

SHARP

ELECTRONIC CALCULATOR WITH ELSI

**Micro
COMPET** QT-8D

INSTRUCTION MANUAL



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INTRODUCTION



Sharp's revolutionary Micro Compet QT-8D incorporating four ELSIs (Extra Large Scale Integrations) with one 4-phase clock generator marks another major advance in the world of space-age miniaturization. Years of pioneering research and achievement in electronic engineering have enabled Sharp to develop an exceptionally remarkable mini-calculator that offers maximum portability and a wide range of mathematical versatility. The QT-8D is thoroughly reliable and carries out calculations with amazing speed and efficiency. This booklet provides a detailed explanation of the Micro Compet's operation.

FEATURES

1. ULTRA-COMPACT AND EASY TO HOLD

ELSI miniaturization considerably reduces overall dimensions and weight; increases dependability and lowers operating costs. Weighs only 1.4 kg (3.1 lbs.).

2. SIMPLE OPERATION

Only four function keys. No special training is required. Simply touch the keys and the answer to almost any practical mathematical problem appears instantly.

3. UNDER-FLOW SYSTEM

Simplifies long answers. For example, 8 digits x 8 digits = 16 digits can be carried out despite the 8 digit display panel. Counting from the left the first 8 digits of the answer are displayed and the rest discarded.

4. DECIMAL POINT CALL BACK SYSTEM

If the integral portion of the result exceeds 8 digits, the decimal point functions even though it doesn't appear on the display panel.

5. SOFT LIGHTING GREEN DISPLAY

Our specially developed non-glare green display panel eliminates eye-strain, improves reading ease.

6. MINUS SIGN INDICATOR

Automatically turns on when the result is negative.

7. DOUBLE-SETTING PROTECTIVE KEYS

Eliminate error, speed up operation . . . no more worry about double-setting of keys.

8. OVERFLOW ERROR CHECK

If the result exceeds 16 digits, all the decimal points turn on and the calculation stops. More than 8 digits can not be entered.

9. MINIMUM POWER CONSUMPTION

The 4-phase logic features require minimum power consumption.

HINTS

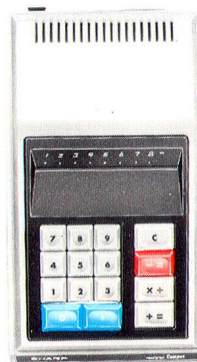
1. As the Micro Compet uses highly sensitive ELSIs and electronic components, avoid placing the unit in hot, dusty or humid locations, or on surfaces subject to excessive vibration.
2. Do not jolt or drop the unit.
3. Do not stand it on its side or turn it over.
4. Do not place articles on top of the unit.
5. When cleaning the cabinet, use the cloth enclosed. Do not use a wet cloth or any organic solutions such as kerosene or benzene.
6. When not in use, keep the unit covered.

SPECIFICATIONS

Power source:	AC 100/110/120/200/220/240V	50 – 60 Hz
Capacity:	8 digits	
Addition & Subtraction:	8 digits \pm 8 digits = 8 digits	
Multiplication:	8 digits \times 8 digits = 8 digits	
Division:	8 digits \div 8 digits = 8 digits	
Product:	up to 8 digits In case that a product exceeds 8 digits, lower digits are discarded, but the decimal point is kept in a register and called back by decimal point call back system.	
Decimal point:	Complete floating decimal point with call back system	
Negative:	Minus sign indication	
Calculation		
speed:	Addition & subtraction - 20 milliseconds	
	Multiplication - 150 milliseconds	
	Division - 200 milliseconds	
ELSI:	4	
IC:	1	
IC (for a clock generator)	1	
Modules:	3	
Transistors:	5	
Diodes:	11	
Clock pulse:	78 kHz	
Temperature:	0 - 40°C (32 - 104°F)	
Power consumption:	AC 7W (maximum), AC 4W (normal)	
Dimensions:	135mm(W) \times 72mm(H) \times 247mm(D)	
	5-5/16''(W) \times 2-13/16''(H) \times 9-11/16''(D)	
Weight:	1.4kg (3.1 lbs.)	

KEY IDENTIFICATION

- 0** ~ **9** Numeral keys. Used for entering numbers.
- .** Determines the decimal point position.
 - C** Clears the calculator and corrects mistaken entry. (See Ex. 6.)
 - + =** When **$\times \div$** key is set, multiplication is carried out. When **$\times \div$** key is not set, addition is carried out.
 - =** When **$\times \div$** key is set, division is carried out. When **$\times \div$** key is not set, subtraction is carried out.
 - $\times \div$** Used when carrying out multiplication and division.



BEFORE OPERATION

When the power is turned on, press the **C** key twice to clear the machine.

Example power on 7567.0987- (appears at random.)
 press **C** key
 (first time) .0225- (appears at random.)
 press **C** key
 (second time) 00000000

OPERATION

Connect power cord to an electric outlet, and turn the unit on. Be sure to press **C** key twice before starting calculations.

1. ADDITION

Ex. 1 – 1 $123.1 + 864.2$

Steps:

	operation	display
1	123.1	123.1
2	$\boxed{+=}$	123.1
3	864.2	864.2
4	$\boxed{+=}$	987.3



Ex. 1 – 2 $2.3 + 2.45 + 2.678$

Steps:

	operation	display
1	2.3	2.3
2	$\boxed{+=}$	2.3
3	2.45	2.45
4	$\boxed{+=}$	4.75
5	2.678	2.678
6	$\boxed{+=}$	7.428

Ex. 1 – 3 12.345678 + 1234.5678

Steps





	operation	display	note
1	12.345678	12.345678	
2		12.345678	
3	1234.5678	1234.5678	
4		1246.9134 78 ← invisible part	

NOTE: Underflow system

In this calculation, the decimal point is aligned to that of addend and the lowest two digits of the answer which exceeds 8 digits, "78," are discarded.

Ex. 1 – 4 8246246 + 3963966 + 98457823 + 35

Steps:

	operation	display	note
1	8246246	8246246.	
2		8246246.	
3	3963966	3963966.	
4		12210212.	
5	98457823	98457823.	
6		11066803 5. ← invisible part	
7	35	35.	
8		00000000	

NOTE: In continuous addition:




1. If the answer exceeds 8 digits, the last digit is shifted one digit to the right

- with the decimal point according to the underflow system as shown in step 6.
2. However, if the addition is performed continuously when the decimal point is not displayed, all decimal points turn on and the calculation stops.

2. SUBTRACTION

Ex. 2 – 1 $358.8 - 1241.6 - 27.5$



Steps:

	operation	display
1	358.8	358.8
2		358.8
3	1241.6	1241.6
4		882.8—
5	27.5	27.5—
6		910.3—

3. MULTIPLICATION







Ex. 3 – 1 1.1×2.2

Steps:

	operation	display
1	1.1	1.1
2		1.1
3	2.2	2.2
4		2.42

Ex. 3 – 2 $2.2 \times 3.3 \times 4.4 \times 5.5$

Steps:

	operation	display
1	2.2	2.2
2		2.2
3	3.3	3.3
4		7.26
5		7.26
6	4.4	4.4
7		31.944
8		31.944
9	5.5	5.5
10		175.6920

Ex. 3 – 3 824005.1 x 930047.2




Steps:

	operation	display	note
1	824005.1	824005.1	
2	$\boxed{\times \div}$	824005.1	
3	930047.2	930047.2	
4	$\boxed{+ =}$	76636363 $\boxed{6040.72}$	← invisible part
5	$\boxed{\times \div}$	76636363 $\boxed{6040.72}$	decimal point call back
6	.0000001	0.0000001	
7	$\boxed{+ =}$	76636.363 $\boxed{0000.}$	correct number of digit (12)

- NOTE: 1) When the result of calculation exceeds 8 digits, only the upper 8 digits are displayed. (step 4)
- 2) In the above case, the decimal point call back system indicates the number of digits in answer.
- 3) In the above example, by multiplying 76636363 by 0.0000001 (step 6), the decimal point is called back as 76636.363 (step 7). This indicates that the decimal point is at the fourth digit from the last figure (step 4).
- 4) Thus, by this operation, the correct integer digits of product are known in the above example . . . 12 digits.





Ex. 3 – 4 $(-4) \times 5$

Steps:

	operation	display	note
1		—	minus sign indicator on
2	4	4.—	
3		4.—	minus sign indicator off
4	5	5.—	
5		20.—	

Ex. 3 – 5 $(-4) \times (-5)$



Steps:

	operation	display	note
1		—	minus sign indicator on
2	4	4.—	
3		4.—	minus sign indicator off
4		4.	
5	5	5.	
6		20.	

4. DIVISION







Ex. 4 – 1 $264 \div 12$

Steps:

	operation	display
1	264	264.
2		264.
3	12	12.
4		22.000000




Ex. 4 – 2 $256 \div 12 \div 0.56 \div 2.3$

Steps:

	operation	display	note
1	256	256.	
2		256.	
3	12	12.	
4		21.333333	The 7th decimal place is discarded.
5		21.333333	
6	.56	.56	
7		38.095237	The 7th decimal place is discarded.
8		38.095237	
9	2.3	2.3	
10		16.563146	The 7th decimal place is discarded.

Ex. 4 – 3 $(-264) \div 12$









Steps:

	operation	display	note
1		—	minus sign indicator on
2	264	264.—	
3		264.—	
4	12	12.—	
5		22.000000—	

5. MIXED CALCULATION

Ex 5.
$$\frac{(5 + 12) \times 0.2 + 48 - 16}{4}$$

Steps:

	operation	display
1	5	5.
2		5.
3	12	12.
4		17.
5		17.
6	.2	.2
7		3.4
8	48	48.
9		51.4
10	16	16.
11		35.4
12		35.4
13	4	4.
14		8.8500000

6. CORRECTING MISTAKES

Ex. 6 3×5 (mistake) 4 (correct)

Steps: └──────────────────┘





	operation	display	note
1	3	3.	
2	$\times \div$	3.	
3	5	5.	(mistake)
4	C	3.	}
5	$\times \div$	3.	
6	4	4.	
7	$+=$	12.	(correct)

7. OVERFLOW ERROR

1) Addition

Ex. 7 – 1 $23456789 + 98765437 + 24689$







Steps:

	operation	display	note
1	23456789	23456789.	
2		23456789.	
3	98765437	98765437.	
4		12222222 	← invisible part
5	24689	24689.	
6		00000000	

2) Multiplication

Ex. 7 – 2 $642895 \times 56782 \times 425566$





Steps:

	operation	display	note
1	642895	642895.	
2		642895.	
3	56782	56782.	
4		36504863 	← invisible part
5		36504863 	
6	425566	425566.	
7		00000000	

3) Division

Ex. 7 – 3 $89898989 \div 0.0000012 \div 0.0000023$

Steps:

	operation	display	note
1	89898989	89898989.	
2		89898989.	
3	.0000012	0.0000012	
4		74915824 166666.	← invisible part
5		74915824 166666.	
6	.0000023	0.0000023	
7		00000000	

NOTE: As seen in examples 7 – 2, 7 – 3, if the whole number exceeds 16 digits, all decimal points turn on and the calculation stops.



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