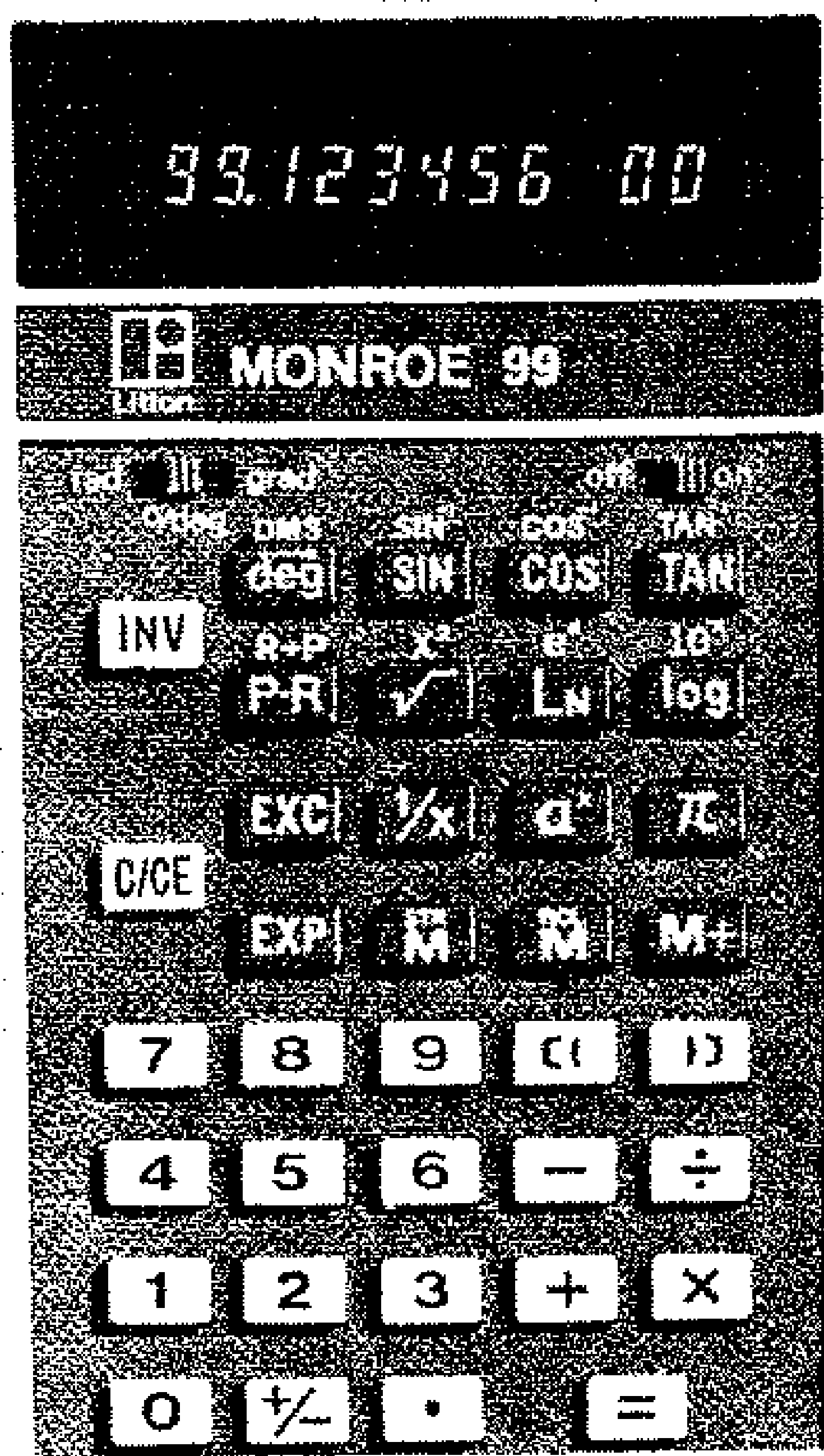
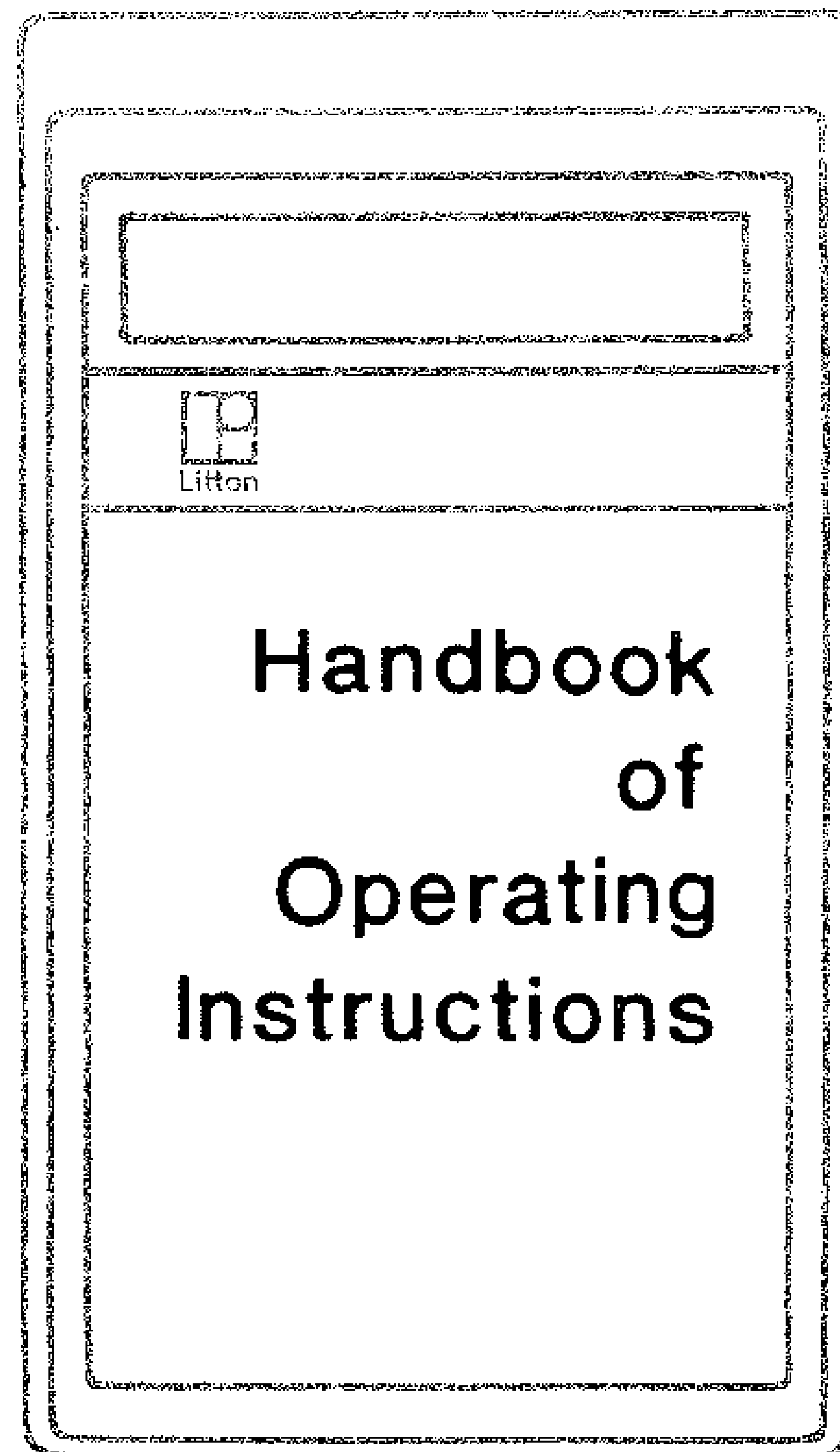


MONROE 99



Monroe, The Calculator Company

MONROE 99



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Printed in Japan

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About your 99

As you become acquainted with your **99** through the various example problems provided in this booklet, it will quickly become evident that this new Monroe was specially designed with your calculating requirements in mind.

The **99** is not just another scientific hand-held calculator. Its portability, ease of operation, power, and dependability help you solve long and tedious problems with speed and accuracy, wherever you are.

As a leader in the calculator industry, Monroe offers you the added advantage of knowing that over 60 years of experience has been built into the Monroe **99**.

To make sure you will be just as happy with your **99** tomorrow as you are today, Monroe offers you service from any one of over 300 branch offices conveniently located throughout the United States and Canada.

Congratulations on your new Monroe!

Operating Controls

BASIC CONTROLS

off  on **ON/OFF SWITCH**

Turns calculator on or off and clears the calculator.



NUMERIC ENTRY KEYS

Enter numbers into the display exactly as you would write them.



DECIMAL POINT KEY

Used for entry of the decimal point in a number. Whole numbers do not require the decimal point entry.



CHANGE SIGN KEY

Changes the algebraic sign of the number in the display.



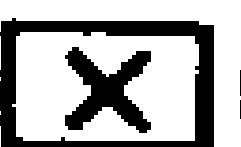
PLUS KEY

Enters number in the display as an addition factor or completes a calculation and sets up the result as an addition factor.



MINUS KEY

Enters number in the display as a subtraction factor, or completes a calculation and sets up the result as a subtraction factor.



MULTIPLY KEY

Enters number in display as a multiplicand (first number in a multiplication sequence) or completes a calculation and sets up the result as a multiplicand.



DIVIDE KEY

Enters number in display as a dividend (first number in a division sequence) or completes a calculation and sets up the result as a dividend.



EQUALS KEY

Completes addition, subtraction, multiplication, division and power calculations.

(Each depression of the equals key conditions the calculator to retain the last number entered and the last function key depressed as constants).



CLEAR/CLEAR ENTRY KEY

Clears an incorrect keyboard entry or, if no keyboard entry exists, clears the calculator for a new calculation. Clears an overflow or error condition expressed in the display as zeros surrounded by decimal points . Does not clear the memory.



PARENTHESES KEYS

For solving equations with one or two levels of parenthetical expressions, i.e., $2 + [3 \times (4 + 5)] = x$. The  key opens the parenthetical expression, the  key completes the parenthetical expression and automatically sets up the result as a factor.



POWER KEY

Raises any number (a) to any power (x), within the dynamic range of the calculator.

MEMORY KEYS



STORE MEMORY KEY

Stores number in the display in the memory. Clears any amount previously in memory replacing it with number in the display.



RECALL MEMORY KEY

Recalls contents of the memory into the display, does not clear memory.



MEMORY PLUS KEY

Adds number in the display to the contents of the memory.

SPECIAL FUNCTION KEYS

- π KEY**
Enters the value π (3.1415926) into the display.
- EXP EXPONENT KEY**
Conditions calculator to accept a numeric entry as an exponent (power of 10).
- EXC EXCHANGE KEY**
Interchanges factors in a calculation eliminating the need for re-entry.
- $1/x$ RECIPROCAL KEY**
Calculates reciprocal of the number in the display.

SPECIAL FUNCTION KEYS WITH INVERSE FUNCTIONS

- INV INVERSE KEY**
Certain keys have inverse functions, these inverse functions are represented directly above the appropriate keys. Depression of the inverse key prior to these appropriate keys will cause the inverse function of that key to be calculated. The following keys have inverse functions:

$\sin^{-1}$ $\cos^{-1}$ $\tan^{-1}$ $\ln$ $\log$

A. Trigonometric Functions

rad $\frac{\circ}{\text{deg}}$ **RADIAN, DEGREE, GRAD SWITCH**
Used to select the units (degrees, radians, grads) in which angular entries and results are displayed.

- SIN SINE KEY**
Calculates the sine of the number in the display.
- $\sin^{-1}$ INV SIN**
Calculates the arc sine of the number in the display.
- COS COSINE KEY**
Calculates the cosine of the number in the display.
- $\cos^{-1}$ INV COS**
Calculates the arc cosine of the number in the display.

- TAN TANGENT KEY**
Calculates the tangent of the number in the display.

$\tan^{-1}$ INV TAN
Calculates the arc tangent of the number in the display.

- deg DEGREE KEY**
Converts an angle expressed in degrees, minutes and seconds to its decimal equivalent in degrees.

$\frac{\text{DMS}}{\text{deg}}$ INV deg
Converts an angle expressed in decimal degrees to degrees, minutes and seconds.

- P-R POLAR TO RECTANGULAR KEY**
Converts polar coordinates to rectangular coordinates.

$\frac{R-P}{P-R}$ INV P-R
Converts rectangular coordinates to polar coordinates.

B. Logarithmic Functions

- LN LN KEY**
Calculates the natural logarithm (base_e) of the number in the display.

e^x INV LN
Calculates the antilog_e of the number in the display.

- log LOG KEY**
Calculates the common logarithm (base₁₀) of the number in the display.

10^x INV log
Calculates the antilog₁₀ of the number in the display.

C. Square/Square Root Functions

- $\sqrt{}$ SQUARE ROOT KEY**
Calculates the square root of the number in the display.

x^2 INV $\sqrt{}$
Calculates the square of the number in the display.

Applications

BASIC OPERATIONS

+ **-** ADDITION/SUBTRACTION

	Enter	Depress	Read
$8 + 4 - 3 =$	8	+	8.0000000 00
	4	-	12.000000 00
	3	=	9.0000000 00

+ **-** REPEAT ADDITION/SUBTRACTION

	Enter	Depress	Read
$3 + 2 + 2 - 4 - 4 =$	3	+	3.0000000 00
	2	=	5.0000000 00
		= -	7.0000000 00
	4	=	3.0000000 00
		=	-1.0000000 00

X MULTIPLICATION

	Enter	Depress	Read
$-8 \times 4 \times 10 =$	8	+/- X	-8.0000000 00
	4	X	-32.000000 00
	10	=	-320.00000 00

÷ DIVISION

	Enter	Depress	Read
$\frac{8.05 \times .333}{9 \times 1.08} =$	8.05	X	8.0500000 00
	.333	÷	2.6806500 00
	9	+	2.9785000 -01
	1.08	=	2.7578703 -01

POWER CALCULATIONS

a^x RAISING A NUMBER TO A POWER

	Enter	Depress	Read
$3.2^5 =$	3.2	a^x	32.000000 00
	5	=	335.54400 00

a^x COMBINING A POWER CALCULATION WITHIN A PROBLEM

	Enter	Depress	Read
$7.4^{1.2} + 8.6^{-1.2} =$	7.4	a^x	7.4000000 00
	1.2	+ (()	11.042800 00
	8.6	a^x	8.6000000 00
	1.2	+/-)	7.5613900 -02
		=	11.118413 00

Depressing **a^x** will complete a calculation and set the solution up as a base to be raised to a power, example:

	Enter	Depress	Read
$[2 + 3 \times .5]^4 =$	2	+	2.0000000 00
	3	X	5.0000000 00
	.5	a^x	2.5000000 00
	4	=	39.062500 00

CONSTANTS

The calculator has constants in all basic operations, i.e.; addition, subtraction, (see repeat addition/subtraction), multiplication, division and power calculations. The entry which precedes the depression of the $\boxed{=}$ key will be the constant factor with the constant mode of operation being that which was last used.

$\boxed{\times}$ CONSTANT MULTIPLICATION

	Enter	Depress	Read
$3 \times 2 =$	3	$\boxed{\times}$	3.0000000 00
$4 \times 2 =$	2	$\boxed{=}$	6.0000000 00
$5 \times 2 =$	4	$\boxed{=}$	8.0000000 00
	5	$\boxed{=}$	10.0000000 00

$\boxed{\div}$ CONSTANT DIVISION

	Enter	Depress	Read
$\frac{180.6}{6.02} =$	180.6	$\boxed{\div}$	18.060000 00
	6.02	$\boxed{=}$	3.0000000 00
$\frac{18.06}{6.02} =$	18.06	$\boxed{=}$	3.0000000 00

$\boxed{a^x}$ RAISING DIFFERENT BASES TO A CONSTANT POWER

	Enter	Depress	Read
$2^3 =$	2	$\boxed{a^x} \boxed{3} \boxed{=}$	8.0000000 00
$3^3 =$	3	$\boxed{=}$	27.000000 00
$4^3 =$	4	$\boxed{=}$	64.000000 00

MIXED/PARENTHETICAL CALCULATIONS

Enter problems involving mixed and/or parenthetical expressions as you would write them.

$\boxed{+}$ $\boxed{-}$ $\boxed{\div}$ $\boxed{\times}$ MIXED CALCULATION

	Enter	Depress	Read
$3 + 5 - 2 \div 4 \times 6 =$	3	$\boxed{+}$	3.0000000 00
	5	$\boxed{-}$	8.0000000 00
	2	$\boxed{\div}$	6.0000000 00
	4	$\boxed{\times}$	1.5000000 00
	6	$\boxed{=}$	9.0000000 00

$\boxed{(}$ $\boxed{)}$ ONE LEVEL OF PARENTHESES

$3.5 + 7.2 =$	3.5	$\boxed{+}$	35.000000 00
$8.3 - 2.7 =$	7.2	$\boxed{\div} \boxed{(}$	10.700000 00
	8.3	$\boxed{-}$	8.3000000 00
	2.7	$\boxed{)}$	5.6000000 00
		$\boxed{=}$	1.9107142 00

$\boxed{(}$ $\boxed{)}$ NESTED PARENTHESES

$2 + [(\frac{3+4}{5}) \times (\frac{5-6}{2})] =$	2	$\boxed{+}$	2.0000000 00
		$\boxed{(} \boxed{(}$	2.0000000 00
	3	$\boxed{+}$	3.0000000 00
	4	$\boxed{\div}$	7.0000000 00
	5	$\boxed{)} \boxed{\times} \boxed{(}$	1.4000000 00
	5	$\boxed{-}$	5.0000000 00
	6	$\boxed{\div}$	-1.0000000 00
	2	$\boxed{)} \boxed{)}$	-5.0000000 -01
		$\boxed{=}$	-7.0000000 -01
		$\boxed{=}$	1.3000000 00

MEMORY OPERATION

Using the Memory to store and recall may be executed as often as necessary to aid in the solution of a problem.

STR **M** **RCL** **M** STORE AND RECALL MEMORY

$$\frac{28(2.12469^{1.203})}{14(2.12469^{1.203}) - \ln(2.12469^{1.203})} =$$

Enter	Depress	Read
2.12469	α^x	2.1246900 00
1.203	= M X	24759200 00
28	÷ (C)	69.325760 00
14	X M =	34.662880 00
	AC M LN)	33.756268 00
	=	20537151 00

Accumulating numbers in memory is accomplished by depression of the **M+** key following a keyboard entry.

M+ ACCUMULATE TO MEMORY

	Enter	Depress	Read
10 + 25 - 6 =	10	M	10.000000 00
	25	M+	25.000000 00
	6	+/- M+	-6.00000000 00
		M	29.0000000 00

ENTERING EXPONENTS

To enter a number as a power of 10, depress the **EXP** key prior to entering the numeric power. If the power of 10 is negative, depress change sign after the numeric power entry.

EXP EXPONENT

	Enter	Depress	Read
18.06×10^{12}	18.06	EXP	18.06 00
6.02×10^{23}	12	÷	1.8060000 13
	6.02	EXP	6.02 00
	23	=	3.0000000 -11

	Enter	Depress	Read
$-8 \times 4 \times 10^{-15}$	8	+/- X	-8.0000000 00
	4	EXP	4. 00
	15	+/-	4. -15
		=	-3.2000000 -14

SPECIAL FUNCTIONS

1/x RECIPROCAL

	Enter	Depress	Read
$\frac{1}{47.3}$	47.3	1/x	2.1141649 -02

(continued)

SPECIAL FUNCTIONS (continued)

Using the $\sqrt[n]{x}$ key and a^x key in conjunction you can find unknown roots of numbers.

a^x $\sqrt[n]{x}$ FINDING UNKNOWN ROOT OF A NUMBER

	Enter	Depress	Read
$\sqrt[5]{32} =$	32	a^x	32.000000 00
	5	$\sqrt[n]{x}$	2.0000000 -01
		=	2.0000000 00

π PI

Depression of the π key recalls the constant value of π (3.1415926) to the display.

	Enter	Depress	Read
$2\pi =$	2	$\times$	2.0000000 00
		π	3.1415926 00
		=	6.2831852 00

EXC EXCHANGE

	Enter	Depress	Read
$3 \times 5 =$	3	$\times$	3.0000000 00
$2 \times 3 =$	5	EXC	3.0000000 00
		=	15.000000 00
		=	6.0000000 00

SPECIAL FUNCTIONS WITH INVERSE FUNCTIONS

To determine the Inverse Function of a number, simply depress the INV key prior to the appropriate Special Function key.

Trigonometric Functions

When using the trigonometric keys move the $\text{rad} \leftrightarrow \text{grad}$ switch to the desired units you wish to have displayed.

SIN SINE

	Enter	Depress	Read
$\text{SIN } 30.8^\circ =$	30.8	SIN	5.1204300 -01
$100 \times \text{SIN } 89.9^\circ =$	100	$\times$	100.00000 00
		SIN	9.9999800 -01
		=	99.999800 00

SIN^{-1} INV ARC SINE

	Enter	Depress	Read
$\text{SIN}^{-1} .67 =$	.67	INV SIN	42.067100 00
$3 \times \text{SIN}^{-1} .92 =$	3	$\times$	3.0000000 00
		INV SIN	66.926100 00
		=	200.77830 00

(continued)

Trigonometric Functions (continued)

COS COSINE

	Enter	Depress	Read
$\text{COS } 17.4^\circ =$	17.4	COS	9.5424000 -01
$\text{COS } \frac{63.1}{3} =$	63.1 $\div$ 3 $=$	COS	21.033333 00 9.3337200 -01

INV COS^{-1} ARC COSINE

	Enter	Depress	Read
$\text{COS}^{-1} 0.5 =$	.5	INV COS	60.000000 00
$\text{COS}^{-1} (-0.5) =$	.5 $\pm/\mp$	INV COS	120.000000 00

TAN TANGENT

	Enter	Depress	Read
$\text{TAN } .73 \text{ Radians} =$	.73	TAN	8.9491700 -01
$\text{TAN}^2 .34 \text{ Radians} =$	.34	TAN X $=$	3.5373700 -01 1.2512986 -01

INV TAN^{-1} ARC TANGENTS

	Enter	Depress	Read
$\text{TAN}^{-1} .13 =$	.13	INV TAN	7.4069100 00
$\frac{\text{TAN}^{-1} .62}{4.9} =$	.62 $\div$ 4.9 $=$	INV TAN =	31.798900 00 6.4895714 00

Logarithmic Functions

LN NATURAL LOGARITHMS

	Enter	Depress	Read
$\text{LN } 17.2 =$	17.2	LN	2.8449100 00
$\text{LN } 0.00123 =$	.00123	LN	-6.7007400 00

INV e^x ANTILOG_e

Antilog _e	1.76473	INV LN	5.8399900 00
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log COMMON LOGARITHM

$\text{LOG } 21.4 =$	21.4	log	1.3304100 00
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INV 10^x ANTILOG₁₀

Antilog ₁₀	2.6571521	INV log	45.410100 00
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Square Root

✓ SQUARE ROOT

$\sqrt{25} =$	25	✓	5.0000000 00
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INV x^2 SQUARING

4	INV ✓	=	16.000000 00
4	X	=	4.0000000 00
2.1	X	=	8.4000000 00
1.21	)	=	10.164000 00
	= ✓		2.4157814 00

ANGLE/COORDINATE CONVERSION

Converting an angle expressed in Degrees, Minutes and Seconds to Decimal Equivalent.

deg CONVERTING ANGLES TO DECIMAL DEGREES

o/deg		Enter	Depress	Read
30° 30' 15"	(degrees)	30	deg	30.000000 00
	(minutes)	30	deg	30.500000 00
	(seconds)	15	deg	30.504166 00

The calculator also converts fractional seconds if entered. Before proceeding to another problem, depress **C/CE** so that the entry is not accepted as a fractional second.

INV **DMS** CONVERTING ANGLES EXPRESSED IN DECIMAL TO DEGREES, MINUTES AND SECONDS

o/deg		Enter	Depress	Read
30.504166	(degrees)	30.504166		30.504166 00
	(minutes)		INV deg	30.249960 00
	(seconds)		INV deg	14.997600 00

The calculator will continue converting to fractional seconds if **INV deg** is depressed.

P-R CONVERTING POLAR COORDINATES TO RECTANGULAR COORDINATES

o/deg		Enter	Depress	Read
(θ, R) = (30, 6.2)		30	P-R	3.000000 00
to (x, y)		6.2	P-R	5.369360 00
			P-R	3.100000 00

INV **R-P** CONVERTING RECTANGULAR COORDINATES TO POLAR COORDINATES

o/deg		Enter	Depress	Read
(x, y) = (3, 4)		3	R-P	3.000000 00
to (θ, R)		4	INV R-P	53.130100 00
			R-P	5.000000 00

Operations Causing Overflow and Error Conditions

Entry or result lies outside the dynamic range of the calculator $\pm 9.999 \dots \times 10^{\pm 99}$

Division by zero

Square root of -x

For a^x when 0° , ($a \leq 0$ and $x < 0$), ($a \leq 0$ and $x > 0$).

Arc sine of x } $-1 > x > 1$
Arc cosine of x }

For Log_{10} , Log_e : $x \leq 0$

General Information

CONVERTER/CHARGER FOR AC OPERATION

Connect the converter/charger to the calculator (illus. 1). Then connect converter to an appropriate AC outlet (illus. 2). Operation on AC can take place with or without batteries.

NOTE: Use Monroe Model BC20 only.

BATTERY INFORMATION

Battery Life/Discharge

The Nickel Cadmium rechargeable batteries have a minimum operating time of 8 hours on a full charge.

When the batteries are low, the extreme left and right digits in the display will dim.

Further calculations will continue to be accurate, however it is time to recharge batteries.

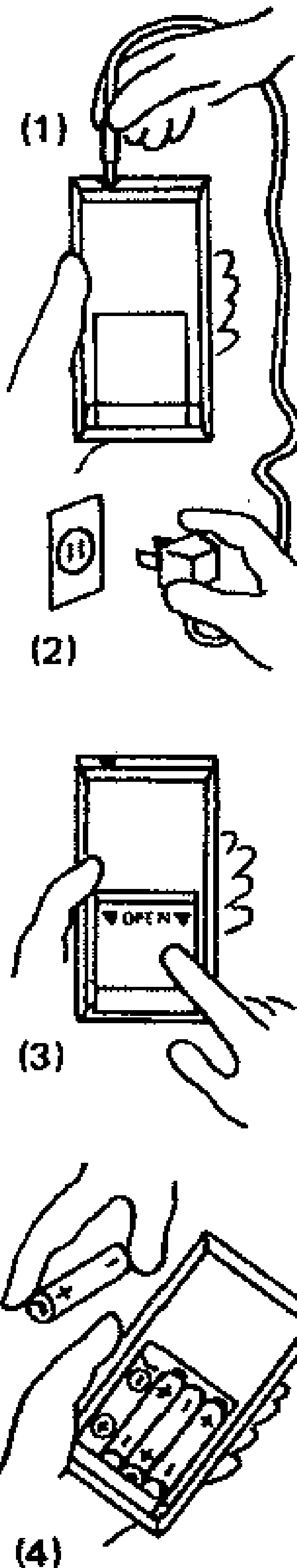
Opening the Calculator

Open the back of the calculator by sliding the door in the direction of the arrows (illus. 3).

Replacing Batteries

Remove the used batteries and insert new ones making sure the positive (+) and negative (-) symbols on the batteries correspond to the symbols in the battery housing. (illus. 4).

NOTE: Use four approved AA Nickel Cadmium batteries only, available from your local Monroe Branch.



Care

The soft cover protects the keyboard and electronic components from dirt and dust when the calculator is not in use. Always be sure that the calculator is off before putting it in its cover.

Service

With the 1,600 factory-trained service personnel in the United States and Canada, Monroe offers prompt and expert service. Technical service, should the need arise, is available at a Monroe branch office listed in your telephone directory.

Accessories

- Soft contoured cover
- Converter/charger for AC operation — Monroe Model BC20
- (4) AA Nickel Cadmium rechargeable batteries

Specifications

Dimensions:

6.5 in.(L) x 3.48 in.(W) x 1.34 in.(H)
165 mm(L) x 88.4 mm(W) x 34 mm(H)

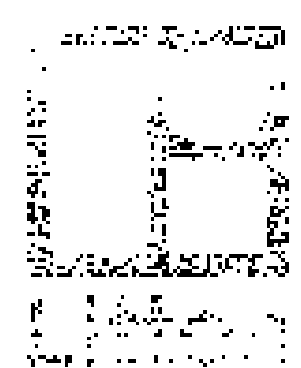
Weight: 9.5 ounces (270 grams)

Operating Temperature Range:

32° F to 104° F
(0° C to 40° C)

Power Requirements:

(4) AA Nickel Cadmium Batteries
Monroe BC20 Charger/Converter



MONROE

Monroe, The Calculator Company

**The American Road, Morris Plains, New Jersey, U.S.A.
Toronto, Canada • Zurich, Switzerland**

Sales and Service Throughout the World

1893-S