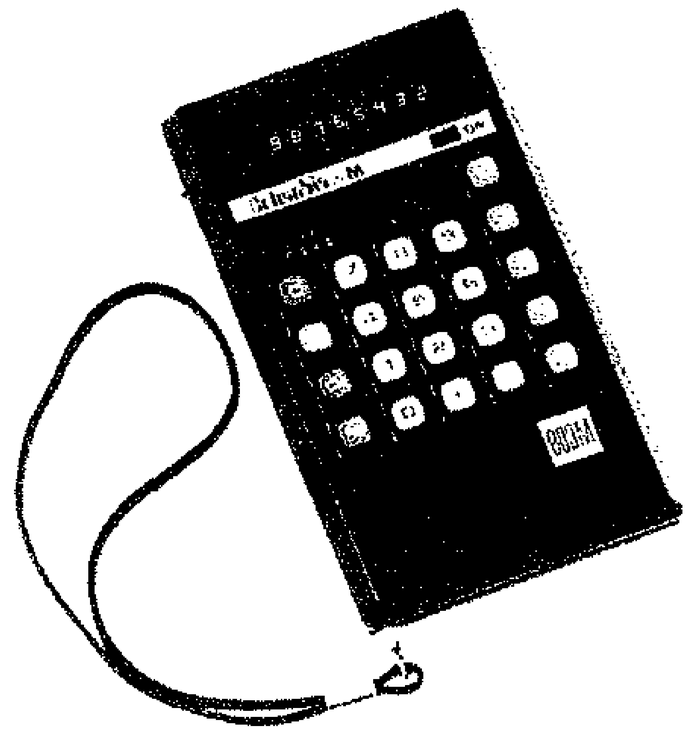
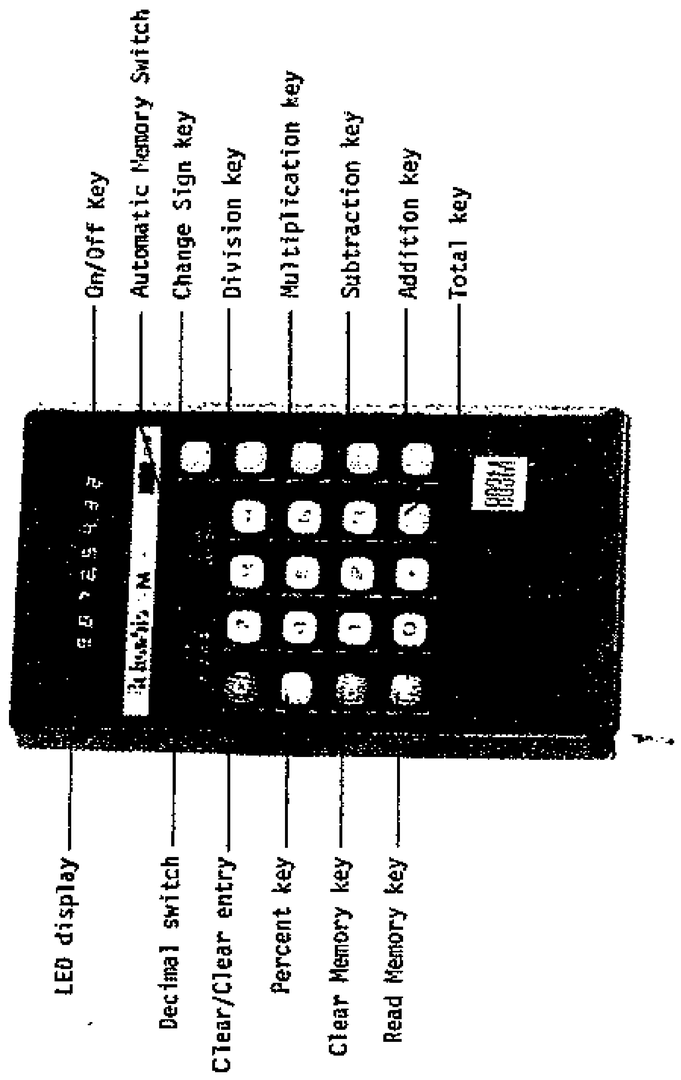
INSTRUCTION MANUAL



Memory III

Columbia Scientific
1730 22nd Street
Santa Monica, California • 90404
(213) 828-5648



Congratulations! You have just become the owner of the finest, most complete and most versatile electronic calculator 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 III calculator so it may serve you well for many years.

Your (803M) Columbia Memory III 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 chargeable batteries are new they may not accept a full charge 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 our 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 III. When it is in need of recharging, the display will get dimmer, it will fail to calculate, the numbers will begin to "break up" in the display, or numbers may flash and zeros appear to the left of the display. Do not be alarmed!

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.

Function Keys

Your 803M 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. Example: 12.345 would be entered as follows:
[1] [2] [·] [3] [4] [5]

The red [C] key stands for "Clear". This is a dual purpose key. If you have indexed wrong numbers you may clear these numbers by depressing the [C] key, without clearing any previous totals or entries, providing you have not yet depressed any of the command keys ([+] [÷] [X] [-] [=]).

Upon completion of any calculation, you may "clear" all numbers and totals from the 803M by depressing the [C] key.

The "Change sign key" [+/-] causes all numbers displayed on the display panel to be changed from a positive to a negative number, or vice versa, for further calculation. It is also used to make negative (minus) entries into the memory register.

The [%] key allows instant calculation of percentages by indexing the percentage number the way you would say it rather than converting that number into its true mathematical designation. Example: With most calculators the number 5% must be indexed as .05 followed by the depression of the [=] key. But with your 803M you merely index 5 and depress the [%] key. Your 803M will automatically multiply your number by

5 and divide it by 100 to give you the decimally correct answer. More on this later.

Memory Keys

The [RM] key stands for "Read Memory". This causes any numbers stored in the memory register to be displayed when depressed. It will display those stored figures without "clearing" those figures.

The [CM] key stands for "Clear Memory". This key, when depressed, causes your 803M to forget any numbers stored in the memory register. It will not clear other numbers on the display panel.

The AM Off switch is your direct access to the memory register. With this switch in the "Off" position, your 803M will not store numbers for future reference. But with this switch in the "On" (AM) position, all calculation results will be accumulated (stored) in the memory register. AM stands for "Accumulating Memory". When your 803M stores figures in the memory a small red light will suddenly appear to the extreme left of the display panel and remain lit until you clear the memory by depressing the [CM] key.

All entries into the memory are accomplished by depressing the blue equals [=] key. Therefore, to add 12 into the memory you would switch the "AM" switch to the "On" (left) position, enter [1] [2] on the keyboard, and depress the [=] key. You will see the memory light come on in the display panel. Your 803M will now remember the number 12 until you 1) Turn off your calculator; or 2) Depress your [CM] "Clear Memory" key. More about this later.

Decimal System

Your 803M is equipped with the most sophisticated and useful decimal system ever equipped on a calculator its size. The decimal switch F 2 4 $ allows you to determine the decimal positioning in your results.

[F] With the decimal switch in the "F" position your 803M will allow the decimal in your results to auto-

matically "float" to the proper position. More about this later.

[2] With the decimal switch in the "2" position your 803M will cause decimals in all results, if any, to be displayed at 2 places only. The 2nd decimal will also be "rounded-off" to the nearest 100th.

[4] With the decimal switch set in the "4" position your 803M will confine all decimals in the answer, if any, to 4 places, and will automatically "round-off" the 4th decimal to the nearest 10,000th.

To demonstrate the decimal switch functions, let's do the following problem: 146 ÷ 12

Set decimal switch at "F" position.

Index [1][4][6]

Depress [÷] key

Index [1][2]

Depress [=] key (Read answer: 12.166666)

Here your answer has been allowed to "float" to the maximum number of places.

Set decimal switch at "2" position.
Now repeat the above problem.

You will now see your answer is 12.17. Your decimal has been confined to 2 places and "rounded-off." This is particularly useful in calculating dollars and cents and computing sales taxes.

Set decimal switch at "4" position.
Now repeat the above problem.

You will see your answer is 12.1667. Now your decimal has been confined to 4 places and "rounded-off" at the 4th decimal place.

[$] The "$" position on your decimal switch is used for addition and subtraction only. Its purpose is to

eliminate the necessity of indexing the decimal point with the [·] key when adding columns of dollars and cents figures. Let's do the following problem:

$11.06
+.05
+.04
+.04
+.04
-.25
-.25

First, set decimal switch at "F" position. (This is to demonstrate the problem as it must be done with most calculators).

Index [1][1][·][0][6]	(Read 11.06)
Depress [+] key	(Read 11.06)
Index [·][0][5]	(Read 0.05)
Depress [+] key	(Read 11.11)
Index [·][0][4]	(Read 0.04)
Depress [+] key	(Read 11.15)
Index [·][0][4]	(Read 0.04)
Depress [+] key	(Read 11.19)
Index [·][0][4]	(Read 0.04)
Depress [+] key	(Read 11.23)
Index [·][2][5]	(Read 0.25)
Depress [-] key	(Read 10.98)
Index [·][2][5]	(Read 0.25)
Depress [-] key	(Read answer: 10.73)

Now let's do it the 803M way.

Set decimal switch at "$" position.

Index [1][1][0][6] (Read 11.06)

Depress [+] key (Read 11.06)

Index [5] (Read 0.05)

Depress [+] key (Read 11.11)

Index [4] (Read 0.04)

Depress [+] key (Read 11.15)

Depress [+] key (Read 11.19) 0.04 has been repeated

Depress [+] key (Read 11.23) 0.04 has been repeated

Index [2][5] (Read 0.25)

Depress [-] key (Read 10.98)

Depress [-] key (Read answer: 10.73) -0.25 has been repeated

You just saved 15 depressions! Remember to move the decimal switch to "F", "2", or "4" before using the answer for further calculations.

"Implied Constant" for Adding and Subtracting

In doing the above problem you noticed that your 803M allows you to add or subtract numbers repeatedly without re-entry. This is because your 803M has the ability to remember the last number indexed into the keyboard.

Because of its unique "Implied Constant" system it also has the following capabilities.

"Implied Constant" for Multiplication

When multiplying various numbers continuously by a constant multiplier, it is possible, after completing

the first problem, to "program" your 803M to do additional multiplication problems by merely indexing the "variable" number only and depressing the [=] key. For example: 12.345 X 9
12.345 X 11
12.345 X 13

Set decimal switch at "F" position

Index [1][2][.][3][4][5]

Depress [X] key

Index [9]

Depress [=] key (Read 111.105 first answer)

Your 803M is now remembering your multiplier (12.345) and the fact that you are multiplying. Now:

Index [1][1]

Depress [=] key (Read 135.795 second answer)

Index [1][3]

Depress [=] key (Read 160.485 third answer)

"Implied Constant" for Division

For constant division using a common divisor, the principle is the same as above except your 803M will remember the second factor (divisor) and the fact that you are dividing. For example: 153 ÷ 12.987
146 ÷ 12.987
16 ÷ 12.987

Set decimal switch at "F" position

Index [1][5][3]

Depress [÷] key

Index [1][2][.][9][8][7]

Depress [=] key (Read first answer: 11.781011)

Index [1][4][6]

Depress [=] key (Read second answer: 11.242011)

Index [1][6]

Depress [=] key (Read third answer: 1.2320012)

"Keyboard Memory" System

Your Columbia 803M has another unique "Memory System" which is particularly useful in business calculations for computing tax add-ons and discounts. You will recall that your 803M has the ability to remember a number entered into the keyboard for repeated addition and subtraction. It also has the ability to remember the previous number entered into the keyboard! Let's take the following problem and go through it in 2 ways, 1) The way it is done with an ordinary calculator; and, 2) The way it is done on the 803M. Problem: An item sells for $99.95. Sales tax of 5% must be charged. What is the amount of the sales tax? What is the total selling price?

$99.95 X 5% = ? + $99.95 = ?

1) Set decimal switch at "F" position

Index [9][9][·][9][5]

Depress [X]

Index [·][0][5] (for 5%)

Depress [=] (Read sales tax: 4.9975)

Depress [+] key

Index. [9][9][·][9][5]

Depress [+] key (Read total price: 104.9475)

"Rounded-off" this answer would be $104.95.

2) Set decimal switch at "2" position

Index [9][9][·][9][5]

Depress [X] key

Index [5]

Depress [%] key (Read sales tax: 5.00)

Depress [+] key (Read total price: 104.95)

You will see that you just saved 8 depressions and received your answer "rounded-off" to the nearest cent.

Here's another typical problem: An item sells for $179.88 with a discount of 33.3%. Sales tax is 6%. Freight charges of $2.35 must be added to the net price. 179.88 X (-33.3%) = ? X 6% = ? + 2.35 = ?

Set decimal switch at "2" position.

Index [1][7][9][·][8][8]

Depress [X] key

Index [3][3][·][3]

Depress [%] key (Read discount: 59.90)

Depress [-] key (Read net price: 119.98)

Depress [X] key

Index [6]

Depress [%] key (Read sales tax: 7.20)

Depress [+] key (Read total price: 127.18)

Index [2][·][3][5]

Depress [+] key (Read total sales cost: 129.53)

Using the "Accumulating Memory"

Now let's perform a typical invoice extension problem and obtain a "Grand Total".
The problem: 7 items at $3.68 each; 11 items at $3.65 each; 13 items at $12.65 each; less a 7% discount; plus 6% sales tax; plus $1.50 delivery charge.

Set decimal switch at "2" position.
Set "AM" switch to left position (On).

Index [7]

Depress [X]

Index [3] [.] [6] [8]

Depress [=] (Read first answer: 25.76)

You will notice that the memory light has come on to tell you the 803M is storing your answer.

Index [1] [1]

Depress [X] key

Index [3] [.] [6] [5]

Depress [=] key (Read second answer: 40.15)

Index [1] [2] [.] [6] [5]

Depress [X] key

Index [1] [3]

Depress [=] key (Read third answer: 164.45)

Depress [RM] key (Read total: 230.36)

Depress [X] key

Depress [+/-] key (to make your next calculation a discount)

Index [7]

Depress [%] key (Read discount: -16.13)

Depress [RM] key (Read reduced total: 214.23)

Depress [X] key

Index [6]

Depress [%] key (Read sales tax: 12.85)

Depress [RM] key (Read sales price: 227.08)

Index [1] [.] [5] [0]

Depress [+] key (Read total invoice: 228.58)

Before proceeding to the next problem you must depress the [CM] key to clear the memory. [C]

Let's proceed to a proration problem (percentage distribution against total sales). The problem: Department "A" sales are $3,456.00; Department "B" sales are $7,891.00; Department "C" sales are $1,230.00; Department "D" sales are $2,589.00.

What are the total sales? What percentage of the total sales was done by each department? Make certain the percentages total to 100%.

3,456.00 + 7,891.00 + 1,230.00 + 2,589.00 = TS
3456 ÷ TS = ? %
7891 ÷ TS = ? %
1230 ÷ TS = ? %
2589 ÷ TS = ? %
100%

Set decimal switch at "2" position, "AM" switch off.

Index [3] [4] [5] [6]

Depress [+] key

Index [7] [8] [9] [1]

Depress [+] key

Index [1][2][3][0]

Depress [+] key

Index [2][5][8][9]

Depress [+] key (Read total sales: 15166.)

Depress [÷] key

Depress [=] key
(this causes the 15,166 to switch to the position of constant divisor)

Set "AM" switch on to accumulate percentage totals.

Index [3][4][5][6]

Depress [=] key (Read 0.23 for 23% of sales)

Index [7][8][9][1]

Depress [=] key (Read 0.52 for 52% of sales)

Index [1][2][3][0]

Depress [=] key (Read 0.08 for 8% of sales)

Index [2][5][8][9]

Depress [=] key (Read 0.17 for 17% of sales)

Depress [RM] key (Read 1.00 for 100% of sales)

Individual Sales Calculation and Grand Totals

Now we will perform calculations using both the "Keyboard Memory System" and the "Accumulating Memory".

First sale: An item sells at $115.50. Sales tax is 5%. What is the tax? What is total sale?

Second sale: An item lists for $59.95. It is discounted 15%. What is the amount of the discount? What is the total sale?

Third problem: An item lists at $3.95. It is discounted 50% and 10%. What are the amounts of each discount. What is the net cost?

Fourth problem: What is the total of all the above sales?

Set decimal at "2" position. "AM" switch off. [CM]

1) Index [1][1][5][.][5]

Depress [X] key

Index [5]

Depress [%] key (Read Tax: 5.78)

Depress [+] key (Read Total Sale: 121.28)

"AM" switch on ←

Depress [=] key (Adds 121.28 into memory)

"AM" switch off →

2) Index [5][9][.][9][5]

Depress [X] key

Index [1][5]

Depress [%] key (Read discount: 8.99)

Depress [-] key (Read net sale: 50.96)

"AM" switch on ←

Depress [=] key (Adds 50.96 into memory)

"AM" switch off →

3) Index [3][.][9][5]

Depress [X] key

Index [5][0]

Depress [%] key (Read 1st discount: 1.98)

Depress [-] key (Read new net: 1.97)

Depress [X] key

Index [1][0]

Depress [%] key (Read 2nd discount: .20)

Depress [-] key (Read net sale: 1.77)

"AM" switch on ←

Depress [=] key (Adds 1.77 into memory)

4) Depress [RM] key (Read Grand Total: 174.01)

Squaring and Raising to Power

Let's square the number 12 (12^2).

Decimal set at "F" position - "AM" switch off. [CM]

Index [1][2]

Depress [X] key

Depress [=] key (Read answer: 144.)

Now let's find 12.2 to the third power (12.2^3).

Index [1][2][.][2]

Depress [X] key

Depress [=] key (Read 12.2^2: 148.84)

Depress [=] key (Read 12.2^3: 1815.848)

Find the answer to this problem (2.56^8)

Index [2][.][5][6]

Depress [X] key

Depress [=] key (Read: 2.56^2: 6.5536)

Depress [X] key

Depress [=] key (Read 2.56^4: 42.949672)

Depress [X] key

Depress [=] key (Read 2.56^8: 1844.6743)

or, you may do the same problem in this manner:

Index [2][.][5][6]

Depress [X] key

Depress [=] key (Read 2.56^2: 6.5536)

Depress [=] key (Read 2.56^3: 16.777216)

Depress [=] key (Read 2.56^4: 42.949672

Depress [=] key (Read 2.56^5: 109.95116)

Depress [=] key (Read 2.56^6: 281.47496)

Depress [=] key (Read 2.56^7: 720.57589)

Depress [=] key (Read 2.56^8: 1844.6742)

Now let's find the answer to this problem:

(9^3 X 6^5 = ?)

Index [9]

Depress [X] key

Depress [=] key (Read 9^2: 81.)

"AM Switch On ⟵

Depress [=] key (Read 9^3 : 729.)

"AM" Switch Off ⟶

Index [6]

Depress [X] key

Depress [=] key (Read 6^2: 36.)

Depress [=] key (Read 6^3: 216.)

Depress [=] key (Read 6^4: 1296.)

Depress [=] key (Read 6^5 : 7776.)

Depress [X] key

Depress [RM] key (Read 9^3 : 729.)

Depress [=] key (Read answer: 5668704.)

Payroll Application with Overtime and Deductions

The problem is as follows: An employee is paid $4.87 per hour. He has worked 40 hours at regular pay and 7 hours at time and one-half. We must deduct 5.84% F.I.C.A., $22.40 Withholding Tax, $3.70 Union Dues, and $1.06 for Credit Union. We must see his straight time pay, overtime pay, gross pay and his net pay.

Set decimal at "2" Position
"AM" Switch On ⟵ Depress [CM]

Index [4][.][8][7]

Depress [X] key

Index [4][0]

Depress [=] key (Read straight pay: 194.80)

Index [4][.][8][7]

Depress [X] key

Index [7]

Depress [X] key

Index [1][.][5](for time and one-half)

Depress [=] key (Read overtime pay: 51.14)

Depress [RM] key (Read Gross Pay: 245.94)

Depress [X] key

Index [5][.][8][4]

Depress [+/-] key (To make this a deduction)

Depress [%] key (Read FICA: -14.36)

Depress [RM] Key (Read Pay after FICA: 231.58)

Index [2][2][.][4] (withholding tax)

Depress [-] key

Index [3][.][7] (Union dues)

Depress [-] Key

Index [1][.][0][6] (Credit union)

Depress [-] Key (Read Net Pay: 204.42)

Depreciation of Calculation of Fixed Assets

Find the yearly dollar depreciation for each year and the value of the fixed asset after each year. Problem: One milling machine which was purchased for $14,500.00 must be depreciated in 3 years until only 10% of the original purchase price remains (which is the salvage value of the machine). The 10% salvage value may be within plus or minus 1% as allowed by Standard Depreciation Schedules.

Set decimal switch at "2" Position
"AM" Switch On ⟵ Depress [CM]

Index [1][4][5][0][0]

Depress [=] Key (To place into memory)

Index [.][5][3][6] (The 3 yr. formula allowed on standard depreciation schedules)

Depress [X]

Depress [+/-] (To make all calculations subtract from memory)

Depress [RM] Key

Depress [=] Key (Read 1st year depreciation: -7772.)

Depress [RM] Key (Read 1st year value: 6728.)

Depress [=] Key (Read 2nd year depreciation: -3606.21)

Depress [RM] Key (Read 2nd year value: 3121.79)

Depress [=] Key (Read 3rd year depreciation: -1673.28)

Depress [RM] Key (Read 3rd year value: 1448.51)

This instruction manual and your 803M can make you an expert in using electronic calculators and will increase your enjoyment of this fine instrument. We at Columbia Scientific hope you find this 803M to be your most valuable tool.

Columbia Scientific
1730 22nd St.
Santa Monica, CA 90404