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MX80
Electronic
Calculator



BOWMAR

Instructions
For Use

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INTRODUCTION

Your Bowmar MX80 Calculator represents a significant engineering achievement resulting in full-size capability in a pocket-size package. Advances in miniaturized computer circuits using single-chip LSI (Large Scale Integration), LED (Light Emitting Diode) display technology, and a unique snap-action keyboard have provided a rugged, reliable unit, and the self-contained nickel-cadmium rechargeable batteries permit convenient use even when AC power is not available.

The MX80 performs addition, subtraction, multiplication, division and percentage including chain or mixed multiplication and division, and utilization of a stored constant. It also has a capability to mark up or discount a number after the percentage is calculated. Ten digits are provided for entry and readout with a full floating decimal and a positive or negative sign. Additional display indicators denote Power On, Low Battery, Overflow, Error and Minus Sign. A "Battery Saver" feature to extend battery operating time causes the display to blank out approximately 30 seconds after the last entry, without the loss of a problem.

It is suggested that the following instructions be read with the calculator at hand, and that all examples be performed with the unit to increase your familiarity. A short outline of operating procedures is also printed on the back of the calculator.

OPERATION

AC Operation:

Set the switch on the back of the Charger/Power Supply to the electrical outlet voltage, i.e., 115 or 230 Volts. Plug the Charger into the outlet and the connector into the Calculator. (Note that the connector is keyed.) After these connections, the power switch may be turned on and operation started.

Battery Operation:

Disconnect the Charger cord and turn the power switch "ON". With normal use a full battery charge can be expected to supply about 5 hours of working time.

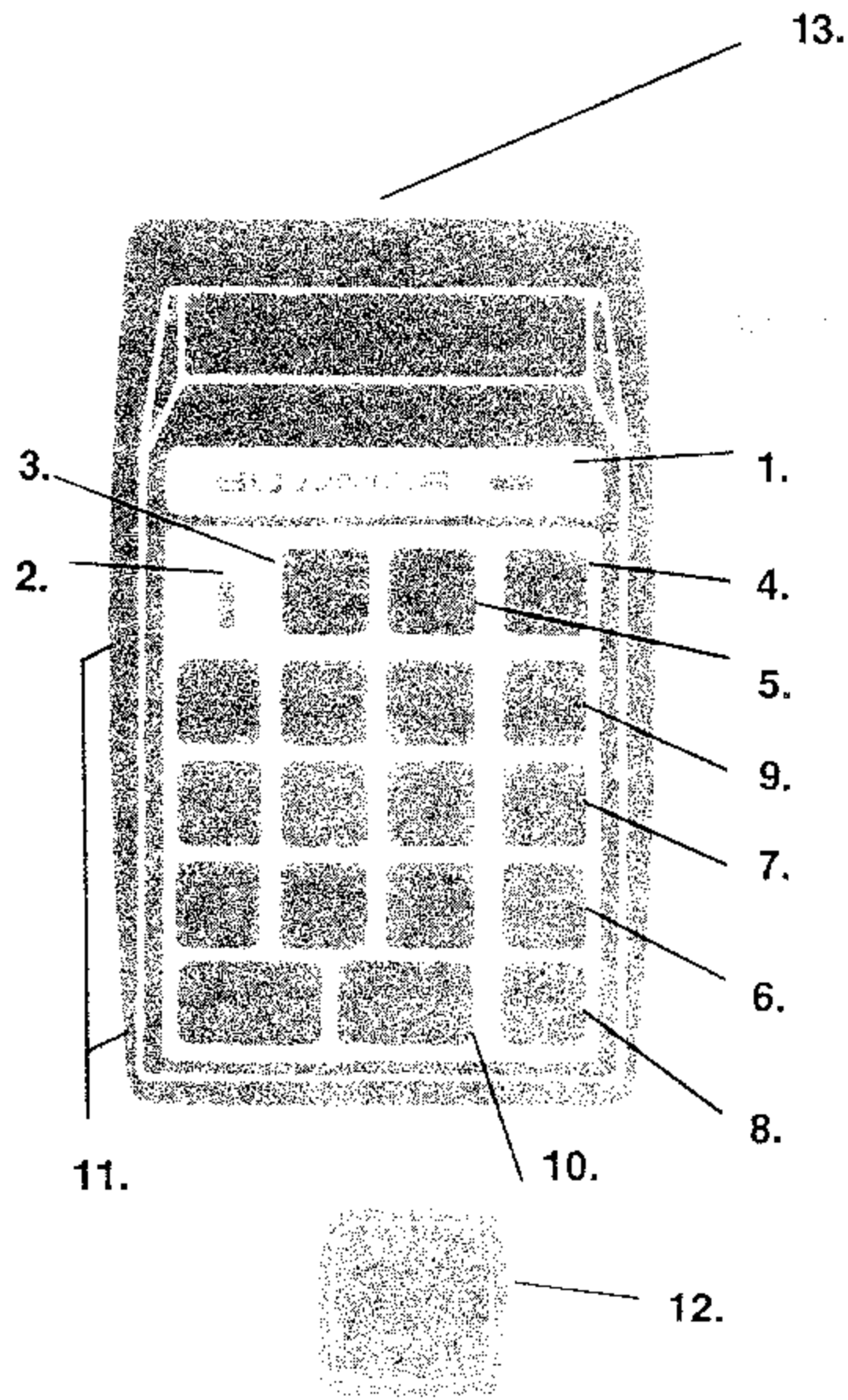
NOTE: When the low battery indicator (L) on the display is lighted, do not continue battery operation. This indicates need for a battery charge. Use of the Calculator can be continued during the charge cycle. Charging will continue whether calculator is on or off.

Battery Charging:

Simply follow the same procedure as in AC operation. The Calculator may be used during the charge period if desired. In order to fully charge a battery which has been completely discharged, 7 hours is required. In most cases, an overnight charge should be adequate.

NOTE: Although no damage will result from prolonged periods with the Charger connected, it is advisable to remove the Charger when it is not in use or after a full recharge cycle.

CAUTION: To avoid possible damage, use only the charger provided with the calculator.



CONTROLS & INDICATORS

1. "ON" Switch Turns Calculator "ON" & "OFF".
2. 'K' Switch Slide switch with 2 positions; in the up position, the 'K' operation is in effect. Use of 'K' allows a number to be entered and retained as a "constant" for series multiplication or division.
3. **%** Key Performs %, mark-up, and discount operation.
4. **C** Key Clears the Calculator and the display of all numbers.
5. **CE** Key Clears the display of the previous keyboard entry.
6. **X** Key Enters a "multiply" command.
7. **÷** Key Enters a "divide" command.
8. **+=** Key Adds the entered number, or carries out a previously entered "multiply" or "divide" command.
9. **-=** Key Adds a minus sign to an entry. Subtracts the entered number or completes a previously entered "multiply" or "divide" command.

PRELIMINARY INSTRUCTIONS

1. To clear (erase)

A. Touch the **C** key

B. Cleared display will be:

0.

2. To enter (write a number)

Example: enter 123.45

A. First, clear by touching **C**

B. Then touch number and decimal keys for 123.45 one at a time. Always start with the left hand digit and progress from left to right.

Display will then be:

123.45

3. To clear an incorrect entry

Example: 48+ 12 is your calculation

A. You have already entered 48

Display is:

48.

B. You now touch the **+ =** key

Display will be:

48.

C. Then you enter 13 by mistake

The display is:

13.

A mistake!

D. To clear 13, touch the **CE** key

Display will be:

0.

E. Then enter '12'

Display will be:

12.

F. Finally, touch the **+ =** key for answer

Display will be:

60.

Note: Use **CE** during, or immediately after entry of a number.

CALCULATIONS

1. ADDITION

Example #1: To calculate $16.39 + 9.83 =$

Do these steps

display will be

- | | |
|---------------------------|--------------|
| a. Touch C | 0. |
| b. Enter 16.39 | 16.39 |
| c. Touch += | 16.39 |
| d. Enter 9.83 | 9.83 |
| e. Touch += Answer | 26.22 |

Example #2:

To calculate $16 + 9 + 8.3 + 4.1 =$

Do these steps

display will be

- | | |
|---------------------------|-------------|
| a. Touch C | 0. |
| b. Enter 16 | 16. |
| c. Touch += | 16. |
| d. Enter 9 | 9. |
| e. Touch += | 25. |
| f. Enter 8.3 | 8.3 |
| g. Touch += | 33.3 |
| h. Enter 4.1 | 4.1 |
| i. Touch += Answer | 37.4 |

2. SUBTRACTION

Example #1: To calculate $12.81 - 3.6 =$

Do these steps

display will be

- | | |
|--------------------------|--------------|
| a. Touch C | 0. |
| b. Enter 12.81 | 12.81 |
| c. Touch += | 12.81 |
| d. Enter 3.6 | 3.6 |
| e. Touch = Answer | 9.21 |

Example #2: To calculate $23 - 6 + 2.1 - 5 =$

Do these steps

display will be

- | | |
|--------------------------|-------------|
| a. Touch C | 0. |
| b. Enter 23 | 23. |
| c. Touch += | 23. |
| d. Enter 6 | 6. |
| e. Touch = | 17. |
| f. Enter 2.1 | 2.1 |
| g. Touch += | 19.1 |
| h. Enter 5 | 5. |
| i. Touch = Answer | 14.1 |

Example #3:

To calculate $62 - 82 + 10 - 40 =$

Do these steps

display will be

- a. Touch **C** 0.
- b. Enter 62 62.
- c. Touch **+=** 62.
- d. Enter 82 82.
- e. Touch **-=** — 20.
- f. Enter 10 10.
- g. Touch **+=** — 10.
- h. Enter 40 40.
- i. Touch **-=** Answer — 50.

3. MULTIPLICATION

Example #1: To calculate $29.32 \times 56.5 =$

Do these steps

display will be

- a. Touch **C** 0.
- b. Enter 29.32 29.32
- c. Touch **X** 29.32
- d. Enter 56.5 56.5
- e. Touch **+=** Answer 1656.58

Example #2: To calculate $3 \times 21 \times 6.1 =$

Do these steps

display will be

- a. Touch **C** 0.
- b. Enter 3 3.
- c. Touch **X** 3.
- d. Enter 21 21.
- e. Touch **X** 63.
- f. Enter 6.1 6.1
- g. Touch **+=** Answer 384.3

Example #3: To calculate $31 \times 6 =$

Use of 'K' Switch

$31 \times 8.2 =$

$31 \times 7.6 =$

Do these steps

display will be

- a. Touch **C** 0.
- b. Push 'K' on (up) 0.
- c. Enter 31 31.
- d. Touch **X** 31.
- e. Enter 6 6.
- f. Touch **+=** 1st Answer 186.
- g. Enter 8.2 8.2

- h. Touch **+=** 2nd Answer **254.2**
- i. Enter 7.6 **7.6**
- j. Touch **+=** 3rd Answer **235.6**
- k. Push 'K' off (down)

4. DIVISION

Example #1: To calculate $376 \div 53 =$

Do these steps display will be

- a. Touch **C** **0.**
- b. Enter 376 **376.**
- c. Touch **+** **376.**
- d. Enter 53 **53.**
- e. Touch **+=** Answer **7.094339622**

Example #2: To calculate $81 \div 3 \div 9 =$

Do these steps display will be

- a. Touch **C** **0.**
- b. Enter 81 **81.**
- c. Touch **+** **81.**
- d. Enter 3 **3.**

- e. Touch **+** $\frac{1}{3}$ **27.**
- f. Enter 9 **9.**
- g. Touch **+=** Answer **3.**

Example #3: To calculate $181 \div 15 =$

Use of 'K' switch $96 \div 15 =$

$117 \div 15 =$

Do these steps display will be

- a. Touch **C** **0.**
- b. Push 'K' on (up) **0.**
- c. Enter 181 **181.**
- d. Touch **+** **181.**
- e. Enter 15 **15.**
- f. Touch **+=** 1st Answer **12.06666666**
- g. Enter 96 **96.**
- h. Touch **+=** 2nd Answer **6.4**
- i. Enter 117 **117.**
- j. Touch **+=** 3rd Answer **7.8**
- k. Push 'K' off (down)

5. PERCENTAGE

Example #1: To calculate 5% of 375

Do these steps

display will be

- | | | |
|---------------------------|--|--------------|
| a. Touch C | | 0. |
| b. Enter 5 | | 5. |
| c. Touch % | | 0.05 |
| d. Touch X | | 0.05 |
| e. Enter 375 | | 375. |
| f. Touch += Answer | | 18.75 |

Example #2: Markup after adding 3% sales tax on an item of \$16.00

Do these steps

display will be

- | | | |
|---------------------------------|--|--------------|
| a. Enter 16 | | 16. |
| b. Touch X | | 16. |
| c. Enter 3 | | 3. |
| d. Touch % | | 0.48 |
| e. Touch += Final Amount | | 16.48 |

Example #3: 10% discount, 5% sales tax on an item of \$250.

Do these steps

display will be

- | | | |
|---|--|---------------|
| a. Enter 250 | | 250. |
| b. Touch X | | 250. |
| c. Enter 10 | | 10. |
| d. Touch % | | 25. |
| e. Touch = Value After 10% Discount | | 225. |
| f. Touch X | | 225. |
| g. Enter 5 | | 5. |
| h. Touch % | | 11.25 |
| i. Touch += Final Amount to be Paid | | 236.25 |

Example #4: What % is 75 of 125?

Do these steps

display will be

- | | | |
|---|--|-------------|
| a. Enter 75 | | 75. |
| b. Touch + $\frac{\circ}{\circ}$ | | 75. |
| c. Enter 125 | | 125. |
| d. Touch % Answer | | 60. |

6. MIXED ARITHMETIC

Example #1: To calculate $23 \times (-4) \div (-6) =$
Do these steps display will be

- | | | |
|-------------------|----------------|--------------------|
| a. Touch C | | 0. |
| b. Enter 23 | | 23. |
| c. Touch X | | 23. |
| d. Enter 4 | | 4. |
| e. Touch = | | 92. |
| f. Touch + | $\frac{23}{6}$ | 92. |
| g. Enter 6 | | 6. |
| h. Touch = | Answer | 15.33333333 |

Example #2:
To calculate $\frac{(9 + 6 - 5) \times 8}{20} =$

Do these steps display will be

- | | | |
|-------------------|--|------------|
| a. Touch C | | 0. |
| b. Enter 9 | | 9. |
| c. Touch + | | 9. |
| d. Enter 6 | | 6. |
| e. Touch + | | 15. |
| f. Enter 5 | | 5. |

- | | | |
|-------------------|----------------|------------|
| g. Touch = | | 10. |
| h. Touch X | | 10. |
| i. Enter 8 | | 8. |
| j. Touch + | $\frac{23}{6}$ | 80. |
| k. Enter 20 | | 20. |
| l. Touch + | | 4. |
| m. Enter 8 | | 8. |
| n. Touch = | Answer | 4. |

Example #3: 5% of $(5 + 16 + 17) \times 8$

Do these steps display will be

- | | | |
|-------------------|--|-------------|
| a. Enter 5 | | 5. |
| b. Touch + | | 5. |
| c. Enter 16 | | 16. |
| d. Touch + | | 21. |
| e. Enter 17 | | 17. |
| f. Touch + | | 38. |
| g. Touch X | | 38. |
| h. Enter 8 | | 8. |
| i. Touch + | | 304. |

- j. Touch **X** 304.
- k. Enter 5 5.
- l. Touch **%** Answer 15.2

7. EXPONENTS

Example #1: To calculate $(3)^5 =$

Do these steps display will be

- a. Touch **C** 0.
- b. Push 'K' on (up) 0.
- c. Enter 3 3.
- d. Touch **X** 3.
- e. Touch **=** 9.
- f. Touch **=** 27.
- g. Touch **=** 81.
- h. Touch **=** Answer 243.
- i. Push 'K' off (down)

8. OVERFLOW INTERPRETATION

The positive or negative overflow indicator indicated by Γ or \square respectively, will appear when the display capacity of the calculator is exceeded.

For example, multiplication of two positive numbers
 12345678×345678
 will give the following display

Γ 426.7629279

or multiplication of a positive and a negative number

12345678×-345678

will give the following display

\square 426.7629279

The " Γ " or " \square " symbol indicates positive or negative "overflow" respectively, and indicates an answer of more than 10 digits shown. To obtain the correct decimal location for either case, simply record the displayed number and move the decimal point 10 places to the right. The real answer will then be:

$\pm 4,267,629,279,000.$
 \downarrow 10 places \uparrow

This procedure applies to all operations; multiplication, division, addition, subtraction and percentage. Use the 'C' key to clear the overflow.

9. TO RECALL THE DISPLAY AFTER 'BLANKING'

During battery operation, the display will automatically turn off, if there is no keyboard activity for about 30 seconds. This feature is provided to conserve the battery power. Depress any key on the keyboard to recall the 'blanked' display.

BATTERY NOTES

1. With normal use at room temperature, a full battery charge can be expected to supply about 5 hours of accumulated working time.
2. The Calculator may be used while its battery is charging.
3. Batteries that have been neither used nor charged for as long as 2 or 3 months will suffer substantial loss of operating time through a tendency to self-discharge. As a general rule, batteries lose about 1% charge per day due to self-discharge, at normal temperatures.
4. For optimum performance and long life:
 - a. Alternate frequently between Battery and AC power.
 - b. Operate at or near normal room temperatures.
 - c. Charge as soon as possible upon appearance of the Low-Battery indicator.
5. Recharge time is 7 hours for a fully discharged battery.
6. The Low-Battery indicator is designed to appear as soon as battery voltage drops to the lowest value that will support optimum performance of the Calculator. Should further discharge occur, through continued operations or self-discharge, the Low-Battery indicator may fail to appear. Do not continue to operate on batteries when this condition is noted, or a damaged battery may result.
7. As a general rule, if improper operation occurs, first try the Calculator with its charger connected. If operation is then normal, this indicates the batteries are low.
8. Do not store the unit in high temperature areas such as the top of radiators or the rear deck of automobiles exposed to the sun. The Calculator will operate satisfactorily over an ambient temperature range of 0 to 50C (32 to 122F) and relative humidity to 95%.

WARRANTY

Bowmar/ALI, Inc. warrants to the purchaser of this new Bowmar Calculator that if the machine or any part thereof in the judgment of Bowmar is proven to be defective in material or workmanship within one year from date of original purchase, such defects will be repaired or replaced (at the Company's option) free of charge for parts and labor.

This warranty does not apply to any product which has been damaged by accident or which has been misused, abused, altered, or repaired by anyone other than Bowmar.

This warranty is in lieu of all other warranties expressed or implied, and no person is authorized to assume for Bowmar any other liability in connection with the sale of this product.

To obtain repairs, the Calculator should be delivered, prepaid, to Bowmar/ALI, Inc. at address shown below. In-warranty units will be returned postage prepaid.

BOWMAR/ALI, INC., ACTON, MASS. 01720

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