

EASY INSTRUCTIONS FOR OPERATING

**THE COMPTOMETER IS A HIGH-SPEED, DIRECT-ACTING,
EASILY-PORTABLE DESK MACHINE FOR BOTH
ADDING AND CALCULATING**

THE operation of the Comptometer is extremely simple—nothing to do but press the keys—the machine does the rest.

An Automatic Safeguard, known as the "Controlled-key"—an exclusive feature found only in the Comptometer—positively prevents the registering of an error from a partial or incomplete key-stroke.

How the Controlled-Key Blocks Short Key-Strokes.



This is how it does it. The operator added right along down to £42. 2. 4. **Then something happened.** She slighted a key stroke—didn't put the 4-key clear down.

Did she notice it?

She couldn't help it. The machine automatically locked up and refused to add another figure until the fault was corrected.

Did she have to cancel and add the columns all over again?

No, she simply completed the unfinished stroke, touched the release key and went right on.

It was the **Controlled-key** that did it. Like a sentinel on guard, the Controlled-key stands watch over every keystroke. **It will not permit an imperfect key-stroke to register an error.**

Only when a fault occurs that would otherwise produce an error, does the Controlled-key clamp on the brakes.

That is why, even in the hands of a beginner, it will not permit an incomplete key-stroke to register an error. Every key-stroke must give the **right answer or none at all.**

See page seven for instructions on "When the Machine Locks in Adding."

If not made by Felt & Tarrant, it's not a Comptometer

ADDITION RULES

THE three columns of keys to the extreme right side of the keyboard are for adding pence, units of shillings and tens of shillings. The next three white columns are for adding units, tens and hundreds of £s. The next three green columns are for adding thousands, tens of thousands and hundreds of thousands of £s; the keys farther to the left are for adding higher denominations of £s. By "column" of keys is meant the keys in the same up and down line, reading from 1 to 9.

When adding, the keys are used according to the large figures on them. To add £4, locate the units of £s' column (which is the 4th column from the right) and strike the key having on it a large 4. No keys are struck for ciphers. To add £404 strike the 4 key in the hundreds of £s' column and skip the tens of £s' column and add 4 in the units of £s' column.

Always add the items from the top item downward and it is always best for a beginner to keep the place with the index finger of the left hand, running the finger down the column of figures while adding it.

The keys should be operated only one at a time. For instance in adding 235, press down the 2 key, then the 3 key and then the 5 key.

Remember to place the finger on the key desired and push it down until you feel it strike bottom. This push-stroke requires practice, for it differs distinctly from the sharp, staccato blow on a typewriter. It is the easiest known stroke on the fingers, for the blow of hitting the key is done away with. This method of operating ensures absolute accuracy and fair speed in the beginning and ultimately becomes very rapid.

For the first few days go very slowly, memorizing the keyboard and acquiring the stroke. Speed will come later.

Between the repeated depressions of a key as in adding 6 by depressing 3 and 3; or where the same figure is added twice as in adding £50 and £50, always lift the finger slightly off the key after each stroke. Lift the finger off the key about $\frac{1}{4}$ of an inch. Do not lift the finger too high, but just enough so that it will be off the key. Watch this carefully at first, and the sense of touch will soon develop so that you will, without any conscious effort, always lift the finger slightly off the key before making the next stroke.

Always prove an addition by adding it again. Re-addition of the original figures is, of course, the quickest, easiest and surest method.

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ADDITION RULES

Sight Method, Adding Each Item Complete

OFTEN it is necessary to add each item complete—that is not adding the shillings and pence first, then pounds separately. This is especially so in adding from different book pages, adding slips or checks, making cross additions, when adding amounts not written in columns, or in adding amounts that are not in sterling.

When adding each item separately and completely, use only the first and second fingers and add all figures with the first finger, except the right-hand figure which should be added with the second finger.

Remember to place the finger on the key desired, and push it down until you feel it strike bottom. This push-stroke requires practice, for it differs distinctly from the sharp, staccato blow of a typewriter. It is the easiest known stroke on the finger, for the blow of hitting the key is done away with. This method of operating ensures absolute accuracy and fair speed in the beginning and ultimately becomes very rapid.

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Example :—

No. 1	No. 2.	No. 3	No. 4	No. 5	No. 6
£41 7 9	£91 5 9	£79 2 7	£42 6 7	£21 2 5	£96 5 7
18 5 7	78 2 5	65 7 6	58 1 4	15 9 6	5 8 2
21 4 5	451 3 5	413 4 5	87 0 0	43 2 1	68 4 2
4 6 7	6 4 7	135 0 0	45 5 0	87 6 5	102 1 9
432 3 5	5 6 0	223 5 7	235 0 0	1 9 2	79 1 8
14 4 6	12 3 5	86 4 0	57 6 8	218 1 9	517 2 9
5 3 8	38 0 0	240 0 0	68 7 7	93 1 5	61 4 8
432 2 5	913 5 0	33 4 6	433 2 4	37 9 2	43 2 7
165 7 0	42 3 4	6 5 7	700 0 0	479 9 9	97 5 2
21 2 5	95 7 0	53 3 0	55 2 5	61 2 9	89 7 5
86 9 5	146 0 5	400 0 0	24 5 0	54 3 7	97 8 6

Add each column and write down the total obtained. Then prove at once by re-adding the column. Add each column at least four times in order to firmly fix in your mind the combinations used. Nothing will convince you so thoroughly of the perfect accuracy as the fact that you can, without previous practice, get the correct total time after time without error. If an error is made it will be the direct result of trying to go too fast.

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ADDITION RULES

Touch Method

THE touch method is advised for the operator who will use the Comptometer for an hour a day or more and wishes to become a highly efficient operator. It is just as simple as the sight method but admits of almost unlimited speed. A large part of the time spent in operating an ordinary adding machine is lost in looking from the work to the keyboard. The easiest method to operate the Comptometer entirely by touch is to use only the lower half of the keyboard. Thus, every key to be operated is within easy reach of the fingers, without moving the hand up and down the keyboard.

Rule :—

In beginning, place a blotter between the rows of **5** and **6** keys.

To add **9**, strike **4** and **5**

To add **8**, strike **4** twice.

To add **7**, strike **3** and **4**

To add **6**, strike **3** twice

To make touch operating very simple, the odd keys **1, 3, 5**, etc., are made with cup-shaped tops and the even keys **2, 4**, etc., with flat tops. With this in mind, add the following columns, beginning at the top of each column and adding down. Use the first finger for adding in the tens column only and the second finger for adding in the units column only. Keep each finger on its own column. Find the keys by feeling, as much as possible.

Remember to put the finger on the key desired, and push it down until you feel it strike bottom. This push-stroke requires practice, for it differs distinctly from the sharp staccato blow of a typewriter. It is the easiest known stroke on the finger, for the blow of hitting the key is done away with. This method of operating ensures absolute accuracy and fair speed in the beginning and ultimately becomes very rapid. For the first few days go very slowly, memorizing the keyboard and acquiring the stroke. Speed will come later.

Examples :—

No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7
22	33	43	23	67	84	25
23	34	33	36	43	47	92
33	43	12	43	77	63	14
34	32	54	48	65	84	52
44	31	23	35	95	93	71
45	35	32	49	48	32	42
55	53	24	43	64	26	35
54	25	25	36	23	82	92
43	24	35	42	72	48	25

Add each column and write down the total obtained. Then prove it at once by re-adding the column. Add each column at least four times in order to firmly fix in your mind the combinations used. Nothing will convince you so thoroughly of the perfect accuracy as the fact that you can, without previous practice, get the correct total time after time without error. If an error is made it will be the direct result of trying to go too fast.

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ADDITION RULES

USE the first and second fingers of right hand and first finger of left hand. First add the shillings and pence only, adding the tens of shillings with first finger of left hand, units of shillings with the first finger of right hand, and pence with the second finger of right hand. Leave the total of the shillings and pence in the answer register and—

Then, add the pounds, adding the tens with first finger and the units with second finger of right hand.

Remember to place the finger on the key desired and push it down until you feel it strike bottom. This push-stroke requires practice, for it differs distinctly from the sharp, staccato blow on a typewriter. It is the easiest known stroke on the finger, for the blow of hitting the key is done away with. This method of operating ensures absolute accuracy and fair speed in the beginning, and ultimately becomes very rapid.

For the first few days go very slowly, memorizing the keyboard and acquiring the stroke. Speed will come later.

Examples :—

No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7
£24 6 4	£66 4 3	£62 4 3	£24 3 6	£54 5 6	£33 4 5	£66 8 8
55 3 3	50 3 4	17 5 6	42 6 7	43 2 1	65 3 4	26 1 9
44 2 4	83 7 5	23 6 7	43 2 4	32 6 1	77 2 1	64 4 5
26 7 8	74 9 6	11 2 4	62 4 3	11 3 3	43 1 2	72 5 6
83 3 3	34 2 2	12 3 6	17 5 6	32 2 4	63 3 3	48 9 1
45 2 1	94 3 4	13 3 6	23 4 6	82 8 7	63 4 4	24 6 3
46 3 5	85 0 9	38 1 1	21 1 1	72 5 6	14 5 5	74 2 6
76 6 7	58 8 7	47 2 4	32 3 5	23 2 4	54 3 3	15 4 1
44 3 2	75 4 3	40 5 4	46 5 4	72 2 7	25 9 8	45 3 6
58 2 3	66 2 1	80 6 6	22 6 6	44 4 5	65 6 7	28 5 3
87 6 8	16 1 1	90 2 4	35 2 4	62 7 5	53 2 2	96 7 1
95 5 5	44 3 3	55 8 9	44 2 4	43 3 1	54 4 3	37 9 2
78 8 9	18 7 6	32 2 2	71 6 5	23 5 2	91 2 4	45 1 3

Add each column and write down the total obtained. Then prove at once by re-adding the column. Add each column at least four times in order to firmly fix in your mind the combinations used. Nothing will convince you so thoroughly of the perfect accuracy as the fact that you can, without previous practice, get the correct total time after time without error. If an error is made it will be the direct result of trying to go too fast.

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ADDITION RULES

USE the first and second fingers of right hand and first finger of left hand. First, add the shillings and pence only, adding the tens of shillings with first finger of left hand, units of shillings with first finger of right hand and pence with second finger of right hand. Leave the total of the shillings and pence in the answer register, and—

Then, add the pounds, adding hundreds with first finger of left hand, tens with first finger of right hand and the units with second finger of right hand.

Remember to place the finger on the key desired and push it down until you feel it strike bottom. This push-stroke requires practice, for it differs distinctly from the sharp, staccato blow of a typewriter. It is the easiest known stroke on the finger, for the blow of hitting the key is done away with. This method of operating ensures absolute accuracy and fair speed in the beginning and ultimately becomes very rapid.

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Examples :—

No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7
£54 0 0	£22 0 0	£333 6 4	£789 4 5	£73 2 3	£75 4 5	£70 0 0
73 6 8	65 9 8	43 4 5	555 6 4	633 7 5	98 6 7	543 2 1
20 0 0	37 4 3	400 6 7	54 6 7	22 9 8	45 2 1	29 0 0
100 8 7	60 4 5	45 0 0	45 7 6	32 7 5	80 0 0	98 2 3
32 4 0	20 6 5	45 7 8	40 0 0	78 2 1	945 2 4	378 8 0
67 6 8	200 0 0	78 6 4	434 5 4	67 3 5	31 2 2	345 4 5
36 3 5	23 6 7	20 0 0	56 2 0	87 6 7	111 3 4	896 8 7
33 0 0	24 2 4	88 7 8	64 0 2	12 5 0	70 0 0	454 2 2
45 6 5	800 0 0	98 0 0	98 8 7	226 7 8	76 4 1	30 0 0
4 5	44 5 8	63 5 5	500 0 0	36 8 8	13 1 2	236 7 9
34 4 8	366 5 7	13 7 5	42 4 5	78 8 7	22 1 1	400 0 0
50 0 0	10 0 0	13 0 0	75 3 2	33 3 4	67 7 8	323 0 0
38 4 4	32 2 2	67 0 0	53 4 0	35 7 5	400 9 0	2 3 0

Add each column and write down the total obtained. Then prove at once by re-adding the column. Add each column at least four times in order to firmly fix in your mind the combinations used. Nothing will convince you so thoroughly of the perfect accuracy as the fact that you can, without previous practice, get the correct total time after time without error. If an error is made it will be the direct result of trying to go too fast.

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The Controlled-Key Comptometer prevents errors due to partial key strokes, common to the older type machines. The Controlled-Key device gives instant signal of an error by locking all the key-board except the column in which the partial stroke was made—and this is left open for correction. Sixty per cent. of the value of the Controlled-Key is in the positive signal of an error when made. The other 40% lies in the operator's ability to correct the error without having to re-add the column.

When any key locks in adding it is a positive signal that a partial key stroke was made, either on the last key depressed, or on the key previous to the last.

CONTROLLED-KEY RULES

When any key locks in adding, **always** go back and try to operate the **last key depressed**.

RULE 1. If this key goes down, touch the red Correction Button and continue the addition, starting on the **key that locked and signalled the error**.

RULE 2. But if this **last key depressed** is found locked, touch the red Correction Button and **add in the previous key**; then continue the addition, starting on the **key that locked and signalled the error**.

Note : If the "key previous to the last" is larger than the "last key depressed," cancel and re-add the column.

EXAMPLE OF RULE 1.

Intentionally press the 40-key part way down. On attempting to strike the 5-key you find it locked. Following your rule, go back and strike again the **last key depressed** (40), touch the Correction Button and your correction is made. Continue adding, starting on the **key that locked and signalled the error**, "5."

	45
	125
	67
	45
	282

EXAMPLE OF RULE 2.

In adding this column, intentionally press the 30-key part way down. Then give the 40-key a regular stroke. On attempting to strike the 5-key, you find it locked.

To correct, go back to the **last key depressed** (40), and you will find it locked.

Following the rule, touch the Correction Button and **add in the previous key** (the 30).

	30
	45
	56
	280
	320
	731

This completes the correction and you continue adding, beginning on the key which locked and signalled the error, "5."

IN MULTIPLICATION AND DIVISION

When the key locks under the fingers, the positive danger-signal prevents an error slipping into an answer without the knowledge of the operator. Owing to the speed of the Comptometer, it is simpler and faster on small calculations to cancel and go over the problem than to stop and make the correction.

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EASY INSTRUCTIONS FOR OPERATING

MULTIPLICATION

Primary Rule

Example :—Multiply 1364 x 57.

PLACE the 1st finger of the left hand on the 50-key and the 1st finger of the right hand on the 7-key. Strike the 57 in this position as many times as the right hand figure (4) of the multiplicand indicates. Move both fingers one column to the left and strike as many times as indicated by the second figure (6) of the multiplicand. Continue to move to the left, striking in each column the multiplier as many times as indicated by the successive figures (3, 1) of the multiplicand.

In beginning multiplication confine yourself to the use of the first finger of the right hand and the first finger of the left hand.

After the fingers have been positioned on the keys representing the multiplier, strike slowly, giving each key a full push-stroke, until you feel it strike bottom. Raise the fingers slightly above the keys after each stroke. Speed will develop quickly.

After placing the fingers on the proper keys, then look only at the example while striking the keys, so you will not lose track of or misread any of the figures.

In each of the following examples use the first finger of the left hand for the tens figure of the multiplier and the first finger of the right hand for the unit figure :

No. 1 24,531 35	No. 2 12,456 68	No. 3 5,315 64	No. 4 23,456 75	No. 5 84,143 79
No. 6 35,642 45	No. 7 15,341 88	No. 8 45,673 28	No. 9 36,341 23	No. 10 14,683 47
No. 11 89,986 37	No. 12 15,366 15	No. 13 65,418 31	No. 14 94,345 63	No. 15 14,312 86
No. 16 26,433 19	No. 17 46,541 91	No. 18 63,222 83	No. 19 46,812 61	No. 20 46,533 11

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EASY INSTRUCTIONS FOR OPERATING

MULTIPLICATION RULES

Example :—Multiply 314 x 45.

PLACE the first and second fingers of the right hand on the keys in the right-hand columns representing the multiplier (45), and strike as many times as indicated by the right-hand figure (4) of the multiplicand; move the fingers one column to the left and strike as many times as the 2nd figure (1) of the multiplicand indicates. Continue to move to the left, striking as many times as the succeeding figure (3) of the multiplicand indicates.

Never multiply with more than two fingers of each hand. Give each key a full stroke.

Multiply each of the following problems, using the fingers as shown by the abbreviations in front of, and following the multiplier. 1 L and 2 L indicate 1st and 2nd fingers of the left hand. 1 R and 2 R indicate 1st and 2nd fingers of the right hand.

Raise the fingers slightly above the keys after each stroke. Never use the thumb.

Examples :—

No. 1 43 1 R 34 2 R	No. 2 13 2 R 42 1 R	No. 3 47 1 L 62 1 R	No. 4 83 1 L 37 1 R	No. 5 276 1 L 345 1 & 2 R
No. 6 19 2 R 54 1 R	No. 7 342 1 L 153 2 & 1 R	No. 8 43 1 L 39 1 R	No. 9 43 1 L 13 1 R	No. 10 56 89 1 & 2 R
No. 11 75 1 R 46 2 R	No. 12 83 1 L 87 1 R	No. 13 28 1 L 19 1 R	No. 14 284 1 L 324 1 & 2 R	No. 15 104 1 L 678 1 & 2 R

Where the multiplier has four figures, split the multiplier. Example : Multiply 12,365 by 8,379. First multiply 12,365 by 79, leaving the result on the register. Then multiply 12,365 by 83, starting the 83 in the fourth and third columns.

NOTE : A hyphen indicates where the multiplier should be split.

In all ordinary cases where you are multiplying through with two figures, use both hands—the first finger of each.

No. 16 6744 1 L 735 1 & 2 R	No. 17 2456 65-35	No. 18 5613 27-18	No. 19 58426 53-78	No. 20 5362 1 L 523 1 & 2 R
No. 21 17465 43-45	No. 22 15082 1 L 3104 1 & 2 R	No. 23 13461 19-19	No. 24 13723 73-65	No. 25 19147 92-23
No. 26 4817 37-29	No. 27 5447 1 L 625 1 & 2 R	No. 28 6714 73-68	No. 29 3672 94-45	No. 30 5754 16-17

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FIXED POINT METHOD OF MULTIPLICATION

Applied to suitable classes of work "Fixed Point" method gives quickest results.

Method : Fix or place the decimal pointer down in what is considered the most suitable position for working.

Hold the figures of the multiplier in their units position.

Whole numbers to the immediate left of pointer and decimal to the immediate right of pointer.

When figures are held in their proper or natural position, this is known as the Units position, and they may be multiplied in this position only by the unit of the other factor.

If the figures held are to be multiplied by tens, hundreds or thousands, etc., move once to the left—from units position—for each multiple of ten. To multiply by a decimal, move once to the right—from units position—for each successive decimal place.

Example : 123.7 x 86.2

Place 4th pointer down in the centre of the machine. Hold 86.2 (whole numbers to immediate left of pointer and decimal to immediate right of pointer). Move the fingers two columns to the left and depress once (hundreds), move once to right and depress twice (tens), move once again to right and depress three times (units) and once again to right and depress seven times (1st decimal place). Where a multiplicand has more than one decimal place, move the fingers once to the right for each successive decimal place.

Answer 10662.94

Work out the following examples :—

271.4	143.72	33.62	611.2
86.2	96.4	79.3	8.87
52.12	32.26	346.21	14.374
8.4	7.43	4.67	32.78

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MULTIPLICATION OF SHILLINGS AND PENCE

TO multiply a quantity at a price in shillings and pence it is necessary to convert the pence to a decimal of a shilling.

Below is given a chart showing the decimal equivalents of pence and pence fractions, i.e. $2/10\frac{1}{2} = 2.875$, $3/8\frac{1}{4} = 3.6875$, etc. The extension will then be a simple one of whole numbers and decimals.

Work over a fixed decimal point.

Example : $46\frac{1}{2}$ @ $42/7\frac{1}{2}$.

Place 4th pointer down in the middle of machine. Hold 46.5 (whole numbers to immediate left of pointer and decimal to immediate right). Move fingers one column to left and depress four times (tens). Move once to the right and depress twice (units). Refer to decimal chart to convert $7\frac{1}{2}$ d. to decimal of a shilling = .625. Then depress keys accordingly, moving once to the right for each successive decimal place.

Answer in machine will then show 1982.0625 shillings. To convert .0625 to pence and a fraction, refer to decimal chart = $\frac{3}{4}$ d.

Answer : £99-2-0 $\frac{3}{4}$.

Work out the following examples :—

24 @ 16/3	123 @ 7/6	70 @ 42/9	27 @ 63/1
264 @ 9/9 $\frac{3}{4}$	41 @ 5/7 $\frac{3}{4}$	61 @ 12/6 $\frac{3}{4}$	434 @ 1/0 $\frac{3}{4}$

Pence and Pence Fractions of One Shilling.

	1	2	3	4	5	6	7	8	9	10	11	
	.083	.166	.25	.333	.416	.5	.583	.666	.75	.833	.916	
$\frac{1}{4}$	.02083	.10416	.1875	.27083	.35416	.4375	.52083	.60416	.6875	.77083	.85416	.9375
$\frac{1}{2}$.0416	.125	.2083	.2916	.375	.4583	.5416	.625	.7083	.7916	.875	.9583
$\frac{3}{4}$.0625	.14583	.22916	.3125	.39583	.47916	.5625	.64583	.72916	.8125	.89583	.97916

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MULTIPLICATION OF £. s. d.

TO multiply a quantity at a price in Pounds, shillings and pence it is necessary to convert the shillings and pence to a decimal of a Pound. Below is given a chart showing shillings as a decimal of a Pound, and also a chart showing pence as a decimal of a Pound, i.e., $10/6 = .5 + .025 = .525$.

Example : 84 @ £2-17-4½.

Place 5th pointer down in the middle of machine. Hold 84 to immediate left of pointer and depress twice in that position (units). 17/- = .85 therefore, move the fingers one column to right and depress eight times (1st decimal place), move once more to the right and depress five times (2nd decimal place). 4½d. = .01875 therefore, remain in the second decimal place and depress once more, then move once to the right for each successive decimal place and depress accordingly.

Answer in machine will then show £240.975. To convert .975 to shillings and pence refer to decimal charts below. .95 = 19/- .025 = 6d.

Answer : £240-19-6.

Work out the following examples :—

72 @ £47-17-6.

48 @ £13-10-5½.

142 @ £9-10-7½.

116 @ £21-19-2½.

11 @ £26 - 4-4½.

59 @ £13-2-6.

Shillings Expressed as a Decimal of £1.

1 /- = .05	6 /- = .3	11 /- = .55	16 /- = .8
2 /- = .1	7 /- = .35	12 /- = .6	17 /- = .85
3 /- = .15	8 /- = .4	13 /- = .65	18 /- = .9
4 /- = .2	9 /- = .45	14 /- = .7	19 /- = .95
5 /- = .25	10 /- = .5	15 /- = .75	

Pence and Pence Fractions of £1.

	1	2	3	4	5	6	7	8	9	10	11
	.00416	.0083	.0125	.016	.02083	.025	.02916	.033	.0375	.0416	.04583
1d.	.0010416	.0052083	.009375	.0135416	.0177083	.021875	.0260416	.0302083	.034375	.0385416	.0427083
2d.	.002083	.00625	.010416	.014583	.01875	.022916	.027083	.03125	.035416	.039583	.04375
3d.	.003125	.0072916	.0114583	.015625	.0197916	.0239583	.028125	.0322916	.0364583	.040625	.0447916

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ACCUMULATION

TO accumulate, multiply over a fixed decimal point and leave each answer in the machine for a final or total result. Accumulation with a fixed decimal point is invaluable in Commercial work, particularly in the checking of invoices, etc. Much time is saved as there is no need for the comparing and checking of single items, and the cancelling of the machine after each extension.

There are four proofs determined by accumulation.

1. That each extension is correct.
2. That no error of transposition has been passed.
3. That no error of point has been passed.
4. That the addition is correct.

Example 1 :

47 @ 2/3 each.	£5 5 9
22 @ 10/6 „	11 11 0
123 @ 4/6 „	27 13 6
	<hr/>
	£44 10 3

Place decimal pointer down in about the middle of machine. Place fingers on 47 to immediate left of decimal pointer and multiply by 2.25 (do not clear machine), place fingers on 22 to immediate left of decimal pointer and multiply by 10.5 (do not clear machine). Then place fingers on 123 to immediate left of decimal pointer and multiply by 4.5. Accumulated answer now in the machine = 890.25 shillings = £44 10s. 3d. This agrees with the above total, therefore invoice is proved correct.

Example 2 :

26 @ £12-12-6 each	£328 5 0
141 @ 2-10-9 „	357 15 9
52 @ 5-11-0 „	288 12 0
	<hr/>
	£974 12 9

Place the fingers on 26 to immediate left of decimal pointer, and multiply by 12.625 (do not clear machine). Place fingers on 141 to immediate left of decimal pointer and multiply by 2.5375 (do not clear machine) then place fingers on 52 to immediate left of decimal pointer and multiply by 5.55. Accumulated answer now in machine = £974.6375 = £974 12s. 9d.

This agrees with the above total, therefore invoice is proved correct.

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LARGE DECIMAL MULTIPLICATIONS

IN MULTIPLYING large numbers containing decimals, it is advisable to work from the left toward the right. Hold the multiplier with its left-hand figure on the left-hand column of the machine. Strike here as many times as is shown by the left-hand figure of your multiplicand, and then move one column to the right, etc. Point off as many register holes from the left as the sum of the whole numbers in the multiplicand and multiplier.

Example :—Multiply 12.345 × 4.356

Hold **4356** with the **4** on the left-hand column of the machine and in this position strike once—move each finger one column to the right and strike twice; one more column to the right and strike three times—then four times, then five times. The result as it stands on the register is **053774820**. There are two whole numbers in **12.345** and one in **4.356**, making together three register holes to point off from the left of the machine, and your answer is **53.77482**.

Note. Hyphen in multiplier indicates that it should be split.

Examples :

No. 1	No. 2	No. 3	No. 4
346.21	14.374	2.2635	.35624
1 L 4.67 1 & 2R	2 & 1L 32.78 1 & 2R	9.4-56	91.-47
No. 5	No. 6	No. 7	No. 8
11.463	4627.1	26.516	314.62
1 L 37.8 1 & 2R	1 L .846 1 & 2R	2 & 1L 21.68 1 & 2R	7.3-49

THREE FACTOR MULTIPLICATIONS (WITHOUT CANCELLING)

WHERE you have three numbers to be multiplied together, like **465 × 138 × 325**, you should multiply **465 × 138** on the right of the machine, leaving your result **64170** on the register. As **64170** is in the register once, you want it only **324** more times, so you hold **324** with the **4** over the left-hand figure (**6**) of the **64170**. Strike here the number of times indicated—six. Move to the right one column and strike the number of times indicated—four. Move one more column to the right and strike once. Move one more column to the right and strike seven times and the answer is **20,855,250**. As you move from left to right, the figure in the answer register under the **4**-key on which your finger is, shows the number of times the **324** should be struck.

Example :—Multiply 45 × 267 × 457.

45 × 267 = 12015 (Let this result remain in the register).
457 minus one, equals **456**.

Holding **456** with the right-hand figure (**6**) over the left-hand figure (**1**) of **12015**, strike successively toward the right **1**, **2**, **01** and **5** times. Answer **5,490,855**.

Examples :

No. 9 345 × 289 × 56	No. 10 789 × 88 × 546	No. 11 6452 × 344 × 66	No. 12 33 × 875 × 458
No. 13 645 × 4456 × 28	No. 14 389 × 673 × 438	No. 15 75 × 6489 × 567	No. 16 372 × 44 × 8879

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SUBTRACTION

To subtract one number from another, proceed as follows :

Example : 2843—462.

Add **2843** on the Comptometer at the right hand side of machine (ignore shillings and pence columns as the subtraction is of whole numbers only).

Pass the fingers of the left hand over the answer register from right to left until there is visible an amount as great or greater than the **462** to be subtracted. In doing this there is first visible, "**3**," then "**43**," then "**843**." **843** being larger than **462** hold back the cut-off (one of the small levers in front of the first row of keys) to the left of the **8**.

Now, with the right hand depress the keys bearing the small figures **461** (see Note 1 on following page), and the result is shown, **2381**.

With 2381 in the register, subtract 873 from it.

Pass the fingers of the left hand over the register from right to left until you can see an amount (**2381**) larger than **873** then hold back the cut-off to the left of the **2**. There is one column of keys intervening between this cut-off and the **873** to be subtracted.

Depress the small cipher in this intervening column and then the small **872** and the answer, **1508** appears

2381
0872
1508

See Rule 4

RULES

Rule 1. Put the larger amount in the Comptometer as in adding.

Rule 2. Hold back the cut-off at the left of an amount equal to or larger than the amount to be subtracted.

Rule 3. Holding back the cut-off, depress the amount to be subtracted in small figures, less one. (See Note 1 on following page).

Rule 4. If any column or columns intervene between the cut-off being held back and the amount to be subtracted, depress the small cipher key in such column or columns.

EXAMPLES

The apostrophes in the following examples indicate where the cut-off is to be held back.

To Subtract

2143	Strike large figures	'2143	
642	Strike small figures	0641	See Rule 4
1501			
17036	Strike large figures	1'7036	
85	Strike small figure	0084	See Rule 4
16951			
950	Strike large figures	'950	
704	Strike small figures	703	See Note 2
246			
64725	Strike large figures	'64725	
46005	Strike small figures	46004	See Note 2
18720			

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SUBTRACTION, Continued

Subtraction of £. s. d.—The principle remains the same with the exception of the Ten Shilling Key.

Where 10/- is embodied in the amount to be subtracted, as for example £28-16-8, the 10/- key is ignored. Therefore, strike in small figures £28-6-7. In the case of say, £47-6-7 where there are only units of shillings, the 10/- key must be struck. Therefore strike in small figures £47-06-6.

To Subtract

£62 16 6	Strike large figures	.....	£62 16 6	See Rule 4
3 6 7	Strike small figures	.....	03 06 6	
59 9 11				
£27 14 2	Strike large figures	.....	£27 14 2	See Note 3
10 16 1	Strike small figures	.....	10 6 0	
16 18 1				
£157 11 6	Strike large figures	.....	£157 11 6	See Note 4
29 18 2	Strike small figures	.....	2- 8 1	
127 13 4				

NOTES

Note 1.—In subtracting the small amount, use the keys with the corresponding small figures, except for the right-hand figure of value, for which one less must be used.

					Right Hand Figure of Value.
To subtract	.....462	127	3600	4620	
Use small figures	461	126	35	461	

Note 2.—The small cipher keys should be depressed the same as any other where they come between figures of value—as in 704—but should be disregarded if they come at the right of the amount—as in 7500.

To subtract	..... 704	To subtract	..... 46005
Use small figures	..... 703	Use small figures	..... 46004
To subtract	..... 7500	To subtract	..... 63500
Use small figures	..... 74	Use small figures	..... 634

Note 3.—If the right-hand figure of value in the amount to be subtracted is a "1," then one less is "0," and this small cipher should be struck.

To subtract	..... 3241	To subtract	..... 3100
Use small figures	..... 3240	Use small figures	..... 30

Note 4.—As there are no small 9-keys, pass any column in the amount to be subtracted which contains "9"; except where 9 is the right-hand figure of value, when, of course, the small "8" is used.

To subtract	..... 8947	To subtract	..... 983
Use small figures	..... 8 46	Use small figures	..... 82
To subtract 1695	To subtract 379
Use small figures 16 4	Use small figures 378

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SHEET No. 9.

GRAPHIC DIVISION

DIVISION on the Comptometer is even more simple than with pencil and paper. Instead of estimating mentally how many times the divisor is contained, the Comptometer tells you exactly. It is useless, however, to attempt division, until thoroughly familiar with the use of the small figures on the keys (see pages 15 and 16).

Divide 63542 by 77

Add the dividend 63542 on the left side of the keyboard and turn down decimal pointer to agree with the decimal point in the dividend.

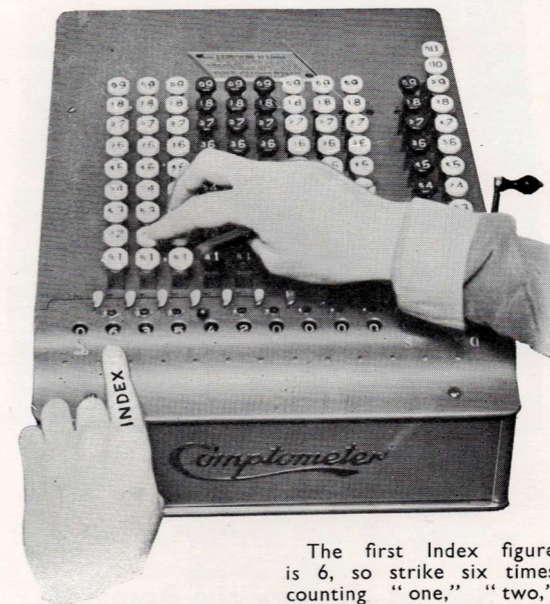
For the **answer decimal point**, turn down the pointer as many places to the left of dividend decimal pointer as there are **whole** number places (figures to the left of the decimal point) in the divisor.

Place fingers on keys numbered in small figures 76 (always hold one less than the divisor). Hold the 76 over 35 of the 635, as the first two figures 63 are too small to contain the divisor. (See cut at left for beginning position.)

First—Catch Up to the Index

(See cut at left)

Multiply the divisor in this position by the Index. (The "Index" is the figure in the register just to the left of the columns in which the divisor is held.) If the Index increases, keep on multiplying until you "catch up" to the Index.



The first Index figure is 6, so strike six times counting "one," "two," "three," "four," "five," "six," and since the index

figure has increased, keep on striking—"seven." On the seventh stroke the number of strokes made agrees with the Index.

Second—Reduce the Remainder

(See cut at right)

Look at the amount (96) in the register underneath the divisor keys. This amount is called the remainder. As the remainder is larger than the divisor, 77, continue striking, in the **same position**, until the remainder is reduced to less than the divisor.

One more stroke and the remainder, 96, is reduced to 19.

8 becomes the first answer figure.

Third—Move Divisor One Column to the Right



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GRAPHIC DIVISION, Continued

Obtain the second answer figure in exactly the same manner as the first

First—Catch Up to the Index

(See cut at right)

Watching the Index, or register figure to the left of the columns you are about to strike, multiply the divisor by the Index.

The Index contains the figure 1, so strike once, counting "one," and as the Index has increased keep on striking—"two."

On the second stroke the number of strokes made **agrees** with the Index.



Second—Reduce the Remainder

(See cut at left)

Look at the amount (40) in the register underneath the divisor keys. As this remainder is already less than the divisor (77), no more strokes are necessary.

2 now becomes the second answer figure.

Third — Move Divisor One Column to the Right



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GRAPHIC DIVISION, Continued

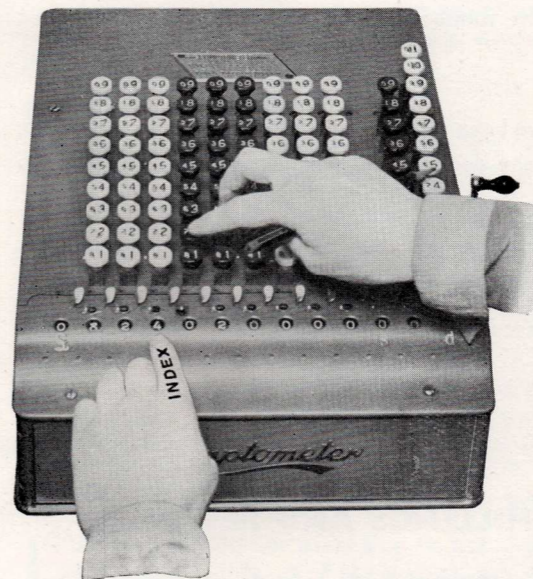
All answer figures are obtained in the same manner as the two previous ones

First — Catch Up to the Index

(See cut at left)

Watching the Index, or register figure to the left of the columns we are about to strike, multiply the divisor by the Index.

The Index contains the figure 4, so strike four times, counting "one," "two," "three," "four," **agreeing** on the fourth stroke.



Second — Reduce the Remainder

(See cut at right)

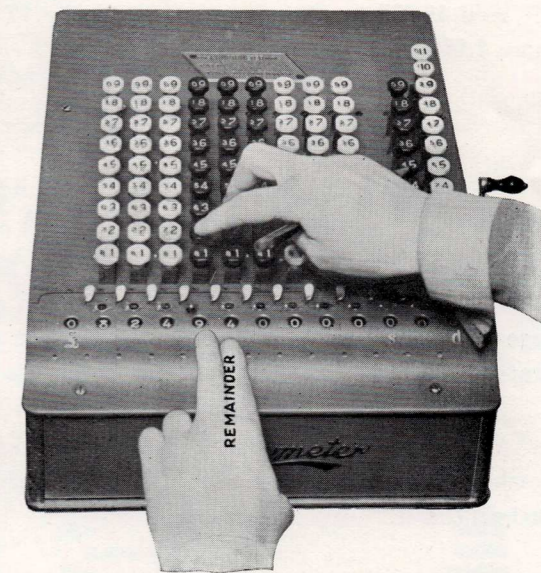
Look at the amount (94) in the register underneath the divisor keys. As this is larger than the divisor, 77, continue striking in the **same position**, until the remainder is less.

One more stroke and the remainder, 94, is reduced to 17.

5 becomes the third answer figure. The complete answer now shows in the register, 825, with a remainder of 17.

You will note that we continued to divide until an answer figure was obtained in the register to the left of the decimal point first established. If we continued to divide, getting answer figures to the right of the decimal point, we would get a **decimal** remainder.

NOTE : Always Hold the Divisor Keys with Both Hands. The eyes—not the fingers—should follow the "index" and "remainder." In the illustrations one hand points to the "index" and "remainder" because it is easier to instruct in this way.



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DIVISION OF SHILLINGS AND PENCE

ADD dividend on left side of keyboard by first adding shillings, turn down decimal pointer and add pence expressed as a decimal of a shilling (refer to decimal chart on page 11).

Move pointer once to the left for each whole number in the divisor and then proceed according to instructions given on pages 17-19.

Work until 3 figures after the decimal point have been obtained. Then read answer. Whole numbers will represent shillings, and to convert the decimal to pence and a fraction, refer to decimal chart.

Example : $19/7\frac{1}{2} \div 17.$

Add **19.625** into machine and divide by **17** according to instructions. Answer will then show **1.154=1/2.**

DIVISION OF POUNDS, SHILLINGS AND PENCE

ADD dividend on left side of keyboard by first adding pounds, turn down decimal pointer and add shillings and pence expressed as a decimal of a pound (refer to decimal charts on page 12). Move pointer once to the left for each whole number in the divisor and then proceed according to instructions given on pages 17-19.

Work until 4 figures after the decimal point have been obtained. Then read answer. Whole numbers will represent pounds, and to convert the decimal to shillings and pence, refer to decimal charts.

Example : $\pounds 526-12-6 \div 42.$

Add **526.625** into machine and divide by **42** according to instructions. Answer will then show **12.5386.**

$.5 = 10/-$ $.0386 = 9\frac{1}{4}d.$

Answer $\pounds 12-10-9\frac{1}{4}.$

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THE PRINCIPAL POINTS TO REMEMBER IN DIVISION ARE:

Strike the dividend in the machine, using the large figures on the keys.

Turn down a pointer on the machine as many columns to the left of the decimal point in the dividend as there are whole number places in the divisor. This will be the decimal point for the answer.

First—Catch Up to the Index.

by multiplying the divisor (small figures less 1) until the number of strokes made **agrees** with the Index. If the Index contains a cipher, of course, no "catching up" is necessary.

Second—Reduce the Remainder.

by striking the divisor until the Remainder is less than the divisor. If the Remainder is already less than the divisor, of course, no reducing is necessary.

Third—Move Divisor One Column to the Right.

Rule for Pointing Off When Dividing by a Decimal.

If the divisor is a decimal without zeros, the answer pointer is the same as the dividend pointer; but if the divisor has zeros like .0016, the answer pointer is as many places to the **right** of the dividend pointer as there are zeros immediately to the right of the decimal point in the divisor.

USE OF SMALL FIGURES

IN striking the divisor according to the small figures (or co-digits) on the keys, always strike the right-hand figure of the divisor, less one. If the right-hand figure or figures be a cipher or ciphers, then strike one less for the first right-hand figure that is not a cipher. For instance, strike according to the small figures as follows:

For	12	For	147
strike small figures	11	strike small figures	146
For	19	For	4216
strike small figures	18	strike small figures	4215

Ciphers are always struck, except when they are the extreme right-hand figures, in which case they are passed over, and one less is struck for the first right-hand figure that is not a cipher.

For	704	For	46005
strike small figures	703	strike small figures	46004
For	7040	For	704000
strike small figures	703	strike small figures	703

If the first right-hand figure (not counting ciphers) is a "1," then one less is "0," and this cipher should be struck.

For	3041	For	3100
strike small figures	3040	strike small figures	30

Where 9 occurs, there being no small 9, that column is passed over, except when 9 is the right-hand figure (not counting ciphers), then, of course, small 8 is struck.

For	8947	For	983
strike small figures	8 46	strike small figures	82
For	1695	For	379
strike small figures	16 4	strike small figures	378

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LONG DIVISION

Easy Method for Dividing by Five or More Figures, Using Four-Place Trial Divisor and Obtaining Three Answer Figures at a Time.

Problem : 4567.89 ÷ 2436.65

Rule—

Add the dividend from left to right starting on the left side of the keyboard, and turn down decimal pointer to mark position of the dividend decimal point.

To mark the **answer** decimal point, turn down the pointer which is as many pointers to the left of the dividend decimal point as there are whole places in the divisor. Now turn up the dividend pointer.

Divide by the first **four** figures of the divisor, using the small figures on the keys (not taking one less) and do not stop dividing until you get the **first three answer figures**. After getting the third answer figure, continue to hold with the left hand the position of the two left-hand figures of the divisor.

Place fingers of **right** hand on columns immediately to the right of the two columns held with the left hand, on keys for the remaining unused figures* of the divisor, holding according to the **small** figures and one less for the extreme right hand figure of value of the divisor. Leave left hand inactive on the keyboard.

*If it is not convenient to hold all at once with the right hand the remaining unused figures of the divisor, then hold one or two of the remaining figures at a time.

Illustration—

Register shows 04567'89. (') indicates turned down decimal pointer.

Register shows 0'456789.

Divide 0'456789 by 2436 (holding small figures 2436 with two hands) and do not stop dividing until you get the first three answer figures—187. Do not take the fingers of the left hand from keys 24.

Right hand fingers take positions on small figures 64 (65 less 1) on columns immediately to right of position held with the left hand.

LONG DIVISION, Continued

Rule—

Depress keys held by the **right** hand the number of times indicated by the first of the three answer figures already obtained. Then **move** right hand one position to the right and strike the number of times as indicated by the second answer figure. Again **move** right hand one position to the right and strike the number of times indicated by the **third** answer figure already obtained.

The left hand remains inactive on the keyboard.

Resume holding the first four fingers of divisor, with position for **first two figures on the columns marked with the left hand**, and the position for next two figures on columns immediately to the right.

(If remainder in register under columns held, should be equal to or **larger** than the divisor, depress **complete** divisor once more.)

Move finger position one place to the right, and divide to get the next three answer figures, exactly the same way as the first three were obtained.

It is not necessary to strike in the remaining figures of the divisor the second time, as these figures would not affect a six-place answer.

Illustration—

From left to right, strike small figures 64 once, then move to right and strike eight times, then move to right and strike seven times. Register shows 1.87113545.

Fingers of right hand take position on small figures 36. Right and left hand now hold small figures 2436.

Remainder 1135 is not larger than 2436.

Move both hands one position to the right and divide again by 2436 to get three more answer figures.

Register shows 1.87465. Answer 1.87465.

TABLES USED IN CONNECTION WITH THE



ON page 25 are illustrations of tables used in connection with the Comptometer. We have other tables also. Send us examples of your figure work and we will send you the table best fitted to your needs, together with instructions covering their use. Any of these tables will be sent free, on request.

Following is a brief description of the tables shown in this book :

Pence and Pence Fractions of One Shilling Table No. 1 gives the decimal equivalents of a shilling from $\frac{1}{4}$ d. to $11\frac{3}{4}$ d., and on the reverse side the decimal equivalents of one pound from $\frac{1}{4}$ d. to $11\frac{3}{4}$ d.

Pence and Sixteenths of One Shilling Table No. 2 gives the decimal equivalents of a shilling from $\frac{1}{16}$ d. to $11\frac{15}{16}$ d. and on the reverse side $\frac{1}{32}$ d. to $11\frac{31}{32}$ d.

Pounds, Ounces and Drams Table No. 3 gives the decimals of a 16-oz. pound for any number of drams and ounces. To price any part of a lb. it is only necessary to multiply the price per lb. by the decimal for the number of drams or ounces shown on the card.

Wages Table No. 4 for 47-hour week gives the decimal equivalents from $\frac{1}{4}$ hour to $59\frac{3}{4}$ hours.

Wages Table No. 5 for 48-hour week gives the decimal equivalents from $\frac{1}{4}$ hour to $59\frac{3}{4}$ hours.

Timber Specification Tables Nos. 6 and 6a give the decimal equivalents for converting timber of various widths to a standard.

Gross Table No. 8 gives the decimal for each fractional part of a gross and for each unit. To find the price of 7 dozen and 6 units, or 90 units, it is only necessary to multiply the price per gross by the

decimal for this quantity shown on the table. This table is used also for plate glass figuring.

Day Card Table No. 9 (365 days) shows the decimal part of a year for each day and is used for figuring interest, discount and insurance cancellations.

This card also shows the number of days from the first of the year and the number of days to the end of the year for any day.

Annas and Pies as decimals of One Rupee Table No. 10 gives the decimal equivalents of 1 Pie to 15 Annas 11 Pies.

Quarters and Pounds of a Cwt. Table No. 21 gives the decimal equivalents of a Cwt. from $\frac{1}{2}$ lb. to 3 qrs., 27 lbs. To make an extension, one simply multiplies the price or rate by the decimal shown for the quantity. The reverse side gives decimal parts of a ton to any number of Quarters and Pounds. To get the price of any number of Quarters and Pounds, it is only necessary to multiply the price per ton by the amount shown on the table.

Decimal Equivalent of Fractions Table No. 29 gives the decimal equivalents of fractions from $\frac{1}{4}$ to $\frac{23}{23}$ ths, and also 23 useful reciprocals. This table is of particular value in invoice inventory extensions.

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