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INSTRUCTION MANUAL

Memory II

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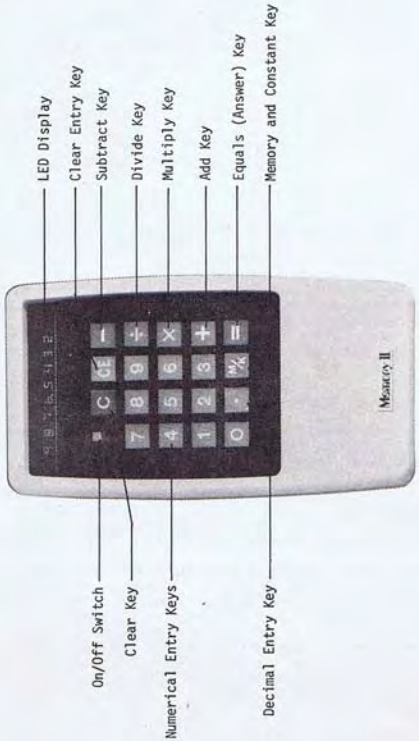

Congratulations! You have just become the owner of one of the finest, and most advanced electronic instruments ever made. You will find it to be more than a luxury ...it will become one of your most valuable tools.

Please read this book carefully. It is important for you to know the abilities of your new Columbia Memory II calculator so it may serve you well for many years.

Your Columbia Memory II is equipped with nickel cadmium batteries that can be recharged when they lose their power. When you receive your calculator it is possible these batteries may be discharged and, therefore, fail to operate your calculator. This is possible since rechargeable batteries will lose their charge by approximately 1% per day when they are not being used. Whenever your calculator is stored for long periods, it will be necessary to recharge them before using your calculator again.

When rechargeable batteries are new they may not accept a full recharge the first few times they are recharged. Do not be alarmed if your calculator requires frequent recharging when you first use it. The nickel cadmium

cells in your calculator are designed to take several hundred discharge/recharge cycles before losing their capacity. They should last for years under normal use if cared for properly. If replacement should become necessary, at any time, return your unit to Columbia Scientific. They will be replaced at no charge during the guaranty period. After the guaranty period, as specified on your warranty card, they will be replaced for a nominal charge.

Your calculator is supplied with an AC Adaptor/Charger which is to be used for recharging the batteries in your Memory II. When it is in need of recharging a tiny "L" will appear to the extreme right of the display to indicate your batteries are low.

At this point plug the recharger unit into the hole in the top of the calculator and plug the recharger into any 110V wall outlet. You may now operate your calculator while it is plugged into the electrical outlet. While you are using your calculator the batteries are not being recharged. Recharging will resume when the calculator is turned off. So that your batteries will have the longest possible life span, it is advisable to charge for only 12 to 15 hours at a time, then use your calculator until the batteries have discharged again (this should take approximately 4 to 6 hours of calculating time).

Do not use any AC Adaptor/Charger other than the unit supplied with your calculator

Your Memory II has 10 keys (0 through 9) which are used to index into the calculator the numbers needed for calculation. The decimal key [.] is used to index the decimal point, if needed, into its proper place and is used just as you would write it. Example: 12.345 would be entered as follows: [1][2][.][3][4][5]

Your [.] key also functions as a means to assign the amount of decimals in your answers. When your calculator is initially turned on, the decimal in your answers will automatically "float" to its proper position in that answer. Example: 99.95 X .05 = 4.9975.

If, however, you wish the answer to be limited to 2 decimals, or 3 decimals, etc., you may command your calculator to do so by depressing the [.] and the [=] key and then the number of decimals you wish. Example: You may wish the answer to 99.95 X .05 to be confined to 2 decimals, for dollars and cents purposes. Depress the keys as follows: [.][=][2] [9][9][.][9][5] [X][.][0][5] [=] (Read: 5.00).

You will immediately see that the calculator has "rounded off" the answer to the nearest cent. It has caused 4.9975 to become 5.00. This is particularly useful in computing dollars and cents answers and for calculating tax. When you command the calculator to fix decimals in the answer to 0, 1, 2, 3, 4, or 5 places, the last visible number will be "rounded off" as demonstrated above.

You can see your Columbia Memory II has one of the most sophisticated decimal systems available.

The [C] key stands for "Clear". When depressed it will cause any numbers showing on the display panel to disappear, AND will cause the calculator to forget ALL previous numbers or commands. In other words, the calculator forgets everything and is ready to start all over again, and signifies this by displaying a single zero and a decimal point (0.) on the display board.

The [CE] key stands for "clear entry". When a mistaken entry is made, the [CE] key allows you to erase only the mistaken entry without letting the calculator forget previous entries or commands.

The [M/K] key is your memory key. The "M" stands for "memory" and the "K" stands for "constant". The letter "K" is an international symbol for "constant". The [M/K] key allows you to store any number for indefinite periods of time for your future reference. The numbers stored in the memory can be added to, subtracted from, multiplied by, or divided by other numbers. Therefore, your memory can also be used as a "constant" for continuous multiplication, division, addition or subtraction. It can be the most versatile key on the entire keyboard.

Your Memory II also has a unique battery saving device built into the circuitry. If you have left your calculator unattended with numbers on the display, the circuits inside cause the display to go blank. This is signified by a small dash (-) appearing on the display just above the [C] key. This will occur after approximately 15 to 20 seconds of inactivity. When you see this dash appear you will know the drain on your batteries has been significantly reduced. The calculator has not, however, forgotten the numbers that were on the display panel. To restore these numbers you merely depress the [=] key.

Occasionally you may see a small zero or a large "E" on the extreme right side of the display panel. These symbols indicate an unusual answer or entry. When the small "0" appears, the calculator is telling you the answer has gone "over" its capacity of 8 digits. When

this happens you will also see that the decimal point has shifted to another position in the answer. The decimal point is telling you how many numbers you actually have in the answer and the 8 numbers displayed are the leading 8 digits in the answer. Example: [1][2][3][4][5][6][7][8][X][1][0][=] (Read: 1.2345678). Since the decimal is one position to the right it is telling you to add one more digit to the total answer. Therefore, the answer would actually be 123456780.

When the "E" appears to the right side of the display you have "exceeded" the 8-digit capacity of the calculator when you entered the numbers. In other words, you have entered 9 or more numbers. At this point the calculator will ignore the extra digits and continue to calculate.

When you receive an answer that is accompanied by a minus (-) sign on the right hand side of the display you have a negative result (credit balance).

Your Columbia Memory II is designed with what is commonly called "algebraic logic". This means you give the mathematical equasions to the calculator in the exact manner that you would think or say the problem. Example: 2 + 3 + 4 - 5 X 7 ÷ 8 =. This type of internal logic eliminates the need to clear [C] the calculator between operations.

BASIC OPERATIONS

1. Addition Example: 123 + 45 = 168

   Depress the [1][2][3] keys

   Depress the [+] key

   Depress the [4][5] keys

   Depress the [=] key (Read: 168. on display)

2. Subtraction Example: 678 - 90 = 588.

   Depress the [6][7][8] keys

   Depress the [-] key

   Depress the [9][0] keys

   Depress the [=] key (Read: 588. on display)

3. Addition and subtraction
   Example: 932 + 56 - 73 = 915

Depress the [9][3][2] keys

Depress the [+] key

Depress the [5][6] keys

Depress the [-] key

Depress the [7][3] keys

Depress the [=] key (Read: 915. on display)

4. Multiplication Example: 456 X 2 = 912

Depress the [4][5][6] keys

Depress the [X] key

Depress the [2] key

Depress the [=] key (Read: 912. on display)

5. Division Example: 789 ÷ 3 = 263

Depress the [7][8][9] keys

Depress the [÷] key

Depress the [3] key

Depress the [=] key (Read: 263. on display)

6. Calculating with Decimals

Example: 65.38 X 1.44 = 94.1472

Depress the [6][5][•][3][8] keys

Depress the [X] key

Depress the [1][•][4][4] keys

Depress the [=] key (Read: 94.1472 on display)

7. Mixed calculations

Example: 75 + 98 - 36 X 44 ÷ 7 = 861.14285

Depress the [7][5] keys

Depress the [+] key

Depress the [9][8] keys

Depress the [-] key (intermediate result 173.)

Depress the [3][6] keys

Depress the [X] key (intermediate result 137.)

Depress the [4][4] keys

Depress the [÷] key (intermediate result 6028.)

Depress the [7] key

Depress the [=] key (Read: 861.14285 on display)

You will notice that each time you touch a command key ([+][-][X][÷]) an answer will appear on the display. This is the actual result of the calculation performed to that point (intermediate result).

ADVANCED CALCULATIONS

For these next problems merely follow the problem as indicated with squares [ ] around the keys.

1. Negative Numbers

Example: (-26) + (-15) = -41

Depress [-][2][6][+][-][1][5][=] (Read: 41.-) [C]

Example: (-4) X 8 = -32

Depress [-][4][X][8][=] (Read: 32.-) [C]

Example: 32 ÷ (-4) = -8

Depress [3][2][÷][-][4][=] (Read: 8.-)

2. Chain Functions with decimals

Example: 95.6 + 78 X 3.2 ÷ 7.6 = 73.094736

Depress [9][5][•][6][+][7][8][X][3][•][2][÷]

[7][•][6][=] (Read 73.094736)

Example: 56 + 58.2 X (-23) ÷ 9 = 291.844444-

Depress [5][6][+][5][8][•][2][X][-][2][3][÷]

[9][=] (Read: 291.84444-)

Example: $\frac{(2 + 5 - 3) \text{ X } 8}{4} - 7 = 1$

Depress [2][+][5][-][3][X][8][÷][4][-][7][=] (Read 1.)

Using the Memory

Each time the [=] key is depressed, the number then appearing on the display may be put into the memory by depressing the [M/K] key. You may read a number stored in the memory by again depressing the [M/K] key, provid-

ing the [=] key is not depressed immediately prior to depressing the [M/K] key. In other words, depressing the [=] key, then the [M/K] key causes that number to be remembered. Depressing just the [M/K] key causes the stored number to appear in the display and does not clear the memory. Example: [5][=][M/K] causes the memory to store the number 5. To prove this depress the [C] key to clear the calculator, then depress the [M/K] key and the 5 will again appear. The number 5 will remain in the memory indefinitely until (1) you turn off the calculator; (2) you put a new number into the memory; (3) you subtract 5 from the memory.

1. Adding and using memory for grand total

Example:
```
2 + 3 = 5
3 + 4 = 7
4 + 5 = 9
```
The grand total of the 3 addition problems is 5 + 7 + 9 = 21

Depress [2][+][3][=] (Read 5.)

Depress [M/K] (5. is now stored in memory)

Depress [3][+][4][=] (Read 7.)

Depress [+][M/K][=][M/K] (you have just added the total 7. to the 5. in the memory, and put the new total (12.) into the memory)

Depress [4][+][5][=] (Read 9.)

Depress [+][M/K][=] (Read 21.) Final grand total

2. Multiplying and using memory for grand total

Example:
```
12 X 2 = 24
13 X 3 = 39
14 X 4 = 56
```
The grand total of the 3 multiplication problems is 24 + 39 + 56 = 119

Depress [1][2][X][2][=] (Read 24.)

Depress [M/K] (24. is now stored in the memory)

Depress [1][3][X][3][=] (Read 39.)

Depress [+][M/K][=][M/K] (you have just added the total 39. to the previous total 24. and placed the new total(63.)into the memory)

Depress [1][4][X][4][=] (Read 56.)

Depress [+][M/K][=] (Read 119. Final grand total)

3. Constant Multiplication

Example:
```
12.25 X 11 = 134.75
12.25 X 19 = 232.75
12.25 X 15 = 183.75
```

Depress [1][2][·][2][5][=][M/K]

(You have now placed 12.25 into the memory to be used as a constant)

Depress [X][1][1][=] (Read 134.75)

Depress [1][9][X][M/K][=] (Read 232.75)

Depress [1][5][X][M/K][=] (Read 183.75)

4. Constant Division

Example:
```
145 ÷ 12.93 = 11.21423
147 ÷ 12.93 = 11.368909
159 ÷ 12.93 = 12.296983
```

Depress [1][2][·][9][3][=][M/K]

(You have now placed 12.93 into memory to be used as a constant)

Depress [1][4][5][÷][M/K][=] (Read 11.21423)

Depress [1][4][7][÷][M/K][=] (Read 11.368909)

Depress [1][5][9][÷][M/K][=] (Read 12.296983)

5. Constant Multiplication, Division, Addition & Subtraction

Example:
```
1.2345 X 59 = 72.8355
1.2345 X 68 = 83.946
76 ÷ 1.2345 = 61.563385
1.2345 + 6.8 = 8.0345
79.2 -1.2345 = 77.9655
```

Depress [1][·][2][3][4][5][=][M/K]

(You have now placed 1.2345 into memory to be used as a multi-purpose constant)

(For [X][÷][+][-]).

Depress [X][5][9][=] (Read 72.8355)

Depress [6][8][X][M/K][=] (Read 83.946)

Depress [7][6][÷][M/K][=] (Read 61.563385)

Depress [6][•][8][+][M/K][=] (Read 8.0345)

Depress [7][9][•][2][-][M/K][=] (Read 77.9655)

6. Raising to Power Example: $12^3 = 1728$

Depress [1][2][=][M/K]

(You have now placed 12 into memory to be used as a constant for squaring and raising to power)

Depress [X][M/K][=] (Read 144. or 12^2)

Depress [X][M/K][=] (Read 1728. or 12^3)

Example: $25^4 = 390625$

Depress [2][5][=][M/K]

(You have now placed 25 into memory to be used as a constant for squaring and raising to power)

Depress [X][M/K][=] (Read 625. or 25^2)

Depress [X][M/K][=] (Read 15625. or 25^3)

Depress [X][M/K][=] (Read 390625. or 25^4)

COMMERCIAL APPLICATIONS

1. Simple Discounts

Example: An item sells for $53.50 with a discount of 12%. What is the amount of the discount?

Depress [5][3][•][5][X][-][•][1][2][=] (Read 6.42-)

(Note: Percentage figure must be expressed in 1/100ths; i.e., 12% = .12)

Example: An item sells for $53.50 with a discount of 12%. What is the amount of the discount? What is the reduced sales price?

Depress [5][3][•][5][=][M/K]

[X][-][•][1][2][=] (Read 6.42- discount)

[+][M/K][=] (Read 47.08 sales price)

Example: An item sells for $16.98 with a discount of 5%. What is the amount of the discount? What is the reduced sales price?

Depress [1][6][•][9][8][=][M/K]

[X][-][•][0][5][=] (Read 0.849- discount)

[+][M/K][=] (Read 16.131 sales price)

Since this problem is dealing with dollars and cents, it would be desirable to have the discount read to only 2 decimal places ($.85 instead of $.849) with the answer "rounded-off" to the nearest cent. Let's do the above problem using "round off."

Depress [•][=][2] (You have now instructed the calculator to reduce decimal to 2 places and round off to nearest cent).

Depress [1][6][•][9][8][=][M/K]

[X][-][•][0][5][=] (Read 0.85-)

[+][M/K][=] (Read 16.13 sales amount)

2. Discount and Tax Add-ons Using Memory

Decimal set at 2 places with round-off([•][=][2])

Example: An item sells for $119.95 with a discount of 33%. What is the discount? What is the reduced price? Sales tax of 5% must be charged. What is the amount of the sales tax? What is the net price?

Depress [1][1][9][•][9][5][=][M/K]

[X][-][•][3][3][=] (Read 39.58- discount)

[+][M/K][=] (Read 80.37 reduced price)

[M/K][X][•][0][5][=] (Read 4.02 tax)

[+][M/K][=] (Read 84.39 net price)

Note: Decimal settings will remain at 2 places until you either assign a new decimal setting (such as [-][=][5] for 5 places) or until you turn calculator off. If turned off and then on again, decimal will return to full "floating" system without rounding off. You may select 0-1-2-3-4 or 5 decimal places and the fraction to the farthest right of the display panel will automatically round off to the nearest number. You may select 6 or 7 decimal places without round-off.

3. Multi-Decimal Settings

Examples:
(Decimal at 6 places) - 155 ÷ 12 = 12.916666
(Decimal at 5 places) - 155 ÷ 12 = 12.91667
(Decimal at 4 places) - 155 ÷ 12 = 12.9167
(Decimal at 3 places) - 155 ÷ 12 = 12.917
(Decimal at 2 places) - 155 ÷ 12 = 12.92
(Decimal at 1 place) - 155 ÷ 12 = 12.9
(Decimal at 0 places) - 155 ÷ 12 = 13

Depress [•] [=] [6] [1] [5] [5] [=] [M/K] [÷] [1] [2] [=] (Read 12.916666 - no rounding)

Depress [•] [=] [5] [M/K] [÷] [1] [2] [=] (Read 12.91667- rounded)

Depress [•] [=] [4] [M/K] [÷] [1] [2] [=] (Read 12.9167- rounded)

Depress [•] [=] [3] [M/K] [÷] [1] [2] [=] (Read 12.917 - rounded)

Depress [•] [=] [2] [M/K] [÷] [1] [2] [=] (Read 12.92- rounded)

Depress [•] [=] [1] [M/K] [÷] [1] [2] [=] (Read 12.9- no rounding necessary)

Depress [•] [=] [0] [M/K] [÷] [1] [2] [=] (Read 13.- rounded)

Depress [•] [=] [0] [M/K] [÷] [1] [2] [X] (Read 12.916666- no rounding)

Note: Even with decimal set at 0 places you can cause answer to fully float by commanding your answer with any key except the [=] key.

4. Typical Invoice Extension

Problem: 7 items @ $3.68
11 items @ $3.65
1 item @ $12.65
Less 7% discount on total
Plus 6% sales tax
Plus $1.50 delivery

Depress [7] [X] [3] [·] [6] [8] [=] [M/K] (Read 25.76)

[1] [1] [X] [3] [·] [6] [5] [+] (Read 40.15)

[1] [2] [·] [6] [5] [+] (Read 52.8)

[M/K] [=] [M/K] (Read 78.56)

[X] [-] [·] [0] [7] [=] (Read 5.50- discount)

[+] [M/K] [=] [M/K] (Read 73.06 sales amount)

[X] [·] [0] [6] [=] (Read 4.38 sales tax)

[+] [M/K] [+] (Read 77.44 total sale)

[1] [·] [5] [=] (Read 78.94 total with delivery)

5. Percentage Distribution Aginst Total Sales (Proration)

Problem:
Department A Sales = $3,456.00
Department B Sales = 7,891.00
Department C Sales = 1,230.00
Department D Sales = 2,589.00
Find total gross sales and the percentage of gross sales for each department.

Decimal at 2 places ([•] [=] [2])

Depress [3] [4] [5] [6] [+] [7] [8] [9] [1] [+] [1] [2] [3] [0] [+] [2] [5] [8] [9] [=] (Read 15166. total gross sales)

[M/K] [3] [4] [5] [6] [÷] [M/K] [=] (Read .23 or 23% of gross)

[7] [8] [9] [1] [÷] [M/K] [=] (Read .52 or 52% of gross)

[1] [2] [3] [0] [÷] [M/K] [=] (Read .08 or 8% of gross)

[2] [5] [8] [9] [÷] [M/K] [=] (Read .17 or 17% of gross)