STAT 2
(Advanced Statistics Application)

Statistical Calculation (STAT) Software for the ALGEBRA FX2.0

1.Modifications Made to ALGEBRA 2.0 by STAT2

●Changes to the Function Menu

Installing STAT2 changes the function menu of the STAT Mode list input screen (initial screen) as shown below.

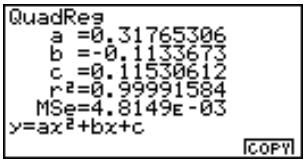
Pressing a function key that corresponds to the added item displays a menu that lets you select one of the functions listed below.

- F3 (TEST) ... Test (Chapter 2, page 6)
- F4 (INTR) ... Confidence interval (Chapter 3, page 31)
- F5 (DIST) ... Distribution (Chapter 4, page 42)

The SORT and JUMP functions available with ALGEBRA FX2.0 are moved to the TOOL menu (F6 and F1) by STAT2.

●Calculation of the Coefficient of Determination (r^2) and MSE

STAT2 adds calculation of the coefficient of determination (r^2) for quadratic regression, cubic regression, and quartic regression. The following types of MSE calculations are also added for each type of regression.



- Linear Regression ... $MSE = \frac{1}{n-2}\sum_{i=1}^{n}(y_i - (ax_i + b))^2$
- Quadratic Regression ... $MSE = \frac{1}{n-3}\sum_{i=1}^{n}(y_i - (ax_i^2 + bx_i + c))^2$
- Cubic Regression ... $MSE = \frac{1}{n-4}\sum_{i=1}^{n}(y_i - (ax_i^3 + bx_i^2 + cx_i + d))^2$
- Quartic Regression ... $MSE = \frac{1}{n-5}\sum_{i=1}^{n}(y_i - (ax_i^4 + bx_i^3 + cx_i^2 + dx_i + e))^2$
- Logarithmic Regression ... $MSE = \frac{1}{n-2}\sum_{i=1}^{n}(y_i - (a + b\ln x_i))^2$

- Exponential Repression ... $MSE = \frac{1}{n-2}\sum_{i=1}^{n}(\ln y_i - (\ln a + bx_i))^2$
- Power Regression ... $MSE = \frac{1}{n-2}\sum_{i=1}^{n}(\ln y_i - (\ln a + b\ln x_i))^2$
- Sin Regression ... $MSE = \frac{1}{n-2}\sum_{i=1}^{n}(y_i - (a\sin(bx_i + c) + d))^2$
- Logistic Regression ... $MSE = \frac{1}{n-2}\sum_{i=1}^{n}\left(y_i - \frac{C}{1 + ae^{-bx_i}}\right)^2$

●Estimated Value Calculation for Regression Graphs

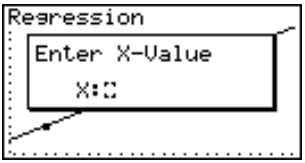
STAT2 adds a Y-CAL function that uses regression to calculate the estimated y-value for a particular x-value after a paired-variable statistic regression graph is drawn.

The following is the general procedure for using the Y-CAL function.

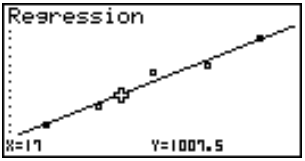
1. After drawing a regression graph, press [F6] [F2] (Y-CAL) to enter the graph selection mode, and then press [EXE].

   If there are multiple graphs on the display, use ▲ and ▼ to select the graph you want, and then press [EXE].

- This causes an x-value input dialog box to appear.



2. Input the value you want for x and then press [EXE].



- This causes the coordinates for x and y to appear at the bottom of the display, and moves the pointer to the corresponding point on the graph.

3. Pressing [X,θ,T] or a number key at this time causes the x-value input dialog box to reappear so you can perform another estimated value calculation if you want.
4. After you are finished, press [ESC] to clear the coordinate values and the pointer from the display.

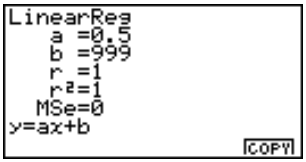
· The pointer does not appear if the calculated coordinates are not within the display range.

· The coordinates do not appear if [Off] is specified for the [Coord] item of the [SETUP] screen.

· The Y-CAL function can also be used with a graph drawn by using DefG feature.

●Regression Formula Copy Function from a Regression Calculation Result Screen

In addition to the existing regression formula copy function that lets you copy the regression calculation result screen after drawing a statistical graph (such as Scatter Plot), STAT2 also adds a function that lets you copy the regression formula obtained as the result of a regression calculation. This type of copy operation is performed by pressing [F6](COPY).



■ Tests, Confidence Interval, and Distribution Calculations

STAT2 adds functions for performing tests, confidence interval, and distribution calculations. This manual fully describes each of these calculations in separate chapters: Chapter 2 Tests, Chapter 3 Confidence Interval, and Chapter 4 Distribution.

●Parameter Settings

The following describes the two methods you can use to make parameter settings for test, confidence interval, and distribution calculations.

• Selection
With this method, you press the function key that corresponds to the setting you want to select from the function menu.

• Value Input
With this method, you directly input the parameter value you want to input. In this case, nothing appears in the function menu.

· Pressing [ESC] returns to the list input screen, with the cursor in the same position it was at before you started the parameter setting procedure.

· Pressing [SHIFT] [ESC] (QUIT) returns to the top of list input screen.

· Pressing [EXE] without pressing [F1] (CALC) under "Execute" item advances to calculation execution. To return to the parameter setting screen, press [ESC], [AC], or [EXE].

●Common Functions

• The symbol "■" appears in the upper right corner of the screen while execution of a calculation is being performed and while a graph is being drawn. Pressing [AC] during this time terminates the ongoing calculation or draw operation (AC Break).

• Pressing [ESC] or [EXE] while a calculation result or graph is on the display returns to the parameter setting screen. Pressing [SHIFT] [ESC] (QUIT) returns to the top of list input screen.

· Pressing [AC] while a calculation result is on the display returns to the parameter setting screen.

• Pressing [CTRL] [F5] (G↔T) after drawing a graph switches to the parameter setting screen (G↔T function). Pressing [CTRL] [F5] (G↔T) again returns to the graph screen.

· The G↔T function is disabled whenever you change a setting on the parameter setting screen , or when you perform a [CTRL] [F3] (SET UP) or [SHIFT] [OPTN] (V-Window) operation.

• You can perform the PICT menu's screen save or recall functions after drawing a graph.

· The ZOOM Function and SKETCH function are disabled.

The TRACE function is desabled, except for the geaph display of two-way ANOVA.

The graph screen cannot be scrolled.

• After drawing a graph, you can use a Save Result feature to save calculation results to a specific list. Basically, all items are saved as they are displayed, except for the first line title.

· Each time you execute Save Result, any existing data in the list is replaced by the new results.