MIXED PROBLEMS

1. 143×0.387
2. 168×0.324
3. $18.9 \times 132 \times 0.0481$
4. $22.9 \times 116 \times 0.524$
5. $832 \div 6.41$
6. $716 \div 8.32$
7. $\dfrac{643 \times 8.12}{5.19}$
8. $\dfrac{469 \times 757}{5.13}$
9. $\dfrac{9 \times 3.2}{7}$
10. $\dfrac{11 \times 6.8}{5}$
11. $1 \div 3.43$
12. $1 \div 2.78$
13. 29.8×4.87
14. 68.3×2.91
15. $79.1 \times 3.62 \times 5.55$
16. $93.2 \times 22.1 \times 0.625$
17. $16.35 \div 8.02$
18. $14.62 \div 7.03$
19. $\dfrac{11.95 \times 9.12}{3.40}$
20. $\dfrac{16.28 \times 5.37}{4.60}$
21. $\dfrac{2.81 \times 8.11}{6.02}$
22. $\dfrac{3.74 \times 8.81}{7.08}$
23. $.0642 \times 80.6$
24. 0.0824×60.3

ANSWERS

1. 55.3	**2.** 54.4	**3.** 120
4. 1391	**5.** 130	**6.** 86.1
7. 1006.	**8.** 691	**9.** 4.12
10. 14.96	**11.** 0.292	**12.** 0.360
13. 145	**14.** 198.8	**15.** 1589
16. 1287	**17.** 2.04	**18.** 2.080
19. 32.1	**20.** 19.00	**21.** 3.79
22. 4.65	**23.** 5.17	**24.** 4.97

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FORM M-18

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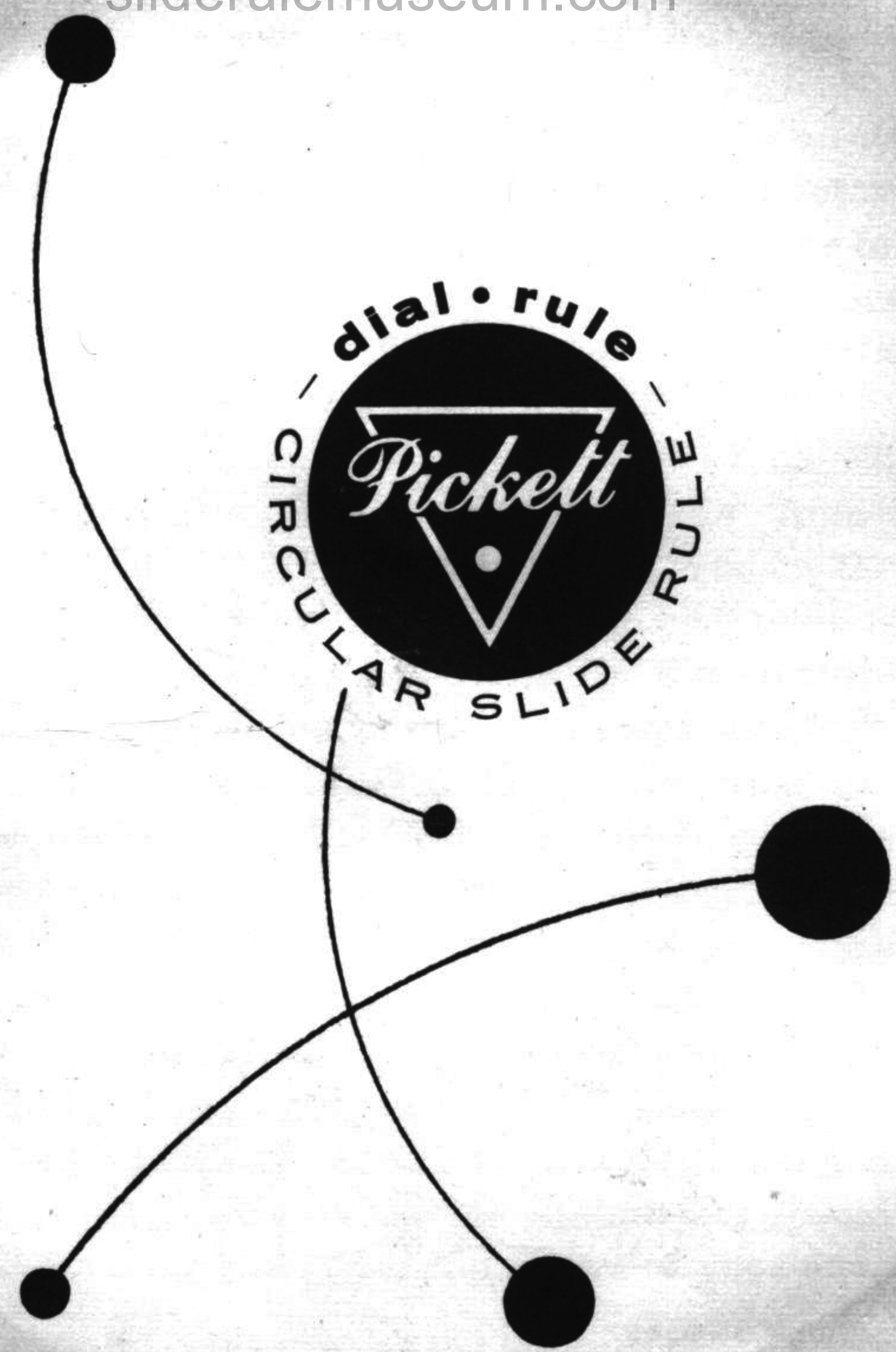

YOUR MODEL NO. 101-C INSTRUCTION MANUAL

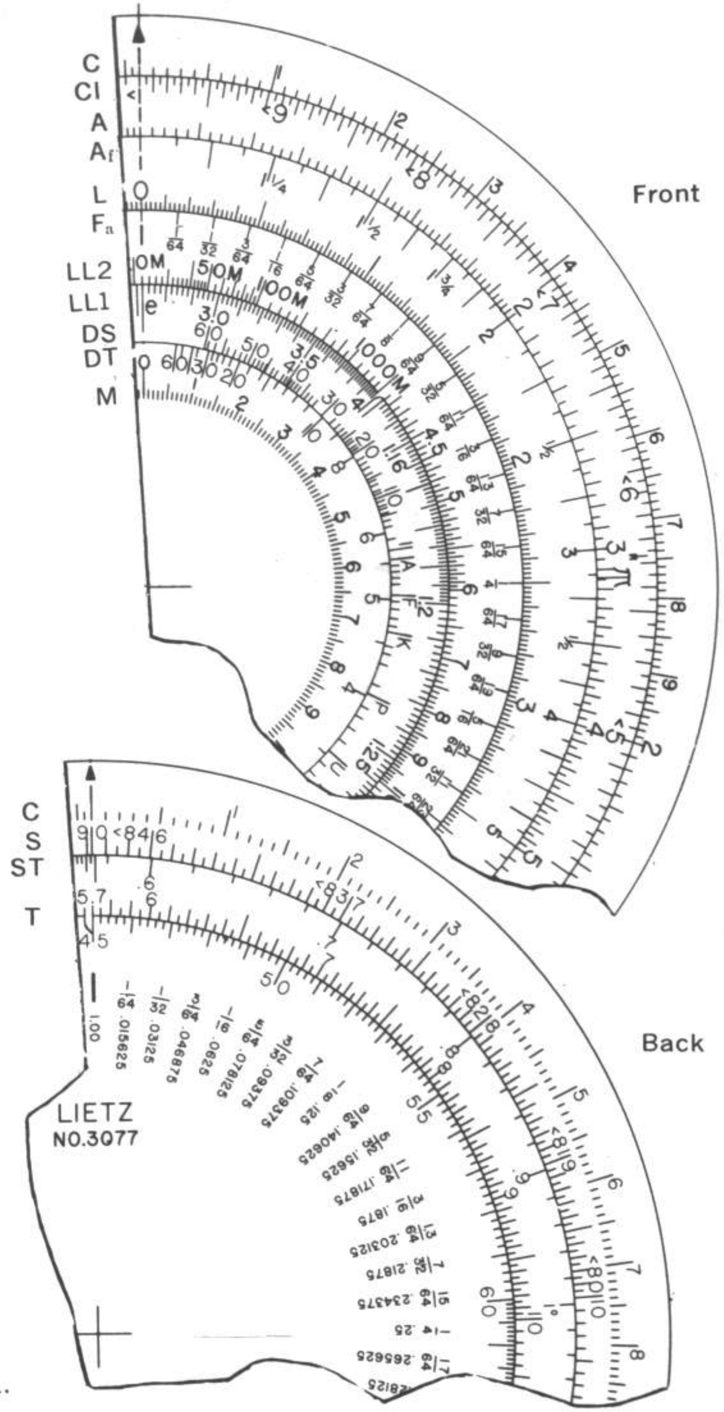

Fig. 1.

INTRODUCTION

The circular slide rule can be used to make many different kinds of calculations. It consists of a set of *scales* arranged in concentric circles, and of one or more movable *indicators*. Hairlines on the indicators are used to help read the scales and to transfer a length of scale from one place to another.

For convenience in discussion each scale is named by a letter. The outer-most scale on the "front" face is a logarithmic "C" scale. It is read in the clockwise direction. Below and adjacent to it is another "C" scale which is read in the opposite direction. This scale is called "C-inverse" or "CI". The names of the other scales on the front are shown in Figure 1. The scales on the back will be described later.

The indicator which is closest to the face of the rule will be called the lower, or "L" indicator. The indicator that is mounted above L, and turns with it, will be called the upper or "U" indicator.

This manual will tell how to read the scales and how to use them. To become skillful you should work the examples given and others of your own.

READING THE C AND THE CI SCALES

The C scale is made by separating the circle into 9 parts. The marks or "graduations" have large numerals (1, 2, 3, etc.) near them. These numerals and their marks are used to locate the first digit (from the left) of any number. To locate 259, look first for the large 2. Set the hairline of L over the graduation mark.

The spaces between the large numerals are separated into 10 parts. The graduation marks are used to locate the second digit of any number. For 25, find the fifth long mark that is on around the circle from the 2.

The spaces are again divided into smaller parts, but there is not room to show the numerals. Until you get to the large 2, there are 10 parts. Between the large 2 and 4, there are only 5 subdivisions, so each mark counts as 2. Thus, to locate 359, find the 4th short mark beyond 35. You are now at 358. Halfway between it and the next mark is the setting for 359 (see Figure 2).

Beyond 4 there are only 2 subdivisions, so each counts as 5. There is a short mark for 755 between 75 and 76. Thus 753 is about three-fifths of the way between the mark for 750 and the mark for 755.

The CI scale is read like the C scale but in the opposite direction. Study the readings shown in Figure 2.

In reading or setting numbers on these scales, the decimal point is ignored. For example, 259, and 2.59, and 0.259, and 0.0259 are all set in the same way.

Numbers located on the C scale are reciprocals of the opposite reading on the CI scale, and conversely. For example, 2 on C is opposite ½, or 0.5, on CI.

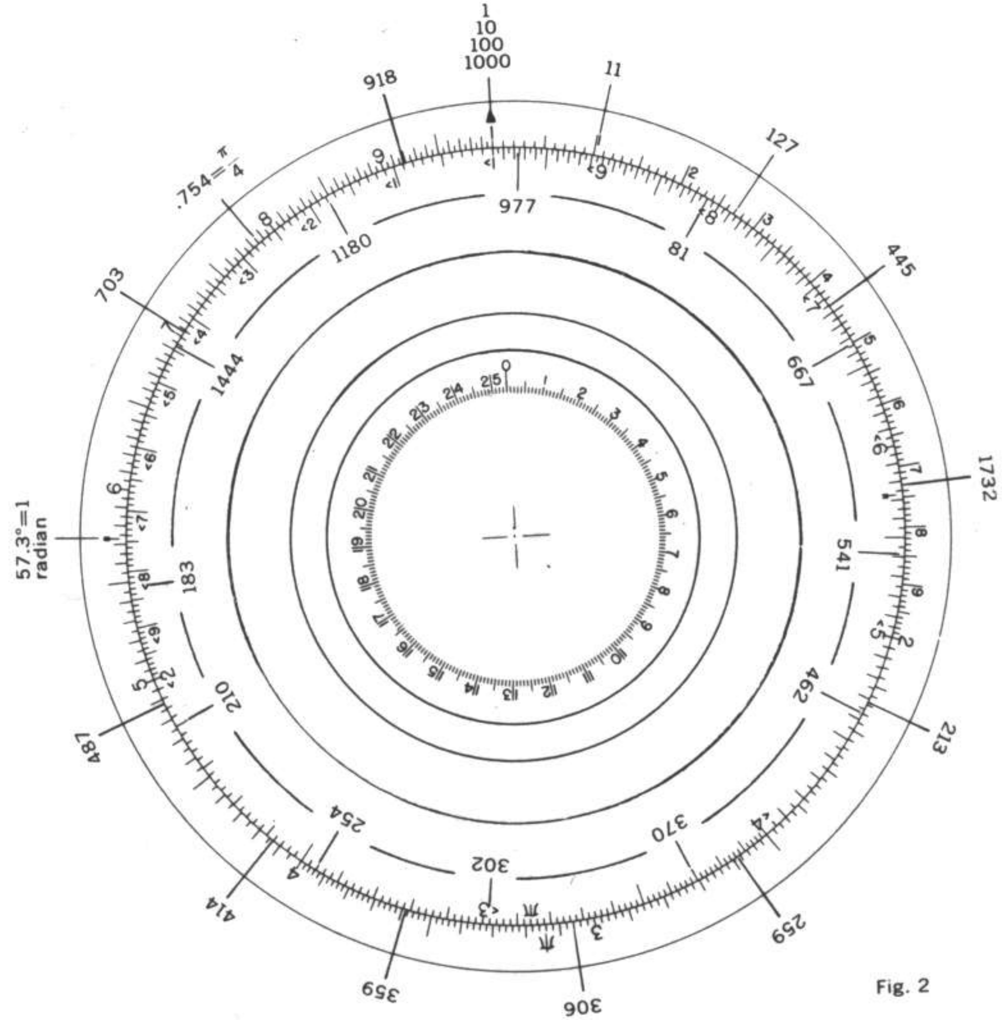

Fig. 2

Similarly, 8 on C is opposite 0.125 on CI. In the same way, 25 on CI is opposite 0.4 on C. Also, 0.6 on CI is opposite 1.667 on C. In each case the product of the two members of the opposite pair is 1. This relation is useful in simplifying computations.

MULTIPLICATION

Multiplication may be done by using only the C scale. For example, to multiply 2 × 3, set L over 2 and U over 1. Move L until U is over 3. Under the hairline of L read 6. The general rule follows.

***Rule:* To find the product *P* of any two numbers *a* and *b*, set L over *a* and U over 1. Move L until U is over *b*, and read the product *P* under L.** This rule may be shown in chart form as follows:

L	a	P
U	1	b

Another way to do the example is:

L	1	b
U	a	P

In these charts notice the proportions $\frac{a}{1}=\frac{P}{b}$ and $\frac{1}{a}=\frac{b}{P}$ may be seen. From these it follows that $P=a\times b$.

- Examples:

(a) Find 14 × 23. Set L over 14 and U over 1. Move L until U is over 23. Under L read 322.

(b) Find 36 × 19. Set L over 1, and U over 36. Move L over 19 and read 684 under U.

The decimal point in the answer may be found by estimating. In the example 14 × 23, think "10 × 23 would be 230. The answer will be in the hundreds. It must be 322, not 32.2 or 3220." In the example 36 × 19, think "this is about 36 × 20, which would be 720. Hence the answer is 684."

Multiplication can also be done by using the C and CI scales. For 2 × 3, set L over 2 and U over 1 on C. Set L over 3 on CI and read product on CI under U. Shown in chart form this is:

	C	CI
L	2	3
U	1	6

The chart for the general case is:

	C	CI
L	a	b
U	1	P

- Examples:

(a) Find 1.96 × 45.2. Set L over 1.96 on C and U over 1. Move L over 45.2 on CI and read 88.6 under U on CI. Think: 1.96 is near 2, and 2 × 45 = 90, so the answer is 88.6.

(b) Find 714 × 84.7. Set as in chart:

	C	CI
L	714	847
U	1	P

The product is near 700 × 80 or 56,000. It is 60,500.

DIVISION

Division may be done using only the C scale. For example, to find the quotient $Q=6\div3$, set L over 6 on C, and U over 3. Move L until U is over 1, and read the answer 2 under L. This is the reverse of the multiplication process. The general rule follows.

***Rule:* To find the quotient $Q=a\div b$ of any two numbers, set L over a on the C scale, and U over b. Move L until U is over 1, and read the quotient under L.**

The chart for this rule is:

L	a	Q
U	b	1

Thus

L	6	Q
U	3	1

In these charts notice the proportions $\frac{a}{b}=\frac{Q}{1}$ and $\frac{6}{3}=\frac{Q}{1}$.

- **Examples:**

(a) Find $83 \div 7$. Set L over 83 on C, and U over 7. Move L until U is over 1 and under L read 11.86.

(b) Find $75 \div 92$. Set L over 75 on C, and U over 92. Move L until U is over 1 and under L read 0.815. To locate the decimal point, notice that the answer must be near 7/9, or more nearly, 8/10, and in decimal form this is 0.8.

Division can also be done by using the C and CI scales. For $6\div3$, set L over 6 and U over 3 on C. Move L to 1, and under U read 2 on CI. This example and the general case are shown in charts below.

	C	CI
L	6	1
U	3	Q

	C	CI
L	a	1
U	b	Q

- **Examples:**

(a) Find $63.4 \div 3.29$. Set L over 63.4 on C, and U over 3.29. Move L to 1, and under U read 19.27 on CI. The decimal point is found by noting that the answer must be near $60 \div 3$, or 20.

(b) Find $26.4 \div 47.7$. Set L over 264 on C, and U over 477. Move L to 1, and under U read 553 on CI. The decimal point must be at the left, since 26 is about half, or 0.5, of 48. Answer, 0.553.

There is another way to use the CI scale in division. If the CI scale is used first, the settings are as in the charts below.

	CI	C
L	6	1
U	3	Q

	CI	C
L	a	1
U	b	Q

- **Example:**

Find $137 \div 513$. Set L over 137 on CI, and U over 513 on CI. Move L to 1, and under L read 267 on C. The answer must be somewhere near ¼, so it must be 0.267.

COMBINED OPERATIONS

The C scale can be used to do combined multiplication and division as in the example $(6 \div 3) \times 4$, or $\frac{6 \times 4}{3}$. To see how to do this let us combine the first chart shown above for division (page 8) with the first method for multiplication (page 6). Only the C scale needs to be used.

The two charts are shown below, first separately, then combined.

L	6	2
U	3	1

with

L	2	8
U	1	4

becomes

L	6	answer
U	3	4

Therefore, set L over 6 on C, and U over 3. Move L until U is over 4, and read the answer 8 under L. You can see that the intermediate setting of U to 1 and the reading of 2 on L can be omitted. The general case is shown below.

$$\frac{a \times b}{c}$$

L	a	answer
U	c	b

• Examples:

(a) Find (42 × 37) ÷ 65, or $\frac{42 \times 37}{65}$. Set L over 42 and U over 65. Move L so U is over 37, and read the answer, except for the decimal point, as 239 under L. Note that 42÷65 is about ⅔, and two-thirds of 37 is about 24. Therefore the answer must be 23.9.

(b) Find $\frac{5.17 \times 1.25 \times 9.33}{4.3 \times 6.77}$. Set L over 517, and U over 43. Move L until U is at 125. Move U, leaving L fixed, so U is over 677. Move L until U is over 933. Under L read 207. By using rounded numbers the decimal point may be found and the answer then is 2.07.

Continued multiplication, such as 2 × 3 × 4, can be done several ways. Thus, set L over 2 on C and U over 1. Move L so U is over 3, then keeping L fixed,

move U back to 1. Now move L so U is over 4, and read the answer 24 under L. The chart is shown below.

L	2	6		answer
U	1	3	1	4

Another method uses the CI scale. Set L over 2 on C, and set U over 3 on CI. Move L so U is over 4. Under L read 24. The chart:

L	2	answer
U	3 on CI	4

• Examples:

(a) Find 2.9 × 3.4 × 7.5. Set L over 29 on C, and U over 34 on CI. Move L until U is over 75 on C. Read answer as 739, except for the decimal point, under L on C. The result is near 3 × 3 × 8, or 72, so it must be 73.9.

(b) Find 17.3 × 43 × 9.2. Set L over 173 on C, and U over 43 on CI. Move L until U is over 92 on C. Read the answer as 684, except for the decimal point, on C under L. Round off to 20 × 40 × 10, which gives 8000, so the answer is 6,840.

Note. A set of examples of various types, together with their answers, is given at the end of this booklet. It is suggested that you use them for practice now, before continuing with other scales.

THE A AND A_f SCALES: Squares and Square Roots

The A scale is similar to a C scale which has been reduced to half of its former length. Consequently, as L moves around on the A scale past 2, 3, 4, etc. the graduation mark for 10 is reached after half of a revolution. Continuing on around, the scale is repeated, but now the main divisions may be read as 20, 30, 40, etc.

The outer A scale is subdivided decimally. Thus the length between 1 and 2 is first divided into 10 parts. These are again sub-divided into 5 parts, so each of the shortest marks counts as 2. Between 2 and 5 the shortest marks count as 5. From 5 on around to 10 each short mark represents the second digit of a number set on the scale. There are no sub-divisions of these "tenths."

The inner A scale, or A_f, is subdivided by the common fraction system. Between 1 and 2 the main subdivisions are eighths. A numeral for $1\frac{2}{8}$ or $1\frac{1}{4}$ is printed, and similarly for $1\frac{4}{8}$ or $1\frac{1}{2}$ and $1\frac{6}{8}$ or $1\frac{3}{4}$. No numerals are shown at $1\frac{1}{8}$, at $1\frac{3}{8}$, or at $1\frac{5}{8}$. The shortest marks here are for sixteenths. From 2 on around to 10, the main sub-divisions are fourths. In this part of the scale the shortest marks represent eighths. Sixteenths can be set by splitting the space between the marks for the eighths. However, on continuing around the scale we see that a mark for $\frac{7}{64}$ is shown and labelled with the numeral. In this section around as far as $\frac{1}{2}$, the short marks are for 64ths. The next one after $\frac{7}{64}$ is $\frac{8}{64}$ or $\frac{1}{8}$; then comes $\frac{9}{64}$; $\frac{10}{64}$ or $\frac{5}{32}$; $\frac{11}{64}$ is not labelled, but $\frac{12}{64}$ is labelled $\frac{3}{16}$. It continues in this way to $\frac{32}{64}$, or $\frac{1}{2}$. From $\frac{1}{2}$ on around to 1, the

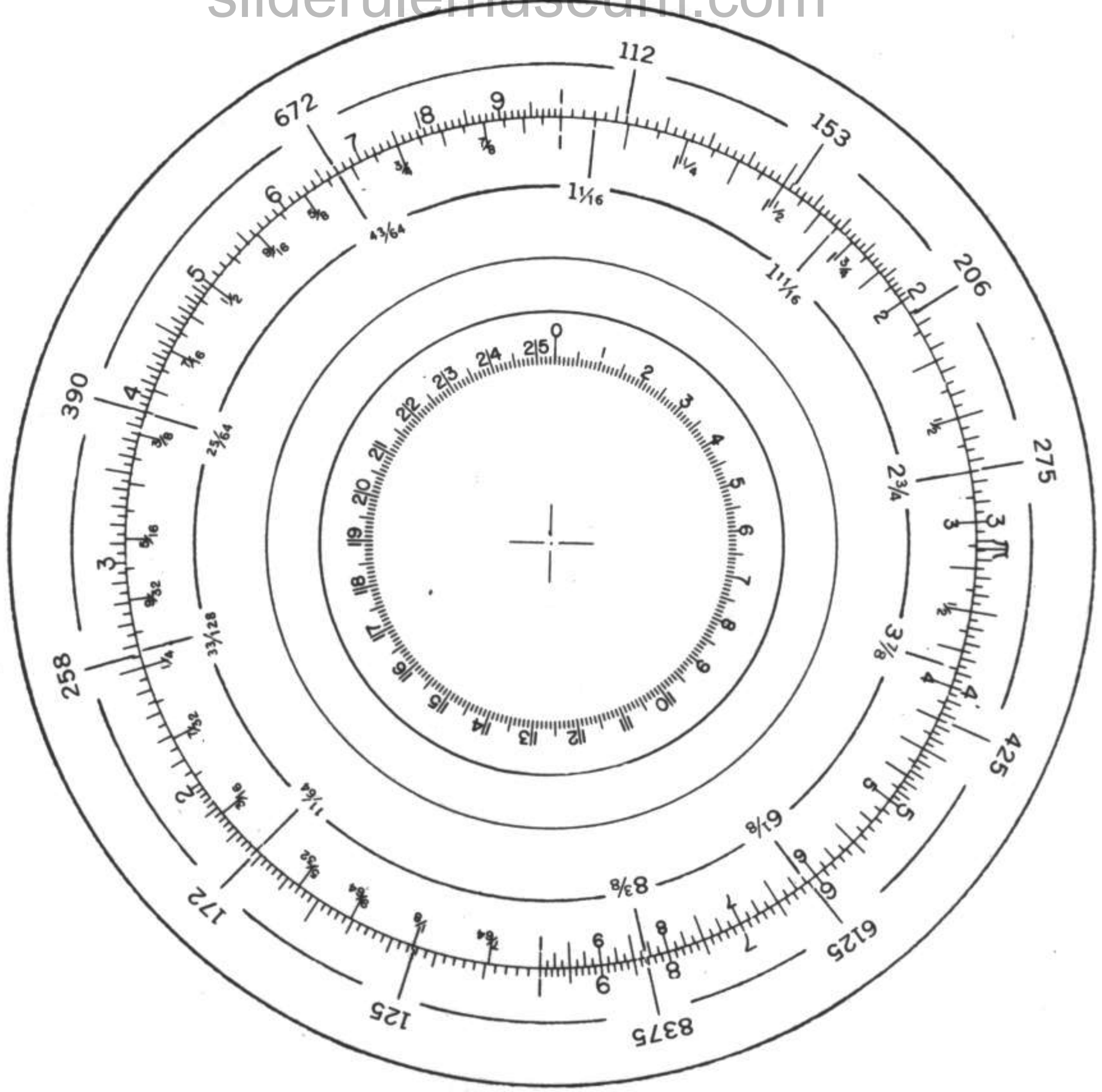

Fig. 3.

short marks are for 32nds. The first is not labelled, but the next, or $\frac{18}{32}$ is labelled $\frac{9}{16}$. You can count by 32nds on around to 1.

The main use of the A scales is to find squares and square roots.

***Rule:* When L is set over any value on the C scale, the square of that value is under L on the A scales. Conversely, when L is set over any value on the A scales, the square root of that value is under L on the C scale.**

• EXAMPLES:

(a) Find 2×2, or 2^2. Set L over 2 on C. Read 4 under L on A.

(b) Find $\sqrt{4}$. Set L over 4 on A. Read 2 under L on C.

(c) Find 4.23^2. Set L over 423 on C, read 17.9 on A.

(d) Find $\sqrt{9/32}$. Set L over 9/32 on A_f, ; read 0.053 on C.

In finding square roots, the numeral should be separated into groups of two figures, starting from the decimal point. If the first group (counting from the left) has only one digit, the first section of the A scale is used. If the first group has two figures, the second section is used. There is one figure in the square root for each group in the number.

• EXAMPLES:

(a) Find $\sqrt{84,100}$. Write 8′41′00. There is one figure in the first group, so use the first section of A. The answer is 290.

(b) Find $\sqrt{0.000094}$. Write the number 0.00′00′94. The group 94 has 2 digits. Use the second part of A. The answer is 0.0097.

If a number is set on an A scale, the reciprocal of the square root may be read on the CI scale. Also, the A scales convert common fractions to decimals (for example, 3/16 on A_f is opposite 0.1875 on A), but there is a set of such conversions on the back of the rule.

LOGARITHMS AND ADDING FRACTIONS

The mantissa of a logarithm may be found by using the L scale. Do not confuse the L *scale* with the L *indicator* in the discussion that follows. The L scale is a uniform scale; that is, the graduation marks are all the same distance apart. The main divisions are labelled 1, 2, 3, etc. The main subdivisions are tenths and give the second digit of the mantissa. The shortest subdivisions are fifths, and are counted as 2. The decimal point is always on the left of the mantissa. (See Fig. 1, page 2) The characteristic of the logarithm must be found by one of the usual methods.

***Rule:* To find the mantissa, set the L *indicator* over the number on the C scale, and read the mantissa on the L *scale*. Conversely, if the mantissa is known, set the L indicator over it on the L scale, and the number is under the hairline on the C scale.**

• EXAMPLES:

(a) Find log 2. Set L indicator over 2 on C. Read 0.301 on L scale.

(b) Given that log $n = 2.477$, find n. Set the L indicator over 477 on the L scale, read 300 on the C scale. The characteristic is 2, so the number is 300.

The F_a is a uniform scale on which the graduations represent 64ths. It is used to add fractional values shown on the scale.

***Rule:* To add any two fractions on the F_a scale, set L over one of the fractions and U over 1. Move L until U is over the other fraction, and read the sum under L.**

• EXAMPLES:

(a) Find $\frac{19}{64} + \frac{3}{8}$. Set L over $\frac{19}{64}$, and U over 1. Move L until U is over $\frac{3}{8}$. Read $\frac{43}{64}$ under L.

(b) Add $\frac{27}{32}$ and $\frac{13}{64}$. Set L over $\frac{27}{32}$ and U over 1. Move L until U is over $\frac{13}{64}$. Note the sum is more than 1. Read $1\frac{3}{64}$ under U on L.

One fraction can also be subtracted from another by reversing the above process. Thus to find $1\frac{3}{64} - \frac{13}{64}$, set L over $1\frac{3}{64}$ on F_a, and U over $\frac{13}{64}$. Move L until U is over 1. Under L read the result $\frac{27}{32}$. In the general case, the charts below show how to find $a + b$ and $a - b$.

L	a	Sum
U	1	b

L	a	Difference
U	b	1

THE LL SCALE: Powers and Roots

The LL scale is a "Log-Log" scale used to find the power of a base to any exponent, or to find any root of a number. Set the L indicator over 14 on the C scale. Then the beginning of the LL1 scale is under the hairline. This is the inner LL scale. The first graduation mark is for 1.15. The first numeral for the scale is at 1.16. Continuing on around the circle you can find numerals for 1.2, then 1.25, etc. on to 4. Now the scale continues on the *outer* circle as LL2. (See Fig. 4) You can find the numerals 4.5, then 5, 6, 7, etc., to 1000. After that the symbol 2M appears. This stands for 2,000. Continuing on thru 3M, the scale ends at 1000M, which stands for 1,000,000.

In reading the LL scale you must observe carefully how the subdivisions are put in. At the start, the main ones are for hundredths. After 1.16 they are for 1.17, 1.18, 1.19. There are other subdivisions here, so you

can set to the nearest thousandth. The decimal points are shown or can be supplied by inspection. As the scale continues, the graduations get closer together and less precision is possible. By the time you get

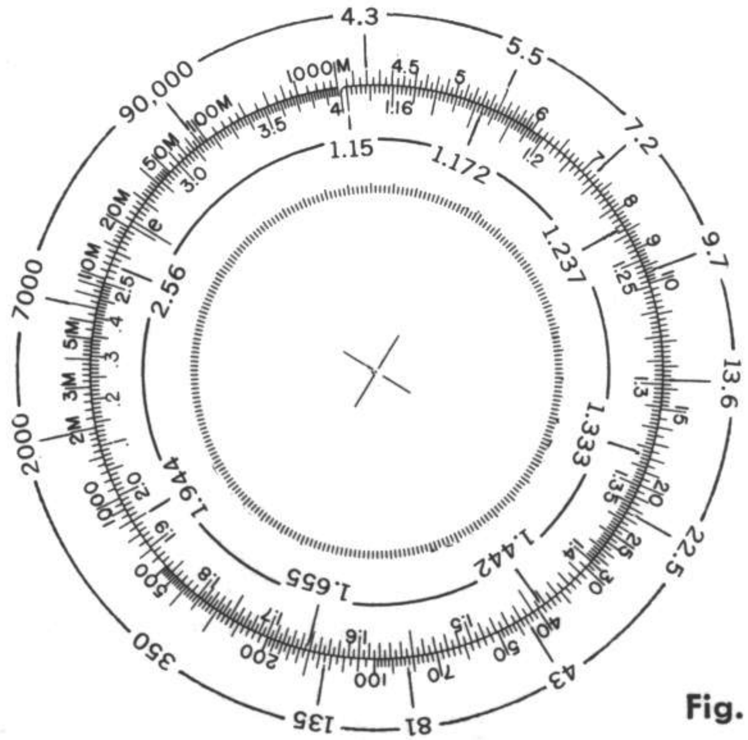

Fig. 4.

around to 2, you can still set to the hundredths, but the small marks are so close together that the next digit can only be set roughly. On the outer, or LL2 scale you can set three digits of the number till you get to 20, but after that it gets more difficult.

As a first example with the LL scale, find 2^3. Set the L indicator over the exponent 3 on the C scale, and U over 1 of the C scale. Move L until U is over 2 on LL1. Under L read 8 on LL2. The general rule and a chart for it and this example are on the next page.

***Rule:* To find a power of a number on the LL scale, set L over the exponent and U over 1 on C. Move L until U is over the base on LL, and under L read the power on LL. In symbols, find a^n.**

	C	LL
L	n	ans
U	1	a

	C	LL
L	3	ans
U	1	2

• Examples:

(a) Find $1.5^{2.4}$. Set L over 24 of C and U over 1. Move L until U is over 1.5 of LL1. Under L read 2.65 on LL1.

(b) Find $4.3^{5.21}$. Set L over 5.21 and U over 1 of C. Move L until U is over 4.3 of LL2. Read 2M or 2000 under L on LL2. It is clear from the size of the numbers that the answer is a large number on LL2, and not near 2 on LL1, which is also under the hairline of L. If, however, the problem had been to find $4.3^{0.521}$, then the answer *would* have been 2.14 on LL1. Note that 0.521 is about ½, and so the answer is roughly the square root of 4, or 2.

To find roots of numbers on the LL scale, use fractional exponents in decimal form. Thus for $\sqrt[3]{8}$, write $8^{\frac{1}{3}}$, or $8^{0.333}$. Then use the rule as given above. The problem may also be done by setting the index of the root (3 in the example) on CI, since this automatically puts L over 0.333 on C. If the base is a number which is a decimal fraction (for example, 0.125), use C and CI to find its reciprocal (1/0.125 is 8). Thus $\sqrt[3]{0.125}$ is changed to $8^{0.333}$. The result is 2. Now the reciprocal of this is found to get the answer, which is 0.5.

The logarithm of a number to base e is found by

setting the indicator over the number on the LL scale and reading the natural logarithm under the hairline on the C scale. In other words, numbers on C are exponents for e which give numbers on LL.

• Examples:

(a) Find $\log_e 2$. Set indicator over 2 on LL1. Read 0.693 on C.

(b) Find $\log_e 20$. Set indicator over 20 on LL2. Read 3 on C.

(c) If the natural logarithm of a number is 1.243, find the number. Set L over 1.243 on C. Read 3.47 on LL2.

THE DS AND DT SCALES:
Drill Sizes and Double Depth of Threads

The DS scale together with the L or F_a scale is used to find the size of a drill which is indicated by a numeral or letter. Or, if the size of the drill is known, either as a decimal fraction of an inch or as a common fraction, the number or letter of the corresponding drill may be found.

***Rule:* Set the L indicator over the number or letter of a drill on the DS scale, and read the size from the L scale or the Fraction scale F_a, and conversely.**

• Examples:

(a) For a size K drill, set L over K on DS, read 0.281″ on L and 9/32 on F_a.

(b) For a size 30 drill, set L over 30 on DS, read 0.129″ on L.

The graduations on the DT scale represent the number of threads per inch, ranging from 60 to 3.

When the L indicator is set over one of these marks, the reading on the L scale is *double* the depth of the thread that is standard for that pitch. For the range 60 to 13 threads per inch the decimal point and one zero should be on the left of the value read from the L scale. For the range 13 to 3, the decimal point should be at the left of the first digit that is read.

- EXAMPLES:

(a) For 36 threads to the inch, set L over 36 on DT. Read 0.036 on the L scale.

(b) For 10 threads to the inch, set L over 10 on DT. Read 0.130 on the L scale.

THE M SCALE: Metric Conversions

The innermost scale on the front is used for changing a measure from inches to millimeters, and conversely. Set the L indicator over 1 on the L scale. Under it read 25.4 millimeters on the M scale. Since 1 inch equals 25.4 mm., this example shows how the scales are related.

***Rule:* To convert inches to millimeters, set the L indicator over the number of inches on the L scale, and read the number of millimeters on the M scale, and conversely. Similarly, common fractions can be converted to millimeter measure by using F_a.**

- EXAMPLES:

(a) To find the number of mm. in 2.3″, set L over 23 on the L scale, and read 58 on M.

(b) How many inches are 126mm.? Set the L indicator over 126 on M, read 4.97 on the L scale. This is nearly ½″.

THE S SCALE: Trigonometric Function Values

The outer scale on the back of the slide rule is an ordinary C scale like the one on the front. The other scales on the back are used to find trigonometric function values when the size of the angle is known, or to find the angle if the trigonometric function value is known. There is only one indicator on the back.

The S scale is for sines. It begins with the angle value 5.7° which is opposite 1 of the C scale. Start with the indicator there and move it clockwise, reading numerals on the right-hand side of the marks. You go past 6°, 7°, 8°, etc. and end with 90°. The scale is subdivided for decimal fractions of a degree. As far as 20° there are marks for the tenths. From 20° to 30° each sub-division counts as 2 tenths of a degree. Beyond 30° the one short sub-division counts as 5 tenths. Beyond 80° the only sub-division is for 85°.

***Rule:* To find the value of sines of angles on the S scale, set the indicator over the angle value and read the sine function value on C, and conversely. The decimal point is at the left of the numeral read.**

- EXAMPLES:

(a) Find sin 9.6°. Set L over 9.6 on S. Read 0.167 on C.

(b) Find sin 37.2°. Set L over 37.2 on S; read 0.605 on C.

(c) Verify that sin 79° equals 0.982.

(d) If the value of the sine is 0.472, find the angle. Set L over 472 on C, and read the angle 28.2° on S.

The S scale is also used to find the cosines of angles. In this case the scale is read *counter-clockwise*, using the numerals on the left-hand side of the marks. The cosines of small angles (found near the right-hand end) are near 1. The first sub-division mark is for 5°; and the next is for 10°.

• Examples:

(a) Find cos 28.6°. Set indicator over 28.6 on S, reading counter-clockwise. Read 0.878 on C.

(b) Find cos 75°. Set indicator over 14, reading counter-clockwise. Read 0.259 on C.

(c) If the value of the cosine is 0.317, find the angle. Set indicator over 317 on C, read 71.5° on S.

THE ST SCALE: Small Angles

If the angle is between 0.57° and 5.7°, the ST scale is used. At the start the main graduations are for tenths of a degree. Then 1° is shown, and farther on 2°, 3°, etc. Between the degree marks there are subdivisions for tenths of a degree. Between the tenths are marks which are counted as 2 hundredths of a degree. When values are read from the ST scale, a zero must be placed between the decimal point and the first digit read from the C scale.

• Examples:

(a) Find sin 2°. Set indicator over 2° on ST. Read 0.0349 on C.

(b) Find sin 0.94°. Set indicator on 0.94 on ST. Read 0.0164 on C.

(c) If the sine of an angle is 0.0265, find the angle. Set indicator over 265 on C. Read 1.52° on ST.

THE T SCALE: Tangents

The innermost scale on the back is a scale for tangents. It has two sections. Set the indicator over 1 of the C scale, and note that it is over the beginning of

the T scale, at 5.7°. Reading clockwise around the scale you will find numerals for 6°, 7°, etc. as on the sine scale. However, after one complete revolution the T scale reaches 45°. It then continues on the adjacent scale through 50°, 55°, etc. on up to 84.3°.

***Rule:* To find the values of tangents of angles on the T scale, set the indicator over the angle value and read the tangent function value on C, and conversely. If the angle is set on the outer T scale the decimal point is at the left of the numeral read from the C scale. If the angle is on the inner T scale, the decimal point is at the right of the first digit read from the C scale.**

• Examples:

(a) Find tan 14.7°. Set indicator over 14.7 on outer T. Read 0.262 on C.

(b) Find tan 72.3°. Set indicator over 72.3 on inner T. Read 3.13 on C.

(c) Verify that tan 18.6° = 0.337 and tan 66.4° = 2.29.

The tangents of small angles are very nearly equal to the sines. Therefore the ST scale is also used for them. The decimal point is the same as for sines. Thus tan 2° = 0.0349.

DECIMAL EQUIVALENTS

The decimal fraction equivalents of common fractions beginning with 1/64 and extending up to 1 are given on the back. Actually, the arrangement is a table and not a scale.