Thank you for purchasing the SHARP Scientific Calculator Model EL-W531TG/TH. After reading this manual, store it in a convenient location for future reference.

Notes:
- On the sheet with calculation examples is used English notation (with a decimal point).
- This product uses a decimal point 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 on a car dashboard or near a heater, and avoid exposing it to excessively humid or dusty environments. Since the product is not waterproof, do not use it or store it where fluids, for example water, can splash onto it. Raindrops, water spray, juice, coffee, steam, perspiration, etc., also will cause malfunction.
- Clean with a soft, dry cloth. Do not use solvents or a wet cloth.
- Do not drop or apply excessive forces.
- Never dispose of batteries in a fire.
- Keep batteries out of the reach of children.
- For the sake of your health, try not to use this product for long periods of time. If you need to use the product for an extended period, be sure to allow your eyes, hands, arms, and body adequate rest periods (about 10~15 minutes every hour).
- If you experience any pain or fatigue while using the product, discontinue use immediately. If the discomfort continues, please consult a doctor.

This product, including accessories, may change due to upgrading without prior notice.

NOTE
- SHARP strongly recommends that an expert permanent records be kept of all important data. Data may be lost or altered in virtually any electronic memory product under certain circumstances. Therefore, SHARP assumes no responsibility for data lost or otherwise rendered unusable whether as a result of improper use, repairs, defects, battery replacement, use after the specified battery life has expired, or on any other cause. SHARP will not be liable for any accidental or consequential economic or property damage caused by misuse and/or maltreatment of this product and its peripherals, unless such liability is acknowledged by law.

Press the RES/RESET switch (the button, with the tip of a ball-point pen or similar object, in the key assembly) only in the following cases:
- When using for the first time
- After replacing the battery
- To clear all memory contents
- When an abnormal condition occurs and all keys are inoperative.

In case of use with a portable or laptop, Note that pressing the RES/RESET switch erases all data stored in memory.

If service should be required on this calculator, use only a SHARP servicing dealer, SHARP service facility, or SHARP repair service where available.

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6. Press [*] if the answer is correct, [X] appears and the next question is displayed.
   - If the answer is wrong, [X] appears and the same question is displayed.
   - This will be counted as an incorrect answer.
   - If you press [C] without entering an answer, the correct answer is displayed and
     then the next question is displayed. This will be counted as an incorrect answer.
   - Continue answering the series of questions by entering the answer and pressing [X]
8. After finishing, press [AC] and the number and percentage of correct answers are
displayed.
9. Press [RCL] to return to the initial screen for your current drill.

RANGES OF MATH DRILL QUESTIONS

The ranges of questions for each operator type is as follows:

- Addition operator
  - 0 0 20 20
- Subtraction operator
  - 0 0 20 20
- Multiplication operator
  - 1 0 11 12
- Division operator
  - 0 0 144 12
- Mixed operators
  - Questions in all the above ranges are displayed

ERROR AND CALCULATION RANGES

Errors

An error occurs if an operation exceeds the calculation ranges, or if a mathematically
illegal operation is attempted. When an error occurs, pressing (DEL) or (AC) automatically
resumes the cursor in the place in the equation where the error occurred. Edit the equation or press (C) to clear the equation.

Error Codes and Error Types

ERROR 01: Syntax error
- An attempt was made to perform an invalid operation.
Example: Press (4) (8) (2) (4) (C) (2) (0) (C)

ERROR 02: Calculation error
- The absolute value of an intermediate or final calculation result equals or exceeds 10^10.
- An attempt was made to divide by zero (or an intermediate calculation resulted in zero).
- The calculation ranges were exceeded while performing calculations.
- For a negative number was entered as a step value in TABLE mode. The absolute value of a starting value or a step value equals or exceeds 10^10 in TABLE mode.
- When the number to be factored into primes is greater than 2 and other than a 10-digit positive integer, or when the result of prime factorization is a negative number, decimal, fraction, or it.

ERROR 03: Negative error
- The available number of buffers was exceeded. (There are 10 buffers for numeric values and 64 buffers for calculation instructions).

ERROR 04: Data overrun error
- Data items exceeded 100 in STAT mode.

Alert Messages

Cannot divide
- The selected item cannot be divided by zero (or an intermediate calculation resulted in zero).

Example: Press (4) (8) (2) (4) (C) (2) (0) (C)
In this example, delete the exponent before attempting to delete the parenthesis.

Cannot call
- The function or operation stored in definable memory (D1 – D3) cannot be called.
Ex: An attempt was made to recall a statistical variable from within NORMAL mode.

Buffer full
- The equation (including any calculation ending instructions) exceeded its maximum input buffer.

Ex. An attempt was made to recall a statistical variable from within NORMAL mode.

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

SPECIFICATIONS

Display:
- 96 x 32 dot matrix liquid crystal display
- Display of calculation results:
  - Mantissa: 10 digits
  - Exponent: ± 10^10
  - mantissa: 10 digits
  - Exponent: ± 10^10

Internal calculations:
- Mantissa: up to 14 digits
- Exponent: up to 20 digits

Pending operations:
- 64 calculations 10 numeric values
- Power source:
  - EL-W531TG: Built-in solar cells
  - EL-W531TH: 1.5V (DC) Alkaline battery (LR44 or equivalent) x 1
  - EL-W531TH: 1.5V (DC) Heavy-duty manganese battery x 1

Operating time:
- EL-W531TG: Approx. 3,000 hours when continuously displaying 55555 at 25°C (77°F)
- EL-W531TH: Approx. 17,000 hours when continuously displaying 55555 at 55°C (131°F)

Operating temperature:
- 0°C – 40°C (32°F – 104°F)

Dimensions:
- 80 mm (H) x 166 mm (W) x 15 mm (D)

Weight:
- EL-W531TG: Approx. 110 g (with batteries)
- EL-W531TH: Approx. 115 g (with batteries)

Accessories:
- Battery x 1 (installed), operation manual and hard case

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

[Image: Diagram showing battery placement and replacement process]

BATTERY REPLACEMENT

Notes on Battery Replacement

Improper handling of batteries can cause electrolyte leakage or explosion. Be sure to observe the following handling rules:

- Make sure the new battery is the correct type.
- When replacing, orient the battery properly as indicated in the calculator.
- The battery is factory-installed before shipment, and may be exhausted before it reaches the service life stated in the specifications.

Notes on erasure of memory contents

When the battery is replaced, the memory contents are erased. Erasure can also occur if the calculator is defective or when it is repaired. Make a note of all important memory contents in case accidental erasure occurs.

When to Replace the Battery

EL-W531TG: If the display has poor contrast or nothing appears on the display when [S<] is pressed in dim lighting, even after adjusting the display contrast, it is time to replace the battery.
EL-W531TH: If the display has poor contrast even after adjusting the display contrast, the battery requires replacement.
### Dynamic Range

#### Attention:
Your product is marked with this symbol. It means that used electrical and electronic products should not be mixed with general household waste. There is a separate collection system for these products.

**Information on the Disposal of this Equipment and its Batteries**

1. **In the European Union**
   - **Attention:** If you want to dispose of this equipment, please do not use the ordinary dust bin!
   - Used electrical and electronic equipment must be treated separately and in accordance with legislation that requires proper treatment, recovery and recycling of used electrical and electronic equipment. Following the implementation by member states, private households within the EU states may return their used electrical and electronic equipment to designated collection facilities free of charge.* In some countries*, your local retailer may also take back your old product free of charge if you purchase a similar new one.
   - *) Please contact your local authority for further details.
   - If your used electrical or electronic equipment has batteries or accumulators, please dispose of these separately beforehand according to local requirements.
   - By disposing of this product correctly you will help ensure that the waste undergoes the necessary treatment, recovery and recycling and thus prevent potential negative effects on the environment and human health which could otherwise arise due to inappropriate waste handling.

2. **In other Countries outside the EU**
   - If you wish to discard this product, please contact your local authorities and ask for the correct method of disposal.

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**Function**

<table>
<thead>
<tr>
<th>Function</th>
<th>Dynamic range</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\sin x$, $\cos x$, $\tan x$</td>
<td>$-10^{10} &lt; x &lt; 10^{10}$</td>
</tr>
<tr>
<td>$\arcsin x$, $\arccos x$, $\arctan x$</td>
<td>$-1 &lt; x &lt; 1$</td>
</tr>
<tr>
<td>$x^2$</td>
<td>$-10^{10} &lt; x &lt; 10^{10}$</td>
</tr>
<tr>
<td>$x^3$</td>
<td>$-10^{10} &lt; x &lt; 10^{10}$</td>
</tr>
<tr>
<td>$x^4$</td>
<td>$-10^{10} &lt; x &lt; 10^{10}$</td>
</tr>
<tr>
<td>$\sqrt{x}$</td>
<td>$0 &lt; x &lt; 10^{10}$</td>
</tr>
<tr>
<td>$\sqrt[3]{x}$</td>
<td>$0 &lt; x &lt; 10^{10}$</td>
</tr>
<tr>
<td>$\sqrt[4]{x}$</td>
<td>$0 &lt; x &lt; 10^{10}$</td>
</tr>
</tbody>
</table>

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**Attention:**
If you want to dispose of this equipment, please do not use the ordinary dust bin!

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**Manufactured by:**
SHARP CORPORATION
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