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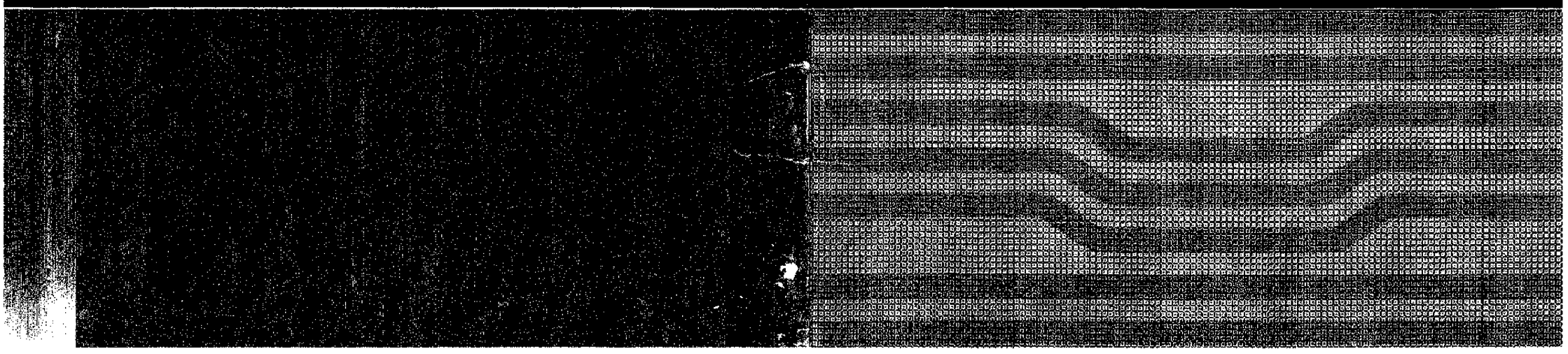
SHARP COMPET

ELSI MATE

ELECTRONIC CALCULA

EL-83

INSTRUCTION MANU



CONTENTS

INTRODUCTION

The new EL-8300 is a special calculation with unit conversion function. There is so much it can do! The compact solid state LSI circuitry enables calculations up to 8 digits instantly, with maximum economy and stability. Fractional calculations and unit conversion can be easily performed.
So many deep think extras, too including tax/discount calculation, percentage calculation and many others. The EL-8300 even has a unique decimal position select function! A real time-saving, work-saving companion from the world's leading manufacturer of electronic calculators!

FEATURES

- Constant addition/subtraction/multiplication/division
- Square calculation
- Reciprocal calculation
- Power calculation
- Tax/Discount calculation
- Chain calculation
- Repeat addition & subtraction
- Complete sign logic system
- Percentage calculation
- Unit conversion calculation
- Fractional calculation
- Algebraic calculation method
- Approximate results in excess of 8 digits
- Decimal position function

OVERFLOW ERROR

Overflow error in detected is the following cases: difference

1. When the integer portion of sum, difference, product and quotient exceeds 8 digits.
2. When the integer portion of the unit conversion result exceeds 8 digits.
3. When the unit conversion is mistaken. (For example, g → m).
4. When divisor is zero.

When the overflow error (1) or (2) takes place, approximate result and decimal points are all displayed with the sign ⌐ (⌐ in the case of negative valve).
The overflow error can be reset by using [ON/AC].

HOW TO REPLACE THE BATTERY

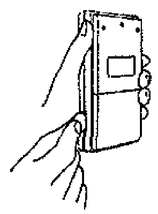


Fig. 1

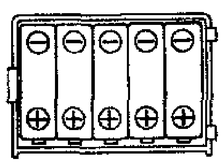


Fig. 2

Turn off the power source switch.

1. Hold the unit with its display part facing down.
2. Put a coin into a groove on the side of the unit to release the hook inside the unit. (Fig.1)
3. Take out the battery case. (Fig.2)

CALCULATION EXAMPLES

1.) Addition subtraction, multiplication and division

Key operations are to be in accordance with algebraic method.

Addend Minuend Multiplicand Divided	≦ 8 digits	Augiend Subtrahend *Multiplier* Divisor	≦ 8 digits
Sum Difference Product *Quotient*	≦ 8 digits	Decimal portion ≦ 7 digits	

CAUTION

1. When the voltage of the battery is lowered, the display will become dark.
   In such a case please exchange the battery with new one.
2. In case you do not use this calculator for a long time, please take out the battery and preserve it in a dry, cool and shady place.

2). Unit conversion

In case of conversion in the some group such as weight unit group, volume (capacity) u group, and temperature unit group, conversion is executed by any keys of [CONV1] [CONV2] , or [CONV3] . In case of conversion among length units, execution is as follov

[CONV1] : conversion of length units (i.e.m→cm)
[CONV2] : conversion of area units (i.e.m^2→cm^2)
[CONV3] : conversion of volume units (i.e.m^3→cm^3)

Overflow error is detected when conversion among different unit group is executed.
Conversion can be executed even during calculation.
Length units : mm, cm, m, Km, inch, feet, yeard, mile
Weight units : *gram*, Kg, lb, OZ
Volume units : fl·oz, qt, gal, ml, lit
Temperature units: °C, °F
Nautical miles and statute miles can be converted by Naut/Land switch. Concerning fl·o: qt, and gal, both US type and UK type can be converted by U·S/Imp switch.
Key operation is as follows.

[N] [CONV1(2,3)] [N unit] [Unit to be converted]

Conversion of length, area, and volume units

Examples	Key operation	Display	Remarks
5.7 nautical miles = ? land miles	5.7	5.7	
	CONV 1/MI	5.7	Naut/Land switch→ Naut
	↓	5.7	Naut/Land switch→ Land
	↓	6.5594431	
$1m^2 = ?cm^2$	1	1.	
	CONV 2/MII	1.	
	↓	1.	
	↓	10000.	
$1cm^3 = ?mm^3$	1	1.	
	CONV 3/MIII	1.	
	↓	1.	
	↓	1000.	

Conversion of weight units

Examples		Key operation	Display	Remarks
3Kg = ?g	(1)	3	3.	3Kg = ?g
3000g=?OZ	(2)	CONV 1/MI	3.	
105.8218 OZ = ?lb	(3)	↓	3.	
		↓	3000.	Ans. (1)
		CONV 1/MI	3000.	3000 g = ?OZ
		↓	3000.	
		↓	105.82188	Ans. (2)
		CONV 2/MII	105.82188	105.82188 OZ=?lb
		↓	105.82188	
		↓	6.6138675	Ans. (3)

Conversion of volume units

Examples	Key operation	Display	Remarks
			U.S. Imp switch→Imp
37.57 uk gal	37.57	37.57	
= ? us gal	CONV 1/MI	37.57	
	[3]	37.57	UK gal
		37.57	U·S/Imp switch→U·S
45.119702US gal	[2]	45.119702	U·S. gal
= ? US quarts	CONV 1/MI	45.119702	
	[3]	45.119702	U·S gal
180.4788 US gal	[2]	180.4788	U·S quarts
= ? litters	CONV 3/MIII	180.4788	
	[2]	180.4788	U·S quarts
	[÷]	170.79664	ℓitters

Conversion of temperature units

Examples	Key operation	Display	Remarks
0°C = ?°F	0	0.	
	CONV 1/MI	0.	
	[+/-]	0.	
	[9/5]	32.	
212°F = ?°C	212	212.	
	CONV 2/MII	212.	
	[9/5]	212.	
	[+/-]	100.	

3) Memory function

Memory register has 3 words. Memory function operates in accordance with [X→M] an [RM] by following key operation.

In case of [X→M] :

[ENT/A] [CONV 1/MI] Number of display register enters memory MI.

[ENT/A] [CONV 2/MII] Number of display register enters memory MII.

[ENT/A] [CONV 3/MIII] Number of display register enters memory MIII.

In case of [RM] :

[READ/B] [CONV 1/MI] *Number of memory register MI recalls display register.*
[READ/B] [CONV 2/MII] Number of memory register MII recalls display register.
[READ/B] [CONV 3/MIII] Number of memory register MIII recalls display register.

These memory functions can be used for normal unit conversion.

4) Normal unit conversion

In case of A=αB (α: conversion coefficient), key operation for unit conversion is as follows.

[α] [M+] [CONV/MI] [N] [CONV/MI] [M+] [READ/B] → Nα
[CONV/MI] [READ/B] [ENT/A] → N/α

N : Numeral keys

Examples	Key operation	Display	Remarks
$1 = 2.65DM	2.65	2.65	
	[ENT/A]	2.65	
	[CONV1/MI]	2.65	Input 1$ = 2.65DM
$100 = ? DM	100	100.	
	[CONV1/MI]	100.	
	[ENT/A]	100.	
	[READ/B]	265.	$100 = 26.5 (DM)
5DM = ?$	5	5.	
	[CONV1/MI]	5.	
	[READ/B]	5.	
	[ENT/A]	1.8867924	5DM = 1.8867924 ($)

5) Decimal position

Decimal position is set by [ENT/A] [÷] [N] operation. N is to be 0,1,2,3,4,5,6,7,8, and
In case of N=8,9 Decimal position is in complete floating mode. (F-7-6-5-4-3-2-1-0)
Even if decimal position is performed, numbers before decimal position are displayed wh
complete floating mode is redesignated.
Complete floating mode is automatically designated by power-on.

Key operation	Display	Remarks
Power on		
2 ÷	2.	
3 ÷	0.6666666	
ENT/A	0.6666666	TAB = 4
÷	0.6666666	
4	0.6667	
ENT/A	0.6667	TAB = 0
÷	0.6667	
0	1.	
=	0.	Cost. cal (0.6666666÷3)
ENT/A	0.	TAB = F
÷	0.	
9	0.2222222	
=	0.074074	Cost. cal (0.2222222÷3)

6) Clear key function

1) Resets overflow error in case of error detection. But registers and memory contents are protected.
2) When such modes as PRT/A , READ , CONV1/MI , CONV2/MII , CONV3/MIII and REG/A ÷ are designated, cancels these modes.
3) In normal state, functions as clear entry in case of depression after number read-in, and all-clear except memory in case of depression after completion of calculation.
4) In any state, clears all except memory and TAB when successively depressed twice.

Examples	Key operation	Display	Remarks
999999999 x 9 = 8999999991	1) 99999999 ×	99999999.	
	9 =	8.9.9.9.9.9.9.9.⌐	Overflow error
	CE/AC	*8.9999999*	Approximate number display ($\times 10^8$)

Calculations	Examples	Operations
Addition & Subtraction	500 − 25 + 50 − 30 = 495	500 [M+] 25 [M+] 50 [M+] 30 [=] →495.
Multiplication & Subtraction	2.2 x 3.3 x 4.4 ÷ 5.5 = 5.808	2.2 [×] 3.3 [×] 4.4 [÷] 5.5 [=] →5.808
Constant calculation	2 + 3 = 5 4 + 3 = 7	2 [+] 3 [=] →5. 4 [=] →7.
	11.11 x 99.99 = 1110.8889 33.33 x 99.99 = 3332.6667	11.11 [×] 99.99 [=] →1110.8889 33.33 99.99 [=] →3332.6667
Repeat addition& subtraction	5 + 5 + 5 + 5 = 20	5 [+] [=] →10. Same result is obtained by [+] key depression instead of [=] key. [=] →15. [=] 20.
	2 − 2 − 2 − 2 = −4	2 [−] [=] →0. [=] 2− [=] 4−

Calculations	Examples	Operations
Power calculation	3^2 =9 3^3 =27 3^4 =81	3 [×] [=] →9. Same result is obtained by [×] key depression instead of [=] key. [=] →27. [=] →81.
Mixed calculation	$\frac{(123+456)\times 12+789}{741}$ = 10.441295	123 [÷] 456 [×] 12 [÷] 789 [÷] 741 [=] →10.441295 [INT] [÷] [5/4] →10.44130 [INT] [÷] [3] →10.441, [INT] [÷] [=] →10.441295
Tax/Discount calculation	500 + (500 x 15%) =575. 500 − (500 x 20%) =400.	500 [+] 15 [%] [=] →575. 500 [−] 20 [%] [=] →400.
Fractional calculation	$5\frac{4}{3}$ + 1/2 = 6.8333333	5 [a b/c] 4 [a b/c] 3 [+] 1 [a b/c] 2 [=] →6.8333333
	$9\frac{6}{3}$ x 2/5 = 4.4	9 [a b/c] 6 [a b/c] 3 [×] 2 [a b/c] 5 [=] →4.4

SPECIFICATIONS

Power source:	DC: SUM-3E x 5 AC: Adaptor EL-97 Operates for 16 hours on five manganes dry batteries.....(at 20°C) (Slightly changes according to the kinds of the batteries and the way of use. (AM-3 x 5 ..... 26H)
Capacity:	8 digits
Decimal point:	TAB-set (N=0,1,2,3,4,5,6,7) and complete floating mode (N=8,9)
Calculations:	4 arithmetic calculations, constant calculation, power calculation, reciprocal calculation, tax/discount calculation, chain calculation, repeat addition & subtraction, approximate calculation, percentage calculation, unit conversion calculation, fractional calculation.
Components:	LSI, etc.
Memory register:	3
Temperature:	0°C-40°C (32°F-104°F)
Power consumption:	DC: 0.47W
Dimensions:	89(W) x 34(H) x 149(D)mm, 3-1/2"(W) x 1-7/16"(H) x 5-7/8"(L)
Weight:	320g

*DESIGN AND SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

MEMO

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