

## Appendix

### Commonly-Used Keystrokes for Curve Fitting/Data Analysis

This section outlines keystrokes that you will need to be familiar with to work the activities in this book.

#### Entering Data

Data is entered and displayed from the STAT lists. To enter the data:

1. Press **[STAT]** **1:Edit**. This will take you to the stat editor.
2. If there is any data presently in the lists that you wish to use, you should first clear the lists. To do this, move the cursor up so it highlights the heading on the list you would like to clear. Press **[CLEAR]** **[ENTER]** to clear the list. Repeat these steps on any list you want to clear.

L1	L2	L3	1
1	-3.16	-3.35	
2	-3.64	-3.1	
3	-4.44	-2.85	
4	-5.56	-2.6	
5	-7	-2.35	
6	-8.76	-2.1	
7	-10.84	-1.85	

L1 = { ., 1, ., 2, ., 3, ., 4...

3. Once the lists are clear, move the cursor to the list where you want to place the data and enter the numbers one at a time. Be sure to press **[ENTER]** after each number is entered. Once one column is entered, move to the next column and start data entry again.

#### Displaying the Data as a Scatter Plot

This assumes you already have the data entered.

1. Press **[2nd]** **[STATPLOT]** to display the STAT PLOT menu.
2. Turn off any plots that are on by selecting **4:PlotsOff** and pressing **[ENTER]**.
3. If you had to turn off any STAT PLOTS in step 2, press **[2nd]** **[STATPLOT]** again.

STATPLOTS			
1:	Plot1...Off		
↳	L3	L4	▣
2:	Plot2...Off		
↳	L1	L2	▣
3:	Plot3...Off		
↳	L1	L2	▣
4:	PlotsOff		

- Press **1** to activate the Plot 1 menu.
- Use the cursor to move to each highlighted object.  
Press **ENTER** to set your calculator as shown at the right. When your cursor is at **Xlist**, press **2nd** [**L1**] and then move to **Ylist** and press **2nd** [**L2**].
- Once your calculator settings match the screen at the right, press **ZOOM** **9:ZoomStat** to plot the points.



### *Fitting an Equation to the Data*

Note: In my class the students are never allowed to use the built-in regression methods until:

- ♦ they can fit the same type of curve with other methods, and
- ♦ they understand (or at least we have discussed) how the calculator does each fit.

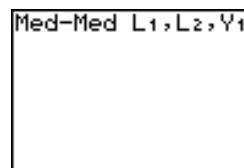
- Press **STAT** **►** to display the STAT CALC menu. This menu shows the type of curves the calculator can fit to data sets.
- Press the number associated with the type of curve you want to fit to the data.



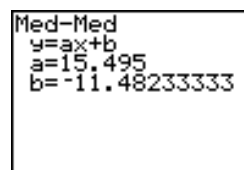
- |  |               |
|--|---------------|
| 3 Median Fit                             | 9 Natural Log |
| 4 Linear Regression                      | 0 Exponential |
| 5 Quadratic                              | A Power       |
| 6 Cubic                                  | B Logistic    |
| 7 Quartic                                | C Sine        |
| 8 Linear Regression in $y = ax + b$ form |               |

For example, if you want to fit a median-fit line to the data you would select **3:Med-Med**. This will return you to the HOME screen with the type of curve showing and the cursor blinking, waiting for more input.

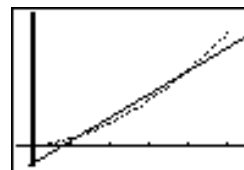
- You need to tell the calculator which two lists you would like to fit an equation to and where you want to store the equation. If you want to let  $x = L1$ ,  $y = L2$ , and the equation to be placed in  $Y1$  you would press:  
**2nd** [**L1**] **,** **2nd** [**L2**] **,** **VARS** **►** **1:Function** **1:Y1**.



- When you press **ENTER**, the screen will show the equation of that particular family of functions that best fits the data.

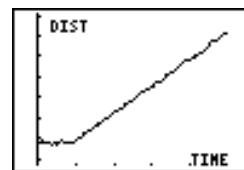


5. Press **ZOOM** 9:ZoomFit and data will be displayed with the curve superimposed on the plot.



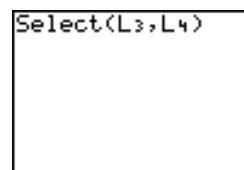
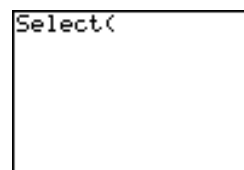
### Using the Built-in Select Feature of the TI-83

This data is fairly representative of what might be recorded by a person walking away from a CBR. The data shows two parts. One part is when the person was standing still before they started. The second part is when they actually started to walk. Let's say you want to only work with the second part of the data.

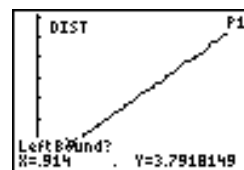


The depicted data is in L1, L2. We will select it out the second part of the data and place it in L3, L4.

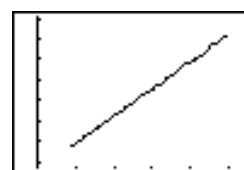
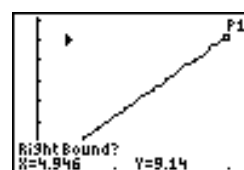
1. Press **2nd** [LIST] **▸** 8:Select(. Now you enter where you want to store the selected data. To use L3, L4, press **2nd** [L3] **,** **2nd** [L4] **)** **ENTER**.



2. To actually select the part of the graph you will use, press **▸** to move to the left end of the data you want to keep and press **ENTER**. This sets the left bound.



Move to the right end of the data you want and press **ENTER**. This selects the data you want, places it in L3, L4, and displays L3, L4.



## Keystrokes for Linking Two TI-83 Calculators

Connect the two calculators with the link cable. *Push both ends of the cable in firmly.*

1. On the RECEIVING calculator press: **2nd** [LINK] **▶** to display the RECEIVE menu. Press **1** to select **1:Receive**. The message **Waiting...** will be displayed.

```
PROGRAM
Name=
```

2. On the SENDING calculator press: **2nd** [LINK] to display the SEND menu. Press the number in front of the type of object you want to send. For this example, assume you want to send **L1** and **L2**. To do this, press **4:List**.

```
SEND RECEIVE
1:All+...
2:All-...
3:Prgrm...
4:List...
5:Lists to TI82...
6:GDB...
7:Pic...
```

3. Press **▼** to move down the list, pressing **ENTER** when you are in front of each item you want to send. In our example, you would press **ENTER** in front of **L1** and **L2**. The selected items will have a shaded box in front of them when they have been selected.

```
SEND TRANSMIT
▶L1 LIST
L2 LIST
L3 LIST
L4 LIST
L5 LIST
L6 LIST
RESID LIST
```

4. Once you have marked the items you want, press **▶** to move to the right and display the TRANSMIT menu. Press **ENTER**. This will start the transmission.

```
SEND TRANSMIT
▶L1 LIST
▶L2 LIST
▶L3 LIST
L4 LIST
L5 LIST
L6 LIST
RESID LIST
```

```
SELECT TRANSMIT
1:Transmit
```

5. Watch the screen of the receiving calculator. If there is already an object with the same name, you will get a message saying you are trying to link a **DUPLICATE OBJECT**. Press **2:Overwrite** to overwrite the object and thus get the new object. This will erase the old object with that name. If you needed to keep the old object, press **4:Quit**, then rename the old object and start the process again.

```
DuplicateName
1:Rename
2:Overwrite
3:Omit
4:Quit
L1 LIST
```

6. Once the data is transferred, you will see a **DONE** message.

```
Receiving...
L1 LIST
▶L2 LIST
Done
```

## Turning Data into a Program

Note: These instructions assume the data you intend to save is in L1, L2.

1. Press **PRGM** **▶** **▶** **ENTER**.

```
Receiving...
L1          LIST
▶L2         LIST
           Done
```

2. Type the name you want and then press **ENTER**.

```
PROGRAM:P85N16
:
```

3. Press **2nd** **RCL** **2nd** **L1** **ENTER** **2nd** **RCL** **2nd** **L1** **ENTER**.

This recalls the data in L1 and puts it in your program.

Press **2nd** **RCL** **2nd** **L2** **ENTER** **2nd** **RCL** **2nd** **L2** **ENTER**.

This recalls the data in L2 and puts it in your program.

```
PROGRAM:P85N16
:
Rcl L1
```

```
PROGRAM:P85N16
:(2.000,3.000,4.
000,5.000,6.000)
```

```
PROGRAM:P85N16
:(2.000,3.000,4.
000,5.000,6.000)
→L1
```

4. Press **2nd** **QUIT** to exit.

This ends the simplest version of the program. The data has been placed in the program. When the program is executed the data will be placed back in L1, L2.

## TI-83 Plus Grouping and Archives

### Saving Objects as Groups

You have just finished a class where you used a CBL program (BALLDROP) to collect data for a freefalling object. The data is in L1, L2. You fit a model to the data (Y1) and the bell is about to ring. You need to clear this information out of the calculator and prepare for your next class.

Your options are to run to a computer and save everything, or save it in archive memory as a group on the TI-83 Plus.

1. Press **2nd** **[MEM]** **8:Group**

```
MEMORY
2:Mem Mgmt/Del...
3:Clear Entries
4:ClrAllLists
5:Archive
6:UnArchive
7:Reset...
8:Group...
```

2. Select **1:Create New** and enter the name you want for the total data you are about to save. In this example, I named it **P3ACT12** for period 3 activity 12. Press **ENTER**.

```
GROUP UNGROUP
1:Create New
```

```
GROUP
Name=P3ACT12
```

3. Select what you want to save with this name. This works the same as the TI-GRAPH LINK. Since I am storing three different type of object (list, equation, program), I pressed **2:All-**.

```
GROUP
1:All+...
2:All-...
3:Prgm...
4:List...
5:GDB...
6:Pic...
7:Matrix...
```

```
SELECT DONE
▶ BOOKDROP PRGM
L1 LIST
L2 LIST
L3 LIST
L4 LIST
L5 LIST
L6 LIST
```

4. Move down the list, pressing **ENTER** beside any object that you want stored. When they are selected, the **▶** will turn into a **■**.

```
SELECT DONE
▶ BOOKDROP PRGM
■ L1 LIST
■ L2 LIST
■ L3 LIST
L4 LIST
L5 LIST
L6 LIST
```

- When you have finished your selection, press **▶** and **ENTER**. You are finished.

The group **P3ACT12** has now been saved in archived memory.

```
SELECT Done
Done
```

```
Copying
Variables to
Group:
P3ACT12           Done
```

### Ungrouping

- Press **2nd** **[MEM]** **8:Group**.

```
MEMORY
2:Mem Mgmt/Del...
3:Clear Entries
4:ClrAllLists
5:Archive
6:UnArchive
7:Reset...
8:Group...
```

```
GROUP UNGROUP
1:Create New
```

- Press **▶** to select **UNGROUP**.

*Note the \* by the names that shows they are in archived memory, not the regular RAM.*

```
GROUP UNGROUP
1:*AAA
2:*ACCIDENT
3:*BB
4:*CAR1
5:*GARBAGE
6:*MEALWORM
7↓:*P3ACT12
```

- Press **▼** to move down and select the group you want. Press **ENTER** when you are beside an object you want to unarchive.

If the object you are bringing back already exists in RAM, select **2:Overwrite** **ENTER**.

*Note: Before you ungroup, be sure to group anything that is in your memory that you want to save.*

```
GROUP UNGROUP
1:*AAA
2:*ACCIDENT
3:*BB
4:*CAR1
5:*GARBAGE
6:*MEALWORM
7↓:*P3ACT12
```

```
DuplicateName
1:Rename
2:Overwrite
3:Overwrite All
4:Omit
5:Quit
  
BOOKDROP PRGM
```

```
Ungrouping:
P3ACT12
  BOOKDROP PRGM
  L1      LIST
  L2      LIST
  ▶ Y1    EQU
           Done
```

### To Archive or Un-Archive

1. Press **[2nd] [MEM] 2:Mem Mgmt/Del.**

```
MEMORY
1:About
2:Mem Mgmt/Del...
3:Clear Entries
4:ClrAllLists
5:Archive
6:UnArchive
7:Reset...
```

2. Press **[↓]** to move down to select the type of object you are going to either archive or unarchive.

```
RAM FREE 19784
ARC FREE 59967
1:All...
2:Real...
3:Complex...
4>List...
5:Matrix...
6:V-Vars...
```

To look at programs, for example, press **7:Prgm.**

```
RAM FREE 19784
ARC FREE 59967
3:Complex...
4>List...
5:Matrix...
6:V-Vars...
7:Prgm...
8:Pic...
```

You now see a list of all the programs. Those marked with a \* are already in the archive and thus do not take up the working RAM. Those with no \* are in the working RAM. To change from archived to unarchived, cursor down to the object you want to change and press **[ENTER]**.

```
RAM FREE 19784
ARC FREE 59967
>*BALLDROP 807
  BOOKDROP 1310
  *BOUNCE 815
  *BOUNCEIT 2931
  *BOUNCEN 2261
  *BOYLE 198
```

You now see a list of all the programs. Those marked with a \* are already in the archive and thus do not take up the working RAM. Those with no \* are in the working RAM. To change from archived to unarchived, cursor down to the object you want to change and press **[ENTER]**.

```
APPLICATIONS
1:Finance...
2:CBL/CBR
3:Español
4:Interact
```

Once an object has been unarchived, it can be used. Until it is unarchived, it cannot be used.

*Note 1: Ungrouping unarchives the objects in the group. Grouping makes an archived copy of the objects.*

*Note 2: An application is run without unarchiving it.*