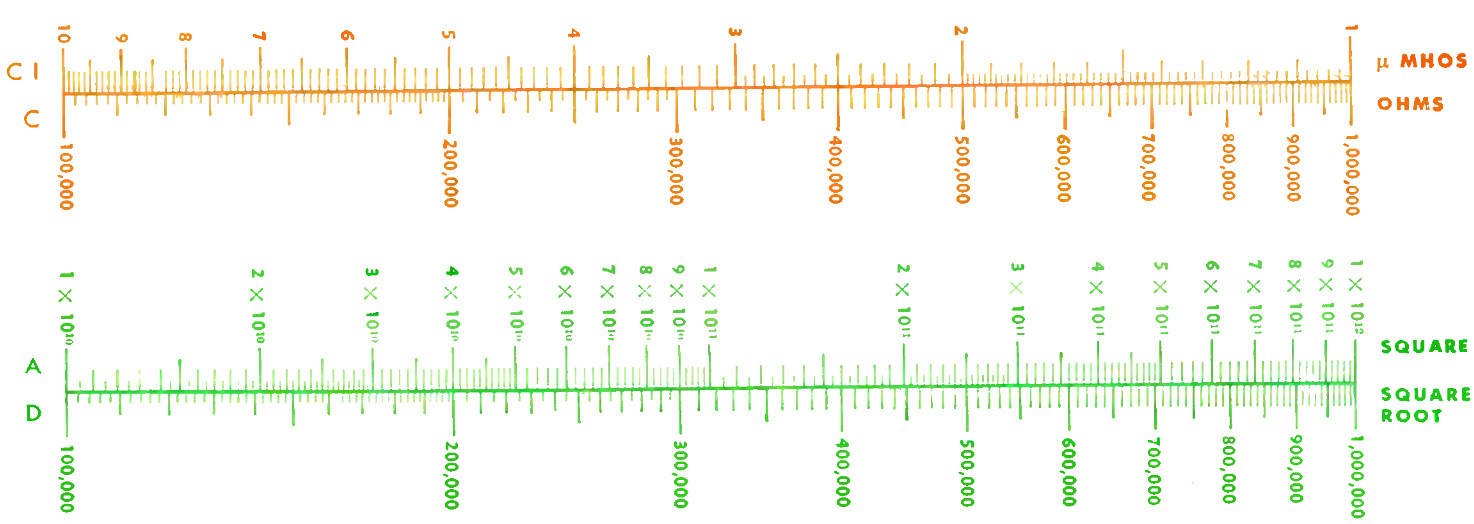

OHMS
100,000
90,000
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
1000 μH
900 μH
800 μH
700 μH
600 μH
500 μH
400 μH
300 μH
200 μH
0.1 μμf
0.09 μμf
0.08 μμf
0.07 μμf
0.06 μμf
0.05 μμf
0.04 μμf
0.03 μμf
0.02 μμf
100 μH
90 μH
80 μH
70 μH
60 μH
50 μH
40 μH
30 μH
20 μH
10 mc
20 mc
30 mc
40 mc
50 mc
60 mc
70 mc
80 mc
90 mc
100 mc
1.0 μμf
0.9 μμf
0.8 μμf
0.7 μμf
0.6 μμf
0.5 μμf
0.4 μμf
0.3 μμf
0.2 μμf
C I
C
μ MHOS
OHMS
100 90 80 70 60 50 40 30 20 10
10,000 20,000 30,000 40,000 50,000 60,000 70,000 80,000 90,000 100,000
A
D
SQUARE
SQUARE ROOT
10,000 20,000 30,000 40,000 50,000 60,000 70,000 80,000 90,000 100,000

PLATE 62


OHMS
1,000,000
900,000
800,000
700,000
600,000
500,000
400,000
300,000
200,000
100,000
0.01 μμf
0.009 μμf
0.008 μμf
0.007 μμf
0.006 μμf
0.005 μμf
0.004 μμf
0.003 μμf
0.002 μμf
0.01 H
0.009 H
0.008 H
0.007 H
0.006 H
0.005 H
0.004 H
0.003 H
0.002 H
0.001 H
0.0009 H
0.0008 H
0.0007 H
0.0006 H
0.0005 H
0.0004 H
0.0003 H
0.0002 H
10 mc
20 mc
30 mc
40 mc
50 mc
60 mc
70 mc
80 mc
90 mc
100 mc
0.1 μμf
0.09 μμf
0.08 μμf
0.07 μμf
0.06 μμf
0.05 μμf
0.04 μμf
0.03 μμf
0.02 μμf


CI
C
μ MHOS
OHMS
10
9
8
7
6
5
4
3
2
1
100,000
200,000
300,000
400,000
500,000
600,000
700,000
800,000
900,000
1,000,000
A
D
SQUARE
SQUARE ROOT

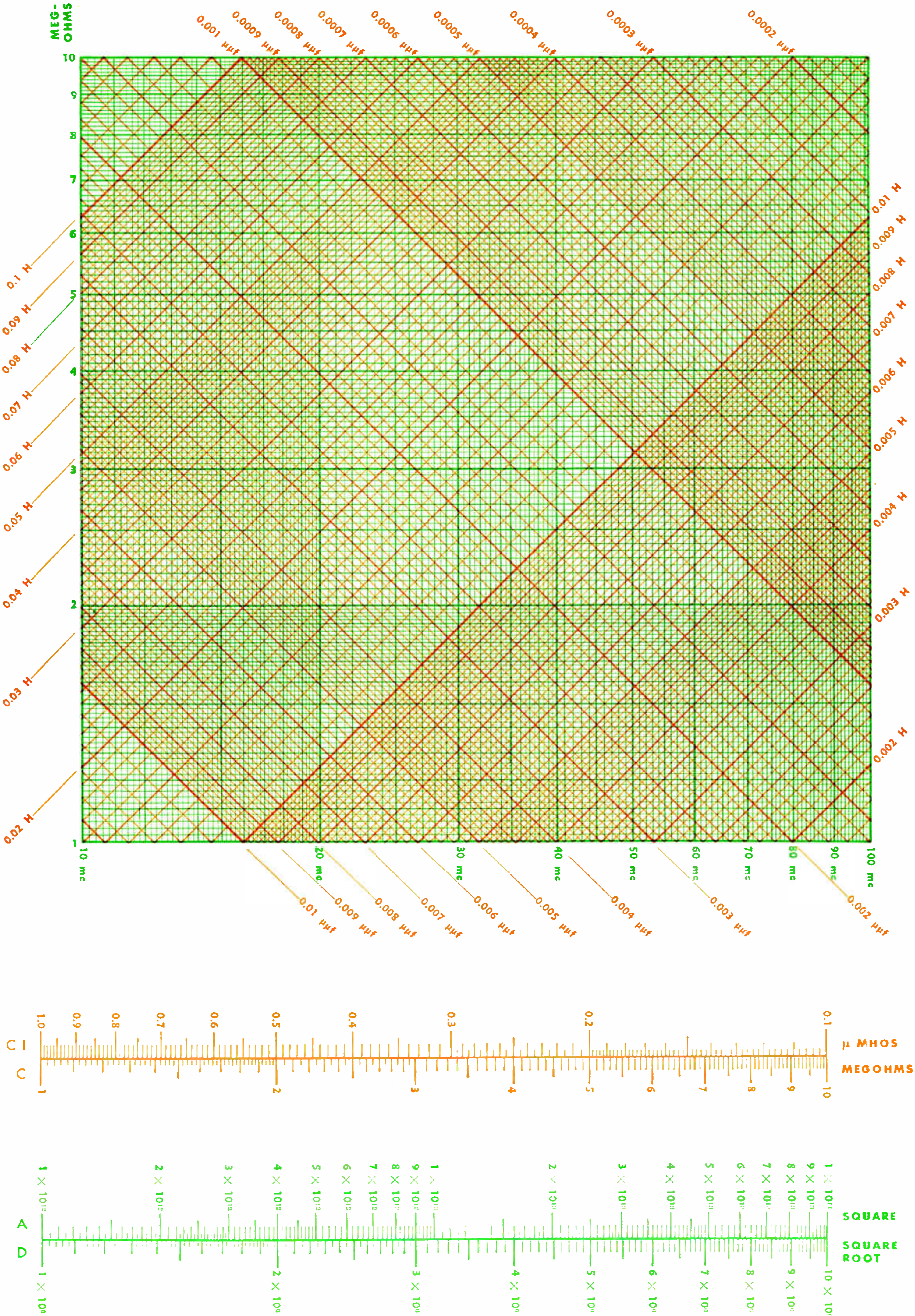
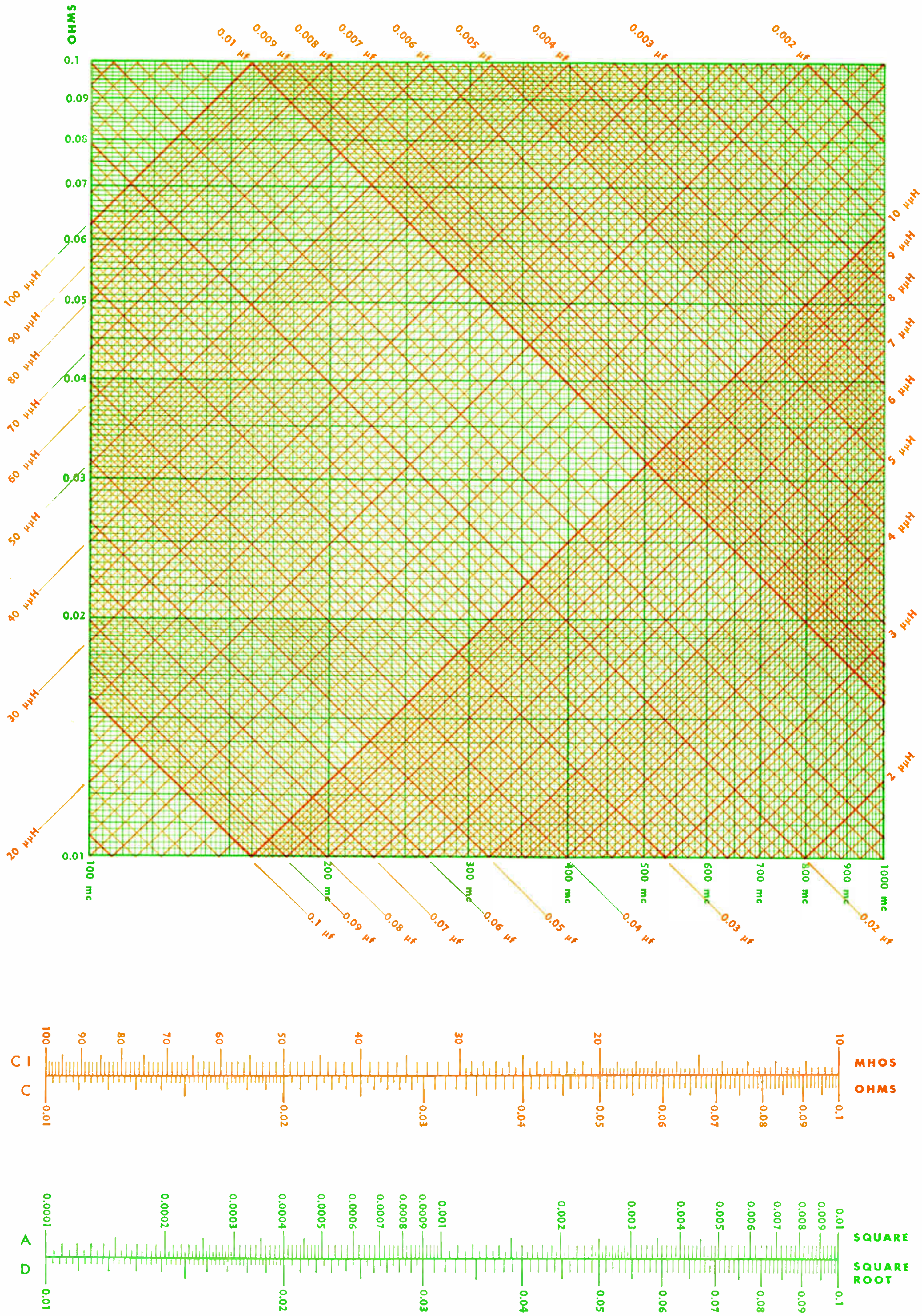

MEG-OHMS
10
9
8
7
6
5
4
3
2
1
0.001 µµf
0.0009 µµf
0.0008 µµf
0.0007 µµf
0.0006 µµf
0.0005 µµf
0.0004 µµf
0.0003 µµf
0.0002 µµf
0.1 H
0.09 H
0.08 H
0.07 H
0.06 H
0.05 H
0.04 H
0.03 H
0.02 H
0.01 H
0.009 H
0.008 H
0.007 H
0.006 H
0.005 H
0.004 H
0.003 H
0.002 H
10 mc
20 mc
30 mc
40 mc
50 mc
60 mc
70 mc
80 mc
90 mc
100 mc
0.01 µµf
0.009 µµf
0.008 µµf
0.007 µµf
0.006 µµf
0.005 µµf
0.004 µµf
0.003 µµf
0.002 µµf
C I
C
1.0 0.9 0.8 0.7 0.6 0.5 0.4 0.3 0.2 0.1
µ MHOS
MEGOHMS
1 2 3 4 5 6 7 8 9 10
A
D
SQUARE
SQUARE ROOT

PLATE 64


OHMS
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.01 μf
0.009 μf
0.008 μf
0.007 μf
0.006 μf
0.005 μf
0.004 μf
0.003 μf
0.002 μf
100 μμH
90 μμH
80 μμH
70 μμH
60 μμH
50 μμH
40 μμH
30 μμH
20 μμH
10 μμH
9 μμH
8 μμH
7 μμH
6 μμH
5 μμH
4 μμH
3 μμH
2 μμH
100 mc
200 mc
300 mc
400 mc
500 mc
600 mc
700 mc
800 mc
900 mc
1000 mc
0.1 μf
0.09 μf
0.08 μf
0.07 μf
0.06 μf
0.05 μf
0.04 μf
0.03 μf
0.02 μf
CI
C
100 90 80 70 60 50 40 30 20 10
0.01 0.02 0.03 0.04 0.05 0.06 0.07 0.08 0.09 0.1
MHOS
OHMS
A
D
0.0001 0.0002 0.0003 0.0004 0.0005 0.0006 0.0007 0.0008 0.0009 0.001 0.002 0.003 0.004 0.005 0.006 0.007 0.008 0.009 0.01
0.01 0.02 0.03 0.04 0.05 0.06 0.07 0.08 0.09 0.1
SQUARE
SQUARE ROOT

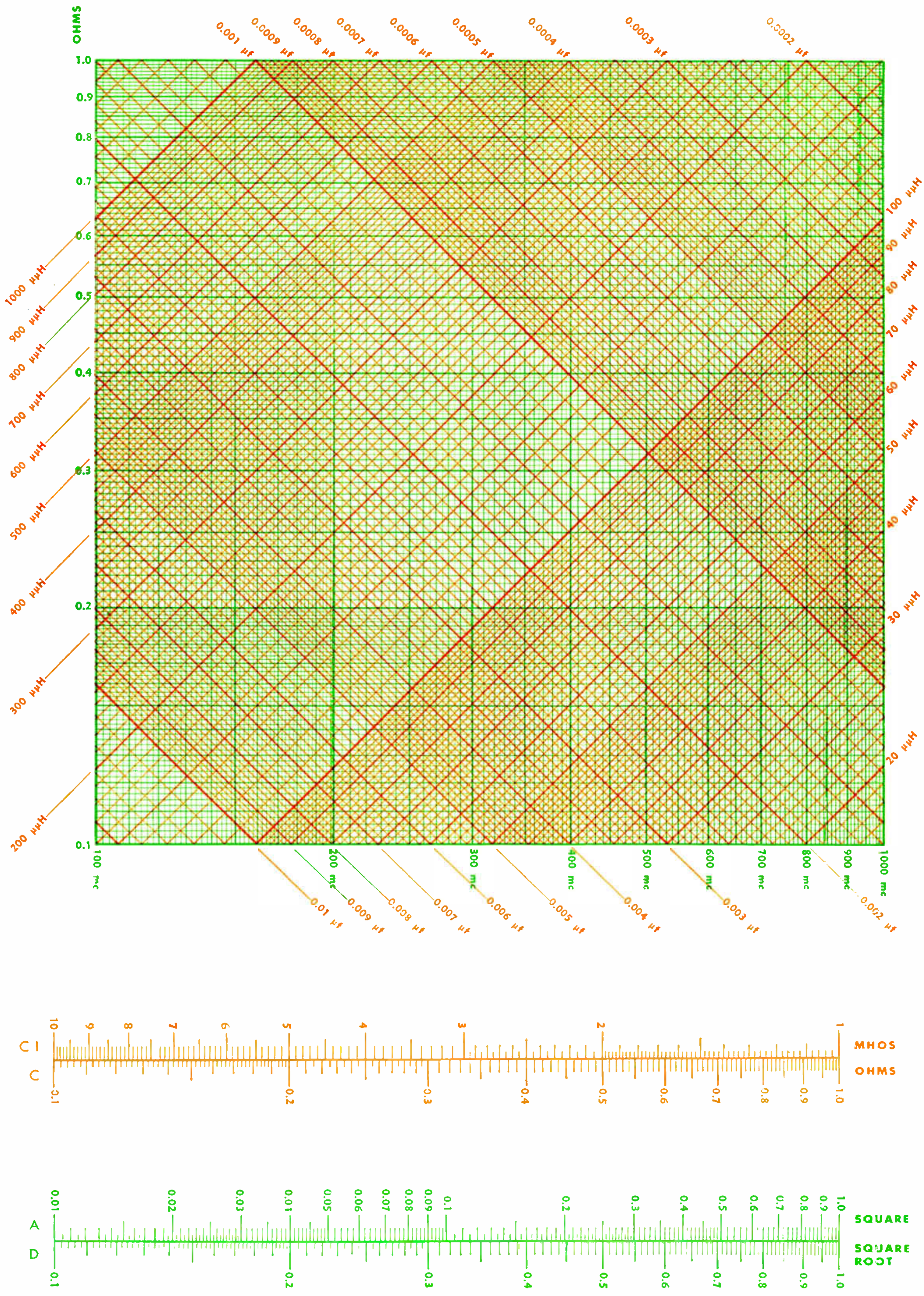
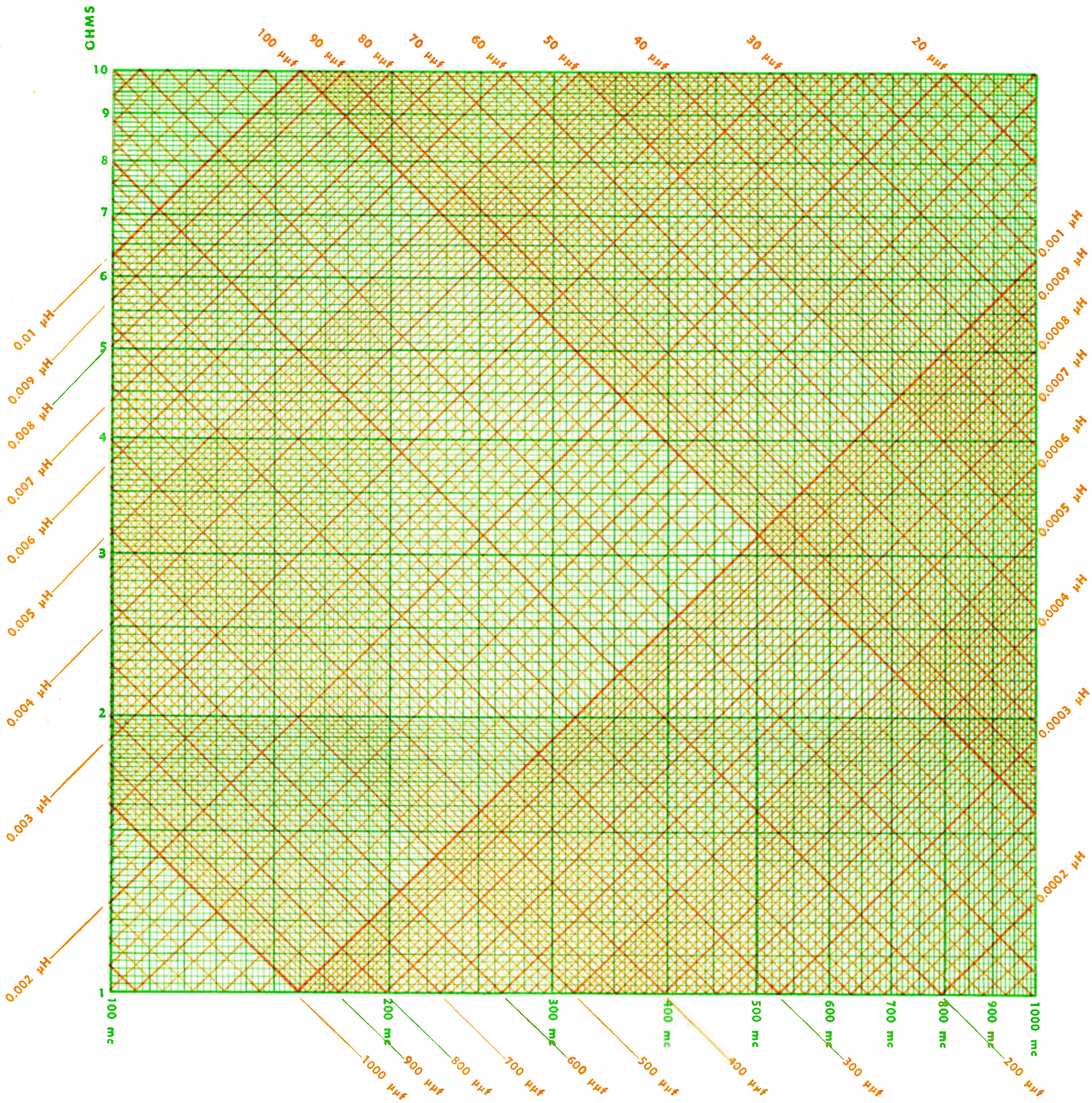
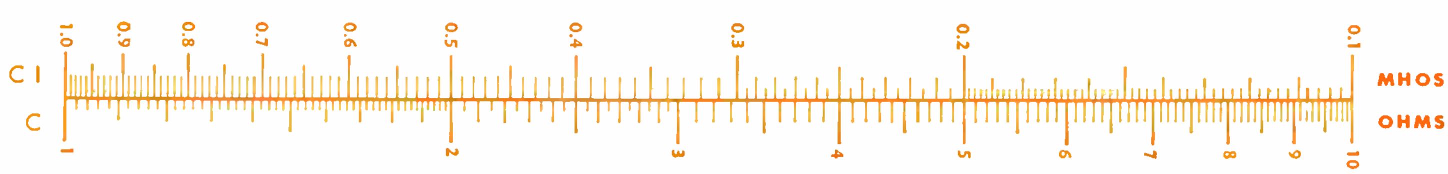

OHMS
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.001 μf
0.0009 μf
0.0008 μf
0.0007 μf
0.0006 μf
0.0005 μf
0.0004 μf
0.0003 μf
0.0002 μf
1000 μμH
900 μμH
800 μμH
700 μμH
600 μμH
500 μμH
400 μμH
300 μμH
200 μμH
100 μμH
90 μμH
80 μμH
70 μμH
60 μμH
50 μμH
40 μμH
30 μμH
20 μμH
100 mc
200 mc
300 mc
400 mc
500 mc
600 mc
700 mc
800 mc
900 mc
1000 mc
0.01 μf
0.009 μf
0.008 μf
0.007 μf
0.006 μf
0.005 μf
0.004 μf
0.003 μf
0.002 μf
CI
C
MHOS
OHMS
A
D
SQUARE
SQUARE ROOT

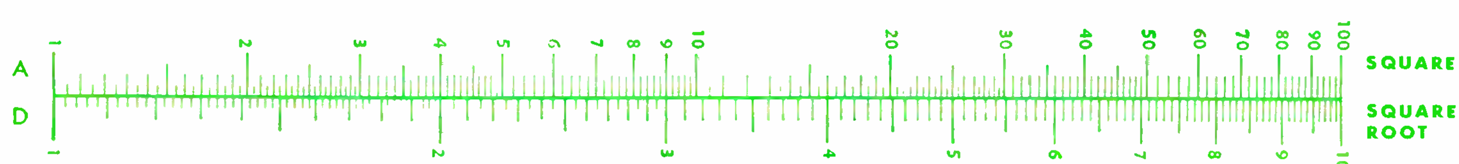
PLATE 66



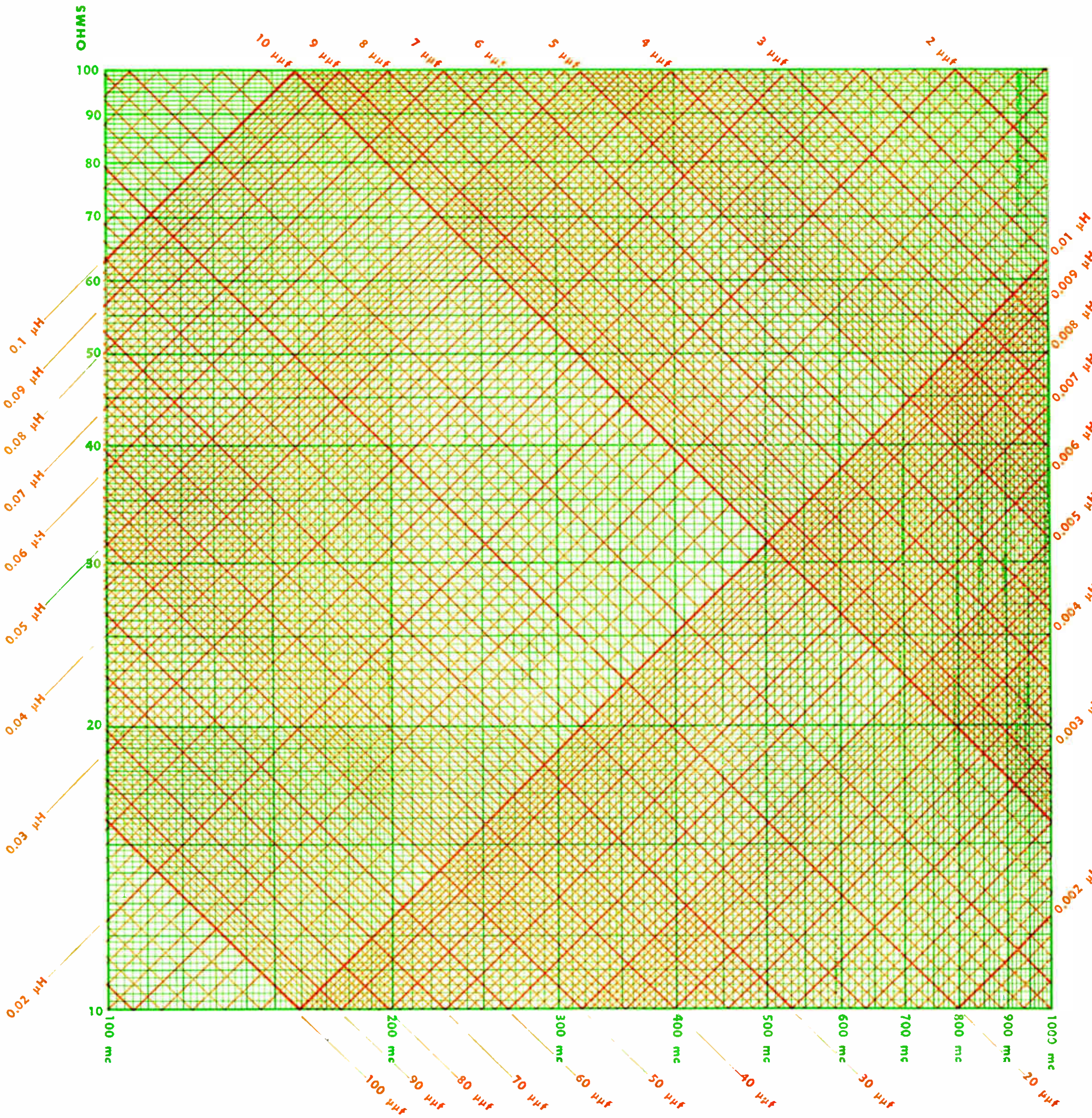
OHMS
10
9
8
7
6
5
4
3
2
1
100 μμf
90 μμf
80 μμf
70 μμf
60 μμf
50 μμf
40 μμf
30 μμf
20 μμf
0.01 μH
0.009 μH
0.008 μH
0.007 μH
0.006 μH
0.005 μH
0.004 μH
0.003 μH
0.002 μH
0.001 μH
0.0009 μH
0.0008 μH
0.0007 μH
0.0006 μH
0.0005 μH
0.0004 μH
0.0003 μH
0.0002 μH
100 mc
200 mc
300 mc
400 mc
500 mc
600 mc
700 mc
800 mc
900 mc
1000 mc
1000 μμf
900 μμf
800 μμf
700 μμf
600 μμf
500 μμf
400 μμf
300 μμf
200 μμf

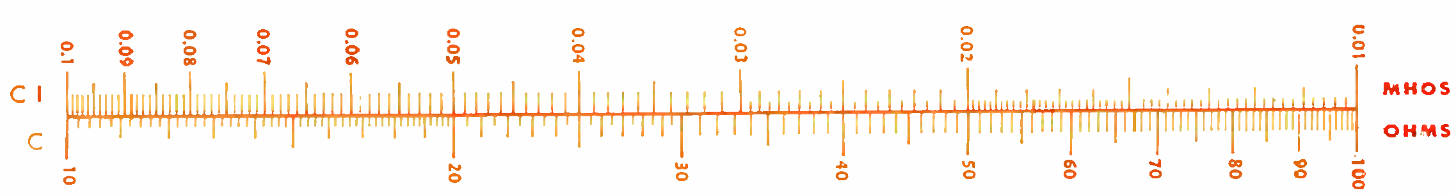


CI
C
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
1
2
3
4
5
6
7
8
9
10
MHOS
OHMS



A
D
1
2
3
4
5
6
7
8
9
10
20
30
40
50
60
70
80
90
100
1
2
3
4
5
6
7
8
9
10
SQUARE
SQUARE ROOT


OHMS
100
90
80
70
60
50
40
30
20
10
10 μμf
9 μμf
8 μμf
7 μμf
6 μμf
5 μμf
4 μμf
3 μμf
2 μμf
0.1 μH
0.09 μH
0.08 μH
0.07 μH
0.06 μH
0.05 μH
0.04 μH
0.03 μH
0.02 μH
0.01 μH
0.009 μH
0.008 μH
0.007 μH
0.006 μH
0.005 μH
0.004 μH
0.003 μH
0.002 μH
100 mc
200 mc
300 mc
400 mc
500 mc
600 mc
700 mc
800 mc
900 mc
1000 mc
100 μμf
90 μμf
80 μμf
70 μμf
60 μμf
50 μμf
40 μμf
30 μμf
20 μμf


CI
C
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
MHOS
OHMS
10
20
30
40
50
60
70
80
90
100

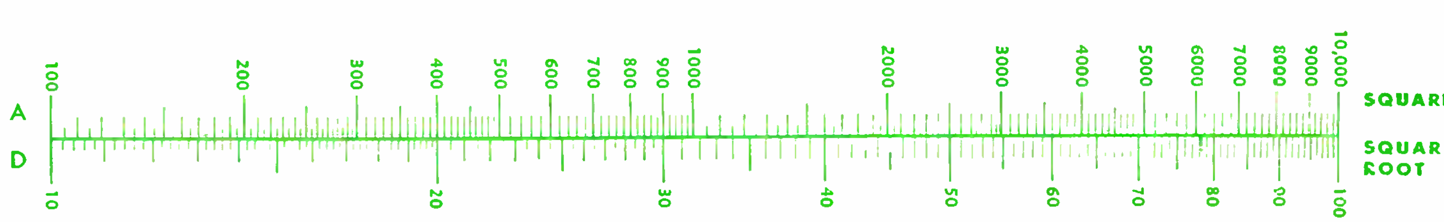
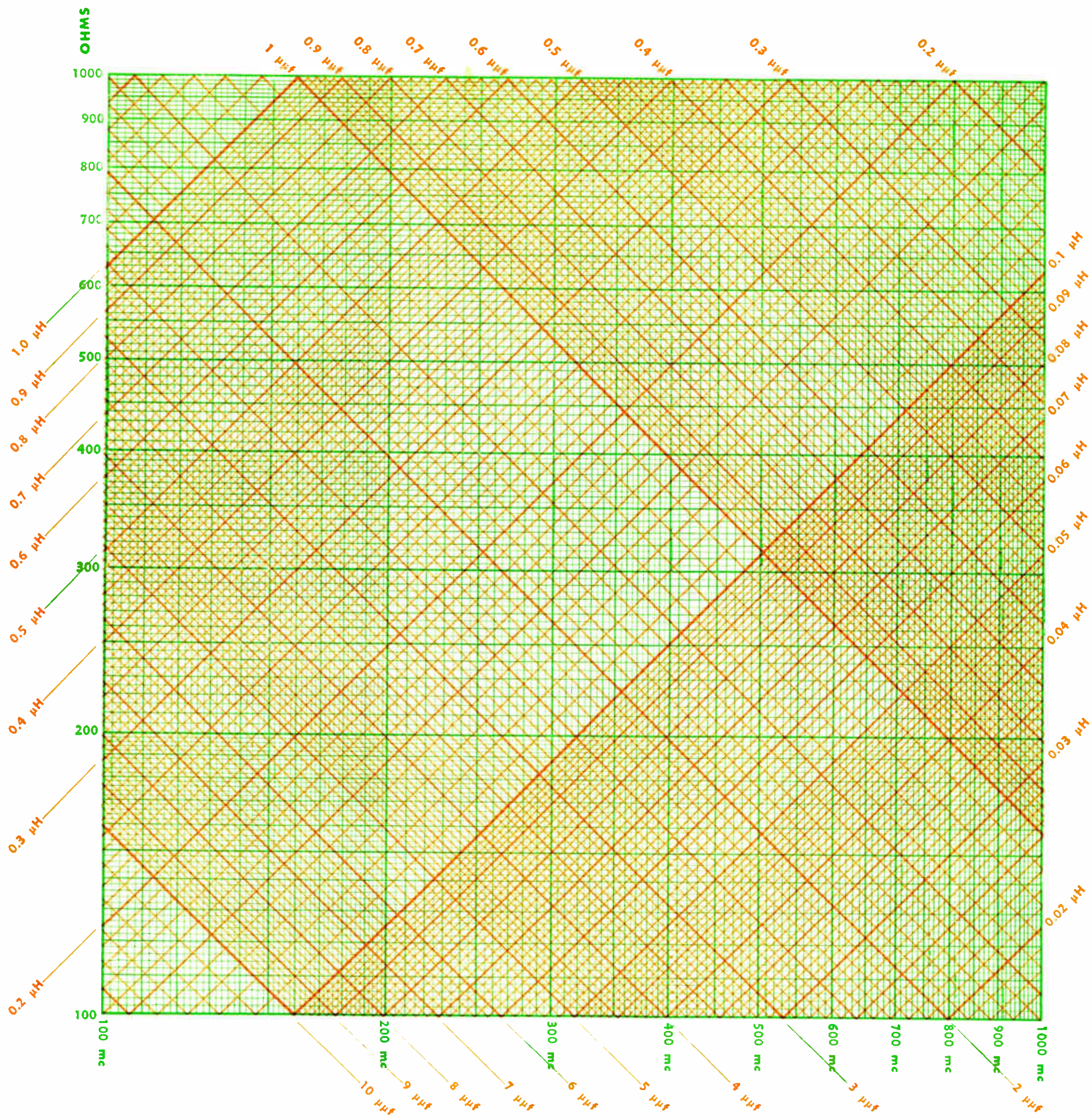
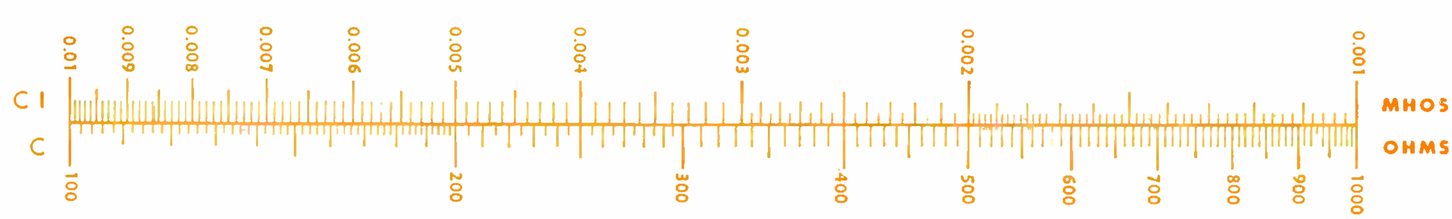

A
D
100
200
300
400
500
600
700
800
900
1000
2000
3000
4000
5000
6000
7000
8000
9000
10,000
SQUARE
SQUARE ROOT
10
20
30
40
50
60
70
80
90
100

PLATE 68


OHMS
1000
900
800
700
600
500
400
300
200
100
1 μμf
0.9 μμf
0.8 μμf
0.7 μμf
0.6 μμf
0.5 μμf
0.4 μμf
0.3 μμf
0.2 μμf
1.0 μH
0.9 μH
0.8 μH
0.7 μH
0.6 μH
0.5 μH
0.4 μH
0.3 μH
0.2 μH
0.1 μH
0.09 μH
0.08 μH
0.07 μH
0.06 μH
0.05 μH
0.04 μH
0.03 μH
0.02 μH
100 mc
200 mc
300 mc
400 mc
500 mc
600 mc
700 mc
800 mc
900 mc
1000 mc
10 μμf
9 μμf
8 μμf
7 μμf
6 μμf
5 μμf
4 μμf
3 μμf
2 μμf


CI
C
MHOS
OHMS
0.01
0.009
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
100
200
300
400
500
600
700
800
900
1000

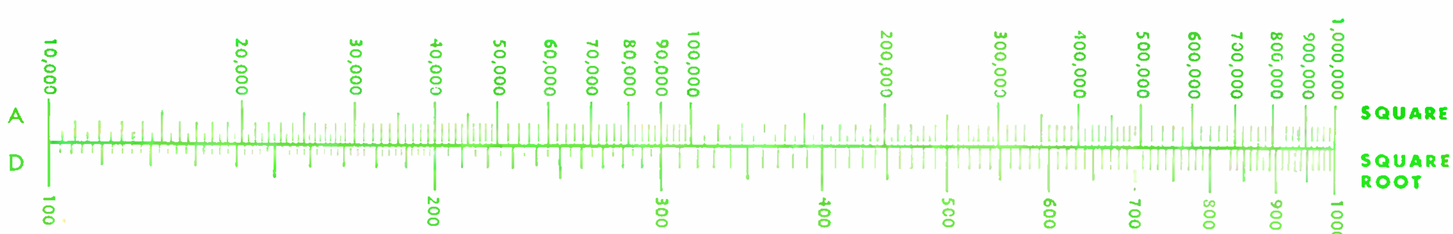

A
D
SQUARE
SQUARE ROOT
10,000
20,000
30,000
40,000
50,000
60,000
70,000
80,000
90,000
100,000
200,000
300,000
400,000
500,000
600,000
700,000
800,000
900,000
1,000,000
100
200
300
400
500
600
700
800
900
1000

PLATE 69

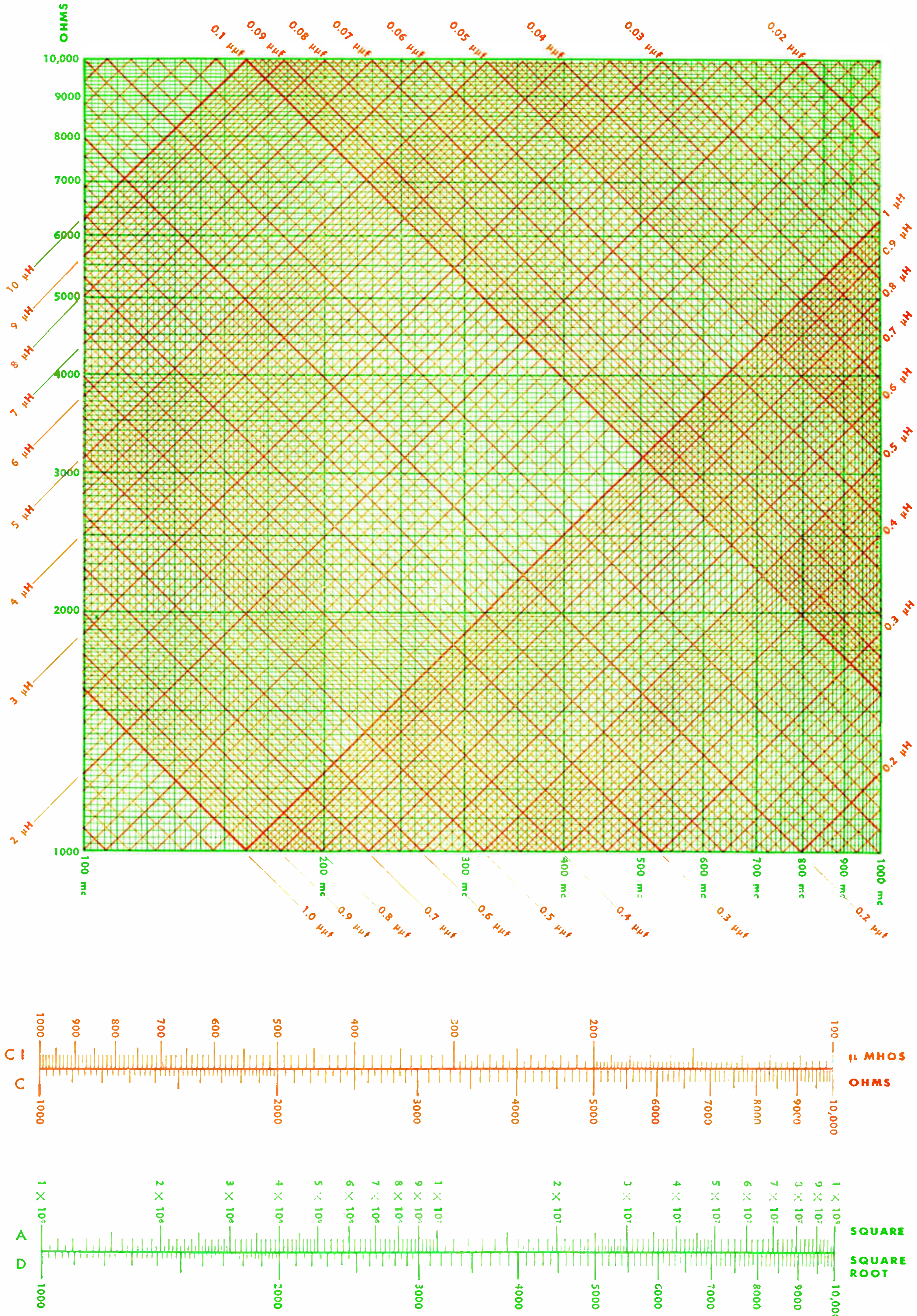
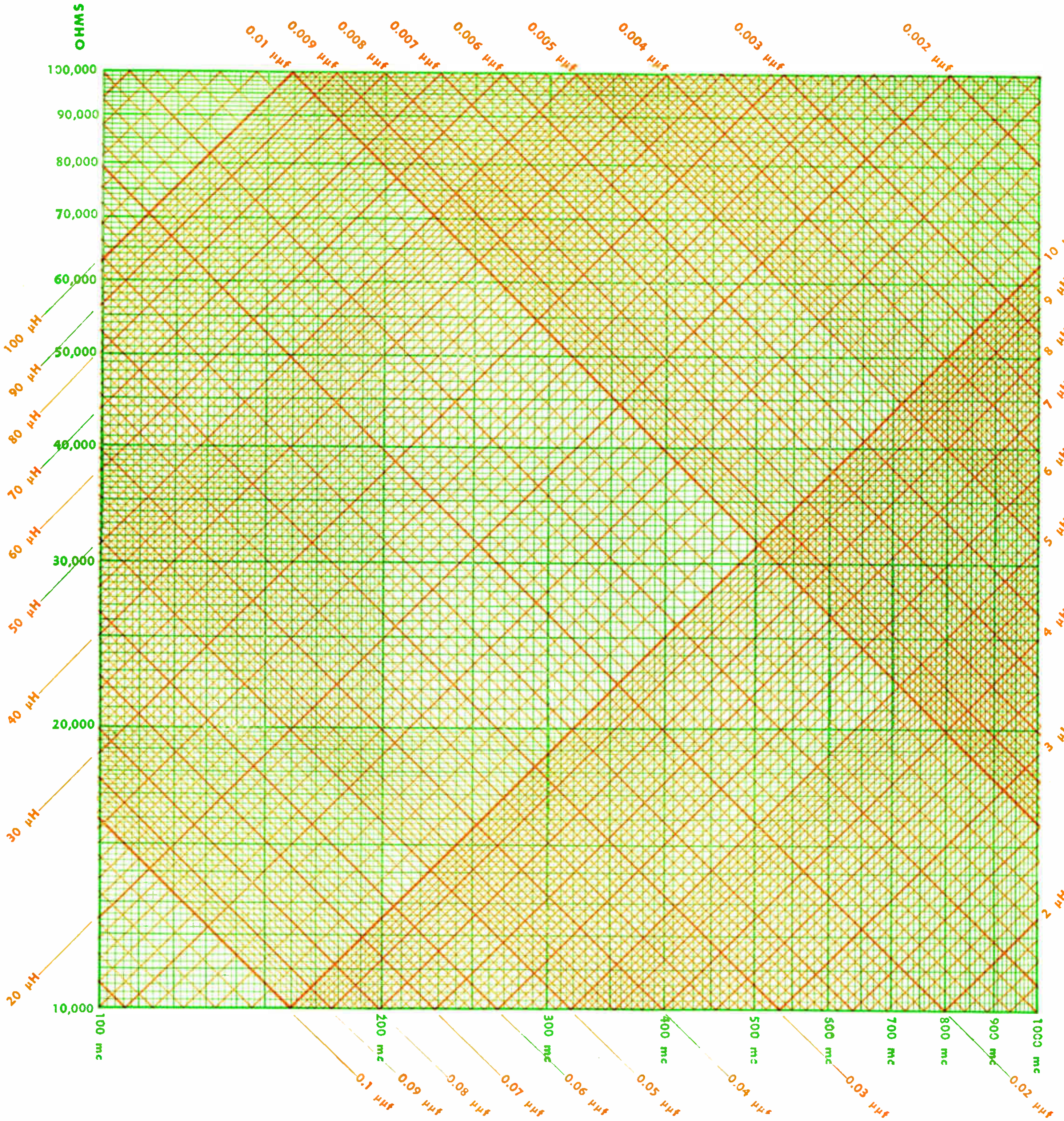

OHMS
10,000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0.1 μμf
0.09 μμf
0.08 μμf
0.07 μμf
0.06 μμf
0.05 μμf
0.04 μμf
0.03 μμf
0.02 μμf
10 μH
9 μH
8 μH
7 μH
6 μH
5 μH
4 μH
3 μH
2 μH
1 μH
0.9 μH
0.8 μH
0.7 μH
0.6 μH
0.5 μH
0.4 μH
0.3 μH
0.2 μH
100 mc
200 mc
300 mc
400 mc
500 mc
600 mc
700 mc
800 mc
900 mc
1000 mc
1.0 μμf
0.9 μμf
0.8 μμf
0.7 μμf
0.6 μμf
0.5 μμf
0.4 μμf
0.3 μμf
0.2 μμf
CI
C
μ MHOS
OHMS
A
D
SQUARE
SQUARE ROOT

PLATE 70


OHMS
100,000
90,000
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0.01 μμf
0.009 μμf
0.008 μμf
0.007 μμf
0.006 μμf
0.005 μμf
0.004 μμf
0.003 μμf
0.002 μμf
100 μH
90 μH
80 μH
70 μH
60 μH
50 μH
40 μH
30 μH
20 μH
10 μH
9 μH
8 μH
7 μH
6 μH
5 μH
4 μH
3 μH
2 μH
100 mc
200 mc
300 mc
400 mc
500 mc
600 mc
700 mc
800 mc
900 mc
1000 mc
0.1 μμf
0.09 μμf
0.08 μμf
0.07 μμf
0.06 μμf
0.05 μμf
0.04 μμ₅
0.03 μμf
0.02 μμf

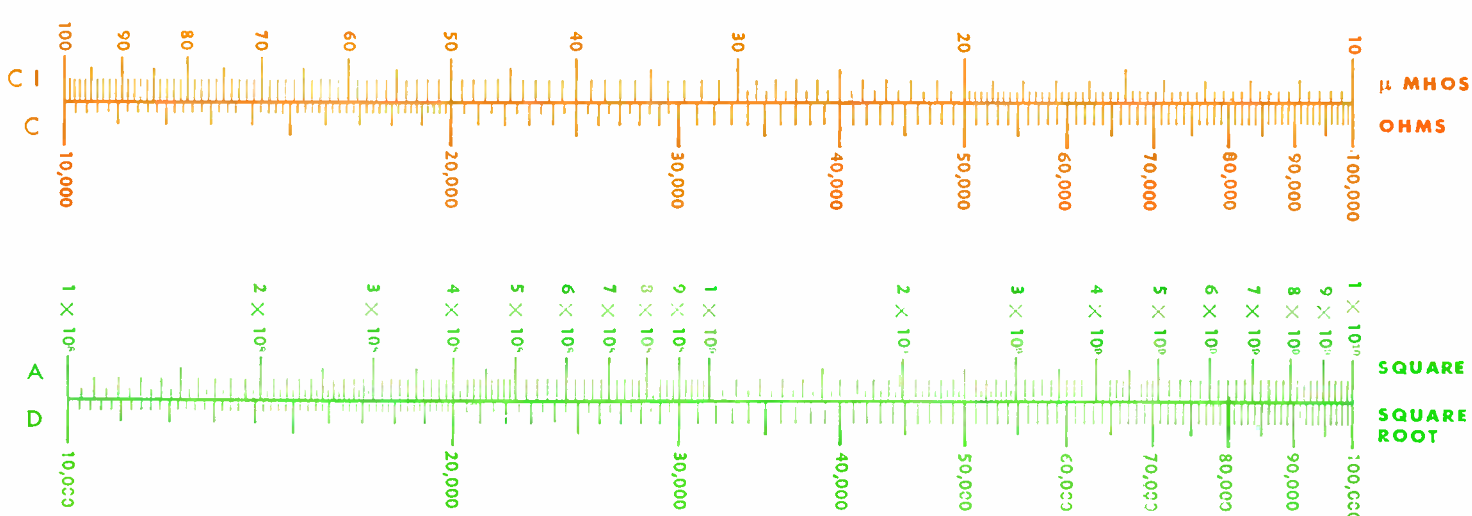
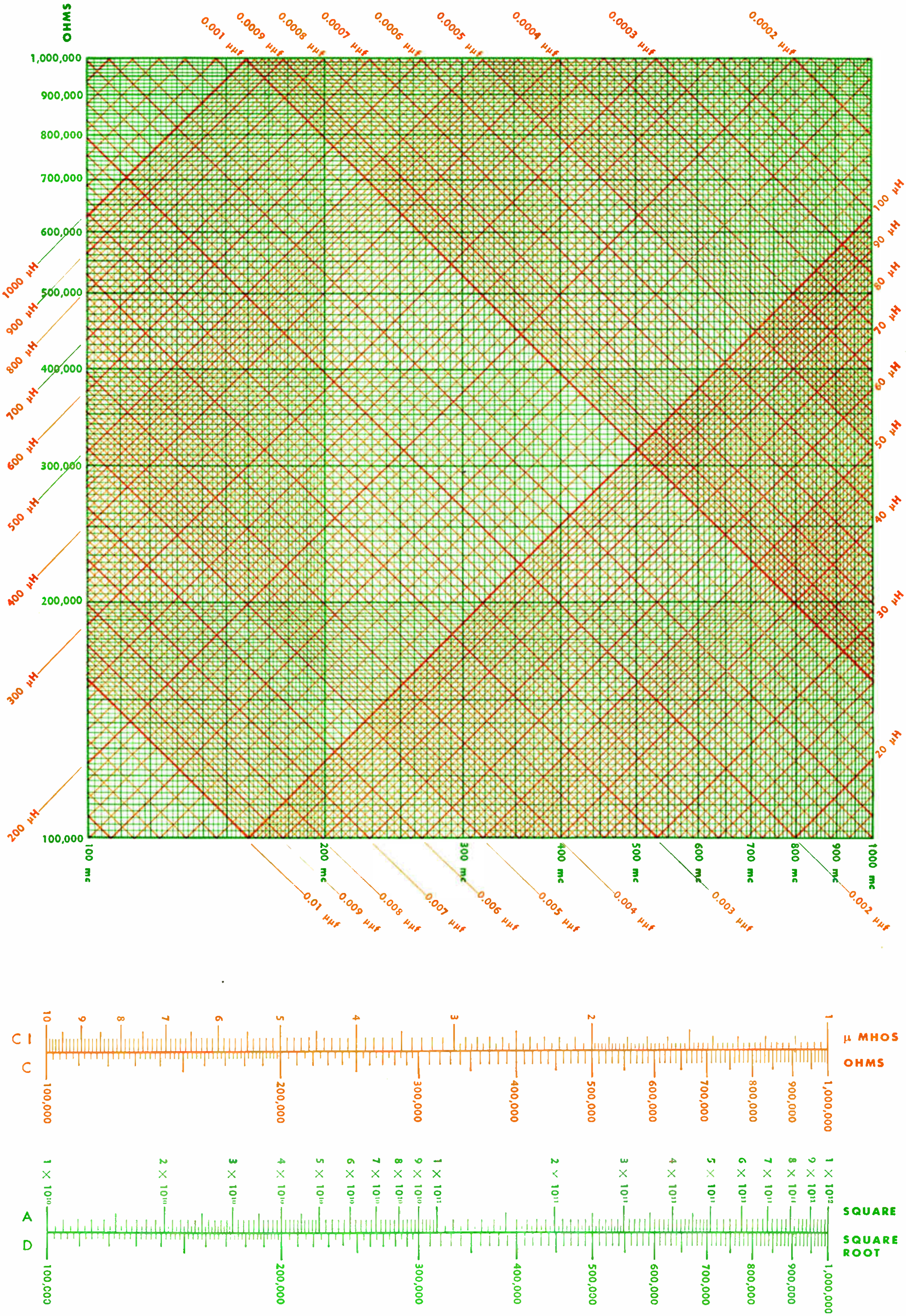
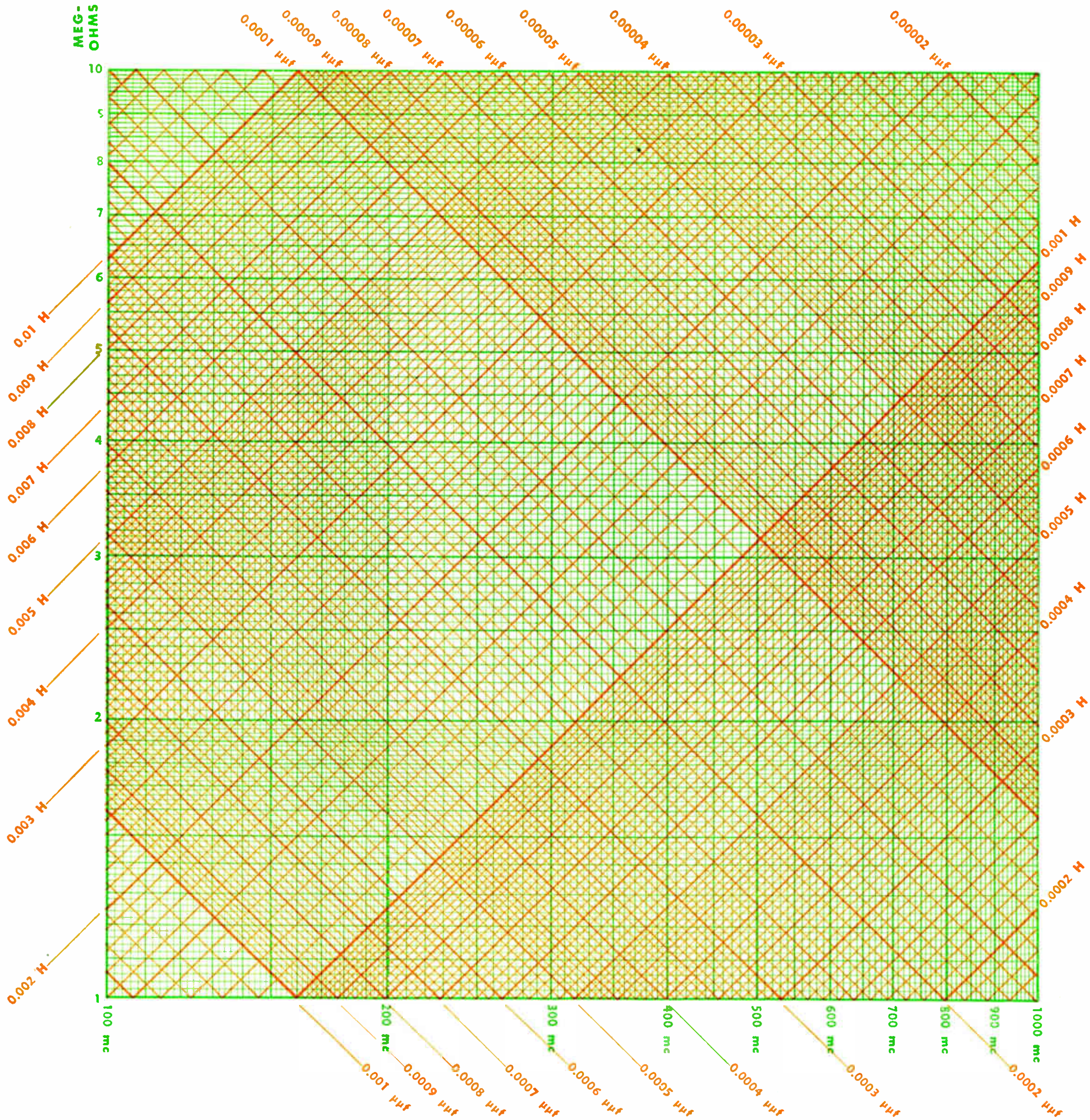

CI
C
100 90 80 70 60 50 40 30 20 10
μ MHOS
OHMS
10,000 20,000 30,000 40,000 50,000 60,000 70,000 80,000 90,000 100,000
A
D
1 × 10⁸ 2 × 10⁸ 3 × 10⁸ 4 × 10⁸ 5 × 10⁸ 6 × 10⁸ 7 × 10⁸ 8 × 10⁸ 9 × 10⁸ 1 × 10⁹ 2 × 10⁹ 3 × 10⁹ 4 × 10⁹ 5 × 10⁹ 6 × 10⁹ 7 × 10⁹ 8 × 10⁹ 9 × 10⁹ 1 × 10¹⁰
SQUARE
SQUARE ROOT
10,000 20,000 30,000 40,000 50,000 60,000 70,000 80,000 90,000 100,000

PLATE 71

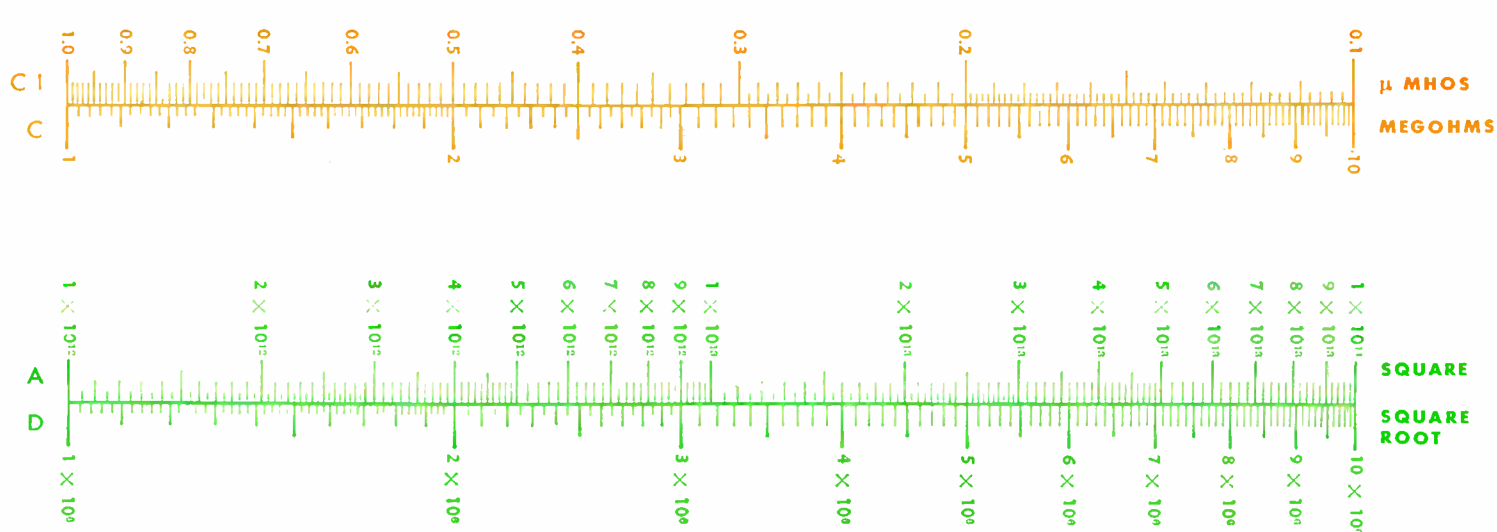


OHMS
1,000,000
900,000
800,000
700,000
600,000
500,000
400,000
300,000
200,000
100,000
1000 μH
900 μH
800 μH
700 μH
600 μH
500 μH
400 μH
300 μH
200 μH
0.001 μμf
0.0009 μμf
0.0008 μμf
0.0007 μμf
0.0006 μμf
0.0005 μμf
0.0004 μμf
0.0003 μμf
0.0002 μμf
100 μH
90 μH
80 μH
70 μH
60 μH
50 μH
40 μH
30 μH
20 μH
100 mc
200 mc
300 mc
400 mc
500 mc
600 mc
700 mc
800 mc
900 mc
1000 mc
0.01 μμf
0.009 μμf
0.008 μμf
0.007 μμf
0.006 μμf
0.005 μμf
0.004 μμf
0.003 μμf
0.002 μμf
CI
C
10 9 8 7 6 5 4 3 2 1
μ MHOS
OHMS
100,000 200,000 300,000 400,000 500,000 600,000 700,000 800,000 900,000 1,000,000
A
D
1 × 10¹⁰ 2 × 10¹⁰ 3 × 10¹⁰ 4 × 10¹⁰ 5 × 10¹⁰ 6 × 10¹⁰ 7 × 10¹⁰ 8 × 10¹⁰ 9 × 10¹⁰ 1 × 10¹¹ 2 × 10¹¹ 3 × 10¹¹ 4 × 10¹¹ 5 × 10¹¹ 6 × 10¹¹ 7 × 10¹¹ 8 × 10¹¹ 9 × 10¹¹ 1 × 10¹²
SQUARE
SQUARE ROOT
100,000 200,000 300,000 400,000 500,000 600,000 700,000 800,000 900,000 1,000,000

PLATE 72

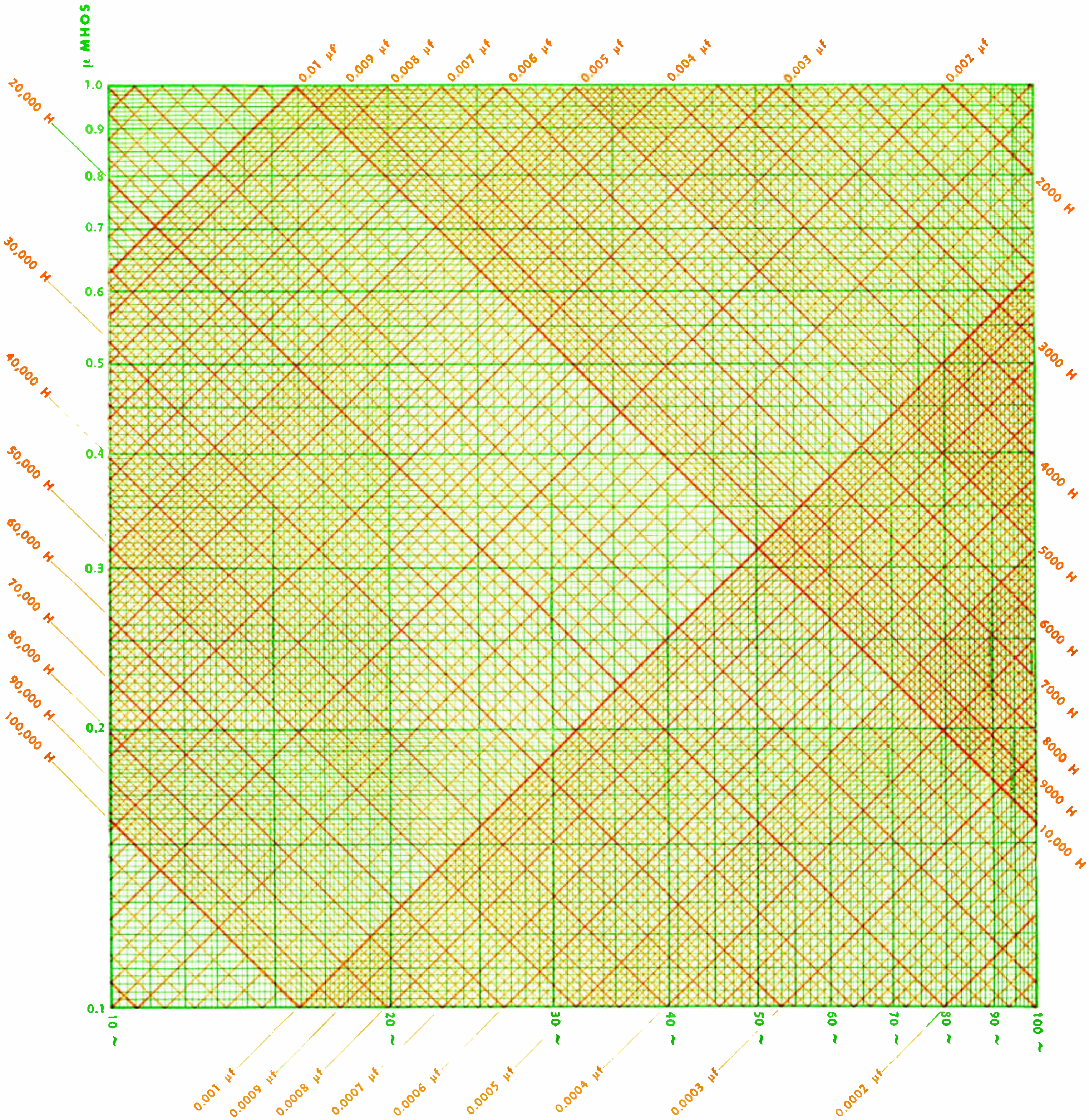


MEG-OHMS
10
9
8
7
6
5
4
3
2
1
0.0001 µµf
0.00009 µµf
0.00008 µµf
0.00007 µµf
0.00006 µµf
0.00005 µµf
0.00004 µµf
0.00003 µµf
0.00002 µµf
0.01 H
0.009 H
0.008 H
0.007 H
0.006 H
0.005 H
0.004 H
0.003 H
0.002 H
0.001 H
0.0009 H
0.0008 H
0.0007 H
0.0006 H
0.0005 H
0.0004 H
0.0003 H
0.0002 H
100 mc
200 mc
300 mc
400 mc
500 mc
600 mc
700 mc
800 mc
900 mc
1000 mc
0.001 µµf
0.0009 µµf
0.0008 µµf
0.0007 µµf
0.0006 µµf
0.0005 µµf
0.0004 µµf
0.0003 µµf
0.0002 µµf

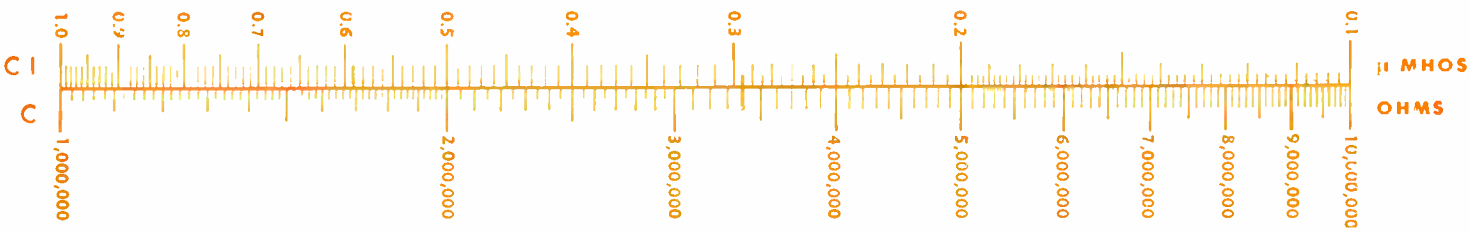


C I
C
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
µ MHOS
MEGOHMS
1
2
3
4
5
6
7
8
9
10
A
D
SQUARE
SQUARE ROOT

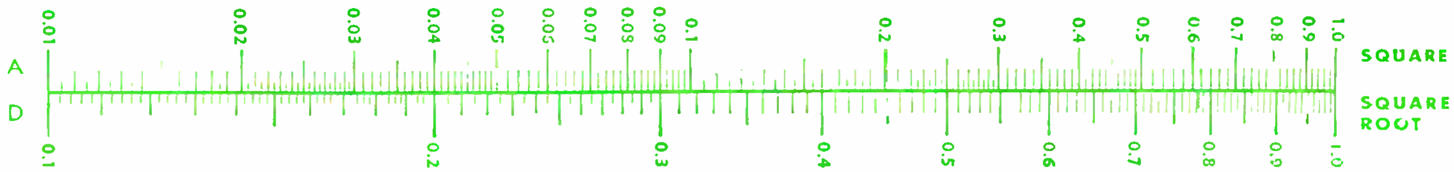
PLATE 73



μ MHOS
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.01 μf
0.009 μf
0.008 μf
0.007 μf
0.006 μf
0.005 μf
0.004 μf
0.003 μf
0.002 μf
20,000 H
30,000 H
40,000 H
50,000 H
60,000 H
70,000 H
80,000 H
90,000 H
100,000 H
2000 H
3000 H
4000 H
5000 H
6000 H
7000 H
8000 H
9000 H
10,000 H
10 ~
20 ~
30 ~
40 ~
50 ~
60 ~
70 ~
80 ~
90 ~
100 ~
0.001 μf
0.0009 μf
0.0008 μf
0.0007 μf
0.0006 μf
0.0005 μf
0.0004 μf
0.0003 μf
0.0002 μf

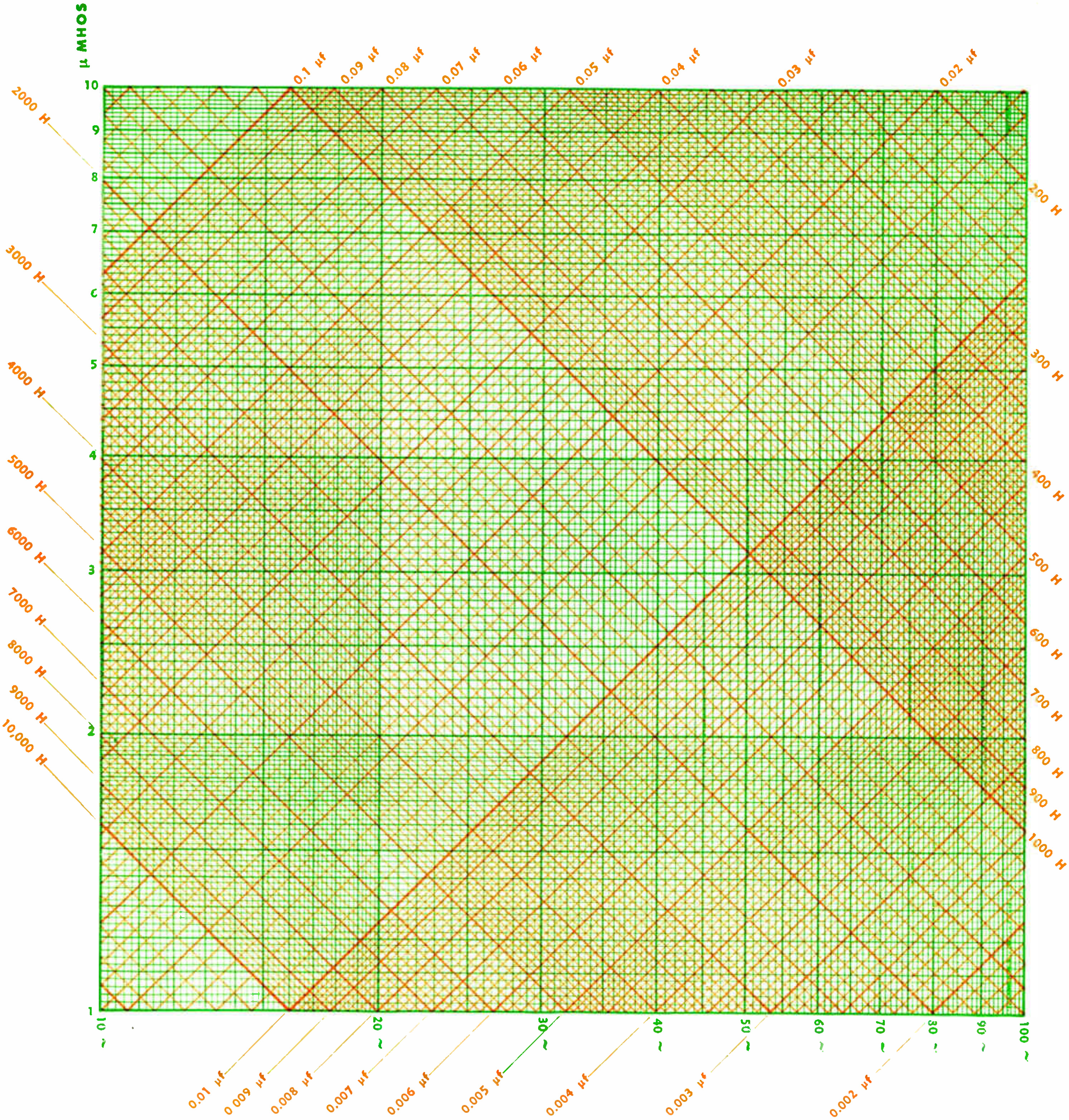


CI
C
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
μ MHOS
OHMS
1,000,000
2,000,000
3,000,000
4,000,000
5,000,000
6,000,000
7,000,000
8,000,000
9,000,000
10,000,000

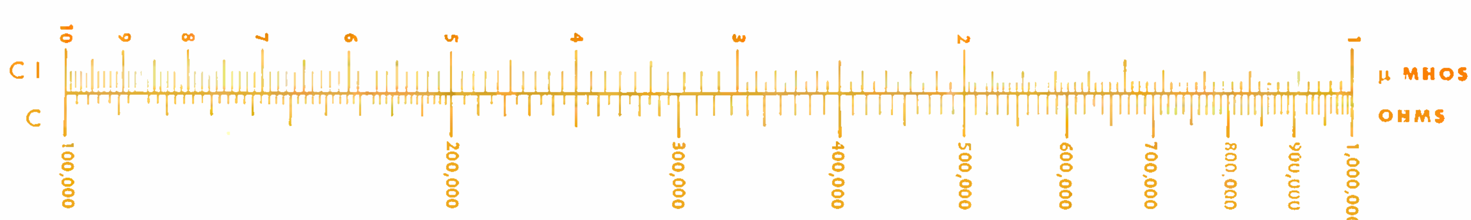


A
D
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
SQUARE
SQUARE ROOT
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0

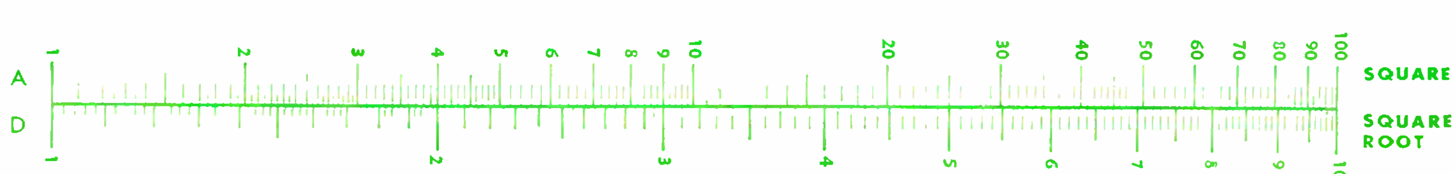
PLATE 74



µ MHOS
10
9
8
7
6
5
4
3
2
1
0.1 µf
0.09 µf
0.08 µf
0.07 µf
0.06 µf
0.05 µf
0.04 µf
0.03 µf
0.02 µf
2000 H
3000 H
4000 H
5000 H
6000 H
7000 H
8000 H
9000 H
10,000 H
200 H
300 H
400 H
500 H
600 H
700 H
800 H
900 H
1000 H
10 ~
20 ~
30 ~
40 ~
50 ~
60 ~
70 ~
80 ~
90 ~
100 ~
0.01 µf
0.009 µf
0.008 µf
0.007 µf
0.006 µf
0.005 µf
0.004 µf
0.003 µf
0.002 µf



CI
C
10
9
8
7
6
5
4
3
2
1
µ MHOS
OHMS
100,000
200,000
300,000
400,000
500,000
600,000
700,000
800,000
900,000
1,000,000



A
D
1
2
3
4
5
6
7
8
9
10
20
30
40
50
60
70
80
90
100
SQUARE
SQUARE ROOT

PLATE 75

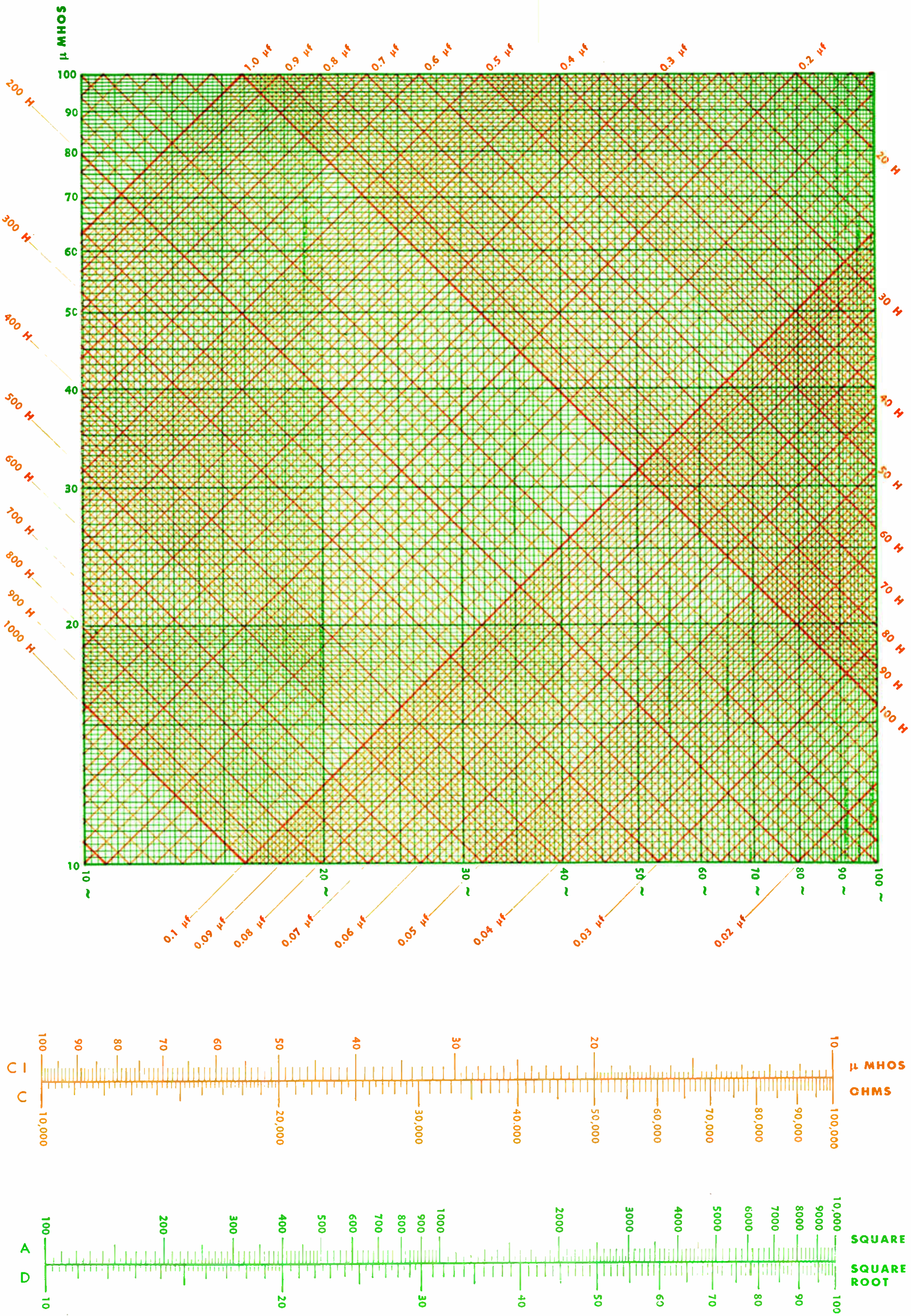
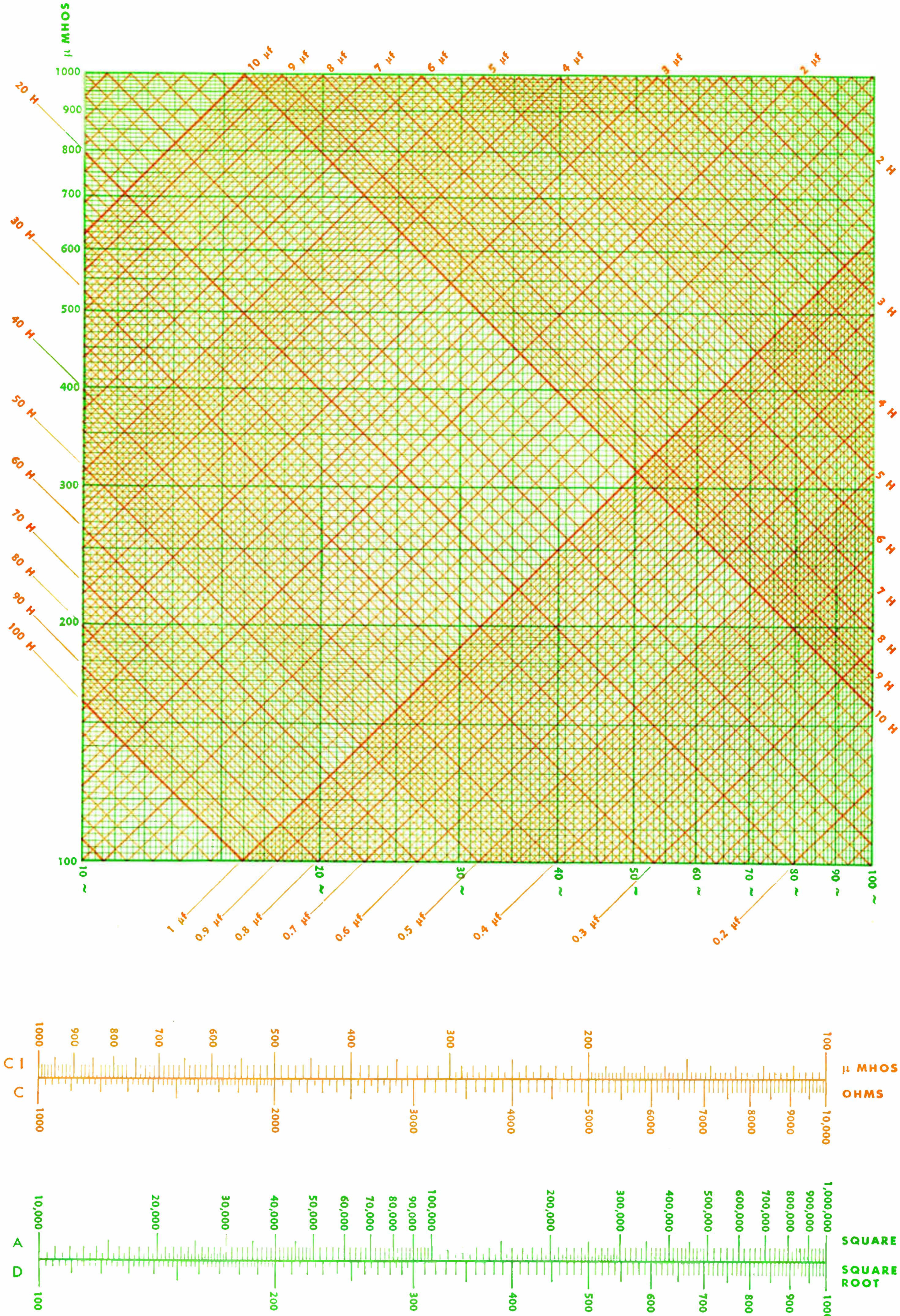
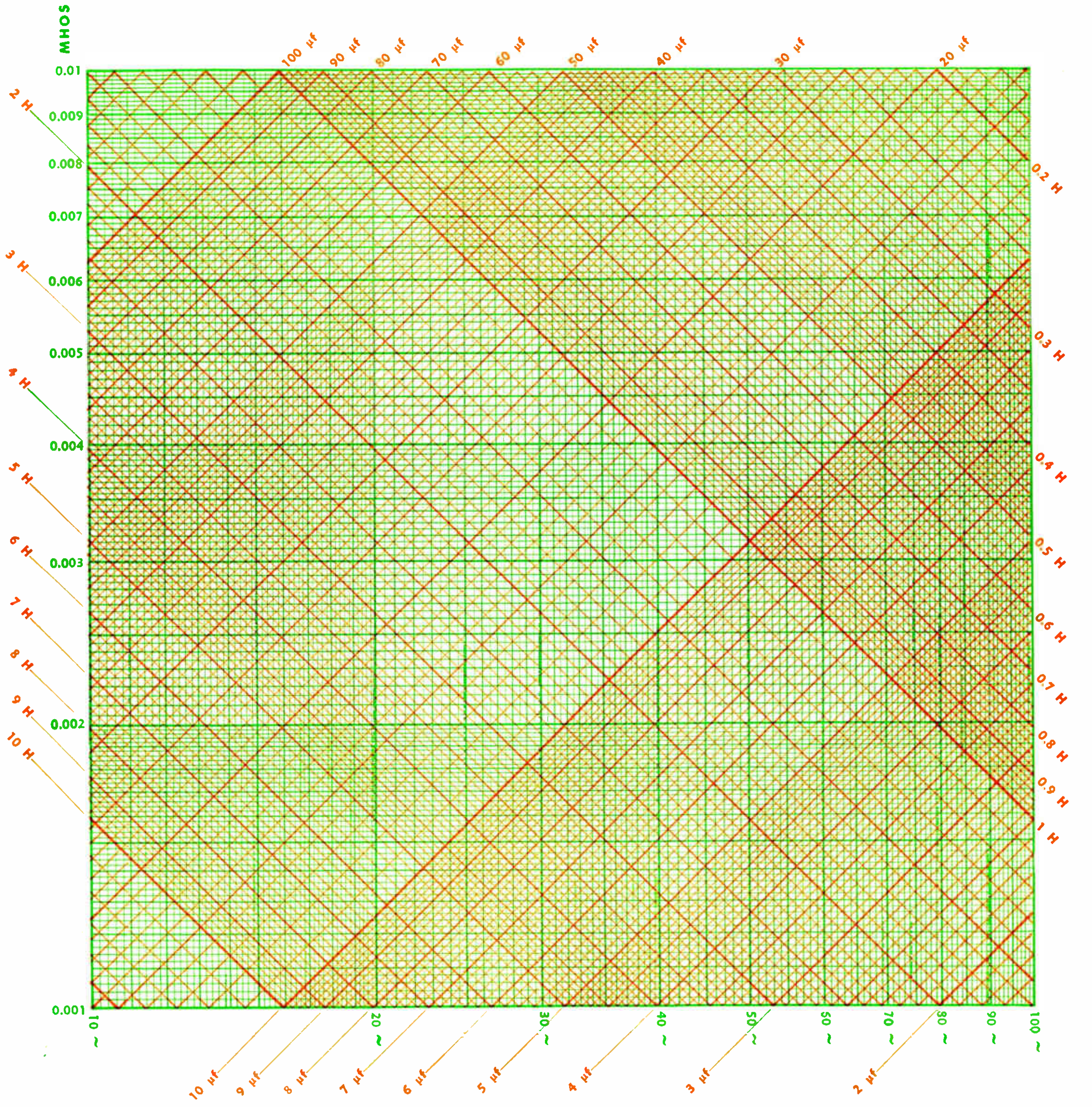
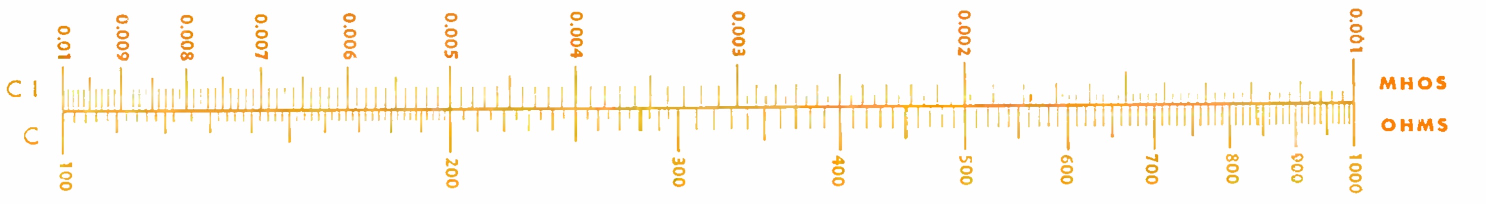

μ MHOS
100
90
80
70
60
50
40
30
20
10
200 H
300 H
400 H
500 H
600 H
700 H
800 H
900 H
1000 H
1.0 μf
0.9 μf
0.8 μf
0.7 μf
0.6 μf
0.5 μf
0.4 μf
0.3 μf
0.2 μf
20 H
30 H
40 H
50 H
60 H
70 H
80 H
90 H
100 H
10 ~
20 ~
30 ~
40 ~
50 ~
60 ~
70 ~
80 ~
90 ~
100 ~
0.1 μf
0.09 μf
0.08 μf
0.07 μf
0.06 μf
0.05 μf
0.04 μf
0.03 μf
0.02 μf
CI
C
μ MHOS
OHMS
100 90 80 70 60 50 40 30 20 10
10,000 20,000 30,000 40,000 50,000 60,000 70,000 80,000 90,000 100,000
A
D
SQUARE
SQUARE ROOT
100 200 300 400 500 600 700 800 900 1000 2000 3000 4000 5000 6000 7000 8000 9000 10,000
10 20 30 40 50 60 70 80 90 100

PLATE 76



µ MHOS
1000
900
800
700
600
500
400
300
200
100
10 ~
20 ~
30 ~
40 ~
50 ~
60 ~
70 ~
80 ~
90 ~
100 ~
20 H
30 H
40 H
50 H
60 H
70 H
80 H
90 H
100 H
2 H
3 H
4 H
5 H
6 H
7 H
8 H
9 H
10 H
10 µf
9 µf
8 µf
7 µf
6 µf
5 µf
4 µf
3 µf
2 µf
1 µf
0.9 µf
0.8 µf
0.7 µf
0.6 µf
0.5 µf
0.4 µf
0.3 µf
0.2 µf
CI
C
µ MHOS
OHMS
A
D
SQUARE
SQUARE ROOT


MHOS
0.01
0.009
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
100 µf
90 µf
80 µf
70 µf
60 µf
50 µf
40 µf
30 µf
20 µf
2 H
3 H
4 H
5 H
6 H
7 H
8 H
9 H
10 H
0.2 H
0.3 H
0.4 H
0.5 H
0.6 H
0.7 H
0.8 H
0.9 H
1 H
10 ~
20 ~
30 ~
40 ~
50 ~
60 ~
70 ~
80 ~
90 ~
100 ~
10 µf
9 µf
8 µf
7 µf
6 µf
5 µf
4 µf
3 µf
2 µf


CI
C
MHOS
OHMS
0.01
0.009
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
100
200
300
400
500
600
700
800
900
1000

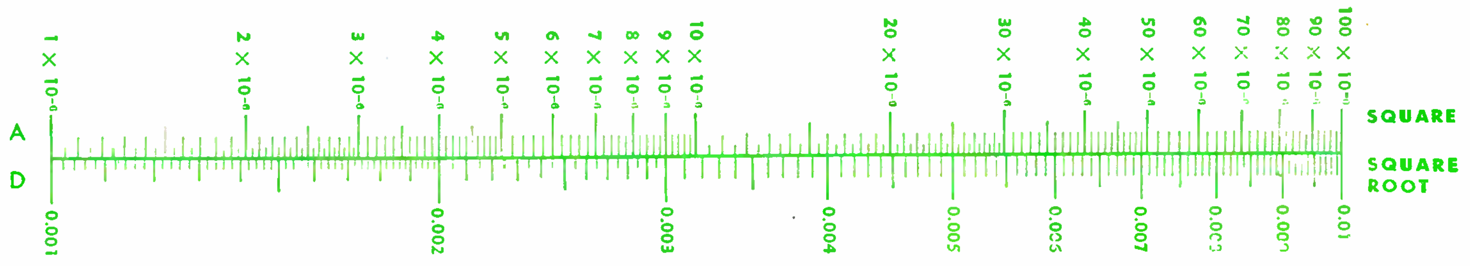
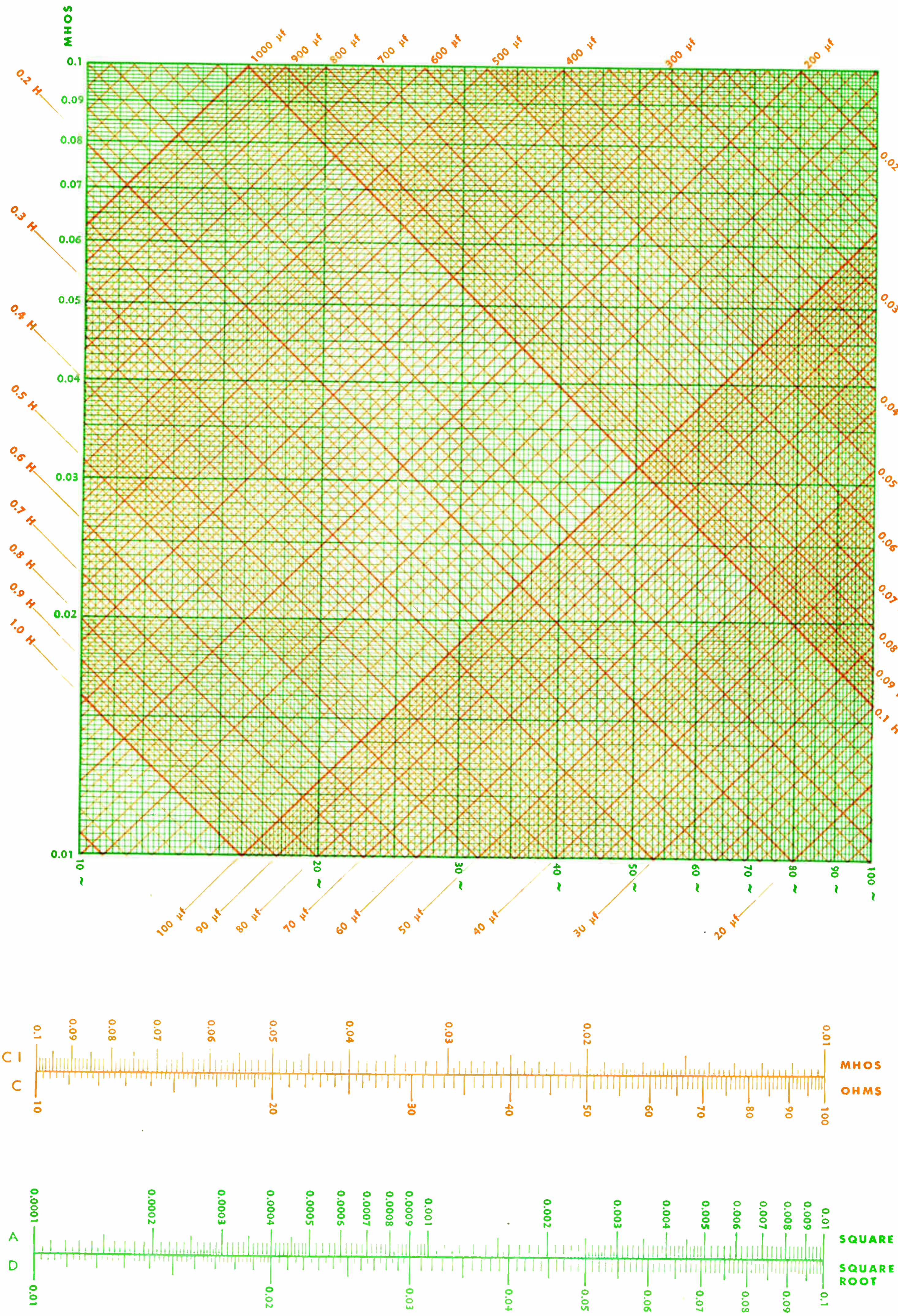
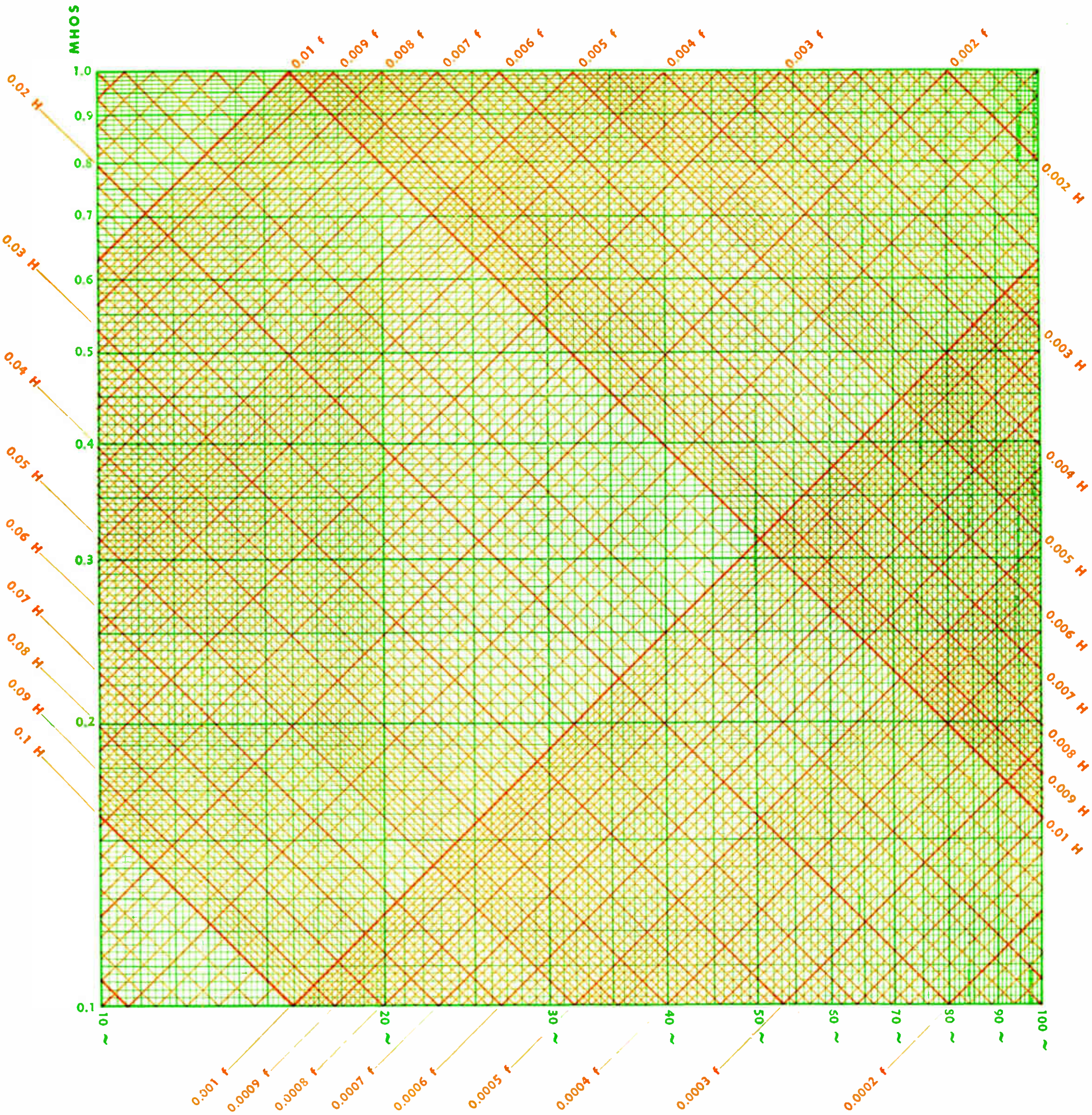
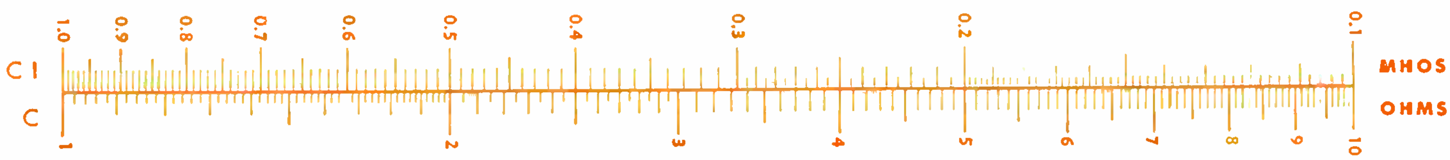

A
D
SQUARE
SQUARE ROOT
1 × 10⁻⁶
2 × 10⁻⁶
3 × 10⁻⁶
4 × 10⁻⁶
5 × 10⁻⁶
6 × 10⁻⁶
7 × 10⁻⁶
8 × 10⁻⁶
9 × 10⁻⁶
10 × 10⁻⁶
20 × 10⁻⁶
30 × 10⁻⁶
40 × 10⁻⁶
50 × 10⁻⁶
60 × 10⁻⁶
70 × 10⁻⁶
80 × 10⁻⁶
90 × 10⁻⁶
100 × 10⁻⁶
0.001
0.002
0.003
0.004
0.005
0.006
0.007
0.008
0.009
0.01

PLATE 78


MHOS
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.2 H
0.3 H
0.4 H
0.5 H
0.6 H
0.7 H
0.8 H
0.9 H
1.0 H
1000 μf
900 μf
800 μf
700 μf
600 μf
500 μf
400 μf
300 μf
200 μf
0.02 H
0.03 H
0.04 H
0.05 H
0.06 H
0.07 H
0.08 H
0.09 H
0.1 H
10 ~
20 ~
30 ~
40 ~
50 ~
60 ~
70 ~
80 ~
90 ~
100 ~
100 μf
90 μf
80 μf
70 μf
60 μf
50 μf
40 μf
30 μf
20 μf
CI
C
MHOS
OHMS
0.1 0.09 0.08 0.07 0.06 0.05 0.04 0.03 0.02 0.01
10 20 30 40 50 60 70 80 90 100
A
D
SQUARE
SQUARE ROOT
0.0001 0.0002 0.0003 0.0004 0.0005 0.0006 0.0007 0.0008 0.0009 0.001 0.002 0.003 0.004 0.005 0.006 0.007 0.008 0.009 0.01
0.01 0.02 0.03 0.04 0.05 0.06 0.07 0.08 0.09 0.1


MHOS
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.02 H
0.03 H
0.04 H
0.05 H
0.06 H
0.07 H
0.08 H
0.09 H
0.1 H
0.01 f
0.009 f
0.008 f
0.007 f
0.006 f
0.005 f
0.004 f
0.003 f
0.002 f
0.002 H
0.003 H
0.004 H
0.005 H
0.006 H
0.007 H
0.008 H
0.009 H
0.01 H
10 ~
20 ~
30 ~
40 ~
50 ~
60 ~
70 ~
80 ~
90 ~
100 ~
0.001 f
0.0009 f
0.0008 f
0.0007 f
0.0006 f
0.0005 f
0.0004 f
0.0003 f
0.0002 f


CI
C
MHOS
OHMS
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
1
2
3
4
5
6
7
8
9
10

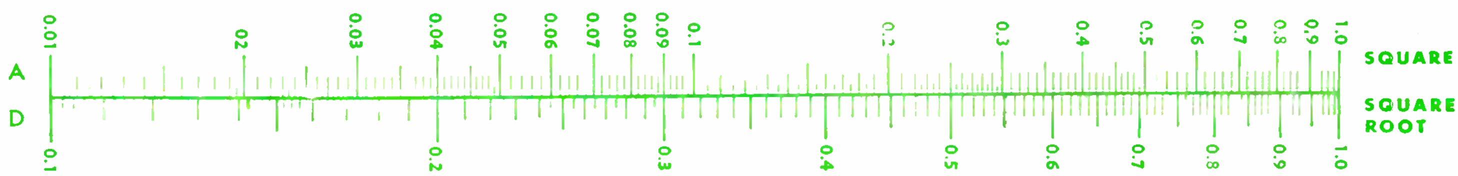
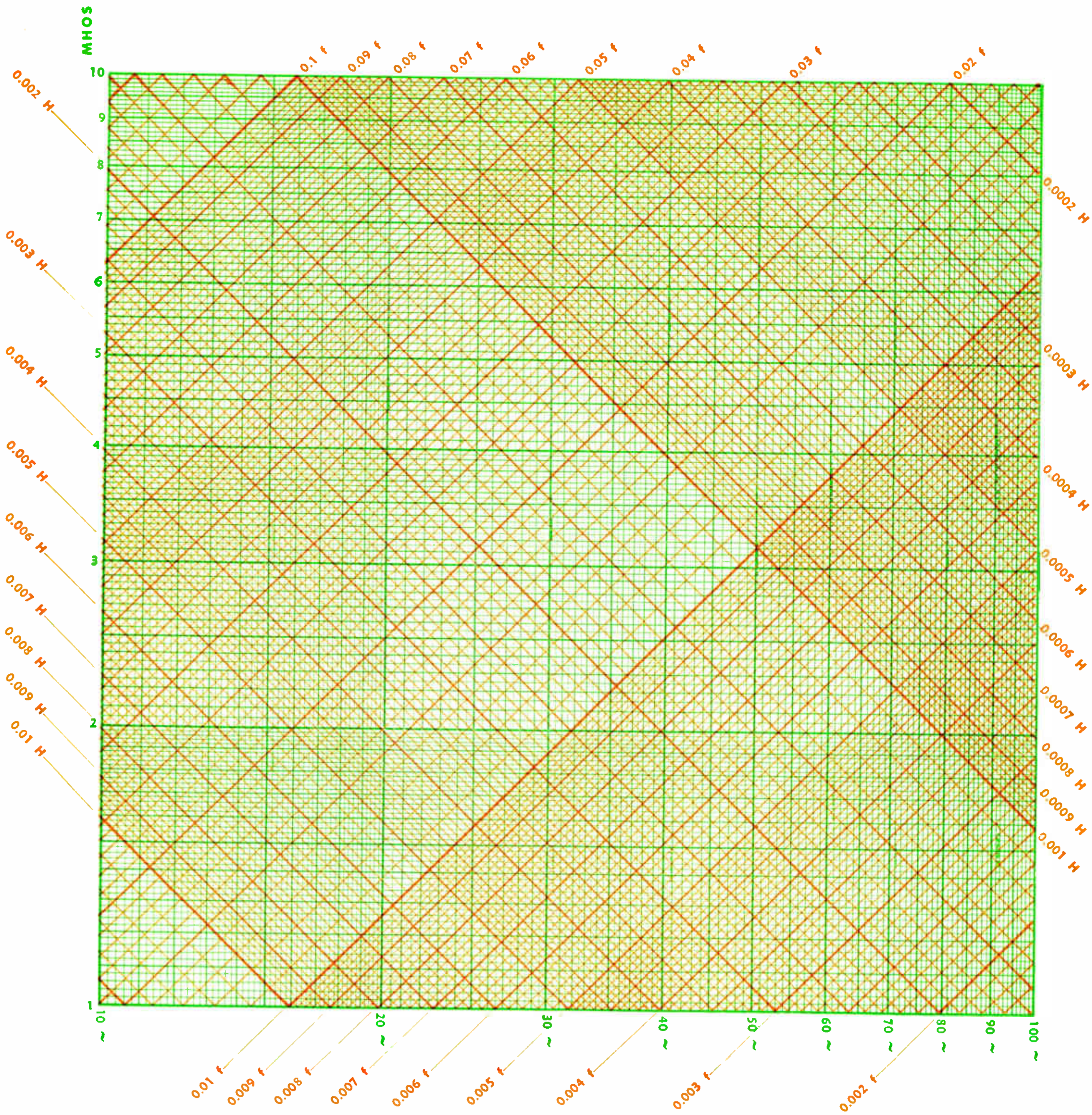
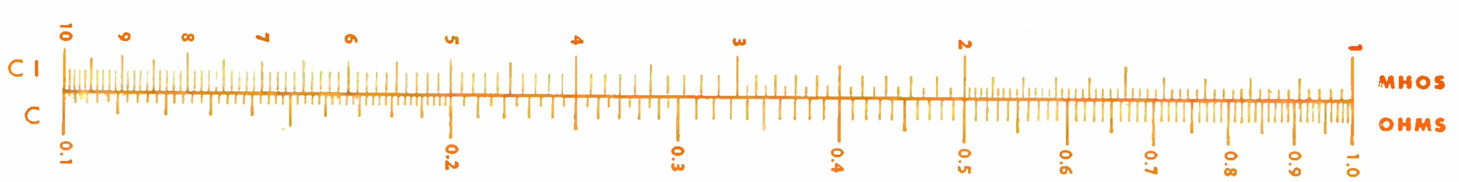
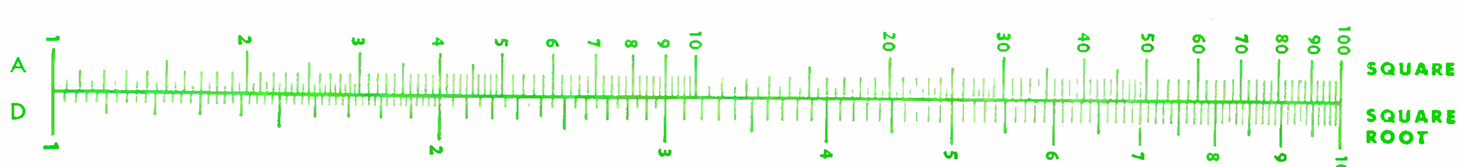

A
D
SQUARE
SQUARE ROOT
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0

PLATE 80


MHOS
10
9
8
7
6
5
4
3
2
1
0.1 f
0.09 f
0.08 f
0.07 f
0.06 f
0.05 f
0.04 f
0.03 f
0.02 f
0.002 H
0.003 H
0.004 H
0.005 H
0.006 H
0.007 H
0.008 H
0.009 H
0.01 H
0.0002 H
0.0003 H
0.0004 H
0.0005 H
0.0006 H
0.0007 H
0.0008 H
0.0009 H
0.001 H
10 ~
20 ~
30 ~
40 ~
50 ~
60 ~
70 ~
80 ~
90 ~
100 ~
0.01 f
0.009 f
0.008 f
0.007 f
0.006 f
0.005 f
0.004 f
0.003 f
0.002 f


CI
C
10
9
8
7
6
5
4
3
2
1
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
MHOS
OHMS


A
D
1
2
3
4
5
6
7
8
9
10
20
30
40
50
60
70
80
90
100
1
2
3
4
5
6
7
8
9
10
SQUARE
SQUARE ROOT

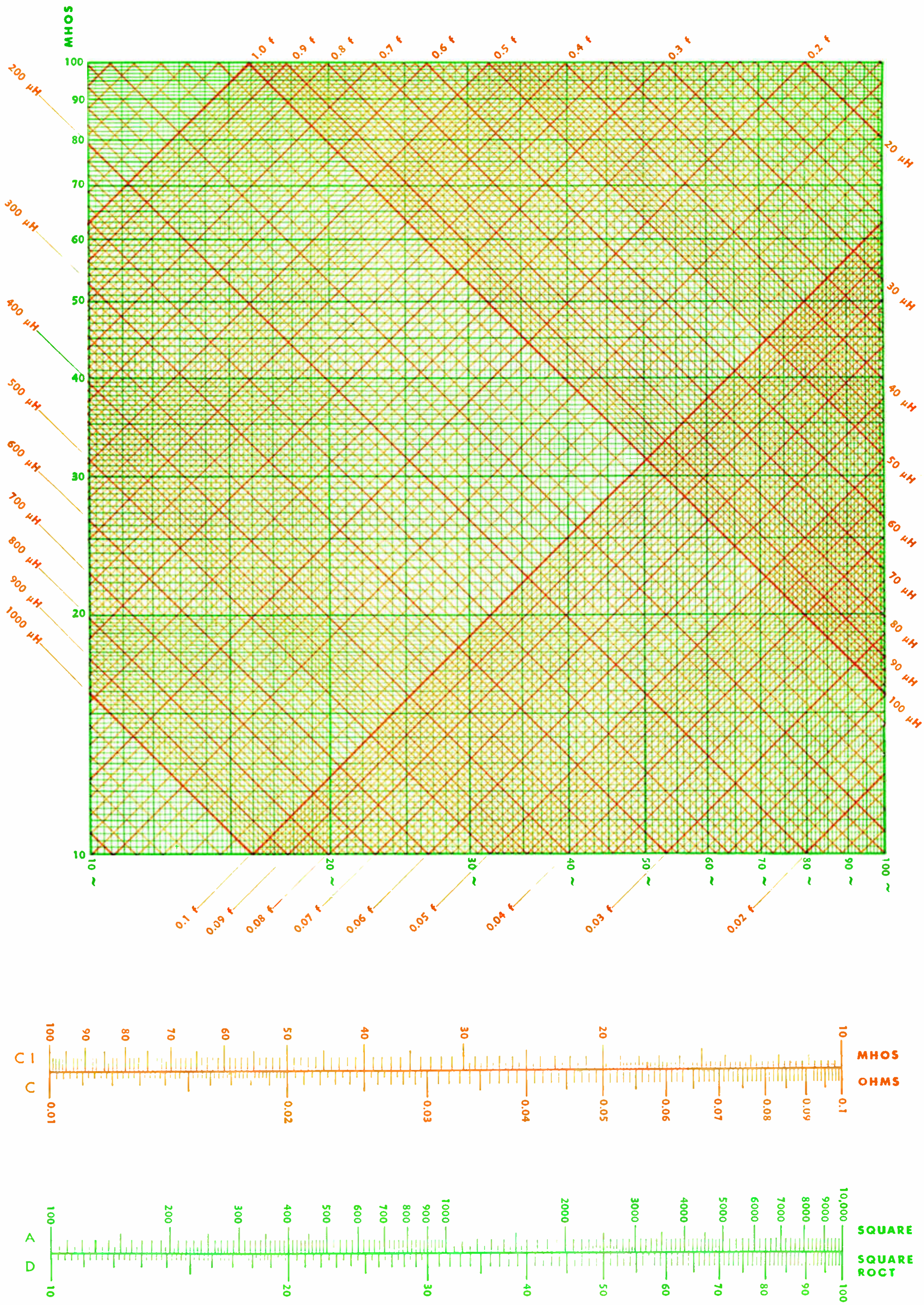
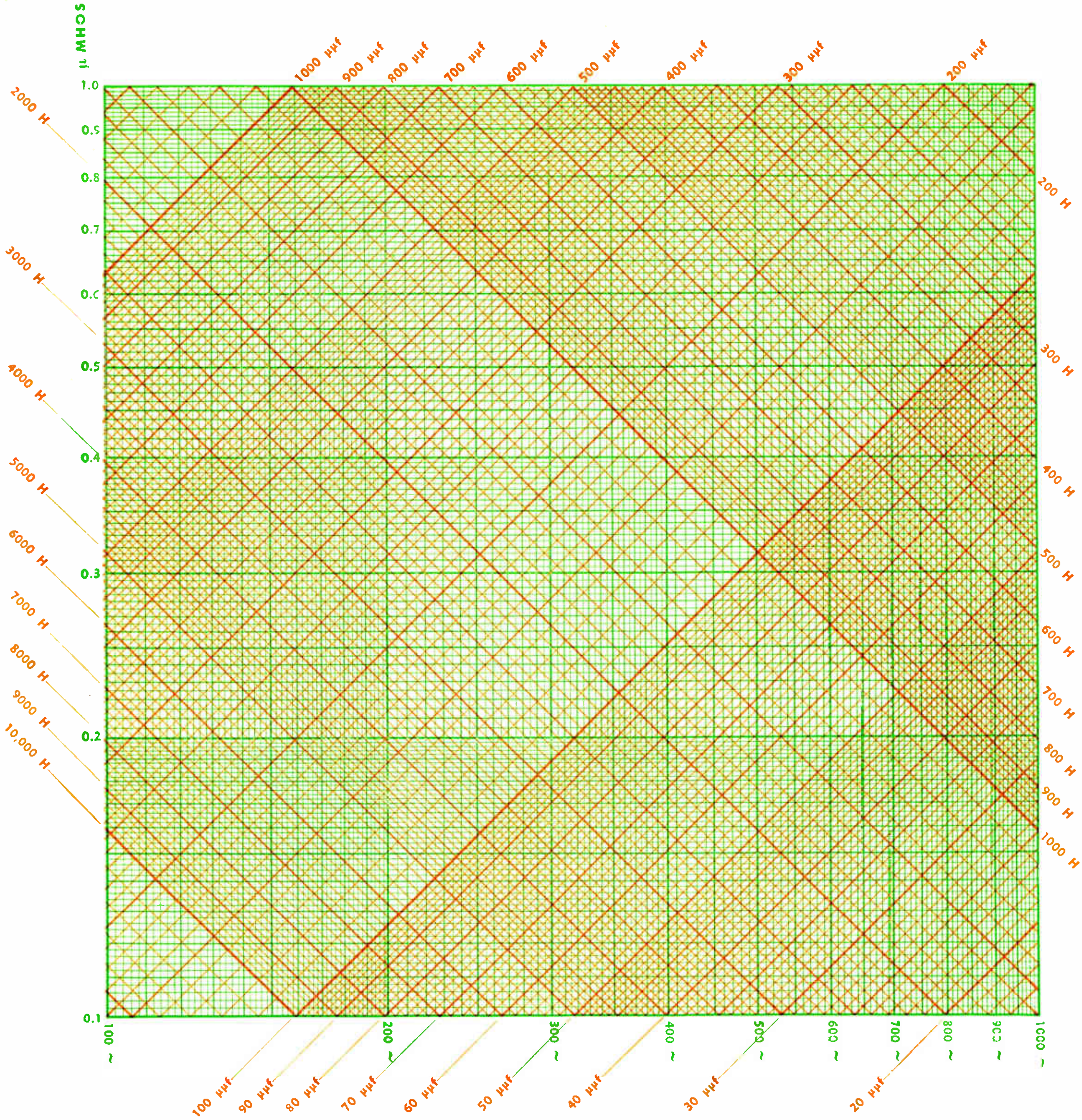
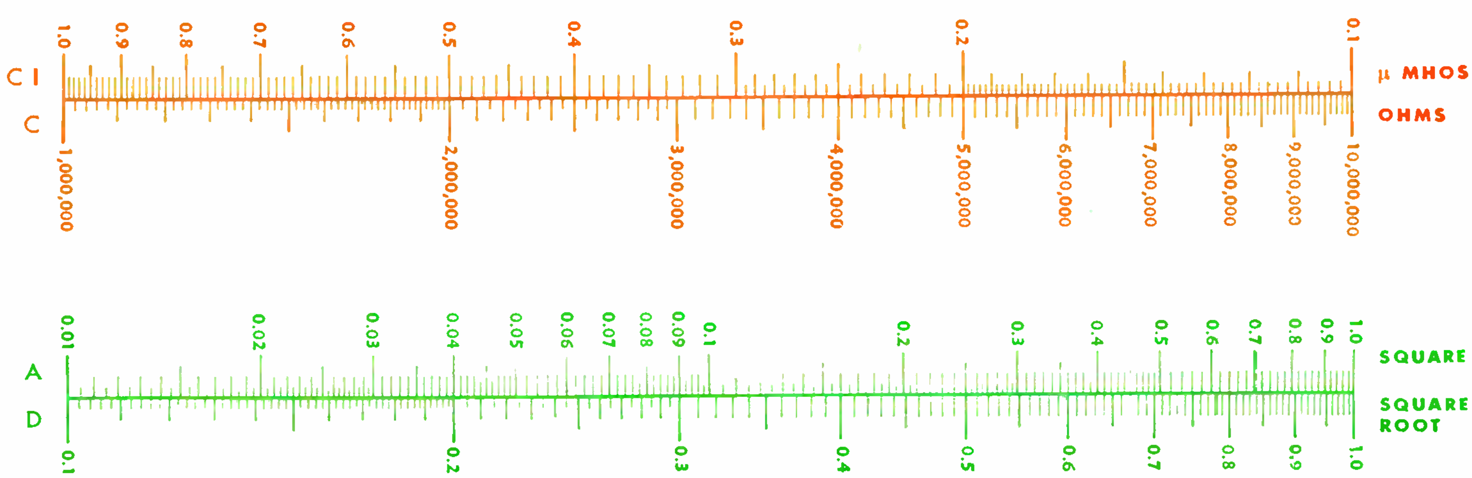

MHOS
100
90
80
70
60
50
40
30
20
10
1.0 f
0.9 f
0.8 f
0.7 f
0.6 f
0.5 f
0.4 f
0.3 f
0.2 f
200 μH
300 μH
400 μH
500 μH
600 μH
700 μH
800 μH
900 μH
1000 μH
20 μH
30 μH
40 μH
50 μH
60 μH
70 μH
80 μH
90 μH
100 μH
10 ~
20 ~
30 ~
40 ~
50 ~
60 ~
70 ~
80 ~
90 ~
100 ~
0.1 f
0.09 f
0.08 f
0.07 f
0.06 f
0.05 f
0.04 f
0.03 f
0.02 f
C I
C
MHOS
OHMS
100 90 80 70 60 50 40 30 20 10
0.01 0.02 0.03 0.04 0.05 0.06 0.07 0.08 0.09 0.1
A
D
SQUARE
SQUARE ROOT
100 200 300 400 500 600 700 800 900 1000 2000 3000 4000 5000 6000 7000 8000 9000 10,000
10 20 30 40 50 60 70 80 90 100

PLATE 82

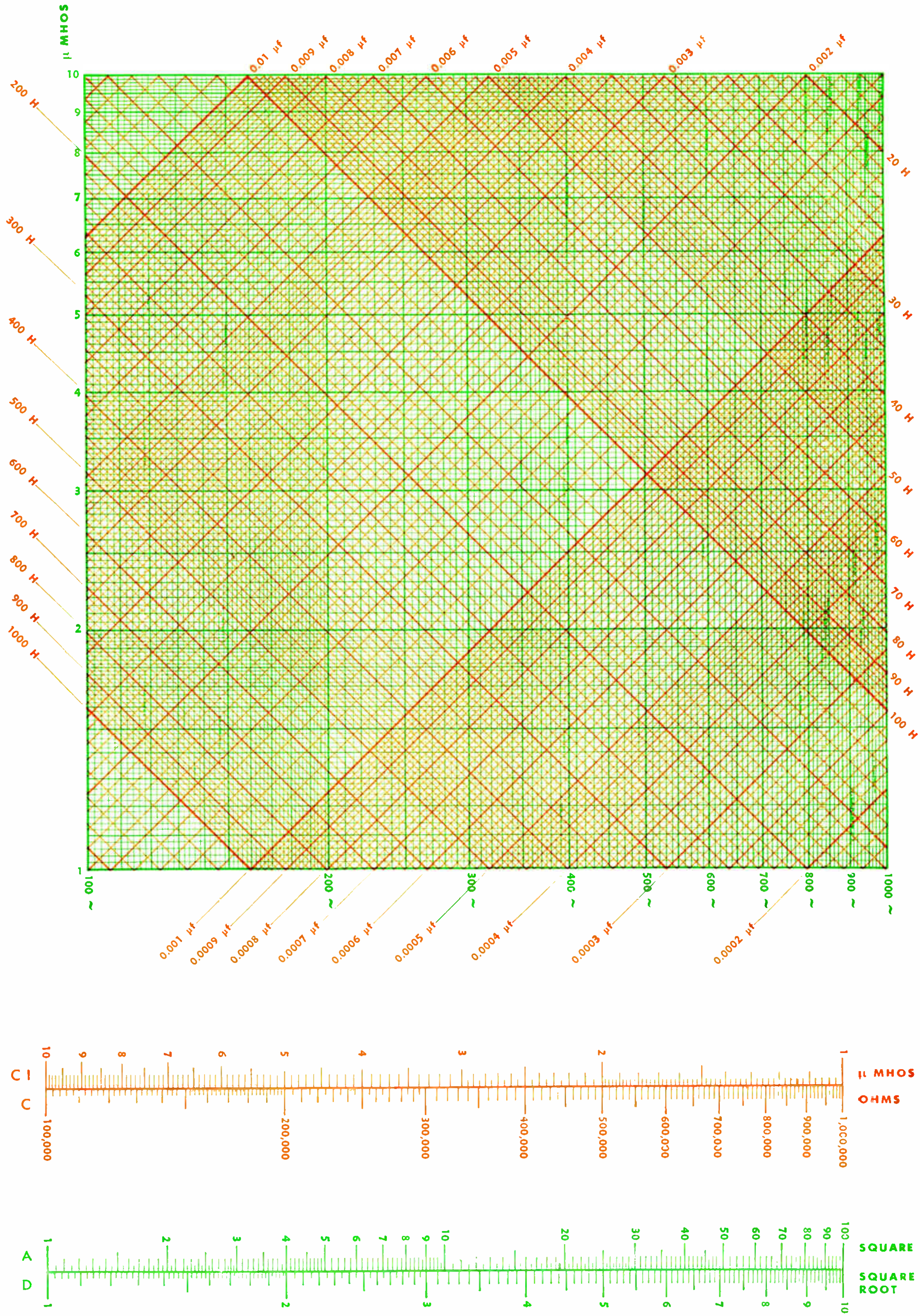


μ MHOS
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
1000 μμf
900 μμf
800 μμf
700 μμf
600 μμf
500 μμf
400 μμf
300 μμf
200 μμf
2000 H
3000 H
4000 H
5000 H
6000 H
7000 H
8000 H
9000 H
10,000 H
200 H
300 H
400 H
500 H
600 H
700 H
800 H
900 H
1000 H
100 ~
200 ~
300 ~
400 ~
500 ~
600 ~
700 ~
800 ~
900 ~
1000 ~
100 μμf
90 μμf
80 μμf
70 μμf
60 μμf
50 μμf
40 μμf
30 μμf
20 μμf



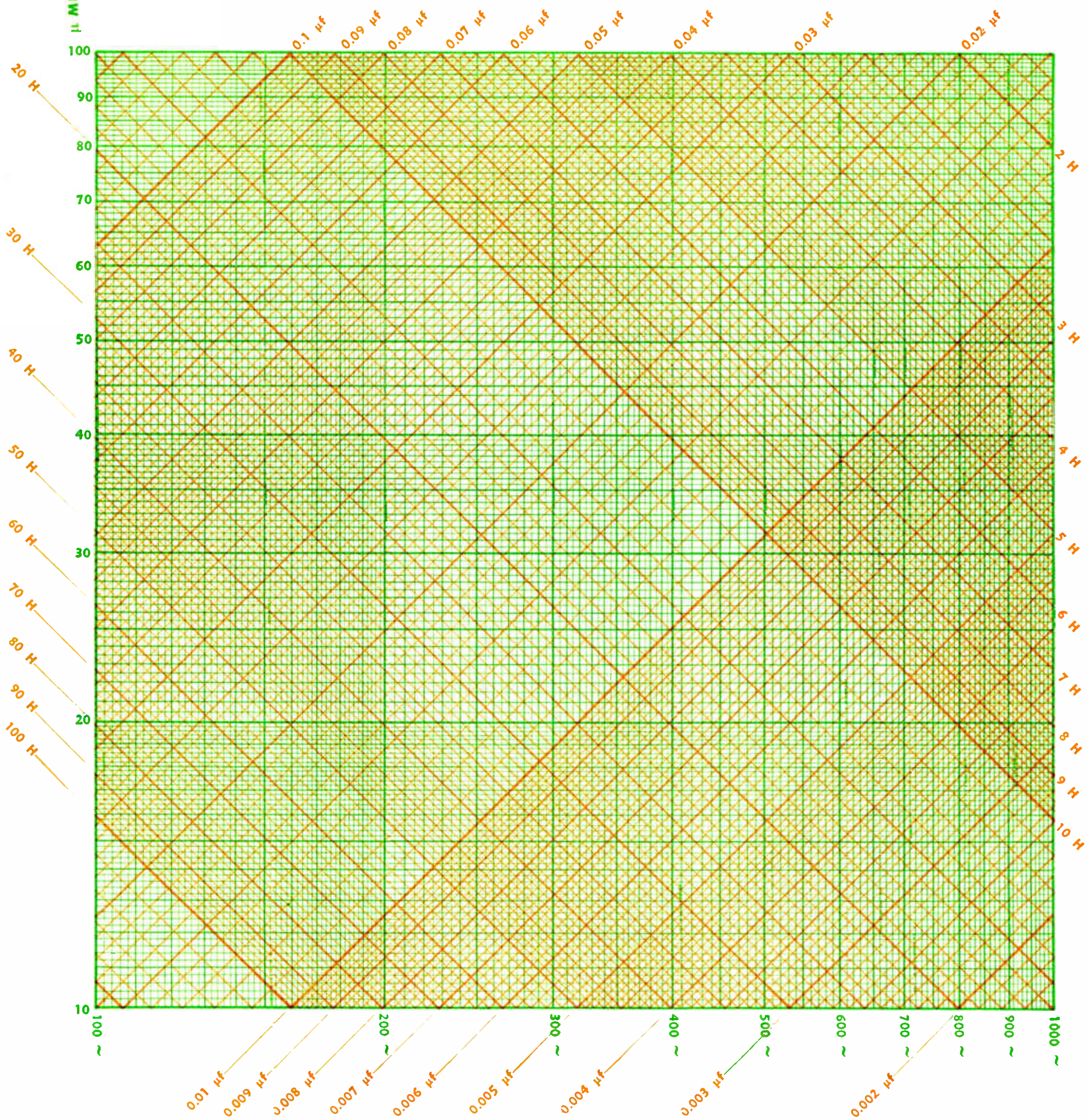
CI
C
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
μ MHOS
OHMS
1,000,000
2,000,000
3,000,000
4,000,000
5,000,000
6,000,000
7,000,000
8,000,000
9,000,000
10,000,000
A
D
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
SQUARE
SQUARE ROOT
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0

PLATE 83

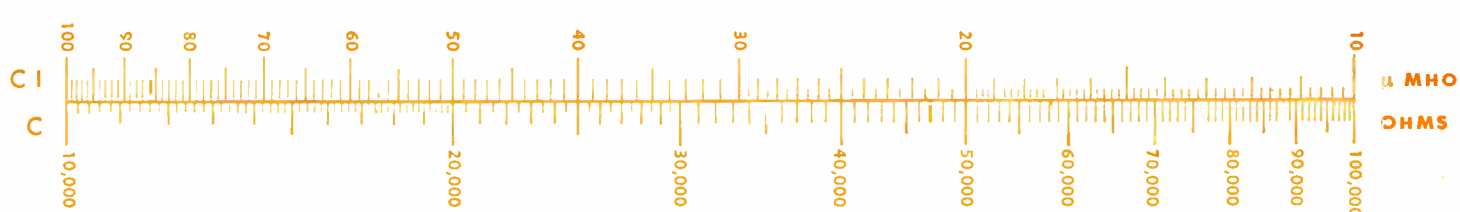


μ MHOS
0.01 μf
0.009 μf
0.008 μf
0.007 μf
0.006 μf
0.005 μf
0.004 μf
0.003 μf
0.002 μf
200 H
300 H
400 H
500 H
600 H
700 H
800 H
900 H
1000 H
20 H
30 H
40 H
50 H
60 H
70 H
80 H
90 H
100 H
100 ~
200 ~
300 ~
400 ~
500 ~
600 ~
700 ~
800 ~
900 ~
1000 ~
0.001 μf
0.0009 μf
0.0008 μf
0.0007 μf
0.0006 μf
0.0005 μf
0.0004 μf
0.0003 μf
0.0002 μf
CI
C
μ MHOS
OHMS
100,000
200,000
300,000
400,000
500,000
600,000
700,000
800,000
900,000
1,000,000
A
D
SQUARE
SQUARE ROOT

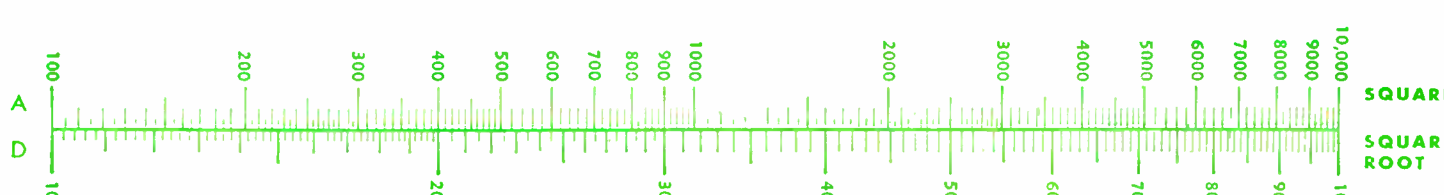
PLATE 84



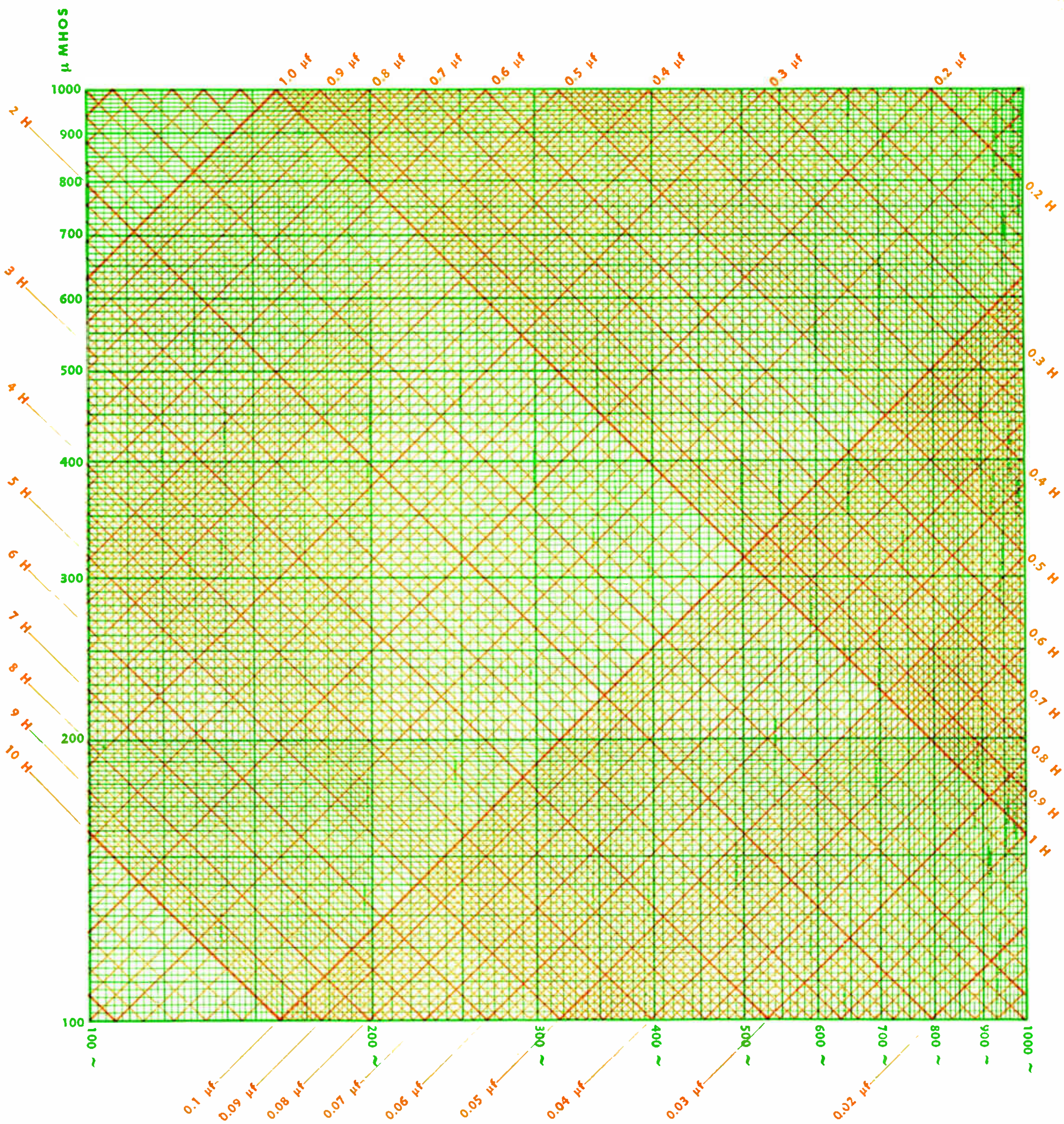
μ MHOS
100
90
80
70
60
50
40
30
20
10
0.1 μf
0.09 μf
0.08 μf
0.07 μf
0.06 μf
0.05 μf
0.04 μf
0.03 μf
0.02 μf
20 H
30 H
40 H
50 H
60 H
70 H
80 H
90 H
100 H
2 H
3 H
4 H
5 H
6 H
7 H
8 H
9 H
10 H
100 ~
200 ~
300 ~
400 ~
500 ~
600 ~
700 ~
800 ~
900 ~
1000 ~
0.01 μf
0.009 μf
0.008 μf
0.007 μf
0.006 μf
0.005 μf
0.004 μf
0.003 μf
0.002 μf

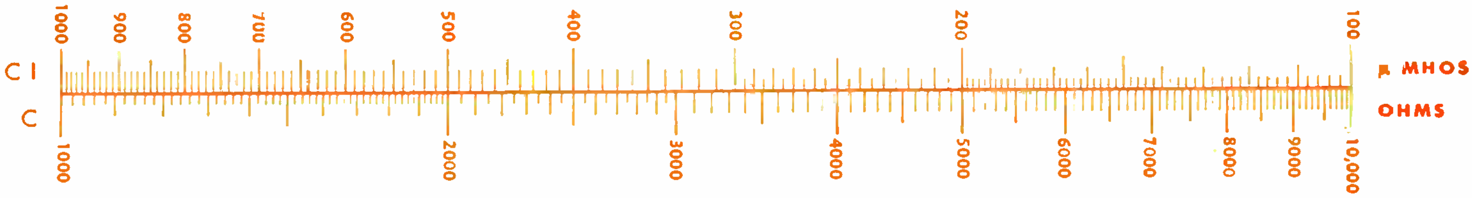


CI
C
100
90
80
70
60
50
40
30
20
10
μ MHOS
OHMS
10,000
20,000
30,000
40,000
50,000
60,000
70,000
80,000
90,000
100,000



A
D
100
200
300
400
500
600
700
800
900
1000
2000
3000
4000
5000
6000
7000
8000
9000
10,000
SQUARE
SQUARE ROOT
10
20
30
40
50
60
70
80
90
100


μ MHOS
1000
900
800
700
600
500
400
300
200
100
1.0 μf
0.9 μf
0.8 μf
0.7 μf
0.6 μf
0.5 μf
0.4 μf
0.3 μf
0.2 μf
2 H
3 H
4 H
5 H
6 H
7 H
8 H
9 H
10 H
0.2 H
0.3 H
0.4 H
0.5 H
0.6 H
0.7 H
0.8 H
0.9 H
1 H
100 ~
200 ~
300 ~
400 ~
500 ~
600 ~
700 ~
800 ~
900 ~
1000 ~
0.1 μf
0.09 μf
0.08 μf
0.07 μf
0.06 μf
0.05 μf
0.04 μf
0.03 μf
0.02 μf


CI
C
1000
900
800
700
600
500
400
300
200
100
μ MHOS
OHMS
1000
2000
3000
4000
5000
6000
7000
8000
9000
10,000

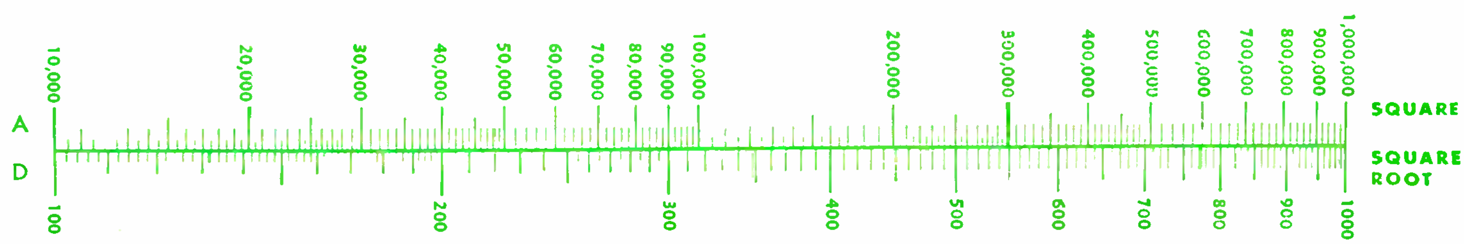

A
D
10,000
20,000
30,000
40,000
50,000
60,000
70,000
80,000
90,000
100,000
200,000
300,000
400,000
500,000
600,000
700,000
800,000
900,000
1,000,000
SQUARE
SQUARE ROOT
100
200
300
400
500
600
700
800
900
1000

PLATE 86

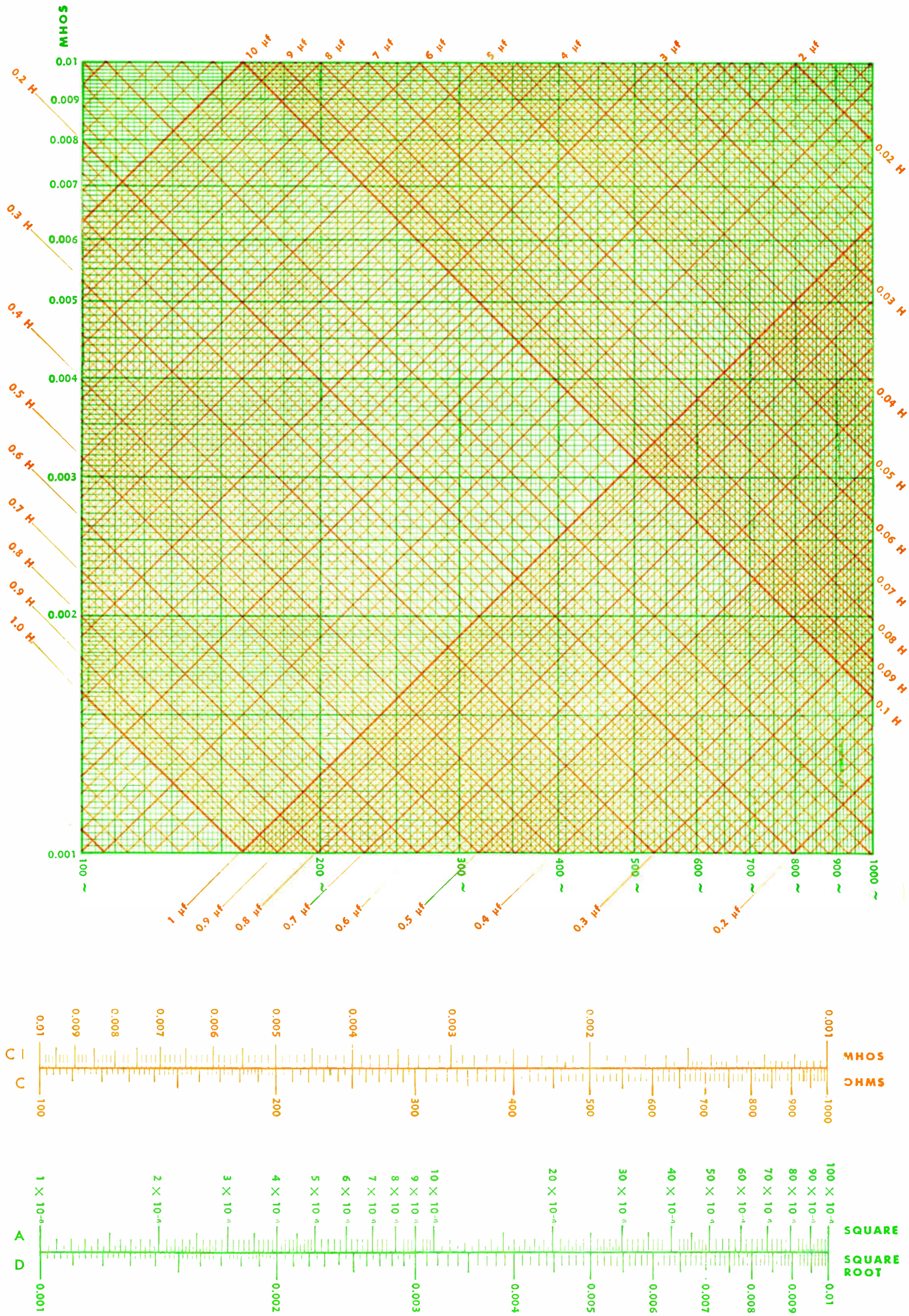
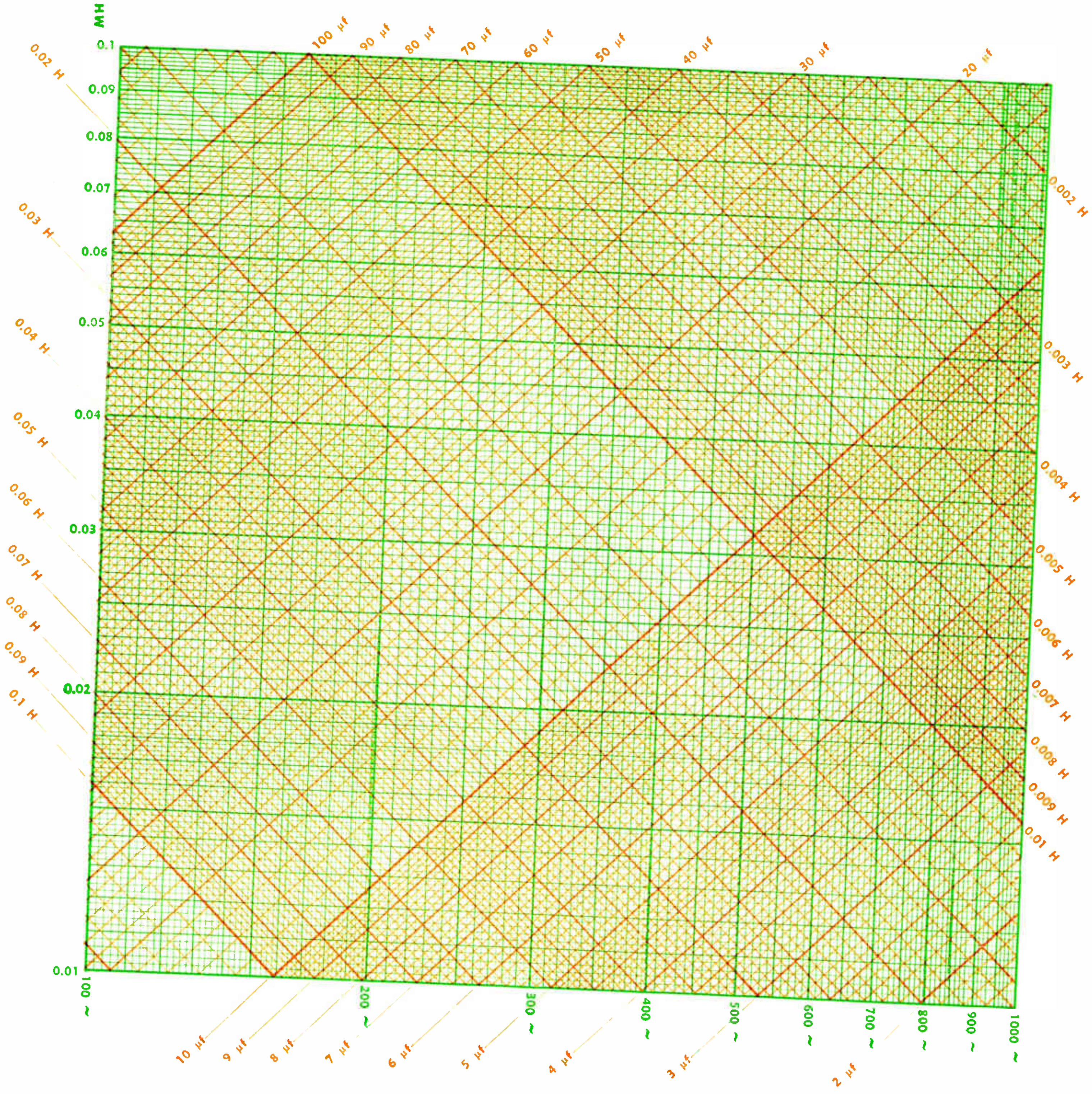

MHOS
0.01
0.009
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0.2 H
0.3 H
0.4 H
0.5 H
0.6 H
0.7 H
0.8 H
0.9 H
1.0 H
10 µf
9 µf
8 µf
7 µf
6 µf
5 µf
4 µf
3 µf
2 µf
0.02 H
0.03 H
0.04 H
0.05 H
0.06 H
0.07 H
0.08 H
0.09 H
0.1 H
100 ~
200 ~
300 ~
400 ~
500 ~
600 ~
700 ~
800 ~
900 ~
1000 ~
1 µf
0.9 µf
0.8 µf
0.7 µf
0.6 µf
0.5 µf
0.4 µf
0.3 µf
0.2 µf
CI
C
MHOS
OHMS
A
D
SQUARE
SQUARE ROOT

PLATE 87


MHOS
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.02 H
0.03 H
0.04 H
0.05 H
0.06 H
0.07 H
0.08 H
0.09 H
0.1 H
100 µf
90 µf
80 µf
70 µf
60 µf
50 µf
40 µf
30 µf
20 µf
0.002 H
0.003 H
0.004 H
0.005 H
0.006 H
0.007 H
0.008 H
0.009 H
0.01 H
100 ~
200 ~
300 ~
400 ~
500 ~
600 ~
700 ~
800 ~
900 ~
1000 ~
10 µf
9 µf
8 µf
7 µf
6 µf
5 µf
4 µf
3 µf
2 µf

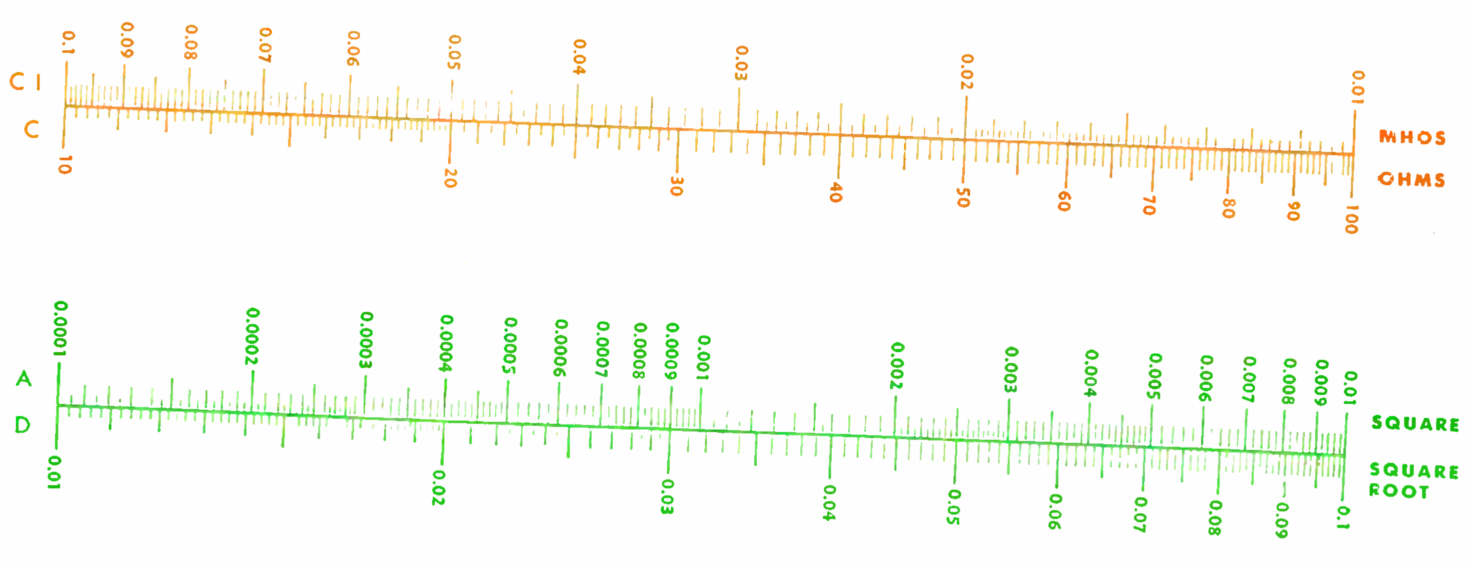
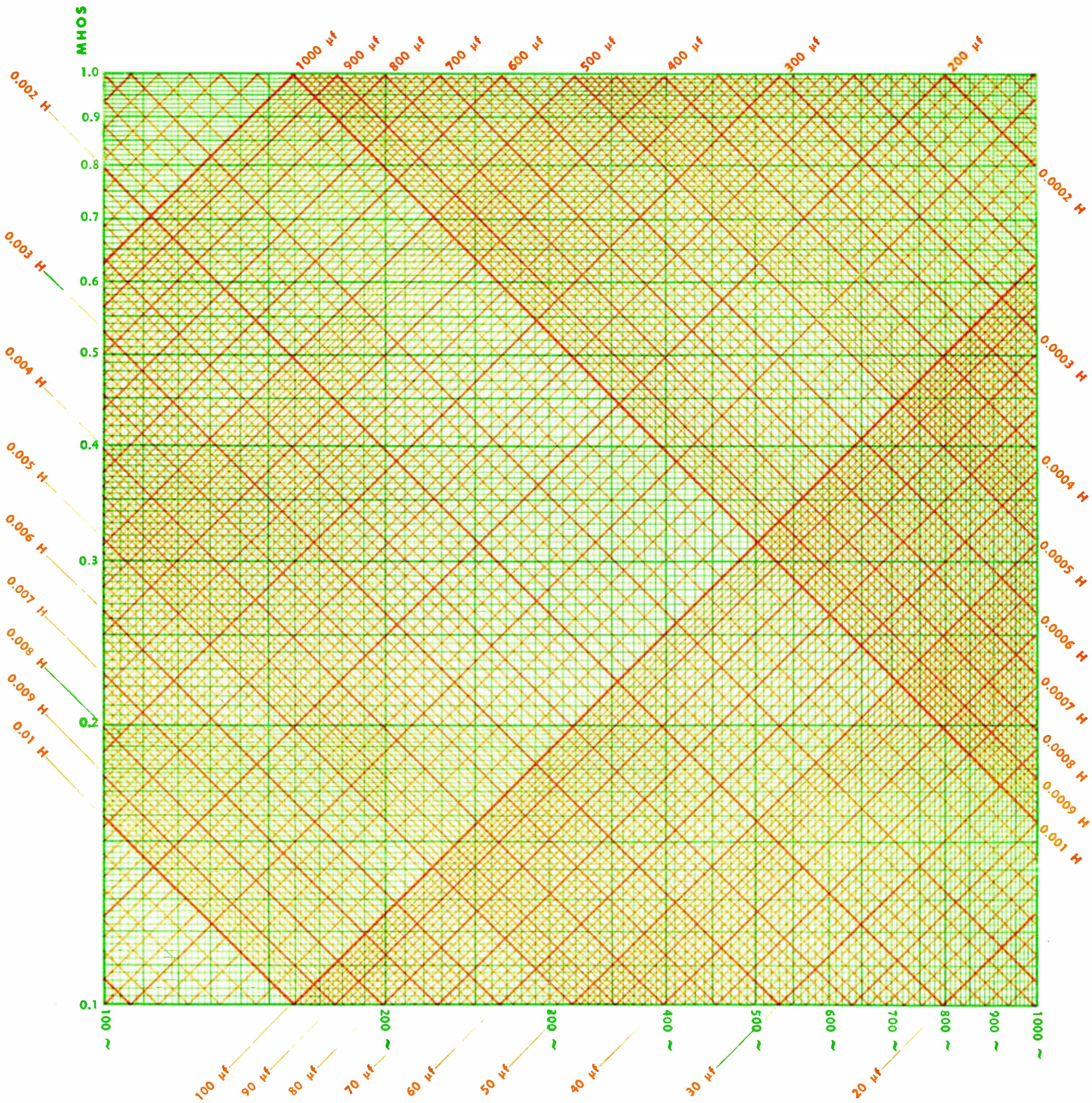
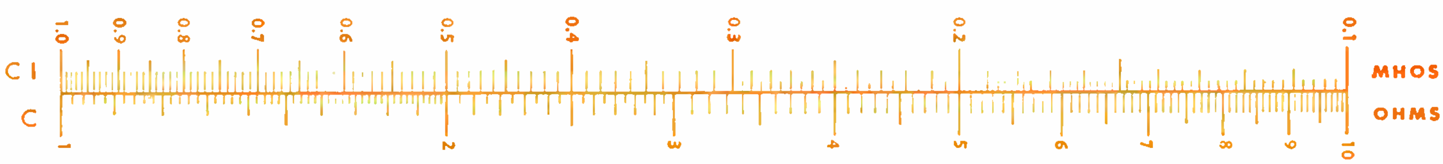

CI
C
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
10
20
30
40
50
60
70
80
90
100
MHOS
OHMS
A
D
0.0001
0.0002
0.0003
0.0004
0.0005
0.0006
0.0007
0.0008
0.0009
0.001
0.002
0.003
0.004
0.005
0.006
0.007
0.008
0.009
0.01
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.1
SQUARE
SQUARE ROOT

PLATE 88


MHOS
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
1000 µf
900 µf
800 µf
700 µf
600 µf
500 µf
400 µf
300 µf
200 µf
0.002 H
0.003 H
0.004 H
0.005 H
0.006 H
0.007 H
0.008 H
0.009 H
0.01 H
0.0002 H
0.0003 H
0.0004 H
0.0005 H
0.0006 H
0.0007 H
0.0008 H
0.0009 H
0.001 H
100 ~
200 ~
300 ~
400 ~
500 ~
600 ~
700 ~
800 ~
900 ~
1000 ~
100 µf
90 µf
80 µf
70 µf
60 µf
50 µf
40 µf
30 µf
20 µf


C I
C
1.0 0.9 0.8 0.7 0.6 0.5 0.4 0.3 0.2 0.1
MHOS
1 2 3 4 5 6 7 8 9 10
OHMS

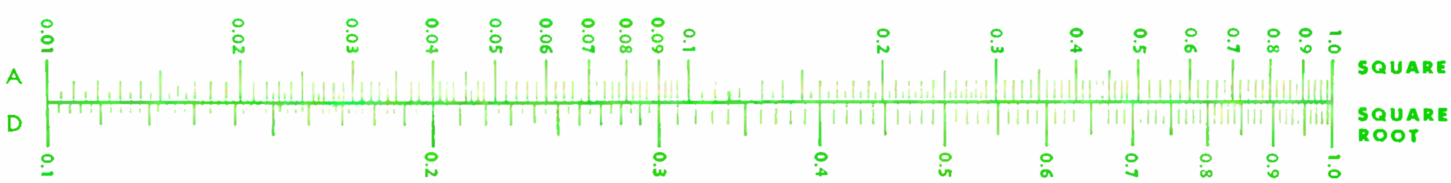

A
D
0.01 0.02 0.03 0.04 0.05 0.06 0.07 0.08 0.09 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
SQUARE
0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
SQUARE ROOT

PLATE 89

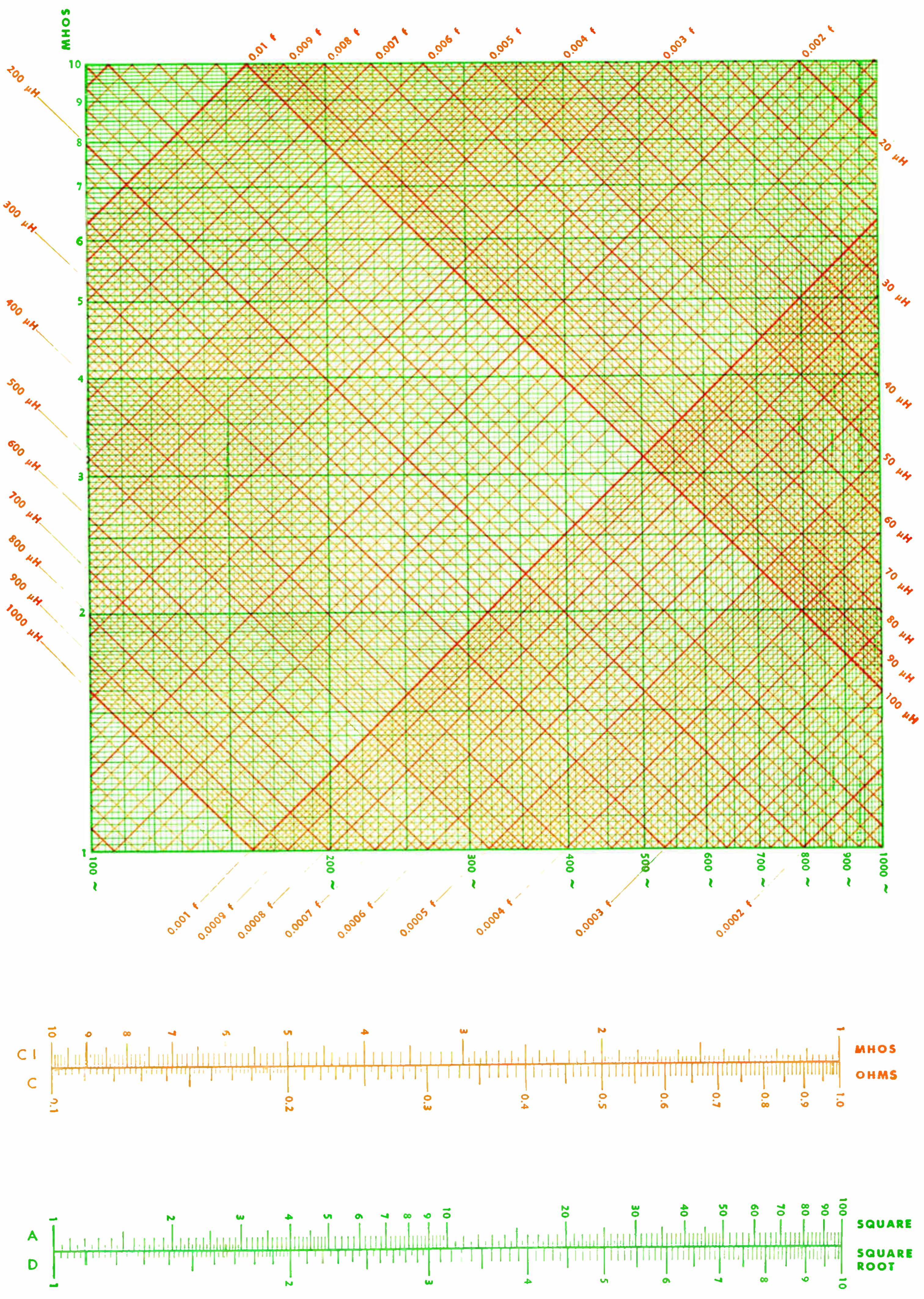
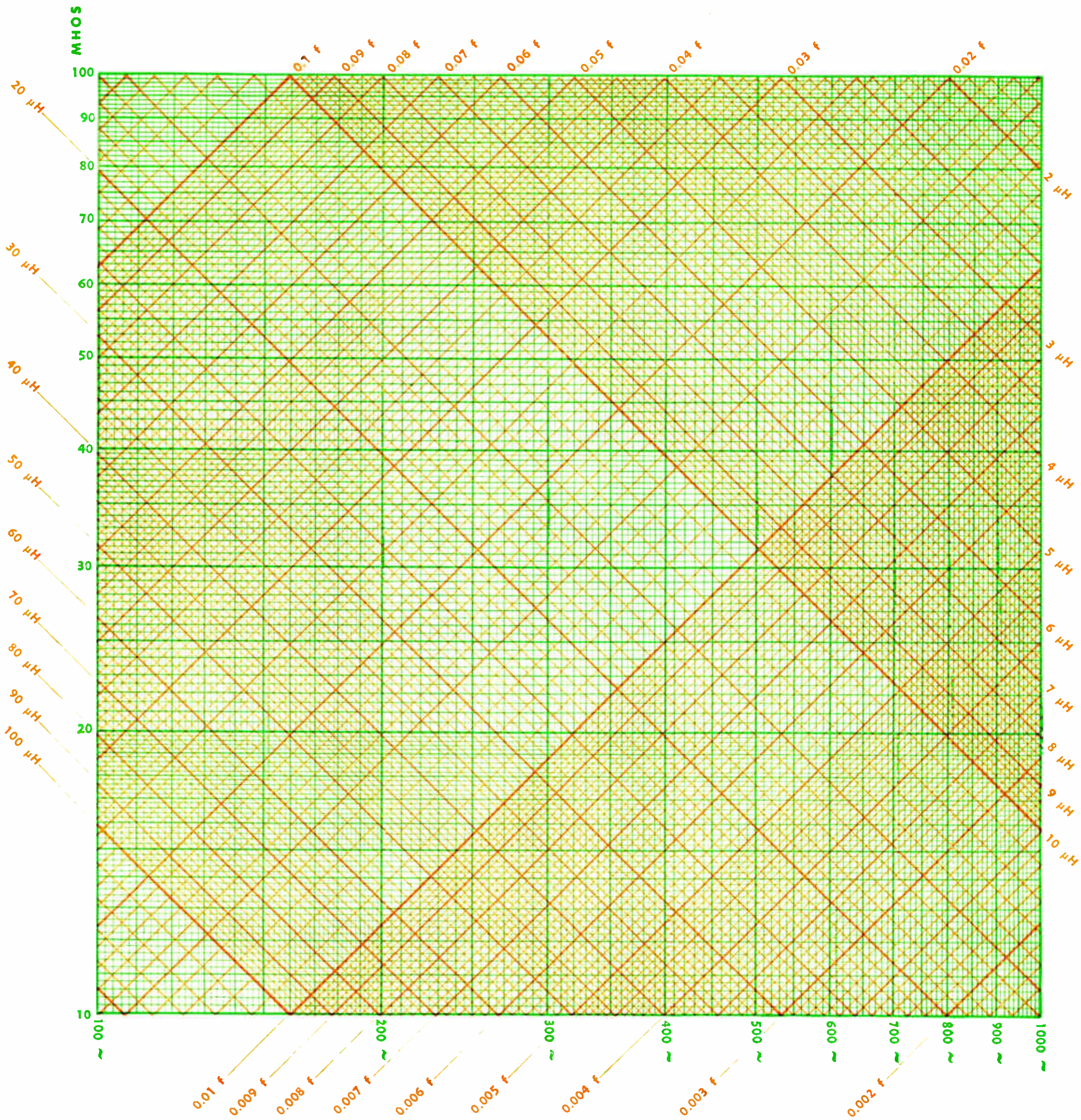
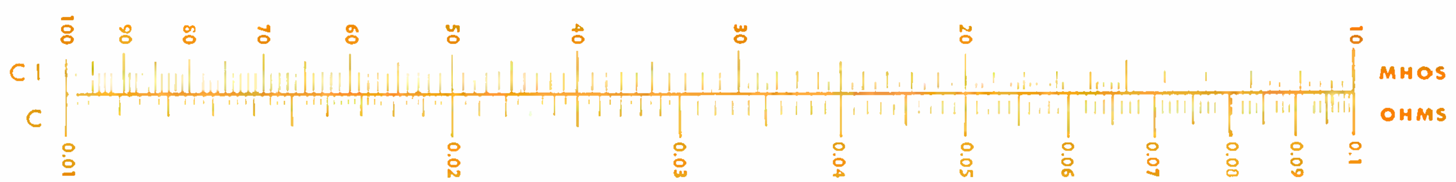

MHOS
0.01 f
0.009 f
0.008 f
0.007 f
0.006 f
0.005 f
0.004 f
0.003 f
0.002 f
200 μH
300 μH
400 μH
500 μH
600 μH
700 μH
800 μH
900 μH
1000 μH
20 μH
30 μH
40 μH
50 μH
60 μH
70 μH
80 μH
90 μH
100 μH
100 ~
200 ~
300 ~
400 ~
500 ~
600 ~
700 ~
800 ~
900 ~
1000 ~
0.001 f
0.0009 f
0.0008 f
0.0007 f
0.0006 f
0.0005 f
0.0004 f
0.0003 f
0.0002 f
CI
C
MHOS
OHMS
A
D
SQUARE
SQUARE ROOT

PLATE 90


MHOS
100
90
80
70
60
50
40
30
20
10
20 μH
30 μH
40 μH
50 μH
60 μH
70 μH
80 μH
90 μH
100 μH
2 μH
3 μH
4 μH
5 μH
6 μH
7 μH
8 μH
9 μH
10 μH
0.1 f
0.09 f
0.08 f
0.07 f
0.06 f
0.05 f
0.04 f
0.03 f
0.02 f
100 ~
200 ~
300 ~
400 ~
500 ~
600 ~
700 ~
800 ~
900 ~
1000 ~
0.01 f
0.009 f
0.008 f
0.007 f
0.006 f
0.005 f
0.004 f
0.003 f
0.002 f


C I
C
100
90
80
70
60
50
40
30
20
10
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.1
MHOS
OHMS

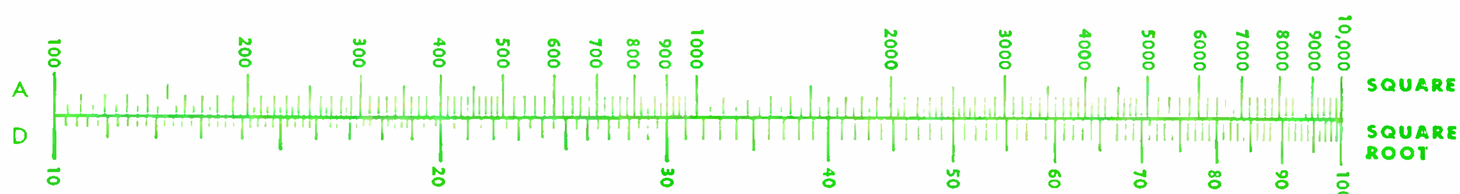

A
D
100
200
300
400
500
600
700
800
900
1000
2000
3000
4000
5000
6000
7000
8000
9000
10,000
10
20
30
40
50
60
70
80
90
100
SQUARE
SQUARE ROOT

PLATE 91

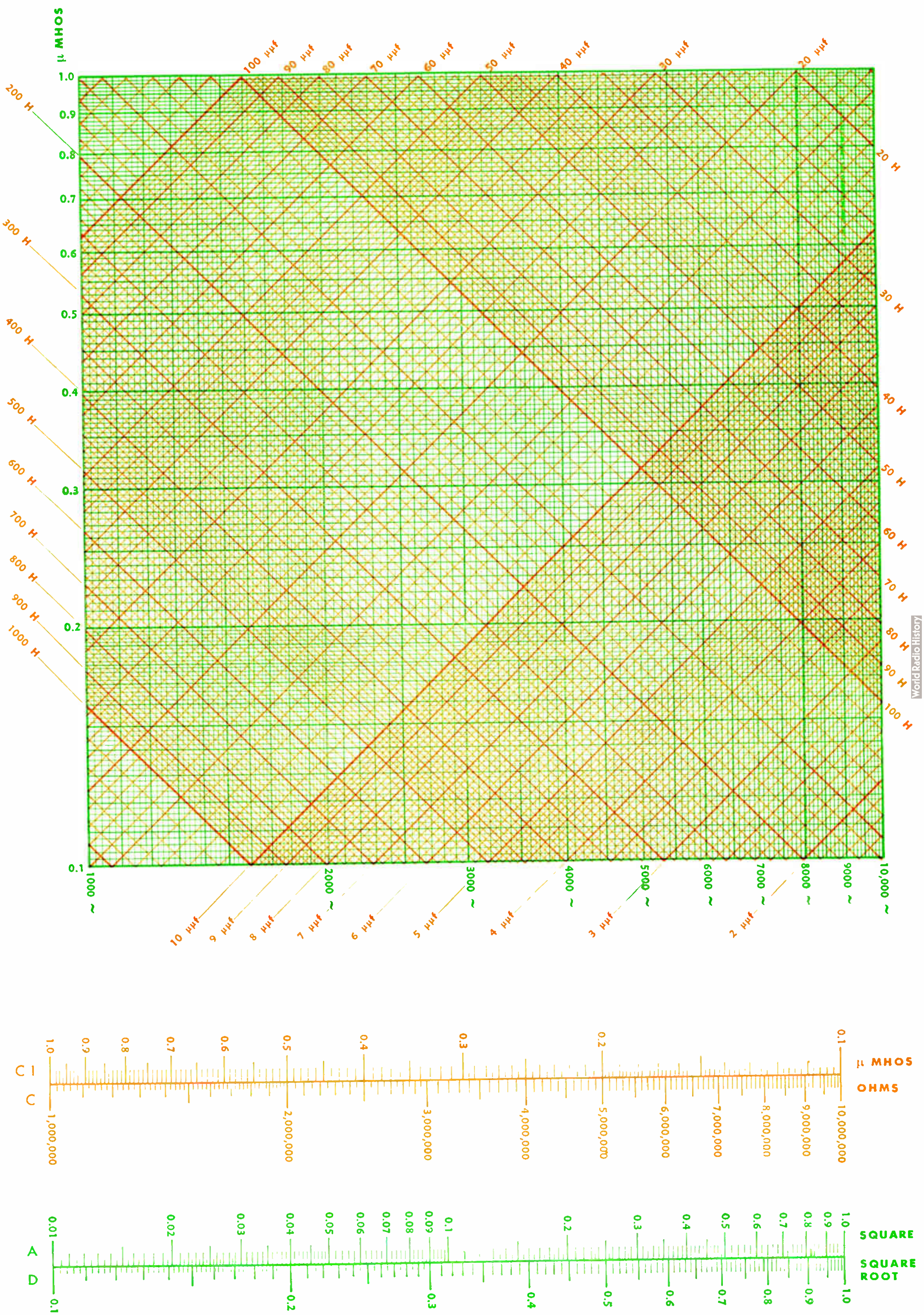
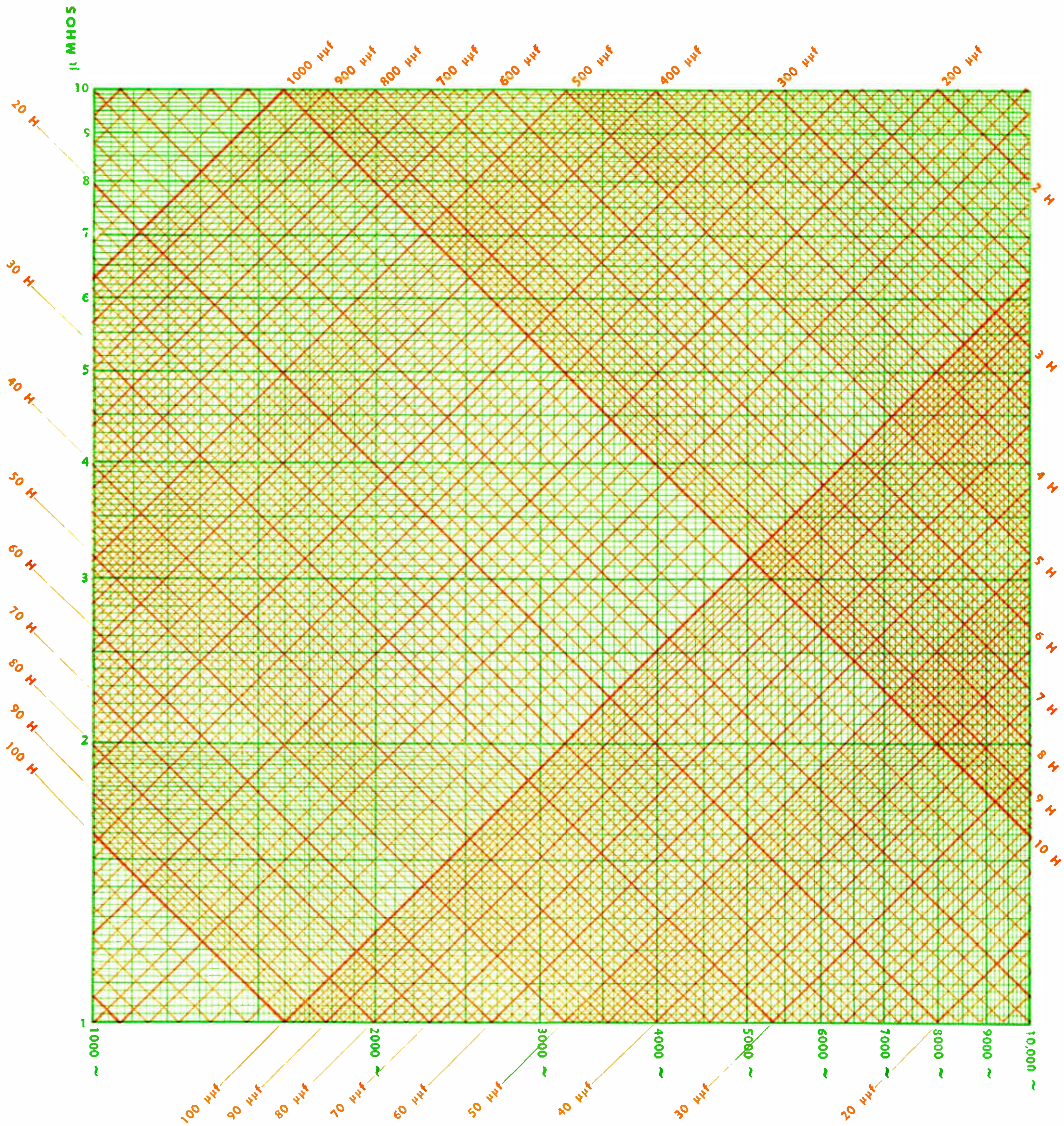
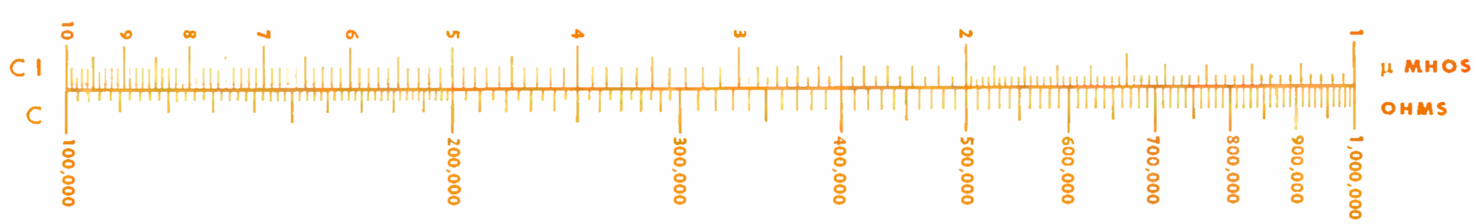

µ MHOS
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
100 µµf
90 µµf
80 µµf
70 µµf
60 µµf
50 µµf
40 µµf
30 µµf
20 µµf
200 H
300 H
400 H
500 H
600 H
700 H
800 H
900 H
1000 H
20 H
30 H
40 H
50 H
60 H
70 H
80 H
90 H
100 H
1000 ~
2000 ~
3000 ~
4000 ~
5000 ~
6000 ~
7000 ~
8000 ~
9000 ~
10,000 ~
10 µµf
9 µµf
8 µµf
7 µµf
6 µµf
5 µµf
4 µµf
3 µµf
2 µµf
CI
C
µ MHOS
OHMS
A
D
SQUARE
SQUARE ROOT

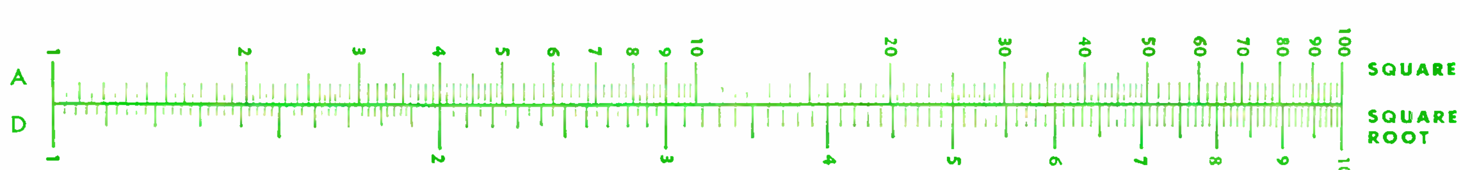
PLATE 92



μ MHOS
1000 μμf
900 μμf
800 μμf
700 μμf
600 μμf
500 μμf
400 μμf
300 μμf
200 μμf
20 H
30 H
40 H
50 H
60 H
70 H
80 H
90 H
100 H
2 H
3 H
4 H
5 H
6 H
7 H
8 H
9 H
10 H
1000 ~
2000 ~
3000 ~
4000 ~
5000 ~
6000 ~
7000 ~
8000 ~
9000 ~
10,000 ~
100 μμf
90 μμf
80 μμf
70 μμf
60 μμf
50 μμf
40 μμf
30 μμf
20 μμf

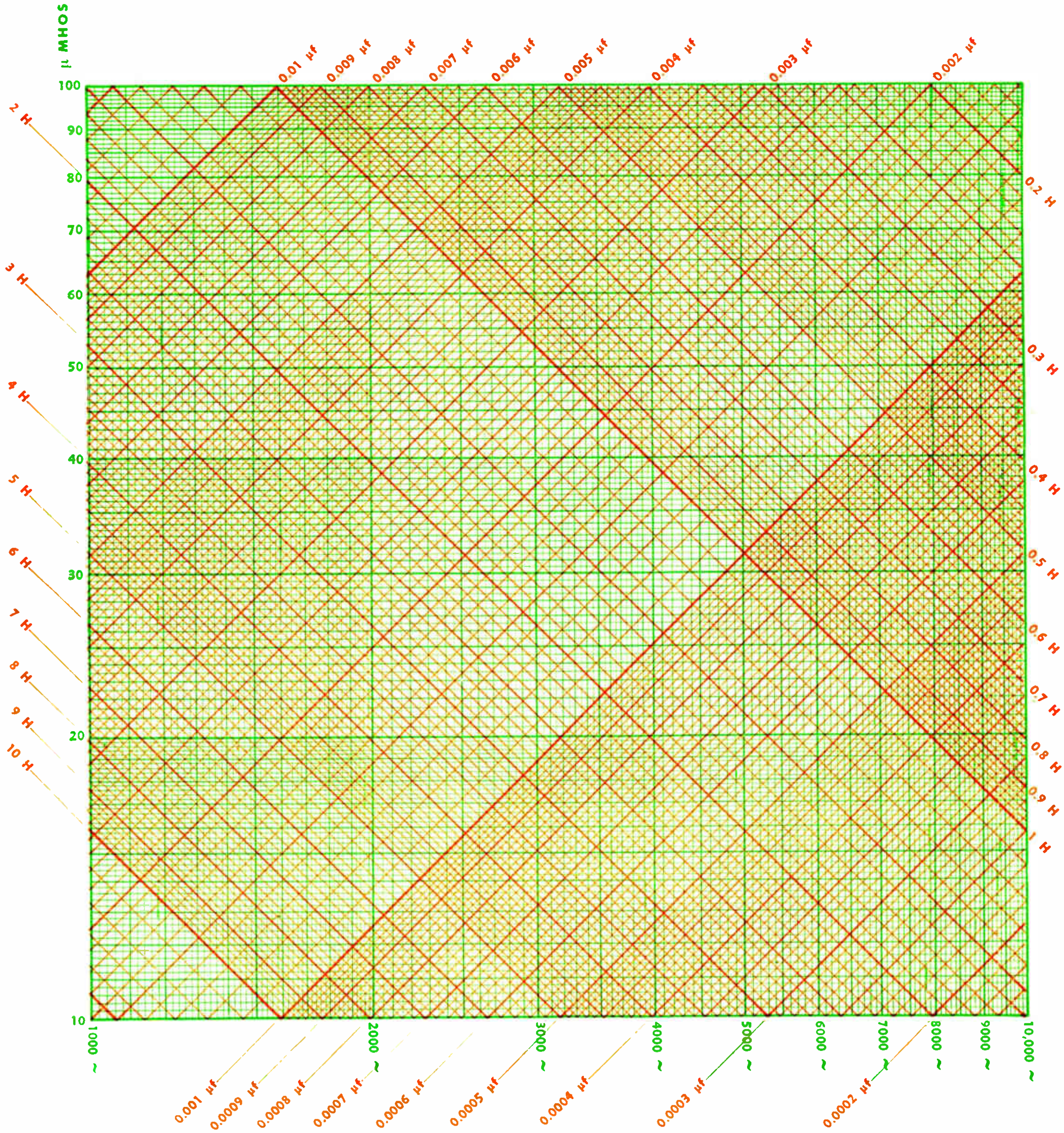


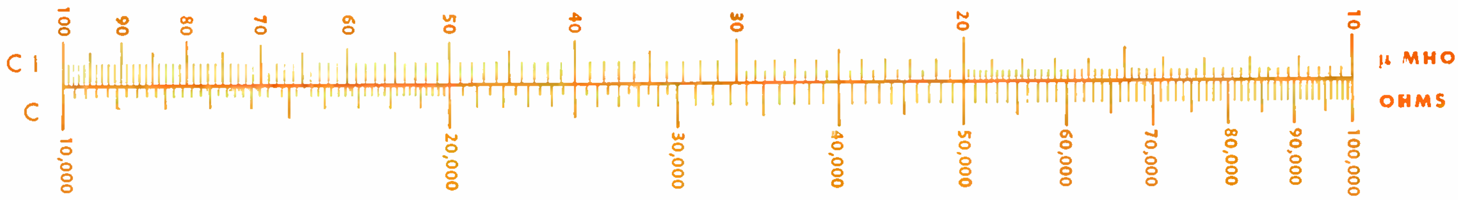
CI
C
μ MHOS
OHMS
100,000
200,000
300,000
400,000
500,000
600,000
700,000
800,000
900,000
1,000,000



A
D
SQUARE
SQUARE ROOT

PLATE 93


µ MHOS
100
90
80
70
60
50
40
30
20
10
2 H
3 H
4 H
5 H
6 H
7 H
8 H
9 H
10 H
0.01 µf
0.009 µf
0.008 µf
0.007 µf
0.006 µf
0.005 µf
0.004 µf
0.003 µf
0.002 µf
0.2 H
0.3 H
0.4 H
0.5 H
0.6 H
0.7 H
0.8 H
0.9 H
1 H
1000 ~
2000 ~
3000 ~
4000 ~
5000 ~
6000 ~
7000 ~
8000 ~
9000 ~
10,000 ~
0.001 µf
0.0009 µf
0.0008 µf
0.0007 µf
0.0006 µf
0.0005 µf
0.0004 µf
0.0003 µf
0.0002 µf


CI
C
100
90
80
70
60
50
40
30
20
10
µ MHOS
OHMS
10,000
20,000
30,000
40,000
50,000
60,000
70,000
80,000
90,000
100,000

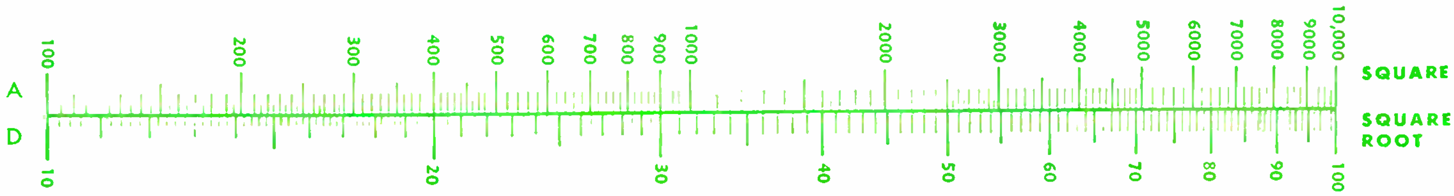
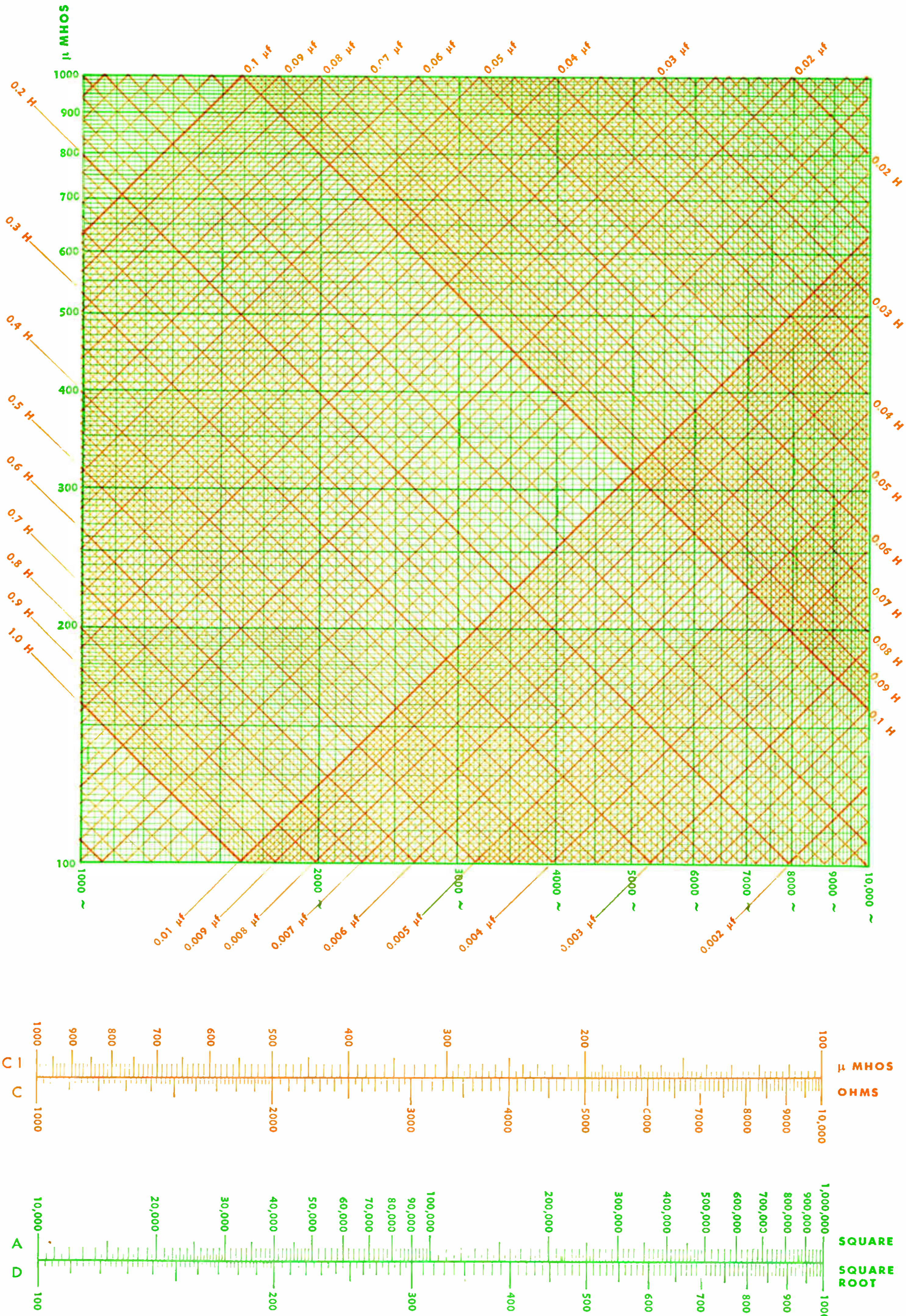

A
D
100
200
300
400
500
600
700
800
900
1000
2000
3000
4000
5000
6000
7000
8000
9000
10,000
SQUARE
SQUARE ROOT
10
20
30
40
50
60
70
80
90
100

PLATE 94



μ MHOS
1000
900
800
700
600
500
400
300
200
100
0.2 H
0.3 H
0.4 H
0.5 H
0.6 H
0.7 H
0.8 H
0.9 H
1.0 H
0.1 μf
0.09 μf
0.08 μf
0.07 μf
0.06 μf
0.05 μf
0.04 μf
0.03 μf
0.02 μf
0.02 H
0.03 H
0.04 H
0.05 H
0.06 H
0.07 H
0.08 H
0.09 H
0.1 H
1000 ~
2000 ~
3000 ~
4000 ~
5000 ~
6000 ~
7000 ~
8000 ~
9000 ~
10,000 ~
0.01 μf
0.009 μf
0.008 μf
0.007 μf
0.006 μf
0.005 μf
0.004 μf
0.003 μf
0.002 μf
C I
C
1000 900 800 700 600 500 400 300 200 100
μ MHOS
1000 2000 3000 4000 5000 6000 7000 8000 9000 10,000
OHMS
A
D
10,000 20,000 30,000 40,000 50,000 60,000 70,000 80,000 90,000 100,000 200,000 300,000 400,000 500,000 600,000 700,000 800,000 900,000 1,000,000
SQUARE
100 200 300 400 500 600 700 800 900 1000
SQUARE ROOT

PLATE 95

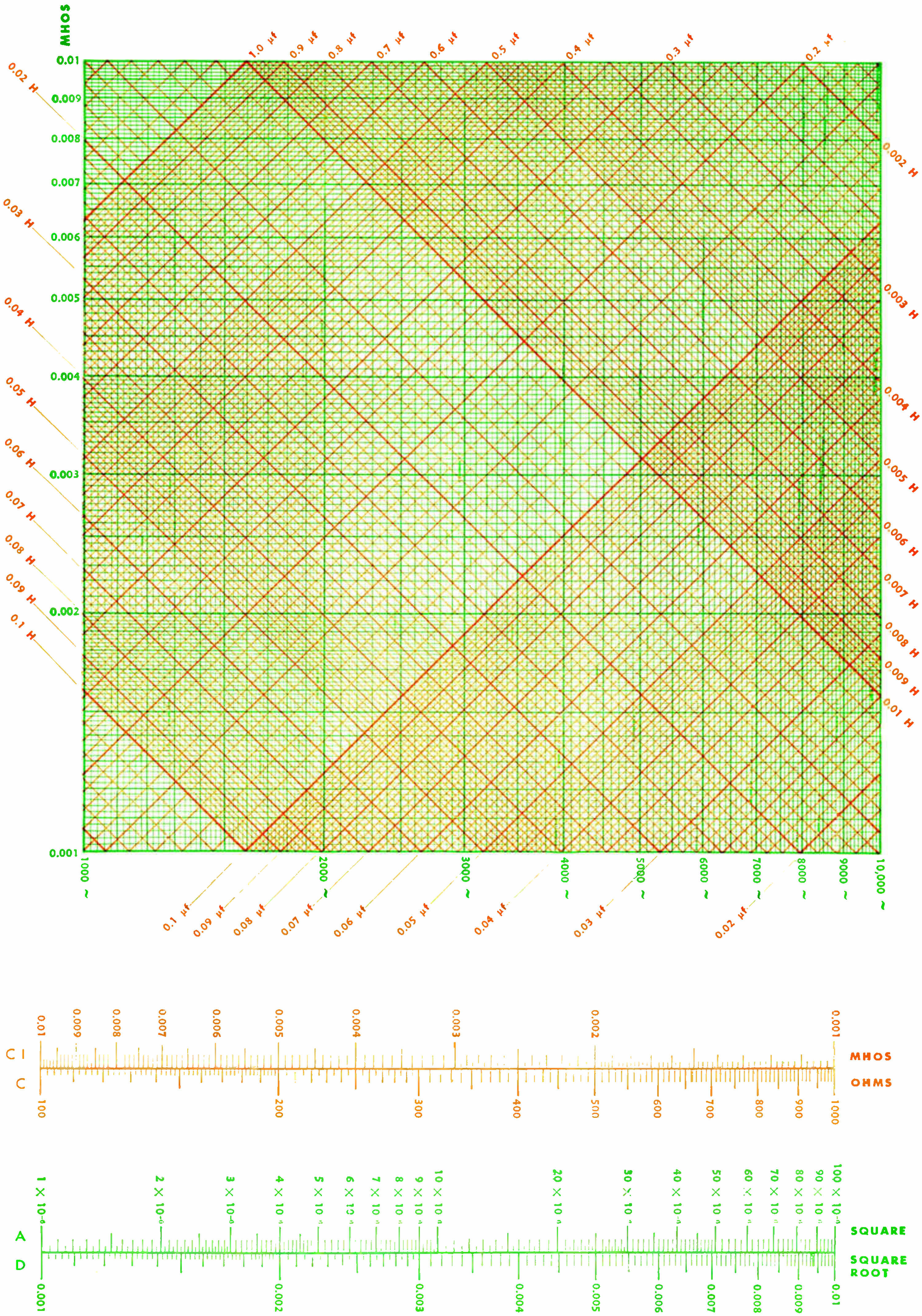
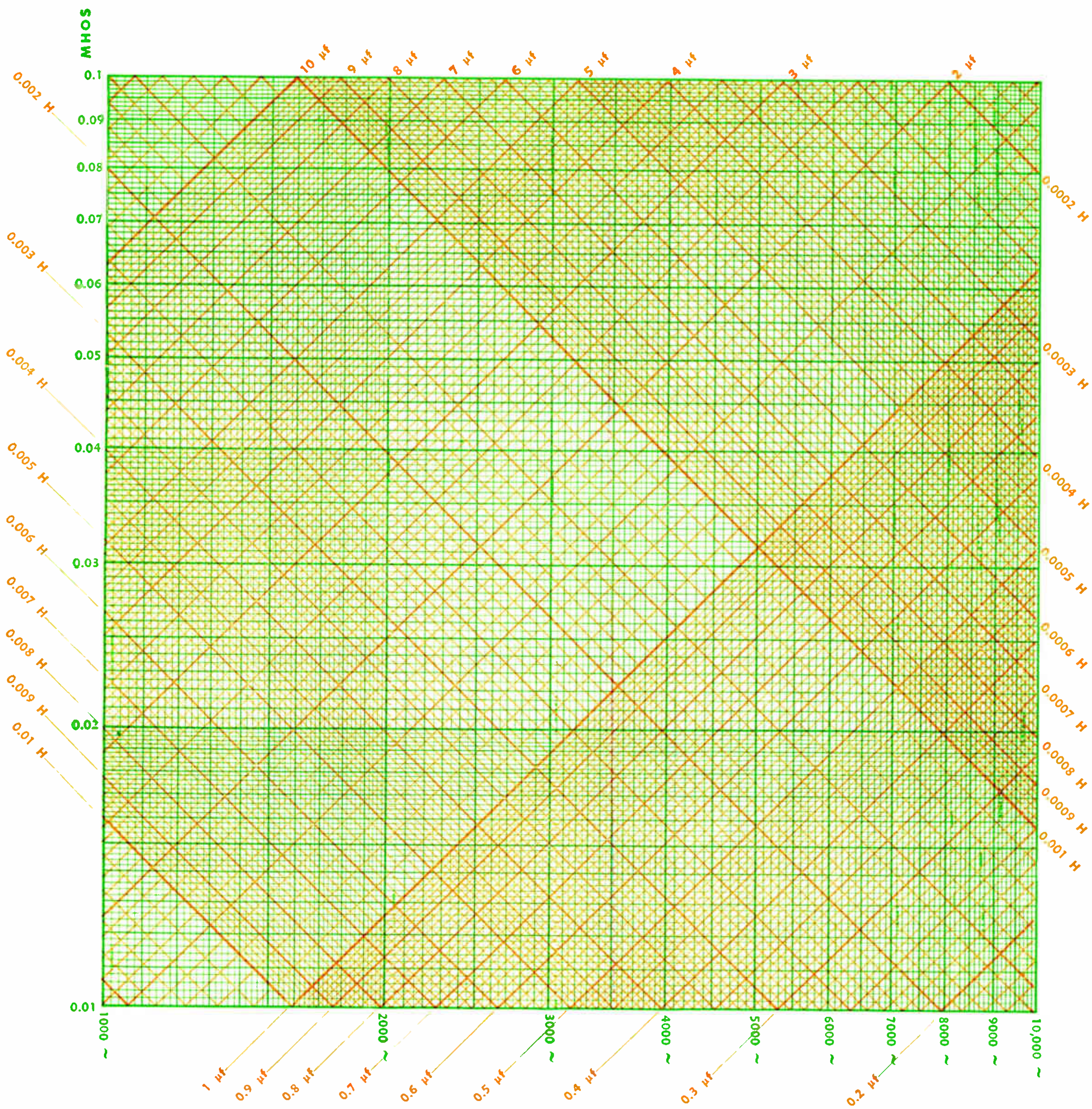
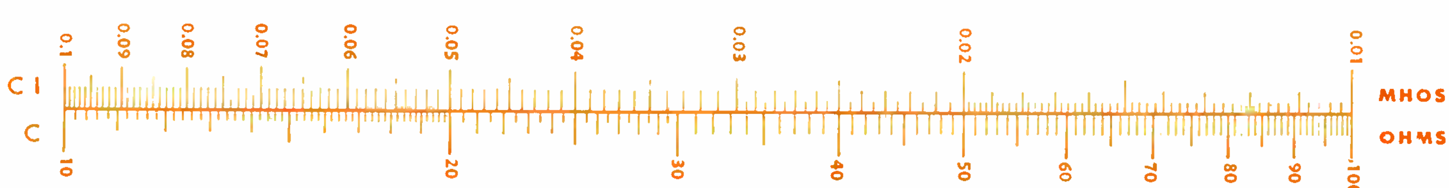
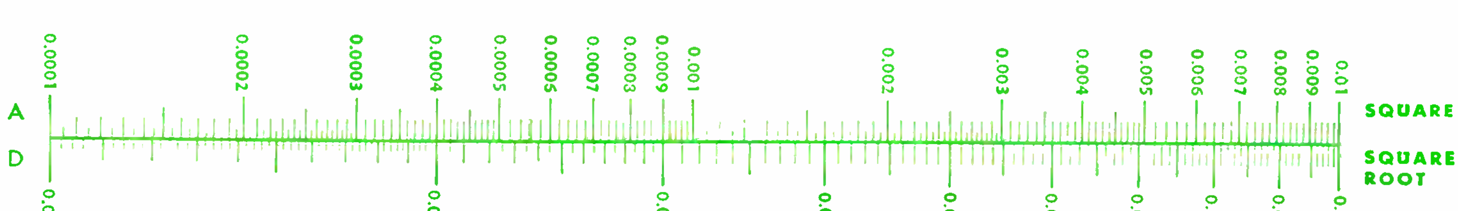
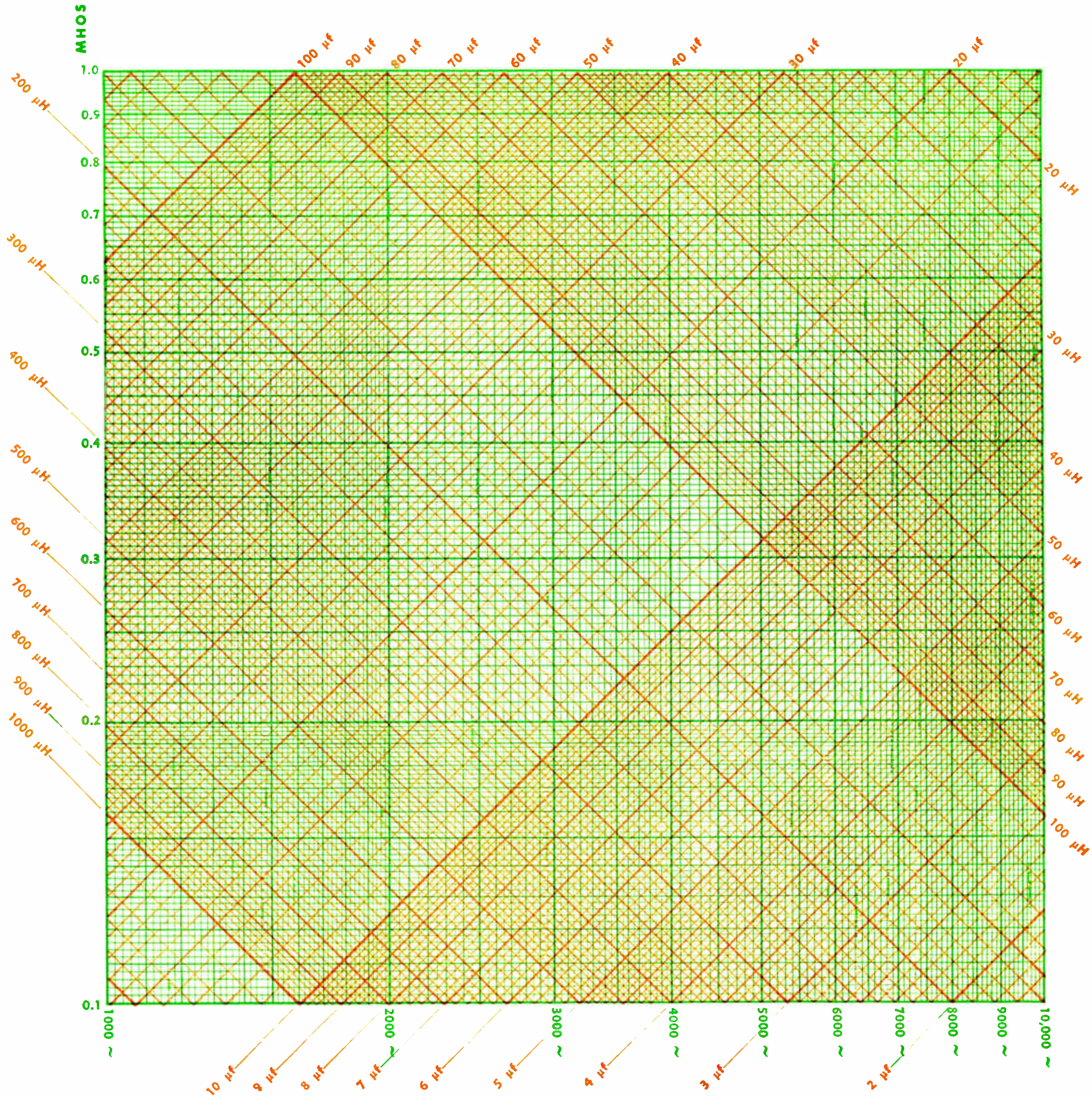

MHOS
0.01
0.009
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
1.0 μf
0.9 μf
0.8 μf
0.7 μf
0.6 μf
0.5 μf
0.4 μf
0.3 μf
0.2 μf
0.02 H
0.03 H
0.04 H
0.05 H
0.06 H
0.07 H
0.08 H
0.09 H
0.1 H
0.002 H
0.003 H
0.004 H
0.005 H
0.006 H
0.007 H
0.008 H
0.009 H
0.01 H
1000 ~
2000 ~
3000 ~
4000 ~
5000 ~
6000 ~
7000 ~
8000 ~
9000 ~
10,000 ~
0.1 μf
0.09 μf
0.08 μf
0.07 μf
0.06 μf
0.05 μf
0.04 μf
0.03 μf
0.02 μf
CI
C
MHOS
OHMS
0.01
0.009
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
100
200
300
400
500
600
700
800
900
1000
A
D
SQUARE
SQUARE ROOT
1 × 10⁻⁶
2 × 10⁻⁶
3 × 10⁻⁶
4 × 10⁻⁶
5 × 10⁻⁶
6 × 10⁻⁶
7 × 10⁻⁶
8 × 10⁻⁶
9 × 10⁻⁶
10 × 10⁻⁶
20 × 10⁻⁶
30 × 10⁻⁶
40 × 10⁻⁶
50 × 10⁻⁶
60 × 10⁻⁶
70 × 10⁻⁶
80 × 10⁻⁶
90 × 10⁻⁶
100 × 10⁻⁶
0.001
0.002
0.003
0.004
0.005
0.006
0.007
0.008
0.009
0.01

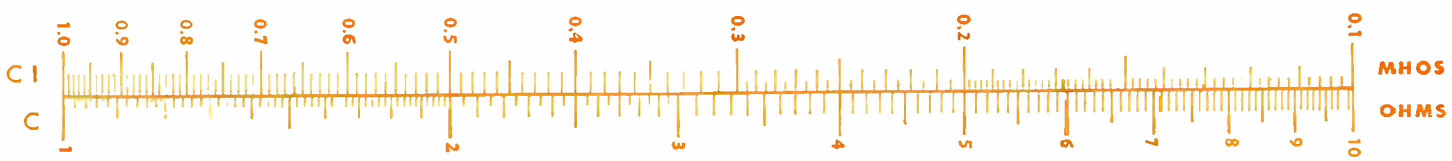
PLATE 96


MHOS
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
10 μf
9 μf
8 μf
7 μf
6 μf
5 μf
4 μf
3 μf
2 μf
0.002 H
0.003 H
0.004 H
0.005 H
0.006 H
0.007 H
0.008 H
0.009 H
0.01 H
0.0002 H
0.0003 H
0.0004 H
0.0005 H
0.0006 H
0.0007 H
0.0008 H
0.0009 H
0.001 H
1000 ~
2000 ~
3000 ~
4000 ~
5000 ~
6000 ~
7000 ~
8000 ~
9000 ~
10,000 ~
1 μf
0.9 μf
0.8 μf
0.7 μf
0.6 μf
0.5 μf
0.4 μf
0.3 μf
0.2 μf


CI
C
MHOS
OHMS
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
10
20
30
40
50
60
70
80
90
100


A
D
SQUARE
SQUARE ROOT
0.0001
0.0002
0.0003
0.0004
0.0005
0.0006
0.0007
0.0008
0.0009
0.001
0.002
0.003
0.004
0.005
0.006
0.007
0.008
0.009
0.01
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.1


MHOS
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
100 µf
90 µf
80 µf
70 µf
60 µf
50 µf
40 µf
30 µf
20 µf
200 µH
300 µH
400 µH
500 µH
600 µH
700 µH
800 µH
900 µH
1000 µH
20 µH
30 µH
40 µH
50 µH
60 µH
70 µH
80 µH
90 µH
100 µH
1000 ~
2000 ~
3000 ~
4000 ~
5000 ~
6000 ~
7000 ~
8000 ~
9000 ~
10,000 ~
10 µf
9 µf
8 µf
7 µf
6 µf
5 µf
4 µf
3 µf
2 µf


CI
C
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
MHOS
OHMS
1
2
3
4
5
6
7
8
9
10

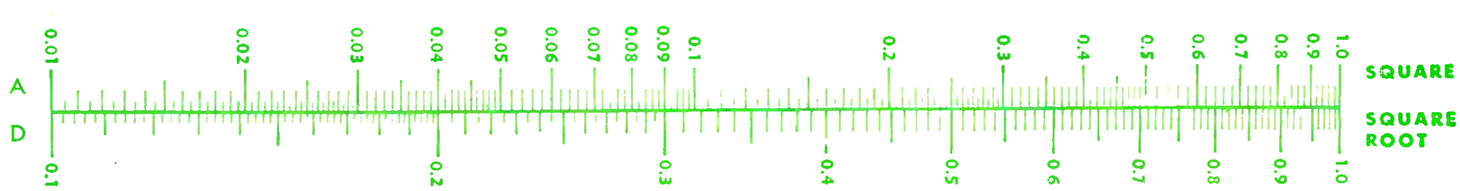

A
D
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
SQUARE
SQUARE ROOT
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0

PLATE 98

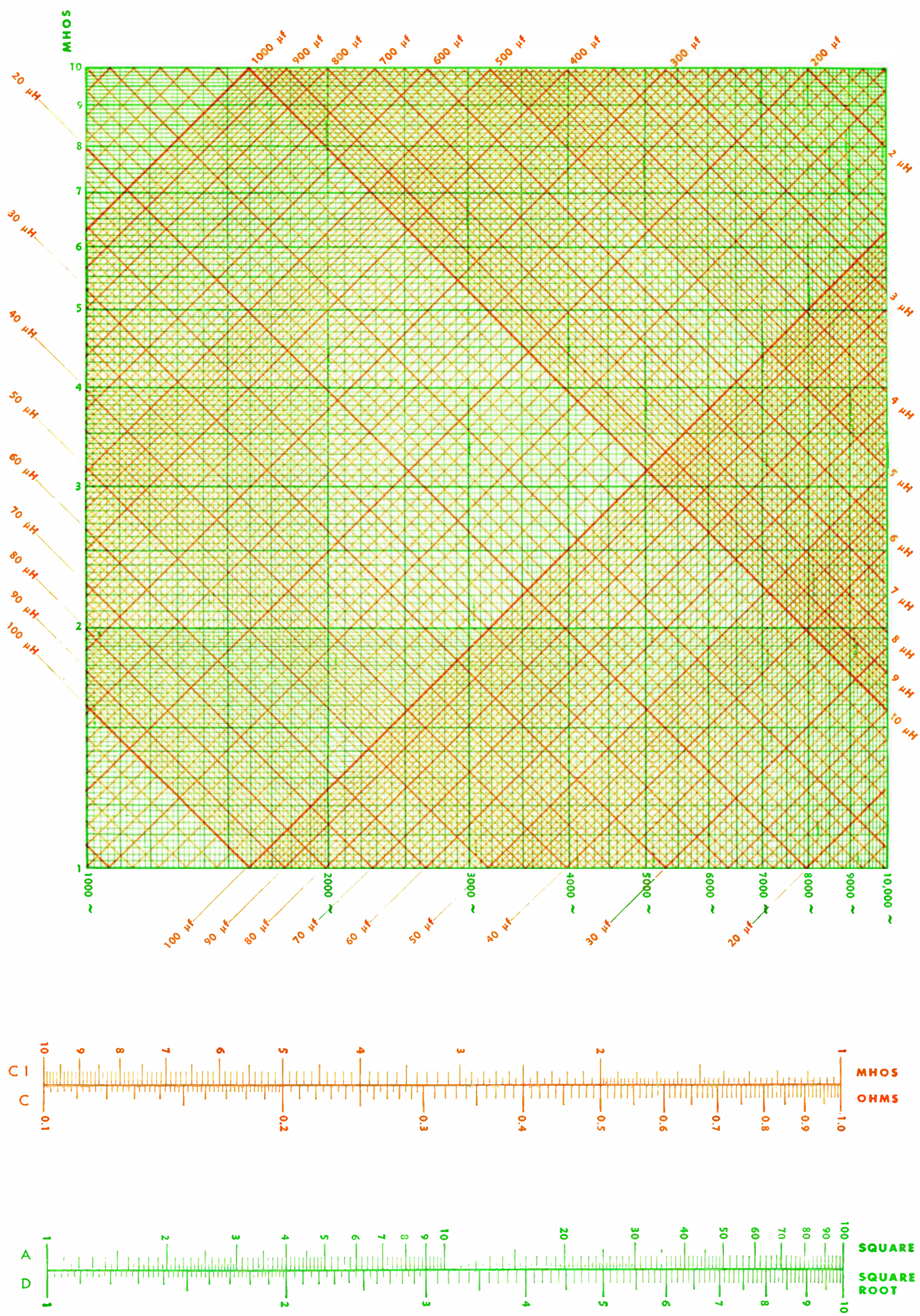
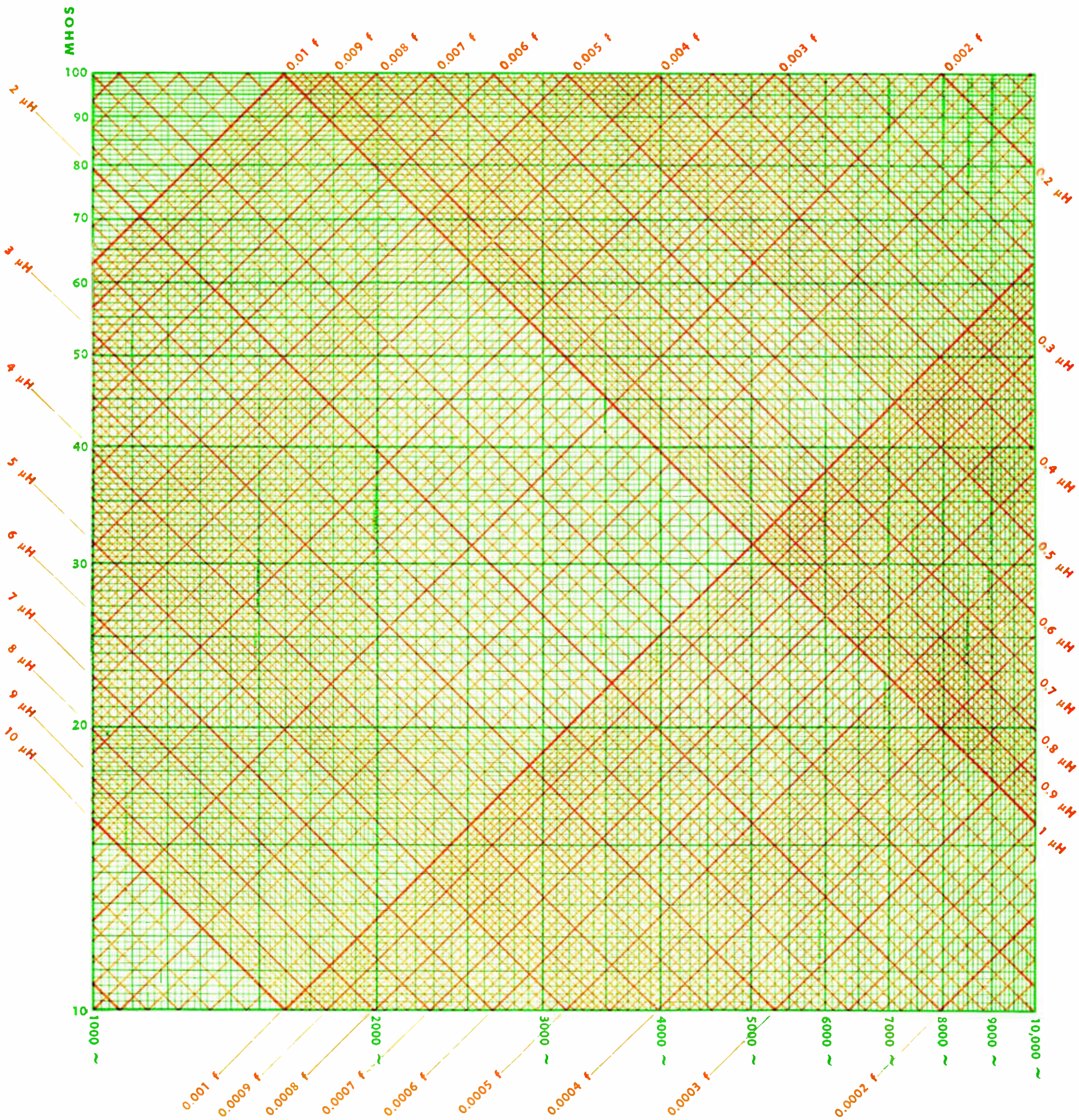
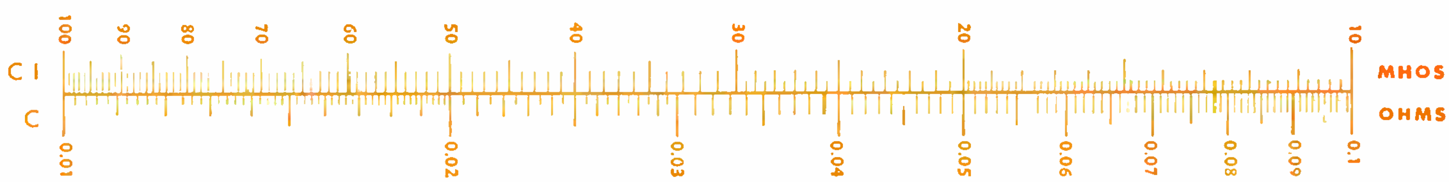

MHOS
1000 µf
900 µf
800 µf
700 µf
600 µf
500 µf
400 µf
300 µf
200 µf
20 µH
30 µH
40 µH
50 µH
60 µH
70 µH
80 µH
90 µH
100 µH
2 µH
3 µH
4 µH
5 µH
6 µH
7 µH
8 µH
9 µH
10 µH
10
9
8
7
6
5
4
3
2
1
1000 ~
2000 ~
3000 ~
4000 ~
5000 ~
6000 ~
7000 ~
8000 ~
9000 ~
10,000 ~
100 µf
90 µf
80 µf
70 µf
60 µf
50 µf
40 µf
30 µf
20 µf
CI
C
MHOS
OHMS
10 9 8 7 6 5 4 3 2 1
0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
A
D
SQUARE
SQUARE ROOT
1 2 3 4 5 6 7 8 9 10 20 30 40 50 60 70 80 90 100
1 2 3 4 5 6 7 8 9 10

PLATE 99


MHOS
100
90
80
70
60
50
40
30
20
10
2 μH
3 μH
4 μH
5 μH
6 μH
7 μH
8 μH
9 μH
10 μH
0.01 f
0.009 f
0.008 f
0.007 f
0.006 f
0.005 f
0.004 f
0.003 f
0.002 f
0.2 μH
0.3 μH
0.4 μH
0.5 μH
0.6 μH
0.7 μH
0.8 μH
0.9 μH
1 μH
1000 ~
2000 ~
3000 ~
4000 ~
5000 ~
6000 ~
7000 ~
8000 ~
9000 ~
10,000 ~
0.001 f
0.0009 f
0.0008 f
0.0007 f
0.0006 f
0.0005 f
0.0004 f
0.0003 f
0.0002 f


CI
C
MHOS
OHMS
100 90 80 70 60 50 40 30 20 10
0.01 0.02 0.03 0.04 0.05 0.06 0.07 0.08 0.09 0.1

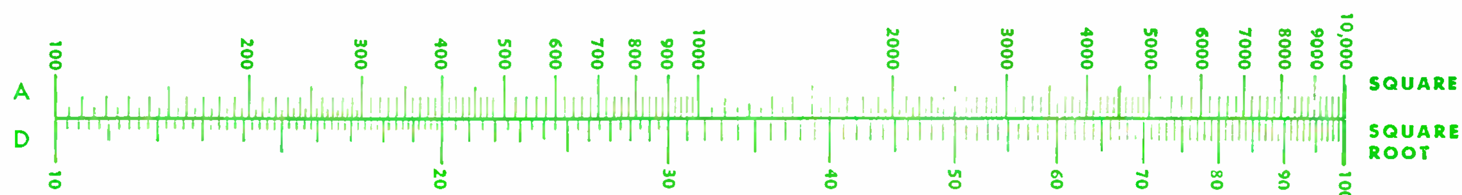
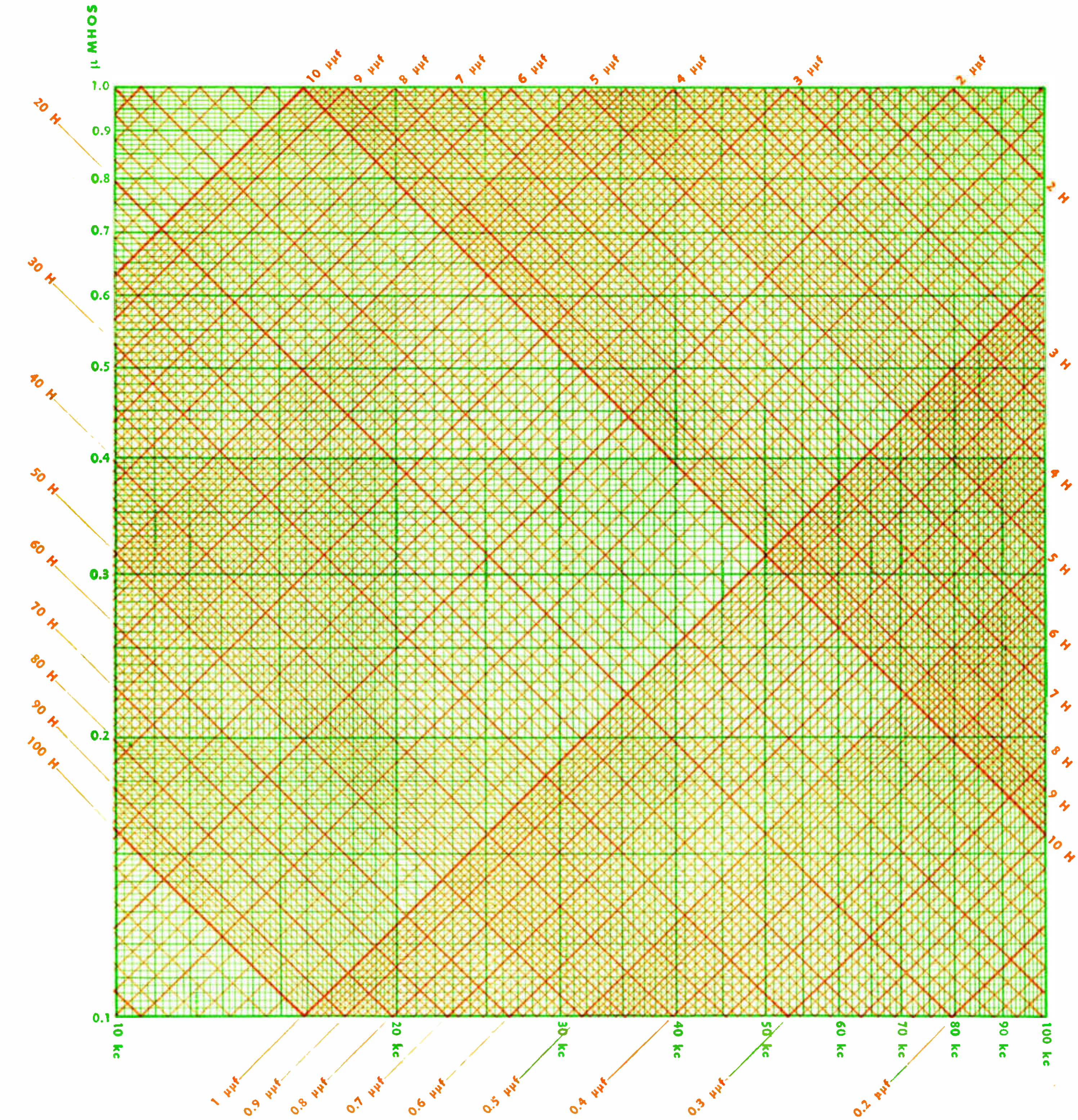
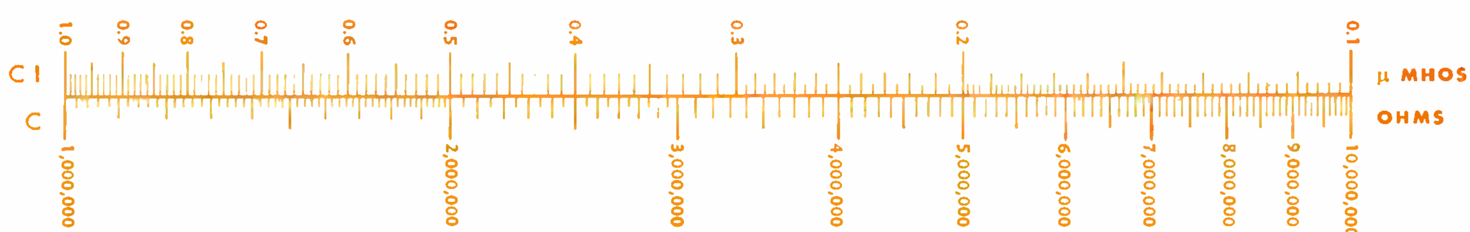

A
D
SQUARE
SQUARE ROOT
100 200 300 400 500 600 700 800 900 1000 2000 3000 4000 5000 6000 7000 8000 9000 10,000
10 20 30 40 50 60 70 80 90 100

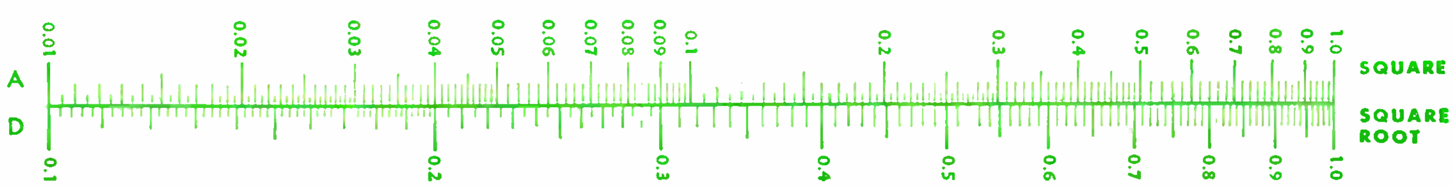
PLATE 100



μ MHOS
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
20 H
30 H
40 H
50 H
60 H
70 H
80 H
90 H
100 H
10 μμf
9 μμf
8 μμf
7 μμf
6 μμf
5 μμf
4 μμf
3 μμf
2 μμf
2 H
3 H
4 H
5 H
6 H
7 H
8 H
9 H
10 H
10 kc
20 kc
30 kc
40 kc
50 kc
60 kc
70 kc
80 kc
90 kc
100 kc
1 μμf
0.9 μμf
0.8 μμf
0.7 μμf
0.6 μμf
0.5 μμf
0.4 μμf
0.3 μμf
0.2 μμf



CI
C
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
μ MHOS
OHMS
1,000,000
2,000,000
3,000,000
4,000,000
5,000,000
6,000,000
7,000,000
8,000,000
9,000,000
10,000,000



A
D
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
SQUARE
SQUARE ROOT
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0

PLATE 101

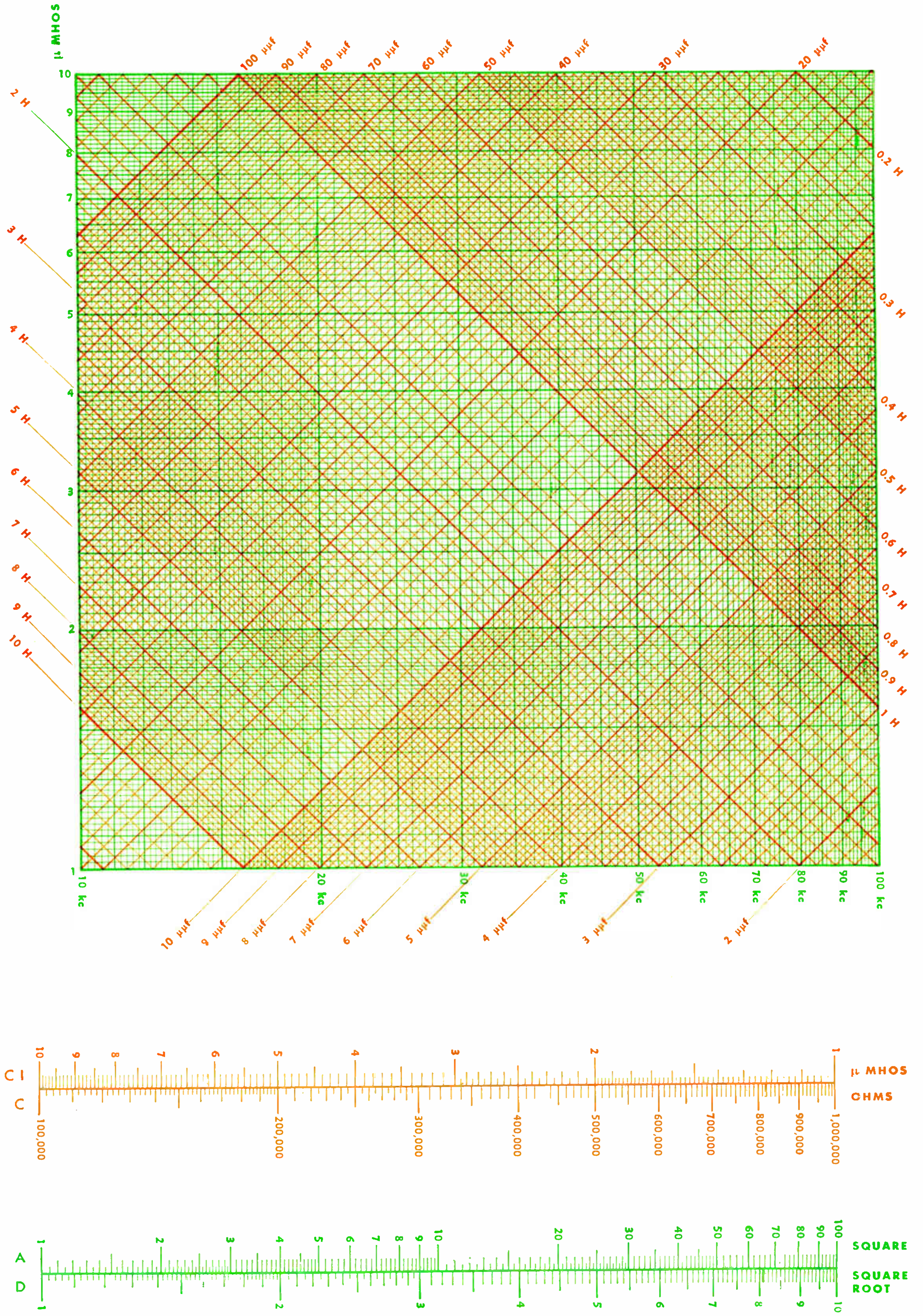
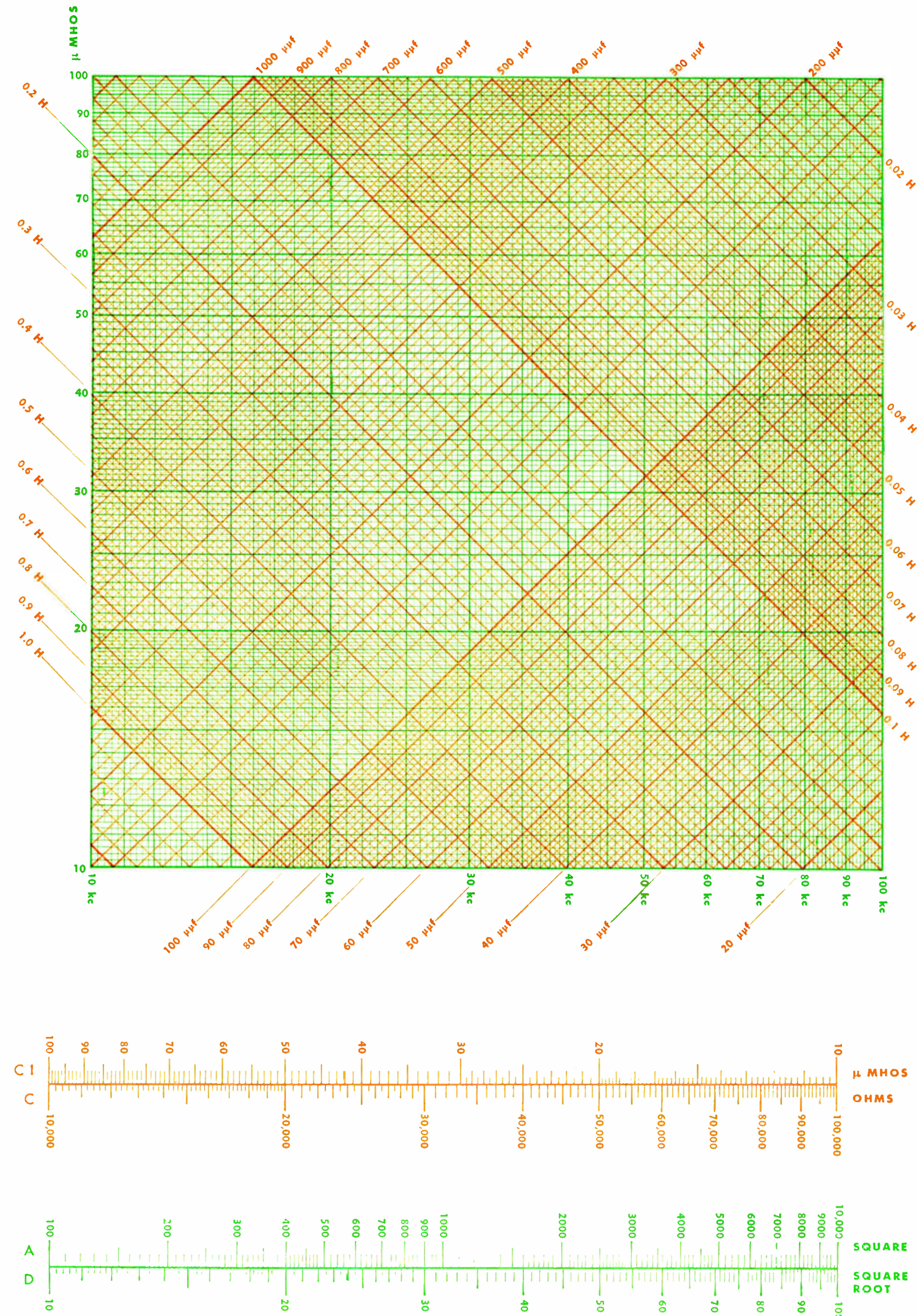
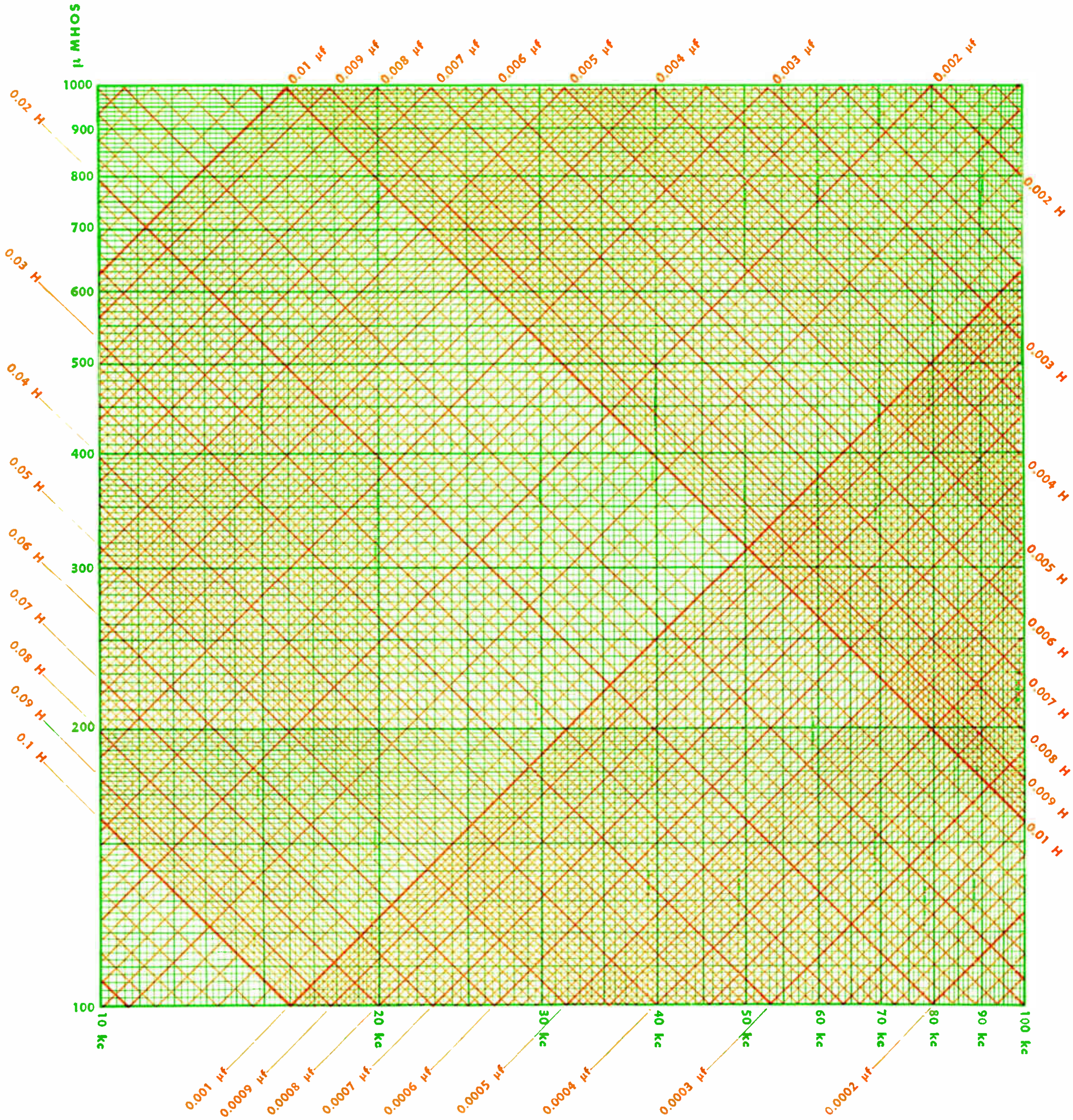
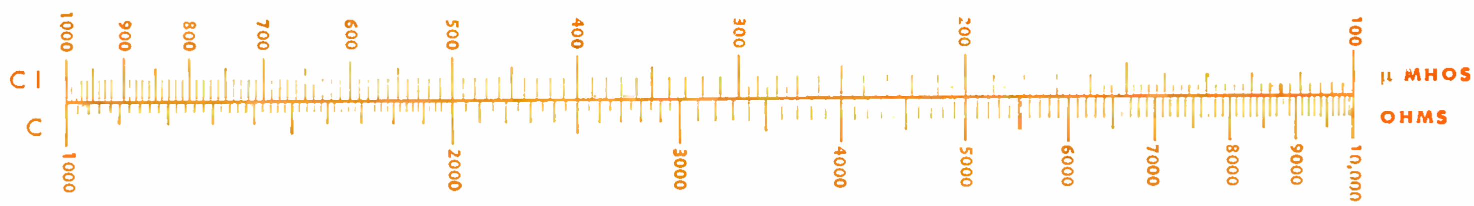

μ MHOS
100 μμf
90 μμf
80 μμf
70 μμf
60 μμf
50 μμf
40 μμf
30 μμf
20 μμf
2 H
3 H
4 H
5 H
6 H
7 H
8 H
9 H
10 H
0.2 H
0.3 H
0.4 H
0.5 H
0.6 H
0.7 H
0.8 H
0.9 H
1 H
10 kc
20 kc
30 kc
40 kc
50 kc
60 kc
70 kc
80 kc
90 kc
100 kc
10 μμf
9 μμf
8 μμf
7 μμf
6 μμf
5 μμf
4 μμf
3 μμf
2 μμf
CI
C
μ MHOS
OHMS
100,000
200,000
300,000
400,000
500,000
600,000
700,000
800,000
900,000
1,000,000
A
D
SQUARE
SQUARE ROOT

PLATE 102



μ MHOS
100
90
80
70
60
50
40
30
20
10
1000 μμf
900 μμf
800 μμf
700 μμf
600 μμf
500 μμf
400 μμf
300 μμf
200 μμf
0.2 H
0.3 H
0.4 H
0.5 H
0.6 H
0.7 H
0.8 H
0.9 H
1.0 H
0.02 H
0.03 H
0.04 H
0.05 H
0.06 H
0.07 H
0.08 H
0.09 H
0.1 H
10 kc
20 kc
30 kc
40 kc
50 kc
60 kc
70 kc
80 kc
90 kc
100 kc
100 μμf
90 μμf
80 μμf
70 μμf
60 μμf
50 μμf
40 μμf
30 μμf
20 μμf
C I
C
100 90 80 70 60 50 40 30 20 10
μ MHOS
OHMS
10,000 20,000 30,000 40,000 50,000 60,000 70,000 80,000 90,000 100,000
A
D
100 200 300 400 500 600 700 800 900 1000 2000 3000 4000 5000 6000 7000 8000 9000 10,000
SQUARE
SQUARE ROOT
10 20 30 40 50 60 70 80 90 100


μ MHOS
1000
900
800
700
600
500
400
300
200
100
0.01 μf
0.009 μf
0.008 μf
0.007 μf
0.006 μf
0.005 μf
0.004 μf
0.003 μf
0.002 μf
0.02 H
0.03 H
0.04 H
0.05 H
0.06 H
0.07 H
0.08 H
0.09 H
0.1 H
0.002 H
0.003 H
0.004 H
0.005 H
0.006 H
0.007 H
0.008 H
0.009 H
0.01 H
10 kc
20 kc
30 kc
40 kc
50 kc
60 kc
70 kc
80 kc
90 kc
100 kc
0.001 μf
0.0009 μf
0.0008 μf
0.0007 μf
0.0006 μf
0.0005 μf
0.0004 μf
0.0003 μf
0.0002 μf


CI
C
1000 900 800 700 600 500 400 300 200 100
μ MHOS
OHMS
1000 2000 3000 4000 5000 6000 7000 8000 9000 10,000

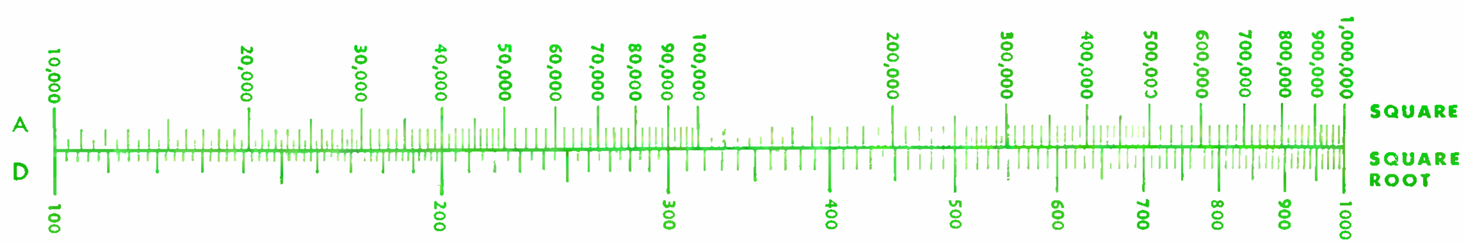
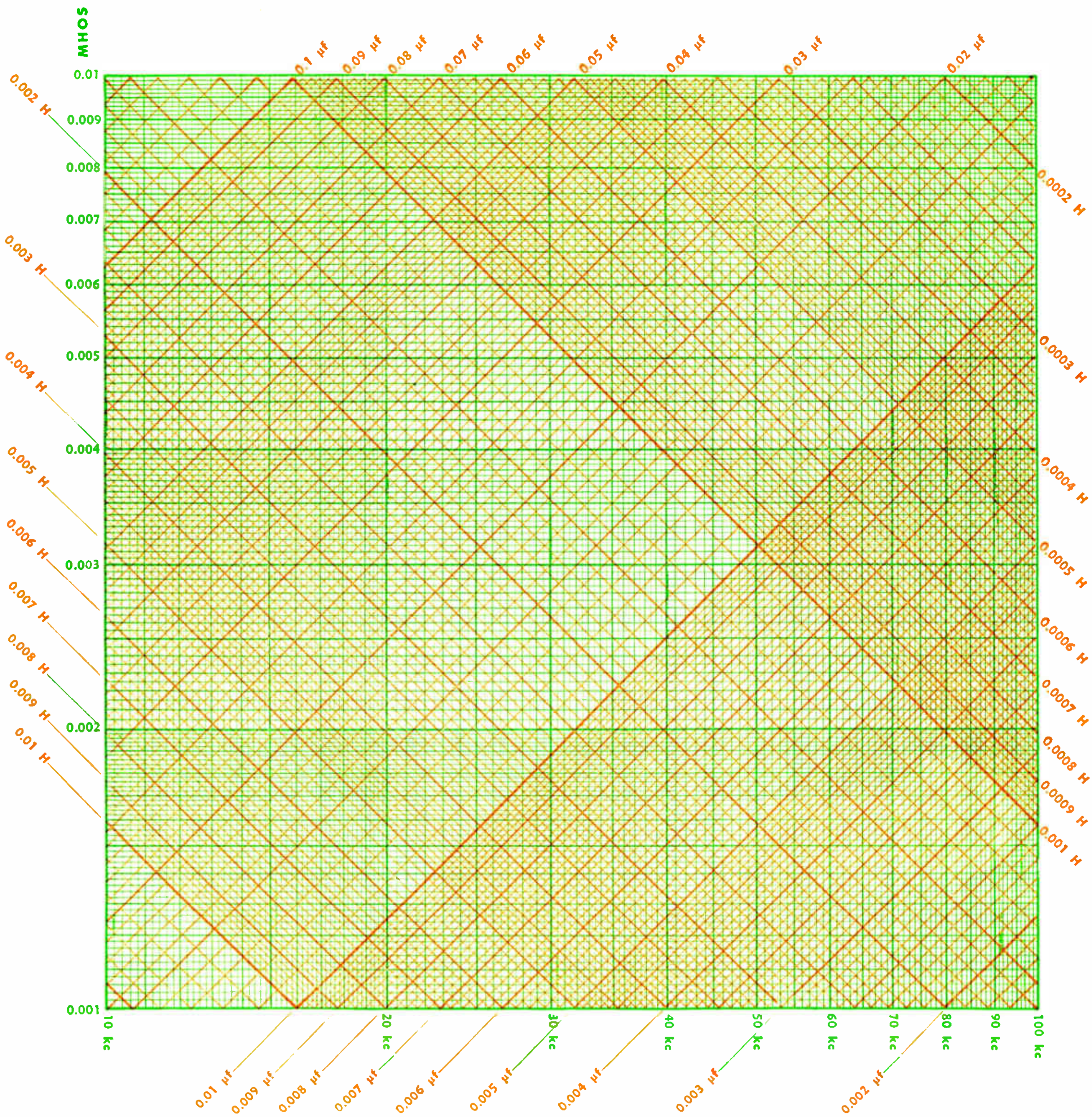
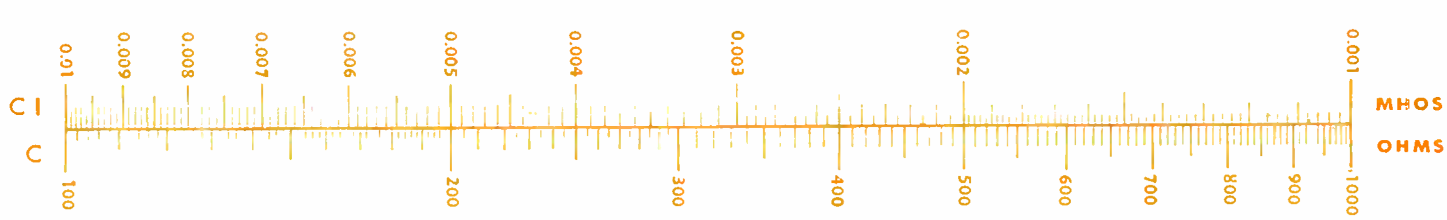
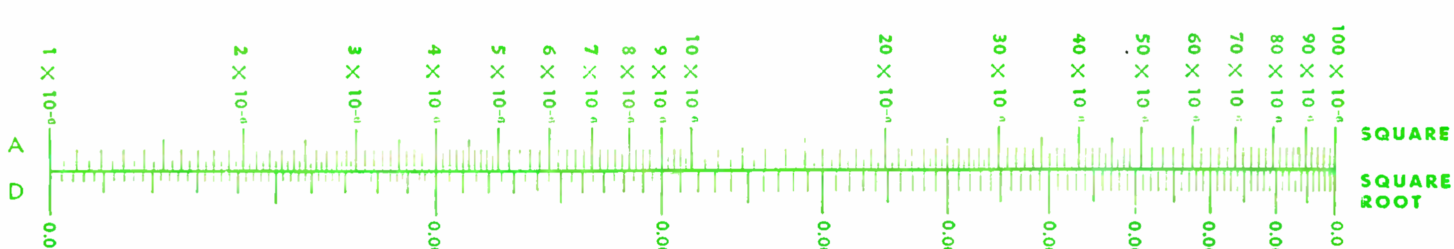
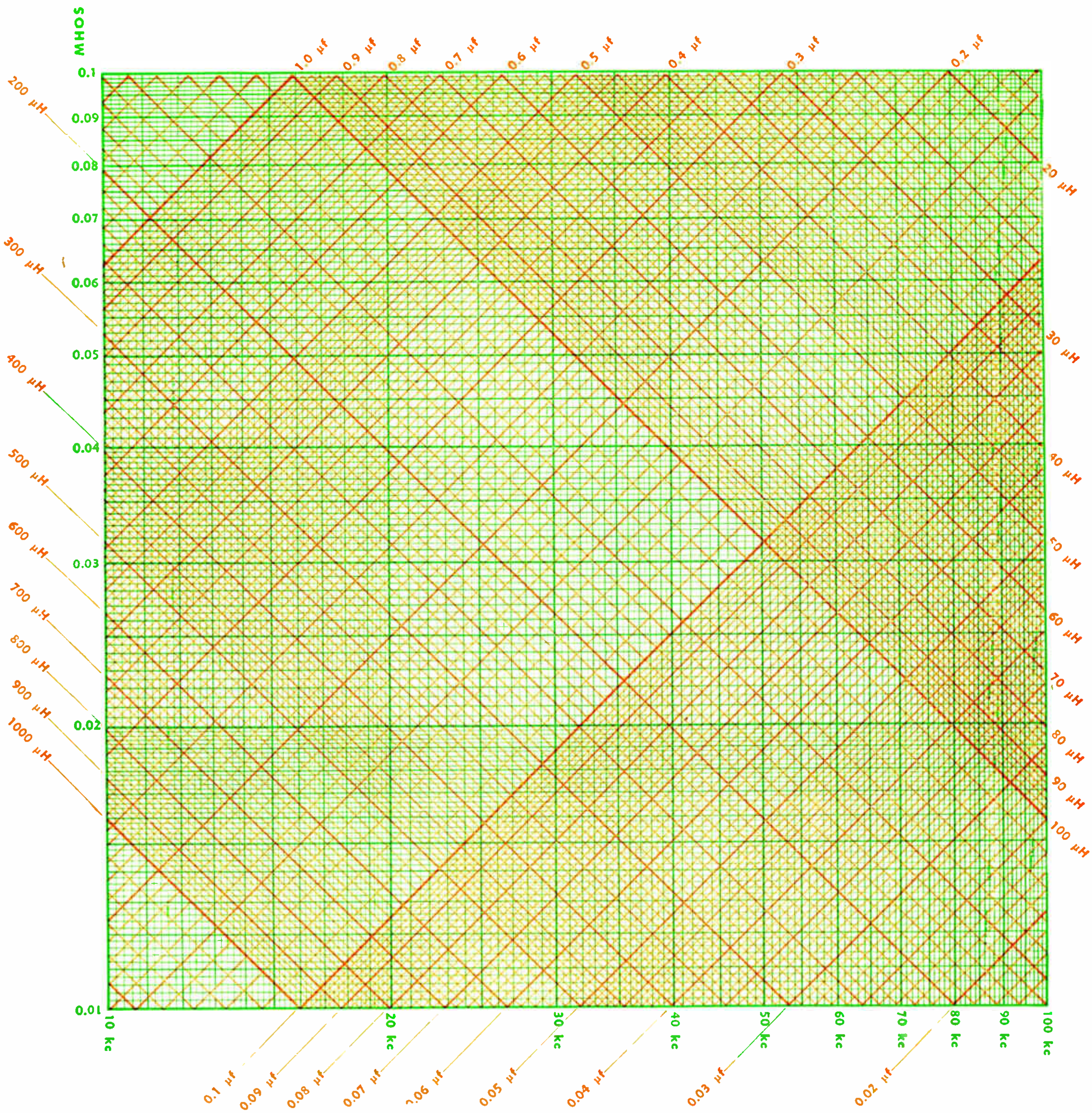

A
D
10,000 20,000 30,000 40,000 50,000 60,000 70,000 80,000 90,000 100,000 200,000 300,000 400,000 500,000 600,000 700,000 800,000 900,000 1,000,000
SQUARE
SQUARE ROOT
100 200 300 400 500 600 700 800 900 1000

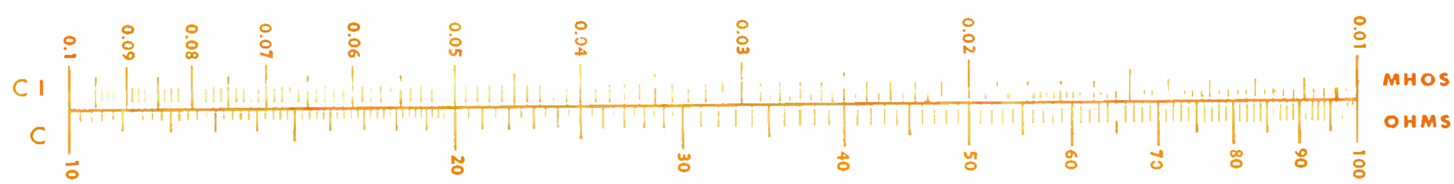
PLATE 104


MHOS
0.01
0.009
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0.1 μf
0.09 μf
0.08 μf
0.07 μf
0.06 μf
0.05 μf
0.04 μf
0.03 μf
0.02 μf
0.002 H
0.003 H
0.004 H
0.005 H
0.006 H
0.007 H
0.008 H
0.009 H
0.01 H
0.0002 H
0.0003 H
0.0004 H
0.0005 H
0.0006 H
0.0007 H
0.0008 H
0.0009 H
0.001 H
10 kc
20 kc
30 kc
40 kc
50 kc
60 kc
70 kc
80 kc
90 kc
100 kc
0.01 μf
0.009 μf
0.008 μf
0.007 μf
0.006 μf
0.005 μf
0.004 μf
0.003 μf
0.002 μf


CI
C
MHOS
OHMS
0.01
0.009
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
100
200
300
400
500
600
700
800
900
1000


A
D
SQUARE
SQUARE ROOT
0.001
0.002
0.003
0.004
0.005
0.006
0.007
0.008
0.009
0.01


MHOS
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
1.0 µf
0.9 µf
0.8 µf
0.7 µf
0.6 µf
0.5 µf
0.4 µf
0.3 µf
0.2 µf
200 µH
300 µH
400 µH
500 µH
600 µH
700 µH
800 µH
900 µH
1000 µH
20 µH
30 µH
40 µH
50 µH
60 µH
70 µH
80 µH
90 µH
100 µH
10 kc
20 kc
30 kc
40 kc
50 kc
60 kc
70 kc
80 kc
90 kc
100 kc
0.1 µf
0.09 µf
0.08 µf
0.07 µf
0.06 µf
0.05 µf
0.04 µf
0.03 µf
0.02 µf


CI
C
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
MHOS
OHMS
10
20
30
40
50
60
70
80
90
100

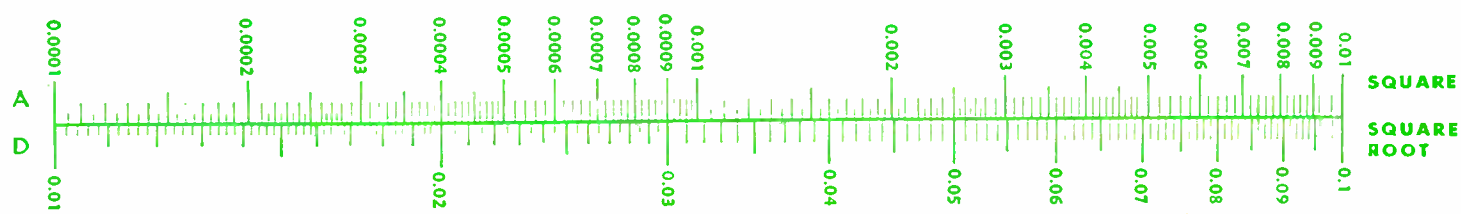
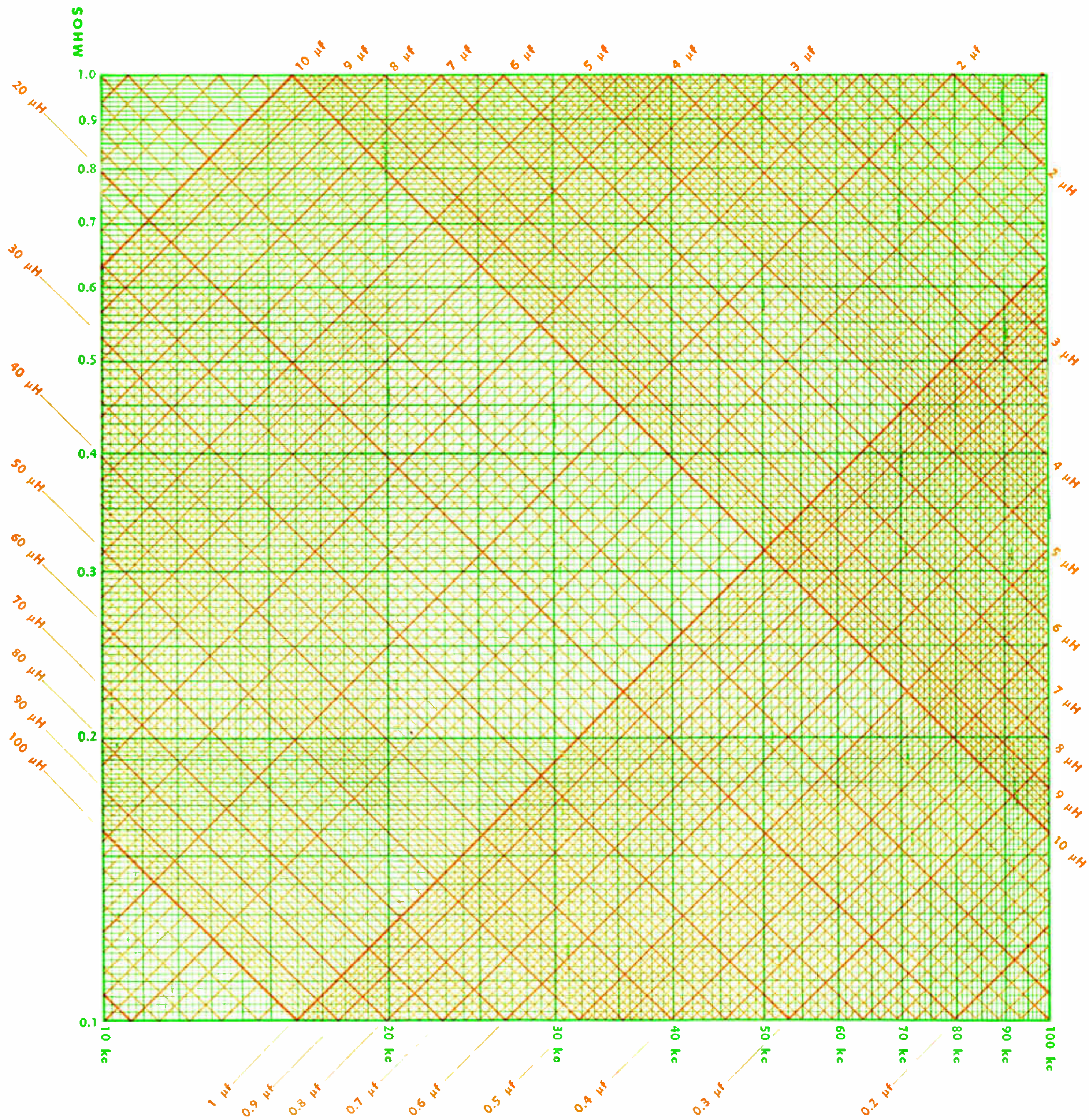
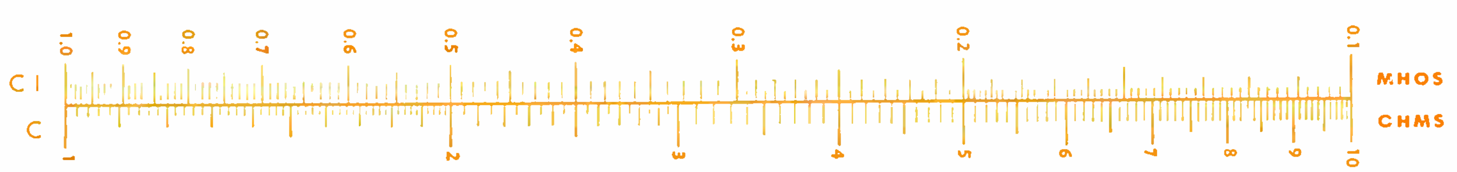
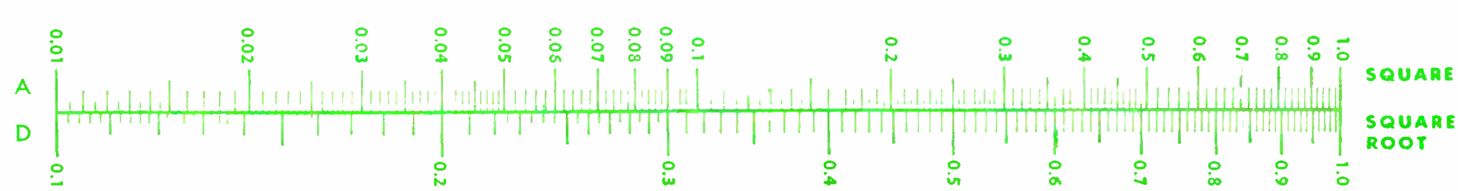
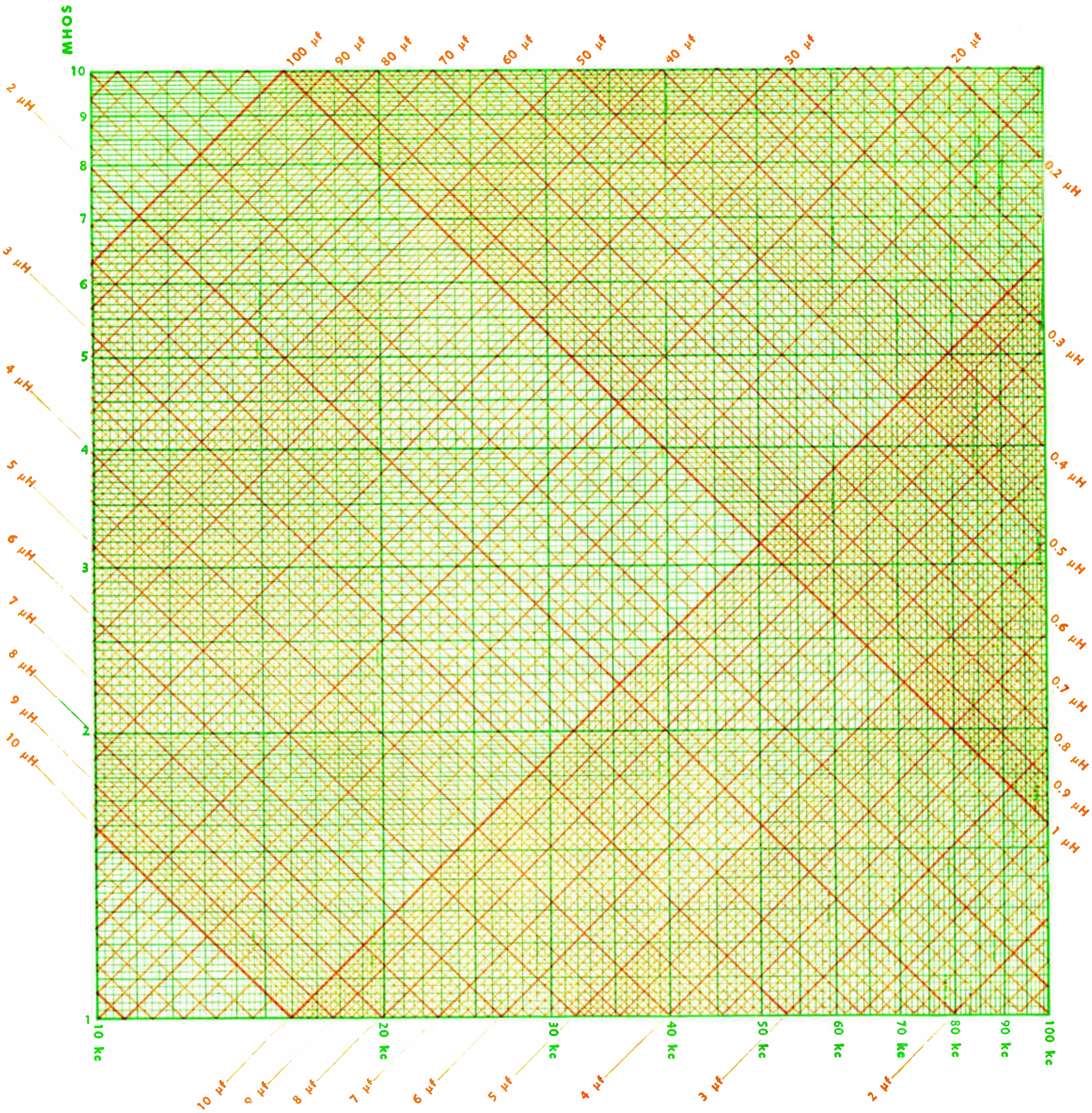

A
D
0.0001
0.0002
0.0003
0.0004
0.0005
0.0006
0.0007
0.0008
0.0009
0.001
0.002
0.003
0.004
0.005
0.006
0.007
0.008
0.009
0.01
SQUARE
SQUARE ROOT
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.1

PLATE 106


MHOS
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
10 µf
9 µf
8 µf
7 µf
6 µf
5 µf
4 µf
3 µf
2 µf
20 µH
30 µH
40 µH
50 µH
60 µH
70 µH
80 µH
90 µH
100 µH
2 µH
3 µH
4 µH
5 µH
6 µH
7 µH
8 µH
9 µH
10 µH
10 kc
20 kc
30 kc
40 kc
50 kc
60 kc
70 kc
80 kc
90 kc
100 kc
1 µf
0.9 µf
0.8 µf
0.7 µf
0.6 µf
0.5 µf
0.4 µf
0.3 µf
0.2 µf


CI
C
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
MHOS
1
2
3
4
5
6
7
8
9
10
OHMS


A
D
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
SQUARE
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
SQUARE ROOT


MHOS
10
9
8
7
6
5
4
3
2
1
100 µf
90 µf
80 µf
70 µf
60 µf
50 µf
40 µf
30 µf
20 µf
2 µH
3 µH
4 µH
5 µH
6 µH
7 µH
8 µH
9 µH
10 µH
0.2 µH
0.3 µH
0.4 µH
0.5 µH
0.6 µH
0.7 µH
0.8 µH
0.9 µH
1 µH
10 kc
20 kc
30 kc
40 kc
50 kc
60 kc
70 kc
80 kc
90 kc
100 kc
10 µf
9 µf
8 µf
7 µf
6 µf
5 µf
4 µf
3 µf
2 µf

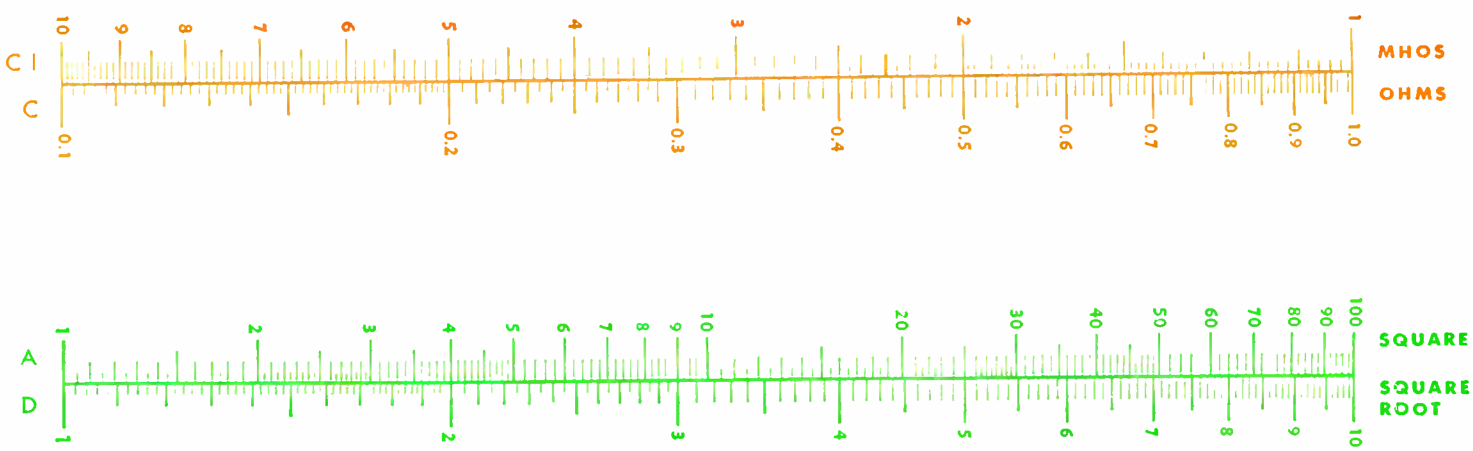
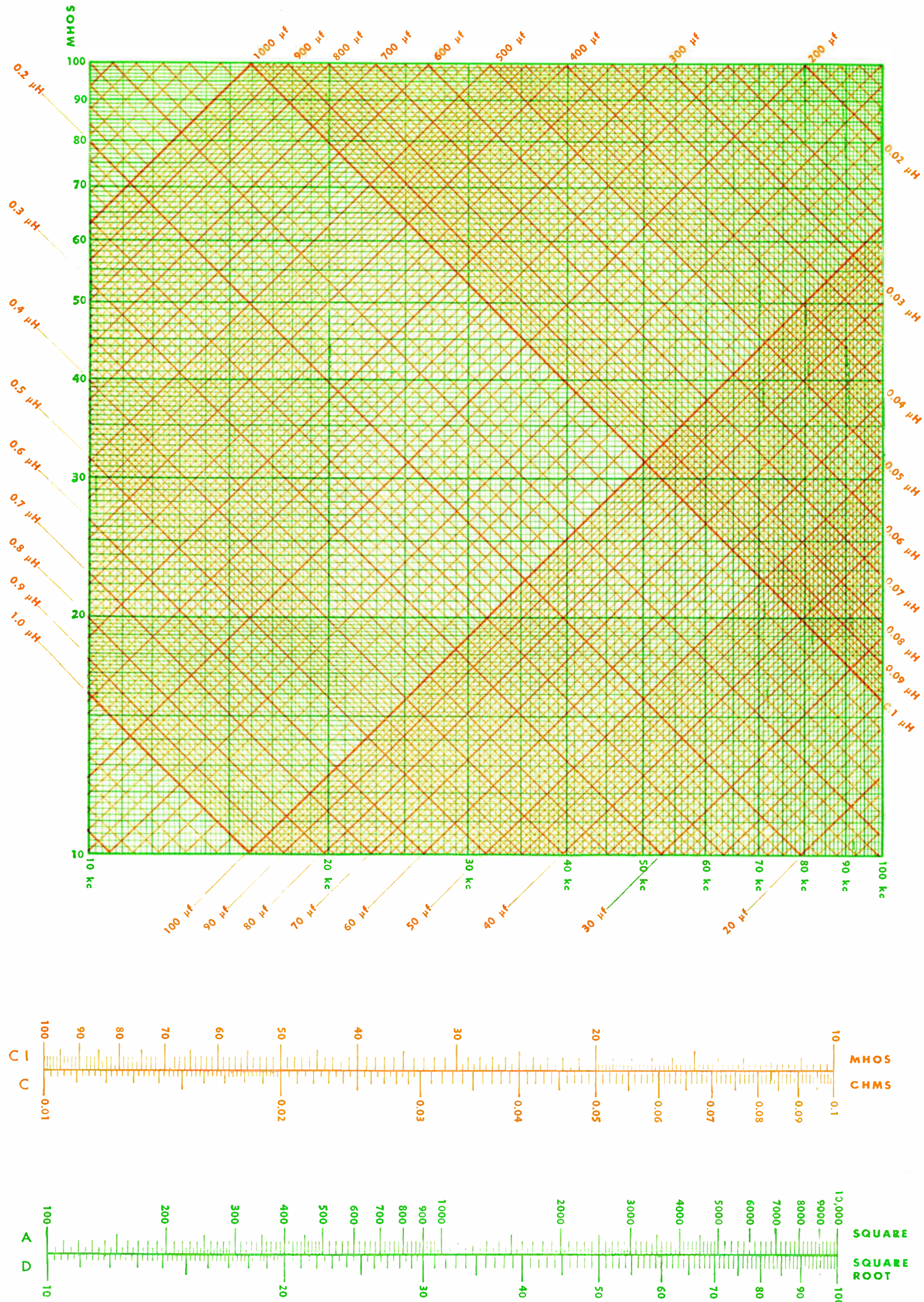

CI
C
10 9 8 7 6 5 4 3 2 1
MHOS
OHMS
0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
A
D
1 2 3 4 5 6 7 8 9 10 20 30 40 50 60 70 80 90 100
SQUARE
SQUARE ROOT
1 2 3 4 5 6 7 8 9 10

PLATE 108


MHOS
1000 μf
900 μf
800 μf
700 μf
600 μf
500 μf
400 μf
300 μf
200 μf
0.2 μH
0.3 μH
0.4 μH
0.5 μH
0.6 μH
0.7 μH
0.8 μH
0.9 μH
1.0 μH
0.02 μH
0.03 μH
0.04 μH
0.05 μH
0.06 μH
0.07 μH
0.08 μH
0.09 μH
0.1 μH
100 90 80 70 60 50 40 30 20 10
10 kc 20 kc 30 kc 40 kc 50 kc 60 kc 70 kc 80 kc 90 kc 100 kc
100 μf
90 μf
80 μf
70 μf
60 μf
50 μf
40 μf
30 μf
20 μf
CI
C
MHOS
OHMS
100 90 80 70 60 50 40 30 20 10
0.01 0.02 0.03 0.04 0.05 0.06 0.07 0.08 0.09 0.1
A
D
SQUARE
SQUARE ROOT
100 200 300 400 500 600 700 800 900 1000 2000 3000 4000 5000 6000 7000 8000 9000 10,000
10 20 30 40 50 60 70 80 90 100

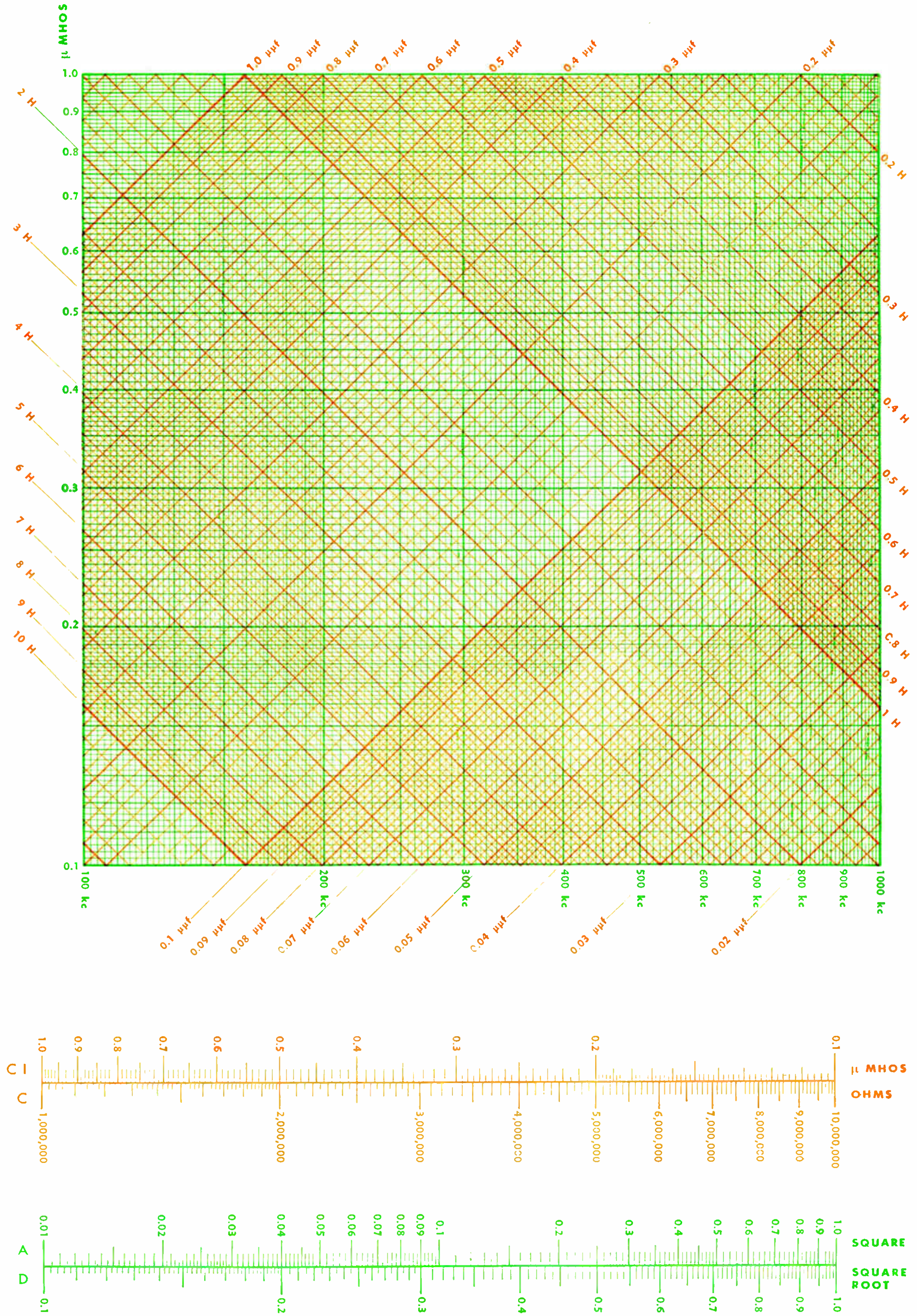
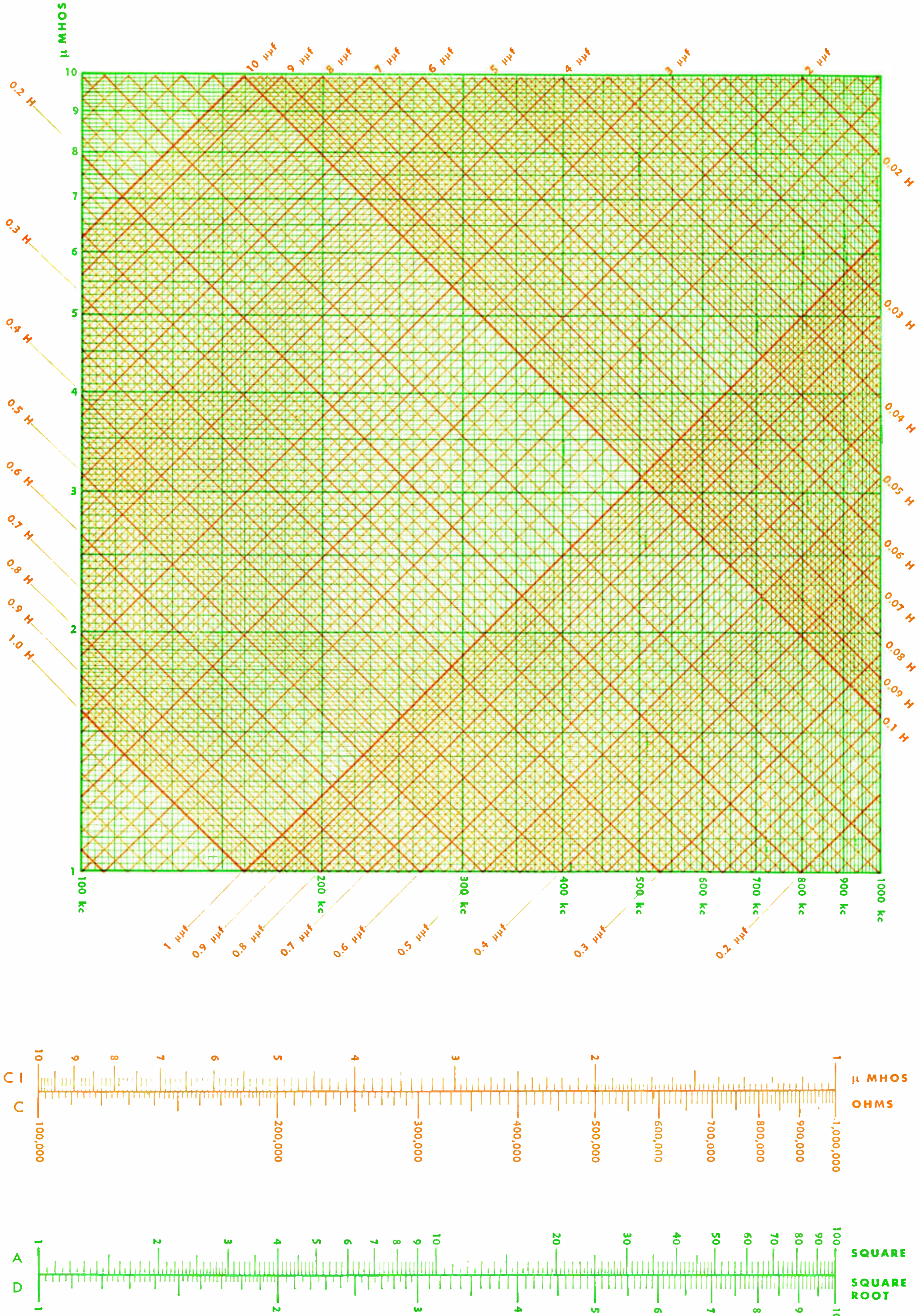

μ MHOS
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
2 H
3 H
4 H
5 H
6 H
7 H
8 H
9 H
10 H
1.0 μμf
0.9 μμf
0.8 μμf
0.7 μμf
0.6 μμf
0.5 μμf
0.4 μμf
0.3 μμf
0.2 μμf
0.2 H
0.3 H
0.4 H
0.5 H
0.6 H
0.7 H
0.8 H
0.9 H
1 H
100 kc
200 kc
300 kc
400 kc
500 kc
600 kc
700 kc
800 kc
900 kc
1000 kc
0.1 μμf
0.09 μμf
0.08 μμf
0.07 μμf
0.06 μμf
0.05 μμf
0.04 μμf
0.03 μμf
0.02 μμf
CI
C
μ MHOS
OHMS
1,000,000
2,000,000
3,000,000
4,000,000
5,000,000
6,000,000
7,000,000
8,000,000
9,000,000
10,000,000
A
D
SQUARE
SQUARE ROOT
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09

PLATE 110



μ MHOS
10 μμf
9 μμf
8 μμf
7 μμf
6 μμf
5 μμf
4 μμf
3 μμf
2 μμf
0.2 H
0.3 H
0.4 H
0.5 H
0.6 H
0.7 H
0.8 H
0.9 H
1.0 H
0.02 H
0.03 H
0.04 H
0.05 H
0.06 H
0.07 H
0.08 H
0.09 H
0.1 H
100 kc
200 kc
300 kc
400 kc
500 kc
600 kc
700 kc
800 kc
900 kc
1000 kc
1 μμf
0.9 μμf
0.8 μμf
0.7 μμf
0.6 μμf
0.5 μμf
0.4 μμf
0.3 μμf
0.2 μμf
CI
C
μ MHOS
OHMS
100,000
200,000
300,000
400,000
500,000
600,000
700,000
800,000
900,000
1,000,000
A
D
SQUARE
SQUARE ROOT

PLATE 111

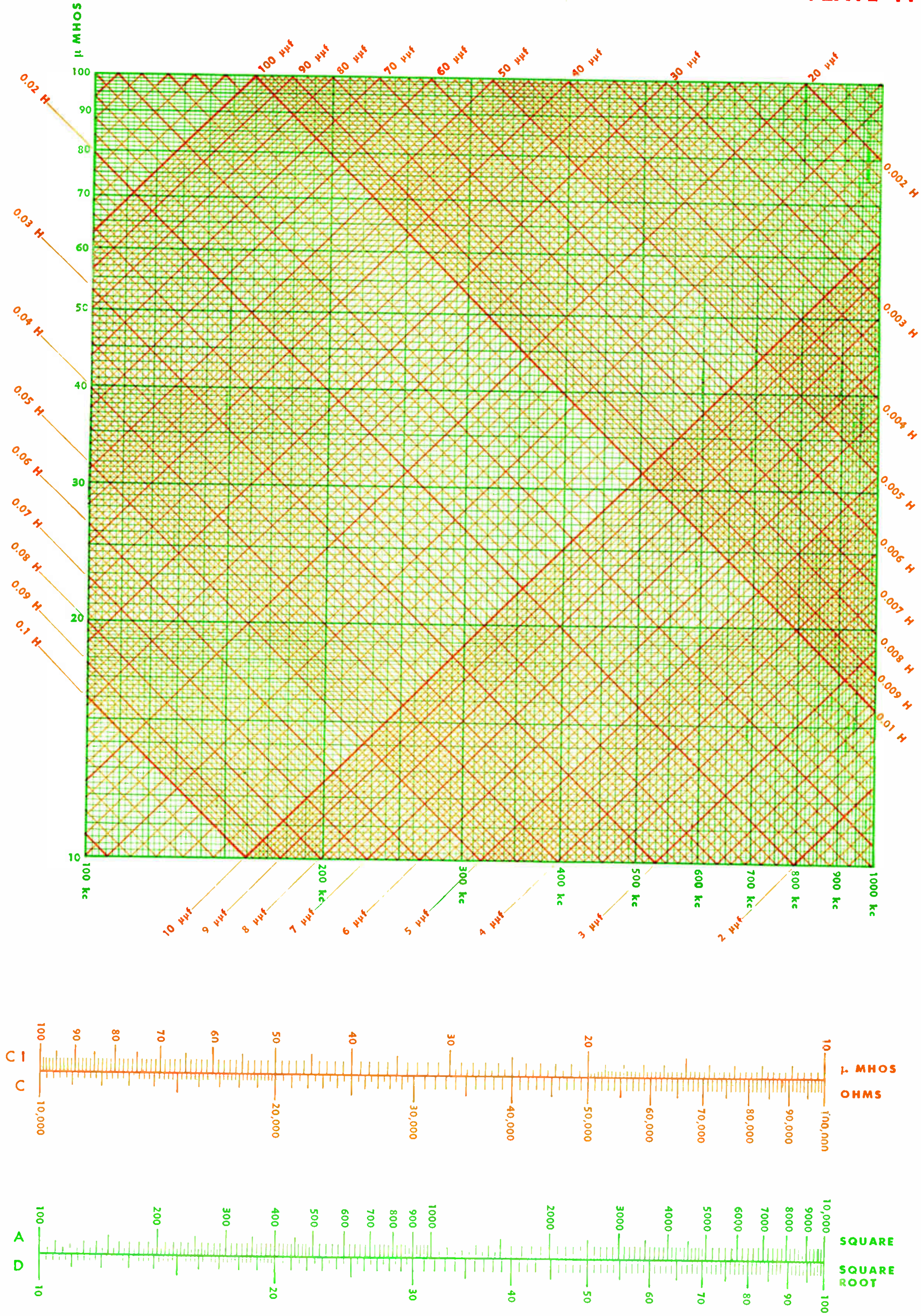
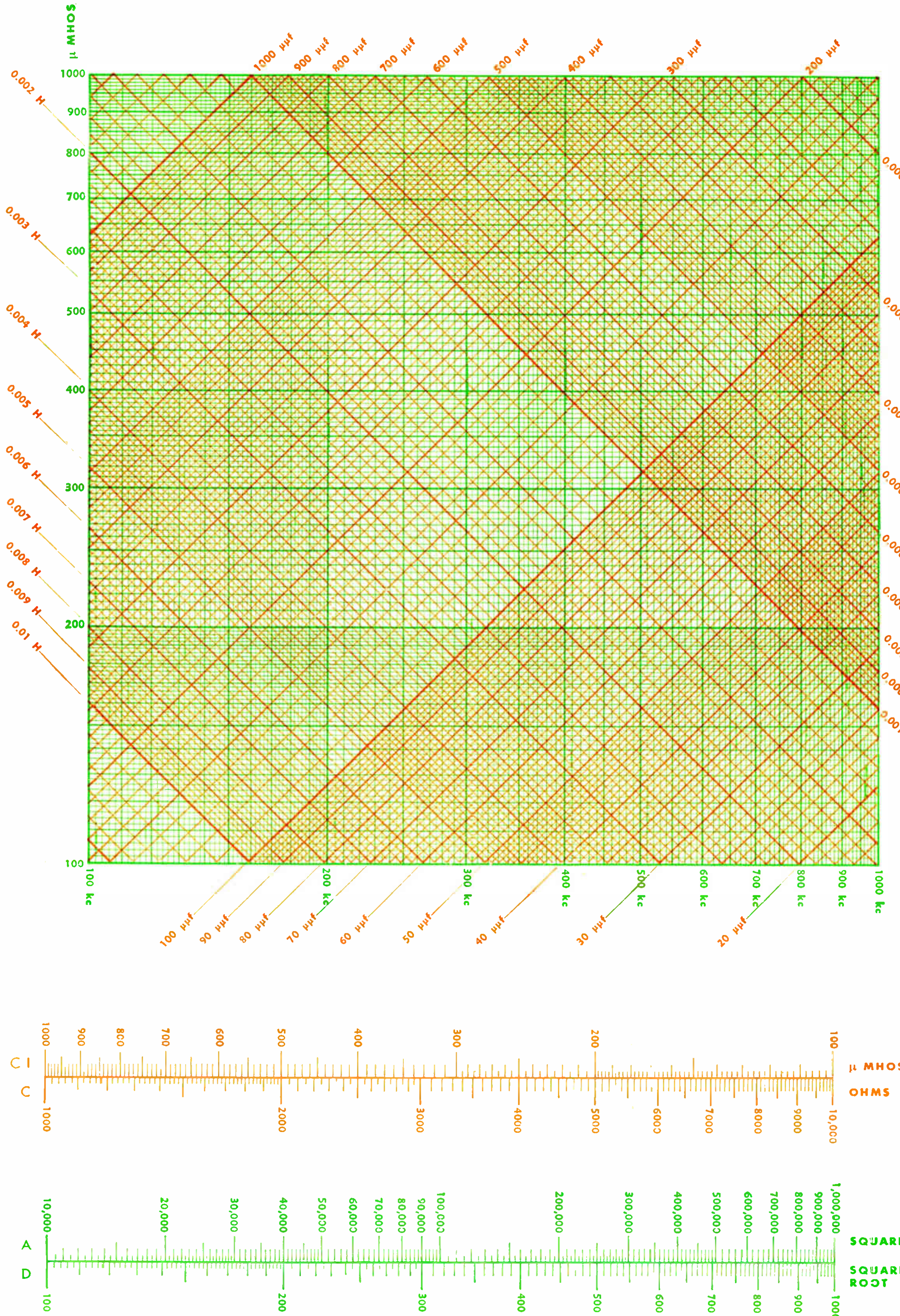
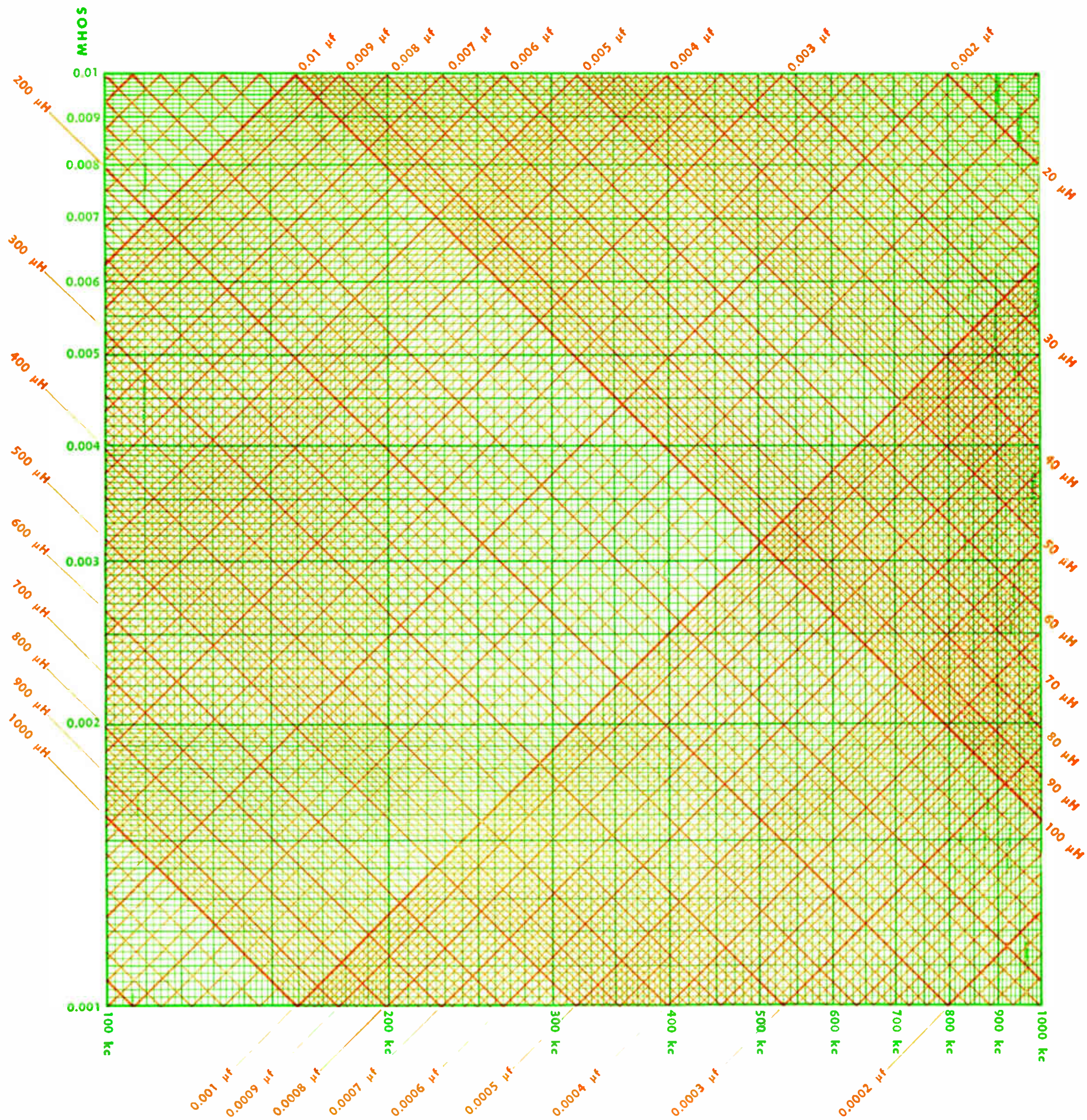
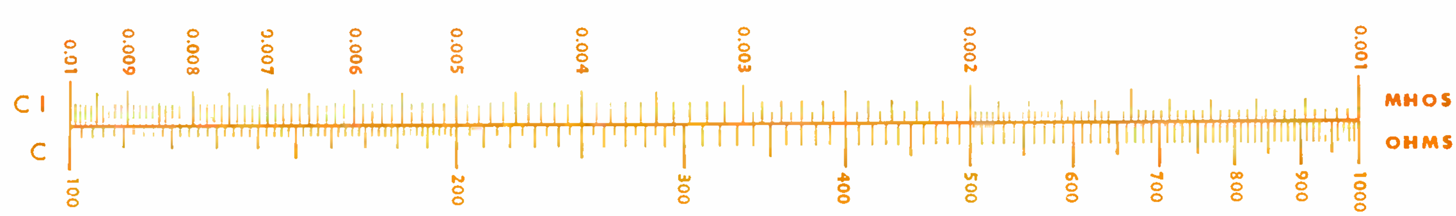

µ MHOS
100
90
80
70
60
50
40
30
20
10
100 µµf
90 µµf
80 µµf
70 µµf
60 µµf
50 µµf
40 µµf
30 µµf
20 µµf
0.02 H
0.03 H
0.04 H
0.05 H
0.06 H
0.07 H
0.08 H
0.09 H
0.1 H
0.002 H
0.003 H
0.004 H
0.005 H
0.006 H
0.007 H
0.008 H
0.009 H
0.01 H
100 kc
200 kc
300 kc
400 kc
500 kc
600 kc
700 kc
800 kc
900 kc
1000 kc
10 µµf
9 µµf
8 µµf
7 µµf
6 µµf
5 µµf
4 µµf
3 µµf
2 µµf
C I
C
µ MHOS
OHMS
100
90
80
70
60
50
40
30
20
10
10,000
20,000
30,000
40,000
50,000
60,000
70,000
80,000
90,000
100,000
A
D
SQUARE
SQUARE ROOT
100
200
300
400
500
600
700
800
900
1000
2000
3000
4000
5000
6000
7000
8000
9000
10,000
10
20
30
40
50
60
70
80
90
100

PLATE 112


µ MHOS
1000
900
800
700
600
500
400
300
200
100
1000 µµf
900 µµf
800 µµf
700 µµf
600 µµf
500 µµf
400 µµf
300 µµf
200 µµf
0.002 H
0.003 H
0.004 H
0.005 H
0.006 H
0.007 H
0.008 H
0.009 H
0.01 H
0.0002 H
0.0003 H
0.0004 H
0.0005 H
0.0006 H
0.0007 H
0.0008 H
0.0009 H
0.001 H
100 kc
200 kc
300 kc
400 kc
500 kc
600 kc
700 kc
800 kc
900 kc
1000 kc
100 µµf
90 µµf
80 µµf
70 µµf
60 µµf
50 µµf
40 µµf
30 µµf
20 µµf
CI
C
µ MHOS
OHMS
1000
900
800
700
600
500
400
300
200
100
1000
2000
3000
4000
5000
6000
7000
8000
9000
10,000
A
D
SQUARE
SQUARE ROOT
10,000
20,000
30,000
40,000
50,000
60,000
70,000
80,000
90,000
100,000
200,000
300,000
400,000
500,000
600,000
700,000
800,000
900,000
1,000,000
100
200
300
400
500
600
700
800
900
1000


MHOS
0.01
0.009
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0.01 μf
0.009 μf
0.008 μf
0.007 μf
0.006 μf
0.005 μf
0.004 μf
0.003 μf
0.002 μf
200 μH
300 μH
400 μH
500 μH
600 μH
700 μH
800 μH
900 μH
1000 μH
20 μH
30 μH
40 μH
50 μH
60 μH
70 μH
80 μH
90 μH
100 μH
100 kc
200 kc
300 kc
400 kc
500 kc
600 kc
700 kc
800 kc
900 kc
1000 kc
0.001 μf
0.0009 μf
0.0008 μf
0.0007 μf
0.0006 μf
0.0005 μf
0.0004 μf
0.0003 μf
0.0002 μf


CI
C
0.01
0.009
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
MHOS
OHMS
100
200
300
400
500
600
700
800
900
1000

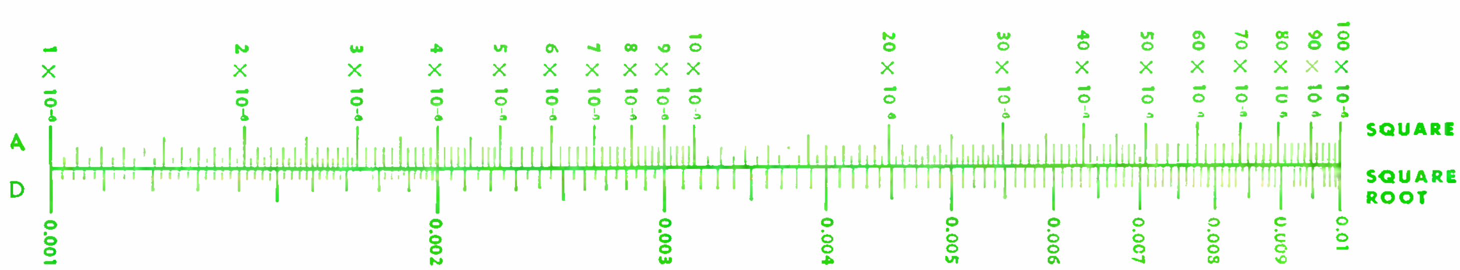
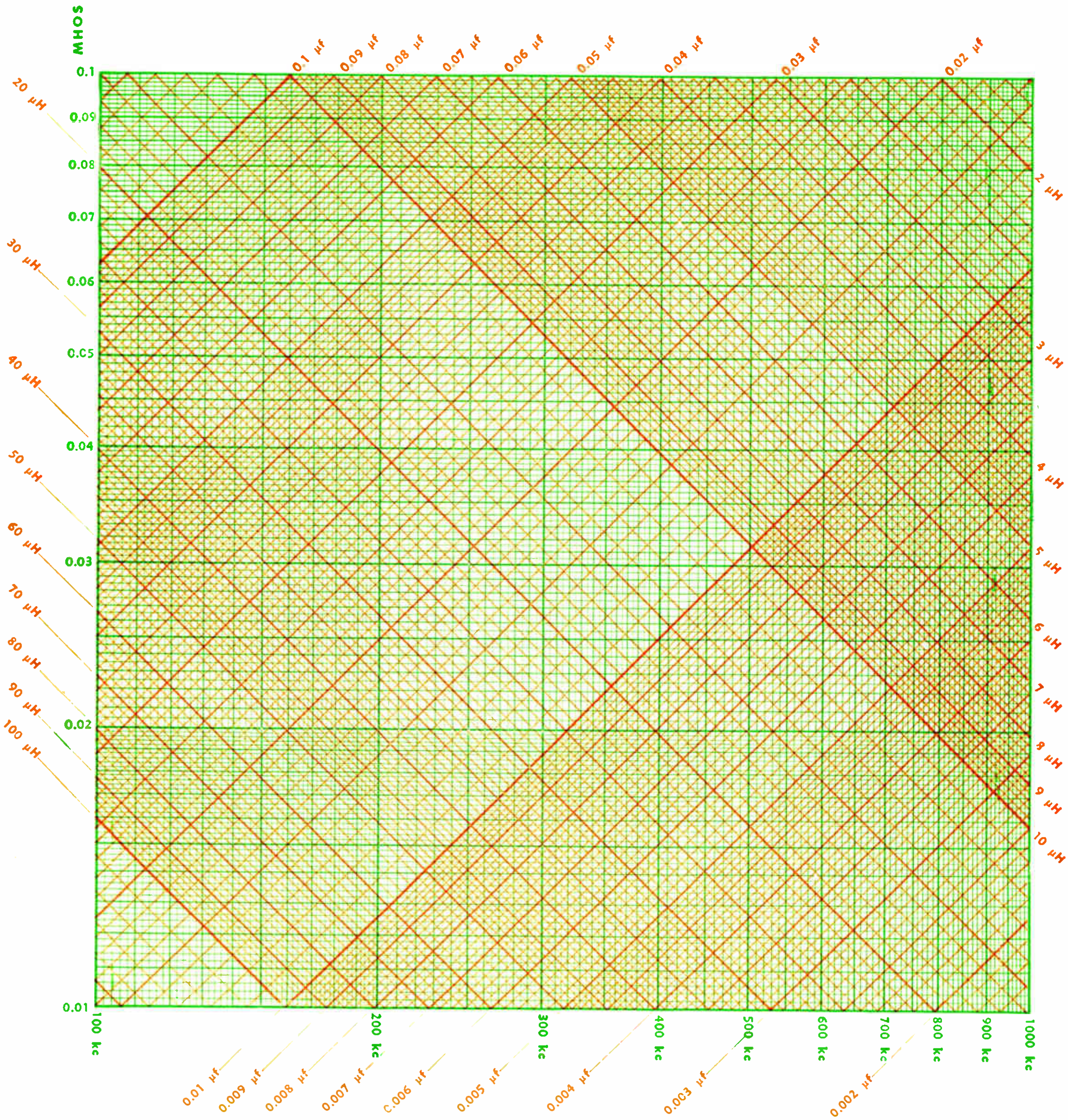
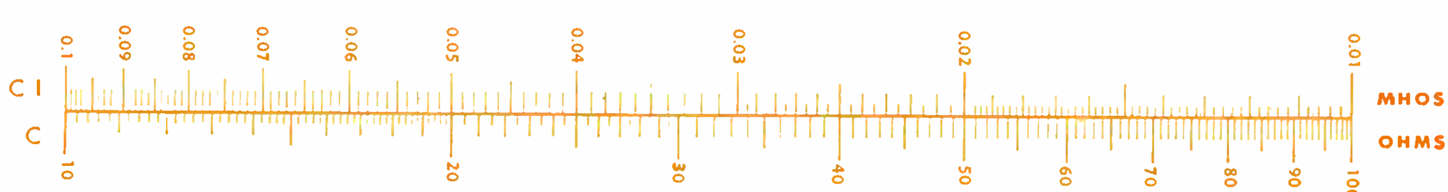
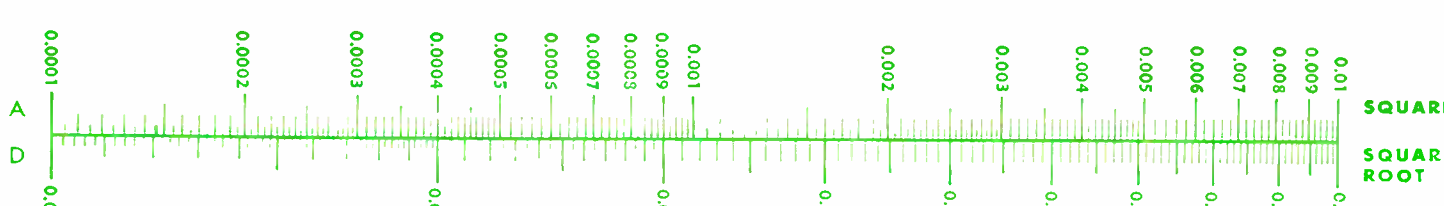
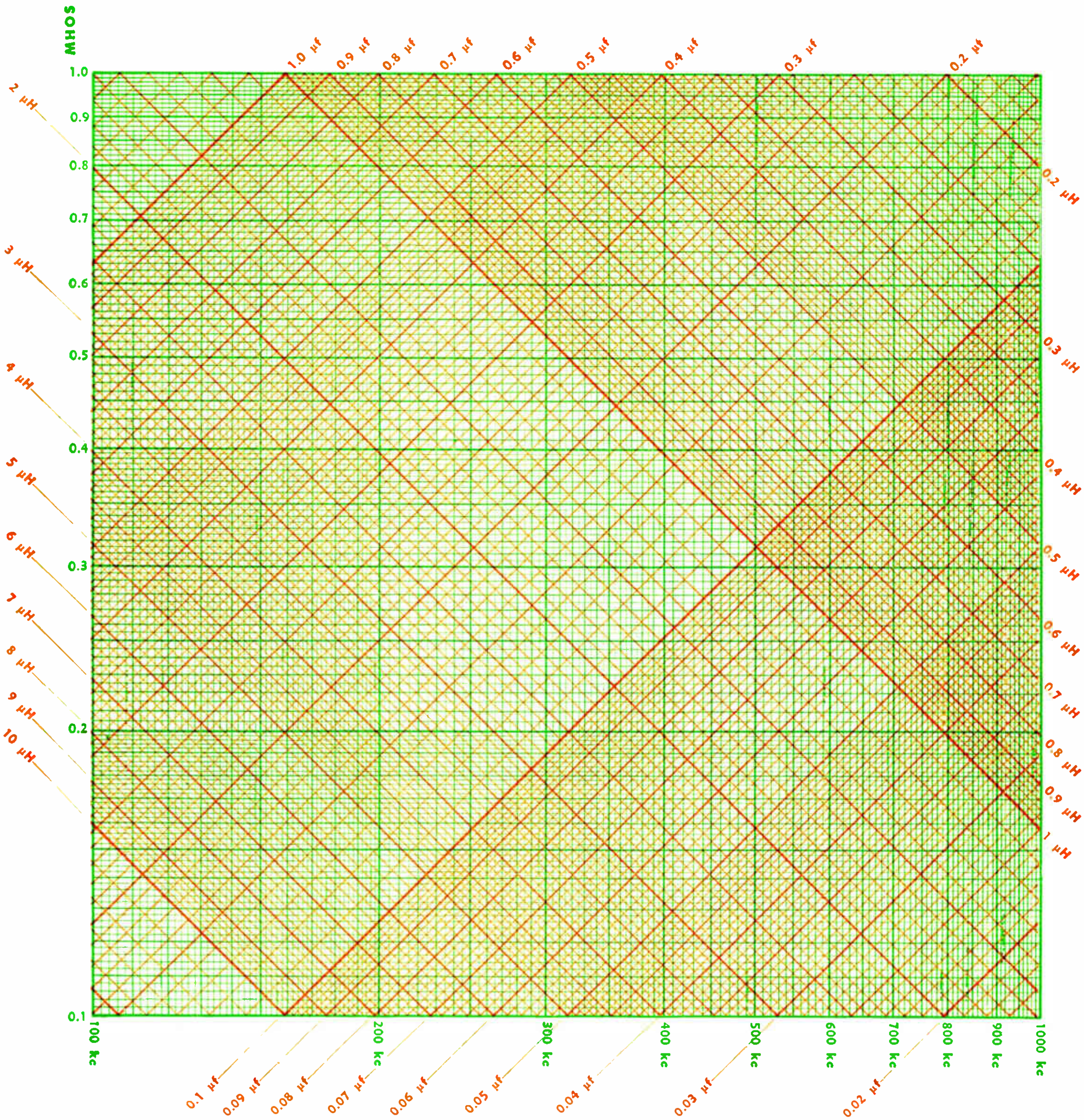

A
D
1 × 10⁻⁶
2 × 10⁻⁶
3 × 10⁻⁶
4 × 10⁻⁶
5 × 10⁻⁶
6 × 10⁻⁶
7 × 10⁻⁶
8 × 10⁻⁶
9 × 10⁻⁶
10 × 10⁻⁶
20 × 10⁻⁶
30 × 10⁻⁶
40 × 10⁻⁶
50 × 10⁻⁶
60 × 10⁻⁶
70 × 10⁻⁶
80 × 10⁻⁶
90 × 10⁻⁶
100 × 10⁻⁶
SQUARE
SQUARE ROOT
0.001
0.002
0.003
0.004
0.005
0.006
0.007
0.008
0.009
0.01

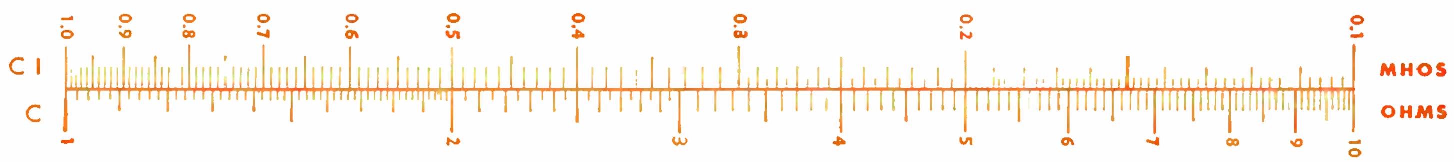
PLATE 114


MHOS
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
20 µH
30 µH
40 µH
50 µH
60 µH
70 µH
80 µH
90 µH
100 µH
0.1 µf
0.09 µf
0.08 µf
0.07 µf
0.06 µf
0.05 µf
0.04 µf
0.03 µf
0.02 µf
2 µH
3 µH
4 µH
5 µH
6 µH
7 µH
8 µH
9 µH
10 µH
100 kc
200 kc
300 kc
400 kc
500 kc
600 kc
700 kc
800 kc
900 kc
1000 kc
0.01 µf
0.009 µf
0.008 µf
0.007 µf
0.006 µf
0.005 µf
0.004 µf
0.003 µf
0.002 µf


C I
C
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
MHOS
OHMS
10
20
30
40
50
60
70
80
90
100


A
D
0.0001
0.0002
0.0003
0.0004
0.0005
0.0006
0.0007
0.0008
0.0009
0.001
0.002
0.003
0.004
0.005
0.006
0.007
0.008
0.009
0.01
SQUARE
SQUARE ROOT
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.1


MHOS
1.0 µf
0.9 µf
0.8 µf
0.7 µf
0.6 µf
0.5 µf
0.4 µf
0.3 µf
0.2 µf
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
2 µH
3 µH
4 µH
5 µH
6 µH
7 µH
8 µH
9 µH
10 µH
0.2 µH
0.3 µH
0.4 µH
0.5 µH
0.6 µH
0.7 µH
0.8 µH
0.9 µH
1 µH
100 kc
200 kc
300 kc
400 kc
500 kc
600 kc
700 kc
800 kc
900 kc
1000 kc
0.1 µf
0.09 µf
0.08 µf
0.07 µf
0.06 µf
0.05 µf
0.04 µf
0.03 µf
0.02 µf


CI
C
1.0 0.9 0.8 0.7 0.6 0.5 0.4 0.3 0.2 0.1
MHOS
OHMS
1 2 3 4 5 6 7 8 9 10

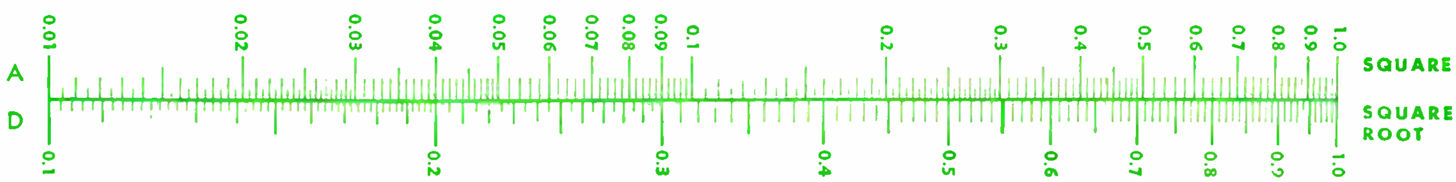
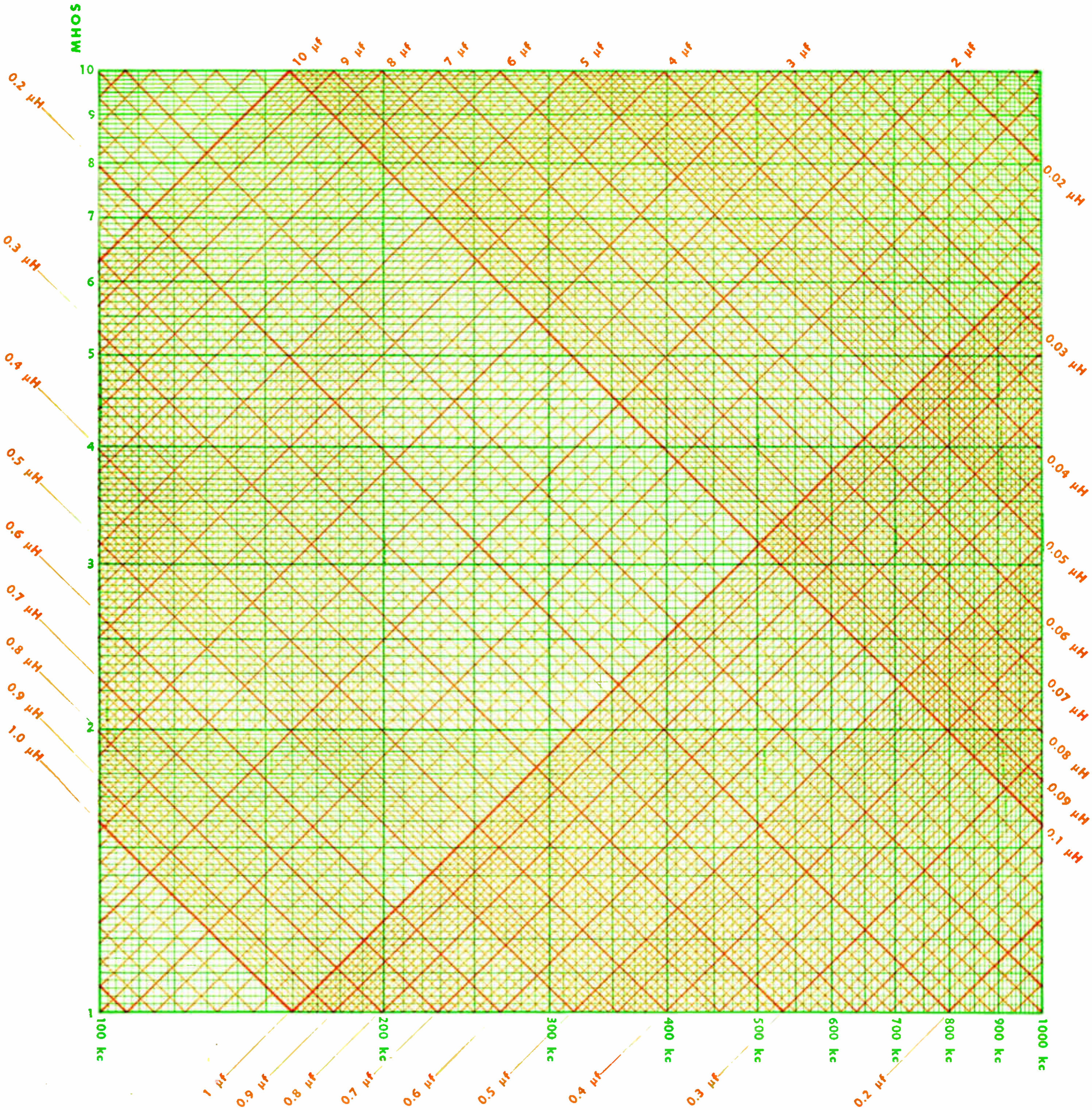
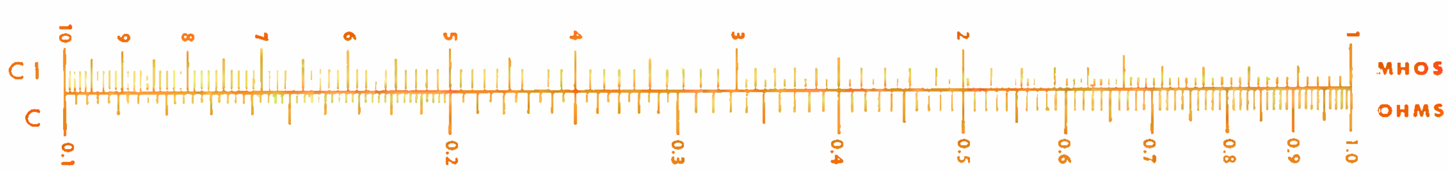

A
D
0.01 0.02 0.03 0.04 0.05 0.06 0.07 0.08 0.09 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
SQUARE
SQUARE ROOT
0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0

PLATE 116


MHOS
10 µf
9 µf
8 µf
7 µf
6 µf
5 µf
4 µf
3 µf
2 µf
0.2 µH
0.3 µH
0.4 µH
0.5 µH
0.6 µH
0.7 µH
0.8 µH
0.9 µH
1.0 µH
0.02 µH
0.03 µH
0.04 µH
0.05 µH
0.06 µH
0.07 µH
0.08 µH
0.09 µH
0.1 µH
100 kc
200 kc
300 kc
400 kc
500 kc
600 kc
700 kc
800 kc
900 kc
1000 kc
1 µf
0.9 µf
0.8 µf
0.7 µf
0.6 µf
0.5 µf
0.4 µf
0.3 µf
0.2 µf


CI
C
MHOS
OHMS

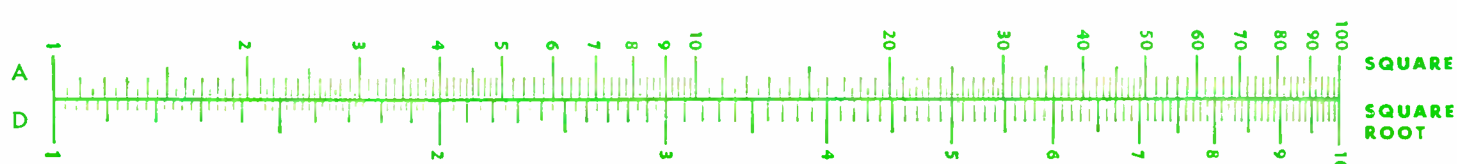
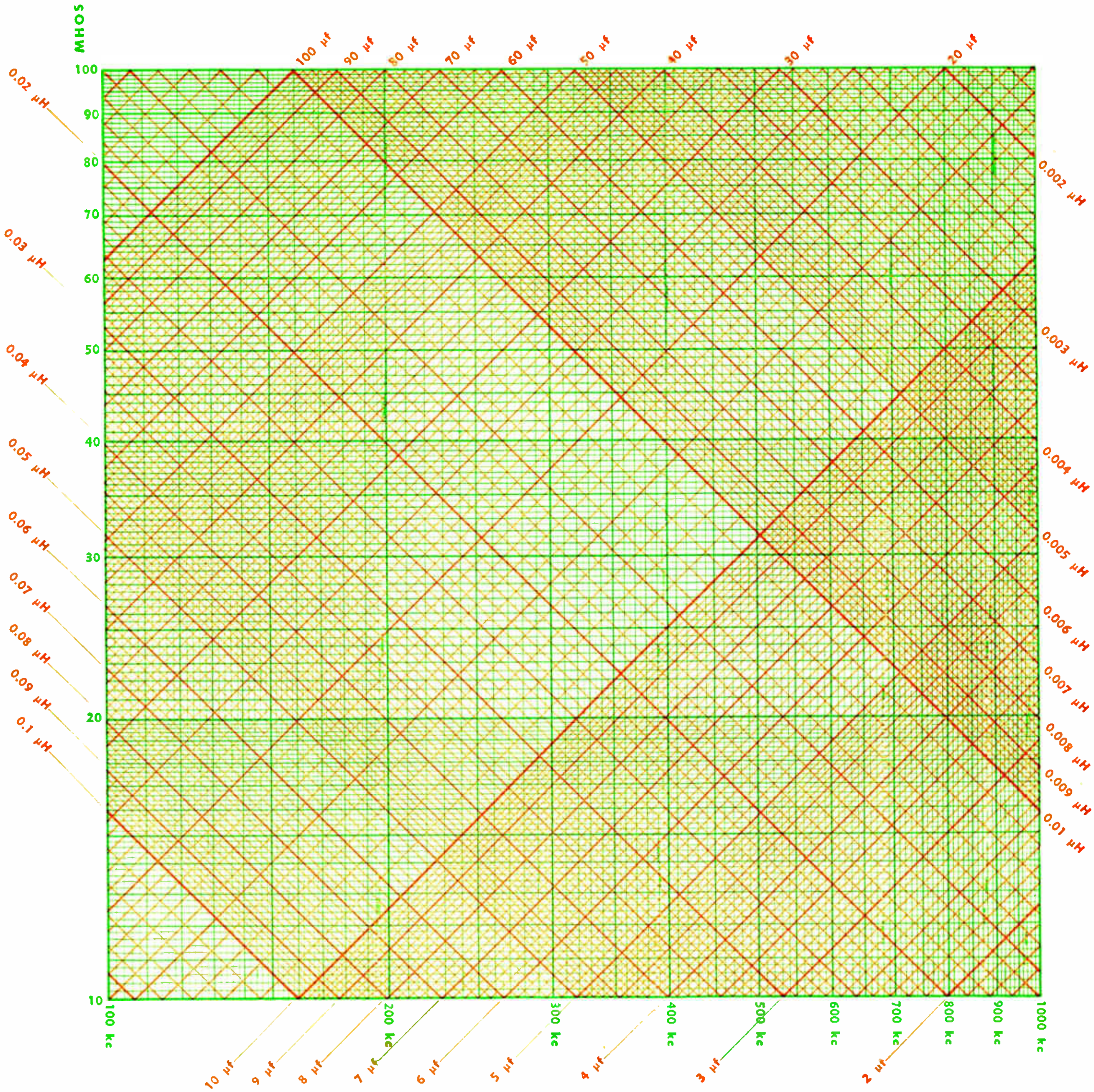
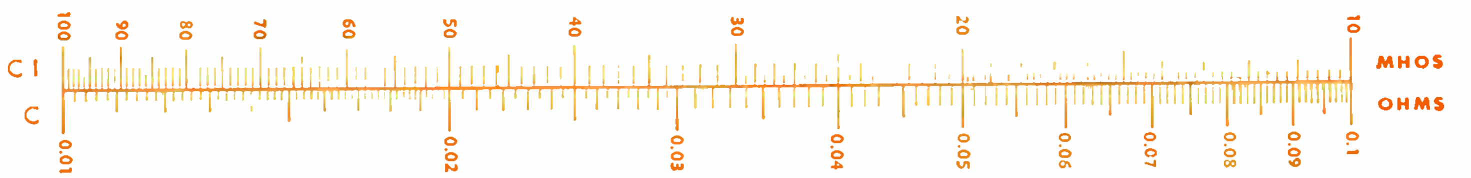

A
D
SQUARE
SQUARE ROOT

PLATE 117


MHOS
100
90
80
70
60
50
40
30
20
10
100 μf
90 μf
80 μf
70 μf
60 μf
50 μf
40 μf
30 μf
20 μf
10 μf
9 μf
8 μf
7 μf
6 μf
5 μf
4 μf
3 μf
2 μf
0.02 μH
0.03 μH
0.04 μH
0.05 μH
0.06 μH
0.07 μH
0.08 μH
0.09 μH
0.1 μH
0.002 μH
0.003 μH
0.004 μH
0.005 μH
0.006 μH
0.007 μH
0.008 μH
0.009 μH
0.01 μH
100 kc
200 kc
300 kc
400 kc
500 kc
600 kc
700 kc
800 kc
900 kc
1000 kc


CI
C
100
90
80
70
60
50
40
30
20
10
MHOS
OHMS
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.1

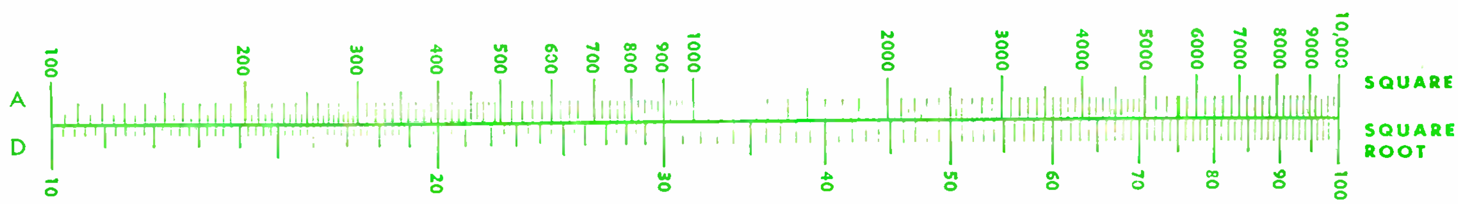
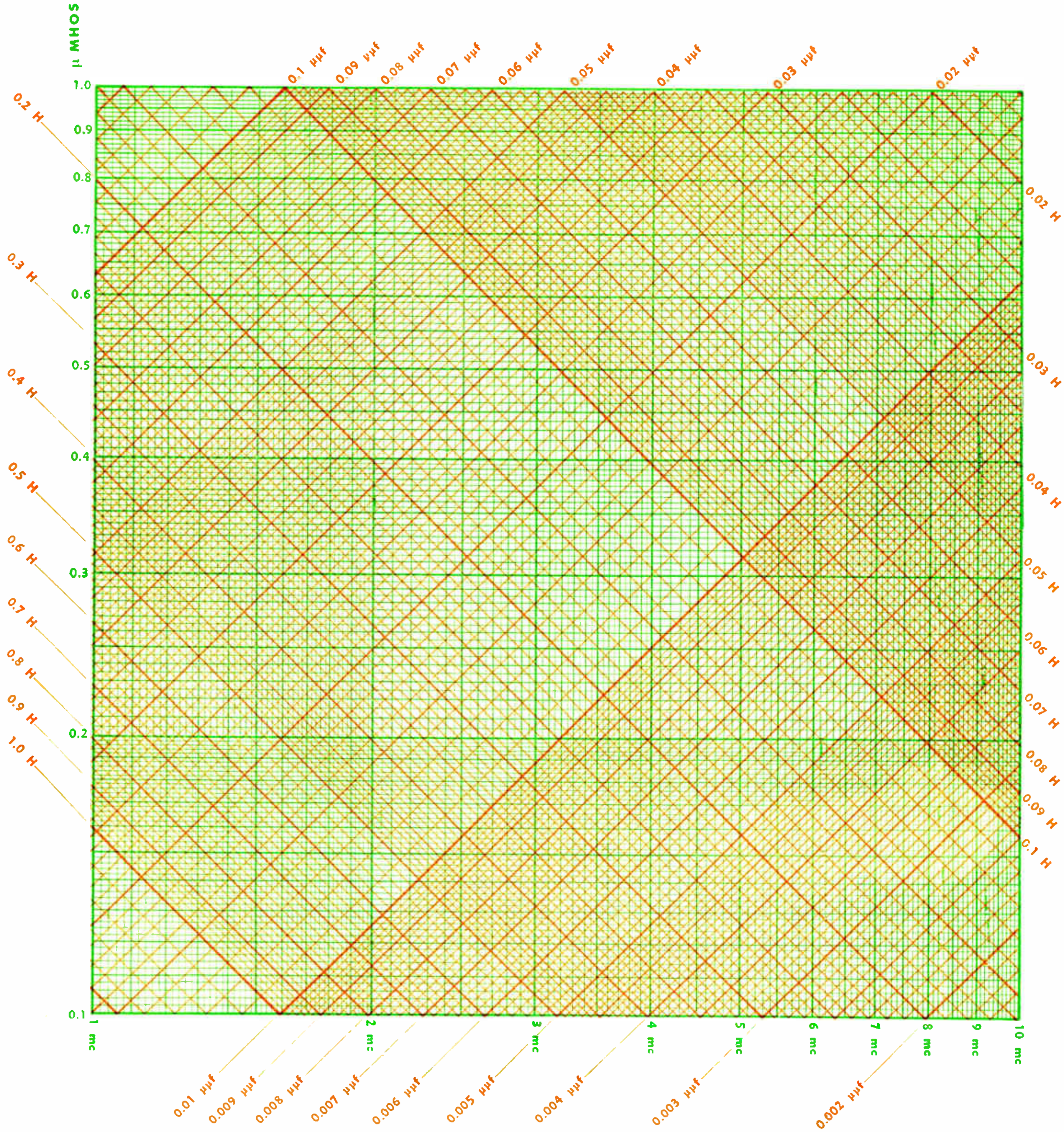
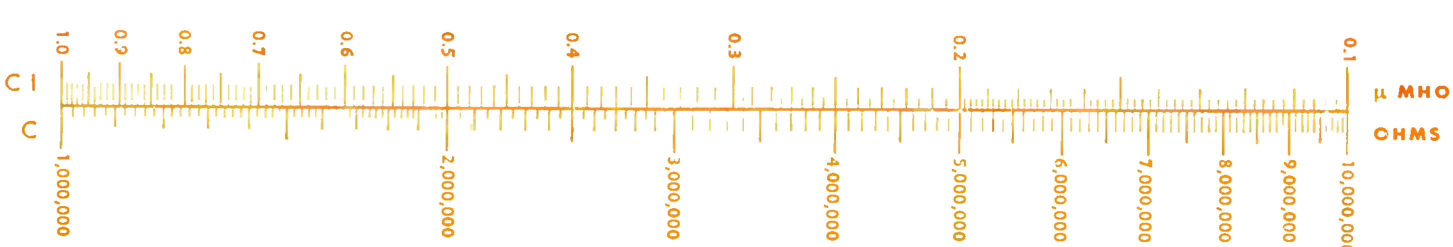

A
D
100
200
300
400
500
600
700
800
900
1000
2000
3000
4000
5000
6000
7000
8000
9000
10,000
SQUARE
SQUARE ROOT
10
20
30
40
50
60
70
80
90
100

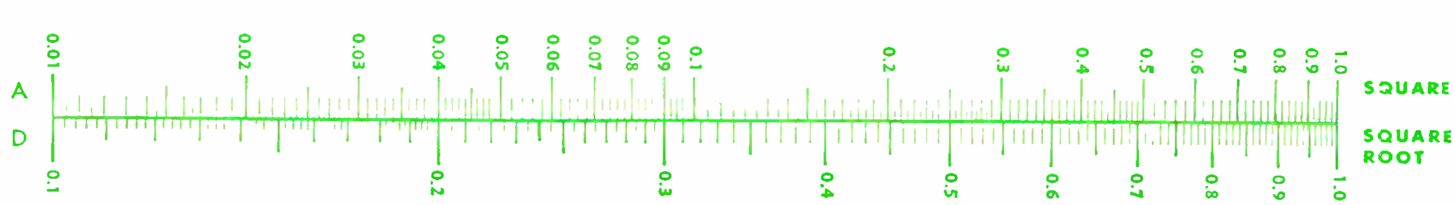
PLATE 118



μ MHOS
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.1 μμf
0.09 μμf
0.08 μμf
0.07 μμf
0.06 μμf
0.05 μμf
0.04 μμf
0.03 μμf
0.02 μμf
0.2 H
0.3 H
0.4 H
0.5 H
0.6 H
0.7 H
0.8 H
0.9 H
1.0 H
0.02 H
0.03 H
0.04 H
0.05 H
0.06 H
0.07 H
0.08 H
0.09 H
0.1 H
1 mc
2 mc
3 mc
4 mc
5 mc
6 mc
7 mc
8 mc
9 mc
10 mc
0.01 μμf
0.009 μμf
0.008 μμf
0.007 μμf
0.006 μμf
0.005 μμf
0.004 μμf
0.003 μμf
0.002 μμf



CI
C
1.0 0.9 0.8 0.7 0.6 0.5 0.4 0.3 0.2 0.1
μ MHOS
OHMS
1,000,000 2,000,000 3,000,000 4,000,000 5,000,000 6,000,000 7,000,000 8,000,000 9,000,000 10,000,000



A
D
0.01 0.02 0.03 0.04 0.05 0.06 0.07 0.08 0.09 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
SQUARE
SQUARE ROOT
0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0

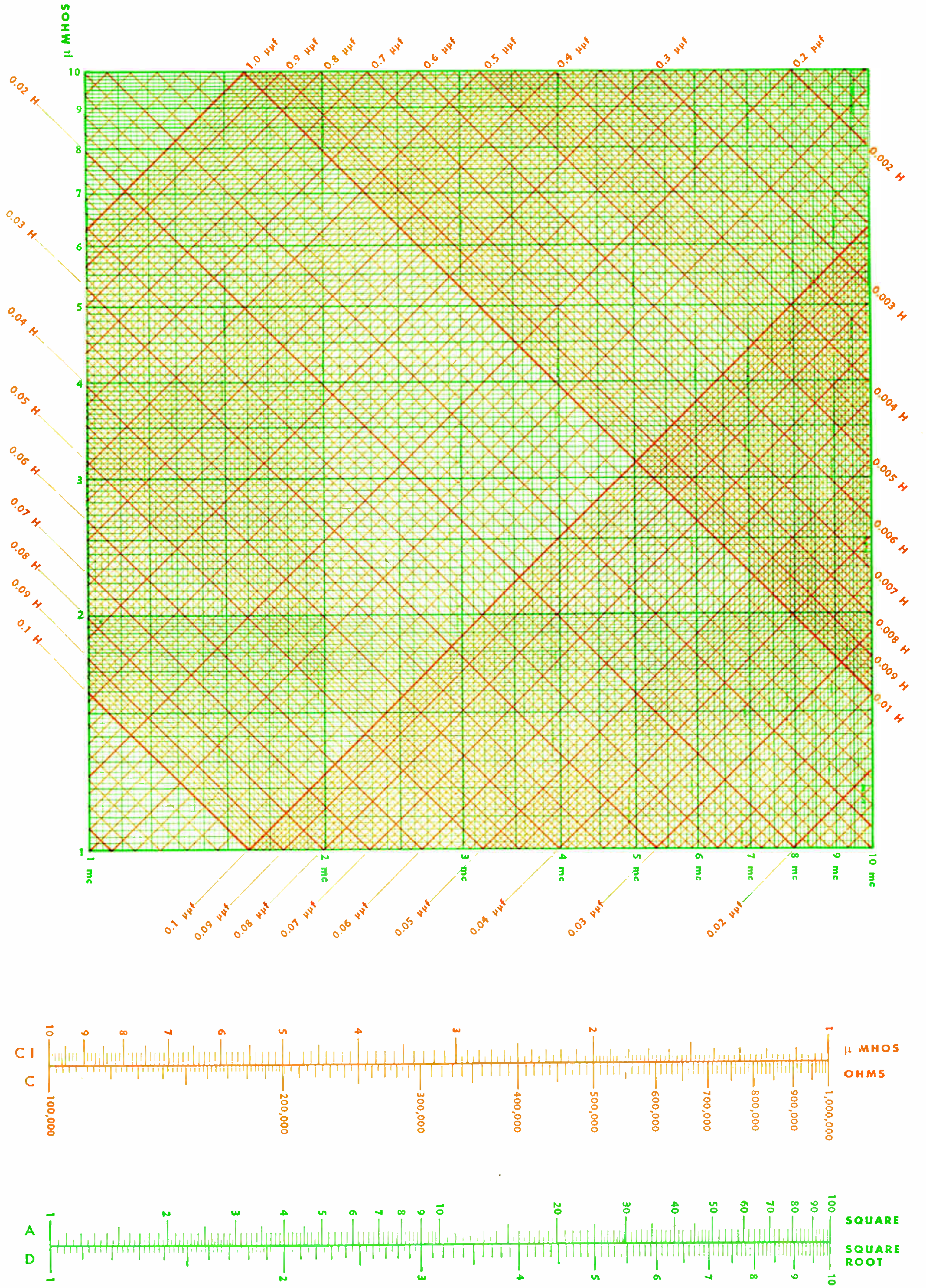
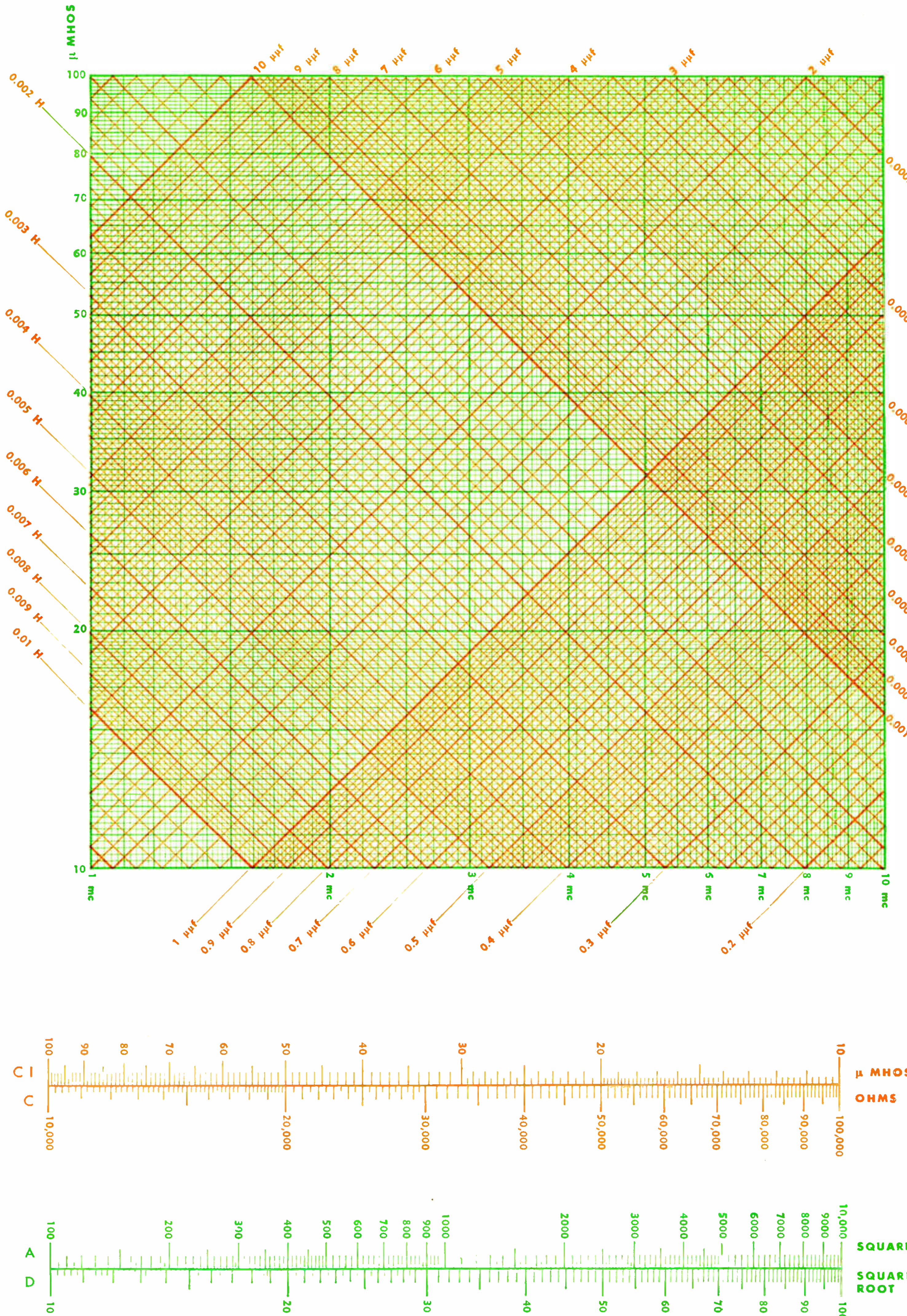

μ MHOS
0.02 H
0.03 H
0.04 H
0.05 H
0.06 H
0.07 H
0.08 H
0.09 H
0.1 H
0.002 H
0.003 H
0.004 H
0.005 H
0.006 H
0.007 H
0.008 H
0.009 H
0.01 H
1.0 μμf
0.9 μμf
0.8 μμf
0.7 μμf
0.6 μμf
0.5 μμf
0.4 μμf
0.3 μμf
0.2 μμf
0.1 μμf
0.09 μμf
0.08 μμf
0.07 μμf
0.06 μμf
0.05 μμf
0.04 μμf
0.03 μμf
0.02 μμf
1 mc
2 mc
3 mc
4 mc
5 mc
6 mc
7 mc
8 mc
9 mc
10 mc
CI
C
μ MHOS
OHMS
A
D
SQUARE
SQUARE ROOT

PLATE 120


μ MHOS
100
90
80
70
60
50
40
30
20
10
1 mc
2 mc
3 mc
4 mc
5 mc
6 mc
7 mc
8 mc
9 mc
10 mc
10 μμf
9 μμf
8 μμf
7 μμf
6 μμf
5 μμf
4 μμf
3 μμf
2 μμf
1 μμf
0.9 μμf
0.8 μμf
0.7 μμf
0.6 μμf
0.5 μμf
0.4 μμf
0.3 μμf
0.2 μμf
0.002 H
0.003 H
0.004 H
0.005 H
0.006 H
0.007 H
0.008 H
0.009 H
0.01 H
0.0002 H
0.0003 H
0.0004 H
0.0005 H
0.0006 H
0.0007 H
0.0008 H
0.0009 H
0.001 H
CI
C
μ MHOS
OHMS
10,000
20,000
30,000
40,000
50,000
60,000
70,000
80,000
90,000
100,000
A
D
SQUARE
SQUARE ROOT
100
200
300
400
500
600
700
800
900
1000
2000
3000
4000
5000
6000
7000
8000
9000
10,000

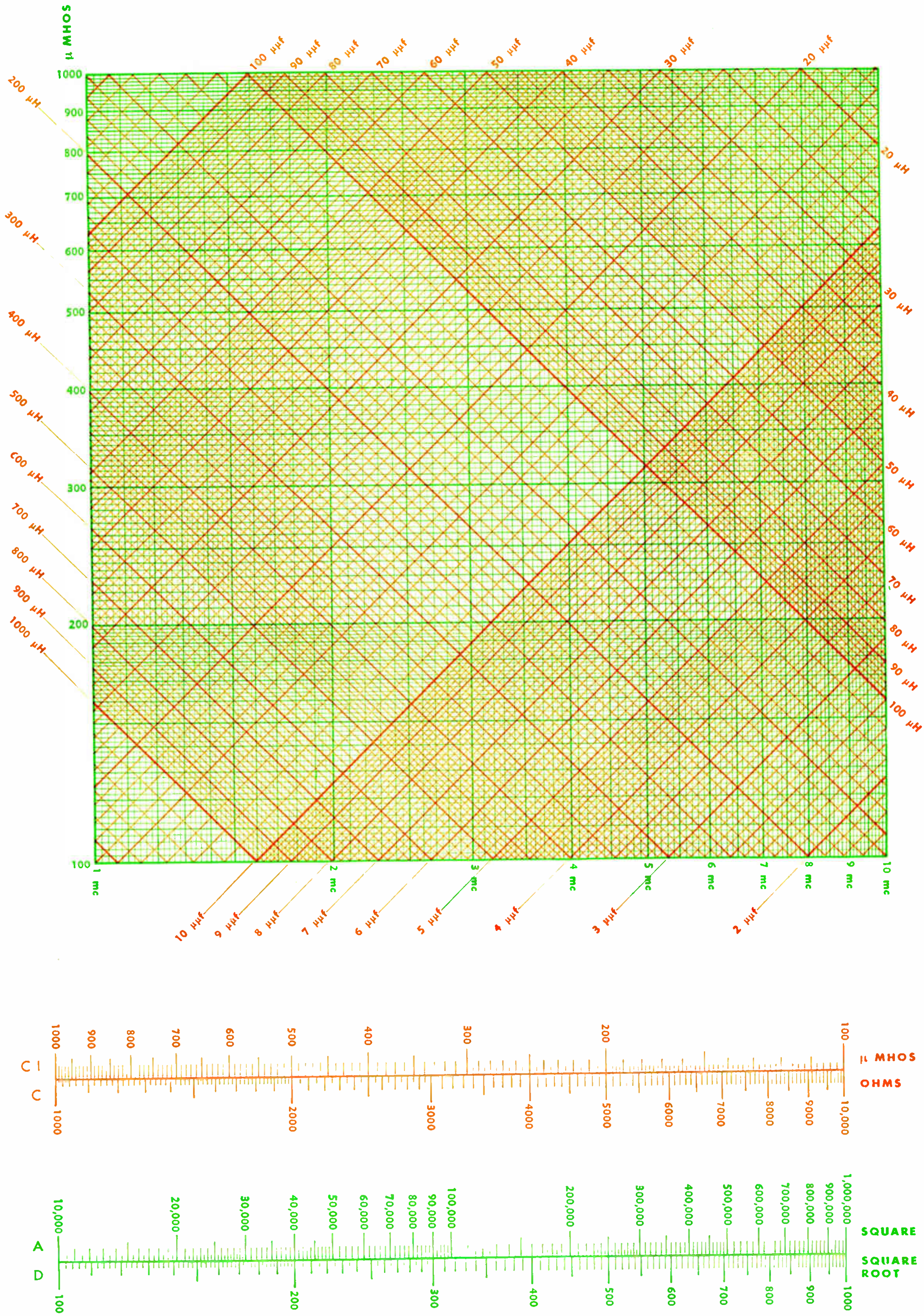
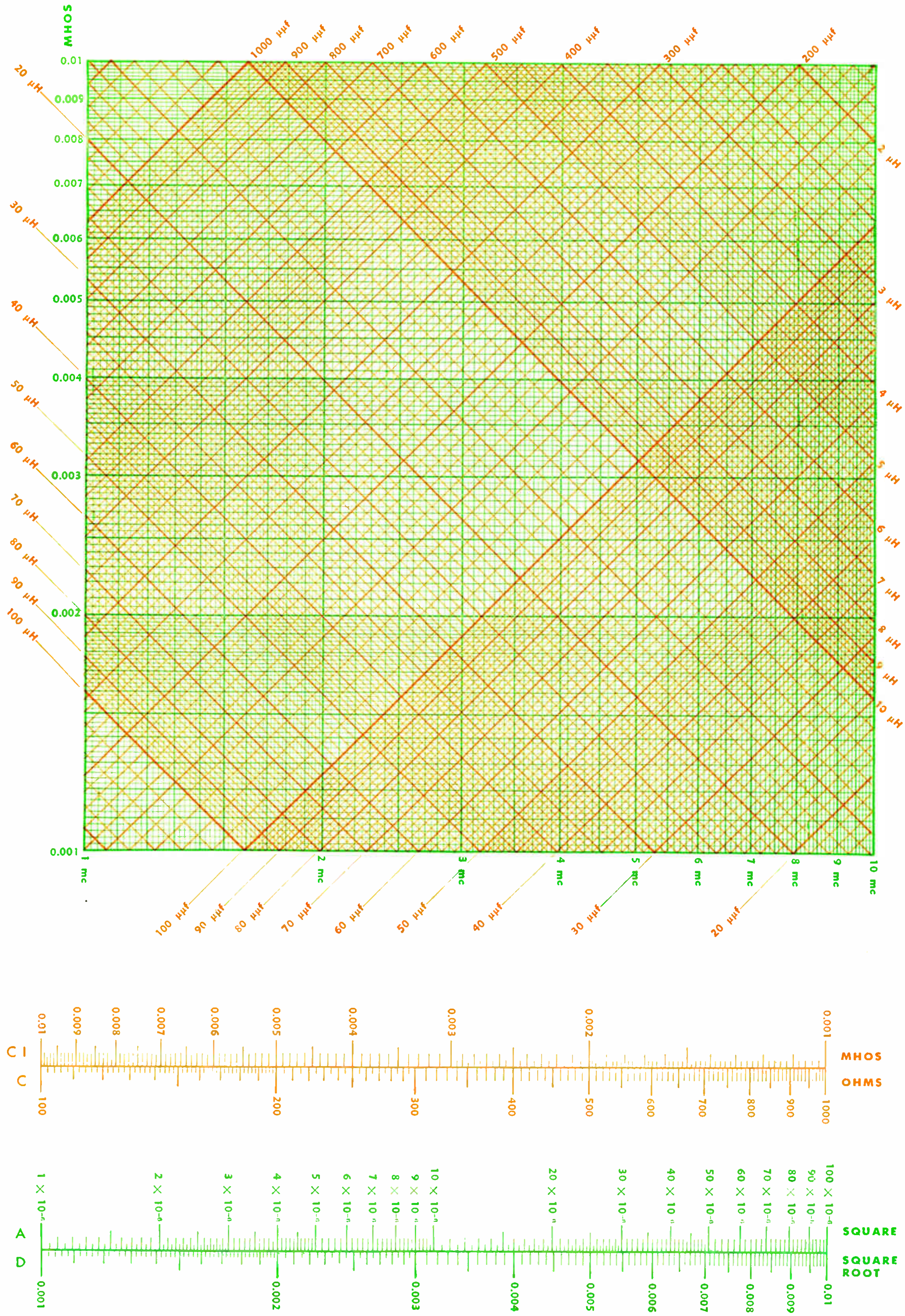
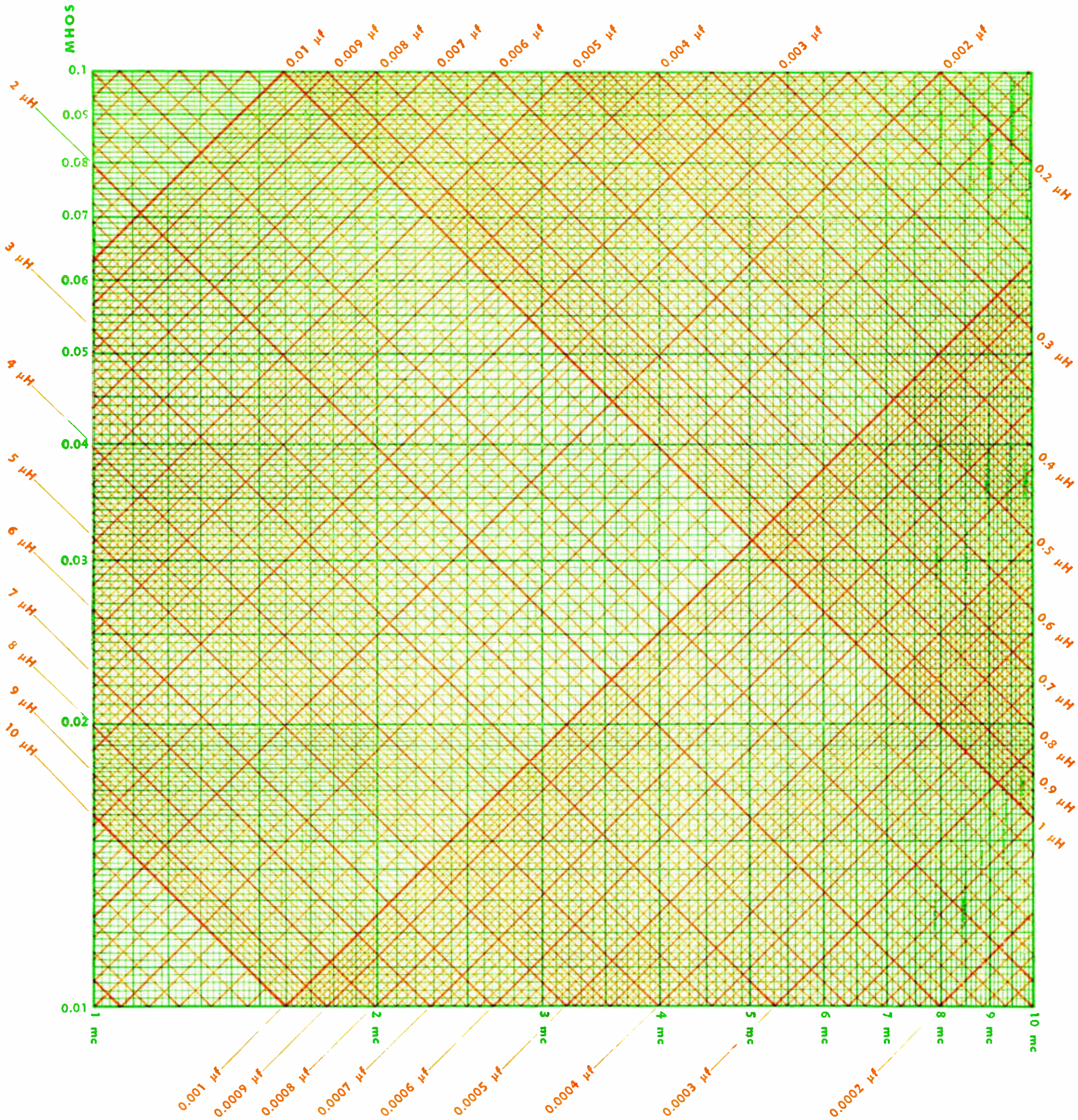

µ MHOS
1000
900
800
700
600
500
400
300
200
100
100 µµf
90 µµf
80 µµf
70 µµf
60 µµf
50 µµf
40 µµf
30 µµf
20 µµf
200 µH
300 µH
400 µH
500 µH
600 µH
700 µH
800 µH
900 µH
1000 µH
20 µH
30 µH
40 µH
50 µH
60 µH
70 µH
80 µH
90 µH
100 µH
1 mc
2 mc
3 mc
4 mc
5 mc
6 mc
7 mc
8 mc
9 mc
10 mc
10 µµf
9 µµf
8 µµf
7 µµf
6 µµf
5 µµf
4 µµf
3 µµf
2 µµf
C I
C
1000 900 800 700 600 500 400 300 200 100
µ MHOS
OHMS
1000 2000 3000 4000 5000 6000 7000 8000 9000 10,000
A
D
10,000 20,000 30,000 40,000 50,000 60,000 70,000 80,000 90,000 100,000 200,000 300,000 400,000 500,000 600,000 700,000 800,000 900,000 1,000,000
SQUARE
SQUARE ROOT
100 200 300 400 500 600 700 800 900 1000

PLATE 122



MHOS
0.01
0.009
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
1000 μμf
900 μμf
800 μμf
700 μμf
600 μμf
500 μμf
400 μμf
300 μμf
200 μμf
20 μH
30 μH
40 μH
50 μH
60 μH
70 μH
80 μH
90 μH
100 μH
2 μH
3 μH
4 μH
5 μH
6 μH
7 μH
8 μH
9 μH
10 μH
1 mc
2 mc
3 mc
4 mc
5 mc
6 mc
7 mc
8 mc
9 mc
10 mc
100 μμf
90 μμf
80 μμf
70 μμf
60 μμf
50 μμf
40 μμf
30 μμf
20 μμf
CI
C
MHOS
OHMS
0.01 0.009 0.008 0.007 0.006 0.005 0.004 0.003 0.002 0.001
100 200 300 400 500 600 700 800 900 1000
A
D
SQUARE
SQUARE ROOT
1 × 10⁻⁶ 2 × 10⁻⁶ 3 × 10⁻⁶ 4 × 10⁻⁶ 5 × 10⁻⁶ 6 × 10⁻⁶ 7 × 10⁻⁶ 8 × 10⁻⁶ 9 × 10⁻⁶ 10 × 10⁻⁶ 20 × 10⁻⁶ 30 × 10⁻⁶ 40 × 10⁻⁶ 50 × 10⁻⁶ 60 × 10⁻⁶ 70 × 10⁻⁶ 80 × 10⁻⁶ 90 × 10⁻⁶ 100 × 10⁻⁶
0.001 0.002 0.003 0.004 0.005 0.006 0.007 0.008 0.009 0.01


MHOS
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.01 µf
0.009 µf
0.008 µf
0.007 µf
0.006 µf
0.005 µf
0.004 µf
0.003 µf
0.002 µf
2 µH
3 µH
4 µH
5 µH
6 µH
7 µH
8 µH
9 µH
10 µH
0.2 µH
0.3 µH
0.4 µH
0.5 µH
0.6 µH
0.7 µH
0.8 µH
0.9 µH
1 µH
1 mc
2 mc
3 mc
4 mc
5 mc
6 mc
7 mc
8 mc
9 mc
10 mc
0.001 µf
0.0009 µf
0.0008 µf
0.0007 µf
0.0006 µf
0.0005 µf
0.0004 µf
0.0003 µf
0.0002 µf

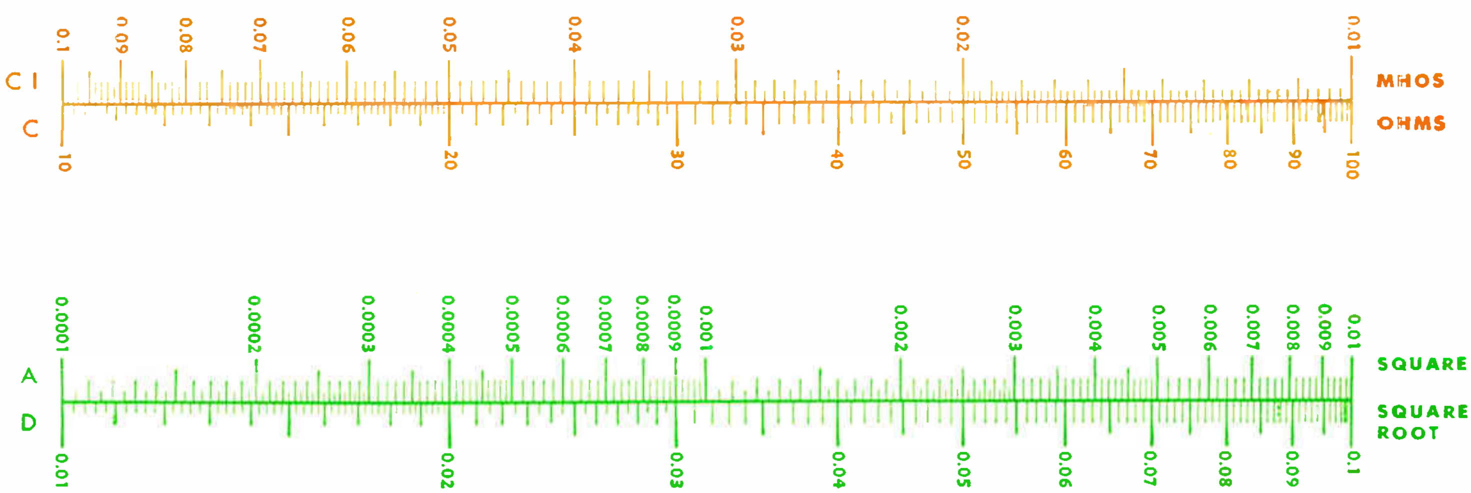
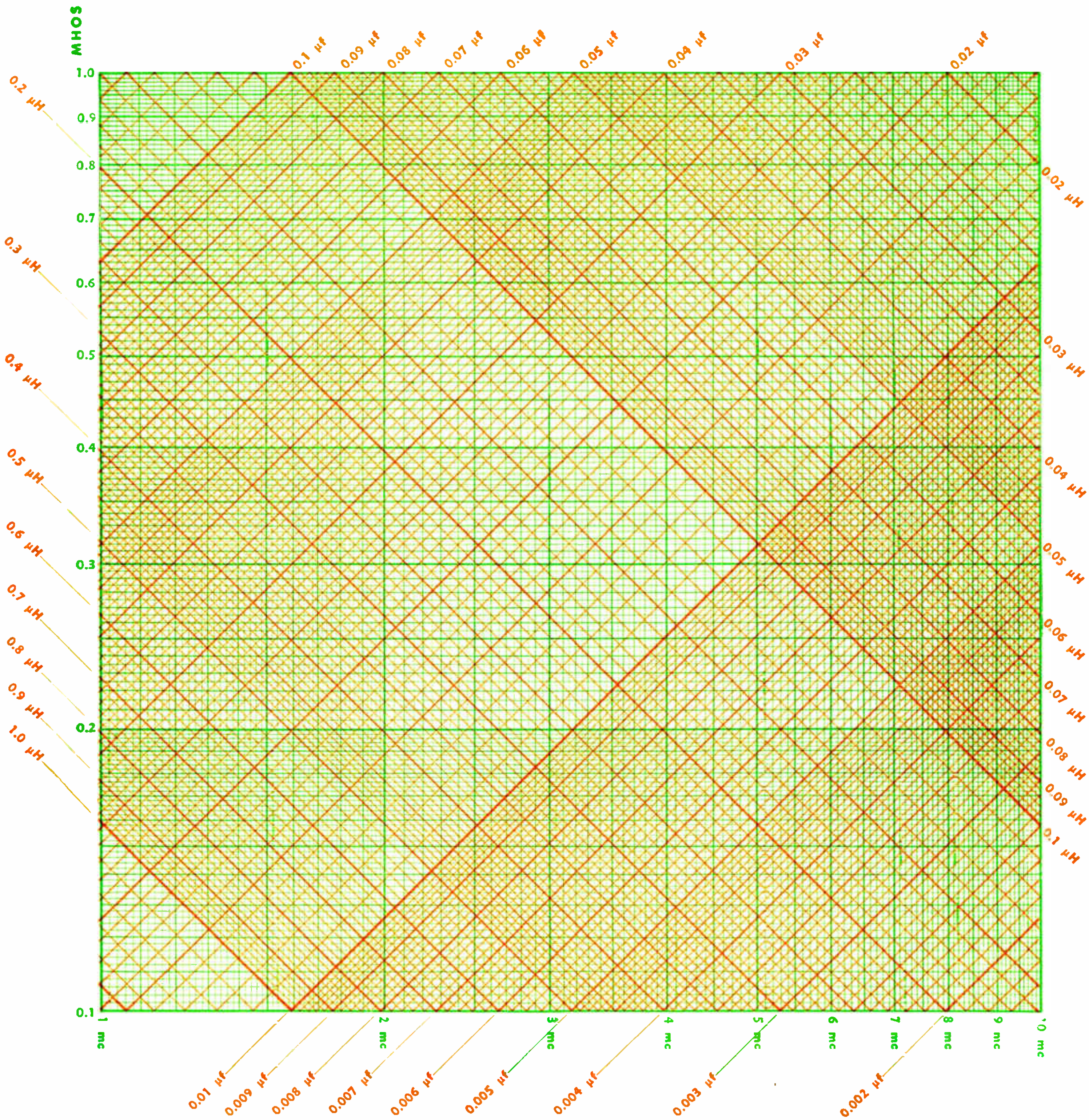
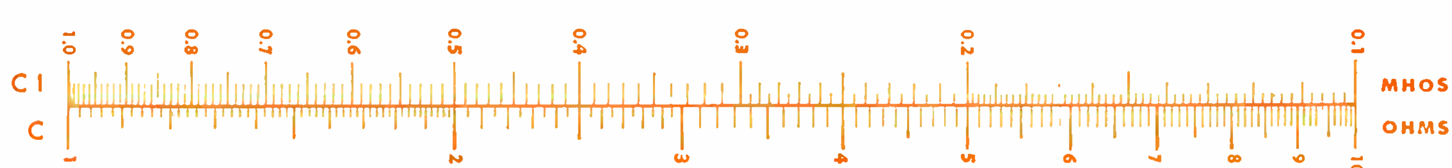
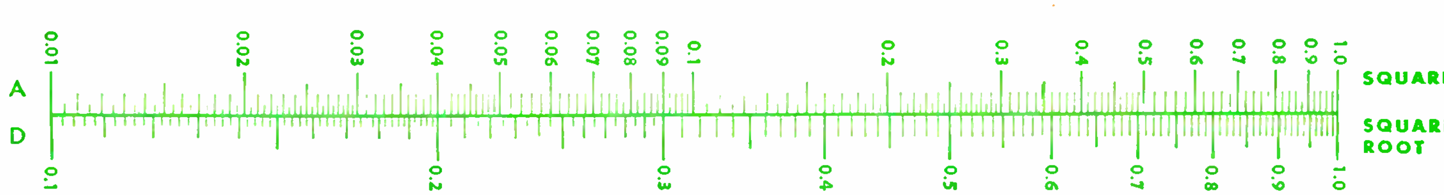
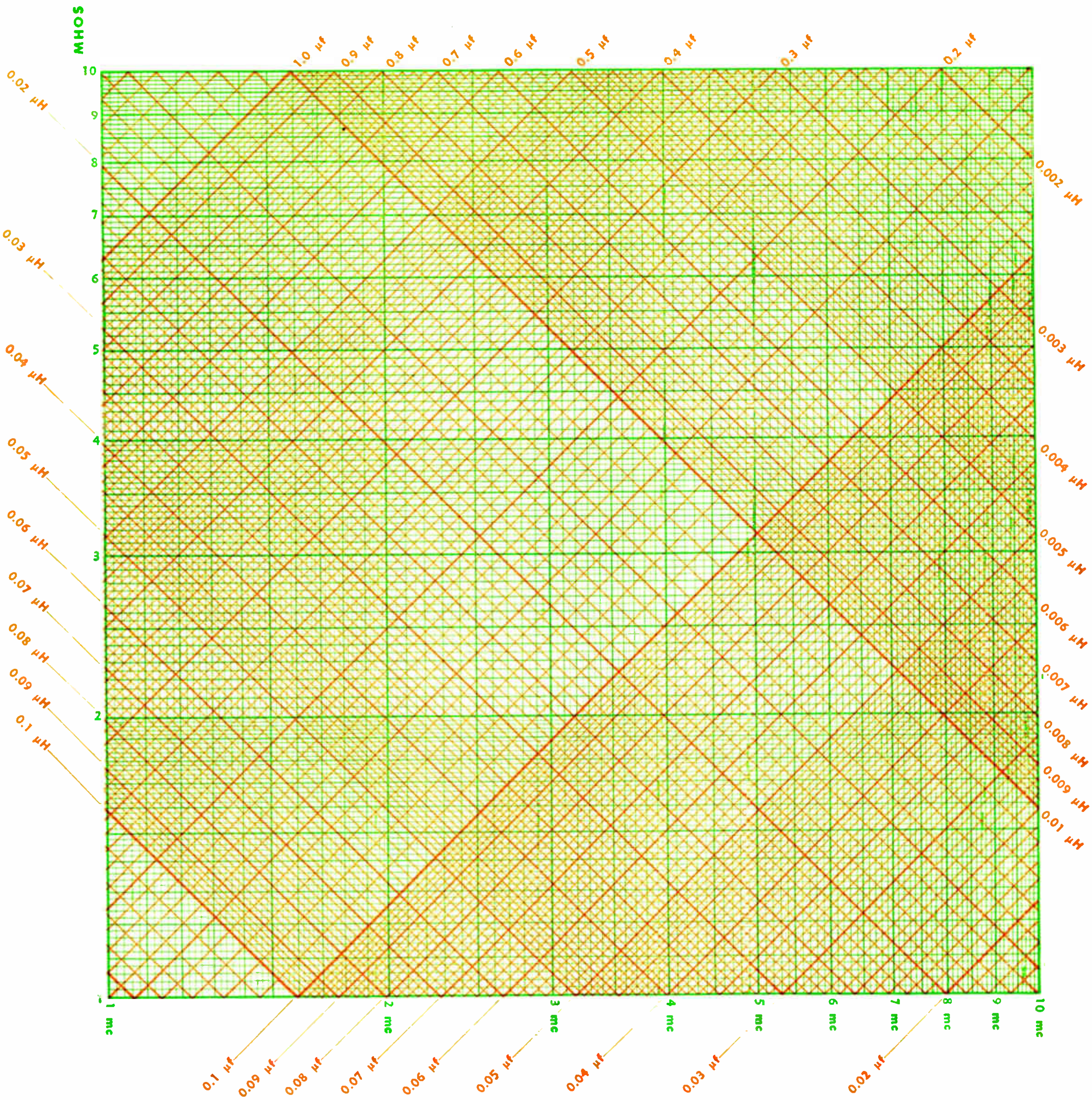

C I
C
MHOS
OHMS
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
10
20
30
40
50
60
70
80
90
100
A
D
SQUARE
SQUARE ROOT
0.0001
0.0002
0.0003
0.0004
0.0005
0.0006
0.0007
0.0008
0.0009
0.001
0.002
0.003
0.004
0.005
0.006
0.007
0.008
0.009
0.01
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.1

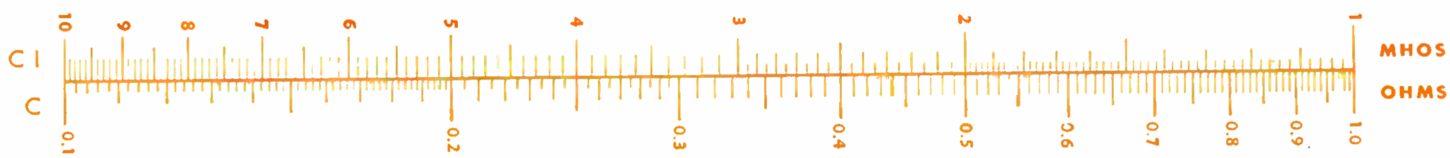
PLATE 124


MHOS
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.1 µf
0.09 µf
0.08 µf
0.07 µf
0.06 µf
0.05 µf
0.04 µf
0.03 µf
0.02 µf
0.2 µH
0.3 µH
0.4 µH
0.5 µH
0.6 µH
0.7 µH
0.8 µH
0.9 µH
1.0 µH
0.02 µH
0.03 µH
0.04 µH
0.05 µH
0.06 µH
0.07 µH
0.08 µH
0.09 µH
0.1 µH
1 mc
2 mc
3 mc
4 mc
5 mc
6 mc
7 mc
8 mc
9 mc
10 mc
0.01 µf
0.009 µf
0.008 µf
0.007 µf
0.006 µf
0.005 µf
0.004 µf
0.003 µf
0.002 µf


CI
C
MHOS
OHMS
1.0 0.9 0.8 0.7 0.6 0.5 0.4 0.3 0.2 0.1
1 2 3 4 5 6 7 8 9 10


A
D
SQUARE
SQUARE ROOT
0.01 0.02 0.03 0.04 0.05 0.06 0.07 0.08 0.09 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0


MHOS
10
9
8
7
6
5
4
3
2
1
1.0 μf
0.9 μf
0.8 μf
0.7 μf
0.6 μf
0.5 μf
0.4 μf
0.3 μf
0.2 μf
0.02 μH
0.03 μH
0.04 μH
0.05 μH
0.06 μH
0.07 μH
0.08 μH
0.09 μH
0.1 μH
0.002 μH
0.003 μH
0.004 μH
0.005 μH
0.006 μH
0.007 μH
0.008 μH
0.009 μH
0.01 μH
1 mc
2 mc
3 mc
4 mc
5 mc
6 mc
7 mc
8 mc
9 mc
10 mc
0.1 μf
0.09 μf
0.08 μf
0.07 μf
0.06 μf
0.05 μf
0.04 μf
0.03 μf
0.02 μf


C I
C
MHOS
OHMS
10
9
8
7
6
5
4
3
2
1
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0

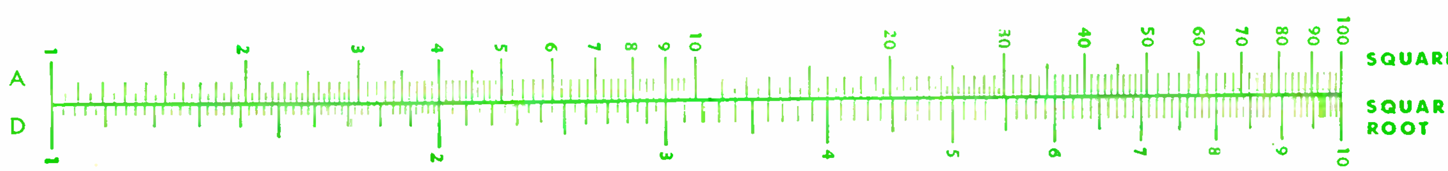
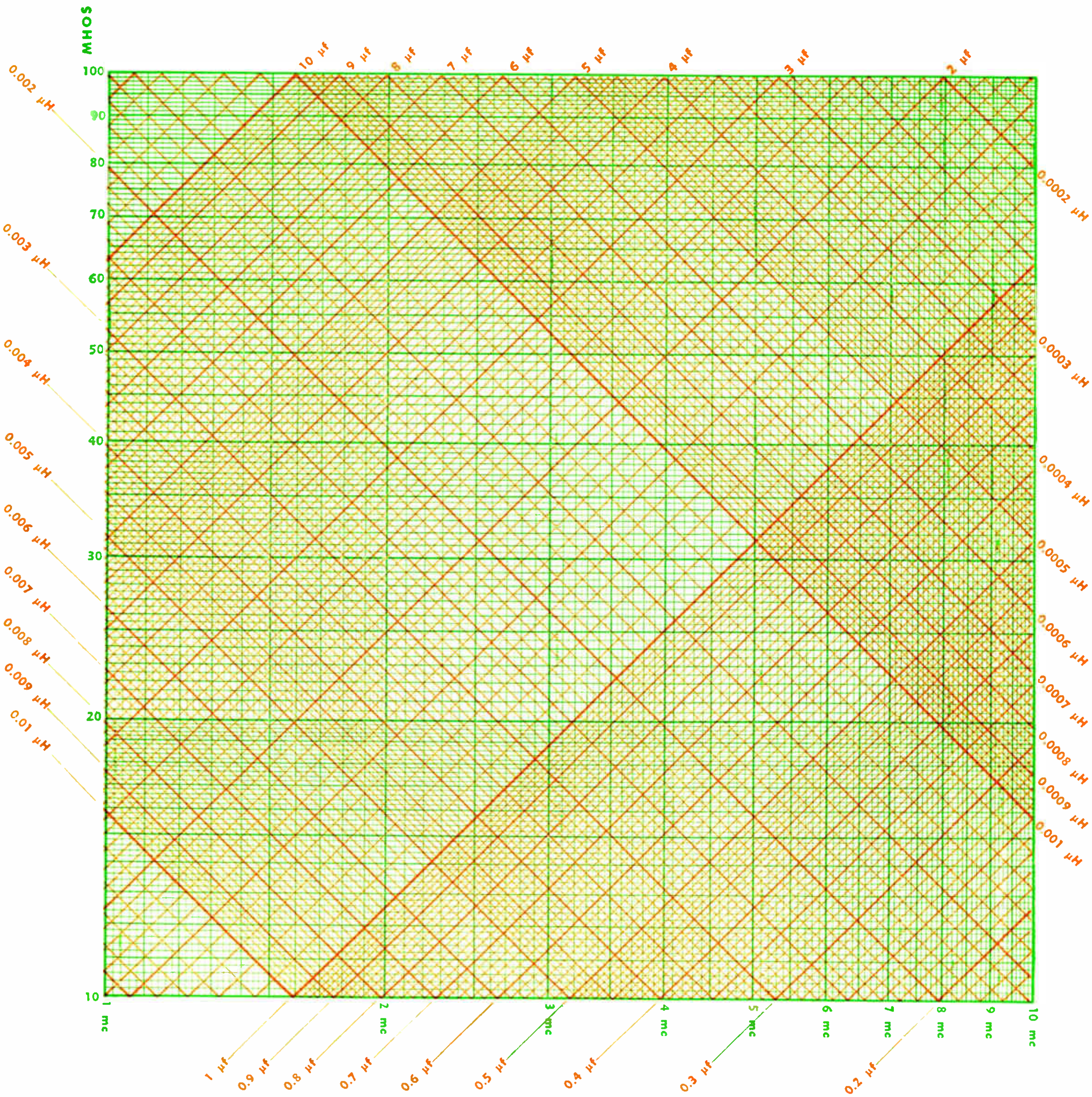
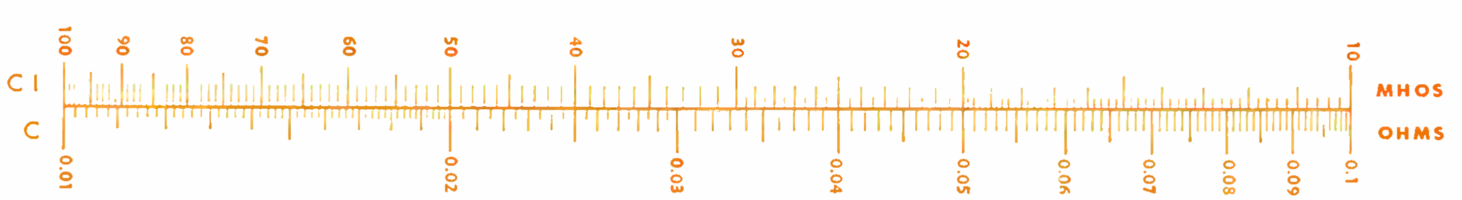
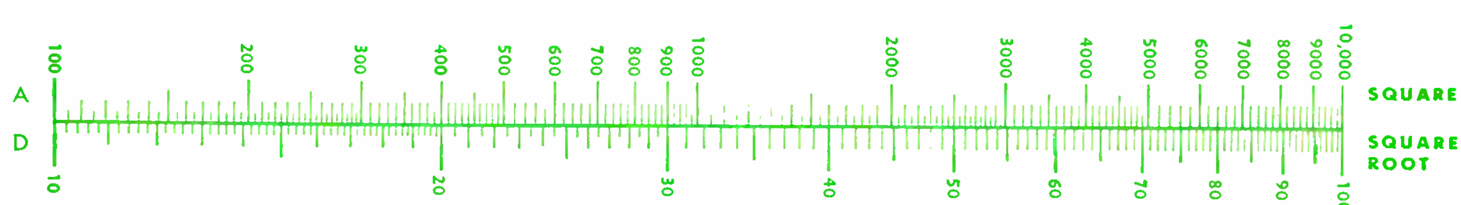
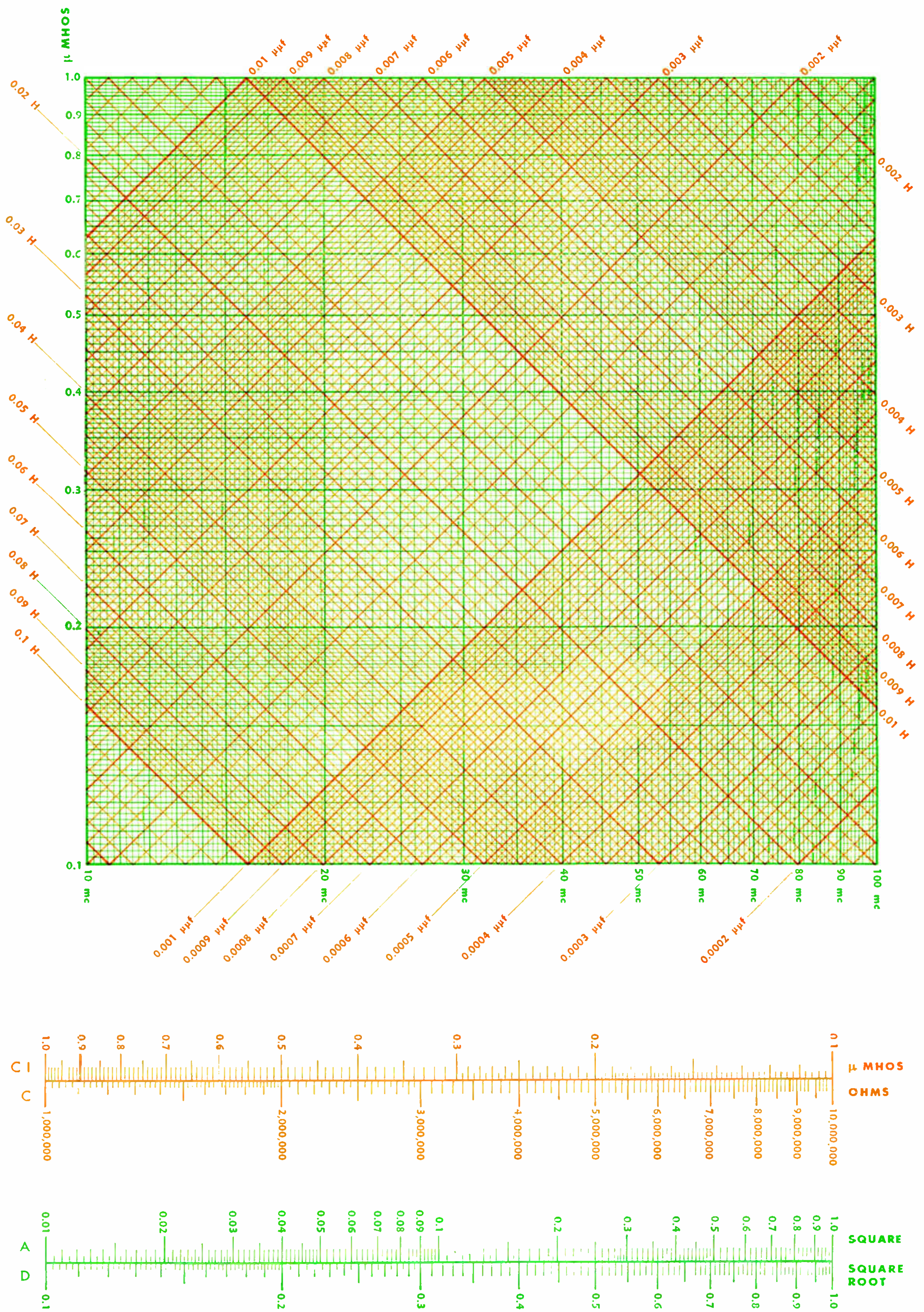

A
D
SQUARE
SQUARE ROOT
1
2
3
4
5
6
7
8
9
10
20
30
40
50
60
70
80
90
100

PLATE 126


MHOS
100
90
80
70
60
50
40
30
20
10
10 µf
9 µf
8 µf
7 µf
6 µf
5 µf
4 µf
3 µf
2 µf
0.002 µH
0.003 µH
0.004 µH
0.005 µH
0.006 µH
0.007 µH
0.008 µH
0.009 µH
0.01 µH
0.0002 µH
0.0003 µH
0.0004 µH
0.0005 µH
0.0006 µH
0.0007 µH
0.0008 µH
0.0009 µH
0.001 µH
1 mc
2 mc
3 mc
4 mc
5 mc
6 mc
7 mc
8 mc
9 mc
10 mc
1 µf
0.9 µf
0.8 µf
0.7 µf
0.6 µf
0.5 µf
0.4 µf
0.3 µf
0.2 µf

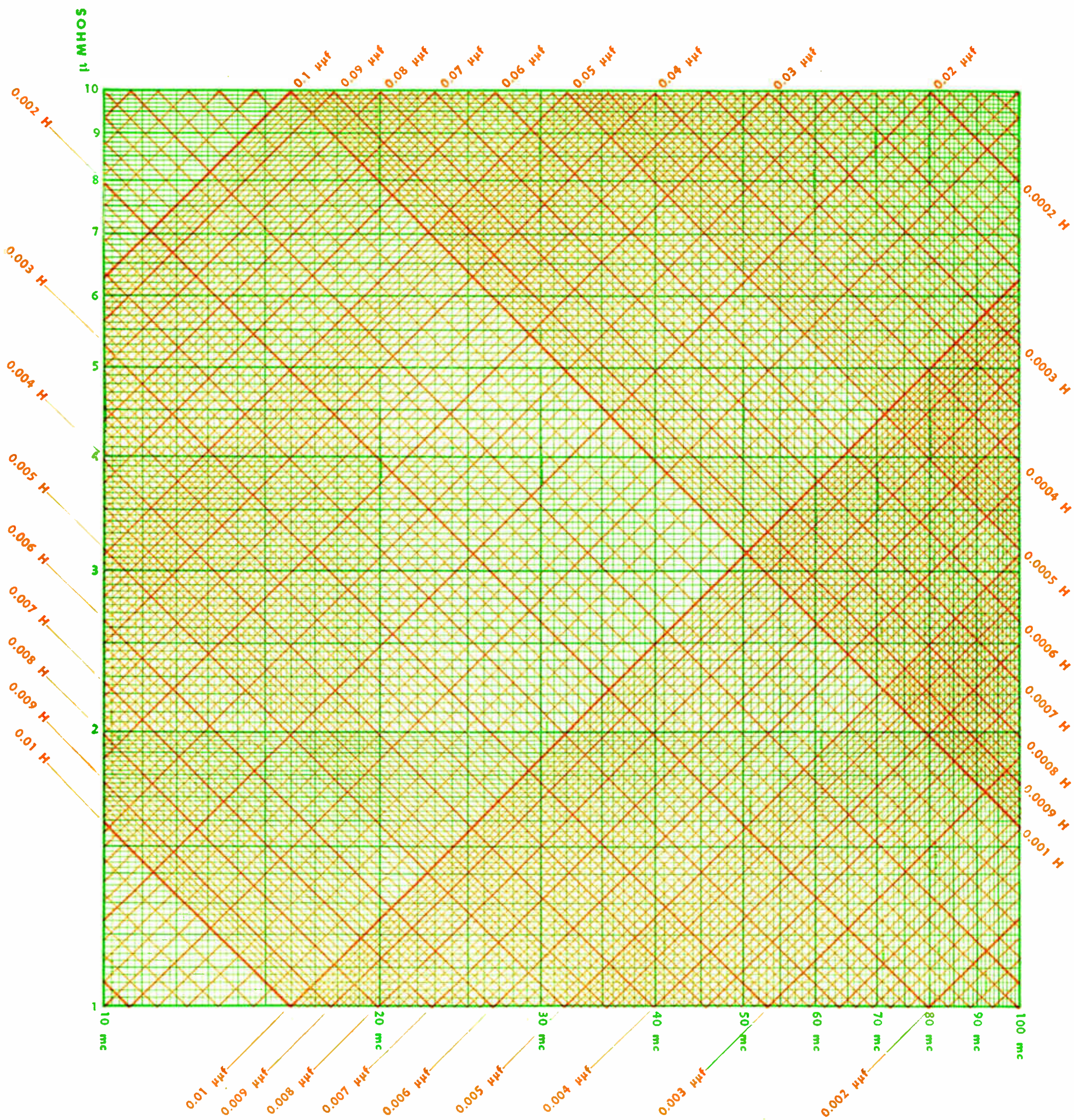

CI
C
100
90
80
70
60
50
40
30
20
10
MHOS
OHMS
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.1


A
D
100
200
300
400
500
600
700
800
900
1000
2000
3000
4000
5000
6000
7000
8000
9000
10,000
SQUARE
SQUARE ROOT
10
20
30
40
50
60
70
80
90
100

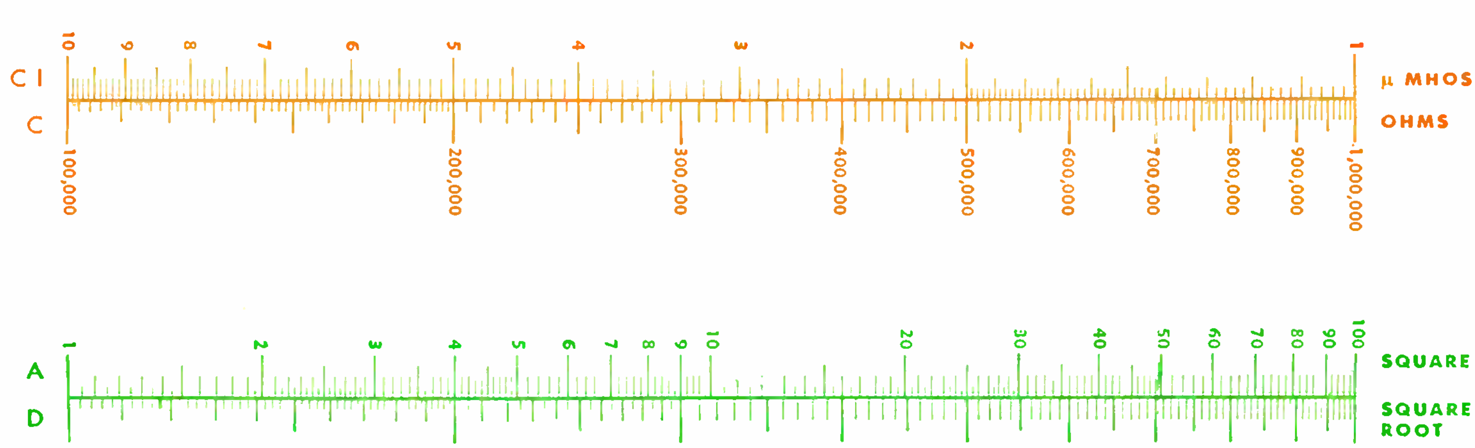


μ MHOS
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.01 μμf
0.009 μμf
0.008 μμf
0.007 μμf
0.006 μμf
0.005 μμf
0.004 μμf
0.003 μμf
0.002 μμf
0.02 H
0.03 H
0.04 H
0.05 H
0.06 H
0.07 H
0.08 H
0.09 H
0.1 H
0.002 H
0.003 H
0.004 H
0.005 H
0.006 H
0.007 H
0.008 H
0.009 H
0.01 H
10 mc
20 mc
30 mc
40 mc
50 mc
60 mc
70 mc
80 mc
90 mc
100 mc
0.001 μμf
0.0009 μμf
0.0008 μμf
0.0007 μμf
0.0006 μμf
0.0005 μμf
0.0004 μμf
0.0003 μμf
0.0002 μμf
CI
C
μ MHOS
OHMS
1,000,000
2,000,000
3,000,000
4,000,000
5,000,000
6,000,000
7,000,000
8,000,000
9,000,000
10,000,000
A
D
SQUARE
SQUARE ROOT
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09

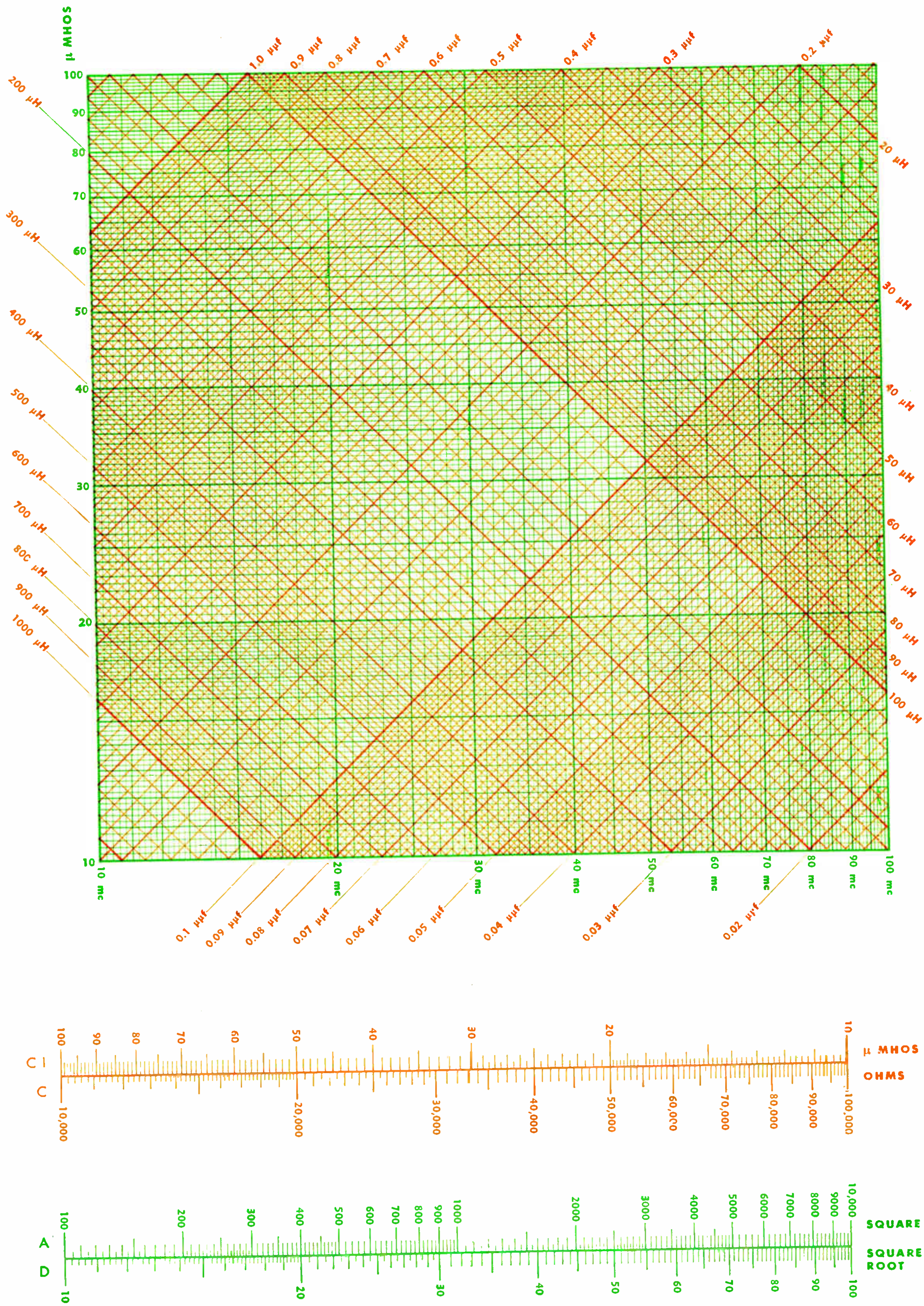
PLATE 128



μ MHOS
0.1 μμf
0.09 μμf
0.08 μμf
0.07 μμf
0.06 μμf
0.05 μμf
0.04 μμf
0.03 μμf
0.02 μμf
0.002 H
0.003 H
0.004 H
0.005 H
0.006 H
0.007 H
0.008 H
0.009 H
0.01 H
0.0002 H
0.0003 H
0.0004 H
0.0005 H
0.0006 H
0.0007 H
0.0008 H
0.0009 H
0.001 H
10
9
8
7
6
5
4
3
2
1
10 mc
20 mc
30 mc
40 mc
50 mc
60 mc
70 mc
80 mc
90 mc
100 mc
0.01 μμf
0.009 μμf
0.008 μμf
0.007 μμf
0.006 μμf
0.005 μμf
0.004 μμf
0.003 μμf
0.002 μμf

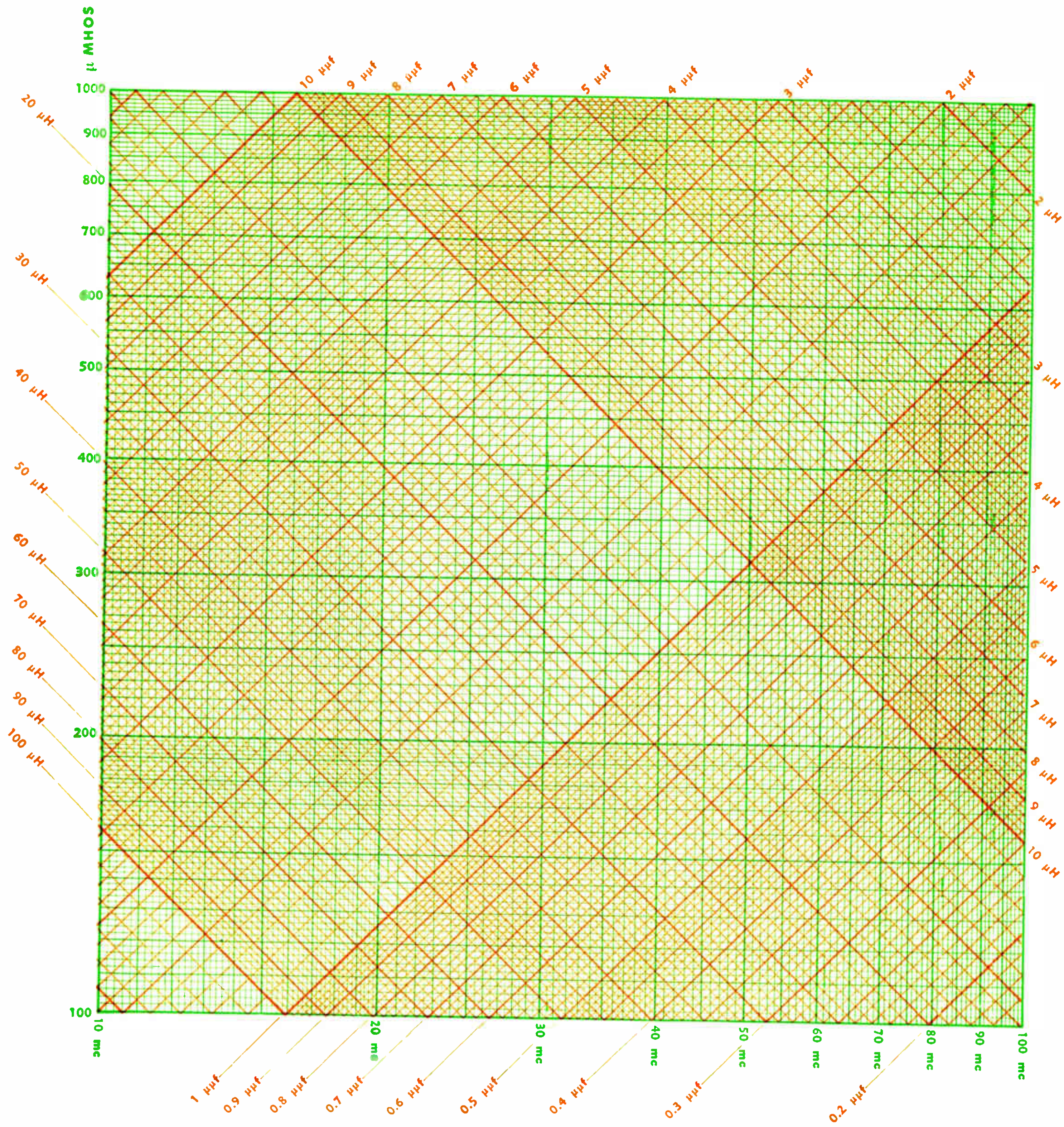


CI
C
10 9 8 7 6 5 4 3 2 1
μ MHOS
OHMS
100,000 200,000 300,000 400,000 500,000 600,000 700,000 800,000 900,000 1,000,000
A
D
1 2 3 4 5 6 7 8 9 10 20 30 40 50 60 70 80 90 100
SQUARE
SQUARE ROOT
1 2 3 4 5 6 7 8 9 10

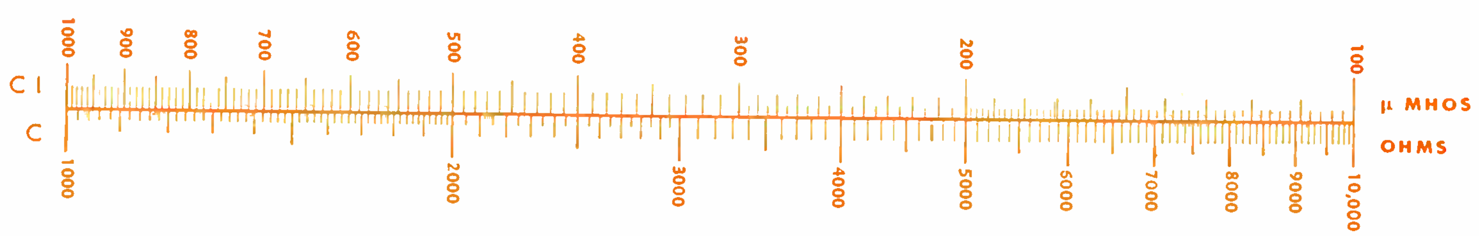


μ MHOS
100
90
80
70
60
50
40
30
20
10
1.0 μμf
0.9 μμf
0.8 μμf
0.7 μμf
0.6 μμf
0.5 μμf
0.4 μμf
0.3 μμf
0.2 μμf
200 μH
300 μH
400 μH
500 μH
600 μH
700 μH
800 μH
900 μH
1000 μH
20 μH
30 μH
40 μH
50 μH
60 μH
70 μH
80 μH
90 μH
100 μH
10 mc
20 mc
30 mc
40 mc
50 mc
60 mc
70 mc
80 mc
90 mc
100 mc
0.1 μμf
0.09 μμf
0.08 μμf
0.07 μμf
0.06 μμf
0.05 μμf
0.04 μμf
0.03 μμf
0.02 μμf
C1
C
μ MHOS
OHMS
100 90 80 70 60 50 40 30 20 10
10,000 20,000 30,000 40,000 50,000 60,000 70,000 80,000 90,000 100,000
A
D
SQUARE
SQUARE ROOT
100 200 300 400 500 600 700 800 900 1000 2000 3000 4000 5000 6000 7000 8000 9000 10,000
10 20 30 40 50 60 70 80 90 100

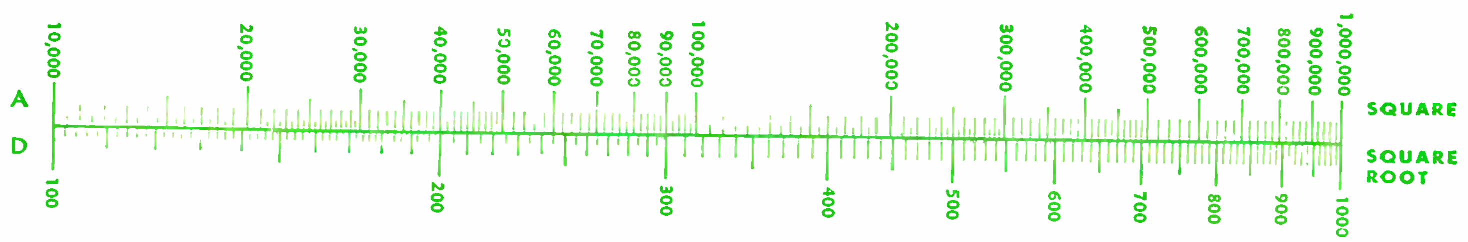
PLATE 130



μ MHOS
1000
900
800
700
600
500
400
300
200
100
10 μμf
9 μμf
8 μμf
7 μμf
6 μμf
5 μμf
4 μμf
3 μμf
2 μμf
20 μH
30 μH
40 μH
50 μH
60 μH
70 μH
80 μH
90 μH
100 μH
2 μH
3 μH
4 μH
5 μH
6 μH
7 μH
8 μH
9 μH
10 μH
10 mc
20 mc
30 mc
40 mc
50 mc
60 mc
70 mc
80 mc
90 mc
100 mc
1 μμf
0.9 μμf
0.8 μμf
0.7 μμf
0.6 μμf
0.5 μμf
0.4 μμf
0.3 μμf
0.2 μμf



CI
C
1000
900
800
700
600
500
400
300
200
100
μ MHOS
1000
2000
3000
4000
5000
6000
7000
8000
9000
10,000
OHMS



A
D
10,000
20,000
30,000
40,000
50,000
60,000
70,000
80,000
90,000
100,000
200,000
300,000
400,000
500,000
600,000
700,000
800,000
900,000
1,000,000
SQUARE
100
200
300
400
500
600
700
800
900
1000
SQUARE ROOT

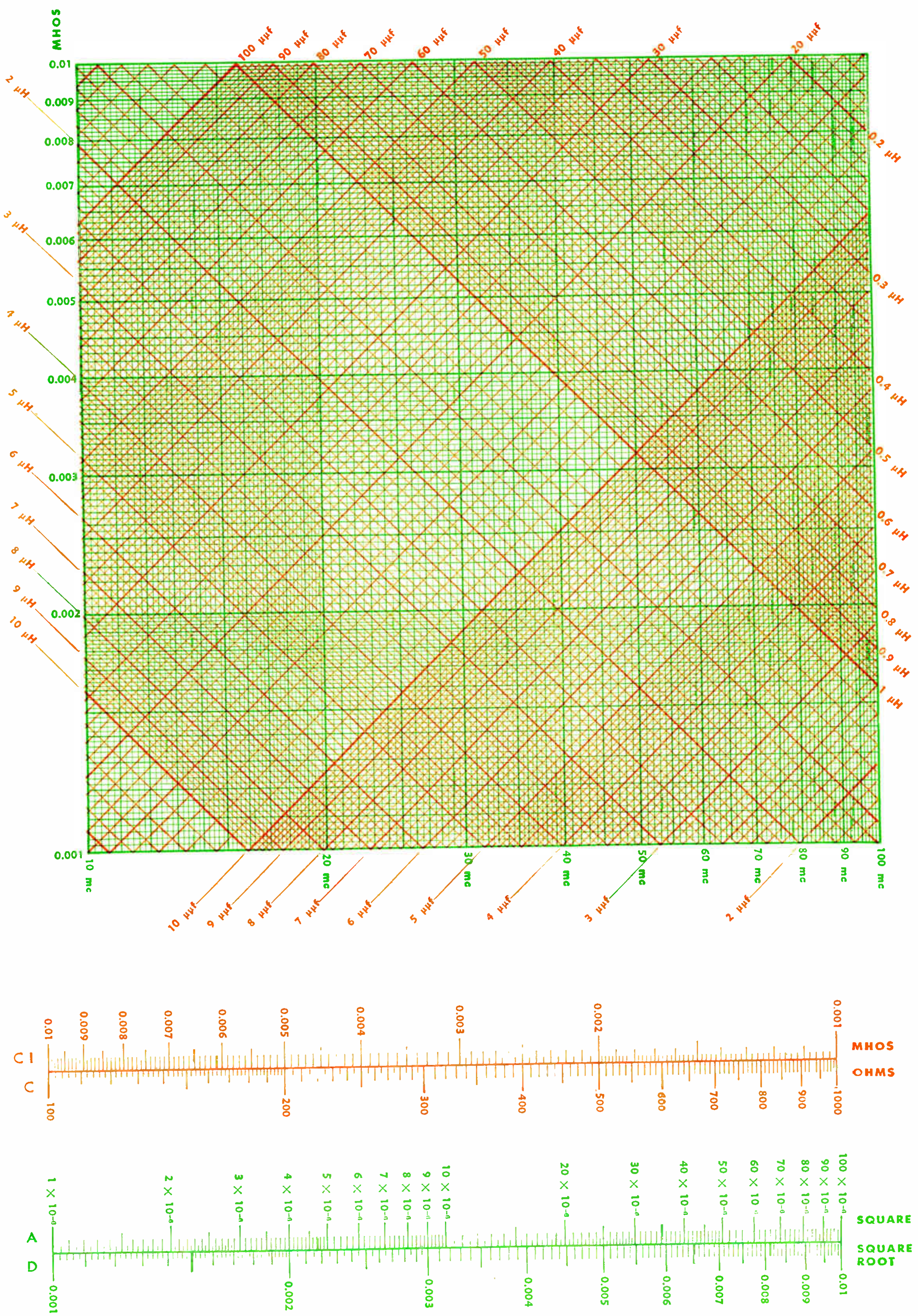
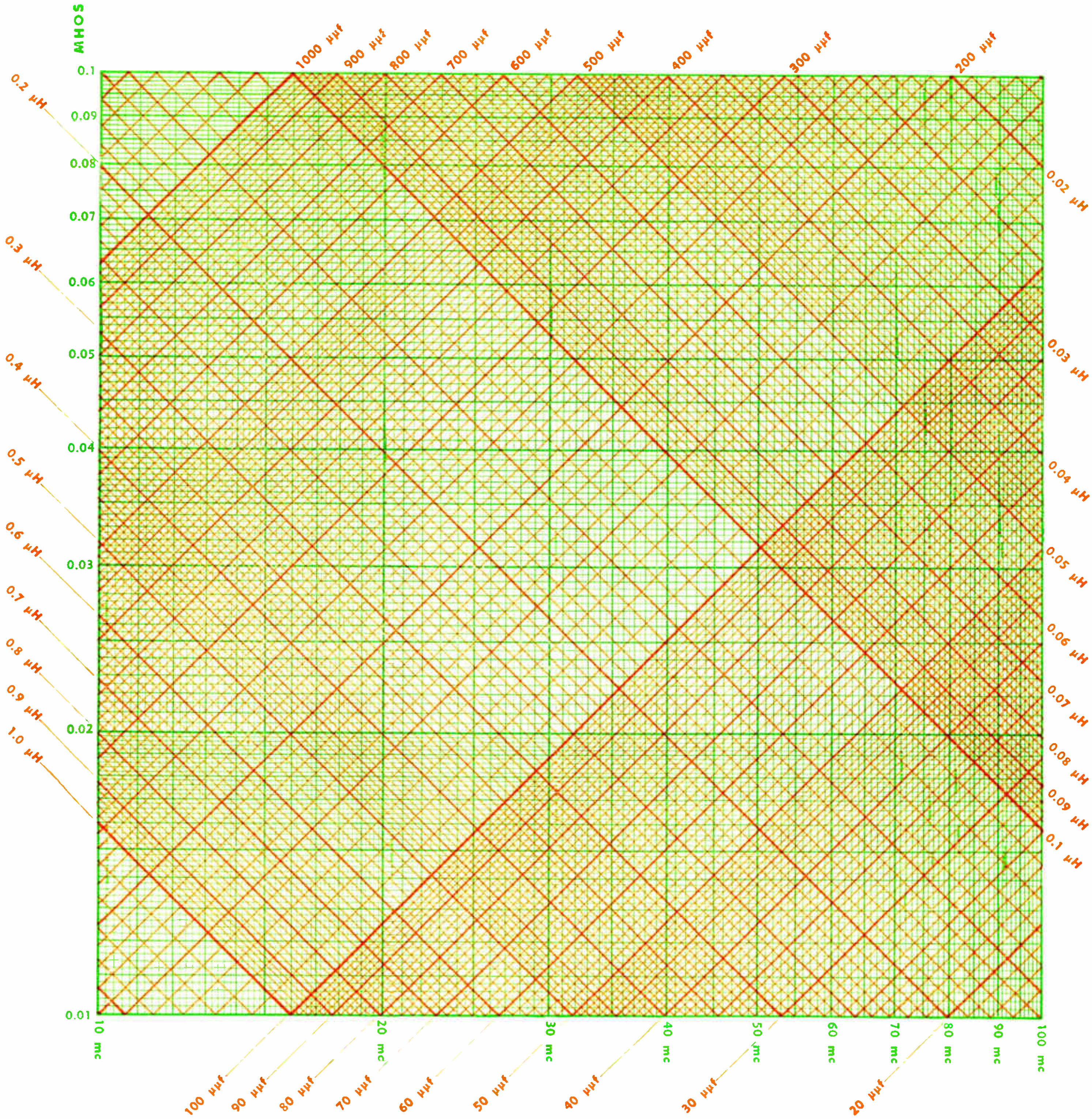
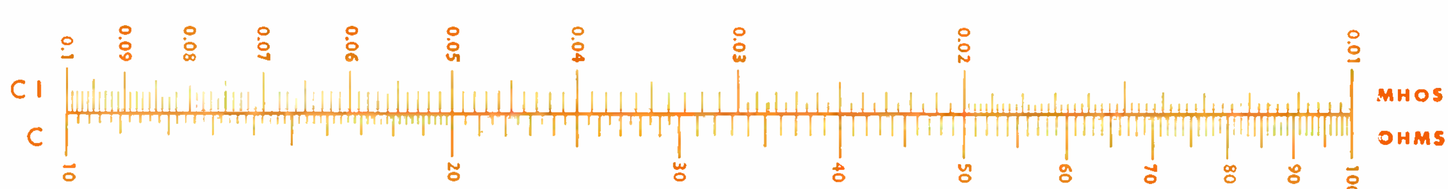

MHOS
0.01
0.009
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
2 µH
3 µH
4 µH
5 µH
6 µH
7 µH
8 µH
9 µH
10 µH
100 µµf
90 µµf
80 µµf
70 µµf
60 µµf
50 µµf
40 µµf
30 µµf
20 µµf
0.2 µH
0.3 µH
0.4 µH
0.5 µH
0.6 µH
0.7 µH
0.8 µH
0.9 µH
1 µH
10 mc
20 mc
30 mc
40 mc
50 mc
60 mc
70 mc
80 mc
90 mc
100 mc
10 µµf
9 µµf
8 µµf
7 µµf
6 µµf
5 µµf
4 µµf
3 µµf
2 µµf
C I
C
MHOS
OHMS
100
200
300
400
500
600
700
800
900
1000
A
D
SQUARE
SQUARE ROOT
1 × 10⁻⁶
2 × 10⁻⁶
3 × 10⁻⁶
4 × 10⁻⁶
5 × 10⁻⁶
6 × 10⁻⁶
7 × 10⁻⁶
8 × 10⁻⁶
9 × 10⁻⁶
10 × 10⁻⁶
20 × 10⁻⁶
30 × 10⁻⁶
40 × 10⁻⁶
50 × 10⁻⁶
60 × 10⁻⁶
70 × 10⁻⁶
80 × 10⁻⁶
90 × 10⁻⁶
100 × 10⁻⁶
0.001
0.002
0.003
0.004
0.005
0.006
0.007
0.008
0.009
0.01

PLATE 132


MHOS
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
1000 μμf
900 μμf
800 μμf
700 μμf
600 μμf
500 μμf
400 μμf
300 μμf
200 μμf
0.2 μH
0.3 μH
0.4 μH
0.5 μH
0.6 μH
0.7 μH
0.8 μH
0.9 μH
1.0 μH
0.02 μH
0.03 μH
0.04 μH
0.05 μH
0.06 μH
0.07 μH
0.08 μH
0.09 μH
0.1 μH
10 mc
20 mc
30 mc
40 mc
50 mc
60 mc
70 mc
80 mc
90 mc
100 mc
100 μμf
90 μμf
80 μμf
70 μμf
60 μμf
50 μμf
40 μμf
30 μμf
20 μμf


CI
C
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
MHOS
OHMS
10
20
30
40
50
60
70
80
90
100

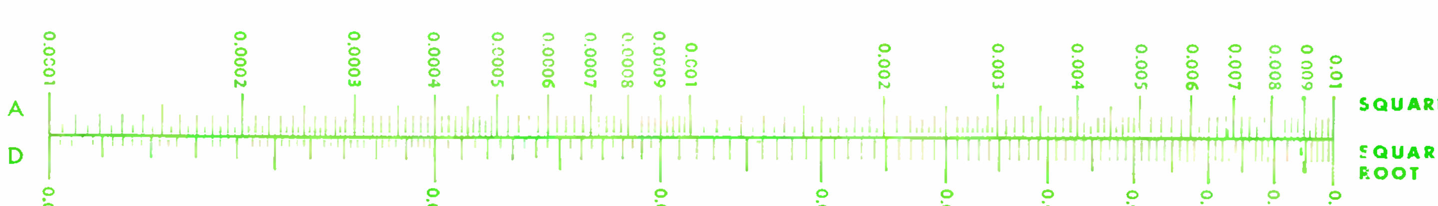
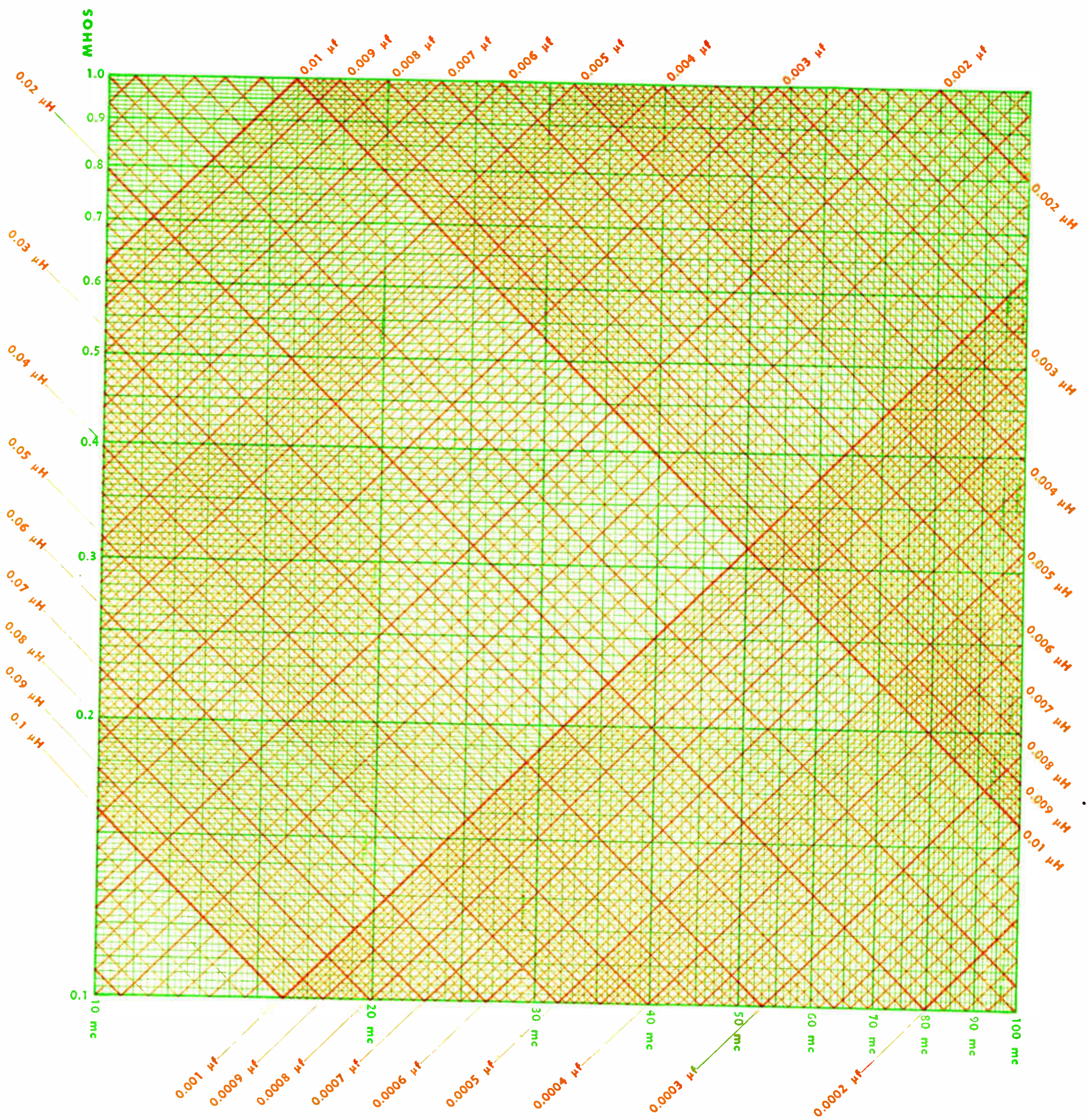

A
D
0.0001
0.0002
0.0003
0.0004
0.0005
0.0006
0.0007
0.0008
0.0009
0.001
0.002
0.003
0.004
0.005
0.006
0.007
0.008
0.009
0.01
SQUARE
SQUARE ROOT
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.1

PLATE 133


MHOS
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.01 μf
0.009 μf
0.008 μf
0.007 μf
0.006 μf
0.005 μf
0.004 μf
0.003 μf
0.002 μf
0.02 μH
0.03 μH
0.04 μH
0.05 μH
0.06 μH
0.07 μH
0.08 μH
0.09 μH
0.1 μH
0.002 μH
0.003 μH
0.004 μH
0.005 μH
0.006 μH
0.007 μH
0.008 μH
0.009 μH
0.01 μH
10 mc
20 mc
30 mc
40 mc
50 mc
60 mc
70 mc
80 mc
90 mc
100 mc
0.001 μf
0.0009 μf
0.0008 μf
0.0007 μf
0.0006 μf
0.0005 μf
0.0004 μf
0.0003 μf
0.0002 μf

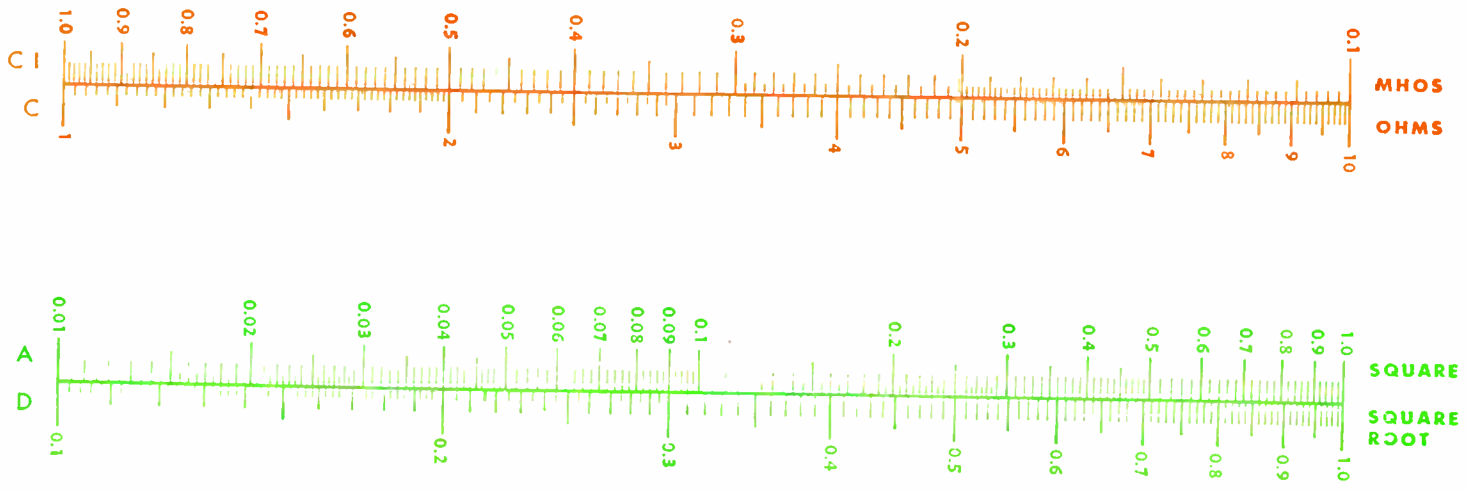
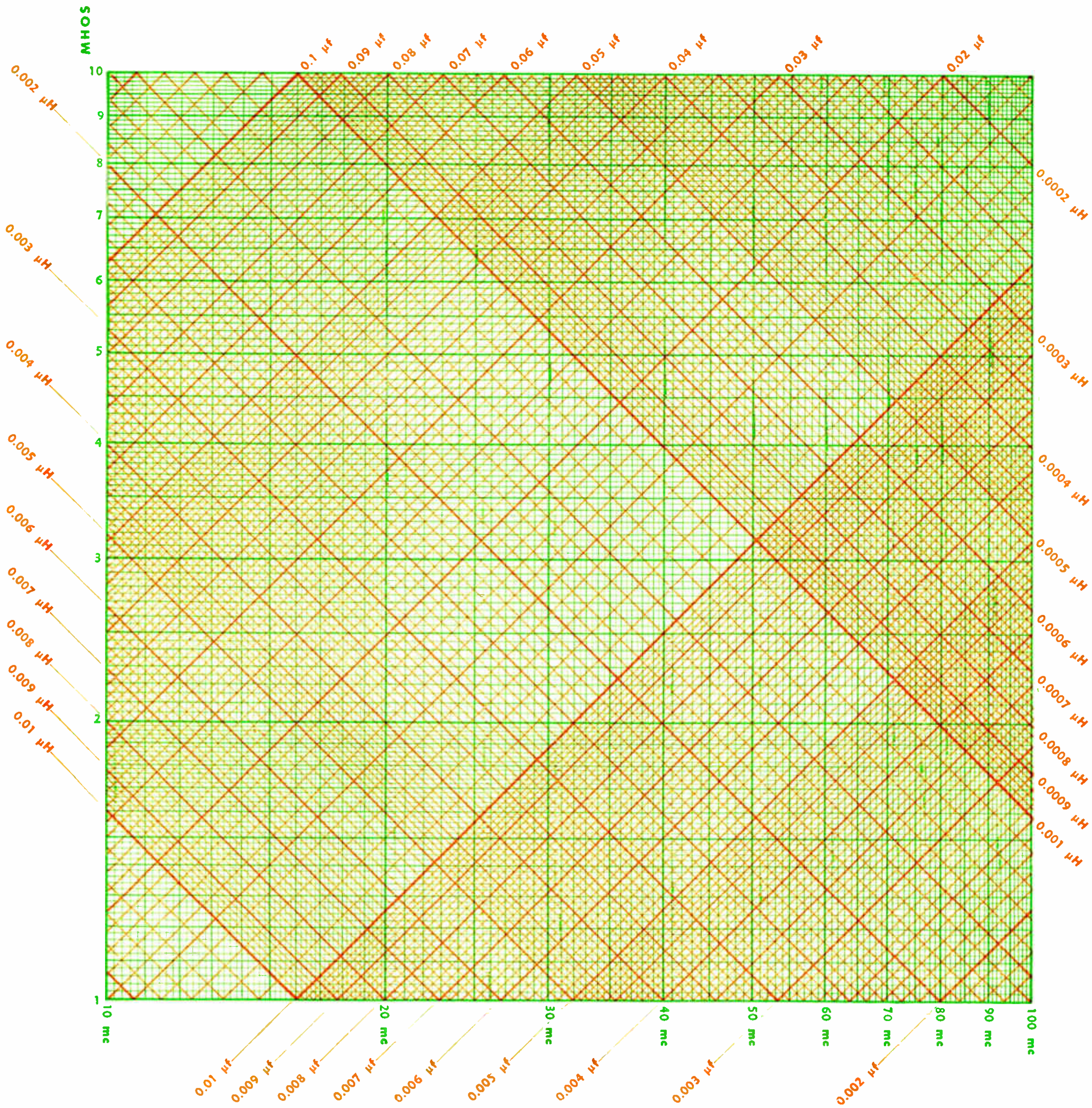
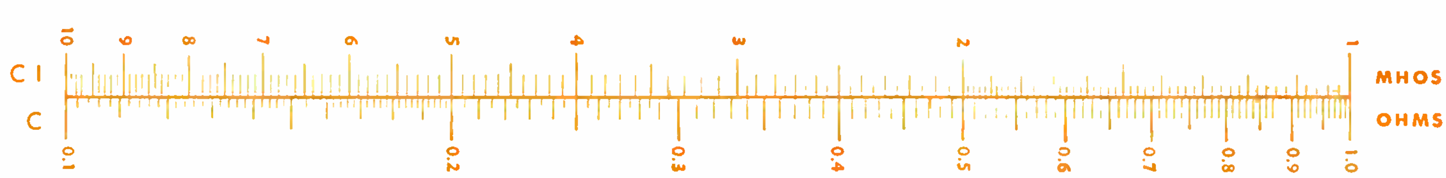

CI
C
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
MHOS
1
2
3
4
5
6
7
8
9
10
OHMS
A
D
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
SQUARE
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
SQUARE ROOT

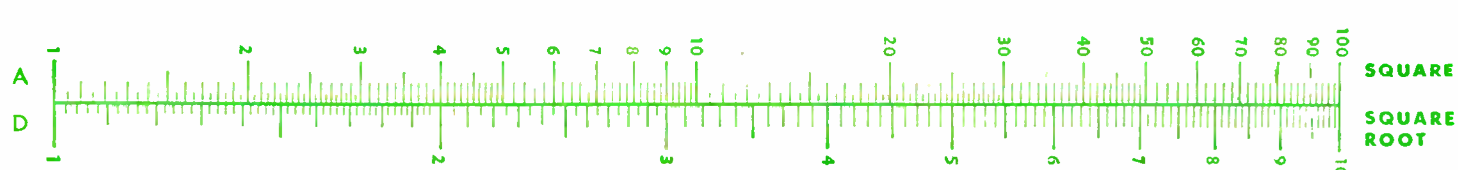
PLATE 134



MHOS
10
9
8
7
6
5
4
3
2
1
0.1 μf
0.09 μf
0.08 μf
0.07 μf
0.06 μf
0.05 μf
0.04 μf
0.03 μf
0.02 μf
0.002 μH
0.003 μH
0.004 μH
0.005 μH
0.006 μH
0.007 μH
0.008 μH
0.009 μH
0.01 μH
0.0002 μH
0.0003 μH
0.0004 μH
0.0005 μH
0.0006 μH
0.0007 μH
0.0008 μH
0.0009 μH
0.001 μH
10 mc
20 mc
30 mc
40 mc
50 mc
60 mc
70 mc
80 mc
90 mc
100 mc
0.01 μf
0.009 μf
0.008 μf
0.007 μf
0.006 μf
0.005 μf
0.004 μf
0.003 μf
0.002 μf

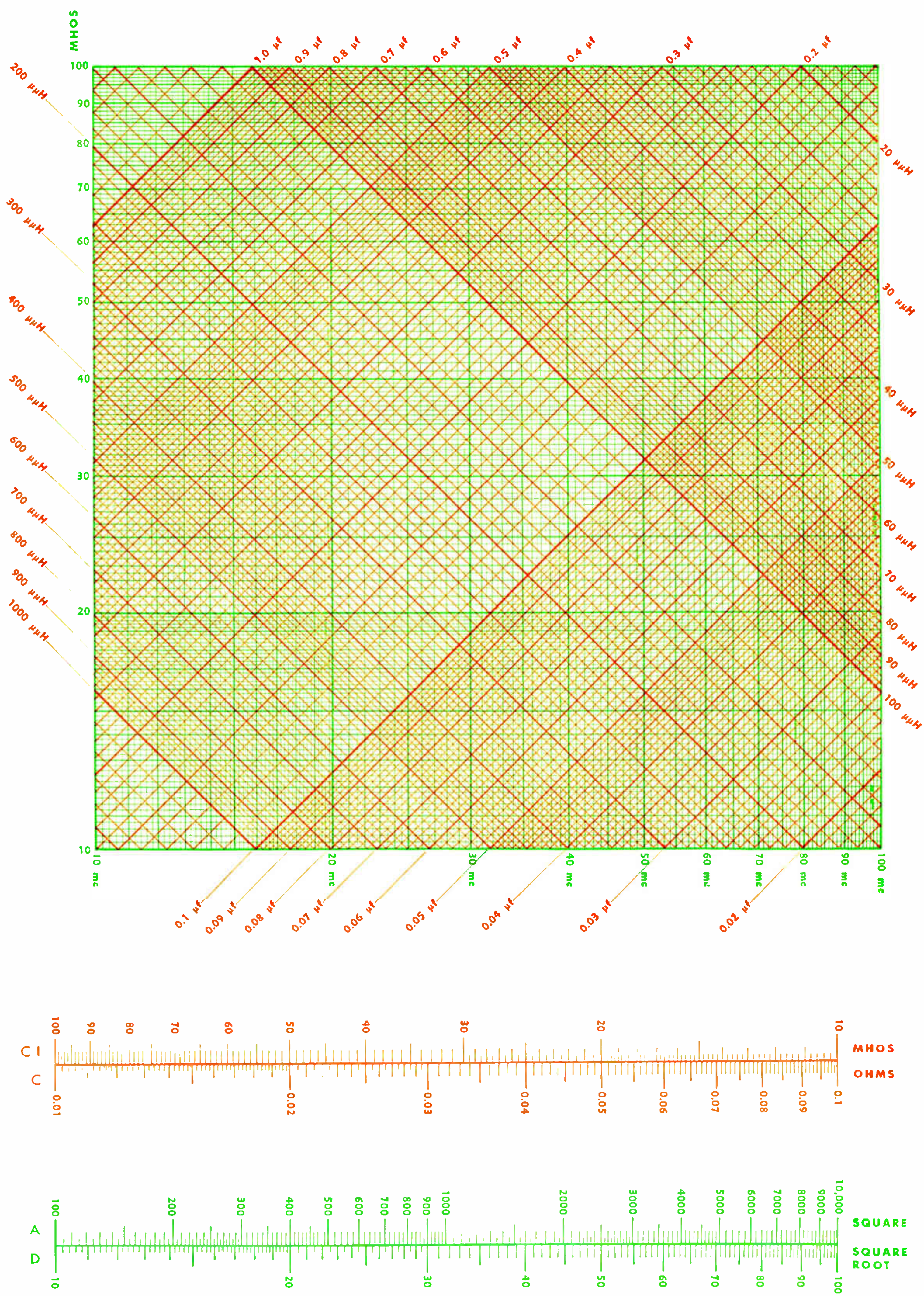


CI
C
10 9 8 7 6 5 4 3 2 1
0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
MHOS
OHMS



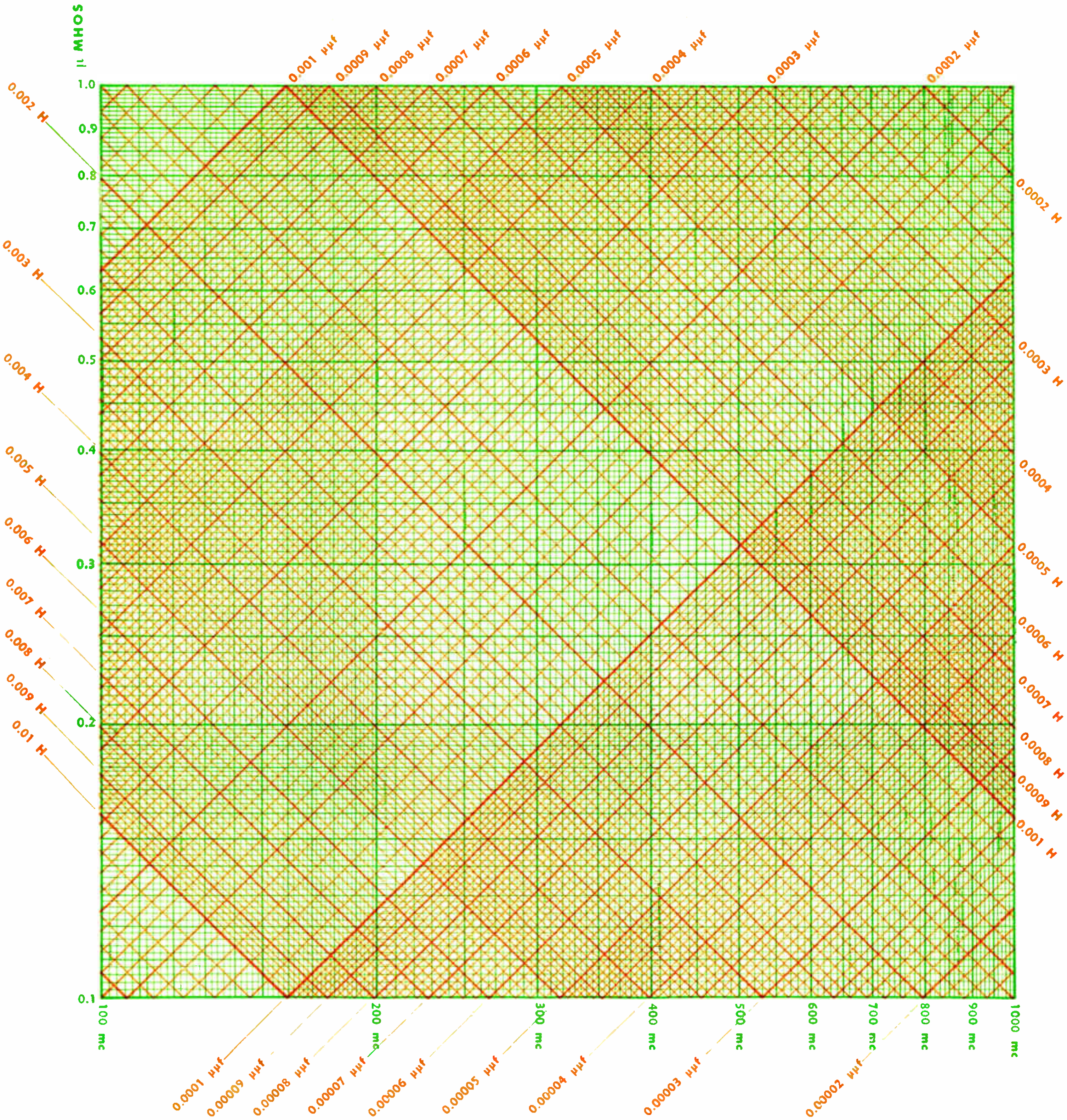
A
D
1 2 3 4 5 6 7 8 9 10 20 30 40 50 60 70 80 90 100
1 2 3 4 5 6 7 8 9 10
SQUARE
SQUARE ROOT

PLATE 135

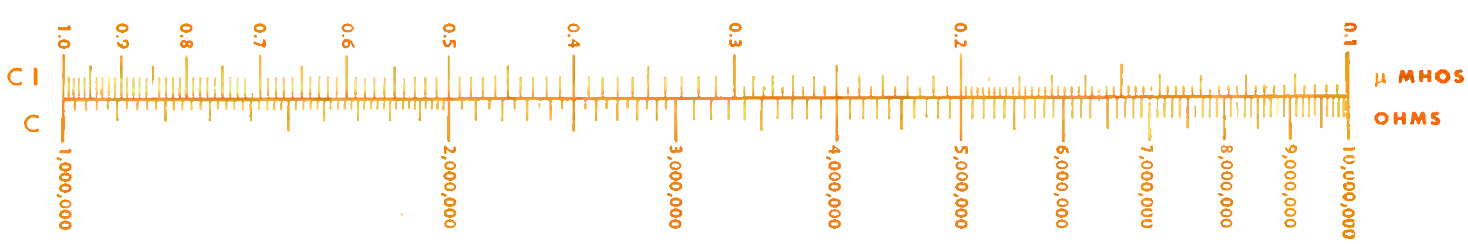


MHOS
200 μμH
300 μμH
400 μμH
500 μμH
600 μμH
700 μμH
800 μμH
900 μμH
1000 μμH
1.0 μf
0.9 μf
0.8 μf
0.7 μf
0.6 μf
0.5 μf
0.4 μf
0.3 μf
0.2 μf
20 μμH
30 μμH
40 μμH
50 μμH
60 μμH
70 μμH
80 μμH
90 μμH
100 μμH
10 mc
20 mc
30 mc
40 mc
50 mc
60 mc
70 mc
80 mc
90 mc
100 mc
0.1 μf
0.09 μf
0.08 μf
0.07 μf
0.06 μf
0.05 μf
0.04 μf
0.03 μf
0.02 μf
CI
C
MHOS
OHMS
A
D
SQUARE
SQUARE ROOT

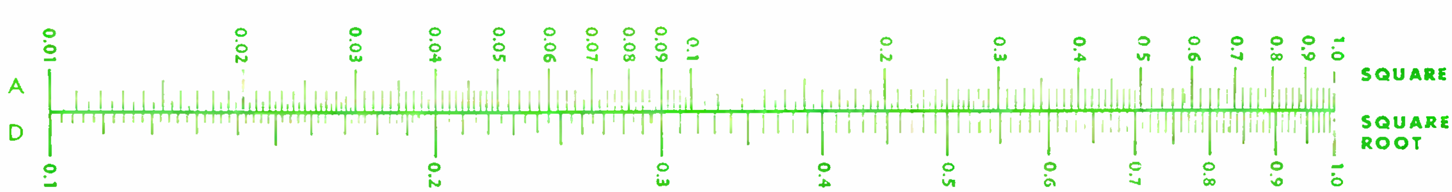
PLATE 136



μ MHOS
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.001 μμf
0.0009 μμf
0.0008 μμf
0.0007 μμf
0.0006 μμf
0.0005 μμf
0.0004 μμf
0.0003 μμf
0.0002 μμf
0.002 H
0.003 H
0.004 H
0.005 H
0.006 H
0.007 H
0.008 H
0.009 H
0.01 H
0.0002 H
0.0003 H
0.0004
0.0005 H
0.0006 H
0.0007 H
0.0008 H
0.0009 H
0.001 H
100 mc
200 mc
300 mc
400 mc
500 mc
600 mc
700 mc
800 mc
900 mc
1000 mc
0.0001 μμf
0.00009 μμf
0.00008 μμf
0.00007 μμf
0.00006 μμf
0.00005 μμf
0.00004 μμf
0.00003 μμf
0.00002 μμf

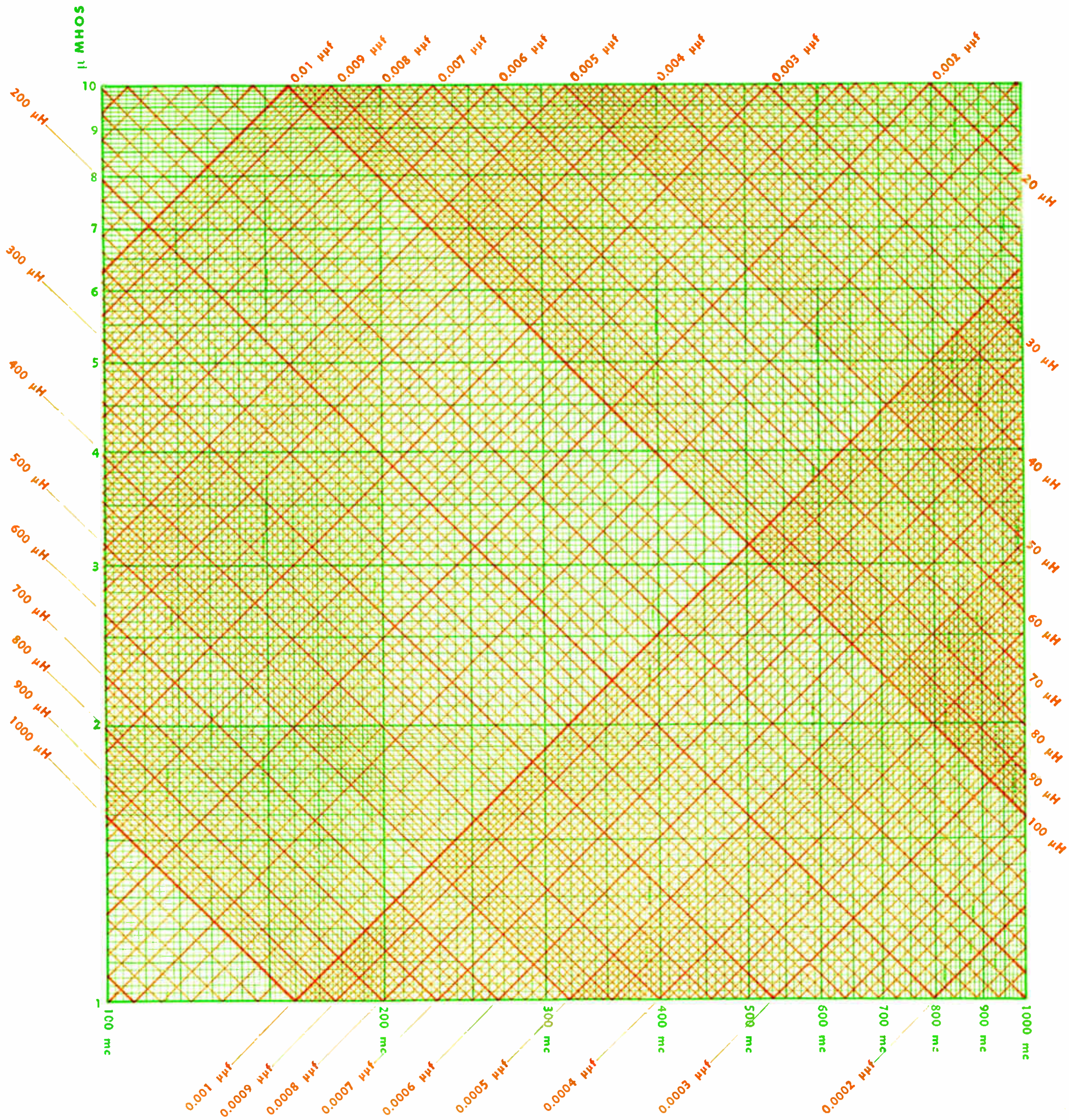


CI
C
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
μ MHOS
OHMS
1,000,000
2,000,000
3,000,000
4,000,000
5,000,000
6,000,000
7,000,000
8,000,000
9,000,000
10,000,000



A
D
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
SQUARE
SQUARE ROOT
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0

PLATE 137


µ MHOS
0.01 µµf
0.009 µµf
0.008 µµf
0.007 µµf
0.006 µµf
0.005 µµf
0.004 µµf
0.003 µµf
0.002 µµf
200 µH
300 µH
400 µH
500 µH
600 µH
700 µH
800 µH
900 µH
1000 µH
20 µH
30 µH
40 µH
50 µH
60 µH
70 µH
80 µH
90 µH
100 µH
100 mc
200 mc
300 mc
400 mc
500 mc
600 mc
700 mc
800 mc
900 mc
1000 mc
0.001 µµf
0.0009 µµf
0.0008 µµf
0.0007 µµf
0.0006 µµf
0.0005 µµf
0.0004 µµf
0.0003 µµf
0.0002 µµf

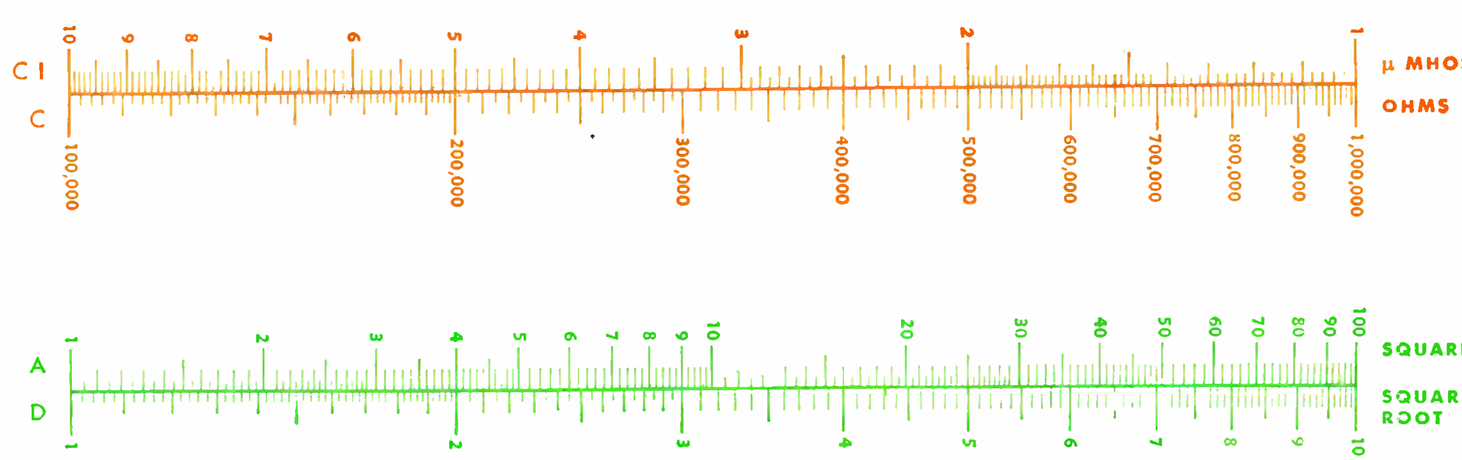
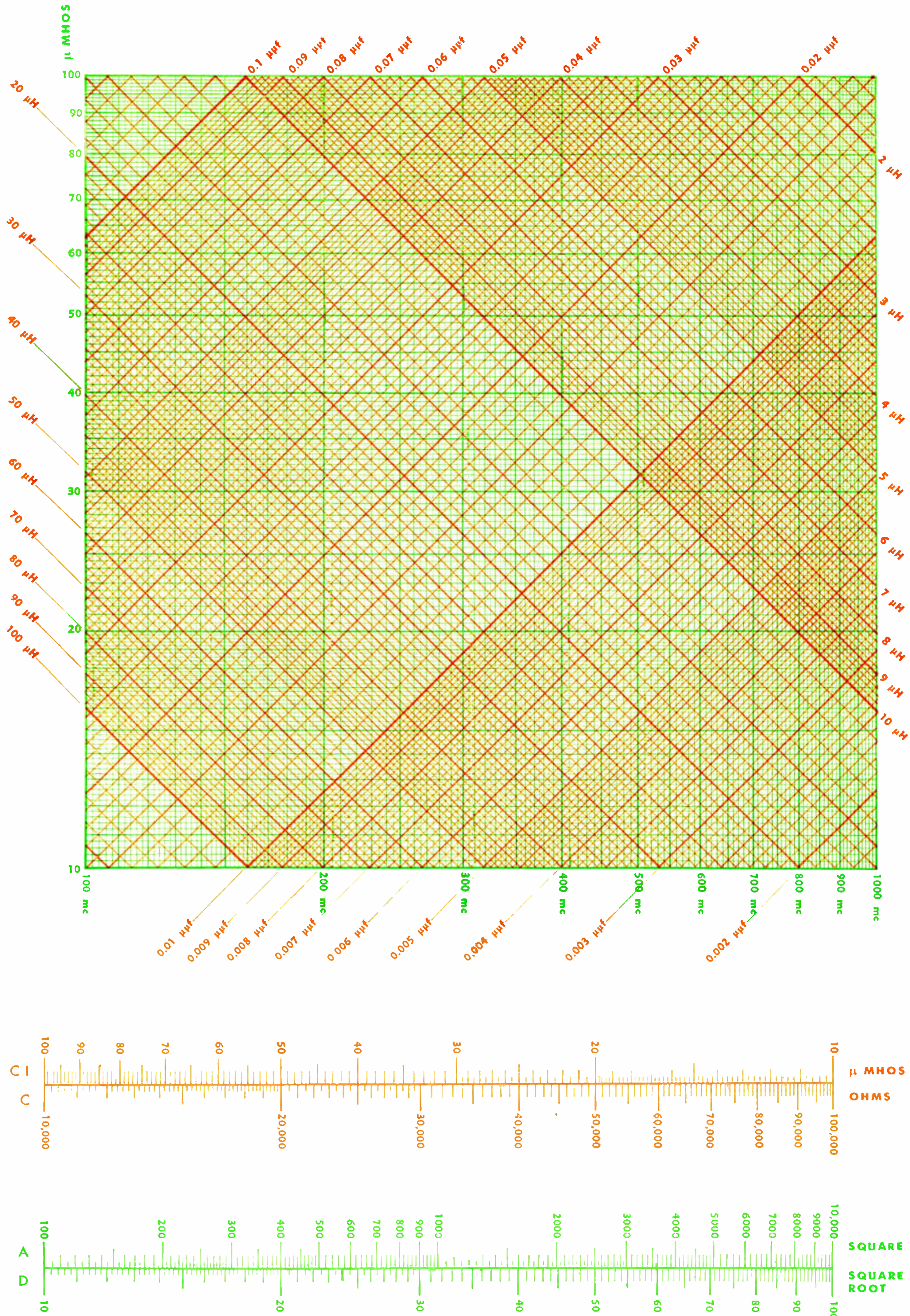

CI
C
µ MHOS
OHMS
A
D
SQUARE
SQUARE ROOT

PLATE 138



μ MHOS
100
90
80
70
60
50
40
30
20
10
0.1 μμf
0.09 μμf
0.08 μμf
0.07 μμf
0.06 μμf
0.05 μμf
0.04 μμf
0.03 μμf
0.02 μμf
20 μH
30 μH
40 μH
50 μH
60 μH
70 μH
80 μH
90 μH
100 μH
2 μH
3 μH
4 μH
5 μH
6 μH
7 μH
8 μH
9 μH
10 μH
100 mc
200 mc
300 mc
400 mc
500 mc
600 mc
700 mc
800 mc
900 mc
1000 mc
0.01 μμf
0.009 μμf
0.008 μμf
0.007 μμf
0.006 μμf
0.005 μμf
0.004 μμf
0.003 μμf
0.002 μμf
CI
C
μ MHOS
OHMS
100 90 80 70 60 50 40 30 20 10
10,000 20,000 30,000 40,000 50,000 60,000 70,000 80,000 90,000 100,000
A
D
SQUARE
SQUARE ROOT
100 200 300 400 500 600 700 800 900 1000 2000 3000 4000 5000 6000 7000 8000 9000 10,000
10 20 30 40 50 60 70 80 90 100

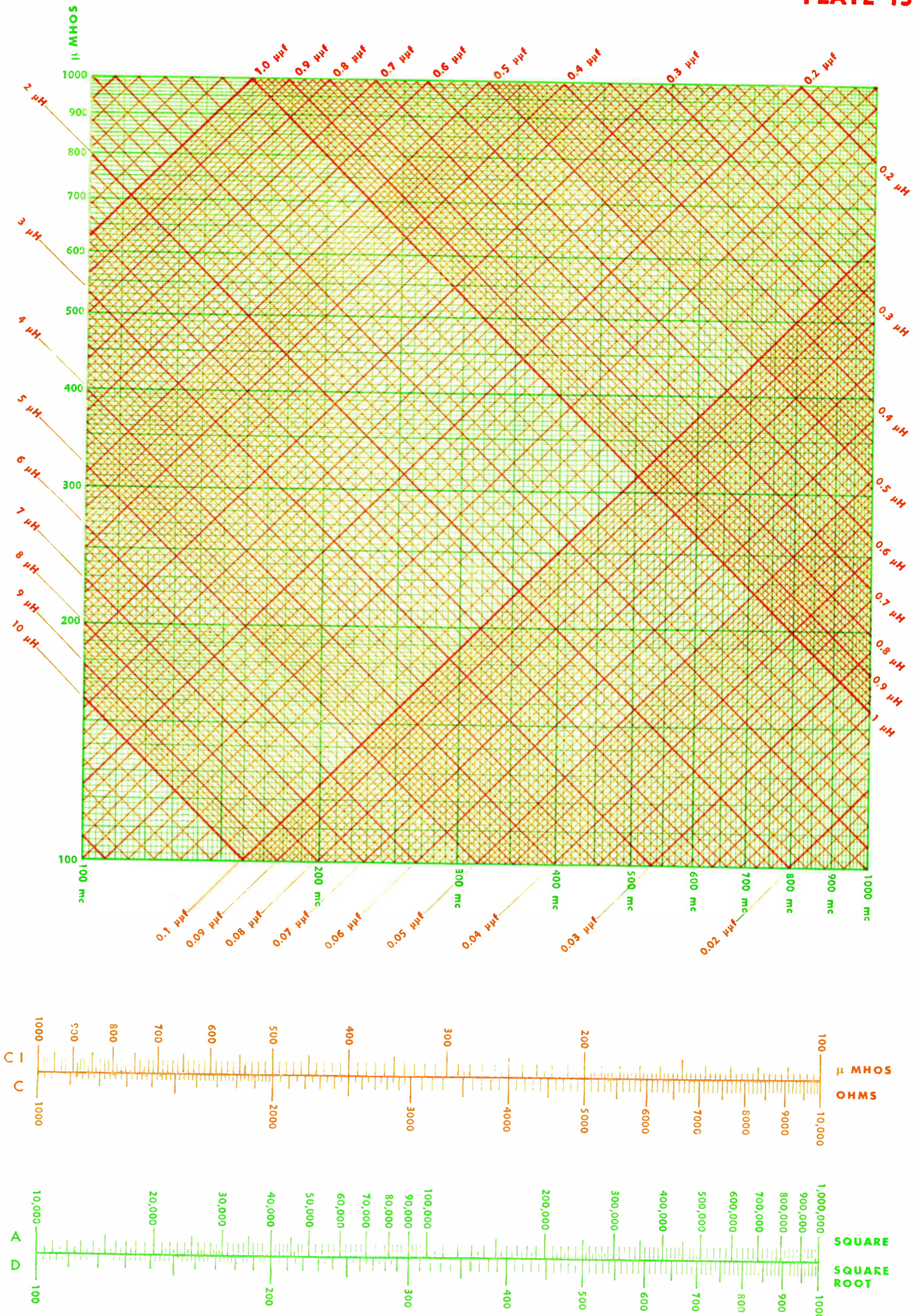
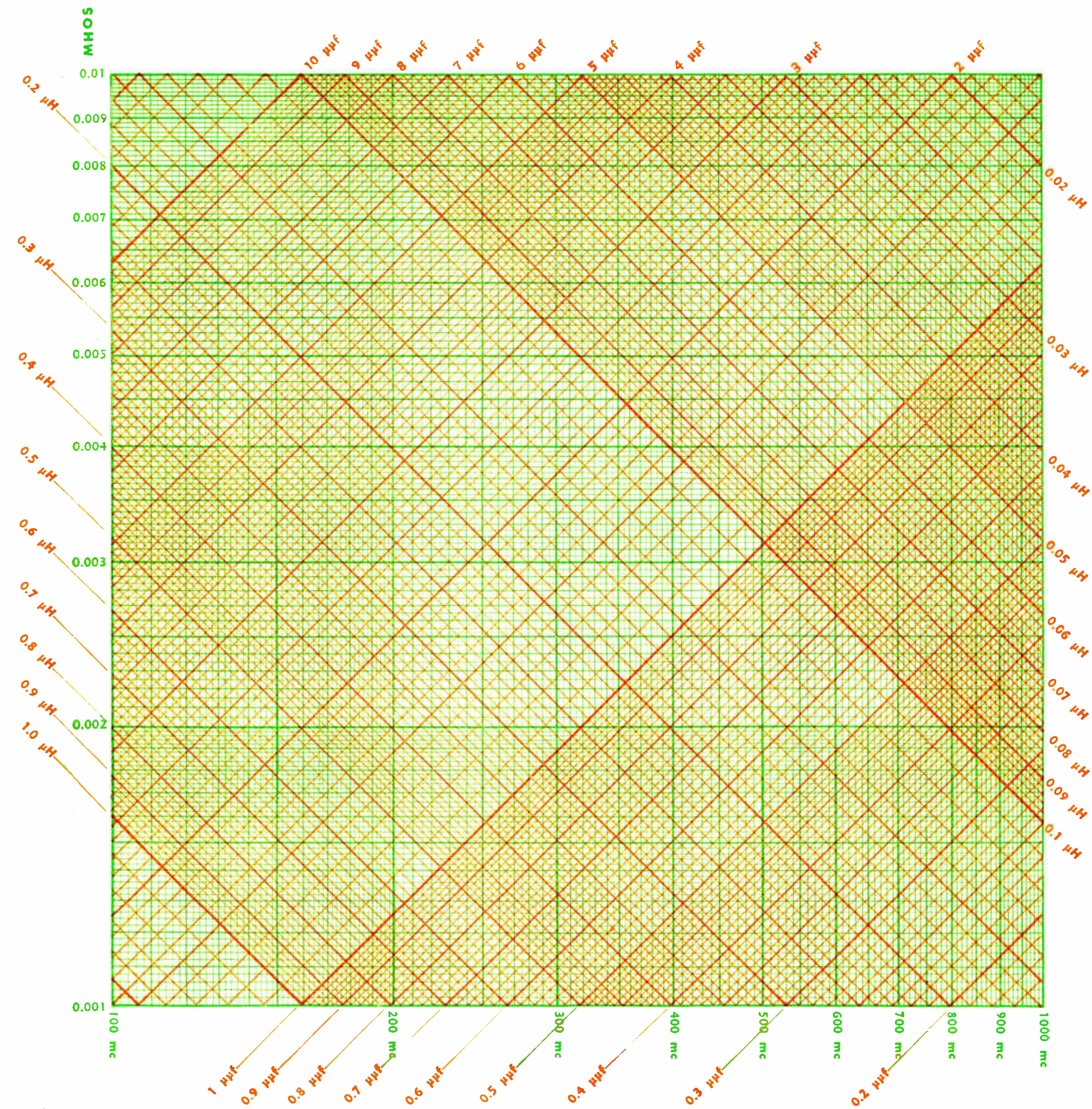
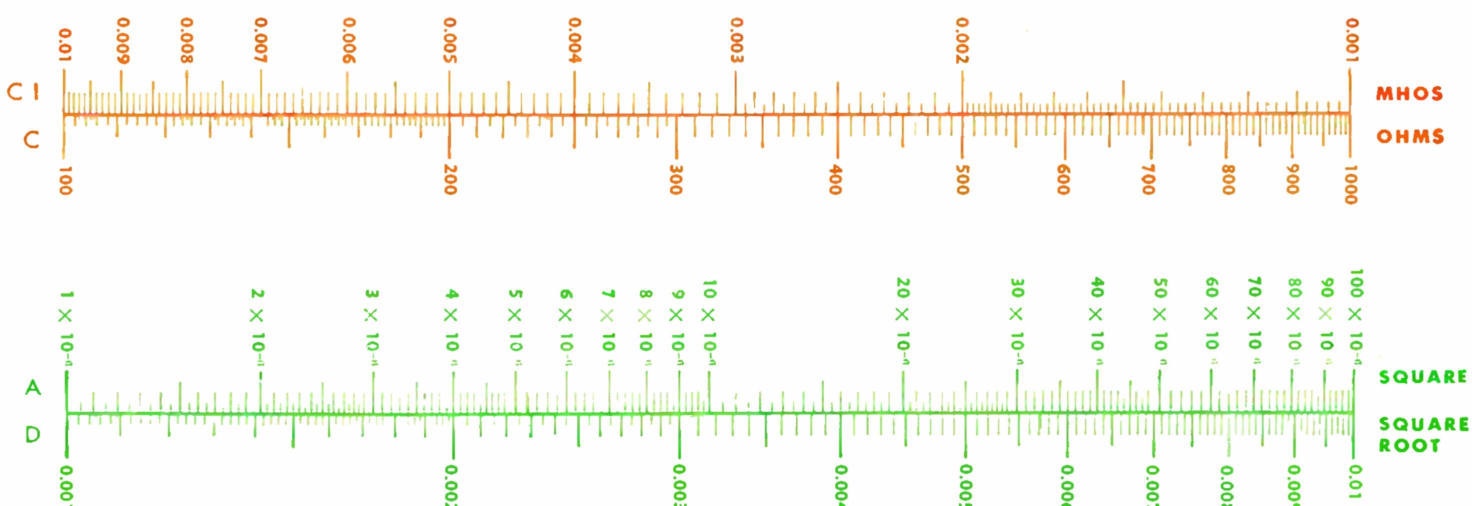
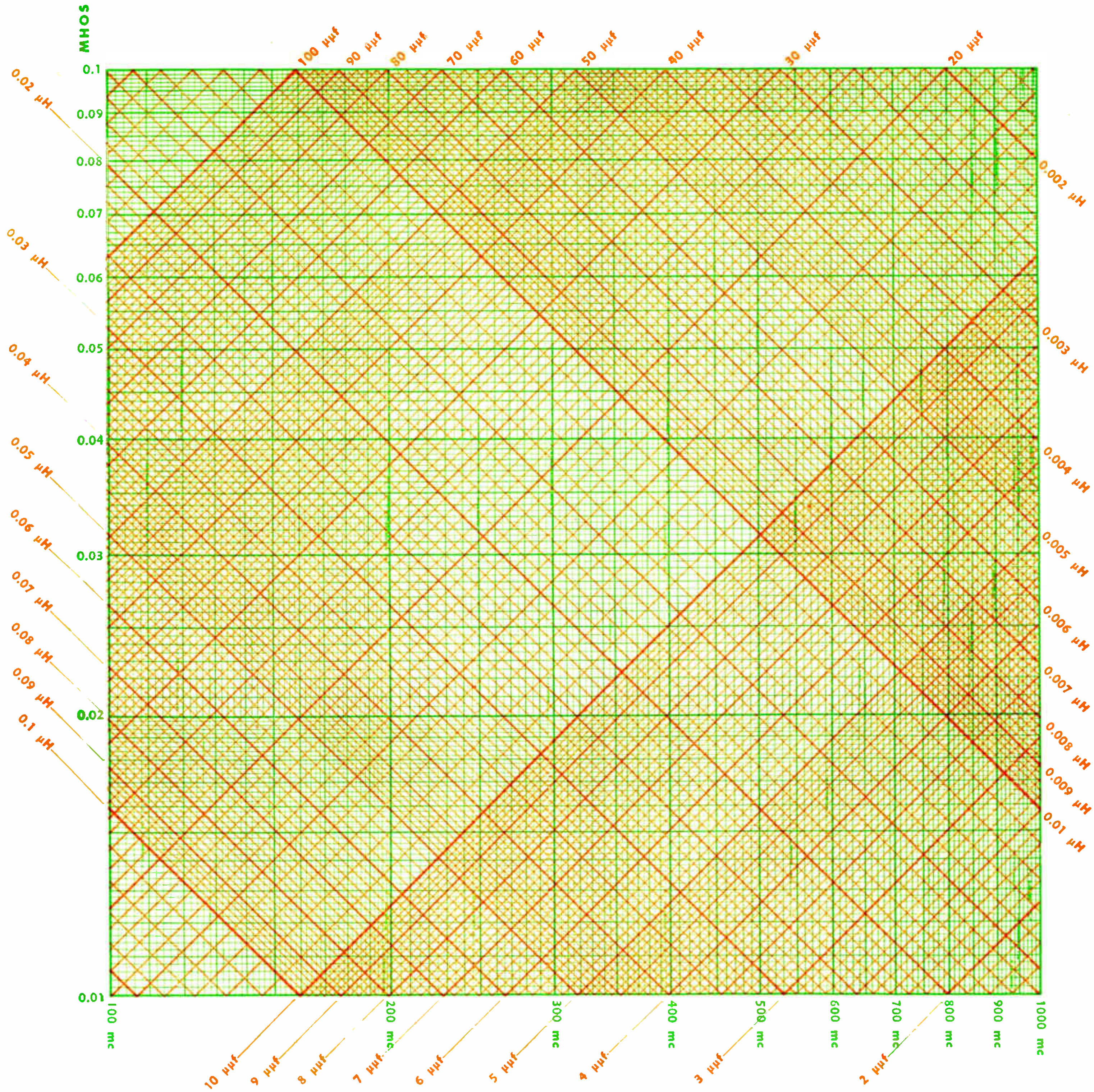
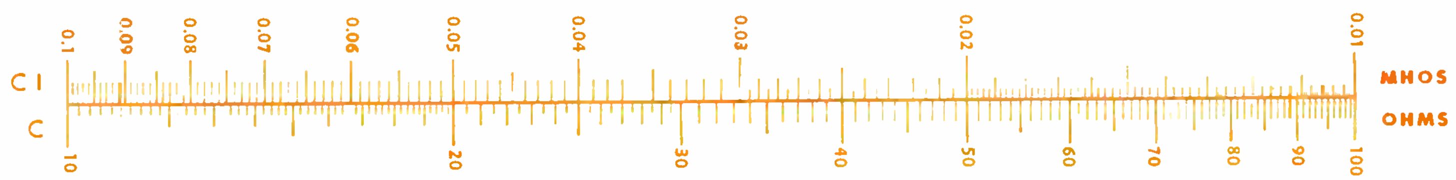

μ MHOS
1000
900
800
700
600
500
400
300
200
100
1.0 μμf
0.9 μμf
0.8 μμf
0.7 μμf
0.6 μμf
0.5 μμf
0.4 μμf
0.3 μμf
0.2 μμf
2 μH
3 μH
4 μH
5 μH
6 μH
7 μH
8 μH
9 μH
10 μH
0.2 μH
0.3 μH
0.4 μH
0.5 μH
0.6 μH
0.7 μH
0.8 μH
0.9 μH
1 μH
100 mc
200 mc
300 mc
400 mc
500 mc
600 mc
700 mc
800 mc
900 mc
1000 mc
0.1 μμf
0.09 μμf
0.08 μμf
0.07 μμf
0.06 μμf
0.05 μμf
0.04 μμf
0.03 μμf
0.02 μμf
CI
C
1000
800
700
600
500
400
300
200
100
μ MHOS
OHMS
1000
2000
3000
4000
5000
6000
7000
8000
9000
10,000
A
D
10,000
20,000
30,000
40,000
50,000
60,000
70,000
80,000
90,000
100,000
200,000
300,000
400,000
500,000
600,000
700,000
800,000
900,000
1,000,000
SQUARE
SQUARE ROOT
100
200
300
400
500
600
700
800
900
1000

PLATE 140


MHOS
0.01
0.009
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
10 μμf
9 μμf
8 μμf
7 μμf
6 μμf
5 μμf
4 μμf
3 μμf
2 μμf
0.2 μH
0.3 μH
0.4 μH
0.5 μH
0.6 μH
0.7 μH
0.8 μH
0.9 μH
1.0 μH
0.02 μH
0.03 μH
0.04 μH
0.05 μH
0.06 μH
0.07 μH
0.08 μH
0.09 μH
0.1 μH
100 mc
200 mc
300 mc
400 mc
500 mc
600 mc
700 mc
800 mc
900 mc
1000 mc
1 μμf
0.9 μμf
0.8 μμf
0.7 μμf
0.6 μμf
0.5 μμf
0.4 μμf
0.3 μμf
0.2 μμf


CI
C
0.01
0.009
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
MHOS
OHMS
100
200
300
400
500
600
700
800
900
1000
A
D
1 × 10⁻⁶
2 × 10⁻⁶
3 × 10⁻⁶
4 × 10⁻⁶
5 × 10⁻⁶
6 × 10⁻⁶
7 × 10⁻⁶
8 × 10⁻⁶
9 × 10⁻⁶
10 × 10⁻⁶
20 × 10⁻⁶
30 × 10⁻⁶
40 × 10⁻⁶
50 × 10⁻⁶
60 × 10⁻⁶
70 × 10⁻⁶
80 × 10⁻⁶
90 × 10⁻⁶
100 × 10⁻⁶
SQUARE
SQUARE ROOT
0.001
0.002
0.003
0.004
0.005
0.006
0.007
0.008
0.009
0.01


MHOS
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
100 μμf
90 μμf
80 μμf
70 μμf
60 μμf
50 μμf
40 μμf
30 μμf
20 μμf
0.02 μH
0.03 μH
0.04 μH
0.05 μH
0.06 μH
0.07 μH
0.08 μH
0.09 μH
0.1 μH
0.002 μH
0.003 μH
0.004 μH
0.005 μH
0.006 μH
0.007 μH
0.008 μH
0.009 μH
0.01 μH
100 mc
200 mc
300 mc
400 mc
500 mc
600 mc
700 mc
800 mc
900 mc
1000 mc
10 μμf
9 μμf
8 μμf
7 μμf
6 μμf
5 μμf
4 μμf
3 μμf
2 μμf


CI
C
MHOS
OHMS
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
10
20
30
40
50
60
70
80
90
100

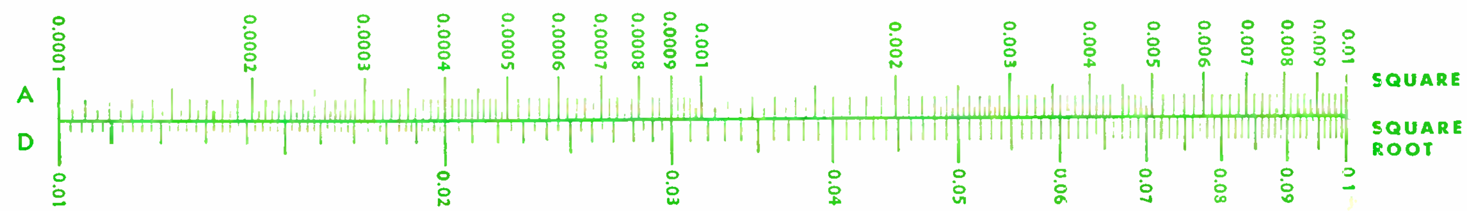
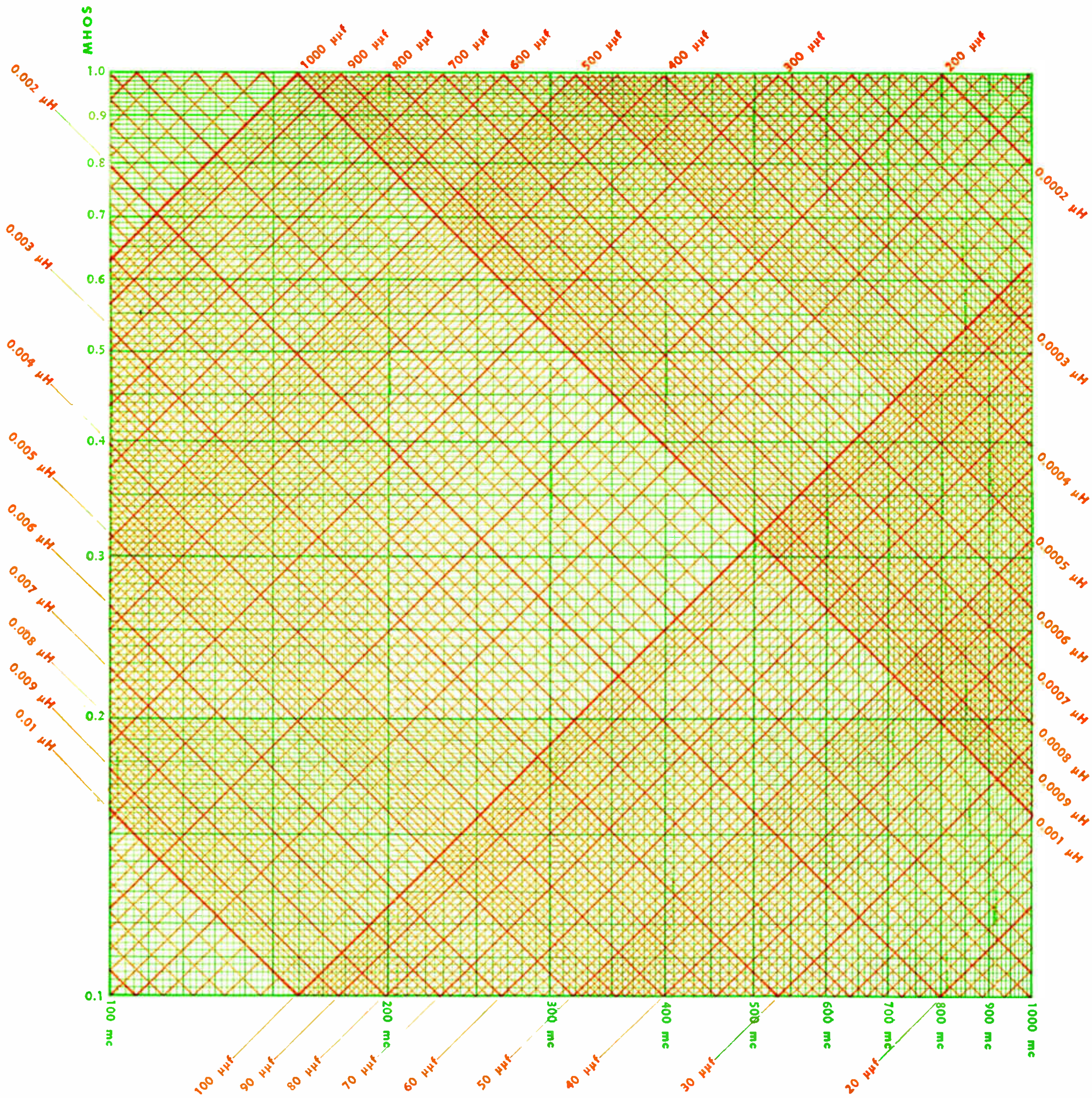
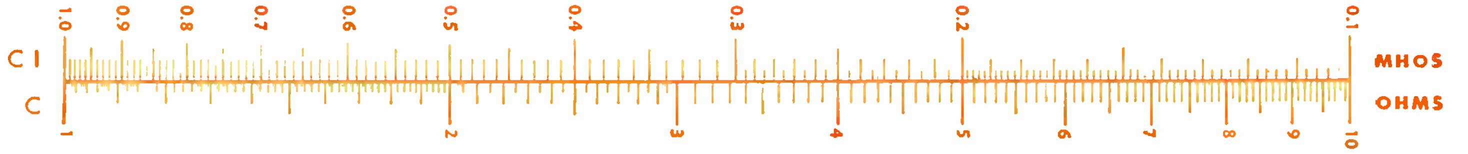

A
D
SQUARE
SQUARE ROOT
0.0001
0.0002
0.0003
0.0004
0.0005
0.0006
0.0007
0.0008
0.0009
0.001
0.002
0.003
0.004
0.005
0.006
0.007
0.008
0.009
0.01
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.1

PLATE 142


MHOS
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
1000 μμf
900 μμf
800 μμf
700 μμf
600 μμf
500 μμf
400 μμf
300 μμf
200 μμf
0.002 μH
0.003 μH
0.004 μH
0.005 μH
0.006 μH
0.007 μH
0.008 μH
0.009 μH
0.01 μH
0.0002 μH
0.0003 μH
0.0004 μH
0.0005 μH
0.0006 μH
0.0007 μH
0.0008 μH
0.0009 μH
0.001 μH
100 mc
200 mc
300 mc
400 mc
500 mc
600 mc
700 mc
800 mc
900 mc
1000 mc
100 μμf
90 μμf
80 μμf
70 μμf
60 μμf
50 μμf
40 μμf
30 μμf
20 μμf


CI
C
1.0 0.9 0.8 0.7 0.6 0.5 0.4 0.3 0.2 0.1
MHOS
1 2 3 4 5 6 7 8 9 10
OHMS

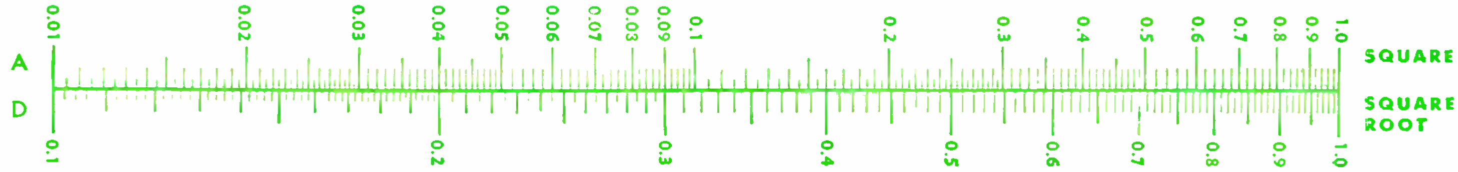
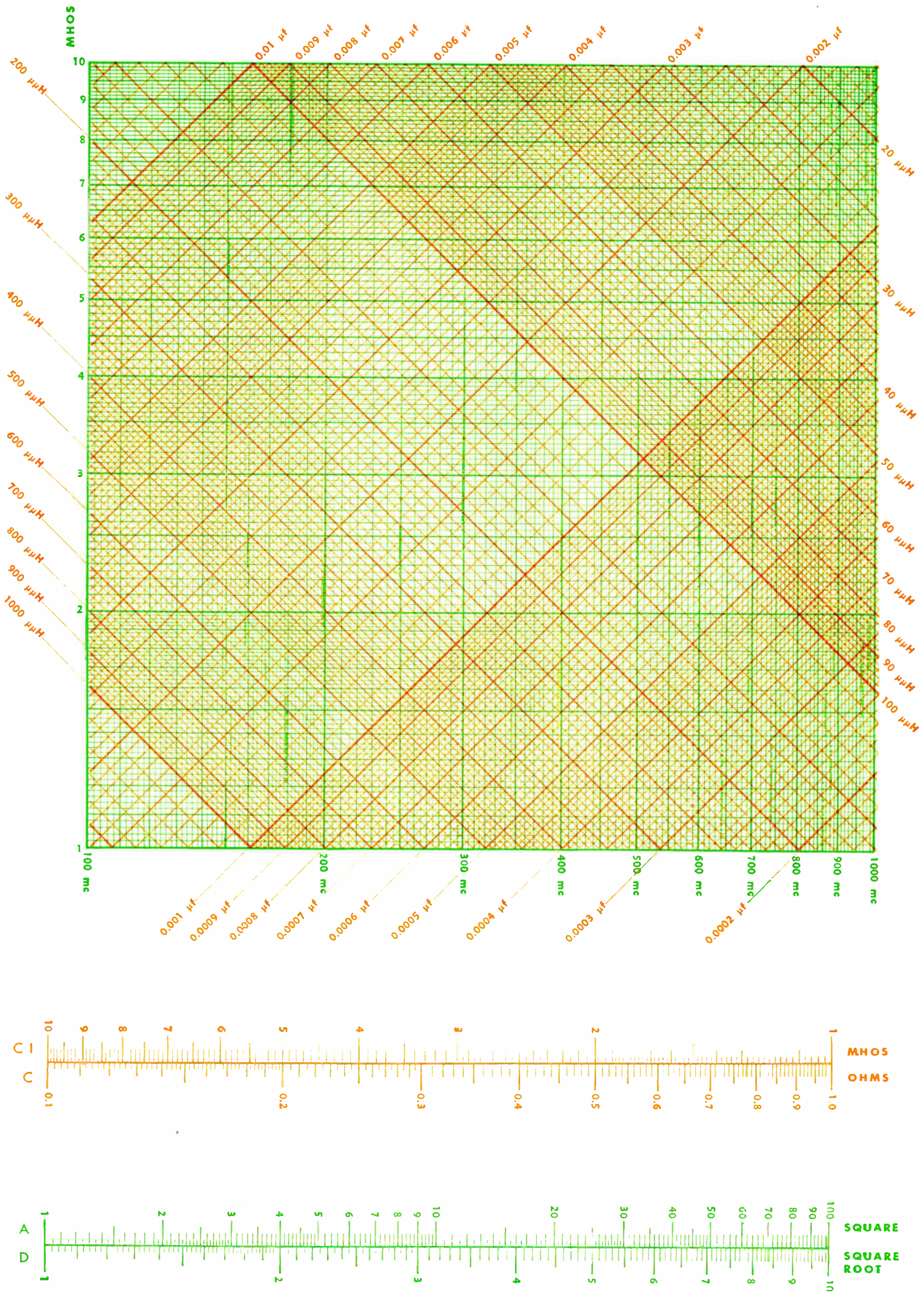
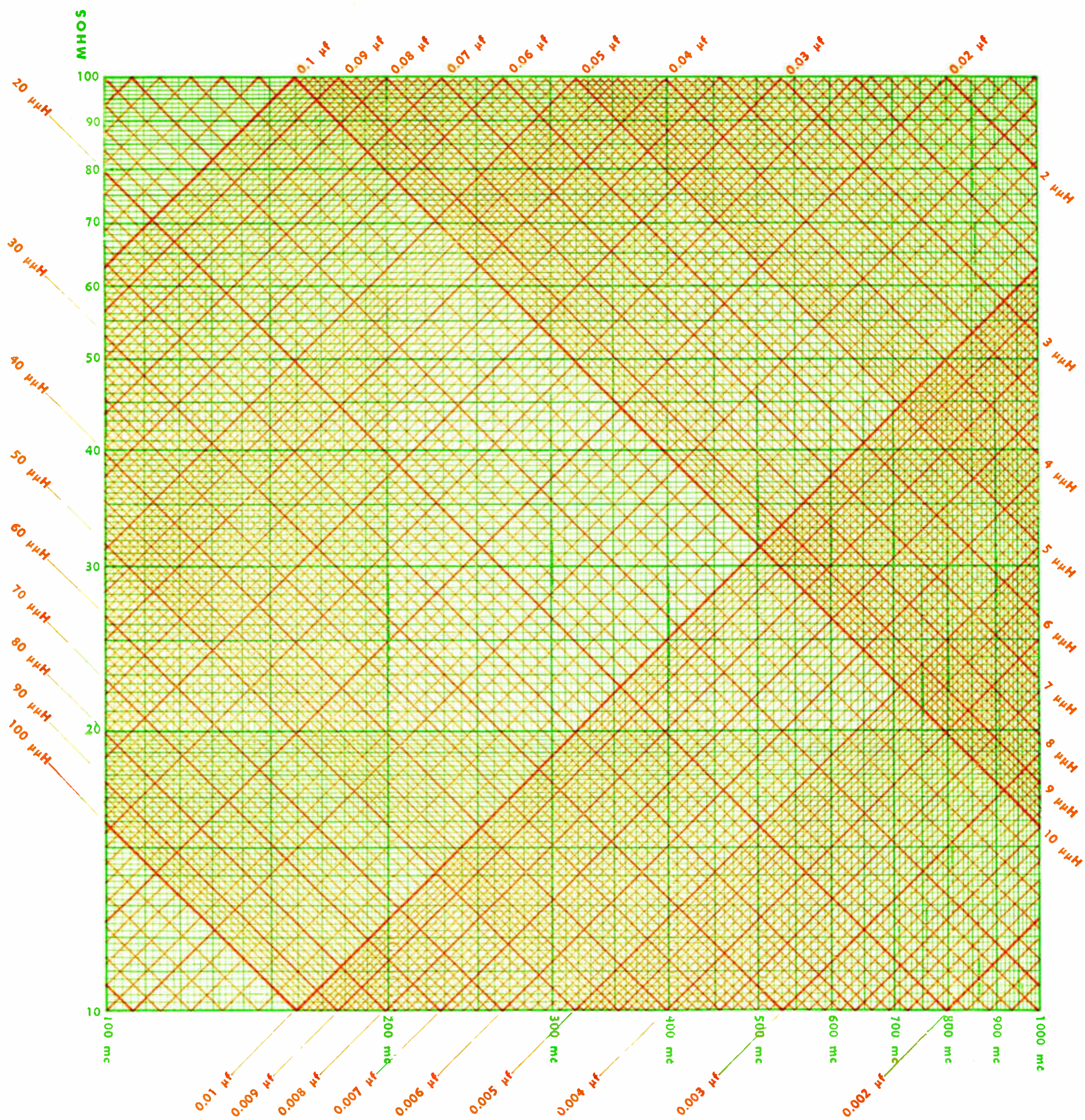

A
D
0.01 0.02 0.03 0.04 0.05 0.06 0.07 0.08 0.09 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
SQUARE
0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
SQUARE ROOT

PLATE 143

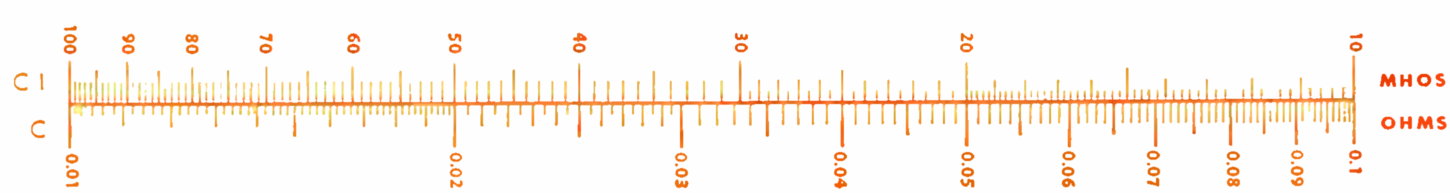


MHOS
10
9
8
7
6
5
4
3
2
1
200 μμH
300 μμH
400 μμH
500 μμH
600 μμH
700 μμH
800 μμH
900 μμH
1000 μμH
20 μμH
30 μμH
40 μμH
50 μμH
60 μμH
70 μμH
80 μμH
90 μμH
100 μμH
0.01 μf
0.009 μf
0.008 μf
0.007 μf
0.006 μf
0.005 μf
0.004 μf
0.003 μf
0.002 μf
0.001 μf
0.0009 μf
0.0008 μf
0.0007 μf
0.0006 μf
0.0005 μf
0.0004 μf
0.0003 μf
0.0002 μf
100 mc
200 mc
300 mc
400 mc
500 mc
600 mc
700 mc
800 mc
900 mc
1000 mc
CI
C
MHOS
OHMS
10 9 8 7 6 5 4 3 2 1
0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
A
D
SQUARE
SQUARE ROOT
1 2 3 4 5 6 7 8 9 10 20 30 40 50 60 70 80 90 100
1 2 3 4 5 6 7 8 9 10

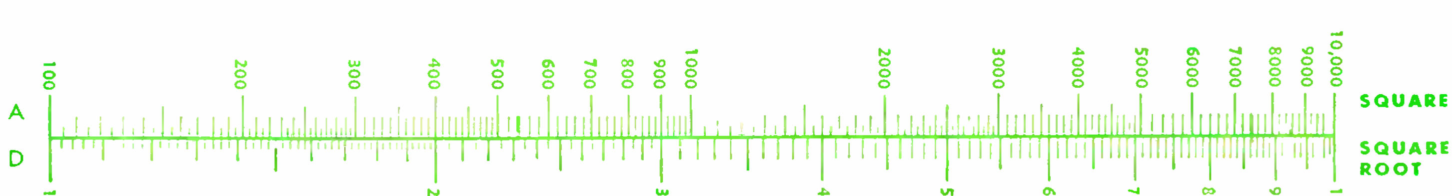
PLATE 144



MHOS
100
90
80
70
60
50
40
30
20
10
0.1 µf
0.09 µf
0.08 µf
0.07 µf
0.06 µf
0.05 µf
0.04 µf
0.03 µf
0.02 µf
20 µµH
30 µµH
40 µµH
50 µµH
60 µµH
70 µµH
80 µµH
90 µµH
100 µµH
2 µµH
3 µµH
4 µµH
5 µµH
6 µµH
7 µµH
8 µµH
9 µµH
10 µµH
100 mc
200 mc
300 mc
400 mc
500 mc
600 mc
700 mc
800 mc
900 mc
1000 mc
0.01 µf
0.009 µf
0.008 µf
0.007 µf
0.006 µf
0.005 µf
0.004 µf
0.003 µf
0.002 µf



CI
C
100
90
80
70
60
50
40
30
20
10
MHOS
OHMS
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.1



A
D
100
200
300
400
500
600
700
800
900
1000
2000
3000
4000
5000
6000
7000
8000
9000
10,000
SQUARE
SQUARE ROOT
10
20
30
40
50
60
70
80
90
100

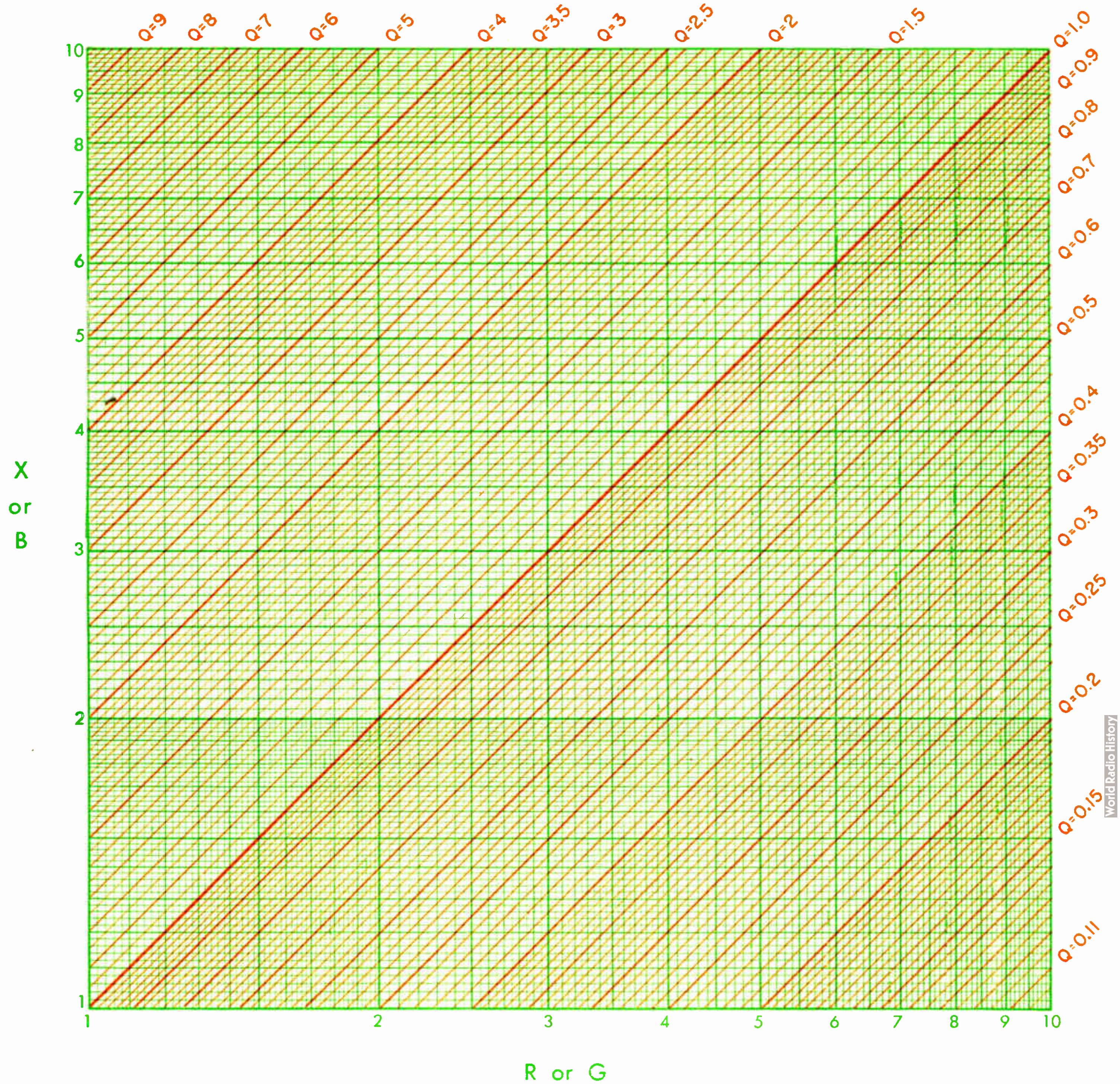
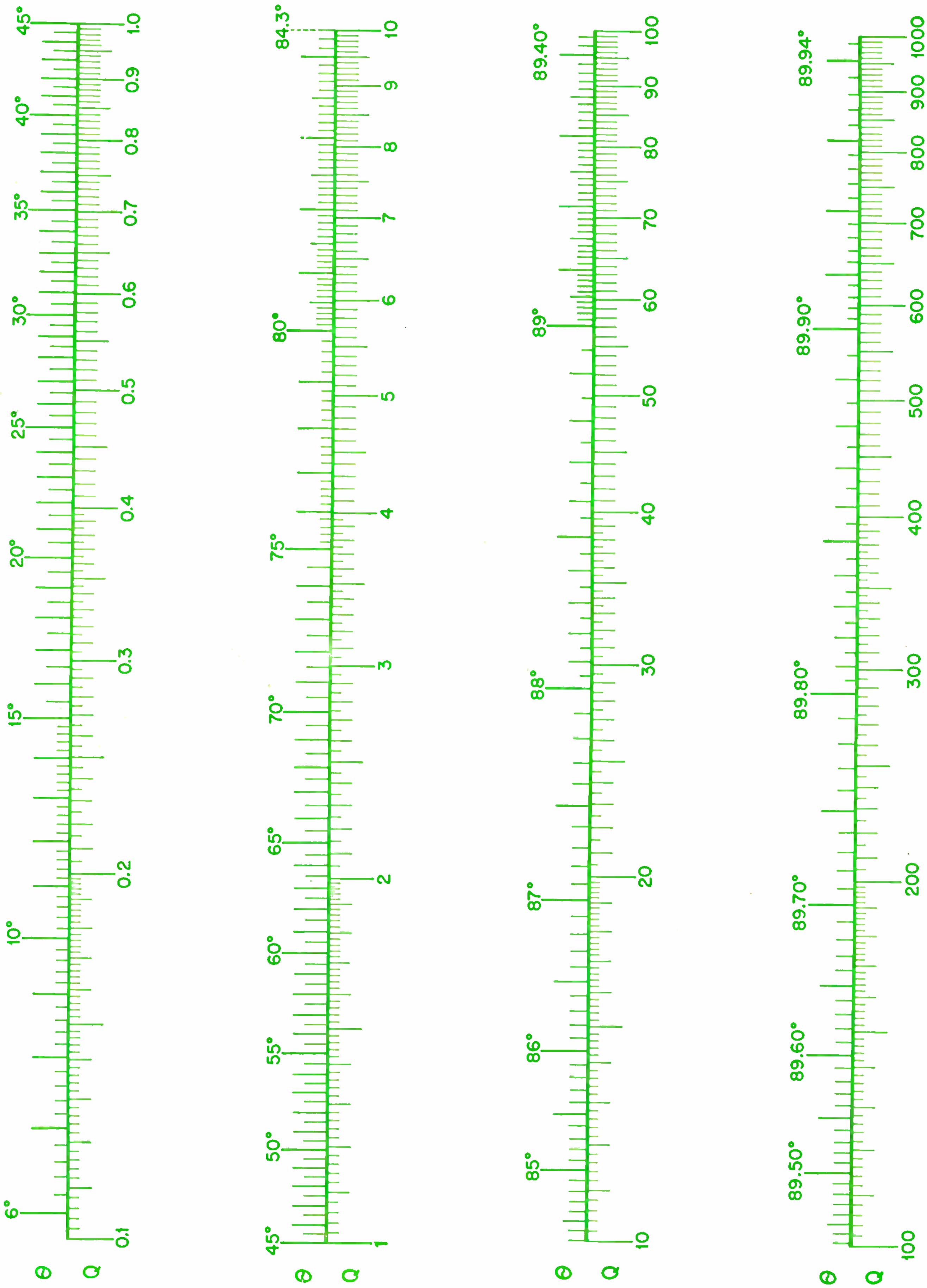

Q=9
Q=8
Q=7
Q=6
Q=5
Q=4
Q=3.5
Q=3
Q=2.5
Q=2
Q=1.5
Q=1.0
Q=0.9
Q=0.8
Q=0.7
Q=0.6
Q=0.5
Q=0.4
Q=0.35
Q=0.3
Q=0.25
Q=0.2
Q=0.15
Q=0.11
X or B
R or G
1
2
3
4
5
6
7
8
9
10

PLATE 146


θ Q
6° 10° 15° 20° 25° 30° 35° 40° 45°
0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
45° 50° 55° 60° 65° 70° 75° 80° 84.3°
1 2 3 4 5 6 7 8 9 10
85° 86° 87° 88° 89° 89.40°
10 20 30 40 50 60 70 80 90 100
89.50° 89.60° 89.70° 89.80° 89.90° 89.94°
100 200 300 400 500 600 700 800 900 1000