



Software that means business™

EPSON PX-8 Portable Calc™ Training Guide

For Release 1.0

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Introduction

WELCOME

The Portable Calc Training Guide is designed to lead you through the creation of a simple spreadsheet, explaining commands and features of the program as they are used in the exercise. The Training Guide does not cover everything you will need to know about the program, but it does introduce you to the basics by giving you the opportunity to use the program as you learn it.

Your time will be used most productively if you follow the instructions in the three lessons before you begin experimenting with the program. Then read the Reference Manual and practice on your own with the commands and functions you read about.

BEFORE YOU BEGIN

- Is your PX-8 turned on and booted up?
(If not, see your PX-8 User's Manual.)
- You do not need to install (adapt) Portable Calc for your particular computer. It comes to you already prepared to run on your PX-8.
- Check to see that there is empty space on the drive you will be using to save your practice files. Use an operating system utility program to do this.

LEGENDS, SYMBOLS, AND SIGNPOSTS

A > OPERATING SYSTEM PROMPT

You will see this symbol throughout the Training Guide. It tells you to start at your PX-8 operating system. Your PX-8 may be logged on to another drive. If so, substitute that drive letter for A.



CONTROL COMMANDS

This symbol stands for the CTRL (control) key. To give a control command, hold down the control key while you type the letter that follows this symbol.



RETURN KEY

Press the RETURN key when you see this.

FACT BOXES

Important information is enclosed inside these boxes.

ITALICIZED WORDS

The first time a Portable Calc term or computer term is used it is in *italics*. Usually the term is defined in the text, and it can also be found in the Glossary at the end of the Reference Manual.

AN EXAMPLE ONSCREEN



This represents your computer screen.

AN EXAMPLE ON PAPER



This represents a printout.

BEEPS

If your computer beeps, it means that you have pressed the wrong key or made some other kind of error. Sometimes you will be required to press the ESCape key before you can continue.

Lesson One: Getting Acquainted

BEFORE YOU BEGIN

In this lesson you will create a very simple spreadsheet with Portable Calc, amounting to little more than a column of numbers. The exercise will demonstrate some basic concepts. You'll see how values are stored in memory, then used in calculations. You'll learn a shortcut method for doing a common mathematical operation and you'll be introduced to a couple of Portable Calc's commands.

You are about to discover (even if you have phobias about math and computers) that there is nothing particularly difficult about using this program. So step up and shake hands with Portable Calc, and find out what a spreadsheet program is like up close!

GETTING STARTED

When you turn on your PX-8 it runs a program called CP/M, your operating system. Get Portable Calc running by typing the first part of its file name (CALC.COM) at the CP/M prompt. (See Appendix C of the Reference Manual for an alternate way to enter programs.)

SEE A >

TYPE **CALC** 

SEE Portable Calc copyright message, then the following display:

```
A1 0% ENTER: data arrow / = ! ->
:--A-----B-----C-----D-----E-----F-----G-----H-----
1 <      >
2
3
4
5
6
```

You have now loaded Portable Calc and you are looking at an empty spreadsheet.

JUST LIKE A CALCULATOR

You can use Portable Calc just as you would a pocket calculator—to do simple arithmetic problems. Watch the top line of the screen (where the *entry cursor* is) as you enter the numbers.

STEP 1 SEE *ENTER: data arrow / = ! ->*

TYPE 2+2

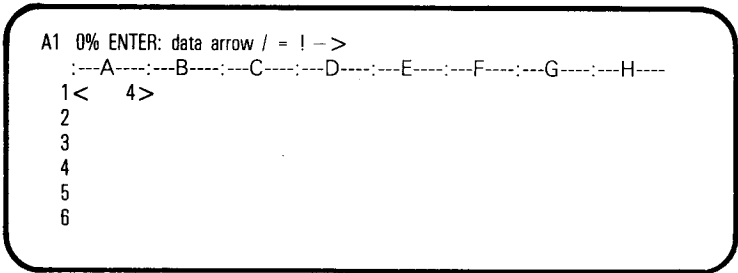
As soon as you type the first digit, the message on the top line (called a *prompt*) changes to read **ENTER: number or expression ->**.

If you make a mistake when you're entering data, use the DElete key or backspace key to erase it.

STEP 2 PRESS



SEE



The answer to your problem, 4, is displayed in the upper left corner of the spreadsheet, in row 1 of the column marked A. Each intersection of a column and a row is called a *cell*. You have just entered some data into a cell.

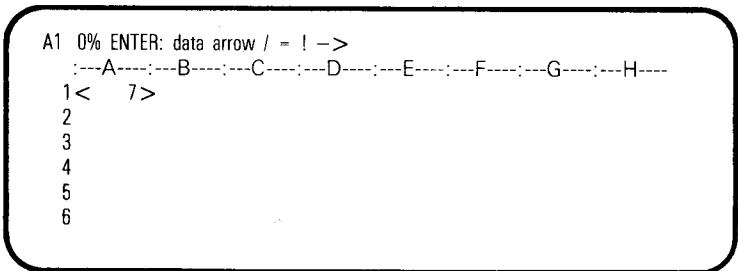
Now, try another calculation.

TYPE

10-3



SEE



The answer, 7, replaces the previous answer in cell A1. You can continue doing calculations for as long as you like, pressing RETURN after each entry. The answers will appear in cell A1. You can think of the RETURN key as equivalent to “equals.”

If you want to correct a mistake in data that you have already entered in a cell, just reenter the data correctly. To erase a cell and leave it blank, type /B.

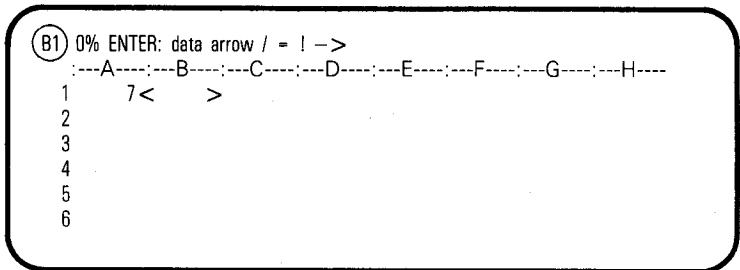
LIKE A CALCULATOR WITH MEMORY

Now try moving to a different cell.

STEP 1 PRESS



SEE

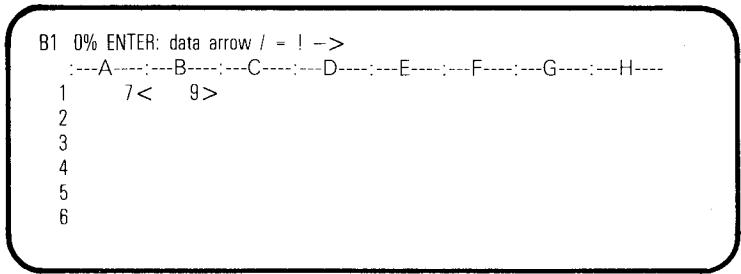


The *cell cursor* moves to the right to cell B1. The cell cursor is the pair of brackets that identifies the cell currently receiving entries. Notice that in the top left corner of the screen Portable Calc tells you where the cell cursor is.

Next, make an entry in cell B1 that refers to cell A1.

STEP 2 TYPE **a1+2** 

SEE




You have recalled the value in cell A1 from memory and used it in another calculation. Unlike a calculator, which usually contains only one memory area, Portable Calc has 16,384 memory areas, or cells.

You can enter *cell names* with either lower- or uppercase letters.

A VERY CALCULATING PROGRAM

Now discover one of the most powerful features of Portable Calc.

STEP 1 PRESS 

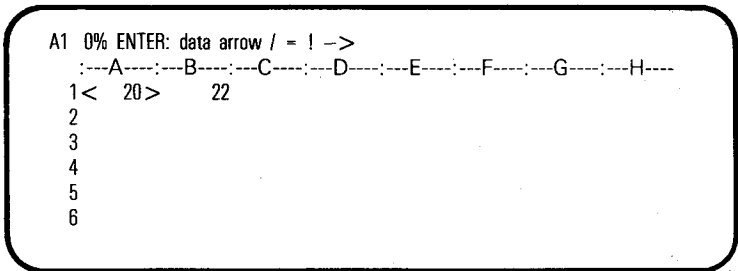
STEP 2 TYPE **20** 

You moved the cell cursor back to cell A1 and entered a number, 20, which replaced the value previously entered there.

Remember that cell B1 contains the expression $a1+2$. Since you have just changed the value of cell A1, the value of B1 should change also. But that doesn't happen automatically. When you enter or change an expression, it's result is calculated immediately. But when you change the value of an expression by changing a cell to which it refers, you must instruct Portable Calc to recalculate. (In Lesson Three you will learn how to make the program recalculate automatically.)

STEP 3 TYPE !

SEE



The Calculate command (!) tells the program to redo every calculation in the spreadsheet. There is only one calculation (or *expression*) in your spreadsheet so far: $a1+2$. Since you have changed the value of cell A1 to 20, Portable Calc recalculates the expression and arrives at the new result, 22, which goes in cell B1.

The expression $a1+2$ remains the same in memory, even though its value (displayed in cell B1) changes every time the value of cell A1 changes.

A PROGRAM THAT FUNCTIONS WELL

When creating a spreadsheet, you often work with lists of numbers. To enter numbers in a column, press the **down arrow** key, instead of RETURN, after each entry. This is a shortcut method that completes an entry and moves the cell cursor at the same time. All the arrow keys can be used in this way.

STEP 1 PRESS  twice

The cell cursor should now be in C1. (Check the top left corner of the screen.)

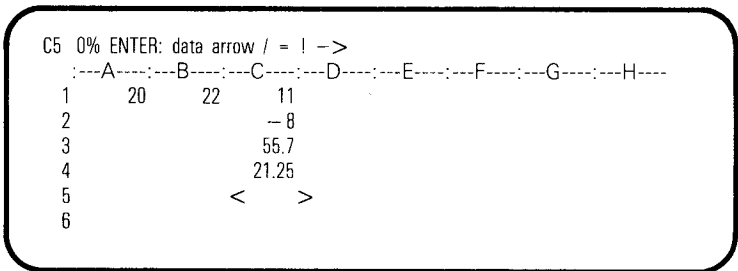
STEP 2 TYPE 11 

STEP 3 TYPE -8 

STEP 4 TYPE 55.7 

STEP 5 TYPE 21.25 

SEE



To add the list of numbers in column C, use a *function* called SUM.

Function names can be entered in upper- or lowercase.

TYPE +sum(c1:c4)



SEE

C5 0% ENTER: data arrow / = | ->

	A	B	C	D	E	F	G	H
1		20	22	11				
2				-8				
3				55.7				
4				21.25				
5				< 79.95 >				
6								

The function **SUM** adds all the values in the cell range defined by C1:C4. That is the group of cells beginning with C1 and ending with C4. The result of the calculation is placed in the *current cell*, which is C5.

+sum(c1:c4) is an expression. When an expression begins with a function, you must type + or @ (or - for a negative expression) first.

A COMMAND PERFORMANCE


Portable Calc's *commands* can perform wonders for you as you construct your spreadsheets. The Edit command (/E), for example, helps you make changes in your entries. There are eleven commands that begin with a slash (/).

- STEP 1 TYPE /
 SEE *COMMAND: BDEFGILOQRS -> /*
- STEP 2 TYPE E
 SEE

	A	B	C	D	E	F	G	H
1	20	22	11					
2			-8					
3			55.7					
4			21.25					
5			< 79.95 >					
6								

The prompt on the top line, listing commands, is replaced by the expression you entered in cell C5. (Note that the function name is in uppercase letters even though you entered it in lowercase.)

You can change the expression by moving the *entry cursor* (the rectangle or underline at the beginning) with the arrow keys, typing in changes wherever you want them.

- STEP 3 PRESS  6 times
 SEE Entry cursor over "1"

STEP 4 TYPE 2 RETURN

SEE

	A	B	C	D	E	F	G	H
C5	0% ENTER: data arrow / = ! ->							
1	20	22	11					
2			-8					
3			55.7					
4			21.15					
5			<68.95>					
6								

You just changed the expression in cell C5 from **+sum(c1:c4)** to **+sum(c2:c4)**. Notice that the value in C5 changed when you pressed RETURN, as a result of the change you made to the expression.

Anytime you want to interrupt a command, press ^U.

A New Look

Portable Calc's Format command gives you a lot of flexibility in designing the way your data will be displayed.

STEP 1 TYPE /F

SEE *FORMAT:*
Global Column Field ->/F

STEP 2 TYPE C

SEE *FORMAT:*
D E G I \$ R L TR TL width.dec ->

STEP 3 TYPE \$ 

SEE

```

C5 0% ENTER: data arrow / = ! ->
  :---A---:---B---:---C---:---D---:---E---:---F---:---G---:---H---
1      20      22      11.00
2                      - 8.00
3                      55.70
4                      21.25
5                      < 68.95 >
6
    
```

All the figures in column C have been converted to dollars-and-cents format.


Save It for a Rainy Day

When you have completed your work, use the Save command to place it in a file where you can get back to it later.

STEP 1 TYPE /S

SEE SAVE: file ->

Choose an available drive that has space for a small file and type the drive name (*a* in the example), a colon, then the file name.

STEP 2 TYPE *a:practice* 

The *entry prompt*, which you have seen many times now, returns to the top line of the screen, and your figures remain displayed on the spreadsheet. The only thing that has changed is that your work is now stored in a file called PRACTICE, on the drive you have selected.

Calling It Quits

When you're ready to leave Portable Calc, use the Quit command.

STEP 1	TYPE	/Q
	SEE	<i>QUIT: Y to confirm -> /Q</i>
STEP 2	TYPE	Y

Your screen will go blank and you will be returned to the operating system (CP/M).

Exiting from the program with the Quit command is the best way to clear a spreadsheet from the screen so you can begin work on another one. There is another way that erases the contents of the cells but not the format settings that you make with the Format command (such as the dollars-and-cents format you used in this lesson). That method uses the Blank and Replicate commands, which you will learn about later. To get a completely clean slate, you must leave the program and enter it again.

Just remember to save any work you will want to return to by using the Save command before Quit. Otherwise, your work will vanish without a trace when you exit from Portable Calc.

FINISHING UP

You have just created and saved a practice spreadsheet. It doesn't convey any meaningful information, but you have learned a number of things in creating it. You know how to load the Portable Calc program, how to use it to do simple calculations, and how to create expressions that refer to other cells. You've used the function **SUM** and the Edit, Format, Save, and Quit commands.

In the next lesson you'll work on a spreadsheet with practical applications, which should help you get a feel for how you can make use of Portable Calc.



Lesson Two: Getting Practical

BEFORE YOU BEGIN







The example used in this chapter is meant to illustrate some of Portable Calc's features in the context of a (somewhat) realistic application. You would not necessarily use the same methods or sequence of operations to construct your spreadsheet if you had a similar application, but you will learn some basic concepts here and will be the wiser for encountering a few pitfalls.

GETTING STARTED

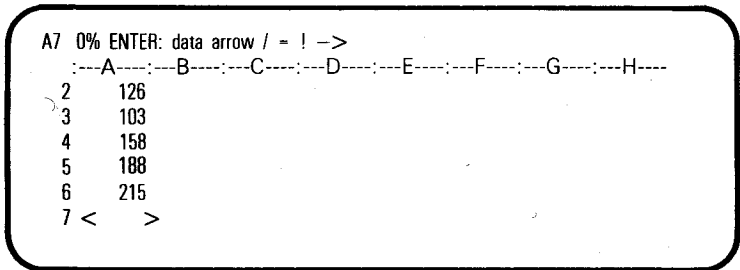
Your company, Harmony House Inc., makes musical instruments, and you have been asked to do a report on flute sales. You have some figures representing sales for the first six months of the year that you want to enter in a spreadsheet.

- STEP 1 SEE A >
- TYPE CALC 
- SEE Portable Calc copyright message
- STEP 2 PRESS 
- SEE An empty spreadsheet

Pressing the space bar (or any key) skips you quickly past the copyright message.

STEP 3	TYPE	79	
STEP 4	TYPE	126	
STEP 5	TYPE	103	
STEP 6	TYPE	158	
STEP 7	TYPE	188	
STEP 8	TYPE	215	

SEE




Notice that when you pressed the **down arrow** key in cell A6, row 1 disappeared from view and row 7 became visible. Your view of the spreadsheet moved down with the cell cursor. Whenever the cursor moves beyond the borders of the portion of the spreadsheet displayed on the screen, a new portion is displayed so that the cursor always remains in view.

Making More Room

Now you have a column of numbers, but nothing to indicate what they mean. They need to be labelled. But before you can enter a label, you need to make some space at the top of the column.

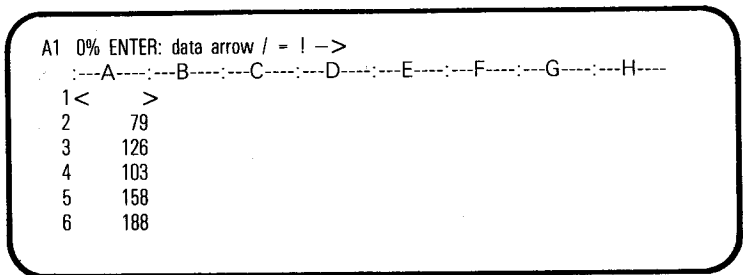
```
STEP 1   TYPE   =
          SEE    GOTO: cell ->

STEP 2   TYPE   a1 
```


The cell cursor jumps to cell A1, and the displayed portion of the spreadsheet changes to include row 1. The Goto command is a short-cut method for moving the cell cursor more than one cell at a time.

```
STEP 3   TYPE   /I
          SEE    INSERT: Row Col ->/I

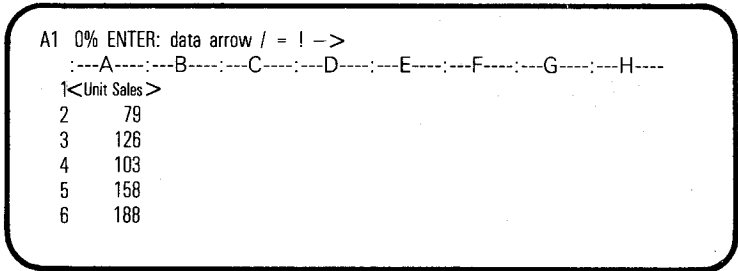
STEP 4   TYPE   R
          SEE
```



You have inserted a row at the row where the cell cursor was located. The contents of row 1 and all those below were pushed down to make room.








STEP 5 TYPE Unit Sales 

SEE



You can enter text as well as numbers and expressions. As you can see, text entries can overflow to the next column if the space is available.

You also want to label each row with the month it represents, so you need to insert a column.

STEP 1	TYPE	/IC	
STEP 2	PRESS		
STEP 3	TYPE	Jan	
STEP 4	TYPE	Feb	
STEP 5	TYPE	Mar	
STEP 6	TYPE	Apr	
STEP 7	TYPE	May	
STEP 8	TYPE	Jun	


STEP 9 PRESS 

SEE

A7	0% ENTER: data arrow / = ! -->								
	A	B	C	D	E	F	G	H	
1	<	>	Unit Sales						
2	Jan		79						
3	Feb		126						
4	Mar		103						
5	Apr		158						
6	May		188						

Pressing the HOME key is a shortcut for getting to cell A1, since you so frequently want to go there.

When you take a look at what you've got, you decide to label column A and separate the labels from the rest of the column with a line.

STEP 1 TYPE **Months** 

STEP 2 TYPE **/IR**

Typing an apostrophe (or right single quote) at the beginning of an entry tells Portable Calc that the next character you type should be repeated throughout the row.

STEP 3 TYPE **'**
SEE *ENTER: repeat text ->*

Now type a hyphen to create the line you want.

STEP 4 TYPE **-** 



SEE

A2	1%	ENTER:	data	arrow	/	=	!	->
1	Months		Unit	Sales				
2	<							>
3	Jan			79				
4	Feb			126				
5	Mar			103				
6	Apr			158				

GETTING RESULTS

So far, you have a nice-looking spreadsheet that tells you the monthly sales figures for flutes for the first half of the year. But you already knew what they were. You need to find out more about flute sales, and these figures can help you discover it.

To get the total number of flutes sold in the six-month period you can use SUM, the function you learned in Lesson One. First, label the row where the total will go.

- | | | | |
|--------|------|-------|--|
| STEP 1 | TYPE | =a10 |  |
| STEP 2 | TYPE | TOTAL |  |
| STEP 3 | TYPE | +sum(| |

You're stuck. You want to fill in the expression with the *cell range* that contains your figures, but you can't remember which cell the first figure is in. Here's a trick to help you out:

- | | | |
|--------|-------|---|
| STEP 4 | PRESS |  |
|--------|-------|---|

Pressing the ESCape key puts Portable Calc in an exploration mode that allows you to use the arrow keys to look for the cell you want. If you pressed an arrow key while making an entry, without pressing ESCape first, it would terminate the entry.

STEP 5 PRESS  7 times

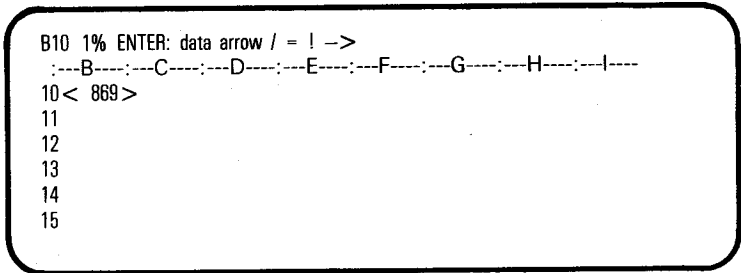
This is the cell you were looking for, cell B3.

STEP 6 PRESS 

When you press ESCape a second time, the cell you're in is entered into your expression automatically.

STEP 7 TYPE :b8) 

SEE



The sum of cells B3 through B8, 869, is placed in cell B10. When you used the Goto command, the screen view changed so that cell B10 is now located in the *home position* (the top left corner of the sheet), where cell A1 is when you first enter Portable Calc.

GETTING AROUND

You have already learned three ways to move the cell cursor: the arrow keys, the Goto command (=), and the HOME key. You have one other option—you can move the cell cursor with CTRL commands. These are the same cursor movement commands used in Portable WordStar:

←	=	^S
→	=	^D
↑	=	^E
↓	=	^X

Any of these cursor movement keys—the CTRL commands or the arrow keys—can be held down to move the cell cursor repeatedly along a row or column.

From now on, the instructions in this Training Guide will simply tell you where to move the cell cursor, without specifying how. You can choose between the various methods you have learned. You will probably want to use the arrow keys or CTRL commands for short hops and the Goto command for longer distances.




Note: The portion of the spreadsheet displayed on your screen may no longer agree exactly with the one shown in this guide if different methods were used to move the cursor. For example, the Goto command sometimes moves your destination cell into the home position.

IN ROUND FIGURES, PLEASE


What do your numbers mean in dollars and cents? Well, you know that a Harmony House flute wholesales for \$152.85. So, you need to set up a third column, labelled “Dollar Sales,” containing expressions that multiply the figures in column B by the cost of a flute.

You want the figures rounded to the nearest dollar for a more concise display, so you must use the Format command (/F). This does not change the way the numbers are stored in memory, only the way they are displayed.

The figures are going to go in column D. First, insert a row at the top of the spreadsheet to make room for the column heading.

- | | | | |
|--------|------|---------------|---|
| STEP 1 | MOVE | To cell D1 | |
| STEP 2 | TYPE | /IR | |
| STEP 3 | TYPE | Dollar |  |
| STEP 4 | TYPE | Sales |  |
| STEP 5 | TYPE | /FCI |  |

You have just selected the Integer option (I) of the Format command, which causes numbers to be rounded off so that no decimal places are displayed. You also selected the Column option (C), which restricts the format change to the column the cell cursor is in.

- | | | | |
|--------|------|--------------------|---|
| STEP 6 | MOVE | To cell D4 | |
| STEP 7 | TYPE | b4 * 152.85 |  |

Multiplication is indicated by the symbol *. The result of the expression you just entered, 12075, appears in cell D4. Note that Portable Calc does not put commas in numbers.

To get the proper variation of this expression into the remaining cells in the column, use the Replicate (/R) command, one of Portable Calc's most exciting features.

STEP 8 TYPE /R

SEE REPLICATE: from, to ->

STEP 9 TYPE d4,d5:d9 

SEE

D4 1% ENTER: data arrow / = ! ->		
A	B	C
1		Dollar
2	Months Unit Sales	Sales
3	-----	
4	Jan 79	< 12075 >
5	Feb 126	19259
6	Mar 103	15744.

Pretty nifty, wasn't it? You just replicated the expression in cell D4 to cells D5 through D9. The expression was adjusted for each cell to fit its new location and the results of the new expressions were calculated—all automatically. Move the cell cursor to one of the cells in the range D5 to D9 and use the Edit command (/E) to examine the contents of the cell. You will see that the cell named in the expression is the cell in column B that's in the same row as the one you're in. Press ^U to leave the expression unchanged.


One more thing. The heading "Dollar Sales" would look better if it were flush against the right of the cell, like the numbers below it. Portable Calc automatically displays text left-justified and numbers right-justified unless you change the format setting. To change the heading to Text Right justified for this column, follow this step:

TYPE /FCTR 

GOING TO PRESS

You have completed your first exercise in learning Portable Calc. Would you like to see your work in print? The Output command makes it possible with a few keystrokes.

First, make sure your printer is hooked up, turned on, and ready.

- STEP 1 TYPE /O
 SEE *OUTPUT: Printer or File ->*
- STEP 2 TYPE P
 SEE *OUTPUT BLOCK: range ->*
- STEP 3 TYPE a1:d11 

The block of cells you have defined will be printed, beginning with cell A1 and ending with cell D11. This block includes the entire sample spreadsheet for this lesson. Here is what it should look like:

Months	Unit Sales	Dollar Sales
Jan	79	12075
Feb	126	19259
Mar	103	15744
Apr	158	24150
May	188	28736
Jun	215	32863
TOTAL	869	

FINISHING UP

Now do you feel like you're getting the hang of this? You've used Portable Calc to perform calculations as well as to generate

expressions, and those are an electronic spreadsheet's primary jobs. Of course, there are many more elaborations of this basic capacity (some of which you will learn in the next lesson), such as comparing two values to arrive at a third, or discovering the smallest, largest, or average value in a range.

In the next lesson you will be building on the work you did in this one, so save the file.

- STEP 1 PRESS
- STEP 2 TYPE /S
- STEP 3 TYPE a:sales.sst

You don't have to move the cursor to cell A1 before saving, but you might want to. Portable Calc saves the cell cursor position along with the data and formatting, so when you load the file again your cursor will be wherever it was when you saved.

Now, exit from Portable Calc.

- TYPE /QY

Lesson Three: Getting Down to Business

BEFORE YOU BEGIN

By the time you finish this lesson, you will have a spreadsheet that presents the information on Harmony House flute sales in several ways. Throughout the lesson, you will be asked to observe how Portable Calc handles the relationships between the various pieces of information. As spreadsheets get more complex, these relationships can get more involved. But if you understand the principles, you will have no more difficulty creating a 3,000-cell spreadsheet than you will creating a 30-cell sheet.

GETTING STARTED

Load Portable Calc (refer to previous lessons if you need instructions), then load the file SALES.SST that you created in Lesson Two.

STEP 1 SEE The Portable Calc entry prompt

TYPE /L

STEP 2 SEE *LOAD: file ->*

TYPE *a:sales.sst*






Your spreadsheet on flute sales appears on the screen.

COUNTING THE PROFITS

You want to add to your spreadsheet by analyzing the figures you have so far with the help of some more information. The manufacturing division of the company has provided you with the cost of producing a flute for each of the months you are analyzing. The cost varies due to changing costs of materials, wages, advertising, etc. You will use that information to arrive at the total profit in flute sales for each month.

First, you must enter the cost information.





- STEP 1 MOVE To cell E1
- STEP 2 TYPE /FCTR 
- STEP 3 TYPE Unit 
- STEP 4 TYPE Cost 

Now go to cell E4 and enter the following numbers in cells E4 through E9, using the **down arrow** key to complete each entry:

72.39
60.62
57.14
65.90
75.88
79.35


What happened to the 0 in 65.90? It was not entered in the cell because it is not necessary—it doesn't contribute any information about the value of the number. Later on we'll change the format of the column so that the decimal points line up.

To calculate profit you require an expression that multiplies the number of flutes sold by the cost per flute, then subtracts that figure from the income derived by selling the flutes.

- STEP 1 MOVE To cell F2
- STEP 2 TYPE /FCTR 
- STEP 3 TYPE Profit 
- STEP 4 PRESS 
- STEP 5 TYPE d4-(b4 * e4) 

Harmony House Inc. made a profit of \$6,356.34 on flutes in January.

Now replicate the expression in cell F4 to cells F5 through F9.

- STEP 7 TYPE /Rf4,f5:f9 
- SEE

F4 5% ENTER: data arrow / = ! ->							
A	B	C	D	E	F	G	H
4 Jan	79		12075	72.39	<6356.34>		
5 Feb	126		19259	60.62	11620.98		
6 Mar	103		15744	57.14	9858.13		
7 Apr	158		24150	65.9	13738.1		
8 May	188		28736	75.88	14470.36		
9 Jun	215		32863	79.35	15802.5		

AN AVERAGE MONTH FOR FLUTE SALES

Next, you want to find out the average monthly profit. Use the function **AVG**.

STEP 1 MOVE To cell A13

STEP 2 TYPE **AVERAGE**



STEP 3 MOVE To cell F13

STEP 4 TYPE **+avg(f4:f9)**



SEE

D13 5% ENTER: data arrow / = ! ->							
:--A--	:--B--	:--C--	:--D--	:--E--	:--F--	:--G--	:--H--
8 May	188		28736	75.88	14470.36		
9 Jun	215		32863	79.35	15802.5		
10							
11 TOTAL	869						
12							
13 AVERAGE							<1.1974E4>

The number you see in cell F13 is the sum of the values in cells F4 through F9, divided by 6. It is expressed in *scientific notation* rather than decimal notation, which is the method of representing numbers that you are probably more used to. In decimal notation the number would be 11974.4016666, which has too many digits to fit in the cell. Numbers can't overflow into the next cell the way text can, so Portable Calc converts the number to scientific notation.

Scientific notation compresses very large or very small numbers by using powers of ten. The power of ten is represented by "E" and the number following it. Therefore,

$$1.1974E4 = 1.1974 \times 10^4 = 1.1974 \times 10,000 = 11974.$$

What happened to the numbers that were to the right of the decimal point (4016666)? There is not enough space to display them, but they reside in Portable Calc's memory as a part of the number in cell F13 and will be used in any calculations involving that number.

Making More Room Again

You can change the width of a column, or of all the columns in your spreadsheet, with the Format command (/F). To see how changing column width can affect the display of your data, make column F wider.

TYPE /FC15 

Now that there is more room, the value in cell F13 displays as 11974.4016666. Scientific notation is no longer needed.

Now set the column width back to 8, which is the *default setting* (the one already in effect when you began your work).

TYPE /FC8 

FLASH!






An administrative assistant in the Sales Department calls to tell you that one of the figures you were given was incorrect. There were 110 flutes sold in March, not 103. Correct the error with the following steps:

STEP 1 MOVE To cell B6

STEP 2 TYPE 110 

A New Approach

Before recalculating the spreadsheet to get the results of the change you just made, you decide to experiment a little with the layout. You try putting the figure for average sales per month in a column by itself. The result of this exercise will teach you something important about *expression adjustment*.

- STEP 1 MOVE To cell H1
- STEP 2 TYPE **Average** 
- STEP 3 TYPE **Profit** 
- STEP 4 TYPE **/FCTR** 
- STEP 5 PRESS 
- STEP 6 TYPE **+ avg(f4:f9)** 

The number that appears in cell H4, is 1.1974E4, the same as the one in cell F13. Neither cell reflects the correction in unit sales for March, because you haven't instructed Portable Calc to recalculate yet. Recalculation should change the figures in cell F6 (monthly profit for March), as well as H4, F13 (average monthly profit) and B11 (total unit sales).

STEP 7 TYPE !

Now look at your sheet. Why wasn't the value in cell H4 updated? It's still 1.1974E4. Go to cell F13 and see if there's any change there:

STEP 8 TYPE =F13 

Yes, there is! According to the figure in cell F13, the average monthly profit is 1.2086E4.

What happened? Well, first you must understand that the entire spreadsheet is recalculated row by row from left to right, starting with row 1, unless you specify with the Global command that it be done column by column. The expression in cell H4 refers to F6, but when the program got to cell H4 in its recalculation, cell F6 had not yet been recalculated to reflect the change in B6. Therefore, the value in H4 was left unchanged.

By the time the program got down to cell F13, F6 had been updated, so the value of F13, which depends on the values in cells F4 through F8, was recalculated correctly.

To avoid incorrect expression evaluation, make sure that cell references do not refer to cells that are evaluated later if those cells contain references to cells that are also evaluated later. For row-by-row evaluation, such referenced cells should not be in higher numbered rows or further in the same row. For column-by-column evaluation, the referenced cells should not be in higher lettered columns or further in the same column.

Setting a Global Option

As mentioned in Lesson One, you can tell Portable Calc to recalculate the entire spreadsheet each time you make a new entry or change an existing one. Do this by setting the Global Calculation option to YES with the following steps:

STEP 1	TYPE	/G
	SEE	<i>Adjust=ALL Border=YES Calc=NO Order=ROW Scroll=YES ->/G</i>
STEP 2	TYPE	C

ANOTHER FLASH!

The same administrative assistant calls to say that the sales figure for July has just come in. You take the information and plug it into your spreadsheet.

STEP 1 MOVE To cell A10

STEP 2 TYPE **Jul** 

STEP 3 TYPE **227** 

STEP 4 TYPE **/IR**

SEE



B11 5% ENTER: data arrow / = ! ->								
	:--A--:	:--B--:	:--C--:	:--D--:	:--E--:	:--F--:	:--G--:	:--H--:
8 May		188		28736	75.88	14470.36		
9 Jun		215		32863	79.35	15802.5		
10 Jul		227						
11								
12 TOTAL		876						
13								

That looks fine, except for one thing: the total in cell B12 hasn't changed. You know the sheet has been recalculated, because you set the Global Calculation option to YES. So why wasn't the figure updated? To find out, check on the expression in B12.

STEP 1 MOVE To cell B12

STEP 2 TYPE **/E**

The expression has not changed—it still refers to the range of cells from B4 to B9. So the value in cell B12 is correct as far as Portable Calc is concerned. The expression was not adjusted because nothing changed within the cell range to which it refers. You must change the expression to include the cell you've added.

- STEP 3 PRESS  9 times
 SEE Entry cursor over "9"
- STEP 4 TYPE 1
- STEP 5 PRESS 

When you're editing the contents of a cell with the Edit command, pressing the up arrow has the effect of inserting a space.

- STEP 6 TYPE 0 

Now the figure in cell B12 changes to 1103, because sales for the month of July have been added in to the total.

If you had inserted a row somewhere between rows 4 and 9 and had entered a figure in column B of the new row, then the expression that totals that column would have been adjusted automatically to include the new cell.

MORE PRACTICE

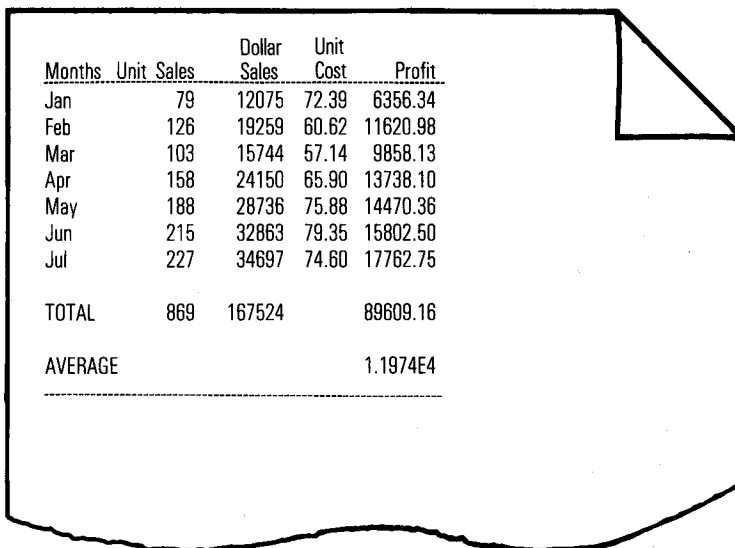
To practice using what you've learned, you might want to complete the Harmony House spreadsheet.

Complete row 10 with the appropriate expressions by replicating (/R) the cells directly above D10 and F10. Use 74.60 as the "Unit Cost" figure for the month of July, in cell E10. Total columns D and F, using the **SUM** function.

You could erase the inaccurate data in Column H by using the Blank command. Place the cell cursor in cell H3 and press /B. Or you could eliminate the entire column with the Delete command by putting the cell cursor anywhere in the column and typing /DC.

To improve the spreadsheet format, assign the Dollar format to columns E and F. Do this by placing the cell cursor in each column and typing /FC\$.

When you have a completed spreadsheet, you might want to print it. The command is /OPa1:f14. The printed sheet should look like this:



Months	Unit Sales	Dollar Sales	Unit Cost	Profit
Jan	79	12075	72.39	6356.34
Feb	126	19259	60.62	11620.98
Mar	103	15744	57.14	9858.13
Apr	158	24150	65.90	13738.10
May	188	28736	75.88	14470.36
Jun	215	32863	79.35	15802.50
Jul	227	34697	74.60	17762.75
TOTAL	869	167524		89609.16
AVERAGE				1.1974E4

If you want to save your spreadsheet, be sure to use the same file name as you did the last time you saved it (SALES.SST). Otherwise, you will create a separate file.

CREATING MODELS

If you were actually an employee at Harmony House Inc., you might have the occasion to create a spreadsheet similar to the one in this lesson, perhaps for the last six months of the year. You could save yourself a lot of time and trouble if you were to use a *template* to do this.

A template is a model of a spreadsheet that is reused with different raw data to create more than one spreadsheet. It is like an outline that you fill in with the current figures. Templates are created for routine tasks, such as filing expense account reports.

To use a template, you load it into Portable Calc, fill it with data, and then save the filled sheet under a different name. For example, your expense account template might be called EXPENSE.SST and a filled-in spreadsheet created with the template could be named 8-12-84.SST.

There is a variety of books on the market that provide instructions for creating commonly-used templates with various spreadsheet programs. These instructions could be adapted for use with Portable Calc, or you might wish to try designing your own templates.

Your use of Portable Calc will be most effective if you take the time to plan your template before you start entering data. Ask yourself what you want to accomplish with the spreadsheet, what information you have available, what relationships exist between different kinds of information, what assumptions you are going to make (if you are forecasting), and how the information can be displayed to best advantage. When you have answered these questions, then you can create a template that will be useful over and over again.

If you have already worked out a spreadsheet (more or less by trial and error, as in this lesson) and it is filled with data, you can save the filled-in sheet and then eliminate the raw data to make a template.

You can leave yourself some clues about where text or numbers are to be filled in by entering a zero in any cell which will later contain a number and double quotes (“) in cells meant for text. The double quotes are a signal to Portable Calc that the entry that follows is text; the quotes do not show up on the spreadsheet. Zeros can also be used in expressions to represent a variable, such as the retail price of a flute, that will be plugged in when the template is used.

When you go to fill in a template, use the Edit command to find out what is in each cell. Then change zeros to numbers and follow quotes with text.

For example, if you created a template out of the spreadsheet in this lesson, this is what would be entered in each cell:

1	:--A--	:--B--	:--C--	:--D--	:--E--	:--F--	:--G--	:--H--
2	Months	Unit Sales		Dollar Sales	Unit Cost	Profit		
3	-----							
4	"	0	+b4*0	0	d4	-(b4*e4)		
5	"	0	+b5*0	0	d5	-(b5*e5)		
6	"	0	+b6*0	0	d6	-(b6*e6)		
7	"	0	+b7*0	0	d7	-(b7*e7)		
8	"	0	+b8*0	0	d8	-(b8*e8)		
9	"	0	+b9*0	0	d9	-(b9*e9)		
10	"	0	+b10*0	0	d10	-(b10*e10)		
11								
12	TOTAL	+sum(b4:b10)	+sum(d4:d10)			+sum(f4:f10)		
13								
14	AVERAGE					+avg(f4:f10)		

Of course, this is not what you would see on the screen when you loaded your template. The text would be displayed, but the rest of the sheet would be blank. This is what you would see in each cell when you used the Edit command.

FINISHING UP

Congratulations on completing the Portable Calc Training Guide! Go on from here by reading the Reference Manual for more detailed information about the program. You will discover other functions and commands that you can use to build more sophisticated spreadsheets. Experiment with designing templates and explore the time-saving results of using Portable Calc for your varied information management needs.

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