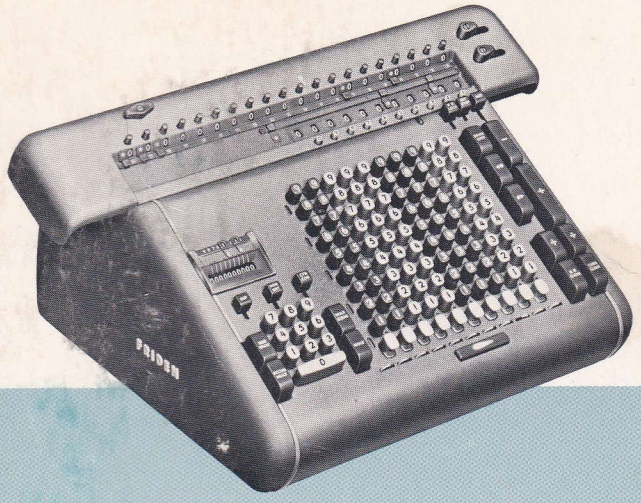



*Instruction Manual*

# Friden

## fully automatic CALCULATOR

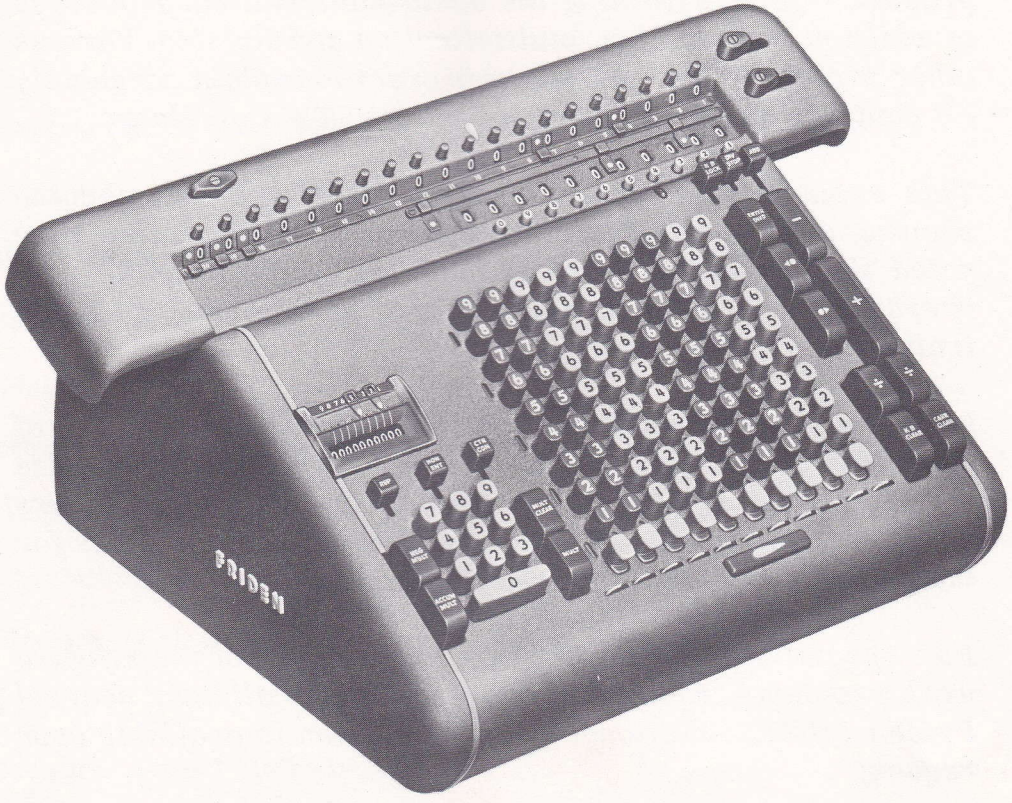
**MODEL STW** _____

Price $2.00

Published by

Friden Educational Center
31 Prince Street
Rochester 7, New York

# OPERATING INSTRUCTIONS
# FRIDEN CALCULATOR
# MODEL STW




FRIDEN FULLY AUTOMATIC CALCULATOR, MODEL STW

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## *FOREWORD*

*This manual explains in simple language the step-by-step procedure for performing the basic mathematical processes of addition, subtraction, multiplication and division. Various other problems are also shown in order to explain adequately all controls and features of the model STW Calculator.*

*This explanation is aided by a line drawing of the machine showing clearly all operating keys and controls. It should be noted that for greater clarity in the following examples, all operating keys mentioned are shaded in the drawings illustrating the calculations.*

*If the operator is not already familiar with the simplicity of operation of the Friden Calculator, he will quickly realize the advantages resulting from the elimination of unnecessary operator decisions. All Friden Calculators are famous for their "touch-one-key" simplicity of operation.*

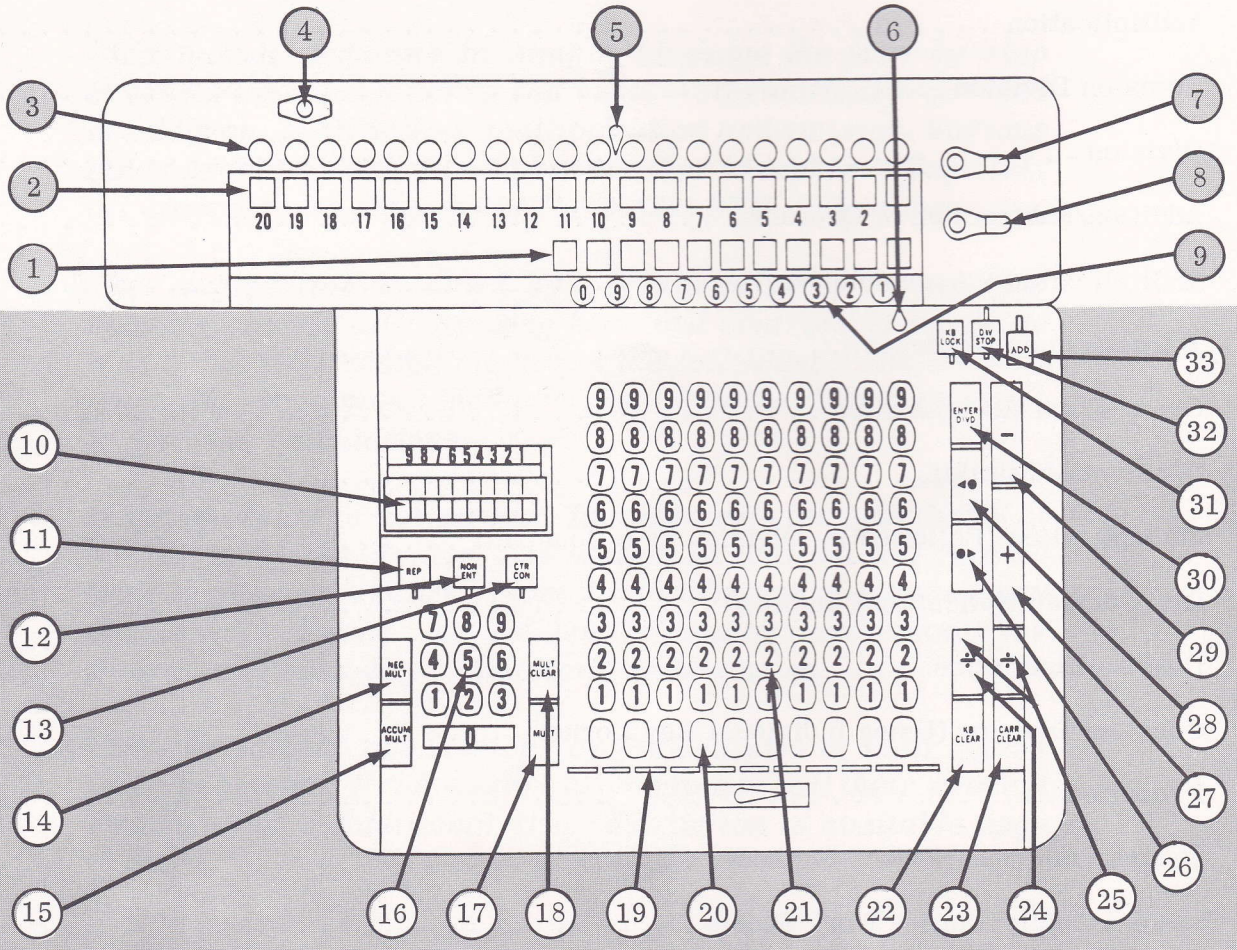
*For specialized applications or for analysis of their figure work problems, Friden users are invited to call their nearest Friden office. Additional free instruction is available upon request.*

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# FRIDEN FULLY AUTOMATIC CALCULATOR MODEL STW

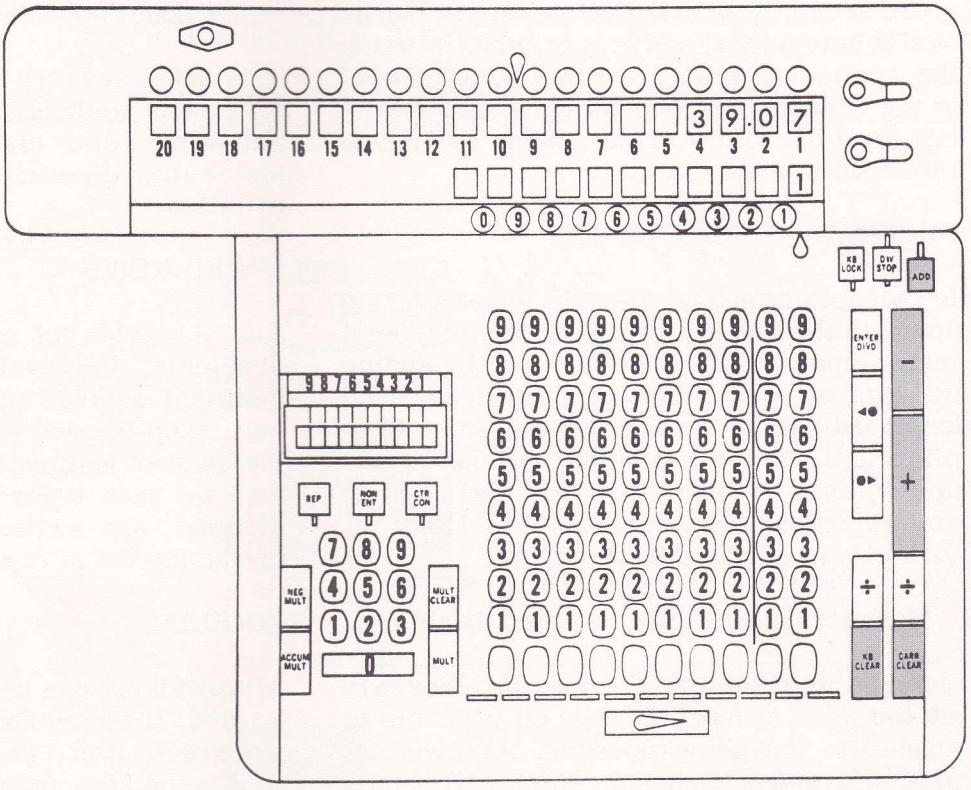
1. Lower Dials
2. Upper Dials
3. Dial Twirlers
4. Upper Left Dials Lock
5. Split Dial Clearance Indicator
6. Carriage Position Indicator
7. Upper Right Dials Lock
8. Lower Dials Lock
9. Tab Stops




10. Multiplier Check Dials
11. Multiplier Repeat Key
12. Non-Entry Control Key
13. Counter Control Key
14. Negative Multiply Key
15. Accumulate Multiply Key
16. Multiplier Keyboard
17. Multiply Key
18. Multiplier Clear Key
19. Keyboard Decimal Markers
20. Column Clear and Lock Keys
21. Keyboard
22. Keyboard Clear Key
23. Carriage Clear Key
24. Divide Key (Negative)
25. Divide Keys (Positive)
26. Right Carriage Shift Key
27. Plus Bar
28. Left Carriage Shift Key
29. Minus Bar
30. Enter Dividend Key
31. Keyboard Lock
32. Division Stop Key
33. Add Key

# ADDITION/SUBTRACTION

In addition and subtraction all amounts must be entered around the same decimal point on the keyboard, and the carriage must remain in the same position throughout the calculation. The decimal in the answer (in the upper dials) will be located directly above the decimal marker on the keyboard.




PROBLEM:

| | |
|---|---|
| Plus | 32.79 |
| Plus | 14.32 |
| Minus | 8.04 |

PROGRAM:

Add Lever Down

Set Decimal Markers

| | |
|---|---|
| Keyboard | 2 |
| Upper Dials | 2 |

METHOD:

1. Depress KB CLEAR and CARR CLEAR together.
2. Set 32.79 on keyboard.
3. Depress Plus bar.
4. Set 14.32 on keyboard.
5. Depress Plus bar.
6. Set 8.04 on keyboard.
7. Depress Minus bar.

Answer: 39.07 appears in upper dials at decimal point.

# NOTES ON MULTIPLICATION

GENERAL

The location of the decimal points for any given sequence of machine operations can be easily determined and programmed by using the applicable rules. Decimal point control is the essence of successful machine operation, and the following comments will cover all aspects of this area.

DECIMAL POINT CONTROL

In multiplication, the product appears in the upper dials. The location of the decimal point in the upper dials is determined by adding the number of decimal places utilized on the keyboard to the number used in the multiplier unit. Place a decimal marker in the upper dials to the left of the dial number corresponding to this total. Reduced to a formula this definition becomes:

Keyboard + Multiplier = Upper Dials

Using a "fixed decimal" program, chosen to fit the work at hand, causes all products to appear in the same position. Any decimal program may be chosen which will handle the maximum number of decimals conveniently. If factors are entered correctly around these positions, the products will appear around the predetermined decimal point in the upper dials. For example, using two decimal places in the multiplier, five on the keyboard, and seven in the upper dials will handle a large percentage of all problems. Since all answers are read at the seventh decimal position in the upper dials, the possibility of error is greatly reduced. Adopting this practice will pay many dividends in accuracy and efficiency.

PROCEDURE

After the machine has been programmed for decimals, multiplication becomes a simple three step operation:

1. Set one factor on the keyboard.
2. Enter the other factor in the multiplier.
3. Depress the Multiply (MULT) key. The product appears in the upper dials.

It is not necessary to clear the machine before each multiplication. One key provides automatic dial clearance, carriage shift and entry clearance at completion of the problem.

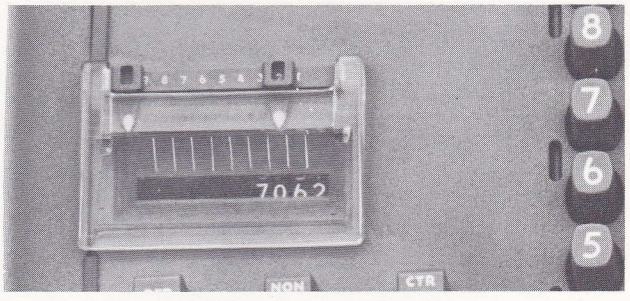
SPEED HINTS

For a series of individual multiplication problems, the cycle method will effect a material savings of time. This consists of setting up the next problem before recording the answer just produced. The first answer may be read before the MULT key is depressed, and written while the machine is producing the next answer.

ACCURACY

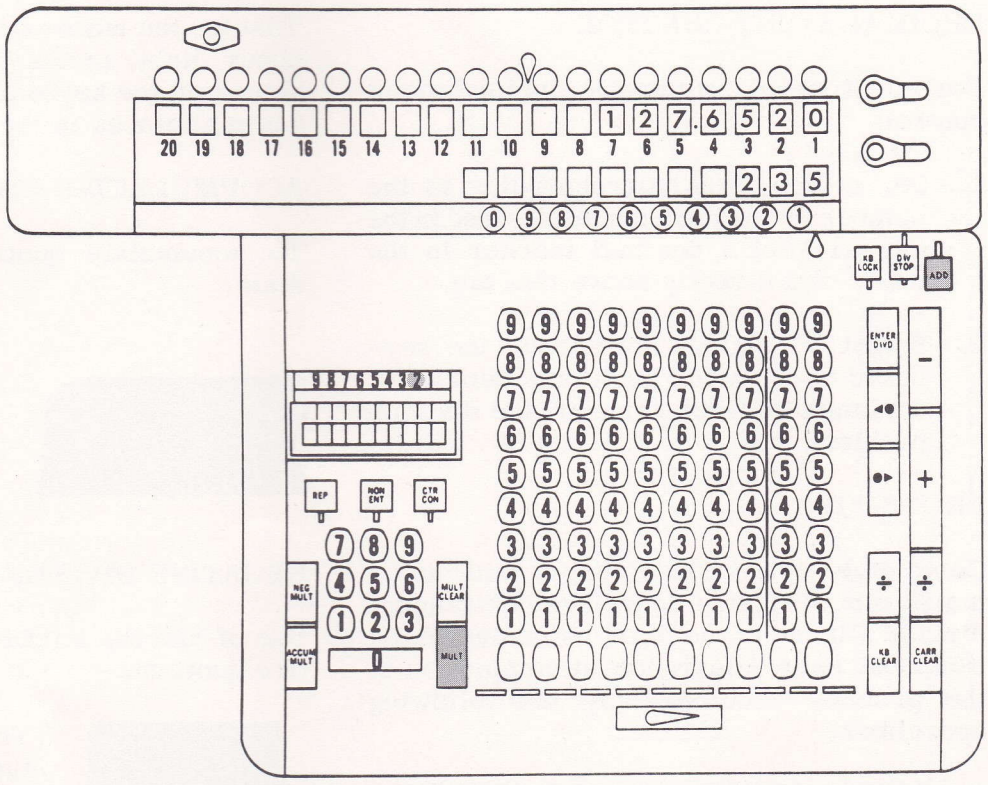
All problems can be checked before they are worked. If the number set on the keyboard is incorrect, it can be readily corrected. Any depressed keys may be changed instantly by the depression of another key in the same column.

The number entered in the multiplier appears in the visible check window.




If this number is entered incorrectly, a touch of the Multiplier Clear (MULT CLEAR) key instantly clears the dials.

# MULTIPLICATION




PROBLEM:

Multiply 2.35 x 54.32

PROGRAM:

Add Lever Down

Set Decimal Markers

| | |
|---|---|
| Keyboard | 2 |
| Multiplier | 2 |
| Upper Dials | 4 |
| Lower Dials | 2 |

METHOD:

1. Set 54.32 on keyboard.
2. Enter 2.35 in multiplier.
3. Depress MULT.

ANSWER: 127.6520 appears in upper dials at decimal point.
Multiplier proof, 2.35, appears in lower dials.

# NOTES ON DIVISION

DECIMAL POINT CONTROL

For positive and automatic decimal point control:

1. Set a Tab Stop corresponding to the number of decimal places desired in the answer. Set a decimal marker in the lower dial directly above this tab.

2. Select a decimal marker on the keyboard to allow for maximum number of decimals in each term of the division problem.

PROCEDURE

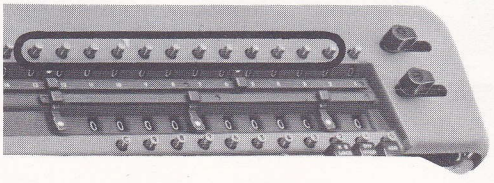
Completely automatic division, with automatic dial clearance, carriage positioning, divisor alignment, decimal point identification, and entry clearance at completion of the problem requires only the following operations:

1. Set the dividend on the keyboard.
2. Depress the ENTER DIVD key.
3. Set the divisor around the same decimal marker on the keyboard and divide.

The quotient will appear in the lower dials around the pre-determined decimal point; the remainder appears in the upper dials.

If a dividend is a product already in the upper dials or is entered by twirlers, deter-

Dial Twirlers



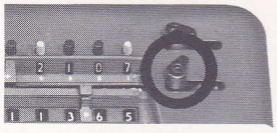
mine the location of the decimal point in the lower dials by use of the following formula:

Upper Dials - Keyboard = Lower Dials

That is, the number of decimal places in the upper dials, minus the number of decimal places on the keyboard equals the number of decimal places in the lower dials.

ACCUMULATIVE DIVISION

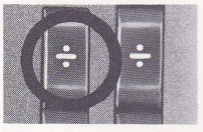
To accumulate quotients, lock the lower dials.



See page 6, for an example.

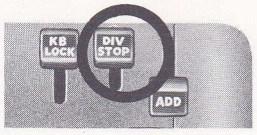
NEGATIVE DIVISION

Use of just the left Divide key yields a negative quotient.



This provides for simultaneous subtraction of the answer from a figure in the lower dials, or from zero when the complement of the true answer is required. See page 6.

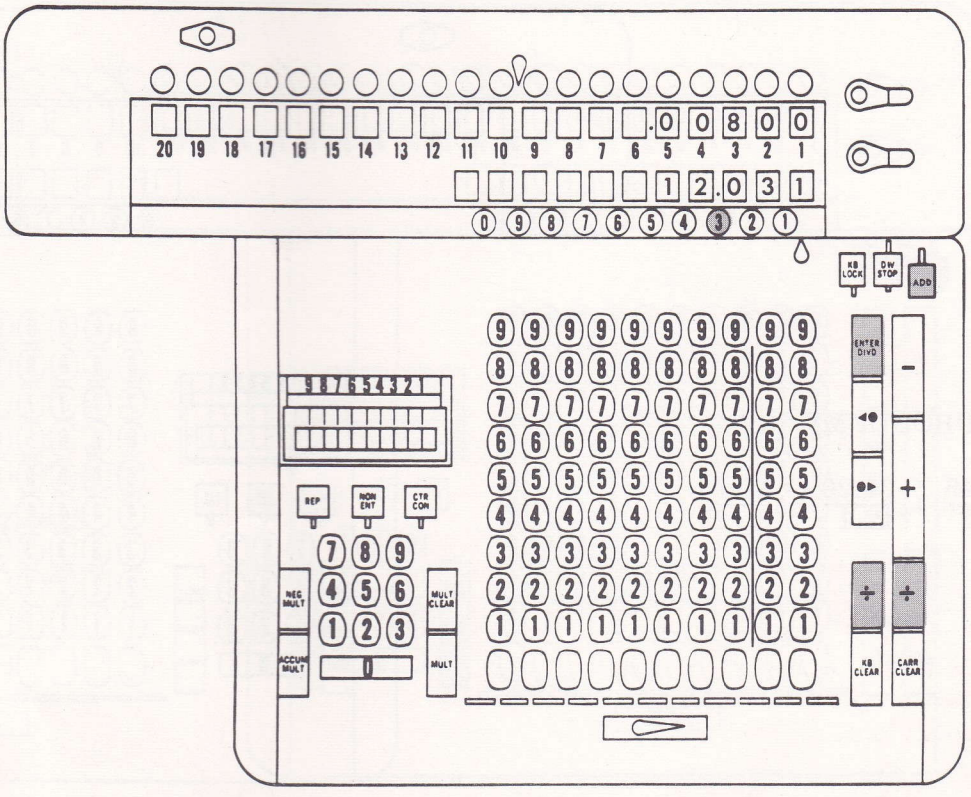
DIVISION STOP




If, after the Divide keys are depressed, the carriage shifts to the extreme right and the machine continues to cycle, either there is no divisor set on the keyboard or the problem exceeds the capacity of the machine program. Move the DIVISION STOP lever up, then repeat the problem with a lower tab setting. Moving this lever down during a division operation causes the machine to stop after the count is completed in that position. Division may be resumed by redepressing the Divide keys.

# DIVISION

Depress the Tab Stop for the number of decimal places required, and set a marker in the lower dials directly above the depressed Tab Stop.




PROBLEM:

144.38 ÷ 12

PROGRAM:

Add Lever Down
Set Tab #3

Set Decimal Markers

| | |
|---|---|
| Keyboard | 2 |
| Upper Dials | 5 |
| Lower Dials | 3 |

METHOD:

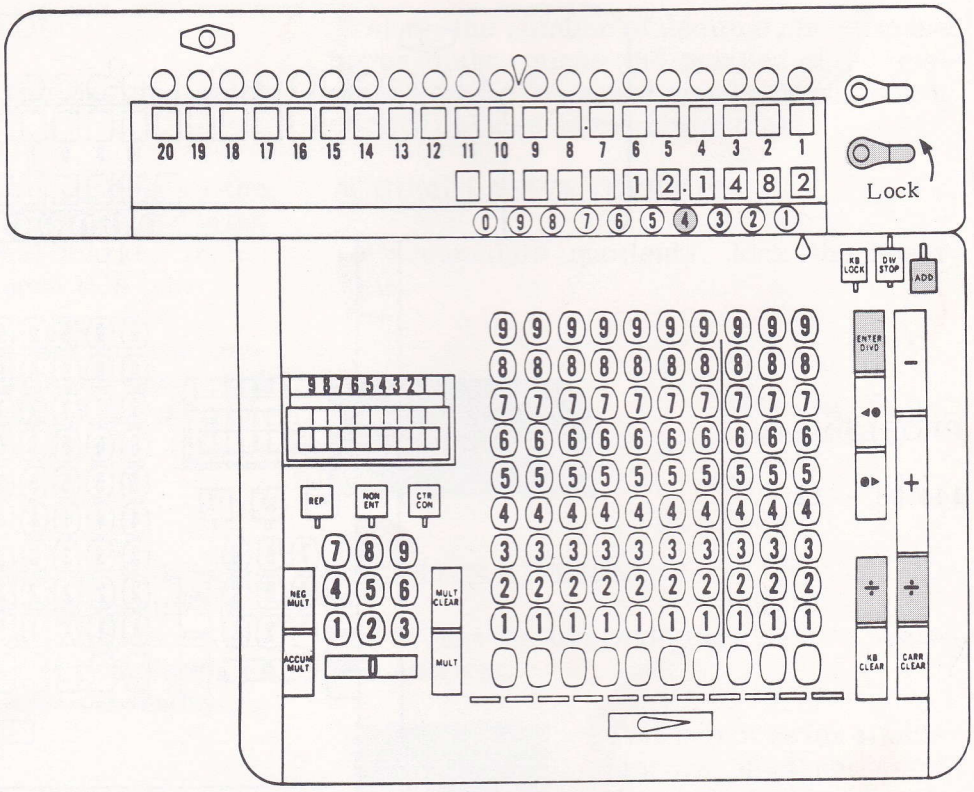
1. Set 144.38 on the keyboard.
2. Depress ENTER DIVD.
3. Set 12.00 on the keyboard.
4. Depress both Divide keys.

ANSWER: 12.031 appears in the lower dials at the decimal point.

NOTE: Amount in upper dials is the remainder.

# ADDITION/SUBTRACTION OF QUOTIENTS

Depress the Tab Stop for the number of decimal places required, and set a marker in the lower dials directly above the depressed Tab Stop.




PROBLEM:

$$\frac{45}{3} + \frac{34.26}{12.1} - \frac{17.76}{3.125}$$

PROGRAM:

Add Lever Down
Clear and lock lower dials*
Set Tab #4

Set Decimal Markers

| | |
|---|---|
| Keyboard | 3 |
| Upper Dials | 7 |
| Lower Dials | 4 |

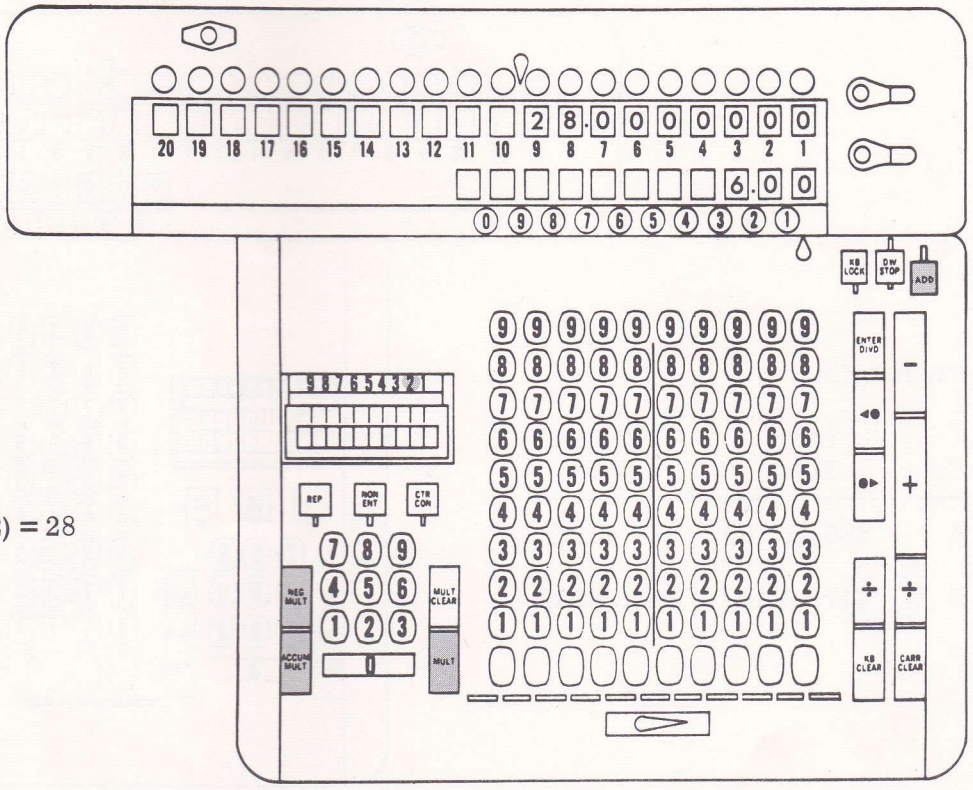
*Hand clearance of dials that are locked may be accomplished by moving the right dial locks to the right by hand. An exclusive Friden feature!

METHOD:

1. Set 45.000 on keyboard.
   Depress ENTER DIVD.
2. Set 3.000 on keyboard.
   Depress both Divide keys.
3. Set 34.260 on keyboard.
   Depress ENTER DIVD.
4. Set 12.100 on keyboard.
   Depress both Divide keys.
5. Set 17.760 on keyboard.
   Depress ENTER DIVD.
6. Set 3.125 on keyboard.
   Depress left Divide key.

ANSWER: 12.1482 appears in the lower dials at the decimal point.

# MULTIPLICATION - ACCUMULATIVE / NEGATIVE




PROBLEM:

$(4 \times 3) + (6 \times 5) - (7 \times 2) = 28$

PROGRAM:

Add Lever Down

Set Decimal Markers

| | |
|---|---|
| Keyboard | 5 |
| Multiplier | 2 |
| Upper Dials | 7 |
| Lower Dials | 2 |

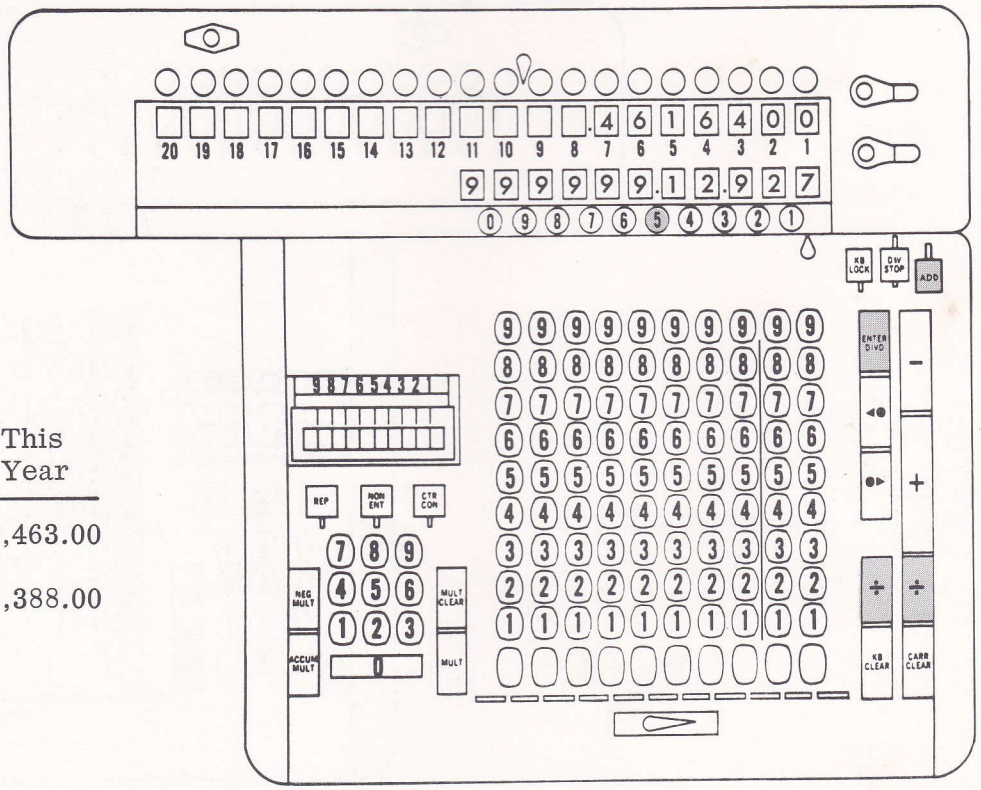
When ACCUM-MULT or NEG-MULT keys are used, the dials do not clear automatically. Addition to, or subtraction from a previous figure in the dials is thus permitted.

METHOD:

1. Set 4.00000 on keyboard.
2. Enter 3.00 in multiplier.
3. Depress MULT.
4. Set 6.00000 on keyboard.
5. Enter 5.00 in multiplier.
6. Depress ACCUM-MULT.
7. Set 7.00000 on keyboard.
8. Enter 2.00 in multiplier.
9. Depress NEG-MULT.

ANSWER: 28.0000000 appears in upper dials at decimal point.

# % INCREASE OR DECREASE




PROBLEM:

| Dept. | Last Year | This Year |
|---|---|---|
| A | $85,418.00 | $97,463.00 |
| B | $47,532.00 | $41,388.00 |

PROGRAM:

Add Lever Down
Set Tab #5

Set Decimal Markers

| | |
|---|---|
| Keyboard | 2 |
| Upper Dials | 7 |
| Lower Dials | 5,3 |

Always set current year on keyboard first.

METHOD:

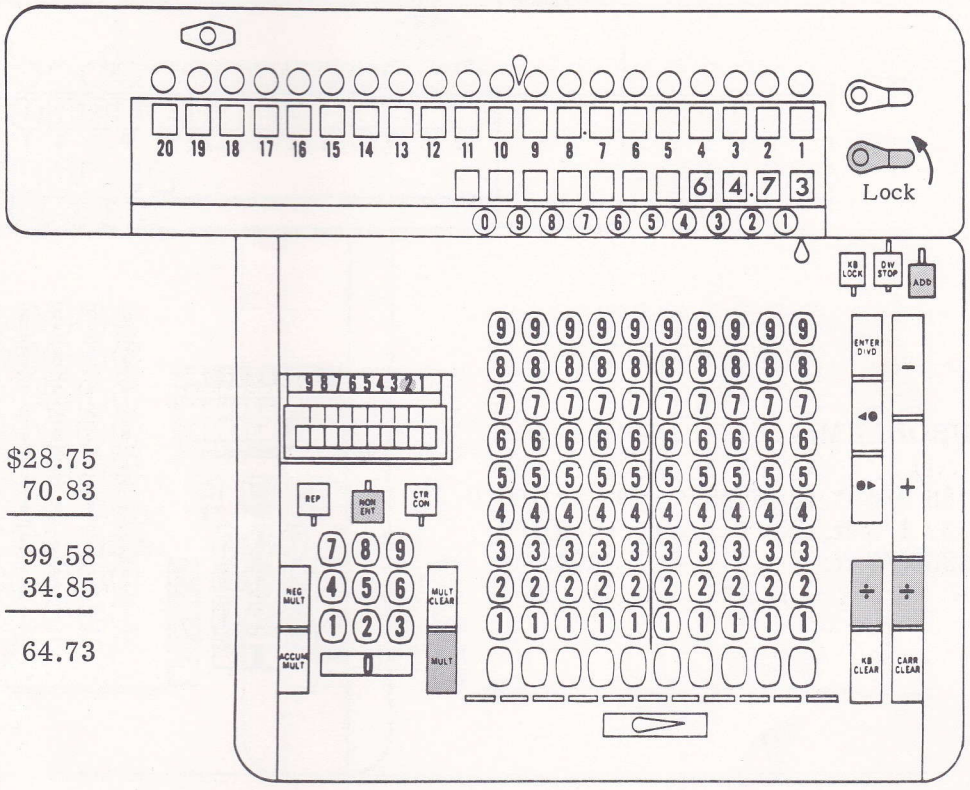
1. Set 97,463.00 on keyboard. Depress ENTER DIVD.
2. Set 85,418.00 on keyboard. Depress both Divide keys.
3. For Dept. "B", repeat steps 1 and 2. However, since there is a decrease, use left Divide key in step #2.

NOTE: The "1" in the first answer is 100%; the decimals, the percent increase. The 9's in the second answer indicate a decrease; the decimals, the percent decrease.

ANSWERS: 1.14.101 (14.1%) and 999 999.12.927 (12.93%) appear respectively in the lower dials at decimal #3.

# GRAND TOTAL ACCUMULATION

To transfer an amount in the upper dials to the lower dials, set a "1" on the keyboard and depress both divide keys.




PROBLEM:

| | |
|---|---|
| 25 items @ $1.15 | $28.75 |
| 5 2/3 Doz. @ $12.50 | 70.83 |
| | 99.58 |
| Less 35% | 34.85 |
| Net | $ 64.73 |

PROGRAM:

Add Lever Down
Non Entry Key Down*
Lock Lower Dials

Set Decimal Markers

| | |
|---|---|
| Keyboard | 5 |
| Multiplier | 2 |
| Upper Dials | 7 |
| Lower Dials | 2 |

METHOD:

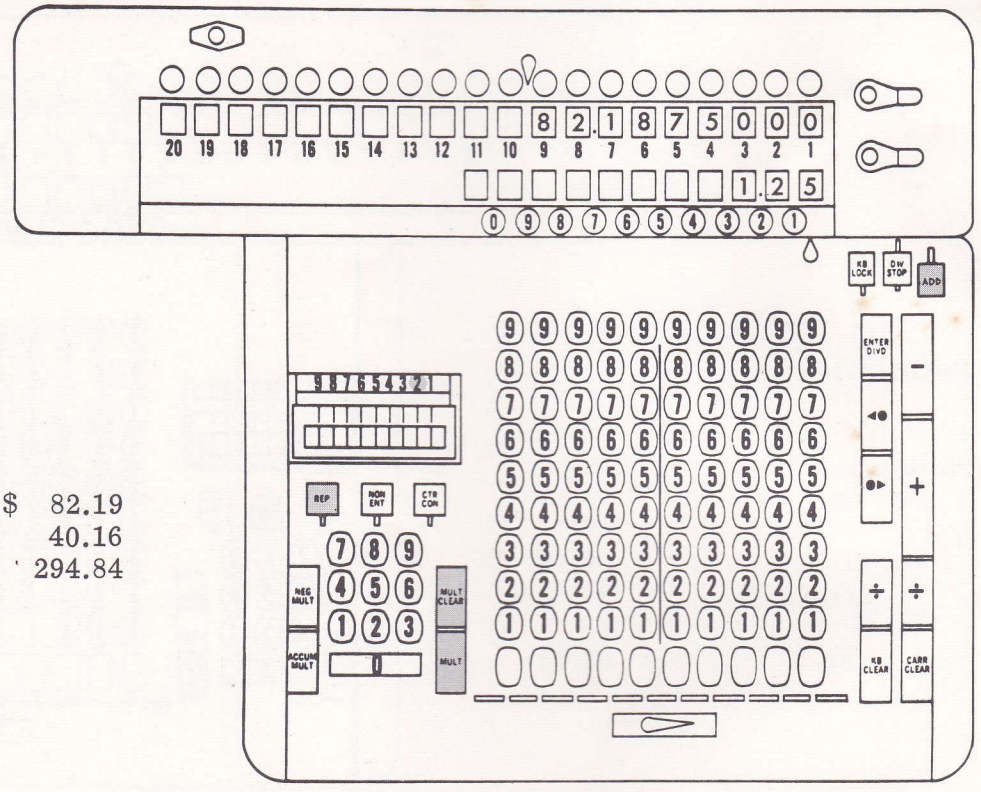
1. Set 25.00000 on keyboard. Enter 1.15 in multiplier. Depress MULT.
2. Transfer to lower dials. Set 1.00000 on keyboard. Depress both Divide keys.
3. Set 5 2/3 on keyboard as 5.66667*. Enter 12.50 in multiplier. Depress MULT.
4. Repeat step #2.
5. Set 99.58000 on keyboard. Enter .35 in multiplier. Depress MULT.
6. Set 1.00000 on keyboard. Depress left Divide key.

* The Non Entry key prevents the count from registering in the lower dials (except in division).

*See page 21 for chart of decimal equivalents.

ANSWER: 64.73 appears in lower dials at decimal point.

# CONSTANT MULTIPLIER




PROBLEM:

| | | |
|---|---|---|
| 65 3/4 ft. @ | $1.25 | $ 82.19 |
| 32 1/8 ft. @ | " | 40.16 |
| 235 7/8 ft. @ | " | 294.84 |

PROGRAM:

Add Lever Down

Set Decimal Markers

| | |
|---|---|
| Keyboard | 5 |
| Multiplier | 2 |
| Upper Dials | 7 |
| Lower Dials | 2 |

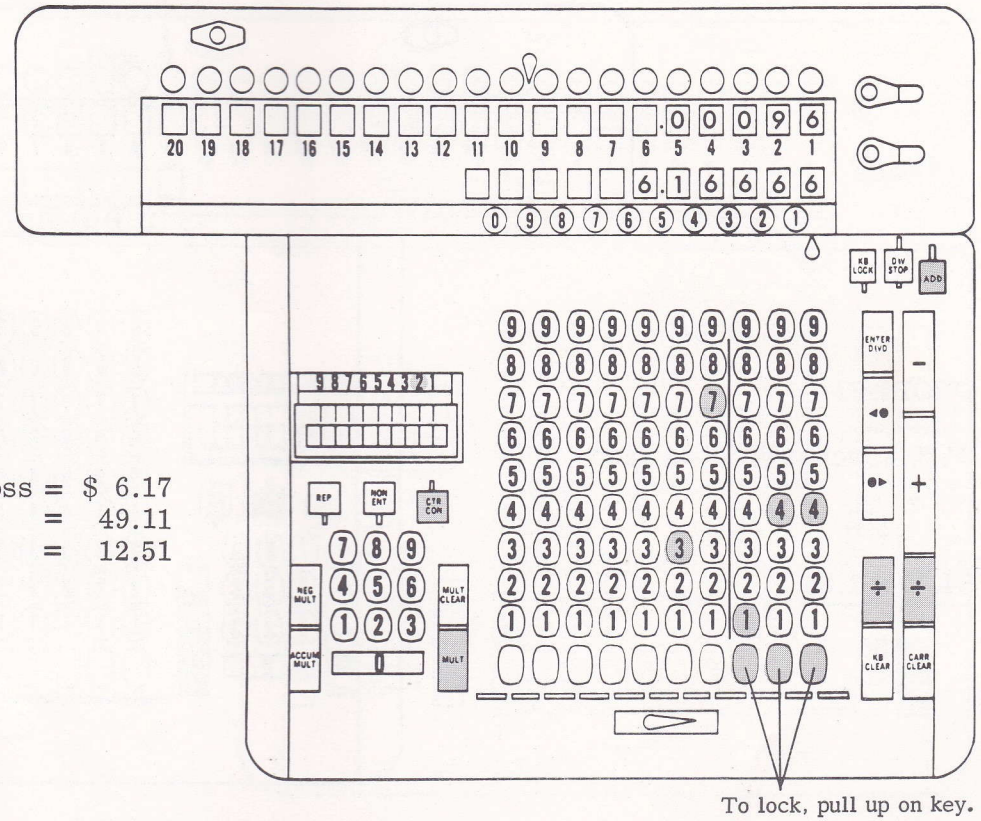
METHOD:

1. Enter 1.25 in multiplier.
2. Move REP key down.
3. Set 65.75000 on keyboard.
4. Depress MULT.
5. Repeat steps 3 and 4 for next two problems. Set 32 1/8 as 32.12500 and 235 7/8 as 235.87500.
6. Move REP key up. Depress MULT CLEAR key*.

* On the latest models, move REP key up during the last multiplication and the Multiplier will clear.

ANSWERS: 82.1875 ($82.19), 40.15625 ($40.16), and 294.84375 ($294.84) appear respectively in the upper dials at the decimal point.

# MULTIPLICATION ( Followed by Division by a Constant )




To lock, pull up on key.
To unlock, depress key.

PROBLEM:

| | | | | |
|---|---|---|---|---|
| 37 pcs. | @ | $24.00 gross | = | $ 6.17 |
| 1025 " | @ | 6.90 " | = | 49.11 |
| 118 " | @ | 15.27 " | = | 12.51 |

PROGRAM:

Add Lever Down
Counter Control Lever Down*

Set Decimal Markers

| | |
|---|---|
| Keyboard | 0,3 |
| Multiplier | 2 |
| Upper Dials | 5 |
| Lower Dials | 5 |

* When down, the Counter Control lever reverses the rotation of the lower dials (except in Negative Division).

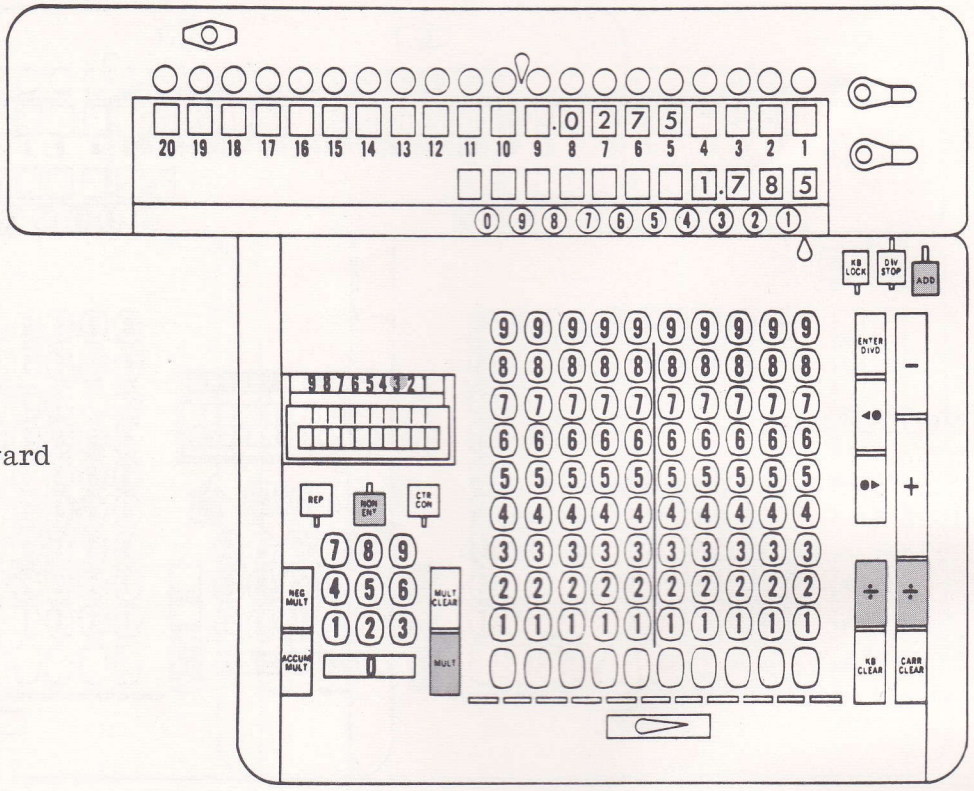
METHOD:

Set 144 (1 gross = 144) on extreme right of keyboard. Lock with individual column key locks.

1. Set 37 on keyboard next to 144.
2. Enter 24.00 in multiplier.
3. Depress MULT.
4. Depress both Divide keys.
5. Repeat steps 1 thru 4 for other problems.

ANSWERS: 6.16666 ($6.17), 49.11458 ($49.11), and 12.51291 ($12.51) appear respectively in the lower dials at the decimal point. The remainder is in the upper dials.

# DIVISION/MULTIPLICATION COMBINED




PROBLEM:

34 3/4 inches @ $1.85 yard

OR

$$\frac{34.75 \times 1.85}{36} = 1.79$$

PROGRAM:

Add Lever Down
Non Entry Key Down

Set Decimal Markers

| | |
|---|---|
| Keyboard | 5 |
| Multiplier | 3 |
| Upper Dials | 8 |
| Lower Dials | 3 |

NOTE: The NON ENT key must be in the "down" position.

METHOD:

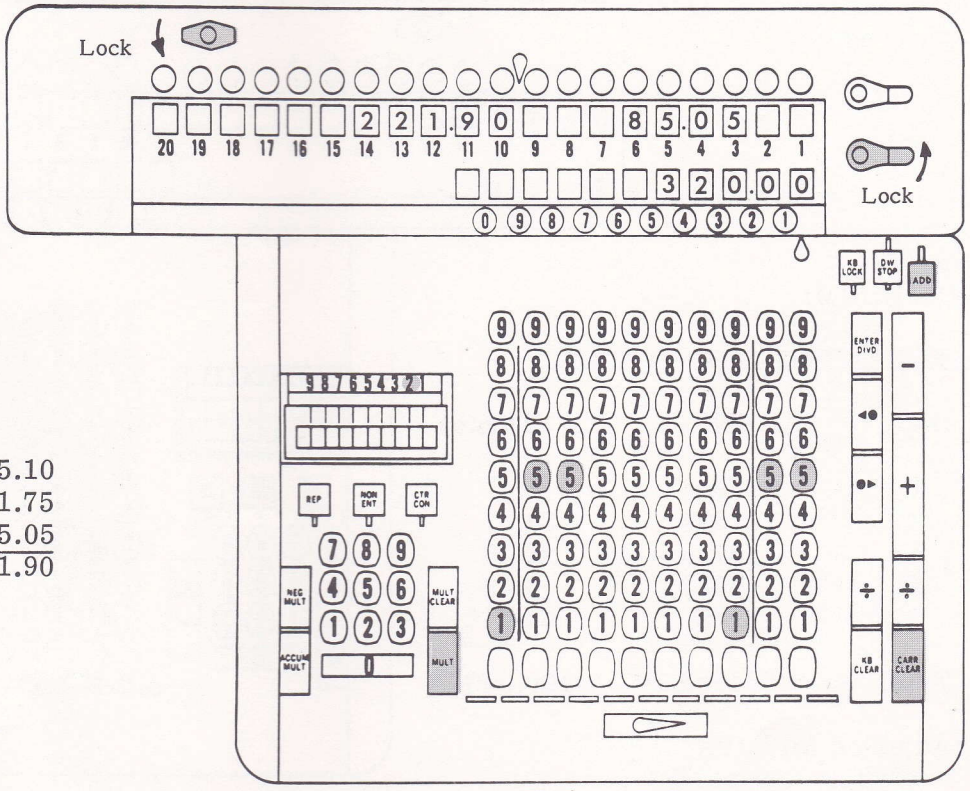
1. Set 34.75000 on keyboard.
2. Enter 1.850 in multiplier.
3. Depress MULT.
4. Set 36.00000 on keyboard.
5. Depress both Divide keys.

ANSWER: 1.785 appears in lower dials at decimal point. The remainder appears in the upper dials.

# DUAL MULTIPLICATION

Locking either side of the upper dials permits individual products on one side and accumulative products on the other.

The Left Dial Lock will prevent upper dial clearance to the left of the dial split indicator.




PROBLEM:

| | | | | |
|---|---|---|---|---|
| 42 pcs. | @ | $1.55 | = | $ 65.10 |
| 35 " | @ | 2.05 | = | 71.75 |
| 243 " | @ | .35 | = | 85.05 |
| 320 " | | | $ | 221.90 |

PROGRAM:

Depress CARR CLEAR key to clear dials. Then lock upper left and lower dials.
Add Lever Down

Set Decimal Markers

| | |
|---|---|
| Keyboard | 2,9 |
| Multiplier | 2 |
| Upper Dials | 4,11 |
| Lower Dials | 2 |

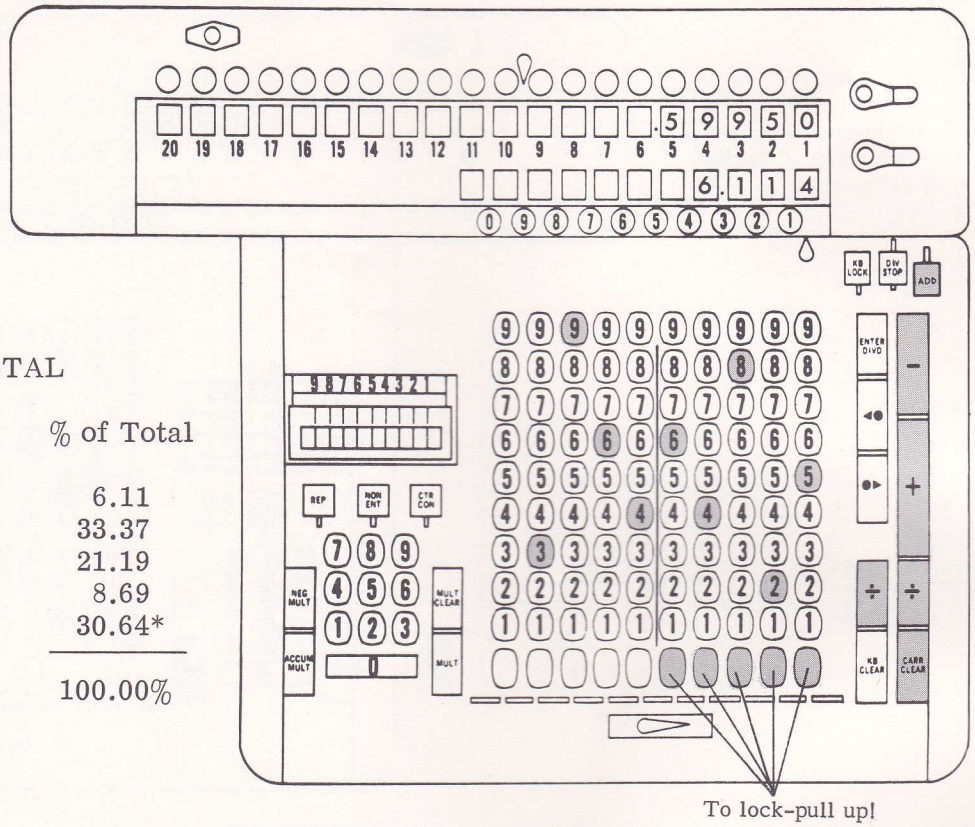
To clear the left upper dial, unlock Left Dial Lock and depress CARR CLEAR key. Or, hand clear by sliding the upper right dials lock to the right.

METHOD:

1. Set 1.55 0000 1.55 on keyboard.
2. Enter 42.00 in multiplier.
3. Depress MULT.
4. Repeat steps 1, 2, and 3 for remaining items.

ANSWER: Total, 221.90, appears in upper left dials. Individual products appear in upper right dials. Total pieces, 320, appear in lower dials.

# CONSTANT DIVISOR (Using Individual Key Locks)




To lock-pull up!

PROBLEM:

PERCENTAGES OF TOTAL

| Dept. | Sales | % of Total |
|---|---|---|
| 1 | $ 3964 | 6.11 |
| 2 | 21635 | 33.37 |
| 3 | 13736 | 21.19 |
| 4 | 5633 | 8.69 |
| 5 | 19857 | 30.64* |
| Total | $64825 | 100.00% |

*Adjusted for .01%

PROGRAM:

Add Lever Down
Set 64825 on extreme right of keyboard and lock with Individual Column key locks.

Set Decimal Markers

| | |
|---|---|
| Keyboard | 5,0 |
| Upper Dials | 5 |
| Lower Dials | 3 |

The Column Clear keys, when raised, also serve as individual column locks.

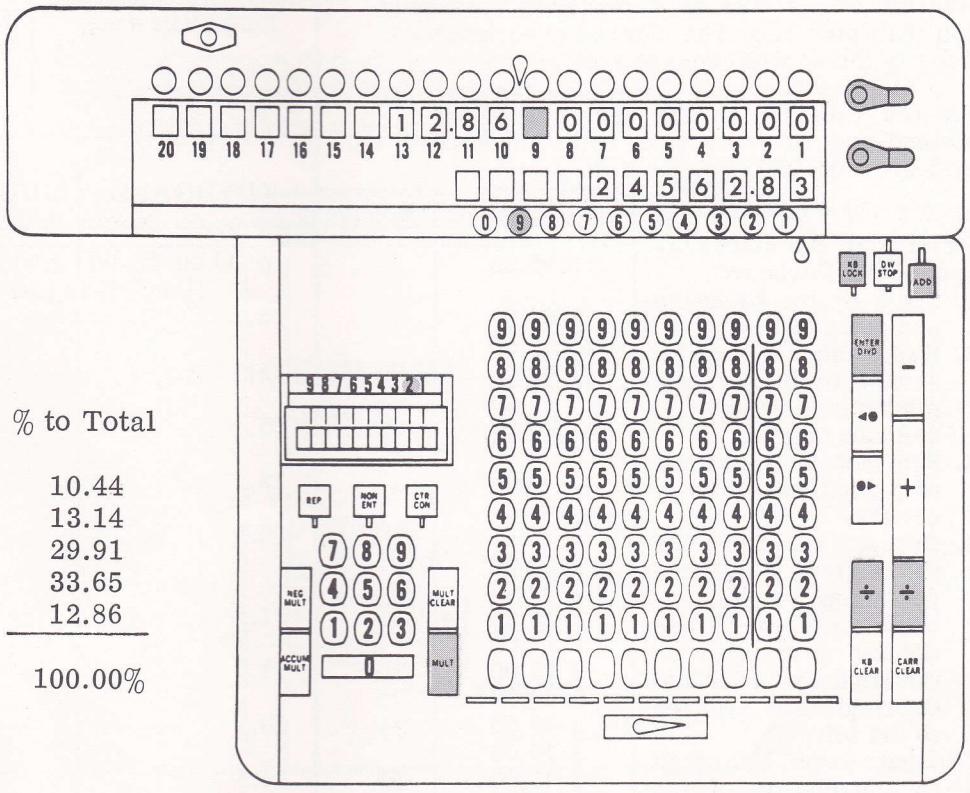
METHOD:

1. Depress CARR CLEAR. Set 3964 on keyboard. Plus, Minus, both Divide.
2. Answer appears in lower dials at decimal #3.
3. Repeat step #1 for all other departments.

ANSWER: All answers appear in lower dials at the decimal point.

# PRORATION

The lower dials contain the accumulated multipliers--positive proof that each multiplication was made correctly.



PROBLEM:

| Dept. | Sales | % to Total |
|---|---|---|
| A | $2565.45 | 10.44 |
| B | 3228.67 | 13.14 |
| C | 7346.52 | 29.91 |
| D | 8265.41 | 33.65 |
| E | 3156.78 | 12.86 |
| Total | $24562.83 | 100.00% |

PROGRAM:

Add Lever Down
Set Tab #9 If the No. 9 Tab Stop will not go down, use the zero (0) Tab Stop.
Set Decimal Markers

| | | |
|---|---|---|
| Keyboard | 2 | |
| Upper Dials | 11 | (Cover Dial 9) |
| Multiplier | 2 | |

* By locking the Reciprocal Remainder in the upper dials, the last figure in each percentage is automatically rounded off. The Right hand upper dials read "zero" after the final multiplication, and, therefore, the percentages add to exactly 100%.

METHOD:

1. Set 100.00% on keyboard.
2. Depress ENTER DIVD.
3. Set 24,562.83 on keyboard.
4. Depress both divide keys.
5. Copy from lower dials to right side of keyboard (4071192). Move KB LOCK down.
6. Lock upper right dials*. Clear and lock lower dials.
7. Enter "A" Sales (2565.45) in multiplier. Depress MULT.
8. Repeat step #7 for other Department sales figures.

ANSWER: All answers appear at decimal #11 in the upper dials.

# SQUARE ROOT BY "FIVES METHOD"

EXAMPLE

$\sqrt{639.} = 25.278\ 449\ 31$

Multiplying the radicand first by 5 permits extraction of the root by subtracting successive odd multiples of 5. The number of such subtractions is the desired square root.

Set the radicand on the keyboard as explained under "Procedure" below. Multiply by 5.000 000 000.

5 x 639 = 3195.00

Starting in the ninth column of the Keyboard:

1. Set 5 on the keyboard and subtract.
2. Raise the keyboard setting to the next odd multiple of 5 (3 x 5 = 15) and subtract.
3. Subtract odd multiples of 5 until an overdraft occurs.
4. Depress the Plus bar to restore a positive remainder.
5. Move only the 5 one column to the right on the keyboard. Shift the carriage one position to the left.

*Repeat steps 1 through 5 to completion of the problem. The root appears in the lower dials and on the keyboard.

| ADD, DIV STOP and CTR CON down | DECIMAL MARKERS |
|---|---|
| | Keyboard 6<br>Multiplier 9<br>Upper Dials 15 |

| REDUCTION | ROOT | KEYBOARD<br>oo oo.oo oo oo | MULTIPLIER<br>o.ooo ooo ooo | CONTROL |
|---|---|---|---|---|
| 31 95.00 | | 6 39.00 00 00 | 5.000 000 000 | MULT |
| | | Hand clear Lower Dials | | KB CLEAR |
| - 5 00.00 | 1 | 5. | | Minus |
| 26 95.00 | | | | |
| -15 00.00 | 2 | 15. | | Minus |
| 11 95.00 | | | | |
| -25 00.00 | 3 | 25. | | Minus |
| 986 95.00 | | | | |
| +25 00.00 | 2 | 25. | | Plus |
| 11 95.00 | | | | |
| | | 20.5 | | Left Shift |
| - 2 05.00* | 21 | | | Minus |
| 9 90.00 | | | | |
| - 2 15.00 | 22 | 21.5 | | Minus |
| 7 75.00 | | | | |
| - 2 25.00 | 23 | 22.5 | | Minus |
| 5 50.00 | | | | |
| - 2 35.00 | 24 | 23.5 | | Minus |
| 3 15.00 | | | | |
| - 2 45.00 | 25 | 24.5 | | Minus |
| 70.00 | | | | Etc., then |
| - 25.05 | 251 | 25.05 | | Minus |
| etc. | | | | |

PROCEDURE

When the radicand contains an even number of digits to the left of the decimal point, set the left-hand digit in column 10. Thus 6250 is set as 6250.000000. When the radicand contains an odd number of digits to the left of the decimal point, set the left-hand digit in keyboard column 9. Thus 625 is set as 0625.000000.

Set radicand on the left of keyboard according to instructions above. Multiply by 5. Clear lower dials. Move Counter Control key down. Set 5 in column 9. Subtract 5, 15, 25, 35, 45, etc., until the bell rings and an overdraft occurs. (An overdraft must be obtained.) Restore the overdraft but do not change the keyboard.

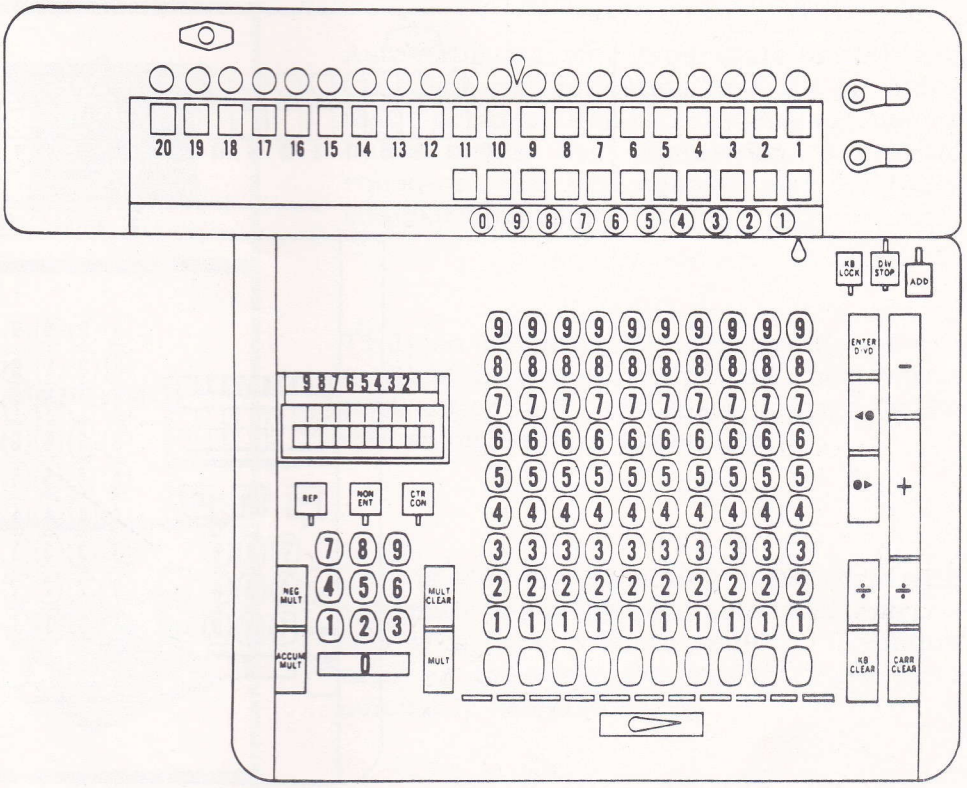
Release the 5 in column 9 and set in column 8. Shift the carriage one column to the left and subtract 5, 15, 25, etc., until an overdraft occurs. Restore the overdraft. Release the 5.

Set 5 in column 7. Shift the carriage and make the subtractions. When the root has been completed in carriage position 2, release the 5 from column 1. Shift the carriage and subtract 0, 1, 2, 3, 4, etc., until the overdraft occurs and then restore it.

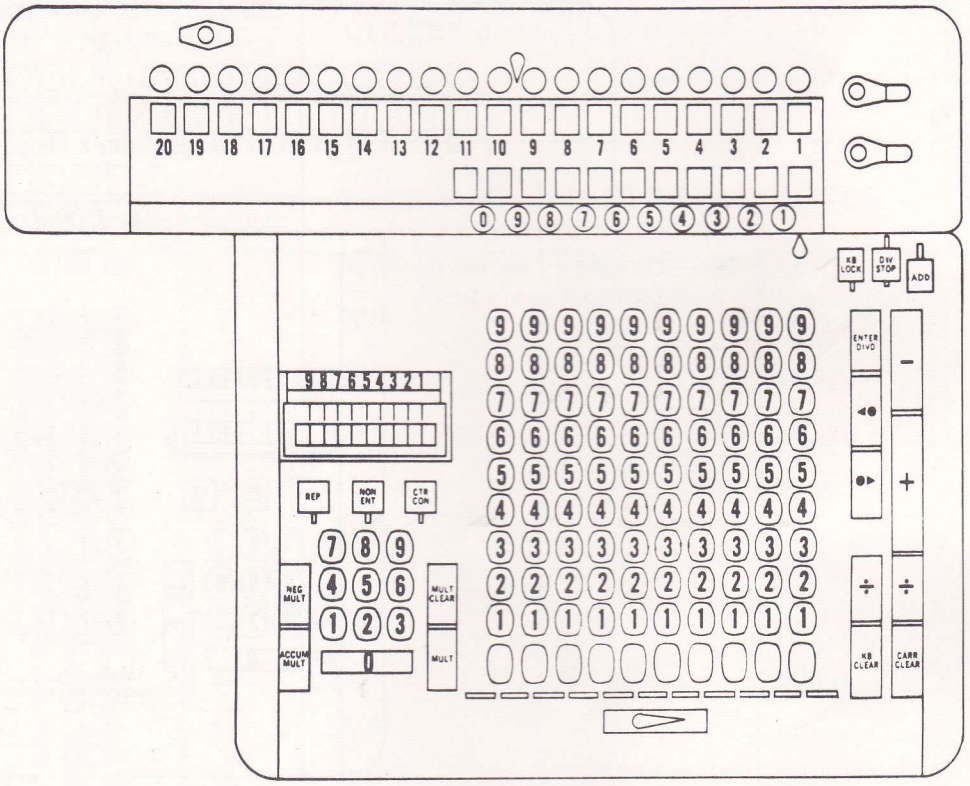
DECIMALS

The square root of a whole number, or a whole number and a decimal, always contains as many whole numbers as there are groups of two figures each, to the left of the decimal in the number. If the number is a decimal, or a decimal with but one preceding cipher, the square root is a decimal. Thus, the square root of .225 is .47434. The square root of .0225 is .15. For each group of two preceding ciphers in a decimal number, the square root contains one preceding cipher. Thus, the square root of .000225 is .015, and of .00225 is .047434.

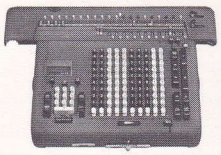
# SPECIAL APPLICATIONS



# SPECIAL APPLICATIONS



# Friden | CALCULATORS AND ADDING MACHINES FOR BUSINESS AND INDUSTRY

| | |
|---|---|
| **MODEL SBT** |  |
|  | **MODEL ACY** |
| **MODEL SRQ** |  |
|  | **MODEL AC** |

Automatic transfer from dials to keyboard for chain multiplication (a x b x c). Automatic accumulation of individual extensions by a single key depression. Automatic round-off of a half cent or more. A fully automatic machine!

Truly an adding/multiplying machine! Automatic step-over of multiplicand, plus repeat subtraction and back space feature, make this an outstanding investment.

This is the only calculator in the world with automatic squaring plus automatic extraction of square root. In addition, it retains many of the other features of Friden fully automatic calculators.

The Model AC Friden Natural Way Adding machine is an ideal unit for everyday figure work. It features: a wide platen, visible Check Dials, automatic credit balance, and all operating keys are live.

- The Product Applications Department at the Friden Educational Center is continuously providing customers with new approaches to mathematical problems through the use of Friden fully automatic calculating machines. These publications include: charts, booklets, manuals, and special applications.

- Charts have been compiled that provide short-cuts in figure handling for specific cases as well as general forms that occur in such industries as banking, insurance, and lumbering.

- Booklets have been published that provide machine methods for handling the major portion of mathematical computations that arise in various industries and fields of endeavor. Extensive material has been compiled in engineering and statistics.

- A complete listing of calculator applications and all other Friden literature may be obtained from Friden branch offices, located in all major cities, or by writing the Friden Educational Center, 31 Prince Street, Rochester 7, New York.

# OPERATING AND MAINTENANCE SUGGESTIONS

For maximum return on your investment . . .

The Friden Calculator is an exceptionally durable, precision instrument, designed for the heaviest work loads of computing. The following suggestions will help to prolong its useful life and increase its efficiency.

Place the machine directly before you with adequate work space before it. In this position, it may be operated and its answers read without the strain of twisting your body.

Be sure the machine has ample clearance for carriage travel in each direction.

Do not attempt to stop the machine during multiplication. It will automatically stop at the completion of any problem. The separate controls are "interlocked" to avoid accidental depression while the machine is in operation.

If the dial twirlers are used manually, be certain they are not left in a position part way between numbers. The attached gears may not become properly engaged in a subsequent operation.

Covering the machine during other-than-working hours will protect against excessive accumulation of dust and grit which may cause extra wear. Unplugging the electrical cord at night will avoid accidental misoperation by unauthorized personnel.

For maximum utility, we suggest that the calculator be protected by providing for regular maintenance service by our factory-trained service technicians. So important and complex a mechanism is deserving of the finest care and special lubricants, regularly applied, which are available only from the manufacturer's representatives.

For prompt mechanical service or operator assistance, call your local Friden office.

# DECIMAL EQUIVALENTS OF COMMON FRACTIONS

| COMMON FRACTIONS | | | | | | | DECIMAL EQUIVALENTS | | |
|---|---|---|---|---|---|---|---|---|---|
| 3rds | 4ths | 6ths | 8ths | 12ths | 16ths | 32nds | | 64ths | |
| | | | | | | | | 1 | .015625 |
| | | | | | | 1 | .031250 | 2 | |
| | | | | | | | | 3 | .046875 |
| | | | | | 1 | 2 | .062500 | 4 | |
| | | | | | | | | 5 | .078125 |
| | | | | 1 | | | .083333 | | |
| | | | | | | 3 | .093750 | 6 | |
| | | | | | | | | 7 | .109375 |
| | | | 1 | | 2 | 4 | .125000 | 8 | |
| | | | | | | | | 9 | .140625 |
| | | | | | | 5 | .156250 | 10 | |
| | | 1 | | 2 | | | .166667 | | |
| | | | | | | | | 11 | .171875 |
| | | | | | 3 | 6 | .187500 | 12 | |
| | | | | | | | | 13 | .203125 |
| | | | | | | 7 | .218750 | 14 | |
| | | | | | | | | 15 | .234375 |
| | 1 | | 2 | 3 | 4 | 8 | .250000 | 16 | |
| | | | | | | | | 17 | .265625 |
| | | | | | | 9 | .281250 | 18 | |
| | | | | | | | | 19 | .296875 |
| | | | | | 5 | 10 | .312500 | 20 | |
| | | | | | | | | 21 | .328125 |
| 1 | | 2 | | 4 | | | .333333 | | |
| | | | | | | | | 22 | |
| | | | | | | 11 | .343750 | | |
| | | | | | | | | 23 | .359375 |
| | | | 3 | | 6 | 12 | .375000 | 24 | |
| | | | | | | | | 25 | .390625 |
| | | | | | | 13 | .406250 | 26 | |
| | | | | 5 | | | .416667 | | |
| | | | | | | | | 27 | .421875 |
| | | | | | 7 | 14 | .437500 | 28 | |
| | | | | | | | | 29 | .453125 |
| | | | | | | 15 | .468750 | 30 | |
| | | | | | | | | 31 | .484375 |
| | 2 | 3 | 4 | 6 | 8 | 16 | .500000 | 32 | |
| | | | | | | | | 33 | .515625 |
| | | | | | | 17 | .531250 | 34 | |
| | | | | | | | | 35 | .546875 |
| | | | | | 9 | 18 | .562500 | 36 | |
| | | | | | | | | 37 | .578125 |
| | | | | 7 | | | .583333 | | |
| | | | | | | | | 38 | |
| | | | | | | 19 | .593750 | | |
| | | | | | | | | 39 | .609375 |
| | | | 5 | | 10 | 20 | .625000 | 40 | |
| | | | | | | | | 41 | .640625 |
| | | | | | | 21 | .656250 | 42 | |
| 2 | | 4 | | 8 | | | .666667 | | |
| | | | | | | | | 43 | .671875 |
| | | | | | 11 | 22 | .687500 | 44 | |
| | | | | | | | | 45 | .703125 |
| | | | | | | 23 | .718750 | 46 | |
| | | | | | | | | 47 | .734375 |
| | 3 | | 6 | 9 | 12 | 24 | .750000 | 48 | |
| | | | | | | | | 49 | .765625 |
| | | | | | | 25 | .781250 | 50 | |
| | | | | | | | | 51 | .796875 |
| | | | | | 13 | 26 | .812500 | 52 | |
| | | | | | | | | 53 | .828125 |
| | | 5 | | 10 | | | .833333 | | |
| | | | | | | | | 54 | |
| | | | | | | 27 | .843750 | | |
| | | | | | | | | 55 | .859375 |
| | | | 7 | | 14 | 28 | .875000 | 56 | |
| | | | | | | | | 57 | .890625 |
| | | | | | | 29 | .906250 | 58 | |
| | | | | 11 | | | .916667 | | |
| | | | | | | | | 59 | .921875 |
| | | | | | 15 | 30 | .937500 | 60 | |
| | | | | | | | | 61 | .953125 |
| | | | | | | 31 | .968750 | 62 | |
| | | | | | | | | 63 | .984375 |

NOTE: When a continuing decimal (thirds, sixths, twelfths, etc.) is used as a factor in multiplication, it should be expressed to one more place than the number of significant digits in the other factor.

Friden, Inc.

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