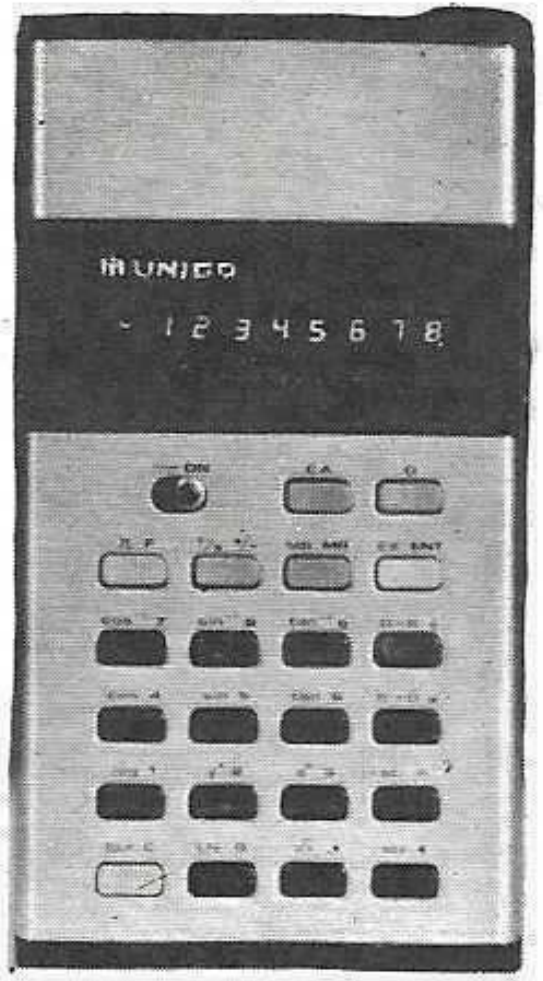
IMPORTANT:
WHEN THE 5th DECIMAL POINT
IS LIGHTED, THE BATTERY IS
BELOW OPERATING LEVEL.
CHANGE BATTERY IMMEDIATELY.

operating manual L-0832

UNICO



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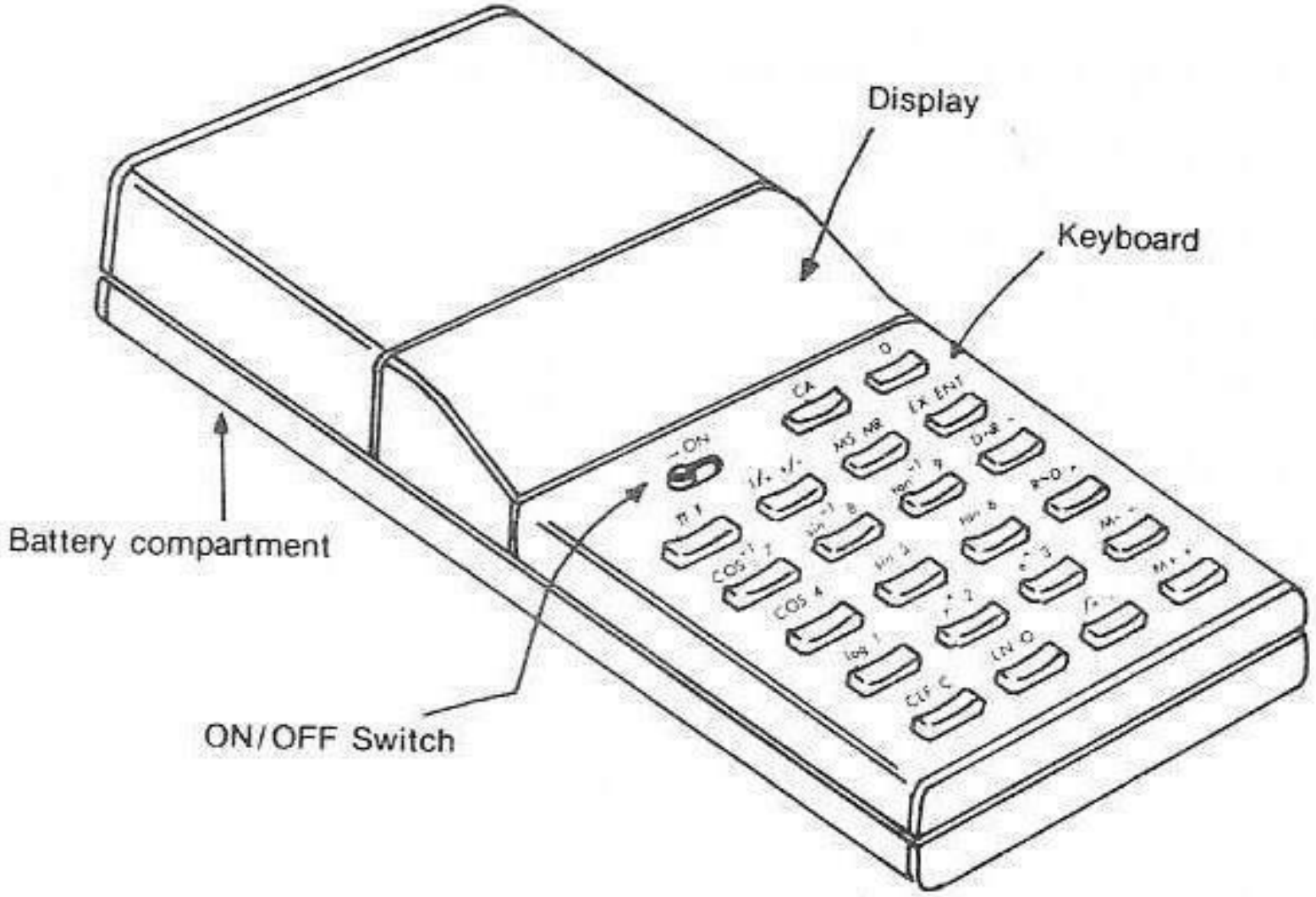
FEATURES

- RPN (Reverse Polish Notation) logic for easier and faster calculation
- 4-key memory (M—, M +, MS, MR)
- Nine-digit LED display with full-floating decimal system
- Scientific functions include:
  tan, sin, cos, $\tan^{-1}$, $\sin^{-1}$, $\cos^{-1}$, e^x, y^x, $\sqrt{x}$, log, 1/x, ln, π
- Direct degree/radian, radian/degree conversion
- Low battery indicator
- Battery saving system
- Error-correction key
- AC/DC operation

NAMES OF VARIOUS PARTS



POWER SUPPLY

The machine is operated by either:

a) one 006p size, 9-V battery, or

b) AC mains supply using AC adaptor with DC output of 9 volts at 100 mA suitable for earphone jack. Tip of DC output pin of adaptor should be positive.

F		—	function key Depression of the function key F sets the calculator in the function mode to select the second function mode for a succeeding key as follows.
F	CLF C = CLF	—	cancels the function mode activated by F key
F	π F = π	—	causes entry and display of the constant π
F	log 1 = log	—	causes immediate execution of common log function and display of the result
F	LN O = LN	—	causes immediate execution of the natural log function and display of the result
F	e^x 3 = e^x	—	causes immediate execution of the exponential function and display of the result
F	y^x 2 = y^x	—	causes execution of a prior function and is stored as a current exponentiation command

F	$\sqrt{x}$ • = $\sqrt{X}$	—	causes immediate execution of the square root function and display of result
F	1/x +/– = 1/x	—	causes immediate execution of the reciprocal function and display of the result
F	M– – = M–	—	subtracts the contents of the display register from the memory register
F	M+ + = M +	—	adds the contents of the display register to the memory register
F	MS MR = MS	—	stores the contents of the display register in the memory register. The display is unchanged and any previously stored number is replaced by the new number
F	EX ENT = EX	—	exchanges the contents of the display and constant register
F	R→D X = R→D	—	converts radians to degrees
F	D→R ÷ = D→R	—	converts degrees to radians

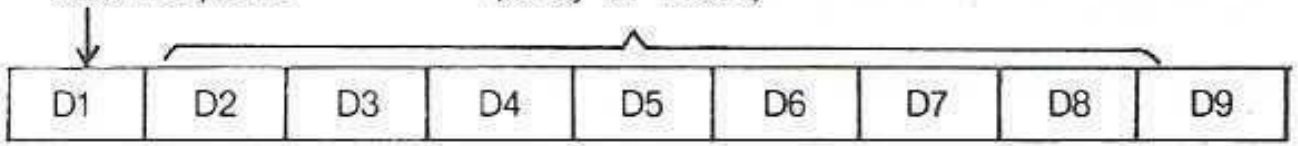
Other keys are explained as follows:

+ — x ÷	—	each causes execution of a prior function and is stored as a current add, subtract, multiply or divide command respectively
MR	—	copies the contents of the memory register into the display/entry register. The memory register contents are not changed.
ENT	—	ENTER Key
+/-	—	complements the sign of the number displayed
C	—	a) clears the entry register when number entry is in process b) clears all registers except memory register
CA	—	clears all registers including memory register
D	—	restores display after display cut-off has been activated.

DISPLAY

1. A 9-digit LED display is used with the 1st digit (the left most digit) for sign and decimal point.

2. The organization of the display format is as follows:



3. Status information

The information for calculation overflow, errors, low battery and display cut-off will be displayed as follows:

Display	Information
.□.□.□.□.□.□.□.□.□.	result overflow
.□.□.□.□.□.□.□.□.□.	error (due to illegal operation)
.	battery is below normal operating level
. . . . .	display cut-off is activated

ERROR CONDITIONS

1. Any overflow or illegal operation (e.g. division by zero) will cause the machine to indicate an error condition by displaying all zeros and decimal points.

2. The error condition can be cleared by using C key.

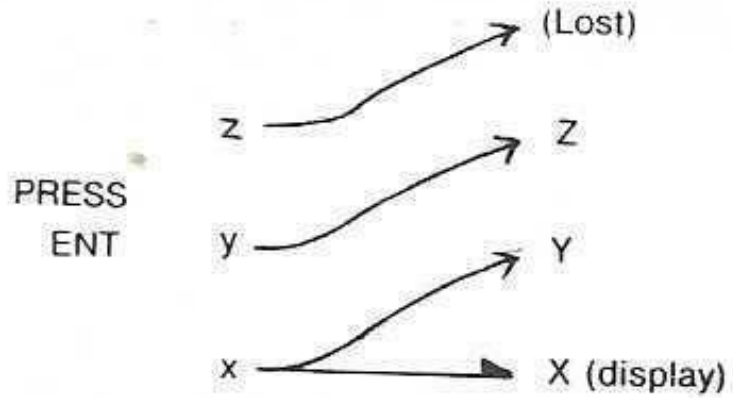
3. Memory is not affected by the error condition.

ARGUMENT LIMITS

Functions	Argument limits
+, −, x, ÷	$X > 99999999$.
÷, 1/x	$\lvert X \rvert \geq 0.0000001$
$\sqrt{X}$	$X > 0$
Y^X	$Y \geq 0$; $18.42060 > XlnY > -28$
Log^X, lnx	$X \geq 0$

e^X	$18.42068 > X > -28$
Sin, Cos	$X \leq 7$ radians, $X \leq 401°$
Tan	$1 X 1 \leq 90°$, $X \leq 7$ radians
Sin^{-1}, Cos^{-1}	$X < 1$
Tan^{-1}	$X < 99999999.$

When a number is keyed in, it goes into the X register (display). When you press ENT, the number is duplicated into Y register. At the same time, the contents of Y register are transferred to register Z and the contents from the register Z are transferred out of the stack The display always shows the number in the X register.



Let us examine how the stack principle works as we do (2 + 3) X (4 + 5) through steps (1) to (9) as follows:

Z						5.	5.		
Y		2.	2.		5.	4.	4.	5.	
X (Display)	2.	2.	3.	5.	4.	4.	5.	9.	45.
Key	2	ENT	3	+	4	ENT	5	+	X
Step	1	2	3	4	5	6	7	8	9

Step 1	:	2 in display (X register)
Step 2	:	2 duplicated into Y register
Step 3	:	3 in display
Step 4	:	Sum (5) formed in Y, then drops into X
Step 5	:	Automatic ENT pushes 5 into Y, display shows 4
Step 6	:	ENT pushes 5 into Z and duplicates 4 into Y
Step 7	:	5 in display
Step 8	:	Sum (9) formed in Y, then drops into X. At the same time, 5 drops into Y
Step 9	:	Product (45) formed in Y, then drops into X

CALCULATION EXAMPLES

Before each calculation, depress CA to clear the display and set the machine.

Two variable functions:

The functions of addition (+), subtraction (—), multiplication (x), division (÷) and exponentiation (y^x) all require two variables.

Basic arithmetic problems:

Example 1.1

$$\frac{(12 + 13) \times (-15)}{16} - 17 = ?$$

Key				Display	Remarks
12	ENT	13	+	25.	12 + 13
15	+/-	x		—375.	
16	÷			—23.4375	
17	—			—40.4375	answer

Example 1.2

$$(5 \times 6) + (24 \div 2) \times (2 + 4) = ?$$

Key	Display	Remarks
5 ENT 6 x	30.	5 x 6
24 ENT 2 ÷	12.	24 ÷ 2
+	42.	30 + 12
2 ENT 4 +	6.	2 + 4
x	252.	42 x 6 (answer)

Example 1.3 Y^X, M +, MS, MR

$2^{2.5} + (2^{2.5} - 2) = ?$

answer: 8.4852735

Key	Display	Remarks
2 ENT 2.5 F y^x 2	5.656849	$2^{2.5}$
F MS MR	5.656849	store 5.656849 in memory
2 ÷	2.8284245	
F M + +	2.8284245	add 2.8284245 into the memory contents
MR	8.4852735	recall the memory contents to the display

The functions of sin, cos tan, $\sin^{-1}$, $\cos^{-1}$, $\tan^{-1}$, e^x, y^x, $\sqrt{x}$, log, ln, 1/x are all single variab functions which are executed immediately upon entry from the keyboard and which operate upon t operand as displayed by the calculator at the time the function is activated. Single variable functio may be activated in multiple sequence.

Example 2.1

$\sqrt{2}$ = ?

answer: 1.4142135

Key	Display	Remark
2 F $\sqrt{x}$ •	1.4142135	$\sqrt{2}$

Example 2.2

In 45 = ?

answer: 3.806663

Key	Display	Remark
45 F LN O	3.806663	In 45

Example 2.3

$\frac{1}{6}$ = ?

answer: .16666666

Key	Display	Remark
6 F 1/x +/−	.16666666	$\frac{1}{6}$

Example 2.4

log 30 = ?

answer: 1.477121

Key	Display	Remark
30 F log 1	1.477121	log 30

Example 2.5

$e^{2.5}$ = ?

answer: 12.18249

Key	Display	Remark
2.5 F e^x 3	12.18249	$e^{2.5}$

Exampe 2.6

tan 30° = ?

answer: .5773502

Key	Display	Remark
30 F tan 6	.5773502	tan 30°

Example 2.7

sin 30° = ?

answer: .5

Key	Display	Remark
30 F sin 5	.5	sin 30°

Example 2.8

cos (0.5 radian) = ?

cos e, R D

answer: .8775826

Key	Display	Remark
.5 F R→D x	28.64789	converts 0.5 radian to degrees
F cos 4	.8775826	

Example 2.9

$\cos^{-1} x$

$\cos^{-1}$ 0.5 = ?

answer: 60.

Key	Display	Remark
.5 F $\cos^{-1}$ 7	60.	

Example 2.10

$\tan^{-1}$ 1.0 = ? (radians)

answer .78539815

Key	Display	Remark
1 F $\tan^{-1}$ 9	45.	answer in degrees
F D→R =	.78539815	answer in radians

OTHER CALCULATIONS

Probability Functions:

a) Gauss: $P_{(x)} = \frac{1}{\sqrt{2\pi}} e^{\frac{-x^2}{2}}$

$P_{(0.35)} = ?$

Key	Display	Remark
F π F	3.1415926	the value of π
ENT 2 x	6.2831852	
F √x • F 1/x +/−	.39894229	$\frac{1}{\sqrt{2\pi}}$
.35 ENT x	.1225	$(.35)^2$
+/− 2 ÷	−.06125	$\frac{-(.35)^2}{2}$
F e^x 3	.9405886	$e^{\frac{-(.35)^2}{2}}$
X	.37524057	answer

b) Poisson: $P_{(u, x)} = \frac{u^x}{x!} e^{-u}$

$P_{(2.5, 4)} = ?$

answer: .13360165

Key	Display	Remark
2.5 ENT 4 F y^x 2	39.06244	2.5^4
2.5 +/- F e^x 3	.082085	$e^{2.5}$
X	3.2064403	$u^x e^{-u}$
2 ENT 3 X 4 X	24.	
F 1/x +/-	.04166666	$\frac{1}{4!}$
X	.13360165	answer

Example 1

$$\sinh X = \frac{1}{2}(e^{X} - e^{-X})$$

sinh 1.5 = ?

Operation:

1.5 F e^{x} 3 F MS MR F 1/x +/– F M– – MR ENT 2

answer: 2.1292778

Example 2

$$\text{Cosh}^{-1}\, x = \ln\left[x + \sqrt{x^2 - 1}\right]$$

$$\text{Cosh}^{-1}\, \frac{\pi}{3} = ?$$

Operation:

F π F ENT 3 ÷ F MS MR ENT X 1 — F $\sqrt{x}$ • F M + +

MR F LNO

answer: .3060418

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