ADAM™ Family Computer System **SimpleCalc™** User Guide

Introduction

Welcome to SimpleCalc! You've purchased the world's first spreadsheet program designed for use with everyday household and personal interests in mind. SimpleCalc is a problem-solving tool just like the spreadsheets businesspeople use, but without many of the complex and infrequently used functions and commands. SimpleCalc teaches you everything you need to know about a spreadsheet quickly and easily, so you can start using it right away. A business spreadsheet takes as much as 50 hours to learn, but you can put SimpleCalc to work for you and your family in just a few hours.

You're probably anxious to load SimpleCalc and see what it looks like, but wait just a bit. First, let's learn what a spreadsheet is and what we can do with it.

What Is A Spreadsheet?

A *spreadsheet* is an electronic version of the large, green columnar accounting worksheets of paper accountants have used for many years. These columnar worksheets are very important to a business, for the accountant uses them to gather, record, manipulate and interpret how well a business is performing financially — and, of course, if it isn't doing well financially it isn't doing well at all. Accounting worksheets detail manufacturing, operating or advertising costs, interest rates, taxes, salaries, profits, and sales projections — just about anything with dollars and cents. Your bank statement is a spreadsheet, and so is your utility bill. As you learn more about SimpleCalc, you'll notice more and more how useful a spreadsheet can be in your life.

Birth of the Spreadsheet

A *columnar sheet* is so called because it has a great many vertical *columns* running from top to bottom. It also has a number of horizontal rows starting at the left margin. Do you remember Bob Cratchit from Dickens' book, A Christmas Carol ? Bob was an accountant who spent his days keeping tabs on old Scrooge's business concerns in his big, thick records books,

which probably weren't as sophisticated or complex as columnar sheets.

Using a very sharp pencil, the accountant records column after column and row upon row of figures on those big green worksheets, which are tallied frequently to make sure the business is running smoothly. A column might list all the debits or credits for a particular month, or it might list all the sales for a certain product. Each entry must be entered on the proper line and each column tallied. Sometimes worksheets are used to estimate or project how business might go if certain conditions existed; then several must be formulated, each with the different figures. Imagine how tedious this work can be, especially if you make a mistake!

ANALYSIS OF MISC. COLUMN / ACCOUNT NO. OR DESCRIPTION	✓	CREDITS	✓	DEBITS	✓	BAL	✓
4/30/84 BAL FWD						18 432 97	
LEASE				500 00		17 932 97	
UTILITIES				67 12		17 865 85	
PHONE				242 09		17 623 76	
DUES & SUBSCRIPTIONS				65 00		17 558 76	
COMPUTER				121 90		17 436 86	
TRAVEL				277 32		17 159 54	
ENTERTAINMENT				109 25		17 050 29	
SALES		2 855 00				19 905 29	
CONSULTING		1 200 00				21 105 29	
OTHER RECEIVABLES		845 90				21 951 19	

It was a job that remained unchanged until 1979 when Dan Bricklin, a graduate student at the Harvard Business School, and his friend Bob Frankston, a computer programmer, invented VisiCalc, the world's first electronic *spreadsheet* for a personal computer.

Now it's easier to fill columns and rows by simply typing the numbers on the computer's keyboard. Not only that, but instead of totaling the columns on a calculator, all the calculating is automatic — the spreadsheet does it for you! And it's much easier to add, change, modify and delete entries. Say you have a column with 25 entries to tally, but the third entry is incorrect. You simply retype the correct entry and the spreadsheet recalculates the total in split seconds.

Another problem with columnar paper is running out of paper – when there aren't enough columns or rows. With an electronic spreadsheet this isn't a problem, for you have many more columns and rows than a sheet of columnar paper. With SimpleCalc you can create spreadsheets with varying dimensions: 5x22, 14x21, 10x30) up to 75 rows and 26 columns any combination which totals less than 300.

You aren't limited just to numbers — you can write text, assign titles to your rows or columns, create lists of words or whatever you like with SimpleCalc. You may think of a spreadsheet as *an electronic organizer,* for it collects, categorizes and demonstrates the mathematical relationships between any information in graph or chart form.

This guidebook shows you how to use SimpleCalc by actually demonstrating a variety of interesting *application worksheets.* We recommend you start at the beginning and work your way through, as each lesson builds upon the previous one. Key words and important terminology are *italicized* throughout the text and compiled in a glossary in the Appendix. Photographs show how your SimpleCalc spreadsheets should look. You'll learn a number of *commands* and *functions,* which are explained in shaded boxes; you can always find the commands quickly by looking for the ☞ at the side of the box. The commands and functions appear in the Appendix and on the enclosed Command Card as well. Another Appendix explains error messages, and the index is designed to help you find important information quickly.

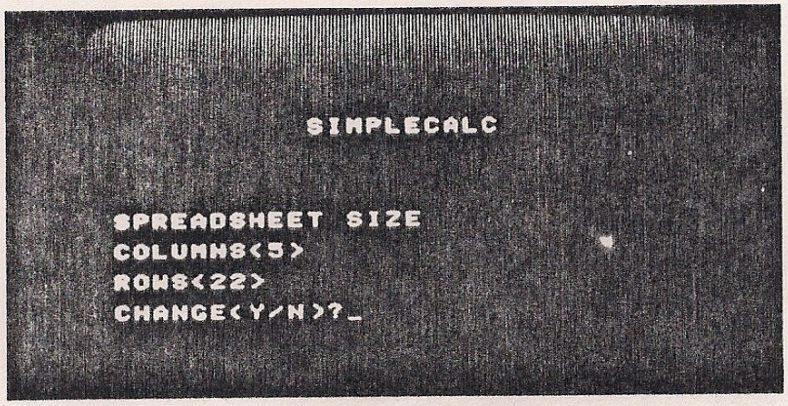
The application worksheets appear in this book and are included on your SimpleCalc data pack or disk as well. Some are examples or illustrations for this guidebook; the Get command recalls a worksheet so you may use it in the lesson. Creating them from scratch as you work through the lesson helps you learn more. Other worksheets are included as examples to help you find many more uses for SimpleCalc.

Are you and ADAM ready? Then let's begin!

Getting started

Your SimpleCalc Digital Data Pack or Disk comes with SmartBASIC and both load automatically. To load from a data pack, turn ADAM on and insert the data pack in the data pack drive, just as you would any other data pack with the label facing you, and pull the computer RESET switch. To load SimpleCalc from a disk, first be certain your disk drive is set up as "device 5" as outlined in the disk drive instruction guide. Turn ADAM on; be certain there is no data pack in the data pack drive. Insert the SimpleCalc disk in the disk drive and pull the computer RESET switch. After a short time (approximately 1½ minutes with a data pack, approximately 30 seconds with a disk) you'll see the SimpleCalc screen.

Press RETURN and you'll see this:



The RETURN Key

ADAM expects you to press the RETURN key each and every time you issue a command, either in SmartBASIC or SimpleCalc. If you think you've issued a command or asked SimpleCalc to do something for you and nothing happened, you probably forgot to press RETURN. You can always hit the key again; it won't hurt anything to press it twice.

SimpleCalc allows you to change the size of the spreadsheet, or *grid*, each time you create a new spreadsheet, before you begin to type anything in. To change it, simply type

y

for yes, and you'll see the cursor move up to the COLUMN line. Type in a number, say

4 RETURN

The cursor skips down to the ROW line; type

25 RETURN

The cursor skips back to the CHANGE line and the new numbers, or values, you've assigned the columns and rows appear inside the brackets. For now, let's make the grid the original size it was, 5 columns by 22 rows. Type

y

again and change the values back to 5 and 22. When you're done and the cursor is on the CHANGE line again, type

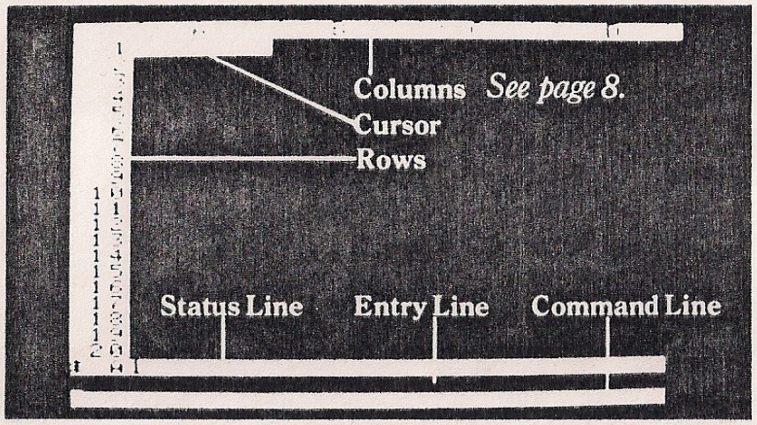
n

The drive starts up and you'll see this message at the bottom of the screen:

WAIT...LOADING SIMPLECALC

This takes approximately 5 minutes with a data pack and approximately 2 minutes with a disk, so be patient. Once SimpleCalc is

loaded, this is what you'll see:



You might want to make a *backup* copy of your SimpleCalc files. Instructions for copying a data pack are in the appendix; see your disk drive instruction guide for copying disks.

We're going to learn the first SimpleCalc *command* now. Whenever we want to issue one of the 13 different commands, we tell ADAM and the program we're doing so by pressing Smart Key I, like a sergeant calling his soldiers to attention. We'll refer to Smart Key I as *SK I;* later you'll learn what tasks Smart Keys II and III perform as well.

Smart Key I

Use the Smart Key I **(SK I)** to start any command in SimpleCalc. All 13 commands are described in this manual, and appear in an appendix at the end and on the enclosed Command Card as well.

Starting SimpleCalc and The Quit Command

To begin using SimpleCalc, simply pull the computer RESET switch, then follow the instructions on the screen.

When you have SimpleCalc on your screen and wish to end your work session, press Smart Key **(SK I)** *then*

q

A message reading "Press ESC or RET" appears. If you press ESCAPE, you'll return to SimpleCalc. If you press RETURN you'll leave SimpleCalc and return to SmartBasic. At this point you should remove the disk or data pack, THEN switch ADAM off.

If you're at the prompt in SmartBasic and want to see the files on your disk or data pack, type

catalog RETURN

You may then return to SimpleCalc by simply typing

run RETURN

Typing Filenames

Whenever you type a filename in SmartBasic, you must type it *exactly as it appears in the catalog.* If it is in *lower case,* type lower case; if it is in *upper case,* type it in all capital letters. If you don't type the filename exactly as it appears in the catalog, SmartBasic will tell you "File Not Found."

The SimpleCalc Screen

Across the top of your screen you'll see four *columns* labeled A, B, C and D. Each is 7 characters wide, meaning you can enter that many characters into the column. Down the left side of your screen are 20 *rows.* This is your *spreadsheet* or *grid,* where you'll see all the SimpleCalc functions perform. Of course, your grid size is actually 5 columns by 22 rows; they just don't all fit on the screen!

If you were to draw lines between each column and row, you would see the grid is comprised of blocks, which we call *cells*. The *cursor,* represented by a light block on your screen, shows you what cell you're in at any given moment. At the bottom of the screen are the three *activity lines*. The top (white) line, which we call the *status line,* tells you which cell the cursor resides in. Right now, the cursor is in cell A1. The second (blue) line is the *entry line,* where you enter data that goes into the cells. The third is the *command line,* which asks you what command you wish to perform or which task is in progress. *(See photo page 6.)*

Activity Lines

There are three lines at the bottom of the screen:

The first is the *status line,* which tells you what cell the cursor is in and what information resides in that cell. The information may be a number, a word or a formula.

The second is the *entry line,* which displays the information you are currently entering into a cell.

The third is the *command line,* which tells you what task SimpleCalc is performing or asking you to perform.

Now press the right arrow key and you'll see the cursor move from cell to cell. Look at the status line and you'll see the cell identifier change from B1 to C1 to D1. Now move the cursor around with the other arrow keys until you are satisfied you understand how it works, then move it back to cell A1.

Cursor Movement

Use the four arrow keys to move the cursor from cell to cell.

The Magic Square

Let's create our first spreadsheet and have some fun at the same time with something called *the magic square.* The magic square is a group of numbers arranged in a square which, when totaled horizontally, vertically or diagonally, always add up to the same number. Albrecht Dürer, an engraver interested in applied geometry, devised the first known magic square, which appeared in an engraving entitled "Melancholia" in the year 1514. It looks like this:

16	3	2	13
5	10	11	8
9	6	7	12
4	15	14	1

We're going to create a magic square with SimpleCalc and make the spreadsheet prove that it works. Is the cursor in cell A1? Ok, then let's begin.

SimpleCalc has something called a *default* for entering numbers; whenever you type a number, it's assumed to be in dollars and cents. Since we're only interested in whole numbers, or *integers,* we need to change the default with the *Format* command. Press SK I then

f

The *command line* asks you to select I for integers or $ for dollars; press

i RETURN

Now simply type the number 16 on the keyboard. SimpleCalc continues entering whole numbers until you use the Format command to switch back to dollars and cents (or until you switch ADAM off).

Did you see the numbers appear right below the status line? This is the entry line, which displays whatever information you are entering into the spreadsheet. As you typed the 1, the line below, the command line, flashed "Enter formula," or the numbers. If you have 16 on the entry line, press RET. Now the 16 appears in cell A1, and on the status line as well.

The Format Command

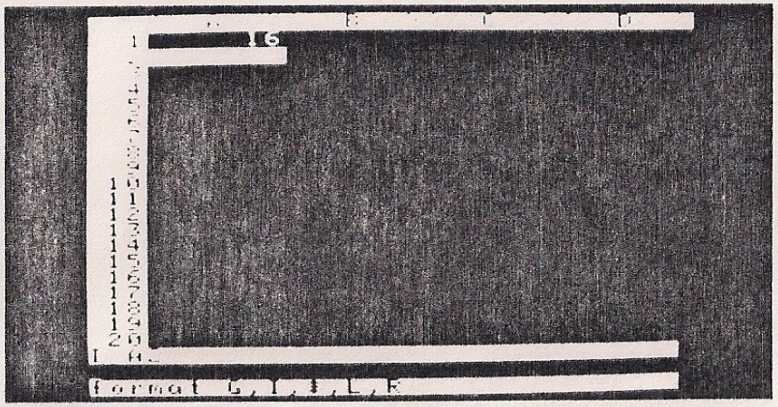
Format *allows you to change from entering numbers in dollars and cents to whole numbers, or integers. Press SK I then f and you'll see*

format G,I,$,L,R

on the command line. Press I to change to integers. The default setting is dollars and cents. When you change to integers it stays that way until you change it back to dollars and cents.

You may also change the way numbers or text appear in the cell using the G, L or R commands. The default setting for numbers is R for right margin justified and the default setting for text is L for left margin justified. If you press G, SimpleCalc positions numbers on the right margin for those who wish to use scientific notation.

You can always see what format you're in by looking at the first character on the status line.



Press either the right arrow or down arrow cursor key to move to the next cell and continue entering the numbers. Note how the status line tells you what cell you're in and what it contains; this is *really* letting you know your status, isn't it?

If you make a mistake typing a number, simply use the BACKSPACE key to back up and type the correct one. If you've typed an incorrect number but have already pressed RETURN, you can still correct it. SimpleCalc Commands allow you to change the spreadsheet and the data in it whenever you want. In this case, let's correct the number. Say you typed 51 instead of 15; we'll use the *Edit* command to correct it. Press SK I then

e

Now simply type the correct number and press RETURN. If you typed one too many numbers — say 151 — all you have to do is use the cursor key to back up to the last 1, press DELETE then RETURN.

The Edit Command and Making Corrections

If you are entering a number and mistype, simply use the BACKSPACE key to back up and type over your mistake. To erase numbers, use the DELETE key (using the cursor movement keys). If you want to add a number, move the cursor with the arrow keys, then press INSERT to type in the change. If the number is all wrong, press the CLEAR key and the entire entry disappears. If you've already pressed RETURN and the number is in the cell, use the Edit Command, ***SK I***

e

to change the information in the cell. Use the DELETE, INSERT and CLEAR keys in the same manner as before.

The Escape Key

Press the ESCAPE key when you wish to get, recalculate, insert, delete — entering a number into a cell, a command, anything. The ESCAPE key stops whatever you're doing and returns SimpleCalc to the "ready" mode, awaiting your next command.

Do you have all 16 numbers entered correctly, just as they appear above? Good! Now let's make SimpleCalc do its stuff. Move the cursor to cell A5. Type the following formula:

a1+a2+a3+a4 RETURN

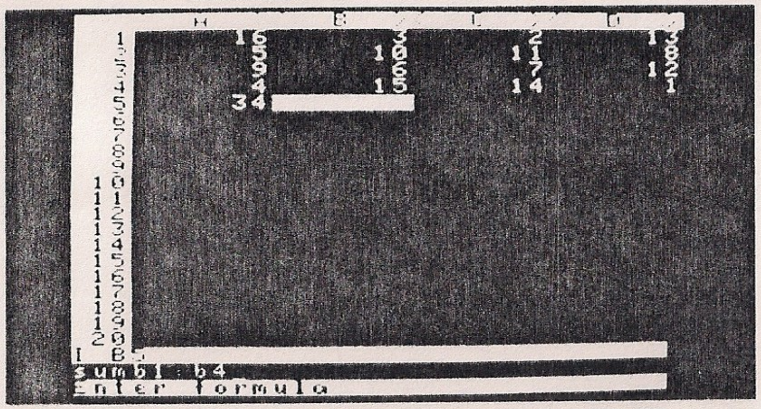
Typing in SimpleCalc

You can type letters and words in either *lower case* (small letters) or *upper case* (all capitals) and SimpleCalc understands them. When you type the letters, they appear on the screen and on the entry line in lower case; after you press RETURN, they appear on the status line in upper case.

Don't leave any spaces in the formula. You've asked SimpleCalc to total the numbers in cells A1 through A4, and should see the number 34 appear in A5.

Now move to cell B5 and do the same thing, but this time let's try a quicker method for totaling the column. Type

sum(b1:b4) RETURN



SUM totals all the cells within a *range* you specify. The range is simply the beginning through ending cells, in this case A1 through A4, B1 through B4, and so on. In this case, the range is only four cells, but you can easily see how SUM would come in handy with a long, long list of numbers. Try SUM out on C5 and D5; you should get 34 every time.

The Sum Function

The SUM function is a quick and easy way to perform addition. You type

sum(a1:a15)

without any spaces between the characters, then RETURN.

So the columns total 34; how about the rows? You recall we mentioned earlier that spreadsheets don't have the space limitations that columnar paper does. You see four columns and 20 rows on the screen, but there are actually 5 columns and 22 rows. Move the cursor to column D, then press the cursor key again. Column A exits stage left and Column E enters stage right!

Go ahead and total the rows. Move the cursor to cell E1 and type

sum(a1:d1) RETURN

and do the same for the twos, threes and fours. You should get 34 every time. Note how the status line tells you what calculation you entered in that cell.

Whew! We've made ADAM do a lot of work with the magic square. It might be a good idea to check the memory banks and make sure we haven't filled them too full. Press SK I and

m

for *Memory*. The command line tells you how much space in bytes you have remaining in memory. Press any key to continue.

Protecting Your Work

Whenever you're using your computer, store or protect your work often. This means that after you've been working on a spreadsheet for a while, use the Store command to record it on the data pack or disk, even if you're not finished. You're less likely to accidentally lose your work, and you may continue working on the same spreadsheet, storing and restoring as often as necessary.

The Memory Command

Use the **Memory** *command frequently to check how much space you have remaining in memory. As a rule of thumb, store your work before you have 1000 or less bytes left. To check memory, press* **SK I** *and the letter* **m.**

By now, you should be convinced that the magic square works, but if you'd like to prove that the diagonals total 34 as well, move the cursor to E5 and type

a1+b2+c3+d4 RETURN

and see what you get. Of course, you may total any or all the diagonals if you wish; they all total 34. Here are a few other sums you can play with:

1) Total the four corners (A1, A4, D1 and D4)
2) Total the four inner squares (B2, B3, C2 and C3)
3) Total the slanting squares (A3, B4, C1, and D2)

How many more can you find? The magic square has fascinated people for many years. Benjamin Franklin loved to devise them but once said, "I still think I might have employed my time more usefully."

Storing Your Spreadsheet

Would you like to keep your magic square? It's very simple. Press the SK I key to use the SimpleCalc Commands, then

s

for *Store*. SimpleCalc asks you to give your file a name, which may be up to 10 characters long. Let's call it

magicsq RETURN

or any other name you like. Listen to the data pack or disk spin and in a minute or two, your first spreadsheet *data file* will be safely stored. The magic square remains on the screen, where you can continue working with it just like you can with SmartWriter. Once you're through, you can STORE it again with the same filename, and the previously stored version will be erased and the new version put in its place. You may also store it with a different name and keep both. If you want to work with the magic square again, use the GET command, then type the filename.

The Store and Get Commands

The STORE Command stores your data file so you can use it again later. You can give your spreadsheet any name you like, up to 10 characters long. Press **SK I** *and the letter* **s**. *You store the cell contents, all formulas and the grid size.*

The GET Command puts the data back in your spreadsheet when you want it. It's a good idea to keep a list of the data files. Press **SK I** *and the letter* **g**.

You may also *Print* out your magic square; press

SK I p RETURN

The Print Command

When you want to print your spreadsheet, press **SK I** *and the letter* **p**. *The command line reads "Press ESC or RET" allowing you to either ESCAPE and resume what you were doing or press RETURN to Print.*

Would you like to try another magic square? Let's clear the screen with the SimpleCalc *Zap* Command.

1118	8181	1888	8811
8888	1811	8118	1181
8111	1188	8881	1818
1881	8818	1111	8188

This gives you an opportunity to practice your *data entry* skills and to make sure you understand using the ESCAPE key, SimpleCalc Commands, and the SUM function.

The Zap Command

When you want to clear your spreadsheet off the screen, press **SK I** *and the letter* **z**, *for Zap. The command line reads "Press ESC or RET" allowing you to either ESCAPE and resume what you were doing or press RETURN to Zap.* **Be very careful** *using Zap, for once something is zapped it's gone forever.*

More fun with math and SimpleCalc

SimpleCalc can do more than just add; it can subtract, multiply, divide and even do powers! You can probably guess that you use these functions in the same way you've used the addition sign. Here are the symbols we use:

+ add
− subtract
* multiply
/ divide
^ powers, or multiplying numbers by themselves (for example, 10x10 is expressed 10^2 or 10 to the second *power*), sometimes referred to as exponents or exponentiation.

Where the Keys Are

The exponentiation symbol is on the key just to the right of the addition symbol; just to the left of the addition key is the subtraction key. The multiplication symbol is the asterisk (SHIFT 8), and division is the diagonal (and question mark) key.

Multiplication

Have you ever heard of the chain letter? Perhaps you've received one that says, "Copy this letter six times, send a dollar to the first person on the list, remove his name, move all the remaining names up one position and put your name at the bottom. In 20 days you'll receive a million dollars." The chain letter depends on something called a *geometric progression*, which requires that every person follow the instructions. We can use SimpleCalc to see how much money you'd receive if in fact everyone sent six copies and their dollar. Type the number 6 in cell A1, then move the cursor to cell A2 and type

a1 *6 RETURN

SimpleCalc has multiplied 6 by 6 and shows 36.00 in cell A2. But multiplying 6x6 is the same as an exponent, isn't it? So, just for the fun of it, move the cursor to cell B2 and type

6^2

which is 6x6 or 6^2. We'll do more with exponents later, but for now move the cursor to cell A3 and type

a2*6 RETURN

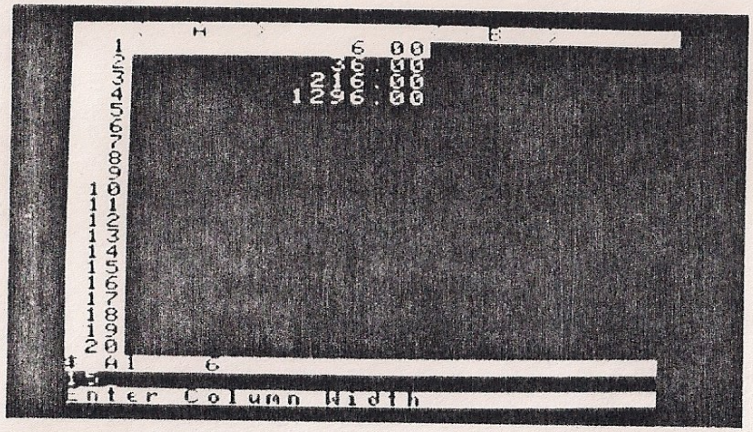
SimpleCalc multiplies 36 by 6 to give you 216.00. Enter the next progression in the formula,

a3*6 RETURN

in cell A4; you should see 1296.00. As you see, this fills the entire cell; the next number will overflow the cell and you won't be able to see the characters to the left. What to do? Change the size of the column, of course, by modifying the column width! We'll use a new SimpleCalc Command, c, for *Column*, to do this. Press SK I and then c; do you see "Enter Column Width" on the status line? Now type

15 RETURN

and watch the screen!



Now continue the formula progression (A4*6, A5*6, etc.) and you can continue to watch your fortunes grow as more and more people send you their dollar.

The Column Width Command

*Press **SK I** key and the letter **c** to change the column width. The default width is 7, but you can make it as narrow as 3 and as wide as 26. Once you've changed the width, it will remain at that setting when you store the data file.*

If you enter a number too large for the column, you'll see a > character appear as the first character in the column, letting you know you must change the column width.

Store this data file now; you can name it anything you like, such as *chletter,* but remember to jot the name down on your disk or data pack file directory. We'll use this spreadsheet again a little later to learn a new command.

Learning About Exponents

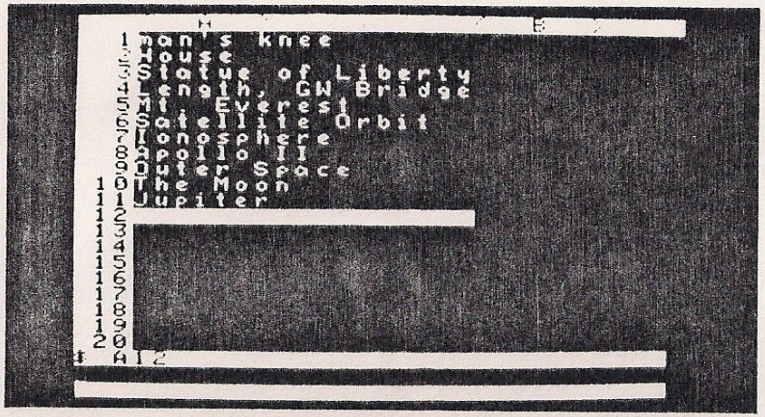
Here's a fun way to learn how quickly numbers grow when you multiply them by themselves. Do you know what a meter is? It's the metric unit of measure, based on how far the king of France could reach his arm; it's 39.37 inches, or just 3.37 inches longer than a yard. The meter is becoming the standard unit of measurement around the world; more and more we see road signs in our country with the distance or mileage calculated in *kilometers,* or 1,000 meters. Let's see what happens to the meter when we exponentiate it.

We'll start with the power of 1 meter in cell A1. Have you zapped your screen clear? Good, now change the column width to 17. First, we'll write in the names of some familiar objects and places as reference points for the powers. This is the first time we've entered *text,* but it's very easy to do. Are you in cell A1? Ok, type

SK II

then the word or information, often called a *character string* since it could be characters other than letters. Write the following

words in cells A1 through A11:



Entering Text: Smart Key II

To enter text, or character strings (text, numbers, or symbols), press Smart Key II **(SK II)**, then enter whatever you wish. Make sure you've set the ***column width*** wide enough to accept the text.

If you enter numbers as text, you won't be able to use formulas to perform calculations upon them.

Now change the B column width to 11 and enter the integer 1, for 1 meter, in B1. This is our starting point. Move the cursor to cell B2 and enter 10, for ten meters or 10 to the first power, the height of a house. Then move to B3 and type

b2^2 RETURN

which is 10 to the second power. Do you see 100 in cell B3? Good! Now continue to exponentiate b2 to each subsequent power (3,4,5, etc.) until you get to A9, outer space. At this point column B is filled up, and even though we could widen it further we wouldn't be able to see both columns A and B at once. By now, however, you should understand how to use exponents.

Earlier we mentioned that SimpleCalc performs calculations in *scientific notation*. If you are interested in this feature, move the cursor to B10 and exponentiate B2 once more (B2^ 9). You'll see

1E+09

which stands for 1 plus nine zeros. In other instances when you enter exponents into cells too small to handle them, SimpleCalc turns the figure into scientific notation like this.

If we converted meters into kilometers, however, we can calculate all the way to Jupiter. Let's move the cursor to column C and widen it to 15. Move the cursor to C4 and enter the number 1; 1000 meters in B4 equals 1 meter in C4. Now enter the number 10 in C5 and continue the exponentiation you learned to do in column B.

What if we wanted to know how many miles these distances translated into? Let's move to cell D4 and learn a new command called ***replicate,*** which makes the rest of our calculating go very quickly. Change the format to $, then enter the formula

c4*.62 RETURN

which gives us the equivalent of one mile to one kilometer. Press SK I then

r

and enter the formula

d4,d5:d11 RETURN

This tells SimpleCalc to take the formula in cell d4 and calculate the numbers in cells d5 through d11. We can replicate any formula or other data in a cell again and again in this manner.

The Replicate Command

Replicate takes the contents from one cell and reproduces them in another cell. This may be a number, a word, or a formula. If it's a number or a word, it's copied; if it's a formula, it recalculates the equation in the cells you specify. Use replicate by pressing **SK I** *then* **r.** *command line reads,*

Enter cell,from:to RETURN

The cell is the cell you wish to copy from, and the from:to is the range of cells you wish to replicate in.

Replicate is a very useful command. You can use it to number rows consecutively; you can perform progressive multiplication; you can duplicate formulas from one column to another. Experiment with Replicate to learn all its powers.

Either Store your work or use the Zap Command to clear the screen and then the Column Command to return to a twelve-character column, then Get the chain letter file you Stored a little while ago. Do you have it back on your screen? Good, now we're going to learn another very useful command called *Recalculate.*

What if there were eight people in the chain letter rather than six? SimpleCalc allows us to find out very quickly how much more money you'd make if two more people were added to the list.

Move the cursor to cell A1 and type in the number 8, then press Smart Key III (SK III). The command line reads

recalculating

and in just a moment the entire equation, from cell A1 to A8, will change. Recalculation goes across rows first then down the columns.

Recalculation: Smart Key III

The Recalculate command makes SimpleCalc come up with new figures when you change numbers or blank cells in a spreadsheet. Simply press **SK III** whenever you want to recalculate.

Putting SimpleCalc to work for your family

SimpleCalc is a powerful tool designed to help you make better decisions. It performs its calculations for you in three different ways:

Formulas, or equations in addition, subtraction, multiplication, division or exponents, which help you calculate numbers. The *interest* and *metrics* applications (data files on your disk or data pack) are practical illustrations.

Inventories, lists of items, whether numbers or characters, that help you keep records on the value of items. The *olympics* and *shoplist* applications show you how to use this.

Modeling, or posing questions about equations; *what if* a certain number changed and how that affects other things. The *budget* and *what if* applications explain how SimpleCalc helps manage your money.

We're going to see how SimpleCalc makes sophisticated projections in these three areas that help you and your family make better decisions.

Formulas

There are two types of formulas SimpleCalc figures: *interest calculations* and *conversions.* We've seen conversion work when we converted metric powers of ten into miles. You can experiment with other metric versus avoirdupois weights and measures later. Here's a simple conversion formula.

A Conversion Application

SimpleCalc operates like a sophisticated calculator, making it easy to enter, store and use important formulas. Suppose you want to buy a new wall-to-wall living room carpet. The formula

for calculating square feet is:

length * width = square feet, or room size

With a clean spreadsheet, using the skills you've learned, enter the following terms in column A to identify the factors:

A1: enter "length"
A2: enter "width"
A3: enter "size"

Now move to B1 and enter the dimensions as integers:

B1: enter 12
B2: enter 20
B3: enter the formula b1*b2

As you can see, B3 shows the total area, 240 square feet. Now say you were considering two different carpetings, one at $15 per square yard and another at $21 per square yard. Move the cursor to C3 and type

b3*15 RETURN

then move to D3 and type

b3*21 RETURN

and you'll see how much each costs.

An Interest Application

SimpleCalc can compute anything you can represent as a formula. For example, you can calculate your automobile mileage, convert metric to avoirdupois, and compute loan payments.

Here is an example of how you can use SimpleCalc for interest calculations. Money and interest historically have been the province of bankers and insurance companies, but in our financially sophisticated society the magic of compounding interest is important to all of us. Most of us either borrow, save or lend money, and some of us do all three. We can make better financial decisions if we understand and use interest formulas.

There are a number of different uses for interest calculations:

1. The future value of a fixed amount of money, as when you deposit $5,000 in a savings account or a money market fund and allow it to earn or accrue interest. Calculated in cell B10 as:

Future value = principal times (1 + interest rate) compounded for n periods

2. The future value of a periodic payment of money, as when you put another $1,000 a year into an IRA account. Calculated in cell B17 as:

Future value = period payment times ((1 +interest rate) compounded for n periods) −1) divided by interest rate

3. The periodic payment you'd have to pay in over a fixed period of time to earn a specified amount. Say you needed to save $20,000 for a child's college education and had 16 years to do so; how much would you have to set aside, and at what interest rate, to save that amount? Calculated in cell B11 as:

Periodic Payment = (future value times interest rate) divided by ((1 + interest rate) compounded for n periods) −1)

4. The present value of a future amount, which tells you how much you need to invest today to have a future amount.

For example, how much must you invest to have $20,000 in 5 years? Calculated in cell B12 as:

Present Value = future value divided by ((1 + interest rate) compounded for np periods)

5. How to calculate an annuity: how much would you need to set aside to have $300 a month income when you reach retirement age? Calculated in cell B18 as:

Present Value = period payment times (1 − present value of 1 $) divided by interest rate

6. A loan payment, the periodic payment to repay an amount borrowed today. Calculated in cell B13 as:

Periodic Payment = (present value times interest rate) divided by (1 − present value of 1 $)

You can use these formulas in the interest calculation application and enter your own numbers into the input cells. Press **SK III,** Recalculate, whenever you enter new formulas.

INPUT CELL	DESCRIPTION
B3	Annual interest percentage. For example, to enter 12.5% you enter 12.5
B4	Number of compounding periods in the year. The following table shows you the number to enter for common interest calculation periods.

INTEREST COMPUTED	PERIODS IN YEAR
Yearly	1
Semi-annually	2
Quarterly	4
Monthly	12
Daily	365

B5	Number of periods to compound. For example, if you borrow money for 4 years with monthly compounding, enter 48 (4 years at 12 periods per year).
B9	Principal Amount For future value it's the amount deposited today. For periodic amount it's future value desired. For present value it's future value desired. For loan payment it's amount borrowed.
B16	Periodic Amount For future value it's fixed amount deposited each period. For present value it's the fixed amount you want to receive each period, the annuity payment.

Inventories

Inventories can be as simple as a shopping list that helps you monitor food prices to cataloguing a valuable stamp collection or household possessions to a check register. Anything which requires simple mathematical maintenance is a good candidate for SimpleCalc inventorying. For example:

- You might create a list of your valuable household possessions in column A, the original purchase date in column B, original purchase price in column C and current net worth in column D.
- If you belong to a church, club or civic group, you could compile a list of donors or contributors to various funds and charities. List the person's name (and address and phone number if you like) in column A, then make column B 1982, column C 1983, column D 1984 and so on, listing their contribution each year.

An Olympics Application

SimpleCalc has several commands that make lists very useful and versatile; let's learn them now. Here is a list of the countries that won medals in the 1980 Winter Olympics at Lake Placid, New York. Is your SimpleCalc screen clear? Good. Change the column A width to 16, then move the cursor *above* cell A1 and into SimpleCalc's border. You have the option of entering data into this area when you don't want to take up room in the cells, either in the columns or in the rows. Use format to right justify the columns so they'll look neater.

If your cursor is above cell A1, where you see < A >, press SK II to enter text and type

country RETURN

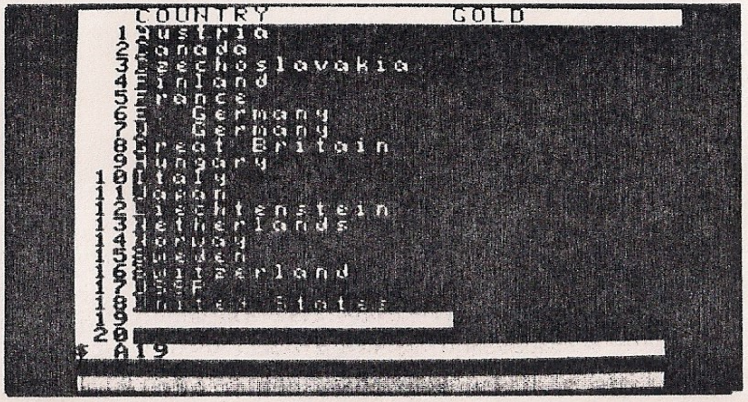
Now move to B, C, D and E, and type GOLD, SILVER, BRONZE and TOTAL respectively.

Using Margins

SimpleCalc allows you to enter text in the spreadsheet margins so you don't have to use the cells if you don't wish to. Simply move the cursor out of the cell into either the columns or the rows, press Smart Key II to enter text and proceed. Use the Column Command to change row or column sizes.

Move the cursor to cell A1 and, using SK II to enter text, type

in the countries shown on the screen:



Do you have all 19 countries? Only 18, you say? Oops, we left Bulgaria out! No problem; move the cursor to A2, press Sk I and i for INSERT. SimpleCalc asks if you wish to insert a column or a row; we want a row, so press

r RETURN

You'll see a blank cell at A2, and all other cells shifted down one position. Now simply press SK II to enter text, type in the word Bulgaria, and you're done.

The Insert and Delete Commands

The Insert command allows you to put an extra row or column in between others you've already filled. Simply put the cursor where you want to insert and press ***SK II*** *and* ***i****, then* ***c*** *for column and* ***r*** *for row. Delete works exactly the same.*

In a similar fashion, if you entered one too many cells in a row or column, you eliminate it using the *Blank* command.

The Blank Command

You can blank a cell by moving to that particular cell and pressing ***SK I*** *then* ***b****. You'll see the message "Press ESC or RET" allowing you to change your mind, press ESCAPE and return to what you were doing, or press RETURN and finish blanking.*

Let's enter the number of medals (in integers) for each country now:

COUNTRY	GOLD	SILVER	BRONZE	TOTAL
Austria	3	2	2	
Bulgaria	0	0	1	
Canada	0	0	1	
Czechoslovakia	0	0	1	
Finland	1	5	3	
France	0	0	1	
E. Germany	9	7	7	
W. Germany	0	2	3	
Great Britain	1	0	0	
Hungary	0	1	0	
Italy	0	2	0	
Japan	0	1	0	
Liechtenstein	2	2	0	
Netherlands	1	2	1	
Norway	1	3	6	
Sweden	3	0	1	
Switzerland	1	1	3	
USSR	10	6	6	
United States	6	4	2	

Once you have all the numbers entered, move the cursor to cell E1, the first in the TOTAL column, and type

sum(b1:d1) RETURN

Now that you have the formula in cell D1, use the Replicate command to calculate all the remaining totals.

You now see how many medals in all three categories each country won, but not every country won medals in each category. Let's find out how many countries won gold, silver and bronze medals. Type

count(b1:b19) RETURN

and you'll have the number of countries winning gold medals. Use count for columns C and D, too.

The Count Function

Count tells you how many whole numbers (not zeros) there are in a range of cells. As a function, it is similar to sum, which adds all the numbers in a range of cells. Use count the same way you would sum:

count(a1:a4) RETURN

Count is useful for a variety of totaling tasks involving whole numbers and zeros, but only works with numbers, not words.

Another useful function is *average.* In our Olympics spreadsheet, we can quickly calculate how many medals each country won on average. Type

avg(b1:d1) RETURN

The Average Function

AVG gives you the average of all the numbers within a range of cells you specify. It's the equivalent of adding the cells together, then dividing by the number of cells. Type

avg(a1:a19) RETURN

to average any cells you wish. You might use AVG to determine the average daily balance in your checking account or your money market fund.

There are two more functions, *minimum* and *maximum,* which we can learn to use in our Olympics example. Like the three previous functions, sum, count and AVG, MIN and MAX tell you the value in a range of cells — in this case the minimum value (excluding zeros) or the maximum value. For example, in columns B, C and D, you could ascertain which countries earned the most and fewest gold, silver or bronze medals. While in this case it may be fairly obvious, with longer columns or more complex numbers, MIN and MAX are very useful.

The Min and Max Functions

MIN and MAX compare the values within a range of cells and tell you either the minimum number or the maximum number. You type

min(b1:b19) RETURN

and the same for maximums. MIN and MAX show you the lowest and highest compound interest you're earning in your savings account or money market fund.

Modeling

Everyone is interested in their future, and when it comes to determining what will happen with our money, SimpleCalc is a big help. We can ask "what if..." and SimpleCalc will give us an answer. For most people, a budget is the most important what-if, for it allows us to see how much income we have and how we must spend (or not spend) to assure our financial security. We can project fixed costs, plan for a new car, a home or a baby, figure out how to save for our children's college education. We can analyze various investments to project their future performance or see what the annual cost of living adjustment (COLA) does to our salary increases.

A "What-If" Application

Bill's an automobile mechanic who bought an ADAM so his 8-year-old son could learn about computers. His wife Nancy works part time as a secretary, and she decided on the ADAM because of its word processing capabilities. They were thinking about having another baby and wondered if they could afford to let Nancy quit her job and not return to work after the baby was born. They had read a lot about spreadsheets and were interested in doing financial projections. So one rainy Sunday afternoon they bought SimpleCalc and Bill wrote the following "what-if" application to see what affect Nancy's quitting her job or having a baby would have on their financial situation.

Based on the percentage increase in salary in the past two

years and his own feeling about his chance for promotion, Bill projected his salary for the next 4 years. Since Nancy might work only 6 months next year, she would earn half her usual pay.

Bill grouped his expenses into 11 categories and then projected what each would be in the next four years:

CATEGORY	ASSUMPTION
Mortgage	no change for the next four years
Food	7% increase in each year
Clothing	10% increase in each year
Medical	14% increase in each year
Maintenance	$300 for 2 years, then 1000 and 500
Utilities	10% increase in each year
Auto	constant through 1986, then 0
Taxes	25% of income
Insurance	no change for the next four years
Entertainment	5% of income
Misc.	6% of income

During the next 2 years, their annual savings would go from positive to negative. But beyond that, once the car was paid off at the end of 1986 and Bill's salary increased, they would begin saving again. Bill and Nancy felt confident that they could afford the new baby without Nancy having to go back to work.

Using their model as a guide, you do the same as Bill and Nancy and project your financial future. You may have other sources of income and different expense categories. But remember, your projections are only as good as your assumptions about the future. It's a good idea to review the assumptions every 3 months and update your model.

Using the Application Worksheets

In the following pages you'll find SimpleCalc application worksheets you can use in your daily life. Once you master the fundamentals, you can create spreadsheets for just about anything you want. Learn the commands and soon SimpleCalc will be a good partner in helping you make better decisions!

To retrieve application worksheets from the SimpleCalc data pack or disk, press SK I then g for get. At the prompt, type in the filename and RETURN. (If for any reason you don't remember all the filenames, you can use the quit command to exit SimpleCalc to SmartBasic, then type **catalog** to read the list, then type **run** to return to SimpleCalc.) The SimpleCalc tape contains the following applications:

FILE NAME	DESCRIPTION
budget	Four week budget
chainlttr	Chain letter
checklist	list of outstanding checks and bank balance
interest	Six interest calculations
magicsq	The magic square
metrics	Metric conversion formula
olympics	Olympic medals awarded in 1980
powers	Powers of ten
shoplist	inventory of things to buy at the store
whatif	five-year income and expense model

These are just a few of the many, many ways you can use SimpleCalc in your home and your life. You may want to devise applications to track expenses, manage your investment portfolio, keep auto maintenance records, help your children manage their allowances or savings accounts, keep better tax records, monitor how much it costs to keep a pet, count calories, keep Little League, bowling or video game scores, or help your club or organization keep inventory and sales records for bake sales, garden sales, yard sales and the like. You'll surely think of many more spreadsheet applications. Happy computing with ADAM and SimpleCalc!

budget

WEEKLY BUDGET	BUDGET	Week 1	Week 2	Week 3	Week 4	AVER.
GROSS INCOME	653.85	653.85	653.85	653.85	653.85	653.85
Mortgage	137.15	137.15	137.15	137.15	137.15	137.15
Food	75.00	62.12	74.85	88.55	74.99	75.13
Clothing	20.00	27.88	0.00	32.95	22.25	20.77
Medical	12.50	12.50	12.50	12.50	12.50	12.50
Maintenance	15.00	12.00	47.00	21.50	10.00	22.63
Utilities	50.00	68.35	8.22	47.88	56.60	45.26
Auto	85.00	88.67	66.20	81.15	91.22	81.81
Taxes	132.50	132.50	132.50	132.50	132.50	132.50
Insurance	32.12	32.12	32.12	32.12	32.12	32.12
Entertainment	25.00	45.55	27.75	12.00	19.25	26.14
Misc.	20.00	15.96	16.00	33.37	18.66	21.00
TOTAL EXPENSE	604.27	634.80	554.29	631.67	607.24	607.00
SAVINGS	49.58	19.05	99.56	22.18	46.61	46.85

chainlttr

	A	B	C	D	E
1	6.00				
2	36.00	36.00			
3	216.00				
4	1296.00				
5	7776.00				
6	46656.00				
7	279936.00				
8	1679616.00				
9	10077696.00				
10	60466176.00				
11	362797056.00				
12	2.17678233E+09				
13	1.3060694E+10				
14	7.83641641E+10				
15	4.70184985E+11				
16					
17					
18					
19					
20					
21					
22					

checklist

	CHECK	AMT	x	DEP	BAL
1					
2	BAL FWD				844.70
101	Sears	29.75			814.95
102	Union Bank	525.90			289.05
103	Thayer Plumb	44.00		595.38	840.43
104	Shell Oil	79.20			761.23
105	Mills Drug	8.60			752.63
106	Ohio Gas	35.65		101.70	818.68
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					

interest

	A	B	C	D	E	F	G	H
1	INTEREST RATE CALCULATIONS							
2		Amounts						
3	Annual Interest (%)	12.75						
4	Periods/Yr. (I)	12						
5	Number periods (I)	48						
6	Periodic Rate (%)	.010625	1.01063					
7			0.60211					
8	CALC. FROM PRINCIPAL							
9	Principal ($)	1000.00						
10	Future Val.(FV) ($)	1660.82						
11	Per. Amt.for FV ($)	16.08						
12	Presnt Val.(PV) ($)	602.11						
13	Loan Payment ($)	26.70						
14								
15	CALC. FROM PERIODIC RATE							
16	Period Amt(PA) ($)	26.33						
17	FV of PA ($)	1637.58						
18	PV of PA ($)	986.01						
19								

magicsq

	A	B	C	D	E
1	16	3	2	13	34
2	5	10	11	8	34
3	9	6	7	12	34
4	4	15	14	1	34
5	34	34	34	34	34
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					

metrics

	FROM	TO	E
1	1.00 CM	.3937	=INCHES
2	1.00 INCHES	2.54	CM
3	1.00 FEET	30.48	=CM
4	1.00 METER	3.28	FEET
5	1.00 MILE	1.61	KM
6	1.00 KM	0.62	MILES
7	1.00 GRAM	.03527	OUNCES
8	1.00 KG	2.21	POUNDS
9	1.00 POUND	.4536	KG
10	1.00 LITER	.2642	GALLON
11	1.00 GALLON	3.79	LITERS
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			

olympics

	COUNTRY	GOLD	SILVER	BRONZE	TOTAL
1	Austria				
2	Canada				0
3	Czechoslavakia				0
4	Finland				0
5	France				0
6	E. Germany				0
7	W. Germany				0
8	Great Britain				0
9	Hungary				0
10	Italy				0
11	Japan				0
12	Liechtenstein				0
13	Netherlands				0
14	Norway				0
15	Sweden				0
16	Switzerland				0
17	USSR				0
18	United States				0
19					
20					
21					
22					

powers

< A >	< B >	< C >	< D >< E >
1man's arm span	1		
2House	10		
3Statue of Liberty	100		
4Length, GW Bridge	1000	1	0.62
5Mt. Everest	10000	10	6.20
6Satellite Orbit	100000	100	62.00
7Ionosphere	1000000	1000	620.00
8Apollo II	10000000	10000	6200.00
9Outer Space	100000000	100000	62000.00
10The Moon	1E+09	1000000	620000.00
11Jupiter		10000000	6200000.00
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			

shoplist

< ITEM >-#-<PRICE>	<SPEND>
1Bread 1 0.89	0.89
2Milk 1/2gl 1 1.09	1.09
3Soup 4 0.35	1.40
4Cereal 1 0.90	0.90
5Soda-Liter 3 1.29	3.87
6Apples 3 0.59	1.77
7Potatoes 5 0.89	4.45
8Tuna Fish 2 0.89	1.78
9Hamburger 1 1.49	1.49
10Coffee 1 2.29	2.29
11Dog food 7 0.43	3.01
12Soap 2 0.65	1.30
13Napkins 1 0.99	0.99
14Toilet Pap 2 0.45	0.90
15Detergent 0 1.59	0.00
16	
17TOTAL	26.13
18	
19	
20	
21	
22	
23	
24	
25	
26	
27	
28	
29	
30	

whatif

ITEM/YEAR	1984	1985	1986	1987	1988	TOTAL
Bill's Pay	25000.00	27500.00	30250.00	33275.00	36602.50	152627.50
Nancy's Pay	10000.00	5000.00				15000.00
GROSS INCOME	35000.00	32500.00	30250.00	33275.00	36602.50	167627.50
Mortgage	4855.00	4855.00	4855.00	4855.00	4855.00	24275.00
Food	5200.00	5564.00	5953.48	6370.22	6816.14	29903.84
Clothing	1500.00	1650.00	1815.00	1996.50	2196.15	9157.65
Medical	1800.00	2052.00	2339.28	2666.78	3040.13	11898.19
Maintenance	720.00	300.00	300.00	1000.00	500.00	2820.00
Utilities	1200.00	1320.00	1452.00	1597.20	1756.92	7326.12
Auto	2440.00	2440.00	2440.00	0.00	0.00	7320.00
Taxes	8750.00	8125.00	7562.50	8318.75	9150.62	41906.87
Insurance	1050.00	1050.00	1050.00	1050.00	1050.00	5250.00
Entertainment	1750.00	1625.00	1512.50	1663.75	1830.12	8381.37
Misc.	2100.00	1950.00	1815.00	1996.50	2196.15	10057.65
TOTAL EXPENSE	31365.00	30931.00	31094.76	31514.70	33391.24	158296.70
SAVINGS	3635.00	1569.00	-844.76	1760.30	3211.26	9330.80

Appendix A: *SimpleCalc Instructions and Commands*

How to use the SimpleCalc Digital Data Pack or Disk:

1. Switch ADAM on
2. Insert SimpleCalc data pack or disk
3. Pull Computer Reset switch and wait
4. When ADAM displays the SIMPLECALC title screen, press the RETURN key.
5. Change the SimpleCalc grid size by pressing y for YES, or press n for NO to continue loading SimpleCalc
6. Change the column and row size as required
7. Type N or n to indicate you're through making changes
8. Wait for SimpleCalc to load

To run SimpleCalc after leaving the program (Quit SimpleCalc) but with data pack or disk still in the drive

Type **run** and press RETURN

The Spreadsheet Grid

Columns are identified on the status line by the symbol @ and letters.

Rows are numbered from 0 to the maximum rows you specify. You can design a grid with up to 75 rows.

Cells are designated by their column and row location in the grid. When SimpleCalc starts the cursor is in cell A1. However, you can move *into the spreadsheet margins* and use that area to assign rows and columns different names.

Size Space limitations mean you can't create a grid larger than 300 cells. Multiplying the number of columns by the number of rows computes the number of cells in the grid; i.e., 10 columns by 30 rows creates a grid with 300 cells. Do not exceed 75 rows or 30 columns or you may not be able to store your data.

SimpleCalculating

SimpleCalc is always ready to accept your keyboard commands. Press the number keys and you'll enter those numbers into the cell in which the cursor resides:

16 RETURN

puts the number 16 in the cell. Use the *arithmetic operators* to perform calculations within a cell:

16+5 RETURN

or between cells:

A1+A2 RETURN

SimpleCalc utilizes the following arithmetic operators:

OPERATOR	DESCRIPTION	EXAMPLE
+	Addition	A1+5
−	Subtraction	B2−E1
*	Multiplication	98.6*C3
/	Division	144/12
^	Exponentiation	10 ^ 1

The Cursor Keys and Smart Keys

Use the four cursor control (arrow) keys to move from cell to cell. The HOME key has no function in SimpleCalc.

By pressing Smart Key I, II or III, you change to another SimpleCalc function:

CONTROL KEY	FUNCTION
SK I	Allows you to enter a Command. The message line displays the first letter of each command: B C D E F G I M P Q R S Z (see Command descriptions following)
SK II	Press to enter a word, text, character string or anything other than numbers and formulas for calculations
SK III	Recalculates work you've previously done where one or more numbers or formulas have changed. Recalculation goes across rows first, then down the columns.

The Smart Key I Commands

Commands allow you to manipulate data in the spreadsheet. To select a command, press SK I. On the command line you'll see BCDEFGIMPQRSZ, the command letters. Type the letter corresponding to the command you wish to perform and follow any instructions on the command line. Press the ESC key to leave the command mode.

B Blank Cell — Blanks, or removes the data in the cell in which the cursor resides.

Example: To Blank cell C5, move the cursor to cell C5 and type SK I, B and RETURN.

C Set Column Width — Allows you to change the width of the column in which the cursor resides. The minimum width is 3 characters and the maximum is 26; 7 is the default width.

Example: To make column D ten characters wide, move cursor to any cell in column D and type SK I, C, 10 and RETURN.

D Delete Row or Column — Deletes the current Row (R) or Column (C). Automatically readjusts the formulas for all cells shifted.

Example: To delete row 5, move the cursor to any cell in row 5 and type SK I, D, R and RETURN.

E Edit Cell Contents — Allows you to add, delete or change cell contents on the entry line.

Example: To edit cell C4, move the cursor to cell C4 and type SK I and E, make your changes and press RETURN. Press ESC to leave edit without making changes.

F Format Cell Display

Sets the cell's display format:
$ Dollars and cents
I Integers or whole numbers
G General, the best fit for number
L Justify text on left margin
R Justify text on right margin

Example: To change $3.45 in cell A1 to display integers, move the cursor to A1, type SK I, F, I and RETURN. The number 3.45 now displays as 3, and every subsequent number you enter into a cell will be an integer until you change format again.

G Get A File

Get a SimpleCalc spreadsheet application file from the data pack or disk. You must have previously created and stored (store command) this file. The get command also changes the grid columns and rows to the same values as the application file.

Example: To get the *budget* file, you type SK I, G, *budget* and RETURN. Be sure to type the filename exactly as it appears in the catalog, in lower case or upper case letters.

I Insert a Row or Column

Inserts a column (C) or row (R) before or to the left of the current cell. If you enter R all rows below, including the current row, shift down one row, and all the cells in the row you've inserted appear empty. Any cells in the last row have their contents replaced with the contents of the next to last row. All shifted cells have their formulas automatically adjusted. If you select C, columns are changed in the same way.

Example: To insert a column and shift column C right one column, move the cursor to any cell in column C. Then press SK I, I, C and RETURN.

M Memory Available

Displays the free (remaining) memory available to store formulas and text. When free memory drops to 1000 bytes, SimpleCalc displays the message, MEMORY CRITICAL. If this happens, store your application file before entering any more data. If it won't store, delete a few cells until it does.

Example: To display the remaining space, press SK I, M. SimpleCalc displays:
Memory Available=4800, Press any KEY

P Print

Prints the entire spreadsheet, everything you see on the screen, on the printer.

Example: To print the spreadsheet, you press SK I, P. If you change your mind, press ESCAPE.

Q Quit

Ends your SimpleCalc work session and returns you to the SmartBasic prompt. Any application file you have not stored is erased.

Example: To end SimpleCalc, press SK I, Q. If you change your mind or forgot to store your work, press ESCAPE. If you want to return to SimpleCalc, type **run** at the SmartBasic prompt.

R Replicate Cell Contents

Copies one cell into a range of cells you specify. If the cell contains a number or a character string, it's copied just as it appears. If the cell contains a formula, it calculates any other cell groups just as it did the original cell group.

Example: To copy the contents of A7, the formula SUM(A1:A6), to total cells B1-B6 in B7 and cells C1-C6 in C7. Press SK I then R. The command line says "Enter cell,from:to" so type a7,b7:c7 RETURN. SimpleCalc replicates the formula from A7. Move the cursor to B7 and you'll see "SUM(B1:B6)" and in C7 "SUM(C1:C6)."

S Store File

Stores the spreadsheet application on the data pack or disk. Empty cells are not stored, but cells with data and the spreadsheet margins are. The spreadsheet remains on the screen once it's stored. You may continue working on it, storing it over and over with the same filename and preserving revisions; you may zap it and start a new spreadsheet; or you may quit to end the work session. You can give the file any name you want

up to 10 characters long.
Example: To store the application file you created to monitor your car's gas mileage, Type SK I, S. The command line says "Store, Enter Filename; type *mileage* and RETURN.

Z Zap — Blanks all cells, making every cell empty including the margins. All data you've entered is gone and **can't be recovered.**
Example: To clear all cells, you type SK I, Z; the command line reads "Zap? Press ESC or RETURN." If you change your mind, press ESCAPE. To zap, press RETURN.

Editing Entries

Whenever the cursor sits blinking on the entry line, SimpleCalc is ready to accept data from you. You can enter up to 26 characters (as long as you've adjusted the column to that width), and when you get to the end of the entry line SimpleCalc automatically shifts the display 15 positions so you may continue to enter characters on the line.
Five keys allow you to edit data on the entry line either while you're entering data or in the Edit command mode. They are:

FUNCTION KEY	DESCRIPTION OF FUNCTION
BACKSPACE	Moves the cursor one position to the left so you can use the INSERT and DELETE
CLEAR	Clears the input line; if you're in the Edit mode, you remain there.
CURSOR ← or →	Moves the cursor either left or right so you can use INSERT and DELETE
DELETE	Deletes the character under the cursor.
ESCAPE	Stops whatever you're doing; clears the current entry, erases lines, exits to the blank entry line.
INSERT	Inserts a character where you position the cursor on the data entry line.

Functions

Functions helps you understand mathematical relationships between a range of cells. You enter the function name and range of cells you wish to analyze on the insert line. The cells must be in either a row (A1:D1) or a column (A1:A6). They are as follows:

FUNCTION	EXAMPLE	DESCRIPTION
AVG (range)	AVG (D3:G3)	The average of all values in the range. Good for scorekeeping. The example is equivalent to (D3+E3+F3+G3)/4.
COUNT (range)	COUNT (A1:A6)	The count or tally (not addition) of all non-zero values in the range.
MAX (cell:cell)	MAX (E1:E5)	Compares the value in the range and displays the greatest value.
MIN (cell:cell)	MIN (C2:C5)	Compares the values in the range and displays the lowest value.
SUM (range)	SUM (B3:E3)	Computes the sum of the values in cells B3 through E3 and is equivalent to B3+C3+D3+E3.

Appendix B:
SimpleCalc Error Messages

SimpleCalc indicates an error in one of four ways:

1. By displaying the letters **ERR** in a cell when an arithmetic overflow occurs — when your calculation is either too large or too small for SimpleCalc to express or if you've divided by zero.
2. By placing **??** when you enter a formula in a cell you've previously deleted, or when you try to replicate a formula in a cell outside the spreadsheet grid.
3. By aborting the SimpleCalc program and displaying a SmartBasic error message, since the program is written in SmartBasic. Here are SmartBasic error messages you may encounter:

End of Data	The SCDATA file isn't on the data pack or disk you're using. Exit to SmartBasic and **run cdf** RETURN
??Reenter	Either SCDATA or the application file you're trying to use has incorrect data. If SCDATA is bad, use instructions. If the application file is bad, use SmartWriter to print the file out and correct the error. You do this by taking the data pack or disk out, pressing RESET to return to SmartWriter, putting the data pack or disk in the drive and pressing the STORE /GET key; find the filename in the directory, get it on the screen and print it out.

4. When an error occurs on the entry line, by displaying an error message on the status line. They are:

Bad Record Format	SimpleCalc found unexpected data while trying to retrieve an application spreadsheet. Causes include missing comma after format code, invalid format code, missing equal sign after cell address, bad cell address, and bad formula. Use SmartWriter to print out the application file and correct the error.
Column too Large	You've tried to put data into a cell in a column that is greater than the maximum columns in the spreadsheet. For example, you specified 10 columns; the letter J identifies the right most column, but the cell address in error refers to a cell in column K. This column doesn't exist. Change the cell address from K or store the application spreadsheet, create a new spreadsheet with a larger number of columns, then get the application.
Comma or Colon Missing	You have entered the replicate command incorrectly. The correct format is **cell,from-cell:to-cell** Correct and press RETURN.
End of Line	You've filled the entire entry line with characters (it accepts 80 maximum) and the cursor is all the way to the right. Move it left, press RETURN if you want to enter all 80 characters, or press ESCAPE.
ERRNUM =(#)	An I/O error has occurred. Refer to the SmartBasic Manual to identify the error number.
Extra)	Your formula has one or more unmatched closing parentheses. A formula must have an equal number (no more than 10) of opening and closing parentheses.
File Not found	The Get command can't find the filename you entered. You may have misspelled it, typed lower case letters when the name is in capitals, or specified the wrong drive. If the error isn't obvious, quit SimpleCalc and type "catalog" at the SmartBasic prompt to check the files.
Invalid Function	You have spelled a function's name incorrectly. The five functions are AVG, COUNT, MAX, MIN and SUM. Press ESC or use the edit command to

correct; then press RETURN.

Invalid Cell Address	You have written the cell address incorrectly. For example, you wrote 1A instead of A1.
Not Command Code	The key you pressed is not a valid command code. Valid command codes are B,C,D,E,F,G,I,M,P,Q, R,S,Z. Enter a valid command or press the ESCAPE key.
Memory Critical	SimpleCalc has less than 1000 characters of free memory. Store your application immediately. Your application may be too large for SimpleCalc, try to shorten it by using shorter character strings and fewer cells.
Row too Large	The cell row is greater than the maximum rows in the spreadsheet. See column too large above.
Syntax Error	You typed a command or formula incorrectly. For example, you might have left out the closing parenthesis in a formula like A3+(5*SUM(C2:C4). The final parenthesis is missing. Correct the error and press RETURN.
Width limited to 3-26	In attempting to change the column you either entered a number smaller than 3 or greater than 26, or you typed a letter. Use the edit command or ESCAPE.

Appendix C: Glossary

Activity lines: The three lines at the bottom of the SimpleCalc screen that convey information to you. From top to bottom, they are the status line, entry line and command line.

Addition: One of the five operators.

Application: A spreadsheet in use. Also termed an application spreadsheet; a number of applications appear at the end of the SimpleCalc manual and on the data pack or disk. See ***data files.***

Average: A function which gives you the average amount in a range of cells.

Blank: A command used to empty a cell.

Catalog: A SmartBasic command that shows you all the files on a data pack or disk.

Cell: One square on the spreadsheet grid, where you enter a number, formula or text.

Cell Address: A way of signifying a cell, i.e. A1, C4.

Character String: Any keyboard letters, characters or numbers you enter using Smart Key II. You can't perform calculations on a character string, only on numbers you enter in the normal manner.

Column: The spreadsheet's vertical dimension, designated with letters (A, B, C, etc.).

Column Width: A command used to widen a column.

Columnar Sheet: A piece of ruled paper accountants use to manually perform the tasks SimpleCalc does for us electronically.

Command: An instruction you give SimpleCalc to perform a

mathematical task for you. There are 13 commands: Blank, Column Width, Delete, Edit, Format, Get, Insert, Memory, Print, Quit, Replicate, Store and Zap.

Command Line: The activity line at the very bottom of the screen which tells you what activity you're engaged in.

Conversion: The mathematical process of transforming one set of values into another: gallons to liters, miles to kilometers, etc.

Count: A function which tallies the number of cells with a value greater than zero (or text).

Cursor: The blinking line on your screen which tells you that ADAM is awaiting your next command, or where next character will be placed.

Data Entry: The process of entering numbers or character strings into a computer. A skill that requires care and attention to detail.

Data File: Information you create with SimpleCalc and store on the data pack or disk. Also termed ***application.***

Data Pack: The special ADAM cassette you use.

Default: A condition the computer or program accepts as the normal condition until you change it. Any time you start ADAM or SimpleCalc, you can expect certain defaults: for example, the keyboard default is lower case letters and the program is ready to accept numbers in dollars and cents.

Delete: A command that eliminates a column or row.

Disk: The floppy disk your ADAM uses to store programs or data.

Division: One of the five operators.

Edit: A command that allows you to change the cell's contents.

Escape: The "goof-proof" key that halts an activity in progress and returns you to "ready."

Exponent: A number multiplied by itself, or squared; also termed a power.

Filename: The term used to describe the name we give a data file or application, usually written as one word since the name is a ten-character word.

Format: A command that allows you to reconfigure data in a cell.

Formula: An equation, a combination of numbers or cell addresses (A1, C4) combined with operators to perform mathematical functions in SimpleCalc.

Function: Five special mathematical tasks SimpleCalc performs: Average, Count, Minimum, Maximum and Sum.

Geometric Progression: Numbers in which if any term is divided into the next term, the result is always the same. Also called the common ratio.

Get: The command which allows you to get a data file or application from data pack or disk.

Grid: The SimpleCalc screen; if you drew lines across the rows and down the columns, you would see a grid.

Initialize: Preparing a data pack or disk to accept data.

Integer: A whole number — 2, 15, 600, as contrasted with a fraction or a dollars-and-cents figure.

Insert: The command that allows you to shift either rows or columns with data in them, entering a new row or column in the space created.

Inventory: One of the tasks SimpleCalc excels at; keeping lists, records, tallies, etc.

Load: A SmartBasic command that takes programs or data files from the data pack or disk and puts them into ADAM's RAM memory.

Lower Case: Letters typed with no capitals.

Margins: The area to the left and at the top of the SimpleCalc screen where row numbers and column letters appear; you may enter data into the margins if you wish.

Maximum: A function that gives you the greatest number within a range of cells.

Memory: The command that lets you check how much space you have remaining to enter data into the spreadsheet.

Minimum: A function that gives you the lowest number within a range of cells.

Modeling: A mathematical task SimpleCalc performs to help you create scenarios or hypothesize about mathematical or financial situations. See ***whatif.***

Multiplication: One of the five operators.

Operators: Addition, Subtraction, Multiplication, Division and Exponentiation.

Print: A command that allows you to print your spreadsheet.

Quit: The command that lets you end your spreadsheet work session.

Range: A group of cells between which you want to perform mathematical calculations; i.e. A1-F1 or C1-C15.

Recalculate: corrects all formulas on the screen when a number is changed or added.

Replicate: The command that takes a formula or data from one cell and enters it into other cells.

Return: The key you must press to execute commands in SimpleCalc.

Rows: The numbered cells that cross the screen from left to right.

Run: The SmartBasic command that tells ADAM to use a program on the data pack or disk.

Scientific Notation: A number written as a power of 10 times another number, such as 3.981071721E+09. See also **exponent.**

Smart Keys: The keys you press to make SimpleCalc perform various mathematical functions for you. SimpleCalc uses Smart Keys I, II and III.

Spreadsheet: An electronic, computerized version of the accountant's columnar sheet that automatically performs mathematical functions for you.

Status Line: The topmost line at the bottom of the screen which tells you cell contents and other information about the data you enter.

Store: The command that allows you to save your data files or applications on the data pack or disk.

Subtraction: One of the five operators.

Sum: A function that totals the contents of a range of cells.

Upper Case: Typing in all capital letters.

Whatif: A hypothetical mathematical condition where you speculate what might happen if certain numeric or financial conditions exist. For example, if certain conditions remain relatively constant, whatif there is a 25% increase in inflation?

Zap: The command that erases all the data you've entered on the screen and returns it to an empty SimpleCalc screen.

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For ADAM™