Scientific Calculator

Model: EL-510RT

Operation Manual

Introduction
Thank you for purchasing the SHARP Scientific Calculator Model EL-510RT. After reading this manual, store it in a convenient location for future reference.

Note:
- On the sheet with calculator examples is used English notation (with a decimal point).
- This product uses a period as a decimal point.

Operational Notes
- Do not carry the calculator around in your back pocket, as it may break when you sit down. The display is made of glass and is particularly fragile.
- Keep the calculator away from extreme heat such as near a heating radiator or a hot bath since it contains hygroscopic electrolytic capacitors.
- Since this product is not water resistant, do not take it or store it where fluids, for example water, can splash on it. Raindrops, water spray, juice, coffee, steam, perspiration, etc., will also damage the product. Clean with a soft, dry cloth. Do not use solvents or a wet cloth.
- Do not drop or apply excessive force.
- Never dispose of batteries in a fire.
- Keep batteries out of the reach of children.
- For the safety of your health, try not to use this product for long periods of time. If you experience any pain or fatigue while using the product, discontinue use immediately.
- If the display is rear-projected, the lens is replaceable. Consult your SHARP dealer.
- This product, including accessories, may change due to upgrading without prior notice.

SHARP strongly recommends that separate permanent written records be kept of important data. Data may be lost or altered in virtual any electronic memory product under certain circumstances. Therefore, SHARP assumes no responsibility for data lost or otherwise rendered unusable whether as result of improper input, use, defects, battery replacement, use after the specified battery life has expired, or any other cause.

- SHARP will not be liable nor responsible for any incidental or consequential eco-
  nomic losses, or for personal injuries or property damage caused by misuse and/or
  malfunctions of this product and its accessories. It is your responsibility to take necessary
  steps to avoid any potential or actual dangers in using this kind of product.

- Operate correctly as indicated in the instruction manual.

Hard Case

Display

Model: EL-510RT

FUNCTIONS

1. Scientific Calculator

2. Fraction Calculations

3. Time, Decimal and Sexagesimal Calculations

4. Coordinate Conversions

5. STATISTICAL CALCULATIONS

6. Timer

7. Battery Replacement

8. Reset Switch

9. Type of Display

10. Key Notation Used in this Manual

11. Coordinate Conversions

12. Calculation Error

13. Battery Replacement

14. Notes on Error Memory

15. When to Replace the Batteries

16. Coordinate Conversions

17. Calculation Error

18. Battery Replacement

19. Notes on Error Memory

20. When to Replace the Batteries

10. Key Notation Used In this Manual

- Normal mode (NORMAL): (default)

- To enter a number or function, press the corresponding key.

- To use a function key, press the corresponding key.

- To use a memory key, press the corresponding key.

- To use a statistical function, press the corresponding key.

- To use a coordinate conversion function, press the corresponding key.

- To use an arithmetic operation, press the corresponding key.

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Cautions
• An exhausted battery left in the calculator may leak and damage the calculator.
• Fluid from a leaking battery accidentally entering an eye could result in serious injury. Should this occur, wash with clean water and immediately consult a doctor.
• Should fluid from a leaking battery come in contact with your skin or clothes, immediately wash with clean water.
• If the product is not to be used for some time, to avoid damage to the unit from leaking batteries, remove them and store in a safe place.
• Do not leave exhausted batteries inside the product.
• Keep batteries out of the reach of children.
• Explosion risk may be caused by incorrect handling.
• Do not throw batteries into a fire as they may explode.

Replacement Procedure
1. Turn the power off by pressing [OFF].
2. Remove the screws. (Fig. 1)
3. Lift the battery cover to remove.
4. Remove the used battery by prying it out with a ball-point pen or other similar pointed device. (Fig. 2)
5. Install a new battery. Make sure the + side is facing up.
6. Replace the cover and screws.
7. Press the RESET switch with the tip of a ball-point pen or similar object.

Automatic Power Off Function
This calculator will turn itself off to save battery power if no key is pressed for approximately 10 minutes.

SPECIFICATIONS
Calculations: Scientific calculations, statistical calculations, etc.
Internal calculations: Mantissas of up to 14 digits
Pending operations: 24 calculations, 10 numeric values
(Mantissa, 10-digit display, 9 memory variables in STAT mode)
Power source: Built-in solar cells
1.5V (DC) Alkaline battery (LR44 or equivalent) × 1
Operating time: Approx. 3,000 hours when continuously displaying 55555 at 25°C (77°F) (varies according to use and other factors)
Operating temperature: 0°C – 40°C (32°F – 104°F)
Dimensions: 76 mm × 135 mm × 10 mm
Weight: Approx. 66 g (with batteries)
Accessories: Battery × 1 (installed), operation manual and hard case

FOR MORE INFORMATION ABOUT SHARP CALCULATORS VISIT:
http://www.sharp-calculators.com

CALCULATION EXAMPLES

1. \[45 \times 285.3 = 12,980.85\]
2. \[2^{a+b} = 32\]
3. \[\log_{10} (1000) = 3\]
4. \[\sin^{-1} (0.5) = 30^\circ\]
5. \[\frac{\text{H} \times \text{C}}{\text{L}} = 200\]

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\[ y^n \begin{align*} &\text{if } y > 0: \quad -10^m < x < 10^m \\
&\text{if } y = 0: \quad 0 < x < 10^m \\
&\text{if } y < 0: \quad x = \min \{0 \mid |x| \leq \frac{1}{2} \cdot 2^{n-1}, x \neq 0\}, \\
&\quad -10^m < x \log |y| < 10^m \end{align*} \]

\[ x^n \begin{align*} &\text{if } x > 0: \quad -10^m < -\frac{1}{2} \log |y| < 10^m (x \neq 0) \\
&\text{if } x = 0: \quad 0 < x < 10^m \\
&\text{if } x < 0: \quad x = 2^{n-1} \\
&\quad (0 \mid |x| \leq \frac{1}{2} \cdot 2^{n-1}, x \neq 0), \\
&\quad -10^m < \frac{1}{2} \log |y| < 10^m \end{align*} \]

\[ e^x \begin{align*} &\text{if } x > 0: \quad -10^m < x < 230.2585092 \\
&\text{if } x < 0: \quad -10^m < x < 100 \end{align*} \]

\[ \sin x, \cos x, \tan x \begin{align*} &\text{if } x \leq 230.2585092 \\
&\text{if } x < 10^m \end{align*} \]

\[ \cosh^{-1} x \begin{align*} &\text{if } 1 < x < 10^m \end{align*} \]

\[ \tanh^{-1} x \begin{align*} &\text{if } |x| < 1 \end{align*} \]

\[ a^x \begin{align*} &\text{if } x < 10^m \end{align*} \]

\[ a^x \begin{align*} &\text{if } x < 10^m \\
&\quad |x| < 1.564434669 \times 10^m \end{align*} \]

\[ \psi_i \begin{align*} &\text{if } 0 < i < 10^m \end{align*} \]

\[ x^y \begin{align*} &\text{if } x < 10^m \end{align*} \]

\[ x^n \begin{align*} &\text{if } x < 10^m \\
&\quad |x| < 10^n (x = 0) \end{align*} \]

\[ n! \begin{align*} &\text{if } 0 < n < 69 \end{align*} \]

\[ \frac{s}{r^2} \begin{align*} &\text{if } 0 < s < 10^m \\
&\quad 0 < r < 10^m \end{align*} \]

\[ \frac{x}{r} \begin{align*} &\text{if } 0 < x < 10^m \\
&\quad 0 < r < 10^m \end{align*} \]

\[ \left\langle r, \theta, \phi \right\rangle \begin{align*} &\text{if } 0 < r < 10^m \end{align*} \]

\[ \text{DRG} \begin{align*} &\text{if } 0 < \theta < 10^m \\
&\text{RAD} : \quad |\theta| < \frac{\pi}{2} \times 10^m \\
&\text{GRAD} : \quad |\theta| < \frac{180}{\pi} \times 10^m \end{align*} \]

\[ \text{DEG} \rightarrow \text{RAD} \\
\text{GRAD} \rightarrow \text{DEG} : \quad |x| < 10^m \]

\[ \text{RAD} \rightarrow \text{GRAD} : \quad |x| < \frac{\pi}{2} \times 10^m \]

\[ \text{SMDC, D, CM} \begin{align*} &\text{if } 0 < n < 10^m \end{align*} \]

\[ * n, r, \theta, \phi \text{ integer} \]