

## Appendix B

### 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 list editor. To enter the data:

1. Press **[STAT]** **1** to select **1:Edit**.
2. If there are any data presently in the lists, you should first clear the lists. To do this, move the cursor up so that it highlights the heading on the list (**L1**) 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	

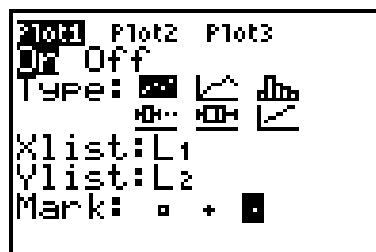
L1 = { .1, .2, .3, .4...

3. After the lists have been cleared, move the cursor to the list in which you want to place the data, and enter the numbers one at a time. Be sure to press **[ENTER]** after each number. After you have finished entering numbers in one column, move to the next column and start data entry again.

## Displaying the Data as a Plot

This assumes that you already have the data entered.

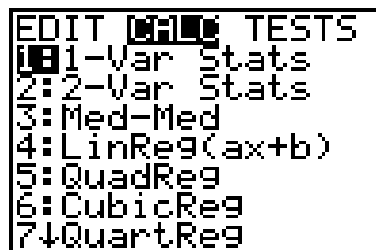
1. Press  $\text{2nd}$  [STAT PLOT] to display the **STAT PLOTS Menu**.
2. To simultaneously turn off all plots that are on, select **4:PlotsOff** and press  $\text{ENTER}$ .
3. To turn on a plot, select the plot and press  $\text{ENTER}$ , or press the number next to the plot you want to turn on.
4. Use the cursor to highlight the type of plot needed and press  $\text{ENTER}$ .
5. Complete the **Xlist**, **Ylist**, and **Mark** information for your data set. Press  $\text{GRAPH}$  to plot the data using your current **WINDOW** settings, or press  $\text{ZOOM}$  9 to select **9:ZoomStat** to automatically adjust the **WINDOW** settings to fit the data set.



## Fitting an Equation to the Data

**Note:** Students should not be encouraged 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 have discussed) how the graphing handheld does each fit.

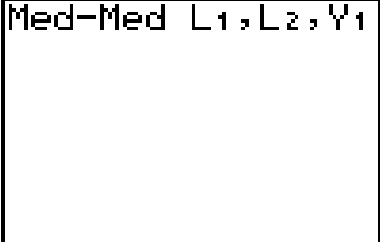
1. Press  $\text{STAT}$  [ ] to display the **STAT > CALC Menu**. This menu shows the types of curves the graphing handheld can fit to data sets.



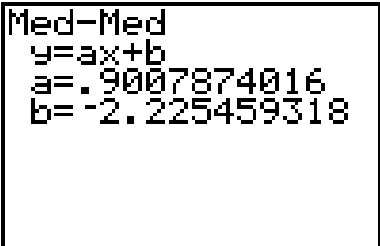
2. Press the number associated with the type of curve you want to fit to the data.

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

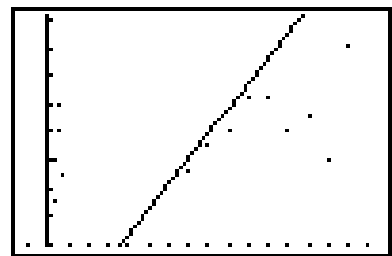
3. You need to tell the graphing handheld which two lists you would like to fit to an equation and where you want to store the equation. If you want to let  $x = L1$ ,  $y = L2$ , and the equation to be placed in **Y1**, you would press:  $\boxed{2nd} \boxed{[L1]} \boxed{,} \boxed{2nd} \boxed{[L2]} \boxed{,} \boxed{VARs} \boxed{\blacktriangleright}$   
**Function** > **Y1**.

A calculator screen displaying the text "Med-Med L1,L2,Y1".

4. When you press  $\boxed{ENTER}$ , the screen will show the equation and the coefficient values for the function that best fits the data.

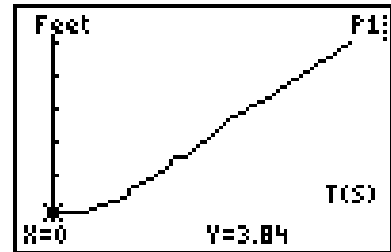
A calculator screen displaying the text "Med-Med", "y=ax+b", "a=.9007874016", and "b=-2.225459318".

5. Press  $\boxed{ZOOM} \boxed{9}$  to select **9:ZoomFit**, and data will be displayed with the curve superimposed on the plot.



### Using the Built-in Select Feature

These data are fairly representative of what might be recorded by a person walking away from a CBR™. The data show two parts. One part is when the person was standing still before starting. The second part is when the person actually started to walk. Assume that you want to work with only the second part of the data.



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

1. Press **2nd** [LIST]. Press **▸** to go to the **OPS Menu**. Select **8:Select(** and press **ENTER**.

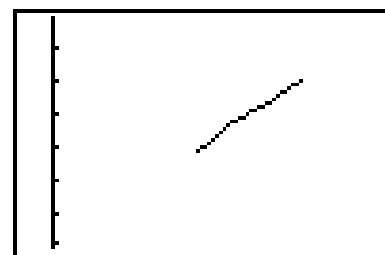
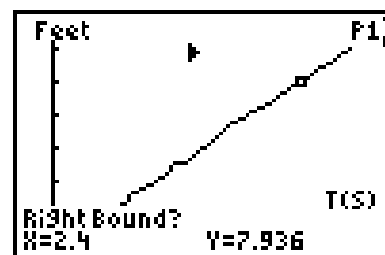
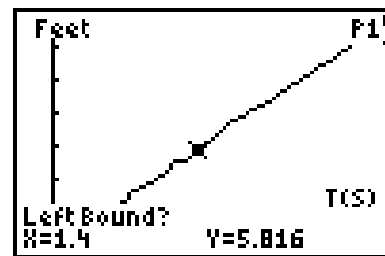
```
Select(
```

2. Enter where you want to store the selected data.

```
Select(L3,L4)
```

- To actually select the part of the graph you will use, press  $\leftarrow$  or  $\rightarrow$  to move to the left end of the data you want to keep, and then press  $\text{ENTER}$ . This sets the left bound.

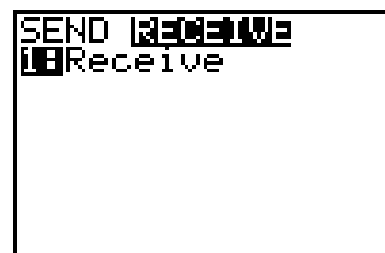
Press  $\rightarrow$  to move to the right end of the data you want, and press  $\text{ENTER}$ . This selects the data you want, places them in **L3**, **L4**, and displays the graph of **L3**, **L4**.



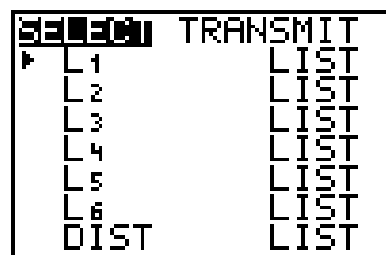
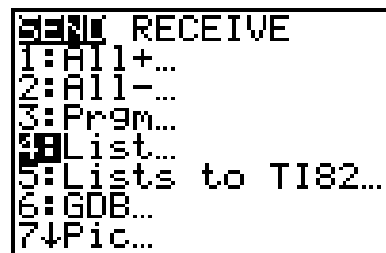
### Keystrokes for Linking Two Graphing Handhelds

Connect the two graphing handhelds with the link cable. Push both ends of the cable in firmly.

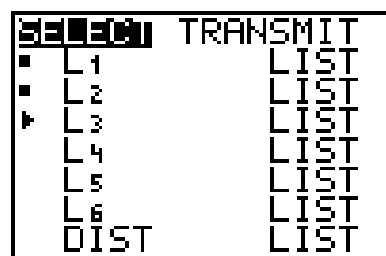
- On the RECEIVING graphing handheld, press  $\text{2nd}$   $\text{LINK}$   $\rightarrow$  to display the **RECEIVE Menu**. Press **1** or  $\text{ENTER}$ . The message **Waiting** is displayed.



2. On the SENDING graphing handheld, press  $\text{2nd}$  [LINK] to display the **SEND Menu**. Press the number in front of the type of object you want to send. For this example, assume that you want to send **L1** and **L2**. To do this, select **4:List**.



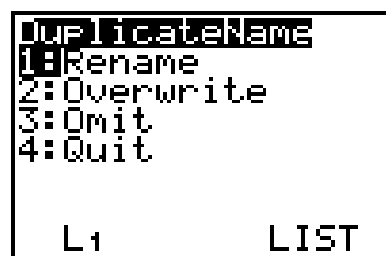
3. Press  $\text{down arrow}$  to move down the list, pressing  $\text{ENTER}$  when you are in front of each item you want to send. In this example, you would press  $\text{ENTER}$  in front of **L1** and **L2**. The selected items will have a shaded box in front of them when they have been selected.



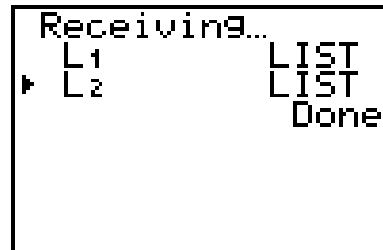
4. After you have marked the items you want to transfer, press  $\text{right arrow}$  to move to the right and display the **TRANSMIT Menu**. Press  $\text{ENTER}$ . This will start the transmission.



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



6. After the data has been transferred, you will see a **Done** message.



### Turning Data into a Program

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

1. Press **PRGM** **▶** **▶** **ENTER**. The blinking cursor indicates that the handheld is in **ALPHA** mode. If the name includes numbers, press **ALPHA** to return to numeral mode.



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



3. Press  $\boxed{2\text{nd}} \boxed{\text{RCL}} \boxed{2\text{nd}} \boxed{\text{L1}} \boxed{\text{ENTER}} \boxed{2\text{nd}} \boxed{\text{RCL}} \boxed{2\text{nd}} \boxed{\text{L1}} \boxed{\text{ENTER}}$ .

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

- Press  $\boxed{2\text{nd}} \boxed{\text{RCL}} \boxed{2\text{nd}} \boxed{\text{L2}} \boxed{\text{ENTER}} \boxed{2\text{nd}} \boxed{\text{RCL}} \boxed{2\text{nd}} \boxed{\text{L2}} \boxed{\text{ENTER}}$ .

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

```
PROGRAM:P85N16
:
Rc1 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  $\boxed{2\text{nd}} \boxed{\text{QUIT}}$  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**.

## Grouping and Archives

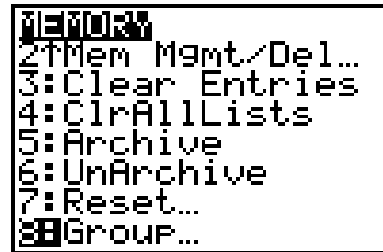
### *Saving Objects as Groups*

You have just finished a class in which you collected data for a free-falling object. The data are in **L1** and **L2**. You finally fit a model to the data (**Y1**), and the bell is about to ring. You need to clear this information out of the graphing handheld and prepare for your next class.

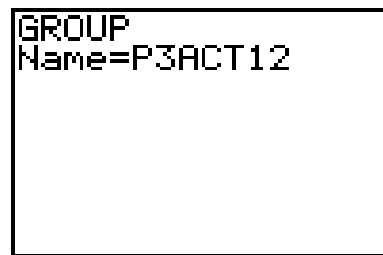
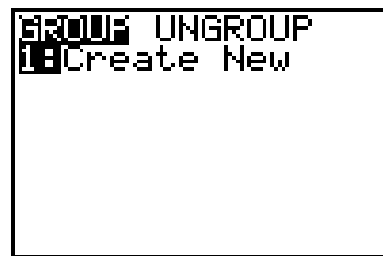
Your options are to run to a computer and save everything or to save it in archive memory as a group on a graphing handheld.



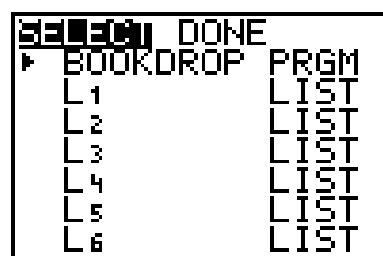
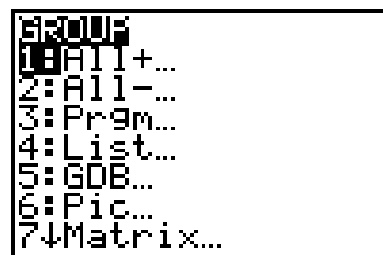
1. Press **2nd** **[MEM]** **8** to select **8:Group**.



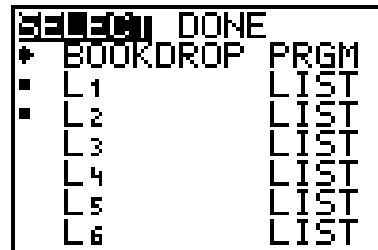
2. Select **1:Create New**, and enter the name you want for the total data you are about to save. In this example, the group is named **P3ACT12** for period 3 activity 12. Press **ENTER**.



3. Select what you want to save with this name. Because three different types of objects (list, equation, program) are stored in this example, select **2:All-**.

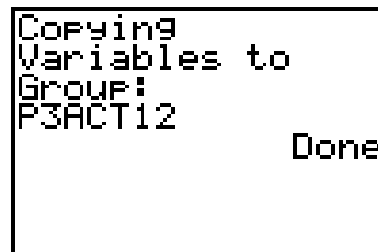
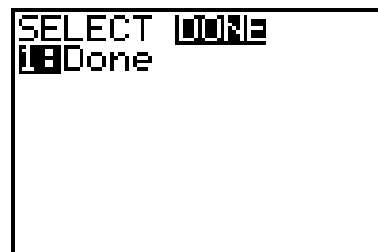


4. Move down the list, pressing **ENTER** beside any object you want stored. When they are selected, the arrow will turn into a square.



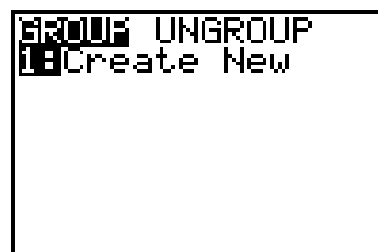
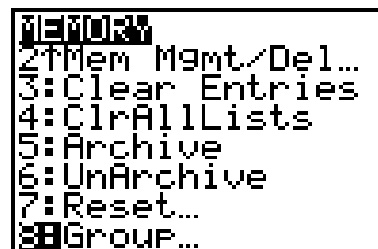
5. When you have finished your selection, press **▶** and **ENTER**.


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



### Ungrouping



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




2. Press  to select **UNGROUP**.

**Note:** The \* next to the names shows that they are in archived memory, not in the regular RAM.

```
GROUP UNGROUP
1:*AA
2:*MATH
3:*P3ACT12
4:*QUEUE
```

3. Press  to move down and select the group you want. Press  when you are beside an object you want to unarchive.

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

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

```
GROUP UNGROUP
1:*AA
2:*MATH
3:*P3ACT12
4:*QUEUE
```

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

L1 LIST
```

```
Ungrouping:
P3ACT12
  L1 LIST
  L2 LIST
  Done
```

### To Archive or Unarchive

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

```

MEM MGMT
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    20592
ARC FREE    521181
1:All...
2:Real...
3:Complex...
4>List...
5:Matrix...
6↓Y-Vars...
    
```

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

```

RAM FREE    20592
ARC FREE    521181
3↑Complex...
4>List...
5:Matrix...
6:Y-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**.

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

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

```

RAM FREE    23446
ARC FREE    64406
1:*AVALANCH    609
2:*ZBRSTD      371
3:*ZMINFO      94
    
```