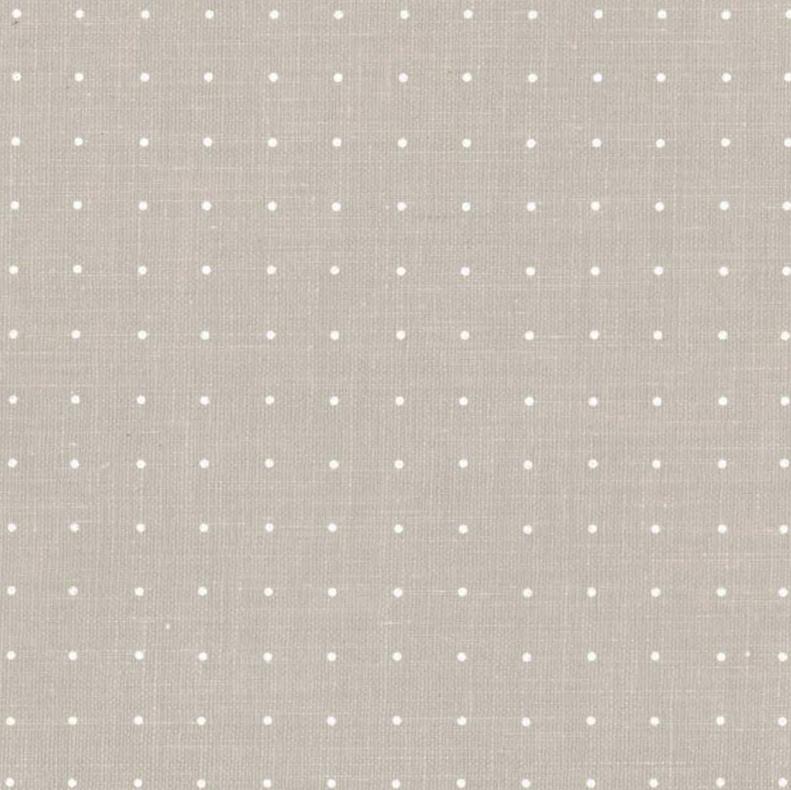




LisaCalc

Lisa

LisaCalc



LisaCalc

Guide to Lisa Manuals

Set up your Lisa following the setup procedures in the Lisa accessories box or in Appendix 1, Setup Procedures, in the *Lisa Owner's Guide*.

Go through Section A, LisaGuide, in the *Lisa Owner's Guide*, for an introduction to the Lisa.

If your dealer or service representative did not set your system Preferences so that the Lisa knows what external devices are attached, follow the instructions in Section D, Desktop Manager Reference Guide, under Set, in the *Lisa Owner's Guide*.

- ▶ Go to Section A, Getting Started, in the manual for each office tool that you want to learn, for the essentials of using that tool.
-

Go to Section B, Lisa Fundamentals, in the *Lisa Owner's Guide*, for the background information you need before beginning long-term work on the Lisa.

You are now ready to start doing your own work on the Lisa:

- If you want self-paced instructions for using a tool, go to Section B, Tutorial, in that tool manual.
 - If you want instructions for performing specific tasks with a tool, go to Section C, Reference Guide, in that tool manual.
-

For specific instructions on filing and desktop management, go to Section D, Desktop Manager Reference Guide, in the *Lisa Owner's Guide*.

For more information on the Lisa hardware, tips on caring for the Lisa, and suggestions for troubleshooting when the system isn't working properly, go to the other sections of the *Lisa Owner's Guide*.

LisaCalc

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Contents

Preface

A. Getting Started with LisaCalc

A quick introduction to the basic skills needed to use LisaCalc.

B. LisaCalc Tutorial

Self-paced instructions on LisaCalc using examples on the Lisa.

C. LisaCalc Reference Guide

Complete information on LisaCalc consisting of an overview and step-by-step procedures.

D. Appendixes

E. Index

Preface

LisaCalc is an electronic spreadsheet and financial modeling tool that helps you perform simple arithmetic problems or complex data analyses. Using LisaCalc you can test variables in the spreadsheet to help you make decisions. You can print your spreadsheets, and you can move them into LisaGraph to create a graph of the data.

This manual contains three kinds of documentation of LisaCalc:

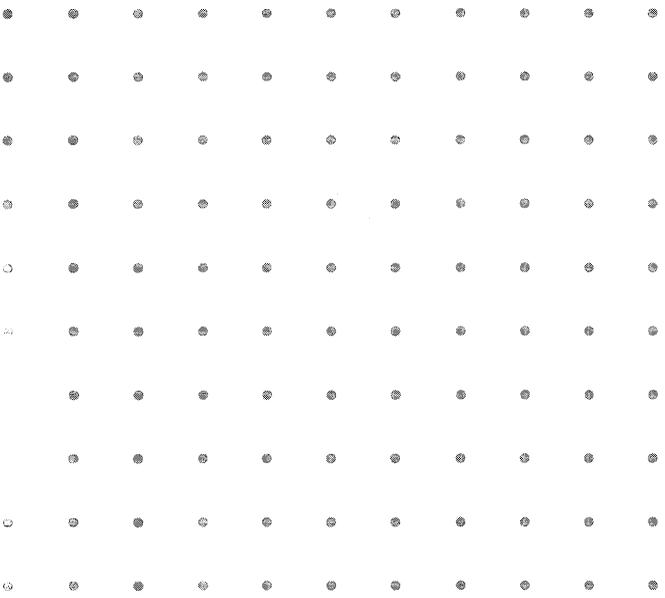
- Section A, Getting Started with LisaCalc, is a quick introduction to the tool. It is designed to give you the basic skills for using LisaCalc.
- Section B, LisaCalc Tutorial, is a step-by-step guide to the major features of LisaCalc. It includes suggestions on how to use LisaCalc efficiently and effectively.
- Section C, LisaCalc Reference Guide, is a complete reference section. It contains instructions for performing specific tasks, including the details of how each feature works.

The material in this manual assumes that you have used LisaGuide, which teaches you the fundamentals of using the Lisa. The LisaGuide diskette came in the front pocket of the *Lisa Owner's Guide*, and instructions for using it appear in Section A of that manual.

Section B, Lisa Fundamentals, of the *Lisa Owner's Guide*, contains important background information about setting up and using the Lisa for long-term work. Make sure you understand the concepts in that section before going on to either the Tutorial or the Reference Guide. Refer to Section D, Desktop Manager Reference Guide, of the *Lisa Owner's Guide*, when you need to know how to do filing or how to perform any of the other tasks outlined in Section B, Lisa Fundamentals.

The material in this manual can be used in either short or long blocks of time. You can complete Getting Started in about 30 minutes. Then you can either go through the Tutorial one chapter at a time or start creating your own documents, looking up procedures in the Reference Guide as you need them.

Section A
Getting Started
with LisaCalc



Getting Started with LisaCalc

With LisaCalc you can produce income and expense statements, budgets, and do complex forecasting — all automatically.

LisaCalc can assist you in quickly making key decisions by allowing you to evaluate various alternative situations that you otherwise wouldn't have time to consider.

Getting Started with LisaCalc is a hands-on exercise. By going step by step through an easy example, you will quickly become familiar with the basic skills for using LisaCalc, and afterward be able to create, edit, file, and print your own LisaCalc documents.

What You Need to Get Started

Here's what you need

- A Lisa set up and plugged in, with the keyboard and mouse attached.
- A ProFile set up and plugged in, with the Office System and LisaCalc tool on it.
- A Printer set up and plugged in if you want to print. Make sure your printer is hooked up to your Lisa and turned on. Printing is optional.
- About 30 minutes.

Note: If your system is not already set up and configured, refer to the *Lisa Owner's Guide*, Appendix 1, Setup Procedures.

ProFile

Lisa

Keyboard

Mouse



If you haven't yet gone through LisaGuide, in which Lisa introduces Lisa, now is a good time to do so — it will make Getting Started even easier. For instructions on starting LisaGuide, refer to the *Lisa Owner's Guide*, Section A, LisaGuide.

If you've already gone through a Getting Started for another Lisa tool, you'll see many similarities in using LisaCalc — the basic concepts for using each Lisa tool are the same.

Starting Up

What You're About To Do

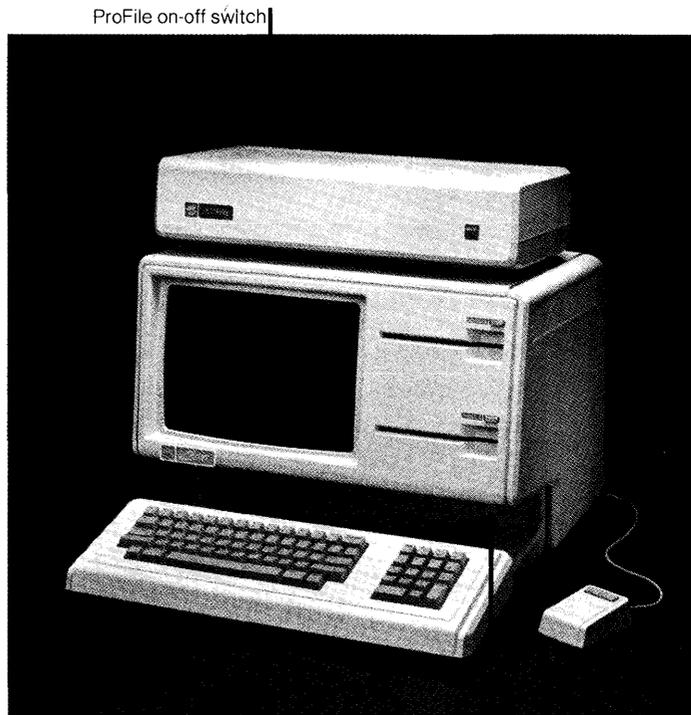
Follow the numbered steps below and on the next page to:

- Turn on and start up your ProFile and Lisa.
- Learn how to brighten the screen if it has dimmed automatically.

Note: If your ProFile and Lisa are already on, skip to step 3. The red ProFile light is lit when the ProFile is on, and the Lisa on-off button is lit when the Lisa is on.

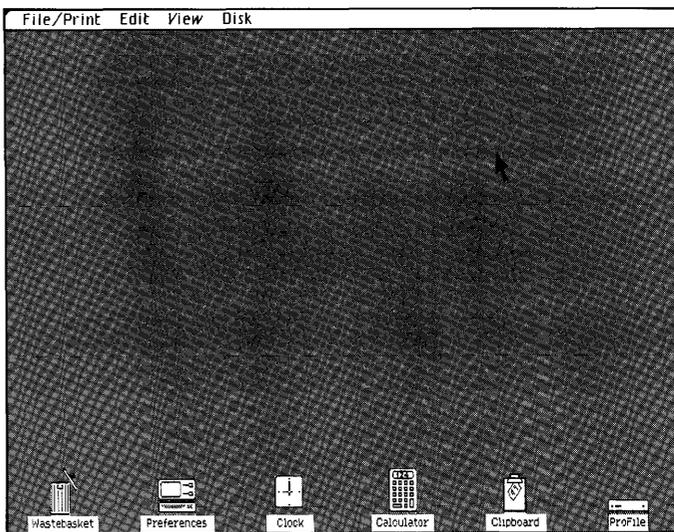
Do This

- 1 Turn on your ProFile by pressing the on-off switch on the back, left-hand side of the ProFile, as shown.
- 2 Turn on your Lisa by pressing the on-off button, at the lower, right-hand side of the Lisa, as shown.



Do This

- 3 After several minutes, when the red ProFile light stops flashing, your screen should look something like the one to the right. (See something different? Refer to the *Lisa Owner's Guide*, Section G, Troubleshooting.)



- 4 If your Lisa has been on for a period of time with no activity, the screen may have automatically dimmed. If your screen is dim, just move the mouse to brighten it.



Screen dim? Move the mouse

The Desktop and the Mouse

What You're About To Do

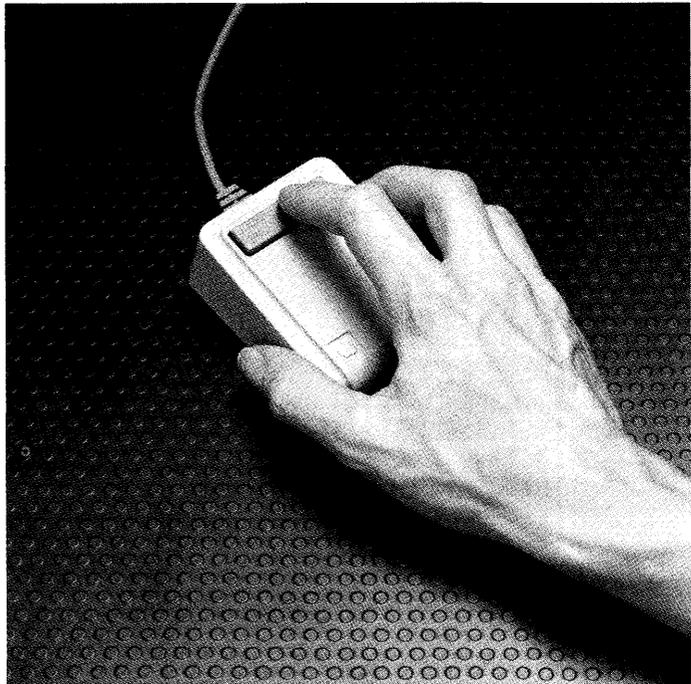
The gray area of your screen is called the **desktop**. Like the desktop of an office desk, it's where you do your work.

The **mouse** is what you use to communicate with your Lisa — you use it to point out what it is you want done.

To get familiar with your Lisa's desktop and how to use the mouse, follow the steps below.

Do This

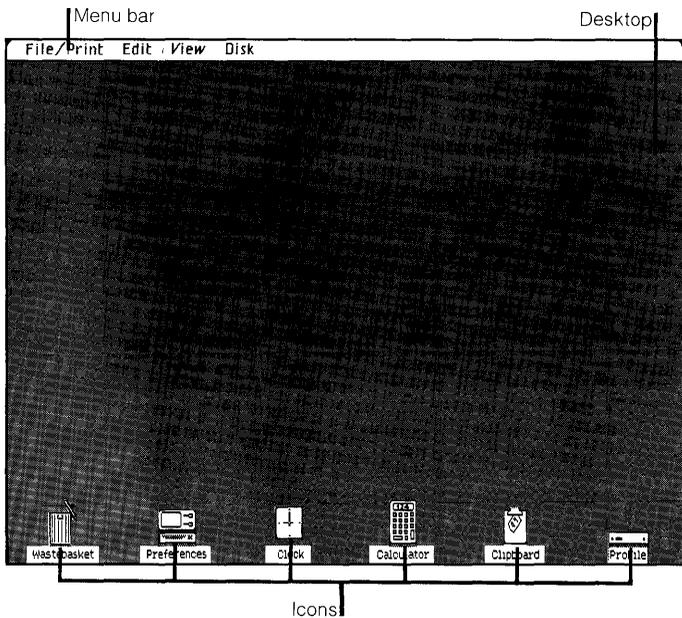
- 1 Hold the mouse as shown. (Don't press the mouse button yet.)



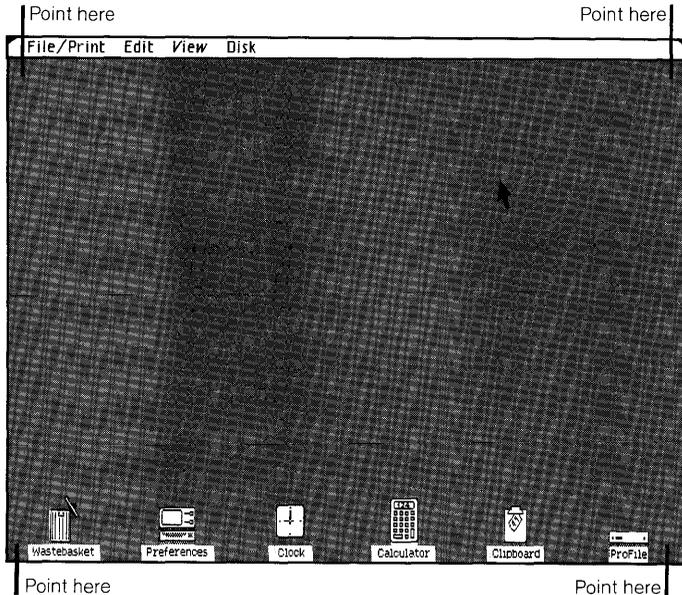
Do This

- Slide the mouse on your desk to move the pointer around the Lisa desktop — the gray part of your screen.

Notice the **menu bar** across the top of your screen — it contains **menus** of different actions you can take. Along the bottom of your screen are various **icons** — graphic symbols that stand for different things.



- To get oriented, move the pointer to the different spots shown to the right. (Trouble making the pointer go where you want it to go? Lift up and reposition the mouse.)



Seeing What's on a Disk

What You're About To Do

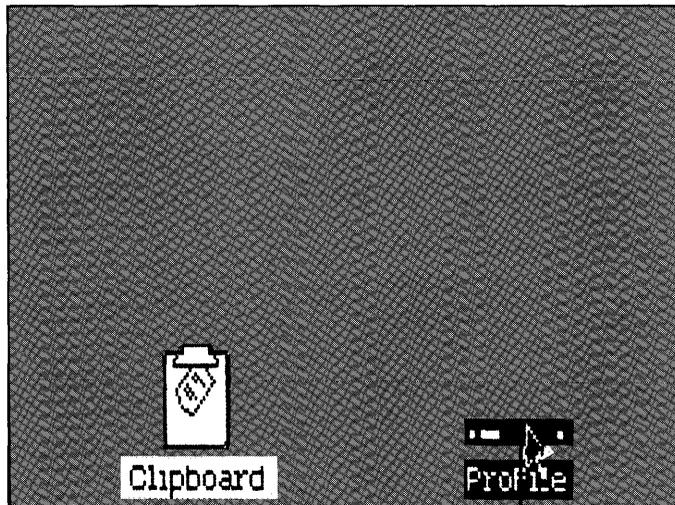
To get at the document you'll work with, you first need to open the ProFile disk icon as described in the steps below.

The way you'll open the disk will illustrate your Lisa's most general principle:

- First you select something.
- Then you do something to what you've selected.

Do This

- 1 Select (highlight) the ProFile disk icon by placing the tip of the pointer on it and clicking the mouse button, as shown. (Icon not highlighted? Try again.)



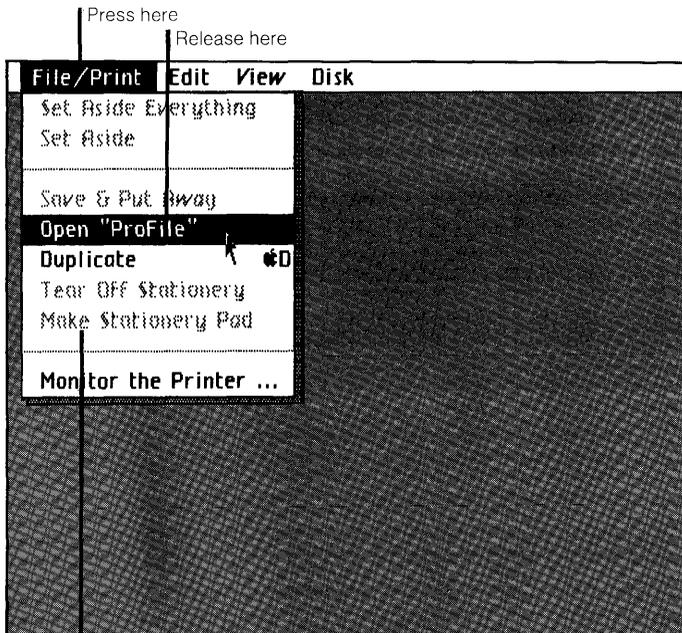
Click on ProFile to select

Do This

- Open the selected disk icon by choosing Open "ProFile" from the File/Print menu.

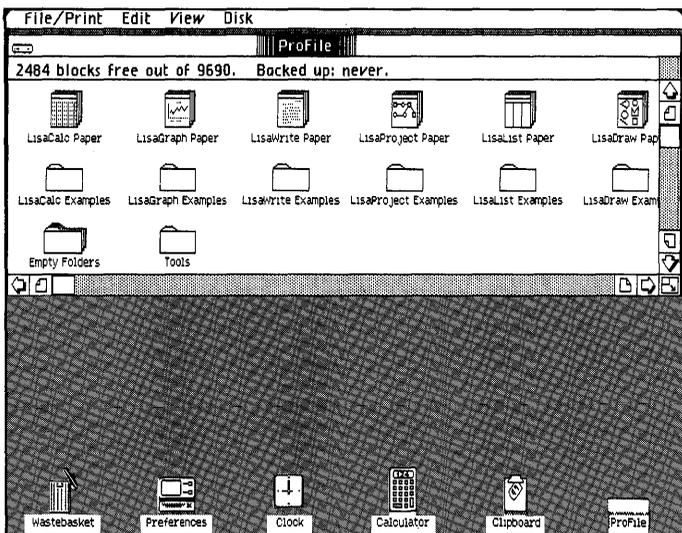
Here's how

- Press and hold with the pointer's tip on File/Print in the menu bar.
- Move the pointer down and release when Open "ProFile" is highlighted. (Is the Open menu item dim? You probably clicked somewhere else on the gray part of the screen and deselected the ProFile icon. Go back to step 1 and make sure the ProFile icon is selected.)



Note: When a menu item is dim, you can't choose it

- Notice the window to the ProFile that zooms open on your Lisa's desktop. Your ProFile is like a very large file drawer — it's where you'll keep most of your work.



Pulling a Document

What You're About To Do

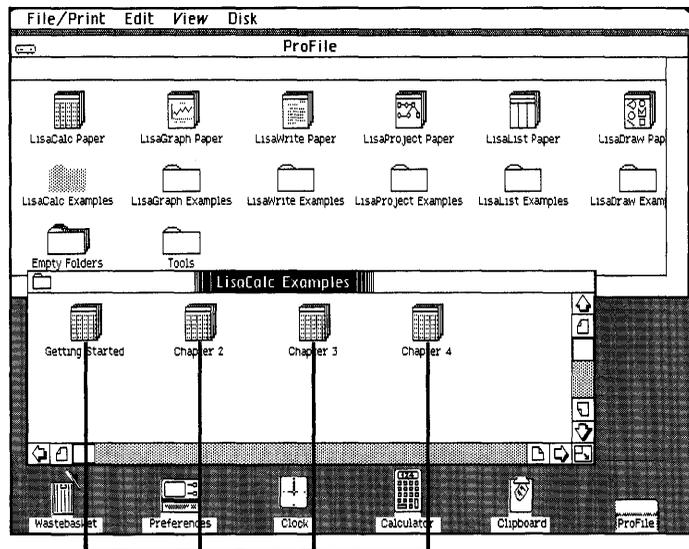
Inside the ProFile window you should see several stationery pads and folders. The LisaCalc Examples folder contains the example you'll be working on here. In the steps below, you will:

- Open the LisaCalc Examples folder.
- Tear off a sheet from the Getting Started stationery pad that's inside the folder.
- Move the new sheet, or document, to a clear spot in the folder.
- Give the new document the name Sales Forecast.
- Open the document.

Do This

- To open the LisaCalc Examples folder:
 - 1 Select the LisaCalc Examples folder by clicking on it.
 - 2 Choose Open "LisaCalc Examples" from the File/Print menu.

Notice the window to the LisaCalc Examples folder that zooms open, and its contents, as shown. The "spreadsheet" patterns on the icons in the folder show they are LisaCalc icons.

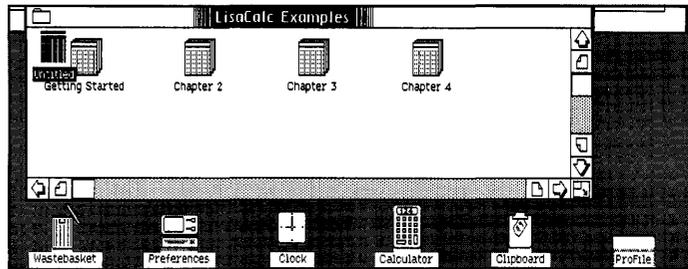


LisaCalc icons

Do This

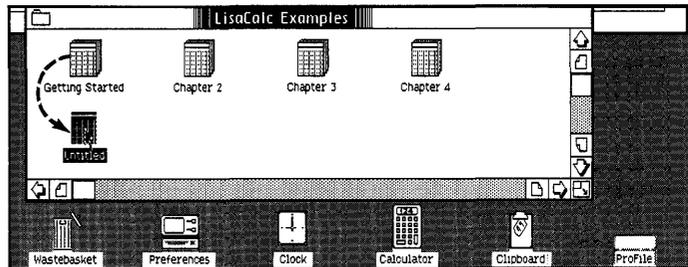
- Copies of the Getting Started example are on the Getting Started stationery pad. To tear off a sheet from the pad:

- 1 Select the Getting Started pad icon.
- 2 Choose Tear Off Stationery from the File/Print menu and wait a moment until the new document appears, as shown.



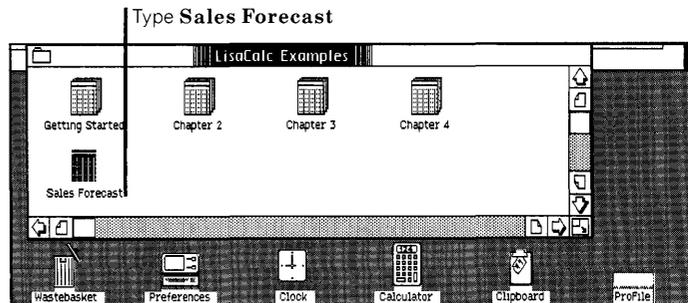
- To move the new icon out of the way, to a clear spot in the folder:

- 1 Place the pointer on the icon.
- 2 Press and hold down the mouse button and move the icon as shown; then release the mouse button.



- To rename the new document:

- 1 Make sure the untitled document icon is still selected (highlighted). If you've deselected the icon by clicking elsewhere on the screen, select it again by clicking on it.
- 2 Type the name **Sales Forecast**. (Typing mistake? Use the **Backspace** key to correct it.)



Do This

- To open the Sales Forecast document:

1 Make sure the document icon is selected (highlighted).

2 Choose Open "Sales Forecast" from the File/Print menu.

Notice how the icon zooms open into a window. Wait a minute — the hourglass, ▾, means wait — until the LisaCalc tool displays the Sales Forecast document, as shown.

	A	B	C	D	E	F
1		Last Quarter				
2						
3		Number of Units Sold	700			
4		Avg Sale Price per Unit \$	200			
5		Avg Cost per Unit \$	100			
6						
7		Sales Revenue	\$ 140,000			
8		Cost of Goods Sold	\$ 70,000			
9		Operating Expenses	\$ 30,000			
10		PROFIT	\$ 40,000			
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

The LisaCalc Document

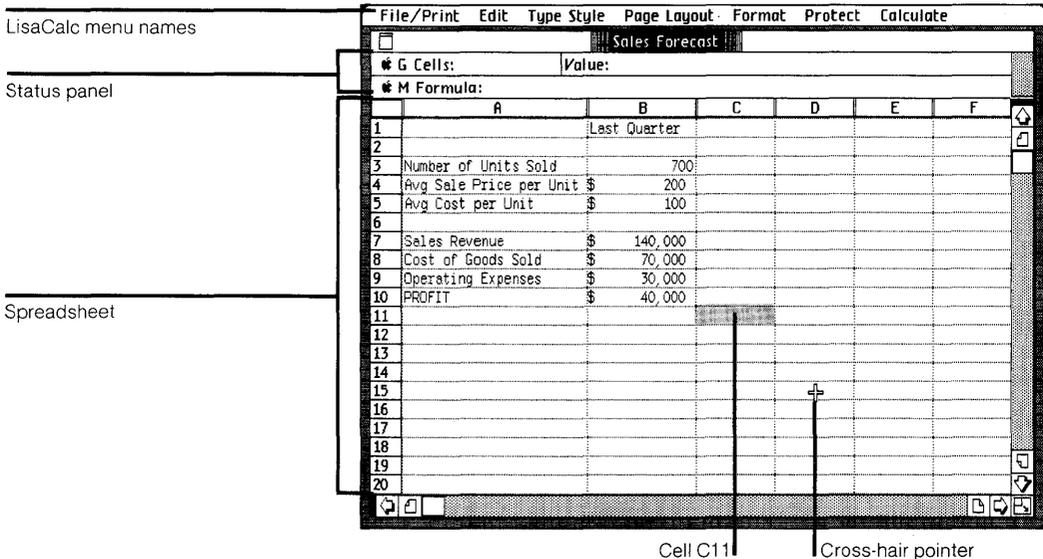
The Sales Forecast document is now open on your Lisa's desktop.

Across the menu bar at the top of the screen are the **LisaCalc menu names**. Each menu contains a list of actions you can take with a LisaCalc document.

The LisaCalc spreadsheet is composed of **lettered columns** and **numbered rows** which intersect to form the **cells** into which you enter information. For example, cell C11 is in column C, row 11.

The **status panel**, above the spreadsheet, contains areas labeled Cells, Value, and Formula, which display a selected cell's coordinates (column and row location), value, and formula.

Without pressing the mouse button, move the pointer around the screen and notice how the shape of the pointer changes to an **arrow pointer**, \uparrow , when it's over the menu bar, to a **text pointer**, I , when it's over the Cells section of the status panel, and to a **cross-hair pointer**, $+$, when it's over the spreadsheet.



What You Are Going to Do

Imagine you work for a fictional company called Switch-On Communications, Inc. One of your competitors has recently introduced a business phone similar to one you produce, but for sale at a lower price than yours. In order to remain competitive, you are planning to lower the price of your phone. You are now preparing next quarter's sales forecast, and you want to see how many lower-priced phones you will have to sell in order to meet your profit objectives.

In the next several pages you will learn to:

- 1. Enter values into cells.**
- 2. Format cell entries so the numbers appear as dollar amounts.**
- 3. Enter formulas so calculations are performed automatically.**
- 4. Ask “What If?” by changing values and evaluating changed results.**
- 5. Change the width of a column so your new column heading will fit.**

When you are finished, your spreadsheet will look like the one below. Compare it with the spreadsheet now on your screen.

Change column width

	A	B	C	D	E
1		Last Quarter	Next Quarter		
2					
3	Number of Units Sold	700	850		
4	Avg Sale Price per Unit \$	200 \$	185		
5	Avg Cost per Unit \$	100 \$	92		
6					
7	Sales Revenue	\$ 140,000	\$ 157,250		
8	Cost of Goods Sold	\$ 70,000	\$ 78,200		
9	Operating Expenses	\$ 30,000	\$ 34,000		
10	PROFIT	\$ 40,000	\$ 45,050		
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

Ask "What If?"

Entering Values

What You're About To Do

Following the steps below, you will enter the values for next quarter's forecast into column C. You'll begin with the assumption that next quarter you'll sell the same number of units at the same price as last quarter. You predict, however, that your operating expenses for next quarter will increase.

Do This

- 1 Enter the word **Next**, for Next Quarter, into cell C1.

Here's how

- Select cell C1 by placing the pointer in the cell and clicking the mouse button once. (Select the wrong cell? Move the pointer to the cell you want and click.)
- Type **Next** and press **Enter**. (Make a mistake? **Backspace** or choose Clear Entries from the Edit menu.)

	A	B	C	D	E
1		Last Quarter	Next		
2					
3	Number of Units Sold	700			
4	Avg Sale Price per Unit	\$ 200			
5	Avg Cost per Unit	\$ 100			
6					
7	Sales Revenue	\$ 140,000			
8	Cost of Goods Sold	\$ 70,000			
9	Operating Expenses	\$ 30,000			
10	PROFIT	\$ 40,000			
11					
12					
13					
14					
15					
16					

Do This

Follow the same procedure to enter the number values into their appropriate cells.

- 2 Enter **700** into cell C3.
- 3 Enter **200** into cell C4.
(Don't worry about dollar signs yet.)
- 4 Enter **100** into cell C5.
- 5 Enter **34000** into cell C9.
(Don't forget to press **Enter**.)

File/Print Edit Type Style Page Layout Format Protect Ca					
Sales Forecast					
G Cells: C9			Value (Number): 34000		
M Formula:					
	A	B	C	D	E
1		Last Quarter	Next		
2					
3	Number of Units Sold	700	700		
4	Avg Sale Price per Unit \$	200	200		
5	Avg Cost per Unit \$	100	100		
6					
7	Sales Revenue	\$ 140,000			
8	Cost of Goods Sold	\$ 70,000			
9	Operating Expenses	\$ 30,000	34000		
10	PROFIT	\$ 40,000			
11					
12					
13					
14					
15					
16					

Formatting Cell Entries

What You're About To Do

All the figures you are dealing with are dollar amounts except for the number of units sold. Follow the steps below to change the format of the cells C4 through C10 so that their entries will be displayed as dollar amounts.

Do This

- 1 Select the cell range from C4 to C10, as shown.

Here's how

- Place the pointer in cell C4.
- Press and hold down the mouse button as you move the pointer down to cell C10; then release. (Select the wrong range? Move the pointer to cell C4 and begin again.)

Press here

		File/Print	Edit	Type Style	Page Layout	Format	Protect	Ca
		Sales Forecast						
		G Cells: C4:C10		Value:				
		M Formula:						
		A	B	C	D	E		
1			Last Quarter	Next				
2								
3		Number of Units Sold	700	700				
4		Avg Sale Price per Unit	\$ 200	200				
5		Avg Cost per Unit	\$ 100	100				
6								
7		Sales Revenue	\$ 140,000					
8		Cost of Goods Sold	\$ 70,000					
9		Operating Expenses	\$ 30,000			34,000		
10		PROFIT	\$ 40,000					
11								
12								
13								
14								
15								
16								

Release here

Do This

- 2 Choose \$1,235 from the Format menu. (Choose the wrong menu item? Go back and choose the one you want.)

Notice how the values you've already entered now appear as dollar amounts. Entries into the remaining formatted cells will also appear as dollar amounts.

File/Print Edit Type Style Page Layout Format Protect Ca					
		Sales Forecast			
G Cells: C4:C10		Value:			
M Formula:					
	A	B	C	D	E
1		Last Quarter	Next		
2					
3	Number of Units Sold	700	700		
4	Avg Sale Price per Unit	\$ 200	\$ 200		
5	Avg Cost per Unit	\$ 100	\$ 100		
6					
7	Sales Revenue	\$ 140,000			
8	Cost of Goods Sold	\$ 70,000			
9	Operating Expenses	\$ 30,000	\$ 34,000		
10	PROFIT	\$ 40,000			
11					
12					
13					
14					
15					
16					

Entering Formulas

What You're About To Do

Sales Revenue = Number of Units Sold X Avg Sale Price per Unit

The formula for that is: $C3 * C4$

You want the calculated result of formula $C3 * C4$ to appear in cell C7, Sales Revenue. Then, you want to calculate the Cost of Goods Sold, and the Profit.

To enter a formula, you follow a different procedure than you do to enter a value. First, you select the cell which is to contain the formula's calculated result. Then, you enter the formula into the status panel, as described below.

Do This

1 Select cell C7.

2 **Important:** You always enter a formula via the status panel. Select an insertion point in the formula area of the status panel by clicking once after the word "Formula:", as shown.

First select cell C7

	A	B	C	D	E
1		Last Quarter	Next		
2					
3	Number of Units Sold	700	700		
4	Avg Sale Price per Unit \$	200 \$	200		
5	Avg Cost per Unit \$	100 \$	100		
6					
7	Sales Revenue	\$ 140,000	\$ 34,000		
8	Cost of Goods Sold	\$ 70,000	\$ 34,000		
9	Operating Expenses	\$ 30,000	\$ 34,000		
10	PROFIT	\$ 40,000	\$ 34,000		
11					
12					
13					
14					
15					
16					

Then click in formula area

Do This

- 3 Is there a blinking insertion point after the word "Formula:"? If not, repeat step 2. If so, type C3*C4 and press **Enter**. (Make a mistake? **Backspace** or choose Clear Entries from the Edit menu.)

Notice the calculated result for Sales Revenue that appears in cell C7.

Type this and press **Enter**

File/Print Edit Type Style Page Layout Format Protect Ca					
Sales Forecast					
G Cells: C7			Value (Number): 140000		
M Formula: C3*C4					
	A	B	C	D	E
1		Last Quarter	Next		
2					
3	Number of Units Sold	700	700		
4	Avg Sale Price per Unit	\$ 200	\$ 200		
5	Avg Cost per Unit	\$ 100	\$ 100		
6					
7	Sales Revenue	\$ 140,000	140000		
8	Cost of Goods Sold	\$ 70,000			
9	Operating Expenses	\$ 30,000	\$ 34,000		
10	PROFIT	\$ 40,000			
11					
12					
13					
14					
15					
16					

Follow the procedure in steps 1 - 3 to enter the following formulas:

- 4 Enter the formula for Cost of Goods Sold, C3*C5, so the calculated result appears in cell C8. (Make a mistake? **Backspace** or choose Clear Entries from the Edit menu, and be sure to enter the formula via the status panel.)
- 5 Enter the formula for Profit, C7-C8-C9, so the calculated result appears in cell C10.

File/Print Edit Type Style Page Layout Format Protect Ca					
Sales Forecast					
G Cells: C10			Value (Number): 36000		
M Formula: C7-C8-C9					
	A	B	C	D	E
1		Last Quarter	Next		
2					
3	Number of Units Sold	700	700		
4	Avg Sale Price per Unit	\$ 200	\$ 200		
5	Avg Cost per Unit	\$ 100	\$ 100		
6					
7	Sales Revenue	\$ 140,000	\$ 140,000		
8	Cost of Goods Sold	\$ 70,000	\$ 70,000		
9	Operating Expenses	\$ 30,000	\$ 34,000		
10	PROFIT	\$ 40,000	36000		
11					
12					
13					
14					
15					
16					

“What If?”: Changing Values and Evaluating Changed Results

What You’re About To Do

Your competition is now selling a phone similar to your Switch-On Exec phone for \$180. Although your phone has a couple of features that the competition’s doesn’t, you are considering lowering the selling price of the Switch-On Exec from \$200 to \$185 in order to remain competitive.

You have set a \$45,000 profit goal for next quarter and want to know how many phones you would have to sell in order to reach that goal. Follow the steps below to evaluate some of the sales options available to you.

Do This

- 1 Enter 185 into cell C4.
(Select the cell, type, and **Enter**.)

Notice how your projected Sales Revenue and Profit figures automatically recalculate — and show you far below your profit goal of \$45,000.

File/Print Edit Type Style Page Layout Format Protect Ca					
		Sales Forecast			
* G Cells: C4		Value (Number): 185			
* M Formula:					
	A	B	C	D	E
1		Last Quarter	Next		
2					
3	Number of Units Sold	700	700		
4	Avg Sale Price per Unit \$	200	185		
5	Avg Cost per Unit \$	100	100		
6					
7	Sales Revenue	\$ 140,000	\$ 129,500		
8	Cost of Goods Sold	\$ 70,000	\$ 70,000		
9	Operating Expenses	\$ 30,000	\$ 34,000		
10	PROFIT	\$ 40,000	\$ 25,500		
11					
12					
13					
14					
15					
16					

Do This

2 Enter 800 into cell C3.

3 As you produce more phones, the Avg Cost per Unit will decrease. So, enter 92 into cell C5.

Notice that if you sell 800 phones for \$185 each, you still won't reach your profit goal of \$45,000.

File/Print Edit Type Style Page Layout Format Protect Ca					
Sales Forecast					
G Cells: C5			Value (Number): 92		
M Formula:					
	A	B	C	D	E
1		Last Quarter	Next		
2					
3	Number of Units Sold	700	800		
4	Avg Sale Price per Unit \$	200	\$ 185		
5	Avg Cost per Unit \$	100	92		
6					
7	Sales Revenue \$	140,000	\$ 148,000		
8	Cost of Goods Sold \$	70,000	\$ 73,600		
9	Operating Expenses \$	30,000	\$ 34,000		
10	PROFIT \$	40,000	\$ 40,400		
11					
12					
13					
14					
15					
16					

4 Now enter 850 into cell C3.

Notice that you will reach your profit goal of \$45,000 if you sell 850 phones at \$185 each.

File/Print Edit Type Style Page Layout Format Protect Ca					
Sales Forecast					
G Cells: C3			Value (Number): 850		
M Formula:					
	A	B	C	D	E
1		Last Quarter	Next		
2					
3	Number of Units Sold	700	850		
4	Avg Sale Price per Unit \$	200	\$ 185		
5	Avg Cost per Unit \$	100	\$ 92		
6					
7	Sales Revenue \$	140,000	\$ 157,250		
8	Cost of Goods Sold \$	70,000	\$ 78,200		
9	Operating Expenses \$	30,000	\$ 34,000		
10	PROFIT \$	40,000	\$ 45,050		
11					
12					
13					
14					
15					
16					

Profit goal reached

Changing the Width of a Column

What You're About To Do

You now want to prepare your Sales Forecast spreadsheet for distribution. Follow the steps below to widen column C and then add to the column heading so that it reads "Next Quarter".

Do This

1 The C/D column handle is the line between the letters C and D at the top of the spreadsheet. Move the cross-hair pointer to the C/D column handle.

2 Press and hold down the mouse button as you move the pointer to the right, just before the letter D; then release.

Notice that column C is now widened.

Press and move with pointer on column handle

	A	B	C	D	E
1		Last Quarter	Next		
2					
3	Number of Units Sold	700	850		
4	Avg Sale Price per Unit	\$ 200	\$ 185		
5	Avg Cost per Unit	\$ 100	\$ 92		
6					
7	Sales Revenue	\$ 140,000	\$ 157,250		
8	Cost of Goods Sold	\$ 70,000	\$ 78,200		
9	Operating Expenses	\$ 30,000	\$ 34,000		
10	PROFIT	\$ 40,000	\$ 45,050		
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

Do This

3 Insert the word **Quarter** in the column heading (cell C1) so that the heading reads “Next Quarter”.

Here’s how

- Click once to select cell C1.
- Click again after the word “Next” to select an insertion point.
- Press the **(Spacebar)** and type **Quarter**.
- Press **(Enter)**.

Your spreadsheet is now complete. To see it without any cell selected, click in the deselect box, as shown.

New heading

File/Print Edit Type Style Page Layout Format Protect Ca				
Sales Forecast				
G Cells:		Value:		
M Formula:				
	A	B	C	D
1		Last Quarter	Next Quarter	
2				
3	Number of Units Sold	700	850	
4	Avg Sale Price per Unit	\$ 200	\$ 185	
5	Avg Cost per Unit	\$ 100	\$ 92	
6				
7	Sales Revenue	\$ 140,000	\$ 157,250	
8	Cost of Goods Sold	\$ 70,000	\$ 78,200	
9	Operating Expenses	\$ 30,000	\$ 34,000	
10	PROFIT	\$ 40,000	\$ 45,050	
11				
12				
13				
14				
15				
16				

Deselect box

Printing Your Document (Optional)

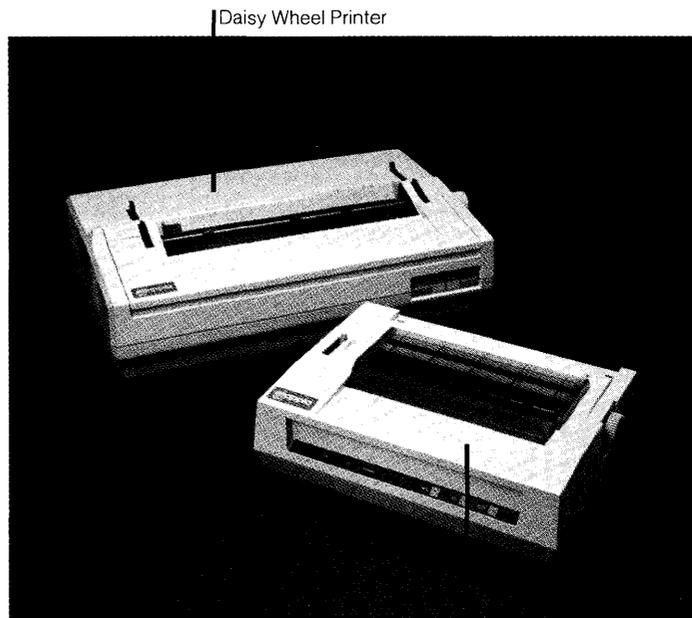
What You're About To Do

If you don't want to print your document now, or don't have a printer available, you can skip this section and go on to **Putting Your Document Away**.

To print a copy of your finished document, follow the steps below.

Do This

- 1 To ensure that your work is saved on the ProFile before you print, choose Save & Continue from the File/Print menu.
- 2 Make sure your printer is hooked up and turned on. (Refer to the manual that came with your printer for information on connecting the printer and loading paper and print ribbons.)



Daisy Wheel Printer

Dot Matrix Printer

Do This

- 3 Choose Print from the File/Print menu to bring up the Print dialog box shown to the right. (See a different message on the screen? Go to the next page and read the "Trouble with printing?" section.)

File/Print	Edit	Type	Style	Page Layout	Format	Protect	Calculate
Print... <input checked="" type="checkbox"/> Finished Quality <input type="checkbox"/> Quick Draft (Text Only)							Cancel
<input type="checkbox"/> While You Wait <input checked="" type="checkbox"/> While You Work							
<input checked="" type="checkbox"/> All Pages <input type="checkbox"/> Only pages: [] Through: []							
Number of Copies: [1] [2] [3] [4] [5] [6] [7] [8] [9] [10]							OK
2							
3	Number of Units Sold		700		850		
4	Avg Sale Price per Unit	\$	200	\$	185		
5	Avg Cost per Unit	\$	100	\$	92		
6							
7	Sales Revenue	\$	140,000	\$	157,250		
8	Cost of Goods Sold	\$	70,000	\$	78,200		

- 4 The current settings in the Print dialog box are fine, so use the mouse to check "OK", as shown. (Trouble? See "Trouble with printing?" on the next page.)

File/Print	Edit	Type	Style	Page Layout	Format	Protect	Calculate
Print... <input checked="" type="checkbox"/> Finished Quality <input type="checkbox"/> Quick Draft (Text Only)							Cancel
<input type="checkbox"/> While You Wait <input checked="" type="checkbox"/> While You Work							
<input checked="" type="checkbox"/> All Pages <input type="checkbox"/> Only pages: [] Through: []							
Number of Copies: [1] [2] [3] [4] [5] [6] [7] [8] [9] [10]							OK
2							
3	Number of Units Sold		700		850		
4	Avg Sale Price per Unit	\$	200	\$	185		
5	Avg Cost per Unit	\$	100	\$	92		
6							
7	Sales Revenue	\$	140,000	\$	157,250		
8	Cost of Goods Sold	\$	70,000	\$	78,200		

Notice that the hourglass appears for a few moments — the hourglass means wait — as your Lisa records the information necessary to print the document.

Click OK

- 5 When your document begins printing and you see the Monitor the Printer dialog box, check "Proceed", as shown. (Trouble? See "Trouble with printing?" on the next page.)

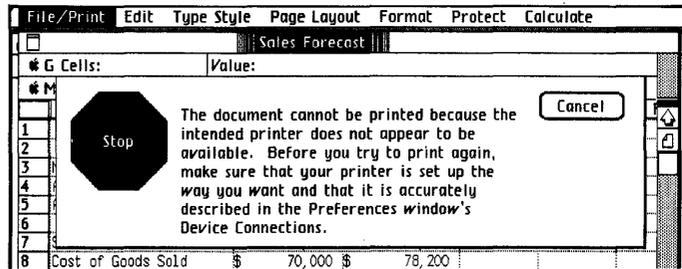
File/Print	Edit	Type	Style	Page Layout	Format	Protect	Calculate
Monitor the Printer..							Terminate
Document being printed: Sales Forecast							
Copy being printed: 1 OF 1							
Page being printed: 0 OF 1							
If you want to do other work while the document is being printed, click Proceed. Otherwise, just wait.							
If you do decide to Proceed, you can get back here by choosing Monitor the Printer from the File/Print menu. You should do that if you hear a whistle or if you want to terminate printing.							Proceed
6							
7							
8							

Notice that once the hourglass disappears and printing begins, you can use your Lisa to do other work.

Click Proceed

Trouble with printing?

- If you see the alert message to the right, refer to the *Lisa Owner's Guide*, Section D, Desktop Manager Reference Guide, under Set Printer Configuration.
- If you see any other alert message, follow its instructions. If needed, refer to the *Lisa Owner's Guide*, Section G, Troubleshooting, under Printers, or see the manual that came with your printer.
- To learn more about printing, refer to Section C, LisaCalc Reference Guide, Chapter 2, under Print.



Putting Your Document Away

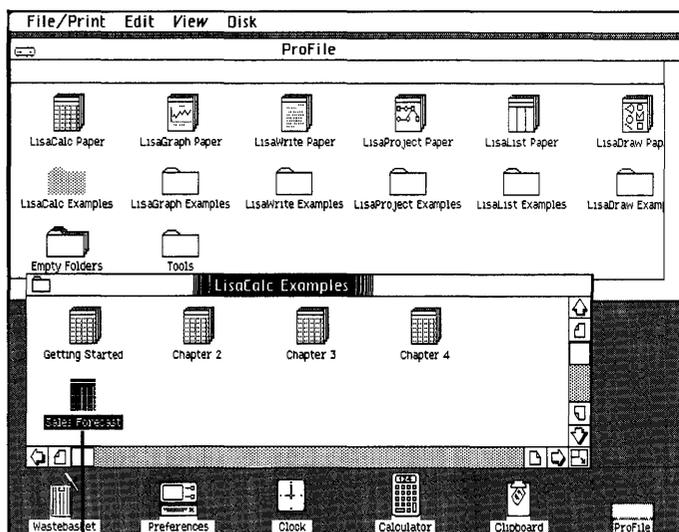
What You're About To Do

Now that you've finished working on your document, follow the steps below to put it away. Even if you chose to print your document and it's still printing, you can continue to use your Lisa to do other work.

Do This

- 1 Choose Save & Put Away from the File/Print menu. (Is the Save & Put Away menu item dim? Then you need to click in the document to make the window active.)

Notice how the window zooms down to a document icon back in its filing home in the LisaCalc Examples folder.



Document is Saved & Put Away

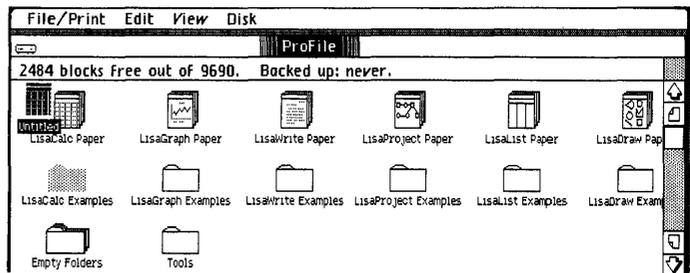
Starting from Scratch

What You're About To Do

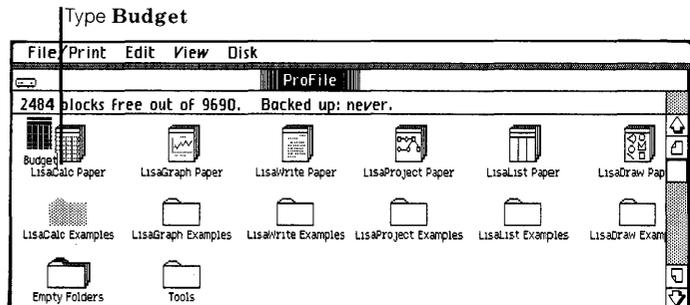
In order to start a new spreadsheet, you need to get a piece of LisaCalc stationery, as described below. Blank LisaCalc stationery is in a pad called LisaCalc Paper, in the ProFile window.

Do This

- 1 Tear off a sheet from the LisaCalc Paper pad at the top of the ProFile window. (Select the pad icon; choose Tear Off Stationery from the File/Print menu.)

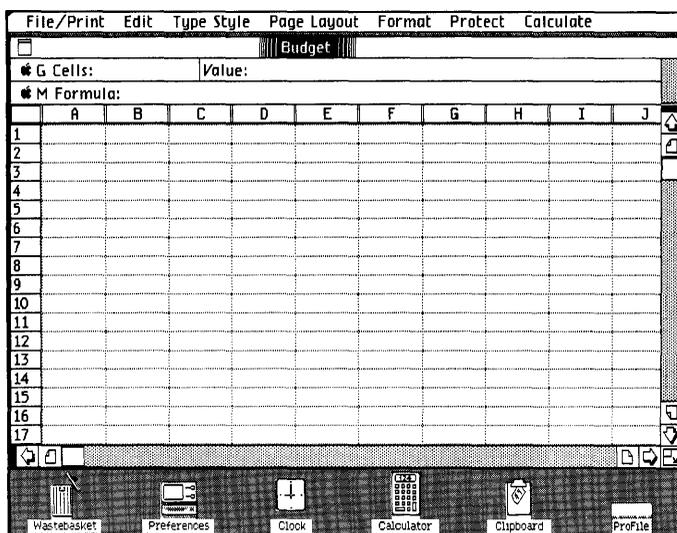


- 2 Don't worry right now about moving the untitled document out of the way. Change the name of the untitled document to **Budget**. (Make sure the icon is selected; then type.)



Do This

- 3 Open the piece of LisaCalc paper you named Budget as you would any document. (Choose Open “Budget” from the File/Print menu.)
- 4 If you want to make your own spreadsheet, do so. Experiment — try different things. Press and move across the menu bar and look at what’s in all your menus. If you want specific information on something, look in the LisaCalc Reference Guide, Section C, or check the index.



Finishing Up

What You're About To Do

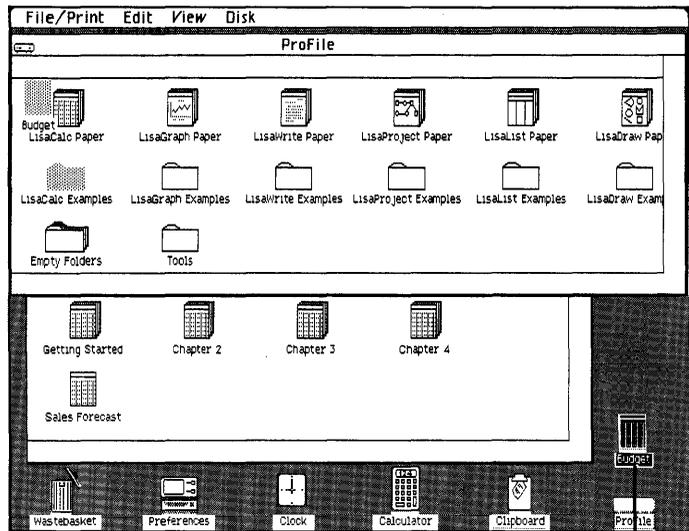
It is a good idea to save all your documents and clear off your Lisa's desktop at least once a day. The steps below illustrate one of the many ways you can manage things on the Lisa desktop.

Note: When you are connecting, disconnecting, moving, or servicing equipment, you must turn off the power. But normally, you should turn off your Lisa only at the end of each week, and always leave your ProFile turned on.

Do This

- 1 Choose Set Aside "Budget" from the File/Print menu and notice how Budget is set aside as an icon on the desktop.

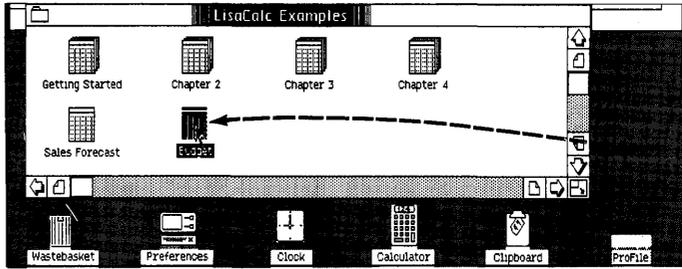
Note: When you're working with several documents at the same time, it's often convenient to keep some of them set aside on the desktop, where it's easy to get at them.



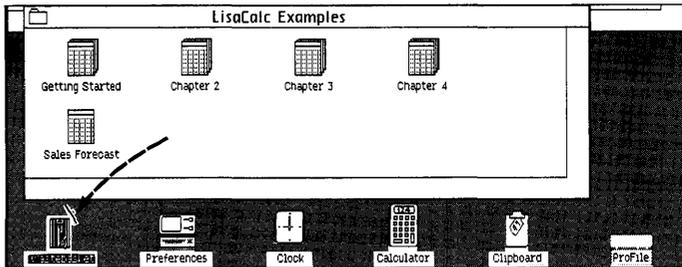
Budget is Set Aside

Do This

- 2 If you want to file the Budget document in a new place, move it to a clear area in the LisaCalc Examples folder, as shown. (Press with the pointer on the icon, move it, and release when the icon is where you want it.)



- 3 If you want to throw away the Budget document, move it to the Wastebasket icon. When the document icon is on the Wastebasket and the Wastebasket icon highlights, release the mouse button and wait for the document to be deposited.

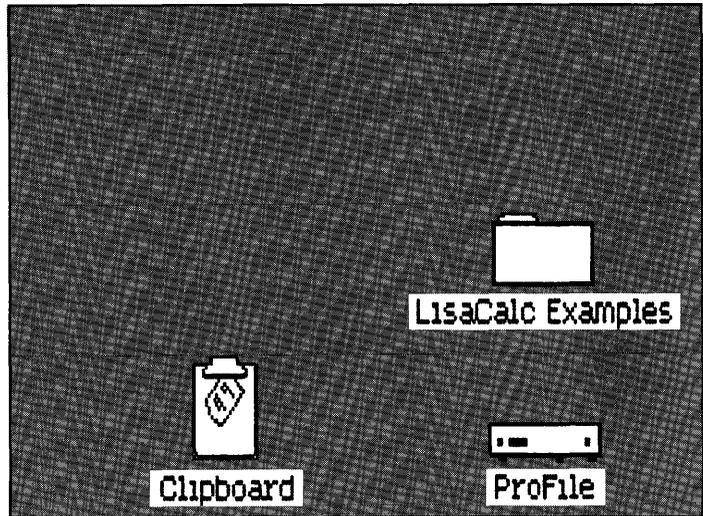


Note: You can always get back the last thing you've thrown away by opening the Wastebasket icon and moving the deposited document back out.

Do This

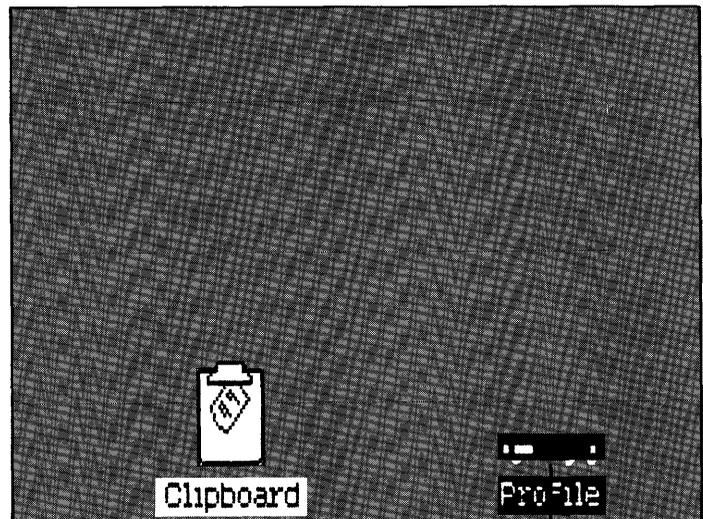
- 4 Now set aside both the LisaCalc Examples folder and ProFile by choosing Set Aside Everything from the File/Print menu.

Notice that both the Folder and ProFile icons are now set aside on the desktop.



- 5 You can put away the LisaCalc Examples folder back in its filing home in the ProFile even when the ProFile window is closed. To do so, select the LisaCalc Examples folder and choose Save & Put Away "LisaCalc Examples" from the File/Print menu.

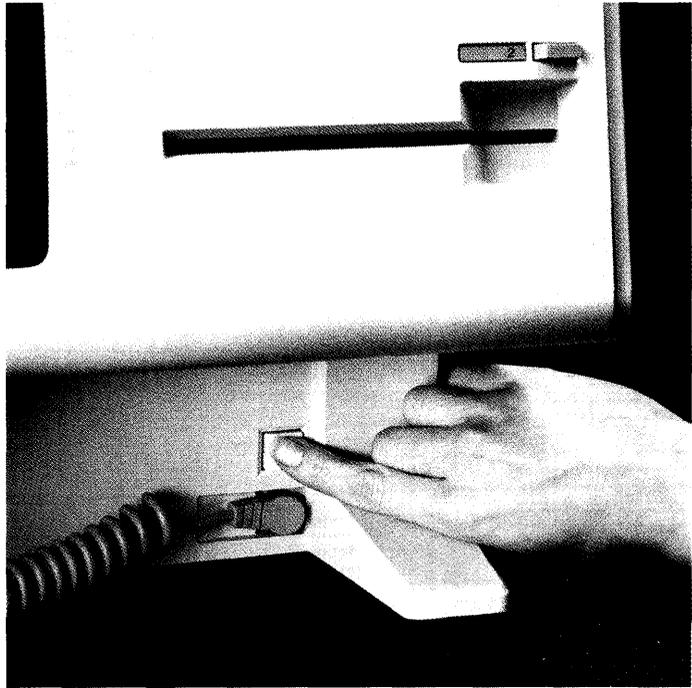
Note: If you want to deselect a selected icon, click once when the pointer is not over the icon.



Folder is Saved & Put Away

Do This

6 When you are ready to work on something else, just open the ProFile again. When you want to turn off Lisa's power — for example, over the weekend — press the lit on-off button, as shown. When you turn on the Lisa again, everything will reappear as you left it when you turned the Lisa off, including documents you may have left open on the desktop. Normally, you should leave the ProFile turned on.



Using LisaCalc

You now have the basic skills necessary for using LisaCalc to produce your own LisaCalc documents. Because the concepts for using each Lisa tool are the same, you also have some of the basic skills for using other Lisa tools: LisaDraw, LisaGraph, LisaList, LisaProject, and LisaWrite.

There is much more you can do with LisaCalc. You can learn about other LisaCalc features by:

- Going through other exercises in the LisaCalc Tutorial, Section B.
- Using the LisaCalc Reference Guide, Section C, as you do your work.
- Just experimenting as you use LisaCalc. Remember — when experimenting, you usually have to select something before taking action with it. It's safe to experiment because most of the things you do can be undone by choosing Undo Last Change from the Edit menu. And if you're experimenting with a document you've torn off of a stationery pad, you can try almost anything and always start fresh by either choosing Revert to Previous Version from the File/Print menu, or by throwing the document away into the Wastebasket, and tearing off a fresh copy from the same stationery pad.

Other LisaCalc Features

-
- Built-in functions, including sum, average, if-then, net present value, compound interest factor, annuity factor, and more. To see what is available, choose Function Hints from the Calculate menu.
 - Being able to Copy a formula and then use Paste Adjusting to replicate it into other LisaCalc cells — no need to retype a formula over and over.
 - Using split screens to evaluate different parts of your spreadsheet at once.
 - Left and right justification, and centering.
 - Inserting new rows and columns.
 - Cutting and pasting between LisaCalc documents, and to LisaWrite and LisaGraph.

Guide to Lisa Manuals

Set up your Lisa following the setup procedures in the Lisa accessories box or in Appendix 1, Setup Procedures, in the *Lisa Owner's Guide*.

Go through Section A, LisaGuide, in the *Lisa Owner's Guide*, for an introduction to the Lisa.

If your dealer or service representative did not set your system Preferences so that the Lisa knows what external devices are attached, follow the instructions in Section D, Desktop Manager Reference Guide, under Set, in the *Lisa Owner's Guide*.

Go to Section A, Getting Started, in the manual for each office tool that you want to learn, for the essentials of using that tool.

- ▶ Go to Section B, Lisa Fundamentals, in the *Lisa Owner's Guide*, for the background information you need before beginning long-term work on the Lisa.
-

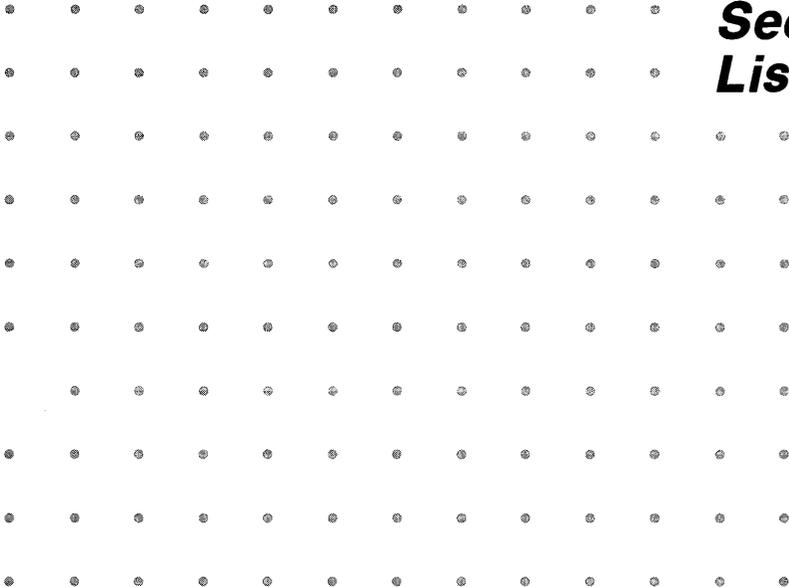
You are now ready to start doing your own work on the Lisa:

- If you want self-paced instructions for using a tool, go to Section B, Tutorial, in that tool manual.
 - If you want instructions for performing specific tasks with a tool, go to Section C, Reference Guide, in that tool manual.
-

For specific instructions on filing and desktop management, go to Section D, Desktop Manager Reference Guide, in the *Lisa Owner's Guide*.

For more information on the Lisa hardware, tips on caring for the Lisa, and suggestions for troubleshooting when the system isn't working properly, go to the other sections of the *Lisa Owner's Guide*.

Section B
LisaCalc Tutorial



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What's in the LisaCalc Tutorial?

This tutorial teaches you about LisaCalc as it guides you step by step through several real-life examples. To get the maximum value from this tutorial, you should try out the examples on your Lisa as you go through it.

All major LisaCalc features are covered in the tutorial, but not always in fine detail. A complete description of each LisaCalc feature can be found in Chapter 2 of Section C, the LisaCalc Reference Guide, in this manual.

Before you start this tutorial, be sure you have completed LisaGuide, in which Lisa introduces Lisa; you can find the LisaGuide diskette in the front pocket of the *Lisa Owner's Guide*. Also, you should have completed Section A, Getting Started with LisaCalc, in this manual. If you haven't completed one or both already, now is a good time to do so.

To complete the activities in this tutorial, you need

- The blank LisaCalc stationery pad that is on your ProFile.
- The sample documents for this tutorial that are in the LisaCalc Examples Folder on your ProFile.

The arrow symbol (►) appears before each activity in the tutorial, and it means "Do something." For example,

- Turn the page to begin the tutorial.

Chapter 1

A Travel Expense Report

A Travel Expense Report

This chapter covers the most basic information about LisaCalc — how to get started, how to create a simple spreadsheet, how to print it, and how to save it. In particular, you will learn how to

- Get a blank spreadsheet.
- Move around within the spreadsheet.
- Enter and edit values.
- Enter and edit formulas.
- Change display format.
- Change column widths.
- Print the spreadsheet.
- Save or discard the spreadsheet.

Getting a Blank Spreadsheet

To see what LisaCalc can do, you're going to set up and fill in a typical business travel expense report. When you finish, you can print it to see the results. Figure 1 shows you what this report looks like when it's typed on a piece of paper.

Travel Expense Report	
Name:	Marco Polo
Dest:	Cathay
Date:	May 1, 1244
Item	
Hotel	55.00
Lunch	5.00
Dinner	13.80
Breakfast	3.75
Car: No. Miles	130
Rate	.20
Total	26.00
Total	103.55

Figure 1. Travel Expense Report

To follow the example in this chapter, you need to create a new LisaCalc spreadsheet,

- ▶ Open the ProFile window by clicking twice on the ProFile icon.
- ▶ Tear off a spreadsheet by clicking twice on the LisaCalc stationery pad icon.
- ▶ Name the new document by typing your initials followed by Ch1. This allows other people to use the same ProFile and not get their documents confused.



LisaCalc Paper



LisaCalc Paper
AO-Ch1

- ▶ Open the document by clicking twice on its icon.



What you now see on your screen — a LisaCalc window containing a blank spreadsheet — should match Figure 2.

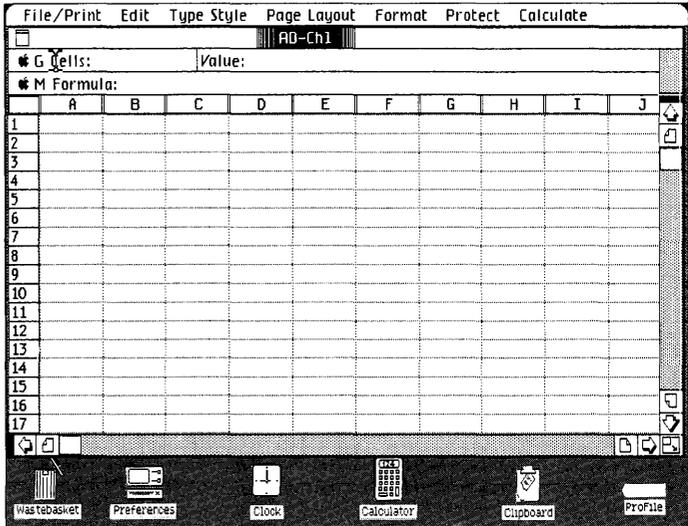


Figure 2. Blank LisaCalc Spreadsheet

The LisaCalc window has two parts. The bottom part is a view of the spreadsheet and the top part is the status panel, which contains information about the spreadsheet.

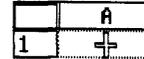
The spreadsheet consists of cells, arranged in rows and columns. The rows run left and right and the columns run up and down. On your screen, the numbers 1 to 17 at the left of the spreadsheet identify the rows. The letters A to J at the top of the spreadsheet identify the columns.

Each cell is identified by a column letter and a row number. For example, cell A1 is the cell in column A and row 1.

The status panel consists of the Cells area, the Value area, and the Formula area; these display the coordinates, value, and formula of the current cell, which is the cell you're currently working with. Since you haven't done anything yet, there is no current cell, and nothing is shown in these areas.

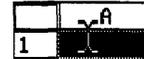
Before you can enter anything in a cell, you have to select it. To select A1,

- ▶ Using the mouse, move the pointer to any point within the cell.

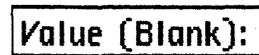
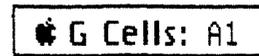


- ▶ Click the mouse button.

When you select A1, it changes to inverse video (black instead of white), indicating that it is now the current cell. The pointer changes to an I-beam. If you move the pointer around, you will discover that it is an I-beam only when it is over the cell. Everywhere else in the spreadsheet, it is still a cross.



In the status panel, A1 now appears in the Cells area, indicating that A1 is the current cell. In addition, in the Value area, the word Blank appears in parentheses after the word Value. This is the part of the status panel that tells you what type of value is in the cell; right now, the cell is blank.



Entering Text and Numbers

LisaCalc cells contain values; a value is either a number or a label. To create the travel expense report, start by typing a label in A1:

- ▶ Type

Travel Expense Report



If you make a mistake, press the **Backspace** key to correct it.

As you type, watch the screen. As soon as you start typing, the pointer disappears and a blinking vertical line appears. This line is called the insertion point; it shows you where the next letter you type will be displayed. If you move the mouse, the pointer reappears, but the insertion point stays where it is. Moving the mouse around does not change the current selection until you press the mouse button.

The letters you type appear simultaneously in two places: in the cell, and in the Value area of the status panel. Also, the word Blank in the Value area has gone away; this is because the cell is no longer blank.

What happens when you get to the right boundary of A1, that is, when you have typed Travel E? From here on, the letters don't appear in A1, but they do appear in the Value area. Why is this?

The reason is that every column in a LisaCalc spreadsheet has a set width. If a value is too long to be shown in the spreadsheet, only the leftmost part of the value is shown. The whole value, however, always appears in the Value area.

Before LisaCalc can do anything with the value in a cell, you must enter the value. To enter the value in A1:

- ▶ Press the **Enter** key on the numeric keypad.



There are a number of different ways to enter a value, which you'll see as you read on. The **Enter** key enters the value while keeping the same cell as the current cell.

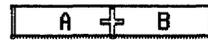
Another change when you press **Enter** is that the Value area now shows the word Text. This means that the value you have just entered is text, rather than a number.

Value (Text):

Changing Column Widths

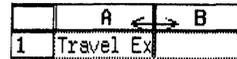
Now you can change the width of column A to hold the whole label you entered. To do this, you have to select the grid handle between column A and column B. The grid handle is the double line between the letters A and B at the top of the column.

- ▶ Move the pointer to the grid handle.

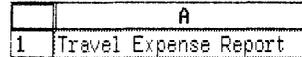


- ▶ Press and hold down the mouse button.

- ▶ Move the pointer to the right. Notice that a flickering line appears where the pointer is.



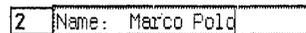
- ▶ When you think the column is wide enough to show the whole label, release the mouse button.



You can move the column boundary to the right or left, as necessary. If it is still not right, repeat the same procedure until all the letters you typed are showing in A1.

Now that you have more room in column A, you can enter some more labels. Start with A2:

- ▶ Select A2. Type



Name: Marco Polo

- ▶ To get to cell A3, press the  key once.



When you select A3, the value in A2 is entered. Whenever you select a different cell, LisaCalc enters the value in the current cell before selecting the new cell.

Correcting Mistakes

In typing the next few labels, you're going to learn some ways to correct mistakes. So type these labels exactly as shown, including the mistakes:

- ▶ Type

Dest: Catay 
Date: Maay 1, 1944
 
Itemm

	A
1	Travel Expense Report
2	Name: Marco Polo
3	Dest: Catay
4	Date: Maay 1, 1944
5	
6	Itemm

You should now be in cell A6.

Backspacing

- ▶ While the insertion mark is still positioned after the double “m,” press the **(Backspace)** key to erase the extra “m.”



Inserting

To change Catay into Cathay:

- ▶ Select cell A3.
- ▶ Position the pointer just after the “t” and click the mouse button. An insertion point appears after the “t.”
- ▶ Type the letter “h.”



In order to insert text in a cell, you have to click the mouse button once to select the cell, and then again to put the insertion point where you want it to be. If you only click the button once, then when you start to type, you will replace the whole value of the cell, rather than inserting text in a particular place.

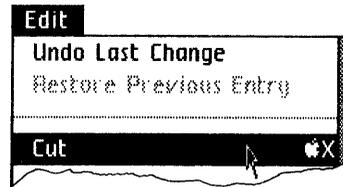
Deleting

To delete the extra “a” in Maay:

- ▶ Select A4.
- ▶ To select a single letter, move the pointer to just before the first “a.” While holding down the mouse button, move the pointer to the right until the letter is shown in inverse video (white on black). Release the mouse button.



- ▶ Choose the Cut item from the Edit menu.



Replacing

To change 1944 to 1244:

- ▶ Move the pointer to the Value area and select the "9," then type a "2."

Date: May 1, 1944
Date: May 1, 1244

This last example shows that text in a cell can be edited either in the spreadsheet view or in the status panel. At this point, your screen should look like Figure 3.

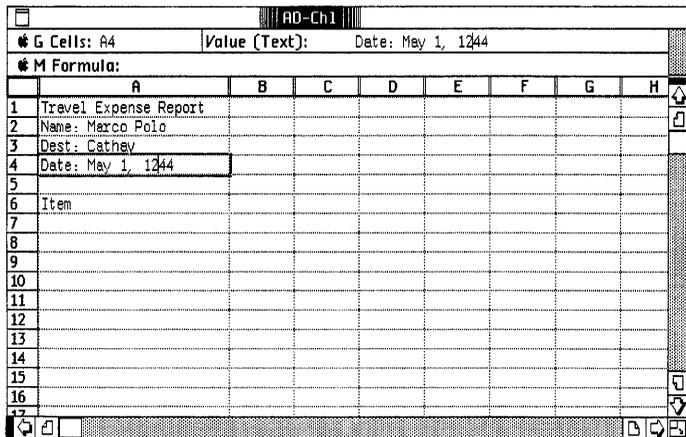


Figure 3. After Correcting Mistakes

Clear Entries

Now, make another deliberate mistake:

- ▶ Select A3.
- ▶ Choose Clear Entries from the Edit menu.

As you can see, Clear Entries wipes out the contents of a cell. It is especially useful when you want to quickly clear a lot of cells at once. It differs from Cut in that Cut puts the contents of the cell onto the Clipboard, and Clear Entries just wipes them out. However, you can still correct the situation.

Undo Last Change

► Choose Undo Last Change from the Edit menu.

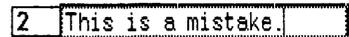
Undo Last Change reverses the effect of the last operation you performed; it “turns back the clock.” In this case, it undoes the Clear Entries. The cell is restored to the state it was in just before the Clear Entries. Not all operations can be undone by Undo Last Change; for example, you cannot undo entering a value in a cell.

Restore Previous Entry

Since Undo only undoes the last operation you did, sometimes you can’t turn back the clock as far as you’d like. To see this,

► Select A2.

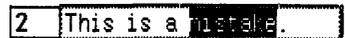
► Type

A screenshot of a spreadsheet cell, labeled '2' in the corner, containing the text "This is a mistake." The cell has a dotted border.

This is a mistake.

What you have typed replaces the previous contents of the cell.

► Select the word “mistake” by positioning the pointer over the word and clicking the mouse button quickly twice.

A screenshot of a spreadsheet cell, labeled '2' in the corner, containing the text "This is a mistake." The word "mistake" is highlighted with a black background.

► Choose Cut from the Edit Menu.

► Choose Undo Last Change from the Edit menu.

Undo Last Change undoes the cut of the word “mistake,” which is the last operation, but it can’t restore the original contents. However, there is a way out.

► Choose Restore Previous Entry from the Edit menu.

Restore Previous Entry returns the cell to the way it was the last time you selected it, no matter how many complicated operations have intervened. However, once you have selected another cell, or chosen Clear Entries, you cannot restore the contents of the original cell.

Now you can enter some of the expense items. To match the travel expense report in Figure 1, the titles for the expenses are going to be in column A and the expenses are going to be in column C.

- ▶ Go to cell A8, either by clicking in the cell or by pressing the  key repeatedly. Type 

Hotel

To enter the hotel amount in C8

- ▶ Press the  key twice.

- ▶ Type 

55.00 

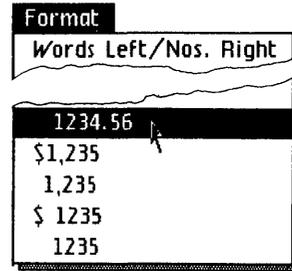
Changing Number Style

Notice that C8 shows the amount as 55, with no zeros. This is because all numbers are shown as simply as possible unless you specify a specific number style. Since almost all the numbers in this spreadsheet are money amounts, you would like to display them as dollars and cents: each number should have a decimal point followed by two digits. To do this, you can change the number style of all the cells to a monetary format. Here's a simple way to change the number style of the whole spreadsheet:

- ▶ Choose Select All of Document from the Edit menu.

This menu option selects all the cells in the spreadsheet. Notice that all the cells on your screen are shown in inverse video.

- Choose 1234.56 from the Format menu.



Each of the monetary number styles shows what the value 1234.56 looks like displayed in that number style. You can display the values with or without a dollar sign, with or without commas, and with or without the cents. If the cents are omitted, the value is rounded to the nearest dollar.

Once you choose 1234.56 as the number style, LisaCalc displays all the numbers in the spreadsheet as dollars and cents, with no dollar sign. In fact, if you look at C8, you'll see that its value is now shown as 55.00.

55.00

Continue entering expenses:

- Select A9 and type

9 Lunch

Lunch  
5 

You might notice that the 5 in A9 is shown as 5, not as 5.00. Whenever a cell is selected, its value is shown unformatted, regardless of the number style in the cell. This is so that you can edit the value. When you leave the cell by selecting another cell, the value reverts to the number style you specified.

- To get to A10, press , which selects the first cell in the next row.



► Type

Dinner (F) (F)

13.8 (Return)

Breakfast (F) (F)

3.75 (Return)

Your screen should look like Figure 4.

	A	B	C	D	E	F	G	H
1	Travel Expense Report							
2	Name: Marco Polo							
3	Dest: Cathay							
4	Date: May 1, 1244							
5								
6	Item							
7								
8	Hotel		55.00					
9	Lunch		5.00					
10	Dinner		13.80					
11	Breakfast		3.75					
12								
13								
14								
15								
16								
17								

Figure 4. After Entering Hotel and Meal Expenses

Entering Formulas

To include the car expense in your report, you need to multiply the number of miles traveled by the amount allotted per mile, which is \$.20 in this example. First, enter the number of miles and the amount per mile in column B:

► With cell A12 selected, type

Car: No. Miles (F)

130 (Return)

Mileage Rate (F)

.20 (Return)

Car Total (F) (F)

To calculate the total car expense, you need to use a formula. A formula is a rule that computes a value, based on other values; it appears in the Formula area of the status panel.

In this case, you want a formula that says:

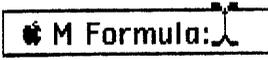
$$\text{Car expense} = \text{Number of miles} \times \text{Amount per mile.}$$

Substituting the corresponding cells, you get

$$C14 = B12 * B13$$

In LisaCalc the * is used as the multiplication operator. To enter the multiplication formula to compute car expense in C14,

- ▶ Select the Formula area by clicking anywhere within the area. An insertion point appears.



- ▶ Type the formula



B12*B13 (Enter)

You can type the B's in lower case, if you want; LisaCalc automatically changes them to upper case when you enter the value.

Your screen should look like Figure 5.

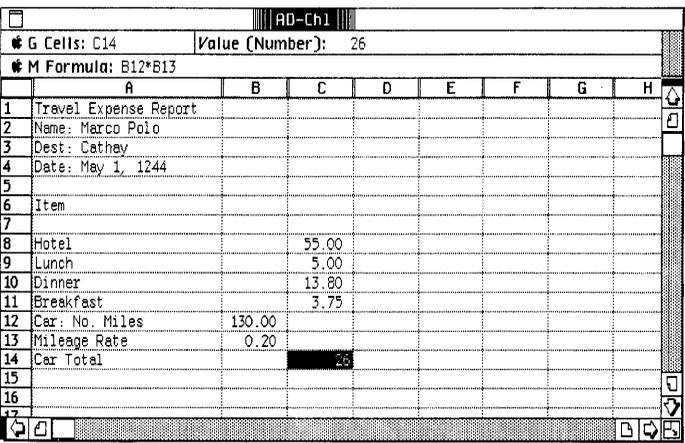


Figure 5. After Entering Car Expenses

C14 now shows the result of the calculation, 26.

Now you're ready to calculate the total for the whole spreadsheet. To do this, you want to add the values in C8, C9, C10, C11, and C14. The formula for this is:

$$C8 + C9 + C10 + C11 + C14$$

- ▶ Enter the label Total in

16	Total
----	-------

 A16.
- ▶ Select C16.
- ▶ Select the Formula area.
- ▶ Type

$C8 + C9 + C10 + C11 + C14$

 (Enter)

$$C8 + C9 + C10 + C11 + C14 \text{ (Enter)}$$

C16 shows the total, 103.55. This formula is somewhat cumbersome; you'll learn an easier way to add a column of figures in the next chapter.

Your screen should look like Figure 6.

	A	B	C	D	E	F	G	H
1	Travel Expense Report							
2	Name: Marco Polo							
3	Dest: Cathay							
4	Date: May 1, 1244							
5								
6	Item							
7								
8	Hotel		55.00					
9	Lunch		5.00					
10	Dinner		13.80					
11	Breakfast		3.75					
12	Car: No. Miles	130.00						
13	Mileage Rate	0.20						
14	Car Total		26.00					
15								
16	Total		103.55					
17								

Figure 6. After Entering Total

Changing Values

Whenever you change a value that is used in a formula, the value of the formula changes automatically. For example, suppose your company changes the mileage rate from 20 cents a mile to 22 cents a mile. If you change the cell containing this value, the cell containing the total car expense will change automatically. To replace the value in B13:

- ▶ Select B13.

► Type

.22

.22 **Enter**

What happens? As soon as you press **Enter**, the value in B13 is updated, the value in C14 changes to 28.60, and the value in C16 changes to 106.15. If you look fast, you can see the cells that are changing turn gray before the new value is displayed. LisaCalc grays a cell before it recalculates its value to let you know which cells are being recalculated.

Now you've filled out an entire expense report. It should look like the one in Figure 7.

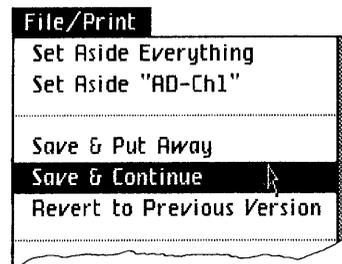
	A	B	C	D	E	F	G	H
1	Travel Expense Report							
2	Marco Polo							
3	Dest: Cathay							
4	Date: May 1, 1244							
5								
6	Item							
7								
8	Hotel		55.00					
9	Lunch		5.00					
10	Dinner		13.80					
11	Breakfast		3.75					
12	Car: No. Miles	130.00						
13	Mileage Rate	.22						
14	Car Total		28.60					
15								
16	Total		106.15					
17								

Figure 7. Completed Spreadsheet

Before you go on to print the spreadsheet, this would be a good time to stop and save the work you have done so far. You should get in the habit of saving your work from time to time, so as to minimize the effect of power interruptions or other unforeseen problems. Don't wait until you have completed a spreadsheet to save it.

To save your spreadsheet,

► Choose **Save & Continue** from the **File/Print** menu.



While your spreadsheet is being saved, you see a Wait alert message informing you that this is what's happening.

Printing the Spreadsheet

To print a spreadsheet, you naturally have to have a printer connected to your Lisa. If you don't have a printer, or it is not set up, you may skip this section for now, and proceed to Filing a Spreadsheet, later in this chapter.

To find out how to set up your printer and hook it up to the Lisa, refer to the manual that came with your printer.

You also need to set up Preferences correctly for your printer. If you have not already done this, do it now. To set up Preferences for your printer, refer to Section D, Desktop Manager Reference Guide, in the *Lisa Owner's Guide*, under Set Printer Configuration.

Once the printer and Preferences have been set up, printing your first spreadsheet is easy.

► Just choose Print from the File/Print menu.

A Print dialog box appears on your screen, as in Figure 8.

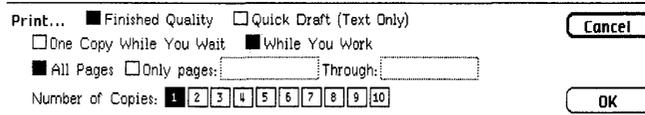
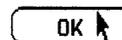


Figure 8. Print Dialog Box

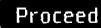
All print settings are as you need them right now. You learn to use the different settings available in the Print dialog box and the Format for Printer dialog box in Section C, LisaCalc Reference Guide, Chapter 2, under Print.

► Click OK in the dialog box.



Your Lisa now displays a message saying that it is preparing to print your document and allow you to continue working, since the Print dialog box specified that you wanted to print your spreadsheet while you work. After that message, the Lisa displays an alert box asking you if you want to cancel the printing or proceed with it. To respond to the message,

- ▶ Click Proceed to continue working while your document is being printed.

A dark rectangular button with the word "Proceed" in white text.

If your Lisa cannot print the spreadsheet while you work, it will display a message to let you know that, and you will have to wait until the document is finished printing and the message disappears.

Filing a Spreadsheet

At this point, you can put away the sample spreadsheet. To do this:

- ▶ Choose Save & Put Away from the File/Print menu.

The document window closes automatically, and its document icon goes back beside the stationery pad in the disk window.

Now you can move the document icon to an empty place in the disk window.

- ▶ Move the pointer into the spreadsheet icon. Press and hold the mouse button while moving the icon to an empty place in the disk window.



- ▶ Release the mouse button.

This completes Chapter 1. Go on to the next chapter, if you like, or come back to it at a later time.

Chapter Summary

Enter	<ul style="list-style-type: none">■ Enter the value; leave the same cell selected.
▲	<ul style="list-style-type: none">■ Enter the value; select the cell above the current cell.
▼	<ul style="list-style-type: none">■ Enter the value; select the cell below the current cell.
▶ or Tab	<ul style="list-style-type: none">■ Enter the value; select the cell to right of the current cell.
◀	<ul style="list-style-type: none">■ Enter the value; select the cell to left of the current cell.
Return	<ul style="list-style-type: none">■ Enter the value; select the leftmost cell in the next row down.
Get a new spreadsheet	<ul style="list-style-type: none">■ Open the ProFile window.■ Click twice on the LisaCalc stationery pad.■ Type a title for the spreadsheet.■ Click twice on the spreadsheet icon.
Enter value	<ul style="list-style-type: none">■ Select the cell.■ Type the value, followed by Enter or by another selection.
Edit value	<ul style="list-style-type: none">■ Select the cell.■ Select the part of the old value to be changed.■ Type the replacement characters, followed by Enter or by another selection.

Move from cell to cell

- Press any arrow key to move in the same direction as the arrow.
- Press **(Return)** to select the first cell in the next row.
- Press **(Tab)** to select the next cell on the right.

Enter formula

- Select the cell you want to enter the formula in.
- Select the Formula area.
- Type the formula, followed by **(Enter)** or by another selection.

Change column width

- Select the grid handle to the right of the column to be changed.
- Holding the button down, move the pointer to the right or the left.
- When the column is the right width, release the button.

Change number style

- Select the cell or cells to be changed.
- Choose the new number style from the Format menu.

Print the spreadsheet

- If you haven't set up your printer yet, see the manual that came with your printer.
- If you haven't set printer Preferences yet, see Section D, Desktop Manager Reference Guide, in the *Lisa Owner's Guide*, under Set Printer Configuration.
- If you need to change any of the options in the Format for Printer dialog box for your document, choose Format for Printer from the File/Print menu and change the options.
- Choose Print from the File/Print menu.
- Respond to any dialog boxes that appear.

Save the spreadsheet

- Choose Save & Put Away from the File/Print menu.

Chapter 2

A Department Budget

A Department Budget

In this chapter, you will learn how to use a different kind of spreadsheet — a department budget. In the process, you will learn more about LisaCalc, including how to

- Copy formulas from one cell to another.
- Use constants.
- Use the Sum function to add a column of numbers.
- Change formulas.
- Create reusable spreadsheets.

Getting an Existing Spreadsheet

In the last chapter, you started with a blank spreadsheet and filled in all the information yourself. In this chapter, you're going to start with a spreadsheet that already has some information on it, and learn how to complete it. When you're done, you're going to make it into a template, which is a framework that can be reused to create similar spreadsheets with different values.

First, you have to get the spreadsheet named Chapter 2.

To begin,

- ▶ Open the ProFile window.



- ▶ Open the LisaCalc Examples folder.



- ▶ Tear off a spreadsheet from the stationery pad named Chapter 2.



- ▶ Type a name for the spreadsheet.



- ▶ Open the spreadsheet by clicking twice on its icon.



Figure 9 duplicates what you see on your screen.

		GCP-Chapter 2						
* G Cells:		Value:						
* M Formula:								
	A	B	C	D	E	F	G	H
1	Sales Department Budget	Jan						
2		(\$000)						
3								
4	Salary							
5	Fringe Benefits	0.0						
6								
7	Payroll Expenses	0.0						
8								
9	Occupancy							
10	Communications							
11	Personnel							
12	Supplies	0.0						
13	Advertising							
14	Sales Promotion							
15	Other							
16								
17	Other Expenses	0.0						
18								
19	Total Expenses	0.0						

Figure 9. Initial Department Budget Example

Formulas and Values

In this department budget, each row is a different budget item; column A contains the labels for the items. Eventually, you will have one column for each month. Right now, only the column for January, column B, is present.

Some of the cells in column B contain formulas; these cells already show values computed from the formulas. They're all zero right now. You're going to fill in the rest of the cells yourself.

First, enter a value for January salary. This will be the cell in the Salary row and the January column, B4.

- ▶ Select B4 and type

62.50 **(Enter)**

As soon as you enter a value in B4, all the cells that were zero show new values. This is because these cells contain formulas that depend on the value in B4. Every time B4 changes, these other cells change.

Take a minute to look at some of these other cells and see what their formulas are.

► Select B5.

Look at the Formula area. The formula is
.3*B4

That is, the fringe benefits for January are 30% of the salary for January.

► Select B7.

The formula for Payroll Expense in B7 is
B4+B5

so Payroll Expense is Salary plus Fringe Benefits.

The Sum Function

B17, Other Expenses, is the total of all expenses except payroll expenses. To see the formula in this cell,

► Select B17.

📍 G Cells: B17	Val
📍 M Formula: sum(B9:B15)	

The formula is

Sum(B9:B15)

This formula is an example of the Sum function. It stands for the sum of all the cells from B9 to B15. It is the same as the formula:

B9+B10+B11+B12+B13+B14+B15

The notation B9:B15 stands for the range of cells beginning with B9 and going to B15. A range is any rectangular group of cells. It can be any number of cells vertically and horizontally. You will be using this notation frequently in LisaCalc; there are quite a few operations that can be done to a range of cells instead of just to a single cell.

In function notation, the items between the parentheses are called the arguments of the function. In this case, there is just a single argument, the range B9:B15. The Sum function adds the values of all its arguments. If any cell is blank or contains a label, its value is 0.

To complete January expenses,

► Fill in the remaining values as follows:

Cell	Value
B9	10.50
B10	2.30
B11	1.00
B13	46.90
B14	35.30
B15	4.86

If you've entered all the values correctly, the value of Total Expenses should be 185.24. Your screen should look like Figure 10.

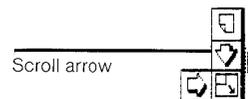
	A	B	C	D	E	F	G	H
1	Sales Department Budget	Jan						
2		(\$000)						
3								
4	Salary	62.50						
5	Fringe Benefits	18.75						
6								
7	Payroll Expenses	81.25						
8								
9	Occupancy	10.50						
10	Communications	2.30						
11	Personnel	1.00						
12	Supplies	3.12						
13	Advertising	46.90						
14	Sales Promotion	35.30						
15	Other	4.86						
16								
17	Other Expenses	103.98						
18								
19	Total Expenses	185.24						

Figure 10. January Expenses

Scrolling the Spreadsheet

In this spreadsheet, there are cells that have been filled in but are not visible on the screen right now. To see them, you need to scroll the spreadsheet up. Here's one way to scroll:

► Move the pointer to the scroll bar at the right of the spreadsheet and position the pointer within the downward-pointing scroll arrow.



- ▶ Press and hold the mouse button. As the spreadsheet moves up, higher numbered rows come into view. Keep your finger on the mouse button until row 22 comes into view, then release the mouse button.

21	Sales Forecast	
22	Expense %	Infinity

If you scroll too far, use the upward-pointing scroll arrow to scroll back the other way. When you're through, the screen should show rows 4 through 22, as shown in Figure 11.

GCP-Chapter 2									
G Cells: B15		Value (Number): 4.86							
M Formula:									
	A	B	C	D	E	F	G	H	
4	Salary	62.50							
5	Fringe Benefits	18.75							
6									
7	Payroll Expenses	81.25							
8									
9	Occupancy	10.50							
10	Communications	2.30							
11	Personnel	1.00							
12	Supplies	3.12							
13	Advertising	46.90							
14	Sales Promotion	35.30							
15	Other	4.86							
16									
17	Other Expenses	103.98							
18									
19	Total Expenses	185.24							
20									
21	Sales Forecast								
22	Expense %	Infinity							

Figure 11. After Scrolling

Two new labels have come into view. The value of Sales Forecast (B21) is blank, but the value of Expense % (B22) is shown as Infinity. What does this mean?

- ▶ Select B22.

The formula in B22 is $B19/B21*100$. This formula computes what percentage Total Expenses are of Sales Forecast by dividing B19 by B21 and multiplying the result by 100. The division is performed before the multiplication, so the formula is the same as:

$$(B19/B21)*100$$

B21 has not been given a value yet, so it is treated as zero for the time being. Since division by zero is not possible, LisaCalc gives B22 a special value, Infinity. This value is usually the result of division by zero, but it can also mean that a value is too large for LisaCalc to recognize.

Now enter a value for January Sales Forecast:

► Select B21 and type

390

390 (Enter)

The value Infinity in B22 is replaced by 47.50.

Using Constants

Constants can save you time when you update the spreadsheet. To see how, take another look at some of the formulas. Start with Fringe Benefits:

► Select B5 and look at the formula:

.3*B4

This formula says that Fringe Benefits are 30% of Salary. If Fringe Benefits increase and the percentage changes, you'll need to change this formula. If the Fringe Benefit percentage is used in several different formulas, you'll have to change it in each place.

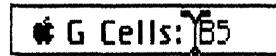
To avoid making the same change in several different places, you can put the percentage in a cell by itself, and rewrite the formulas so that they refer to the coordinates of this cell, not to the actual percentage. Then, when you need to change the percentage, you only need to change it in one place. A value used in this way is called a constant.

You can also use a constant in the formula for Supplies. You can set up cells for the constants in any convenient location. In this case you will use cells B24 and B25. These cells are now below the bottom margin of the spreadsheet.

Editing the Cells Area

To get to cells B24 and B25, you can use a different method for moving around the spreadsheet: replacing the coordinates in the status panel.

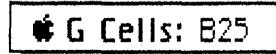
- ▶ Move the pointer to the Cells area and position it just before the letter B in B5.



- ▶ Select the whole “word” B5 by quickly pressing the mouse button twice.



- ▶ Type in the new coordinates, B25, followed by **Enter**.



When the coordinates are replaced, the spreadsheet scrolls automatically to show B24 and B25.

Before entering the constants, you need to enter some labels so you know which constant is which. The labels will be in column A, and the amounts in column B.

To enter the labels,

- ▶ In A24, type

Fringe % **Return**
Supp. %

24	Fringe %
25	Supp. %

To enter the amounts,

- ▶ Select B24 and type

.3 **Return**
.05 **Enter**

24	Fringe %	0.30
25	Supp. %	0.05

Now you can change the formulas that use the constants. First, you want to change the formula in B5. To get to B5, you can edit the Cells area, using a slightly different procedure,

- ▶ While holding down the **Apple** key, press the G key.



Notice that B25 in the Cells area is highlighted.

- ▶ Type

B5 **Enter**

The  key feature is a convenience that allows you to perform many procedures directly from the keyboard, without the mouse. The  key can be used to abbreviate other system commands as well. These will be mentioned as they come up; Appendix 2, Apple Keys, in this manual contains a complete list.

- ▶ Select the .3 in the Formula area and type
B24 

 G Cells: B5
 M Formula: B24*B4

The formula now refers to the cell that contains the constant, not to the constant itself. The value in B5 does not change.

Make the same kind of replacement in the formula in B12:

- ▶ Change the formula in B12 to B25*B4, then press the  key.

 G Cells: B12
 M Formula: B25*B4

Copying Cells

Now that you've finished column B, you can expand the spreadsheet to show all 12 months. First, you want to scroll back to row 1. To do this, you can use the elevator, which is the quickest way to scroll.

The elevator is the empty white box in the scroll bar; a LisaCalc window has a vertical elevator and a horizontal elevator. The position of the elevator within the scroll bar indicates the position of the spreadsheet view within the document. If the elevator is all the way to the top, the spreadsheet view shows the top part of the spreadsheet, including row 1. If the elevator is somewhere in between the top and the bottom, the spreadsheet view shows a part of the spreadsheet in the middle.

To get back to the top of the spreadsheet,

- ▶ Move the pointer to the vertical elevator.



- ▶ While holding down the mouse button, move the elevator as far up in the scroll bar as it will go, then release the mouse button.

- Now type the names of the months in the indicated cells, using the **Tab** key to get from cell to cell:

Cell	Month Name
C1	Feb
D1	Mar
E1	Apr
F1	May
G1	Jun
H1	Jul
I1	Aug
J1	Sep
K1	Oct
L1	Nov
M1	Dec

Your screen should look like Figure 12.

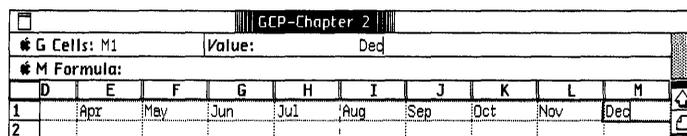


Figure 12. After Entering Month Names

To return to column A, you're going to scroll the spreadsheet using the view button, which is the box in the scroll bar next to the scroll arrow. There are two view buttons in the vertical scroll bar and two in the horizontal scroll bar. Every time you click in one of the view buttons, you move the spreadsheet one "windowful" in the indicated direction. That is, the upper view button in the vertical scroll bar moves the spreadsheet up one windowful, and so forth. To return to column A,

- Move the pointer to the left view button on the horizontal scroll bar. 

- Click the mouse button once.

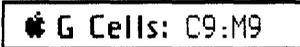
Now you can copy the values and formulas from column B into columns C through M. To learn about different ways to copy, you're going to copy column B one cell at a time. In Chapter 3, Revising a Spreadsheet, you'll learn a way to copy a whole column in one operation.

Copying a Cell with Paste

The simplest way to copy a cell is with the Paste item from the Edit menu. Paste makes an exact copy of the cell. For example, assume that the value for Occupancy is the same for all 12 months. You want to copy B9 into C9 through M9. Here's how to do it,

- ▶ Select B9.
- ▶ Choose Copy from the Edit menu.
- ▶ Select the Cells area by moving the pointer to it and clicking the mouse button three times.
- ▶ Type

C9:M9 **Enter**

A screenshot of the 'Cells' area in the LisaCalc application. It shows a small window with a title bar containing an Apple logo and the text 'Cells: C9:M9'. The window is rectangular and has a thin border.

The notation C9:M9 indicates the range of cells from C9 to M9, inclusive. Whenever you edit the Cells area to select a range, and part of the range is not showing on the screen, LisaCalc scrolls the spreadsheet so that the range is in the upper left corner.

- ▶ Choose Paste from the Edit menu.

The value in B9 is duplicated in each of the cells from C9 to M9.

Similarly, assume you want the values for Communications and Personnel to be the same every month. You also want to copy the (\$000) in row 2. To do this,

- ▶ Select B10 by editing the Cells area.
- ▶ Choose Copy from the Edit menu.
- ▶ Select C10:M10.
- ▶ Choose Paste from the Edit menu.
- ▶ Copy the value in B11 into cells C11:M11.
- ▶ Copy cell B2 into cells C2 through M2.
- ▶ Scroll the spreadsheet back so that A1 is showing.

When you are through, your screen should look like Figure 13.

GCP-Chapter 2								
G Cells: C2:M2		Value:						
M Formula:								
	A	B	C	D	E	F	G	H
1	Sales Department Budget:	Jan	Feb	Mar	Apr	May	Jun	Jul
2		(\$000)	(\$000)	(\$000)	(\$000)	(\$000)	(\$000)	(\$000)
3								
4	Salary	62.50						
5	Fringe Benefits	18.75						
6								
7	Payroll Expenses	81.25						
8								
9	Occupancy	10.50	10.50	10.50	10.50	10.50	10.50	10.50
10	Communications	2.30	2.30	2.30	2.30	2.30	2.30	2.30
11	Personnel	1.00	1.00	1.00	1.00	1.00	1.00	1.00
12	Supplies	3.12						
13	Advertising	46.90						
14	Sales Promotion	35.30						
15	Other	4.86						
16								
17	Other Expenses	103.98						
18								
19	Total Expenses	185.24						

Figure 13. After Pasting Cells

Copying a Cell with Paste Adjusting

What if you expect an expense to increase each month? For example, assume that the value for Salary, row 4, goes up by 1% each month. What's the easiest way to get the right formula into each cell in the row?

The first thing to do is establish the value for February. Since the value each month is 1% greater than the month before, the formula in C4, February, should be $1.01*B4$; that is, 101% of B4.

- Select C4, select the Formula area, and type

$1.01*B4$ (Enter)

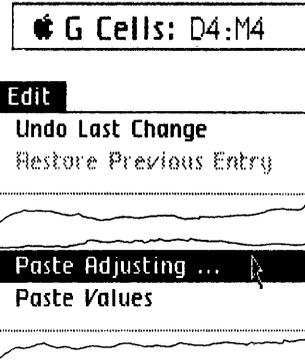
G Cells: C4

M Formula: $1.01*B4$

Now you want the formula in D4 to be $1.01*C4$, the formula in E4 to be $1.01*D4$, and so on up to M4. To copy the formula in C4 to the range D4 through M4, you can use Copy to copy C4 to the Clipboard, then paste the cell to D4:M4. However, in this case, you can't use the Paste menu item, because the formula in each cell then would be $1.01*B4$. Instead, you're going to use Paste Adjusting.

Paste Adjusting pastes a copy of a cell to a range of cells, adjusting the coordinates appropriately for the new cells. In this case, what you need is a formula in each cell that says, “take the cell immediately to the left of this cell, and multiply it by 1.01.” In D4, this would be the formula $C4 * 1.01$. To copy from C4 to the other cells in the row,

- ▶ Choose Copy from the Edit menu to copy C4.
- ▶ Select the range D4:M4 by editing the Cells area.
- ▶ Choose Paste Adjusting from the Edit menu.



Now you see the dialog box shown in Figure 14. The dialog box for Paste Adjusting shows you what the formula would be for cell D4. You know that the formula is for D4 because you see D4 next to the word Cells in the upper left-hand corner of the dialog box. When the formula for D4 is exactly what you want, LisaCalc will copy a similar formula into all the cells in the range.

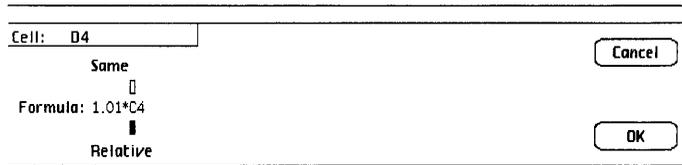
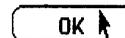


Figure 14. Dialog Box for Paste Adjusting

The dialog box shows you what formula will be in D4 when you click OK. Right now, it shows the formula $1.01 * C4$

which is exactly what you want for D4. If the formula were not correct, you could change it before clicking OK; you'll see an example of this later in this chapter. By telling LisaCalc what formula you want in D4, you are telling it you also want the same sort of formula in all the other selected cells. To finish pasting,

- ▶ Click OK.



The salary values for the remaining months appear as 63.76, 64.39, and so forth.

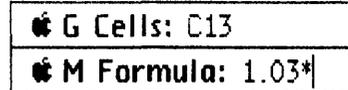
Assume you want to do something similar for Advertising. Let's say Advertising increases by 3% each month. First establish the value for February. This time, in entering the formula, you will see how you can use the mouse instead of the keyboard to enter cell coordinates.

▶ Scroll the spreadsheet so that A1 is showing.

▶ Select C13, then select the Formula area.

▶ Type

1.03*



▶ Move the pointer to B13.



▶ Holding down the **(Option)** key, click the mouse button.



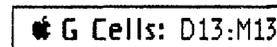
Notice that the coordinates of the cell you clicked in appear in the Formula area. Because you held down the **(Option)** key, you did not actually select B13.

▶ Press the **(Enter)** key.

Now copy the formula into the other months:

▶ Choose Copy from the Edit menu.

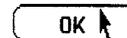
▶ Select the range D13:M13.



▶ Choose Paste Adjusting from the Edit menu.

In the dialog box that comes up, you can see that the formula for D13 is the one you want, so no changes are needed. To finish the paste,

▶ Click OK.



Now you want to do the same thing for Sales Promotion, Other, and Sales Forecast. Sales Promotion will increase by 3% each month, and Other and Sales Forecast will increase by 4%.

▶ Enter the following formulas in column C and use Paste Adjusting to copy them to columns D through M.

Item	Row	Formula
Sales Promotion	14	1.03*B14
Other	15	1.04*B15
Sales Forecast	21	1.04*B21

When you finish, your screen should look like Figure 15.

		GCP-Chapter 2						
G Cells: D21:M21		Value:						
M Formula:								
	A	B	C	D	E	F	G	H
1	Sales Department Budget	Jan	Feb	Mar	Apr	May	Jun	Jul
2		(\$000)	(\$000)	(\$000)	(\$000)	(\$000)	(\$000)	(\$000)
3								
4	Salary	62.50	63.12	63.76	64.39	65.04	65.69	66.33
5	Fringe Benefits	18.75						
6								
7	Payroll Expenses	81.25						
8								
9	Occupancy	10.50	10.50	10.50	10.50	10.50	10.50	10.50
10	Communications	2.30	2.30	2.30	2.30	2.30	2.30	2.30
11	Personnel	1.00	1.00	1.00	1.00	1.00	1.00	1.00
12	Supplies	3.12						
13	Advertising	46.90	48.31	49.76	51.25	52.79	54.37	56.00
14	Sales Promotion	35.30	36.36	37.45	38.57	39.73	40.92	42.15
15	Other	4.86	5.05	5.26	5.47	5.69	5.91	6.15
16								
17	Other Expenses	103.98						
18								
19	Total Expenses	185.24						

Figure 15. The Spreadsheet So Far

Next, you want to extend the value for Payroll Expenses. To see the formula in this cell,

► Select B7.

For each month

Payroll Expenses = Salary Expense + Fringe Benefits

In other words:

B7 = B4 + B5

C7 = C4 + C5

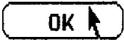
and so forth. In this case, you don't have to set up a formula in column C; you're just going to extend the formula in column B to columns C through M. To do this,

► Choose Copy from the Edit menu.

► Select the range C7:M7.

G Cells: C7:M7

- ▶ Choose Paste Adjusting from the Edit menu.
- ▶ When the dialog box appears, verify that the sample formula is correct, then click OK.



If the numbers in row 7 look wrong, it's because the Fringe Benefits row hasn't been filled in yet. This will be remedied shortly.

- ▶ Follow the procedure above to fill in the values for Other Expenses (row 17), Total Expenses (row 19), and Expense % (row 22).

When you are finished, scroll your spreadsheet back to A1; your screen should look like Figure 16.

aca:ch2							
* G Cells:		Value:					
* M Formula:							
	A	B	C	D	E	F	G
1	Sales Department Budget	Jan	Feb	Mar	Apr	May	Jun
2		(\$000)	(\$000)	(\$000)	(\$000)	(\$000)	(\$000)
3							
4	Salary	62.50	63.12	63.76	64.39	65.04	65.69
5	Fringe Benefits	18.75					
6							
7	Payroll Expenses	81.25	63.12	63.76	64.39	65.04	65.69
8							
9	Occupancy	10.50	10.50	10.50	10.50	10.50	10.50
10	Communications	2.30	2.30	2.30	2.30	2.30	2.30
11	Personnel	1.00	1.00	1.00	1.00	1.00	1.00
12	Supplies	3.12					
13	Advertising	46.90	48.31	49.76	51.25	52.79	54.37
14	Sales Promotion	35.30	36.36	37.45	38.57	39.73	40.92
15	Other	4.86	5.05	5.26	5.47	5.69	5.91
16							
17	Other Expenses	103.98	103.52	106.26	109.09	112.00	115.01
18							
19	Total Expenses	185.24	166.65	170.02	173.48	177.04	180.69

Figure 16. The Spreadsheet So Far

So far, you have copied cells without making any changes, such as Occupancy, and you have copied cells in which all the coordinates were changed for each occurrence, such as Payroll Expenses. You can also copy cells while changing some coordinates but not others.

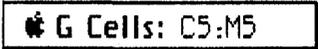
For example, suppose you want to copy Fringe Benefits.

- ▶ Select B5.

The formula in B5 is $B24 * B4$. In this formula, B24 is a constant, while B4 changes each month. You want to leave the constant the same, but change the salary for each month. That is, the formula for February (column C) should be $B24 * C4$, the formula for March (column D) should be $B24 * D4$, and so on. You have to tell LisaCalc that you want the first coordinate in each successive formula to remain unchanged, but you want the second coordinate to change according to the column the cell is in. To do this,

▶ Choose Copy from the Edit menu.

▶ Select the range C5:M5.



▶ Choose Paste Adjusting from the Edit menu.

The dialog box that appears is shown in Figure 17.

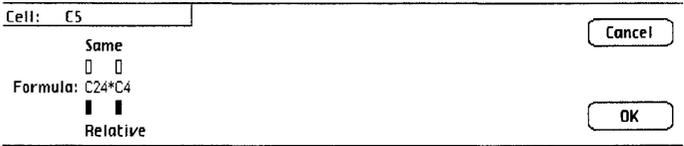


Figure 17. Dialog Box for Paste Adjusting

The dialog box shows the formula for cell C5; right now, the formula is

$C24 * C4$

C4 is correct, but you want C24 to be B24. To fix this,

▶ Click the check box above C24.

C24 changes to B24, and the dialog box looks like Figure 18.

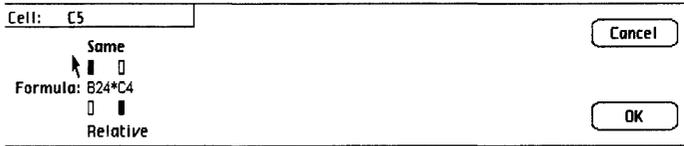
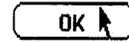


Figure 18. Dialog Box for Paste Adjusting

You have changed the formula to the one you wanted for cell C5, $B24 * C4$. By selecting Same for the first coordinate and Relative for the second coordinate, you are telling LisaCalc that you want the first coordinate to always be B24, and the second coordinate to change in each column.

► Click OK.



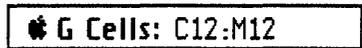
Now the dialog box goes away, and the columns change to show the correct values for row 5.

To complete the spreadsheet, fill in the values for Supplies the same way.

► Select B12 by editing the Cells area.

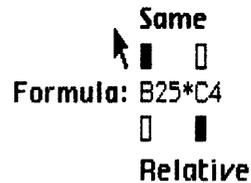
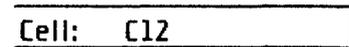
► Choose Copy from the Edit menu.

► Select the range C12:M12.

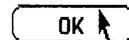


► Choose Paste Adjusting from the Edit menu.

► In the dialog box, click in the box above C25 so that the formula for C12 is $B25 * C4$.



► Click OK.



When you're through, scroll the spreadsheet back to A1; your screen should look like Figure 19.

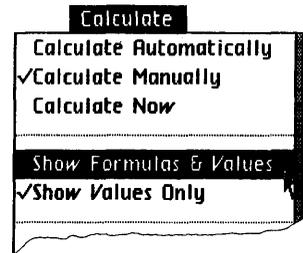
GCP-Chapter 2								
G Cells: C12:M12		Value:						
M Formula:								
	A	B	C	D	E	F	G	H
1	Sales Department Budget	Jan	Feb	Mar	Apr	May	Jun	Jul
2		(\$000)	(\$000)	(\$000)	(\$000)	(\$000)	(\$000)	(\$000)
3								
4	Salary	62.50	63.12	63.76	64.39	65.04	65.69	66.33
5	Fringe Benefits	18.75	18.94	19.13	19.32	19.51	19.71	19.91
6								
7	Payroll Expenses	81.25	82.06	82.88	83.71	84.55	85.39	86.24
8								
9	Occupancy	10.50	10.50	10.50	10.50	10.50	10.50	10.50
10	Communications	2.30	2.30	2.30	2.30	2.30	2.30	2.30
11	Personnel	1.00	1.00	1.00	1.00	1.00	1.00	1.00
12	Supplies	3.12	3.16	3.19	3.22	3.25	3.28	3.31
13	Advertising	46.90	48.31	49.76	51.25	52.79	54.37	56.00
14	Sales Promotion	35.30	36.36	37.45	38.57	39.73	40.92	42.15
15	Other	4.86	5.05	5.26	5.47	5.69	5.91	6.15
16								
17	Other Expenses	103.98	106.68	109.45	112.31	115.25	118.29	121.41
18								
19	Total Expenses	185.24	188.74	192.33	196.02	199.80	203.68	207.64

Figure 19. Completed Spreadsheet

Displaying and Printing Formulas

Now that you've completed the spreadsheet, it would be interesting to see the formulas as well as the values. To do this,

- Choose Show Formulas & Values from the Calculate menu.



Your screen should look like Figure 20.

GCP-Chapter 2								
* G Cells:		Value:						
* M Formula:								
	A	B	C	D	E	F	G	H
1	Sales Department Budget	Jan	Feb	Mar	Apr	May	Jun	Jul
2		(\$000)	(\$000)	(\$000)	(\$000)	(\$000)	(\$000)	(\$000)
3								
4	Salary	62.50	1.01*B4=63.12	1.01*C4=63.76	1.01*D4=64.39	1.01*E4=65.04	1.01*F4=65.69	1.01*G4=66.34
5	Fringe Benefits	B24*B4=18.75	B24*C4=18.94	B24*D4=19.13	B24*E4=19.32	B24*F4=19.51	B24*G4=19.71	B24*H4=19.90
6								
7	Payroll Expenses	B4+B5=81.25	C4+C5=82.06	D4+D5=82.88	E4+E5=83.71	F4+F5=84.55	G4+G5=85.39	H4+H5=86.22
8								
9	Occupancy	10.50	10.50	10.50	10.50	10.50	10.50	10.50
10	Communications	2.30	2.30	2.30	2.30	2.30	2.30	2.30
11	Personnel	1.00	1.00	1.00	1.00	1.00	1.00	1.00
12	Supplies	B25*B4=3.12	B25*C4=3.16	B25*D4=3.19	B25*E4=3.22	B25*F4=3.25	B25*G4=3.28	B25*H4=3.31
13	Advertising	46.90	1.03*B13=48.31	1.03*C13=49.76	1.03*D13=51.25	1.03*E13=52.79	1.03*F13=54.37	1.03*G13=55.90

Figure 20. Formula Display

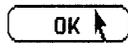
In this display, there is room for only some of the rows, because formulas take more space than values. If you want to see more cells, you can scroll the spreadsheet. You can also widen the columns if you want to.

You can print the formula display the same way you print the value display. It's a good idea to make a printed copy of the spreadsheet, especially if it's complicated. A printed copy has two advantages:

- You can examine all the formulas at the same time, to see if you want to revise any of them.
- You have a permanent record of the formulas in the spreadsheet.

To print the spreadsheet,

- ▶ Choose Print from the File/Print menu.
- ▶ Click OK in the alert box.



Saving Your Spreadsheet

Next, you will learn how to make your spreadsheet into a template. Before going on to this procedure, you should file the document that you have just been working with. To do this,

- ▶ Choose Save & Put Away from the File/Print menu.

You could leave the document where it is in the disk window, but your disk window would soon become cluttered with a lot of document icons. You can create a folder to contain all the related documents.

- ▶ Move the pointer into the empty folder pad icon in the ProFile window, and click the mouse button twice.



- ▶ Type **Tutorial-** followed by your initials.

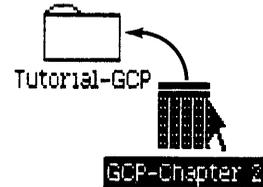


To file the document in your new folder,

- ▶ Move the pointer into the document icon.

To do this, you may have to rearrange the folders on the desktop.

- ▶ Press and hold the mouse button while moving the document icon over the folder icon.



- ▶ Release the mouse button when the folder icon flashes.



- ▶ Move the folder icon to an empty place in the disk window.
- ▶ Move the document that you worked with in Chapter 1 into your new folder to keep all your examples together.

Making the Spreadsheet into a Template

You can use the same spreadsheet you have just created for next year's budget. To do this, you want to keep everything that doesn't change from year to year, and remove everything else. In this case, you probably want to keep all the formulas, labels, and constants. What you have when you get done is called a template.

First, you have to reopen the spreadsheet. To do this,

▶ Click twice on the Tutorial folder to open it.

▶ Move the pointer to the icon that represents the Chapter 2 example you just saved.



▶ Click the mouse button twice.

Protecting Cells

To create a template, you first protect the cells you want to keep, then you clear the other cells.

When a cell is protected, the following rules apply:

- If a protected cell has a formula, you can change the formula but you can't replace it with a value. The value of the cell changes if the cells it depends on change.
- If a protected cell has a value but no formula, you can't change the value.
- If you try to paste anything on top of a protected cell, you are prevented by an alert box that gives you the choice of clearing or not clearing.
- If you try to clear a protected cell, you are prevented by the appearance of an alert box that gives you the choice of clearing or not clearing.
- You can cut or copy a protected cell.
- You can change the format of a protected cell.

In this spreadsheet, you want to start by protecting every cell that has a formula.

▶ Choose Select All of Document from the Edit menu.

▶ Choose Protect Formulas Only from the Protect menu.



Now you want to protect the labels and constants:

▶ Select the range A1:M2



▶ Choose Protect Formulas & Values from the Protect menu.

▶ Protect the range A4:A25, using Protect Formulas & Values.

You also need to protect cells B24 and B25. To do this,

- ▶ Scroll the spreadsheet so that both B24 and B25 are showing.
- ▶ Move the pointer to B24. 
- ▶ Holding down the mouse button, move the pointer to B25. Notice that both cells are highlighted. 
- ▶ Release the mouse button.
- ▶ Choose Protect Formulas & Values from the Protect menu.

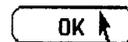
Clearing the Template

To finish making the spreadsheet into a template, clear all the unprotected values:

- ▶ Choose Select All of Document from the Edit menu.
- ▶ Choose Clear Entries from the Edit menu.

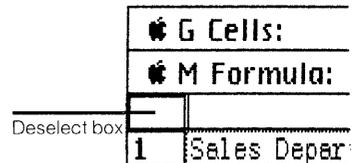
Now you see an alert box warning you that only unprotected cells will be cleared. Since this is what you expected,

- ▶ Click OK in the alert box.



- ▶ Scroll the spreadsheet back to A1.

- ▶ Click in the deselect box at the upper left corner of the spreadsheet view, so that nothing is selected in the spreadsheet.



Your screen should look like Figure 21.

GCP-Chapter 2								
# G Cells:		Value:						
# M Formula:								
	A	B	C	D	E	F	G	H
1	Sales Department Budget	Jan	Feb	Mar	Apr	May	Jun	Jul
2		(\$000)	(\$000)	(\$000)	(\$000)	(\$000)	(\$000)	(\$000)
3								
4	Salary		0.0	0.0	0.0	0.0	0.0	0.0
5	Fringe Benefits	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6								
7	Payroll Expenses	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8								
9	Occupancy							
10	Communications							
11	Personnel							
12	Supplies	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13	Advertising		0.0	0.0	0.0	0.0	0.0	0.0
14	Sales Promotion		0.0	0.0	0.0	0.0	0.0	0.0
15	Other		0.0	0.0	0.0	0.0	0.0	0.0
16								
17	Other Expenses	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18								
19	Total Expenses	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Figure 21. Template after Clear

Now you can save the template.

- ▶ Choose Save & Put Away from the File/Print menu.
- ▶ Change the name of the spreadsheet to "Dept Budget Paper."
- ▶ Choose Make Stationery Pad from the File/Print menu.



Dept Budget Paper

Now you have made this template into a pad of stationery. Next year, when it's time to prepare your department budget, all you will have to do is tear off a sheet from the pad and fill in the missing values.



Dept Budget Paper

Chapter Summary

Scroll spreadsheet

- Move the pointer to the arrow in the scroll bar.
- Press and hold the mouse button until the spreadsheet is positioned correctly.
- or
- Edit the Cells area to show the coordinates of the cell you want to select.

Use constant

- Enter the constant value in a separate cell.
- Write formulas to refer to the cell instead of to the number.

Copy a cell with no changes

- Select the cell.
- Choose Copy from the Edit menu.
- Select the range you want to paste the cell to.
- Choose Paste from the Edit menu.

Copy a cell with changes

- Select the cell.
- Choose Copy from the Edit menu.
- Select the range you want to paste the cell to.
- Choose Paste Adjusting from the Edit menu.
- Change coordinates as necessary in the dialog box.
- Click OK in the dialog box.

Display formulas	<ul style="list-style-type: none"> ■ Choose Show Formulas & Values from the Calculate menu.
Print formulas	<ul style="list-style-type: none"> ■ Choose Show Formulas & Values from the Calculate menu. ■ Choose Print from the File/Print menu.
Protect formulas	<ul style="list-style-type: none"> ■ Select the range of cells whose formulas are to be protected. ■ Choose Protect Formulas Only from the Protect menu.
Protect values	<ul style="list-style-type: none"> ■ Select the range of cells whose formulas are to be protected. ■ Choose Protect Formulas and Values from the Protect menu.
Clear unprotected cells	<ul style="list-style-type: none"> ■ Select the range of cells to be cleared. ■ Choose Clear Entries from the Edit menu.
Make a template	<ul style="list-style-type: none"> ■ Protect cells that are to be in the template. ■ Clear unprotected cells. ■ Save and put away the spreadsheet. ■ Choose Make Stationery Pad from the File/Print menu.

Chapter 3

Revising a Spreadsheet

Revising a Spreadsheet

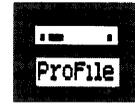
In this chapter, you will learn some more advanced options for changing the appearance and contents of an existing spreadsheet. The features covered include how to

- Select the right format for a cell.
- Center or justify the contents of a cell.
- Create repeating patterns.
- Change the column widths of several columns at the same time.
- See two different parts of the spreadsheet at the same time.
- Move columns.
- Copy a whole column using Paste Adjusting.

A Forecast versus Actuals Example

To get the example for this chapter,

- ▶ Open the ProFile window.



- ▶ Open the LisaCalc Examples folder.



- ▶ Tear off a spreadsheet from the Chapter 3 stationery pad.



Chapter 3

- ▶ Type

Ch3:

followed by your initials
to name the
spreadsheet.



- ▶ Open the spreadsheet.

Your screen should look like Figure 22.

		A	B	C	D	E	F	G	H
1	Sue's Sporting Goods								
2	Upscale Division								
3	1985 Forecast								
4						1st Quarter			
5	FORECAST		Jan	Feb	Mar		Apr	May	Jun
7	Jogging Togs	Units	44000	45600	47900	137500	49300	50200	
8		Price	110	110	110	110	110	110	
9		Revenue	4840000	5016000	5269000	15125000	5423000	5522000	
10	Sneakers	Units	51300	52900	54100	158300	55700	56900	
11		Price	42	42	42	42	42	42	
12		Revenue	2154600	2221800	2272200	6648600	2339400	2389800	
13	Ace Bandages	Units	32000	32500	32900	97400	33700	34100	
14		Price	3.8	3.8	3.8	3.8	3.8	3.8	
15		Revenue	121600	123500	125020	370120	128060	129580	
16	Crutches	Units	11000	11100	11300	33400	11700	12100	
17		Price	11	11	11	11	11	11	
18		Revenue	121000	122100	124300	367400	128700	133100	
19	Totals		7237200	7483400	7790520	22511120	8019160	8174480	
20									
21	ACTUALS								

Figure 22. Opening Screen for Chapter 3

This example shows a comparison between revenue forecast and actual revenue for 1985 for a mythical company named Sue's Sporting Goods. Take a minute to look over the spreadsheet.

The FORECAST section in rows 5 to 19 shows the forecasted revenue for 1985. The forecast is broken down by product and month. For each product, the forecast shows the number of units that Sue expects to sell, the price per unit, and the total revenue. In addition, subtotals are shown for each quarter, as in column F. The subtotal for the fourth quarter is missing; you will add it later in the chapter.

The ACTUALS section in rows 21 to 29 shows the actual revenue for each month. To see this part of the spreadsheet,

- Scroll the spreadsheet so that rows 21 through 29 are showing.

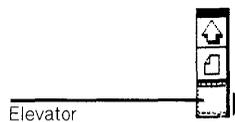
Rows 21 through 29 are shown in Figure 23.

	A	B	C	D	E	F	G	H	
21	ACTUALS								
22	Jogging Togs	Revenue	4792876	5194837	5492876	15480589	5593827	5512347	5
23		Variance	-9736363	35653314	2489282	3510023	150046	-174812	
24	Sneakers	Revenue	2284701	2397005	2306622	6988328	2218842	2047652	2
25		Variance	6038297	8857231	5149195	109767	-515537	-14317	
26	Ace Bandages	Revenue	112470	120876	137564	370910	139287	124533	
27		Variance	-750822	-21247	1003359	21344438	766984	-3894893	
28	Crutches	Revenue	123009	124335	125443	372787	126559	131829	
29		Variance	16603311	830467	9195495	1466249	-166356	-954921	
30									

Figure 23. ACTUALS Section of Spreadsheet

For each product, the ACTUALS section shows the monthly revenue and the variance. The variance is the percentage by which the forecast revenue deviates from the actual revenue; it is positive when the actual exceeds the forecast, and negative when the actual falls short of the forecast.

- Use the elevator to scroll the spreadsheet back so that A1 is showing.



There is nothing actually incorrect about this spreadsheet; all the formulas and values are as they should be. However, for a variety of reasons, it is very hard to read. Your main task in this chapter will be to fix the spreadsheet so that it is easier to use.

Number Styles

One of the reasons this spreadsheet is hard to read is that all the numbers look the same. Although the values include whole numbers like Units, money amounts like Revenue, and percentages like Variance, they are all in the same format. By using the various number styles available on the Format menu, you can give these values a more appropriate and attractive appearance. The Format menu is shown in Figure 24.

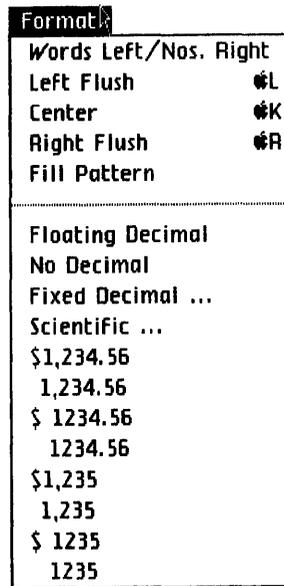


Figure 24. Format Menu

All the cells in this spreadsheet have the same number style: floating decimal, which is the number style provided by LisaCalc when you have not specified one. In floating decimal, numbers are shown as compactly as possible. Digits that are not needed are omitted. For example, in cell C14, a value which is meant to be \$3.80 is shown as 3.8. The final zero is omitted because it is not needed.

Also, in floating decimal, the decimal points in different cells do not necessarily line up; they can appear anywhere within the cell. For these reasons, it is not the most appropriate number style for money amounts; for these, you want a monetary number style.

Monetary Number Styles

Monetary number styles display money amounts either with or without the following elements:

- Dollar sign (\$)
- Commas (,)
- Cents (.29, .00, and so forth)

As you can see from Figure 24, you decide on a monetary number style by looking in the Format menu for the item that looks the way you want your values to look. The monetary number styles on the menu show how the value \$1,234.56 would look in various number styles. For example, if you wanted a dollar sign and commas, but no cents, you would choose \$1,235. The number style is shown as \$1,235 instead of \$1,234 because, with this number style, the value \$1,234.56 is shown rounded to \$1,235. The actual value of the cell does not change, only the way the value is displayed.

The rows in this spreadsheet that contain monetary values are the rows for Price, Revenue, and Totals. There are four Price rows, one for each product. Notice that in three of these rows, the value is a whole number of dollars. In row 14, however, the price is \$3.80, which is shown as 3.8. Therefore, you need a number style that shows cents. An appropriate number style for these rows would be \$ 1234.56.

- ▶ Select row 8 by clicking in the row header.



- ▶ Choose \$ 1234.56 from the Format menu.
- ▶ Do the same for rows 11, 14, and 17.

When you change a number style, only the appearance of the numbers changes; the labels (such as the word Price in B8) do not change. Labels are not affected by number styles.

In monetary number styles, negative values are enclosed in parentheses. You can't see this on this spreadsheet, since all the values in the FORECAST section are positive. However, when a value is positive, one space is added to the right of the value so that it will line up properly with the negative values.

For the Revenue rows, the number style you used for the Price rows is not appropriate. To see why,

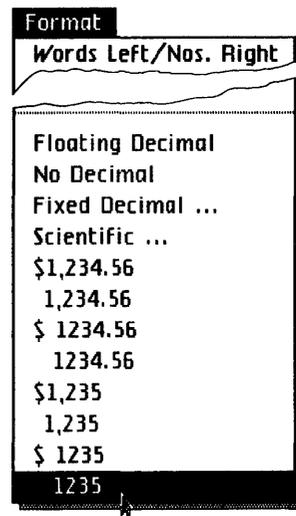
- ▶ Select row 9.



- ▶ Choose \$ 1234.56 from the Format menu.

As you can see, the cells in row 9 now show asterisks (*). This is what LisaCalc displays whenever a value is too large to fit in the cell display. Because these cells contain large values, you want to leave out unnecessary features like the dollar sign and the cents. The best number style is 1235.

- ▶ Choose 1235 from the Format menu.



- ▶ Do the same for rows 12, 15, 18, and 19.

F9 and F19 still show asterisks, indicating that the value is too large to display; you'll see how to fix this later in the chapter.

The rows for Units can be left as they are, since they contain ordinary numbers, not money amounts.

Now your screen should look like Figure 25.

		Ch3:GCP						
G Cells: 19		Value:						
M Formula:								
	A	B	C	D	E	F	G	H
1	Sue's Sporting Goods							
2	Upscale Division							
3	1985 Forecast							
4						1st Quar		
5	FORECAST		Jan	Feb	Mar		Apr	May
6								
7	Jogging Togs	Units	44000	45600	47900	137500	49300	50200
8		Price	\$110.00	\$110.00	\$110.00		\$110.00	\$110.00
9		Revenue	4840000	5016000	5269000	*****	5423000	5522000
10	Sneakers	Units	51300	52900	54100	158300	55700	56900
11		Price	\$ 42.00	\$ 42.00	\$ 42.00		\$ 42.00	\$ 42.00
12		Revenue	2154600	2221800	2272200	6648600	2339400	2389800
13	Ace Bandages	Units	32000	32500	32900	97400	33700	34100
14		Price	\$ 3.80	\$ 3.80	\$ 3.80		\$ 3.80	\$ 3.80
15		Revenue	121600	123500	125020	370120	128060	129580
16	Crutches	Units	11000	11100	11300	53400	11700	12100
17		Price	\$ 11.00	\$ 11.00	\$ 11.00		\$ 11.00	\$ 11.00
18		Revenue	121000	122100	124300	367400	128700	133100
19	Totals		237000	2485400	2790520	*****	3012150	3178800
20								
21	ACTUALS							

Figure 25. After Monetary Number Styles

Fixed Decimal Number Style

The only other rows that need a different number style are the rows for Variance.

- Scroll the spreadsheet so that rows 21 through 29 are showing.

The Variance rows show the percentage by which the actual revenue differs from the forecasted revenue. The value can be either positive or negative. However, you really don't need as many decimal places as are shown now. In fact, the extra decimal places make the numbers hard to read. What you need is a number style that specifies a fixed number of decimal places. This is fixed decimal number style.

To convert the rows to fixed decimal number style:

- Select row 23. 
- Choose Fixed Decimal from the Format menu.

When you choose this number style, a dialog box comes up, as shown in Figure 26.

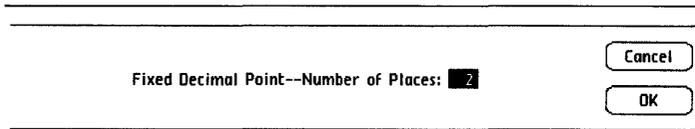
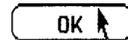


Figure 26. Dialog Box for Fixed Decimal

The dialog box asks you how many decimal places you want; the value 2 is already filled in. Since this sounds about right,

► Click OK.



► Set the same number style for rows 25, 27, and 29.

Your screen should look like Figure 27.

	A	B	C	D	E	F	G	H
20								
21	ACTUALS							
22	Jogging Togs	Revenue	4792876	5194837	5492876	15480589	5593827	5512347
23		Variance	-0.97	3.57	4.25	2.35	3.15	-0.17
24	Sneakers	Revenue	2284701	2397005	2306622	6988328	2218842	2047652
25		Variance	6.04	7.89	1.51	5.11	-5.15	-14.32
26	Ace Bandages	Revenue	112470	120876	137564	370910	139287	124533
27		Variance	-7.51	-2.12	10.03	0.21	8.77	-3.89
28	Crutches	Revenue	123009	124335	125443	372787	126559	131829
29		Variance	1.66	1.83	0.93	1.47	-1.66	-0.55
30								
31								
32								
33								
34								
35								
36								
37								
38								
39								
40								

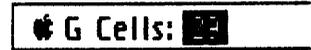
Figure 27. Decimal Number Style

Changing Column Widths on Several Columns

In spite of the number style changes, this spreadsheet is still difficult to read. The main reason for this is that the numbers are crowded together. In addition, some of the values, such as the one in F19, are too large to be displayed. The answer to both these problems is to widen the columns.

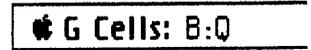
In Chapter 1, you learned a quick way to widen a single column. Now you are going to learn how to widen several columns at the same time. In this spreadsheet, you want to widen columns B through Q; column A is already the correct width.

- ▶ Select the “29” in the Cells area.



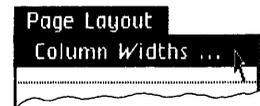
- ▶ Type

B:Q **Enter**



You have just selected columns B through Q.

- ▶ Choose Column Widths from the Page Layout menu.



Now you see a dialog box, as shown in Figure 28. It tells you that the current column width of the first you selected is 8 characters. The 8 is already selected, so you can change it by just typing the new number. All the selected columns will have the same width.

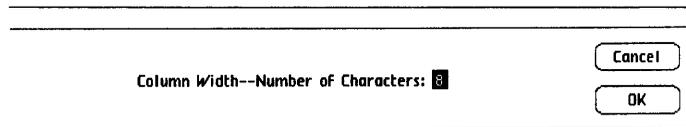


Figure 28. Dialog Box for Column Widths

- ▶ Type

Characters: 9|

9

- ▶ Click OK.
- ▶ Click in the deselect box so that nothing in the spreadsheet is selected.

Your screen should look like Figure 29.

Ch3:GCP									
* G Cells:		Value:							
* M Formula:									
	B	C	D	E	F	G	H	I	J
21									
22	Revenue	4792876	5194837	5492876	15480589	5593827	5512347	5761235	168674
23	Variance	-0.97	3.57	4.25	2.35	3.15	-0.17	2.49	1
24	Revenue	2284701	2397009	2306622	6988328	2218842	2047652	2439927	67064
25	Variance	6.04	7.89	1.51	5.11	-5.15	-14.32	-0.35	-6
26	Revenue	112470	120876	137564	370910	139287	124533	136649	4004
27	Variance	-7.51	-2.12	10.03	0.21	8.77	-3.89	3.93	2
28	Revenue	123009	124335	125443	372787	126559	131829	139584	3979
29	Variance	1.66	1.63	0.92	1.47	-1.66	-0.95	1.52	-0
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									

Figure 29. Column Widths

The next step in making this spreadsheet more orderly is to change the way some of the values are lined up within the cells.

Lining Up Values

Take another look at the Format menu in Figure 24. The first group of menu items all have to do with the way values are lined up within cells. These items are called alignment options. Values can be left flush, right flush, or centered. You can also choose to have a value repeat as a fill pattern. If you don't choose any of these options, then the way the values are lined up depends on what kind of values they are: numbers are right flush, and everything else is left flush.

In this spreadsheet, the month names (row 5) would look better if they were centered.

► Scroll the spreadsheet so that A1 is showing.

► Select row 5.



► Choose Center from the Format menu.

Also, if the names of the products in column A were right flush, they would stand out more effectively.

- ▶ Select the range A7:A16 by moving the pointer to A7, holding down the mouse button, moving the pointer to A16, and releasing the mouse button.

⌘ G Cells: A7:A16

- ▶ Choose Right Flush from the Format menu.
- ▶ Make cells A22:A28 right flush also.

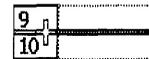
⌘ G Cells: A22:A28

- ▶ Scroll the spreadsheet back so that A1 is showing.

The biggest help in improving the clarity of this spreadsheet would be to draw lines to separate various sections. For example, it would be nice to have a row of periods between rows 9 and 10 to separate the information about Jogging Togs from the information about Sneakers.

To do this, you start by inserting a row between rows 9 and 10:

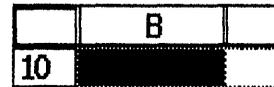
- ▶ Select the grid handle between rows 9 and 10.



- ▶ Choose Insert Blank Row from the Edit menu.

Now you want to fill the row with periods:

- ▶ Select B10.
- ▶ Type a period followed by **Enter**.



- ▶ Choose Fill Pattern from the Format menu.
- ▶ Choose Copy from the Edit menu.

- ▶ Select C10:Q10.

⌘ G Cells: C10:Q10

- ▶ Choose Paste from the Edit menu.

To create a row of periods between Sneakers and Ace Bandages,

- ▶ Select row 10.
- ▶ Choose Copy from the Edit menu.

- ▶ Select the row handle between rows 13 and 14.
- ▶ Choose Paste from the Edit menu.

To create a row of periods between Ace Bandages and Crutches,

- ▶ Select the grid handle between rows 17 and 18.
- ▶ Choose Paste from the Edit menu.
- ▶ Scroll the spreadsheet so that A1 is showing again.

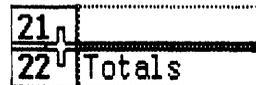
When you finish, your spreadsheet should look like Figure 30.

		Ch3:GCP					
# G Cells: B18:Q18		Value:					
# M Formula:							
	A	B	C	D	E	F	G
1	Sue's Sporting Goods						
2	Upscale Division						
3	1985 Forecast						
4						1st Quart	
5	FORECAST		Jan	Feb	Mar		Apr
6							
7	Jogging Togs	Units	44000	45600	47900	137500	49300
8		Price	\$ 110.00	\$ 110.00	\$ 110.00		\$ 110.00
9		Revenue	4840000	5016000	5269000	15125000	5423000
10							552
11	Sneakers	Units	51300	52900	54100	156300	55700
12		Price	\$ 42.00	\$ 42.00	\$ 42.00		\$ 42.00
13		Revenue	2154600	2221800	2272200	6648600	2339400
14							238
15	Ace Bandages	Units	32000	32500	32900	97400	33700
16		Price	\$ 3.80	\$ 3.80	\$ 3.80		\$ 3.80
17		Revenue	121600	123500	125020	370120	128060
18							12
19	Crutches	Units	11000	11100	11300	33400	11700
20		Price	\$ 11.00	\$ 11.00	\$ 11.00		\$ 11.00
21		Revenue	121000	122100	124300	367400	128700

Figure 30. Fill Patterns

You also might want to draw a line of equals signs just above the Totals line, to indicate that the line is a sum.

- ▶ Insert a blank row between rows 21 and 22.



- ▶ Type an equals sign in B22, followed by **(Enter)**.



- ▶ Choose Fill Pattern from the Format menu.
- ▶ Copy B22 to C22:Q22.
- ▶ Scroll the spreadsheet back to A1.

Split Views

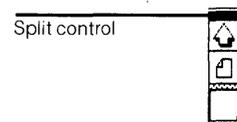
In adding the extra rows to the spreadsheet, you have also made it somewhat larger. One of the results of this is that you cannot see the actuals for each month. You could scroll the spreadsheet so that they are showing, but then you would not be able to see the month names in row 5. What you would really like is to be able to see two different parts of the spreadsheet at the same time.

Suppose you want to see the forecast and actuals for Jogging Togs at the same time. Here's how you do this:

- ▶ Scroll the spreadsheet so that cell A5 is in the upper left-hand corner.

	A	
5	FORECAST	

- ▶ To split the spreadsheet view, move the pointer to the split control at the top of the vertical scroll bar. Hold down the mouse button while moving the split control down until it is between rows 18 and 19. Release the mouse button.



Now your screen should look like Figure 31.

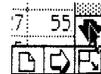
Ch3:GCP							
* G Cells: C22:Q22		Value:					
* M Formula:							
	A	B	C	D	E	F	G
5	FORECAST		Jan	Feb	Mar		Apr
6							
7	Jogging Togs	Units	44000	45600	47900	137500	49300
8		Price	\$ 110.00	\$ 110.00	\$ 110.00		\$ 110.00
9		Revenue	4840000	5016000	5269000	15125000	5423000
10							
11	Sneakers	Units	51300	52900	54100	158300	55700
12		Price	\$ 42.00	\$ 42.00	\$ 42.00		\$ 42.00
13		Revenue	2154600	2221800	2272200	6648600	2339400
14							
15	Ace Bandages	Units	32000	32500	32900	97400	33700
16		Price	\$ 3.80	\$ 3.80	\$ 3.80		\$ 3.80
17		Revenue	121600	123500	125020	370120	128060
18							
19	Crutches	Units	11000	11100	11300	33400	11700
20		Price	\$ 11.00	\$ 11.00	\$ 11.00		\$ 11.00
21		Revenue	121000	122100	124300	367400	128700
22		=====					
23	Totals		7237200	7483400	7790520	22511120	8019160
24							

Figure 31. Split Views

When you have split views, each view has its own scroll bar. In this case, each split view has a vertical scroll bar. These two scroll bars operate independently. Only one horizontal scroll bar is necessary, since neither view can be moved to the left or right without the other one moving in exactly the same way.

Now what you need to do is scroll the bottom view to show the actuals for as many products as possible.

- Move the pointer to the downward-pointing scroll arrow in the lower view. Hold down the button until rows 26 through 31 are showing, then release the button.



Now you can see the forecast and the actuals for each month for the first three products.

To unsplit the screen,

- ▶ Move the pointer to the new split control in the middle of the spreadsheet. While holding down the mouse button, move the split control all the way to the bottom of the screen.



Now the screen is restored to a single view.

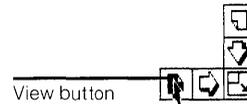
- ▶ Using the elevator button, scroll the spreadsheet so that row 1 is showing again.

Copying a Column

As mentioned earlier, the quarterly totals for the fourth quarter of 1985 are missing from this spreadsheet. The easiest way to add them to the spreadsheet is to copy the formulas from another column of quarterly totals.

In Chapter 2, you learned how to copy a column by copying one cell at a time. Now you will see how a whole column can be copied in one operation. What you want to do is copy column N, which shows the third quarter totals, to column R, using Paste Adjusting.

- ▶ First, use the view button to scroll the spreadsheet so that columns N and R are both showing.



- ▶ Select column N by clicking in the column header.



- ▶ Choose Copy from the Edit menu.

- ▶ Select column R.



- ▶ Choose Paste Adjusting from the Edit menu.

As always, a dialog box appears to let you decide which coordinates are relative and which stay the same. It is shown in Figure 32.

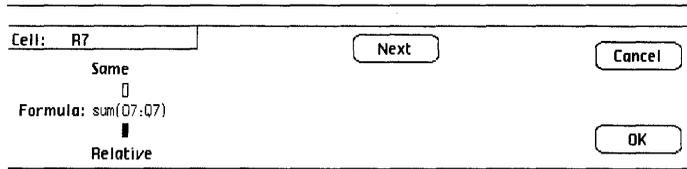


Figure 32. Dialog Box for Paste Adjusting (Columns)

Since each cell in column N needs to be examined and adjusted separately, LisaCalc goes down column N one cell at a time. For each cell that contains a formula, LisaCalc lets you adjust the coordinates to be the way you want them.

The first formula you see is the one that is going to be pasted to R7. Notice that R7 is shown next to the word Cell in the upper left-hand corner of the dialog box. When the formula is the way you want it, you click the Next button to go on to the next cell in the column. If you click OK, you are saying that all the formulas in the column are now correct. If you click Cancel, you are cancelling the whole paste operation.

Since the formula for R7 is correct as shown,

► Click the Next button.



Now you see the formula for R9. The new dialog box is shown in Figure 33.

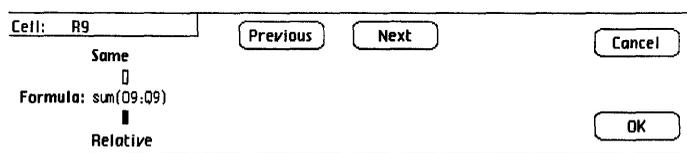


Figure 33. Dialog Box for R9

Notice that something new has been added to the dialog box: a button labeled Previous. This button allows you to go back to the previous cell, in case you realize that the formula in that cell is not correct. As before, Next goes on to the next cell, and OK approves the whole column.

To see how this works,

- ▶ Click the Previous button.

Previous

Now you see cell R7 again.

Cell: R7

Same



Formula: sum(O7:Q7)



Relative

- ▶ Click the Next button.

Next

Now you see R9 again.

Cell: R9

Same



Formula: sum(O9:Q9)



Relative

You may have noticed that when you filled in the Paste Adjusting dialog box for R7, you left all the coordinates relative. This makes sense, since the position of the cells referred to in the formula is the same for this column as it was for column N. If you reflect for a minute on the position of column R as compared to column N, you will see that all the formulas in column R have the same property; that is, that all their coordinates are relative. Once you have determined that this is the case, you don't need to fill in a dialog box for each cell; you just click OK.

- ▶ Click OK.

OK

- ▶ Change R4 to:

4th Quarter

4th Quarter

Your screen should look like Figure 34.

Ch3:GCP										
G Cells: R4				Value (Text): 4th Quarter						
M Formula:										
	N	O	P	Q	R	S	T	U	V	
1										
2										
3										
4	3rd Quart				4th Quart					
5		Oct	Nov	Dec						
6										
7	164800	58200	59100	60200	177500					
8		\$ 110.00	\$ 110.00	\$ 110.00						
9	18128000	6402000	6501000	6622000	19525000					
10										
11	185200	68700	70100	72200	211000					
12		\$ 42.00	\$ 42.00	\$ 42.00						
13	7778400	2885400	2944200	3032400	8862000					
14										
15	107600	38100	38200	39900	116200					
16		\$ 3.80	\$ 3.80	\$ 3.80						
17	408880	144780	145160	151620	441560					
18										
19	40400	14200	14700	14900	43800					
20		\$ 11.00	\$ 11.00	\$ 11.00						
21	444400	156200	161700	163900	481800					
22										

Figure 34. After Paste Adjusting

Moving Columns

Now that you have the values for each month and the quarterly totals, you might as well include a column of yearly totals. To do this,

- ▶ In S4, enter the label:

85 Total

85 Total

- ▶ In S7, enter the formula

M Formula: Sum(F7, J7, N7, R7)

Sum(F7,J7,N7,R7) (Enter)

- ▶ Choose Copy from the Edit menu.

- ▶ Select S8:S33.

G Cells: S8:S33

- ▶ Choose Paste Adjusting from the Edit menu.

- ▶ In the dialog box, click OK.

OK

- ▶ Clear S8, S12, S16, S20, S24, and S25.

- ▶ Copy R10 to cells S10, S14, and S18.

10

- ▶ Copy R22 to S22.

22

- ▶ Widen column S to 9 characters.
- ▶ Scroll the spreadsheet so that L1 is in the upper left corner.

When you get through, your screen should look like Figure 35.

	L	M	N	O	P	Q	R	S	T
1									
2									
3									
4			3rd Quart				4th Quart	Total	
5	Aug	Sep		Oct	Nov	Dec			
6									
7	55400	56200	164800	58200	59100	60200	177500	630400	
8	\$ 110.00	\$ 110.00		\$ 110.00	\$ 110.00	\$ 110.00	\$ 110.00		
9	6094000	6182000	18128000	6402000	6501000	6622000	19525000	69344000	
10									
11	61700	63800	185200	68700	70100	72200	211000	725400	
12	\$ 42.00	\$ 42.00		\$ 42.00	\$ 42.00	\$ 42.00			
13	2591400	2679600	7778400	2885400	2944200	3032400	8862000	30466600	
14									
15	35800	36700	107600	38100	38200	39900	116200	422600	
16	\$ 3.80	\$ 3.80		\$ 3.80	\$ 3.80	\$ 3.80			
17	136040	139460	408680	144780	145160	151620	441560	1609680	
18									
19	13400	13900	40400	14200	14700	14900	45800	153500	
20	\$ 11.00	\$ 11.00		\$ 11.00	\$ 11.00	\$ 11.00			
21	147400	152900	444400	156200	161700	163900	481800	1697900	

Figure 35. After Creating New Column

Now that you've created the column of totals, you might decide that it's not in a very good place. Right now, the column is all the way to the right of the spreadsheet. Suppose you wanted it to the left instead? For example, you might want to put it between columns B and C.

You move a column the same way you move anything else in LisaCalc: by first cutting it from its old location, and then pasting it to its new location. To move column S so that it's between columns B and C,

- ▶ Select column S.



- ▶ Choose Cut from the Edit menu.

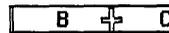
This would be an appropriate time to talk about cutting. It's usually a good idea to paste something as soon as possible after cutting it. After the cut, you can scroll the spreadsheet as necessary, and select the cells you need to select, but you shouldn't stop to do any editing operations, such as entering a value in a cell. The main reason for this is that each time you choose Cut or Copy from the Edit menu, the current contents of the Clipboard disappear. Although you can bring them back again with Undo Last Change, you shouldn't depend on this feature to rescue you.

In the case of columns and rows, there are additional reasons for doing the paste as soon as possible after the cut. When you cut a column, the columns to the right of the column you cut are renamed and moved over to close the gap. Any formulas that have references to these columns are adjusted appropriately. However, formulas that reference the deleted column cannot be adjusted since the column is on the Clipboard. As long as this is true, these cells have the value Error. When you paste the column back to the spreadsheet, the formulas are adjusted correctly.

However, if you insert any blank columns or rows while the column is still on the Clipboard, the formulas might not be adjusted correctly when you paste the column again. The same problem exists when you edit formulas that reference the column you have cut. To avoid any complications, don't try to perform any editing operations between the cut and the paste.

To finish moving the column,

- ▶ Scroll the spreadsheet so that column A is showing.
- ▶ Select the grid handle between columns B and C.
- ▶ Choose Paste from the Edit menu.



Your screen should look like Figure 36.

		Ch3:GCP					
* G Cells: C		Value:					
* M Formula:							
	A	B	C	D	E	F	G
1	Sue's Sporting Goods						
2	Upscale Division						
3	1985 Forecast						
4			85 Total				1st Quart
5	FORECAST			Jan	Feb	Mar	
6							
7	Jogging Togs	Units	657400	44000	45600	47900	137500
8		Price		\$ 110.00	\$ 110.00	\$ 110.00	\$ 110.00
9		Revenue	29344000	4840000	5016000	5269000	15125000
10							
11	Sneakers	Units	729400	51300	52900	54100	158300
12		Price		\$ 42.00	\$ 42.00	\$ 42.00	\$ 42.00
13		Revenue	30466800	2154600	2221800	2272200	6648600
14							
15	Ace Bandages	Units	425600	32000	32500	32900	97400
16		Price		\$ 3.80	\$ 3.80	\$ 3.80	\$ 3.80
17		Revenue	1609680	121600	123500	125020	370120
18							
19	Crutches	Units	137900	11000	11100	11300	33400
20		Price		\$ 11.00	\$ 11.00	\$ 11.00	\$ 11.00
21		Revenue	1512900	121000	122100	124300	367400

Figure 36. After Moving Column

This concludes Chapter 3. You can now print the spreadsheet, if you want to, or just save it using the same procedure as in the other chapters.

Chapter Summary

Left justify values	<ul style="list-style-type: none">■ Select the cells.■ Choose Left Flush from the Format menu.
Right justify values	<ul style="list-style-type: none">■ Select the cells.■ Choose Right Flush from the Format menu.
Center values	<ul style="list-style-type: none">■ Select the cells.■ Choose Center from the Format menu.
Repeat values in cell	<ul style="list-style-type: none">■ Select the cells.■ Choose Fill Pattern from the Format menu.
Split view horizontally	<ul style="list-style-type: none">■ Move the horizontal split icon to a row grid handle and release.
Split view vertically	<ul style="list-style-type: none">■ Move the vertical split icon to a column grid handle and release.
Unsplit view	<ul style="list-style-type: none">■ Move the new split control off the screen.
Insert column or row	<ul style="list-style-type: none">■ Select the grid handle where the column or row is to be inserted.■ Choose Insert Blank Row or Insert Blank Column from the Edit menu.
Move column or row	<ul style="list-style-type: none">■ Select the column or row.■ Choose Cut from the Edit menu.■ Select the grid handle where you want the column or row to go.■ Choose Paste from the Edit menu.

Copy column or row

- Select the column or row to be copied.
- Choose Copy from the Edit menu.
- Select the header or grid handle where the column or row is to be copied.
- Choose Paste or Paste Adjusting from the Edit menu.

Change column width of several columns

- Select the columns.
- Choose Column Widths from the Page Layout menu.
- Type in the column width you want.
- Click OK.

Chapter 4

More about Formulas

More about Formulas

In previous chapters, you have used mostly very simple formulas. In this chapter, you have a chance to explore the different kinds of formulas that you can use with LisaCalc. The features covered in this chapter include how to

- Put together the right mathematical formula.
- Use the Npv function to compute net present value.
- Use dates in formulas and values.
- Use the Lookup function to read from tables.
- Use the If function to choose between alternatives.

Getting the Spreadsheet

The sample spreadsheet for this chapter contains four different examples; each example shows different kinds of formulas.

To get the spreadsheet,

- ▶ Open the ProFile window.



- ▶ Open the LisaCalc Examples folder.



- ▶ Tear off a spreadsheet from the stationery pad named Chapter 4.



- ▶ Type a name for the spreadsheet.



- ▶ Open the spreadsheet. Your screen should look like Figure 37.

		A	B	C	D	E	F	G	H
1	NPV EXAMPLE								
2			T=0	T=1	T=2	T=3			
3	Price (Item #1)		(7000)						
4	Price (Item #2)		(3000)						
5	Investment Tax Credit								
6	Annual Depreciation								
7	Other Savings			2000	2000	4000			
8	=====								
9	Annual Cash Flow								
10									
11	Net Present Value								
12	Discount Rate		0.11						
13									
14	DATE EXAMPLE								
15	Project Task Name	Critical	Manager	Start	Est Time	Est End	Real End	Slack	
16									
17	Squared Circle		Dasher	1/19/84	72 days		3/19/84		
18	Perpetual Motion		Dancer	2/12/84	95 days		5/31/84		
19	Goldbach's Conjecture		Prancer	3/22/84	60 days		6/15/84		
20	Philosopher's Stone		Vixen	5/2/84	103 days		7/2/84		
21	Universal Solvent		Comet	7/3/84	45 days		8/17/84		

Figure 37. Formula Examples

Using Financial Functions

The example for financial functions is in the upper left corner of the spreadsheet; it covers the range A1:E11. This example shows the calculations you might do to evaluate the prospective purchase of two new pieces of equipment for your business. All the values have been filled in; you have to enter the formulas. The cells in the spreadsheet have already been formatted appropriately.

Columns B through E of the spreadsheet represent the successive years during the lifetime of the equipment. T=0 is the present, T=1 is next year, and so forth.

The purchase price of the first piece of equipment is \$7,000 (cell B3); of the second, \$3,000 (cell B4). Since these amounts are negative numbers, LisaCalc displays them surrounded by parentheses. When a cell has a monetary number style, negative numbers are shown surrounded by parentheses.

Row 5 shows the investment tax credit. This is a one-time credit, taken this year. Therefore, you want this amount to be in B5. The investment tax credit is 10% of the total price of the equipment.

► Enter the following formula in B5:

• G Cells: B5
• M Formula: $-.1*(B3+B4)$

$-.1*(B3+B4)$

The result in B5 is 1000.

The .1 is the same as 10%. The minus sign is necessary because the values in B3 and B4 are negative, and you want the value in B5 to be positive.

Why are the parentheses necessary in this formula? That is, why couldn't you just write $-.1*B3+B4$.

To answer this question, we have to go a little more deeply into the way formulas are calculated.

Order of Calculation in Formulas

There are two kinds of components in a LisaCalc formula: operators and operands. Operators indicate the kind of operations to be performed, such as addition, multiplication, and so forth, and operands indicate the objects these operations are to be performed on, such as cell coordinates and numbers. In this formula, the operators are * and +, and the operands are -.1, B3, and B4.

If a formula contains more than one operator, LisaCalc has to decide which operation to perform first before it can calculate the value of the formula. If the formula is

$$-.1*B3+B4$$

then there are two choices: it could perform the multiplication first, or the addition first. The rule LisaCalc applies is the following:

Rule 1: Exponentiation (\wedge) is performed first; then multiplication ($*$) and division ($/$); then addition ($+$) and subtraction ($-$).

Applying Rule 1 in this case means that the multiplication is the first operation to be performed. However, this is not what you want. What would happen is that you would add B4 to -10% of B3. By using parentheses, you avoid this problem. This brings us to the next rule:

Rule 2: Anything inside parentheses is calculated first.

Therefore, if your formula is

$$-.1*(B3+B4)$$

the addition is performed first, followed by the multiplication. This is just what you want.

There is another rule you should be aware of, although it does not apply to this formula:

Rule 3: If a formula contains more than one operator of the same type, the operations are performed from left to right.

“Of the same type” is interpreted according to this list:

Type 1: Exponentiation (\wedge)

Type 2: Multiplication ($*$) and division ($/$)

Type 3: Addition ($+$) and subtraction ($-$)

For example, in the following formula:

$$D26/A27*B25$$

the division is performed before the multiplication. This means that the formula is equivalent to

$$(D26/A27)*B25$$

and not

$$D26/(A27*B25)$$

If you're ever unsure how a formula will be evaluated, you can always use parentheses to control the order of evaluation.

Net Present Value

Now you can continue filling in the spreadsheet. Row 6 is the annual depreciation. Since you have decided that the equipment has a useful life of three years, you want it to depreciate one-third each year, assuming straight-line depreciation. Assuming your company is in the 50% tax bracket, you want to credit half the amount of the depreciation as a tax savings. Therefore in each of the cells C6, D6, and E6, you want the formula:

$$-(1/3)*.5*(B3+B4)$$

The minus sign is necessary so that the values in C6, D6, and E6 will be positive. To fill in this row,

- ▶ In C6, enter the formula

📌 G Cells: C6

📌 M Formula: $-(1/3)*.5*(B3+B4)$

$$-(1/3)*.5*(B3+B4)$$

- ▶ Copy the formula into cells D6 and E6.

📌 G Cells: D6:E6

📌 M Formula:

Because the formula is the same in each cell, you can use Paste instead of Paste Adjusting.

The next row, Other Savings, shows the amounts you estimate the new equipment will save your business. These amounts are constants.

The annual cash flow (row 9) in each column is the sum of the amounts in rows 3 through 7. You can use the Sum function to add these amounts.

- ▶ In B9, enter the formula

📌 G Cells: B9

📌 M Formula: $\text{sum}(B3:B7)$

Sum(B3:B7)

- ▶ Copy this formula to C9 through E9 using Paste Adjusting.

In the dialog box that appears, notice that the formula shown for C9 is correct.

- ▶ Click OK.

Now you are ready to enter the formula for net present value. The NPV function calculates the net value, at the present time, of a cash flow at a specified discount rate. The cash flow is a series of amounts, one for each time period, that is shown in the spreadsheet as a range of cells. In this example, the cash flows at the end of each year are in cells B9 through E9. The discount rate (11%) is in cell B12. To enter the formula,

- ▶ Select the Formula area of B11 and enter the formula

G Cells: B11
M Formula: Npv(B12,B9:E9)

Npv(B12,B9:E9)

The first argument to the function is the discount rate, and the second is the range of cells containing the cash flow.

Now you see the net present value in B11, \$1282. Your spreadsheet should look like Figure 38. You might try changing the discount rate in B12 to see how it changes the value in B11.

		acc:ch4						
* G Cells: B11		Value (Number): 1281.68473204524662						
* M Formula: npv(B12,B9:E9)								
	A	B	C	D	E	F	G	H
1	NPV EXAMPLE							
2		T=0	T=1	T=2	T=3			
3	Price (Item #1)	(7000)						
4	Price (Item #2)	(3000)						
5	Investment Tax Credit	1000						
6	Annual Depreciation		1667	1667	1667			
7	Other Savings		2000	2000	4000			
8	-----							
9	Annual Cash Flow	(9000)	3667	3667	5667			
10								
11	Net Present Value	1281.684						
12	Discount Rate	0.11						
13								
14	DATE EXAMPLE							
15	Project Task Name	Critical	Manager	Start	Est Time	Est End	Real End	Slack
16								
17	Squared Circle		Dasher	1/19/84	72 days		3/19/84	
18	Perpetual Motion		Dancer	2/12/84	95 days		5/31/84	
19	Goldbach's Conjecture		Prancer	3/22/84	60 days		6/15/84	
20	Philosopher's Stone		Vixen	5/2/84	103 days		7/2/84	
21	Universal Solvent		Comet	7/3/84	45 days		8/17/84	

Figure 38. End of NPV Example

Dates

So far in this tutorial, you have used two kinds of values: numbers and labels. You can also use a third kind: dates. As with numbers and labels, you don't have to tell LisaCalc when you're using a date, you just enter it in the proper format and LisaCalc knows how to interpret it.

For example, look at cell D17. It shows the value 1/19/84

This is the date January 19, 1984. Similarly, D18 is February 12, 1984, and so on.

In addition to dates, a value can also be a date part, which is a specified number of days, months, or years. For example, cell E17 contains the value

72 days

The date example starts in cell A14; it is shown in Figure 39.

G Cells:		Value:						
M Formula:								
	A	B	C	D	E	F	G	H
1	NPV EXAMPLE							
2		T=0	T=1	T=2	T=3			
3	Price (Item #1)	(7000)						
4	Price (Item #2)	(3000)						
5	Investment Tax Credit							
6	Annual Depreciation							
7	Other Savings		2000	2000	4000			
8	=====							
9	Annual Cash Flow							
10								
11	Net Present Value							
12	Discount Rate	0.11						
13								
14	DATE EXAMPLE							
15	Project	Task Name	Critical Manager	Start	Est Time	Est End	Real End	Slack
16								
17	Squared Circle		Dasher	1/19/84	72 days		3/19/84	
18	Perpetual Motion		Dancer	2/12/84	95 days		5/31/84	
19	Goldbach's Conjecture		Prencer	3/22/84	60 days		6/15/84	
20	Philosopher's Stone		Vixen	5/2/84	103 days		7/2/84	
21	Universal Solvent		Comet	7/3/84	45 days		8/17/84	

Figure 39. Date Example

Using Dates

In this example, you are completing a chart that shows the status of several projects. When this chart was set up, the information included for each project was the starting date, in the Start column, and the estimated number of days to complete the project, in the Est Time column. This chart makes no distinction between Saturdays and Sundays and normal working days. As time went by, and it became possible to provide more accurate completion dates for the project, these were entered in the Real End column. Given this information, you have to fill in the formulas in the remaining columns.

The first thing you need to calculate is the estimated completion date, in column F. This value is based on the starting date, in column D, and the estimated number of days to complete, column E. To calculate the estimated completion date, you add the estimated number of days to the starting date. To do this,

- ▶ Select F17.
- ▶ Enter the formula

D17+E17

⚙ G Cells: F17
⚙ M Formula: D17+E17

This formula shows you that you can add a date part to a date; the result is a date.

To copy this formula to F18:F21,

- ▶ Choose Copy from the Edit menu.
- ▶ Select F18:F21 by moving the pointer to F18, holding down the mouse button, moving the pointer to F21 and releasing the mouse button.
- ▶ Choose Paste Adjusting from the Edit menu.
- ▶ In the dialog box, verify that the sample formula is correct; then click OK.

The column is shown in Figure 40.

14	DATE EXAMPLE							
15	Project Task Name	Critical	Manager	Start	Est Time	Est End	Real End	Slack
16								
17	Squared Circle		Dasher	1/19/84	72 days	3/31/84	3/19/84	
18	Perpetual Motion		Dancer	2/12/84	95 days	5/17/84	5/31/84	
19	Goldbach's Conjecture		Prancer	3/22/84	60 days	5/21/84	6/15/84	
20	Philosopher's Stone		Vixen	5/2/84	103 days	8/13/84	7/2/84	
21	Universal Solvent		Comet	7/3/84	45 days	8/17/84	8/17/84	

Figure 40. Est End Column

The next thing you want to calculate is the slack remaining on the project. This is the number of days between the real completion date and the estimated completion date. Positive slack means the project is ahead of schedule; negative slack means the project is behind schedule. To calculate the slack, you subtract the real completion date from the estimated completion date:

- ▶ Select H17.
- ▶ Enter the formula

F17-G17

• G Cells: H17
• M Formula: F17-G17

When you subtract one date from another, the result is a number of days. In this case, the number is positive, because the project is ahead of schedule.

- ▶ Copy this formula to cells H18 through H21, using Paste Adjusting.

The column is shown in Figure 41.

14	DATE EXAMPLE							
15	Project Task Name	Critical	Manager	Start	Est Time	Est End	Real End	Slack
16								
17	Squared Circle		Dasher	1/19/84	72 days	3/31/84	3/19/84	12 days
18	Perpetual Motion		Dancer	2/12/84	95 days	5/17/84	5/31/84	-14 days
19	Goldbach's Conjecture		Prancer	3/22/84	60 days	5/21/84	6/15/84	-25 days
20	Philosopher's Stone		Vixen	5/2/84	103 days	8/13/84	7/2/84	-42 days
21	Universal Solvent		Comet	7/3/84	45 days	8/17/84	8/17/84	0 days

Figure 41. Slack Column

Notice that the values in H18 and H19 are negative numbers. This is because in these rows, the real end date comes after the estimated end date. A project is considered critical if this is the case. Therefore you want the word Yes to appear in the Critical column (column B) for these projects. The way to do this is with the If function.

The If Function

The If function lets you set a cell to a particular value if a specified condition is true, and to a different value if the condition is false.

The If function has the following form:

If (condition, value 1, value 2)

The condition is actually a statement that can be true or false. When the If function is calculated, the condition is tested to see whether it is true or false. If the condition is true, then the value of the If function is value 1. If the condition is false, the value of the If function is value 2.

In this case, you want to test whether the estimated ending date comes before the real ending date. If it does, you want to display Yes in the Critical column. If it doesn't, you don't want to display anything in this column. To do this,

► Select B17.

► Enter the following formula:

⌘ G Cells: B17

⌘ M Formula: =if(F17 < G17, "Yes", " ")

If(F17 < G17, "Yes", " ")

This formula needs some explanation. The expression $F17 < G17$ means "F17 is less than G17"; $<$ is the "less than" symbol. So the condition to be tested by this function is whether F17 is less than G17. If it is, then the value of the function is "Yes"; if it is not, then the value of the function is " ". Putting a blank space between two quotation marks is how you display a blank in a cell.

To enter the rest of the formulas in this column,

► Copy the formula to cells B18 through B21, using Paste Adjusting.

Your screen should look like Figure 42. Notice that B18 and B19 show "Yes," indicating that these projects are behind schedule.

aca:ch4								
* G Cells: B18:B21		Value:						
* M Formula:								
	A	B	C	D	E	F	G	H
1	NPV EXAMPLE							
2		T=0	T=1	T=2	T=3			
3	Price (Item #1)	(7000)						
4	Price (Item #2)	(3000)						
5	Investment Tax Credit	1000						
6	Annual Depreciation		1667	1667	1667			
7	Other Savings		2000	2000	4000			
8	=====							
9	Annual Cash Flow	(9000)	3667	3667	5667			
10								
11	Net Present Value	1282						
12	Discount Rate	0.11						
13								
14	DATE EXAMPLE							
15	Project Task Name	Critical	Manager	Start	Est Time	Est End	Real End	Slack
16	=====							
17	Squared Circle		Dasher	1/19/84	72 days	3/31/84	3/19/84	12 days
18	Perpetual Motion	Yes	Dancer	2/12/84	95 days	5/17/84	5/31/84	-14 days
19	Goldbach's Conjecture	Yes	Prancer	3/22/84	60 days	5/21/84	6/15/84	-25 days
20	Philosopher's Stone		Vixen	5/2/84	103 days	8/13/84	7/2/84	42 days
21	Universal Solvent		Comet	7/3/84	45 days	8/17/84	8/17/84	0 days

Figure 42. End of Date Example

Using Tables

The next example on this spreadsheet starts with cell I1.

- Scroll the spreadsheet so that I1 is in the upper left-hand corner.

The example is shown in Figure 43.

aca:ch4									
* G Cells:		Value:							
* M Formula:									
	I	J	K	L	M	N	O	P	Q
1	LOOKUP								
2						TABLES			
3	Zip Code	State	Tax Rate	Sales	Sales Tax	State/Rate		Zip/State	
4									
5	85398			4125		AK	0	80000	CO
6	99423			15248		AZ	.04	82000	WY
7	95223			24888		CA	.0475	83200	ID
8	83346			3433		CO	.03	84000	UT
9	82755			21902		HI	.04	85000	AZ
10	95014			65467		ID	.03	87000	NM
11	81324			9872		MT	0	89000	NV
12	96772			8152		NM	.0375	90000	CA
13	99824			42552		NV	.03	96700	HI
14	96074			1099		OR	0	97000	OR
15	98156			29583		UT	.04	98000	WA
16	80103			17686		WA	.045	99500	AK
17	86219			9884		WY	.03	100000	
18	97010			88374					
19	97005			19825					
20									
21									

Figure 43. Tables Example

In this example, you are head of sales for the western region. You have to calculate the total sales tax your company has collected this year for this region. You have been given a spreadsheet which lists the total sales for each zip code in your region.

To help you calculate the total sales tax, the spreadsheet also contains two tables. The first, in columns N and O, shows the sales tax rate for each state. The states are listed by their two-letter postal abbreviations.

The second table, in columns P and Q, shows what state each zip code is in. The values in column P are the lowest zip code for each state. For example, 80000 is lowest zip code for Colorado, and 82000 is the lowest zip code for Wyoming. This means the zip codes for Colorado run from 80000 to 81999.

The value 100000 in P17 is included to mark the end of the table. If it were not there, any value greater than 99500 but less than 100000 would not be found.

To complete this example, you need to fill in formulas in columns J, K, and M.

In column J, you want the names of the states corresponding to the zip codes in column I. For example, in J5 you want the name of the state containing the zip code in I5; this zip code is 85398. To find this state name, you run down column P until you find the last value before 85398. When you find the value 85000 in P9, you check the corresponding cell in column Q. The value in Q9 is AZ; this is the value you want in J5.

If you wanted, you could fill in all the state names individually by looking them up in the table, but it's much easier to use the Lookup function.

The Lookup function has the following form:

Lookup (value, range 1, range 2)

The value is the value you want to look up in the table. Range 1 is the range where you look up the value, and range 2 is the range that contains the answers you're looking for.

To see how this works,

► Select J5.

- ▶ Enter the following formula:

G Cells: J5

M Formula: `lookup(I5,P5:P17,Q5:Q17)`

Lookup (I5,P5:P17,Q5:Q17)

This formula says that you want to take the value in I5 and look it up in the range P5 through P17. Then you want to find the corresponding value in the range Q5 through Q17. This value is the value of the formula. In fact, you can see that J5 now shows AZ (Arizona), which is the state that zip code 85398 is in.

Now you can copy the formula into the rest of the column.

- ▶ Choose Copy from the Edit menu.

- ▶ Select the range J6:J19.

G Cells: J6:J19

- ▶ Choose Paste Adjusting from the Edit menu. The dialog box is shown in Figure 44.

Figure 44. Dialog Box for Paste Adjusting

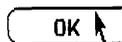
To adjust the formula, remember that the table in columns P and Q stays in the same place, no matter what value you're looking up. The coordinates for these two ranges should be identified as Same, not Relative.

- ▶ Check the boxes above P6:P18 and Q6:Q18.

The dialog box now looks like Figure 45.

Figure 45. Dialog Box for Paste Adjusting

► Click OK.



The State column is shown in Figure 46.

	I	J	K	L	M	N	O	P	Q
1	LOOKUP								
2						TABLES			
3	Zip Code	State	Tax Rate	Sales	Sales Tax	State/Rate	Zip/State		
4									
5	85398	AZ		4125		AK	0	80000	CO
6	99423	WA		15248		AZ	.04	82000	WY
7	95223	CA		24888		CA	.0475	83200	ID
8	83346	ID		3433		CO	.03	84000	UT
9	82755	WV		21902		HI	.04	85000	AZ
10	95014	OH		65467		ID	.03	87000	NM
11	81324	ND		9872		MT	0	89000	WY
12	96772	HI		8152		NM	.0375	90000	CA
13	99824	AK		42552		WV	.03	96700	HI
14	96074	CA		1098		DR	0	97000	OR
15	98156	WA		29583		UT	.04	98000	WA
16	80103	CO		17686		WA	.045	99500	AK
17	86219	NZ		9884		WY	.03	100000	
18	97010	OR		88374					
19	97005	OR		19825					
20									
21									

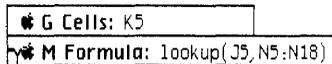
Figure 46. State Column

In column K, you want the tax rates corresponding to the states in column J. For example, in K5 you want the tax rate for the state in J5, which is Arizona. These values come from the table in columns N and O. You can use Lookup in just the same way.

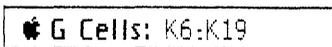
► Select K5.

► Enter the formula

Lookup(J5,N5:N18)



► Copy this formula to cells K6:K19. Adjust the coordinates as in the previous formula.



In this case, the third argument to the Lookup function has been omitted. Therefore, LisaCalc uses the column immediately to the right of the first range as the second range. The Tax Rate column is shown in Figure 47.

aca:ch4									
G Cells: K6:K19 Value:									
M Formula:									
	I	J	K	L	M	N	O	P	Q
1	LOOKUP					TABLES			
2									
3	Zip Code	State	Tax Rate	Sales	Sales Tax	State/Rate		Zip/State	
4									
5	85398	AZ	.04	4125		AK		0	80000
6	99423	WA	.045	15248		AZ		.04	82000
7	95223	CA	.0475	24888		CA		.0475	83200
8	83346	ID	.03	3433		CD		.03	84000
9	82755	WY	.05	21902		HI		.04	85000
10	95014	CA	.0475	65467		ID		.03	87000
11	81324	CD	.03	9872		MT		0	89000
12	96772	HI	.04	8152		NM		.0375	90000
13	99824	AK	.05	42552		NV		.03	96700
14	96074	CA	.0475	1098		OR		0	97000
15	98156	WA	.045	29583		UT		.04	98000
16	80103	CD	.03	17686		WA		.045	99500
17	86219	AZ	.04	9884		WY		.03	100000
18	97010	OR	.05	86374					
19	97005	OR	.05	19825					
20	=====								
21									

Figure 47. Tax Rate Column

To complete the example, you need to fill in the sales tax amount in column M. This amount is just the amount of sales (column L) multiplied by the sales tax rate (column K).

- ▶ Select M5.

G Cells: M5
M Formula: K5*L5

- ▶ Enter the formula

K5*L5

- ▶ Copy this formula to cells M6:M19. Both coordinates are relative.

G Cells: M6:M19

Finally, to add up the sales tax:

- ▶ In M21, enter the formula:

G Cells: M21
M Formula: sum(M5:M19)

Sum(M5:M19)

Your screen should look like Figure 48.

aca:ch4									
# G Cells: M21					Value (Number): 8834.64249999999993				
# M Formula: sum(M5:M19)									
	I	J	K	L	M	N	O	P	Q
1	LOOKUP								
2						TABLES			
3	Zip Code	State	Tax Rate	Sales	Sales Tax	State/Rate		Zip/State	
4									
5	85398	AZ	.04	4125	165	AK	0	80000	CO
6	99423	WA	.045	15248	686	AZ	.04	82000	WY
7	95223	CA	.0475	24888	1182	CA	.0475	83200	ID
8	83346	ID	.03	3433	103	CO	.03	84000	UT
9	82755	WY	.03	21902	657	HI	.04	85000	AZ
10	95014	CA	.0475	65467	3110	ID	.03	87000	NM
11	81324	CO	.03	9872	296	MT	0	89000	NV
12	96772	HI	.04	8152	326	NM	.0375	90000	CA
13	99824	AK	0	42552	0	NV	.03	96700	HI
14	96074	CA	.0475	1098	52	OR	0	97000	DR
15	98156	WA	.045	29583	1331	UT	.04	98000	WA
16	80103	CO	.03	17686	531	WA	.045	99500	AK
17	86219	AZ	.04	9884	395	WY	.03	100000	
18	97010	OR	0	88374	0				
19	97005	OR	0	19825	0				
20									
21									

Figure 48. After Lookup Example

Tax Forms

You've already used the If function in the Dates example above. In this section, you will learn some of the more advanced uses to which this function can be put. This is a rather boring example; you should probably skip it unless you're really interested in tax forms or in more complicated formulas. To see the example for this section,

- ▶ Scroll the spreadsheet so that R1 is in the upper left-hand corner.

Your screen should look like Figure 49.

aca:ch4										
G Cells: M21					Value (Number): 8834.64249999999993					
M Formula: sum(M5:M19)										
R	S	T	U	V	W	X	Y	Z	AA	AB
1	T									
2	T									
3	S									
4	P									
5										
6	T	LINE								
7										
8	R		30000							
9	N	7	(550)							
10	N	18	1600							
11	S	19								
12	T	20								
13	6	21								
14	L	22								
15	T	23								
16	T	23 (i)								
17	T	23 (ii)								
18	T	23 (iii)								
19	S	24								
20	T									
21	T									

Figure 49. Capital Gains and Losses

This example shows how to calculate capital gains and losses for personal income tax. It corresponds to Part III of the IRS Schedule D (1981 version). This schedule is shown in Figure 50.

Part III Summary of Parts I and II			
19	Combine lines 7 and 18, and enter the net gain or (loss) here		
	NOTE: If line 19 is a gain complete lines 20 through 22. If line 19 is a loss complete lines 23 and 24.		
20	If line 19 shows a gain, enter the smaller of line 18 or line 19. Enter zero if there is a loss or no entry on line 18		
21	Enter 60% of line 20		
	If line 21 is more than zero, you may be liable for the alternative minimum tax. See Form 6251.		
22	Subtract line 21 from line 19. Enter here and on Form 1040, line 12		
23	If line 19 shows a loss, enter one of the following amounts: (i) If line 7 is zero or a net gain, enter 50% of line 19, (ii) If line 18 is zero or a net gain, enter line 19; or, (iii) If line 7 and line 18 are net losses, enter amount on line 7 added to 50% of the amount on line 18		
24	Enter here and as a loss on Form 1040, line 12, the smallest of: (i) The amount on line 23; (ii) \$3,000 (\$1,500 if married and filing a separate return); or, (iii) Taxable income, as adjusted		

Figure 50. Schedule D

This example assumes that you have already completed Part I, short-term capital gains and losses, and Part II, long-term capital gains and losses. The result of Part I is in cell T9 and the result of Part II is in cell T10. Adjusted taxable income is in T8.

You may have noticed that column R looks a little odd. This is because it is only one character wide. Column R contains comments for each line that paraphrase the instructions in Schedule D. The column can be widened, but you don't have to if you prefer not to see the comments.

- Widen column R until it looks like Figure 51. It will be 58 characters wide.

	R	S	T
1	IF Example		
2			
3	Schedule D (Form 1040)		
4	Part III		
5			
6	Instructions:	LINE	
7			
8	Adjusted taxable income		30000
9	Net short-term gain or loss; sum of lines 5 and 6	7	(550)
10	Net long-term gain; sum of lines 16 and 17	18	1600
11	Sum of lines 7 and 18	19	
12	If line 19 is gain, smaller of 18 or 19. Zero if no gain	20	
13	60% of line 20	21	
14	Line 19 - line 21	22	
15	If line 19 shows a loss, one of 23 (i), (ii), or (iii)	23	
16	If line 7 is not a loss, 50% of line 19	23 (i)	
17	If line 18 is not a loss, same as line 19	23 (ii)	
18	If lines 7 and 18 are losses, line 7 + 50% of line 18	23 (iii)	
19	Smallest of line 23, \$3000, or adjusted taxable income	24	
20	1040, line 12		
21			

Figure 51. After Widening Column R

The comments in column R are worded similarly to the instructions in schedule D. Column S shows which line on schedule D matches each row in the spreadsheet; the values for each line are in column T.

To show you how to fill in the formulas in column T, we'll start with the simpler formulas and move on to the more complicated formulas. This means that you won't be filling in the cells in order. For this reason, the values shown on your screen aren't necessarily correct until the whole column is filled in.

T8, T9, and T10 are already filled in; they are constants as far as this example is concerned, although actually they have been computed from other parts of the schedule. For cell T11, the description in R11 says "sum of lines 7 and 18." This means you want T11 to be the sum of T9 and T10.

- Enter the following formula in T11:

<ul style="list-style-type: none"> • G Cells: T11 • M Formula: T9+T10

T9+T10

The value in T11 is 1050.

For T13 (IRS line 21), R13 says “60% of line 20.” Line 20 is the amount in T12.

► Enter the following formula in T13:

📌 G Cells: T13

📌 M Formula: .6*T12

.6*T12

The value in T13 is 0 right now.

T14 (line 22) is described as “Line 19 – line 21.” That means you want the value to be T13 subtracted from T11.

► Enter the following formula in T14:

📌 G Cells: T14

📌 M Formula: T11-T13

T11 – T13

The value in T14 is 1050.

To fill in T15 and T19, you need two useful functions you haven’t encountered yet: Max and Min.

Finding Maximums and Minimums

For T15, you need a formula that matches the description in R15. This description reads:

If line 19 shows a loss, one of 23 (i), (ii), (iii).

23 (i) is T16, 23 (ii) is T17, and 23 (iii) is T18. The way this example is set up, two of these cells will be zero, and the other will be greater than zero. You need to find the value that is greater than zero. This will, in fact, be the largest of the three values, or the maximum. To do this, you use the Max function.

► Enter the following formula in T15:

📌 G Cells: T15

📌 M Formula: max(T16, T17, T18)

Max(T16,T17,T18)

The value in T15 is 0 right now.

The description for T19 (line 24) says:

Smallest of line 23, \$3000, or adjusted taxable income.

Line 23 is T15, and adjusted taxable income is T8. To find the smallest of the three values, or minimum, you use the Min function.

- Enter the following formula in T19:

⌘ G Cells: T19
⌘ M Formula: min(T15, 3000, T8)

Min(T15,3000,T8)

The value in T19 is 0.

Max and Min can also have any number of cells, cell ranges, or numbers for arguments.

The remaining formulas all use the If function.

The If Function Revisited

In T16, you need a formula to match the description in R16, which says:

If line 7 is not a loss, 50% of line 19.

Since you've already used the If function in the date example, you shouldn't have any trouble coming up with the appropriate formula. The condition to be tested is whether line 7 (T9) is greater than or equal to zero. If it is, then you want the value of the cell to be 50% of line 19 (T11). If it's not, then you want the value of the cell to be zero. The only remaining fact you need is that the symbol for "greater than or equal to" is \geq .

- Enter the following formula in T16:

⌘ G Cells: T16
⌘ M Formula: if(T9 >= 0, .5*T11, 0)

If(T9 >= 0, .5*T11, 0)

The value in T16 is 0.

Similarly, in T17, you need a formula that matches the description in R17:

If line 18 is not a loss, same as line 19.

Since line 18 is T10 and line 19 is T11,

- In T17, enter the formula:

⌘ G Cells: T17
⌘ M Formula: if(T10 >= 0, T11, 0)

If(T10 >= 0, T11, 0)

The value in T17 is 1050. Notice that T15 and T19 also change to show 1050.

In T18, you need a somewhat more complicated formula. Its description in R18 reads:

If lines 7 and 18 are losses, line 7 + 50% of line 18.

In this case, two conditions are to be tested: "line 7 is a loss" and "line 18 is a loss." How can you test two conditions with the same If function?

You can do this by using And. An If function with And in it looks like this:

If (condition 1 And condition 2, value 1, value 2)

And links two conditions to create a compound condition. If both condition 1 and condition 2 are true, then the compound condition is true, and the value of the cell is value 1. If either condition 1 or condition 2 or both is false, then the compound condition is false, and the value of the cell is value 2.

In T18, condition 1 is "line 7 is a loss," or $T9 < 0$. Condition 2 is "line 18 is a loss," or $T10 < 0$. If the compound condition is true, then the value of the cell is "line 7 + 50% of line 18," or $T9 + .5 * T10$. If the compound condition is false, the value of the cell is zero. To enter this formula,

► Enter the following formula in T18:

If(T9 < 0 And T10 < 0,T9+.5*T10,0)

The spaces on each side of And are required. After entering the formula, the value in T18 is 0.

The next formula to fill in is in T12. The description in R12 reads:

If line 19 is gain, smaller of 18 or 19. Zero if no gain.

This instruction says that if line 19 (T11) is greater than 0, the value of the cell is the minimum of line 19 and line 18 (T10). If line 19 is less than or equal to zero, the value of the cell is zero. On the other hand, if line 18 is zero, then the value of the cell is zero, regardless of the value of line 19.

You can turn this statement into an If function if you turn it around. An equivalent way to phrase it is to say that the value of the cell is zero if either line 18 or line 19 is less than or equal to zero. Otherwise, the value of the cell is the minimum of line 18 and line 19.

To make this into an If function, you need to use Or. Or is similar to And in that it links two conditions into a compound condition. An If function using Or looks like this:

If (condition 1 Or condition 2, value 1, value 2)

If either condition 1 or condition 2, or both, is true, then the value of the cell is value 1. If both condition 1 and condition 2 are false, then the value of the cell is value 2.

In this case, condition 1 is "line 18 is less than or equal to zero." Condition 2 is "line 19 is less than or equal to zero." If the compound condition is true, then the value of the cell is zero; otherwise it is the minimum of line 18 and line 19.

To enter this as a formula,

► Enter the following formula in T12:

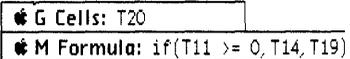
If (T11 <= 0 Or T10 <=0,0,Min(T11,T10))

The value in T12 is 1050. Notice that the values in T13 and T14 also change.

In the last formula you have used a function within a function: the Min function inside the If function. This is perfectly legitimate; in fact, if you wanted, you could use a function within a function within a function, and so forth.

Finally, you need to fill in T20. This is the cell that you will copy to line 12 of form 1040. If you have a net gain in T11, T20 is the same as the value in T14. If you have a net loss in T11, T20 is the same as the value in T19. To do this,

► Enter the following formula in T20:



• G Cells: T20
• M Formula: if(T11 >= 0, T14, T19)

If(T11 >= 0,T14,T19)

The value in T20 is 420.

Your screen should look like Figure 52.

		R	S	T
aca:ch4				
* G Cells: T20		Value (Number): 420		
* M Formula: if(T11 >= 0, T14, T19)				
1	IF Example			
2				
3	Schedule D (Form 1040)			
4	Part III			
5				
6	Instructions:	LINE		
7				
8	Adjusted taxable income			30000
9	Net short-term gain or loss, sum of lines 5 and 6	7		(550)
10	Net long-term gain, sum of lines 16 and 17	18		1600
11	Sum of lines 7 and 18	19		1050
12	If line 19 is gain, smaller of 18 or 19. Zero if no gain	20		1050
13	60% of line 20	21		630
14	Line 19 - line 21	22		420
15	If line 19 shows a loss, one of 23 (i), (ii), or (iii)	23		1050
16	If line 7 is not a loss, 50% of line 19	23 (i)		0
17	If line 18 is not a loss, same as line 19	23 (ii)		1050
18	If lines 7 and 18 are losses, line 7 + 50% of line 18	23 (iii)		0
19	Smallest of line 23, \$3000, or adjusted taxable income	24		1050
20	1040, line 12			420
21				

Figure 52. After Capital Gains

This concludes Chapter 4. You can put away the spreadsheet, if you like, using the same method as in previous chapters.

Chapter Summary

A complete summary of formulas and functions can be found in Appendix 4, Formulas, and Appendix 5, Functions, in this manual.

Chapter 5

Copying to Other Tools

Copying to Other Tools

In this chapter, you learn how to copy values from a LisaCalc spreadsheet to become part of documents in other tools. In particular, you learn how to

- Copy from a spreadsheet into a LisaGraph document.
- Copy from a spreadsheet into a LisaWrite document.

You also can cut and paste data from a LisaCalc spreadsheet to a LisaTerminal document. For how to do this, see the *LisaTerminal* manual.

Copying to LisaGraph

You can copy all or part of a LisaCalc spreadsheet into a LisaGraph table to be plotted. When you do this, only the values, not the formulas, are copied, since LisaGraph cells do not have formulas.

The example shown here is the same example as in the *LisaGraph* manual, Section B, LisaGraph Tutorial, Chapter 4, LisaGraph and Other Tools. If you don't understand any of the LisaGraph operations outlined here, you should refer to that tutorial.

To begin,

- ▶ Open the ProFile disk window.
- ▶ Open the LisaCalc examples folder.
- ▶ Tear off a spreadsheet from the Forecast stationery pad.



- ▶ Type a name for the spreadsheet.



- ▶ Open the spreadsheet.

What you see on your screen should match Figure 53.

aca:ch5					
* G Cells:		Value:			
* M Formula:					
	A	B	C	D	E
1	FORECAST	Sneakers	Jogging Togs	Ace Bandages	
2					
3	Monthly Projections for 1983				
4	JAN	\$ 1580.40	\$ 4400.00	\$ 71.40	
5	FEB	\$ 1251.15	\$ 2800.00	\$ 113.05	
6	MAR	\$ 834.10	\$ 2000.00	\$ 148.75	
7	APR	\$ 1097.50	\$ 2960.00	\$ 160.65	
8	MAY	\$ 1492.60	\$ 3760.00	\$ 178.50	
9	JUN	\$ 1580.40	\$ 2800.00	\$ 208.25	
10	JUL	\$ 2085.25	\$ 2880.00	\$ 249.90	
11	AUG	\$ 2238.90	\$ 2640.00	\$ 297.50	
12	SEPT	\$ 3248.60	\$ 6000.00	\$ 345.10	
13	OCT	\$ 2963.25	\$ 5200.00	\$ 238.00	
14	NOV	\$ 1492.60	\$ 4800.00	\$ 190.75	
15	DEC	\$ 1580.40	\$ 7600.00	\$ 148.75	
16					
17					
18					
19					
20					

Figure 53. Forecast Spreadsheet

You may recognize this spreadsheet as another forecast from Sue's Sporting Goods, similar to the one in Chapter 3. This spreadsheet shows monthly projections for 1983 for three products: Sneakers, Jogging Togs, and Bandages.

Unlike the example in Chapter 3, however, this one shows the months vertically, in column A, and the product names horizontally, in row 1. This is because this version of the spreadsheet has specifically been laid out to be convenient to paste into LisaGraph. The X-axis data is in column A, and the Y-axis data is in columns B through D.

To paste the data into LisaGraph, you start by getting a blank LisaGraph document:

- ▶ Change the size and location of the spreadsheet, as necessary, until you can see the LisaGraph stationery pad.
- ▶ Tear a graph from the LisaGraph stationery pad.



- ▶ Type the name
Sports Forecast



- ▶ Open the document.
- ▶ Change the size and location of the two documents as needed so that you can see at least part of both documents at the same time.

When you're through rearranging the documents, your screen should look somewhat like Figure 54.

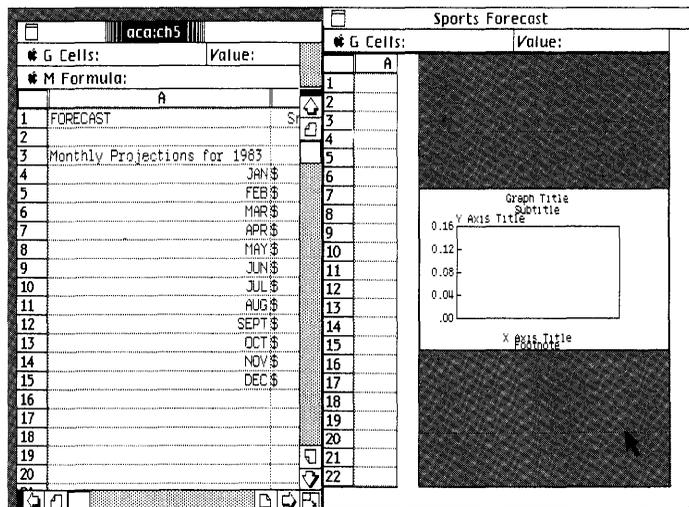


Figure 54. Desktop with Two Documents

Now you're ready to copy the data from LisaCalc into LisaGraph. The only part of the spreadsheet you want to copy is the values in rows 4 through 15. To do this,

- ▶ If necessary, activate the LisaCalc spreadsheet by clicking anywhere within the window.
- ▶ Select the Cells area.
- ▶ Type **G Cells: 4:15** (Enter)
- ▶ Choose Copy from the Edit menu.

G Cells: 4:15

▶ Activate the LisaGraph document.

▶ Select rows 1 through 12.



▶ Choose Paste from the Edit menu.

Now the data you have copied is automatically graphed in LisaGraph. Your screen should look like Figure 55.

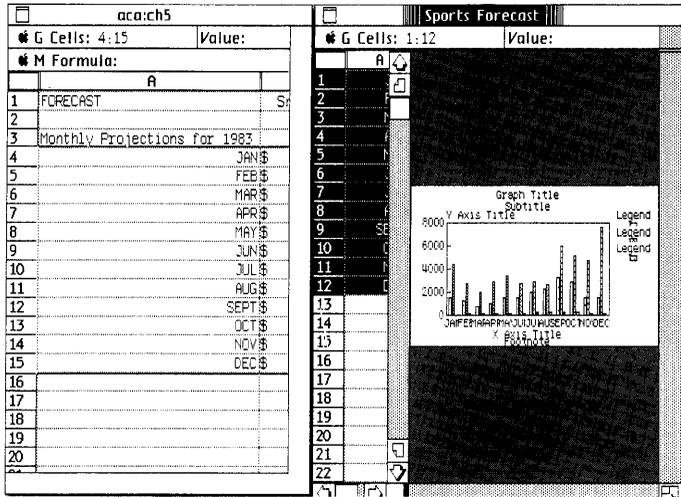
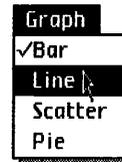


Figure 55. LisaGraph Graph

To make the graph more readable, you can change the graph in the following ways:

▶ Widen the graph so that it fills the whole screen.

▶ Choose Line from the Graph menu.



▶ Add titles and so forth.

Instructions for all these steps can be found in the LisaGraph manual. When you get through, your graph might look like the one in Figure 56.

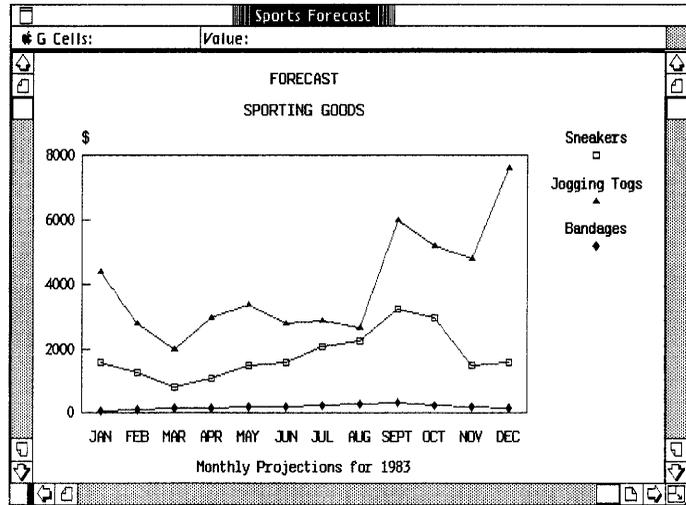


Figure 56. Completed Graph

Copying to LisaWrite

You can copy all or part of a LisaCalc spreadsheet into a LisaWrite document. Only the values of the cells, not their formulas, are copied. When you paste to LisaWrite, tab settings replace the LisaCalc column boundaries, so that the values still look like a spreadsheet. The tab settings are determined by LisaWrite; you might have to change them. Once the values have been copied to the LisaWrite document, they are treated as text; you can no longer perform calculations with them.

The *LisaWrite* manual, Section B, *LisaWrite Tutorial*, Chapter 6, *Working with Multiple Documents*, shows an example of pasting a LisaCalc spreadsheet into a LisaWrite document.

In this example, you paste the spreadsheet in Figure 57 into the LisaWrite document shown in Figure 58.

Furniture						
* G Cells:		Value:				
* M Formula:						
	A	B	C	D	E	F
1	Description	Quantity	Cost/Unit	Mo. Cost		
2						
3	Couch 1654A	1	75.00	75.00		
4	Desks 49876B	3	55.50	166.50		
5	Chairs 1954J	3	39.00	117.00		
6						
7	Total			\$ 358.50		
8						
9						

Figure 57. LisaCalc Spreadsheet

OFFICE SUPPLY CORPORATION COMMERCIAL TERM LEASE AGREEMENT
OFFICE SUPPLY CORPORATION, SAN LEANDRO, CALIFORNIA

CUSTOMER INFORMATION
CUSTOMER'S NAME: John Smith CUSTOMER/CONTRACT NO. A101
BILLING ADDRESS: Alphabet Electronics, 1st & Fremont, Mt. View
INSTALLATION ADDRESS: Same

TERM OF AGREEMENT: 24 MONTH 36 MONTH 48 MONTH

Office Supply Corporation hereby leases to the Customer, and Customer hereby leases from Office Supply Corporation, the Equipment and Furniture described below (hereafter called "The Equipment") in accordance with the terms and conditions and prices set forth below and on the remaining pages hereof.

EQUIPMENT ORDERED	QUANTITY	MONTHLY LEASE AMOUNT/UNIT	MONTHLY COST
-------------------	----------	---------------------------	--------------

Figure 58. LisaWrite Document

The results are shown in Figure 59.

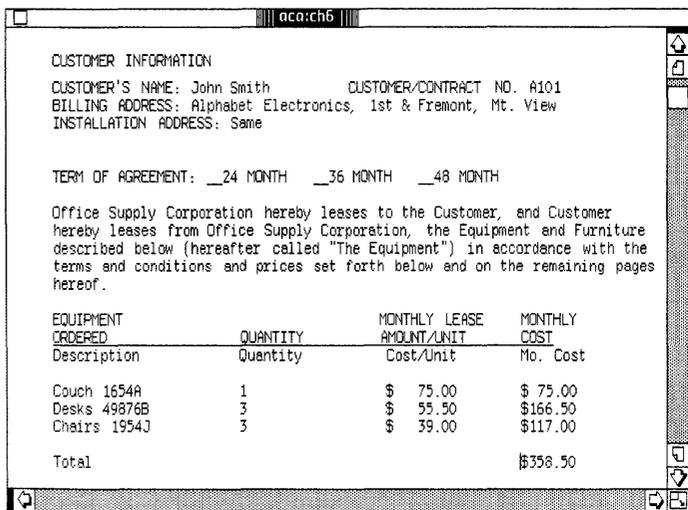


Figure 59. LisaCalc Data Pasted into LisaWrite Document

Chapter Summary

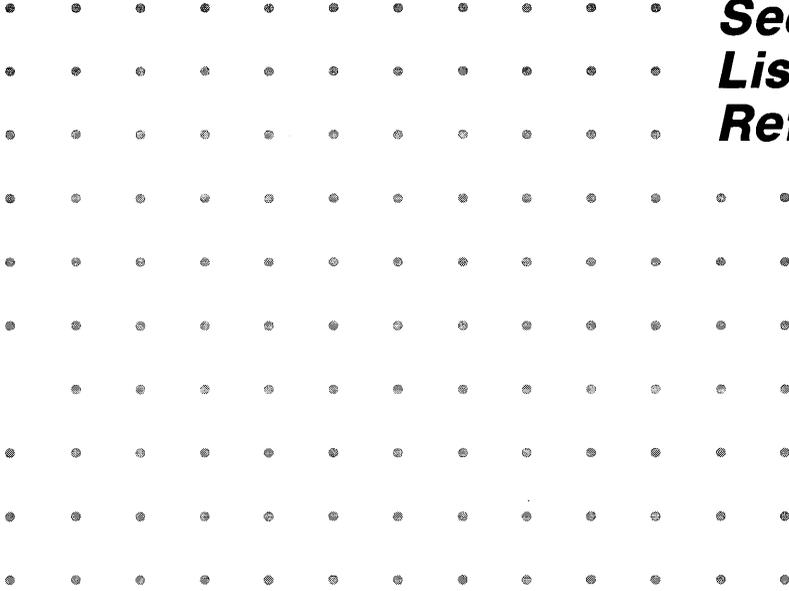
To copy a LisaCalc spreadsheet into a LisaGraph document

- Get or activate the LisaCalc spreadsheet.
- Select the cells that you want to copy.
- Choose Copy from the Edit menu.
- Get or activate the LisaGraph document.
- Select the location in the LisaGraph table where the cells are to be pasted.
- Choose Paste from the Edit menu.
- Edit and format the graph and table.

To copy a LisaCalc spreadsheet into a LisaWrite document

- Get or activate the LisaCalc spreadsheet.
- Select the cells that you want to copy.
- Choose Copy from the Edit menu.
- Get or activate the LisaWrite document.
- Place the insertion point where you want to place the LisaCalc data, or select the text in the LisaWrite document that you want to replace.
- Choose Paste from the Edit menu.
- Edit and format the document.

Section C
LisaCalc
Reference Guide



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What's in the LisaCalc Reference Guide?

This LisaCalc Reference Guide contains complete information about LisaCalc and is divided into two parts. Chapter 1 briefly explains basic LisaCalc concepts. Read Chapter 1 for an overview of LisaCalc and how to use it. Chapter 2 is divided into categories. Within each category there are procedures for accomplishing specific tasks and some examples. Use Chapter 2 for step-by-step instructions on how to complete a particular task within LisaCalc.

You can look for specific topics in the Index, in the table of contents of this Reference Guide, or at the beginning of each category of Chapter 2 of this Reference Guide.

The information in the LisaCalc Reference Guide is based on the assumption that you have completed LisaGuide, for an introduction to your Lisa, and Section A, Getting Started with LisaCalc, for a brief introduction to the basic skills needed to use LisaCalc. For more self-paced instructions on LisaCalc, you can use the LisaCalc Tutorial, Section B.

Chapter 1

Overview

Overview

What's in Chapter 1?

Chapter 1 covers the basic concepts and terminology for LisaCalc. It introduces you to the LisaCalc screen, elements of a LisaCalc spreadsheet, selecting, scrolling, menus, dialog boxes, alert boxes, and the LisaCalc work flow.

The LisaCalc Screen

A LisaCalc window is divided into two parts: the spreadsheet view and the status panel. When you work with a LisaCalc document, the screen typically looks like Figure 1.

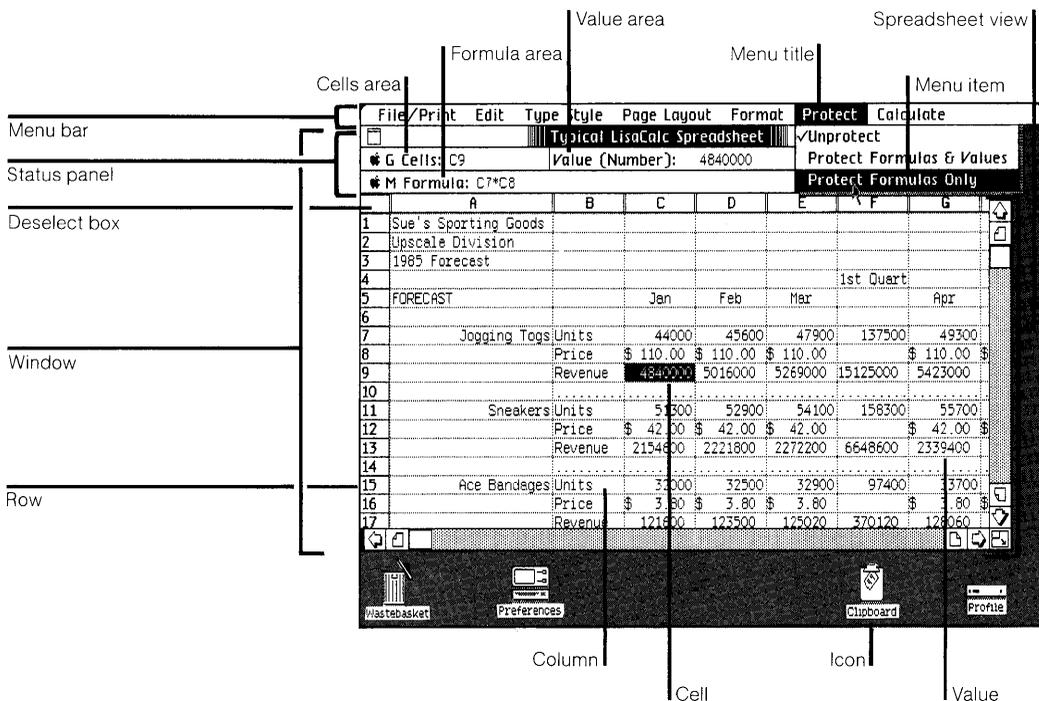


Figure 1. Typical LisaCalc Screen

Icon	Graphic symbol representing something on the Lisa desktop.
Window	Displays the contents of an open icon, such as the contents of a document or a disk.
Menu bar	Displays the names of all available LisaCalc menus.
Menu title	Shows the names of a list of menu items.
Menu item	An option, command, or instruction that affects the current selection when you choose it.
Spreadsheet view	Displays the values of the cells currently visible.
Status panel	Shows information about the selected cell or cells.
Cells area	Shows which cell or cells are selected.
Value area	Shows the contents of the selected cell and the kind of value it contains.
Formula area	Shows the formula of the selected cell.
Deselect box	When selected, indicates that nothing in the spreadsheet is selected.
Cell	A box at the intersection of a row and a column that contains a single value, such as a date.
Column	Cells arranged vertically.
Row	Cells arranged horizontally.
Value	The contents of a cell; a number, label, or date. If a cell has a formula, the value is the result of the formula.

LisaCalc Concepts

A LisaCalc spreadsheet is an arrangement of cells in rows and columns. Each cell is identified by its coordinates, which are the column letter and the row number. For example, cell A1 is in row 1 and column A. A cell can have a value, which is a number, label, or date. A cell can also have a formula, in which case its value is computed from the formula. A formula is a mathematical expression combining numbers, dates, functions, and coordinates of other cells. For more information about formulas, see Appendix 4, Formulas, in this manual.

When you change the value of a cell, the values of cells that depend on it change automatically. You can edit the contents of cells using the same procedures that you use for all Lisa editing. You can also format individual cells, or groups of cells, or the whole spreadsheet.

LisaCalc cells can be protected, which prevents their values from being accidentally cleared or replaced.

Pointers

As you move the mouse, the pointer moves around the screen and assumes different shapes as you move from one area to another. LisaCalc has the following pointer shapes.



The text pointer appears whenever you can select text.



The hollow cross-hair pointer appears in the spreadsheet view to show when you can select cells.



The arrow pointer appears outside the spreadsheet to show when you can select icons, view controls, and menu items. It always points up and to the left.



The check pointer is used to make choices within some dialog boxes.



The hourglass appears when you need to wait while the Lisa finishes what it is doing.

Selecting

You select something by clicking the mouse button on the appropriate object. The current selection is shown in inverse video (white on black).

Table 1. Selecting in LisaCalc

To Select	Do the Following
One cell	<ul style="list-style-type: none">■ Move the pointer into the cell and click the mouse button once. or <ul style="list-style-type: none">■ Type the coordinates of the cell in the Cells area and press Enter. Example: A1 Enter
One column	<ul style="list-style-type: none">■ Move the pointer into the column header and click the mouse button once. or <ul style="list-style-type: none">■ Type the column letter or letters in the Cells area and press Enter. Example: B Enter
One row	<ul style="list-style-type: none">■ Move the pointer into the row header and click the mouse button once. or <ul style="list-style-type: none">■ Type the row number in the Cells area and press Enter. Example: 4 Enter

Table 1. Selecting in LisaCalc, continued

To Select	Do the Following
Several cells, columns, or rows	<ul style="list-style-type: none">■ Move the pointer into the first cell, column header, or row header.■ Press the mouse button and hold it down while moving the pointer into the last cell, column header, or row header; then release the mouse button. <p>or</p> <ul style="list-style-type: none">■ In the Cells area, type the coordinates of the first cell, column, or row.■ Type a colon (:).■ Type the coordinates of the last cell, column, or row, followed by Enter. <p>Examples:</p> <p>A1:B4 Enter</p> <p>A:C Enter</p> <p>3:4 Enter</p>
Between two columns or between two rows	<ul style="list-style-type: none">■ Position the pointer on the grid handle between two columns or rows and click the mouse button once. <p>or</p> <ul style="list-style-type: none">■ In the Cells area, type the coordinate of the first row or column.■ Type a vertical bar ().

Table 1. Selecting in LisaCalc, continued

To Select	Do the Following
	<ul style="list-style-type: none"> ■ Type the coordinate of the second row or column. Examples: A/B 3/4
One or more characters	<ul style="list-style-type: none"> ■ If the characters are in a cell, select the cell first. ■ Move the text pointer to the left of the first character. ■ Press and hold down the mouse button. ■ Move the pointer directly through to the last character and release the mouse button.
One word	<ul style="list-style-type: none"> ■ If the word is in a cell, select the cell first. ■ Move the pointer into the word and click the mouse button twice.
Whole contents of cell	<ul style="list-style-type: none"> ■ If the selection is already in the cell, click the mouse button three times or press the Enter key. ■ If the selection is not in the cell, move the pointer to the cell and click four times.
Next cell left, right, up, or down	<ul style="list-style-type: none"> ■ Press ← key or Shift followed by Tab. ■ Press → key or Tab key. ■ Press ↑ key. ■ Press ↓ key.

Table 1. Selecting in LisaCalc, continued

To Select	Do the Following
First cell in next row	■ Press the Return key.
Formula area	■ Move the pointer to the Formula area and click the mouse button three times. or ■ Hold down the  key and press the M key (for Mathematical formula).
Cells area	■ Move the pointer to the Cells area and click the mouse button three times. or ■ Hold down the  key and press the G key (for Go to).
Value area	■ Move the pointer to the Value area and click the mouse button three times.
Whole spreadsheet	■ Choose Select All of Document from Edit menu.
Extend a selection	■ Move the pointer to the end of the new selection. ■ Press and hold down the Shift key and click the mouse button once.
Deselect; select nothing in the document	■ Move the pointer to the deselect box in the upper-left corner of the spreadsheet view and click the mouse button once.

When you select a cell or group of cells by editing the Cells area, and the cells are not showing on the screen, LisaCalc automatically scrolls the spreadsheet so that the cells are showing.

Scrolling

To see parts of the spreadsheet not showing on the screen, use the view controls to scroll hidden portions of the document into view. Figure 2 shows LisaCalc's view controls.

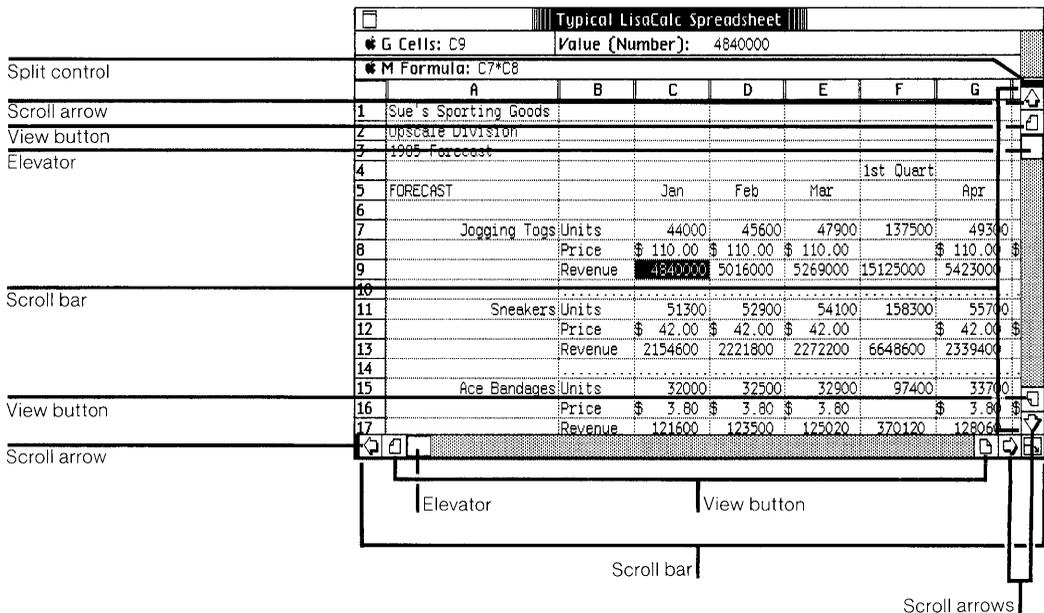


Figure 2. Window with View Controls

Scroll bars

Contain controls that scroll hidden portions of a spreadsheet into view.

Scroll arrows

Bring hidden portions of a spreadsheet into view slowly, one row or column at a time.

Elevators	Move within the scroll bar to indicate where the current view is in relation to the rest of the spreadsheet. Enable you to scroll quickly to any spot in the document.
View buttons	Scroll the next or previous view of the spreadsheet into sight.
Split control	Divides the spreadsheet view into two or more views that can be scrolled independently.

Table 2 explains the different ways to scroll in LisaCalc.

Table 2. Scrolling in LisaCalc

To Scroll	Do the Following
Row by row or column by column	<ul style="list-style-type: none"> ■ Move the pointer into a scroll arrow and click the mouse button once for each row or column.
Continuous rows or columns	<ul style="list-style-type: none"> ■ With the pointer in a scroll arrow, press the mouse button and hold it down until the desired view is shown.
View-sized increments	<ul style="list-style-type: none"> ■ Move the pointer into a view button and click the mouse button.
Continuous view-sized increments	<ul style="list-style-type: none"> ■ With the pointer in a view button, press the mouse button and hold it down until the desired view is shown.
Large jumps	<ul style="list-style-type: none"> ■ Move the pointer into an elevator and hold down the mouse button while moving the elevator up or down in a vertical scroll bar, or left or right in a horizontal scroll bar.

Table 2. Scrolling in LisaCalc, continued

To Scroll	Do the Following
	<ul style="list-style-type: none">■ Release the mouse button when the elevator is in the correct position relative to the beginning and end of the scroll bars.
Split a view vertically	<ul style="list-style-type: none">■ With the pointer on the split control in the vertical scroll bar, press the mouse button and hold it down, moving the mouse toward you at the same time.
Split a view horizontally	<ul style="list-style-type: none">■ With the pointer on the split control in the horizontal scroll bar, press the mouse button and hold it down, moving the mouse to your right at the same time.
Close a split view	<ul style="list-style-type: none">■ With the pointer in the split control of the view you want to close, press and hold the mouse button, pulling the edge of the split view to the original split control.

About Menus

LisaCalc's editing, formatting, printing, and filing operations are listed on menus. The menu bar at the top of the screen shows the names of the available menus. Figure 3 shows the menu bar with the names of LisaCalc menus. A description of all LisaCalc menu items can be found in Appendix 1, Menu Items, in this manual.



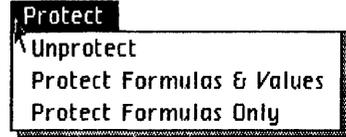
Figure 3. LisaCalc Menu Bar

To choose a menu item,

- ▶ Move the pointer to the menu bar and position it over the name of the menu you want to open.



- ▶ Press the mouse button and hold it down. Notice that the menu is now showing.



- ▶ Move the pointer into the menu item you want. Notice that the item is highlighted.



- ▶ Release the mouse button.

Some menu items are accompanied by an Apple symbol and a letter of the alphabet. This means that you can hold down the  key while typing the letter to choose that menu item rather than choosing the item with the mouse. Refer to Appendix 2, Apple Keys, in this manual, for a list of the menu items that you can choose using the  key.

Some menu items are followed by an ellipsis (. . .). When you choose one of these menu items, a dialog box appears requesting additional information that is required to complete the operation. Dialog boxes are explained in the following section.

When a menu item is shown in gray instead of black, it cannot be chosen at that time. This is usually because it does not apply to the current selection.

Some menu items are grouped together and represent the available choices for a particular menu setting. The current setting has a check mark next to it, while the others don't. If you choose another setting in the group, the current one is automatically turned off.

For example, the Format menu is divided into two sections: the first shows the alignment of the current selection, and the second shows the number style for the selection. For any selection, each section has exactly one check mark. If you choose a different option in the bottom section, the bottom check mark changes, but the top check mark stays as it is.

Dialog Boxes

A dialog box appears beneath the menu bar after you choose a menu item followed by an ellipsis (. . .). Figure 4 shows a LisaCalc dialog box. The dialog box asks you to fill in information required to complete the operation. Usually, default information is already filled in, which you can accept by clicking OK.

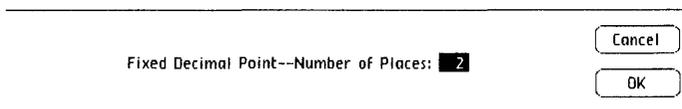
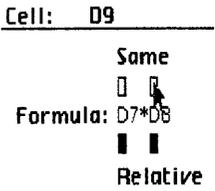


Figure 4. Fixed Decimal Format Dialog Box

To fill in a dialog box,

- ▶ If a value is already selected, and you want to change the value, type in the new value.
- ▶ If the dialog box contains check boxes, move the pointer to the box you want to check and click the mouse button once.

- ▶ When the dialog box shows the information you want, position the pointer in OK and click the mouse button once.

To dismiss the dialog box without changing the document, whether you changed a value in the dialog box or not,

- ▶ Click Cancel.

Alert Boxes

An alert box is a box in which a message from the Lisa is displayed. The message can be Wait, Note, Caution, Stop, or ?, as described below. You can usually respond to these messages by clicking the OK or Cancel button. To do this, move the pointer to the OK or Cancel button and click the mouse button.

Wait Message

The Wait message tells you that the Lisa is carrying out an operation that may take some time. You don't need to respond to the message. However, some Wait messages give you the option of terminating the operation by holding down the  key while typing a period. Figure 5 is an example of a Wait message.

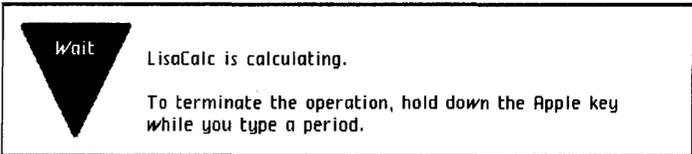


Figure 5. Wait Message

Note Message

The Note message tells you that something might need your attention. Most likely, everything is all right, but there is something you should know about just in case. To dismiss the alert box with a Note message, you just click OK. Figure 6 shows a LisaCalc Note message.

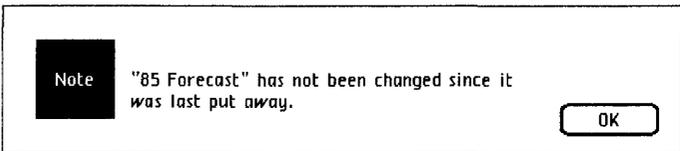


Figure 6. LisaCalc Note Message

Caution Message

The Caution message tells you that you are about to do something risky that cannot be undone or something that may take a long time. To allow the operation to continue, you click OK. To cancel the operation, you click Cancel. Figure 7 shows a Caution message.

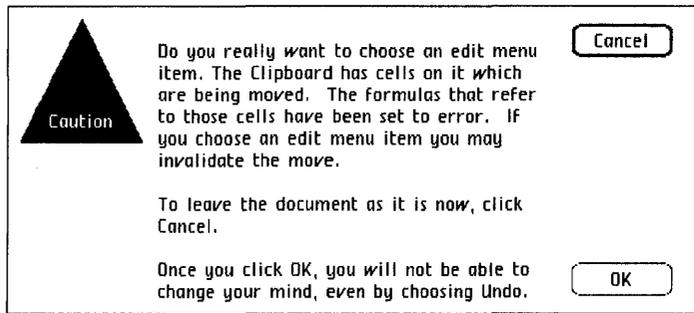


Figure 7. Caution Message

Stop Message

The Stop message tells you that something you requested cannot be done and why. To dismiss the alert box with a Stop message, you click Cancel. Figure 8 is an example of a LisaCalc Stop message.

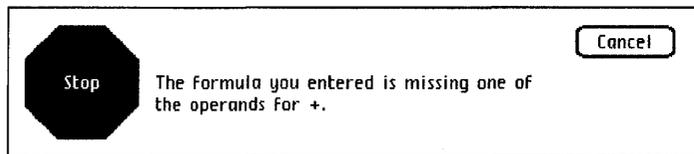


Figure 8. LisaCalc Stop Message

? Message

The ? message tells you that you can choose one of a number of alternative actions. Most ? messages have two or three choices. You dismiss the ? alert box by clicking one of the choices. Figure 9 is an example of a ? message.

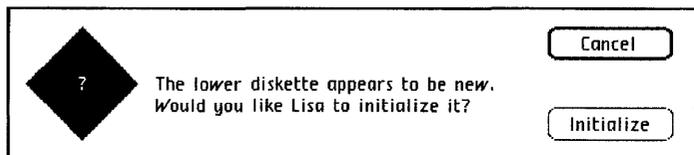


Figure 9. ? Message

LisaCalc Work Flow

The following sections outline how to start a new LisaCalc document and how to work with an existing LisaCalc document. For specific information and step-by-step instructions refer to Chapter 2 of this Reference Guide and to Section D, Desktop Manager Reference Guide, in the *Lisa Owner's Guide*.

Starting a New Document

To start a new LisaCalc document,

- ▶ Open the ProFile window.



- ▶ Tear off a spreadsheet from the LisaCalc stationery pad.



LisaCalc Paper

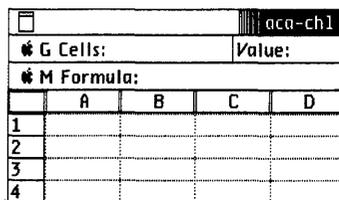
- ▶ Type the new document's name.



aca-ch1

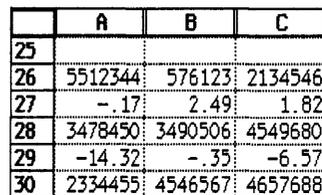
LisaCalc Paper

- ▶ Open the new document's window.



	A	B	C	D
1				
2				
3				
4				

- ▶ Enter data into the spreadsheet.

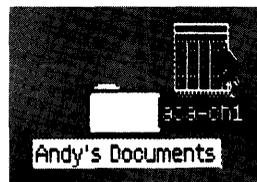


	A	B	C
25			
26	5512344	576123	2134546
27	-.17	2.49	1.82
28	3478450	3490506	4549680
29	-14.32	-.35	-6.57
30	2334455	4546567	4657688

- ▶ Save all changes about every 15 minutes and continue working.
- ▶ Print the spreadsheet, if you like.
- ▶ Put away the completed document.

To organize your documents into a folder and keep the disk window uncluttered, you might want to

- ▶ Move the saved document into a folder of related documents.



or

- ▶ Tear a new folder from the folder pad, name the folder, and move the document into it.

Working with an Existing Document

To get a filed LisaCalc document to work with,

- ▶ Open the ProFile window.



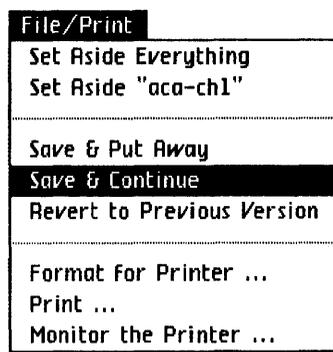
- ▶ If the document is in a folder, open the folder that contains the document that you want to work with.



- ▶ Open the document.



- ▶ Edit and format the document, saving it every 15 minutes.



- ▶ Print the spreadsheet, if you like.
- ▶ Put away the document in its original location.

Chapter 2

Procedures

Procedures

What's in Chapter 2?

Chapter 2 contains the procedures for doing everything that can be done in LisaCalc. To make the procedures easier to find, they have been divided into categories according to function. These categories are:

Calculate

Look here for operations that involve calculations.

- C24 Circle Missing Values
- C27 Dates
- C29 Formulas
- C31 Functions
- C33 Recalculation

Edit

Look here for operations that change the contents of your document.

- C38 Clear Entries
- C40 Copy Cells with Paste
- C45 Copy Cells with Paste Adjusting
- C52 Copy Text
- C54 Cut Cells
- C55 Cut Rows or Columns
- C57 Cut Text
- C58 Enter Value
- C60 Insert Rows or Columns
- C62 Insert Text
- C63 Move Cells
- C67 Move Rows or Columns
- C69 Move Text
- C71 Replace Text
- C72 Restore Previous Entry
- C73 Revert to Previous Version
- C74 Undo Last Change

Format

Look here for operations that change the appearance of the spreadsheet.

- C76 Alignment
- C78 Column Widths
- C80 Number Style
- C84 Printing Type Style
- C86 Screen Type Size
- C87 Show Formulas and Show Values

Print

Look here for print operations.

- C90 Format for Specific Printers
- C95 Insert Page Marks
- C96 Print a Document
- C100 Remove Page Marks

Protect

Look here for operations that protect values from accidental destruction.

- C102 Protect Formulas and Values
- C103 Protect Formulas Only
- C104 Unprotect

Other Tools

Look here for operations that copy values from LisaCalc to other tools.

- C106 LisaGraph
- C107 LisaWrite

Calculate

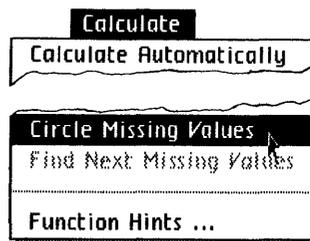
C24 Circle Missing Values
C27 Dates
C29 Formulas
C31 Functions
C33 Recalculation

Calculate

Circle Missing Values

To circle all cells with missing values

- ▶ Choose Circle Missing Values from the Calculate menu.



To find the next missing value

- ▶ Choose Find Next Missing Value from the Calculate menu.

To display the spreadsheet without circles around values

- ▶ Choose Don't Circle Values from the Calculate menu.
-

Circle Missing Values *(continued)*

The purpose of these menu items is to help you find cells whose values may have been omitted or mistyped.

If you choose Circle Missing Values, then all cells in the spreadsheet whose values are missing are circled. This includes the following categories of cells:

1. A blank cell that is referenced by a formula in another cell.
2. A cell whose value is a label, and that is referenced by a formula in another cell, in which the cell occurs as part of a range that is an argument to a function.
3. A cell whose formula references a cell in one of the first two categories or references a cell whose value has been cut.

When you choose Circle Missing Values, the first circled cell below the current selection is selected. You can then enter a value if you decide that the cell is incorrect. When you do this, the circles disappear from any cell that depends on the cell you changed. If Calculate Manually is in effect, the circles don't disappear until you choose Calculate Now.

When you choose Find Next Missing Value, the next cell whose value is still missing is selected. If necessary, LisaCalc automatically scrolls the spreadsheet. Cells described in 3 above are not selected.

When there are no more cells with missing values below the current selection, an alert message is displayed telling you there are no more cells below the current selection.

Calculate

Circle Missing Values (continued)

Find Next Missing Value can also be used to facilitate filling in a template. To do this, you set up the spreadsheet so that it contains all the formulas, but not the values. To begin, select A1. When you choose Find Next Missing Value, LisaCalc selects the first cell that needs to be filled in. After you enter a value in this cell, you choose Find Next Missing Value again, and LisaCalc selects the next cell that needs to be filled in. When the last missing value has been filled in, LisaCalc displays an alert message telling you that there are no more cells with missing values.

In the following example, the formula in A2 is $A1 + 1$, and the formula in B5 is $\text{Sum}(B1:B3)$. Notice which cells are circled.

	A	B
1		23
2		
3		text
4		=====
5		23

To enter a date value

Dates

- ▶ Enter a value of the form:
month/day/year

To enter a date part

- ▶ Enter a value of the form:
 - x days
 - x weeks
 - x months
 - x years

To enter a date formula

- ▶ Enter a formula in one of the following forms:
 - Date
 - Date part
 - Date + date part
 - Date – date part
 - Date part + date part
 - Date part – date part
 - Date – date
-

Calculate

Dates

(continued)

Possible uses for dates include the following:

- Determining whether one date is earlier or later than another.
- Calculating the number of days, months, or years between two dates.
- Converting a number of days to a number of months or years, or the other way around.

Dates are fully explained in Appendix 4, Formulas, in this manual.

Examples

Date

1/4/83
01/04/83
7/4/1776
9/9/9
(= 9/9/1909)

Date Part

5 days
2 weeks
1 month
8 years

Date Formula

1/4/83 + 5 days
9/6/79 - 2 weeks
3 months + 4 days
6 months - 20 months
7/4/1976 - 7/4/1776

Calculate

To enter a formula in a cell

Formulas

- ▶ Select the cell.
- ▶ Select the Formula area by clicking in it or by pressing **⌘** and typing M for Mathematical formula.
- ▶ Type the formula.
- ▶ Enter the formula by pressing **Enter** or selecting another cell.

To quickly enter coordinates of a single cell in a formula

- ▶ Move the pointer to the cell whose coordinates should appear in the formula.
- ▶ While holding down the **Option** key, click the mouse once in the cell.



Calculate

Formulas (continued)

To quickly enter coordinates of a range of cells in a formula

- ▶ Move the pointer to the first cell in the range.
- ▶ Press and hold down the **(Option)** key.
- ▶ Press and hold down the mouse button; move the pointer to the last cell in the range.
- ▶ Release the **(Option)** key and the mouse button.

Formulas are fully explained in Appendix 4, Formulas, in this manual. The topics covered include:

- What sequence the elements of a formula should be in.
- How to construct formulas whose value is a number.
- How to use logical formulas to make choices between alternative values.
- How to use dates in formulas.

Examples

A1*B2
100*(B19-B21)/B21
Sum(A1:A10)
A3 + Max(A4:A7,B4,C5:C8)
2*Pi*A3 ^ 2
B3 > "3/14/82"

To use a function in a formula

Functions

- ▶ Enter the function in the following form
name (argument 1, argument 2, . . .)

To see a summary of functions and their arguments

- ▶ Choose Function Hints from the Calculate menu.

Functions are fully explained in Appendix 5, Functions, in this manual.

A complete list of functions follows.

Name	Purpose
Financial functions	
Annuity	Annuity factor
Compound	Compound interest factor
Npv	Net present value
General purpose functions	
If	Set conditional value
Lookup	Find specified value
Search	Find number of occurrences of a specified value

Calculate

Functions

(continued)

Name	Purpose
Trigonometric and algebraic functions	
Cos	Cosine
Sin	Sine
Tan	Tangent
Acos	Arccosine
Asin	Arcsine
Atan	Arctangent
Exp	Exponential function
Ln	Natural logarithm
Log	Logarithm to the base 10
Sqrt	Square root
Sumsqr	Sum of the squares
Other mathematical functions	
Abs	Absolute value
Average	Average (mean)
Count	Number of values in a range
Int	Integer part
Max	Greatest value
Min	Smallest value
Round	Round value
RoundIeee	Round value
Sum	Total

Examples

Sum(39.5,A1,B2:D7)

Count(A1:E13)

Tan(B39*Pi)

Lookup("Saugerties",A1:A16,D1:D16)

Npv(.14,D1:D12)

If(A1 < B1,29.5,Max(C1,D1,E1))

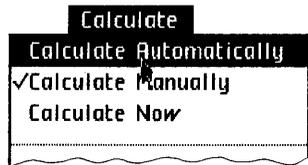
If(E2 = F2,If(G2,23,If(H1,J1,K1)),47.5)

Calculate

Recalculation

If you want the spreadsheet recalculated every time any value changes

- ▶ Choose Calculate Automatically from the Calculate menu.



If you want the spreadsheet recalculated only on request

- ▶ Choose Calculate Manually from the Calculate menu.

To recalculate the spreadsheet immediately

- ▶ Choose Calculate Now from the Calculate menu.

To interrupt recalculation

- ▶ While holding down the  key, press the period key.



In a new spreadsheet, Calculate Automatically is in effect. With this option, whenever the value of a cell changes, all cells that depend on it are recalculated. You can also choose Calculate Now for immediate recalculation of the whole spreadsheet.

Calculate

Recalculation

(continued)

If you have chosen Calculate Manually, no recalculation takes place until you choose Calculate Now. Therefore the value shown for a cell on the screen may not be its correct value.

If the formula in a cell refers to the same cell, either directly or indirectly, this is called a circular reference. LisaCalc attempts to check for circular references, but this is not always possible.

Example

If A1 contains the formula

A1+1

this is a direct circular reference, which LisaCalc can detect.

If A1 and A2 contain the following formulas

A1: A2+1

A2: A1+1

this is an indirect circular reference, which LisaCalc usually cannot detect.

If Calculate Automatically is in effect, LisaCalc recalculates the spreadsheet for about 30 seconds before stopping. After this time, an alert message appears telling you that calculation is not finished. This message means one of two things: either your spreadsheet is too large or complicated to be calculated in 30 seconds, or it contains a circular reference. If you have determined that the spreadsheet doesn't have any circular references, you can choose Calculate Now to complete the recalculation.

Calculate

When you choose Calculate Now, LisaCalc continues to recalculate the spreadsheet until all formulas have been calculated, regardless of whether Calculate Manually or Calculate Automatically is in effect. If your spreadsheet contains a circular reference, LisaCalc will never finish calculating. To interrupt calculation, press the period key while holding down the  key.

While a spreadsheet is being calculated, cells that are going to be changed are shown in gray before the new value is displayed.

Recalculation

(continued)

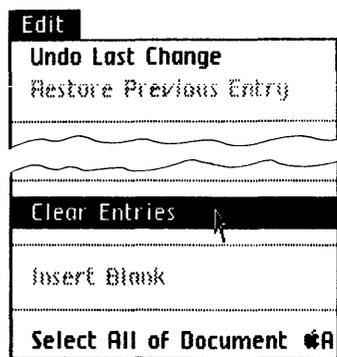
-
- C38 Clear Entries
 - C40 Copy Cells with Paste
 - C45 Copy Cells with Paste Adjusting
 - C52 Copy Text
 - C54 Cut Cells
 - C55 Cut Rows or Columns
 - C57 Cut Text
 - C58 Enter Value
 - C60 Insert Rows or Columns
 - C62 Insert Text
 - C63 Move Cells
 - C67 Move Rows or Columns
 - C69 Move Text
 - C71 Replace Text
 - C72 Restore Previous Entry
 - C73 Revert to Previous Version
 - C74 Undo Last Change

Edit

Clear Entries

To clear cells

- ▶ Select the cells you want to clear.
- ▶ Choose Clear Entries from the Edit menu, or press the **Clear** key.



You can clear entries from one or more cells in the spreadsheet, including whole columns and rows. When you clear entries, values and formulas are removed from the cells but they retain their format.

If a cell is protected, you cannot clear it until you unprotect it. If you clear a range of cells, and some of them are protected, only the unprotected cells are cleared. In this case, you get a warning message. See the Protect procedures in this chapter.

Cleared entries are not placed on the Clipboard and therefore cannot be pasted. You can immediately choose Undo Last Change from the Edit menu to reverse the clear operation.

After you clear a cell, you cannot restore its contents with Restore Previous Entry.

If a formula references a cell that has been cleared, the value of the cleared cell is zero. If, on the other hand, the cell has been cut rather than cleared, the formula has the value Error. Therefore, if you want to remove the contents of a cell, you should use Clear rather than Cut. (This does not apply to a cut that is the first step of a move.)

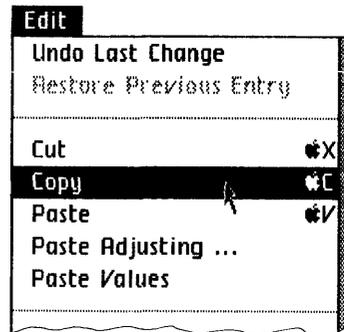
Clear Entries *(continued)*

Edit

Copy Cells with Paste

To copy cells within the same spreadsheet

- ▶ Select the cells that you want to copy.
- ▶ Choose Copy from the Edit menu.

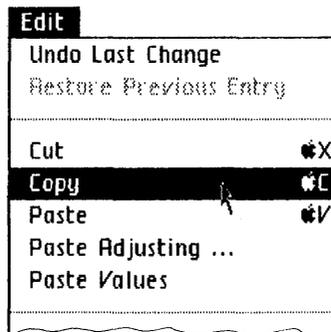


- ▶ Select the new location for the cells.
 - ▶ Choose Paste or Paste Values from the Edit menu.
-

Copy Cells with Paste *(continued)*

To copy cells into another spreadsheet

- ▶ Select the cells that you want to copy.
- ▶ Choose Copy from the Edit menu.



- ▶ Get or activate the spreadsheet that you want to copy to.
- ▶ Select the location for the cells.
- ▶ Choose Paste or Paste Values from the Edit menu.

If you choose Paste, the entire cell, including its format, protection, value, and formula, is copied.

When you copy a range of cells, some of the cells in the range might have formulas that refer to other cells in the range. In this case, the formulas are automatically updated so they refer to the new cells, not the old cells. References to cells outside the range are not changed. Formulas outside the range being copied are not affected. See the example below.

Edit

Copy Cells with Paste (continued)

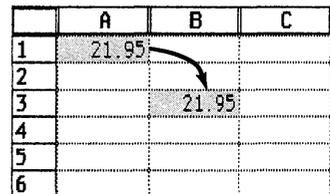
If you choose Paste Values, the format, protection, and value of the cell are copied, but not its formula. The copy of the cell retains its current value; this value does not change when the value in the original cell changes.

One use of Paste Values is when you want to exchange values between spreadsheets. When you copy cells from one spreadsheet to another, Paste may not be appropriate because the locations of the cells in the new spreadsheet may not be the same as the locations of the corresponding cells in the old spreadsheet. However, if you use Paste Values, the formulas of the cells are not copied, and therefore you don't have to worry about the locations of the coordinates.

When you copy cells, a duplicate is put on the Clipboard. When you paste, you are pasting a copy from the Clipboard; a copy remains on the Clipboard so you can paste it again. You can immediately reverse either the copy or the paste operation by choosing Undo Last Change from the Edit menu.

When you copy cells, the following combinations are possible:

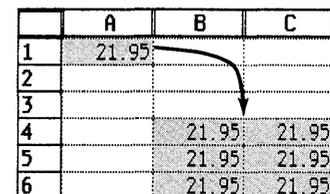
A single cell can be copied to another cell.



A spreadsheet grid with columns A, B, and C, and rows 1 through 6. Cell A1 contains the value 21.95. An arrow points from cell A1 to cell B3, which also contains the value 21.95. All other cells are empty.

	A	B	C
1	21.95		
2			
3		21.95	
4			
5			
6			

A single cell can be copied to a range of cells. The range can have any size or shape.



A spreadsheet grid with columns A, B, and C, and rows 1 through 6. Cell A1 contains the value 21.95. An arrow points from cell A1 to a range of cells B4, C4, B5, C5, B6, and C6. All these cells contain the value 21.95. All other cells are empty.

	A	B	C
1	21.95		
2			
3			
4		21.95	21.95
5		21.95	21.95
6		21.95	21.95

A range of cells can be copied to another range of the same size and shape.

	A	B	C
1	60.15	32.47	
2	21.95	8.82	
3			
4			
5		60.15	32.47
6		21.95	8.82

Copy Cells with Paste

(continued)

A range of cells can be copied to a larger range if the new range is an exact multiple of the size and shape of the old range.

	A	B	C
1	21.95		
2	60.15		
3			
4		21.95	21.95
5		60.15	60.15
6		21.95	21.95
7		60.15	60.15

A range of cells can be copied to a single cell. In this case, the single cell is treated as the upper left corner of a range the same size and shape as the range to be copied.

	A	B	C
1	60.15	23.21	2.92
2	21.95	14.56	18.27
3			
4	60.15	23.21	2.92
5	21.95	14.56	18.27
6			

A column or row can be copied to another column or row.

	A	B	C
1	Afton		Afton
2	Birch		Birch
3	Casey		Casey
4	Doppley		Doppley
5	Erin		Erin
6	Flagstaff		Flagstaff
7	Goddard		Goddard
8	Hefty		Hefty
9	Irving		Irving
10	Jackson		Jackson
11	Kingley		Kingley
12	Lawson		Lawson
13	Miller		Miller
14	Northern		Northern
15	Ofton		Ofton

Edit

Copy Cells with Paste (continued)

A column or row can be copied to a grid handle. A new column or row is inserted at the location, and the old column or row is copied to it.

	A	B	C	D
1				
2	Becky	Casey	Danny	Janis
3				
4				
5				

Example

Cells A1, A2, B1, and B2 have the following formulas:

	A	B
1	23	A1+1= 24
2	A1+1= 24	A2+1= 25

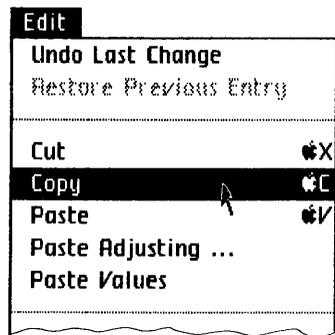
If you copy A1 and A2 to C1 and C2 with Paste, the cells have the following formulas after the copy:

	A	B	C
1	23	A1+1= 24	23
2	A1+1= 24	A2+1= 25	C1+1= 24

Copy Cells with Paste Adjusting

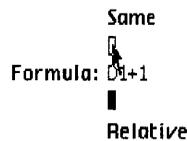
To copy cells with paste adjusting

- ▶ Select the cells that you want to copy.
- ▶ Choose Copy from the Edit menu.



- ▶ Select the new location for the cells.
- ▶ Choose Paste Adjusting from the Edit menu. A dialog box appears.

- ▶ In the dialog box, check the box above any coordinates that you want to be the same instead of relative, until the formula shown for the sample cell is correct.



- ▶ If you are copying more than one cell, click Next to go on to the next cell or Previous to go back to the previous cell.

Previous

Next

Edit

Copy Cells with Paste Adjusting *(continued)*

- ▶ When all the coordinates are adjusted correctly, click OK to complete the operation.
- ▶ To cancel the paste, click Cancel.

OK

Cancel

The combinations that are possible with Paste Adjusting are the same as those for Paste. See the Copy Cells with Paste procedure, under Edit, in this chapter.

When you copy a cell with Paste Adjusting, the entire cell, including its alignment, number style, protection, value, and formula, is copied. Paste Adjusting differs from Paste and Paste Values in that it allows you to systematically adjust formulas in the range you are copying to.

The dialog box shows you what the formula would be for a sample cell from the range you are copying to. Check boxes are shown above and below each coordinate. To indicate that a coordinate is to be the same, you check the box above the coordinate. To indicate that it is to be relative, you check the box below the coordinate (or leave it checked). When you check a box, the sample formula in the dialog box changes automatically.

If a cell range such as A1:B5 occurs in the formula, only one check box appears over the range. The whole range must be relative or the same.

Copy Cells with Paste Adjusting *(continued)*

Initially, all the coordinates are shown as relative. That is, the position of each coordinate relative to the sample cell is the same as the position of the corresponding coordinate in the original formula relative to the original cell. If you change a coordinate to be the same, then it is replaced by the corresponding coordinate from the original cell.

The sample cell stands for all the cells in the range you are copying to. For each coordinate in its formula, whichever choice you make applies to all the cells in the range you are copying to.

Example

1. Suppose the formula in B2 is $A2 + C2$, and you copy this cell, using Paste Adjusting, to the range B4:B6. Suppose further that you want the first coordinate in each formula to be relative, and the second to stay the same.

	A	B	C
1			
2		A2+C2=	
	12	46	34
3		↓	
4	13		
5	14		
6	15		

2. The sample cell in the dialog box is B4. In order to find the relative coordinates for B4, LisaCalc interprets the formula as saying “add the cell to the left of B4 and the cell to the right of B4.” This translates into the formula $A4 + C4$, which is shown in the dialog box.

Cell: B4

Same

Formula: A4+C4

Relative

Edit

Copy Cells with Paste Adjusting (continued)

3. Since you have decided you want the second coordinate to stay the same, you click the box above C4 and it changes to C2.
4. After you click OK, a similar formula is copied to every cell in the range A4:A6.

Cell: B4
Same

Formula: A4+C2

Relative

	A	B	C
1			
2	12	A2+C2= 46	34
3			
4	13	A4+C2= 47	
5	14	A5+C2= 48	
6	15	A6+C2= 49	

You can copy from a range of cells rather than from a single cell. Since each cell in the range can have a different formula, you need to adjust the coordinates for each cell separately. For each cell in the range you are copying from, LisaCalc finds a sample cell in the range you are copying to. The formulas for these sample cells are displayed in the dialog box one at a time, starting at the beginning of the range and proceeding toward the end of the range. To move forward in the range, click Next. To move backward in the range, click Previous.

When you are satisfied that all the sample cells in the range have the correct formula, click OK. If you have not made any changes to a particular cell, all the coordinates in its formula will be relative.

Example

1. Suppose you want to copy from the range A1:A3 to the range C1:E3. That is, you want to copy A1 to C1, D1 and E1; A2 to C2, D2, and E2; and A3 to C3, D3, and E3.

	A	B	C	D
1	A7*6= 108	→		
2	A1+12= 120	→		
3	A10/2= 67.5	→		

2. You select A1:A3 and choose Copy, then you select C1:E3 and choose Paste Adjusting. The dialog box shows the formula for C1, which is the sample cell for A1. Whatever adjustments are made to this cell will also be made to D1 and E1.

Cell: C1	Next	Cancel
Same		
□		
Formula: C7*6		OK
Relative		

3. When the formula for C1 is correct, you click Next and the dialog box changes to show the formula for C2, which is the sample cell for A2.

Cell: C2	Previous	Next	Cancel
Same			
□			
Formula: C1+12			OK
Relative			

4. When you finish making adjustments to the formula, you can click Next to go on to the sample cell for A3. Or, if you want to see the sample cell for A1 again, you can click Previous to go back. When all the formulas are correct, you click OK.

Copy Cells with Paste Adjusting (continued)

Edit

Copy Cells with Paste Adjusting (continued)

If the range of cells you are copying to includes cells that are in neither the same row nor the same column as the original cell, you can separate the row and the column in the dialog box. That is, you can have the row stay the same and the column be relative, or vice versa.

Example

Suppose you want to create a multiplication table. To start with, you have a spreadsheet in which B1 through H1 contain the numbers from 1 to 7. The same numbers are in A2 through A8:

	A	B	C	D	E	F	G	H
1		1	2	3	4	5	6	7
2	1							
3	2							
4	3							
5	4							
6	5							
7	6							
8	7							

To make this spreadsheet into a multiplication table, here's what you do:

1. In B2, enter the formula

$A2*B1$

Now you want to copy B2 to the range B2:H8. When you do this, you want to adjust the formula so that each cell contains the product of two numbers: the number all the way to the left of the same row, and the number at the top of the same column. For example, you want the formula in C3 to be $A3*C1$.

- Choose Paste Adjusting from the Edit menu. A dialog box appears, showing the sample formula for C3, which is now shown as B3*C2.

Cell: C3

Same
☐☐ ☐☐

Formula: B3*C2
☐☐ ☐☐

Relative

Cancel

OK

Copy Cells with Paste Adjusting

(continued)

- In the dialog box, click the box over the B and the box over the 2. When you finish, the formula should be A3*C1.

Cell: C3

Same
☐☐ ☐☐

Formula: A3*C1
☐☐ ☐☐

Relative

- Click OK. The rest of the cells fill in automatically.

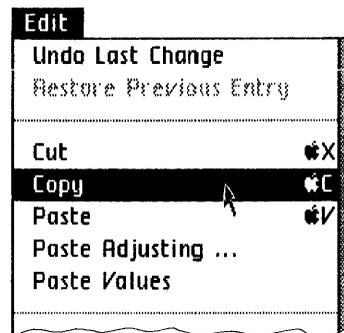
	A	B	C	D	E	F	G	H
1		1	2	3	4	5	6	7
2	1	1	2	3	4	5	6	7
3	2	2	4	6	8	10	12	14
4	3	3	6	9	12	15	18	21
5	4	4	8	12	16	20	24	28
6	5	5	10	15	20	25	30	35
7	6	6	12	18	24	30	36	42
8	7	7	14	21	28	35	42	49

Edit

Copy Text

To copy text within the same spreadsheet

- ▶ Select the text that you want to copy.
- ▶ Choose Copy from the Edit menu.

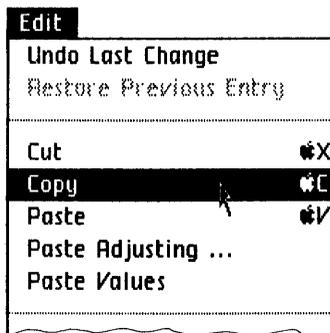


- ▶ Select the new location for the text.
 - ▶ Choose Paste from the Edit menu.
-

Copy Text (continued)

To copy text to another spreadsheet

- ▶ Select the text that you want to copy.
- ▶ Choose Copy from the Edit menu.



- ▶ Get or activate the document that you want to copy to.
- ▶ Select the new location for the text.
- ▶ Choose Paste from the Edit menu.

Text is any sequence of letters, numbers, and punctuation symbols. You can copy text from a cell or from the status panel. When you copy text, a duplicate is put on the Clipboard. When you paste, you are pasting a copy from the Clipboard; a copy remains on the Clipboard so you can paste it again.

To copy text from a cell, first you select the cell, and then you select the text you want to copy.

You can immediately reverse either the copy or the paste operation by choosing Undo Last Change from the Edit menu. To copy a cell, see the Copy Cells with Paste procedure, under Edit, in this chapter.

Edit

Cut Cells

It is not recommended that you cut cells, except as the first step in a move; see the Move Cells procedure, under Edit, in this chapter. If you want to remove the contents of a cell or group of cells, use Clear Entries; see the Clear Entries procedure, under Edit, in this chapter.

The reason why cutting cells is not recommended is that when you cut cells, they are removed from the spreadsheet and put on the Clipboard. If any other cells have formulas that reference the cells you have cut, these references are invalid as long as the cells are on the Clipboard. This could result in the values of these cells becoming Error.

Example

1. A1 has the value 21 and B1 has the formula $A1+1$. Assume you want to change A1 to 23.

	A	B
1	21	$A1+1=$ 22

2. If you select A1 and then choose Cut, A1 is placed on the Clipboard, the space for A1 in the spreadsheet is shown as blank, and the value of B1 becomes Error.

	A	B
1		$Error+1=$ Error

3. If you type 23 in A1, B1 is still shown as Error. There is no way to correct B1 without first pasting A1 back into the spreadsheet or editing B1.

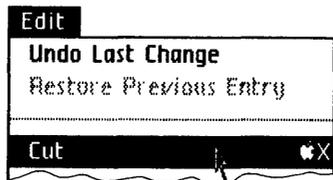
	A	B
1	23	$Error+1=$ Error

The correct way to change the value of A1 is to select A1 and enter the new value. If you want to remove the value from A1, you select A1 and choose Clear Entries.

Cut Rows or Columns

To cut rows or columns

- ▶ Select the rows or columns to be cut.
- ▶ Choose Cut from the Edit menu.



When you cut rows or columns, they are removed from the spreadsheet and placed on the Clipboard. The remaining rows and columns are reordered automatically. All formulas are updated to refer to the new row or column locations instead of the old locations. If a formula refers to a cell in a row or column that was cut, the formula now has the value Error.

You can reverse the cut operation by choosing Undo Last Change from the Edit menu.

Edit

Cut Rows or Columns (continued)

In the following example, column B is cut; the spreadsheet shows the formulas before and after the cut.

	A	B	C	D	E	F
1						
2						
3						
4						1st Quart
5			Jan	Feb	Mar	
6						
7		Units	44000	45600	47900	sum(C7:E7))= 137500
8		Price	\$110.00	\$110.00	\$110.00	
9		Revenue	4840000	5016000	5269000	sum(C9:E9))= 15125000
10						
11		Units	31300	32500	34100	sum(C11:E11))= 97900
12		Price	\$ 42.00	\$ 42.00	\$ 42.00	
13		Revenue	1314600	1365000	1432200	sum(C13:E13))= 4111800

Before

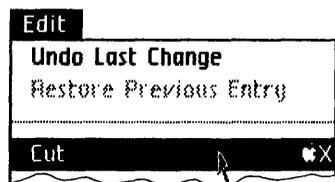
	A	B	C	D	E	F
1						
2						
3						
4						1st Quart
5		Jan	Feb	Mar		Apr
6						
7		44000	45600	47900	137500	49300
8		\$110.00	\$110.00	\$110.00		\$110.00
9		4840000	5016000	5269000	15125000	5423000
10						
11		31300	32500	34100	97900	55700
12		\$ 42.00	\$ 42.00	\$ 42.00		\$ 42.00
13		1314600	1365000	1432200	4111800	2339400

After

Cut Text

To cut text

- ▶ Select the text to be removed.
- ▶ Choose Cut from the Edit menu.



Text is any sequence of letters, numbers, and punctuation symbols. You can cut text from a cell or from the status panel.

To cut text from a cell, first you select the cell, and then you select the text you want to cut.

Text that has been cut is removed from the spreadsheet and placed on the Clipboard. When you cut part of a cell's value, the value isn't changed until you press the **Enter** key or select another cell.

You can immediately reverse the cut operation by choosing Undo Last Change from the Edit menu. In addition, you can paste the text that you cut into the same spreadsheet or into another spreadsheet. See the Move Text procedure, under Edit, in this chapter.

Edit

Enter Value

To enter a value in a cell

- ▶ Select the cell.
- ▶ Type the value.
- ▶ Press the **Enter** key or select another cell.



A cell is either blank, or it contains a value. A value can be either a number, a label, a date, or a date part. If you select a cell that contains a value and you enter a new value, the old value is replaced by the new one, unless the cell is protected.

When a single cell is selected, its full value is shown in the Value area. In the display of the selected cell in the spreadsheet view, as many characters in the leftmost part of the value are shown as will fit in the cell. You can edit the value in either place, with identical results.

In some cases, if the value is too long to be displayed in the Value area, you can see the whole value by widening the column the value is in. This can only happen with labels.

The display of the value in the Value area is in floating decimal number style, except that no value is ever shown as a string of asterisks. Essentially, what this means is:

- If the value is equal to a whole number, it is shown without any decimal places. That is, if you enter 2.000, it is shown as 2 in the Value area.

Enter Value *(continued)*

- If the number has decimal places, the number that is displayed may not be equal to the number you entered. For example, 123.454 might be shown as 123.45399999999999. This is because it is not always possible to store a decimal value exactly. Generally speaking, the slight difference in value does not affect calculations in the spreadsheet.
- The Value area cannot show more than 23 characters, including the sign and the decimal point, if any. Of these 23, no more than 15 can be after the decimal point. If the value is too large to be shown in this many characters, it is shown in scientific number style. See the Number Style procedure, under Format, in this chapter.

After the value has been entered, its type is indicated in the Value area by one of the following words:

Blank
Number
Date
Date Part
Text

Logical values are considered numbers, as are all special constants except Date, which is today's date.

The word indicating the type of the value also tells you, in some cases, if you have mistyped a value. For example, if you type "1983" with the letter L instead of "1983" with the digit 1, the Value area says Text rather than Number.

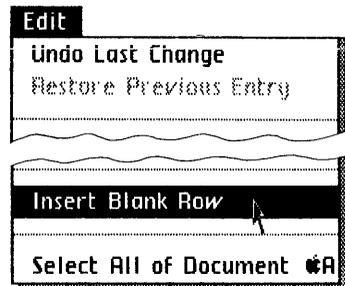
For inserting text into a cell value, see the Insert Text procedure, under Edit, in this chapter. For replacing text in a cell, see the Replace Text procedure, under Edit, in this chapter.

Edit

Insert Rows or Columns

To insert blank rows or columns

- ▶ Select the grid handle where you want the new columns or rows to be.
- ▶ Choose Insert Blank Row or Insert Blank Column from the Edit menu once for each row or column you want.



When you insert a blank row or column, the other columns or rows in the spreadsheet are reordered automatically. All formulas in the spreadsheet are updated to refer to the new names of the rows or columns.

You may immediately reverse this operation by choosing Undo Last Change from the Edit menu.

The following example shows a spreadsheet before and after a blank column has been inserted between columns B and C.

Insert Rows or Columns *(continued)*

	A	B	C	D	E	F	G
1							
2							
3							
4						1st Quart	
5		Jan	Feb	Mar			Apr
6							
7		Units	44000	45600	47900	sum(C7:E7)=	137500 49300
8		Price	\$110.00	\$110.00	\$110.00		\$110.00
9		Revenue	4840000	5016000	5269000	sum(C9:E9*G7*G8)=	15125000 5423000
10							
11		Units	31300	32500	34100	sum(C11:E11)=	97900 55700
12		Price	\$ 42.00	\$ 42.00	\$ 42.00		\$ 42.00
13		Revenue	1314600	1365000	1432200	sum(C13:E13*G11*G12)=	4111800 2339400

Before

	A	B	C	D	E	F	G
1							
2							
3							
4							1st Quart
5			Jan	Feb	Mar		
6							
7		Units		44000	45600	47900	sum(D7:F7)=
8		Price		\$110.00	\$110.00	\$110.00	1375000
9		Revenue		4840000	5016000	5269000	sum(D9:F9)=
10							15125000
11		Units		31300	32500	34100	sum(D11:F11)=
12		Price		\$ 42.00	\$ 42.00	\$ 42.00	97900
13		Revenue		1314600	1365000	1432200	sum(D13:F13)=
							4111800

After

Edit

Insert Text

To insert text

- ▶ Position the pointer where you want to add text and click the mouse button to set the insertion point.
- ▶ Type the text.

Text is any sequence of letters, numbers, and punctuation symbols. You can insert text into a cell or the status panel.

To insert text in a cell, first you select the cell, and then you set an insertion point where you want to insert the text.

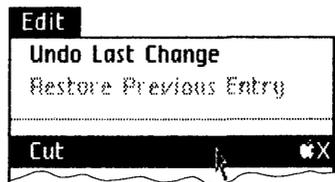
The blinking vertical bar, called the insertion point, shows where the next typed character will go.

When you insert text into a cell value, the change isn't entered until you press the **Enter** key or select another cell.

Move Cells

To move one or more cells within the same spreadsheet

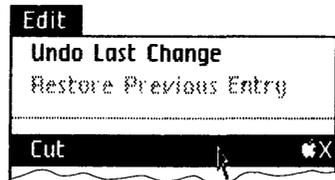
- ▶ Select the cells you want to move.
- ▶ Choose Cut from the Edit menu.



- ▶ Select the new location for the cells.
- ▶ Choose Paste from the Edit menu.

To move one or more cells to another spreadsheet

- ▶ Select the cells you want to move.
- ▶ Choose Cut from the Edit menu.



- ▶ Get or activate the spreadsheet that you want to move the cells to.
 - ▶ Select the new location.
 - ▶ Choose Paste from the Edit menu.
-

Edit

Move Cells (continued)

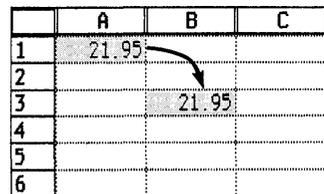
When you cut cells, they are removed from the spreadsheet and put on the Clipboard. If any other cells have formulas that reference the cells you have cut, these references are invalid as long as the cells are on the Clipboard. This results in the values of these cells becoming Error. Therefore, whenever you cut cells to start a move, you should paste them back to the spreadsheet as soon as possible.

When you paste, you are pasting a copy of the cells from the Clipboard; a copy remains on the Clipboard so you can paste again. Any cells that reference the cells you have moved are automatically adjusted to reflect their new location. See example below.

You can immediately reverse either the cut or the paste operation by choosing Undo Last Change from the Edit menu. You cannot reverse the whole move.

When you move cells, the following combinations are possible:

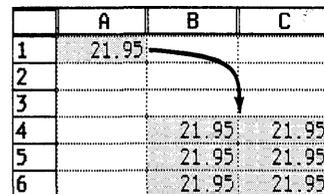
A single cell can be moved to another cell.



A diagram of a spreadsheet grid with columns A, B, and C, and rows 1 through 6. The cell at row 1, column A contains the value 21.95. An arrow points from this cell to the cell at row 3, column B, which also contains the value 21.95. All other cells in the grid are empty.

	A	B	C
1	21.95		
2			
3		21.95	
4			
5			
6			

A single cell can be moved to a range of cells. The range can be any size or shape.



A diagram of a spreadsheet grid with columns A, B, and C, and rows 1 through 6. The cell at row 1, column A contains the value 21.95. An arrow points from this cell to a range of cells from row 4 to row 6, column B, and row 4 to row 6, column C. All these cells contain the value 21.95. All other cells in the grid are empty.

	A	B	C
1	21.95		
2			
3			
4		21.95	21.95
5		21.95	21.95
6		21.95	21.95

A range of cells can be moved to another range of cells with the same size and shape.

	A	B	C
1	60.15	32.47	
2	21.95	8.82	
3			
4			
5		60.15	32.47
6		21.95	8.82

Move Cells (continued)

A range of cells can be moved to a larger range if the new range is an exact multiple of the size and shape of the old range.

	A	B	C
1	21.95		
2	60.15		
3			
4		21.95	21.95
5		60.15	60.15
6		21.95	21.95
7		60.15	60.15

A range of cells can be moved to a single cell. In this case, the single cell becomes the upper-left corner of a range the same size and shape as the range that was moved.

	A	B	C
1	60.15	23.21	2.92
2	21.95	14.56	18.27
3			
4	60.15	23.21	2.92
5	21.95	14.56	18.27
6			

A column or row can be moved to another column or row.

	A	B	C
1	Afton		Afton
2	Birch		Birch
3	Casey		Casey
4	Doppley		Doppley
5	Erin		Erin
6	Flagstaff		Flagstaff
7	Goddard		Goddard
8	Hefty		Hefty
9	Irving		Irving
10	Jackson		Jackson
11	Kingley		Kingley
12	Lawson		Lawson
13	Miller		Miller
14	Northern		Northern
15	Oftan		Oftan

Edit

Move Cells

(continued)

A column or row can be moved to a grid handle. A blank column or row is inserted at the location, and the old column or row is moved to it.

	A	B	C	D
1				
2	Becky	Casey	Danny	Janis
3				
4				
5				

Example

Suppose cells A1, A2, and B1 have the formulas as shown.

	A	B
1	B2+1= 100	A2+1= 102
2	A1+1= 101	99

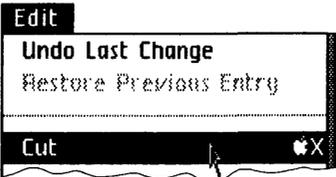
If you move A1 and A2 to C1 and C2, the cells will have the formulas as shown.

	A	B	C
1		C2+1= 102	B2+1= 100
2		99	C1+1= 101

Move Rows or Columns

To move rows or columns

- ▶ Select the rows or columns that you want to move.
- ▶ Choose Cut from the Edit menu.



- ▶ Select the new location for the rows or columns.
- ▶ Choose Paste or Paste Values from the Edit menu.

When you move rows or columns, it is essential that you paste them as soon as possible after you cut them. It's all right to scroll the spreadsheet or change the format of cells, but you shouldn't do anything that changes the contents of the spreadsheet. The reason can be seen from the following sequence of steps:

1. Suppose you want to move column A to be to the right of column C.

	A	B	C
1	10	A1+10= 20	15
2	30	A2+C2= 55	25
3	25	C3+10= 45	35
4	=====		
5	sum(A1:A3)= 65	sum(B1:B3)= 120	sum(C1:C3)= 75

Edit

Move Rows or Columns (continued)

2. First, you cut column A. When you do this, LisaCalc renames all the columns so that old column B becomes new column A, old column C becomes new column B, and so forth. Any formulas that reference cells in the column you cut are set to Error.

	A	B	C
1	Error+10 = Error	15	
2	Error+B2 = Error	25	
3	B3+10= 45	35	
4	=====	=====	=====
5	sum(A1:A 3)= Error	sum(B1:B 3)= 75	

3. The place where you want to paste the column, which used to be the grid handle between columns C and D, has now become the grid handle between columns B and C. You should immediately paste the column there. When you do so, the cells that were set to Error in step 2 are reset to reflect the changed coordinates in the new column.

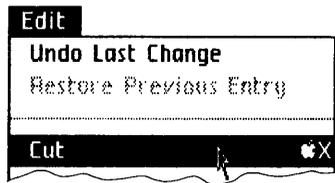
	A	B	C
1	C1+10= 20	15	10
2	C2+B2= 55	25	30
3	B3+10= 45	35	25
4	=====	=====	=====
5	sum(A1:A 3)= 120	sum(B1:B 3)= 75	sum(C1:C 3)= 65

4. Between the cut and the paste, you should not perform any operations that affect the contents of the spreadsheet. In particular, you should not cut or insert any rows or columns, or edit any formulas. If you do so, you will see an alert message that gives you the opportunity to change your mind. If you continue, you might leave the spreadsheet in an ambiguous condition.

To move text within the same spreadsheet

Move Text

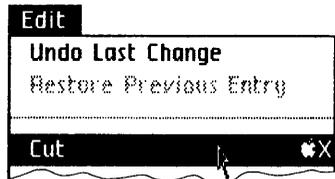
- ▶ Select the text that you want to move.
- ▶ Choose Cut from the Edit menu.



- ▶ Select the new location for the text.
- ▶ Choose Paste from the Edit menu.

To move text to another spreadsheet

- ▶ Select the text that you want to move.
- ▶ Choose Cut from the Edit menu.



- ▶ Get or activate the spreadsheet that you want to copy to.
 - ▶ Select the new location for the text.
 - ▶ Choose Paste from the Edit menu.
-

Edit

Move Text *(continued)*

Text is any sequence of letters, numbers, and punctuation symbols. You can move text from a cell or from the status panel.

To move text from a cell, first you select the cell, and then you select the text you want to move.

When you cut text from the spreadsheet, it is placed on the Clipboard. When you paste, you are pasting a copy of the text from the Clipboard; a copy remains on the Clipboard so you can paste it again.

You can immediately reverse either the cut or the paste operation by choosing Undo Last Change from the Edit menu. To move a cell, see the Move Cells procedure, under Edit, in this chapter.

To replace text

Replace Text

- ▶ Select the text to be replaced.
- ▶ Type the new text.
- ▶ Press the **Enter** key or select another cell.



Text is any sequence of letters, numbers, and punctuation symbols. You can cut text from a cell or from the status panel.

To replace text in a cell, first you select the cell, and then you select the text you want to replace.

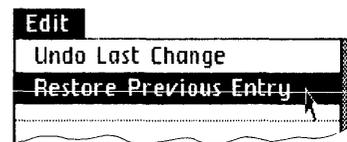
You can reverse the replacement by choosing Undo Last Change from the Edit menu.

Edit

Restore Previous Entry

To restore the previous entry in the cell that you are editing

- ▶ Choose Restore Previous Entry from the Edit menu.



Restore Previous Entry is available only while you are editing a cell. It cancels all changes made to that cell since it was selected. As soon as you select another cell, press the **(Enter)** key, or clear the cell, this item is unavailable.

Example

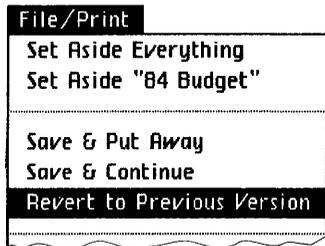
Suppose you select a cell, and then you

1. Insert some text.
2. Cut some text.
3. Add more text.
4. Choose Restore Previous Entry.

All changes to the cell are reversed. The value the cell started with is restored, because you didn't enter the new value.

To undo all changes made to a spreadsheet since it was last saved

- ▶ Choose Revert to Previous Version from the File/Print menu.



- ▶ Click OK in the alert box that appears.

This operation restores the document to the condition it was in when you last saved it. This menu item is always available and applies only to the active document.

Revert to Previous Version

Edit

Undo Last Change

To reverse the effect of the last change

- ▶ Choose Undo Last Change from the Edit menu.



Operations that you can undo include Cut, Copy, Paste, Clear Entry, changing column widths, inserting a blank row or column, formatting a cell, typing a character, setting or removing page breaks, and type style changes.

Operations that you cannot undo include entering a value or formula in a cell, printing, saving a file, Restore Previous Entry, and changing the selection.

If an operation cannot be undone, a message appears telling you that LisaCalc cannot undo the last change.

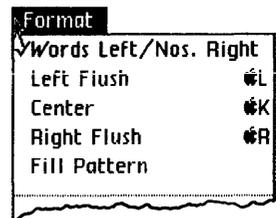
-
- C76 Alignment
 - C78 Column Widths
 - C80 Number Style
 - C84 Printing Type Style
 - C86 Screen Type Size
 - C87 Show Formulas and Show Values

Format

Alignment

To change the way values are aligned in cells

- ▶ Select the cells.
- ▶ Choose an alignment option from the Format menu.



Alignment refers to the way values are lined up in cells.

The cells you align can be blank when you align them; the alignment option takes effect as soon as you enter a value. If you don't choose an alignment option, the option in effect is Words Left/Nos. Right. When a single cell is selected, its value is shown with Words Left/Nos. Right to facilitate editing, regardless of the alignment option in effect.

Alignment does not affect numbers in cells with a monetary number style.

Alignment *(continued)*

With fill pattern alignment, the value is repeated as many times as necessary to fill the cell. If the width of the cell changes, the number of repetitions of the value changes to match.

If you want to see what alignment is in effect in a selected cell, just look at the Format menu; there is a check mark next to the option in effect.

Here's how the value 123 looks in a cell whose column width is 8, with different alignment options:

	A	B
1	Words Left/Nos. Right	123
2	Left Flush	123
3	Center	123
4	Right Flush	123
5	Fill Pattern	12312312

Format

Column Widths

To change the width of one column

- ▶ Position the pointer in the grid handle on the right side of the column.

	A	⇌	B
1	Revised		
2	January		

- ▶ Press and hold down the mouse button while moving the pointer and flickering boundary to the left or right.

	A	⇌	B
1	Revised		
2	January		

- ▶ Release the mouse button when the flickering outline shows the column width you want.

	A	⇌	B
1	Revised Income Statement		
2	January 20, 1983		

To change the width of several columns at once

- ▶ Select the columns.
- ▶ Choose Column Widths from the Page Layout menu.



- ▶ When the dialog box appears showing the number of characters the cells can display, type the number you want.
- ▶ Click OK.

The maximum width of a column is 80 characters.

Format

Column Widths (continued)

Example

Changing the column widths of columns C, D, and E from 8 to 12:

B	C	D	E
	Jan	Feb	Mar
Units	44000	45600	47900
Price	\$110.00	\$110.00	\$110.00
Revenue	4840000	5016000	5269000
Units	31300	32500	34100
Price	\$ 42.00	\$ 42.00	\$ 42.00
Revenue	1314600	1365000	1432200

Before

B	C	D	E
	Jan	Feb	Mar
Units	44000	45600	47900
Price	\$ 110.00	\$ 110.00	\$ 110.00
Revenue	4840000	5016000	5269000
Units	31300	32500	34100
Price	\$ 42.00	\$ 42.00	\$ 42.00
Revenue	1314600	1365000	1432200

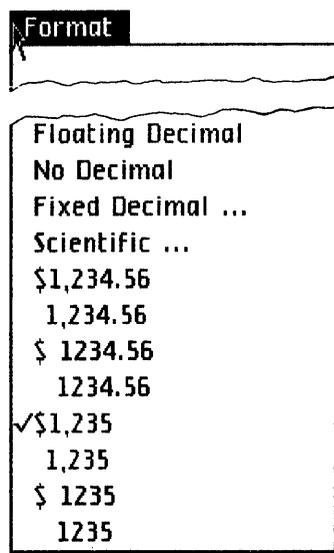
After

Format

Number Style

To change the number style of one or more cells

- ▶ Select the cells.
- ▶ Choose a number style from the Format menu.



A number in a cell can be displayed in any of several styles, depending on the number style chosen and the size of the cell. For example, you can display the value 498 as either 498.0 or \$498.00 or 4.98E+2, etc. In a new spreadsheet, all cells have the floating decimal number style.

Some number styles require LisaCalc to display a rounded value. In this case, the value in the cell is not changed, only the way it is displayed. If the last digit removed is 5, the number is rounded so that the preceding digit is even.

Zero is shown as 0.0, regardless of the number style.

Number Style *(continued)*

The number styles are:

Floating Decimal	Shows numbers in the most convenient style for the size of the value and the width of the column. The number might be shown in the no decimal, fixed decimal, or scientific number style.
No Decimal	Shows numbers rounded to the nearest whole number value.
Fixed Decimal	Shows numbers as values with a fixed number of decimal places. When you choose this menu item, a dialog box appears allowing you to set the number of digits to the right of the decimal point.
Monetary style	Shows numbers in any of the following monetary styles: Dollar sign, commas, cents (\$1,234.56)

Format

Number Style

(continued)

Commas, cents (1,234.56)

Dollar sign, cents
(\$1234.56)

Cents (1234.56)

Dollar sign, commas
(\$1,235)

Commas (1,235)

Dollar sign (\$1235)

Numbers only (1235)

Numbers are shown with right flush alignment. Negative numbers are shown surrounded by parentheses. Positive numbers are shown with a space to the right.

Scientific

Shows numbers with scientific notation and a fixed number of decimal places. When you choose this menu item, a dialog box appears allowing you to set the number of digits to the right of the decimal point. There is always exactly one digit to the left of the decimal point.

In scientific notation, a number looks like this:

1.234E+5

Number Style (continued)

This is the same as the formula

$1.234 * 10^{(+5)}$

or 123,400.

A positive number after the E means the decimal point in the number to the left of the E is to be moved to the right that many places. A negative number after the E means the decimal point in the number to the left of the E is to be moved to the left that many places.

If you want to see what number style is in effect in a selected cell, just look at the Format menu; there is a check mark next to the option in effect.

Example

To give you an idea of how a cell's number style affects the way its value is displayed, the value 987.654321 is shown below as it would appear in a cell that is eight characters wide.

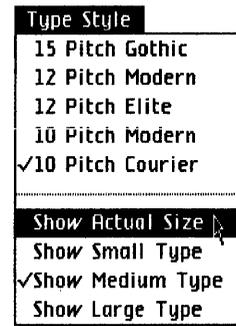
Number Style	Value Displayed
Floating Decimal	987.6543
No Decimal	988
Fixed Decimal (1)	987.7
Scientific (3)	9.877E+2
\$ 1234.56	\$987.65

Format

Printing Type Style

To change the printing typeface of a spreadsheet

- ▶ Choose a font from the Type Style menu.



A character set of a particular size and typeface is called a font. LisaCalc provides a number of different printing fonts. The whole spreadsheet must be the same font.

Size, or pitch, refers to the number of characters printed per inch; 15 pitch prints 15 characters per inch and so on. The “face” is the portion of the character that displays and prints.

Names like Modern and Gothic refer to the kind of type face. For instance, Modern is a sans serif face; there are no serifs, or “feet,” on the characters; Gothic is a serif face, one with “feet.”

Changing the printing font might change the location of the default page marks.

Format

Example

This is 15 pitch Gothic

This is 12 pitch Modern

This is 12 pitch Elite

This is 10 pitch Modern

This is 10 pitch Courier

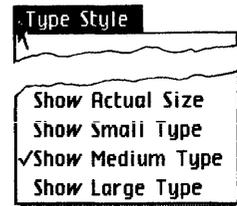
**Printing
Type Style**
(continued)

Format

Screen Type Size

To change the type size shown on the screen

- Choose a screen type size for the spreadsheet from the Type Style menu.



The spreadsheet may be displayed on the screen in small, medium, or large type, regardless of the size used for printing. For instance, choose Show Small Size, 15 characters per inch, to check the table's appearance or Show Large Size, 10 characters per inch, to read and edit values easily. Show Actual Size shows the size of type in which the table will print.

Changing the size of the screen display does not affect the location of the default page marks.

Example

Here are the various sizes when the type style is 12 Pitch Modern:

This is Large Type

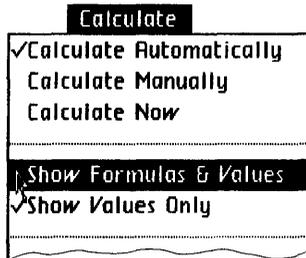
This is Medium Type

This is Small Type

This is Actual Size

To show formulas and values in the spreadsheet

- ▶ Choose Show Formulas & Values from the Calculate menu.



Show Formulas and Show Values

To show only values in the spreadsheet

- ▶ Choose Show Values Only from the Calculate menu.

When you have chosen Show Formulas & Values, you cannot change the contents of the spreadsheet. However, you can scroll the spreadsheet in any direction, change the width of columns, print the spreadsheet, or file it.

Format

Show Formulas and Show Values (continued)

Here are two displays of the same spreadsheet:

	B	C	D	E
		Jan	Feb	Mar
Units		44000	45600	47900
Price	\$	110.00	\$ 110.00	\$ 110.00
Revenue		4840000	5016000	5269000
Units		31300	32500	34100
Price	\$	42.00	\$ 42.00	\$ 42.00
Revenue		1314600	1365000	1432200

Show Values Only

	B	C	D	E
		Jan	Feb	Mar
Units		44000	45600	47900
Price	\$	110.00	\$ 110.00	\$ 110.00
Revenue		4840000	5016000	5269000
Units		31300	32500	34100
Price	\$	42.00	\$ 42.00	\$ 42.00
Revenue		1314600	1365000	1432200

Show Formulas & Values

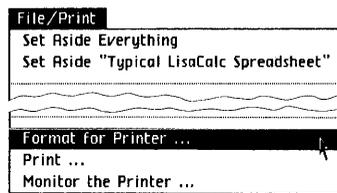
-
- C90 Format for Specific Printers
 - C95 Insert Page Marks
 - C96 Print a Document
 - C100 Remove Page Marks

Print

Format for Specific Printers

To format your document for a specific printer

- ▶ Choose Format for Printer from the File/Print menu.



- ▶ Check the type of printer that this document will print on.
- ▶ If you are using a dot matrix printer, check the orientation and resolution that you want to use for this document.
- ▶ If you are using a daisy wheel printer, check the paper size and print wheel style that you want to use for this document.
- ▶ Check the response you want the Lisa to make if no printer matches the settings you've picked.

What do you want done if the printer you've specified does not appear to be connected to this machine?

Tell Me Pick an Available Printer for Me Disregard it

- ▶ Click OK.

Printer format settings are stored with the spreadsheet, so that they are remembered even after the spreadsheet is put away.

Settings in the Format for Printer Dialog Box

The Format for Printer dialog box lets you check the kind of printer you want this document to print on, and then lets you specify some details on size of paper and type style.

You can tell the Lisa to print your document on a dot matrix or daisy wheel printer. The items that follow Print Method in the dialog box change when you change your printer preference from dot matrix to daisy wheel, or back.

Format for Specific Printers (continued)

Dot Matrix Printer Settings

When you choose Dot Matrix printer in the Format for Printer dialog box, you see these additional choices:

Format For Printer...

On which printer do you intend to print this document?

Print Method: Dot Matrix Daisy Wheel

Paper Length: 11" 14"

Orientation: Portrait (tall) Landscape (wide)

Resolution: Normal High

Paper Length: With a dot matrix printer, you can print on 11 or 14 inch paper.

Orientation: This setting tells the Lisa whether to print your document horizontally or vertically on the paper in your printer. When the orientation is Portrait, the Lisa prints the text of your document across the 8-1/2 inch width of your paper, from left to right. When the orientation is Landscape, the Lisa treats the length of the paper (11 or 14 inches) as the width. In other words, it prints the spreadsheet sideways.

Print

Format for Specific Printers

(continued)

Resolution: This tells the Lisa what quality you want the document to print with. Normal resolution gives you a standard character image. High resolution produces a much finer quality character image, but takes longer to print.

When using landscape orientation and normal resolution, the font size of the text will be smaller when it is printed than it was on the screen.

Daisy Wheel Printer Settings

When you choose Daisy Wheel printer in the Format for Printer dialog box, you see these additional choices:

Format For Printer... Cancel

On which printer do you intend to print this document?

Print Method: Dot Matrix Daisy Wheel

Paper Size: 8.5x11" 11x8.5"
 8.5x14" 14x8.5" 14x11"

Print Wheel: Gothic 15 Elite 12 Courier 10 Executive PS
 PS plus *Italics* 10/12/PS 10/12+Ådän'l çhåråçtér's

Paper Size: When you print with a daisy wheel printer, you have five choices for paper size: 8-1/2 x 11 inches; 11 x 8-1/2 inches; 8-1/2 x 14 inches; 14 x 8-1/2 inches; and 14 x 11 inches.

Print Wheel: You have a range of choices in print wheels. The wheel that you choose determines what type style will be displayed on the screen if you have chosen Show Actual Size from the Type Style menu. It has no effect on the screen type style if you have chosen Show Small, Medium, or Large size.

When Settings Don't Match a Printer

In order for the Lisa to follow your instructions in the Format for Printer dialog box, two other factors must be true: Preferences must show that the type of printer with the settings you choose here is attached to the Lisa, and such a printer must be attached.

Whenever you click OK in the Format for Printer dialog box, the Lisa checks the new setting. The Lisa then looks at the bottom line of the dialog box to see what you want done.

Tell Me: When Tell Me is checked, the Lisa notifies you that no printer specified in Preferences meets the settings you have checked. An alert box appears, so that you can decide what you want to do next. Here is what it looks like:

Intended Printer Unavailable!
According to the Preferences Window's list of Device Connections, the Intended Printer for this document is not connected to this machine.

On which printer do you intend to print this document?

A printer that is not listed in Preferences right now.
 Slot 2 Upper -- Dot Matrix -- 11"
 Port A -- Daisy Wheel -- Gothic 15 -- 11x8.5"
 Port B -- Daisy Wheel -- Gothic 15 -- 11x8.5"

What do you want done if the printer you've specified does not appear to be connected to this machine?

Tell Me Pick an Available Printer for Me Disregard it

Pick an Available Printer: When Pick an Available Printer is checked, the Lisa will choose an alternative printer if one doesn't match exactly the settings you requested. For instance, if you've specified a daisy wheel printer but only a dot matrix is attached and checked in Preferences, the Lisa formats your document for the dot matrix printer, rather than for a daisy wheel printer.

Format for Specific Printers (continued)

Print

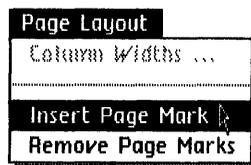
Format for Specific Printers (continued)

Disregard It: When Disregard It is checked, the Lisa notes the difference in printer settings and available printers, but doesn't do anything. This allows you to continue working with your document without being interrupted to make a decision about print formats now. You should check this box when you intend to print the document on a different printer from the one that is connected to your Lisa now.

Insert Page Marks

To insert a page mark in your spreadsheet

- ▶ Select a grid handle between columns or rows where you want the page mark to be.
- ▶ Choose Insert Page Mark from the Page Layout menu.



Page marks control where LisaCalc starts a new page while printing the spreadsheet. When you insert a page mark between two columns or rows, you instruct LisaCalc to print the second column or row at the beginning of a new page, regardless of how much information has been printed on the previous page.

Wherever there is a page mark, it appears on the screen as a dashed line, instead of the solid line usually found between rows and columns.

In addition to any page marks you have specified, LisaCalc also sets default page marks at calculated locations. These default page marks are designed to be one page apart; their location is determined by page size, type style, and other information specified in the Format for Printer dialog box. The default page marks are automatically adjusted whenever you make a change to the spreadsheet that affects the location of the page boundaries. You cannot insert or remove the default page marks.

By inserting page marks, you can print as small a number of rows and columns on each page as you like, but you cannot increase the number of rows and columns beyond the number that will fit on one page.

Print

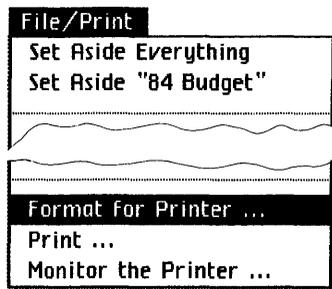
Print a Document

To print a document

- ▶ Make sure your printer is set up and connected to your Lisa. For assistance, see the manual that came with your printer.
- ▶ If you have not previously specified the printers you use in Preferences, do so now, and then start the Lisa again. For assistance, refer to Section D, Desktop Manager Reference Guide, in the *Lisa Owner's Guide*, under Set Printer Configuration.

▶ Get or activate the document.

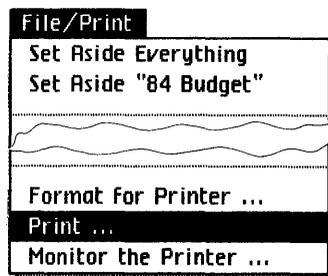
- ▶ If you need to change any of the options in the Format for Printer dialog box for this document, choose Format for Printer from the File/Print menu.



▶ Make any necessary changes in the Format for Printer dialog box that appears.

▶ Click OK.

- ▶ Choose Print from the File/Print menu.



Print a Document (continued)

- ▶ Make any necessary changes in the Print dialog box that appears.
- ▶ Click OK.

Using the current printer settings and the formats you specified in the text, your document begins printing.

For how to make changes in the Format for Printer dialog box, see the Format for Specific Printers procedure, under Print, in this chapter.

If the printer settings and printer don't match, an alert box appears. Alert boxes resulting from a mismatch are discussed in the Format for Specific Printers procedure, under Print, in this chapter.

Sometimes a dialog box titled Monitor the Printer will appear. See While You Work, later in this chapter, for information on this alert box.

Print Dialog Box Settings

The screenshot shows the Print dialog box with the following settings: **Print...** is selected. Under **Quality**, Finished Quality and Quick Draft (Text Only) are visible. Under **Options**, One Copy While You Wait and While You Work are visible. Under **Pages**, All Pages and Only pages: [] Through: [] are visible. Under **Copies**, the **Number of Copies** is set to 1, with a row of buttons for 2, 3, 4, 5, 6, 7, 8, 9, and 10. **Cancel** and **OK** buttons are at the bottom right.

The Print dialog box lets you specify some final details about how your document will print. The choices in the Print dialog box are discussed below.

Quality

Finished Quality: Finished Quality prints your document as you have formatted it on the screen, including special type styles and fonts.

Print

Print a Document (continued)

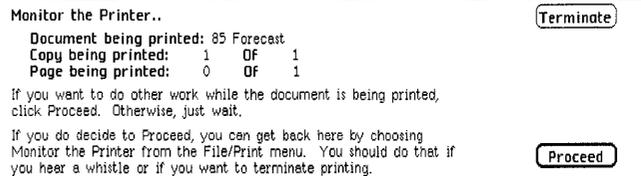
Quick Draft: Quick Draft lets you get a printed copy of the text faster, but without any special type styles and fonts used in your document. On a dot matrix printer, the built-in font is used for Quick Draft. On a daisy wheel printer, whatever print wheel is on the printer is used, even if you've specified a different one in your document.

Speed

While You Wait: You can have the Lisa use most of its attention to print your document while you wait. A document will print more quickly if you choose While You Wait, but you won't be able to use the Lisa for any other tasks.

While You Work: You can print the document while you use the Lisa for other tasks. Some printing conditions make printing while you work inconvenient, however. For example, if you are feeding single sheet paper into your printer, and printing a quick draft, you won't have time to do other activities on the Lisa.

When you choose While You Work, the Monitor the Printer dialog box appears.



This dialog box tells you the document name, the copy, and the page being printed. Click Proceed to return to LisaCalc and continue working. Click Terminate to stop the printing. If you decide to proceed, you can return to this dialog box at any time to stop the printing by choosing Monitor the Printer from the File/Print menu.

Print a Document (continued)

Note that if you hear a whistle, there is a problem with printing while you work. Choose Monitor the Printer from the File/Print menu to see what the problem is.

Number of Pages

A page in LisaCalc is determined by the location of the page marks. See the Insert Page Marks procedure, under Print, in this chapter. In a spreadsheet, page numbering starts at the upper left hand corner and then goes down, until there are no more nonblank rows. Then the numbering starts again at the top of the spreadsheet.

All Pages: You can print all pages of a document. Just make sure All Pages is checked in the Print dialog box.

Selective Pages: To print selective pages of a document, check Only Pages and then fill in the boxes with the starting and ending pages to print.

When you want to print from the beginning of a document through some page number, say 8, you enter "8" in the second box after Through. Similarly, if you want to start at a given page number and print to the end, you need to enter the starting page number in the box after Only Pages.

Number of Copies

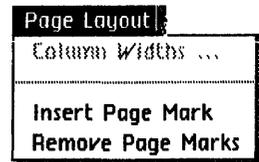
You can print from 1 to 10 copies of any document. Just check the box with the number of copies you want printed.

Print

Remove Page Marks

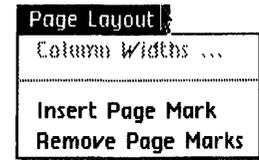
To remove a page mark from your spreadsheet

- ▶ Select the grid handle between columns or rows where the page mark is.
- ▶ Choose Remove Page Marks from the Page Layout menu.



To remove all page marks from your spreadsheet

- ▶ Choose Select All of Document from the Edit menu.
- ▶ Choose Remove Page Marks from the Page Layout menu.



You can remove page marks that you have specified, but you cannot remove the default page marks set by LisaCalc. When you remove one or more page marks, LisaCalc automatically adjusts the default page marks to be one page apart.

Protect

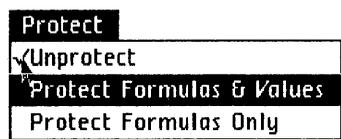
-
- C102 Protect Formulas and Values
 - C103 Protect Formulas Only
 - C104 Unprotect

Protect

Protect Formulas and Values

To protect all cells

- ▶ Select the cells you want protected.
- ▶ Choose Protect Formulas & Values from the Protect menu.



If you select a range of cells and choose Protect Formulas & Values, all cells in the range are protected.

When a cell is protected, the following rules apply:

- You cannot change or replace the value.
- You cannot clear the cell until you unprotect it.
- If you try to paste another cell on top of the cell, an alert box asks you to confirm that you really want to do this.
- You can edit the formula without unprotecting the cell, but you cannot clear the formula.
- You can cut the cell.
- You can copy the cell. The cell you copy to is also protected.
- You can move the cell. The cell you move to is also protected.

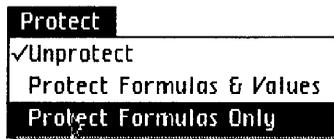
If you want to see whether a selected cell is protected, just look at the Protect menu; there is a check mark next to the option in effect.

Protect

Protect Formulas Only

To protect cells with formulas

- ▶ Select the cells you want protected.
- ▶ Choose Protect Formulas Only from the Protect menu.



If you select a range of cells and choose Protect Formulas Only, only cells in the range with formulas are protected; cells with values only are not protected.

When a cell is protected, the following rules apply:

- You cannot clear the cell until you unprotect it.
- If you try to paste another cell on top of the cell, an alert box asks you to confirm that you really want to do this.
- You can edit the formula without unprotecting the cell, but you cannot clear the formula.
- You can cut the cell.
- You can copy the cell. The cell you copy to is also protected.
- You can move the cell. The cell you move to is also protected.

If a cell with no formula is protected with Protect Formulas Only, then as soon as a formula is entered in the cell, it is protected. If you enter a value or clear the cell instead of entering a formula, the cell becomes unprotected.

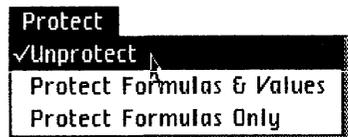
If you want to see whether a selected cell is protected, just look at the Protect menu; there is a check mark next to the option in effect.

Protect

Unprotect

To remove protection from cells

- ▶ Select the cells you want unprotected.
- ▶ Choose Unprotect from the Protect menu.



If you want to see whether a selected cell is protected, just look at the Protect menu; there is a check mark next to the option in effect.

Other Tools

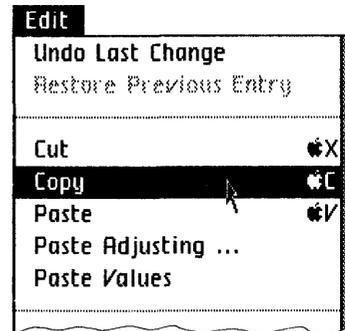
C106 LisaGraph
C107 LisaWrite

Other Tools

LisaGraph

To copy data from a LisaCalc spreadsheet into a LisaGraph table

- ▶ Get or activate the LisaCalc spreadsheet.
- ▶ Select the cells that you want to copy.
- ▶ Choose Copy from the Edit menu.



- ▶ Get or activate the LisaGraph document.
- ▶ Select the location in the LisaGraph table where the cells are to be pasted.
- ▶ Choose Paste from the Edit menu.
- ▶ Edit and format the graph and table; then save, print, and file the LisaGraph document as usual.

When you copy cells from a LisaCalc spreadsheet to a LisaGraph table, LisaGraph retains the values, alignment, and number style but not the formulas, protection, or column width. You can paste rows of cells from LisaCalc into columns in LisaGraph, or columns into rows. The values are automatically plotted in the graph after pasting.

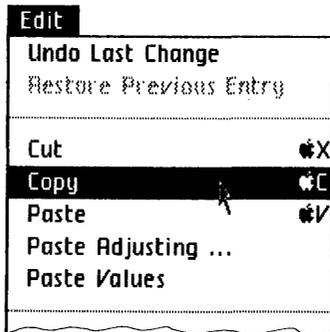
You can also copy cells from LisaGraph into LisaCalc to perform calculations on the values.

Other Tools

LisaWrite

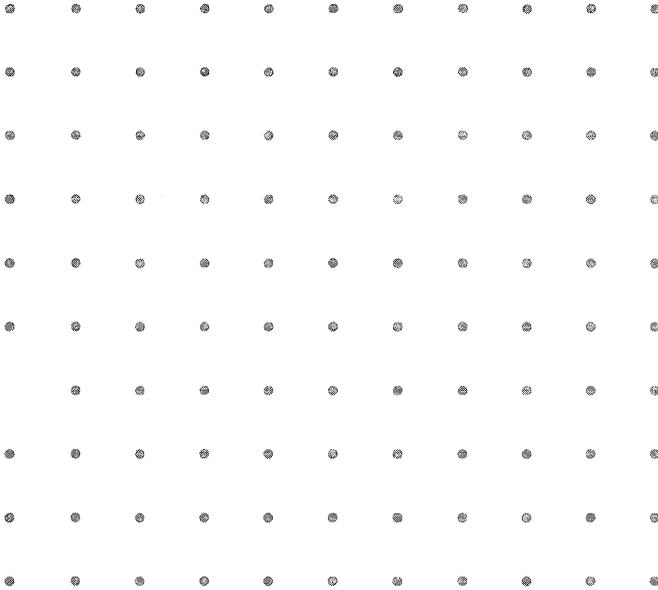
To copy cells from LisaCalc to a LisaWrite document

- ▶ Get or activate the LisaCalc spreadsheet.
- ▶ Select the cells that you want to copy.
- ▶ Choose Copy from the Edit menu.



- ▶ Get or activate the LisaWrite document.
- ▶ Place the insertion point where you want to place the LisaCalc data, or select the text in the LisaWrite document that you want to replace.
- ▶ Choose Paste from the Edit menu.

When you copy cells from a LisaCalc spreadsheet to a LisaWrite document, only the values are copied. The cells are arranged in the LisaWrite document in the same positions as in the LisaCalc spreadsheet. Each column becomes a tab stop. Tab alignments are set to match the alignments that were specified in LisaCalc.



***Section D
Appendixes***

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D7 Appendix 3. Type Fonts

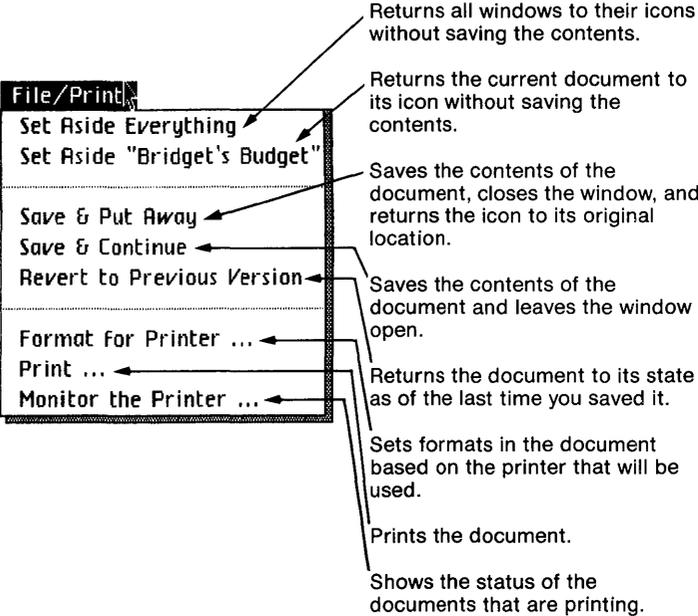
D9 Appendix 4. Formulas

D21 Appendix 5. Functions

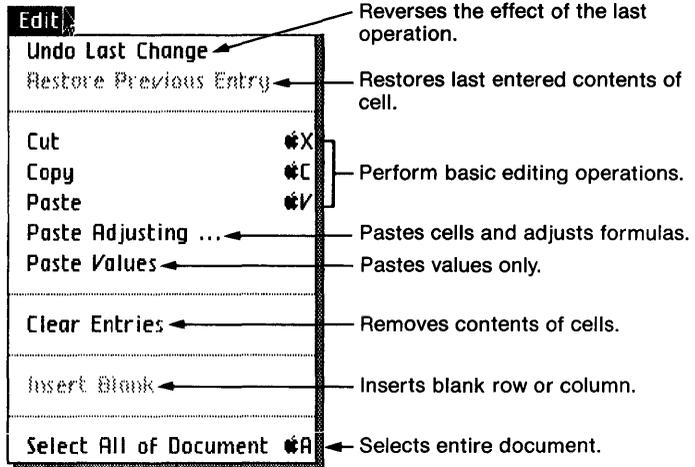
Appendix 1

Menu Items

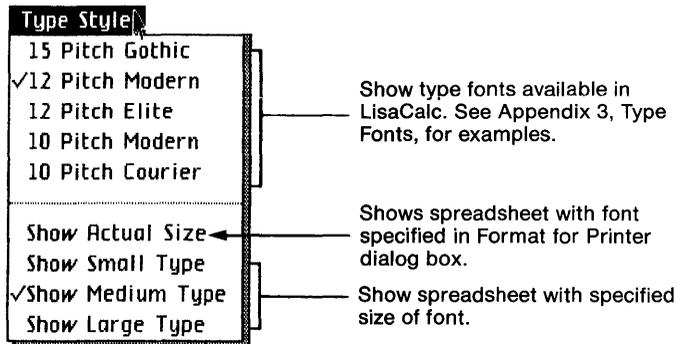
File/Print Menu



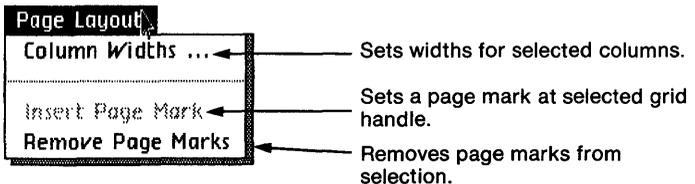
Edit Menu



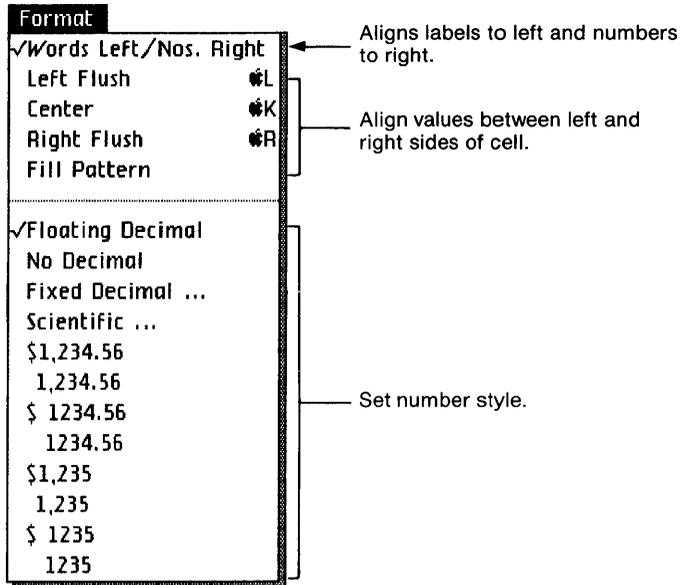
Type Style Menu



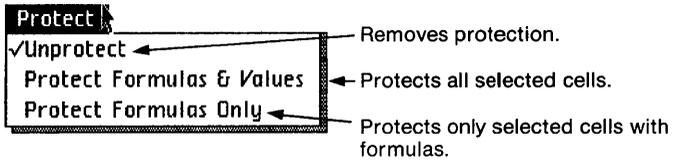
Page Layout



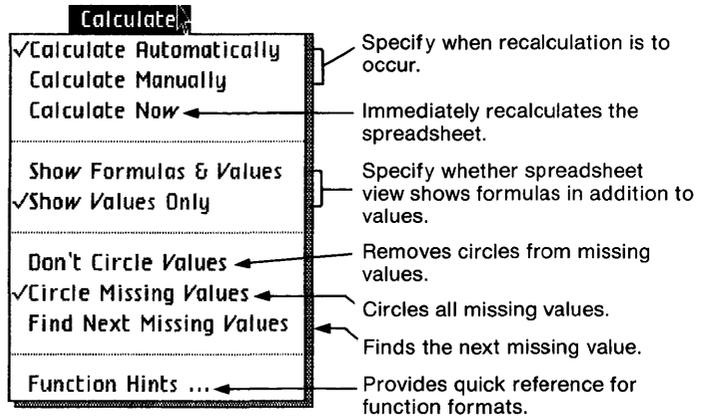
Format Menu



Protect Menu



Calculate Menu



Appendix 2

Apple Keys

Some LisaCalc menu items contain the Apple key symbol (⌘) followed by a character.

Menu items that appear with the Apple key symbol can be chosen by using the mouse or by pressing the (⌘) key and the character associated with that menu item. For example, to use the Cut menu item, you first select what you want to delete, press the (⌘) key, and while holding it down, press the X key.

The following list shows the characters that can be used in combination with the (⌘) key in LisaCalc:

- A Select All of Document
- C Copy
- G Select Cells area ("Go to cell")
- K Center
- L Left Flush
- M Select Formula area ("Mathematical formula")
- R Right Flush
- V Paste
- X Cut
- . Terminate

Appendix 3

Type Fonts

Type of one size and face is called a font. The “face” is the portion of the character that displays and prints. On the Type Style menu, some font names are preceded by a number that indicates character size. This number indicates how many characters will print per inch when you use that type font.

The list below shows the fonts as they print. You can print any of the LisaCalc type styles on a dot matrix printer. To use them with a daisy wheel printer, however, you must have the appropriate wheel. If you choose a font that your printer is not set up to use, an alert message is displayed on the screen.

15 Pitch Gothic
12 Pitch Modern
12 Pitch Elite
10 Pitch Modern
10 Pitch Courier

Appendix 4

Formulas

There are three kinds of formulas in LisaCalc:

- An arithmetic formula has a number as a value.
- A logical formula has True or False as a value.
- A date formula has a date or a date part as a value.

This appendix also describes a group of special constants, such as Error, Date, and so forth.

If you type an invalid formula, and then try to enter it, LisaCalc displays an alert message. It won't let you do anything else until you have corrected or cleared the formula.

Arithmetic Formulas

An arithmetic formula is a series of arithmetic operands separated by arithmetic operators.

Operands

An operand is one of the things shown in Table 4-1.

Table 4-1. Arithmetic Operands

Operand	Example
Number	123.456
Cell coordinate	A42
Function	Sum(A19:D57)
Parenthesized formula	(A1*B4)

The term “parenthesized formula” means that if part of the formula is enclosed in parentheses, it can be used as an operand.

Example

$$(A1*B4)/(C2 - D3)$$

In this case, the division operator has two operands: (A1*B4) and (C2 - D3).

Operators

The arithmetic operators are shown in Table 4-2.

Table 4-2. Arithmetic Operators

Operator	Meaning
+	Addition
-	Subtraction
*	Multiplication
/	Division
DIV	Integer division
REM	Remainder
^	Exponentiation

Exponentiation means “raise to the power.”

Examples

$$3^2 = 9$$

$$8^{(-1/3)} = .5$$

DIV is integer division. It operates like regular division, except that the result is always a whole number; any fractional remainder is discarded.

Examples

$$11 \text{ DIV } 3 = 3$$

$$11 \text{ DIV } -3 = -3$$

$$-11 \text{ DIV } 3 = -3$$

$$-11 \text{ DIV } -3 = 3$$

REM is the remainder operator. Its result is the remainder after integer division. There must be a space on both sides of the letters REM.

Examples

$$26 \text{ REM } 7 = 5$$

$$26 \text{ REM } -7 = 5$$

$$-26 \text{ REM } 7 = -5$$

$$-26 \text{ REM } -7 = -5$$

Order of Evaluation

When a formula contains more than one operator, the order in which the operations are performed depends on what the operators are. There are three categories of operators; these are shown in Table 4-3. Any operations in the first group are performed first, then any operations in the second group, and finally any operations in the third group.

Table 4-3. Order of Evaluation of Arithmetic Operators

Order	Operators
First	^
Second	* / REM DIV
Third	+ -

Examples

$$2+3^2 = 11$$

$$2^3+2 = 10$$

$$3*4+2*5 = 22$$

$$2+4/2+3 = 7$$

$$-2^2 = -4$$

In the last example, the exponentiation operation is performed first, and then the result is subtracted from 0, even though no 0 is shown in the formula.

If a formula contains parentheses, the formula within the parentheses is evaluated first. Therefore, parentheses can always be used to control the order of evaluation.

Examples

$$(2+3)^2 = 25$$

$$3*(4+2)*5 = 90$$

$$(2+4)/(2+3) = 1.2$$

$$2*(-20/(5-3))+(4*(8/2)) = -4$$

$$\text{Sum}(1,2,3,4,5)*\text{Sum}(2,3,4) = 135$$

If a formula contains more than one operator from the same group, the operations are evaluated from left to right. Again, parentheses can be used to change the order of evaluation.

Examples

$$24/4/2 = 3$$

$$24/(4/2) = 12$$

$$2^3^2 = 64$$

$$2^3^2 = 512$$

Logical Formulas

A logical formula has the value True or False. A logical formula can occur either as a formula on its own or as one of the arguments to the If or Search function.

The simplest kind of logical formula is just one of the constants True or False entered as the value of a cell. The next simplest kind is a relational formula. Relational formulas can, in turn, be combined into compound logical formulas through the operators Not, Or, and And.

Logical values and formulas can be used as components of arithmetic formulas. In this case, False is equal to 0, and True is equal to 1.

Relational Formulas

A relational formula compares two operands to see whether they are equal, or if not, which is greater. Each of the two operands of a relational operator is itself a formula. The relational operators are shown in Table 4-4.

Table 4-4. Relational Operators

Operator	Meaning
<	Less than
<=	Less than or equal to
>	Greater than
>=	Greater than or equal to
=	Equal to
<>	Not equal to (that is, less than or greater than)

Example

C1 <= D1

This formula has the value True if C1 is less than or equal to D1; otherwise, it has the value False.

Example

Sum(A1:M2) <> 23.45

This formula has the value True if Sum(A1:M2) is not equal to 23.45; otherwise, it has the value False.

When the operands to a relational formula are labels, only = or <> can be used as the operator.

LisaCalc compares values based on the values stored in memory. Because it is not always possible to store decimal numbers precisely, two values that appear to be equal may be found to be unequal when they are compared.

Compound Logical Formulas

You can combine two or more relational formulas into a compound logical formula using one or more of the operators Not, Or, and And. The possible forms are shown in Table 4-5.

Table 4-5. Compound Logical Formulas

Formula	Value
Not formula 1	True if formula 1 is False; False if formula 1 is True.
Formula 1 Or Formula 2	True if formula 1 or formula 2 or both are True; False if both are False.
Formula 1 And Formula 2	True if both formula 1 and formula 2 are True; otherwise, False.

The operands for Not, And, and Or must be relational formulas or other logical formulas.

When a formula contains more than one relational or logical operator, the order in which the operations are performed is shown in Table 4-6.

Table 4-6. Order of Evaluation of Operators

Order	Operators
First	Arithmetic operators
Second	<, <=, >, >=, =, <>
Third	Not
Fourth	And
Fifth	Or

Table 4-7 shows some examples of logical formulas. In these examples, assume that

A1 = 12
 B1 = 27
 C1 = 39

Table 4-7. Compound Logical Formulas

Formula	Value
Not A1 <= 12	False
A1 > 13 Or B1 = 27	True
A1+B1 = C1 And C1 >= B1+10	True
C1 = 39 Or B1 > 26 And A1 < 6	True
(C1 = 39 Or B1 > 26) And A1 < 6	False

The last two examples show you how parentheses change the order of evaluation of a logical formula. In the first formula, with no parentheses, the And operation is performed before the Or operation. This part of the formula reads:

B1 > 26 And A1 < 6

Since A1 is not less than 6, the And operation results in the value False, even though B1 is greater than 26. This means that the whole formula is equivalent to:

C1 = 39 Or False

Since C1 is equal to 39, the formula is True. In the last formula, however, the parentheses require the Or operation to be performed first. This part of the formula reads:

$C1 = 39 \text{ Or } B1 > 26$

Since C1 is equal to 39, the Or operation results in the value True. This means that the whole formula is equivalent to:

True And $A1 < 6$

Since A1 is greater than 6, the value of the formula is False.

Date Formulas

A date formula is one whose value is a date or a date part. Dates are in the form:

month/day/year

where month is a number from 1 to 12, day is a number from 1 to 31, and year is a number from 1 to 9999. The year can be entered in 1 to 4 digits; if the first two digits are omitted, "19" is assumed.

Dates and date parts can be values, as well as occurring in formulas.

A date must be a legal date. For example,

2/31/84

is not a date, but text. Any date obtained as the value of a formula is always a legal date.

Dates are based on the Julian calendar; in particular, February 29 occurs only in leap years.

The special value Date is always equal to today's date. Its value in a spreadsheet does not change unless the spreadsheet is recalculated. Every time the spreadsheet is recalculated, "Date" is evaluated as equal to today's date.

If a date is entered in the Formula area of a cell, it must be surrounded by quotation marks. In the Value area, quotation marks are not necessary.

Example

“4/2/92”

in a formula is a date, but

4/2/92

is a sequence of two divisions.

A date part is in one of the following forms:

x days

x weeks

x months

x years

You can type

x weeks

in a cell, but as soon as you enter the value, it is changed to

7 * x days

Values are never displayed in weeks.

Date formulas take one of the forms shown in Table 4-8.

Table 4-8. Date Formulas

Formula	Value
– Date	Date
– Date part	Date part
Date + date part	Date
Date – date part	Date
Date part + date part	Date part
Date part – date part	Date part
Date – date	Date part

Examples

“9/5/47” + 10000 days = 1/21/75

“12/11/82” – 1000 days = 3/16/80

“12/25/83” – “3/31/83” = 269 days

1 year + 400 days = 1 year, 400 days

In logical formulas, dates can be compared to dates and date parts can be compared to date parts. The formula:

$\text{Date 1} < \text{Date 2}$

is True if Date 1 occurs before Date 2, and False otherwise.

Example

$\text{Date} > \text{"3/3/84"} + 1 \text{ year}$

has the value True if a year has elapsed since March 3, 1984, and the value False otherwise.

For date parts, only the equal (=) and not equal (<>) comparisons are valid. Two date parts are considered unequal if they are in different units. For example, it is never true that a certain number of months is equal to a certain number of days. The only exception to this rule is that X weeks is equal to 7*X days.

The interpretation of a date part depends on what units it is expressed in. If the formula only contains date parts, then date parts expressed in the same units are combined, but not date parts in different units.

Examples

$1 \text{ year} + 17 \text{ days} = 1 \text{ year}, 17 \text{ days}$

$1 \text{ month} + 3 \text{ weeks} = 1 \text{ month}, 21 \text{ days}$

$3 \text{ years} + 4 \text{ months} + 5 \text{ years} - 2 \text{ months} = 8 \text{ years}, 2 \text{ months}$

In a formula of the form:

$\text{Old Date} + \text{date part} = \text{New Date}$

the interpretation of the date part is as follows:

- If the date part is a number of days, New Date is found by counting forward that many days from Old Date.
- If the date part is a number of weeks, it is converted to days when the formula is calculated, but is still shown as weeks in the formula.
- If the date part is a number of months, that many months are added to the month part of Old Date. The year part is increased if necessary, but the day part does not change, unless leaving the day part the same would result in an illegal date.
- If the date part is a number of years, New Date is the same date, except that the number of years is increased or decreased accordingly. An exception is February 29, in a non-leap year, which is changed to March 1.

Examples

“4/30/85” + 1 month = “5/30/85”

“1/31/85” + 1 month = “3/3/85”

“2/10/84” + 1 year = “2/10/85”

“2/10/84” + 365 days = “2/9/85”

The same interpretation applies for a formula of the form:

Old Date – date part = New Date

except that the date part is subtracted instead of added.

You can convert date parts expressed in one unit into any other unit by using the following form:

(Number Unit 1) Unit 2

This form takes a date part specified in Unit 1 and converts it to one in Unit 2. For example:

(3 months) days = 90 days

In this example, 3 months are converted to the corresponding number of days. The rules used in conversion are as follows:

1. For months, days, and years, the following applies:

1 week = 7 days

1 month = 30 days

1 month = 4 weeks = 28 days

1 year = 12 months

1 year = 365 days

1 year = 52 weeks = 364 days

2. Weeks are first converted to days, and then treated as in rule 1.

3. Amounts less than a whole number of units are rounded down.

4. If the answer after converting is 0, it is always shown as “0 days” regardless of the original units.

Examples

(Date – “1/1/83”) months = number of months since beginning of year

(23 months) days = 690 days

(23 months) years = 1 year

(121 days) months = 4 months

(1 year) weeks = 364 days

(1 month) weeks = 28 days

In the last two examples, the answer is shown in days because values are never shown in weeks. After conversion to weeks, the number of days shown is always divisible by seven.

Date parts can be arguments to the functions Int, Round, and RoundIEEE, shown in Appendix 5, Functions, in this manual. The result of one of these functions is the whole number of units in the date part, without the units. The whole number can then be used in contexts where date parts are forbidden, for example multiplication.

Example

$$4 * \text{Int}(3 \text{ weeks}) = 12$$

Special Constants

Certain labels are given special meanings by LisaCalc. When these labels appear in the Formula area, they stand for certain special values. These labels are:

Date When used in a formula, or by itself in the Formula area, today's date is substituted. If the spreadsheet is recalculated, and the date has changed, the new date is substituted. If the spreadsheet is not recalculated, the value of Date stays the same, even if today's date has changed. Date is only meaningful in a formula; when it is used as the value of a cell, it is interpreted as the text value "Date," not as today's date.

Example: $\text{Date} + 6 \text{ months} =$ The date six months from today.

Error This value is returned by LisaCalc whenever an error occurs in calculating a formula. It can also be used in a formula if you want to flag an error in a cell. When Error appears as an operand in a formula, the value of the formula is also Error.

Example: $\text{If}(\text{B1} > \text{C1}, \text{A1}, \text{Error}) =$ The value of A1 if B1 is greater than C1, otherwise Error.

Infinity	<p>The largest possible value. Infinity is returned as the result of division by zero, or as the result of certain functions. — Infinity is the negative number with the largest magnitude.</p> <p>Example: If (A1 = Infinity, “Overflow”, “OK”) = The word Overflow if A1 contains Infinity, otherwise the word OK.</p>
Na	<p>Not Available. This value is returned by the Lookup function if the value being looked up is out of range, and by the Search function if the value is not found. You can use it as the value of a cell if some information is not available yet, but you don’t want an error in the spreadsheet. When Na appears as a value in a formula, the value of the formula is also Na.</p> <p>Example: The value of A1 is Na. The formula in A2 is A1 + 1. Therefore, the value of A2 is also Na.</p>
Pi	<p>The mathematical constant Pi (3.14159265358979 . . .). Pi is only meaningful in the formula of a cell; when it is used as a value, it is interpreted as the text value “Pi,” not as a number.</p> <p>Example: Cos(Pi) = -1</p>

Appendix 5

Functions

Functions are used in formulas. A function can either be a formula by itself, or it can be a component of a longer formula.

If you want a quick reminder of the name or arguments of a particular function, choose Function Hints from the Calculate menu.

Function Arguments

The form of a function is:

name (argument 1, argument 2, . . .)

The number of arguments for the function, and what the arguments can be, differ for each function. All of the arguments fall into one of the three categories shown in Table 5-1.

Table 5-1. Kinds of Arguments

Argument	Definition
Value	<p>A single value; something that is or could be the contents of a cell.</p> <p>Examples:</p> <p>23.5</p> <p>A2</p> <p>A26*B27</p> <p>C1 < D2</p> <p>true</p> <p>“9/5/47”</p> <p>3 months</p> <p>“Yearly Total”</p>

Table 5-1. Kinds of Arguments, continued

Argument	Definition
Range	<p>A range of cells in the usual notation. A range cannot be a whole row or column.</p> <p>Examples:</p> <p>A1:B10</p> <p>D27</p>
List	<p>A list of values and ranges, separated by commas. Any number of values and ranges is allowed.</p> <p>Examples:</p> <p>B2:B30,C5,42.3</p> <p>A1:A2,A1:B10,"1/19/95", "Tomorrow"</p> <p>1,2,3,4,5</p>

Each of these types of arguments is a collection of one or more values. Every value belongs to a certain data type; a function may allow values of only certain types. If you use an argument of the wrong type, the most likely result is that the function will be assigned the special value Error. The data types are shown in Table 5-2.

Table 5-2. Data Types of Arguments

Type	Definition
Blank	<p>An empty cell. When used as a number in a formula, a blank is equal to zero.</p>
Number	<p>A whole or decimal number.</p> <p>Examples:</p> <p>23.2</p> <p>4.5E+2</p> <p>\$123.45</p>

Table 5-2. Data Types of Arguments, continued

Type	Definition
Logical	True or False. When used as a number in a formula, True is equal to 1, and False is equal to 0.
Date	A calendar date. Example: "8/12/34"
Date part	A number of days, weeks, months, or years. Examples: 1 day 2 weeks 3 months 5 years
Label	Any value not in one of the above categories. When used as a number in a formula, a label is equal to 0. Examples: Truue 23.A \$12?.45 3 moths Break-Even Factor

Abs

Abs (Value)	Number.
Type of Value	Number.
Result	Abs returns a positive value of the same magnitude as Value. That is: <ul style="list-style-type: none">■ If Value ≥ 0, result = Value.■ If Value < 0, result = $-$Value.
Example	Abs(3.2) = 3.2 Abs(-3.2) = 3.2
Error Conditions	Abs returns Error if Value is not a number.

Acos

Acos (Value)	Number. $-1 \leq \text{Value} \leq 1$
Type of Value	Number. $-1 \leq \text{Value} \leq 1$
Result	Arccosine of Value, in radians. $0 \leq \text{Result} \leq \text{Pi}$.
Error Conditions	Acos returns Error if Value is not a number or is outside the range indicated.

Annuity

Annuity (Value 1, Value 2)	Number. Value 1 is the interest rate per period.
Type of Value 1	Number. Value 1 is the interest rate per period.
Type of Value 2	Number. Value 2 is the number of periods.

Result	<p>Annuity returns a number called the annuity factor. When this factor is multiplied by the return per period of an investment, the result is the present value of the annuity. The formula used for calculation is:</p> $(1 - (1 + \text{Value } 1)^{-\text{Value } 2}) / \text{Value } 1$
Example	<p>Suppose you want to know how much your monthly payments would be on a 30-year mortgage for \$100,000, if the interest rate were 15% a year. This is 360 payments; the interest each month is 1.25%. The formula for this would be:</p> $100000 / \text{Annuity}(.0125, 360)$ <p>The answer is 1264.44.</p>
Error Conditions	<p>Annuity returns Error if Value 1 is not a number or is less than or equal to -1, or if Value 2 is not a number.</p>

Asin

Asin (Value)	
Type of Value	Number. $-1 \leq \text{Value} \leq 1$.
Result	<p>Arcsine of Value, in radians.</p> $-\text{Pi}/2 \leq \text{Result} \leq \text{Pi}/2$
Error Condition	Asin returns Error if Value is not a number.

Atan

Atan (Value)	
Type of Value	Number.
Result	Arctangent of Value, in radians. $-\text{Pi}/1 < \text{Result} < \text{Pi}/2$.
Error Condition	Atan returns Error if Value is not a number.

Average

Average (List)	
Type of List	Any number of numbers, logical values, or labels.
Result	Average returns the average (mean) of the values in the list. It is equivalent to: $\text{Sum}(\text{list})/\text{Count}(\text{list})$ or the sum of the values in the list divided by the number of values in the list. In computing the number of values in the list, LisaCalc includes labels but omits blank cells. If any of the values is Na, the result of the function is Na.
Example	$\text{Average}(14.2, \text{True}, 100) = 38.4$
Error Conditions	Average returns Error if any of the values in the list are dates or date parts, or have the value Error. Blank cells are allowed and do not contribute to the result.

Compound

Compound (Value 1, Value 2)	
Type of Value 1	Number. Value 1 is the interest rate per period.
Type of Value 2	Number. Value 2 is the number of periods.
Result	Compound returns the compound interest factor, which, when multiplied by the principal, yields the total compounded value of a debt or investment. The formula used for calculation is: $(1 + \text{Value 1})^{\text{Value 2}}$
Example	Suppose you have \$75,000 invested at 18% a year, compounded monthly, and you want to find out how much you will have at the end of four years. This is 48 periods, at 1.5% interest per period. The formula for this would be: $75000 * \text{Compound}(.015, 48)$ The answer is \$153,260.87
Error Conditions	Compound returns Error if Value 1 is not a number, or is less than or equal to -1 , or if Value 2 is not a number.

Cos

Cos (Value)	
Type of Value	Number, in radians.
Result	Cosine of Value.
Error Condition	Cos returns Error if Value is not a number.

Count

Count (List)

Type of List

Any number of values of any type.

Result

Count returns the number of values in the list that are not blank. If the value of a cell is any number of spaces, the cell is not considered blank by the Count function.

Example

Count(A1:A7) = 5

G Cells: A8		Value (Number): 5				
M Formula: count(A1:A7)						
	A	B	C	D	E	
1	2.3					
2						
3	1/3/87					
4	4 years					
5	true					
6						
7	assets					
8						

Error Conditions

None.

Exp

Exp (Value)

Type of Value

Number.

Result

Exp returns the exponential function of Value, which is e^{Value} .

Examples

Exp(1) = 2.718281828459

Exp(-1) =
.36787944117144

Error Conditions

Exp returns Error if Value is not a number.

If

If (Value 1, Value 2, Value 3)

Type of Value 1

Logical formula.

Type of Value 2

Any type of value.

Type of Value 3	Any type of value.
Result	If Value 1 is equal to True, the result of the function is Value 2. If Value 1 is equal to False, the result of the function is Value 3.
Examples	<p>If (A1 < 27,B1,C1) = B1 if A1 is less than 27, C1 otherwise.</p> <p>If (D1,“yes”,“no”) = The label “yes” if D1 is true, otherwise the label “no.”</p> <p>If (A1 < 2 And B1 < 2,Min(C1:C8), Max(C1:C8)) = If A1 and B1 are both less than 2, the smallest value in C1:C8, otherwise the largest value in C1:C8.</p> <p>For more examples, see the LisaCalc Tutorial, Section B, Chapter 4.</p>
Error Conditions	If returns Error if Value 1 is not a logical value, or if Value 1 is True and Value 2 is Error, or if Value 1 is False, and Value 2 is Error.

Int

Int (Value 1, Value 2)	
Type of Value 1	Number or simple date part.
Type of Value 2	Whole number. Value 2 can be omitted.

Result

Int returns the truncated value of Value 1; that is, Value 1 with some of its decimal places deleted. If Value 2 is present and is not zero, it indicates the number of decimal places to be included in the result. If Value 2 is omitted or zero, the result has no decimal fraction.

If Value 2 is negative, that number of digits to the left of the decimal point goes to zero. If Value 2 is positive, that number of digits to the right of the decimal point is truncated. If Value 2 is not a whole number, it is rounded to the nearest whole number.

If Value 1 is a simple date part, Int returns the number of units (days, months, or years) without the units.

Examples

$\text{Int}(4.23) = 4$

$\text{Int}(4.23,0) = 4$

$\text{Int}(1.234567,3) = 1.234$

$\text{Int}(-1.234567,3) =$
 -1.234

$\text{Int}(1.234567, -3) = 0$

$\text{Int}(14 \text{ months}) = 14$

$\text{Int}(1 \text{ year} + 2 \text{ months}) =$
Error

$\text{Int}(1234, -2) = 1200$

$\text{Int}(1234 \text{ years}, -2) = 1200$

Error Conditions

Int returns Error if Value 1 is not a number or a simple date part, or if Value 2 is not a number.

Ln

Ln (Value)	
Type of Value	Positive number.
Result	Ln returns the natural logarithm of Value. This is the logarithm to the base e.
Examples	Ln(2.7182818284591) = 1 Ln(2) = .69314718055995 Ln(10) = 2.302585092994
Error Conditions	Ln returns Error if Value is not a positive number. Ln(0) is equal to Infinity.

Log

Log (Value)	
Type of Value	Positive number.
Result	Log returns the logarithm of Value to the base 10.
Examples	Log(2.7182818284591) = .43429448190326 Log(2) = .30102999566398 Log(10) = 1
Error Conditions	Ln returns Error if Value is not a positive number. Log(0) is equal to infinity.

Lookup

Lookup(Value, Range 1, Range 2)	
Type of Value	Any type of value except a date part.
Type of Range 1	Can contain any type of cells; must be compatible with Value.

Type of Range 2

Can contain any type of cells. Range 2 can be omitted. Range 1 and Range 2 should have the same number of cells, but one can be part of a row while the other is part of a column. If Range 2 is smaller than Range 1, then whenever a value is found in Range 1 in a cell in which there is no corresponding value in Range 2, Lookup returns Na.

Result

Lookup treats Range 1 as a table in which it looks up Value. It checks Range 1 in order to find a value that matches Value. When Value is found, the corresponding entry in Range 2, counting one-for-one, is returned as the result of the function. If Value 1 is not matched exactly, but a value exceeding it is found, then the entry immediately before the value that exceeds Value 1 is returned as the result of the function. If Range 2 is omitted, then the next column or row is treated as Range 2.

If Range 1 is more than one column wide and one row deep, the range is examined by going down each column from top to bottom before moving on to the next column.

If Value is a date or number, Lookup assumes that Range 1 is arranged in ascending numerical sequence. If it is not in sequence, then Lookup stops looking for values as soon as it finds a value out of sequence.

If Value is a label, it must be enclosed in quotation marks, unless it is a single word. For labels, the values in Range 2 do not have to be in any particular order. Upper case letters and lower case letters are considered the same when Lookup is looking for a match.

Example

See the LisaCalc Tutorial, Section B, Chapter 4.

Error Conditions

If Value is a label, it must be matched exactly in Range 1, or the result of the function is Na (Not Available). If Value is a number or date, it must fall between the first and last values in Range 1, or the result of the function is Na.

Max

Max (List)

Type of List

Numbers, logical values, labels, or dates. Dates cannot be mixed with any of the other types.

Result

Max returns the largest value in the list. If List is a list of dates, Max returns the date occurring the latest. Labels are equal to 0.

Examples	$\text{Max}(1.2, -200, 3) = 3$ $\text{Max}("1/9/87", "2/4/93", "3/15/72") = 2/4/93$ $\text{Max}(\text{False}, .3, .4, \text{True}, .7) = \text{True}$
Error Conditions	Max returns Error if the items in List are not of compatible types, or if any item in the list has the value Error.

Min

Min (List)	
Type of List	Numbers, logical values, labels, or dates. Dates cannot be mixed with any of the other types.
Result	Min returns the smallest value in the list. If List is a list of dates, Min returns the date occurring the earliest. Labels have the value 0.
Examples	$\text{Min}(1.2, -200, 3) = -200$ $\text{Min}("1/9/87", "2/4/93", "3/15/72") = 3/15/72$ $\text{Min}(\text{False}, .3, .4, \text{True}, .7) = \text{False}$
Error Conditions	Min returns Error if the items in List are not of compatible types, or if any item in the list has the value Error.

Npv

Npv (Value,Range)	
Type of Value	Number. Value is the discount rate.
Type of Range	Numbers. Range is the cash flow over successive periods, one cell for each period.
Result	Npv returns the net present value of an investment yielding a specified cash flow at a given discount rate.
Example	See the LisaCalc Tutorial, Section B, Chapter 4.
Error Conditions	Npv returns Error if Value is not a number, or if Range contains any cells whose value is not a number.

Round

Round (Value 1, Value 2)	
Type of Value 1	Number or simple data part.
Type of Value 2	Whole number. Value 2 can be omitted.
Result	Round returns the rounded value of Value 1; that is, Value 1 with some of its rightmost decimal places deleted, and the last remaining place rounded appropriately. If Value 2 is present and is not zero, it indicates the number of decimal places to be included in the result. If Value 2 is omitted or zero, the result has no decimal fraction.

If Value 2 is negative, that number of digits to the left of the decimal point is rounded to zero. If Value 2 is positive, that number of digits to the right of the decimal point is rounded. If Value 2 is not a whole number, it is rounded to the nearest whole number.

If Value 1 is a simple date part, Round returns the number of units (days, months, or years) without the units.

If the next decimal place after the last one to be kept is a 5, followed only by zeroes, the number is rounded up if positive, and down if negative.

Examples

$\text{Round}(1.739) = 2$

$\text{Round}(1.8725,3) = 1.873$

$\text{Round}(-1.8725,3) = -1.873$

$\text{Round}(1.87251,3) = 1.873$

$\text{Round}(1250.000, -2) = 1300$

$\text{Round}((5+7) \text{ years}) = 12$

$\text{Round}(1250 \text{ days}, -2) = 1300$

Error Conditions

Round returns Error if Value 1 is not a number or a simple date part, or if Value 2 is not a number.

RoundIEEE

RoundIEEE (Value 1, Value 2)

Type of Value 1	Number or simple date part.
Type of Value 2	Whole number. Value 2 can be omitted.
Result	<p>RoundIEEE returns the rounded value of Value 1; that is, Value 1 with some of its rightmost decimal places deleted, and the last remaining place rounded appropriately. If Value 2 is present and is not zero, it indicates the number of decimal places to be included in the result. If Value 2 is omitted or zero, the result has no decimal fraction.</p> <p>If Value 2 is negative, that number of digits to the left of the decimal point is rounded to zero. If Value 2 is positive, that number of digits to the right of the decimal point is rounded. If Value 2 is not a whole number, it is rounded to the nearest whole number.</p> <p>If Value 1 is a simple date part, RoundIEEE returns the number of units (days, months, or years) without the units.</p> <p>If the next decimal place after the last one to be kept is a 5, followed only by zeroes, the number is rounded in whichever direction makes the last digit an even number.</p>

Examples	$\text{RoundI}(\text{1.739}) = 2$
	$\text{RoundI}(\text{1.8725}, 3) = 1.872$
	$\text{RoundI}(-1.8725, 3) = -1.872$
	$\text{RoundI}(\text{1.87251}, 3) = 1.873$
	$\text{RoundI}(\text{1250.000}, -2) = 1200$
	$\text{RoundI}(\text{(5+7) years}) = 12$
Error Conditions	$\text{RoundI}(\text{1250 months}, -2) = 1200$
	RoundI returns Error if Value 1 is not a number or a simple date part, or if Value 2 is not a number.

Search

Search (Range, Value 1, Value 2, Value 3)	
Type of Range	Values of any type.
Type of Value 1	Logical formula.
Type of Value 2	Number. Value 2 is optional.
Type of Value 3	Number. Value 3 is optional, but must be present if Value 2 is present.
Result	Search examines each cell in Range to see if it meets the criteria specified by Value 1. If Value 2 and Value 3 are omitted, then, if Value 1 is True, the result of Search is a count of the nonblank values in Range. In this case, Search is the same as Count. If Value 1 is False, the result of the function is Na.

If Value 2 is present, it specifies an initial value for the result of the function. If Value 3 is present, it specifies what the result of the function will be whenever one of the items being searched for is found.

Two special constants that can only be used in the Search function are Cell and Result. Cell refers to the value of the cell being examined. Result refers to the current value of the result of Search. Search can be thought of as a procedure that is executed once for each cell in Range.

Search functions cannot be nested.

Examples

Search (A1:A10,Cell= 10)

This example returns the number of cells in A1:A10 that are equal to 10.

Search
(A1:A10,Cell= 10,0,
Result+ 1)

This example is identical to Search (A1:A10,Cell= 10).

Search (A1:A10,
Cell >= 10 And Cell
< 100)

The result is the number of cells in the range A1:A10 that have 2-digit values.

Search (A1:A100,True,20,
Result+ 3)

Search starts with a result of 20 and increases it by 3 for each nonblank cell in the range A1:A100. That is, for each nonblank cell in the range the result is successively 20, 23, 26, 29, and so forth until no nonblank cells are left.

Search (A1:A10,True,0, Result + Cell ^ 2)

This example returns the sum of the squares of the numbers in the range A1:A10. It is the same as the Sumsqr function, except that any labels in the range result in Error.

Search(A1:A10,True,0, Result + If(Cell > 10000,Cell*1.10,Cell))

In this example, the values in A1:A10 are sales figures for this year in ten different categories. The example assumes that for any category in which the total is greater than \$10,000, sales next year will be 10% higher. The result of the function is the sum of the sales figures in the range, with those over \$10,000 increased by 10%.

Search (A1:A10, Cell > 1000, True, True)

This example returns True if the range A1:A10 contains any value greater than 1000; otherwise, it returns Na.

Sin

Sin (Value)	
Type of Value	Number, in radians.
Result:	Sine of Value.
Error Conditions	Sin returns Error if Value is not a number.

Sqrt

Sqrt (Value)	
Type of Value	Positive number.
Result	Sqrt returns the positive square root of Value.
Example	$\text{Sqrt}(13.69) = 3.7$
Error Conditions	Sqrt returns the value Error if Value is negative or not a number.

Sum

Sum (List)	
Type of List	Any types of values except dates. Values must be compatible.
Result	Sum returns the sum of the values in List. Blank cells and labels are treated as zero.
Example	$\text{Sum}(1.45, \text{True}, \text{"Balance"}, -.007) = 2.443$ $\text{Sum}(3 \text{ months}, 2 \text{ years}, 15 \text{ months}) = 2 \text{ years}, 18 \text{ months}$
Error Conditions	Sum returns the value Error if any of the items in List is a date, or is not compatible with the other items, or has the value Error.

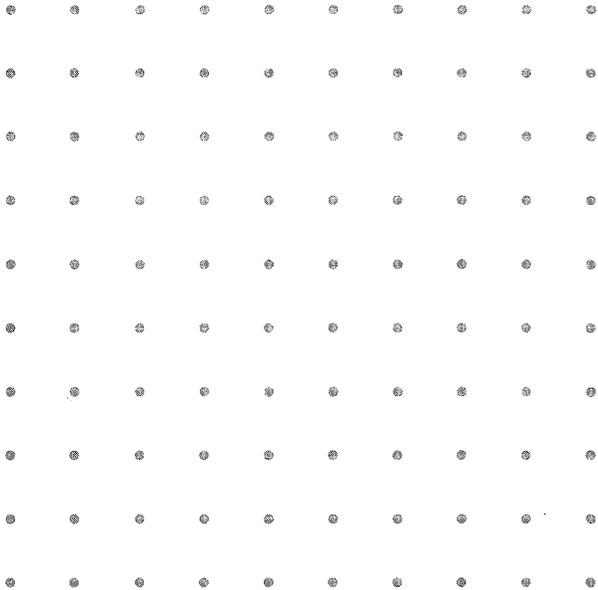
Sumsqr

Sumsqr (List)	
Type of List	Numbers, logical values, and labels.
Result	Sumsqr returns the sum of the squares of the items in List. Blank cells and labels are equal to zero.
Example	Sumsqr(1,2,3,4,5,6,7,8,9,10) = 385 Sumsqr(.1,.2,.3,.4,.5,.6,.7,.8,.9,1) = 3.85 Sumsqr(1,1,2,3,5,8,13,21,34,55) = 4895
Error Conditions	Sumsqr returns the value Error if List contains any dates or date parts, or if any of the cells has the value Error.

Tan

Tan (Value)	
Type of Value	Number, in radians.
Result	Tangent of Value.
Error Conditions	Tan returns Error if Value is not a number. If Value is equal to $(4n + 1) * \text{Pi} / 2$, where n is a whole number, positive or negative, then Tan returns either Infinity or a very large positive or negative number.

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