unique slide rules quick instructions

Introduction. The Unique Range of Slide Rules has been designed with a view to easy reading, and these notes cover the basic uses of the rules, and a few minutes' study with the rule in front of the reader will enable him to start feeling the benefit of time-saving in ordinary calculations which the slide rule gives.

Construction. There are only three main parts to any slide rule, the stock, or main part of the rule, the slide, and the cursor, that is the sliding device carrying an index line.

The following **Main Scales** are fitted to almost every rule in the range.

A For multiplication and/or division, and for determining
B squares and square roots.

They are a pair of scales and are identical as are:

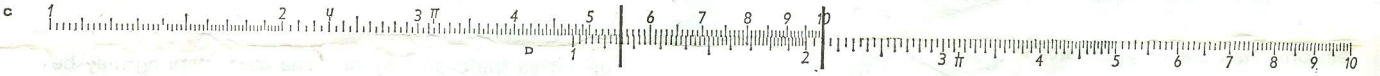
C
D

for multiplication and division with maximum accuracy.

Reading the Scales. Consider first the main scales C and D for these are the scales that most people use more often than any others. The scales are not "even" ones like those of a thermometer or an inch rule. Therefore the degree of subdivision between figures 1 and 2, 2 and 4 and 4 and 10 is not the same. On 10" length slide rules the first line to the right of 1 is 101—the first division following 2 however is not 201 but 202 and that following 4 is 405. On 5" length slide rules the degree of subdivision is naturally somewhat less. A good deal of extra accuracy can be obtained by the careful user who can estimate for instance 1672 as 2/10 or 1/5 the distance between 167 and 168, both these latter figures being marked as actual line on the rule, between 1·6 and 1·7. At this stage the user must realize that in using any slide rule a figure such as 1672 can be considered as ·001672, 1·672, 16·72, etc., a slide rule will not determine the position of the decimal point for us. Sometimes the position of the decimal point will be obvious, sometimes mental arithmetic will have to be used. Once the user can read the scales of his slide rule, the rest is easy. Now see above and read the values off a.b.c.d. These are: a — 1·45, b — 2·2, c — 5·6, d — 7.5.

Multiplication. Can be accomplished on A and B or C and D scales, but we strongly advise using the C and D Scales, these give enhanced accuracy. All that is necessary is to find one number which is to be multiplied in Scale D, place the cursor over it, bring the 1 of scale C into coincidence and then read off the answer in scale D opposite the other figure to be multiplied in C.

Example (see above). To multiply 15 x 45. Find 15 in scale D, move the cursor line over it, put 1 of scale C under the cursor line and opposite 45 in C, read the answer 675 in D. The reader will have noticed that it is not essential to use the cursor, but at this stage it is recommended to save "losing the place". In some cases when 1 of scale C is used the answer lies off the scale. In such a case the 10 of scale C must be used.



Example (see above). 2·1 x 5·5. Find 2·1 in scale D, place **right hand 10** against it (use cursor to do this if you like), opposite 5·5 in scale C read answer 11·55 in D, again use the cursor to read the result if you find this a convenience.

Multiplication can also be accomplished in scales A and B if desired, in above directions use A were D is mentioned and B where C is mentioned.

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Continued overleaf

Division. Set the slide so that the divisor in scale C is coincident with the dividend in scale D. The result will be found in D opposite one of the 1s in scale C.

Example (above) Divide 13·9 by 5·65. Find 139 in scale D and move 565 in scale C opposite it. Opposite 1 in C read answer 246 in D.

Squares. Are obtained by reading from scale D to scale A by means of the cursor. For example, opposite 15 in scale D will be found 225 in scale A.

Square Roots. These are obtained by projecting from scale A to scale D, using the cursor. Since, however, any given number appears twice in scale A, care is needed in selecting the one to be used. The rule is: if the original number has an odd number of digits, or when less than unity has an odd number of cyphers immediately following its decimal point, then the left hand half of scale A must be used. When the number of digits preceding or cyphers following the decimal point is even, the right hand half must be used.

Example. To find the square root of 289. Find 289 in left hand (because 289 has an odd number of digits) half of scale A, opposite this in scale D read answer 17, by means of the cursor.

Reciprocal Scale. This scale is exactly the same as the C scale except that it reads from right to left. Reciprocals of numbers are obtained by reading from scale D to scale R, sometimes marked as CI (C—Inverted).

Example. To find the reciprocal of 4. Set cursor to 4 in R and read the answer ·25 in scale D.

Multiplication using R Scale. A feature of the R scale is that in conjunction with C and D, 3 factors may be multiplied at one setting of the slide.

Example. 2·8 x 3·2 x 6·5. Put the cursor line over 2·8 in D, move 3·2 in R underneath it (do not forget that the R scale reads the other way round); opposite 6·5 in C read answer 58·2 in D.

Log-Log Scales LU on upper edge of the rule.
LL on lower edge of the rule.
The most useful purpose which the log-log scales serve is computing powers and roots when the exponents are fractional.

Examples. To evaluate $6.4^{3.21}$, find 6.4 in LL and put the cursor index over it, next move 1 in C scale to coincide with the cursor line, then move the cursor to 3·21 in C and read answer 387 in LL.
To evaluate $5\sqrt{30}$. Put cursor line over 30 in LL, then put 5 in C into coincidence with it, opposite 10 in C read answer 1·973 in LU.

Trigonometrical Scales. Some Unique Rules are provided with **sine** and **tangent** scales, denoted by S & T. Also appearing sometimes is a combined Sine & Tangent Scale (ST) for values under 5·7° where for most practical purposes the values of sines and tangents are the same. In each case to find the required value, all that is necessary is to project, by means of the cursor, from the required value in the trigonometrical scale into scale D.

Examples. Sin 20° (Scale S) = ·342 (Scale D).
Tan 27·5° (Scale T) = ·521 (Scale D).
Tan (or Sin) 2° (Scale ST) = ·0349 (Scale D).

Calculations involving £ s. d. Generally it will be necessary to decimalise the shillings and pence part of the sum involved, for instance £18 17s. 6d. will have to be considered as 18·875 and at the end of the calculation the fractional part of the answer will have to be converted into shillings and pence, e.g. 8·717 = £8 14s. 4d., **unless the Unique** Monetary Slide Rule is used, where the scales are actually calibrated in pounds shillings and pence.

Specialised Instructions. Supplementary instructions are supplied free with Unique, Chemical, Darmstadt/Brighton, Dualistic, Commercial and Electrical Slide Rules. The simple directions for the use of the Monetary Rule are carried on the reverse of the rule itself.

Unique Half-hour instructions, 10 pence from all stationers. Teach yourself the slide rule, English Universities Press, 40p. Both available by post from Unique Ltd., Telscombe Cliffs, Newhaven, Sussex, at 10p + postage 5p and 40p + 10p postage respectively.

Directions for Care of your UNIQUE Slide Rule.

Keep the rule in its case when not in use and never leave it in direct sunlight. The Body portion of most rules incorporates a brass spring, so that the tension of the slide may be adjusted if necessary by removing slide and cursor and gently but firmly bending the two halves of the body in or out as the case may be. The cursor spring may be removed and "set up" if desired, by removing the cursor and inserting the point of a penknife under the middle of the spring, and levering upwards. First fit a small piece of card or paper between spring and window portion of the cursor, this will avoid scratching the under surface of the cursor.