Appendix

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Appendix A Resetting the Calculator



Warning!

The procedure described here clears all memory contents. Never perform this operation unless you want to totally clear the memory of the calculator. If you need the data currently stored in memory, be sure to write it down somewhere before performing the RESET operation.

To reset the calculator

1. Press MENU to display the main menu.



2. Highlight the **MEM** icon and press **EXE**, or press **8**.



3. Use to move the highlighting down to "Reset" and then press EE.



 Press F1 (YES) to reset the calculator or F4 (NO) to abort the operation without resetting anything.



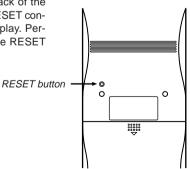
• If the display appears to dark or dim after you reset the calculator, adjust contrast.

Resetting the calculator initializes it to the following settings.

Item	Initial Setting	
Icon	RUN	
Angle Unit	Rad	
Exponent Display Range	Norm 1	
Fraction Reduction	Automatic	
Mixed Fraction	Display	
Graph Type	Rectangular coordinate (Y=)	
Statistical Graph	Automatic	
Variable Memory	Clear	
Answer Memory (Ans)	Clear	
Graphic Display/Text Display	Clear	
View Window	Clear (initialized)	
View Window Memory	Clear	
Graph Function	Clear	
Enlargement/Reduction Factor	Clear (initialized)	
Table & Graph Data	Clear	
List Data	Clear	
Statistical Calculation/Graph Memory	Clear	
Program	Clear	
Input Buffer/AC Replay	Clear	



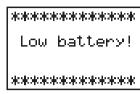
- Performing the RESET operation while an internal calculation is being performed will cause all data in memory to be deleted. Make sure that no calculation be being performed before starting a RESET operation.
- If the calculator stops operating correctly for some reason, use a thin, pointed object to press the RESET button on the back of the calculator. This should make the RESET confirmation screen appear on the display. Perform the procedure to complete the RESET operation.



Appendix B Power Supply

This unit is powered by two AAA-size (LR03 (AM4) or R03 (UM-4)) batteries. In addition, it uses a single CR2032 lithium battery as a back up power supply for the memory.

If the following message appears on the display, immediately stop using the calculator and replace batteries.



If you try to continue using the calculator, it will automatically switch power off, in order to protect memory contents. You will not be able to switch power back on until you replace batteries.

Be sure to replace the main batteries at least once every two years, no matter how much you use the calculator during that time.



Warning!

If you remove both the main power supply and the memory back up batteries at the same time, all memory contents will be erased. If you do remove both batteries, correctly reload them and then perform the reset operation.

The batteries that come installed in this unit when you purchase it are for factory test purposes, so they will probably not provide normal service life.

■ Replacing Batteries

Precautions:

Incorrectly using batteries can cause them to burst or leak, possibly damaging the interior of the unit. Note the following precautions:

- Be sure that the positive (+) and negative (–) poles of each battery are facing in the proper directions.
- Never mix batteries of different types.
- · Never mix old batteries and new ones.
- Never leave dead batteries in the battery compartment.
- Remove the batteries if you do not plan to use the unit for long periods.
- Never try to recharge the batteries supplied with the unit.
- Do not expose batteries to direct heat, let them become shorted, or try to take them apart.









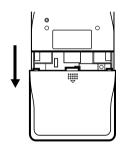
(Should a battery leak, clean out the battery compartment of the unit immediately, taking care to avoid letting the battery fluid come into direct contact with your skin.)

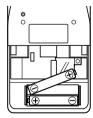
Keep batteries out of the reach of small children. If swallowed, consult with a physician immediately.

•To replace the main power supply batteries



- Never remove the main power supply and the memory back up batteries from the unit at the same time.
- Be sure to switch the unit off before replacing batteries. Replacing batteries with power on will cause data in memory to be deleted.
- * Never replace the main power supply battery compartment cover or switch the calculator on while the main power supply batteries are removed from the calculator or not loaded correctly. Doing so can cause memory data to be deleted and malfunction of the calculator. If mishandling of batteries causes such problems, correctly load batteries and then perform the RESET operation to resume normal operation.
- Be sure to replace all two batteries with new ones.
- 1. Press SHIFT OFF to turn the calculator off.
- 2. Push the battery compartment cover on the back of the calculator in the direction noted in the illustration and remove it.
- 3. Remove the two old batteries.
- 4. Load a new set of two batteries, making sure that their positive (+) and negative (-) ends are facing in the proper directions.
- 5. Replace the battery compartment cover and press (AC/ON) to turn power on. The memory backup battery provides power to the memory while the main batteries are removed, so memory data is not lost.
 - Power will not switch on if you press (AC/ON) while the main power supply battery compartment cover is open.
 - · Do not leave the unit without main power supply batteries loaded for long periods. Doing so can cause deletion of data stored in memory.







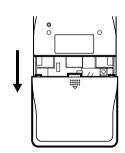
• If the figures on the display appear too light and hard to see after you turn on power, adjust the contrast.

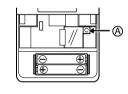


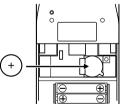
To replace the memory back up battery

- * Before replacing the memory back up battery, switch on the unit and check to see if the "Low battery!" message appears on the display. If it does, replace the main power supply batteries before replacing the back up power supply battery.
- * Never remove the main power supply and the memory back up batteries from the unit at the same time.
- * Be sure to switch the unit off before replacing batteries. Replacing batteries with power on will cause data in memory to be deleted.
- * Be sure to replace the back up power supply battery at least once 2 years, regardless of how much you use the unit during that time. Failure to do so can cause data in memory to be deleted.
- 1. Press SHIFT OFF to turn the calculator off.
- Push the battery compartment cover on the back of the calculator in the direction noted in the illustration and remove it.
- Remove screw

 on the back of the calculator, and remove the back up battery holder.
- 4. Remove the old battery.
- Wipe off the surfaces of a new battery with a soft, dry cloth. Load it into the calculator so that its positive (+) side is facing up.
- Pressing down on the battery with the battery holder, replace the screw that secures the holder in place.
- Replace the battery compartment cover and press to turn power on. The main battery provides power to the memory while the backup batteries are removed, so memory data is not lost.







About the Auto Power Off Function

The calculator switches power off automatically if you do not perform any key operation for about 6 minutes. To restore power, press

The calculator automatically turns off it is left for about 60 minutes with a calculation stopped by an output command (▲), which is indicated by the "–Disp–" message on the display.

Appendix C Error Message Table

Message	Meaning	Countermeasure
Syn ERROR	Calculation formula contains an error. Formula in a program contains an error.	 Use or to display the point where the error was generated and correct it. Use or to display the point where the error was generated and then correct the program.
Ma ERROR	Calculation result exceeds calculation range. Calculation is outside the input range of a function. Illogical operation (division by zero, etc.) Poor precision in differential calculation results.	①②③ Check the input numeric value and correct it. When using memories, check that the numeric values stored in memories are correct. ④ Try using a smaller value for Δx (x increment/decrement).
Go ERROR	 No corresponding Lbl n for Goto n. No program stored in program area Prog "file name". No corresponding "Next" for "For", no corresponding "LpWhile" for "Do", or no corresponding "WhileEnd" for "While". 	 Correctly input a Lbl n to correspond to the Goto n, or delete the Goto n if not required. Store a program in program area Prog "file name", or delete the Prog "file name" if not required. Correctly match "Next" with "For", "LpWhile" with "Do", or "WhileEnd" with "While".
Ne ERROR	Nesting of subroutines exceeds 10 levels.	Ensure that Prog "file name" is not used to return from subroutines to main routine. If used, delete any unnecessary Prog "file name". Trace the subroutine jump destinations and ensure that no jumps are made back to the original program area. Ensure that returns are made correctly.

Appendix

Message	Meaning	Countermeasure
Stk ERROR	Execution of calculations that exceed the capacity of the stack for numeric values or stack for commands.	Simplify the formulas to keep stacks within 10 levels for the numeric values and 26 levels for the commands. Divide the formula into two or more parts.
Mem ERROR	Not enough memory to hold function input in the Graph Mode for graph drawing. Not enough memory to hold function input in the TABLE Mode. Not enough memory to store data in list function.	(1)2(3) • Keep the number of variables you use for the operation within the number of variables currently available. • Simplify the data you are trying to store to keep it within the available memory capacity. • Delete no longer needed data to make room for the new data.
Arg ERROR	Incorrect argument specification for a command that requires an argument.	 Correct the argument. Fix n, Sci n : n = integer from 0 through 9. Lbl n, Goto n : n = integer from 0 through 9.
Dim ERROR	Illegal dimension used during list calculations.	Check list dimension.

Appendix D Input Ranges

Function	Input ranges	Internal digits	Accuracy	Notes
sinx cosx tanx	(DEG) $ x < 9 \times 10^{9}^{\circ}$ (RAD) $ x < 5 \times 10^{7} \pi \text{rad}$ (GRA) $ x < 1 \times 10^{10} \text{grad}$	15 digits	As a rule, accuracy is ±1 at the 10th digit.	However, for tanx: $ x \neq 90(2n+1)$:DEG $ x \neq \pi/2(2n+1)$:RAD $ x \neq 100(2n+1)$:GRA
sin ⁻¹ x cos ⁻¹ x	x ≤ 1	"	"	
tan-1x	$ x < 1 \times 10^{100}$			
log <i>x</i> In <i>x</i>	$1 \times 10^{-99} \le x < 1 \times 10^{100}$	"	"	
10 ^x	$-1 \times 10^{100} < x < 100$			
e^x	-1×10^{100} < $x \le 230.2585092$	"	п	
\sqrt{x}	$0 \le x < 1 \times 10^{100}$	"		
X ²	x <1 × 10 ⁵⁰			
1/ <i>x</i>	$ x < 1 \times 10^{100}, x \neq 0$. "	"	
$3\sqrt{X}$	$ x < 1 \times 10^{100}$			
x!	$0 \le x \le 69$ (x is an integer)	"	"	
nPr nCr	Result < 1 × 10 ¹⁰⁰ n, r (n and r are integers) $0 \le r \le n,$ $n < 1 \times 10^{10}$	п	п	
Pol (<i>x</i> , <i>y</i>)	$\sqrt{x^2 + y^2} < 1 \times 10^{100}$	"	"	
Rec (r,θ)	$ r < 1 \times 10^{100}$ (DEG) $ \theta < 9 \times 10^{90}$ (RAD) $ \theta < 5 \times 10^{7}\pi$ rad (GRA) $ \theta < 1 \times 10^{10}$ grad	11	п	However, for $\tan \theta$: $ \theta \neq 90(2n+1)$:DEG $ \theta \neq \pi/2(2n+1)$:RAD $ \theta \neq 100(2n+1)$:GRA

Function	Input ranges	Internal digits	Accuracy	Notes	
0,,,,	$ a , b, c < 1 \times 10^{100}$ $0 \le b, c$	15 digits	As a rule, accuracy is ±1 at the 10th digit.		
\(\lambda\)	$ x < 1 \times 10^{100}$ Sexagesimal display: $ x < 1 \times 10^7$			±1 at the	
^(x')		u	п		
$x\sqrt{y}$	$y > 0: x \neq 0$ $-1 \times 10^{100} < \frac{1}{x} \log y < 100$ $y = 0: x > 0$ $y < 0: x = 2n + 1, \frac{1}{n}$ $(n \neq 0, n \text{ is an integer})$ However; $-1 \times 10^{100} < \frac{1}{x} \log y < 100$	"	11		
a ^b /c	Total of integer, numerator and denominator must be within 10 digits (includes division marks).	11	II		
STAT	$ x < 1 \times 10^{50}$ $ y < 1 \times 10^{50}$ $ n < 1 \times 10^{100}$ $x\sigma_{n}, y\sigma_{n}, \overline{x}, \overline{y}, a, b, c, r:$ $n \neq 0$ $x\sigma_{n-1}, y\sigma_{n-1}: n \neq 0, 1$	"	"		

^{*} Errors may be cumulative with internal continuous calculations such as ^ (x^y), $^x\sqrt{y}$, x^t , $^3\sqrt{x}$, sometimes affecting accuracy.

Appendix E 2-byte Command Table

Spaces in the following commands are indicated by "\u00c1".

OPTN menu commands

d/dx(, Max(, Min(, Mean(, Median(, Seg(, Dim, Fill(, Sum, List

VARS menu commands

Y, Xt, Yt, Xmin, Xmax, Xscl, Ymin, Ymax, Yscl, Tmin, Tmax, Tptch, Xfct, Yfct, Q₁, Q₃, $x_1, y_1, x_2, y_2, x_3, y_3, F \sqcup Start, F \sqcup End, F \sqcup pitch, <math>c$

Commands available with the RGM key

If, Then, Else, IfEnd, For, To, Step, Next, While, WhileEnd, Do, LpWhile, Return, Break, Stop, ClrText, ClrGraph, ClrList, DrawGraph, DrawStat, DrawTG-Con, DrawTG-Plt, DispTable

Commands available with the F3 (MENU) key in the PRGM Mode

1-Variable, 2-Variable, LinearReg, Med-MedLine, QuadReg, LogReg, ExpReg, PowerReg, S-Gph1, S-Gph2, S-Gph3, Square, Cross, Dot, Scatter, *xy*Line, Hist, MedBox, N-Dist, Linear, Med-Med, Quad, Log, Exp, Power, Y=Type, ParamType, Y>Type, Y<Type, Y≤Type, Y≤Type, SortA(, SortD(, G□SelOn, G□SelOff, T□SelOn, T□SelOff, DrawOn, DrawOff, List1, List2, List3, List4, List5, List6

Commands available with the FRGM Mode

S-WindAuto, S-WindMan, G-Connect, G-Plot, VarRange, VarList1, VarList2, VarList3, VarList4, VarList5, VarList6

Commands available with the shell key

StoV-Win, RcIV-Win, Vertical, Horizontal

Appendix F Specifications

Model: fx-7400G

Calculations / Graph Function

Basic calculation functions:

Negative numbers; exponents; parenthetical addition, subtraction, multiplication, division (with priority sequence judgement function - true algebraic logic)

Built-in scientific functions:

Trigonometric/inverse trigonometric functions (angle units: degrees, radians, grads); logarithmic/exponential functions; reciprocals, factorials; square roots; cube roots; powers; roots; squares; negative signing; exponential notation input; π , parenthetical calculations; internal rounding; random numbers; angle unit specification; fractions; decimal-sexagesimal conversion; coordinate transformation; permutation; combination; number of decimal place and significant digit specification

Built-in functions:

Exponential notation range; delete, insert, answer functions; replay; memory status display (bytes used/unused); multistatements; output command input

Fraction Reduction: Automatic, Step-by-Step

Differentials:

Extraction of derivative using differential from center point

List calculations:

Data sorting (ascending, descending); maximum value; minimum value; average, median; sum; numeric sequence generation

Variables: 26

Calculation range:

Exponential display range: Norm 1: $10^{-2} > |x|, |x| \ge 10^{10}$

Norm 2: $10^{-9} > |x|, |x| \ge 10^{10}$

Rounding:

Performed according to the number of specified significant digits and decimal places.

Built-in function graphs (rectangular coordinate):

sin, cos, tan, sin⁻¹, cos⁻¹, tan⁻¹, log, ln, 10^x , e^x , x^2 , $\sqrt{}$, $3\sqrt{}$, x^{-1}

Graph Types:

Rectangular coordinate: y = f(x)

Parametric: (x, y) = (f(T), g(T))

Inequality: $(y > f(x), y < f(x), y \ge f(x), y \le f(x))$

Graph Function Memory:

Graph function storage, editing, selection, drawing

Graph Functions:

View Window parameter setting; trace; scroll; overwrite; list graph; zoom [box, factor (zoom in, zoom out, original size)]; sketch [plot; line; horizontal/vertical lining]; manual graphing; clear screen; View Window memory; graph function display; simultaneous drawing of multiple graphs

Table & Graph:

Input/editing of function (up to 10 can be input); numeric table generation; graph drawing; numeric table delete, insert, add

Statistics:

Standard deviation: number of data; mean; standard deviation (two types); sum; sum of squares; statistical calculations (mode, median, maximum, minimum, first quartile point, third quartile point); normal probability distribution; single-variable statistical graphs (histogram bar graph; box graph for median; normal distribution curve)

Regression: number of data; mean of x; mean of y; standard deviation of x (two types); standard deviation of y (two types); sum of x; sum of y; sum of squares of x; sum of squares of y; constant term; regression coefficient; correlation coefficient; Med-Med calculations; regression graphs (linear regression graph; Med-Med graph; quadratic regression graph; logarithmic regression graph; exponential regression graph; power regression graph)

Data Plot: Scatter/Plot; xy line graphing

Programming

Input, storage, recall, execution of programs in program area; editing and deletion of file names and program contents; recall by file name

Program commands:

Loop (If, For, Do, While); Control (Prog [subroutine], Stop, Return, Break); Unconditional jump (Goto, Lbl); Conditional jump (\Rightarrow); Count jump (Isz, Dsz); Relational operators (=, \neq , >, <, \geq , \leq); Clear (CIrText, CIrGraph, CIrList); Display (function graph, statistical graph, Table & Graph, numerical table); Input (?); Output (\triangleleft); Delimiter (:)

General Commands:

Function graph (8); function table (2); list (2); statistical (33), set-up commands (17)

Check Function: program check, debugging, etc.

Program capacity:

7 kbytes (max.)

General

Display system:

13-character × 6-line display; 10-digit mantissa and 9-digit mantissa and 2-digit exponent when using exponential format for calculations: displays sexagesimal, fraction values

Text display:

Function commands, program commands, alpha characters within remaining memory capacity

Frror check function:

Check for illegal calculations (using values greater than 10¹⁰⁰), illegal jumps, etc. Indicates by error message display.

Power supply:

Main: Two AAA-size batteries (LR03 (AM4) or R03 (UM-4))

Back-up: One CR2032 lithium battery

Power consumption: 0.05W

Battery life

Main:

LR03 (AM4): Approximately 2,000 hours (continuous display of main menu)

Approximately 2 years (power off)

R03 (UM-4): Approximately 1,000 hours (continuous display of main menu)

Approximately 2 years (power off)

Back-up: Approximately 2 years

Auto power off:

Power is automatically turned off approximately six minutes after last operation.

The calculator automatically turns off if it is left for about 60 minutes with a calculation stopped by an output command (▲), which is indicated by the "–Disp–" message on the display.

Ambient temperature range: 0°C to 40°C

Dimensions: 18.9 mm (H) \times 77 mm (W) \times 158 mm (D)

 $^{3}/_{4}$ " (H) \times 3" (W) \times 6 $^{1}/_{4}$ " (D)

Weight: 130g (including batteries)

Program Mode Command List

