OFFICE MACHINE PRACTICE

THE MONROE
CALCULATING MACHINE

By

C. H. KATENKAMP

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Contents

Suggestions to the Student

The constantly increasing use of machines in the modern business office has made it necessary for commercial students to acquire the ability to operate the more common office machines.

Because of this condition, the school has provided this machine for your use. Learn it as well as you can, for by doing so, you are increasing your earning capacity.

This booklet is designed to teach you how to operate the Monroe Calculating Machine. It teaches only such operations on the machine as every office worker should know. The special processes used in certain offices can be quickly learned if you understand the fundamentals taught in this course. Enough examples have been given to illustrate the various processes taught. If you require more problems, your instructor will furnish them for you.

The work in this booklet has been arranged so that you may proceed as rapidly as you are able. Your chances of securing a position are increased by the extent of your knowledge of office machines. Therefore, work persistently and use your time to the greatest possible advantage.

To understand the pages that follow, it is necessary for you to read every word of the instructions very carefully. Before starting to work any job, read all the instructions given for it. After you have read the instructions through, begin to work the job. In working the job, be sure that you follow directions exactly. Perform each step in the order in which it is suggested in the instruction sheet. If you follow this plan, you will have very little difficulty in learning to operate the machine.

Work by yourself as much as possible. This will help you to develop the trait of self-reliance, which, in turn, will make you more valuable as an office worker. If you have difficulty, seek the aid of your instructor, but do not ask for his assistance until you have read the instructions over at least three times and tried to work out the problem for yourself.

As you work each problem, prove it. The method of proving the problems is usually explained in the job sheet. Do not skip this. If you would develop a habit of accuracy and become a valuable office worker, you must learn how to prove your answers. Develop the habit of proving your work.

THE MONROE CALCULATING MACHINE

Before you can proceed with your work on the Monroe, it is necessary that you learn the names of those parts of the machine that you will use. As you progress in your work, other names will be taught you. At present you need learn only those given below.

Job 1

PARTS OF MACHINE

Like other calculating machines, the Monroe is built in two styles—electrically operated and hand operated.

If the machine is electrically operated, you will find two bars at the right-hand side of the keyboard. One is marked with a plus sign and the other with a minus sign. Press the plus sign to add. Press the minus sign to subtract. If the machine is not electrically operated, you will use the operating crank.

The Operating Crank. If the machine is hand operated, you will find the operating crank on the right-hand side of the machine—the crank nearest you.

On the right side of the machine is a small gold arrow. Find it. This arrow does not appear on the electrically driven machine, for it is not needed. In turning the operating crank, be sure that you always stop at this arrow. If you fail to do so, you will find that the machine is locked when you try to use it for the next problem.

When using the operating crank, you must be sure always to turn it one complete revolution. Always stop at the gold arrow.

1

Carriage-Shift Lever. The carriage-shift lever is on the front of the machine. Its function is to shift the carriage to the right or to the left. Try it. If the carriage will not move, turn the operating crank so that it is exactly opposite the gold arrow described above; then try to shift the carriage. If it fails to move, signal the instructor.
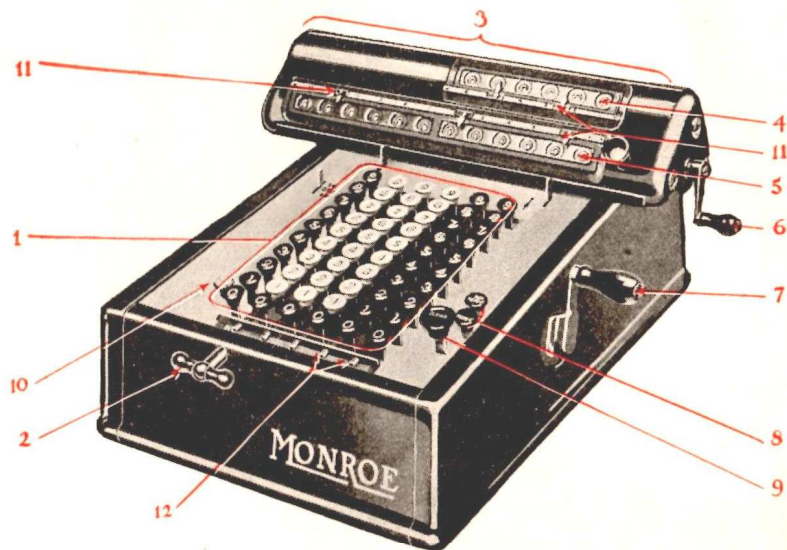

ILLUSTRATION 1

MONROE ADDING-CALCULATOR
MODEL K 120

1. Keyboard
2. Carriage-shift lever
3. Carriage
4. Upper dials
5. Lower dials
6. Dials clear-out crank
7. Operating crank
8. Repeat and non-repeat keys
9. Clear key
10. Item counter
11. Decimal markers on dials
12. Decimal markers on keyboard

The Clear-Out Crank. At the right-hand side of the carriage is the clear-out crank. Its purpose is to clear the dials after you have finished any problem on which you are working. A forward turn (away from you) will clear the upper dials. A backward turn (towards you) will clear the lower dials. If the clear-out crank will not turn, see if the operating crank is exactly opposite the gold arrow.

Job 2

ADDITION

All arithmetical problems depend on four operations: adding, subtracting, multiplying, and dividing. These are called the "four fundamentals." The major part of your work on the Monroe will consist in learning how to perform these four fundamentals on the machine. The first of the fundamentals is addition.

Addition on the Monroe is a very simple matter indeed. Follow the steps outlined below and you will soon learn how to do this sort of work:

1. At the right-hand side of the machine is a red key marked "Non-repeat." On some models of the machine, this key is merely a blank red key. If so, it will be the only blank key on the right-hand side of the keyboard. Depress it.

2. Use the shift lever to shift the carriage as far to the left as possible. For the present, you should always be sure that the carriage is in this position before you start to add.

3. See that both the upper and the lower dials show zeros only. If they do not, turn the clear-out crank forward to clear the upper dials, and then backward to clear the lower dials.

4. See that none of the keys on the keyboard are down. If any are, depress the clear key, which you will find at the right front of the keyboard. On some models it says "clear." On others it shows only a large zero (O).

5. Set the number 24 in the last two columns to the right of the keyboard.

There is no touch method of operation, so you may look at the keys. Simply depress the 4 in the units, or extreme right-hand, column and the 2 in the tens, or next to last, column on the right. If the keys will not go down when you depress them, see if the operating crank is opposite the gold arrow on the right of the keyboard. If it is not, move it to that position.

6. Turn the operating crank one full turn forward (away from you), stopping at the gold arrow. The number 24 should appear in the lower dials and the keyboard should automatically clear. If the machine is electrically driven, depress the plus bar instead of turning the operating crank.

7. Set 33 on the keyboard in the same manner as you set the 24.

8. Turn the operating crank forward one full turn again. This time the sum of 24 and 33, or 57, should appear in the lower dials, and the keyboard should again clear. The upper dials will show a 2, which indicates that you have added two numbers.

Locate the clear-out crank and give it one full turn backwards (toward you). This should clear the lower dials. Give it one full turn forward. This should clear the upper dials. If the clear-out crank will not move, move the operating crank opposite the gold arrow.

All addition is performed in this manner. To see if you understand just how to add, you are asked to work the following problems. Prove your work after each addition by reversing the direction of adding. If you add up the columns the first time, add down the second.

1	2	3	4	5
58	71	765	5897	543457
93	86	667	7543	761379
57	11	622	2492	376436
91	65	875	5475	211672
54	57	171	1162	124149
23	76	838	8295	673412
98	49	114	4159	585297
87	26	333	7475	555264
11	92	717	1134	398764
—	—	—	—	—

The problems you have solved contain only six digits. The size of the numbers that you may add depends on the size of the keyboard. If your keyboard has only six columns, you will be able to add only six digit numbers, but if the keyboard has eight columns, you will be able to add numbers of eight figures, and so on.

Job 3

ADDITION OF DECIMALS

Many times it is necessary to add figures made up of dollars and cents. To do this, it will be necessary to use a decimal marker to separate the dollars from the cents. These decimal markers are used on the keyboard to assist in setting the numbers correctly, and in the lower dials to assist in reading the answer correctly.

Keyboard. Between each row of figures on the keyboard is a small strip of metal. This strip of metal can be turned over. It is green on one side and white on the other. When the green side is turned up, its color harmonizes with the color of the keyboard, and therefore the strip is not noticeable. When the white side is turned up, its color stands out from the rest of the keyboard, and it is readily noticed that the decimal point is there. For this reason, then, the white side is used as the decimal marker.

As the problems that you will be asked to work first are for dollars and cents only, you will need only two decimal places on the keyboard, so you should turn the second strip from the right so that its white side is up, and you should turn all the others so that their green sides are up.

Lower Dials. Just above the lower dials is a small rod, to which are attached some arrows. These arrows slide to the right and left. As you plan to work with dollars and cents, you will slide one of these markers to the space at the left of the figure 2, which you can see on the bar to which the arrow is attached.

1	2	3	4	5
58.75	3.45	5.26	.17	1672.15
61.21	.89	138.59	1.11	475.37
2.38	12.37	205.22	12.38	42.75
14.81	18.94	31.61	143.79	5.17
31.25	123.86	5.21	1165.24	.29
1.64	.79	14.61	.17	3.68
7.17	83.91	.37	1.74	45.96
13.26	17.57	1.47	115.47	.14

Now that you have set the decimal markers in the position in which you want them, you proceed to add as you did before.

Set the cents in the preceding problems to the right of the decimal marker on the keyboard and the dollars to the left. Prove your work.

Sometimes it is necessary to add figures containing more than two decimal places. When this happens, you proceed as you did before, except that you set the decimal markers to agree with the number of decimal places in the figures that you are adding. In problems 6 to 10, the numbers contain three decimal places, so you turn up the white side of the third metal strip and you set the decimal marker that appears above the lower dials to the left of the figure 3. Set the decimal markers as indicated, and then add the following problems. Prove your work.

6.	7	8	9	10
678.231	237.567	41.236	.625	.54
9.413	7.981	.225	1.13	.65
7.659	4.213	1.25	672.52	.675
22.389	1.532	6.237	42.371	21.62
206.796	6.461	.428	62.896	3.278

Set the machine for four decimal places for problems 11 to 15:

11	12	13	14	15
23.4567	23.1498	19.4518	1.9872	.6258
19.7856	6.9159	6.3215	.2163	1.32
69.2239	65.9143	.6782	.2167	21.3165

Job 4

ADDING NAUGHTS

Quite often numbers contain naughts. When setting such numbers, just skip the column in which the naught appears. For instance, in the first number in problem 1 you should set the 2, skip the O, set the 3, and set the 6. Solve these problems. Prove your work.

1	2	3	4	5
20.36	240.02	6021.10	.0008	.4107
14.06	600.25	210.07	.003	.0241
7.60	20.60	980.80	.06	1.003
203.60	60.05	807.60	2.1304	20.1030
230.06	88.00	200.00	6.2002	60.0004

Job 5

CORRECTIONS AND INTERRUPTIONS

Corrections. There is an old saying that "to err is human." You should be constantly on your guard to prevent errors. You should check all the work that you do to make sure that it has been done correctly, and you should always give your undivided attention to the problem at hand. Daydreaming and talking to your neighbor will cause errors.

You may strike the wrong key while adding on the Monroe. If you discover the error before you have turned the operating crank, it is a very simple matter to correct it. The following illustration will show how easy it is to make a correction in the situation described.

Set 24567 on the keyboard. Assume that you made a mistake and that the number should be 24568. There are

three ways of making this correction: If you depress the clear key, the entire number will be cleared from the keyboard. Depress this key and clear the number. You are now ready to set the number correctly on the keyboard. Do so. Turn the operating crank forward.

Now set the number 24965 on the keyboard. Assume that the number that you just set was set incorrectly. Suppose that it should be 24985. You can make this correction in a different way. On the front of the keyboard is a row of red keys. On some models these keys are blank; on others they contain naughts. These are correction keys also. Each clears one column only. As the number that you have just set is incorrect in the tens column only, you can correct it by depressing the red key at the foot of the tens column, which clears the 6 out of the tens column. You can then set the correct digit, which is 8. Do this and then turn the operating crank forward. Your total should be 49553.

There is a still quicker way to correct a number of this type. Simply depress the correct number on the keyboard. As you do so, the incorrect number will be eliminated. Set 24216 on the keyboard. Suppose that it should have been 24126. Just depress the proper keys and your correction will be made. Remember that these methods of correcting errors can be used only *before* you have turned the operating crank.

If you do not discover the error until *after* you have turned the operating crank, you must make the correction by subtracting the incorrect amount out of the machine. The way in which this is done will be explained under "Subtraction." Until then, you must either use the red keys if you have not turned the operating crank, or clear

the machine and begin all over again if you have turned the operating crank.

Interruptions. In any office, interruptions occur frequently. If you are interrupted while adding a column of figures on the Monroe, you must mark your stopping place before you leave the machine. If you fail to do so, you will not know where to begin when you return to the machine. Many operators use the item counter and the repeat key for this purpose.

The Repeat Key. You will find this key on the right-hand side of the keyboard. It will have either an *R* or the word "Repeat" on it. When you depress it, you lock the keys down so that the machine does not automatically clear when you turn the operating crank. If you are interrupted when using the machine with this key depressed, the number that you last added will still be on the keyboard. When you return to the machine, you will then know exactly where you left off. If you use the repeat key, it is necessary for you to clear the keyboard after each number, for the keyboard does not automatically clear when the repeat key is down. To practice using the key, follow these directions:

1. Depress the repeat key.
2. Set 25 on the keyboard.
3. Turn the operating crank.
4. Press the clear key.
5. Set the next number and then proceed as before.

Add the figures in the problems on page 11, using the repeat key. Prove each.

If you are interrupted while working the problems, set the next number on the keyboard and turn the operating crank halfway forward. This will lock the number down.

When you return to your work, you can easily tell, by looking on the keyboard, which number you set last. You then complete the other half of the revolution that you started and continue with the problem. You cannot do this on the electrically driven machine.

1	2	3	4	5
2560	41.26	26.213	19.2104	.21643
4627	40.27	41.267	77.0042	.20071
6938	33.45	17.249	4.3147	.00023
7849	37.16	22.312	26.6002	.02134

Item Counter. The item counter is used to count the number of items that you have added. You will find it in the lower left-hand corner of the keyboard. Press the figure 1 in the column at the extreme left. Turn the item counter so that the arrow points to the right-hand side of the keyboard. Every time that you turn the operating crank forward, the figure 1, which you have locked down by turning the item counter, will record in the lower dials. On a six-column keyboard, this item counter is suitable when the total of the figures that are being added is in the tens of thousands. As soon as the total reaches the hundreds of thousands, the amount will add in the column in which the item counter is adding. As an example of the use of the item counter, you are asked to add the following items. Problem 10 is an illustration of the difficulty that arises when the figures add in the same column as the item counter. In such cases do not use the item counter. In your answer show the number of items and also the total of the items in each problem.

6	7	8	9	10
41	340	1.26	46.89	1021.58
43	210	.40	8.901	2468.09
48	501	3.06	4.786	4568.89
78	65	346.47	24.07	567.47
79	33	6.47	1.899	68.94
41	48	.09	4.56	2345.58
—	—	—	—	—

Job 6

SUBTRACTION

Subtraction on the Monroe is as easy as addition. Simply turn the operating crank in the opposite direction from that in which you turned it to add. If you are operating an electrically driven machine, depress the minus bar in order to subtract. If you are using the operating crank, the rule of stopping at the arrow applies in subtraction as in addition. The rules concerning the decimal points are the same. It is, of course, necessary to insert the larger number first. Consider this problem:

$$67 - 49.$$

1. Place 67 on the keyboard and turn the operating crank forward. This puts the minuend in the machine.

2. Clear the keyboard, and then put the subtrahend, 49, on the keyboard.

3. Turn the handle backwards (towards you). The difference, 18, should appear in the lower dials. Pay no attention to the upper dials. Solve the following problems. Prove each. To do so, add the subtrahend to the answer and it should equal the minuend.

1	2	3	4	5
5678	246.39	256.891	24.8901	24.31
−2109	−129.98	−35.987	−21.7698	−6.9876
—	—	—	—	—

Job 7

SUBTRACTION—WHEN SUBTRAHEND IS LARGER THAN MINUEND

Sometimes it is necessary to subtract a number from one that is smaller. In such cases, one subtracts in the usual manner, but the answer is interpreted differently. Consider this problem:

$$\begin{array}{r} 258 \\ -697 \\ \hline \end{array}$$

1. Shift the carriage as far to the left as possible.

2. Set 258 on the right of the keyboard, and turn the operating crank forward. This places the number in the carriage.

3. Set 697 on the keyboard and turn the operating crank backward. The answer is 99999561. (See Illustration 2.)

4. Set 561 on the keyboard and then strike 9's in the other columns. A six-column keyboard would show this: 999561. More 9's are needed to fill out a larger keyboard. Now turn the operating crank towards you twice. Your answer will be 439. Disregard the numbers that appear to the left of the naughts in the lower dials.

5. As the subtrahend was larger than the minuend, you must use a minus sign when writing your answer. The
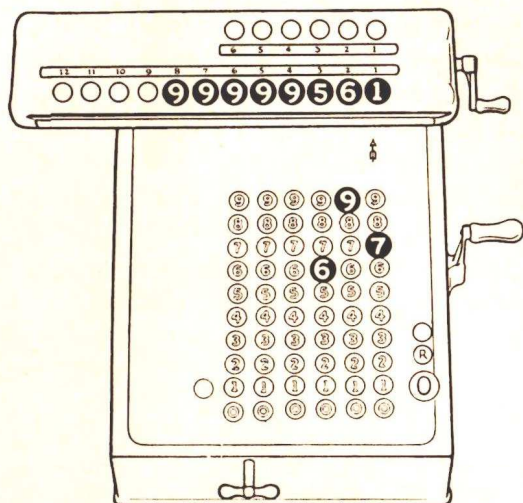
ILLUSTRATION 2

correct answer is −439. *This is important.* Remember, when your answer is preceded by a series of 9's, you change the 9's to a minus sign.

To see if you understand just what is meant, you are asked to work the following problems:

1	2	3	4	5	6
256	468.79	1.345	489	4789	.98
−798	−597.41	−2.5678	−2931	−235891	−37.

Perhaps you have wondered just why you work such problems when it would be so much easier simply to put the larger number on top and subtract in the regular manner. The answer to that is that sometimes you will not know

how the answer is coming out, and hence you cannot put the larger number on top. Suppose, for instance, you were adding a column of figures consisting of debits and credits. You would not be able to tell until you had reached the answer whether or not it would be plus or minus. To illustrate, you are asked to solve the following problems. The sign − means subtract. Some of these problems will have minus answers. Others will have plus answers. If the answer is minus, follow steps 4 and 5 in the instructions given above in order to find the correct answer. Prove your work.

7	8	9	10	11
213	22.09	367.789	−78.57	278.39
−230	−131.78	67.468	46.21	−789.61
379	− 36.09	−789.116	48.68	798.36
461	−247.39	−407.255	90.21	518.97
−697	679.35	56.378	−468.17	−135.47
457	351.47	−357.909	−578.31	− 89.31
469	896.43	516.479	−981.28	− 76.31

Job 8

MULTIPLICATION

Multiplication on the Monroe is quite simple, for it is just like multiplication with paper and pencil. Multiplication is really repeated addition; therefore, in working multiplication problems on the Monroe, always work with the repeat key down. Consider this problem:

$$56 \times 34.$$

1. Set the multiplicand 56 on the keyboard.
2. Depress the repeat key.

3. Shift the carriage as far to the left as possible.

4. Multiply by the 4 units. To multiply, simply turn the operating crank forward four times. If the machine is electrically driven, it will be necessary for you to depress the plus bar four times instead of turning the operating crank. You will see 224 in the lower dials and a 4 in the upper dials.

5. Multiply by the 3 tens. To do this, you must first shift from the units to the tens column. To do this, turn the carriage-shift lever one turn to the right. After this, turn the operating crank forward three times.

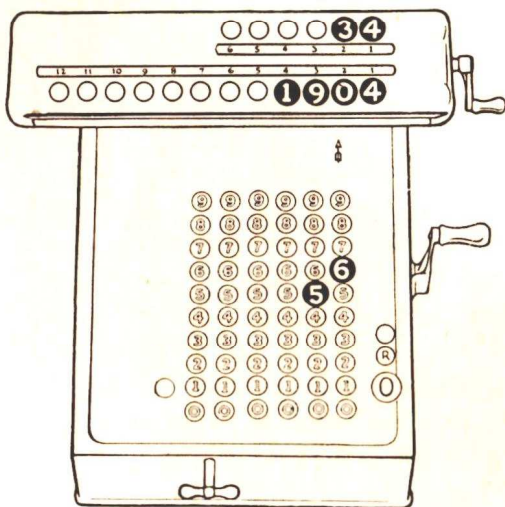6. Your answer of 1904 will appear in the lower dials.

ILLUSTRATION 3

7. The upper dials will show the multiplier.

8. The keyboard will show the multiplicand. No further proof is necessary.

All multiplication problems are worked in the same manner. Try the procedure on the following problems:

1. 23×92 **3.** 169×45
2. 15×12 **4.** 711×34
      5. 74×76

Continue to shift the carriage for each place in the multiplier. Consider this problem:

$$2751 \times 4326.$$

1. Set the multiplicand on the keyboard. It is customary to consider the larger number as the multiplicand; so you set 4326.

2. Depress the repeat key.

3. Shift the carriage as far to the left as possible.

4. Multiply by the 1 unit. Turn the operating crank forward once.

5. Shift the carriage one place to the right.

6. Multiply by the 5 tens. Turn the operating crank forward five turns.

7. Shift the carriage another place to the right.

8. Multiply by the 7 hundreds. Turn the operating crank forward seven times.

9. Shift the carriage another place to the right.

10. Multiply by the 2 thousands. Turn the handle forward two times.

11. Your answer of 11900826 will appear in the lower dials.

12. The upper dials will show the multiplier.

13. The keyboard will show the multiplicand.
Try these problems:

6. 2561 × 3247	**9.** 2134 × 6798
7. 5124 × 6713	**10.** 4126 × 5213
8. 4782 × 1241	**11.** 2134 × 6217

Job 9

MULTIPLICATION—NAUGHTS IN THE MULTIPLIER

When a naught occurs in the multiplier, shift the carriage an additional position to allow for the naught. Consider this problem:

$$3489 \times 506.$$

To work this problem proceed in the following manner.

1. Set the multiplicand 3489 in the machine.

2. Shift the carriage as far to the left as possible.

3. Turn the operating crank forward six times in order to multiply by the 6 units.

4. Shift the carriage one place to the right. As the tens figure in your multiplier is a zero, do not turn the operating crank, but, instead,

5. Shift the carriage one more place to the right. This brings you to the hundreds column.

6. As the hundreds figure in the multiplier is 5, turn the operating crank forward five times.

7. The answer, 1765434, will appear in the lower dials.

8. The multiplier, 506, will appear in the upper dials.

9. This same procedure should be followed whenever you have a zero in the multiplier. Naughts in the multiplicand are set in the same manner as they are set in addition. Try these problems:

1. 4678 × 809	**3.** 3567 × 4008
2. 4873 × 601	**4.** 5139 × 8003
	5. 4001 × 2003

Job 10

MULTIPLICATION—DECIMALS

In arithmetic, you determine the number of decimal places in the product or answer of a multiplication by adding the number of decimal places in the multiplier to the number of decimal places in the multiplicand. You do exactly the same thing on the Monroe. Consider this problem:

$$4.56 \times .27$$

You know that you will have four decimal places in the answer, because there are two in the multiplier and two in the multiplicand.

1. Set the multiplicand on the keyboard and point off between the 4 and the 5. To point off, simply turn the metal strip so that the white side is up. On the other strips the white side should be down.

2. Next, point off in the multiplier. The multiplier will appear in the upper dials when you are finished, so point off there. As there are two places in the multiplier, set the decimal marker in the upper dials to the left of the figure 2 that appears on the metal strip to which the marker is attached.

3. Now point off the product or answer. As the answer will appear in the lower dials, set the decimal marker for the lower dials to the left of the figure 4 that appears on the metal strip to which the decimal marker is attached. (See Illustration 4.)

Go over these instructions again. Remember that the decimal markers are always set *before* starting to multiply.
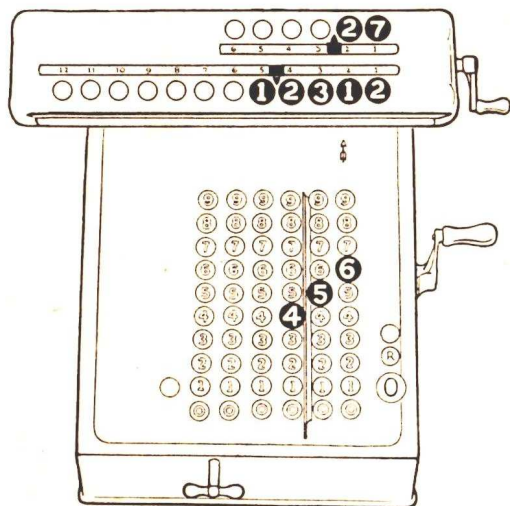
ILLUSTRATION 4

Simply add the number of places on the keyboard to the number of places in the upper dials to determine the number of places to point off in the lower dials. Solve the following problems. Point off before you begin to multiply.

1. 3.8125×8.875	4. $.1875 \times 11.75$
2. 61.625×2.54	5. $.6667 \times .625$
3. 6.0625×4.125	6. $34.4167 \times .625$

Preceding Ciphers. When the multiplier or multiplicand contains preceding ciphers, they should be ignored in the actual process of multiplying, but they should be considered when pointing off. Consider problem 7. You should:

1. Set the multiplicand, 8974, on the keyboard as usual.
2. Point off in upper dials. The decimal marker is set at 3.

3. Point off in the lower dials. Three places in the upper dials plus no places on the keyboard makes three places in the lower dials.

4. Multiply by the 7. Your answer should be 62.818.

7. $8974 \times .007$	9. $316.27 \times .0008$
8. $2167.5 \times .003$	10. $417.89 \times .0004$

Job 11

MULTIPLICATION—SHORT CUTS

Sometimes you will be able to save quite a bit of effort in multiplying by using short cuts. The proper time for using short cuts is largely a matter of opinion, but a few instances may be cited here. Consider this problem:

$$4261 \times 99.$$

Suppose you are multiplying from the right of the keyboard.

1. Set the multiplicand on the extreme right of the keyboard and set the carriage to the extreme left.

2. Now, ordinarily, you would turn the handle forward nine times to multiply by the 9 units. You would then shift the carriage one place and turn the handle forward nine times again in order to multiply by the 9 tens. This means that you would have to turn the handle a total of 18 times.

3. You can save 16 revolutions of the handle by first multiplying by 100 and then subtracting the multiplicand from the product $(100 - 1 = 99)$. Therefore, the quickest way to work the problem given is to shift the carriage to

the third place, turn the handle forward once to multiply by 100, then shift the carriage back to the first place, and turn the handle back once to subtract the multiplicand once.
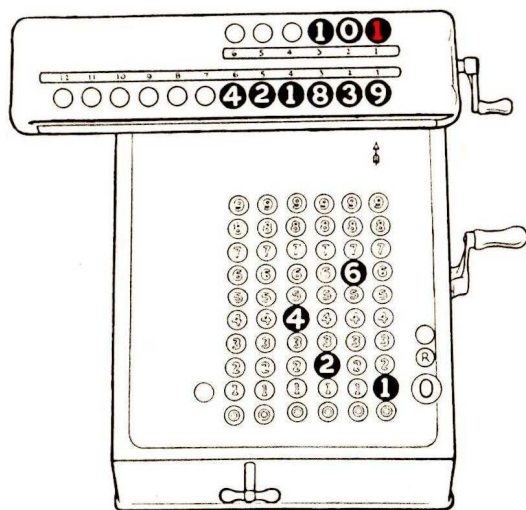

ILLUSTRATION 5

This requires but two revolutions of the operating crank, while the other method requires 18.

Solve the following problems:

1. 457 × 99		**6.** 2452 × 999
2. 681 × 98		**7.** 8763 × 980
3. 736 × 97		**8.** 4231 × 974
4. 271 × 97		**9.** 721 × 987
5. 2421 × 89		**10.** 2652 × 899

Job 12

DIVISION

Division on the Monroe is as simple as multiplication. It is merely a process of repeated subtraction.

Consider this problem:

$$144 \div 12.$$

1. Clear the keyboard and dials.

2. Shift the carriage to the extreme right, so that you will always have room to carry the answer as far as you wish.

3. Set the dividend at the extreme left of the keyboard and turn the operating crank forward to put the number into the machine.

4. Clear the upper dials and the keyboard.

5. Set the divisor 12 on the extreme left of the keyboard.

6. Depress the repeat key.

7. Now study the keyboard. The divisor, 12, is set in the extreme left-hand columns. Look directly above these columns to the lower dials and notice which figures of the dividend appear there. In this case 14 appears directly over the divisor.

8. Ask yourself this question, "Will the divisor go into the numbers directly above it?" In other words, will 12 go into 14?

9. As it will, you turn the operating crank towards you once. This records a red 1 in the upper dials and leaves a remainder of 24 in the lower dials.

10. Now look again at the dials directly above the divisor. Ask the same question, "Will the divisor go into the number directly above it?" In other words, will 12 go into 2?

11. It will not; so you shift the carriage one place to the left.

12. Now study the figures that appear directly above the divisor. They are 24. (See Illustration 6.)
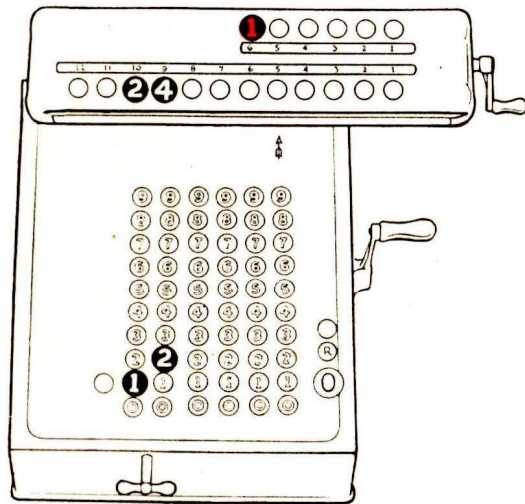
ILLUSTRATION 6

13. Ask yourself the same question, "Will the divisor go into the numbers directly above it?" In other words, will 12 go into 24?

14. It will; so you turn the operating crank towards you once.

15. Study the numbers again. Will 12 go into 12?

16. It will; so turn the operating crank towards you again.

17. As no numbers are left in the lower dials, the division is completed. The answer is 12, which will now appear in the upper dials in red.

18. Prove your work. To do so, multiply the answer by the divisor (12×12). The result should be the dividend (144).

Take one more, this time a hard one. Here it is:

$$50481 \div 237.$$

1. Set the dividend on the keyboard as far to the left as possible.

2. Shift the carriage as far to the right as possible.

3. Turn the operating crank forward. This puts the dividend in the lower dials.

4. Clear the keyboard and the upper dials.

5. Set the divisor 237 on the extreme left of the keyboard.

6. Depress the repeat key.

7. Look directly above the 237. The number that you will see is 504. Will 237 go into 504? It will; so you:

8. Turn the operating crank one full turn backwards.

9. The remainder is 267. Will 237 go into 267? It will; so you:

10. Give the crank another turn towards you. The remainder is 30. Will 237 go into 30? It will not; so you:

11. Shift the carriage one place to the left. Now the number that appears above the divisor is 308. Will 237 go into 308? It will; so you:

12. Turn the operating crank backwards once. The remainder is 71. Will 237 go into 71? It will not; so you:

13. Shift the carriage another place to the left. The number that now appears above the divisor is 711. Will 237 go into 711? It will; so you:

14. Give the crank another turn. The remainder is 474. Will 237 go into 474? It will, so turn the operating crank another time. The remainder is 237. Will the divisor go into 237? It will; so you:

15. Turn the handle once more. As there is no further remainder, you have finished. The answer, 213, appears in the upper dials.

Sometimes in turning the operating crank backwards, you turn it too many times. When this happens, a bell will ring. If you hear the bell ring, stop turning the crank backwards and start to turn it forward until it rings again. Then proceed as before. To see if you have mastered the procedure, you are asked to solve the following problems. Carry problems out until no figures are left in the lower dials. .Prove each.

1. 120417 ÷ 267	6. 216108 ÷ 276
2. 70525 ÷ 325	7. 610213 ÷ 617
3. 238846 ÷ 614	8. 233073 ÷ 423
4. 59400 ÷ 216	9. 272118 ÷ 627
5. 548793 ÷ 843	10. 325312 ÷ 416

Job 13

DIVISION—DECIMALS

The manner of pointing off decimal places on the Monroe is the same as that used in pencil and paper division.

You subtract the number of places in the divisor from the number in the dividend in order to determine the number in the quotient.

As the divisor is the number set on the keyboard, and as the dividend is the number set in the lower dials, the rule may be changed to this: Subtract the number of decimal

places on the keyboard (divisor) from the number of decimal places in the lower dials (dividend) to determine the number of decimal places in the upper dials (quotient).

Consider this problem:

$$25.75 \div 3.35.$$

Proceed as follows:

1. Set the dividend in the lower dials.

2. Set the decimal between the 5 and the 7. The lower dials now read 25.750000000, as in Illustration 7.

3. Clear the upper dials and the keyboard.

4. Set the divisor on the keyboard.

5. Turn up a white strip between the first 3 and the second 3. The number on the keyboard will now read 3.35000. (See Illustration 7.)

6. Count the number of decimal places on the keyboard. Count from the right-hand side of the machine and you will discover that there are five decimal places marked off. Subtract this number from the number pointed off in the lower dials (9). The answer indicates the number of places to be pointed off in the upper dials. As the answer is 4, slide the decimal marker in the upper dials to the left of the figure 4. (See Illustration 7.)

7. Proceed to divide as instructed in the preceding jobs.

Please remember that you always set the decimal points *before* you start to work the problem.

Is it clear to you? Here it is again. Subtract the number of places on the keyboard from the number of places in the lower dials to determine the number of places to mark off in the upper dials.
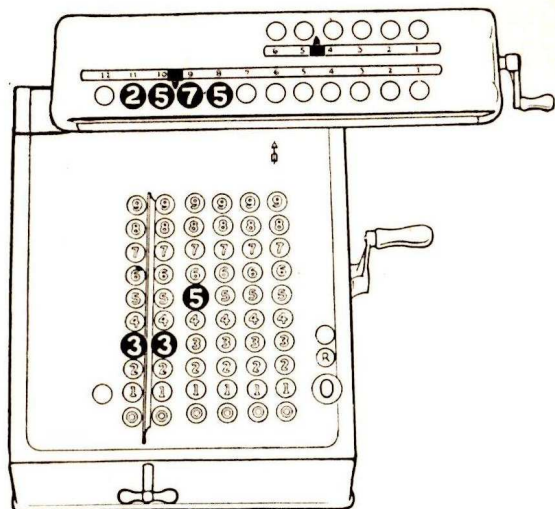
ILLUSTRATION 7

Solve the following problems. Carry the answer out to the third decimal place in the upper dials.

When you have carried your answer to the third place in the upper dials, you will notice that a number remains in the lower dials. This number is your remainder. Unless the answer is to be extremely accurate, it is not necessary to record this remainder. Most offices, after ascertaining the answer to the third decimal place, drop the remainder. Therefore, in the problems that follow it will not be necessary to show the remainder:

1. $128.43 \div 29.5$
2. $962.99 \div 37.3$
3. $26.938 \div 2.45$
4. $63.824 \div 5.75$
5. $5.4620 \div 8.65$
6. $3.4871 \div 8.17$
7. $24.765 \div .826$
8. $875.08 \div 42.9$
9. $69.346 \div 2.091$
10. $7.8251 \div 9.48$

Job 14

DIVISION—WHOLE NUMBERS

Note that whole numbers are understood to have decimal places, even if they are not written. In any whole number, the decimal place is understood to be at the right of the last figure to the right. In the number 6789, for instance, the decimal point is understood to be at the right of the 9.

It is important that you take this into consideration in working division problems on the Monroe, for if you do not, it is quite likely that the answer will be incorrectly pointed off. This is particularly true when the dividend is smaller than the divisor.

Consider this problem:

$$300 \div 600.$$

Work it without any attention to decimal places. Your answer is 5, but is it 5. or .05 or .5? If you do not point off before you start, you will not know the correct answer. Solve these problems. Carry the answer to the third decimal only.

1. $75 \div 150$
2. $340 \div 785$
3. $1960 \div 85$
4. $75 \div 500$
5. $872 \div 436$
6. $19 \div 38$
7. $60 \div 150$
8. $2314 \div 8976$
9. $1826 \div 4170$
10. $2457 \div 8916$

Job 15

DIVISION—PRECEDING CIPHERS

When the divisor contains preceding ciphers, you must be careful to point off correctly. The best way to do this is to

consider the divisor a whole number, and to make an adjustment in the answer to care for the preceding ciphers. Consider this problem:

$$4689 \div .09.$$

1. Set the dividend, 4689, in the left of the lower dials and point off.

2. Clear the upper dials and the keyboard.

3. Set the divisor, 9, on the keyboard, in the extreme left-hand column.

4. Point off on the keyboard. Although the divisor is .09, consider it as 9. for the present, and turn up the strip at the right of the 9. Do you understand just what you have done? You have shifted the decimal point two places to the right.

5. Point off in upper dials.

6. Divide as instructed before. Your answer thus far is 521.

7. Because you shifted the decimal point of the divisor two places to the right, it is now necessary for you to shift the decimal marker in your answer two places to the right, which will give you the correct answer of 52100.

Consider this problem:

$$24780 \div .0028.$$

1. Set the dividend in the left of the lower dials and point off.

2. Clear the upper dials and keyboard.

3. Set 28 to the left of the keyboard and point off to the right of the 8. This means that you have shifted the decimal point four places to the right. When you get your

answer, it will be necessary to shift the decimal point four places to the right to agree with this.

4. Point off in the upper dials.

5. Divide as before. Your answer is 885.00. Shift decimal point four places to the right and your correct answer will be 8850000. Try these problems:

11. $213.69 \div .06$	15. $37213 \div .0078$
12. $389.76 \div .032$	16. $287.96 \div .035$
13. $67.627 \div .0367$	17. $241.82 \div .074$
14. $4216.7 \div .0027$	18. $364.87 \div .009$

Job 16

DIVISION—WHEN THE UPPER DIALS ARE TOO SMALL

Sometimes the number of places required in the dividend is too great for the upper dials to show the correct decimal point. When this occurs, you must keep in mind the proper place in which to mark off the decimal point, and then place it in your answer.

Consider this problem:

$$8.21 \div 5612.3.$$

Set these two numbers as you would ordinarily set them for division. There are two places on the keyboard and ten in the lower dials, which make eight for the upper dials. When you try to point off eight places in the upper dials, however, you discover that there are but six, so you must bear in mind that, whatever answer you secure, you must add two naughts to the left of the answer in order to get the proper answer. To prevent forgetting to add these naughts, it is a good plan to put them on your paper before you start to work the problem. Therefore, before you work

the problem, write a decimal point and two naughts on your paper like this: .00. If you carry this problem all the way across the keyboard, the upper dials will read 146285. Should you write this answer as it appears in the dials, it would be incorrect. Remember that you must insert the two naughts before the figures in order to get the correct answer, which, in this case, is .00146285.

Now try these problems:

1. $25 \div 56456$	3. $.478 \div 715678$
2. $129 \div 78956.1$	4. $1 \div 217.32$
5. $78 \div .26413$	

Job 17

FRACTIONS—ADDITION

Fractions cannot be used as such on the Monroe. They must first be reduced to decimals. Everyone should know the common decimal equivalents. If you do not, consult the table on page 52.

In the problems that follow, it will be necessary for you to carry out the decimal equivalents to four places only. Some have more decimal places, but it is not necessary to carry them so far for this work.

1. Consider the first problem below.

2. Glance down the column of figures to be added and determine the fraction that will require the greatest number of decimal places when written as a decimal. In this problem, the largest number of places required is three, because $\frac{1}{8}$, when written as a decimal, will require three places (.125).

3. Next set the decimal marker on the keyboard for this largest fraction. To do this, turn up the white side of the third metal strip from the right. Remember the other metal strips should have the green side on top.

4. Set the whole numbers at the left of the decimal marker and the fractions at the right. Be very careful to set the fractions in the proper position on the keyboard.

5. Add as instructed before. In the fourth and fifth problems, you will be able to carry the fraction out two places only, if you have a six-dial machine.

1	2	3	4	5
$14\frac{3}{4}$	$37\frac{3}{8}$	$46\frac{1}{8}$	$76.12\frac{1}{4}$	$26.45\frac{1}{8}$
$26\frac{1}{4}$	$19\frac{5}{8}$	$27\frac{1}{3}$	$45.25\frac{1}{3}$	$27.96\frac{1}{3}$
$98\frac{1}{8}$	$41\frac{2}{3}$	$45\frac{3}{4}$	$5.30\frac{1}{2}$	$42.87\frac{1}{2}$
$42\frac{1}{2}$	$92\frac{1}{8}$	$72\frac{3}{8}$	$36.67\frac{1}{4}$	$37.68\frac{3}{8}$
$46\frac{1}{4}$	$78\frac{1}{4}$	$89\frac{2}{3}$	$9.45\frac{1}{2}$	$17.65\frac{3}{4}$

Job 18

FRACTIONS—SUBTRACTION

Subtraction of fractions is the same as subtraction of whole numbers, except that the fractions must be changed to decimals before they can be subtracted on the Monroe. In the following problems convert the fractions into decimals of not more than three places. If the machine is not large enough to carry all the figures, drop the last two figures of the decimal equivalent; for instance, drop the last two figures of .3333, if it is necessary.

1	2	3	4	5
23¼	251⅜	458⅔	981⅛	786¾
18⅓	78⅓	214½	456⅕	287⅛

Job 19

FRACTIONS—MULTIPLICATION

Multiplication of fractions on the Monroe proceeds in the same manner as regular multiplication, except that the fractions must first be reduced to their decimal equivalents. Multiply the following numbers. Carry fractions to three places only.

1	2	3	4	5
45¼	25⅛	507¾	608⅙	.67½
27⅔	17⅕	213⅓	789⅓	.47¼

Job 20

FRACTIONS—DIVISION

Division of fractions is exactly like the division of whole numbers, except that the fractions must first be reduced to decimals. Solve the following problems. Be careful about pointing off. If you have forgotten about pointing off in division, refer to Job 13, which explains it fully. Carry the fractions to three places only.

1. $725⅔ ÷ 34⅛$
2. $3486½ ÷ 6¼$
3. $4786¾ ÷ 927⅛$
4. $1721⅔ ÷ 62⅚$
5. $5261¼ ÷ 25½$

Job 21

SIMPLE DISCOUNT

Working discount is a simple process on the Monroe. You first find 100% of the gross amount, and then deduct the amount of discount offered. Consider this problem:

$$45.25 \text{ less } 15\%$$

First find 100% of this amount. To do this, follow these steps:

1. Depress the repeat key.
2. Set the list price of 45.25 on the right of the keyboard.
3. Now if you were writing 100%, you would write it "1.00," would you not? It is written this way on the Monroe. Therefore, it is necessary to shift the carriage two places to the right. At the top right-hand side of the keyboard is a small gold arrow. This arrow points towards the dials. Its purpose is to help find any particular dial. In this problem you wish to get a 1 in the third dial, so you shift the carriage until the arrow points to the third dial.
4. Now turn the operating crank forward. Set your decimal marker in the upper dials at 2, because you write 100% as 1.00.
5. Point off in the lower dials. In this case, you set the decimal marker between the 5 and the 2.
6. You are now ready to deduct the discount of 15%. Just as in pencil and paper calculation, discounts are written as decimals on the Monroe; for instance, 15% is written as .15. This means that the figures of the decimal, which are 1 and 5, must come to the right of the decimal point.

7. To do this, shift the carriage one place to the left.

8. Now subtract the first figure of the decimal, which is 1, by turning the operating crank backwards once. The upper dials will now show 1.10 and the 1 to the right of the decimal point will be red.

9. Again shift the carriage one place to the left. As the next number of the decimal is 5, turn the operating crank backwards five times. The upper dials will now read 1.15 and the discount of 15% will be shown in red to the right of the decimal point. The lower dials will show the answer of 38.4625.

If you have done your work correctly, when you have finished, the dials of your machine will look like Illustration No. 8.
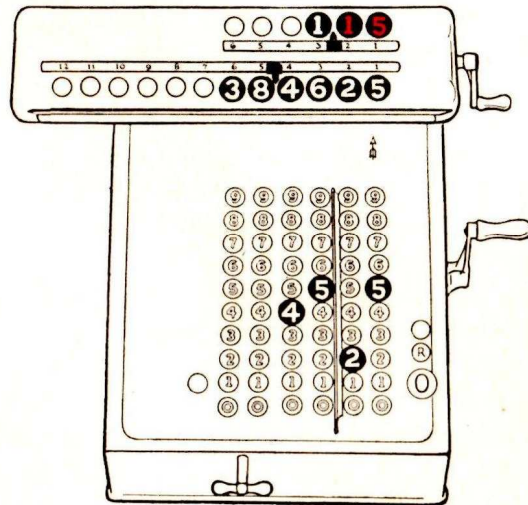

ILLUSTRATION 8

If you think you understand this procedure, solve the following problems:

1. 35.45 less 12%   3. 67.50 less 33%
2. 17.25 less 35%   4. 97.26 less 20%
                5. 18.75 less 5%

Job 22

DISCOUNT—FRACTIONAL PERCENTAGES

One sometimes encounters fractions of percentages. These fractions of a per cent are often expressed in decimals, as .5% or .8%. Such problems are worked on the Monroe in exactly the same manner as any other discount, but you must be very careful in changing the percentages to decimals. Remember that the % mark itself means two decimal places, and that the other decimal places are in addition to these two. For instance, when expressed as decimals, the percentages mentioned above would be written .005 and .008 respectively. This raises a new problem at once.

Consider this problem:

87.26 less .5%.

1. As you will need three decimal places for the discount, you set the decimal marker in the upper dials at the third position from the right.

2. Set the gross amount on the keyboard.

3. Shift the carriage to get 100% of the list price. As you are using three decimal places in this problem, 100% must be written 1.000. Turn the operating crank forward once.

4. Point off in the lower dials.

5. Deduct the discount.   As the discount is .5%, it must be written .005.   Shift the carriage accordingly and subtract the discount.   (See Illustration No. 9.)   If you have done your work correctly, an answer of 86.82370 will appear in the lower dials.
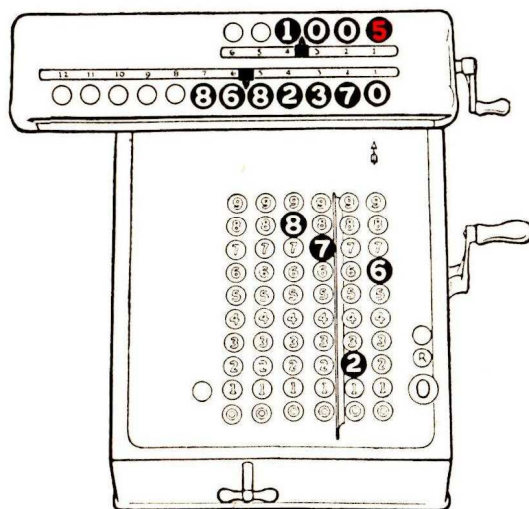

ILLUSTRATION 9

Now try the following problems:

1. 67.85 less .8%   3. 107.36 less .7%
2. 89.45 less .2%   4. 134.57 less .6%
               5. 267.41 less .3%

These same rules are followed when the per cent to be deducted is expressed as a mixed number, such as 12½% or 15¼%.

You must first reduce the fraction at the end of the per cent to a decimal; for instance, 12½% would be written .125; 15¼% would be written as .1525.   In this second example, the discount has four decimal places and, as a result, you must set the decimal marker in the upper dials to the fourth decimal place.

Consider this problem:

$$567.78 \text{ less } 12\tfrac{1}{4}\%.$$

Now 12¼% expressed as a decimal would be written .1225, which means that it requires four decimal places in the upper dials.

1. Set the decimal marker of the upper dials at 4.
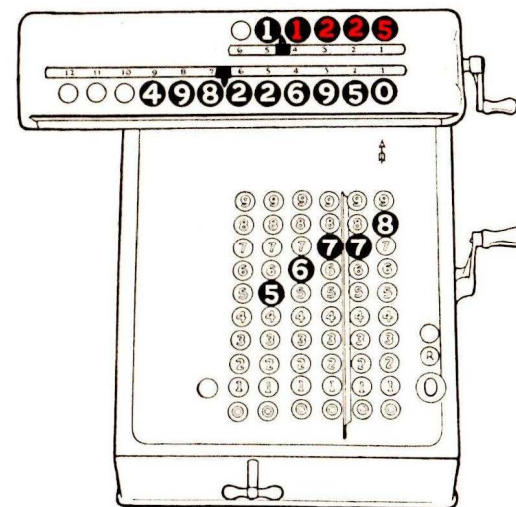2. Set the gross amount on the keyboard.

ILLUSTRATION 10

3. Shift the carriage so that the figure 1 of 100% will appear to the left of the decimal point.

4. Turn the operating crank forward once. The upper dials will now read 1.0000 and the list price will appear in the lower dials.

5. Point off in the lower dials.

6. Shift the carriage one place to the left.

7. Start to subtract the discount by turning the operating crank backwards once. From this point on proceed as before. (See Illustration No. 10.)

Try these problems. Use four decimal places only.

6. 678.98 less 12½%   **8.** 234.56 less 20⅓%
7. 456.72 less 35¼%   **9.** 67.35 less 5¼%
                10. 67.25 less 3⅓%

Job 23

CHAIN DISCOUNTS

Sometimes vendors offer a series of discounts instead of one. When this is done, the procedure is a little different from that of simple discount, which you have just studied. Suppose you receive a bill of $65.00, less 25%–15%–15%.

Follow these steps:

1. Set 65.00 on the right of the keyboard.

2. Clear both dials.

3. Depress the repeat key.

4. Shift the carriage until it is in a position to write 100% (1.00).

5. Turn the operating crank forward to get 100%, or 1.00.

6. Point off in the lower dials.

7. Deduct the 25% in red as before.

8. If you performed the first part of the work correctly, your answer in the lower dials should be 48.75. The next step is to deduct 15% from 48.75. This means that you must change the number on the right of the keyboard. Accordingly, the first thing to do is to copy the 48.75 from the lower dials to the right of the keyboard. As the number 48.75 is in the lower dials already, it is unnecessary to put it there. Accordingly, you do not find 100% of this number. It is already there. Do you understand this? You must, however, deduct the discount. Remember that 15% is really .15 on the Monroe, and therefore the number must appear in red in the same two dials in which the 25% appeared.
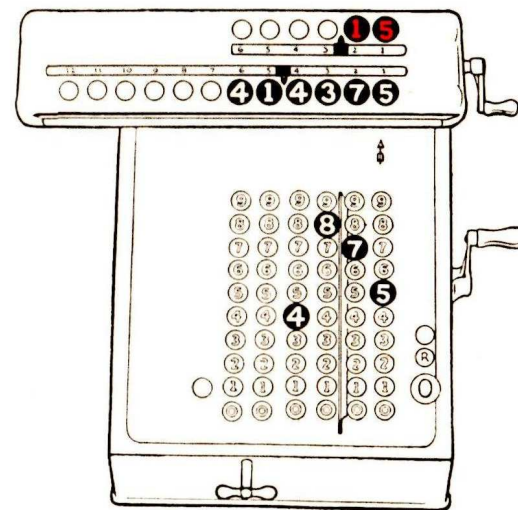

ILLUSTRATION 11

9. Now clear the upper dials only.

10. Deduct the 15% in the same manner that you deducted the 25%. If you do your work correctly, you will have 41.4375 in the lower dials as an answer when you finish. (See Illustration 11.)

11. Now follow the same procedure as before. Here it is again:

a. Copy the amount from the lower dials to the right of the keyboard. The amount is 41.4375. Change it to 41.44, but do not change the amount in the lower dials.

b. Clear the upper dials.

c. Subtract the 15% discount in the same manner and in the same dials as before. The answer should be 35.2215.

If you do not understand the instructions thus far go over them again and take only one step at a time.

After you have mastered the instructions, solve the following problems:

1. 156.95 less 15–12–11%	6. 246.21 less 8–7–6%
2. 286.98 less 20–15–10%	7. 458.25 less 15–12%
3. 456.93 less 25–20–15%	8. 247.91 less 12–10%
4. 789.58 less 10–25–12%	9. 789.26 less 3–21%
5. 987.47 less 10–15–11%	10. 987.63 less 20–15–10%

Job 24

CHAIN DISCOUNTS—WORKING FROM LEFT

The answers obtained in the preceding job are not strictly accurate, because you dropped a part of the decimal at various times. If you should desire a more accurate answer, it would be necessary for you to begin your work

at a point nearer to the center of the dials, so that you would not be forced to drop part of your decimal.

Consider this problem:

$$\$17.45 \text{ less } 2\text{–}5\text{–}2\%.$$

This time you will work from the left of the dials, so that you will have more room for your decimals.

1. Set the list price to the left of the keyboard, but shift the carriage to the right as far as possible.

2. Clear both dials.

3. Point off on the keyboard.

4. Turn the crank forward once, to get 100% of the amount.

5. Move the decimal point to the right of the 1 that appears in the upper dials and to the right of the 7 that appears in the lower dials. This is the same as the first step in the preceding job, except that the numbers have been set further to the left in the dials.

6. Deduct the first discount as in the other problems. The answer is now 17.101.

7. Set 17.101 on the keyboard. Do not change the decimal marker that appears on the keyboard. Put the 17 to the left of the decimal marker and the 101 to the right of the decimal marker.

8. As the amount is already in the lower dials, you do not have to find 100% of the amount, so you are ready to deduct the second discount.

9. Clear the upper dials.

10. Deduct the second discount. Remember that 5% is written as .05. The lower dials will now read 16.24595.

11. Clear the upper dials again.

12. Set 16.24595 on the keyboard. If the keyboard is too small to hold all the figures, drop the figures on the right. Do not move the decimal point on the keyboard but set the 16 to the left of the decimal point and the 24595 to the right of it.

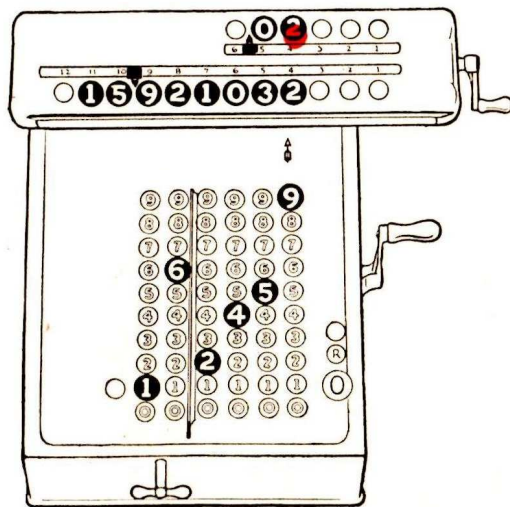13. Deduct the next discount. The answer 15.921032 or 15.92 will appear in the lower dials.

ILLUSTRATION 12

Work through this problem again. Keep at it until you understand it thoroughly. Then solve the following problems:

1. 877.84 less 15–10–8%   3. 921.65 less 4–7–8%
2. 675.21 less 8–6–2%   4. 627.43 less 25–20–15–12%
                5. 973.14 less 20–15–12–10%

Job 25

CHAIN DISCOUNTS—DECIMAL EQUIVALENTS

In working chain discounts, most modern offices use a table of decimal equivalents. Instead of working the discounts as you have been doing, the operator simply refers to the table of decimal equivalents and finds a single decimal to take the place of the three or four decimals in the chain. A table of the more common chain discounts is shown on page 51.

Consider this problem:

43.25 less 15–10–5%.

1. Find the column headed 15 in the table.

2. Look down this column until you come to the line 10–5.

3. Trace the line across and you will find that .72675 is the decimal equivalent for the discounts given. In other words, instead of deducting three discounts, 15–10–5, you can get the same results by multiplying by .72675.

4. Multiply 43.25 by .72675 and your answer of 31.-4319375 will appear in the lower dials.

5. Drop the fraction and your answer, 31.43, is the net amount of the discount. Solve the following problems by referring to this table to locate a single discount:

1. 876.25 less 5–5–2½%   3. 241.63 less 10–7½–5%
2. 928.37 less 7½–5–5%   4. 671.89 less 12½–7½–5%
                5. 478.22 less 25–10–10–10–10–10%

Job 26

PERMANENT DECIMAL POINT

Sometimes in offices problems are met in which the decimal point shifts frequently. According to what you have been taught, you would have to change the decimal markers each time you had a different number of decimal places. This takes some time, so, in order to save time, it is better to set the decimal point in a given place and then work the problems around it instead of moving it. Consider these problems:

1. 4.6262×7.4567 3. 4.2134×7.1789
2. 89.456×74.829 4. 2.16378×1.324
5. 2.1637×1.324

1. First scan the entire list of multipliers. Note that the greatest number of decimal places in any of them is four.

2. Set the decimal marker in the upper dials at 4. Remember that the upper dials show the multiplier.

3. Next scan the list of multiplicands. The greatest number of decimal places among them is four. It could be three or two, but it happens to be four; so you set the decimal marker on the keyboard at the fourth place from the right.

4. The total of the number of decimal places on the keyboard and in the upper dials now equals eight, so you set the decimal marker of the lower dials at 8. After these markers are once set, do not change them again. Work around them.

5. Set the multiplicand of the first problem on the keyboard with the number 4 to the left of the decimal point and the other numbers to the right.

6. Move the carriage until it is in the proper position to multiply by the first right-hand figure of the multiplier.

7. Multiply by 7.

8. Move the carriage one place to the right and multiply by the 6.

9. Move the carriage one place to the right and multiply by the 5.

10. Move the carriage once to the right and multiply by 4.

11. Move the carriage one place to the right and multiply by 7. The answer 34.49618554 should appear in the lower dials. Now clear the keyboard and both dials.

12. You are ready for the second problem. Do not move the decimal points but set the multiplicand with the whole number, 89, to the left of the decimal marker on the keyboard.

13. Shift the carriage until it is in the proper position for multiplying.

14. Multiply in the usual manner.

15. Proceed in the same manner with the other problems. Do not move the decimal markers, but set and work the problems around them.

Job 27

REVIEW

You have now completed learning the fundamentals of Monroe calculating machine operation. Before you take your test, however, it will be better for you to review some

of the work in order to fix it more firmly in your mind. Jobs 27 and 28 contain problems illustrating the various principles you have studied. Try these problems. If you do not understand just how to work them, review the job that teaches that principle. When you have completed the review jobs, ask your instructor for a copy of the examination.

Addition and Subtraction. Some of these problems have plus answers but others have minus answers. Be sure that you know how to tell the correct answer when it is minus. If you have forgotten, review Job 7.

1	2	3	4	5
41½	267⅜	864.27	2.1675	.62
43⅓	− 42¾	−213.09	−26.0007	−26.007
−89¼	89⅔	67.82	.8972	6.2
167⅔	−563⅙	−241.58	− 1.02	− .72
−98⅛	132½	70.89	10.4207	30.

Multiplication. Be careful about pointing off. (See Job 10.)

6. 2.1478 × 2.65
7. 31.82 × .426¾
8. 8937 × 1.0002
9. 625 × 473½
10. .973 × .8216
11. 2167 × .008
12. 318.25 × .0026

Short Cuts. If you know the trick, you can save considerable time on these. (See Job 11.)

13. 2678 × 99
14. 214 × 98
15. 786 × 989
16. .6214 × 899
17. 742 × 890

Division. Be careful of decimals. Where is the decimal point in a whole number? Jobs 12, 13, 14, and 15 will tell you.

18. 826 ÷ 87½
19. 79.34 ÷ 821⅓
20. 216.43 ÷ 27.89
21. 7817 ÷ 92.35
22. 6007 ÷ 8.102
23. 417.85 ÷ .025
24. 21.784 ÷ .097

Upper Dials Too Small. Better review Job 16 for these.

25. 26¾ ÷ 43217
26. 178 ÷ 2674.23
27. .216 ÷ 213897
28. 12¼ ÷ 874.20
29. .67⅛ ÷ 92167

Discounts. (See Jobs 21, 22, and 23.)

30. 67.86 less 5%
31. 428.57 less 12½%
32. 825.78 less 15–10%
33. 927.46 less 20–15–10%
34. 214.67 less 30–25%

Use the table of decimal equivalents to work the following:

35. 278.56 less 7½–5–5–2½%
36. 341.79 less 10–7½–2½%
37. 4235.66 less 25–10–10–5%
38. 1207.85 less 15–10%
39. 6021.79 less 10–5–2½%
40. 783.45 less 22½–10–5%

Job 28

REVIEW (*Continued*)

In the following review, the problems are purposely mixed up. Carry decimal equivalents to three places only.

1	2	3
278⅛	89.6½	.6
−456¼	−47.8⅓	200.
782⅛	.9⅙	60.007
−561½	−92. ¼	− 2.10
789⅙	18.	−200.12

4. 4673 × 27.653
5. 2167 × 246
6. 2179 × 98
7. 215.38 × 2165.87
8. 247 ÷ 62¼
9. 7923 ÷ .441
10. 12½ ÷ 986.4
11. 67.86 less 27½ − 2½%
12. 846.26 less 25−10−10−5−2½%
13. 1 ÷ 67892
14. 42.517 × 785.018

15. .268 × .897
16. .2413 × 899
17. 274.61 less 35−5−2½%
18. 923.78 less 15−5−5%
19. 27 ÷ 86247
20. 452.78 ÷ .8967
21. 31.68 × .006
22. 36.218 ÷ .085
23. 217.984 ÷ .0036
24. 6.1782 × .00035¼
25. 946.72 less 20−10−10−5%

Appendix

TABLE OF CHAIN DISCOUNT EQUIVALENTS

Rate	5	7½	10	12½	15	16⅔	20	22½	25
Net	.95	.925	.90	.875	.85	.83333	.80	.775	.75
2½	.92625	.90188	.8775	.85313	.82875	.8125	.78	.75563	.73125
5	.9025	.87875	.855	.83125	.8075	.79167	.76	.73625	.7125
5−2½	.87994	.85678	.83363	.81047	.78731	.77187	.741	.71784	.69469
55	.85738	.83481	.81225	.78969	.76713	.75208	.722	.69944	.67088
55−2½	.83594	.81394	.79194	.76995	.74795	.73328	.70395	.68195	.65995
7½	.87875	.85563	.8325	.80938	.78625	.77083	.74	.71688	.69375
7½−2½	.85678	.83423	.81169	.78914	.76659	.75156	.7215	.69895	.67641
7½−5	.83481	.81284	.79088	.76891	.74694	.73229	.703	.68103	.65906
10	.855	.8325	.81	.7875	.765	.75	.72	.6975	.675
10−2½	.83363	.81169	.78975	.76781	.74588	.73125	.702	.68006	.65813
10−5	.81225	.79088	.7695	.74813	.72675	.7125	.684	.66263	.64125
10−5−2½	.79194	.7711	.75026	.72942	.70858	.69469	.6669	.64606	.62522
10−7½	.79088	.77006	.74925	.72844	.70763	.69375	.666	.64519	.62438
10−10	.7695	.74925	.729	.70875	.6885	.675	.648	.62775	.6075
10−10−5	.73103	.71179	.69255	.67331	.65408	.64125	.6156	.59636	.57713
10−10−5−2½	.72175	.69399	.67524	.65648	.63772	.62522	.60021	.58145	.5627
10−10−10	.69255	.67433	.6561	.63788	.61965	.6075	.5832	.56498	.54675
10−10−10−5	.62330	.60689	.59049	.57409	.55769	.54675	.52488	.50848	.49208
10−10−10−10	.56097	.54620	.53144	.51668	.50192	.49208	.47239	.45763	.44287

TABLE OF DECIMAL EQUIVALENTS FOR FRACTIONS

1.00	½	⅓	¼	⅕	⅙	⅛	¹⁄₁₀
1	.50	.33⅓	.25	.20	.16⅔	.12½	.10
2	1.00	.66⅔	.50	.40	.33⅓	.25	.20
3		1.00	.75	.60	.50	.37½	.30
4			1.00	.80	.66⅔	.50	.40
5				1.00	.83⅓	.62½	.50
6					1.00	.75	.60
7						.87½	.70
8						1.00	.80
9							.90
10							1.00