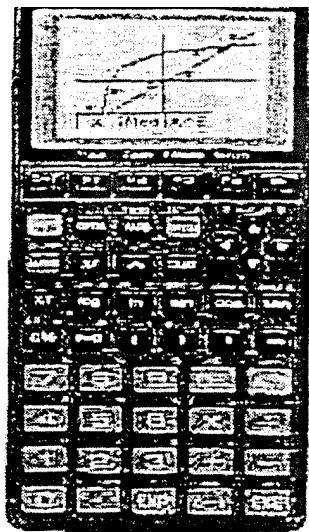


**Using the
Casio
CFX-7400G
graphics calculator**



**A brief tour of the
Casio *fx*-7400G**

by John Dowsey & David Tynan

Working from home

When you turn on the *fx-7400G*, you will see an icon menu, where each icon represents a different mode or major application of the calculator.

Basic calculations

The *fx-7400G* will perform the calculations of a standard scientific calculator. Most of these would be completed in the RUN mode (or Home Screen). However, graphics calculators have too many functions and features to be displayed on keys. For this reason, the *fx-7400G* employs 'soft menus', accessed via a strip of function keys located just below the screen.

$$5.3+1.4$$

$$1.11,12$$

$$23,12$$

$$\sin^{-1} 4 \div 5$$

Ma ERROR

$$\sin^{-1} 4.5$$

$$53.13010235$$

$$53^{\circ}07'48.37''$$

$$27! \div 22!$$

$$9687600$$

$$27 \times 26 \times 25 \times 24 \times 23$$

$$9687600$$

$$\cos (0,30,60,$$

$$90,120,150,180)$$

Ans

$$1 \quad 0.856$$

$$2 \quad 0.5$$

$$d/dx(X^2, 2.1)$$

$$2.1 \div X: ((X+.01)^2 - X^2) \div .01$$

$$4.2$$

$$4.21$$

Looking for patterns

How long does it take to double your money?

$$1000 \times 1.06$$

$$1060$$

$$\text{Ans} \times 1.06$$

$$1123.6$$

$$1191.016$$

How is the investment growth affected by the interest rate?

$$1000 \times (1.06, 1.07, 1.08, 1.09, 1.10)^{12}$$

Ans

$$1 \quad 1012.6$$

$$2 \quad 2252.1$$

$$3 \quad 2518.1$$

$$2012.196472$$

How is the investment growth affected by the compounding period?

$$1000 \times (1 + 0.06 / (1, 12, 365))^{(1, 12, 365)}$$

Ans

$$1 \quad 1060$$

$$2 \quad 1081.6$$

$$3 \quad 1081.8$$

$$1060$$

Iteration

Using the repeated calculation feature and the Ans function, we can show a recursive relationship. Where will it end?

$$1 + 1 + \text{Ans}$$

$$29$$

$$1.034482759$$

$$1.966666667$$

$$1.508474576$$

One-line programming

Simple programs can be written to help with the applications of frequently used formulas.

$$? \div R: ? \div H: 2\pi R(H + R)$$

$$10.125$$

$$6.2$$

$$1038.551626$$

Random number generation

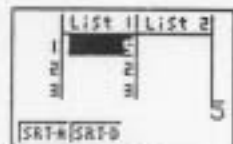
The fx-7400G will generate pseudorandom numbers between 0 and 1. Combining this feature with the one-line programming capability, you can generate and store the results of a simulation.

Method 1 (one-line programming)

```
0→N
N+1→N: Int (6×
Ran#+1)→List
1[N]
```

Method 2 (sequence command)

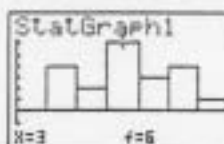
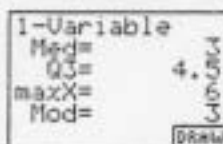
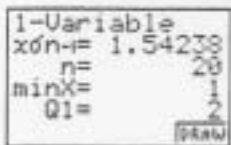
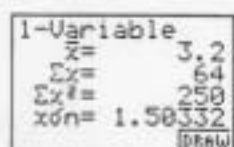
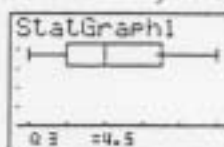
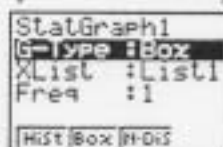
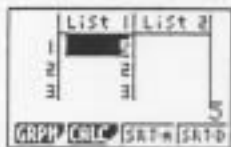
```
Seq(Int (6×Ra
n#+1), X, 1, 20,
1)→List 1
Done
```



Basic statistics

Stats 'n plots

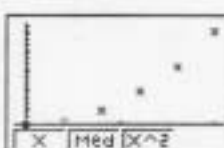
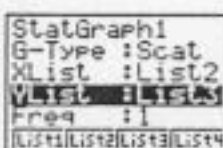
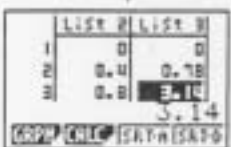
Major advances have been made with the statistics capabilities of this calculator. Data entry is via 'lists', and statistical graphs and summary statistics are easy to obtain.



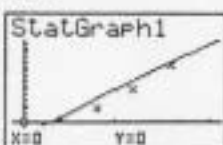
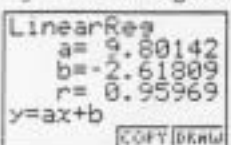
Fitting function models to data

Entering the data is as for the above example, scrolling across to use List 2 and List 3. A quadratic model may be appropriate, but how can we tell?

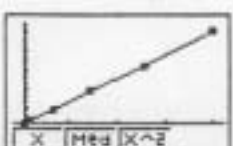
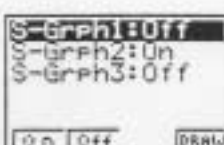
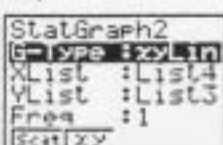
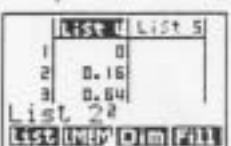
Enter and plot the data



Try a linear regression model



Manipulate the lists (aha!)



Working with functions

Looking for patterns

How is the investment growth affected by the interest rate?

```
G-Func : Y=
Y1: 1000(1.05)^X
Y2: 2000
Y3:
Y4:
[SEL] [DEL] [DNUM]
```



Transformation creations

Lists make generating function graphs less tedious, and can help students focus on the affects of a parameter on the form of the graph.

Sparkler



```
G-Func : Y=
Y1: X(-2, -1,
Y2:
Y3:
Y4:
[SEL] [DEL] [DNUM]
```



Lattice

```
G-Func : Y=
Y1: List 1+X
Y2: List 1-X
Y3:
Y4:
[LIST] [PROP] [NUM]
```

List 1	List 2
1	0
2	0.4
3	0.8
	-5

SRT+DATA



Function tables

Often we wish to quickly generate a table of function values, in this example (from 'Mobile Phone Problem**) to compare various payment schemes for mobile phones.

```
T-Func : Y=
Y1: 10+1.2X
Y2: 20+0.8X
Y3: 35+0.4X
Y4:
[SEL] [DEL] [DNUM] [TABL]
```

Table Range

X	
Start:	20
End:	60
ptch:	1

X	Y1
24	38.8
25	40

FORM [DNUM] G-COM [G-PLT]

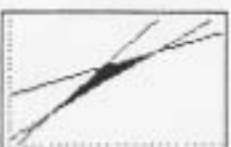
X	Y2
24	39.2
25	40

FORM [DNUM] G-COM [G-PLT]

Defining inequalities

What if the rules above were inequalities rather than functions (ignoring context). The fx-7400G will shade not only the area corresponding to each inequality, but also the resultant region (satisfying all constraints).

```
G-Func : Y≤
Y1: 10+1.2X
Y2: 20+0.8X
Y3: 35+0.4X
Y4:
[Y>] [Y<] [Y≤] [Y≥]
```



**"Graphic Algebra" is available from Curriculum Corporation or the AAMT

Programming

The *fx-7400G* has some limited calculus features, but can be programmed to extend its capabilities in this (and other areas), as the examples below illustrate.

Simulation example

```

0->I
For 1->I to 20
  0->W
  For 1->N To 100
    Int (9xRan#+1) ->A
    Int (9xRan#+1) ->B
    Int (9xRan#+1) ->C
    If (A+B+C)≥15:
      Then W+1->W
    IfEnd
  Next
WINS= " :W
W->List 1 [I]
Next
  
```

WINS=	
	47
WINS=	
	51
- Disp -	

Solving example

```

"GUESS":?->X
While Abs Y1>0.0000001
  X - (Y1÷(d/dx(Y1,X)))->X
WhileEnd
{X,Int(Y1) }
  
```

Prog "ROOT"
GUESS
?
1Ø

Integration example

```

"LOWER" ?->A
"UPPER" ? ->B
100->N
A->X:O->S:Y1->S
(B-A)÷N->W
For 1->K To N-1
  X+W->X
  2Y1+-S->S
Next
  
```

LOWER?
Ø
UPPER?
5
41.66875

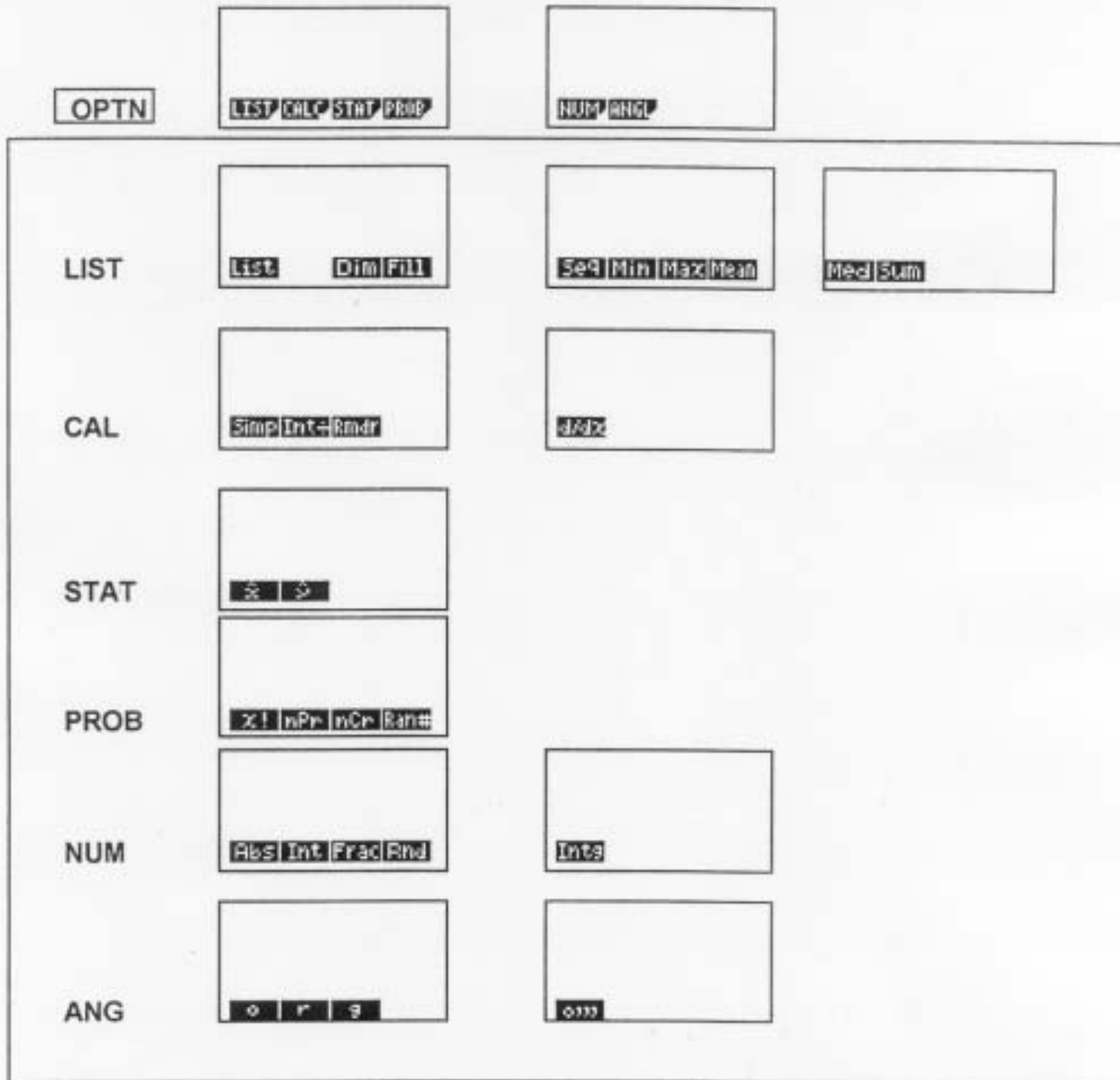
Menu Maps

fx - 7400G

1. Option Key,
2. Variable Data Key,
3. Programming Commands,
4. Statistics Mode - Progressive Menu Items



RUN Mode The OPTN key menu map



- Pressing the continuation key (arrow function key) advances from the left to right screen. Continual pressing will return you to the first screen.
- The QUIT key will exit you from the OPTION menu.

SAMPLE SCREENS

$d/dx(2X+1, 2)$ $d/dx(X^2+2X, 3)$ 8	8C2 28 8P2 56	Ran# 0.2805105525 0.6650930012 0.34665983 0.880290193	Int (6Ran#+1) 4 3 2
d/dx	$X!$ nPr nCr $Ran\#$	$X!$ nPr nCr $Ran\#$	Abs Int Frac Rnd

Results are displayed after each press of the EXE key.

40° 0.6981317008 180° 3.141592654	$\sin^{-1}.523$ 31.53370156	$\sin^{-1}.523$ 31°32'01.33"	$\sin^{-1}.523$ 0.5503669176
0 1 2 3	000 000	000 000	

Pressing the AC/ON key, then the upward arrow key continuously, will scroll through all previous commands from most to least recent. Pressing the downward arrow, will scroll in the opposite chronology.

$d/dx(X^2+2X, 3)$ $X!$ nPr nCr $Ran\#$	8C2 $X!$ nPr nCr $Ran\#$	8P2 $X!$ nPr nCr $Ran\#$
---	---------------------------------	---------------------------------

up arrow key

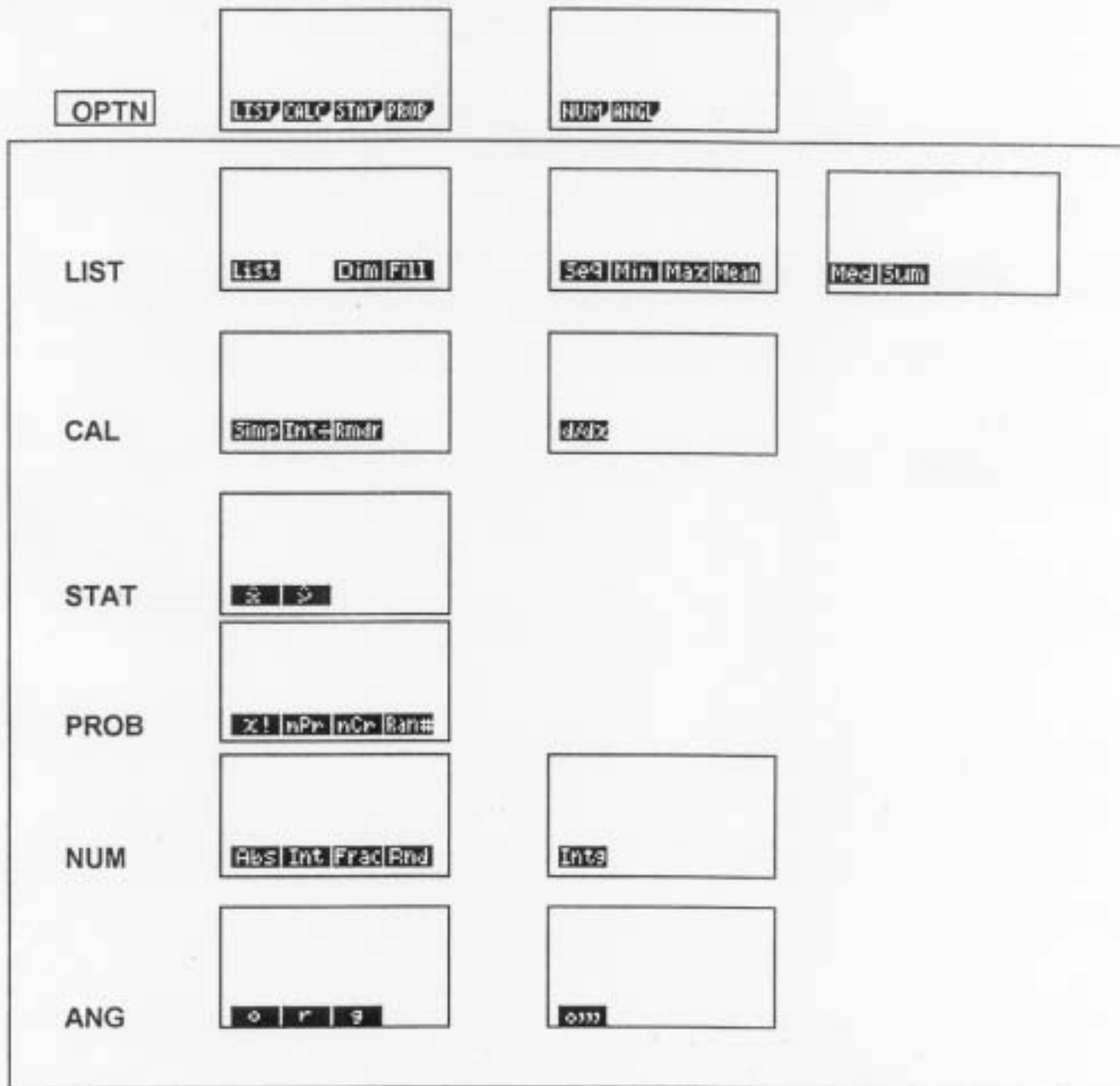
present screen



down arrow key

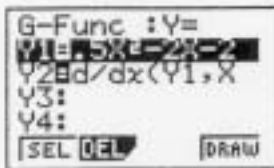


RUN Mode The **OPTN** key menu map



- Pressing the continuation key (arrow function key) advances from the left to right screen. Continual pressing will return you to the first screen.
- The QUIT key will exit you from the OPTION menu.

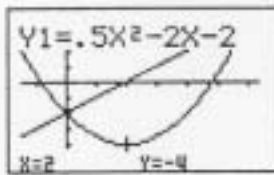
SAMPLE SCREENS



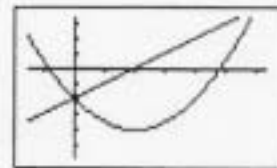
G-Func :Y=
Y1= $.5X^2-2X-2$
Y2=d/dx(Y1,X)
Y3:
Y4:
SEL DRAW

To locate d/dx: OPTN, green > key.
Y:, VARS, green > key,
GRPH (F2) then Y (F1). (See map.)
Press QUIT to exit VARS menu.

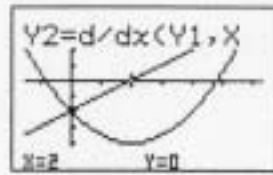
Note: Y memory location using the alpha key can not be used.



To trace graphs, press SHIFT F1.

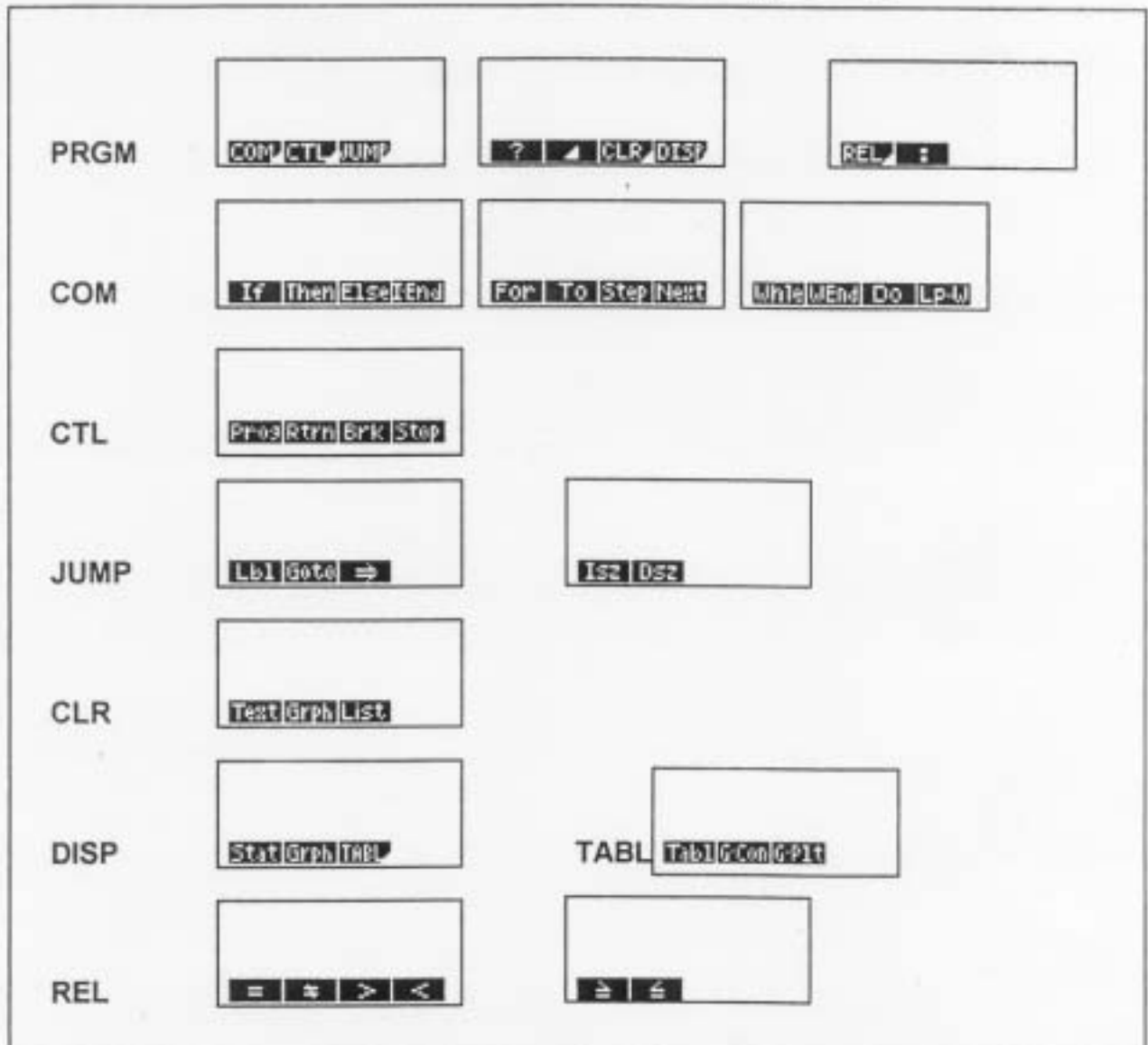


To draw graphs, press F4.

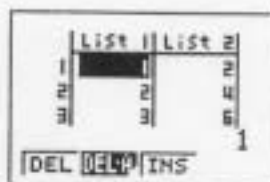
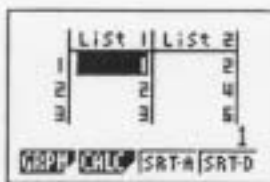
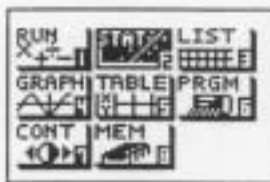


To toggle between graphs press down arrow key.

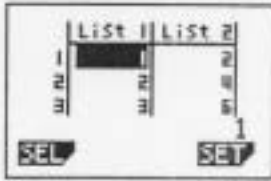
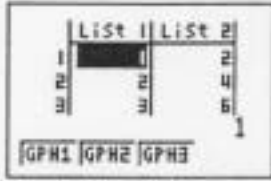
The PRGM menu map (**SHIFT** **VARS**)



PROGRESSIVE MENU ITEMS - STAT MODE

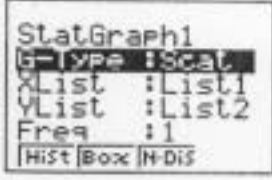
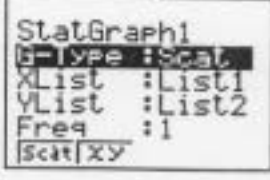
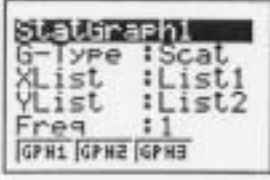


GRPH



One of three statgraphs, GPH1, GPH2, GPH3, can be displayed. The initial default graph type is a scatter graph.

SET



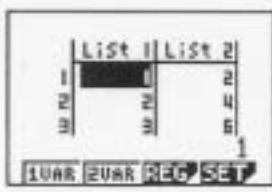
The SET item allows the graph type and graph settings to be specified.

SEL

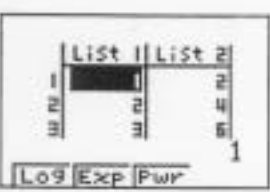
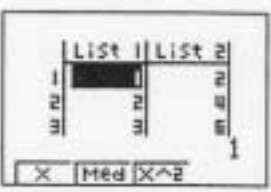


The SEL item enables the display of more than one statgraph.

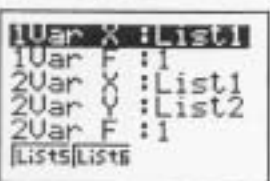
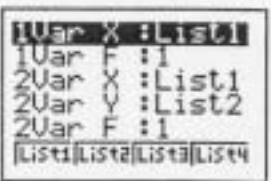
CALC



REG



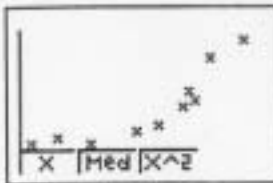
SET



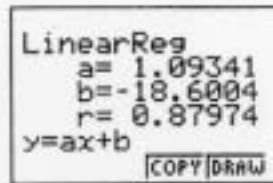
The CALC menu accesses numerical statistical data.

- Pressing the continuation key (arrow function key) advances from the left to right screens. Continual pressing will return you to the first screen.
- The QUIT key will exit you from a menu item, and returns you to the first STAT menu screen.

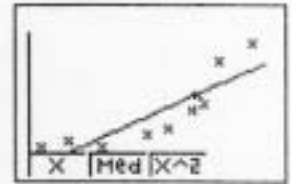
SAMPLE SCREENS



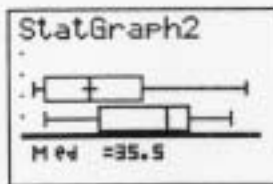
Regression lines can be drawn with scatterplots.



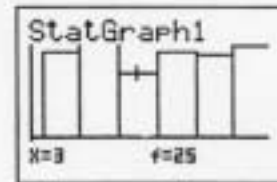
F1 here has accessed the linear regression type.



Pressing F4 then draw in the line of best fit.



The SEL item has been used to display the two boxplots. Each can be traced for min, Q1, med, Q3 and max values.



The SET item is used to change Statgraph1 to a Histogram. Frequencies can be traced.