Clearing the Entry and Memories

Operation     Entry (display)        A – F, X, Y     ANS?     STAT?
MEM         RESET

- Clear    - Retain
1 Independent memory
2 Temporary memory A – F, X, Y, and Y
3 Last answer memory
4 Statistical data entry for X data
5 V, t, r, n, C, S, r, v, R, s, y, n, a, r, c
6 All variables are cleared. See About the Memory clear key for details.

- This key combined with the [RESET] switch has the same effect as the RESET switch.
- See About the Memory clear key for details.

Memory clear key
Press [MEM] to display the menu.
- To clear all variables (A – F, X, Y, ANS, STAT, VAR), press [MEM] and select [1].
- To clear the calculator, press [MEM] and select [2].

The [MEM] operation will clear all data stored in memory, and restore the calculator’s default setting.

Entering and Correcting the Equation

Cursor keys
- Press [a] or [b] to move the cursor. You can also return to the equation after getting an answer by pressing [c]. See the next section for the using the ’a’ and ’b’ keys.
- In the SET UP menu and other locations, use the ’a’ or ’b’ key to move the flashing cursor. Press [c] if you need to scroll up/down the view, use the ’c’ key.

Insert mode and Overwrite mode in the Equation display
- Pressing [d] switches between the two setting modes: insert mode (default) and overwrite mode. A triangular cursor indicates that an entry will be inserted at the cursor, while the rectangular cursor indicates to overwrite preexisting data as you make entries.
- To insert a new insert in the insert mode, move the cursor to the position immediately after where you wish to insert, then make a desired entry. In the overwrite mode, data under the cursor will be overwritten by the number you enter.
- The mode set will be retained until the next reset operation.

Delete key
- To delete a number/move, move the cursor to the number/movement you wish to delete, then press [e]. If the cursor is located at the right end of an equation, the ’d’ key will function as a back space key.

Multiline Display Function
This calculator is equipped with a function to recall previous equations in the normal mode.
Equations also include calculation editing instructions such as ’x’ and a maximum of 142 characters can be stored in memory. When the full, stored equations are deleted in the order of the oldest first. Pressing [a] will display the previous equation and the answer. Further pressing [a] will display previous equations (after returning to the previous equation, press [a] to view equations in order).
In addition, [b] can be used to jump to the oldest equation.

- To edit an equation after returning it, press [c].
- To display the equation, press [d] immediately after obtaining a calculation answer.

The multi-line memory is cleared by the following operations: [MEM], [MEM] (including the Automatic Power Off feature), mode change, memory clear ([MEM], [MEM], [MEM], [MEM], [MEM], [MEM], [MEM], [MEM], [MEM], [MEM]), memory calculation, chain calculation, angle unit change, coordinate conversion, angle inverse conversion, numerical value storage to the temporary memories and independent memory, and input/output of calculation data.

Priority Levels in Calculations
This calculator performs operations according to the following priority:

1. Fractions ([A], [B]) Functions preceded by their argument (x, y, r, φ, etc.)
2. ’x’ and a maximum of 142 characters can be stored in memory. When the full, stored equations are deleted in the order of the oldest first. Pressing [a] will display the previous equation and the answer. Further pressing [a] will display previous equations (after returning to the previous equation, press [a] to view equations in order).
In addition, [b] can be used to jump to the oldest equation.

- To edit an equation after returning it, press [c].
- To display the equation, press [d] immediately after obtaining a calculation answer.

The multi-line memory is cleared by the following operations: [MEM], [MEM] (including the Automatic Power Off feature), mode change, memory clear ([MEM], [MEM], [MEM], [MEM], [MEM], [MEM], [MEM], [MEM], [MEM], [MEM]), memory calculation, chain calculation, angle unit change, coordinate conversion, angle inverse conversion, numerical value storage to the temporary memories and independent memory, and input/output of calculation data.

INITIAL SETUP:
Mode Selection
Normal mode (NORMAL) (default)
Used to perform arithmetic operations and function calculations. If parentheses are used, parentheses will be closed in the same order.

- In the constants calculations, constants will be displayed as K.
- In the case of utilizing postfix functions (or), the multiplication symbol will be specified.
- Random function ....................... Y memory
- Random number ....................... X memory (or y memory)

Sequential mode (SOLV, SOLV) (default)
Used to perform statistical calculations. When executing mode selection, temporary memories, statistical variables, statistical data and last answer memory will be cleared even when resetting the mode.

HOME key
Pressing [MEM] on RETURN returns to normal mode from other modes.

- Note: Equations and values currently being entered will disappear, in the same way as when the mode is changed.

SET UP menu
- Press [e] to display the SET UP menu.
- A menu item can be selected by:
  - moving the flashing cursor by using the ’a’ and ’b’ keys, then pressing the [SET UP] or [X] key, or
  - pressing the number key corresponding to the menu item number.

- The [SET UP] menu is displayed on the screen, press [e] to preview the next menu screen.
- Press [c] to exit the SET UP menu.

Selecting the Display Notation and Decimal Places

Four display notations are used to display calculation results: Floating point, Fixed decimal point, Scientific notation, and Engineering notation.

- When the FIX, SC, or ENG indication is displayed, the number of decimal places (TAB) can be set to any value between 0 and 9. Displayed values will be reduced to the corresponding number of digits.
- If a floating point display does not fit in the specified range, the calculator will display the result using the scientific (exponential) notation system. See Setting the Floating Point Numbers System in Scientific Notation for details.

- Press [c] to exit the SET UP menu.
Conversions can be performed between the following bases:

- Four basic arithmetic operations and memory calculations can be performed using the sexagesimal system.

- Calculation results are internally obtained in scientific notation with up to 14 digits for the mantissa. However, since calculation results are displayed in the form designated, the internal calculation result may differ from that shown in the display. 

- The internal value is converted to match that of the display, so that the displayed value can be used without change in subsequent operations.

**Statistical Calculations**

- Press [MODE] to select the statistical mode. The seven statistical calculations listed below can be performed. After selecting the statistical mode, select the desired sub-mode by pressing the number key corresponding to your choice.

- To change statistical sub-mode, press [MODE] and then select the desired sub-mode.

  - (SD)  Single-variable statistics
  - (QUAD) Quadratic regression calculation
  - (EXP) Exponential regression calculation
  - (LOG) Logarithmic regression calculation
  - (PWR) Power regression calculation

- The following statistical functions are available:

  - Calculation of the mean, sample standard deviation, and population standard deviation.
  - Calculation of the coefficient of determination and inverse regression calculation.
  - Calculation of the correlation coefficient and linear regression calculation.
  - Calculation of the coefficient of determination and quadratic regression calculation.

**Coefficient of Determination**

- The coefficient of determination, denoted by $r^2$, is calculated as follows:

$$ r^2 = \frac{SS_{reg}}{SS_{tot}} $$

where $SS_{reg}$ is the sum of squares of the regression and $SS_{tot}$ is the total sum of squares.

**Error and Calculation Ranges**

- Errors are possible when an operation exceeds the calculation range or if a mathematically illegal operation is attempted. When an error occurs, pressing [M+ or [M-] automatically moves the cursor back to the place in the equation where the error occurred. Edit the equation and press [M+] or [M-] to clear the equation.

**Calculation Ranges**

- The following ranges specified, this calculator is accurate to ±1 of the least significant digit of the mantissa. However, a calculation error increases in continuous calculations due to accumulation of each calculation error. (This is the same for $r^2$ etc.)

**Battery Replacement**

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

- Make sure the battery is in the correct type.

- When installing, 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.

**Battery Life**

- Approx. 17 000 hours when continuously displaying 55556 at 29°C (79°F).

**Specifications**

- Calculations: Scientific calculations, statistical calculations, etc.

- Internal calculations: Mantissas of up to 14 digits

- Pending operations: 24 calculations, 10 numerical values (3 numeric values in STAT mode)

- Number keys:

  - [EL-531TG] Built-in solar cells
  - 56 solar cells

- Operating temperature:

  - [EL-531TG]: Approx. 5 000 hours when continuously displaying 55556 at 29°C (79°F)

- Operating temperature:

  - [EL-531TG]: 0°C ~ 40°C (32°F ~ 104°F)

- Dimensions:

  - 80 mm x 181 mm x 15 mm

- Weight:

  - [EL-531TG]: 145 g (with batteries)

- Accessories:

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

**For More Information About Sharp Calculators:**

- http://www.sharp-calculators.com
[CALCULATION EXAMPLES]

[1] \( \begin{align*}
\text{C3155}\rightarrow \text{C3155} & \rightarrow \text{C3155} \\
\text{C3355}\rightarrow \text{C3155} & \rightarrow \text{C3155} \\
\text{C3355}\rightarrow \text{C3155} & \rightarrow \text{C3155} \\
\end{align*} \)

[2] \( \begin{align*}
\text{X} & \rightarrow \text{X} & \rightarrow \text{X} & \rightarrow \text{X} & \rightarrow \text{X} \\
\text{X} & \rightarrow \text{X} & \rightarrow \text{X} & \rightarrow \text{X} & \rightarrow \text{X} \\
\end{align*} \)

[3] \( \begin{align*}
\text{X} & \rightarrow \text{X} & \rightarrow \text{X} & \rightarrow \text{X} & \rightarrow \text{X} \\
\text{X} & \rightarrow \text{X} & \rightarrow \text{X} & \rightarrow \text{X} & \rightarrow \text{X} \\
\end{align*} \)

[4] \( \begin{align*}
\text{X} & \rightarrow \text{X} & \rightarrow \text{X} & \rightarrow \text{X} & \rightarrow \text{X} \\
\text{X} & \rightarrow \text{X} & \rightarrow \text{X} & \rightarrow \text{X} & \rightarrow \text{X} \\
\end{align*} \)

[5] \( \begin{align*}
\text{X} & \rightarrow \text{X} & \rightarrow \text{X} & \rightarrow \text{X} & \rightarrow \text{X} \\
\text{X} & \rightarrow \text{X} & \rightarrow \text{X} & \rightarrow \text{X} & \rightarrow \text{X} \\
\end{align*} \)

[6] \( \begin{align*}
\text{X} & \rightarrow \text{X} & \rightarrow \text{X} & \rightarrow \text{X} & \rightarrow \text{X} \\
\text{X} & \rightarrow \text{X} & \rightarrow \text{X} & \rightarrow \text{X} & \rightarrow \text{X} \\
\end{align*} \)

[7] \( \begin{align*}
\text{X} & \rightarrow \text{X} & \rightarrow \text{X} & \rightarrow \text{X} & \rightarrow \text{X} \\
\text{X} & \rightarrow \text{X} & \rightarrow \text{X} & \rightarrow \text{X} & \rightarrow \text{X} \\
\end{align*} \)

[8] \( \begin{align*}
\text{X} & \rightarrow \text{X} & \rightarrow \text{X} & \rightarrow \text{X} & \rightarrow \text{X} \\
\text{X} & \rightarrow \text{X} & \rightarrow \text{X} & \rightarrow \text{X} & \rightarrow \text{X} \\
\end{align*} \)

[9] \( \begin{align*}
\text{X} & \rightarrow \text{X} & \rightarrow \text{X} & \rightarrow \text{X} & \rightarrow \text{X} \\
\text{X} & \rightarrow \text{X} & \rightarrow \text{X} & \rightarrow \text{X} & \rightarrow \text{X} \\
\end{align*} \)

The range of the results of inverse trigonometric functions:

- DEG 0 ≤ x ≤ 90
- CHORD 0 ≤ x ≤ 100
- Radian 0 ≤ x ≤ 100
**Dynamic range**

- For `x`: $10^m$ to $10^n$
- For `y`: $10^m$ to $10^n$

### Function Values

- **x**: $\sin x$, $\cos x$
- **y**: $\tan x$, $\cot x$
- **z**: $\sec x$, $\csc x$
- **m**: $\sinh x$, $\cosh x$
- **n**: $\tanh x$, $\coth x$

### 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.

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

---

**Manufactured by:**
SHARP CORPORATION
1 Takumi-cho, Sakai-ku, Sakai City, Osaka 590-8522, Japan

For EU only:
- SHARP CORPORATION
- 1 Takumi-cho, Sakai-ku, Sakai City, Osaka 590-8522, Japan

**For UK only:**
- SHARP CORPORATION
- 1 Takumi-cho, Sakai-ku, Sakai City, Osaka 590-8522, Japan