AA-N587A-TV

Rainbow™ 100

Multiplan™–86

User's Guide

Developed by Microsoft Corporation
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digital equipment corporation

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The postage-prepaid READER'S COMMENTS form on the last page of this document requests the user's critical evaluation to assist us in preparing future documentation.

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Preface

Multiplan-86 is a personal productivity tool that helps you analyze data. As an aid for both business and personal needs, Multiplan-86 is one of the most powerful modeling and planning tools ever invented. With Multiplan-86 you can do the capital budgeting for a small company; you can make major sales force decisions or analyze product planning; you can plan your personal investments and put together a budget for your family . . . and much more. Customized for use on Digital's Rainbow 100, Multiplan-86 is more powerful and easier to use than ever.

Multiplan-86 is easy to learn, and its versatility is enhanced by the skill of its user. As you become more familiar with Multiplan-86, and better able to exercise its powers, you'll be surprised at how quickly and efficiently you'll accomplish various tasks.

The two volumes of this manual are designed as a tutorial and a reference guide to Multiplan-86. Volume 1 is the tutorial, which gives you an overview of the features of the system. Volume 2 is a detailed reference guide to all Multiplan-86 features. Volumes 1 and 2 complement one another; together, they allow you to learn both the concepts and uses of Multiplan-86.

The design of Multiplan-86 allows you to work intuitively; its capabilities allow you to accomplish a wide variety of tasks.

We hope you enjoy working with your powerful new accomplice: Multiplan-86.

Introduction

Uses of Multiplan-86

Multiplan-86 frees you from the limitations of more traditional methods of calculation. It offers you a new dimension in calculation: a chance to ask "What if?" to test out plans. You will soon learn how to manipulate data to obtain the answers you need. Among Multiplan's many features, the following are among the most important:

Multiplan-86 offers you a worksheet 255 rows long and 63 columns wide for words, numbers, and formulas. Multiplan-86 allows you to connect several worksheets so that you can build up a chain of sheets that provide information to each other.

Multiplan-86 offers you a way to manipulate data for planning or forecasting by asking:

What if costs rise by 10% for one item and 6.5% for another?

What if production increases?

What if sales of one item skyrocket?

What if home utility bills soar?

Is it worth it to pay express freight to get a product early?

Is it worth it to give a discount to marginal buyers?

Multiplan-86 allows you to alter a critical number and watch the figures change across your worksheet, and to observe the effects over time of a small change here, an improvement there. You can run sensitivity analyses, do budget and resource planning, and schedule more efficiently. You'll soon agree that Multiplan-86 is a vast improvement over "hand calculating" methods.

Multiplan-86 overcomes the limitations of paper worksheets. You can instantly move data, or insert or delete space as necessary, thereby eliminating the costly and tiresome work of typing or hand-printing the worksheet over and over.

Multiplan-86 communicates with you as directly and naturally as possible, providing many aids to help you to accomplish your objectives.

How to Proceed

An interactive program like Multiplan-86 can be learned only by use. This volume is designed to be read and referred to as you use Multiplan-86. It's important that you try, test, and experiment as you learn. You'll be surprised at how quickly it all falls together. There is no way that anything you type can damage the computer or Multiplan-86, so don't hesitate to experiment.

This book, the *Multiplan-86 User's Guide* introduces the use of Multiplan in a tutorial manner: in simple steps with many practical examples. You'll learn by using Multiplan-86 to make a financial analysis of a model firm—Spencer Ceramics. The tutorial presents Multiplan-86 in a manner that shows the system's main features as they are commonly used.

Begin by working through this book. Chapter 1, "Fundamentals," and Chapter 2, "Building a Worksheet," help you become familiar with the keyboard and screen display and introduce you to the Multiplan-86 typing aids.

"Entering Formulas" and "Naming Cells and Copying," Chapters 3 and 4, lead you further into the use of Multiplan-86. When you complete these chapters, you'll have used some of the most important Multiplan-86 commands and features.

Chapter 5, "Windows, Copying Formulas, and Options," introduces the finer points of the Multiplan-86 screen display. After completing it, you'll be ready to print some samples of your work. Chapter 6, "Printing a Worksheet," tells you how. The final chapter in the tutorial, Chapter 7, "Using Multiple Worksheets," takes you beyond working with a single sheet. You learn how to organize data on multiple sheets and to draw data from them for use on another sheet.

As you work through this book, you'll find it helpful to refer to the *Multiplan-86 Reference Manual.*

The *Multiplan-86 Reference Manual* begins with a chapter entitled, "Elements of Multiplan-86," which explains in-depth the Multiplan-86 worksheet, how to enter commands, how to edit, what formulas are, how access to files works, and what happens when the worksheet undergoes changes that move data.

The *Multiplan-86 Reference Manual* contains a large reference section that provides detailed descriptions of all Multiplan-86 commands in the "Command Directory," and of all mathematical and statistical functions in the "Function Directory." All messages displayed by Multiplan-86 are listed in Appendix A, "Prompts and Error Messages." Appendix B presents "Helpful Hints" that suggest ways to make your Multiplan-86 sessions more efficient and effective; if you follow the hints, you'll save time and space.

Begin applying Multiplan-86 to simple tasks, making frequent use of the *Multiplan-86 Reference Manual.* As you gain experience, use Multiplan-86 for more complex tasks, such as organizing multiple worksheets. You'll soon find that you have a firm grip on a powerful tool.

1

Fundamentals

Making A CP/M/Multiplan Diskette

Before using Multiplan-86 for the first time, you must: select two blank diskettes, copy the CP/M-86/80 operating system software onto both diskettes, and then copy Multiplan-86 onto the diskettes. One diskette will become your "working copy"—the one used daily—and the other will become your "backup copy." If your "working copy" gets corrupted due to hardware or other unforseen problems, use the "backup copy."

To make your working copy, follow the steps outlined in the next two sections.

Copying the Operating System Files

1. Display the Rainbow 100 Main System Menu according to one of the following procedures:

   - If the Rainbow 100 computer is turned off—Make sure that no diskettes are in the drives. Turn on the Rainbow 100 computer with the drive doors opened or closed. The Main System Menu should be displayed on the screen.

- If the Rainbow 100 computer is turned on—Reset the Rainbow 100 computer by pressing the Set-Up key, followed by typing <Ctrl/Set-Up>. The Main System Menu should be displayed on the screen.

2. Remove the CP/M-86/80 working diskette from its protective envelope.
3. Open the door to drive A. Before inserting the CP/M-86/80 working diskette into the drive, be sure the diskette does not have a write-protect tab affixed to it. If so, peel the tab off, insert the diskette into drive A, and close the door to drive A.
4. Start the CP/M-86/80 operating system by pressing the A key in response to the Main System Menu. A> should be the last characters displayed on the screen.
5. Remove a blank diskette from the diskette box in the Rainbow 100 CP/M-86/80 Operating System Kit.
6. Remove the blank diskette from its protective envelope.
7. Open the drive B door and insert the blank diskette. Close the drive B door.

   NOTE: If you did not turn on or reset the computer just before inserting the diskettes, type <Ctrl/C> after A> to tell the operating system that you have inserted new diskettes into the drives.

8. The following procedure, which copies the operating system to the blank diskette using the SUBMIT program, should complete in about two minutes. You type only one instruction. In this instruction, A is the source drive and B is the destination drive. The remainder of the instructions are typed by the computer.

   NOTE: If any error messages are displayed at any time during the following procedure, refer to Chapter 7, Error Messages, in the Rainbow 100 User's Guide.

   After the A>, type:

   SUBMIT SYSCOPY A B<Ret>

As the operating system is being copied, the small lights beside each drive turn on and off and the drives make clicking and whirring sounds. When the copying procedure is completed, the operating system displays A>.

9. Check that all the files were copied. After the A>, type:

   DIR B:<Ret>

   The file names should be displayed on the screen followed by:

   A>

   Then, after the A>, type:

   DIRS B:<Ret>

   The file names should be displayed on the screen followed by:

   A>

10. Repeat steps 1 through 9 on another blank diskette.

    After copying the operating system files onto two blank diskettes, go to the next section to copy Multiplan-86 onto these diskettes.

Copying Multiplan-86

1. Open the drive A door and remove the CP/M-86/80 working diskette. Return it to its protective envelope and store it in a safe place.
2. Open the drive B door and remove the system/application diskette—that is, the diskette onto which you just copied the operating system files.
3. Insert the system/application diskette (the diskette you just removed from drive B) into drive A. Close the drive A door.
4. Insert the Multiplan-86 master diskette into drive B. (This is the diskette in the Multiplan-86 package.)

5. To tell the operating system that you have changed diskettes, press the Ctrl and C keys simultaneously.

   When you press <Ctrl/C>, you hear clicking sounds from the drive and the small light beside drive A turns on briefly. The operating system displays the following on your screen:

```
A>^C
A>
```

6. Copy Multiplan-86 (in drive B) onto the diskette already containing the operating system (in drive A). To do this, use PIP, a program that copies files from one diskette to another.

   NOTE: *If any error messages are displayed at any time during the following procedure, refer to Chapter 7, Error Messages, in the Rainbow 100 User's Guide.*

   Type:

```
PIP A:=B:*.*[OV]<Ret>
```

   where:

   A: is the location you are copying to (the destination drive).

   B: is the location you are copying from (the source drive).

   . is a symbol indicating all files.

   [OV] are added instructions for PIP.

   As the Multiplan-86 files are being copied, the small lights beside each drive turn on and off and the drives make clicking and whirring sounds. PIP displays:

```
COPYING --
```

followed by a list of all the file names as they are copied. The file names are the same names as those on the source diskette. When all the files are copied, the operating system displays:

```
A>
```

7. Open the door to drive A and remove the system/application diskette, which now contains both the operating system files and Multiplan-86. Place the diskette in its protective envelope and label it:

   Multiplan-86: Backup copy

   Store this copy in a safe place.

8. Insert into drive A the second diskette onto which you copied the operating system files. Close the door to drive A and repeat steps 5 through 7, *except*, at the end of step 7, after removing the diskette from drive A, label it:

   Multiplan-86: Working Copy

   Reinsert the diskette into drive A, close the door to drive A, and press: press the Ctrl and C keys simultaneously.

9. Open the drive B door and remove the Multiplan-86 master diskette. Return it to its protective envelope and store it in a safe place.

10. Insert a data diskette into drive B to use with the Multiplan-86. Use this diskette to store information. Close the drive B door.

    NOTE: Multiplan-86 assumes drive A is the default drive. Therefore, the diskette in drive B contains all data files. You must insert a blank diskette in drive B.

11. To tell the operating system that you have changed diskettes, press the Ctrl and C keys simultaneously

    When you press <Ctrl/C>, you hear clicking sounds from the drive and the small light beside drive A turns on briefly. The operating system displays the following on your screen:

```
A>^C
A>
```

You have now successfully created a system/application diskette which contains the operating system files and Multiplan-86. With this diskette, you can now start the operating system and use Multiplan-86. Be sure to write the following information on the diskette's label:

- The name of the operating system—CP/M-86/80.
- Multiplan-86-Working copy.

Described above is the preferred method of creating a system/application diskette. Refer to the discussion of the SUBMIT program in the *Rainbow 100 User's Guide* if you want to customize this procedure to copy other files.

Loading and Starting Multiplan-86

Once you have made a CP/M/Multiplan diskette, you can use Multiplan-86 by inserting this diskette into drive A and the blank diskette into drive B. The diskette in drive B will hold the data that you enter into the computer. Always use drive A to hold your working copy of Multiplan-86 (i.e., the copy containing Multiplan-86 and CP/M-86/80), always use drive B to hold the diskette you plan to store data on.

To start running Multiplan-86, after inserting the diskettes, type **MP**.

Within seconds, Multiplan-86 will appear on your video display.

The Rainbow 100 Keyboard

As soon as you start running Multiplan-86, familiarize yourself with the Rainbow 100 keyboard—in particular, with the set of arrow keys on the right-hand side of the keyboard (Figure 1). Used alone, the arrow keys let you move the cell pointer around on the worksheet. Used in combination with the NEXT SCREEN key, the arrow keys let you view other window-size pages of the worksheet.

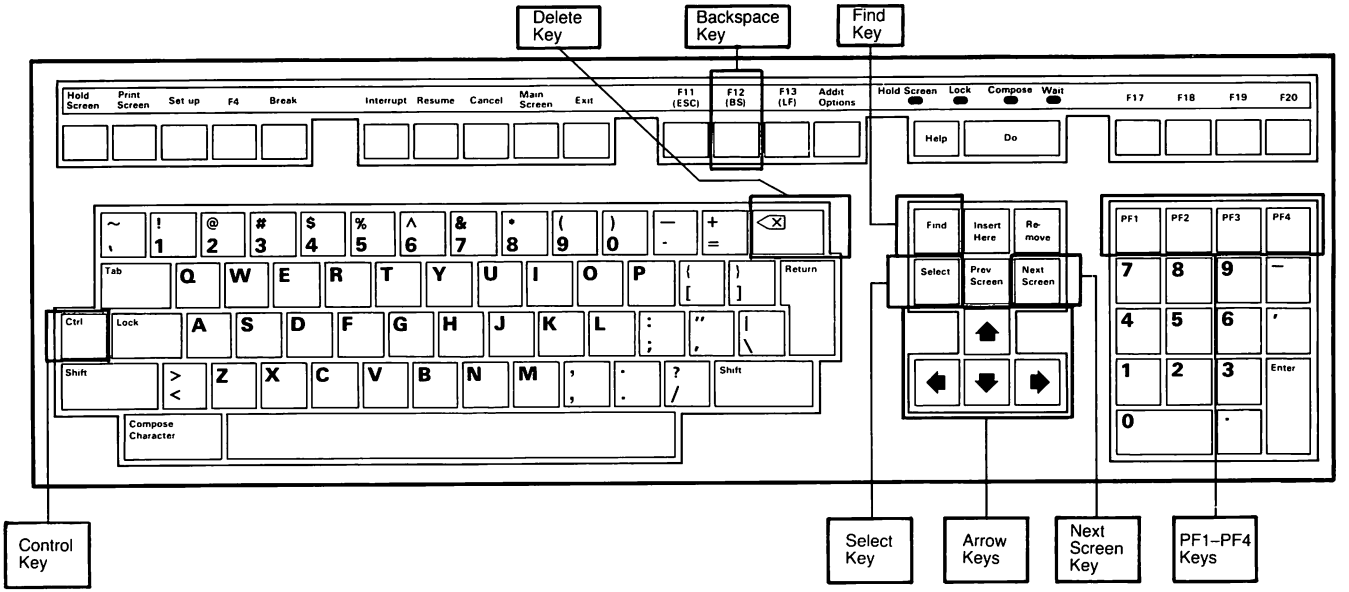


Figure 1. The Rainbow 100 Keyboard

Summarized in Table 1 are the functions performed by special keys and by CONTROL key combinations.

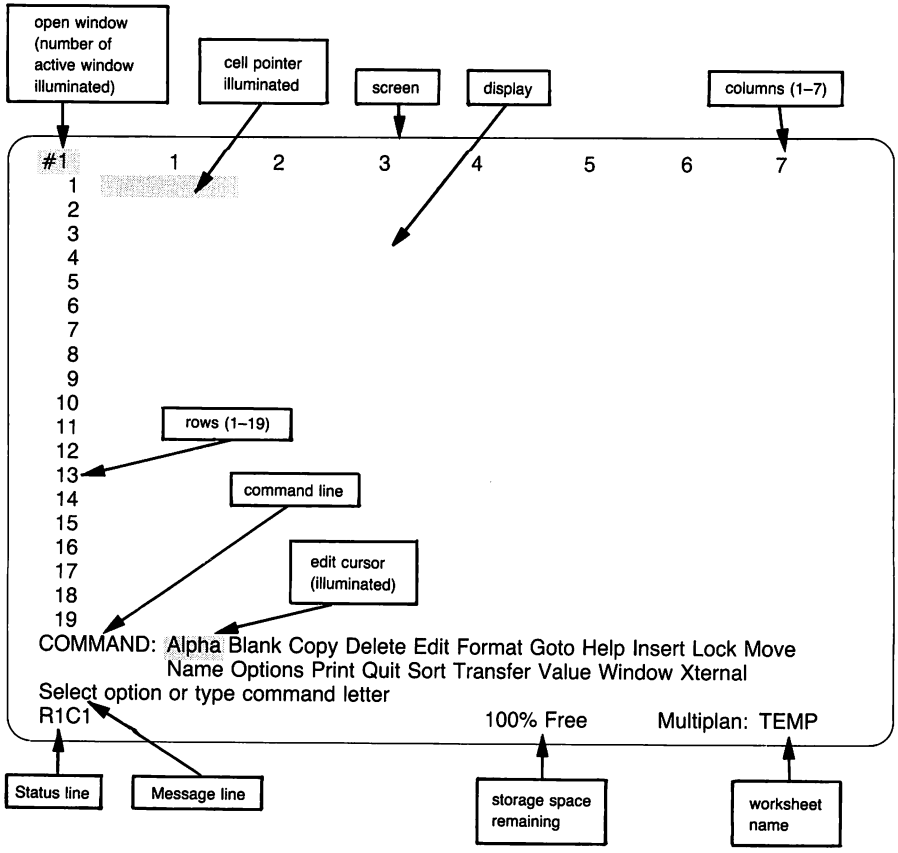
Table 1. Functions Performed by Special Rainbow 100 Keys

Key Name	Key's Function
UP ARROW key	(UP DIRECTION) Moves the cell pointer upward on the worksheet.
DOWN ARROW key	(DOWN DIRECTION) Moves the cell pointer downward on the worksheet.
LEFT ARROW key	(LEFT DIRECTION) Moves the cell pointer leftward on the worksheet.
RIGHT ARROW key	(RIGHT DIRECTION) Moves the cell pointer rightward on the worksheet.
FIND key	(NEXT UNLOCKED CELL) Moves the cell pointer to the next cell that contains data.
CTRL/Q (Press the CONTROL key and the Q key simulantaneously)	(HOME) Moves the cell pointer to Row 1, column 1—the start of the worksheet.
CTRL/Z (Press the CONTROL key and the Z key simultaneously)	(END) Moves the cell pointer to the last row down and right that is formatted.
NEXT SCREEN/ARROW key (Press the NEXT SCREEN key and then the ARROW key appropriate for the direction you want to scroll in. Press *and release* these keys as often as necessary to arrive at the page you want.)	(NEXT PAGE) Lets you see the next window—size page of the worksheet.
SELECT key	(NEXT WINDOW) Moves the cell pointer to the Next Window when the Window Split command is in effect.
HELP key	(HELP) Causes Multiplan-86 to display HELP information on the screen.

Key Name	Key's Function
DELETE key or BACKSPACE key	(DELETE/BACKSPACE) Moves cursor leftward in menu; deletes, one character at a time, anything you have typed in.
TAB key	(TAB) Moves the edit cursor rightward in the menu and among command fields.
SPACE BAR	(SPACE) Moves the edit cursor rightward in the menu.
RETURN key	(RETURN) Tells Multiplan-86 to carry out a command already selected from the menu or typed in response to a prompt.
CTRL/C (Press the CONTROL key and the C key simultaneously)	(CANCEL) Halts command execution; returns you to the menu.
PF2 key	(CHARACTER LEFT) Moves the edit cursor one character leftward.
PF3 key	(CHARACTER RIGHT) Moves the edit cursor one character rightward.
PF1 key	(WORD LEFT) Moves the edit cursor one word leftward.
PF4 key	(WORD RIGHT) Moves the edit cursor one word rightward.
REMOVE key	(REMOVE) Remove some proposed responses.
@ key	(REFERENCE) Changes relative references to absolute references.
! key	(RECALCULATE) Recalculates the entire worksheet. If typed in a formula, the formula will be replaced by its results.

The Screen

When Multiplan-86 is loaded and ready, your screen shows the following display:



Screen 1

Notice the numbers, words, and highlighted areas on the screen. What you see now is the basic Multiplan-86 screen. You will learn what the parts are as we progress through this manual.

Your screen displays only a small portion of the actual worksheet available to you. You can imagine the screen as a window to your worksheet (Figure 2):

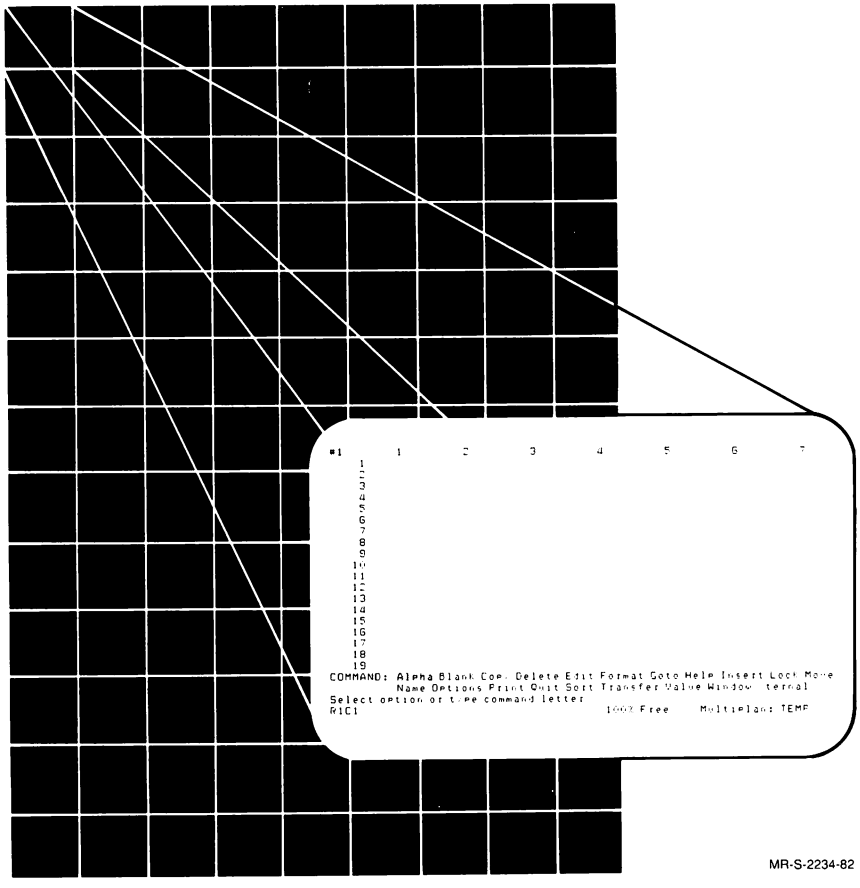


Figure 2. Window to the Worksheet

With Multiplan-86, it is possible for you to view the worksheet through more than one window at a time, and to see information on different parts of the worksheet. You will learn how to do that in Chapter 5.

Columns are numbered across the top. The illustrated screen now shows you 7 of the 63 worksheet columns.

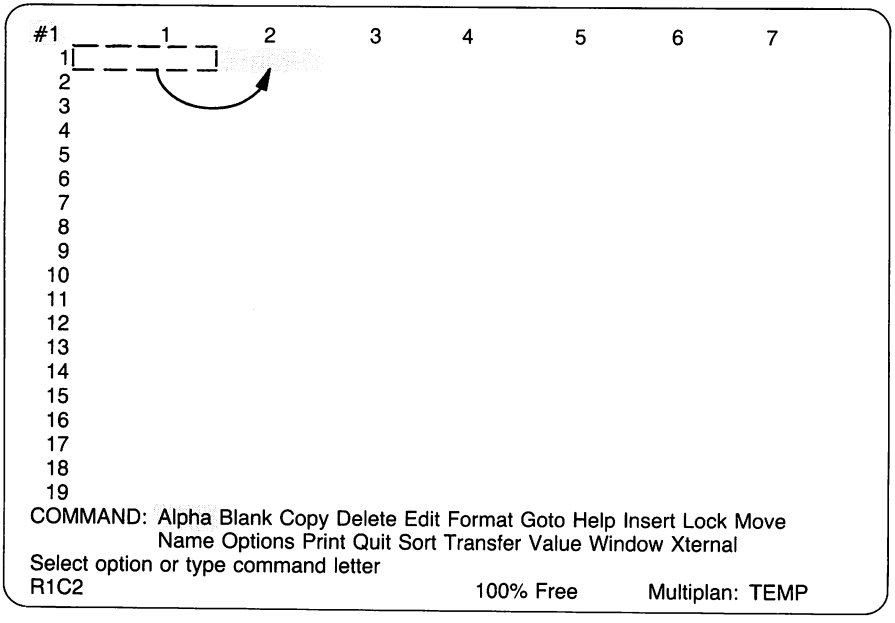
Rows are numbered down the left side of the display. The illustrated screen now shows you 19 of the 255 worksheet rows.

Imagine lines running vertically between the column numbers and horizontally between the row numbers to form boxes on the worksheet. Each box is called a "cell." Cells hold the information of the worksheet.

The cell that is available for immediate use, the active cell, is illuminated by the cell pointer. The cell pointer is in the upper left corner of the display; in row 1, column 1. A cell is identified by its location; the row number is always given first, followed by the column number. Cell "row 1, column 1" (R1C1) is the active cell now.

Moving the Cell Pointer

Press the RIGHT ARROW key once. Now look at the cell pointer. You moved it one cell to the right, to column 2 (Screen 2). The pointer is now in row 1, column 2 (R1C2). That cell is now the active cell.



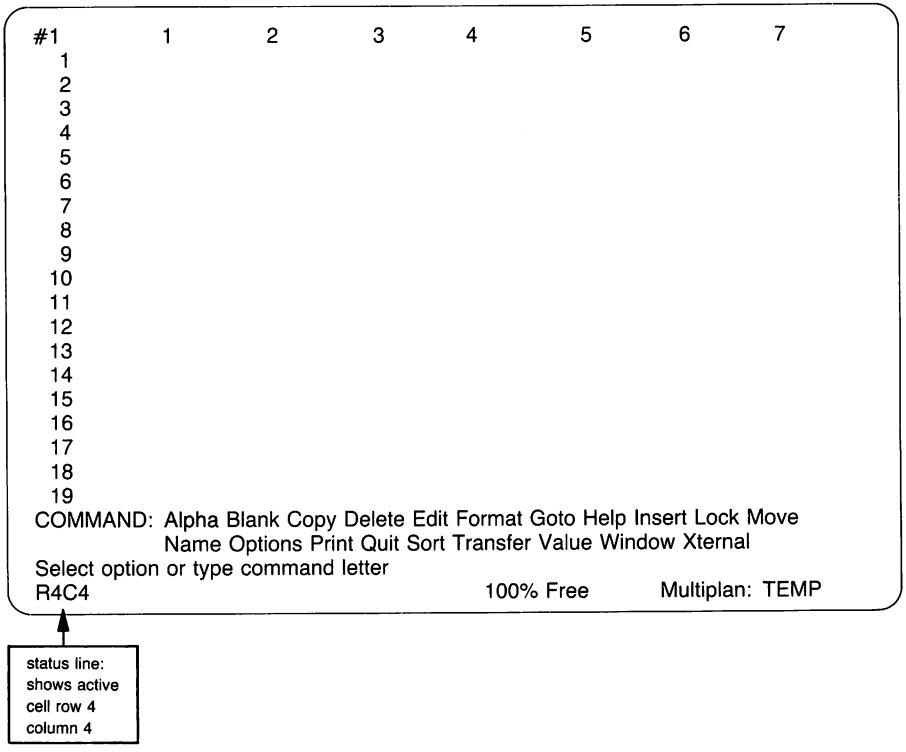
Screen 2

Try the other direction keys. Watch how the cell pointer moves.

Try to move the cell pointer to row 4, column 4 (R4C4). You can press the direction keys in any order you want.

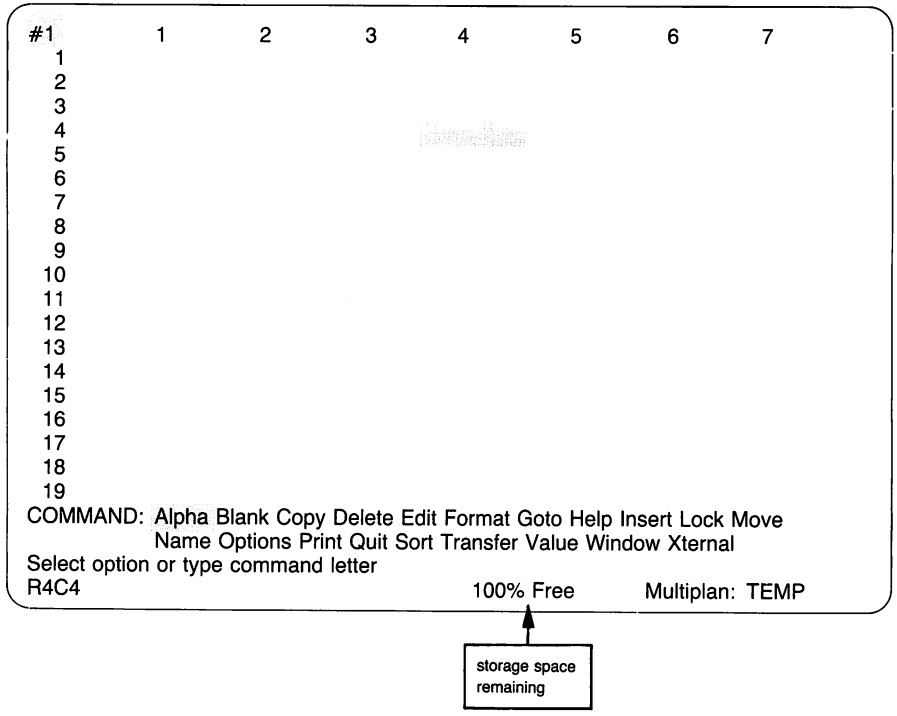
The Status Line

The bottom line of the screen is called the status line. It tells you the location of the active cell and what it contains. Right now the status line should read R4C4, which is a location. If any other location is shown, use the direction keys to move the cell pointer to row 4, column 4. The space next to R4C4 shows the contents of the cell; right now the cell is blank, so the space is empty.



Screen 3

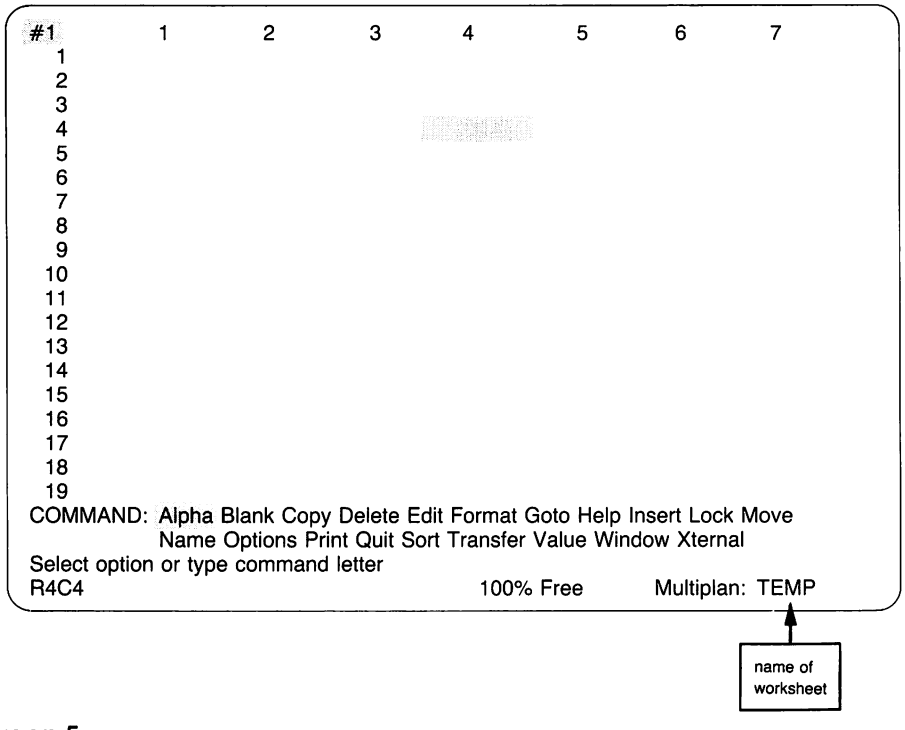
Look at the percent in the center of the status line. It tells you how much working memory is left. This value will vary with the amount of data you are working on and with the amount of memory on your Rainbow 100.



Screen 4

100% Free means that all of working memory is available for your use. Check this percent as you continue with your work. The number shows how much working memory is left.

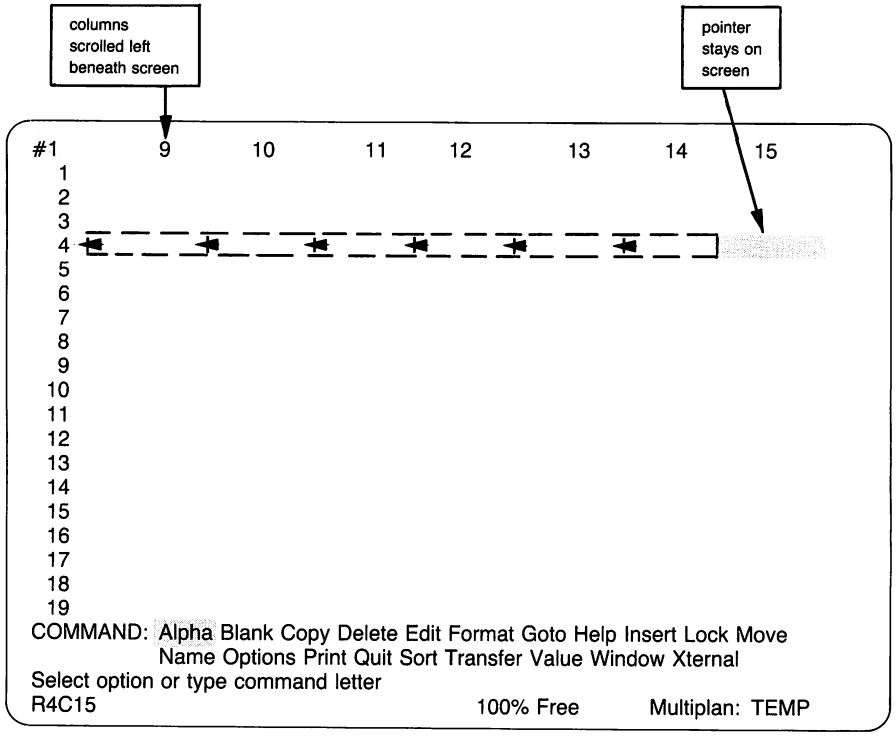
Since you can name worksheets for ready reference, the status line also tells you the name of the worksheet currently in use. Until you give your sheet a name of your own, Multiplan-86 calls it TEMP (for temporary).



Screen 5

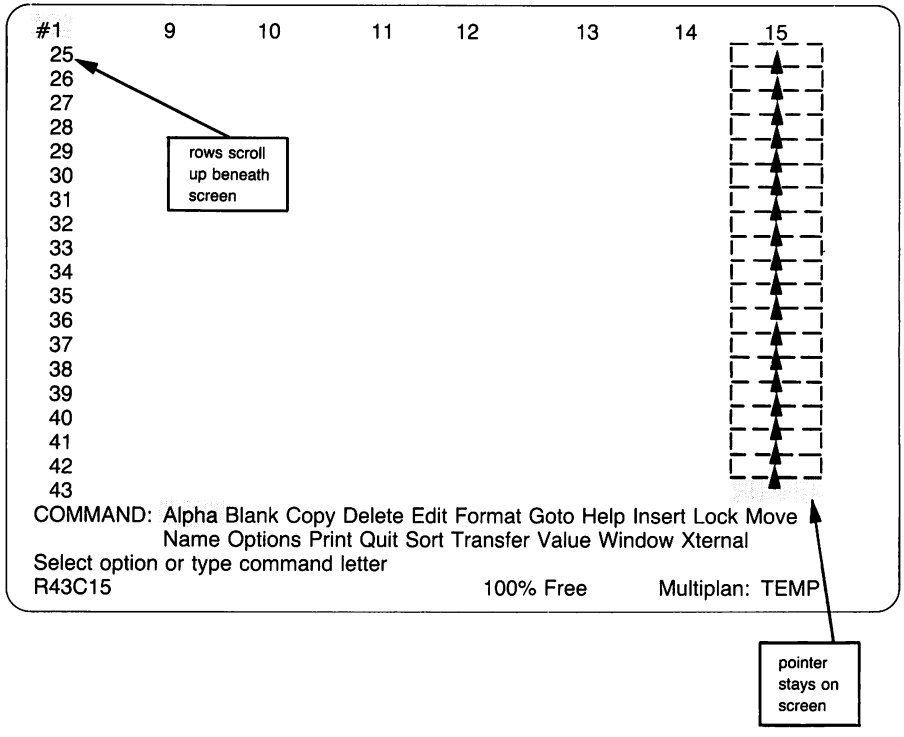
Scrolling the Worksheet

The illustrated screen shows you only seven columns. What if you want to see column 15? Press the RIGHT ARROW key until the cell pointer reaches the right edge of the display. As you continue to press the RIGHT ARROW key, the pointer remains still; but the columns move to the left beneath it. This is called scrolling. Press the RIGHT ARROW key until column 15 is reached. (Columns 1 through 8 are no longer visible on the left.) You are now in row 4, column 15 (R4C15) (Screen 6).



Screen 6

Now press the DOWN ARROW key until the cell pointer reaches row 43. You are now in row 43, column 15 (R43C15) (Screen 7).

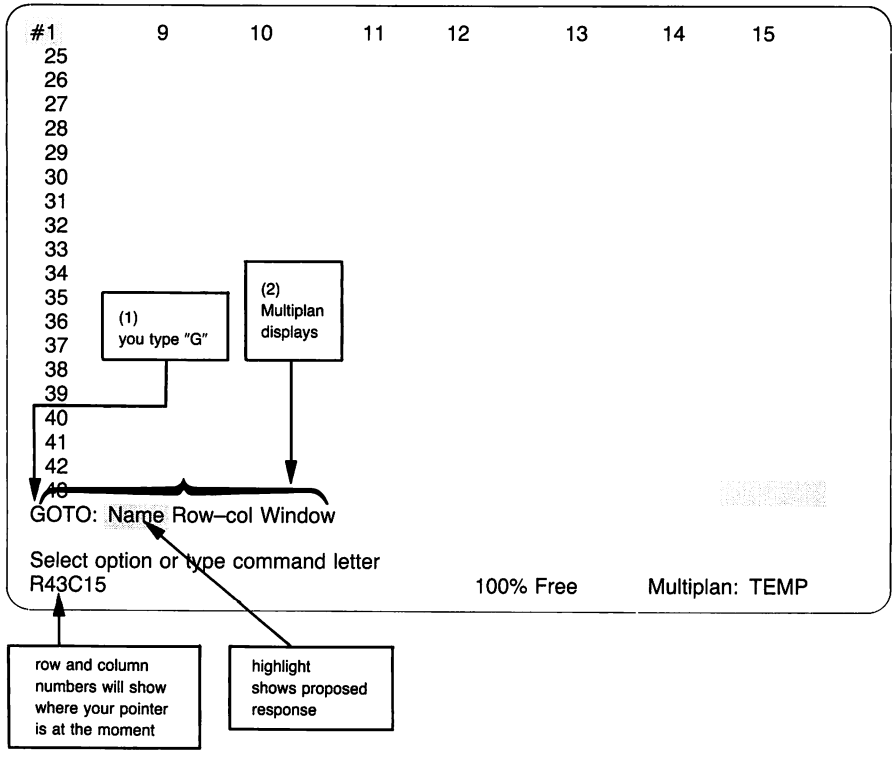


Screen 7

Notice that during all of these movements, the cell pointer always stays on the screen. When the cell pointer reaches the edge of the display, the row numbers or the column numbers scroll underneath the screen. You could visualize this as sliding the window around the worksheet.

You could return to the upper left corner of the worksheet (R1C1) by pressing the UP ARROW and LEFT ARROW keys until the cell pointer arrives there. There is another, faster way to move the cell pointer to R1C1.

The GOTO (G) Command . There is a way that is faster than using the direction keys to reach a cell on a different part of the worksheet. Press the **G** key. On the command line which is at the bottom of the screen, above the status line and message line, you should see the command (Screen 8):

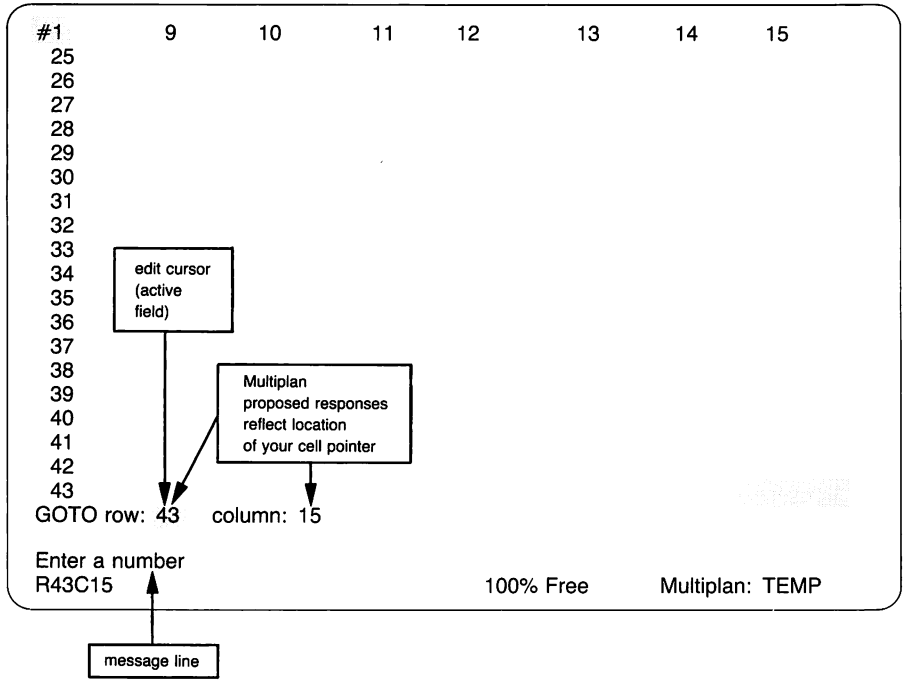


Screen 8

You can see that the Goto Command now offers you a choice of subcommands: Name, Row-col(umn), or Window. (Names are discussed in Chapter 4; Windows in Chapter 5.)

Look at the illuminated box on the command line. It shows which command is selected on a menu.

If you now press **R**, your display will look like Screen 9.

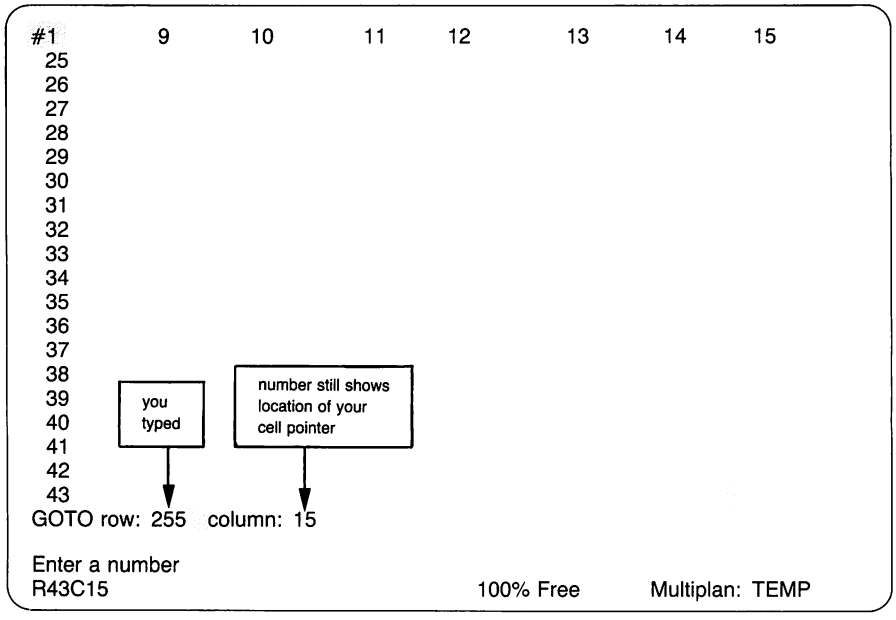


Screen 9

Multiplan-86 also displays numbers in the command line, in this example, one number by "row" and one number by "column." The words "row" and "column" are the names of command "fields," which are where you tell Multiplan-86 how you want a command carried out. Entries in these command fields are called "responses". When you first select a command, Multiplan-86 proposes responses in the command fields; these responses are called "proposed responses." Multiplan-86 determines proposed responses from various aspects of the worksheet and your previous responses in commands fields. In this case, the proposed responses in the command fields are based on the current position of the cell pointer.

Look at the message line below the command line. It reads, "Enter a number". The highlight (called the edit cursor) is in the first field ("row"). Respond with the last row on the worksheet, row 255: type **255**.

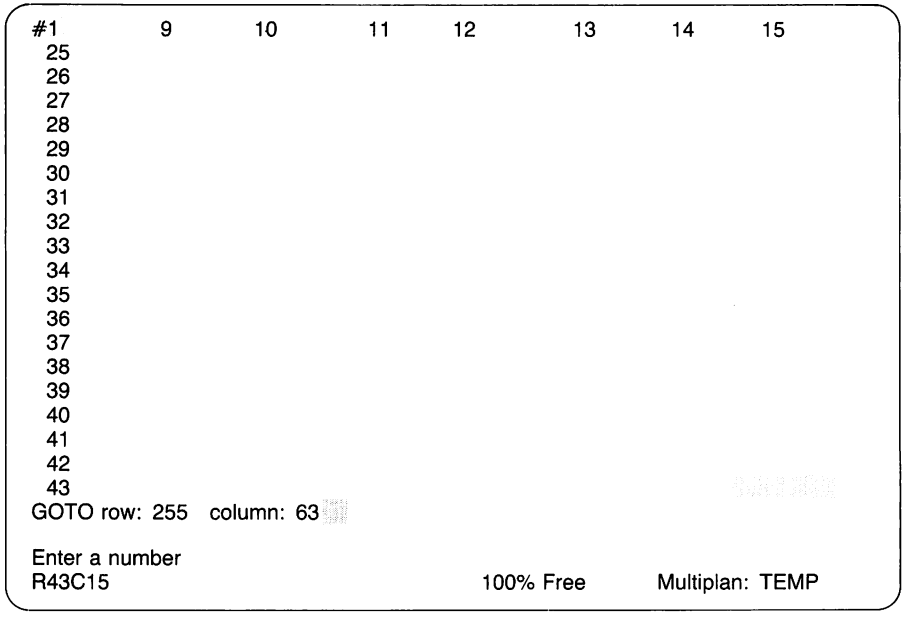
The command line should now look like the one in Screen 10.



Screen 10

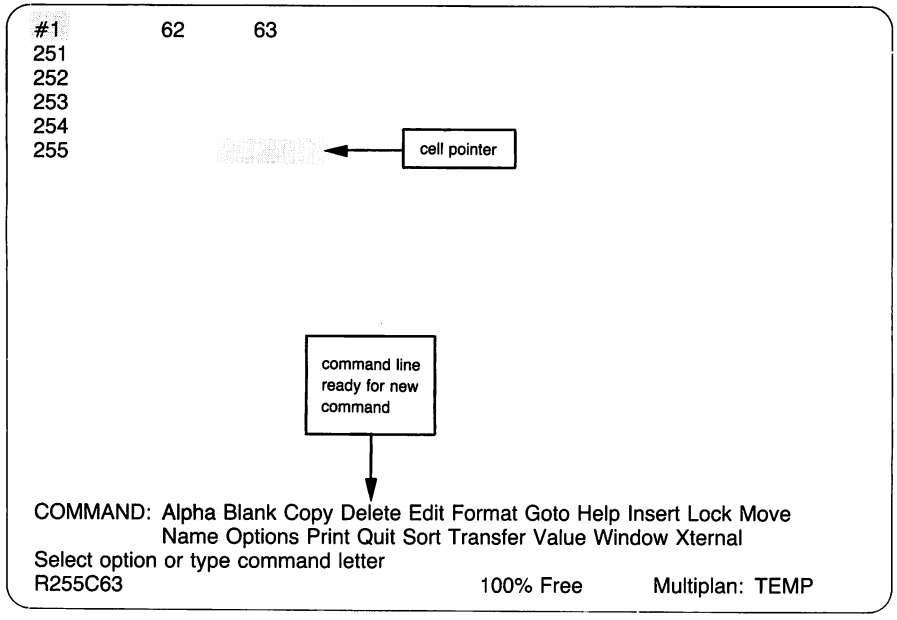
The edit cursor is now after the 255. Press TAB to move the cursor to the second field in the command line.

With the edit cursor in the second field ("column"), pick the last column on the worksheet, column 63: type **63**. The command line looks like this:



Screen 11

You have now selected the cell (by its row and column numbers) to which you want the cell pointer to go. But, Multiplan-86 does not carry out the command until you tell it to do so. Press RETURN. Your screen should look like Screen 12:



Screen 12

You have moved the cell pointer to a different part of the worksheet by using the Goto command. Use this command to move quickly to any part of the worksheet.

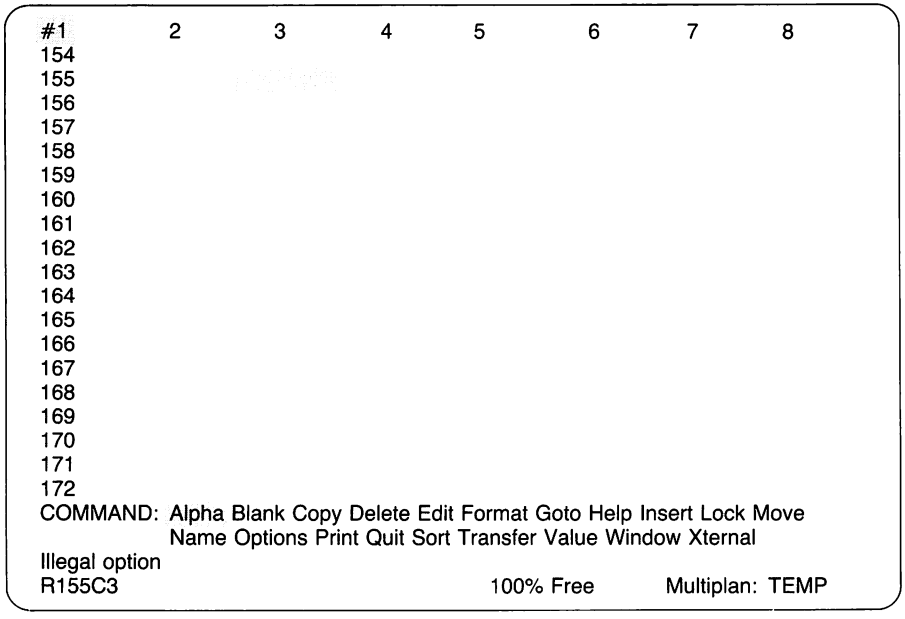
What if you changed your mind? Suppose you decided you wanted row 155 instead of row 255. Press **G**, then **R** again. When the edit cursor is in the first field for row number, simply type **155**. If you want to change the last field for column number, use the TAB key to move the edit cursor to that field and type in the new number, for example, **3**. Notice that, as you type **3**, both digits of the **63** are replaced at once.

Press RETURN to carry out the command. The cell pointer is now on row 155, column 3.

Command Selection From Menus

All Multiplan-86 commands are selected as the Goto Command is: you first select the initial letter of the command you want, then you choose one of several versions of the command (subcommands) with another letter.

NOTE: *If you press a key that does not work as a command (an invalid command), such as the letter j, the command line does not change, but you see the message "Illegal option".*



Screen 13

The lists of commands (or subcommands) are called menus. In fact, any time you see choices on the command line, that is a menu. You can select an option from a menu, as the message in the message line tells you to do ("Select an option or type command letter"), by typing the first letter of the option you want.

There's another way to select commands and other options from the menu. Press either the TAB key or the SPACE BAR and watch the command line. The highlight moves left to right, stopping at each command name.

Press either the TAB key or the SPACE BAR until Goto is highlighted. Now press RETURN. The command line should look the same as it did when you typed *G* earlier.

Similarly, you can press either the TAB key or the SPACE BAR to move between "Name", "Row-col", and "Window". When the highlight rests on "Row-col", press RETURN and you'll see the "row" and "column" fields as before.

Either the BACKSPACE key or the DELETE key can be used to backup (move right to left) through a menu.

To save you time, Multiplan-86 presents the choice of subcommands in the order you are most likely to use them. If choices are equally as likely to be used, they are presented in alphabetical order.

You continue to select subcommands until the command line shows command fields. Command fields tell Multiplan-86 how to perform the command.

Multiplan-86 Proposed Responses. When the command line shows fields (for the Goto Row-col command the fields are "row" and "column"), each field shows a proposed response. In some fields, the proposed response is a blank. In some fields, a proposed response which looks like a typed-in response is given. In fields that have a menu of possible responses, the proposed response is shown either by the highlight when the edit cursor is in that field, by parentheses when the edit cursor is in that field, or by parentheses when the edit cursor is in another field.

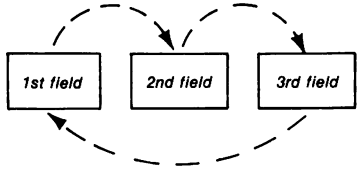
Proposed responses often reflect the current settings, positions, and name of the worksheet that you are working with. If you agree with the proposed response, merely press the RETURN key to carry out the command; or press TAB to move to the next command field. If you do not want the proposed response, you can change the command field to the response you want.

When you are selecting a command or subcommand, the first choice shown is highlighted. This is also called a proposed response. If you agree with the proposed response, merely press the RETURN key, or press the SPACE BAR or the BACKSPACE key to move to another choice. The command line changes to display your choice.

Filling in the Command Line: The TAB Key. The command line is divided into as many fields as there are choices to be made. The edit cursor shows you which field is active (available for immediate use).

The cursor is moved from field to field by the TAB key, and returns to the first field after the last field has been reached.

In commands with more than two fields, the TAB key moves the cursor like this:



MR-S-2440-82

Figure 3. TAB Key Movement

Look at the message line below the command line. Multiplan-86 shows you what kind of response you should make in each field. As you move from field to field, the message may change. For the Goto Row-col command it doesn't because both fields require the same type of response, but the message changes for other commands, as you will see later.

Carrying Out a Command: The RETURN Key . Multiplan-86 does not carry out the command until you tell it to do so. The RETURN key is used to carry out commands.

Also, as shown earlier, the RETURN key is used after you use the TAB key or SPACE BAR to move the edit cursor to command or subcommand name. (Use the BACKSPACE key to move the edit cursor backward.)

You can press the RETURN key at any time that the command line appears as you want it. If all the responses in the command fields are correct, you can simply press RETURN; you are not required to move the edit cursor first.

When a command has been carried out, the command line reappears and waits for a new command from you.

Cancelling a Command: CTRL/C . At any time before you press RETURN to carry out a command, you can press a CTRL/C to cancel the command. When you press a CTRL/C, the main command menu reappears; and the worksheet appears as it did before you began the command.

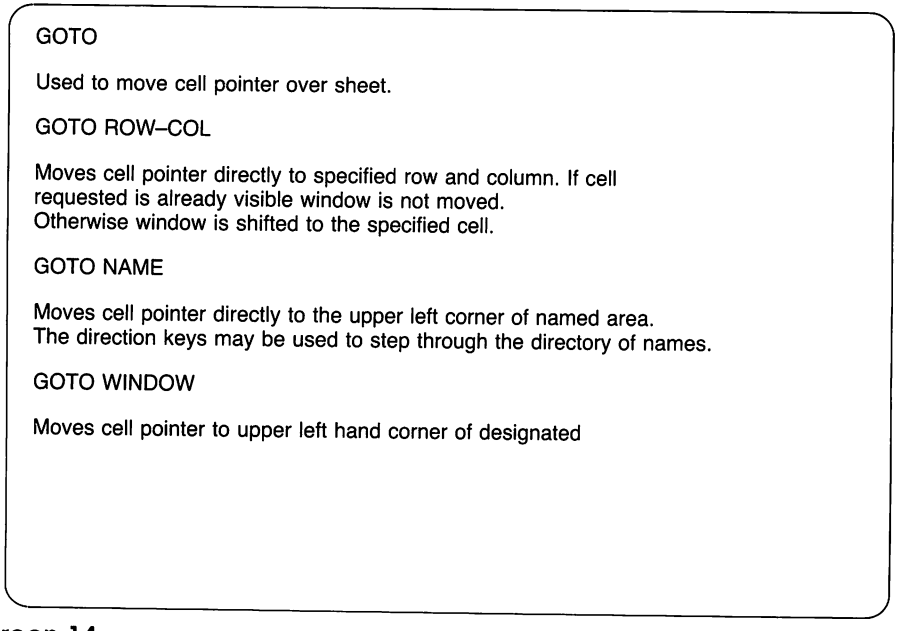
The HELP (H) Command

Multiplan-86 includes a special Help Command to assist you while using Multiplan-86.

The help information is always available to you simply by pressing the HELP key on the Rainbow 100 Keyboard.

Let's use the Goto Command to illustrate how the Help command works.

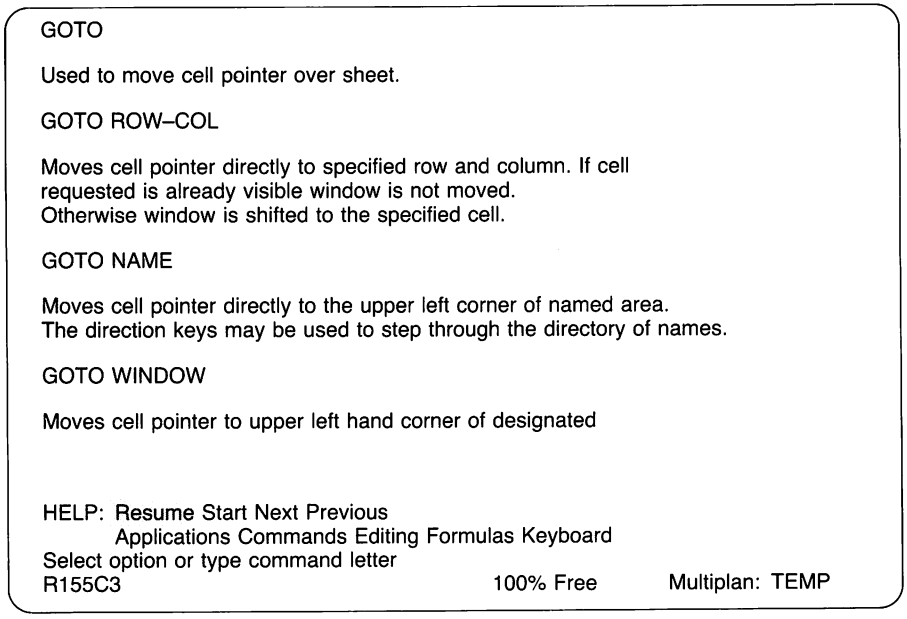
Select the Goto command by using SPACE; do not press RETURN. When the highlight rests on Goto, press the HELP key. The Multiplan-86 worksheet is replaced by the HELP information for the Goto command (Screen 14).



Screen 14

As you can see, the information given for "GOTO ROW-COL" describes what happened when you used the Goto Row-col command.

Notice also that there is a new menu in the command line that looks like:



Screen 15

These subcommands are used to view various parts of the help information.

For right now, press **C** (for Commands). The Goto information is replaced by the beginning of the "COMMAND OVERVIEW," which describes how to select commands, as discussed earlier.

Now, press **N** (for Next). The rest of the "COMMAND OVERVIEW" is shown. You will need to use the N subcommand often, because the information for many topics is longer than one screenful.

Now, press **R** (for Resume). The Multiplan-86 worksheet display is exactly as you left it; no changes were made. As you can see, the Goto command is still highlighted.

By using the Help Command, you'll begin to see how it adapts the information to your situation. Let's take Goto again.

Select Goto (if you used the SPACE BAR to do this, press RETURN). With the "Name" subcommand highlighted, press the HELP key.

Now the screen shows only part of the Goto information, with "GOTO NAME" at the top.

Press **R**. Move the highlight to Row-col and press the HELP key. Now "GOTO ROW-COL" is at the top.

Whenever you request HELP information with the HELP key, the information at the top of the screen describes the command or subcommand you selected.

When you are at the menu, the HELP key works in a slightly different way. (To return to the main command menu—press CTRL/C.) When the main command menu is on display, press the HELP key. Multiplan-86 replaces the worksheet display with the beginning of the Help information.

Now, you can use the Help subcommands in the menu to move through the help information.

From now on, whenever you need quick assistance, you know you can get help by pressing the HELP key.

One final piece of information on the HELP Command: Press the HELP key, then press **K** (for Keyboard). The beginning of the list of keys appears. Use "Next" (press **N**) to view the rest of the list. After you have finished looking at the HELP file on the keyboard, type **R** to return to the main menu.

The Quit (Q) Command

In your next Multiplan-86 lesson, you will learn how to write in the cells. To leave Multiplan-86 now, however, use the Quit Command. Press **Q**. Your screen shows:

Screen 16

The command line asks you to confirm your decision to erase the screen by typing Y for Yes. Press **Y**.

Later you will learn how to save any work you have done before you use the Quit Command.

The worksheet is cleared from the screen and replaced by the CP/M prompt.

Summary

In this session you learned:

- What the different parts of the screen look like and what they mean.
- Where the direction keys are located on the keyboard, and what they do.
- How to move the cell pointer using the direction keys.
- Where the status line is located, and what it tells you.
- How to scroll the worksheet by using the direction keys.
- How to get to another cell quickly by using the Goto (G) Command.
- How commands are structured.
- How Multiplan-86 helps you by presenting proposed responses.
- How to move the edit cursor between fields by using the TAB key.
- How to carry out a command by using the RETURN key.
- How to request help by using the Help (H) command.
- How to leave Multiplan-86 by using the Quit (Q) command.

2

Building a Worksheet

In Chapter 1, you learned how to start Multiplan-86 and how the rows and columns are used to identify the cells of the worksheet.

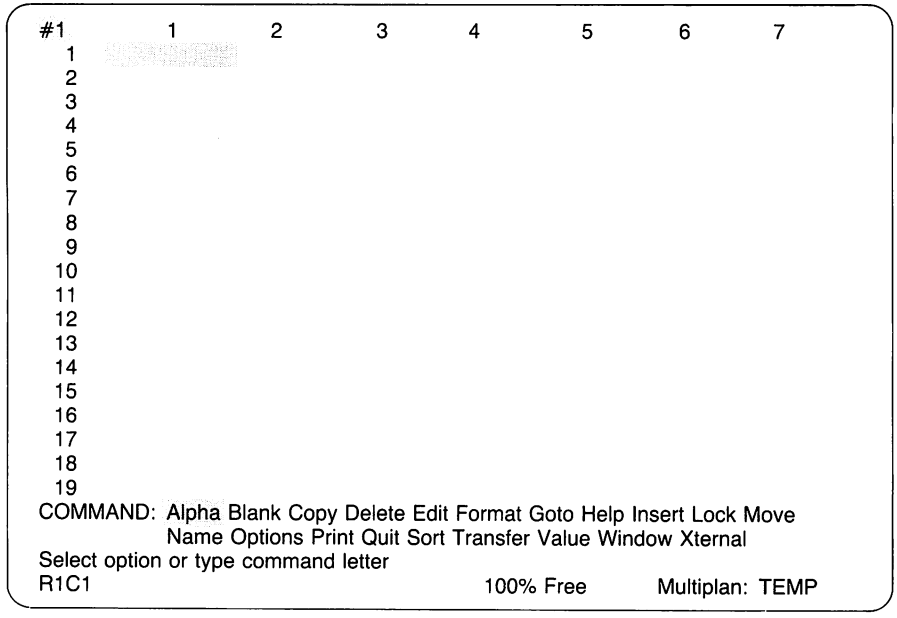
You also learned how to move the cell pointer to different parts of the worksheet by using the direction keys, and how to move the pointer quickly by using the Goto command.

In this session you shall begin to build a worksheet. You will learn how to change cell entries and correct mistakes as you go along. You will also begin work on a financial analysis for a model company—Spencer Ceramics.

A large industrial firm is considering buying Spencer Ceramics and has requested a projected income statement; the firm has asked for a summary operating budget, showing projected sales, costs, and gross profits. If, on the basis of this information, Spencer Ceramics looks like a good investment, the firm will send in its own accountants to do a more detailed survey.

The Worksheet Number Grid

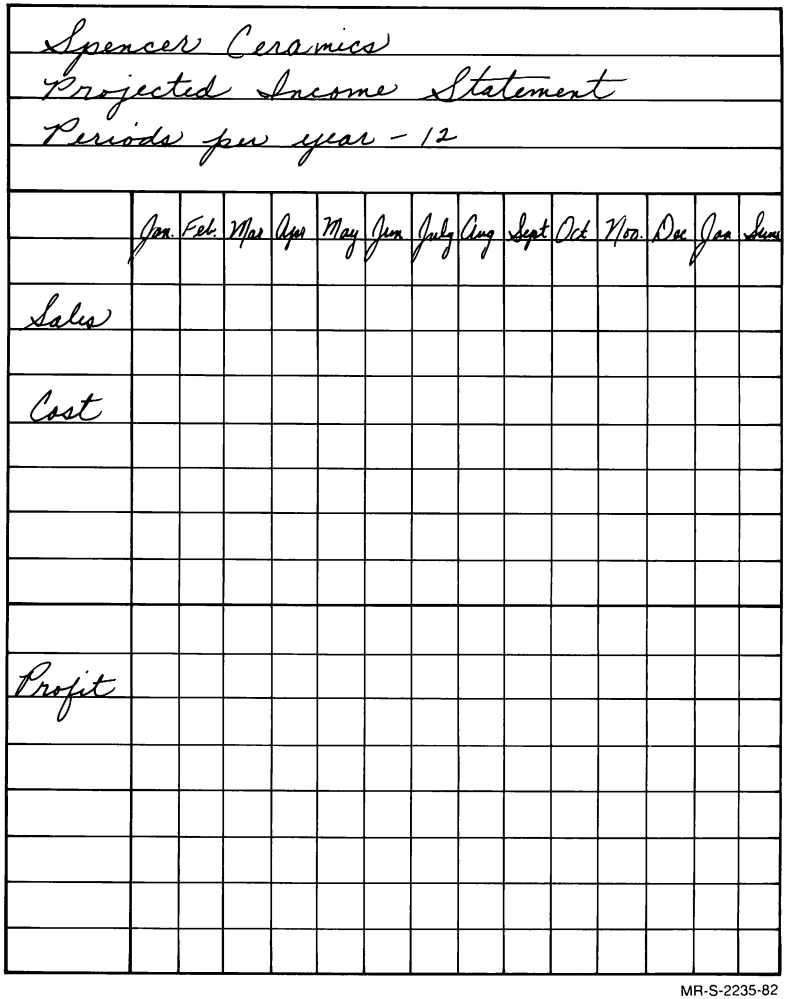
Load the Multiplan-86 disk according to the instructions given in "Loading and Starting Multiplan-86," in Chapter 1. In a moment you will see that the row and column numbers, as well as the command, message, and status lines appear on the screen.



Screen 17

The row and column numbers are merely guides for entering the forecast data. The information on the command, message, and status lines is there only to help you enter the figures on the worksheet and does not appear on the final printed form.

To plan what needs to be done in your analysis of Spencer Ceramics, sketch a brief outline with pencil and paper, showing how the table is to be set up.



MR-S-2235-82

Figure 4. Sample Income Statement

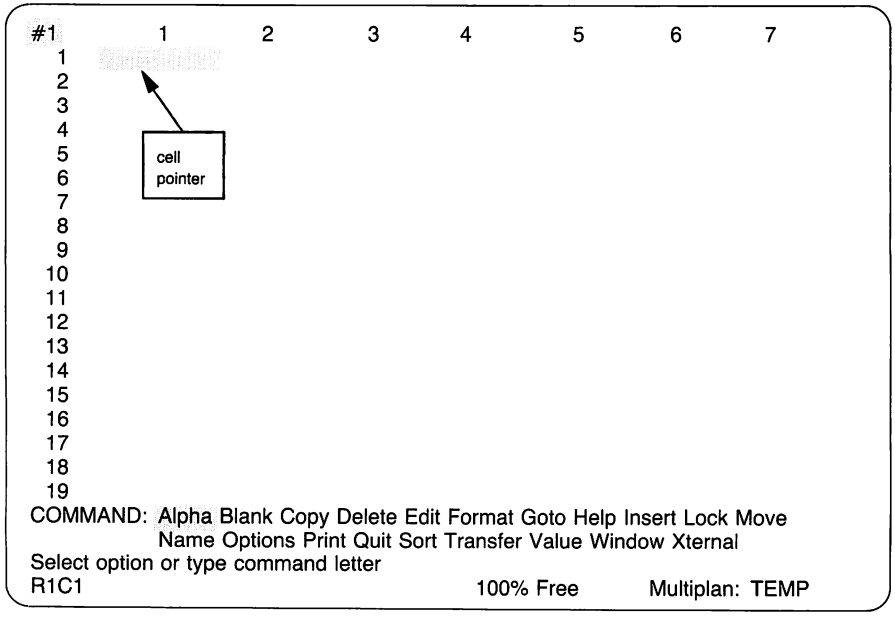
With Multiplan-86, it is easy to expand the table later to add more items, to insert rows or columns of space, or to delete unwanted items. It is even easy to change a figure, such as January sales; Multiplan-86 recalculates the entire table automatically.

Entering Text

The Alpha (A) Command . To prepare the table for the figures on Spencer Ceramics, begin by entering the headings for the rows and columns. You can add a title to the sheet later.

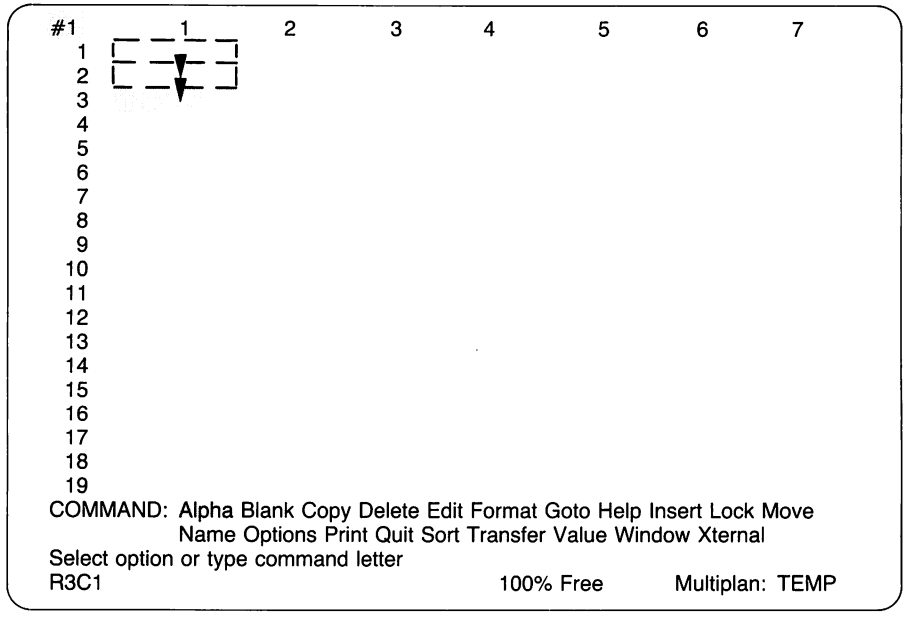
Text and numbers are entered in different ways. Since Multiplan-86 is designed to deal primarily with numbers and formulas, it automatically recognizes numbers as soon as they are typed. Therefore, if you want to enter text or a title, you must specifically tell Multiplan-86 that you want to enter text, and not a formula, into the cell. You do this by using the Alpha (A) Command.

Before you begin, look at the cell pointer on your screen. It should be in row 1, column 1 (R1C1). If it is not, use the arrow keys or the GOTO Command to place it there.



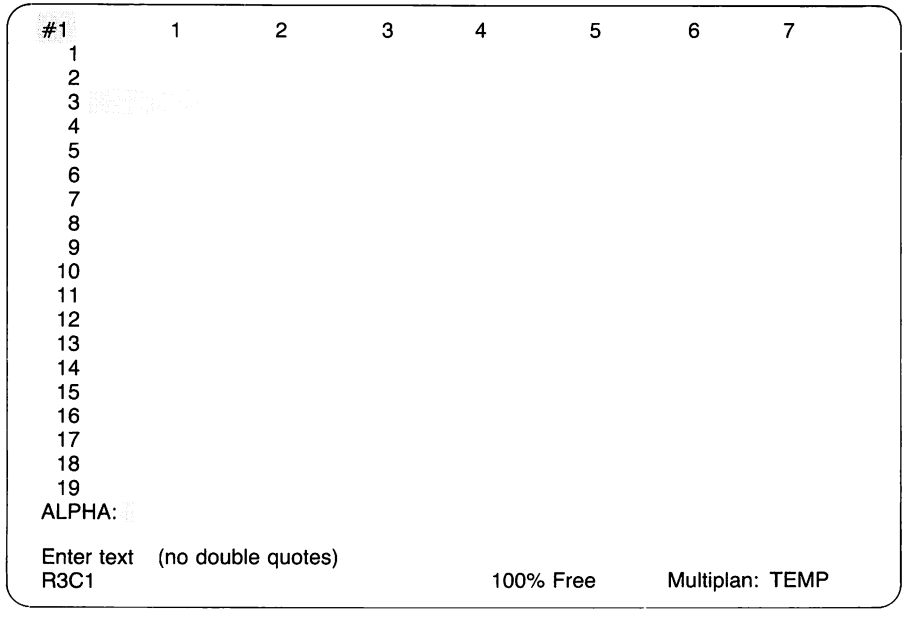
Screen 18

Since you will need some room at the top of your table for the names of the months, move the cell pointer down two rows. The pointer is now in row 3, column 1 (R3C1).



Screen 19

Now press **A**. You see:



Screen 20

The command line indicates selection of the Alpha Command, and the message line informs you that the next step is to enter the text you want. Begin by entering Sales in column 1.

Type **Sales.**

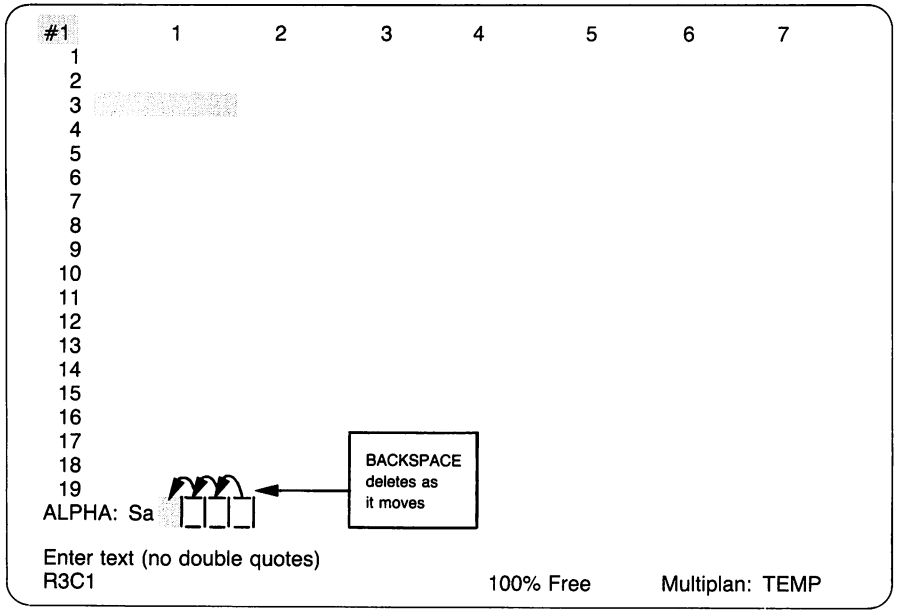
NOTE: *Multiplan-86 does not care if typed entries are upper or lower case.*

Now you see:

ALPHA:Sales

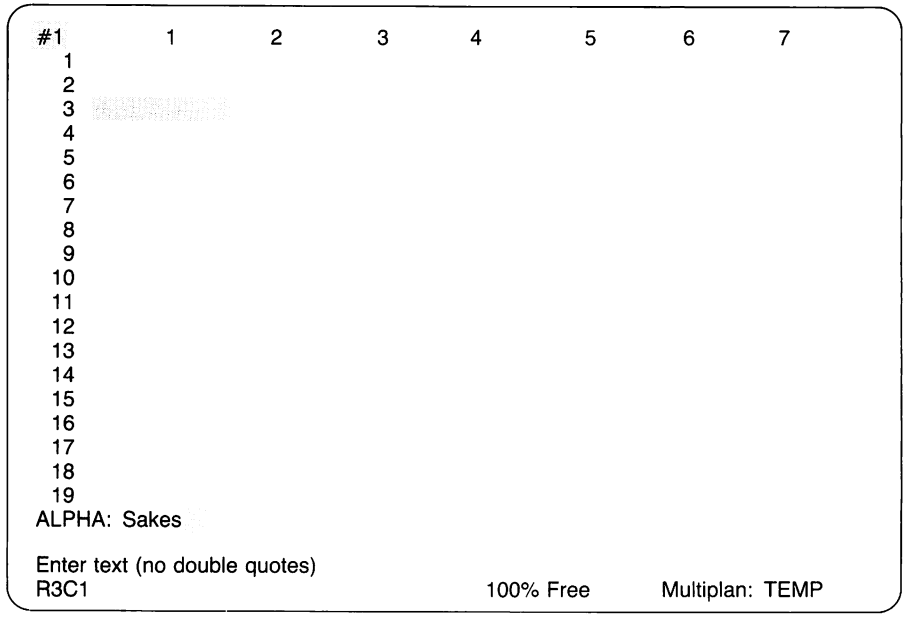
Correcting Typing Errors

The BACKSPACE Key . The edit cursor is located immediately after the text you have typed. Before you press RETURN to enter the command in the cell, try editing the word *Sales* by using the BACKSPACE key. Press BACKSPACE three times. You see that the edit cursor deletes the character to its left as it moves. You now have:



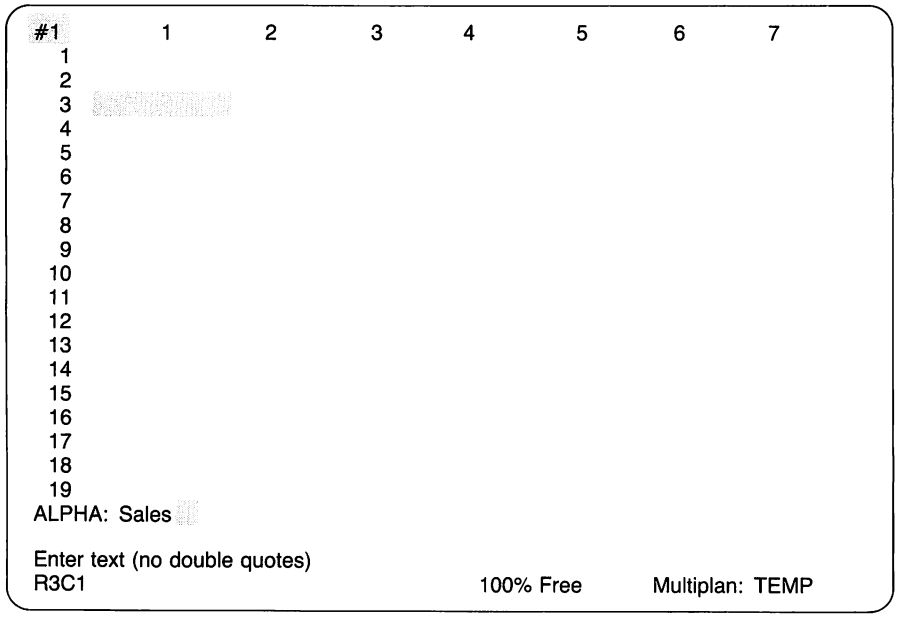
Screen 21

This time type the word incorrectly. Finish typing *Sakes*. Notice that the new characters appear just to the left of the edit cursor. When you've finished typing, you have:



Screen 22

Now use BACKSPACE again and correct the text to *Sales* once again, so that the screen looks like:

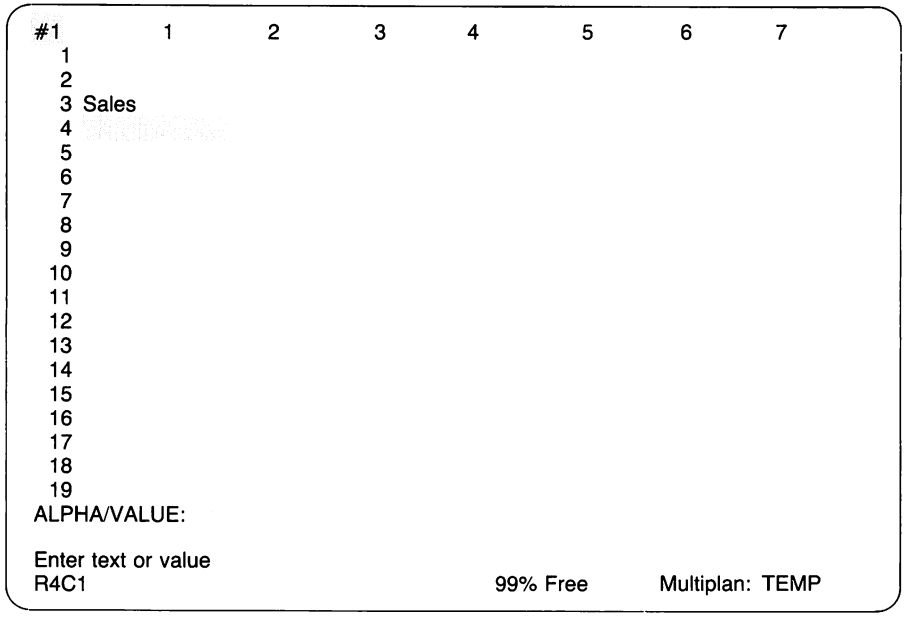


Screen 23

Entering Data with the Direction Keys

Now that the word Sales is correct, you can enter it into the cell in two ways:

1. You could first press RETURN, and *Sales* would appear in the cell R3C1. Try it to see. You now need to press a direction key to move the pointer to the next cell. Before you press a direction key, consider the second way to enter data.
2. A faster way to enter text is to press the DOWN ARROW key (instead of RETURN), moving the pointer to the next cell in which you want to work. *Sales* is entered automatically. Try it. Press *A* (for Alpha); *Sales* now appears next to ALPHA: in the command line. Now press the DOWN ARROW key. **Sales** reappears in cell R3C1, and the cell pointer moves down to R4C1. Notice the command line; it shows:



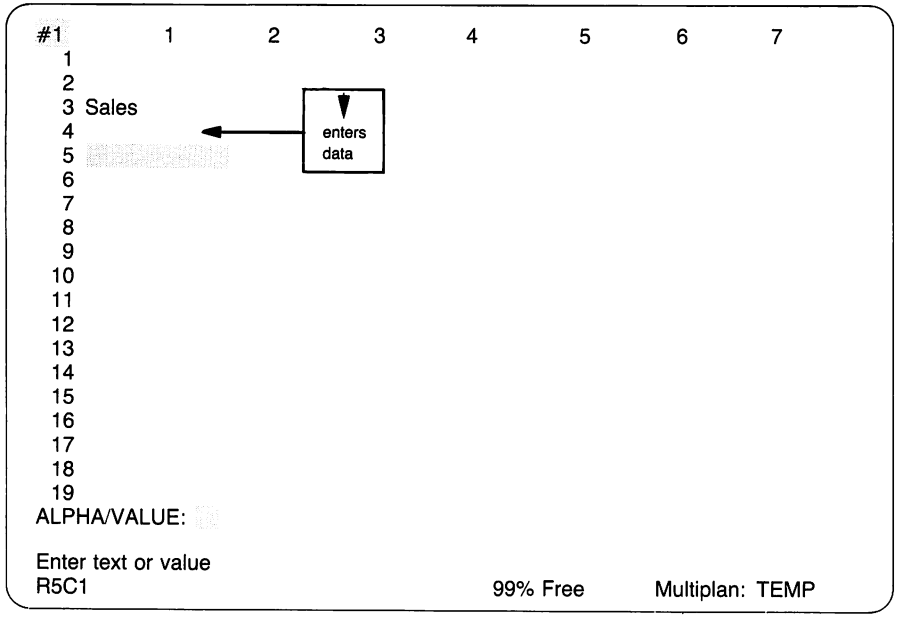
Screen 24

The next key you press selects either the Alpha Command or the Value Command, just as if you pressed **A** or **V**.

If you press one of the characters = (equals), + (plus), - (minus), . (period), ((right parenthesis), or " (quotation mark), you select; the Value Command. All other keys select the Alpha Command. (You may, of course, use any direction key; your choice depends on the cell you want to use next.)

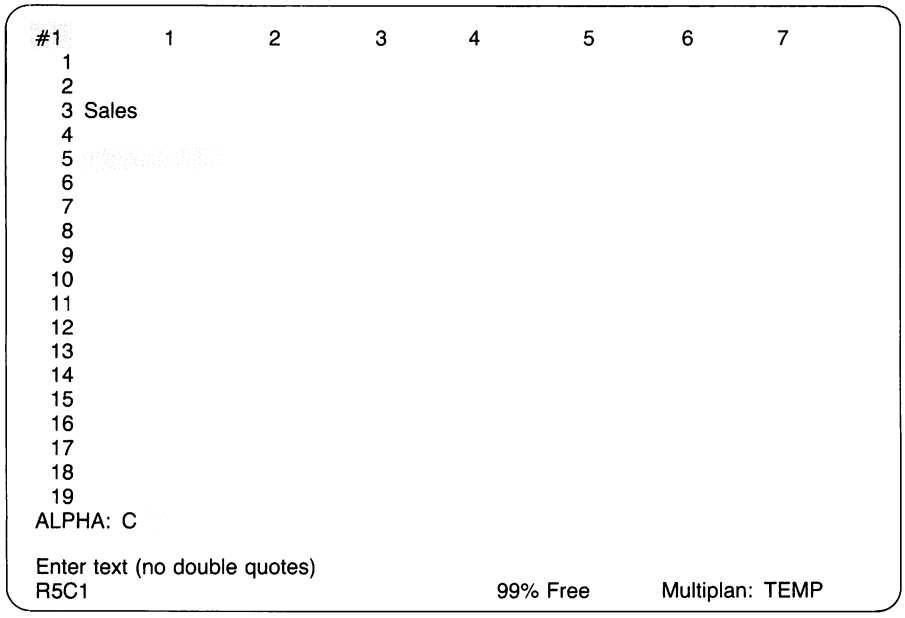
This feature saves you many keystrokes as you continue to work with Multiplan-86, especially when entering a sequence of text and values in successive cells.

To enter Cost, move down to row 5 in column 1. The cell pointer should now be in row 5, column 1 (R5C1).



Screen 25

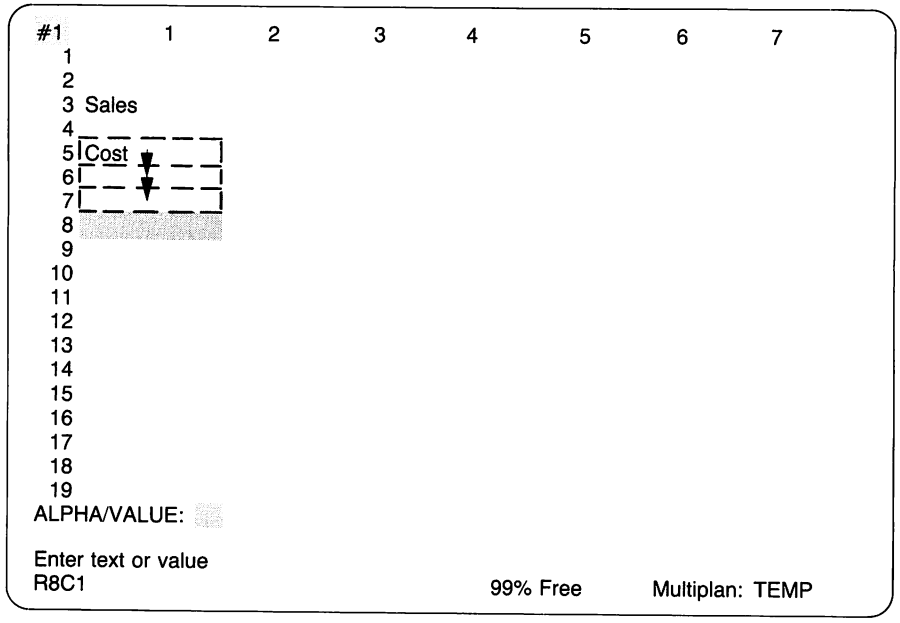
Multiplan-86 is waiting for your next instruction. Tell it that you want to enter more text by beginning to type *Cost.* As soon as you press *C,* the command line changes from ALPHA/VALUE: to ALPHA:, and the message line changes from "Enter text or value" to; "Enter text".



Screen 26

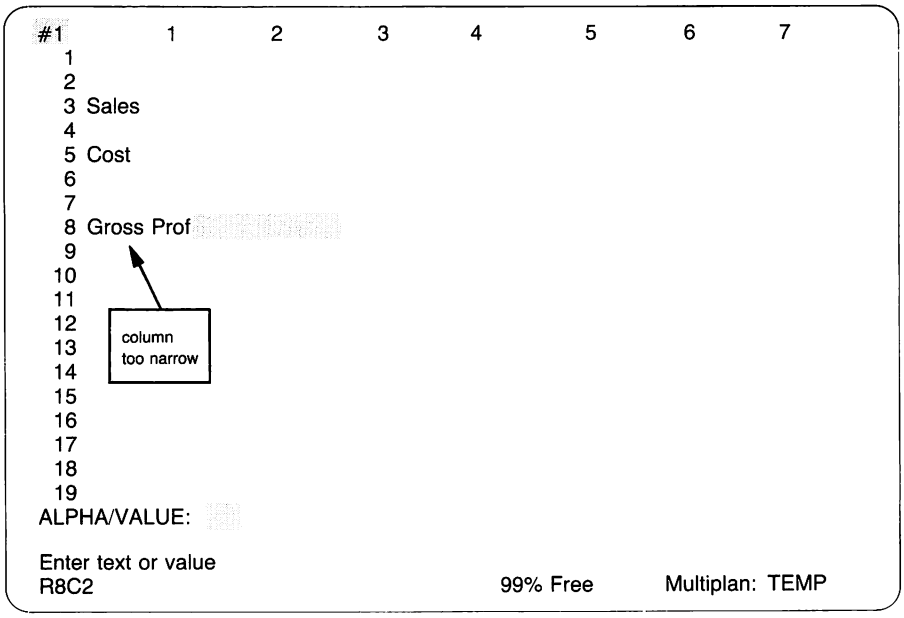
Finish typing **Cost**.

To enter Cost in row 5, column 1 (R5C1), press the DOWN ARROW key until the screen looks like this:



Screen 27

Now enter **Gross Profits** in cell R8C1 (your current position), and press the RIGHT DIRECTION key once.



Screen 28

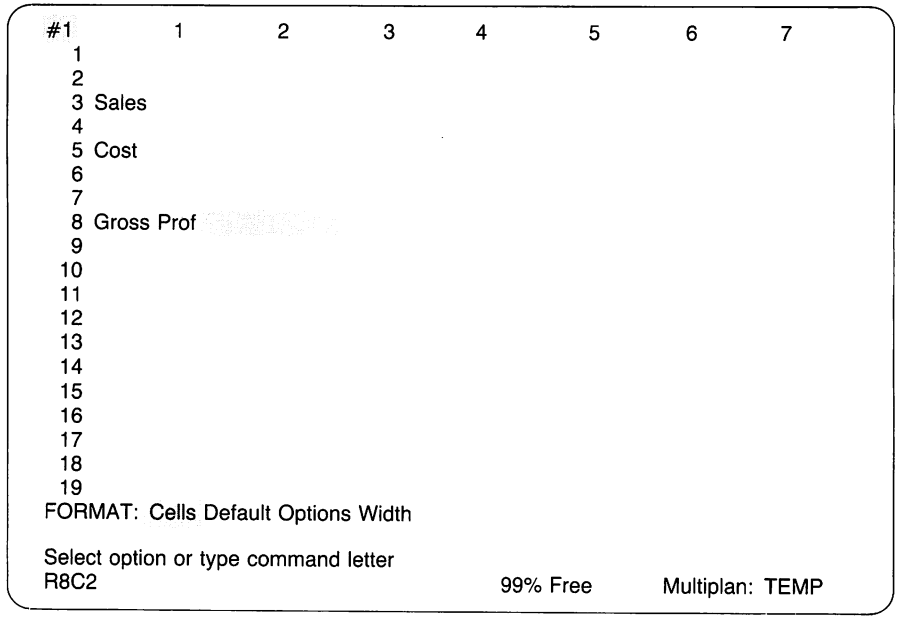
Column Width

Look at row 8, column 1. You can see that the column is not wide enough to accommodate all the characters in *Gross Profits*. Multiplan-86 has not lost any of the information you have entered. Multiplan-86 displays as much information as it can in the space it has. If you give the column more space, Multiplan-86 displays the remainder of the characters.

When you loaded Multiplan-86, it began with a column width of 10 characters. Column width is easily changed using the Format Width command.

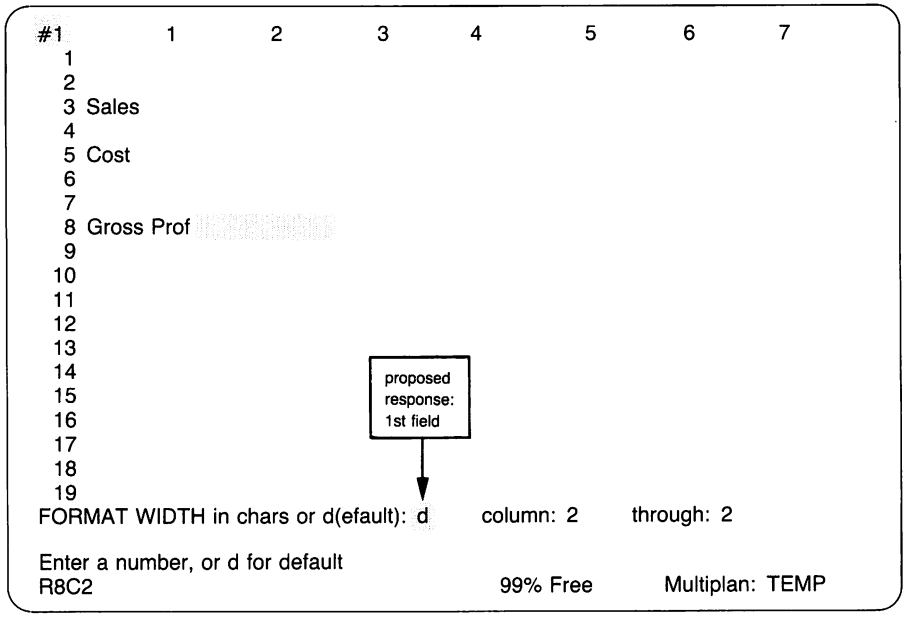
Press a Ctrl/C

The Format Width Command . Press **F**. On the command line you see:



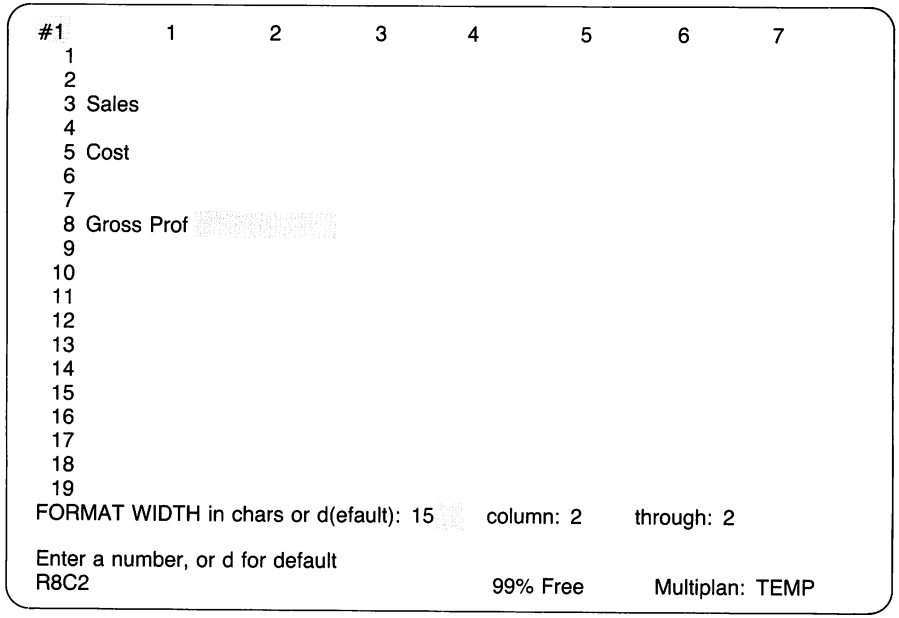
Screen 29

At this point you need only the Format Width subcommand. The other subcommands will be explained later and will become clear as you use them. For now, however, press **W**. You see:



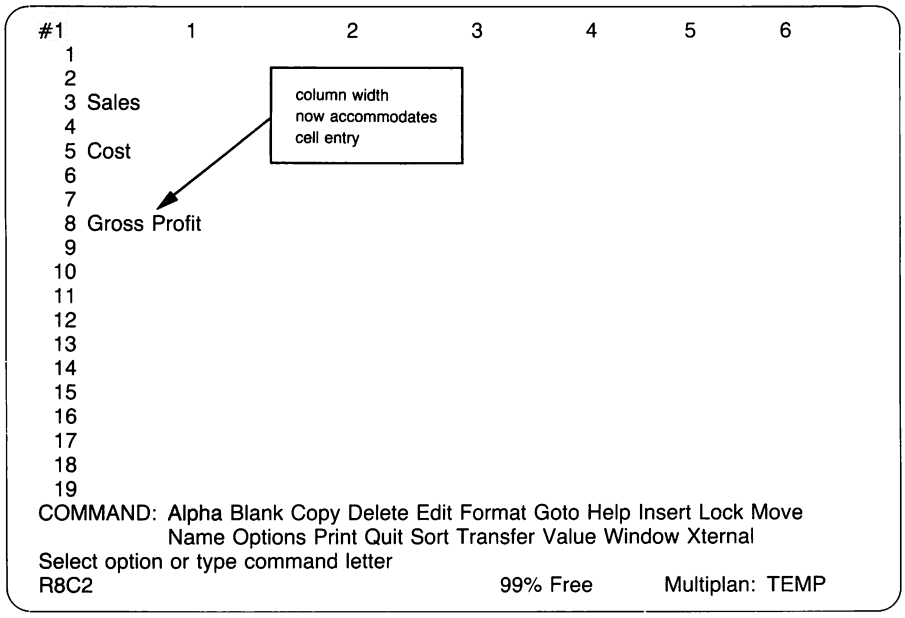
Screen 30

In the first field, Multiplan-86 shows "d" (for default) as the proposed response, but you can also specify the number of characters of width you want. Since 10 characters (which is what you now have) is not wide enough to show your heading completely, choose the width you need. *Gross Profits* has 13 characters (12 letters and 1 space). Select 15 characters of width to give yourself enough room. Type **15**. Now you see:



Screen 31

Multiplan-86 now lets you select just the columns you want to widen. The proposed response is to widen columns 1 and 2. As you only want to widen column 1 at this time, tab to "column:" and enter **1**, tab to "through:" and enter **1** and then press the Return key.



Screen 32

Gross Profits can now be fully seen in column 1 because that column has been widened. Your sheet is now ready for the first numbers.

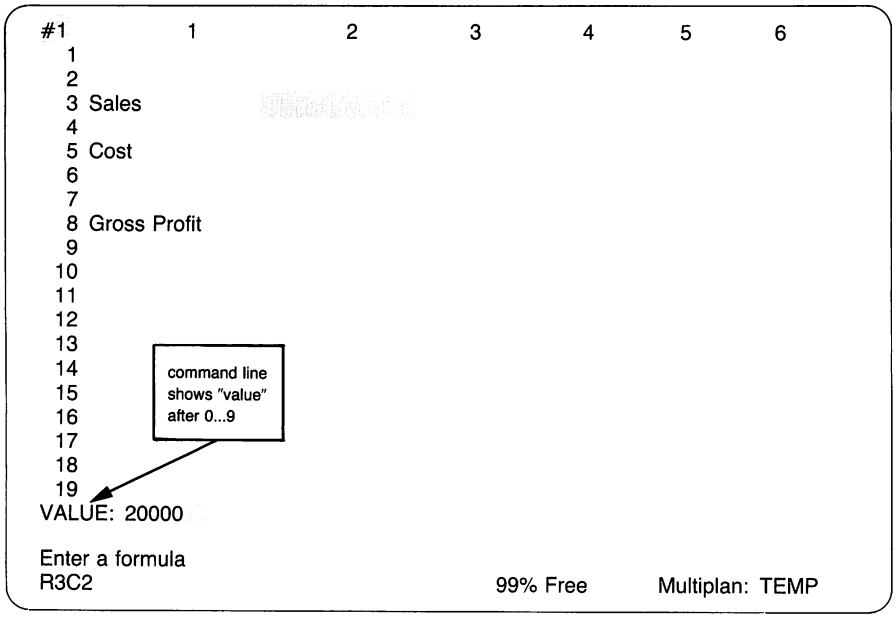
Entering Numbers

The sales figures for Spencer Ceramics show that the average amount of monthly sales last year was $20,000.

Move the cell pointer to row 3, column 2 (R3C2) opposite *Sales.* Type **20000.** (Use the numbers at the top of the keyboard.)

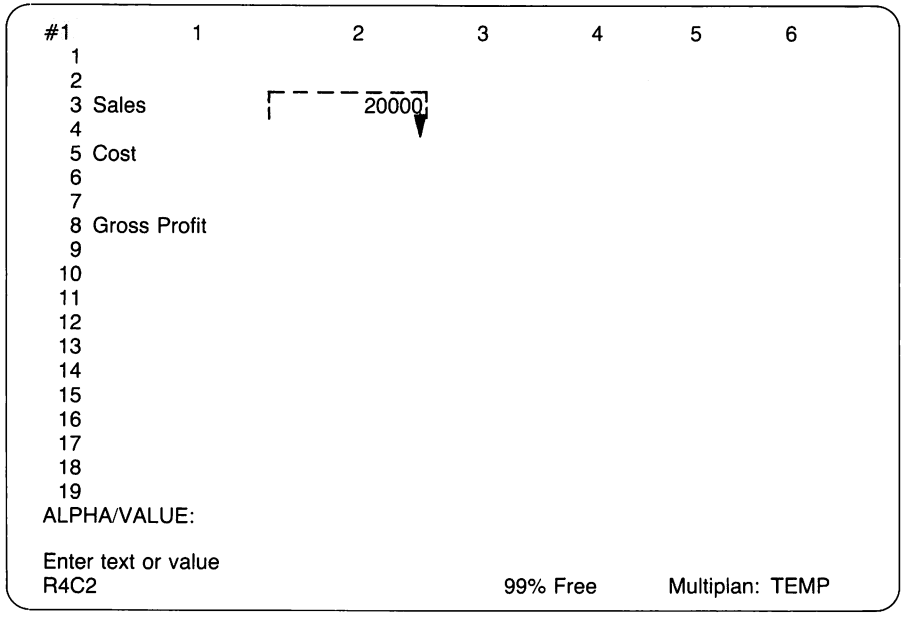
NOTE: *Multiplan-86 handles commas in a special way (using the Format Options command), so you do not use commas (20,000) or spaces (20 000) when entering numbers. Also, you do not have to tell Multiplan-86 that you want to enter a number, as you do for text (to enter text, you must use the Alpha command). As soon as you type a digit from 0 to 9, Multiplan-86 treats it as if you had selected the Value command. Do not type the $ now. Fill in all the figures first. You'll learn how to change them to dollars later.*

Look at the command line.



Screen 33

Press the DOWN ARROW key. Now you have:

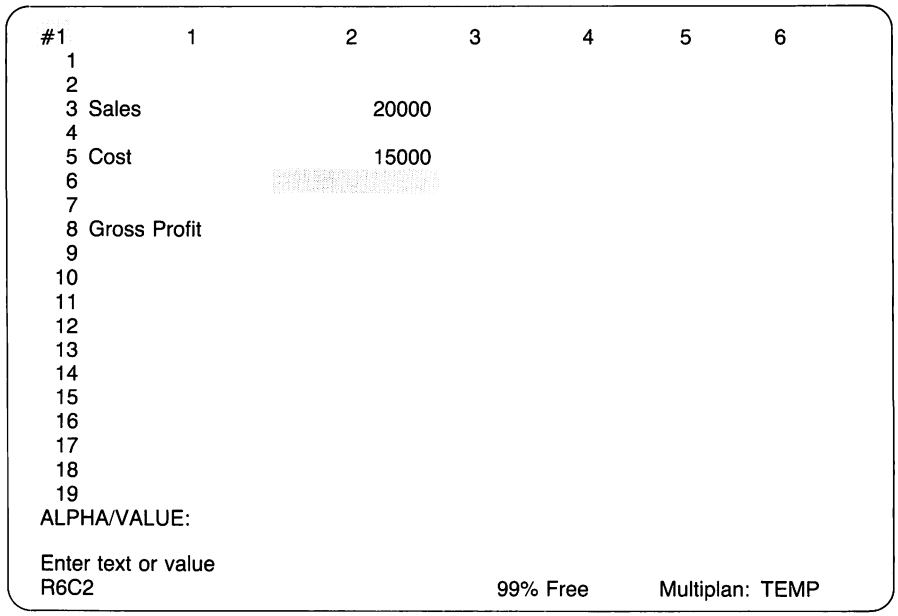


Screen 34

Spencer Ceramics' costs were $15,000 per month. Enter 15000 in row 5, column 2, like this:

1. Move the pointer to the desired cell (row 5, column 2).
2. In the command line, type the number **15000**.
3. Use the DOWN direction key to enter the number in the cell.

Now your screen should look like this:



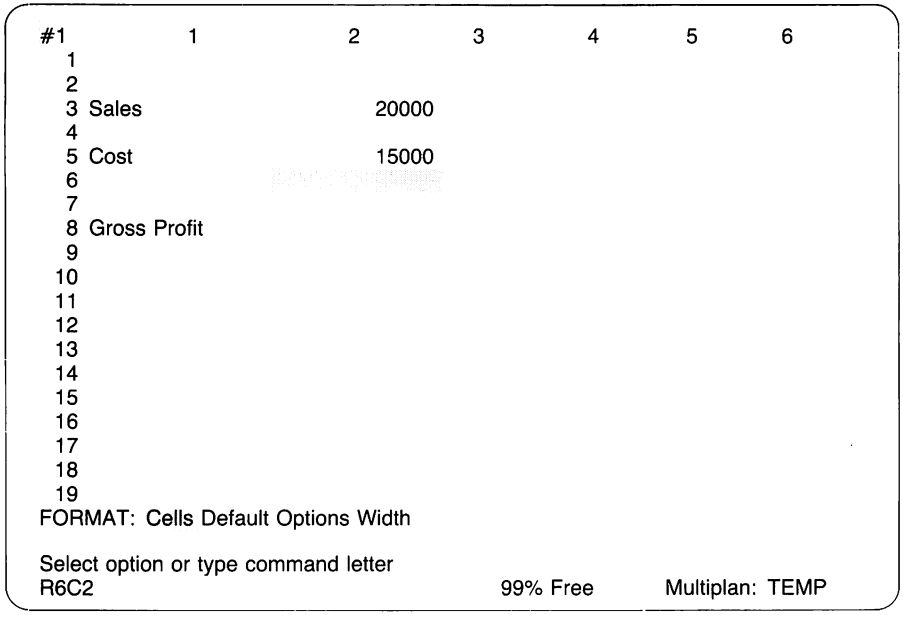
Screen 35

Since all the figures you are working with on this project have to do with finances, you may decide that it would be better to have all the numbers displayed as dollars. It's easy to make the change.

The Format Cell Command

Multiplan-86 offers a wide selection of formats in which cell entries can be displayed. The command used for this particular purpose is Format.

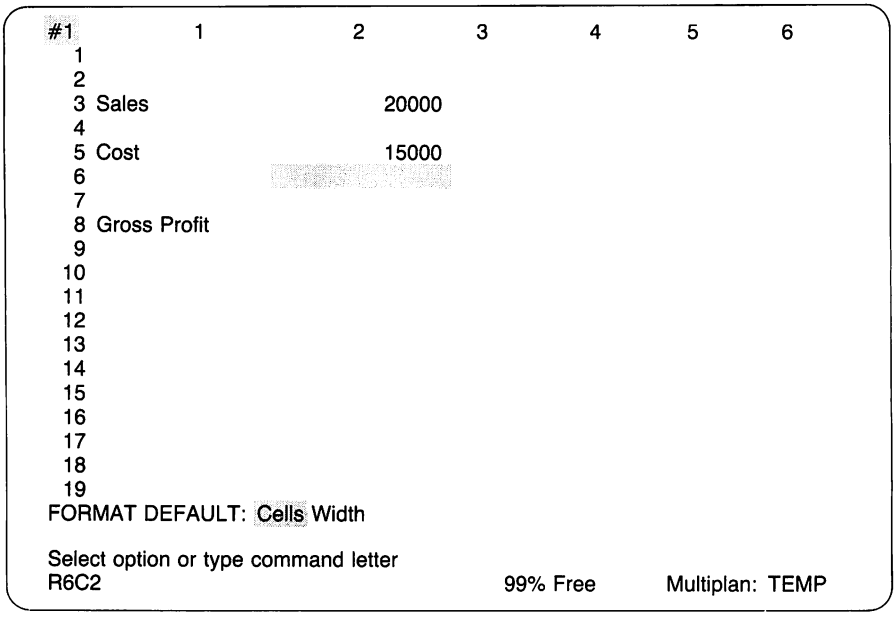
Press a CTRL/C and press **F**. You see:



Screen 36

This time you want to change the format of all cells. Move the edit cursor to DEFAULT (using TAB or SPACE BAR), and press the RETURN key.

The command line shows:



Screen 37

Now select the proposed response *Cells* by pressing the RETURN key. The command line now shows:

```
#1          1          2          3          4          5          6
  1
  2
  3 Sales                20000
  4
  5 Cost                 15000
  6
  7
  8 Gross Profit
  9
 10
 11
 12
 13
 14
 15
 16
 17
 18
 19
FORMAT DEFAULT CELLS alignment: Ctr Gen Left Right
          format code: Cont Exp Fix(Gen)Int $ * %        # of decimals: 0
Select option
R6C2                                        99% Free       Multiplan: TEMP
```

Screen 38

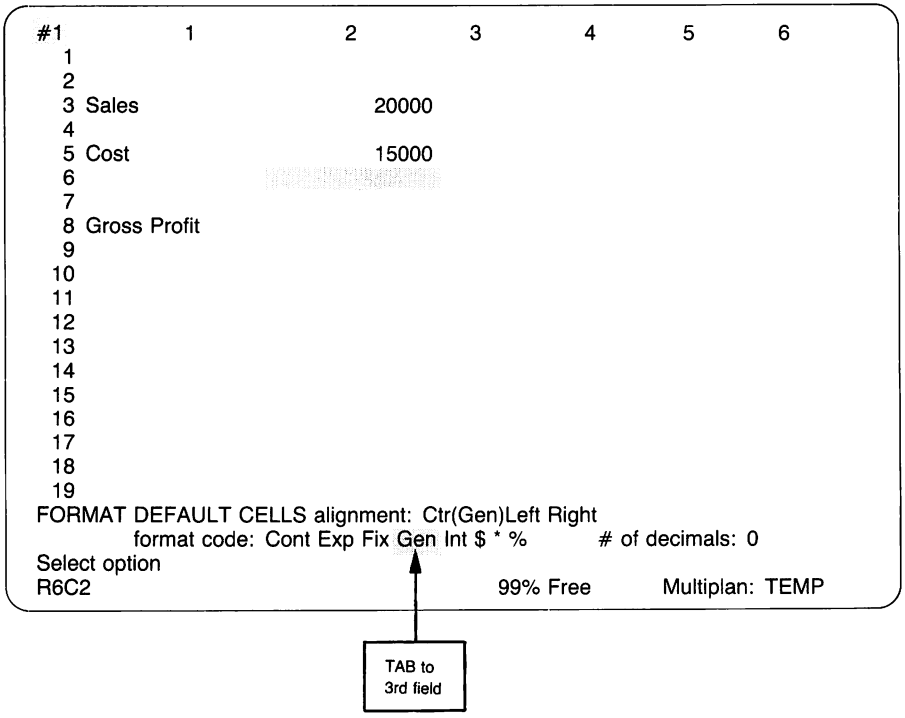
In the first field you choose the alignment setting.

Alignment . Alignment means where text and numbers are placed in a cell: flush with the left edge, flush with the right edge, centered, or a mix of right and left.

The "alignment" field offers you these choices as follows:

Settings	Examples	Effect
Ctr	Sales $1000.25 $50.25	text and numbers centered.
Gen	Sales $1000.25 $50.25	text flush left numbers flush right
Left	Sales $1000.25 $50.25	text and numbers flush left
Right	Sales $1000.25 $50.25	text and numbers flush right

Any alignment choice that sets the numbers to the right is acceptable because you want the decimal points to be in line with each other. Therefore, you can choose Gen or Right with the same effect on the numbers. However, because this command can affect all cells, including column 1, all of your text is moved to the right, too. Since the proposed response (Gen) is acceptable, press TAB to move to the next field to choose the format of the display.

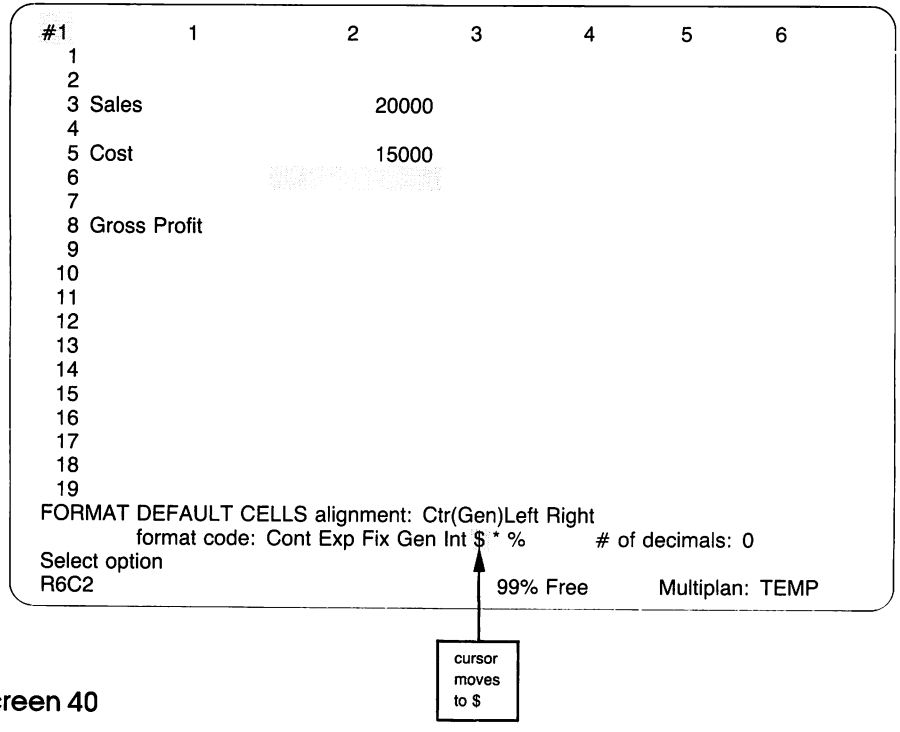


Screen 39

Formats . The second field contains several choices for the type of display. At this point, you know you want the format code for dollars. Some of the other choices are quite specialized. The following chart gives a brief summary of these formats; they are thoroughly explained in the "Command Directory" in the *Multiplan-86 Reference Manual.*

Settings	Meanings	Examples
Cont	Continuous	Spencer Ceramics
Exp	Scientific	1.4301E–23 4.67E5
Fix	Fixed Point	4.513
Gen	General	(all examples typed in so far)
Int	Integer	3.1416 shown as 3
$	Dollars	$20000.00 ($150.00)
*	Bar Graph	3 shown as ***
%	Percent	.0513 shown as 5.13%
-	(Do not change format)	

Choose dollars instead of the proposed response by typing a dollar sign (**$**).



Screen 40

The dollar symbol automatically gives you two decimal places, so you do not need to specify a number in the last field.

As soon as you have made certain that all your choices are correct, press RETURN to carry out your choices. Your screen should look like this:

```
#1          1          2          3          4          5          6
  1
  2
  3 Sales              $20000.00
  4
  5 Cost               $15000.00
  6
  7
  8 Gross Profit
  9
 10
 11
 12
 13
 14
 15
 16
 17
 18
 19
COMMAND: Alpha Blank Copy Delete Edit Format Goto Help Insert Lock Move
         Name Options Print Quit Sort Transfer Value Window Xternal
Select option or type command letter
R6C2                                   99% Free        Multiplan: TEMP
```

Screen 41

You have made three choices in the Format command:

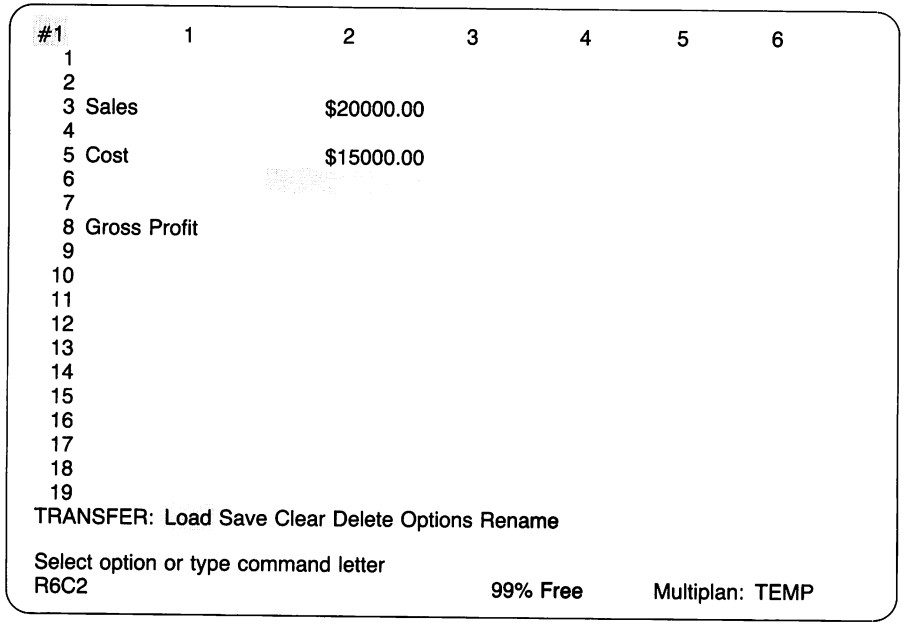
1. You selected Format Default Cells to choose settings for all cells.
2. You selected the proposed alignment of the contents of the cells.
3. You selected the display format for dollars ($), which automatically gave you two decimal places.

*NOTE: You can change the way numbers are displayed any time you like without changing their values. For example, you can show the same value as 3, 3E0, $3.00, 300%, or even "***", depending on the format setting you select. See the "Command Directory" for the Format Command in the Multiplan-86 Reference Manual.*

You learned a lot about formatting in this session, but you will learn more in the next chapter. In the next chapter, you will also use a more detailed breakdown of costs to make a more comprehensive forecast for Spencer Ceramics.

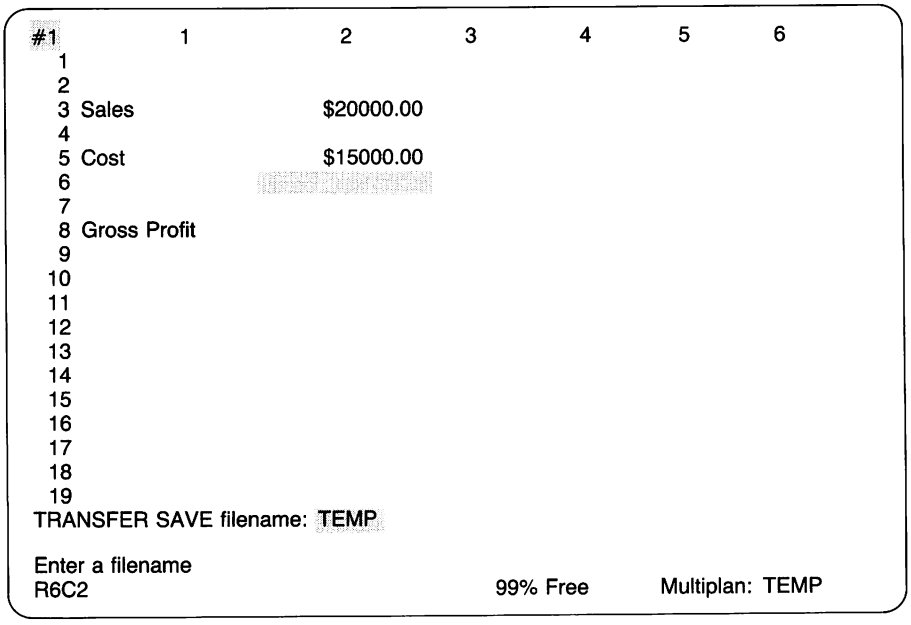
Storing Your Work

The Transfer Save Command . Save your worksheet so you won't have to start all over next time. To do this, use the Transfer Save Command. Press **T**. The command line now shows:



Screen 42

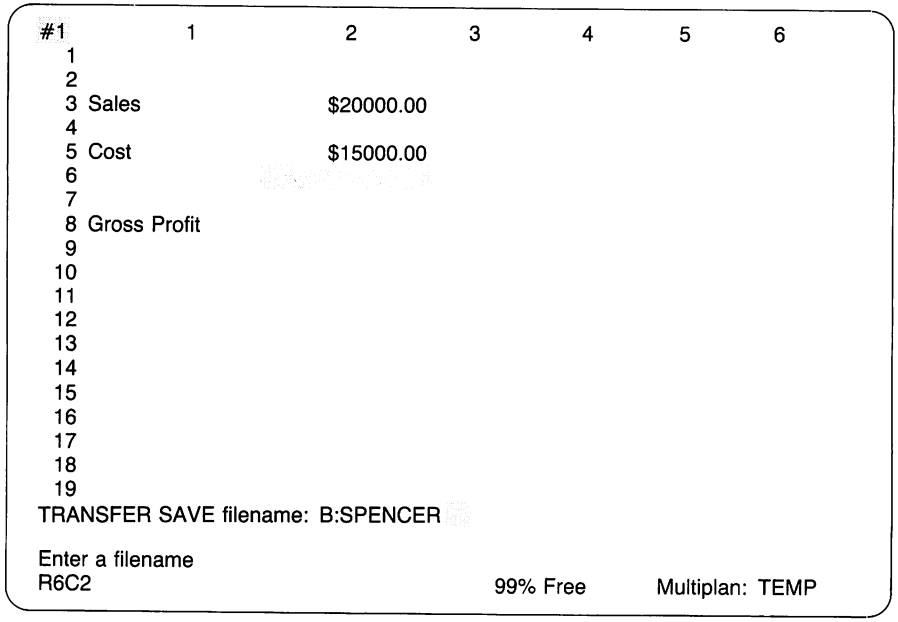
To save your work, choose Save by pressing **S**.



Screen 43

Multiplan-86 assumes that you will use the "default" drive, that is, drive A. Thus, *always* be sure to specify which drive is holding the diskette on which you want to save your work; specify drive B by typing **B:** before typing the filename. Then, give your worksheet a meaningful filename, so that it is easy to remember when you load the sheet in the next session.

Type **B:SPENCER**

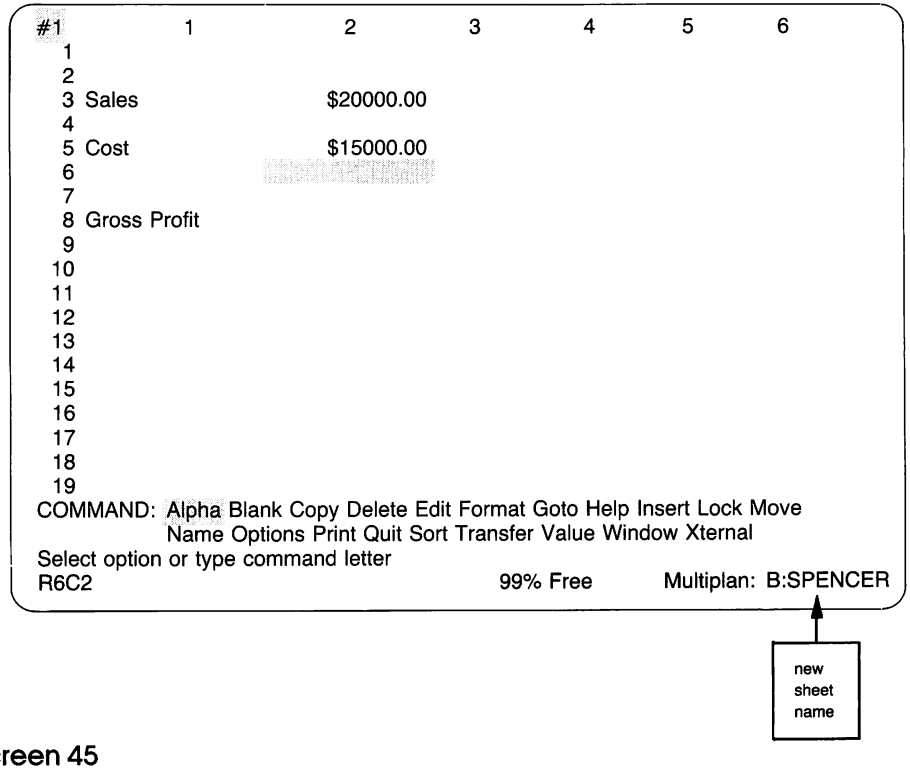


Screen 44

When you typed the name SPENCER, you replaced the name TEMP, which Multiplan-86 gave the sheet in the absence of another name. From now on, you must load the diskette containing the SPENCER file into drive B (your Multiplan-86 working diskette should first be loaded into drive A) any time you want to work on the SPENCER file. You must ask for the file by its exact name— SPENCER—or Multiplan-86 will not be able to find it on the diskette.

NOTE: *Always store your data files on a diskette in drive B. The Multiplan/CP/M diskette in drive A does not have sufficient space to hold data files.*

Press RETURN to complete the command. Note that the sheet name on the status line is now changed to reflect the new sheet name.



Screen 45

The Quit (Q) Command . To leave Multiplan-86, press **Q** (for Quit), as you did at the end of the last session:

Be sure you saved your work with the Transfer Save Command before you press **Y**.

Press **Y**. The screen should now be blank.

When you begin the next session, you will use the Transfer Load Command to pick up where you left off.

Summary

In this session you learned:

- How to use the Alpha (A) Command to enter text.
- How to use BACKSPACE to correct typing errors by deleting characters.
- How to enter data using the direction keys.
- How to change the width of columns using the Format Width Command.
- How to enter numbers in cells.
- How to change cells to the dollar format using the Format Default Cells Command.
- What alignment settings are available.
- What format settings are available. How to save your work using the Transfer Save command.

3

Entering Formulas

In the last session you learned to put text (using the Alpha Command) and numbers in cells by pointing to them with the cell pointer, typing the information in the command line, then entering it in the cell by pressing either RETURN or one of the direction keys.

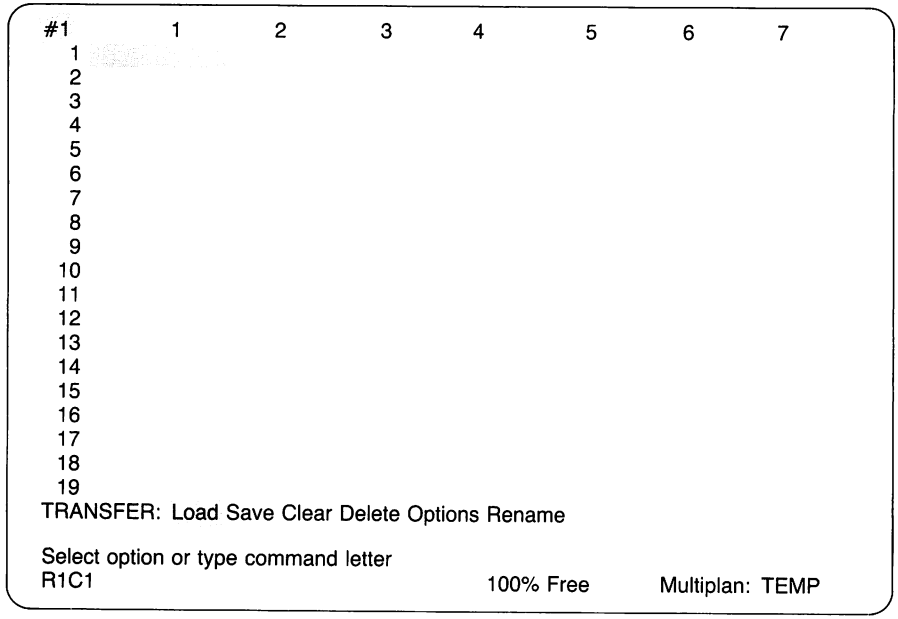
You also learned to use the Format Command to display the numbers in dollar format.

At the end of the session you saved your worksheet in a file that you named SPENCER.

In this session you will get more practice in entering words and numbers and in formatting cells. Most important, you will learn to enter formulas.

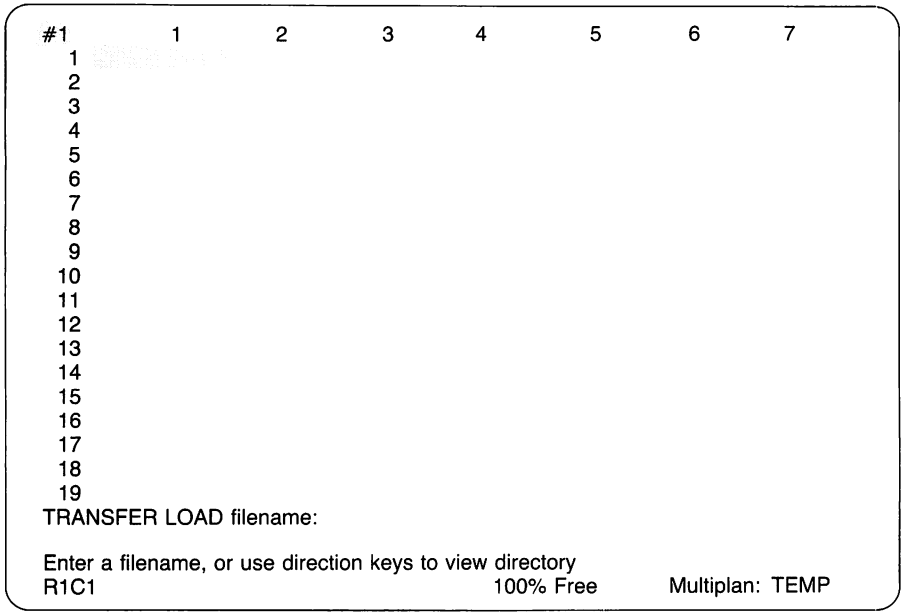
Loading Your File

The Transfer Load Command . Load and start running Multiplan-86 according to the instructions in "Loading and Starting Multiplan-86," in Chapter 1. Note that the row and column numbers appear on the screen, but the information you typed in earlier does not. You have to load the file before that information appears. Press **T**. The command line will show:



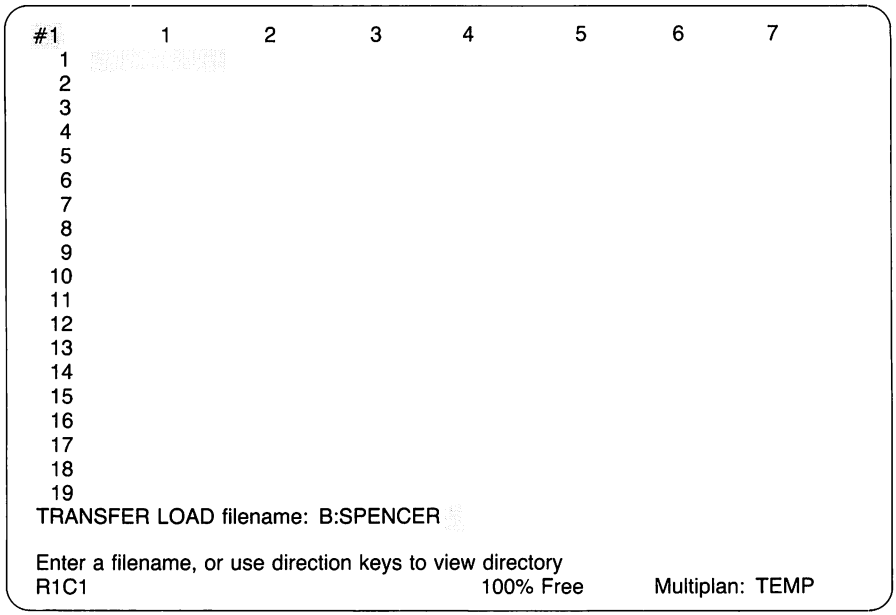
Screen 46

Multiplan-86 has selected "Load" as its proposed response. Since you want to load your file into Multiplan-86, merely press RETURN (or press **L**). The command line shows:



Screen 47

Type the name of the file you wish to load, preceded by the drive name, **B:SPENCER**. (Be sure you consistently use an uppercase, or capital, B to specify the drive name; otherwise, you will receive an error message.) You should see:



Screen 48

Then, press RETURN. Your file looks like this when it is loaded:

```
#1          1          2          3          4          5          6
  1
  2
  3 Sales              $20000.00
  4
  5 Cost               $15000.00
  6
  7
  8 Gross Profit
  9
 10
 11
 12
 13
 14
 15
 16
 17
 18
 19
COMMAND: Alpha Blank Copy Delete Edit Format Goto Help Insert Lock Move
         Name Options Print Quit Sort Transfer Value Window Xternal
Select option or type command letter
R6C2                                  99% Free      Multiplan: B:SPENCER
```

Screen 49

Notice that the cell pointer is at cell R6C2, just as it was when you saved this worksheet at the end of the last chapter.

The Insert Command

Look at the following breakdown of Spencer Ceramics' monthly costs:

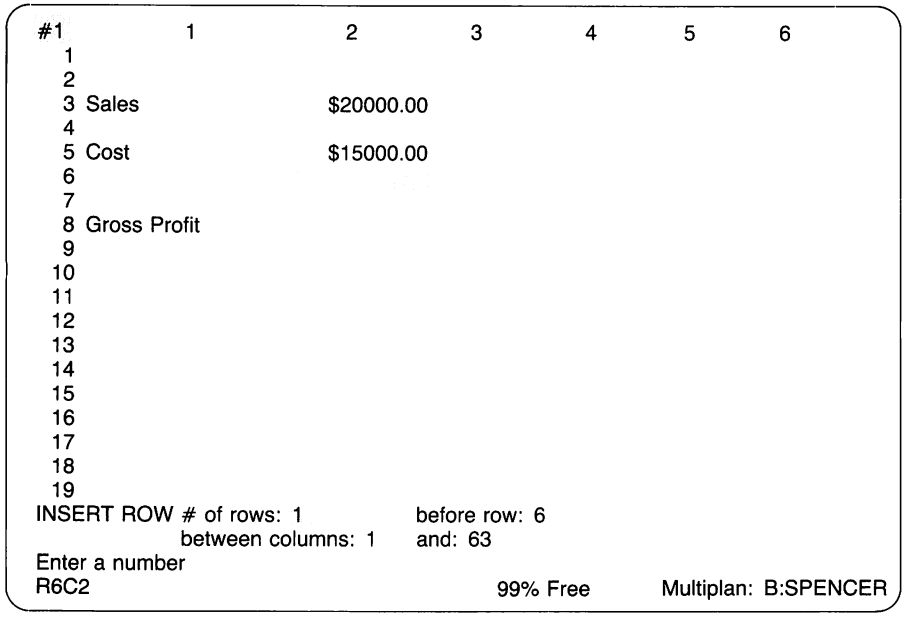
Material = $ 4,000.00
Labor = $ 7,000.00
Overhead = $ 4,000.00
Total Costs = $15,000.00

Your worksheet must be expanded to make room for the new information. You need space for Material, Labor, and Overhead, as well as *Total Costs.* To insert either rows of space or empty columns, use the Insert Command. Press **I.**

```
#1          1          2          3          4          5          6
  1
  2
  3 Sales              $20000.00
  4
  5 Cost               $15000.00
  6
  7
  8 Gross Profit
  9
 10
 11
 12
 13
 14
 15
 16
 17
 18
 19
INSERT: Row Column

Select option or type command letter
R6C2                                99% Free        Multiplan: B:SPENCER
```

Screen 50

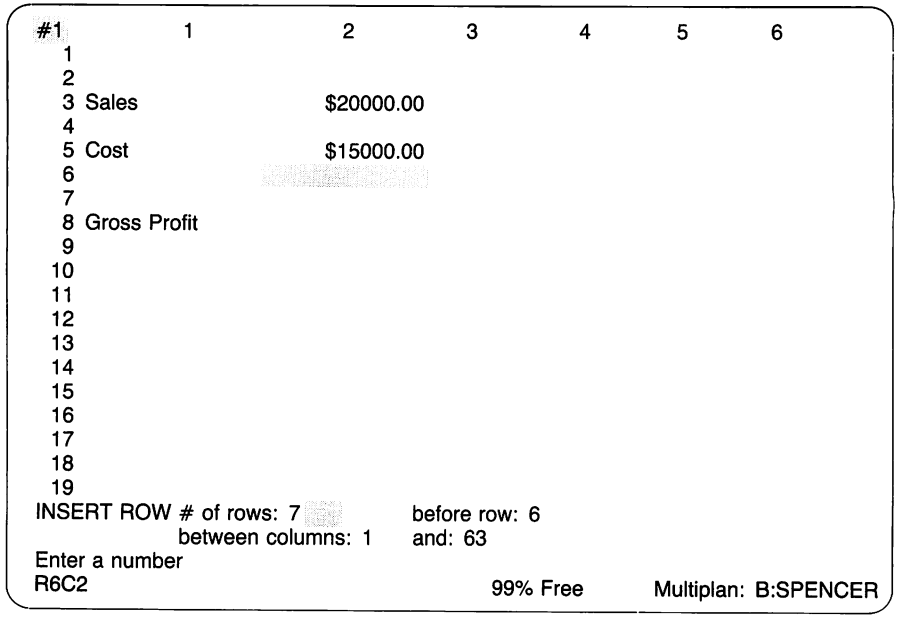
The proposed response, Row (R), is what you want. (You need to add some extra rows of space.) Press RETURN to select R.



Screen 51

Notice that the proposed responses are based on the position of the cell pointer. Because the cell pointer is at row 6, Multiplan-86 proposes the insertion of one row of space before row 6, extending from column 1 through 63; in other words, across the whole worksheet.

The new figures require at least five rows (four for figures and one for the total costs). Allow yourself enough room. Plan to add seven rows. Press **7**.

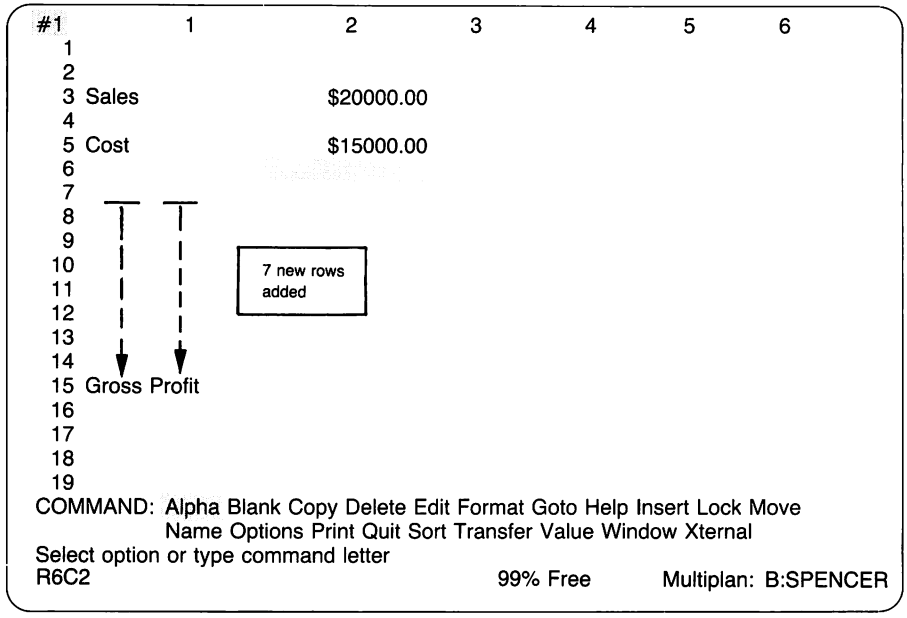


Screen 52

Look at the second field. In the "before row" field, you tell Multiplan-86 where to insert the new space by filling in which row the space should go in front of. You need the space between row 5 and row 8. You can put the new rows in front of row 6 or 7 or 8. Since the proposed response of row 6 is all right, we don't need to change it.

Multiplan-86 also proposes that you insert the new rows of space across all of the columns by saying " . . . between columns 1 and 63". Since you want the space to extend across at least 14 columns in your worksheet, you also do not need to type any numbers in either the third or fourth fields. Just press RETURN to carry out the command as it stands.

Now you see:



Screen 53

Entering Additional Text

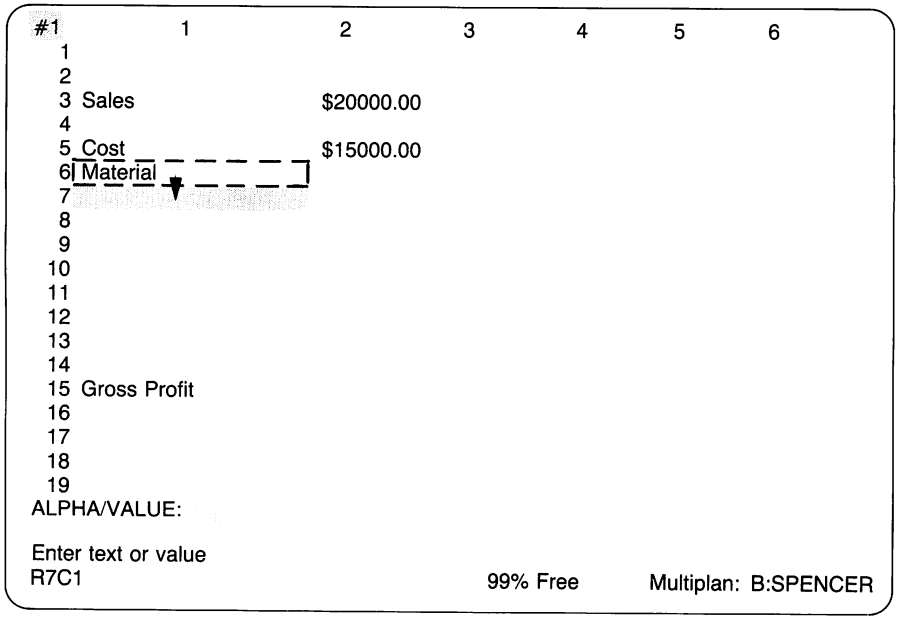
You can add the new information in the space you have created. Under *Cost* (row 5), you can type the subcategories of *Material* in row 6, *Labor* in row 7, and *Overhead* in row 8. Leave a row of space between *Overhead* and *Total Costs* for a line, and type *Total Costs* in row 10. The procedure is the same as given in Chapter 2, and is summarized here:

Move the cell pointer to row 6, column 1 using the LEFT ARROW key.

Press **A** (or RETURN).

Type **Material.** If you make a mistake in entering text, BACKSPACE and type over the mistake.

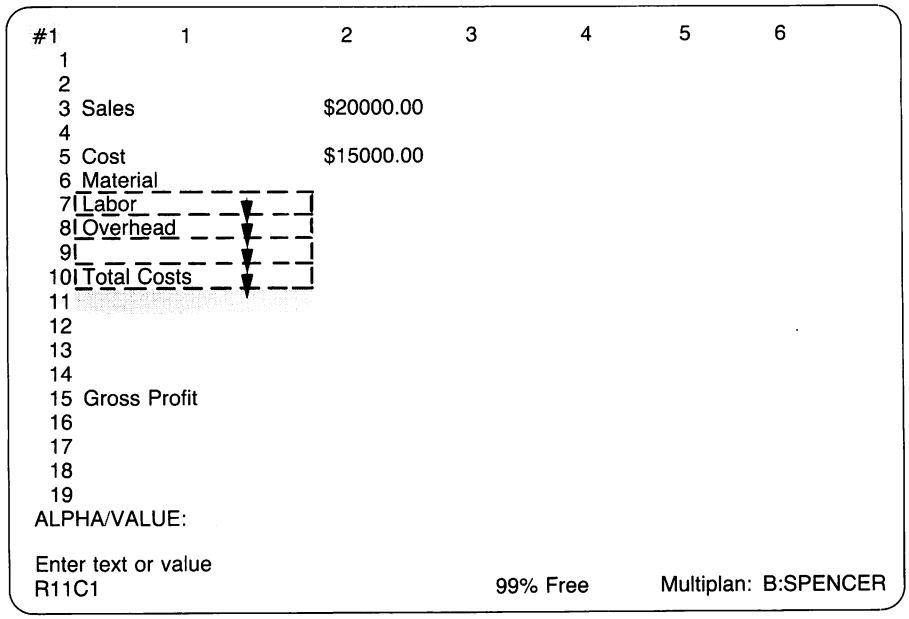
Press the down arrow to enter *Material.* Your screen now looks like this:



Screen 54

Enter *Labor* in row 7 and *Overhead* in row 8 in the same way.

Leave row 9 empty for now, and move the pointer to row 10. Enter **Total Costs**, as you entered other text. Your screen should now look like this:



Screen 55

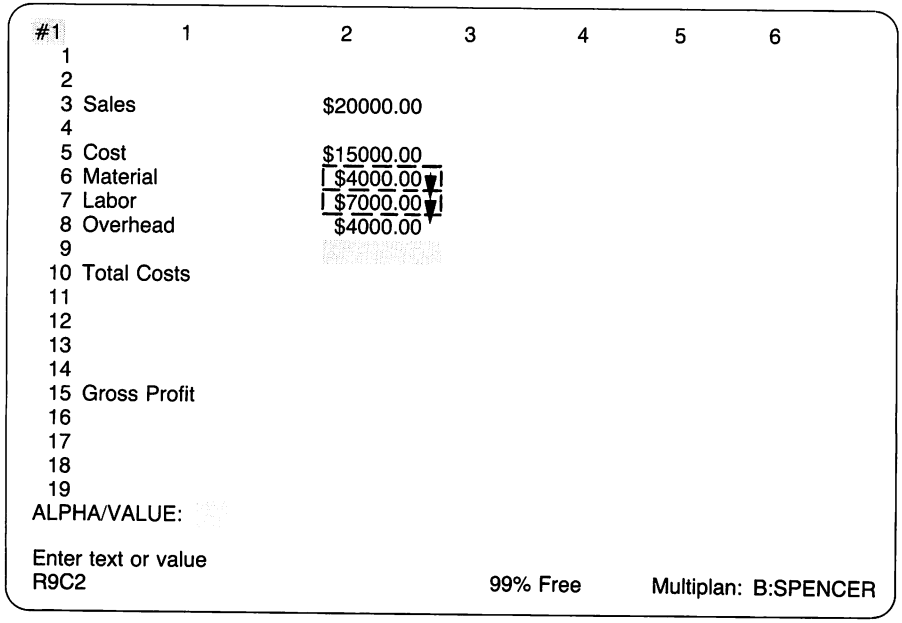
Entering Additional Numbers

Now you are ready to enter the numbers. Move the cell pointer to row 6, column 2. Type **4000**.

Press the DOWN ARROW key.

Type **7000** and press the DOWN ARROW key.

For the last number (by *Overhead*), type **4000** and press the DOWN ARROW key. You see:

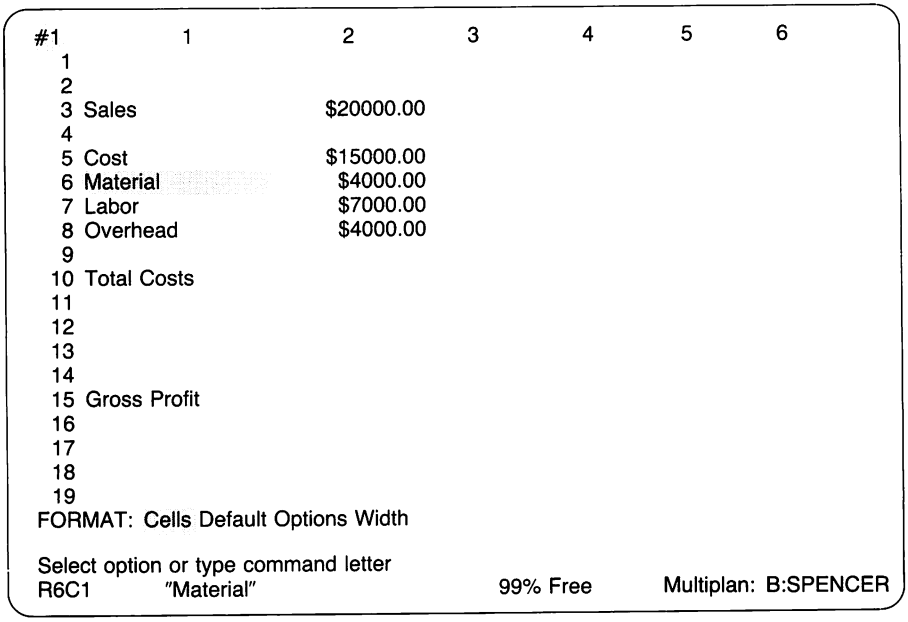


Screen 56

Aligning Cell Contents

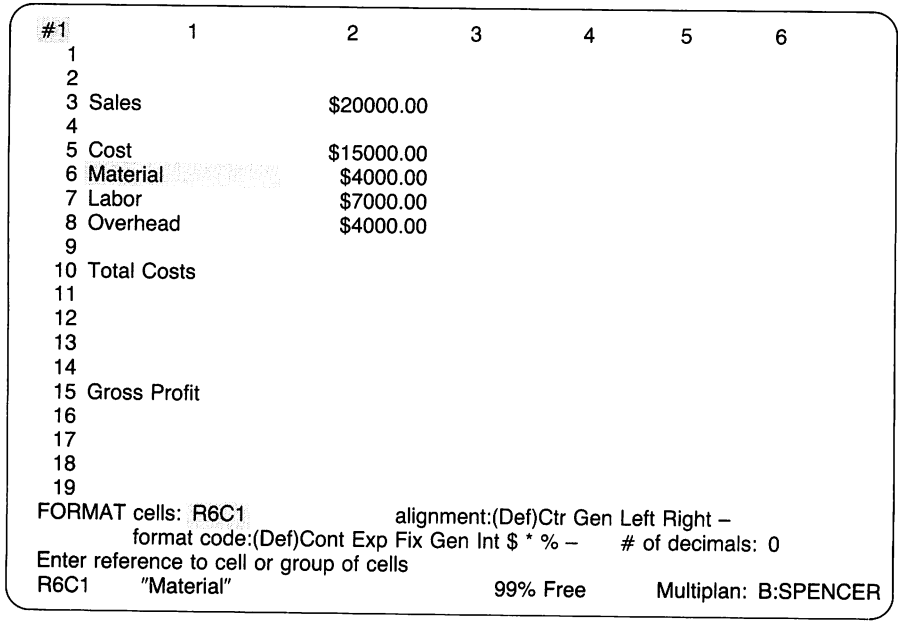
To make it clear that the four entries under *Cost* (Material, Labor, Overhead and Total Costs) are subcategories, you will want to align them to the right side of column 1. First, position the cell pointer on the first cell to be aligned R6C1 (row 6, column 1).

To align cells, use the Format Command. Press CTRL/C and press **F**.



Screen 57

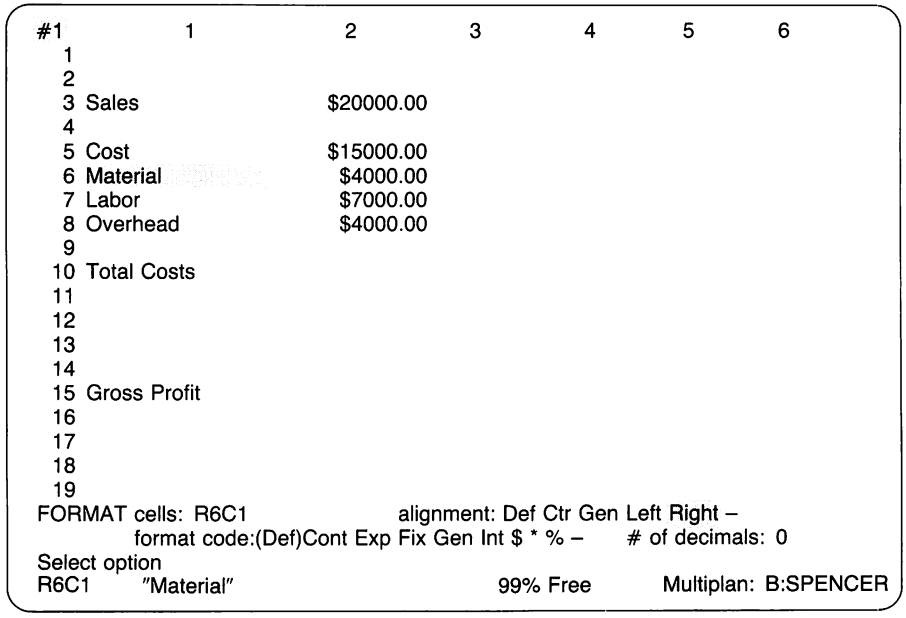
From the command line choices, choose "Cells" (by pressing **C** or RETURN). The command line now shows:



Screen 58

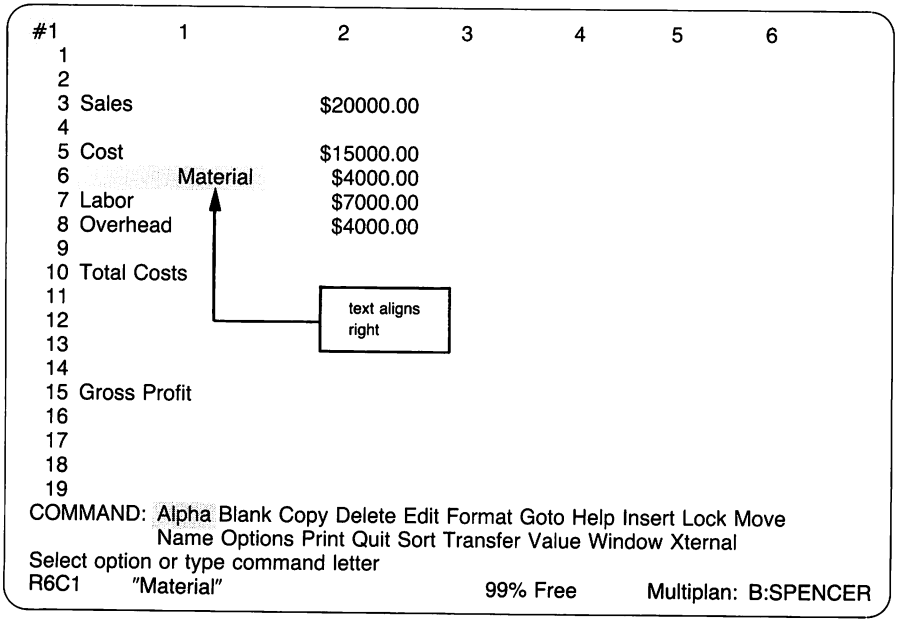
The first field ("cells") shows the "active" cell (where the cell pointer is located). You want to align this cell, so leave the proposed response as is.

TAB to the next field ("alignment"). To select an alignment here, use the same method you used for the Format Default Cells Command in Chapter 2. Press **R**. The command line shows:



Screen 59

The "format code" setting is correct and the "# of decimals" does not concern us now, so press RETURN. You will see:

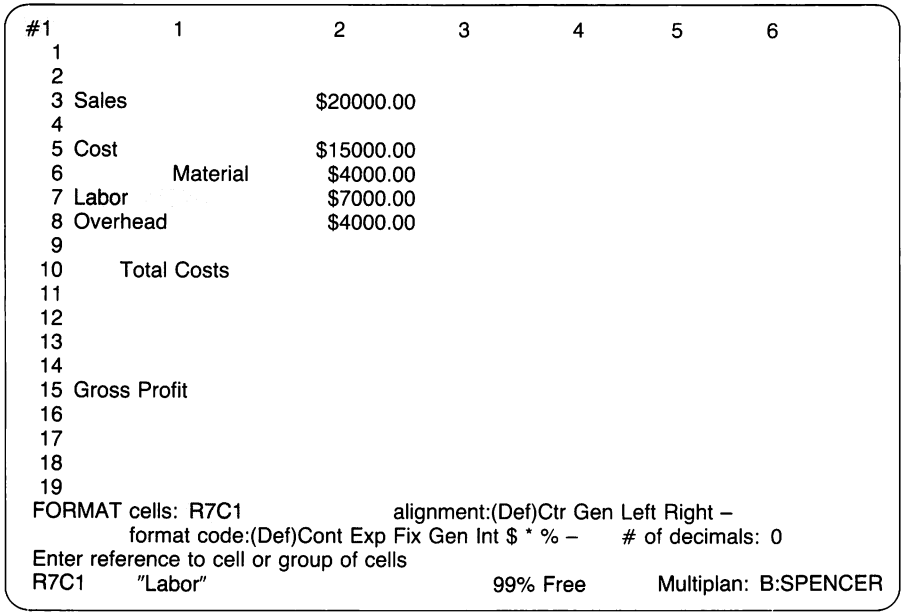


Screen 60

You also want to align rows 7 through 10 in column 1 to the right. You can do this by using the symbol for "range."

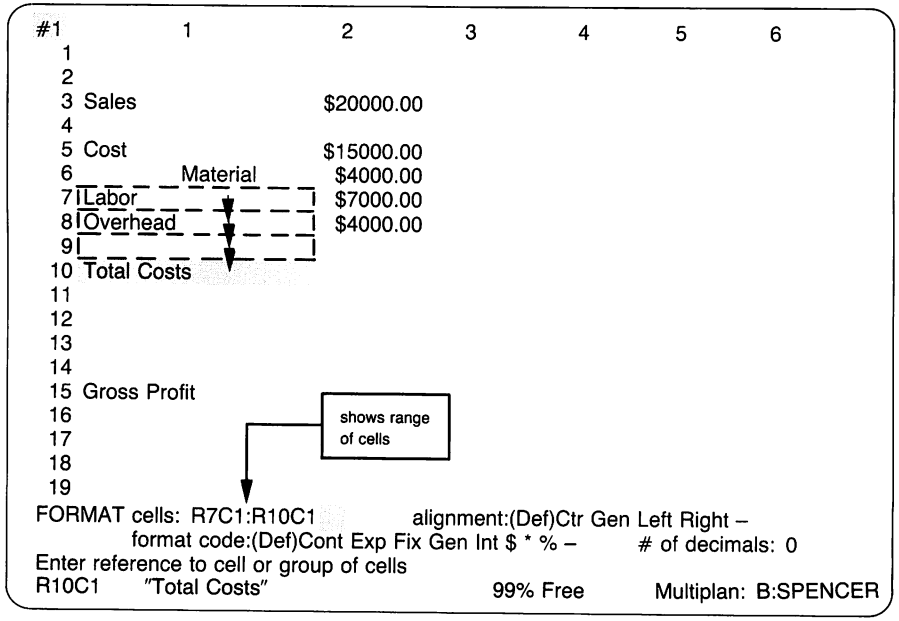
Ranges: The Colon . With Multiplan-86, you can perform tasks on more than one cell at a time by typing two cell locations separated by a colon. Let's try this out on *Labor, Overhead,* and *Total Costs* in column 1.

1. Move the cell pointer to *Labor* (R7C1).
2. Press **F**.
3. Press **C** or the RETURN key. You can now see R7C1 in the "cells" field:



Screen 61

4. Press : . Notice that the response in the field is not deleted. Multiplan-86 helps you with entering a range that starts at the active cell.
5. Now let Multiplan-86 do the work for you. Press the DOWN ARROW key until the cell pointer is in row 10 (R10C1). Notice the response in the "cells" field. It shows the range of cells you want to change.



Screen 62

6. TAB to the second field ("alignment"). In the second field, you again want to change the proposed response from "Def" (which aligns words to the left) to "Right".
7. Press **R**.
8. As before, the proposed responses in the other two fields are what you want, so press RETURN.

Your screen should now show you the new alignment for rows 6 through 10 in column 1:

```
#1          1              2          3          4          5          6
  1
  2
  3 Sales                  $20000.00
  4
  5 Cost                   $15000.00
  6          Material       $4000.00
  7             Labor       $7000.00
  8        Overhead         $4000.00
  9
 10      Total Costs
 11
 12
 13
 14
 15 Gross Profit
 16
 17
 18
 19
COMMAND: Alpha Blank Copy Delete Edit Format Goto Help Insert Lock Move
         Name Options Print Quit Sort Transfer Value Window Xternal
Select option or type command letter
R7C1     "Labor"                          99% Free      Multiplan: B:SPENCER
```

Screen 63

In Chapter 4, you learn more about "ranges" and other kinds of references to cells.

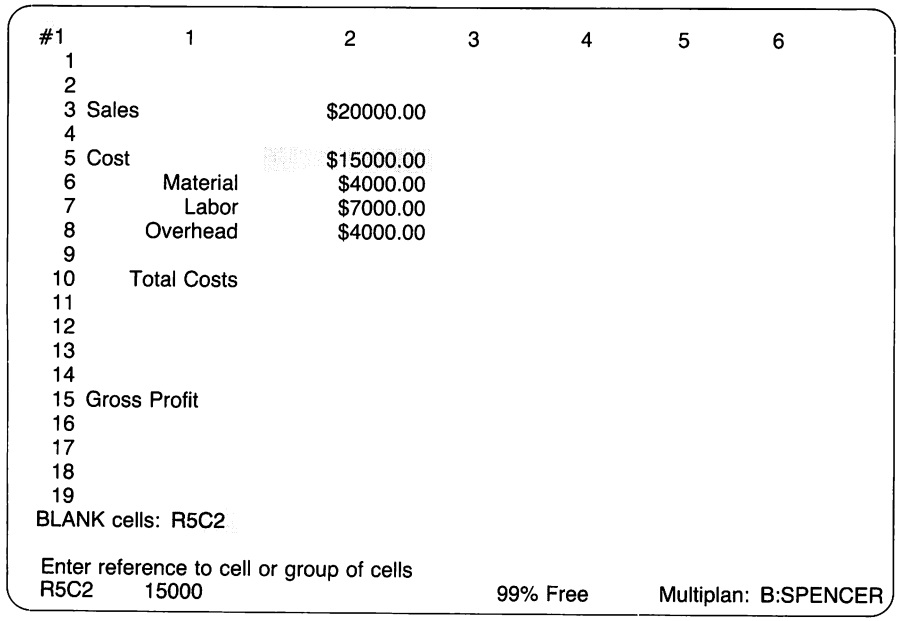
The Blank Command

Now you are ready to enter *Total Costs* in row 10.

When you do so, you have two rows showing total costs. You started with *Costs* in row 5, and now you have another row for *Total Costs.* To correct this unwanted duplication, you want to blank out the number $15000.00 in row 5, column 2. The worksheet will be clearer if the heading "Cost" is left as a major category heading in column 1, but you want the number to appear next to *Total Costs.*

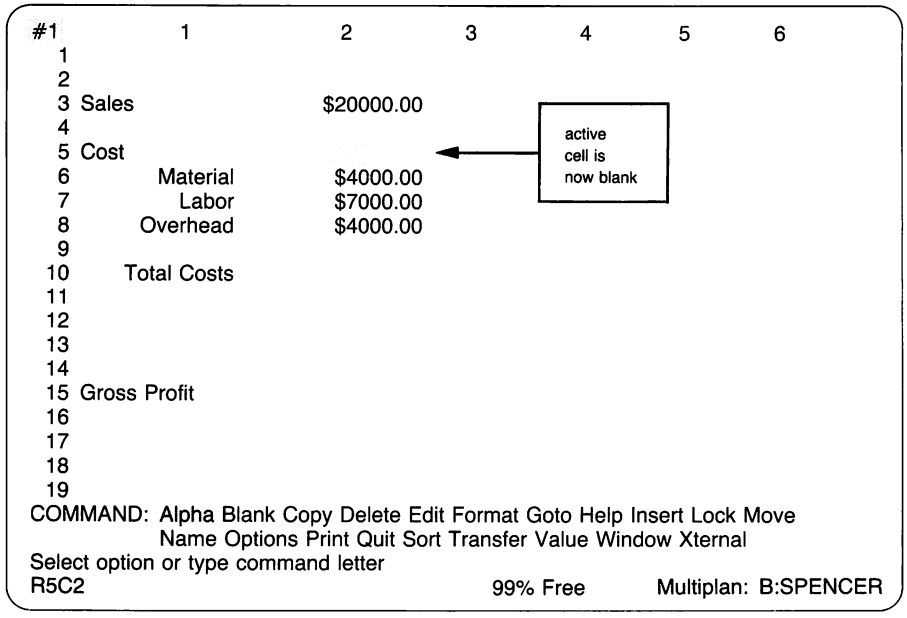
Use the Blank Command to blank out the $15000.00. First move the cell pointer to row 5, column 2.

Press **B**. The command line shows:



Screen 64

Look at the cell number highlighted by the edit cursor. It shows you that the cell pointer is in row 5, column 2. All you have to do is press RETURN and the contents of the cell are erased. Watch R5C2 as you press RETURN.



Screen 65

You can also use this command to blank out a group of cells. You can first press **B** (for Blank), then specify a range, as you did earlier for the Format Cells Command. But you do not need to do this now.

Formulas

Now you are ready to enter a formula for calculating the *Total Costs.* The total costs in row 10 are calculated by adding the three items above it. Move the cell pointer down to *Total Costs,* (row 10, column 2).

Building a Formula . You might be tempted not to bother with a formula. After all, you could just enter $15000.00 because you already know that number belongs there. You need a formula, however, because costs may change. You need something that works for other months, too, so that you don't have to calculate costs yourself every time.

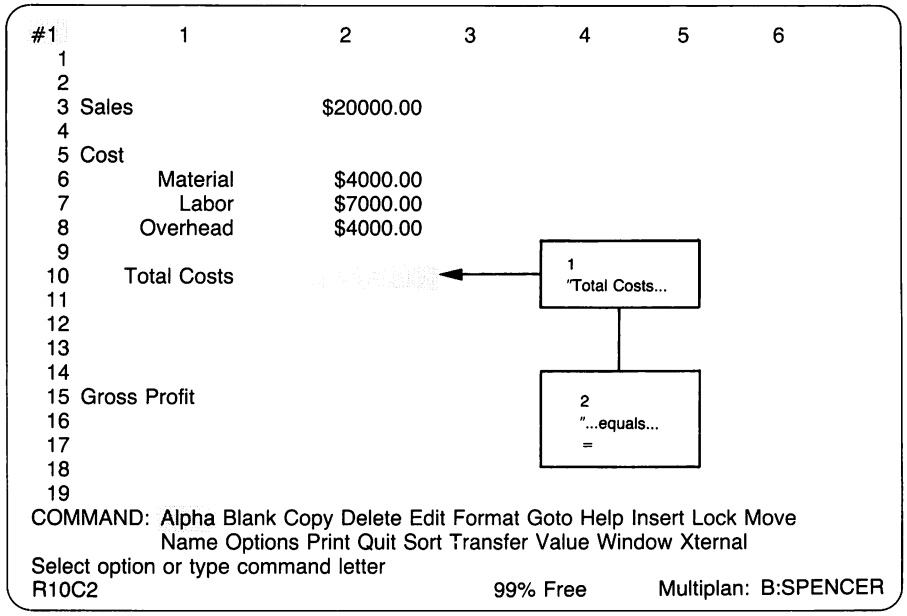
Without touching any keys for a moment, think about what you are doing. Point with your fingers to row 10, column 2 (*Total Costs*) on your display screen.

Think:

- *Total Costs* (row 10, column 2),
- is the sum of (now point to row 6, column 2) *Material,*
- plus (now point to row 7, column 2) *Labor,*
- plus (now point to row 8, column 2) *Overhead.*

You follow the same procedure using your cell pointer.

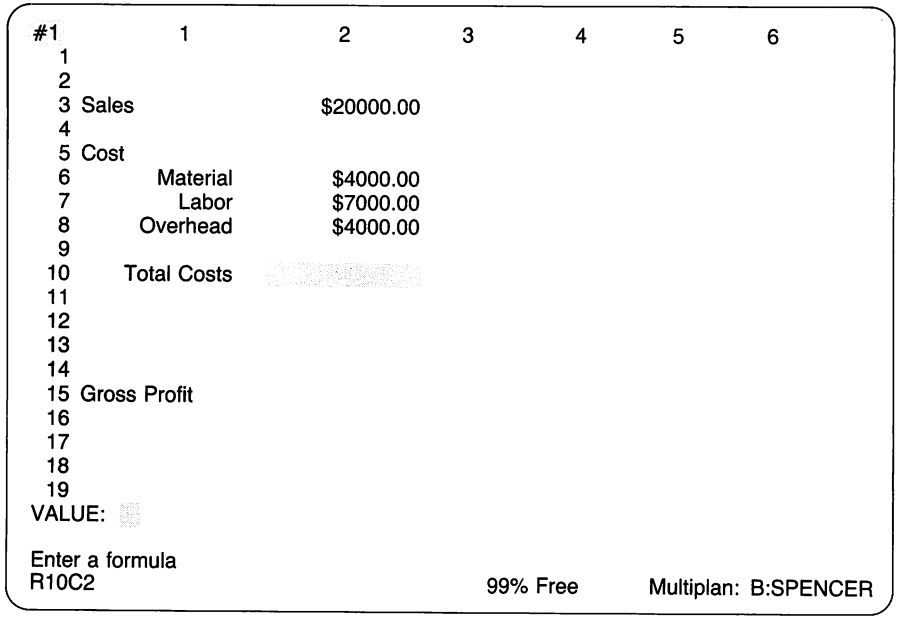
Say to yourself:	Do this:
Total Costs . . .	1. Place the cell pointer on Total Costs (row 10,column 2).


#1 1 2 3 4 5 6
1
2
3 Sales $20000.00
4
5 Cost
6 Material $4000.00
7 Labor $7000.00
8 Overhead $4000.00
9
10 Total Costs
11
12
13
14
15 Gross Profit
16
17
18
19
1
"Total Costs...
2
"...equals...
=
COMMAND: Alpha Blank Copy Delete Edit Format Goto Help Insert Lock Move
Name Options Print Quit Sort Transfer Value Window Xternal
Select option or type command letter
R10C2 99% Free Multiplan: B:SPENCER

Screen 66

equals . . .

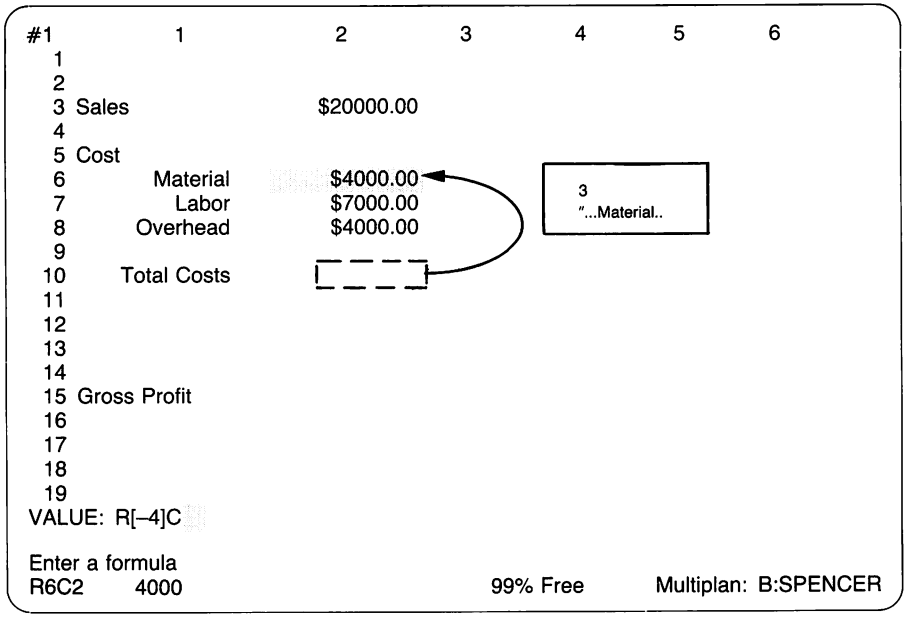
2. Press =. (To begin a formula in Multiplan-86, use either = or V for the Value command.) Look at the command line.



Screen 67

row 6 (Material) . . .

3. Move the cell pointer up four rows to row 6. (Watch the R6C2 formula being built on the command line. The entry R[-4]C is a formula to tell Multiplan-86 to go up four rows in this column to find a value).



Screen 68

plus . . .

4. Press + Watch how the formula builds. Notice that the cell pointer moves back to its original position (R10C2).

row 7 (Labor) . . .

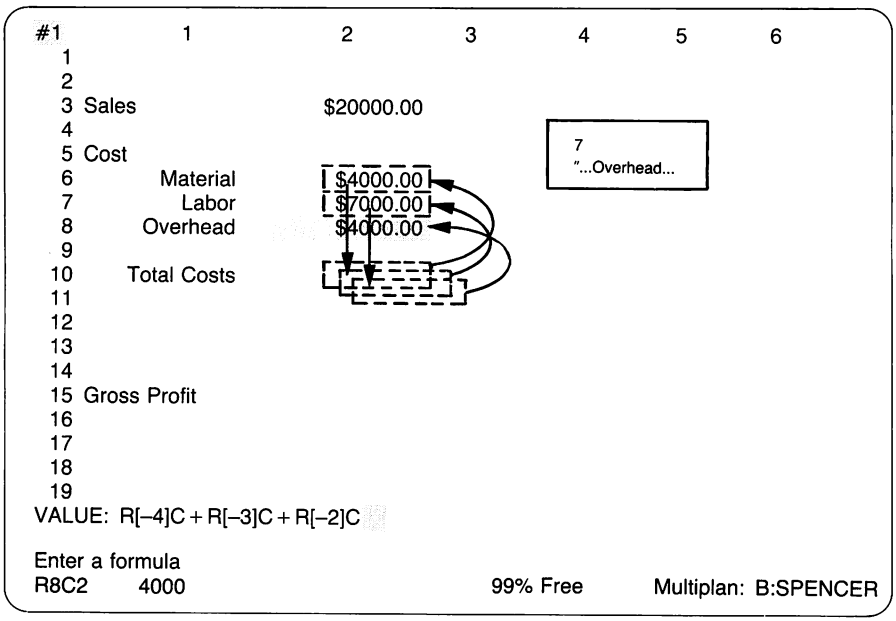
5. Move the cell pointer to row 7 (R7C2).

plus . . .

6. Press +

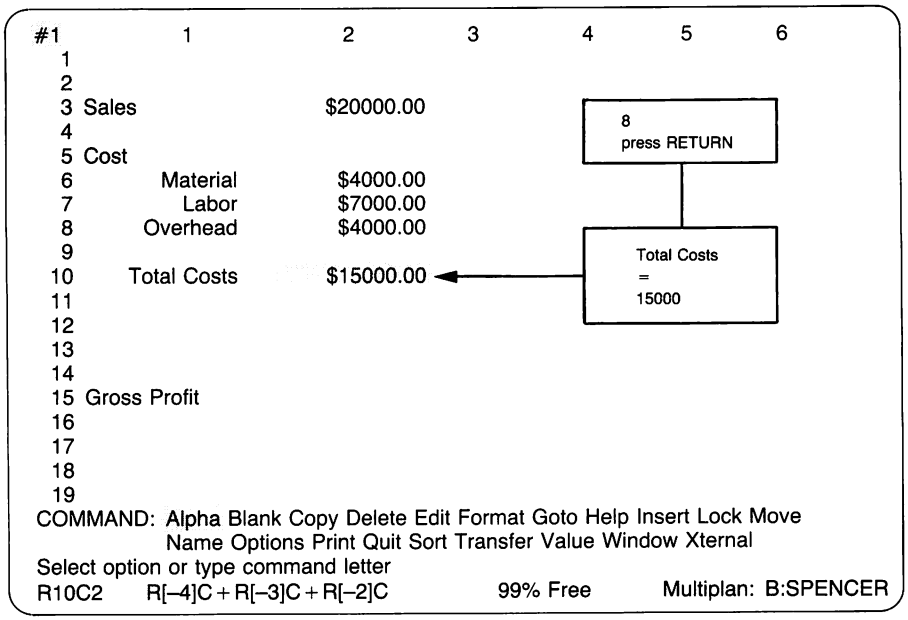
"row 8 (Overhead)."

7. Move the cell pointer to Overhead (R8C2).



Screen 69

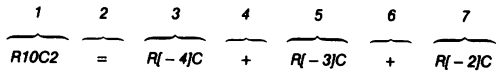
8. Press RETURN. You see Total Costs now as $15000.00. Look at the status line to see the formula Multiplan-86 used to calculate the total.



Screen 70

The dollar format you selected in Chapter 2 with the Format Default Cells Command automatically gives you two decimal places. Because of this default setting, any numbers you enter appear in dollars unless you specifically change them with the Format Cells Command.

The formula you see on the status line is the way Multiplan-86 states what you said as you built the formula. Multiplan-86 states:



MR-S-2439-82

1. This cell is the active cell.
2. It contains . . .
3. the cell 4 rows up from here (or 'this row minus 4') in this column . . .
4. plus . . .
5. the cell 3 rows up from here . . .
6. plus . . .
7. the cell 2 rows up from here.

NOTE: When a formula in Multiplan-86 does not give a row or column number, it means "this" row or "this" column.

Reviewing and/or Changing a Formula

At some later time, you may forget exactly how you calculated the figure in a particular cell. You can see the contents of a cell by moving the cell pointer to it and looking at the status line.

If you wish to change the formula, place the cell pointer on that cell and use the Edit command (press **E**) to bring the formula onto the command line. Then, use the Character Right (PF3) and Character Left (PF2) keys with the BACKSPACE key to make the changes you want.

These two keys are among the editing keys that Multiplan-86 provides you. The editing keys are explained further in Chapter 1 of the *Multiplan-86 Reference Manual.* In a nutshell, with the editing keys you can move the highlight around the command line, insert new text, and delete or replace old text. There are nine editing keys, altogether. They are explained in the following list.

DELETE or BACKSPACE	Moves the edit cursor leftward, deleting what you've typed
TAB or SPACE BAR	Moves the edit cursor rightward
PF2	Moves the edit cursor one character leftward
PF3	Moves the edit cursor one character rightward
PF1	Moves the edit cursor one word leftward
PF4	Moves the edit key one word rightward
REMOVE key	Removes the proposed response
RETURN key	Tells Multiplan-86 to carry out a command that you typed in
CTRL/C	Halts command execution; returns you to the menu

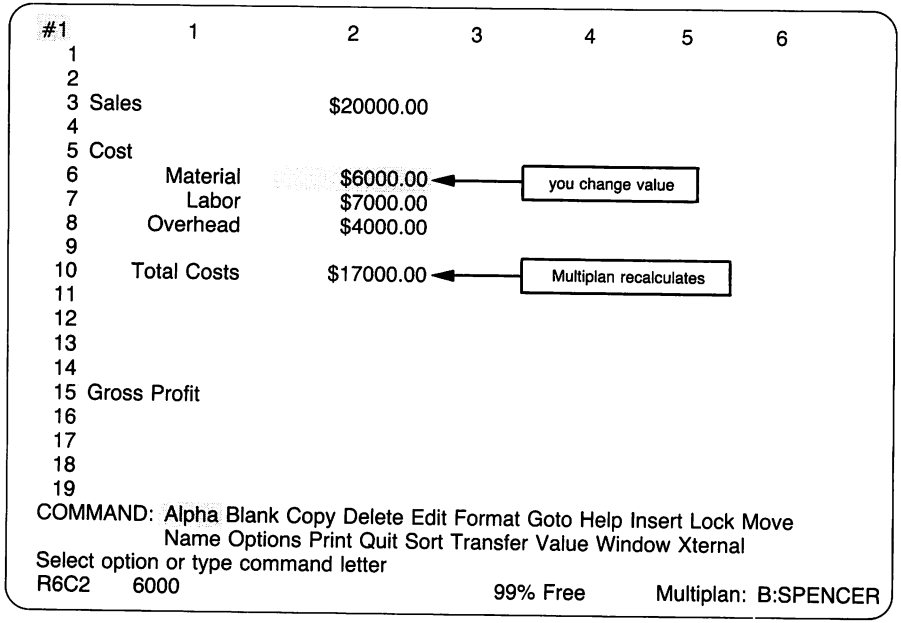
The Status Line: Cell Contents

If a formula is too long to be shown in full on the status line, use Edit to place the formula in the command line so that you can review all of it.

Do not be confused by the numbers and letters displayed on the status line. With practice, you will find it easy to understand the formulas and other information.

The status line shows what is actually contained in the active cell. While the active cell may display the number $15000.00, the status line tells you what formula governs that cell. The value displayed for the cell may change, but the formula remains constant. If, for example, the cost of materials were $6000 instead $4000, the figure displayed in the *Total Cost* cell would change to $17000.00. Yet, the status line would still show the same formula.

Try it. Move the cell pointer to R6C2 ($4000.00). Type **6000**. Press RETURN and watch the display change to the following:



Screen 71

Total Costs now shows $17000.00. Now, change the cost of materials back to $4000.00, and watch *Total Costs* change back to $15000.00.

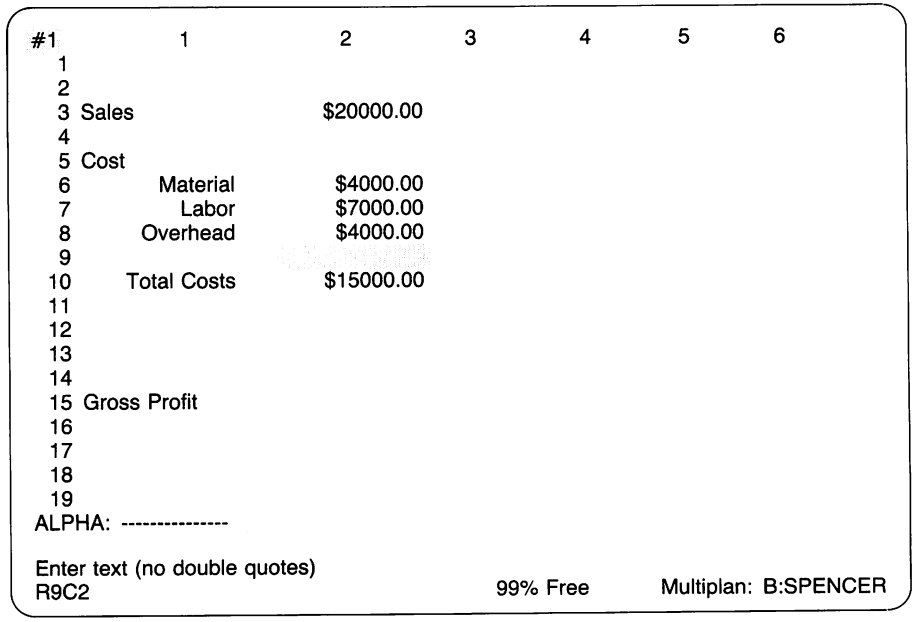
Drawing Lines

To make the worksheet easier to read, draw a line in row 9, column 2, using dashes to separate the subcategories from *Total Costs.* Follow the same procedure you used earlier to enter text:

1. Move the cell pointer to row 9.
2. Press **A** (for Alpha).

   NOTE: If you missed this step and tried to enter the dash without the Alpha Command, the command line would show VALUE and would be ready for a negative number or a formula. If you did do this, press CTRL/C and start this step over again.

3. Type the dash 15 times to fill the spaces in the cell:



Screen 72

4. Press RETURN. You now see:

```
#1          1              2          3          4          5          6
  1
  2
  3 Sales                 $20000.00
  4
  5 Cost
  6          Material      $4000.00
  7            Labor       $7000.00
  8        Overhead        $4000.00
  9                        ------
 10      Total Costs       $15000.00
 11
 12
 13
 14
 15 Gross Profit
 16
 17
 18
 19
COMMAND: Alpha Blank Copy Delete Edit Format Goto Help Insert Lock Move
         Name Options Print Quit Sort Transfer Value Window Xternal
Select option or type command letter
R9C2     "----------"                  99% Free        Multiplan: B:SPENCER
```

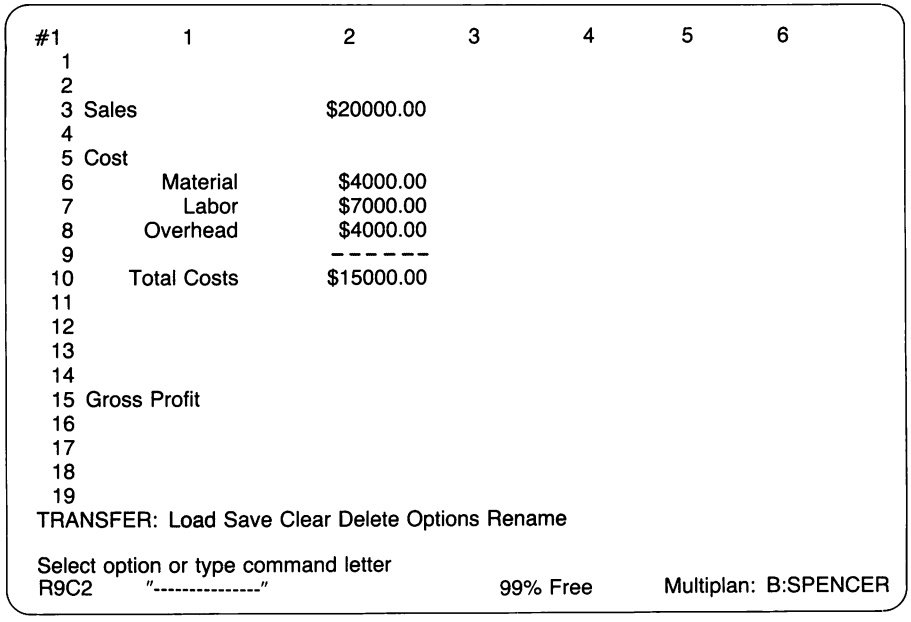
Screen 73

You will learn how to extend this line across the entire worksheet, or across as many columns as you wish. Later, you also get more practice in entering formulas using the cell pointer. With practice, it becomes even easier and even more natural to use Multiplan-86.

The Transfer Save Command (Review)

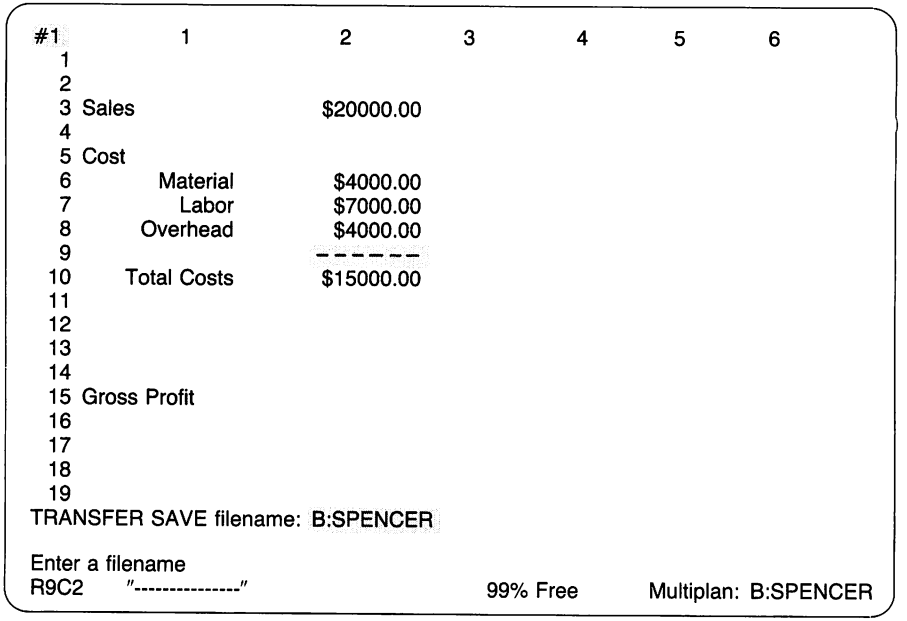
Save your work by using the Transfer Save Command as you did before:

Press **T**. The command line shows:



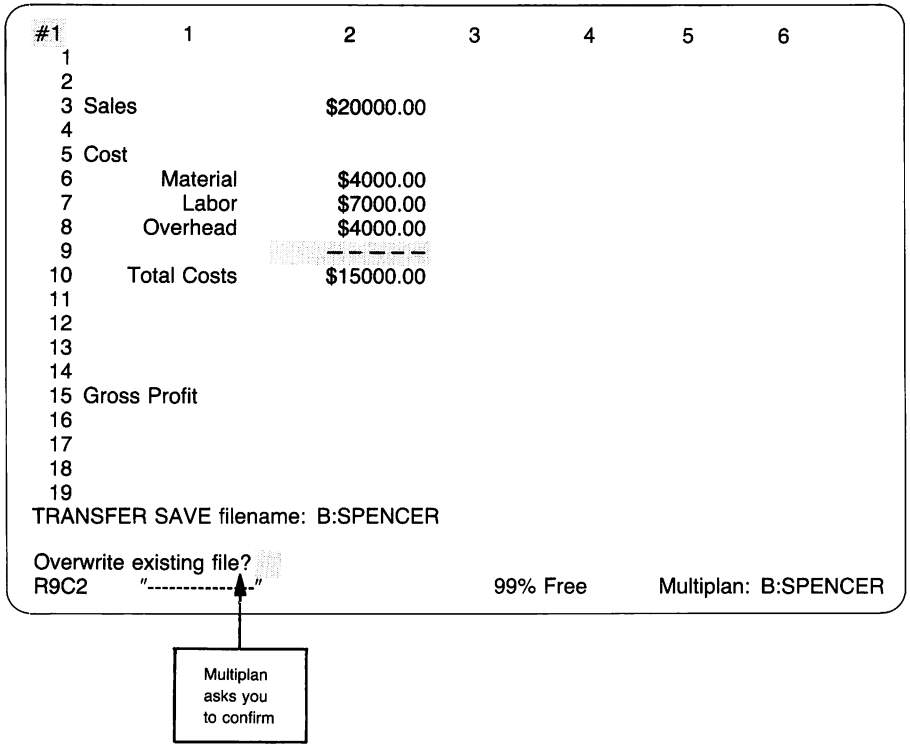
Screen 74

Choose Save by pressing **S**. Now the command line shows:



Screen 75

The proposed response is the last file name used, B: SPENCER. Since that is what you want, press RETURN.



Screen 76

Multiplan-86 is now asking you if you want the worksheet on the screen to replace the one in the file. Since you do want your new work saved, press **Y** (for Yes). The command line now returns to:

```
#1          1          2          3          4          5          6
  1
  2
  3 Sales              $20000.00
  4
  5 Cost
  6          Material   $4000.00
  7            Labor    $7000.00
  8         Overhead    $4000.00
  9                     -------
 10       Total Costs   $15000.00
 11
 12
 13
 14
 15 Gross Profit
 16
 17
 18
 19
COMMAND: Alpha Blank Copy Delete Edit Format Goto Help Insert Lock Move
         Name Options Print Quit Sort Transfer Value Window Xternal
Select option or type command letter
R9C2      "---------------"                99% Free        Multiplan: B:SPENCER
```

Screen 77

Any time you select a command that can affect a worksheet as a whole, Multiplan-86 asks you to confirm the action by pressing **Y**. This is true of worksheets on the screen and worksheets in a disk file. These actions include, for example, saving a file under a name previously used. It's also true when you quit a Multiplan-86 session.

Your worksheet has been saved. Leave Multiplan-86 for this session by typing **Q** (Quit) and **Y** (Yes) to confirm.

Summary

In this session you learned:

- How to load your file.
- How to create more space by inserting empty rows using the Insert Command (**I**).
- How to enter additional text using the Alpha Command with the direction keys.
- How to enter additional numbers.
- How to align the contents of specific cells.
- How to remove the contents of specific cells using the Blank (**B**) Command.
- How to build formulas using the cell pointer and how to read what the formula on the status line shows.
- How to use the cell pointer and the status line to review a formula, and how to use the cell pointer and the Edit Command (**E**) to change a formula.
- How to draw a line using the dash (-).
- How to save your new work with the Transfer Save Command (writing over old work).

4

Naming Cells and Copying

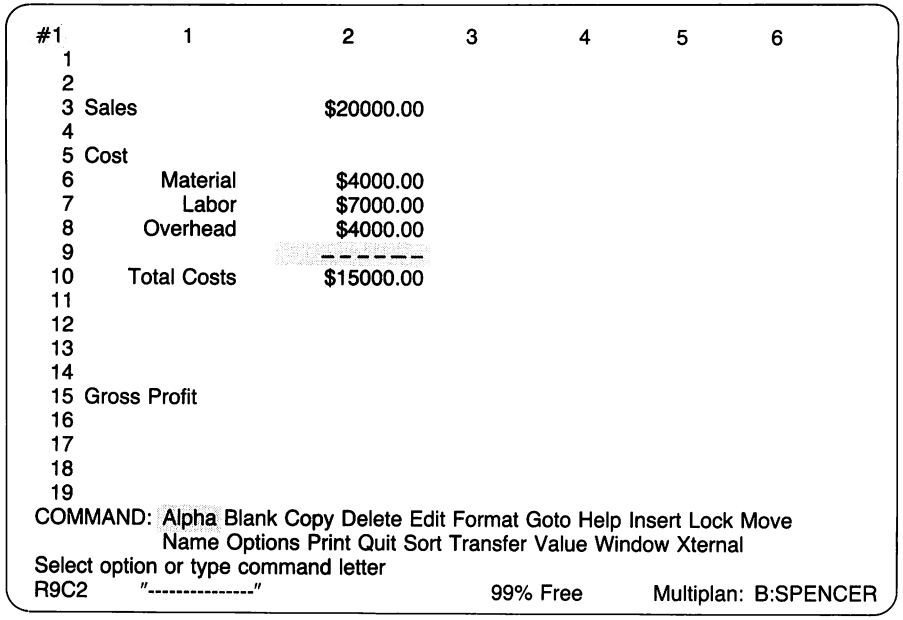
In the last session, you entered cost figures into the worksheet. You then built a formula for *Total Costs* using the cell pointer.

In this session you will get more practice in building formulas. You will also learn how to copy cells and how to name them.

The Transfer Load Command (Review). Load and start Multiplan-86 according to the instructions in "Loading and Starting Multiplan-86," in Chapter 1. Now load the diskette holding the SPENCER file into drive B. To review:

Press **T** (Transfer)
Press **L** or RETURN (to select Load).
Type **B:SPENCER**
Press RETURN.

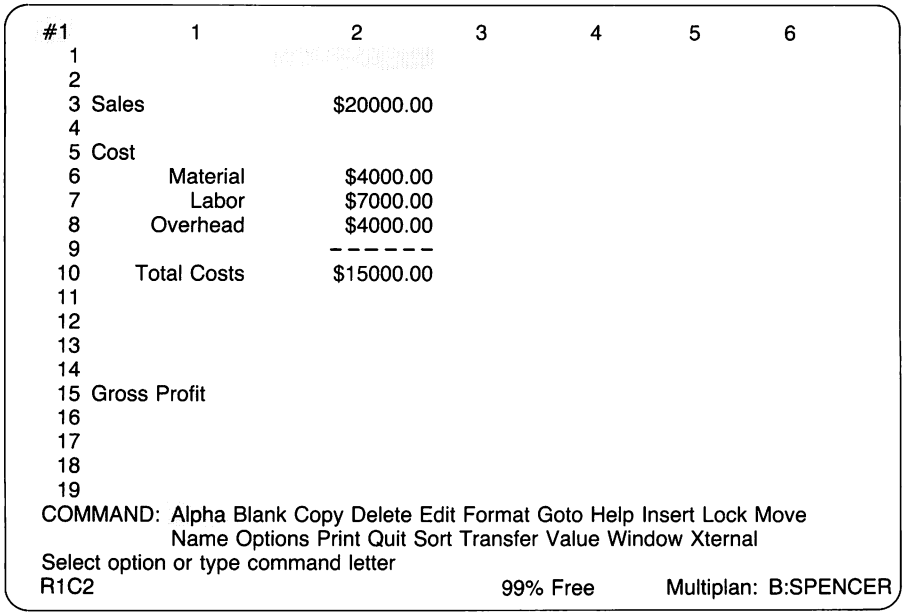
Your screen should show:



Screen 78

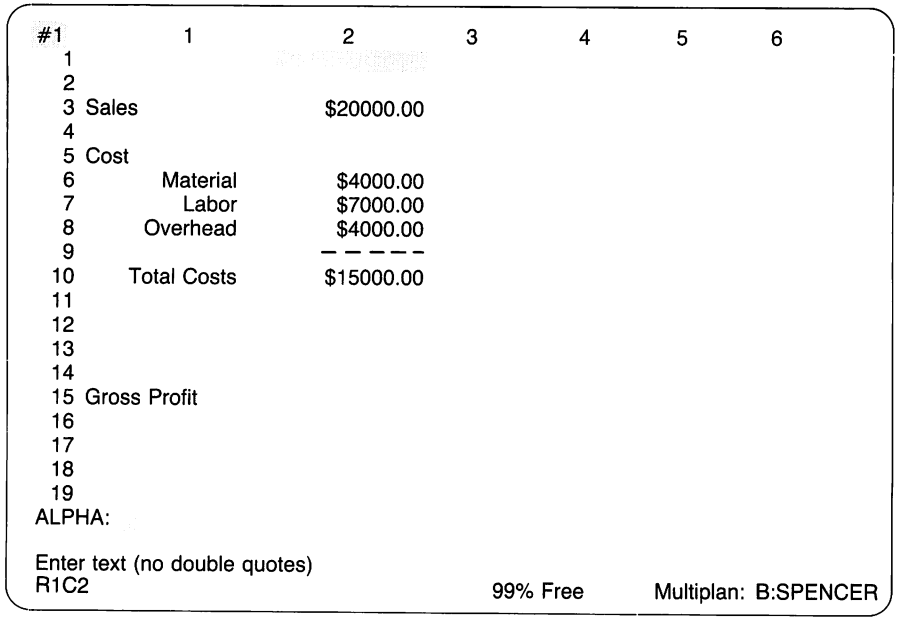
Titles

You need to be able to tell which month is which, so you want to put the names of the months across the top of the worksheet. Move the cell pointer to row 1, column 2.


#1 1 2 3 4 5 6
3 Sales $20000.00
5 Cost
6 Material $4000.00
7 Labor $7000.00
8 Overhead $4000.00
10 Total Costs $15000.00
15 Gross Profit
COMMAND: Alpha Blank Copy Delete Edit Format Goto Help Insert Lock Move
Name Options Print Quit Sort Transfer Value Window Xternal
Select option or type command letter
R1C2 99% Free Multiplan: B:SPENCER

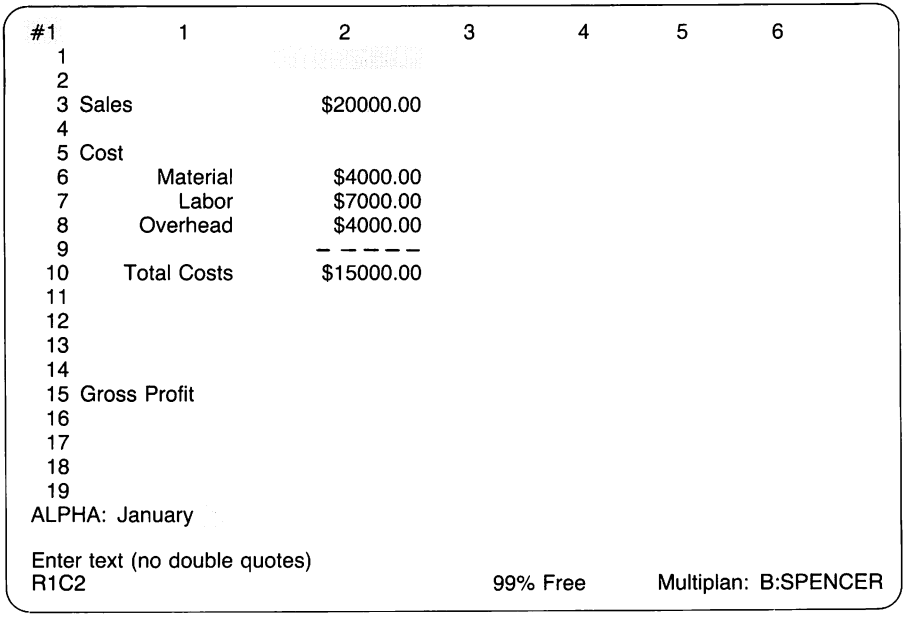
Screen 79

Enter the names of the months across the top of the worksheet. You want to enter the months starting with January in row 1, column 2 (R1C2), so press **A** (for the Alpha Command):



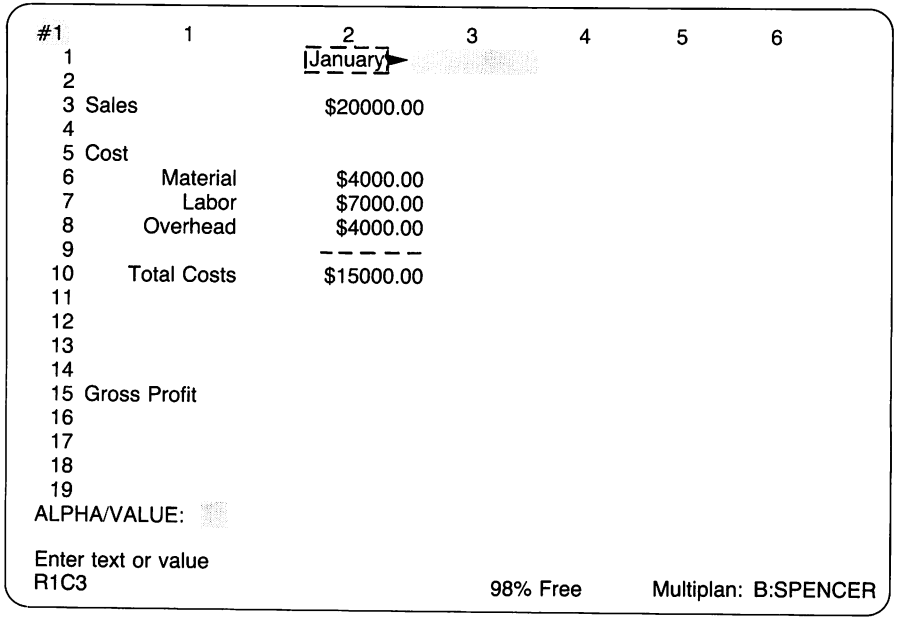
Screen 80

Type **January.**



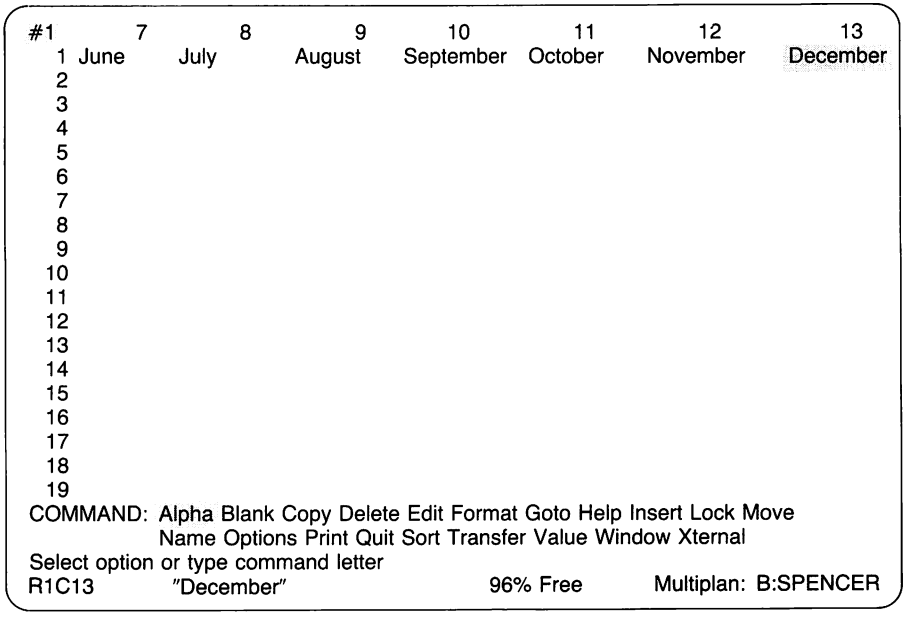
Screen 81

Move the cell pointer to the next cell, row 1, column 3 (R1C3). Remember that moving the cell pointer automatically enters the word; there is no need to press RETURN or Alpha each time.



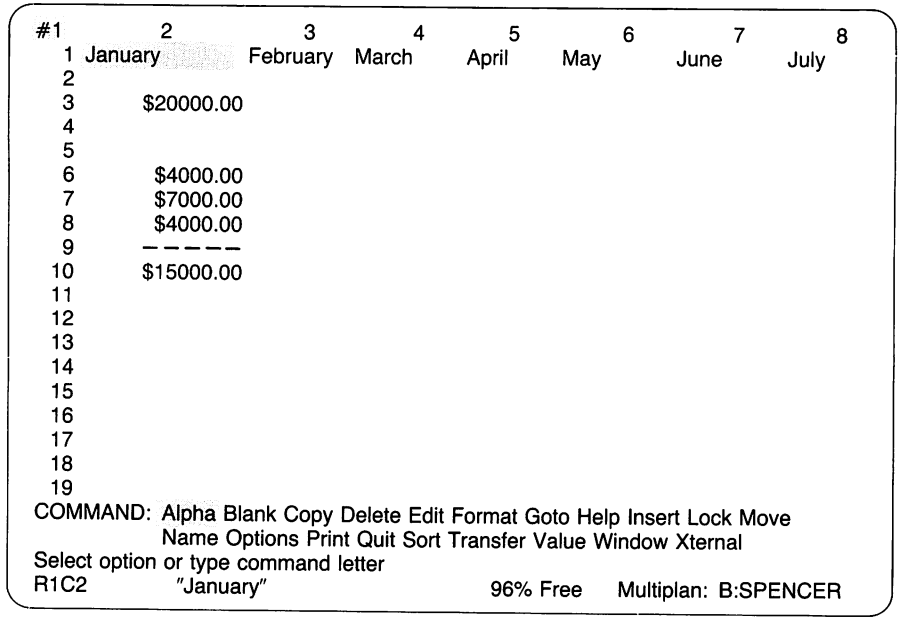
Screen 82

Follow the same procedure until you have listed all twelve months. You automatically scroll the screen as you move the cell pointer. Press RETURN after the last month to return to the main command menu.



Screen 83

Move the pointer back to January (row 1, column 2) (R1C2).

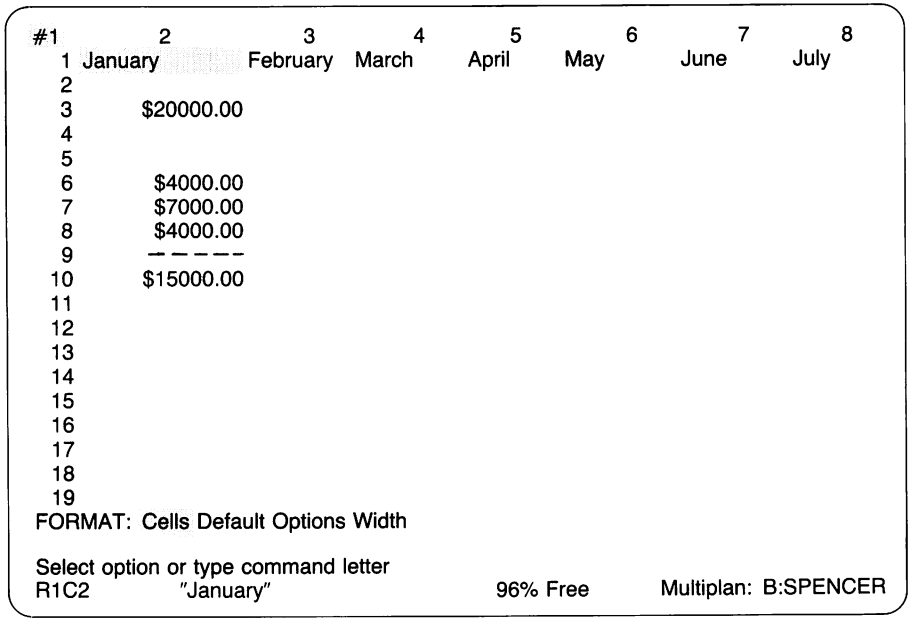


Screen 84

Format: Align Center

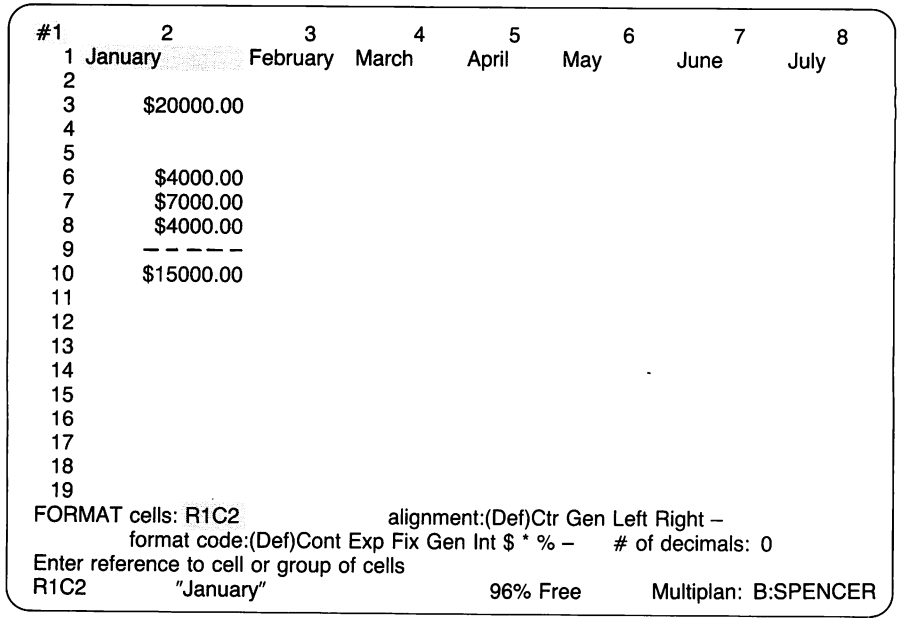
Because they are text, the names of the months are aligned left in the Multiplan-86 "General" format (the format in which your worksheet began). It looks nicer and is easier to follow if the names of the months are centered over the columns. Use the Format Cells Command with the "Center" alignment to accomplish this.

Press **F**.



Screen 85

Press **C** or RETURN (for Cells).

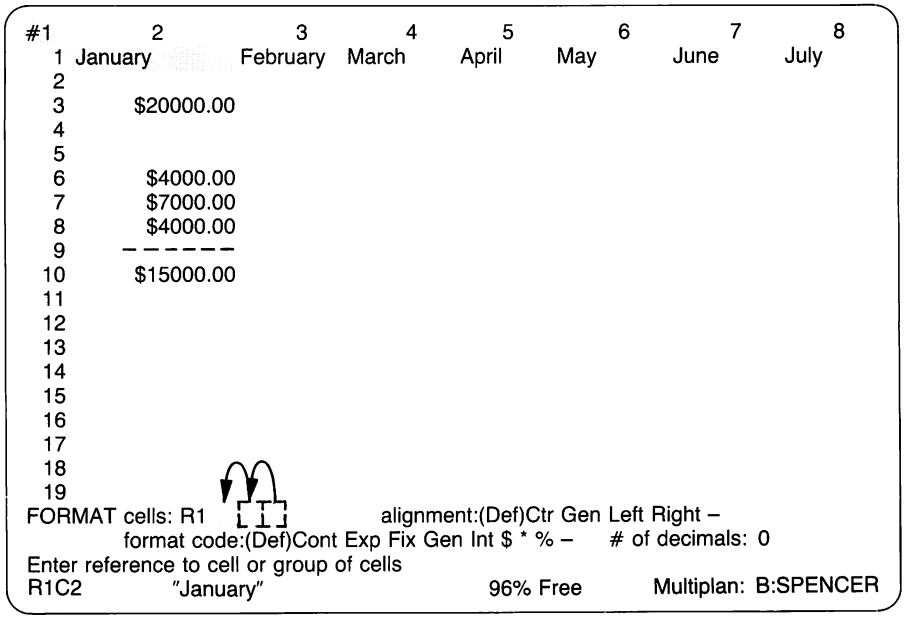


Screen 86

You want to format all twelve months, so you could follow the same procedure you used earlier to format a range of cells (the subheadings for *Cost*). But it is much faster and more efficient to format the whole row at once.

Press the CHARACTER RIGHT (PF3) key to move the edit cursor to the end of the first field (R1C2).

Earlier, instead of pressing the RIGHT ARROW key a number of times to give the range, you typed colon and another cell reference. This time you want to format a whole row. You could type the column numbers yourself (2:63), but there's a more efficient way. Simply delete the C2 from the cell reference, using BACKSPACE.



Screen 87

This leaves the response as R1, which tells Multiplan-86 to format the whole row. (Similarly, C1, for example, means format the whole column 1.)

Press TAB to get to the second field. Type **C** to choose "Center".

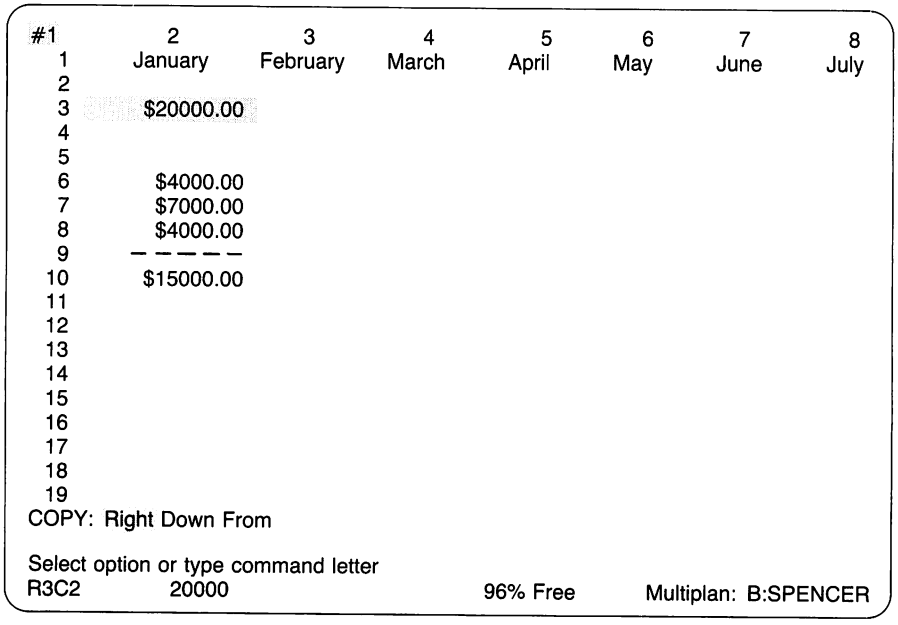
Press RETURN now because the "format code" field is correct and the "# of decimals" field does not apply.

The names of the months are now aligned in the center over the columns of numbers and are easier to read.

The Copy Right Command

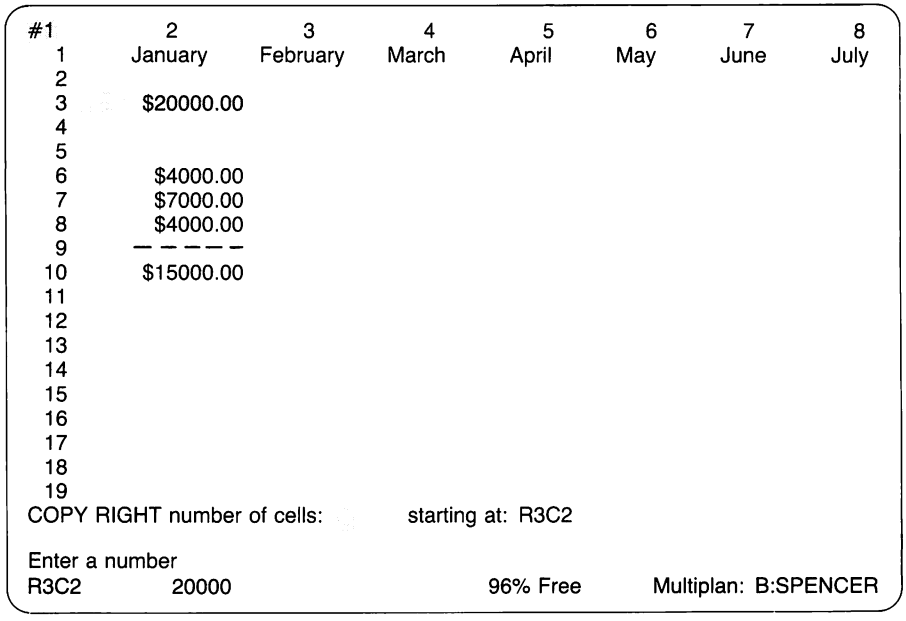
The figures you entered for Spencer Ceramics were for only one month. You also want to show the rest of the year. Start by copying the figures you have for this one month into the remaining months of the year (the next 11 columns). Later you can change some figures for costs or sales to see the effects of the changes on Spencer Ceramics' profits.

To copy the number for *Sales* ($20000.00) into the next eleven cells, move the cell pointer to $20000.00 (row 3, column 2). Press **C** (for the Copy Command). Your command line shows:



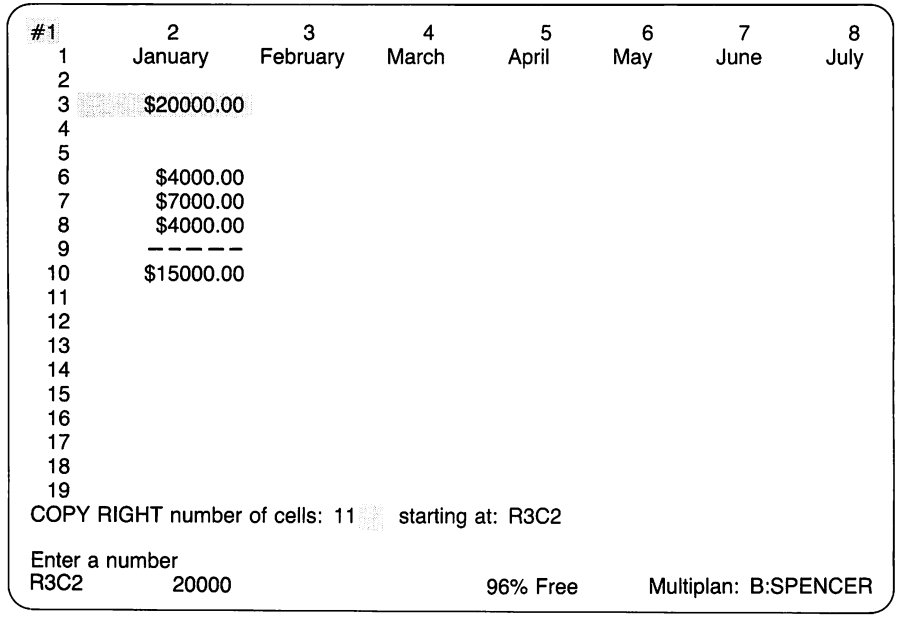
Screen 88

Choose the Copy Right Command to copy from one cell into the cells to its right. Press **R**. The command line shows:



Screen 89

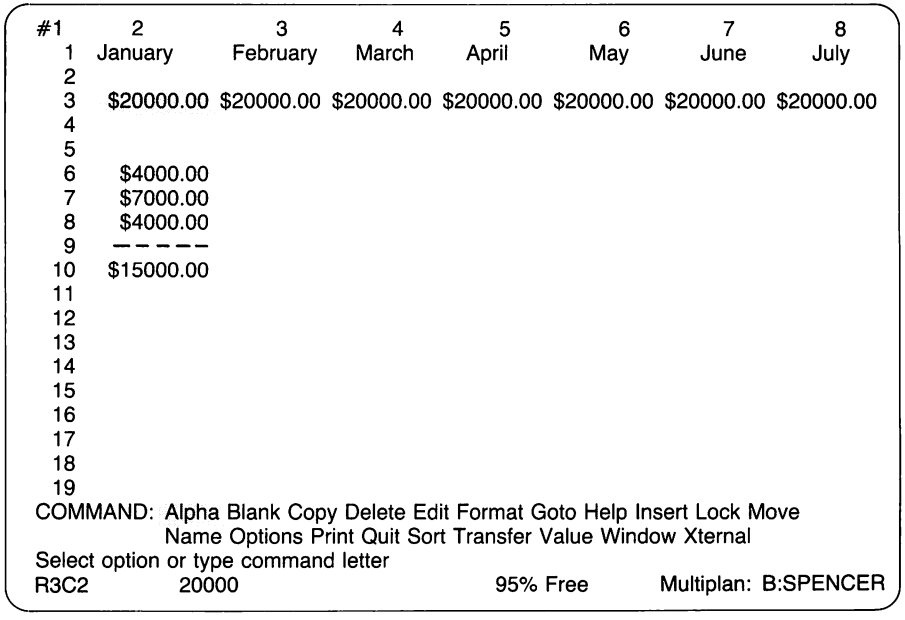
Where the edit cursor is located, type **11**, for the number of times you want the formula in R3C2 copied.



Screen 90

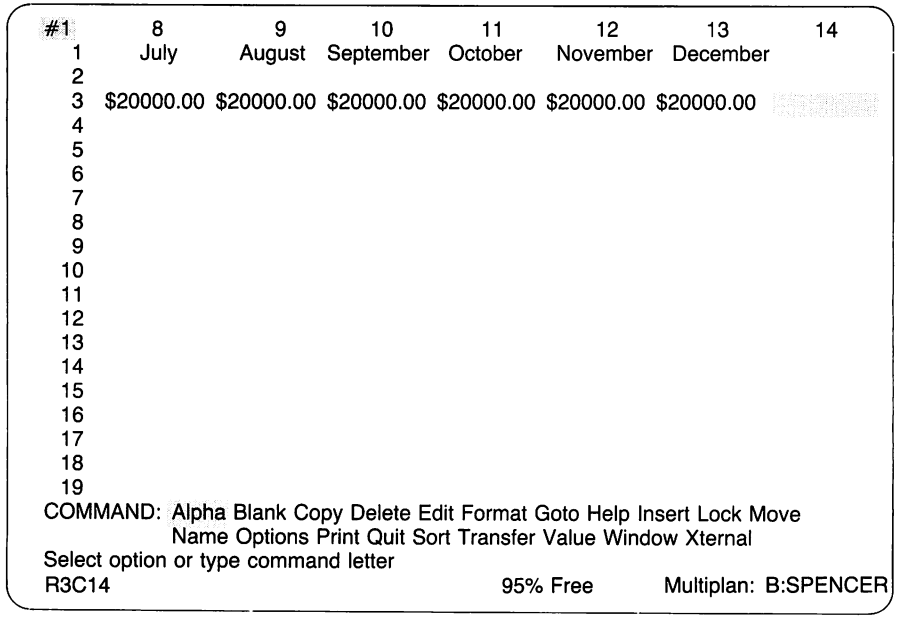
Multiplan-86 proposed the cell you want to copy (the location of the cell pointer) as the starting point. You already specified how many copies of that cell you want.

Press RETURN.



Screen 91

The screen is too small to display the whole year at one time, but you can see the rest of the year. Press the RIGHT ARROW key to scroll the sheet beneath the pointer. Scroll until both columns 13 and 14 are visible. The sales figures stop at column 13 (the last of the twelve months of the year).



Screen 92

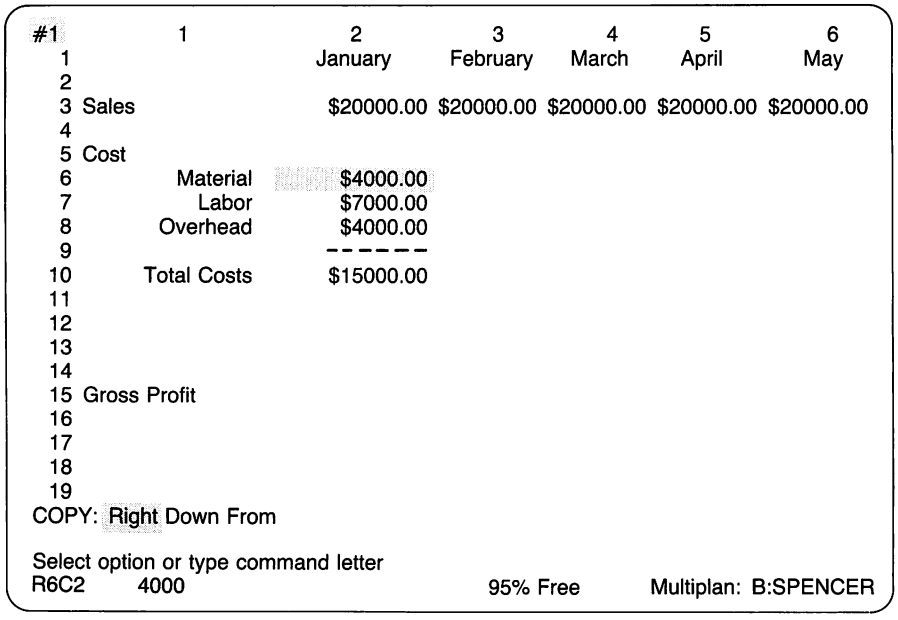
Now, fill in the cost figures, again using the Copy command. Instead of copying one row at a time (as you did when you copied the $20000.00 for *Sales*), use the Copy Right Command to copy a group of cells.

First, move the cell pointer to the upper left of the area you want to copy. You want to copy the information from rows 6 through 10 in column 2, to the same rows in the remaining columns—columns 3 through 13—to fill in the rest of the months. Move the cell pointer to row 6 in column 2.

```
#1          1                2          3          4          5          6
  1                        January   February     March      April        May
  2
  3 Sales                $20000.00  $20000.00  $20000.00  $20000.00  $20000.00
  4
  5 Cost
  6          Material     $4000.00
  7            Labor     $7000.00
  8         Overhead     $4000.00
  9                      --------
 10       Total Costs    $15000.00
 11
 12
 13
 14
 15 Gross Profit
 16
 17
 18
 19
COMMAND: Alpha Blank Copy Delete Edit Format Goto Help Insert Lock Move
         Name Options Print Quit Sort Transfer Value Window Xternal
Select option or type command letter
R6C2     4000                              95% Free        Multiplan: B:SPENCER
```

Screen 93

Press **C** for the Copy Command.



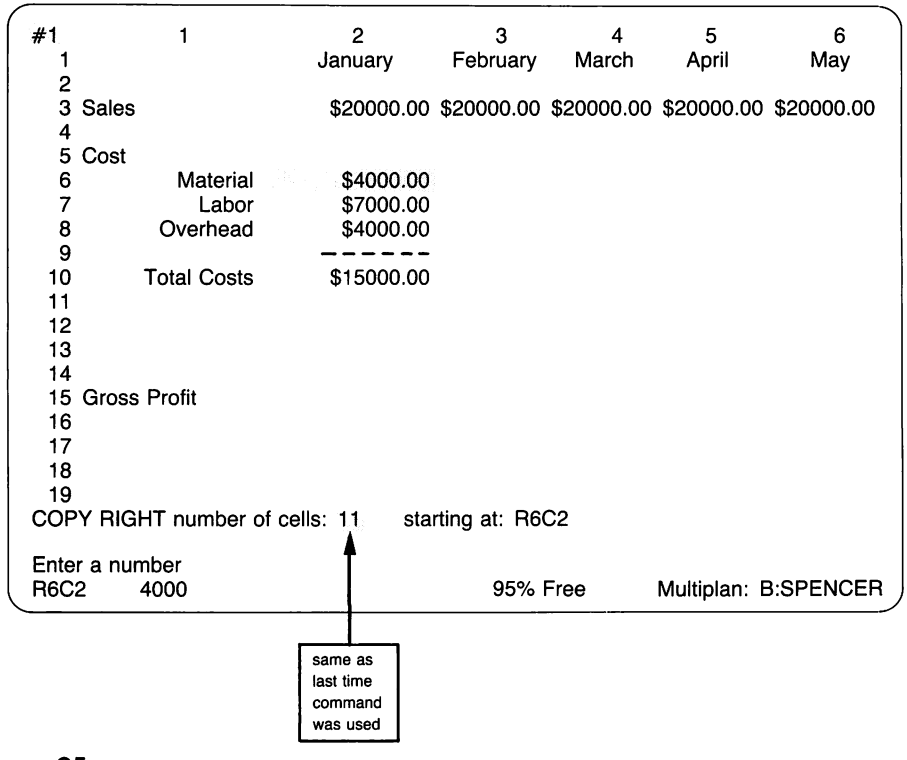
#1	1	2	3	4	5	6
1		January	February	March	April	May
2						
3	Sales	$20000.00	$20000.00	$20000.00	$20000.00	$20000.00
4						
5	Cost					
6	Material	$4000.00				
7	Labor	$7000.00				
8	Overhead	$4000.00				
9		------				
10	Total Costs	$15000.00				
11						
12						
13						
14						
15	Gross Profit					
16						
17						
18						
19						

COPY: Right Down From

Select option or type command letter
R6C2 4000 95% Free Multiplan: B:SPENCER

Screen 94

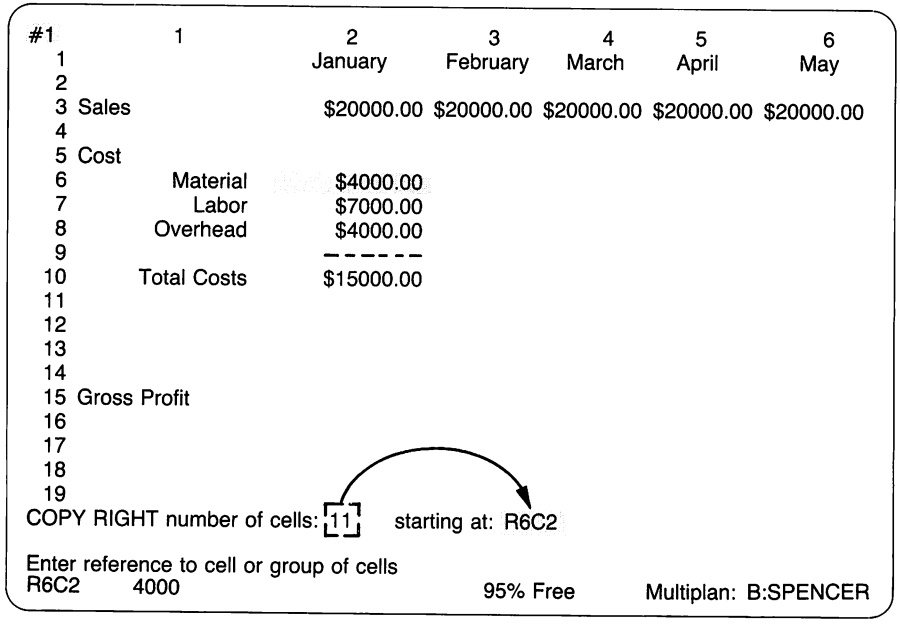
Press **R** (for Copy Right).



Screen 95

Notice that the "number of cell" field shows *11*, the same number you typed the last time you used the Copy Right Command. Multiplan-86 always proposes the number you used for the last Copy Right Command. The number you want is 11 (this copy is just like the last one for *Sales*).

Press TAB to move to the "starting at" field.



Screen 96

If you were copying only one row, this response would be right. But you want to copy 5 rows of column 2 to the right, so you need to enter a range.

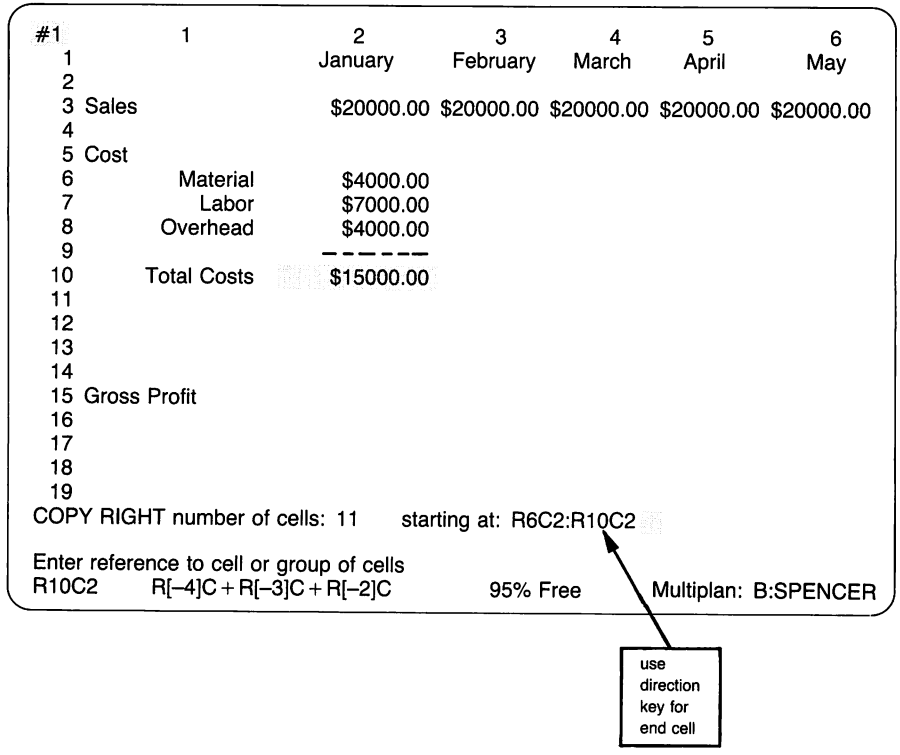
Press :

```
#1          1              2          3          4          5          6
  1                      January   February   March      April      May
  2
  3 Sales                $20000.00 $20000.00 $20000.00 $20000.00 $20000.00
  4
  5 Cost
  6          Material     $4000.00
  7            Labor      $7000.00
  8         Overhead      $4000.00
  9                       ------
 10       Total Costs     $15000.00
 11
 12
 13
 14
 15 Gross Profit
 16
 17
 18
 19
COPY RIGHT number of cells: 11     starting at: R6C2:

Enter reference to cell or group of cells
R6C2      4000                          95% Free        Multiplan: B:SPENCER
```

colon (:) to build a "range"

Screen 97

Press the DOWN ARROW key until the cell pointer is on $15000.00 (next to *Total Costs* R10C2).



Screen 98

Notice that the range has been built.

Press RETURN and watch the values appear across the screen. The values for *Total Costs* appear last because you are copying a formula and Multiplan-86 has to calculate the value after it finishes copying the formulas. You should now see:

```
#1          1                2          3          4          5          6
  1                        January   February     March      April        May
  2
  3 Sales                $20000.00  $20000.00  $20000.00  $20000.00  $20000.00
  4
  5 Cost
  6          Material     $4000.00   $4000.00   $4000.00   $4000.00   $4000.00
  7          Labor        $7000.00   $7000.00   $7000.00   $7000.00   $7000.00
  8          Overhead     $4000.00   $4000.00   $4000.00   $4000.00   $4000.00
  9                      ---------- ---------- ---------- ---------- ----------
 10          Total Costs  $15000.00  $15000.00  $15000.00  $15000.00  $15000.00
 11
 12
 13
 14
 15 Gross Profit
 16
 17
 18
 19
COMMAND: Alpha Blank Copy Delete Edit Format Goto Help Insert Lock Move
         Name Options Print Quit Sort Transfer Value Window Xternal
Select option or type command letter
R6C2     4000                          92% Free        Multiplan: B:SPENCER
```

Screen 99

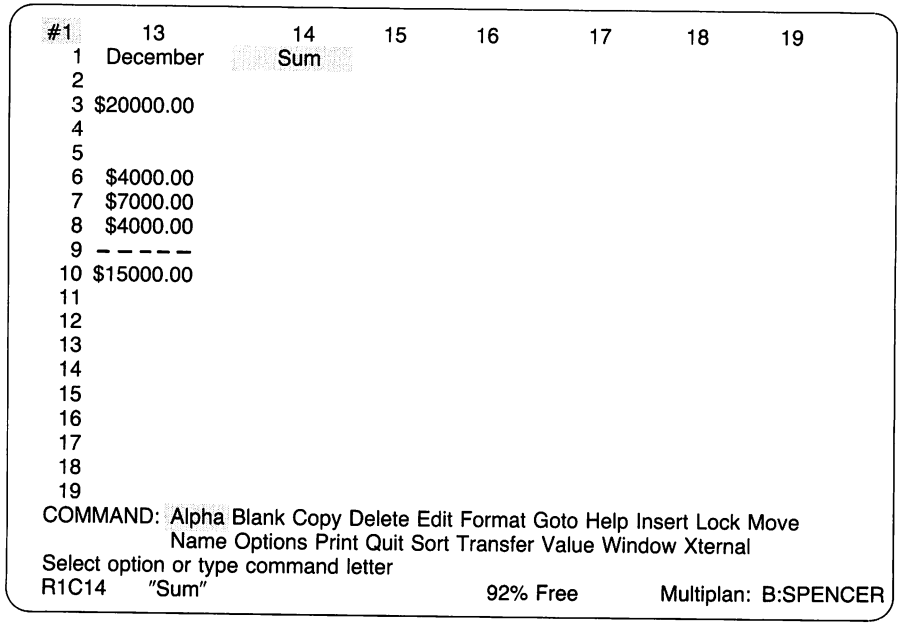
It looks like Spencer Ceramics has made a lot of money. Wouldn't you like to see how much? Then let's add another column heading in column 14, row 1 for the sums. Use the Goto Command to move the cell pointer to R1C14.

Press **G**
Press **R.**
Type **1**, press the TAB key, type 14
Press RETURN.

Enter the title Sum in column 14.

Press **A** (Alpha).
Type **Sum**
Press RETURN.

Now your screen should show:



Screen 100

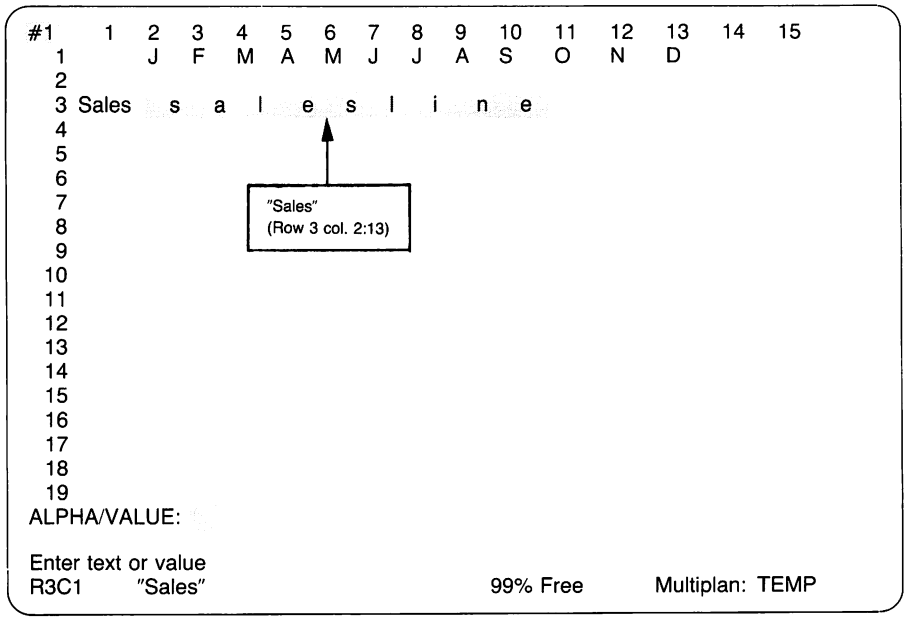
The word *Sum* is centered over column 14 because you used the Format Cells Command earlier to "center" the whole row.

Formulas (Review) . A formula does calculations for you, and also allows the numbers to change so that Multiplan-86 recalculates the result. So you want to build formulas wherever you can.

In Chapter 3, you built a formula to calculate total costs for you. Now, you want to build a formula to calculate *Gross Profits.* Say to yourself, "*Gross Profits* is *Sales* minus *Total Costs.*" A formula that used these names would be easily recognizable and just as easy to build as the formulas you have already built. Before you can build such a formula, you must define names for some cells.

Naming Cells

To figure out *Gross Profits* easily, you must first name the groups of cells that contain sales and total cost figures, so that the names can be used in a formula. Multiplan-86 has a way to name cells or groups of cells, so that you can refer to them easily. For example, you can, name a whole row, such as row 3; you can name it *Sales*, meaning the whole line of numbers showing Sales. If you could see your whole screen at once, you could imagine the row named *Sales*. It would look like this:



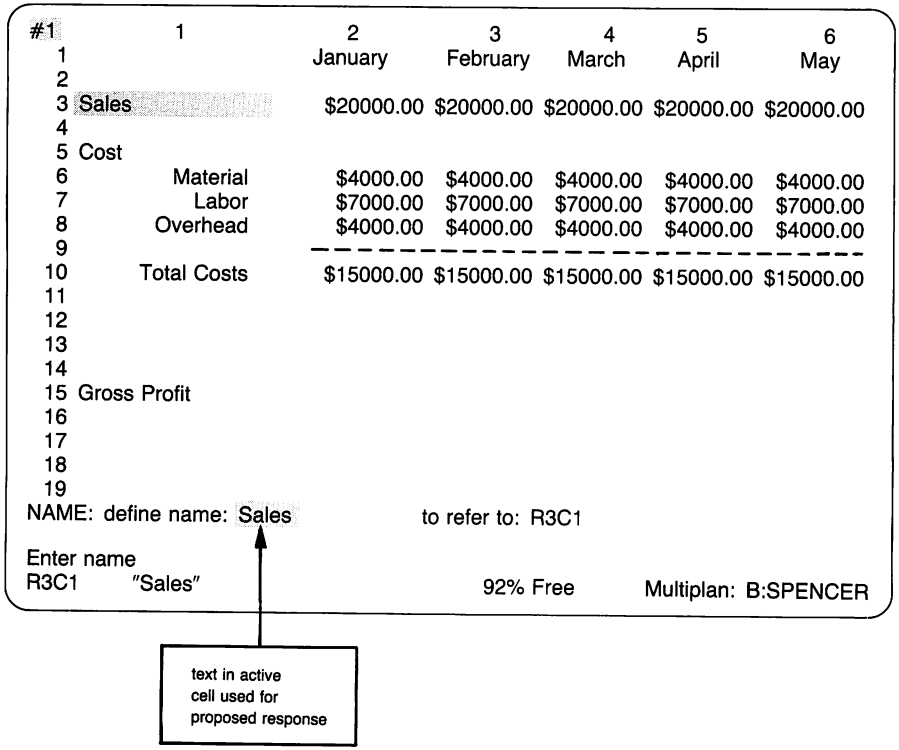
Screen 101

NOTE: *When you name a cell or group of cells, make the name one long word; do not use spaces or hyphens. (For more information, see the discussion of the Name Command in the Multiplan-86 Reference Manual.)*

Start by naming row 3 Sales.

Move the cell pointer to R3C1 (row 3, column 1).

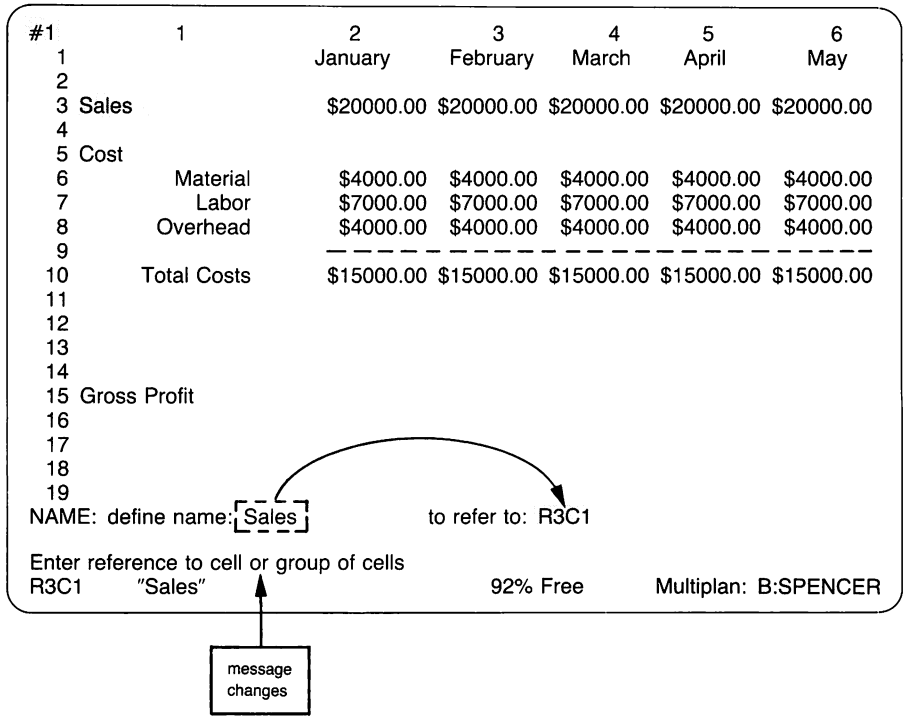
Press **N**.



Screen 102

In the first field, Multiplan-86 proposes *Sales* as the name to be defined. This is helpful for quickly turning titles on a worksheet into names. Titles are text that you place in a cell. Names are references to areas on the worksheet. A name may be the same as a title, as it is here. But, the area the name refers to may be different from the area that contains the title.

Press TAB to move to the next field.



Screen 103

Notice that when you tabbed to the "to refer to" field, the message changed to "Enter reference to cell or group of cells." Multiplan-86 is asking you to specify which cells this name refers to. You want *Sales* to refer to the cells in row 3, columns 2 through 13, press the RIGHT ARROW key once. The response in the "to refer to" field is now R3C2. Press : (colon), then the RIGHT ARROW key to move the cell pointer to column 13 (December). You should see:

```
#1       7           8           9          10          11          12          13
 1     June        July       August   September    October    November    December
 2
 3 $20000.00  $20000.00  $20000.00  $20000.00  $20000.00  $20000.00  $20000.00
 4
 5
 6  $4000.00   $4000.00   $4000.00   $4000.00   $4000.00   $4000.00   $4000.00
 7  $7000.00   $7000.00   $7000.00   $7000.00   $7000.00   $7000.00   $7000.00
 8  $4000.00   $4000.00   $4000.00   $4000.00   $4000.00   $4000.00   $4000.00
 9 -----------------------------------------------------------------------------
10 $15000.00  $15000.00  $15000.00  $15000.00  $15000.00  $15000.00  $15000.00
11
12
13
14
15
16
17
18
19
NAME: define name: Sales                 to refer to: R3C2:R3C13

Enter reference to cell or group of cells
R3C13      20000                           92% Free      Multiplan: B:SPENCER
```

Screen 104

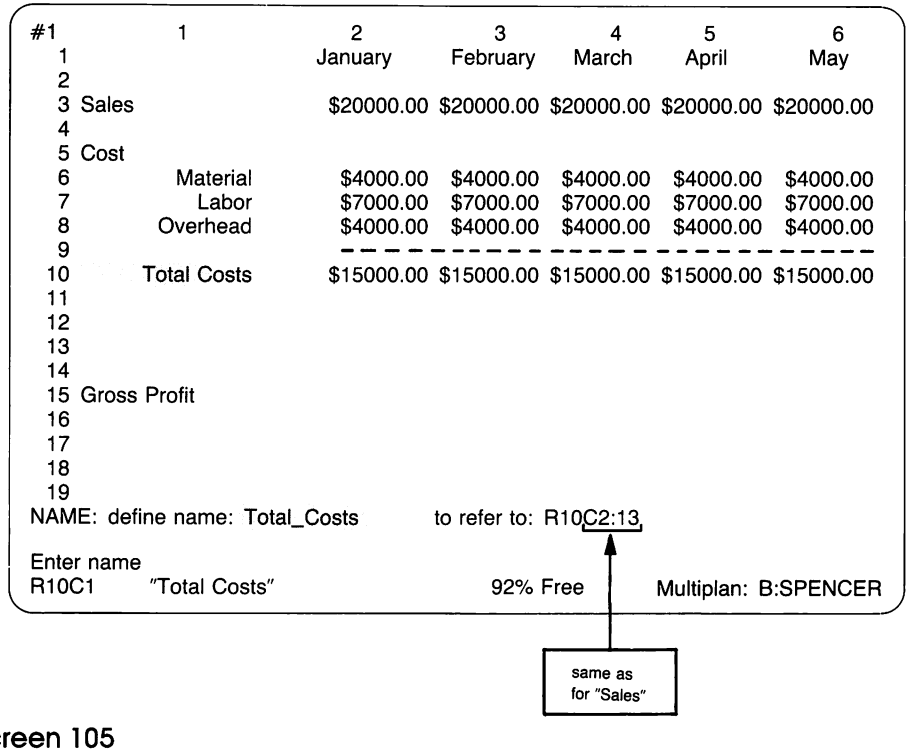
Press RETURN.

You could have typed **13** after the colon instead of using the cell pointer, which is faster if you know which cells compose the group you are naming.

Now define *Total Costs.*

Move the cell pointer to *Total Costs* (R10C1).

Press **N.**



Screen 105

Notice *Total_Costs* in the "define name" field and R10C2:13 in the "to refer to" field (the C2:13 part is the same as for *Sales!*). You need only press RETURN to define *Total Costs.*

NOTE: *Multiplan-86 changes any spaces in titles to underlines and deletes any illegal characters when titles are defined as names. The titles themselves are unaffected.*

The same procedure works for *Material, Labor,* and *Overhead.* To define these names:

Move the cell pointer to the title.

Press **N**.

Press RETURN.

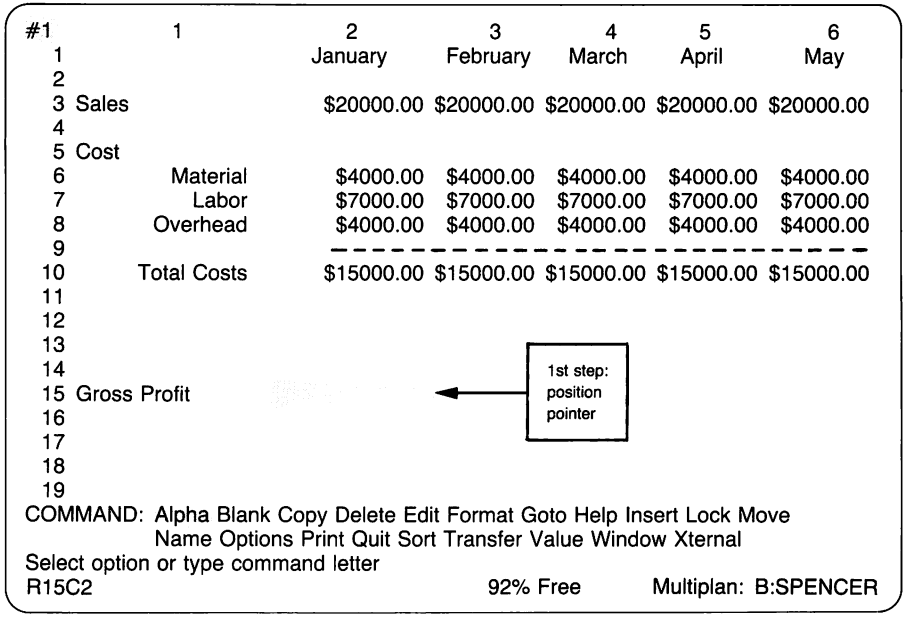
By proposing responses, Multiplan-86 makes it easy to quickly define a number of names for groups of cells that have similar shapes. In other cases, the proposed responses may not be what you need. So, you should always check the definition proposed for a name before you press RETURN.

You will not be able to see the names on the screen. The name can be used later in a formula or any other way that cell references can be used. It can also be used to refer to data on this sheet from other sheets. You will learn more about this later.

If you forget which cells a name refers to, you can use the Name Command to find out. Press **N**, then use the RIGHT ARROW key to "step forward through" the list of names. Each time you press the RIGHT ARROW key, another name appears; and the group of cells it refers to appears in the second field. If you forget which name you used, follow the same procedure until the name you are searching for appears. (Press CTRL/C to return to the regular command line.)

Building a Formula Using Names

Move the cell pointer to row 15, column 2, next to *Gross Profits.*



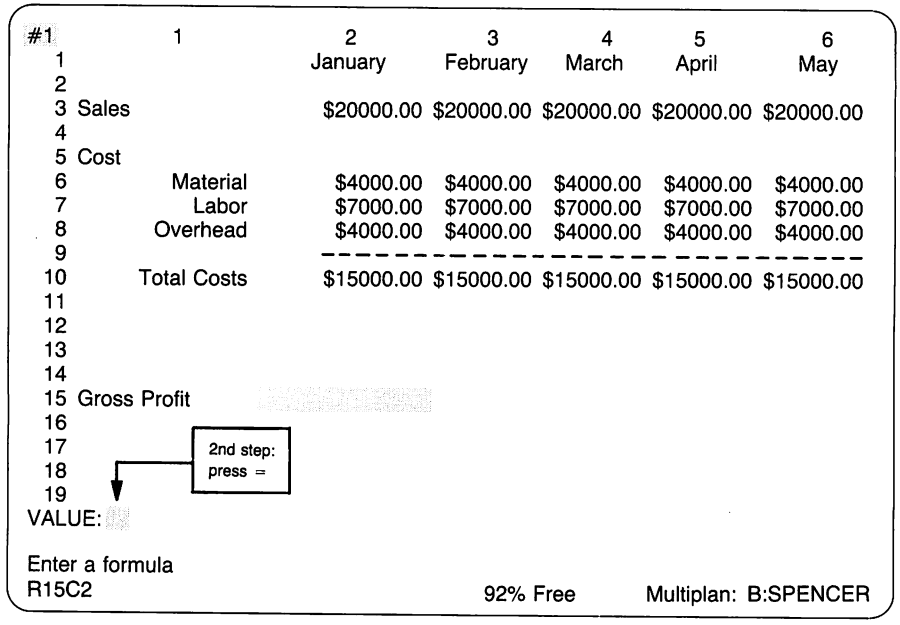
Screen 106

Again, say to yourself, "*Gross Profits* is *Sales* minus *Total Cost.*"

Gross Profits = Sales – Total Costs

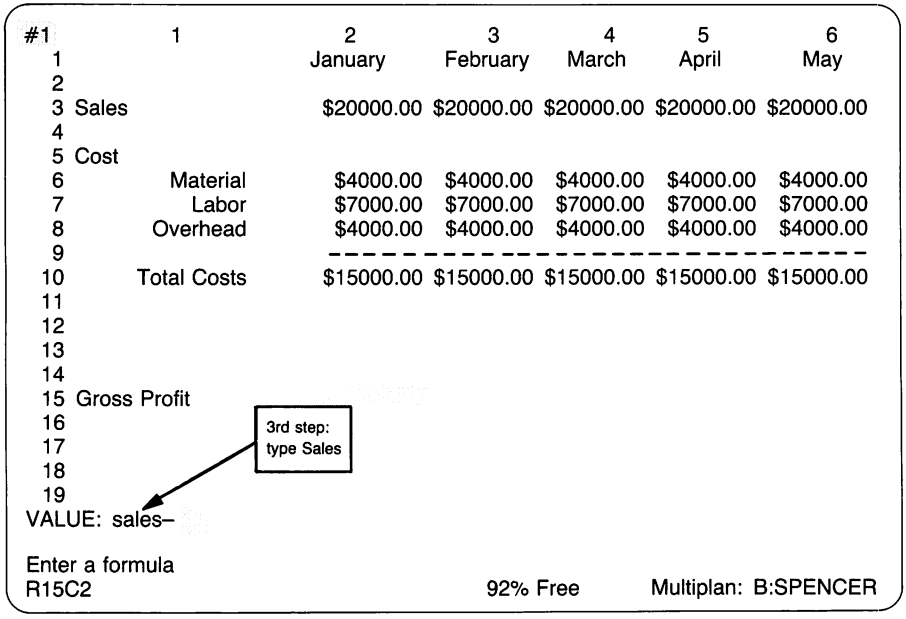
Now build the formula.

Press =



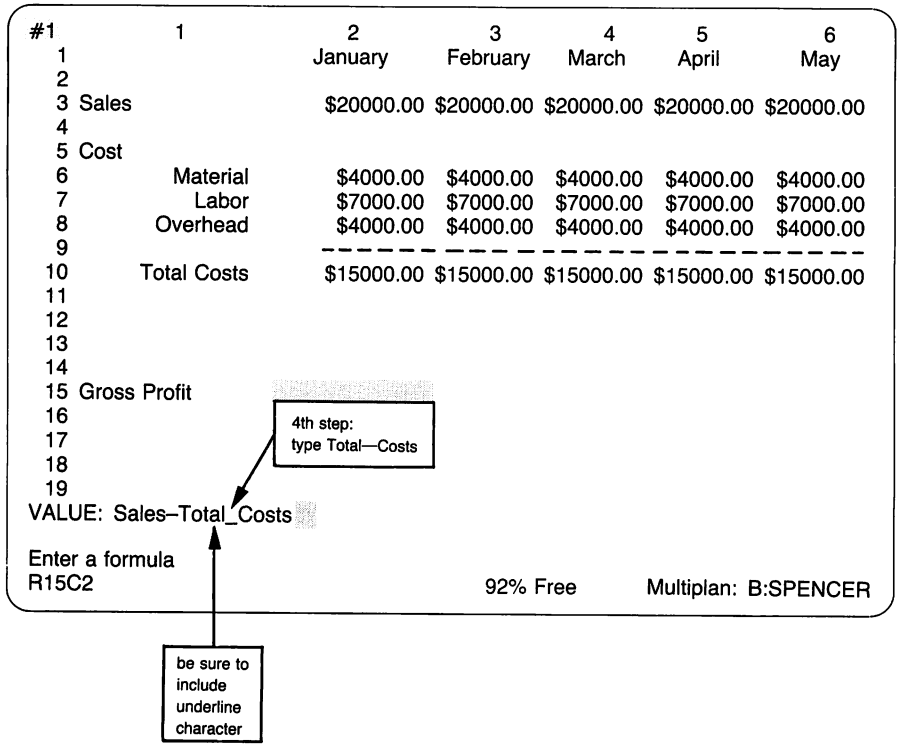
Screen 107

Type *Sales* and press the – (minus sign).



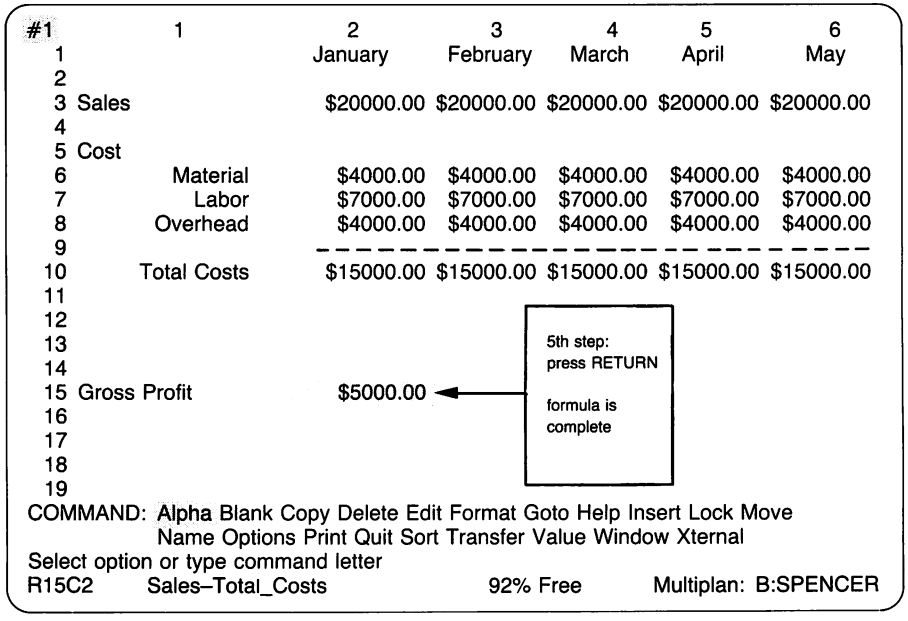
Screen 108

Now type **Total_Costs** (be sure to include the underline character between *Total* and *Costs*).



Screen 109

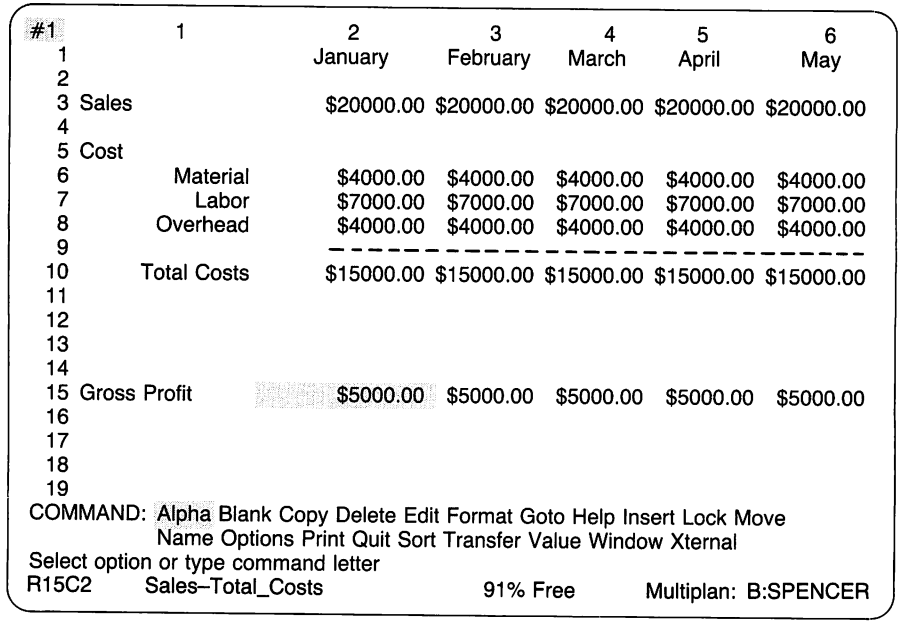
Press RETURN.



Screen 110

Look at the cell for *Gross Profits* (row 15, column 2). When you pressed RETURN, Multiplan-86 calculated your formula and placed the results in the cell. *Gross Profits* now shows $5000.00, and the status line displays the *Gross Profits* formula (Sales-Total_Costs).

Now copy this formula to the right 11 times (*C, R, 11,* RETURN).



Screen 111

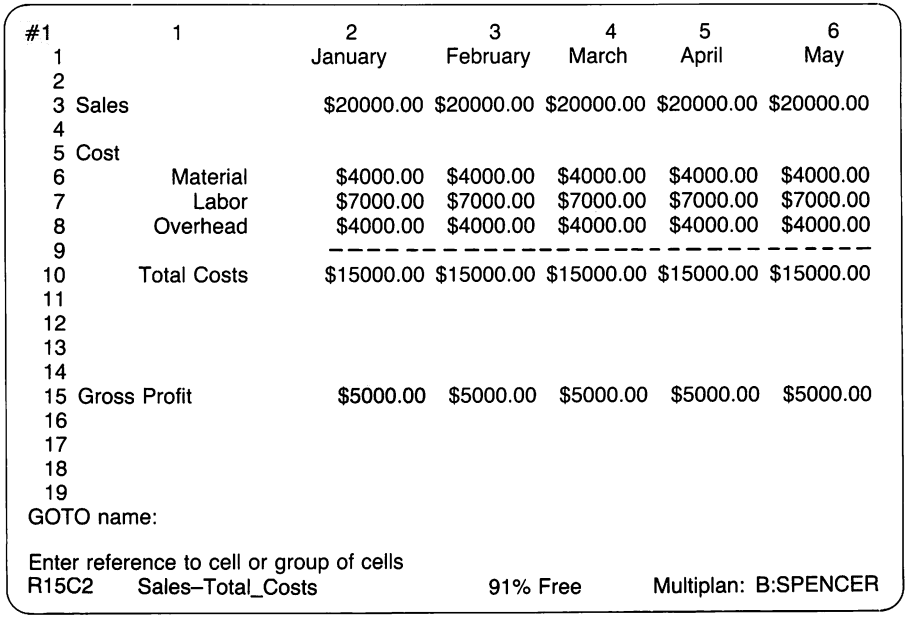
Remember that *Sales* is defined as a 12-cell area (January through December) and so is *Total Costs.* The $5000.00 is, of course, the correct result for each month. But why does a formula that subtracts all of *Total Costs* from all of *Sales* give the correct result each month? (If you change either a sales figure or a cost figure for one month, the *Gross Profits* figure changes in that column only.)

Even though you specify part or all of a row, as you did here by using the names *Sales* and *Total Costs,* Multiplan-86 calculates in only one column at a time when it needs only one value for the result. Multiplan-86 works the same way if you specify all or part of a column; it calculates in only one row at a time when it needs only one value for the result. This topic is discussed in detail in Chapter 1 of the *Multiplan-86 Reference Manual.*

The Goto Name Command

Named cells are easy to locate by using the Goto Command. To see how the pointer moves, first place it on row 15, column 5 (R15C5). Now Press **G**.

Choose name by pressing **N** or RETURN.



#1	1	2	3	4	5	6
1		January	February	March	April	May
2						
3	Sales	$20000.00	$20000.00	$20000.00	$20000.00	$20000.00
4						
5	Cost					
6	Material	$4000.00	$4000.00	$4000.00	$4000.00	$4000.00
7	Labor	$7000.00	$7000.00	$7000.00	$7000.00	$7000.00
8	Overhead	$4000.00	$4000.00	$4000.00	$4000.00	$4000.00
9		---	---	---	---	---
10	Total Costs	$15000.00	$15000.00	$15000.00	$15000.00	$15000.00
11						
12						
13						
14						
15	Gross Profit	$5000.00	$5000.00	$5000.00	$5000.00	$5000.00
16						
17						
18						
19						

GOTO name:

Enter reference to cell or group of cells
R15C2 Sales–Total_Costs 91% Free Multiplan: B:SPENCER

Screen 112

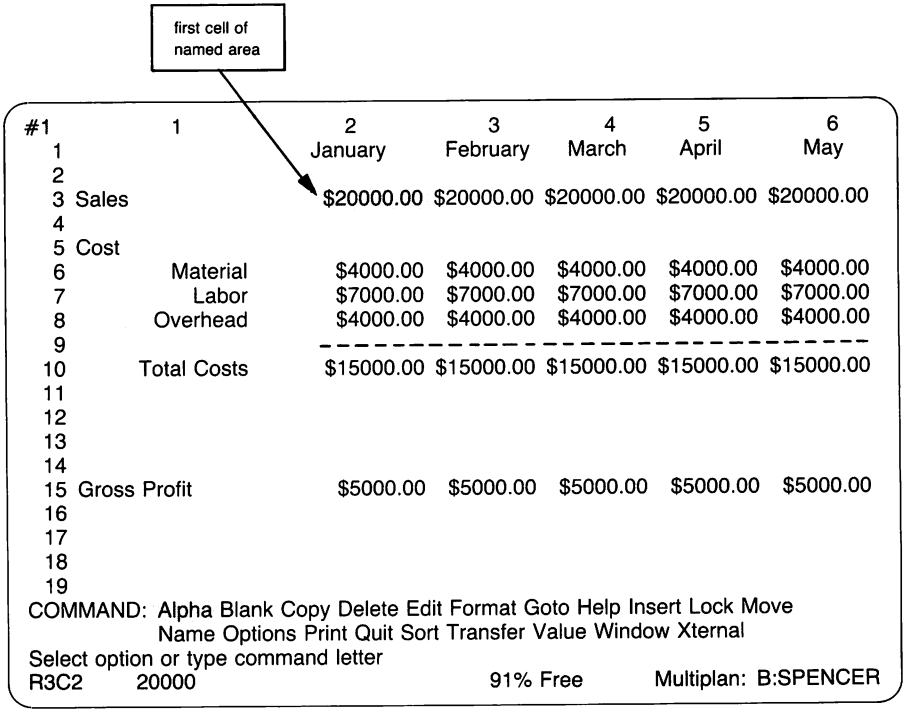
Type **Sales.**

```
#1        1                2          3          4          5          6
  1                        January    February   March      April      May
  2
  3 Sales                  $20000.00  $20000.00  $20000.00  $20000.00  $20000.00
  4
  5 Cost
  6           Material     $4000.00   $4000.00   $4000.00   $4000.00   $4000.00
  7             Labor      $7000.00   $7000.00   $7000.00   $7000.00   $7000.00
  8          Overhead      $4000.00   $4000.00   $4000.00   $4000.00   $4000.00
  9                        ---------- ---------- ---------- ---------- ----------
 10       Total Costs      $15000.00  $15000.00  $15000.00  $15000.00  $15000.00
 11
 12
 13
 14
 15 Gross Profit           $5000.00   $5000.00   $5000.00   $5000.00   $5000.00
 16
 17
 18
 19
GOTO name: sales

Enter reference to cell or group of cells
R15C2     Sales-Total_Costs              91% Free        Multiplan: B:SPENCER
```

Screen 113

NOTE: *Just as with the Name Command, you can use the ARROW keys to "step through" the list of names. When the name you want appears, press RETURN.*

Press RETURN. Your screen now looks like this:



Screen 114

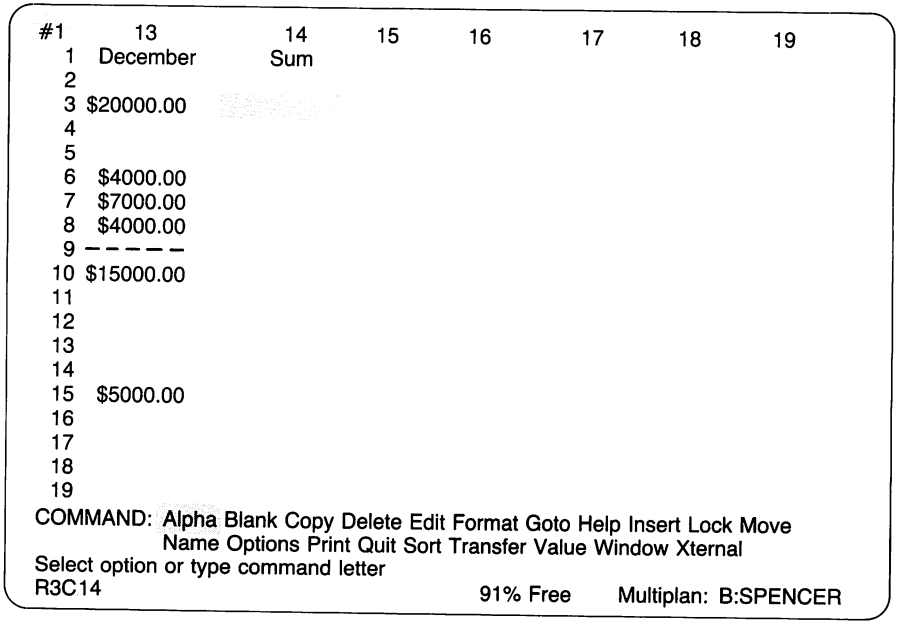
The cell pointer always goes to the first cell in the named area; the leftmost cell if the area is a row, the uppermost cell if it's a column, the upper leftmost cell if it's a block of cells.

NOTE: *When you name a cell, the name stays the same no matter what is in the cell. For example, you named a group of cells Sales, and you can put whatever you want in the group of cells. You can even change what is in it. The cell is still called Sales; you can get to it by its name (that is, Goto Name, Sales.)*

The only way you can remove a name is to define it as blank. For example, to remove the name *Sales*, press **N**, then RIGHT ARROW key until *Sales* appears, then TAB. Now, simply blank out the row and column numbers by pressing the SPACE BAR once; then, using the BACKSPACE key, remove the row and column numbers to which it (Sales) refers: You should press CTRL/C now because you don't want to remove *Sales* as a defined name. If you do remove the name *Sales*, you will need to redefine *Sales* to refer to R3C2:13 before continuing.

Calculating Functions: SUM

To calculate the sales total for Spencer Ceramics during the twelve months, use the Multiplan-86 function SUM. Begin by moving the cell pointer to the cell where the result will appear, row 3, column 14.



Screen 115

Type **V** (to begin the function). The command line shows:

```
#1      13          14        15        16        17        18        19
  1   December      Sum
  2
  3  $20000.00
  4
  5
  6   $4000.00
  7   $7000.00
  8   $4000.00
  9   -------
 10  $15000.00
 11
 12
 13
 14
 15   $5000.00
 16
 17
 18
 19
VALUE:

Enter a formula
R3C14                                  91% Free          Multiplan: B:SPENCER
```

Screen 116

Type **SUM(Sales)**

NOTE: *When using any of the Multiplan-86 functions, type the function name followed immediately by an opening parenthesis. Do not leave any space between the function name and the opening parentheses.*

Press RETURN. You see:

```
#1      13          14        15        16        17        18        19
  1  December       Sum
  2
  3 $20000.00 ##########
  4
  5
  6  $4000.00
  7  $7000.00
  8  $4000.00
  9 -------
 10 $15000.00
 11
 12
 13
 14
 15  $5000.00
 16
 17
 18
 19
COMMAND: Alpha Blank Copy Delete Edit Format Goto Help Insert Lock Move
         Name Options Print Quit Sort Transfer Value Window Xternal
Select option or type command letter
R3C14    SUM(Sales)                  91% Free        Multiplan: B:SPENCER
```

Screen 117

Number Signs (#). When numbers are too large to be shown in the current formatted column width, they are displayed as number signs (###) until the column is made wide enough to accomodate the number.

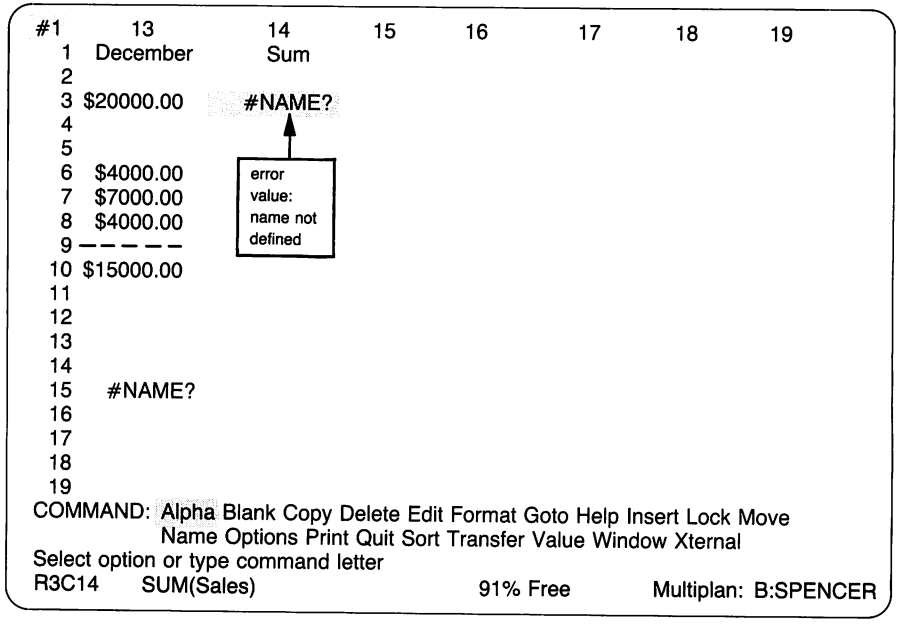
Column 14 has not been widened, so it is not wide enough to accommodate the sum of sales figure in the dollar format (remember: your whole sheet is formatted in dollars), because the dollar format adds a dollar sign, a decimal, and two places after the decimal point. Look at the status line. It shows that cell R3C14 contains SUM (Sales). You have to widen the column to display the dollar value as numbers instead of as number signs. Use the Format Width Command to widen column 14. Press **F**. Press **W**. Type **15**, as you did when you widened column 1. Press RETURN. You will see:

```
#1      13          14          15      16      17      18      19
  1  December       Sum
  2
  3 $20000.00     $240000.00
  4
  5
  6  $4000.00
  7  $7000.00
  8  $4000.00
  9 -----
 10 $15000.00
 11
 12
 13
 14
 15  $5000.00
 16
 17
 18
 19
COMMAND: Alpha Blank Copy Delete Edit Format Goto Help Insert Lock Move
         Name Options Print Quit Sort Transfer Value Window Xternal
Select option or type command letter
R3C14    SUM(Sales)                  91% Free        Multiplan: B:SPENCER
```

Screen 118

Error Values . If you enter a formula that Multiplan-86 cannot calculate to a number or text, Multiplan-86 uses one of the special error values as the result. Error values start with a number sign (#). For example, look at the value in cell R3C14, which is the sum of sales. (If the cell pointer is not there already, move it to R3C14.) The formula is SUM(Sales). Let's "undefine" *Sales*. Press **N**. Press the RIGHT ARROW key until *Sales* appears in the "define name" field. Press TAB. Now press the REMOVE key. The reference for *Sales* disappears. Press RETURN and the name *Sales* no longer exists.

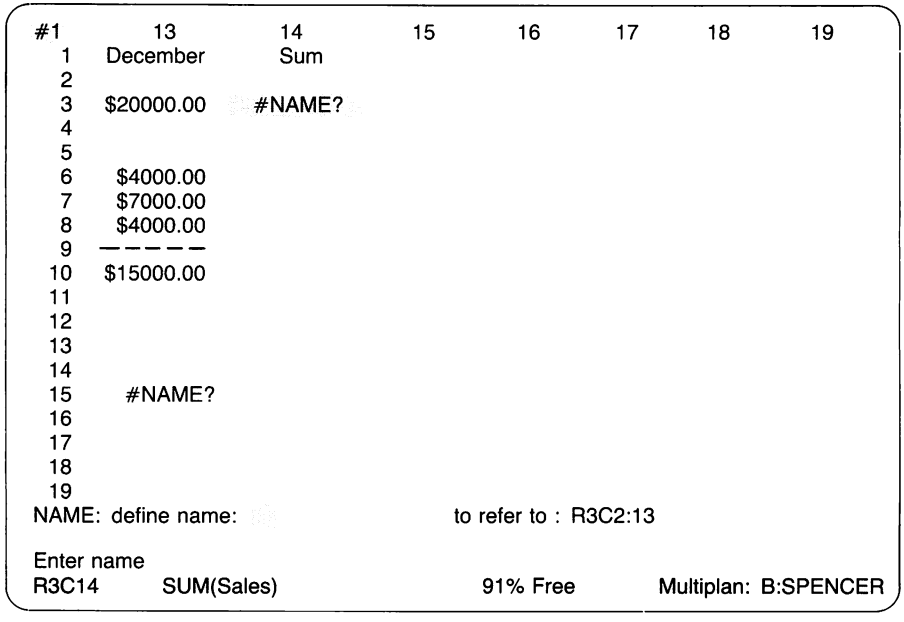
At the same time notice what happens in cell R3C14. The value changes from $240000.00 to #NAME?.



Screen 119

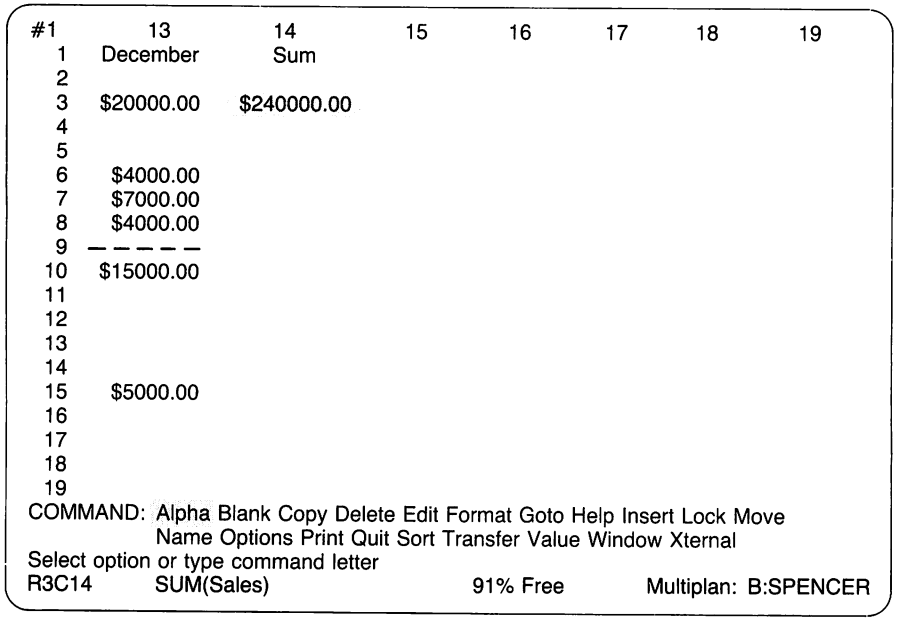
This means that Multiplan-86 found a name you haven't defined yet.

Now, redefine Sales to refer to R3C2:13. Press **N**; the "define name" field is blank, but the "to refer to" field shows R3C2:13!



Screen 120

Type **Sales**, then press RETURN. The value $24000.00 reappears in cell R3C14.



Screen 121

Remember, when you defined *Total Costs*, the "to refer to" field had a proposed response that fit. Because *Sales* refers to a group of cells with the same shape as the last name defined (*Total Costs*), the proposed response is correct for redefining *Sales*, as long as the cell pointer is in the correct position before starting the Name Command.

The other error values you might see as you build a worksheet are: #DIV/0!, #N/A, #NULL!, #NUM!, #REF!, #VALUE!. All of the error values are described in Chapter 1 of the *Multiplan-86 Reference Manual.*

Relative and Absolute References

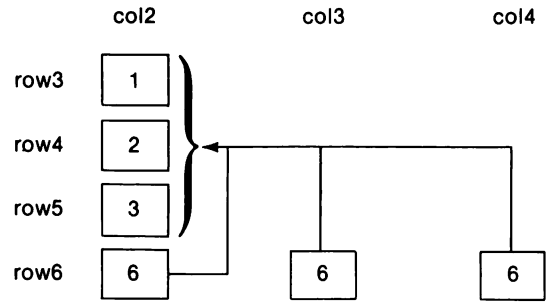
So far you have been using three different ways to refer to cells. Sometimes, you referred to a cell as R3C14, or a group of cells as R3C2:13. Sometimes, you referred to a group of cells by name, as when you built the formula SUM(Sales) or Sales–Total__Costs. Sometimes, you referred to a cell by R[–4]C, as when you built the formula for Total Costs.

When you refer to cells by R3C14, R3C2:13, or similar references to specific row numbers and specific column numbers, you are using absolute references. When you refer to a cell by R[–4]C and similar references to the current row plus or minus a number of rows, you are using relative references (which can also be used for columns).

The major difference between absolute and relative references appears when copying formulas. When you copied the formula for *Total Costs* across all 12 months, the correct value appeared in each column. You do not see any difference between a formula with absolute references and one with relative references in this case, because the values for *Material*, *Labor*, and *Overhead* are the same in each column. But, if one or more values changed in one column, the value of *Total Costs* in that one column will differ.

On the other hand, if the formula has absolute references, all copies of *Total Costs* depend on the values in column 2 rather than on the values in each column.

If you specify the exact row and column number for each of these items by making an absolute reference to their position, such as R6C2+R7C2+R8C2, you have to change each of the references for the *Total Cost* formula to remain correct in each column.

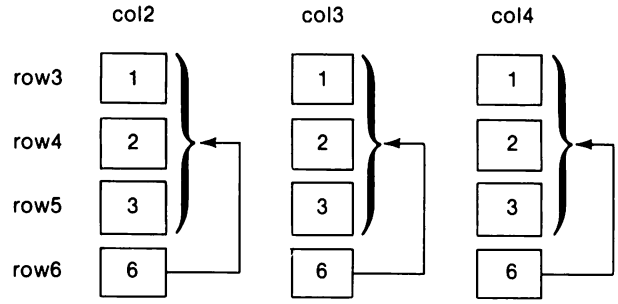


Absolute Formula in row6: R3C2 + R4C2 + R5C2

MR-S-2441-82

Figure 5. Copied Absolute Formulas Refer to the Same Cells

If the 2 in col2 becomes a 3, then all 6s in row6 become 7s; if any value in row3, row4, or row5 of col3 or col4 changes, there is no effect in row6.



Relative Formula in row6: R[– 3]C + R[– 2]C + R[– 1]C

MR-S-2442-82

Figure 6. Copied Relative Formulas Refer to Different Cells

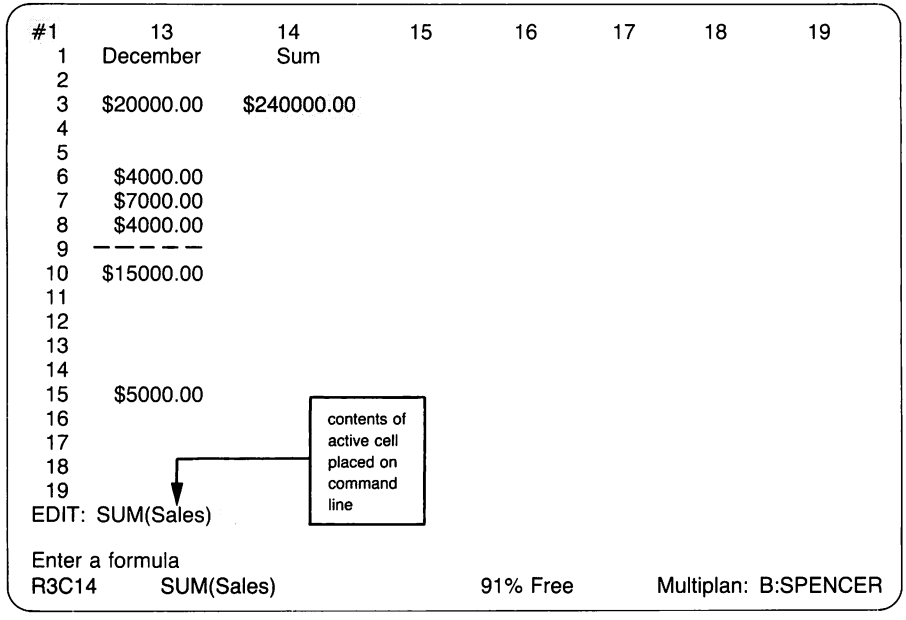
If one of the 2s in row4 becomes a 3, then the value in row6 in that one column becomes a 7.

For these reasons, you used a formula with relative references, built by using the cell pointer, to calculate *Total Costs*. Similarly, using a formula with relative references to calculate the sum of *Sales* allows you to copy the formula for calculating the sums of *Total Costs* and *Gross Profits*.

First, you need to edit the formula in row 3, column 14 (R3C14).

Move the cell pointer to R3C14.

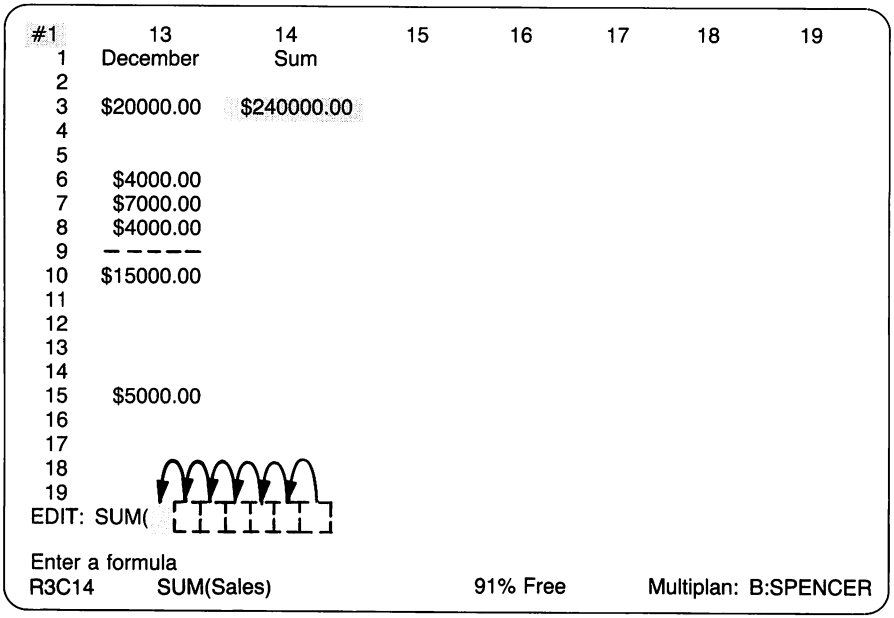
Press **E** (for Edit). The command line now looks like:



Screen 122

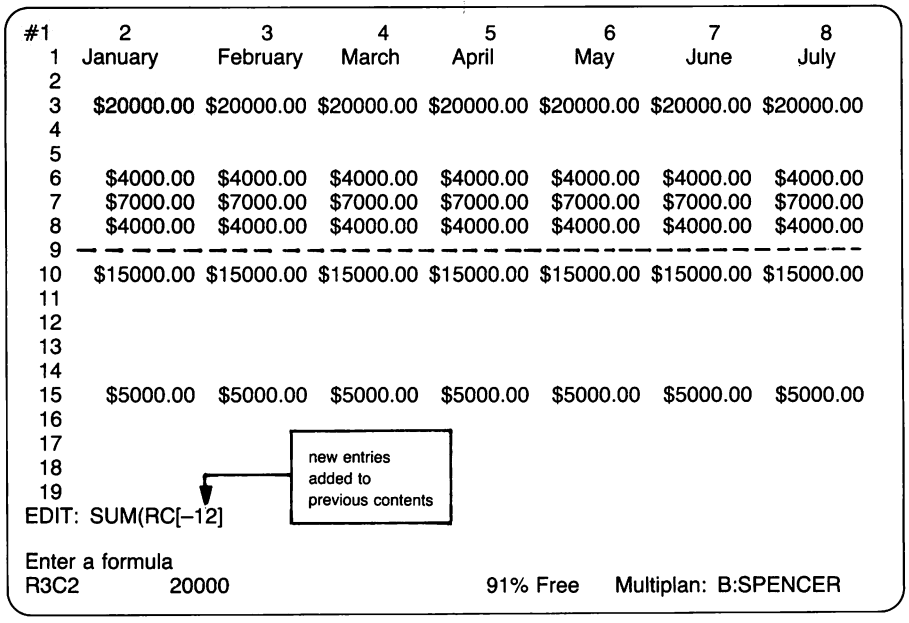
The formula in the active cell is now displayed on the command line.

Press BACKSPACE to erase *Sales)*, but leave *SUM(*.



Screen 123

Press the LEFT ARROW key until the cell pointer reaches R3C2.



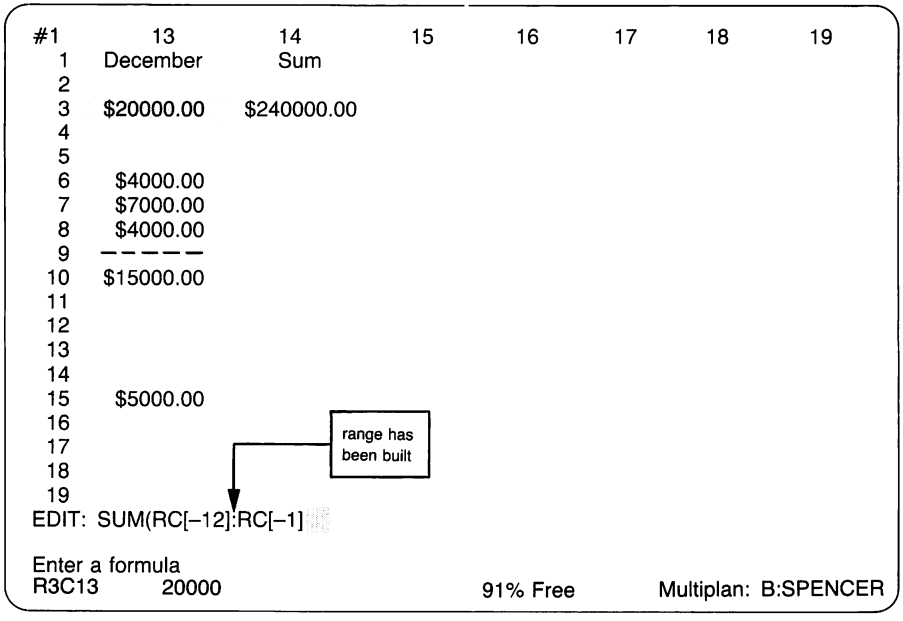
Screen 124

Press : (colon)

```
#1        13          14          15          16          17          18          19
  1    December        Sum
  2
  3    $20000.00   $240000.00
  4
  5
  6     $4000.00
  7     $7000.00
  8     $4000.00
  9    ---------
 10    $15000.00
 11
 12
 13
 14
 15     $5000.00
 16
 17
 18
 19
EDIT: SUM(RC[-1]:

Enter a formula
R3C14        SUM(Sales)                    91% Free      Multiplan: B:SPENCER
```

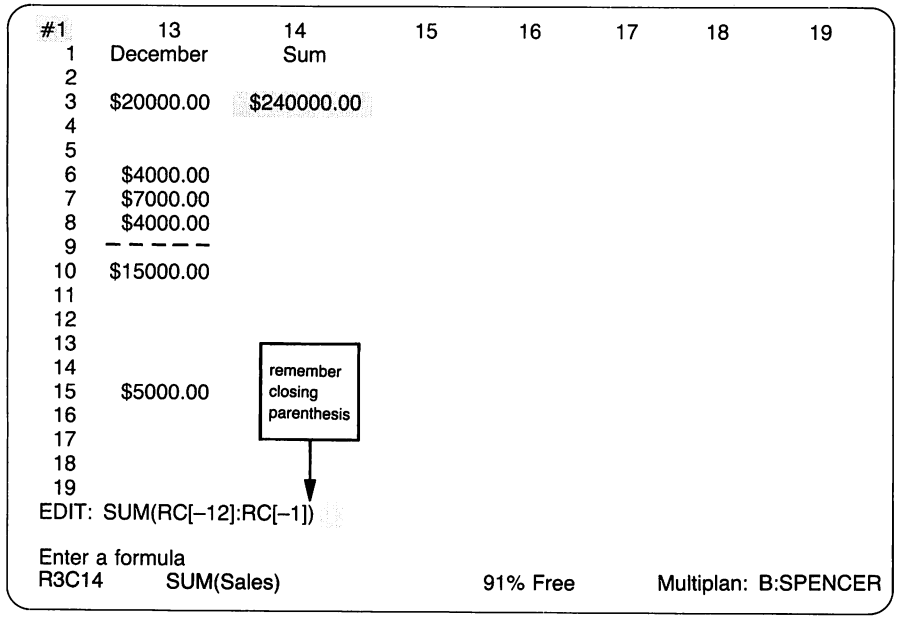
Screen 125

Press the LEFT ARROW key once (to R3C13).



Screen 126

Press) (right parenthesis)



Screen 127

Press RETURN. Your screen now looks like:

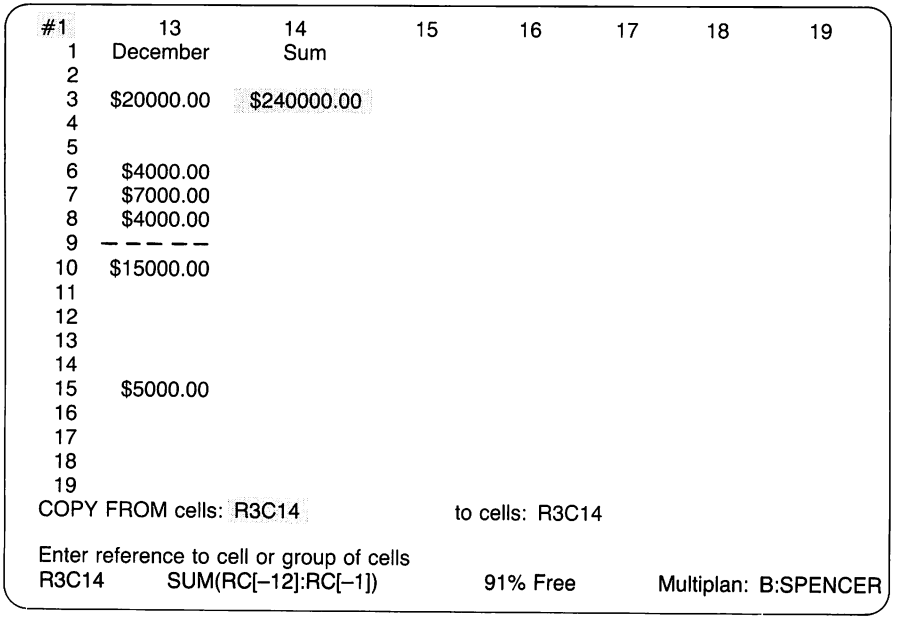
```
#1        13          14          15          16          17          18          19
  1    December        Sum
  2
  3    $20000.00   $240000.00
  4
  5
  6     $4000.00
  7     $7000.00
  8     $4000.00
  9    ---------
 10    $15000.00
 11
 12
 13
 14
 15     $5000.00
 16
 17
 18
 19
COMMAND: Alpha Blank Copy Delete Edit Format Goto Help Insert Lock Move
         Name Options Print Quit Sort Transfer Value Window Xternal
Select option or type command letter
R3C14    SUM(RC[-12]:RC[-1])          91% Free          Multiplan: B:SPENCER
```

Screen 128

Now, you can easily use this same formula to calculate the sums for *Total Costs* and *Gross Profits* using the Copy From Command.

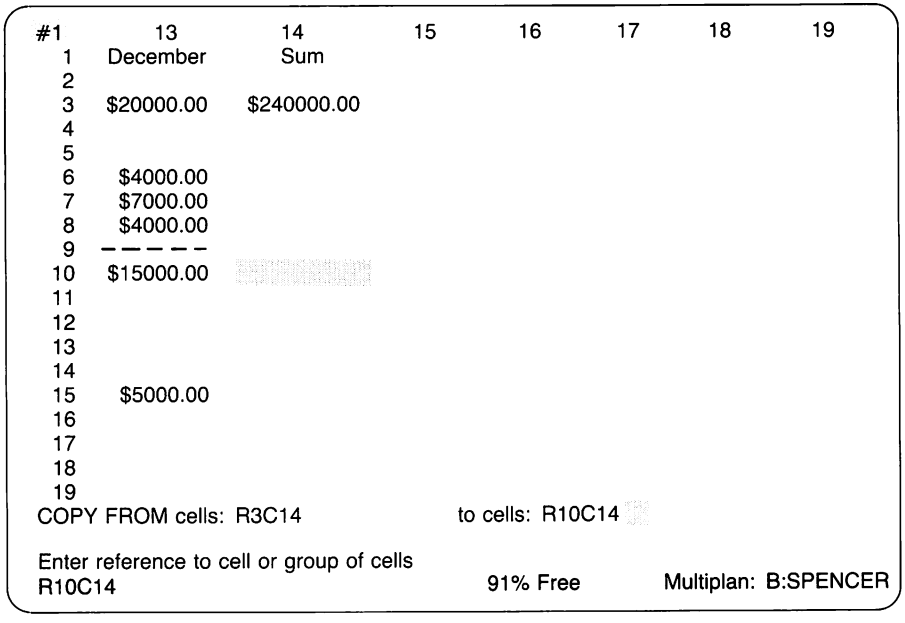
Copying a Formula: The Copy From Command

Press **C**, then **F**.



Screen 129

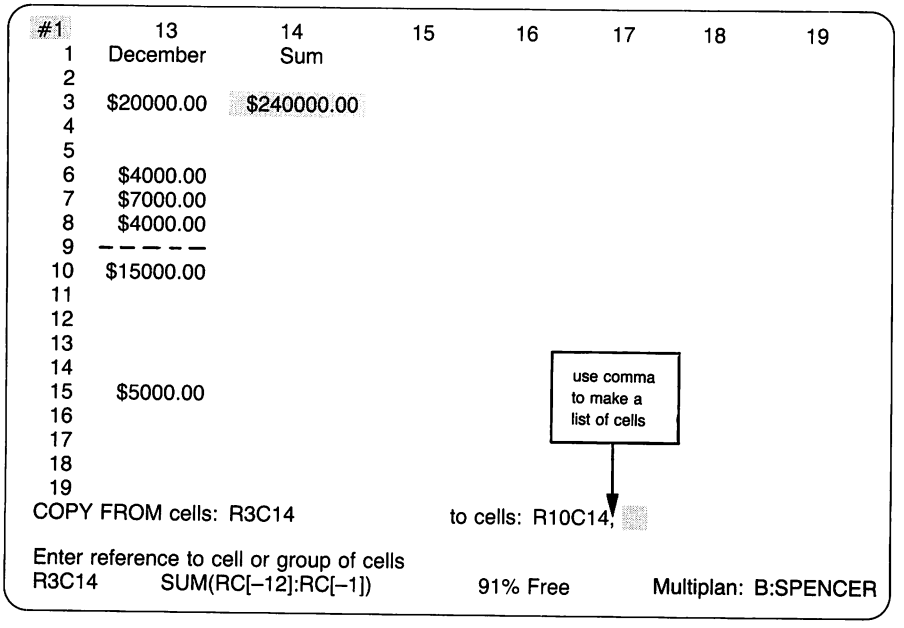
Multiplan-86 proposes that you copy from the active cell, which is what you want to do. Press TAB. The proposed response in the "to cells" field is not correct. Press the DOWN ARROW key until the cell pointer reaches row 10.



Screen 130

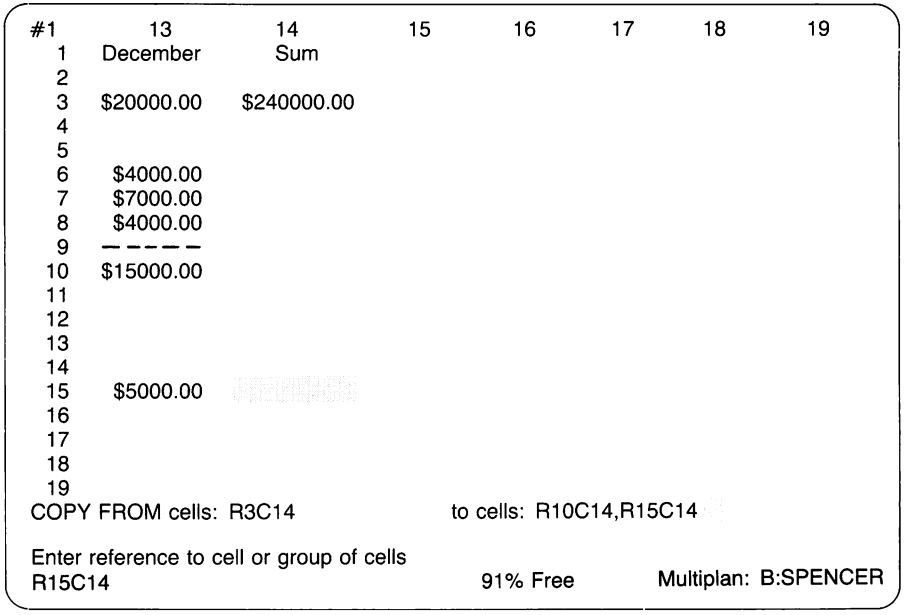
This is one of the cells to receive a copy of the formula. The other is in row 15. Because the cells are not next to each other, you can't use a range as you have done before with the colon. You need, instead, to make a list of cells. To make a list, use the comma.

Press , (comma)



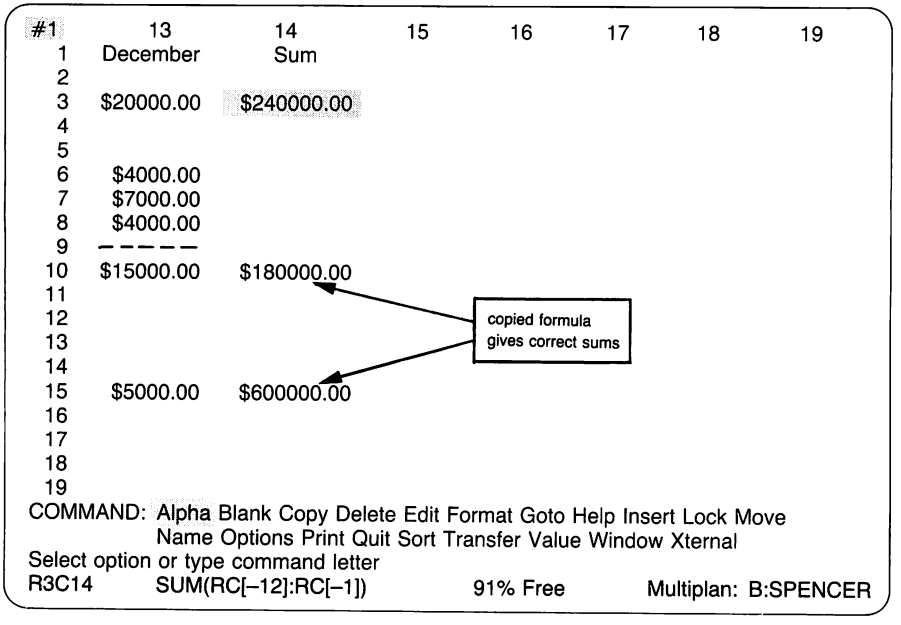
Screen 131

Now press the DOWN ARROW key until the cell pointer reaches row 15.



Screen 132

Press RETURN, and watch the values appear in rows 10 and 15 of column 14:



Screen 133

It's time to take a break. To make it easier when you return, move the cell pointer back to the beginning of the worksheet. Multiplan-86 always loads a worksheet exactly as it was when you saved it. Use Goto Row 3, Column 2.

In the next session, you will see how Spencer Ceramics' profits change as the figures that make up costs and sales change.

Save your work by the *T*ransfer *S*ave Command. To review:

Press **T** (Transfer)
Press **S** (Save)
Press RETURN.

You see the question:

Overwrite existing file?

Type **Y**

To update, or overwrite, the old file with the new information you have added.

Your work has now been saved and will be available for you when you return. Press **Q** (for Quit), and **Y** (to confirm).

Summary

In this session you learned:

- How to Transfer Load your worksheet (review).
- How to place titles on your worksheet.
- How to align the titles in the center of the column (Format Cells).
- How to copy one cell to the right.
- How to copy a group of cells to the right.
- How to build formulas (review).
- How to name cells and groups of cells.
- How to build a formula using names.
- How to calculate the sum of a named area.
- How Multiplan-86 indicates by displaying number signs (#) that a number is too large to be displayed within the present width of a column.
- How Multiplan-86 displays error values for formulas that it cannot calculate.
- How relative references and absolute references differ.
- How to copy a formula using the Copy From Command.

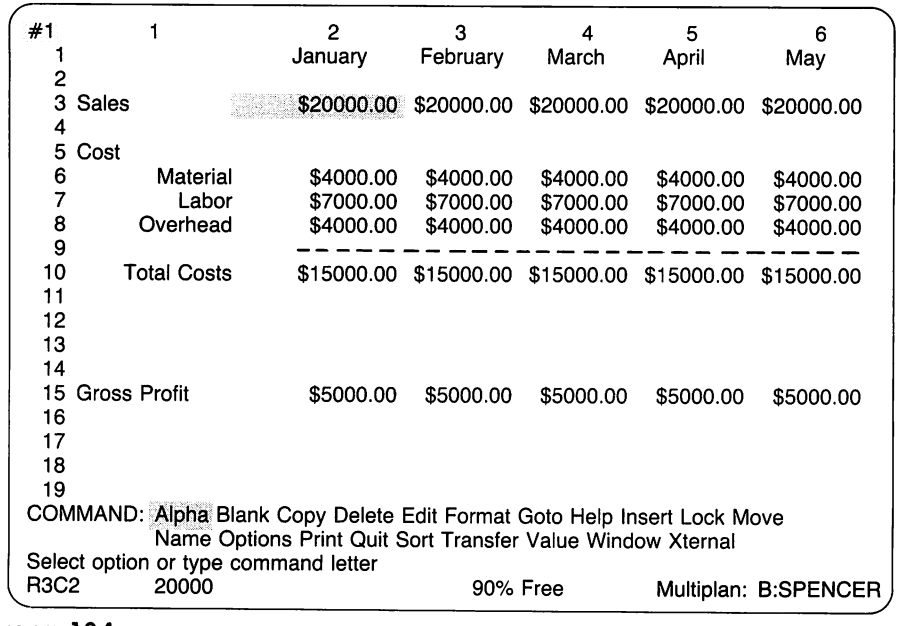
5

Windows, Copying Formulas, and Options

In the last session you reviewed the procedure for building formulas, and you learned how to copy cells into other cells on the worksheet. You also learned how to name cells, how to use the Goto Command to move the pointer to the named area, and how to do a calculation using a name and a function.

In this session you will learn how to view several portions of the worksheet at once by "opening windows," as well as how to manipulate these windows quickly and easily.

Load the Multiplan-86 disk in drive A and the disk containing the SPENCER file in drive B; then Transfer Load B:SPENCER. The screen should look just as it did when you left it last time.



#1	1	2	3	4	5	6
1		January	February	March	April	May
2						
3	Sales	$20000.00	$20000.00	$20000.00	$20000.00	$20000.00
4						
5	Cost					
6	Material	$4000.00	$4000.00	$4000.00	$4000.00	$4000.00
7	Labor	$7000.00	$7000.00	$7000.00	$7000.00	$7000.00
8	Overhead	$4000.00	$4000.00	$4000.00	$4000.00	$4000.00
9						
10	Total Costs	$15000.00	$15000.00	$15000.00	$15000.00	$15000.00
11						
12						
13						
14						
15	Gross Profit	$5000.00	$5000.00	$5000.00	$5000.00	$5000.00
16						
17						
18						
19						

COMMAND: Alpha Blank Copy Delete Edit Format Goto Help Insert Lock Move
Name Options Print Quit Sort Transfer Value Window Xternal
Select option or type command letter
R3C2 20000 90% Free Multiplan: B:SPENCER

Screen 134

Fixing Titles

The Window Split Title Command . You can keep the headings for *Sales, Cost,* and so forth, in view while you look at the last half of the year. You may have difficulty telling what numbers you are looking at when you get past April if you can't see the headings.

You can "fix" the titles in place, so that they remain visible, as you scroll the columns by using the Window Split command. Note that when the Window Split Title command is used, the screen will appear with double-title columns.

Press **W**.

#1	1	2	3	4	5	6
1		January	February	March	April	May
2						
3	Sales	$20000.00	$20000.00	$20000.00	$20000.00	$20000.00
4						
5	Cost					
6	Material	$4000.00	$4000.00	$4000.00	$4000.00	$4000.00
7	Labor	$7000.00	$7000.00	$7000.00	$7000.00	$7000.00
8	Overhead	$4000.00	$4000.00	$4000.00	$4000.00	$4000.00
9		---	---	---	---	---
10	Total Costs	$15000.00	$15000.00	$15000.00	$15000.00	$15000.00
11						
12						
13						
14						
15	Gross Profit	$5000.00	$5000.00	$5000.00	$5000.00	$5000.00
16						
17						
18						
19						

WINDOW: Split Border Close Link

Select option or type command letter
R3C2 20000 90% Free Multiplan: B:SPENCER

Screen 135

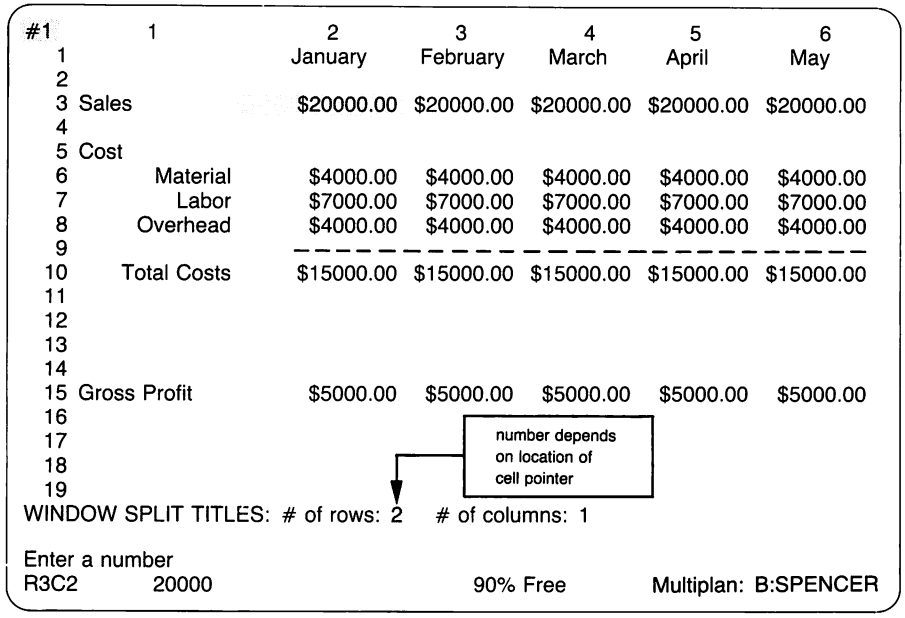
There are several subcommands to choose from: for now choose Split by pressing **S** or RETURN.

```
#1      1                2          3          4          5          6
   1                     January    February   March      April      May
   2
   3 Sales               $20000.00  $20000.00  $20000.00  $20000.00  $20000.00
   4
   5 Cost
   6        Material     $4000.00   $4000.00   $4000.00   $4000.00   $4000.00
   7          Labor      $7000.00   $7000.00   $7000.00   $7000.00   $7000.00
   8       Overhead      $4000.00   $4000.00   $4000.00   $4000.00   $4000.00
   9                     ---------- ---------- ---------- ---------- ----------
  10     Total Costs     $15000.00  $15000.00  $15000.00  $15000.00  $15000.00
  11
  12
  13
  14
  15 Gross Profit        $5000.00   $5000.00   $5000.00   $5000.00   $5000.00
  16
  17
  18
  19
WINDOW SPLIT: Horizontal Vertical Titles

Select option or type command letter
R3C2        20000                      90% Free          Multiplan: B:SPENCER
```

Screen 136

Of the subcommands you see, pick Titles because you want to fix the titles (or headings), in place, down column 1.

Press **T**.



Screen 137

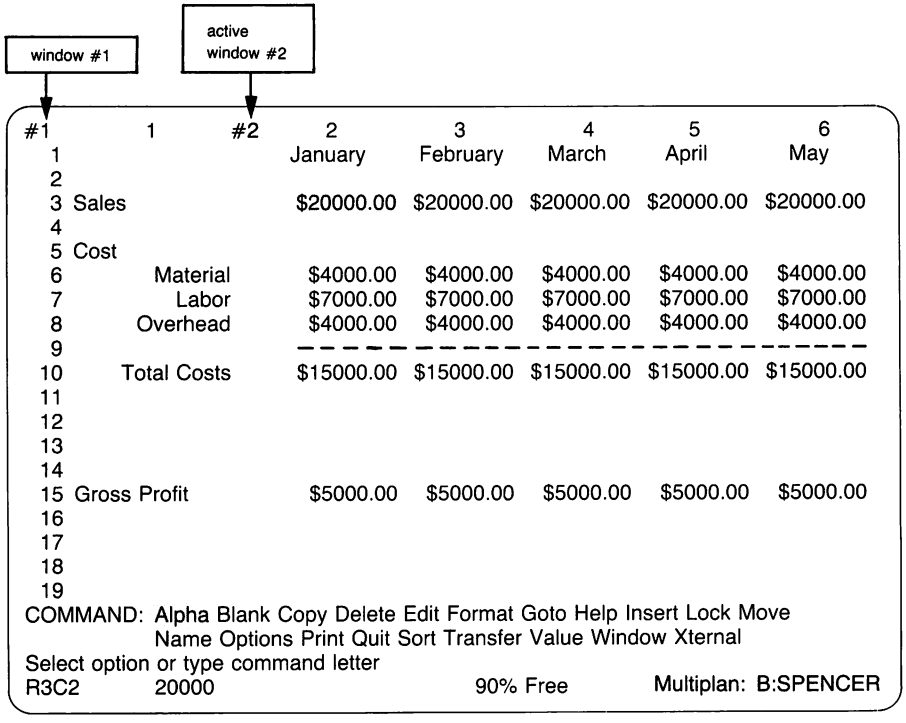
In the first field, type a zero (0) because you only want to split the window vertically, by columns.

NOTE: *You cannot ask Multiplan-86 to split more columns or rows than you can see on the screen. If you do, the "Window will not fit" message appears.*

```
#1      1                2          3          4          5          6
   1                     January    February   March      April      May
   2
   3 Sales               $20000.00  $20000.00  $20000.00  $20000.00  $20000.00
   4
   5 Cost
   6        Material     $4000.00   $4000.00   $4000.00   $4000.00   $4000.00
   7          Labor      $7000.00   $7000.00   $7000.00   $7000.00   $7000.00
   8       Overhead      $4000.00   $4000.00   $4000.00   $4000.00   $4000.00
   9                     ---------- ---------- ---------- ---------- ----------
  10     Total Costs     $15000.00  $15000.00  $15000.00  $15000.00  $15000.00
  11
  12
  13
  14
  15 Gross Profit        $5000.00   $5000.00   $5000.00   $5000.00   $5000.00
  16
  17
  18
  19
WINDOW SPLIT TITLES: # of rows: 0   # of columns: 1

Enter a number
R3C2      20000                        90% Free          Multiplan: B:SPENCER
```

Screen 138

TAB to the second field. In the second field ("# of columns"), Multiplan-86 is asking how many columns you want to split. You want one column for the titles. Because 1 is the proposed response, merely press RETURN.



Screen 139

NOTE: *Notice the shaded #2 in between columns 1 and 2. This number is the active window.*

Now, when you scroll to December, you are still able to see the headings for *Sales, Costs,* and *Gross Profits.* Try pressing the RIGHT ARROW key until July comes into view with the titles still fixed to the left of the screen. Now press the LEFT ARROW key to get back to January.

Opening a Window

The Window Split Command . You have actually opened a second window by splitting the one you were working on. Save your work at this stage by using the **T**ransfer **S**ave command (with **Y**es to overwrite the existing file).

NOTE: *It is important that you save the worksheet, as you will use the Transfer Clear command to clear your screen after you practice opening and closing windows. The Transfer Clear Command destroys the active worksheet, which you can retrieve only if it has been saved.*

Now do some experimenting with opening and closing windows by using the **W**indow **S**plit command.

Position the cell pointer before you start the Window command on the row you want (for horizontal splits) or on the column you want (for vertical splits). For now, move the cell pointer to R11C2.

Now press **W**.

#1	1	#2	2	3	4	5	6
1			January	February	March	April	May
2							
3	Sales		$20000.00	$20000.00	$20000.00	$20000.00	$20000.00
4							
5	Cost						
6	Material		$4000.00	$4000.00	$4000.00	$4000.00	$4000.00
7	Labor		$7000.00	$7000.00	$7000.00	$7000.00	$7000.00
8	Overhead		$4000.00	$4000.00	$4000.00	$4000.00	$4000.00
9							
10	Total Costs		$15000.00	$15000.00	$15000.00	$15000.00	$15000.00
11							
12							
13							
14							
15	Gross Profit		$5000.00	$5000.00	$5000.00	$5000.00	$5000.00
16							
17							
18							
19							

WINDOW: Split Border Close Link

Select option or type command letter
R11C2 90% Free Multiplan: B:SPENCER

Screen 140

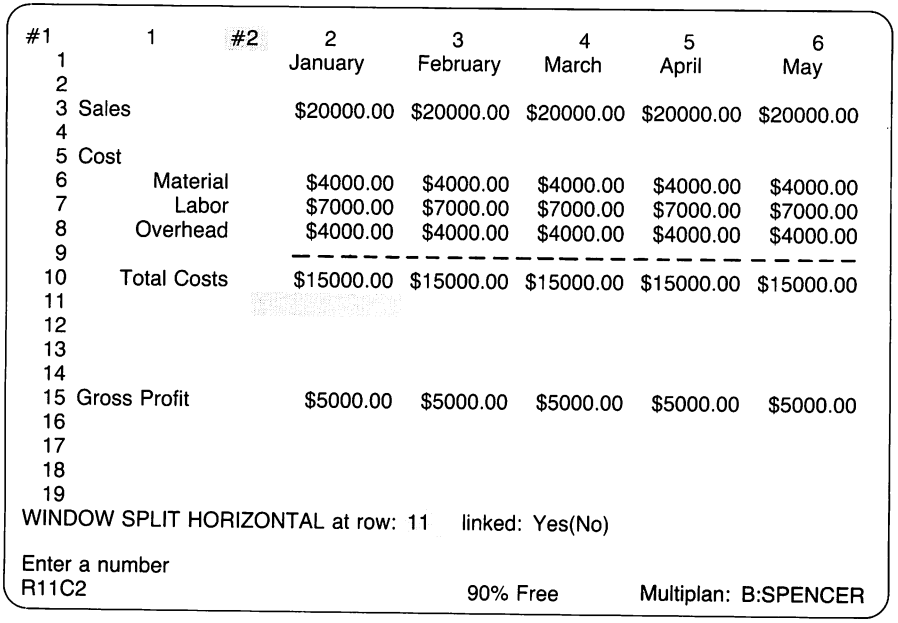
Now press **S.**

```
#1        1        #2      2          3          4          5          6
  1                        January    February   March      April      May
  2
  3 Sales                  $20000.00  $20000.00  $20000.00  $20000.00  $20000.00
  4
  5 Cost
  6          Material      $4000.00   $4000.00   $4000.00   $4000.00   $4000.00
  7            Labor       $7000.00   $7000.00   $7000.00   $7000.00   $7000.00
  8        Overhead        $4000.00   $4000.00   $4000.00   $4000.00   $4000.00
  9                        ---------- ---------- ---------- ---------- ----------
 10      Total Costs       $15000.00  $15000.00  $15000.00  $15000.00  $15000.00
 11
 12
 13
 14
 15 Gross Profit           $5000.00   $5000.00   $5000.00   $5000.00   $5000.00
 16
 17
 18
 19
WINDOW SPLIT: Horizontal Vertical Titles

Select option or type command letter
R11C2                                  90% Free          Multiplan: B:SPENCER
```

Screen 141

The Horizontal choice allows you to split a window across the screen at the row number you specify. The Vertical choice lets you split a window up and down at the column you choose.

Press **H**.



#1	1	#2	2	3	4	5	6
1			January	February	March	April	May
2							
3	Sales		$20000.00	$20000.00	$20000.00	$20000.00	$20000.00
4							
5	Cost						
6	Material		$4000.00	$4000.00	$4000.00	$4000.00	$4000.00
7	Labor		$7000.00	$7000.00	$7000.00	$7000.00	$7000.00
8	Overhead		$4000.00	$4000.00	$4000.00	$4000.00	$4000.00
9							
10	Total Costs		$15000.00	$15000.00	$15000.00	$15000.00	$15000.00
11							
12							
13							
14							
15	Gross Profit		$5000.00	$5000.00	$5000.00	$5000.00	$5000.00
16							
17							
18							
19							

WINDOW SPLIT HORIZONTAL at row: 11 linked: Yes(No)

Enter a number
R11C2 90% Free Multiplan: B:SPENCER

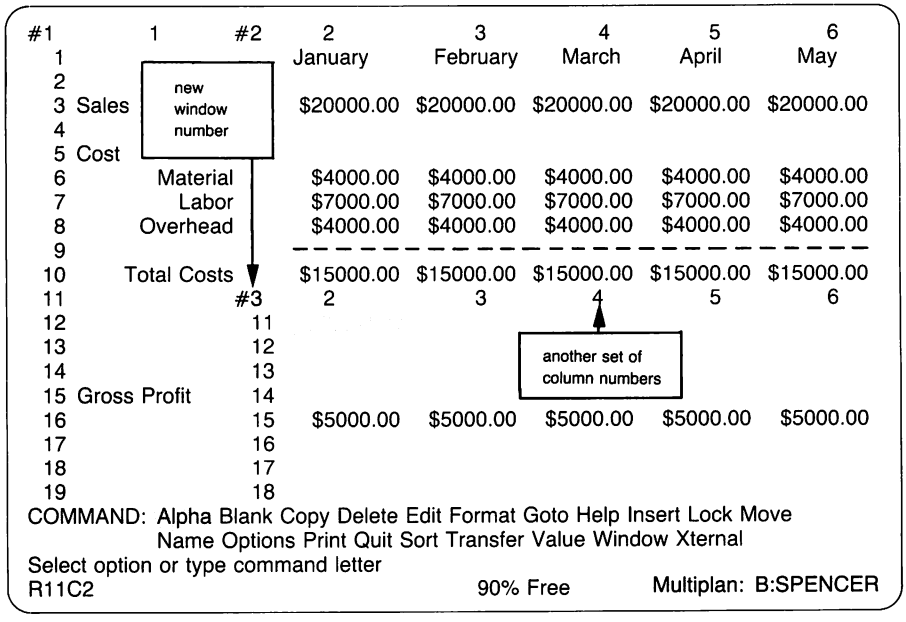
Screen 142

The first field ("at row") asks at what row you want to split the window. Multiplan-86 proposes row 11, which is what you want. (That's why you want to position the cell pointer before starting a command.)

The second field shows linking status: "linked: Yes(No)".

When windows are linked, they scroll together. That means that, as you move the cell pointer at the edge of one of the linked windows, the contents of both windows move across the screen at the same time.

For now, press RETURN. The screen should look like:

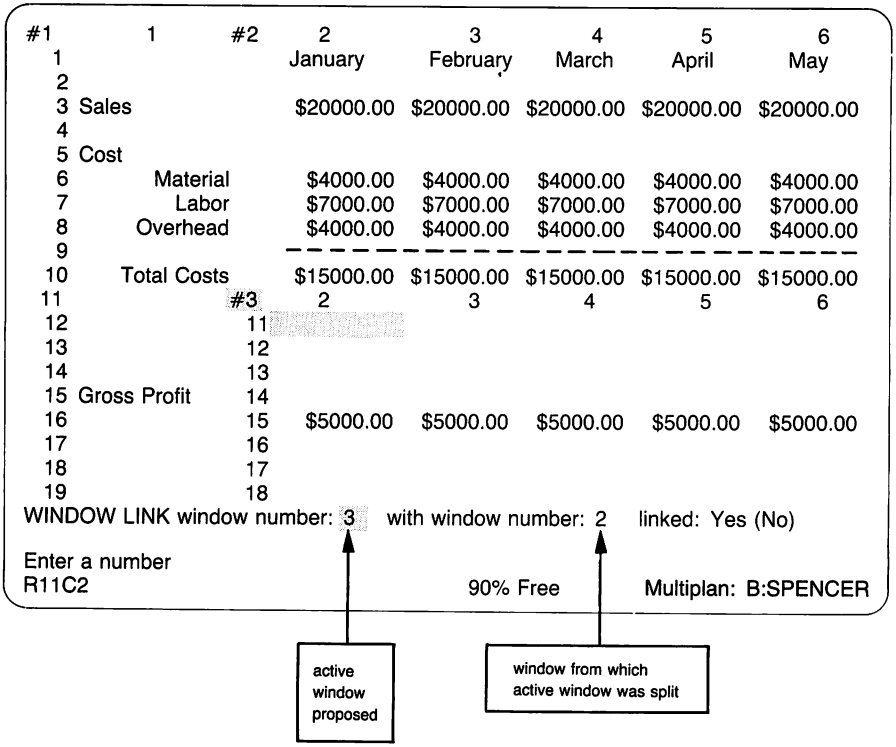


Screen 143

Notice the column numbers at the top of window #3. Scroll across to column 14, then scroll back to column 2. Window #2 is unaffected. When windows are not linked, you can open windows to view different parts of the worksheet simultaneously. If you specify **Y** when splitting, windows #2 and #3 move together.

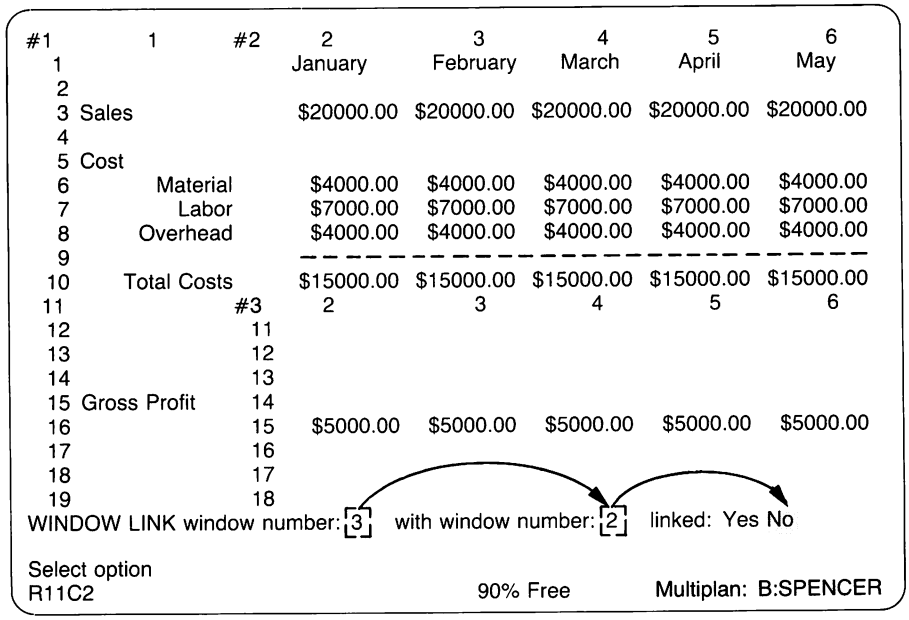
Linking Windows

The Window Link Command . Once windows are split, you can change their link status with the Window Link command. Press **W**, then press **L**.



Screen 144

Multiplan-86 proposes linking #3 with #2, which is what you want. Press TAB twice.



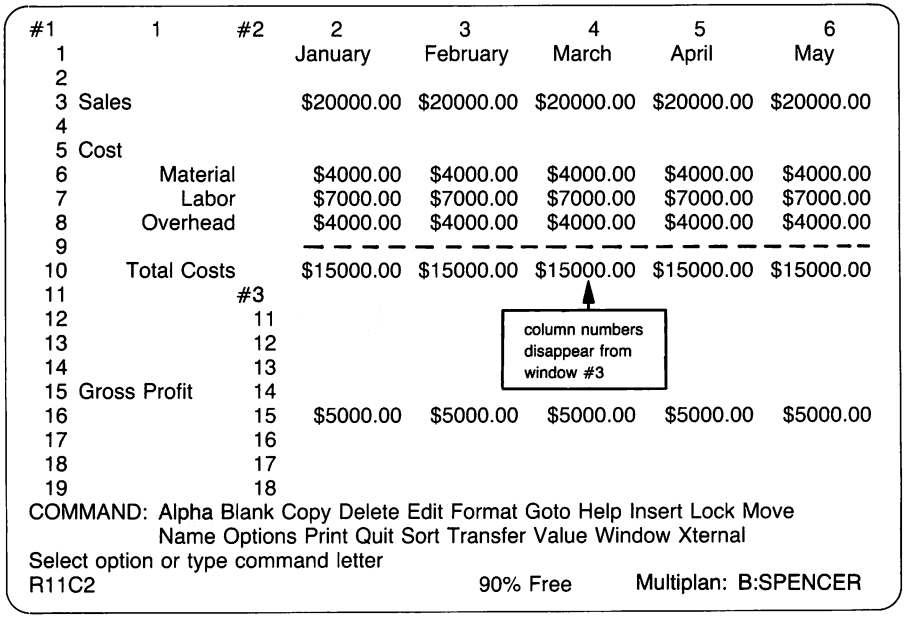
Screen 145

Press **Y** or the SPACE BAR to select "Yes".

```
#1        1          #2    2          3          4          5          6
  1                        January    February   March      April      May
  2
  3 Sales                  $20000.00  $20000.00  $20000.00  $20000.00  $20000.00
  4
  5 Cost
  6       Material         $4000.00   $4000.00   $4000.00   $4000.00   $4000.00
  7         Labor          $7000.00   $7000.00   $7000.00   $7000.00   $7000.00
  8      Overhead          $4000.00   $4000.00   $4000.00   $4000.00   $4000.00
  9                        ---------- ---------- ---------- ---------- ----------
 10    Total Costs         $15000.00  $15000.00  $15000.00  $15000.00  $15000.00
 11                  #3    2          3          4          5          6
 12                  11
 13                  12
 14                  13
 15 Gross Profit     14
 16                  15    $5000.00   $5000.00   $5000.00   $5000.00   $5000.00
 17                  16
 18                  17
 19                  18
WINDOW LINK window number: 3   with window number: 2   linked: Yes No

Select option
R11C2                                  90% Free          Multiplan: B:SPENCER
```

Screen 146

Press RETURN and watch the column numbers for window #3.



Screen 147

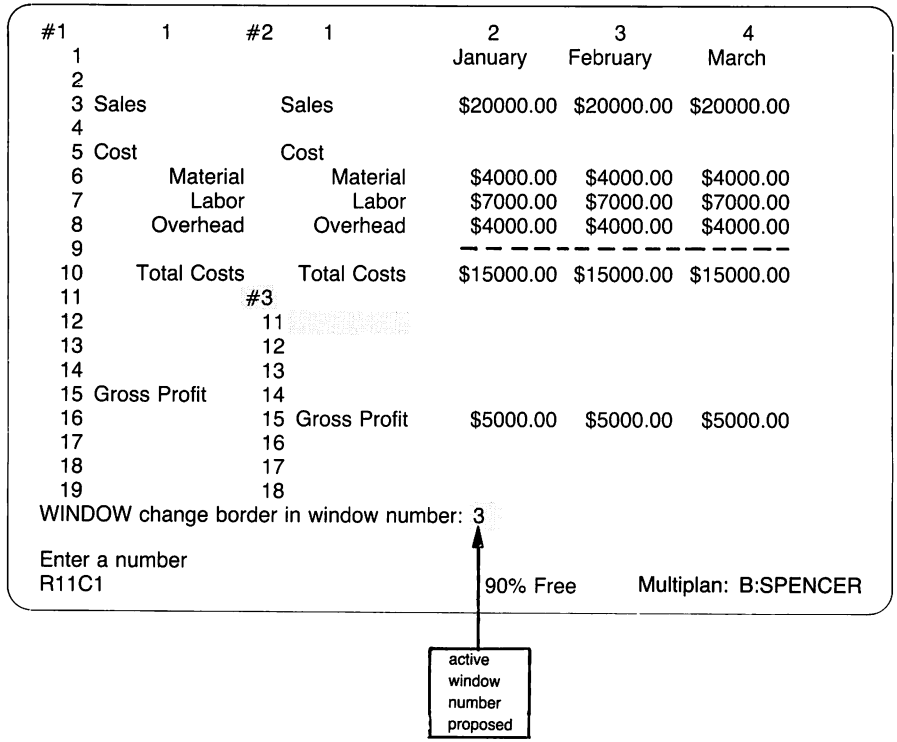
They have disappeared! This is a sign that windows are linked. The column numbers for windows #2 now stand for both windows #2 and #3.

Scroll to column 14. The information in both windows scrolls. Scroll back to column 1; the information again moves together across the screen.

Bordering Windows

The Window Border Command . If a window is bordered, the window has a line drawn around it that sets the window off from the surrounding worksheet. The sheet you now have is not bordered.

Try the Window Border command to see what a bordered window looks like. Press **W**, then **B**.

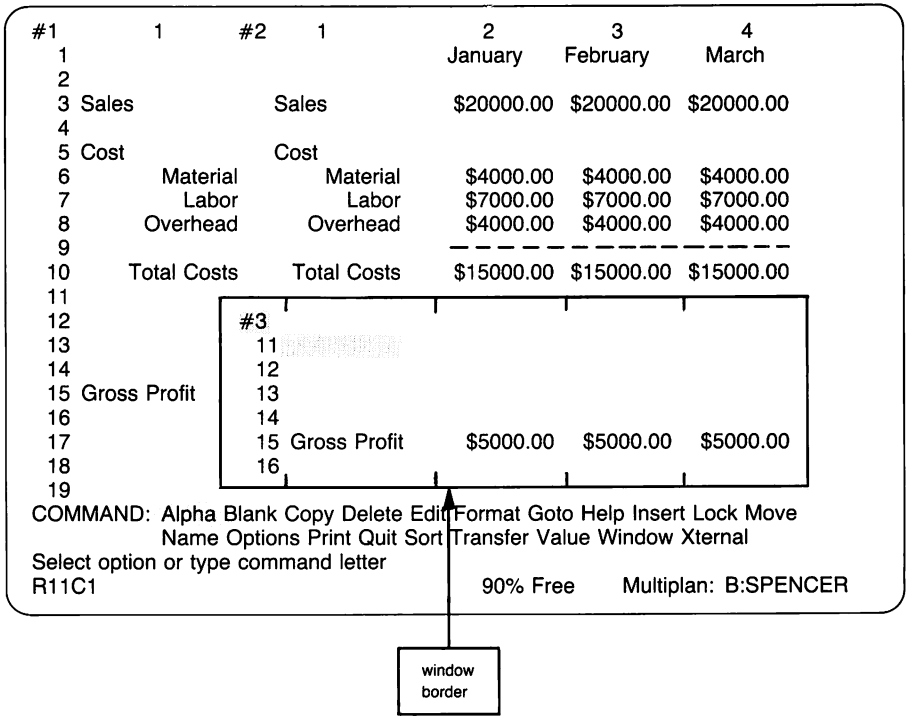


Screen 148

Multiplan-86 proposes the active window, but you could give any open window number.

Simply press RETURN to border window #3.

The display should look like:



Screen 149

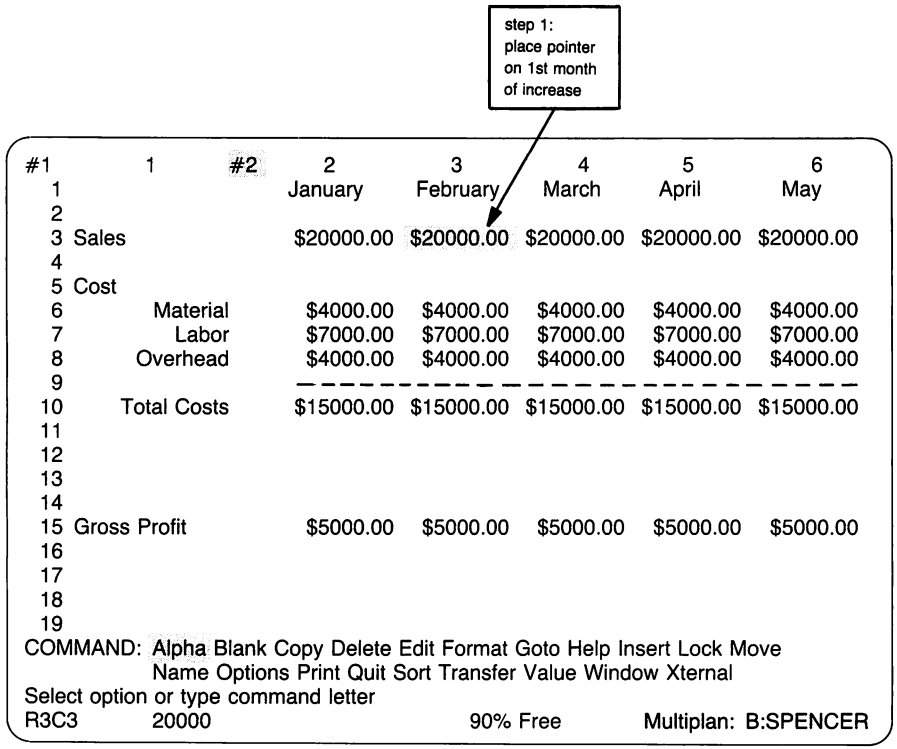
If you split a bordered window, both resulting windows have borders.

Try opening (Press **W**, then **S**) and closing (Press **W**, then **C**) windows until you become familiar with the command. Use the SELECT key to move the pointer from window to window until it is in the window you wish to split.

When you are finished, clear the screen (**T**ransfer **C**lear, **Y**es) and reload your worksheet (**T**ransfer **L**oad **B:SPENCER**).

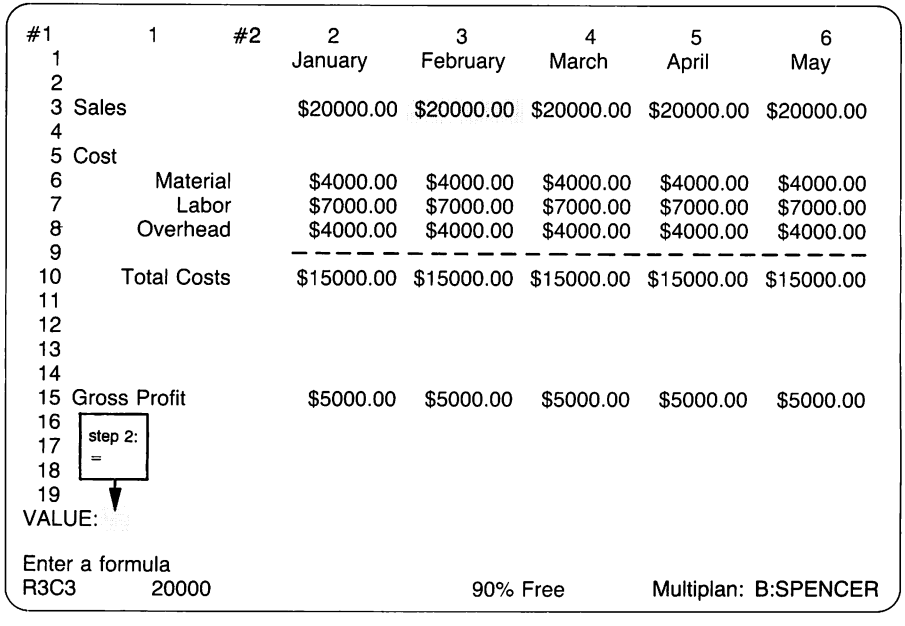
A Formula Showing Increasing Sales

Your information on Spencer Ceramics indicates that sales have been increasing by around 1% a month. To see the effect of a 1% monthly increase in sales, first move the pointer to row 3, column 3 (R3C3), under February, which is the first month that shows an increase.



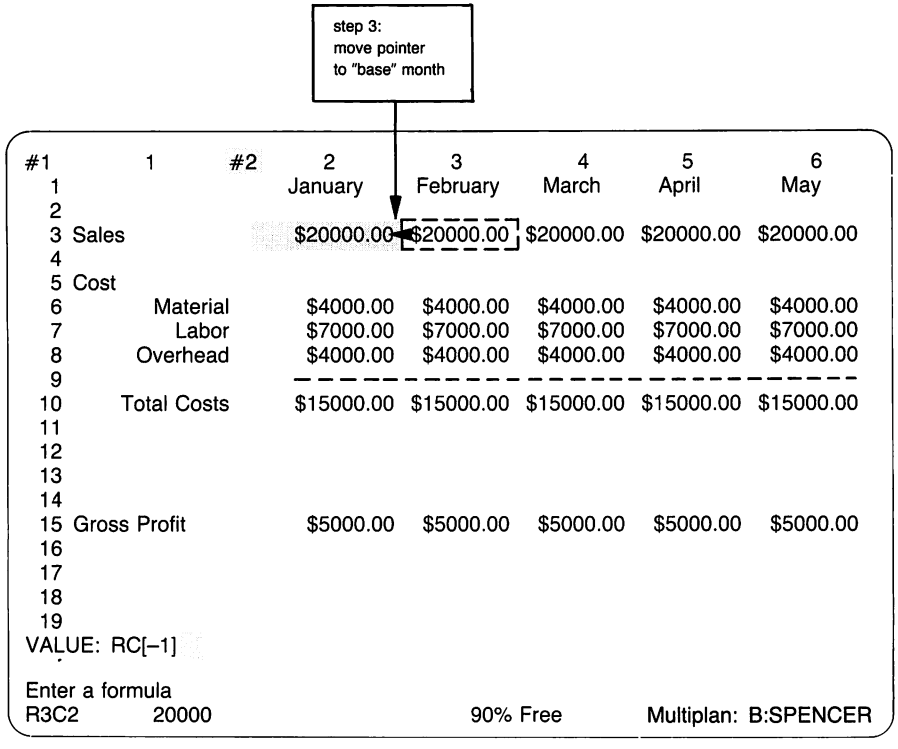
Screen 150

Press = or **V**. Your command line shows:



Screen 151

Using January sales as a base for the remaining months, type in a formula that shows each month's sales as a 1% increase over the preceding month's sales. Move the cell pointer back to row 3, column 2, under January.

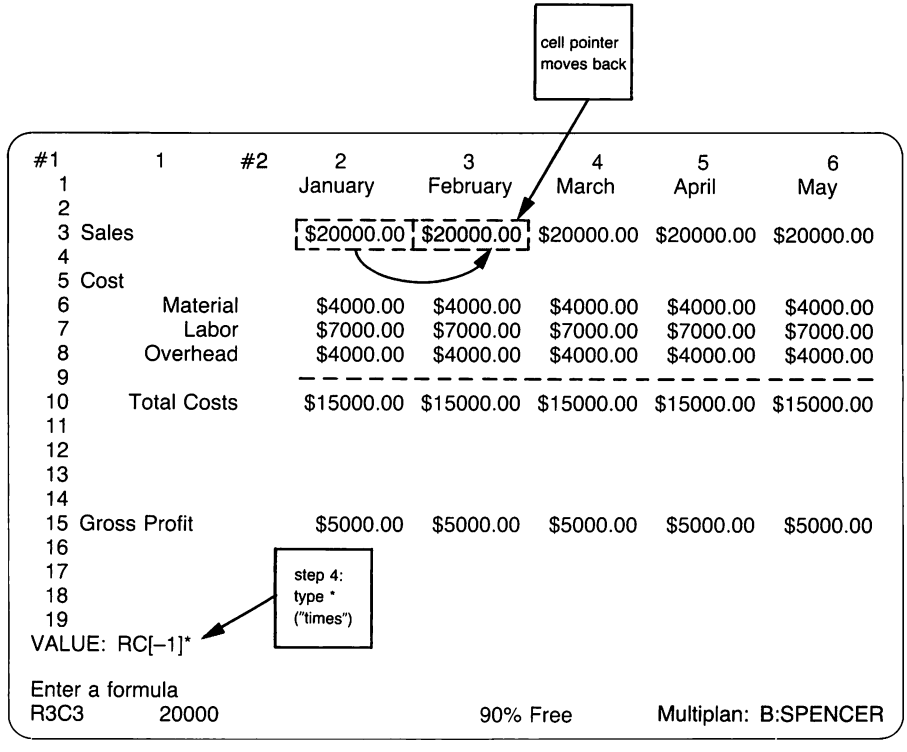


Screen 152

NOTE: *Notice the formula being built in the command line.*

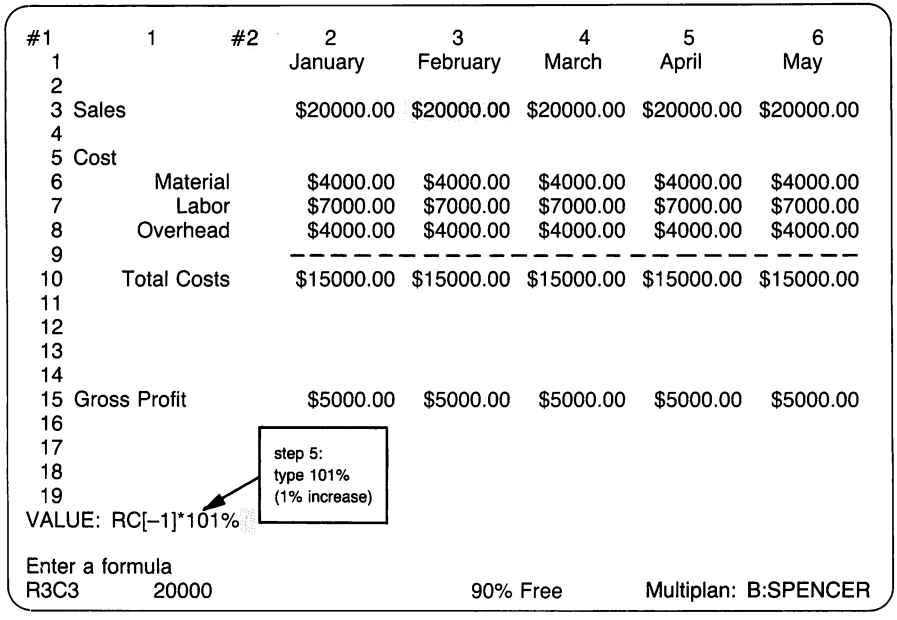
To show February's sales as a 1% increase over January's, you need to multiply January's sales by 101% (that is, February sales are 101% of January's).

Press * (the asterisk is the sign for multiply).



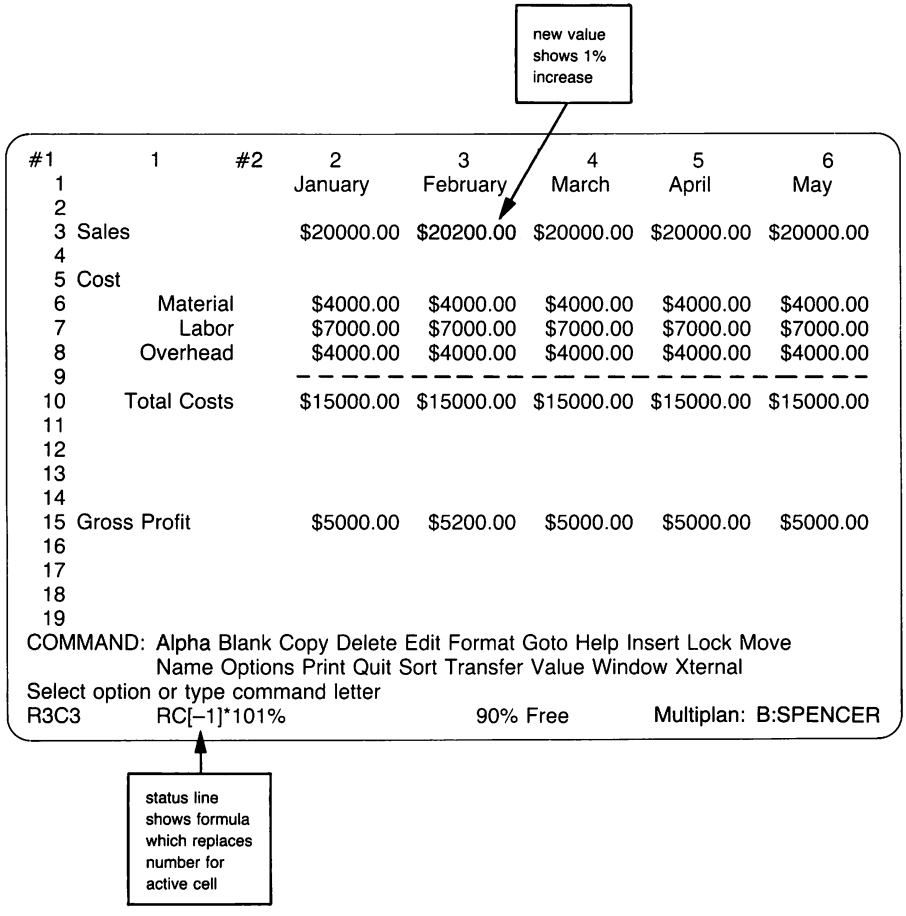
Screen 153

Now type **101%** (use the number **1**, not the lowercase letter **l**).



Screen 154

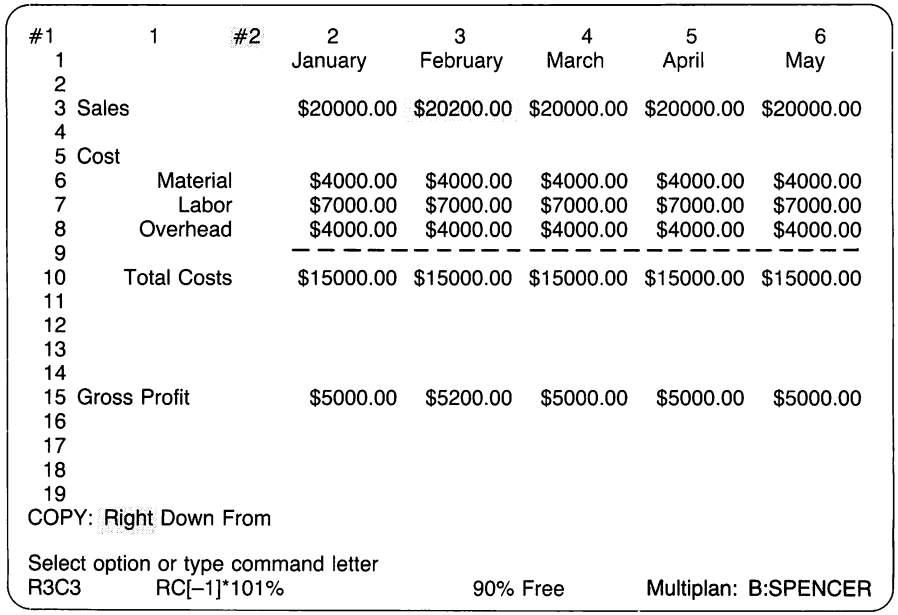
Press RETURN. You should see the new cell value for February showing a 1% increase over the previous month, January.



Screen 155

Copying a Formula to the Right

The Copy Right Command . There is no formula in the cell for January because January acts as the "base" month for the 1% increase. Therefore, you copy the formula for February into the remaining 10 months of the year. To copy this formula to the right, be sure the cell pointer is on R3C3 (under February), and press **C**.



#1	1	#2	2	3	4	5	6
1			January	February	March	April	May
2							
3	Sales		$20000.00	$20200.00	$20000.00	$20000.00	$20000.00
4							
5	Cost						
6	Material		$4000.00	$4000.00	$4000.00	$4000.00	$4000.00
7	Labor		$7000.00	$7000.00	$7000.00	$7000.00	$7000.00
8	Overhead		$4000.00	$4000.00	$4000.00	$4000.00	$4000.00
9							
10	Total Costs		$15000.00	$15000.00	$15000.00	$15000.00	$15000.00
11							
12							
13							
14							
15	Gross Profit		$5000.00	$5200.00	$5000.00	$5000.00	$5000.00
16							
17							
18							
19							

COPY: Right Down From

Select option or type command letter

R3C3 RC[–1]*101% 90% Free Multiplan: B:SPENCER

Screen 156

Press **R** for RIGHT.

```
#1        1        #2      2          3          4          5          6
  1                         January    February   March      April      May
  2
  3 Sales                   $20000.00  $20200.00  $20000.00  $20000.00  $20000.00
  4
  5 Cost
  6          Material       $4000.00   $4000.00   $4000.00   $4000.00   $4000.00
  7            Labor        $7000.00   $7000.00   $7000.00   $7000.00   $7000.00
  8         Overhead        $4000.00   $4000.00   $4000.00   $4000.00   $4000.00
  9                         ---------- ---------- ---------- ---------- ----------
 10       Total Costs       $15000.00  $15000.00  $15000.00  $15000.00  $15000.00
 11
 12
 13
 14
 15 Gross Profit            $5000.00   $5200.00   $5000.00   $5000.00   $5000.00
 16
 17
 18
 19
COPY RIGHT number of cells:    starting at: R3C3

Enter a number
R3C3        RC[-1]*101%                  90% Free          Multiplan: B:SPENCER
```

Screen 157

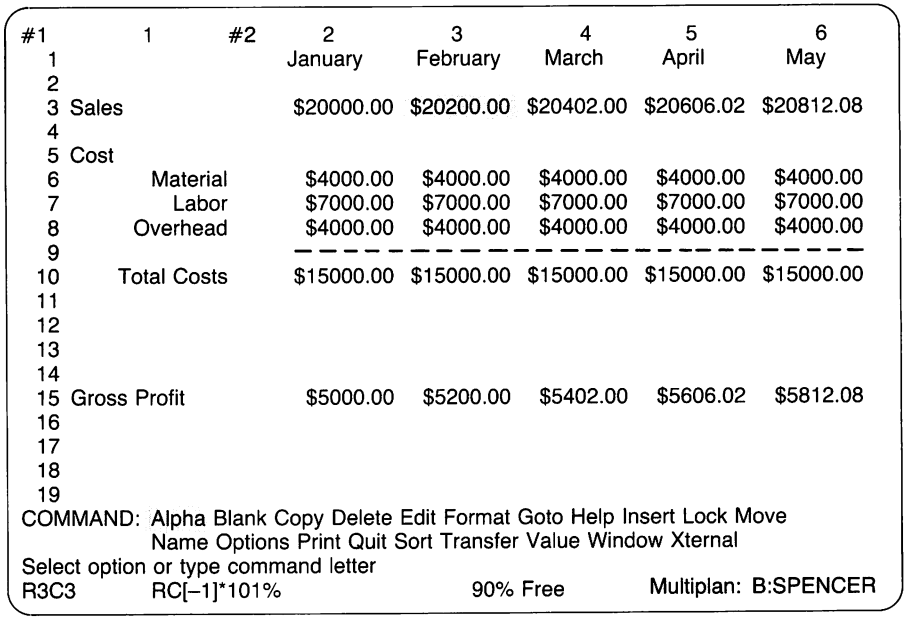
In the first field ("number of cells"), type **10.**

```
#1        1        #2      2          3          4          5          6
  1                         January    February   March      April      May
  2
  3 Sales                   $20000.00  $20200.00  $20000.00  $20000.00  $20000.00
  4
  5 Cost
  6          Material       $4000.00   $4000.00   $4000.00   $4000.00   $4000.00
  7            Labor        $7000.00   $7000.00   $7000.00   $7000.00   $7000.00
  8        Overhead         $4000.00   $4000.00   $4000.00   $4000.00   $4000.00
  9                         ---------- ---------- ---------- ---------- ----------
 10      Total Costs        $15000.00  $15000.00  $15000.00  $15000.00  $15000.00
 11
 12
 13
 14
 15 Gross Profit            $5000.00   $5200.00   $5000.00   $5000.00   $5000.00
 16
 17
 18
 19
COPY  RIGHT number of cells: 10   starting at: R3C3

Enter a number
R3C3        RC[-1]*101%                  90% Free          Multiplan: B:SPENCER
```

Screen 158

In the second field ("starting at"), you see that R3C3 (the active cell) is the proposed response. That is where you want to start because the other 10 cells are to be copies of this cell.

Press RETURN and watch the results.

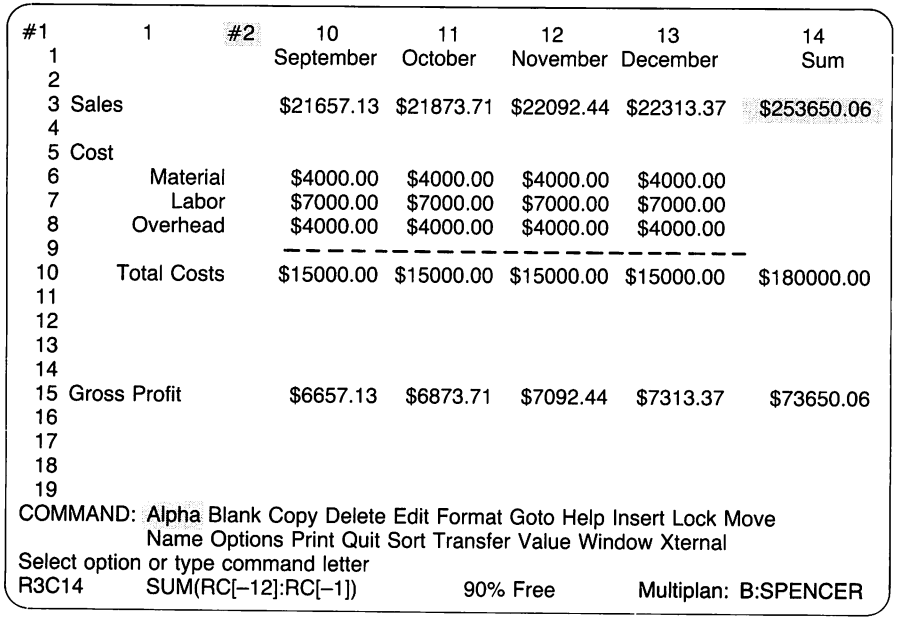


#1	1	#2	2	3	4	5	6
1			January	February	March	April	May
2							
3	Sales		$20000.00	$20200.00	$20402.00	$20606.02	$20812.08
4							
5	Cost						
6		Material	$4000.00	$4000.00	$4000.00	$4000.00	$4000.00
7		Labor	$7000.00	$7000.00	$7000.00	$7000.00	$7000.00
8		Overhead	$4000.00	$4000.00	$4000.00	$4000.00	$4000.00
9							
10		Total Costs	$15000.00	$15000.00	$15000.00	$15000.00	$15000.00
11							
12							
13							
14							
15	Gross Profit		$5000.00	$5200.00	$5402.00	$5606.02	$5812.08
16							
17							
18							
19							

COMMAND: Alpha Blank Copy Delete Edit Format Goto Help Insert Lock Move
Name Options Print Quit Sort Transfer Value Window Xternal
Select option or type command letter
R3C3 RC[−1]*101% 90% Free Multiplan: B:SPENCER

Screen 159

Now move the cell pointer to row 3, column 14 (R3C14). You are now able to see the sales figures resulting from a 1% monthly increase. The formula was copied to the remainder of the year, and the cells that depended on sales figures (Gross Profits and sum of Sales, for example) were updated to include the new information.



#1	1	#2	10	11	12	13	14
1			September	October	November	December	Sum
2							
3	Sales		$21657.13	$21873.71	$22092.44	$22313.37	$253650.06
4							
5	Cost						
6		Material	$4000.00	$4000.00	$4000.00	$4000.00	
7		Labor	$7000.00	$7000.00	$7000.00	$7000.00	
8		Overhead	$4000.00	$4000.00	$4000.00	$4000.00	
9							
10		Total Costs	$15000.00	$15000.00	$15000.00	$15000.00	$180000.00
11							
12							
13							
14							
15	Gross Profit		$6657.13	$6873.71	$7092.44	$7313.37	$73650.06
16							
17							
18							
19							

COMMAND: Alpha Blank Copy Delete Edit Format Goto Help Insert Lock Move
Name Options Print Quit Sort Transfer Value Window Xternal
Select option or type command letter
R3C14 SUM(RC[–12]:RC[–1]) 90% Free Multiplan: B:SPENCER

Screen 160

Before you go on, save your work (*T*ransfer *S*ave, *Y*es to overwrite).

What if?...

The SPENCER worksheet is based on the assumption that the company will have $20,000.00 in sales in January, (the "base" month). The rest of the sales figures are calculated from a formula that assumes a sales increase of 1% per month. All the cost figures are the same for each month.

What if the actual "base" figures (figures you typed in rather than figures calculated from formulas) are different from the estimates you typed in? You want to change the "base" figures, but protect your formulas (especially for calculating total costs and gross profits) from alteration. How do you protect

your formulas from accidental alteration? And, how do you quickly find which cells contain the "base" figures?

Multiplan-86 has a Lock command to protect formulas and text and a NEXT UNLOCKED CELL key to move quickly from one "base" figure to the next.

Protecting the Worksheet: The Lock Formulas Command

Press **L**, then **F**. The command line changes to:

```
#1        1        #2      10          11          12          13          14
  1                        September   October     November    December    Sum
  2
  3 Sales                  $21657.13   $21873.71   $22092.44   $22313.37   $253650.06
  4
  5 Cost
  6          Material      $4000.00    $4000.00    $4000.00    $4000.00
  7            Labor       $7000.00    $7000.00    $7000.00    $7000.00
  8        Overhead        $4000.00    $4000.00    $4000.00    $4000.00
  9                        ----------  ----------  ----------  ----------
 10      Total Costs       $15000.00   $15000.00   $15000.00   $15000.00   $180000.00
 11
 12
 13
 14
 15 Gross Profit           $6657.13    $6873.71    $7092.44    $7313.37    $73650.06
 16
 17
 18
 19
LOCK FORMULAS:

Enter Y to confirm
R3C14       SUM(RC[-12]:RC[-1])          90% Free          Multiplan: B:SPENCER
```

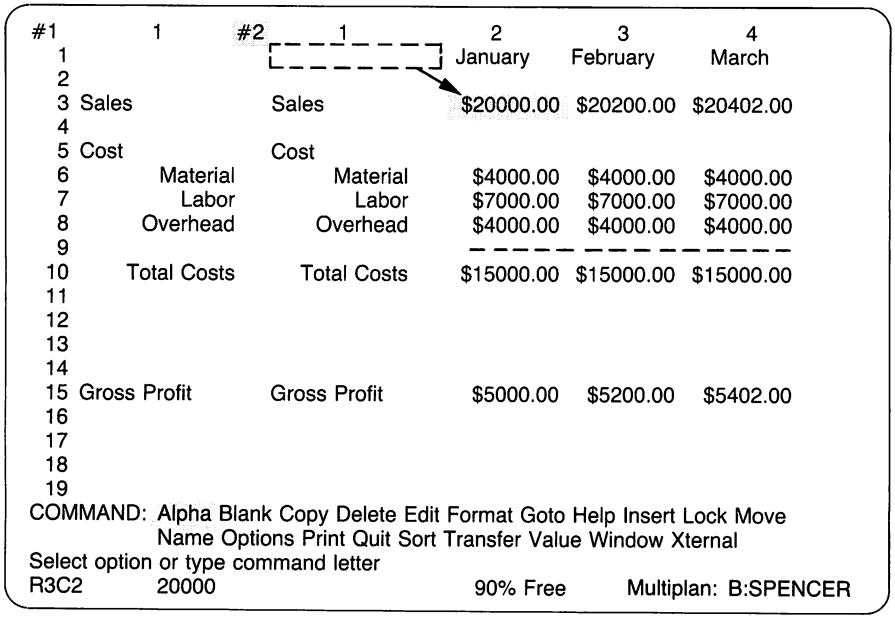
Screen 161

The message line shows the message "Enter Y to confirm." The only entry you make here is **Y** if you want all the cells with formulas or text locked, or any other key to cancel the command.

Press **Y**. The command menu returns.

The NEXT UNLOCKED CELL Key

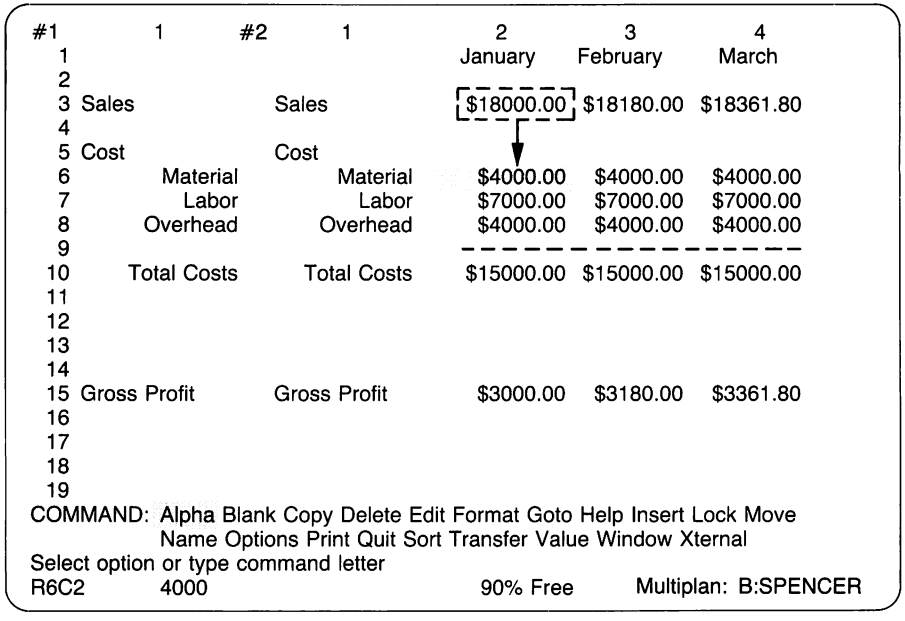
To see the effect of the Lock Formulas command, type a CTRL/Q to go to R1C1. Now press the FIND key (NEXT UNLOCKED CELL). Your screen should display:



Screen 162

The cell pointer moves to R3C2, which is the first cell from the beginning of the worksheet that contains typed-in data rather than text or a formula. Notice that blank cells are also ignored.

Type **18000**, then press RETURN. Again, press the NEXT UNLOCKED CELL key (the FIND key).



#1	1	#2	1	2	3	4
1				January	February	March
2						
3	Sales		Sales	$18000.00	$18180.00	$18361.80
4						
5	Cost		Cost			
6		Material		Material	$4000.00	$4000.00	$4000.00
7		Labor		Labor	$7000.00	$7000.00	$7000.00
8		Overhead		Overhead	$4000.00	$4000.00	$4000.00
9						
10		Total Costs		Total Costs	$15000.00	$15000.00	$15000.00
11						
12						
13						
14						
15	Gross Profit			Gross Profit	$3000.00	$3180.00	$3361.80
16						
17						
18						
19						

COMMAND: Alpha Blank Copy Delete Edit Format Goto Help Insert Lock Move
Name Options Print Quit Sort Transfer Value Window Xternal
Select option or type command letter
R6C2 4000 90% Free Multiplan: B:SPENCER

Screen 163

The value in R3C2 (January sales) changed, and Multiplan-86 recalculated the figures in the sales and gross profits rows. The cell pointer is now at R6C2, the next unlocked cell. If you want, you can alter the value in this cell, then watch the changes on the profit picture. Already you can see that gross profits dropped from $5000 to $3000 in January, with similar reductions in the following months.

You might want to press the FIND key (NEXT UNLOCKED CELL) several more times to see which cells remain unlocked.

Unlocking Cells

To unlock cells again, press **L**, then **C**. In the "cells" field, specify the whole worksheet, as follows:

Press the HOME key (CTRL/Q)

Press : (colon)

Press the END key (CTRL/Z).

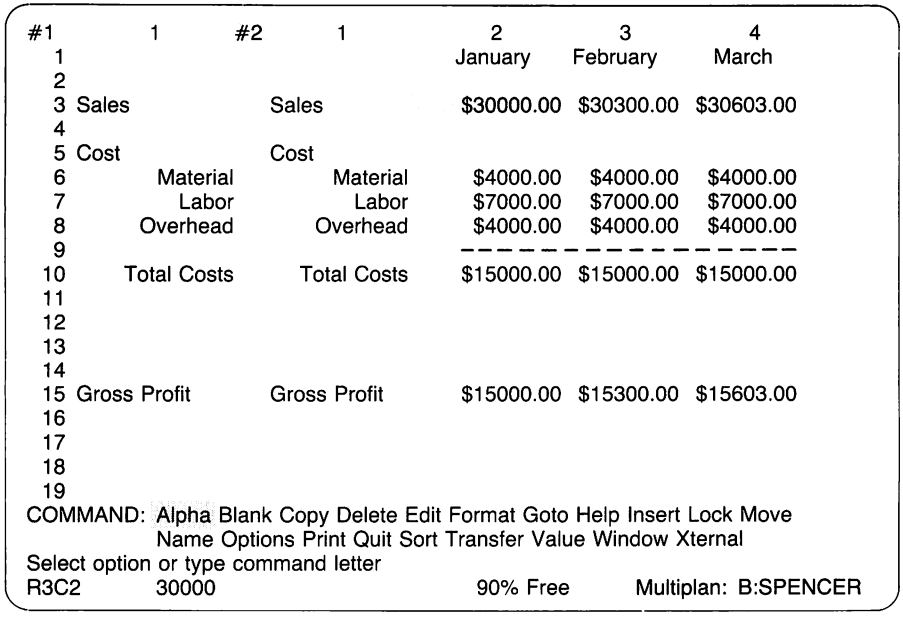
Press RETURN.

All cells should now be unlocked. Press the FIND key (NEXT UNLOCKED CELL) several times; the cell pointer should move from one cell to the next, just as if you were pressing the RIGHT ARROW key.

The Options Command

As you have seen, if you change the contents of a cell, such as January sales, Multiplan-86 recalculates all of the cells that depend upon that cell.

Use the Goto command to move your pointer to row 3, column 2. Change January sales by typing **30000**. Press RETURN and watch the remaining sales and profits figures change when you press RETURN.


#1 1 #2 1 2 3 4
1 January February March
2
3 Sales Sales $30000.00 $30300.00 $30603.00
4
5 Cost Cost
6 Material Material $4000.00 $4000.00 $4000.00
7 Labor Labor $7000.00 $7000.00 $7000.00
8 Overhead Overhead $4000.00 $4000.00 $4000.00
9
10 Total Costs Total Costs $15000.00 $15000.00 $15000.00
11
12
13
14
15 Gross Profit Gross Profit $15000.00 $15300.00 $15603.00
16
17
18
19
COMMAND: Alpha Blank Copy Delete Edit Format Goto Help Insert Lock Move
Name Options Print Quit Sort Transfer Value Window Xternal
Select option or type command letter
R3C2 30000 90% Free Multiplan: B:SPENCER

Screen 164

If you change the formula in row 3, column 3 (under February), to reflect a 2% increase (*102%), Multiplan-86 automatically recalculates the worksheet.

If your worksheet contains many formulas, each change may require several moments to complete the recalculation. To speed up entering a number of changes, you can turn off the automatic recalculation option by using the Option command. Press **O**.

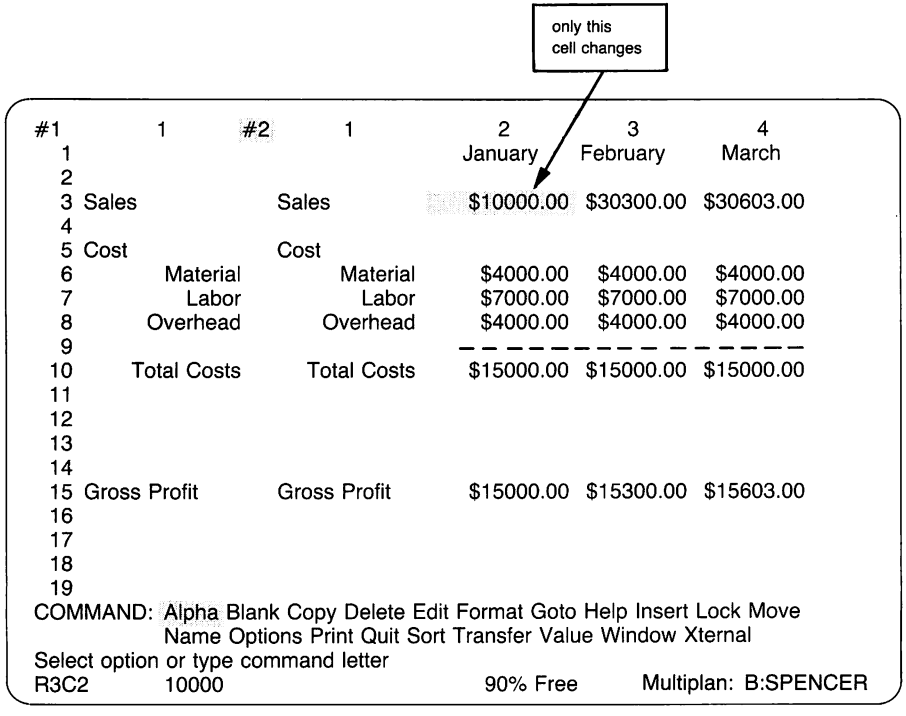
```
#1        1      #2        1          2          3          4
  1                                   January    February   March
  2
  3 Sales          Sales              $30000.00  $30300.00  $30603.00
  4
  5 Cost           Cost
  6       Material           Material  $4000.00   $4000.00   $4000.00
  7         Labor              Labor   $7000.00   $7000.00   $7000.00
  8      Overhead           Overhead   $4000.00   $4000.00   $4000.00
  9                                    ---------- ---------- ----------
 10    Total Costs        Total Costs  $15000.00  $15000.00  $15000.00
 11
 12
 13
 14
 15 Gross Profit         Gross Profit  $15000.00  $15300.00  $15603.00
 16
 17
 18
 19
OPTIONS recalc: Yes No     mute: Yes(No)

Select option
R3C2        30000                        90% Free        Multiplan: B:SPENCER
```

Screen 165

Select "No" by pressing **N** or by pressing the SPACE BAR once.

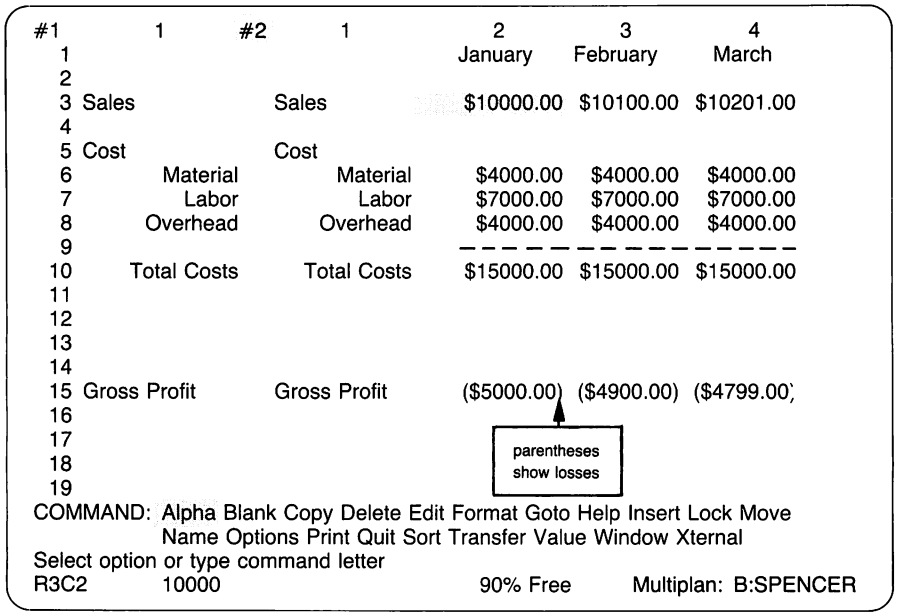
Press RETURN.

Now change the number for January sales to **10000** and press RETURN. Notice that only the cell for January sales changed.



Screen 166

During the time the option to recalculate is turned off, you can do a one-time calculation by pressing the RECALC key (!). Press the RECALC key, and watch the screen. The worksheet has been recalculated. *Gross Profits* (row 15) now shows losses in parentheses.



Screen 167

Use the Option command to change back to automatic recalculation (**O**ption, **Y**es, RETURN). (Your work was already saved by the earlier Transfer Save command.)

Summary

In this session you learned:

- How to fix row and column titles to let you scroll while viewing the headings (**W**indow **S**plit **T**itles).
- How to open a new window (**W**indow **S**plit).
- How to link windows so that they scroll together, either by rows or by columns, or both (**W**indow **L**ink).
- How to draw a border around a window (**W**indow **B**order).
- How to enter a formula to show an increasing sales percentage.
- How to copy a formula into other cells to the right (**C**opy **R**ight review).
- How to lock cells with formulas or text so you can perform "what if" experiments.
- How to use the FIND key (NEXT UNLOCKED CELL) to find cells that contain typed-in-data.
- How to unlock locked cells.
- How to use the Option command to suspend the Multiplan-86 automatic recalculation feature.

6

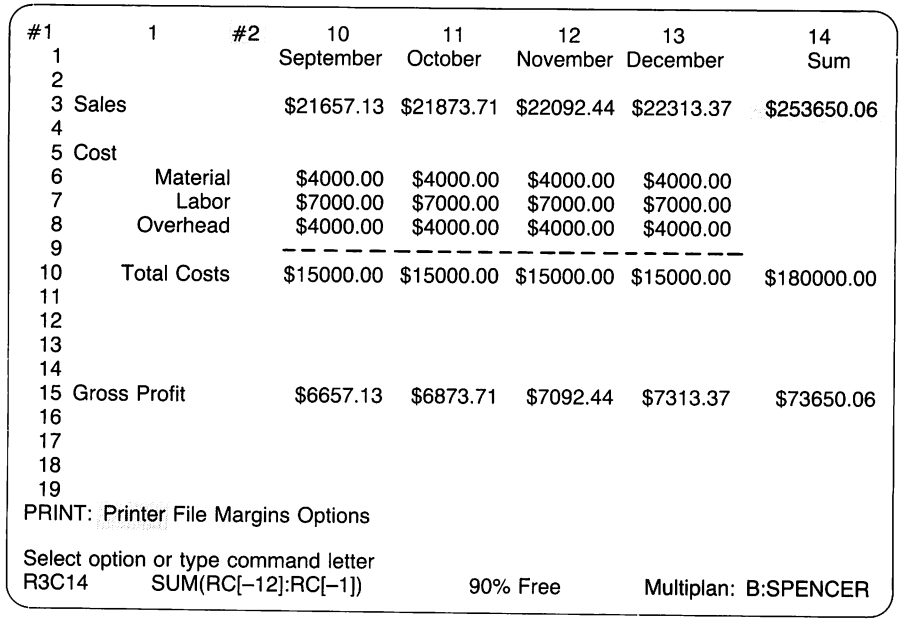
Printing a Worksheet

You have now become familiar with the basic command structure of Multiplan-86, using the keyboard and commands to build a worksheet that responds quickly and accurately to changes.

In this session you will learn to use the Multiplan-86 Print command to print a copy of the summary operating budget that you developed to show Spencer Ceramics' projected sales and profits. You can copy your work on paper or on a disk file.

The Print Command

Start up Multiplan-86 and load the disk containing the SPENCER file onto drive B. Next, use the Multiplan-86 Print command (*P*) to get a paper copy of your work. Press **P**.



Screen 168

Multiplan-86's proposed response for the Print command is **P**, or "Printer". You can press RETURN and have your worksheet printed without specifying margins. Multiplan-86 has default margins that it uses unless you specify different margins. These margins are:

left	5 characters
top	6 lines
print width	70 characters
print length	54 lines
page length	66 lines

Multiplan-86 prints as many columns across the page as will fit within these margins. Any columns left over are printed on a second page, with row and column numbers.

This method of printing permits you to cut and paste the printed pages to form a worksheet with the same dimensions you set up on the screen.

The Print Printer Command

Before you print the worksheet, be sure the printer is connected properly, turned on, and ready to print.

To produce a paper copy of your worksheet, press *P* or RETURN. Your worksheet should now be printing on your printer.

The printed pages should look something like the next three illustrations:

	January	February	March	April	May
Sales	$20000.00	$20200.00	$20402.00	$20606.02	$20812.08
Cost					
Material	$4000.00	$4000.00	$4000.00	$4000.00	$4000.00
Labor	$7000.00	$7000.00	$7000.00	$7000.00	$7000.00
Overhead	$4000.00	$4000.00	$4000.00	$4000.00	$4000.00
Total Costs	$15000.00	$15000.00	$15000.00	$15000.00	$15000.00
Gross Profits	$5000.00	$5200.00	$5402.00	$5606.02	$5812.08

June	July	August	September	October	November
$21020.20	$21230.40	$21442.71	$21657.13	$21873.71	$22092.44
$4000.00	$4000.00	$4000.00	$4000.00	$4000.00	$4000.00
$7000.00	$7000.00	$7000.00	$7000.00	$7000.00	$7000.00
$4000.00	$4000.00	$4000.00	$4000.00	$4000.00	$4000.00
$15000.00	$15000.00	$15000.00	$15000.00	$15000.00	$15000.00
$6020.20	$6230.40	$6442.71	$6657.13	$6873.71	$7092.44

December	Sum
$22313.37	$253650.06
$4000.00	
$7000.00	
$4000.00	
$15000.00	$180000.00
	$73650.06

MR-S-2443-82

Figure 7. Sample Printout

Other Print Subcommands

The Print command gives you several other subcommands. These subcommands are summarized here. For descriptions of these subcommands, refer to the Command Directory in Part 2 of the *Multiplan-86 Reference Manual.*

Print File . This subcommand lets you store a printable version of a worksheet on diskette for printing at a later time. However, you may wish to make a disk copy (or several copies) of the worksheet as it appears on the printed page. You can then print the worksheet again at some future time, or call it up for editing with a word processing program you might have. If you do not have a printer available, you need to have a disk copy to take to another computer for printing. The Multiplan-86 Print File command allows you to make such a copy for later use, or for inclusion into reports prepared by work processing programs.

Print Margins . This subcommand lets you set the margins for printing a worksheet.

Print Options . This subcommand lets you decide what you want to show on the printed sheet.

You can print:

- Only the parts of the worksheet you specify. For example, you could specify just the column showing the sums for sales, costs, and gross profits (column 14).
- Only the formulas in the cells instead of the values. For example, with the formulas option turned on, Multiplan-86 would print Sales-Total_Costs (the formula for *Gross Profits* instead of $5000.00.) only the worksheet with row and column numbers.

Summary

In this session you learned:

- How to start printing.
- What other subcommands are part of the Print command.

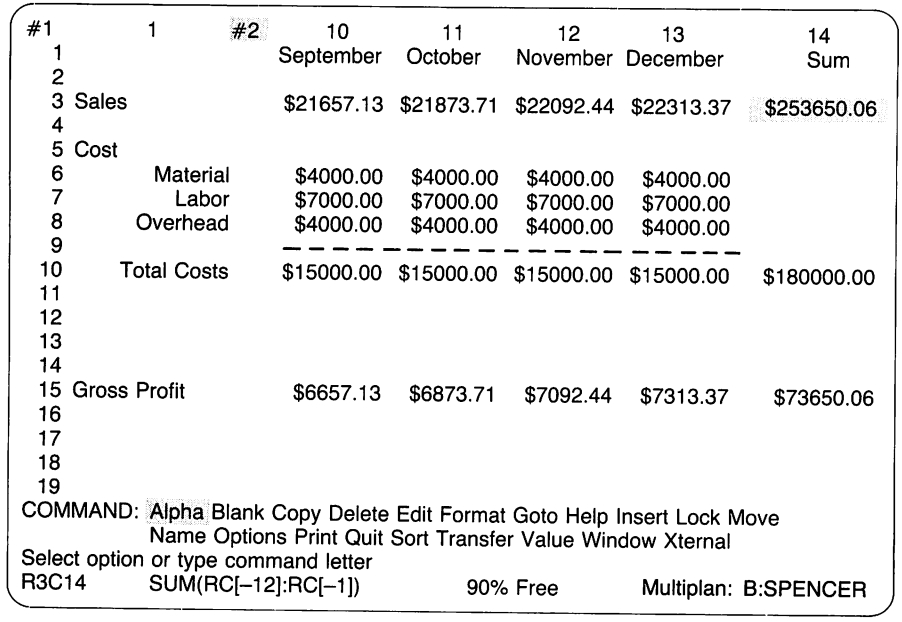
7

Using Multiple Worksheets

In this session you will learn to use information from other worksheets in entries and formulas on your active sheet.

The worksheet you have been compiling for Spencer Ceramics is a summary worksheet showing sales, costs, and gross profits. It was based on information for one month, then projected into the remaining months of the year to show potential profits. Review the data you already have. *T*ransfer *L*oad the *SPENCER* worksheet if the worksheet is not currently loaded.

Your worksheet should look like this:



#1	1	#2	10	11	12	13	14
1			September	October	November	December	Sum
2							
3	Sales		$21657.13	$21873.71	$22092.44	$22313.37	$253650.06
4							
5	Cost						
6		Material	$4000.00	$4000.00	$4000.00	$4000.00	
7		Labor	$7000.00	$7000.00	$7000.00	$7000.00	
8		Overhead	$4000.00	$4000.00	$4000.00	$4000.00	
9							
10		Total Costs	$15000.00	$15000.00	$15000.00	$15000.00	$180000.00
11							
12							
13							
14							
15	Gross Profit		$6657.13	$6873.71	$7092.44	$7313.37	$73650.06
16							
17							
18							
19							

COMMAND: Alpha Blank Copy Delete Edit Format Goto Help Insert Lock Move
Name Options Print Quit Sort Transfer Value Window Xternal
Select option or type command letter
R3C14 SUM(RC[–12]:RC[–1]) 90% Free Multiplan: B:SPENCER

Screen 169

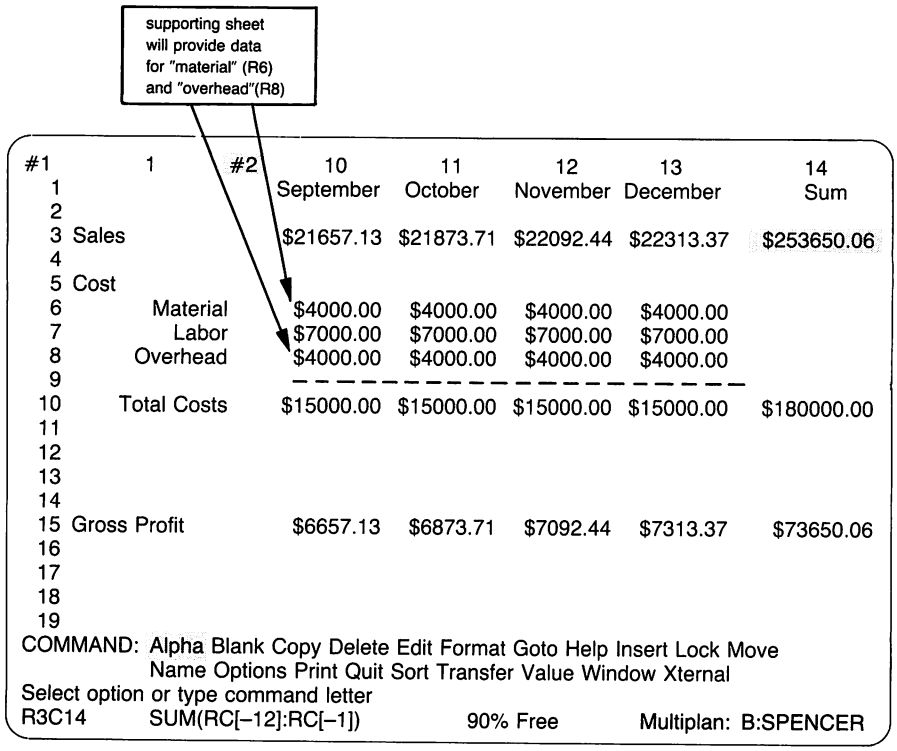
On this summary sheet, the costs of many types of items are added together to calculate the cost of materials and overhead for each month. You are now ready to use more detailed information about the company.

Look at the breakdown of Spencer Ceramics' material and overhead costs for January in Table 2.

Table 2. Breakdown of Costs for January

	Material		Overhead
Clay	$1500	Utilities	$1100
Glaze	1500	Rent	2500
Brushes	500	Telephone	200
Sponges	200	Water	200
Plaster	300		
Total	$4000	Total	$4000

In the course of business, Spencer Ceramics keeps a record of each type of item that makes up *Material* and *Overhead* shown on the summary sheet. You may want to add detail to your report on Spencer Ceramics. You can do this by setting up a worksheet for costs, which supplies totals for rows 6 and 8 of the summary sheet. (Assuming for the present that labor costs remains the same).


supporting sheet
will provide data
for "material" (R6)
and "overhead"(R8)
#1 1 #2 10 11 12 13 14
September October November December Sum
3 Sales $21657.13 $21873.71 $22092.44 $22313.37 $253650.06
5 Cost
6 Material $4000.00 $4000.00 $4000.00 $4000.00
7 Labor $7000.00 $7000.00 $7000.00 $7000.00
8 Overhead $4000.00 $4000.00 $4000.00 $4000.00
10 Total Costs $15000.00 $15000.00 $15000.00 $15000.00 $180000.00
15 Gross Profit $6657.13 $6873.71 $7092.44 $7313.37 $73650.06
COMMAND: Alpha Blank Copy Delete Edit Format Goto Help Insert Lock Move
Name Options Print Quit Sort Transfer Value Window Xternal
Select option or type command letter
R3C14 SUM(RC[–12]:RC[–1]) 90% Free Multiplan: B:SPENCER

Screen 170

Relating Worksheets to Each Other

Using Multiplan-86, you are able to set up separate worksheets, which can draw information, as needed, from one another.

The information on Spencer Ceramics could be set up to relate like this:

Summary	Detail
Material	Material Total
Overhead	Overhead Total
"Dependent Sheet"	"Supporting Sheet"

Figure 8. Sheet Dependency Diagram

Sheets that provide data for another sheet are called supporting sheets: they support the calculation of the other sheet by providing data to it. Sheets that use data from other sheets are called dependent sheets: they depend on the data of other sheets for their calculation.

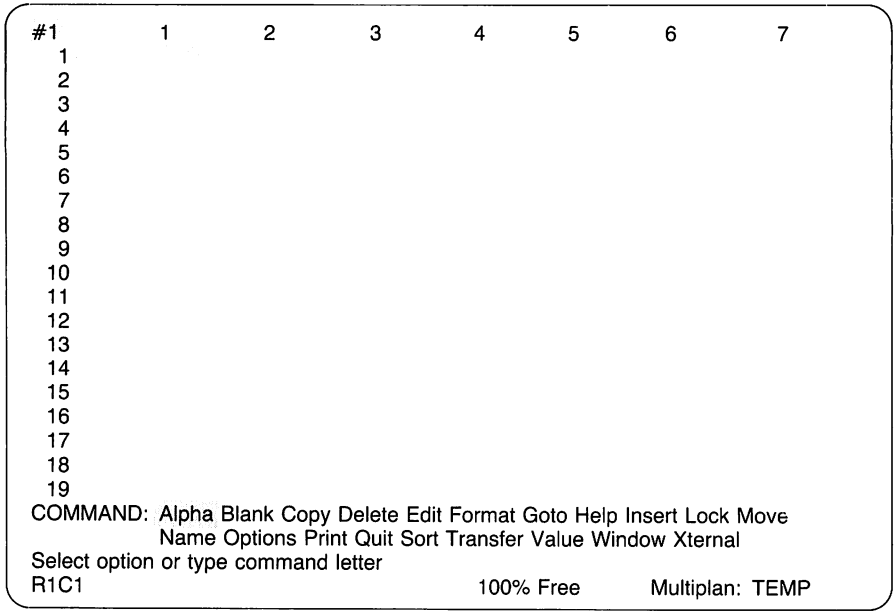
Once a supporting worksheet has been connected to a dependent worksheet, named cells on the supporting sheet can be copied to the dependent sheet.

If, for example, a cost figure changes on the Costs supporting sheet, related numbers on the summary worksheet also change the next time the summary sheet is loaded.

The Transfer Clear Command. Use the Transfer Clear command to clear the screen so that you can start a new worksheet.

NOTE: *The Transfer Clear command clears the sheet of all numbers, text, name definitions, and other information. It prepares a completely new sheet. The information on the screen is destroyed unless it has been saved. Therefore, if you entered any new information you want saved since you loaded the sheet, be sure to save it first.*

Your screen looks just as it does when you first started Multiplan-86:



Screen 171

Building a Supporting Sheet

It is not necessary to construct an elaborate supporting sheet to illustrate the use of the eXternal command. You can see how Multiplan-86 draws from other worksheets by the use of a simple example.

Before you continue with the new figures, a summary of the process of connecting worksheets will give you an idea of what's to come.

First, you build a supporting sheet to calculate the values you want to use in your work on the summary worksheet.

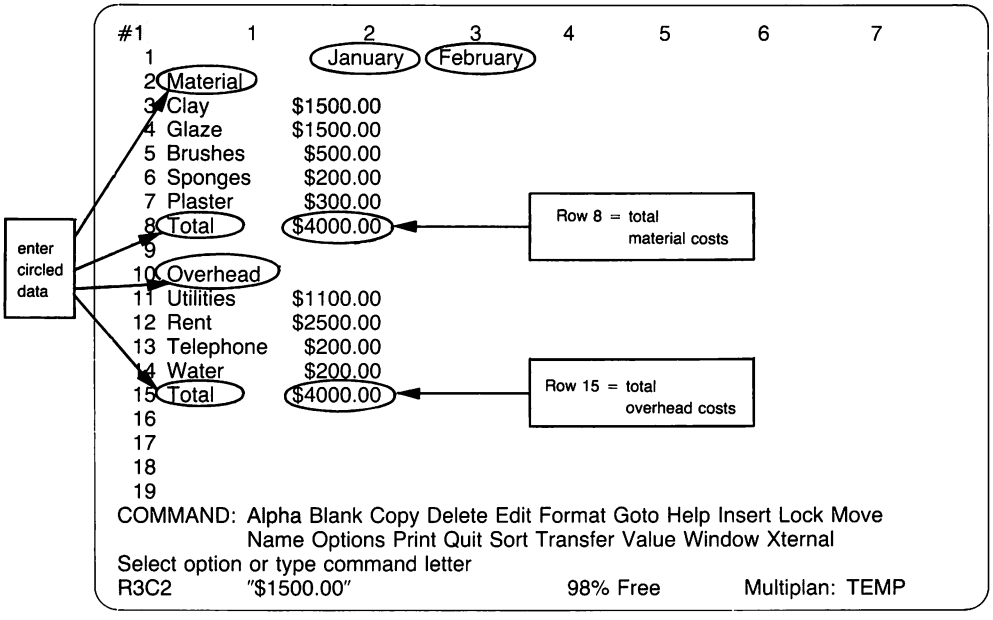
Second, *N*ame the groups of cells that contain the values you want to use.

Third, *T*ransfer *S*ave the supporting sheet.

Fourth, *T*ransfer *L*oad the dependent sheet.

Fifth, e*X*ternal *C*opy the named cells from the supporting sheet.

Build the supporting sheet, using the following sample worksheet as a guide. Enter on your supporting worksheet the data that is circled:

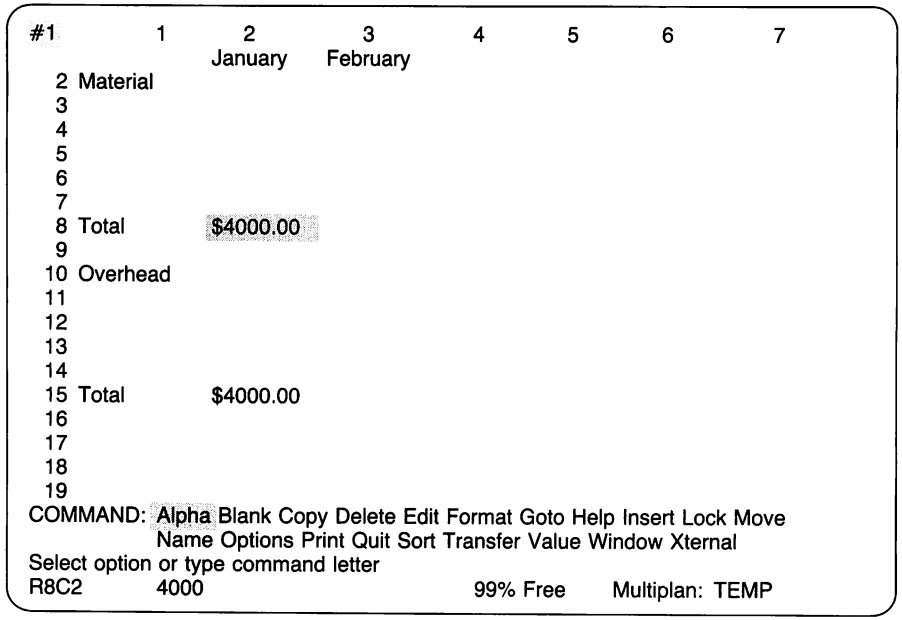


Screen 172

Notice that when you enter the dollar amount, the dollar sign and decimal point do not get printed. Because this is a new screen, it is not formatted. Before continuing with this worksheet, you should format the worksheet by performing the following procedures:

1. Type **F**, then **W**
2. Type **15** in the first field, **1** in the "Column" field, and **1** in the "Through" field; then press RETURN.
3. Type **F**, then **D** and press RETURN
4. Press TAB, type a **$**, and press RETURN

Your screen should look like the following:

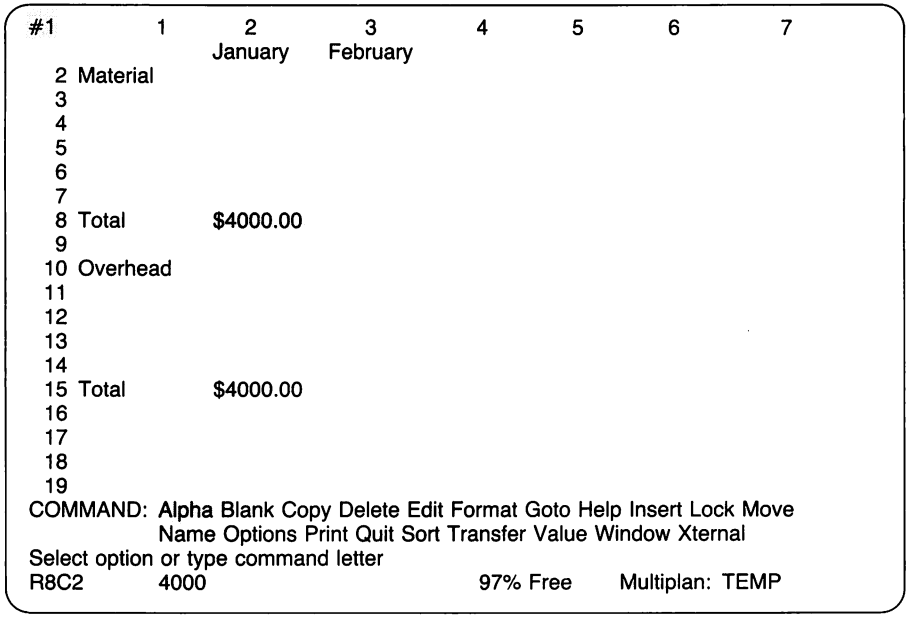


Screen 173

To align the months, perform the following procedures:

1. Move the cell printer to R1C2
2. Type **F**, then **C**.
3. Type a colon and then **14**
4. TAB over to "Alignment" and type **C** (for center); then press RETURN.

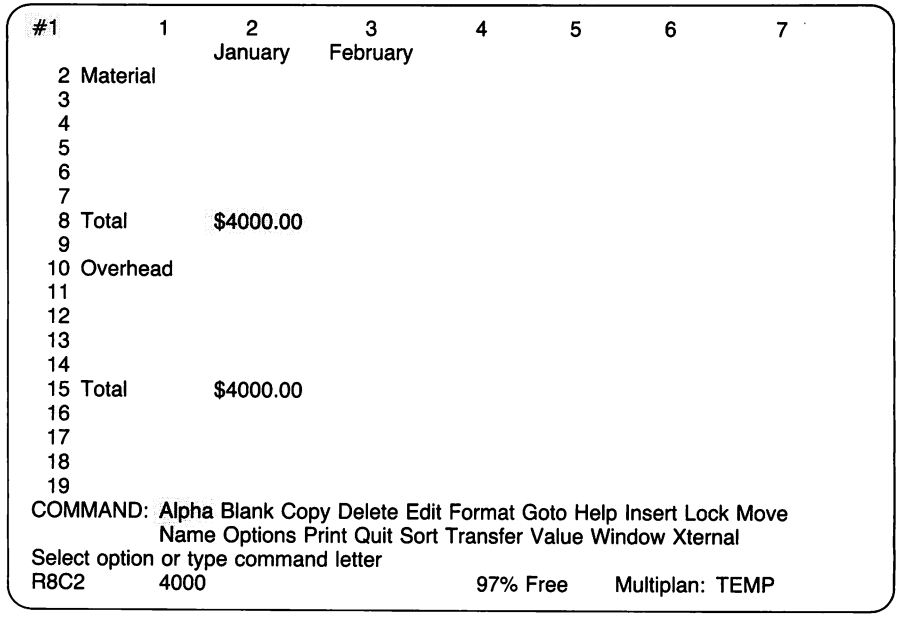
Your screen should look like the following:



Screen 174

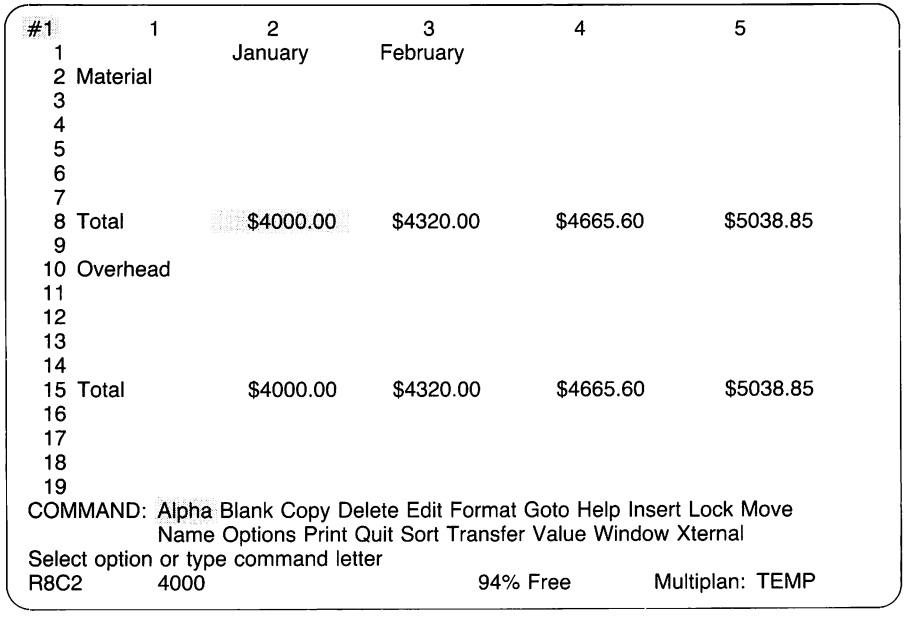
Move the cell pointer to R8C2.

Because you use only the total costs of materials and overhead on the summary sheet, you need to set up only the totals of the two main categories, using row 8 for *Total Material Costs* and row 15 for *Total Overhead Costs*, as follows:



Screen 175

Costs increase as sales increase. Include these increases in your worksheet. Starting with February, enter a formula increasing total costs in each category by 0.8% (RC[-1]*1.08). Copy these formulas to the right 10 cells.



Screen 176

You need to name two groups of cells before you connect this worksheet with the SPENCER summary worksheet. The connections between worksheets is made through defined names. Recall that you already defined names on the SPENCER worksheet: *Sales, Material, Labor,* and *Overhead.*

Use the same process here to define names on the supporting sheet for the two groups of cells that you copy to the SPENCER worksheet.

***NOTE:** Data for columns 6 and 7 are not included in screens 176 through 178.*

For now, define 'Materialcosts' to refer to R8C2:13.

Move the cell pointer to R8C2

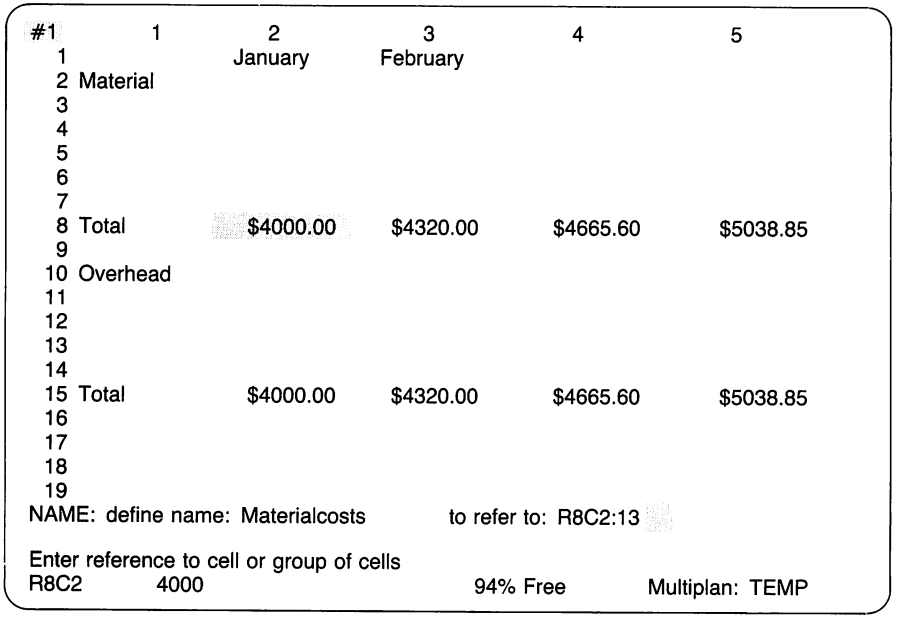
Press **N**

Type **Materialcosts**

Press TAB

Press **:** (colon)

Type **13**



Screen 177

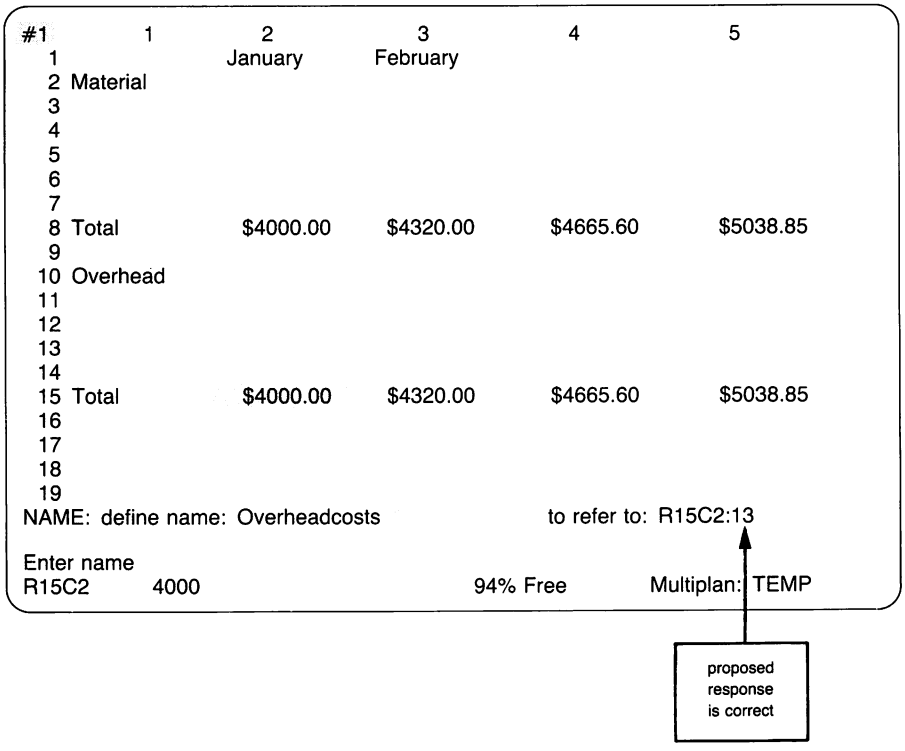
Press RETURN

Define 'Overheadcosts' to refer to R15C2:13

Move the cell pointer to R15C2

Press **N**

Type **Overheadcosts**



Screen 178

Press RETURN

Now, save this worksheet with a name that indicates a relationship between the supporting (detail) sheet and the dependent (summary) sheet. The next section describes one way to name related worksheets.

Naming Related Worksheets

Each supporting worksheet must be given a name and saved in a file. That file name is used with the eXternal command to make the data accessible to dependent sheets. Multiplan-86 is able to find any worksheet on the disk being used, but giving the sheets related names makes it easier to keep track of them and use them quickly and accurately.

You named the first worksheet SPENCER. Using a form of that name for related worksheets, which are also files once they have been saved, helps you to recognize later which sheets belong together. It is helpful to capitalize the names of the sheets to distinguish them from cell names, but it is not essential.

To name a supporting sheet, you could follow a procedure like this:

1. Use the general file name first (or some abbreviation of it):

   SPEN

2. Next, add an additional name or abbreviation to create the supporting file name (a name that quickly identifies the worksheet to you as a supporting worksheet of the main (dependent) worksheet):

   SPENCOST

   Now **T**ransfer **S**ave B:SPENCOST.

The eXternal Command . *T*ransfer *L*oad *B:SPENCER.* Your screen should look like:

```
#1        1        #2      10          11          12          13          14
  1                        September   October     November    December    Sum
  2
  3 Sales                  $21657.13   $21873.71   $22092.44   $22313.37   $253650.06
  4
  5 Cost
  6          Material      $4000.00    $4000.00    $4000.00    $4000.00
  7            Labor       $7000.00    $7000.00    $7000.00    $7000.00
  8        Overhead        $4000.00    $4000.00    $4000.00    $4000.00
  9                        ----------  ----------  ----------  ----------
 10      Total Costs       $15000.00   $15000.00   $15000.00   $15000.00   $180000.00
 11
 12
 13
 14
 15 Gross Profit           $6657.13    $6873.71    $7092.44    $7313.37    $73650.06
 16
 17
 18
 19
COMMAND: Alpha Blank Copy Delete Edit Format Goto Help Insert Lock Move
         Name Options Print Quit Sort Transfer Value Window Xternal
Select option or type command letter
R3C14    SUM(RC[-12]:RC[-1])          90% Free      Multiplan: B:SPENCER
```

Screen 179

Move the cell pointer to R6C2.

The eXternal command is selected by pressing X (for "external"). Press **X**.

```
#1          1        #2      1            2           3           4
   1                                   January    February      March
   2
   3 Sales                Sales       $20000.00  $20200.00  $20402.00
   4
   5 Cost                 Cost
   6         Material         Material  $4000.00   $4000.00   $4000.00
   7            Labor            Labor  $7000.00   $7000.00   $7000.00
   8         Overhead         Overhead  $4000.00   $4000.00   $4000.00
   9                                    - - - - - - - - - - - - - - - -
  10      Total Costs      Total Costs $15000.00  $15000.00  $15000.00
  11
  12
  13
  14
  15 Gross Profit         Gross Profit  $5000.00   $5200.00   $5402.00
  16
  17
  18
  19
EXTERNAL: Copy List Use

Select option or type command letter
R6C2        4000                       90% Free       Multiplan: B:SPENCER
```

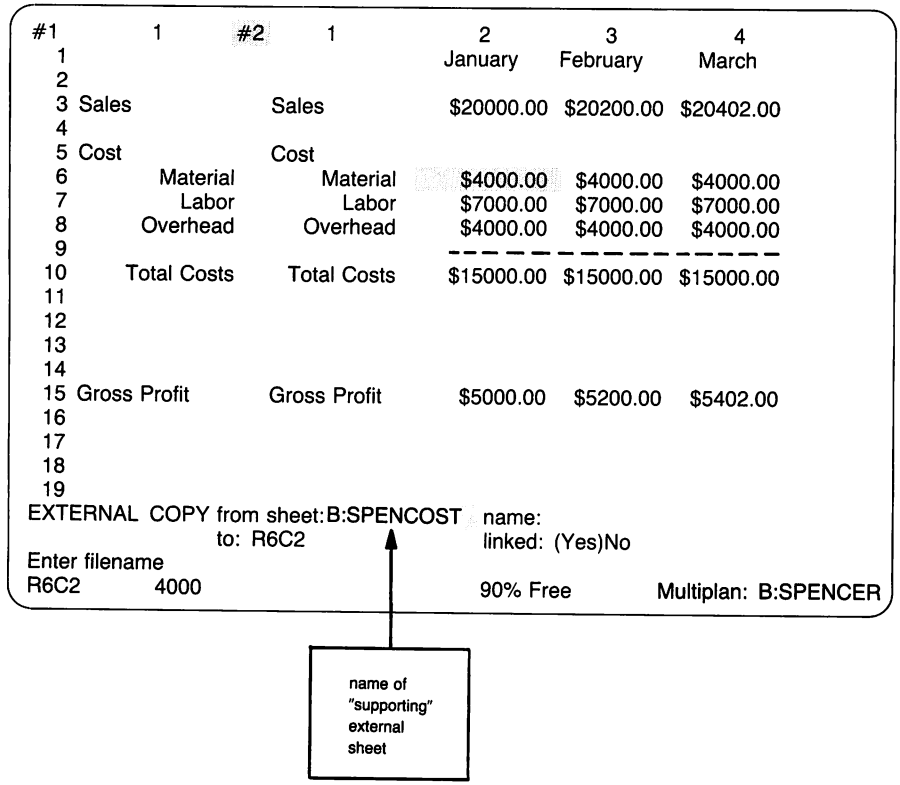
Screen 180

Press **C** or RETURN to select "Copy". The command line should look like:

```
#1        1      #2      1          2          3          4
  1                                 January    February   March
  2
  3 Sales            Sales          $20000.00  $20200.00  $20402.00
  4
  5 Cost             Cost
  6         Material          Material   $4000.00   $4000.00   $4000.00
  7           Labor             Labor    $7000.00   $7000.00   $7000.00
  8        Overhead          Overhead    $4000.00   $4000.00   $4000.00
  9                                     ---------- ---------- ----------
 10      Total Costs       Total Costs   $15000.00  $15000.00  $15000.00
 11
 12
 13
 14
 15 Gross Profit       Gross Profit      $5000.00   $5200.00   $5402.00
 16
 17
 18
 19
EXTERNAL COPY from sheet:               name:
                  to: R6C2              linked: (Yes)No
Enter filename
R6C2        4000                        90% Free          Multiplan: B:SPENCER
```

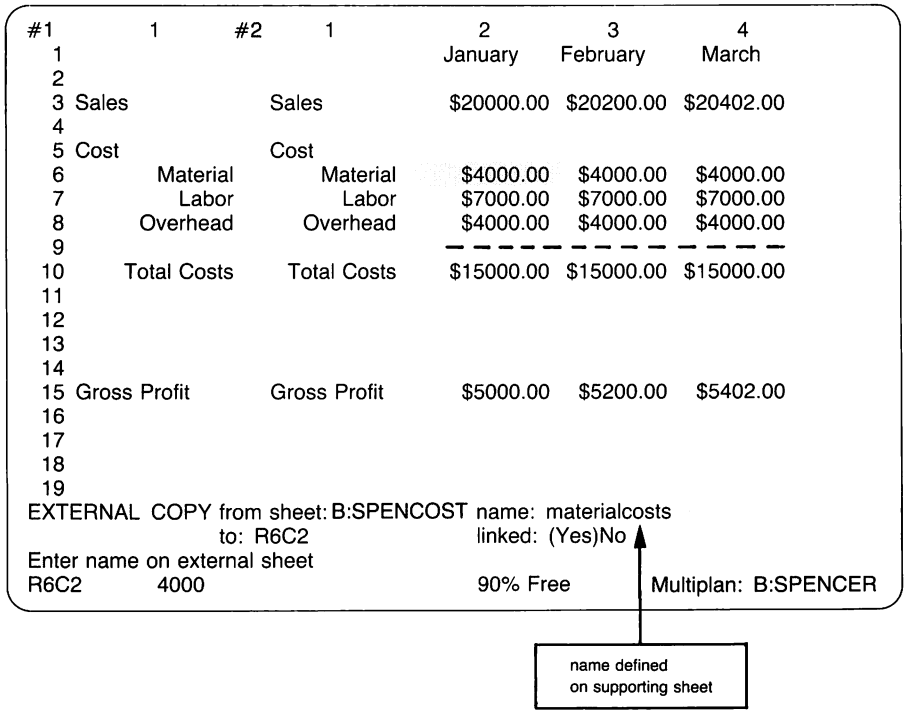
Screen 181

In the first field ("from sheet"), type the name of the supporting sheet from which you want to copy information. Type **B:SPENCOST.**



Screen 182

TAB to the second field ("name"). Type the name of the group of cells you want to copy to the active cell. Type **Materialcosts.**



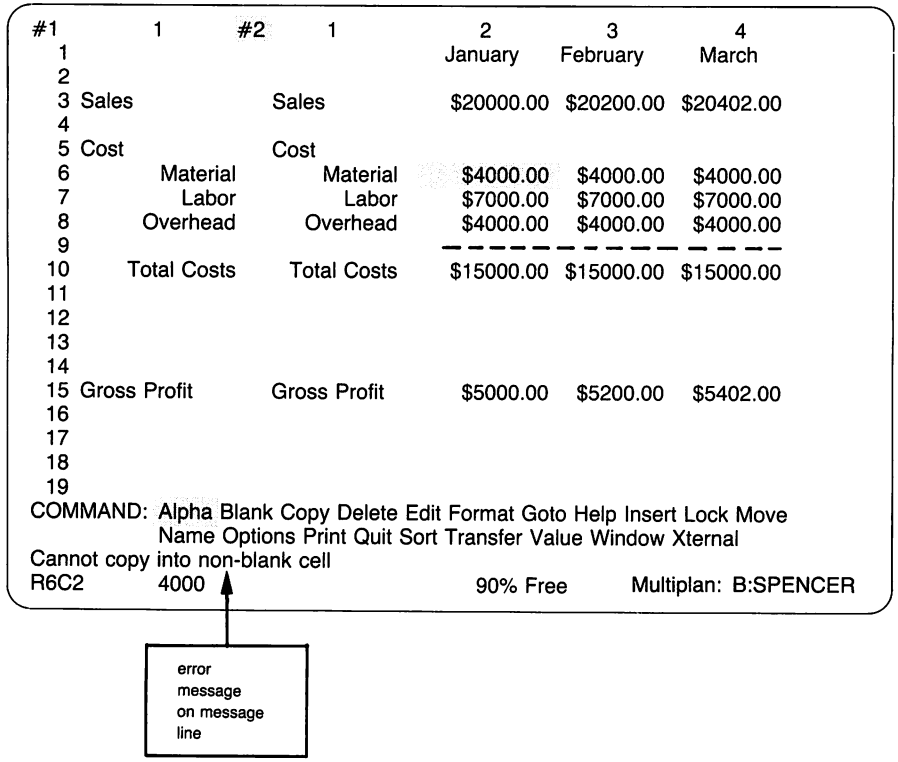
Screen 183

Notice that the third field ("to") proposes the active cell as the beginning of the area to receive the copied information. This is the correct response because you positioned the cell pointer before starting to use the eXternal command.

The proposed response in the "linked" field is "Yes". This means that a permanent connection set between SPENCER and SPENCOST. You want a permanent connection between worksheets whenever you put the current figures on one worksheet, but want the summary to be on another, as you have been doing with SPENCOST (current figures) and SPENCER (summary).

Leave the "Yes" response as is; press RETURN.

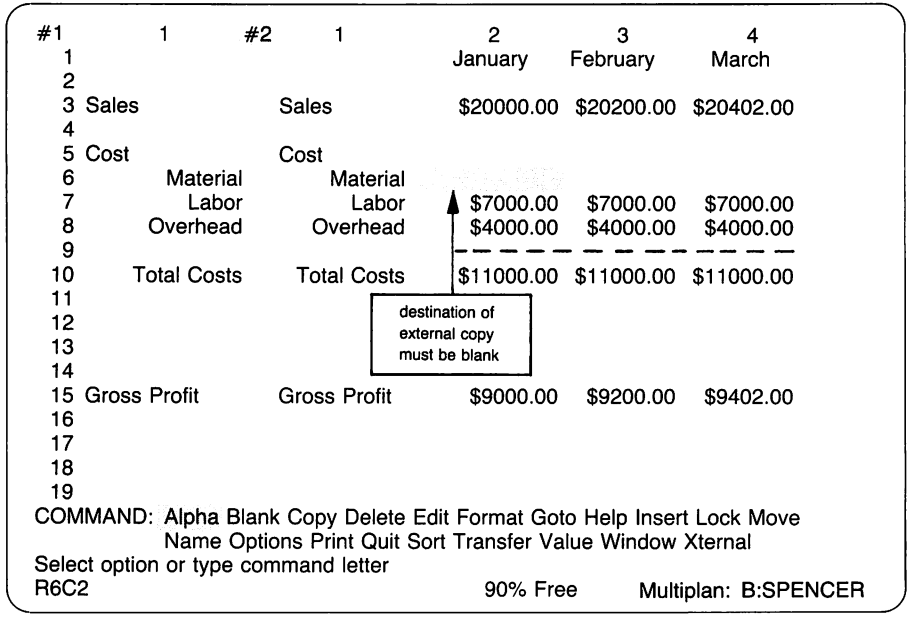
Something's wrong! In the message line you see:



Screen 184

The eXternal Copy command, unlike the regular Copy commands, copies into blank cells only to protect the information on the active sheet. So, you must first blank out the cells in row 6.

Press **B**. Press **:** (colon). Press the RIGHT ARROW key until the cell pointer reaches column 13. Press RETURN. The cells in row 6, columns 2 through 13 should be blank.

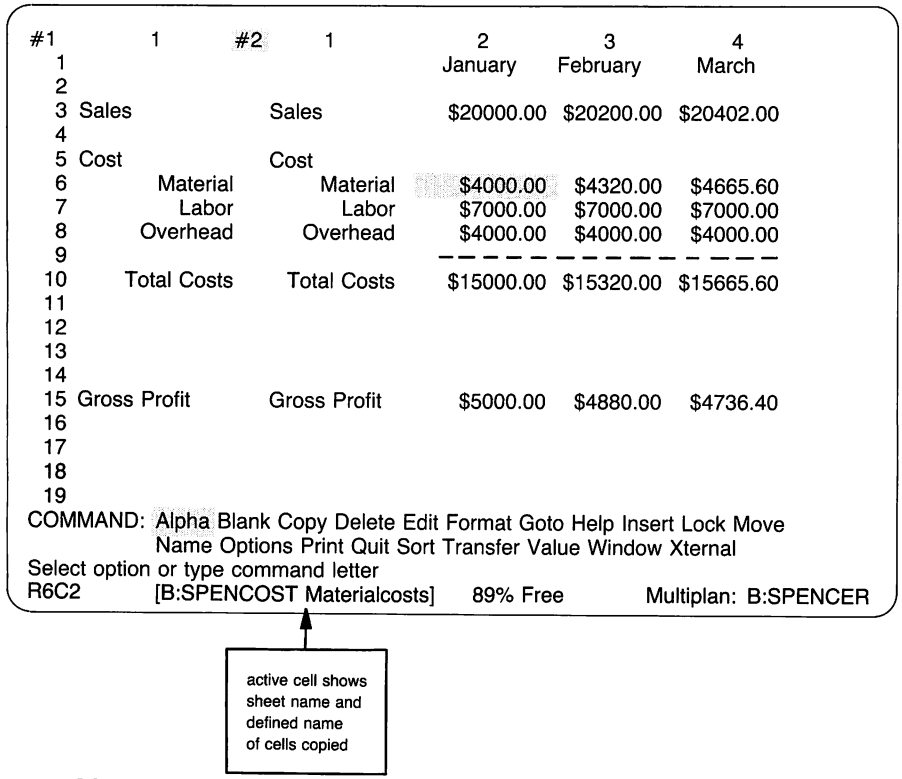


Screen 185

Now, use the eXternal Copy command again, as described above, briefly:

1. Press **X**
2. Press **C**
3. Type **B:SPENCOST**
4. Press TAB
5. Type **Materialcosts**
6. Press RETURN

The values from SPENCOST should now appear on your screen:



Screen 186

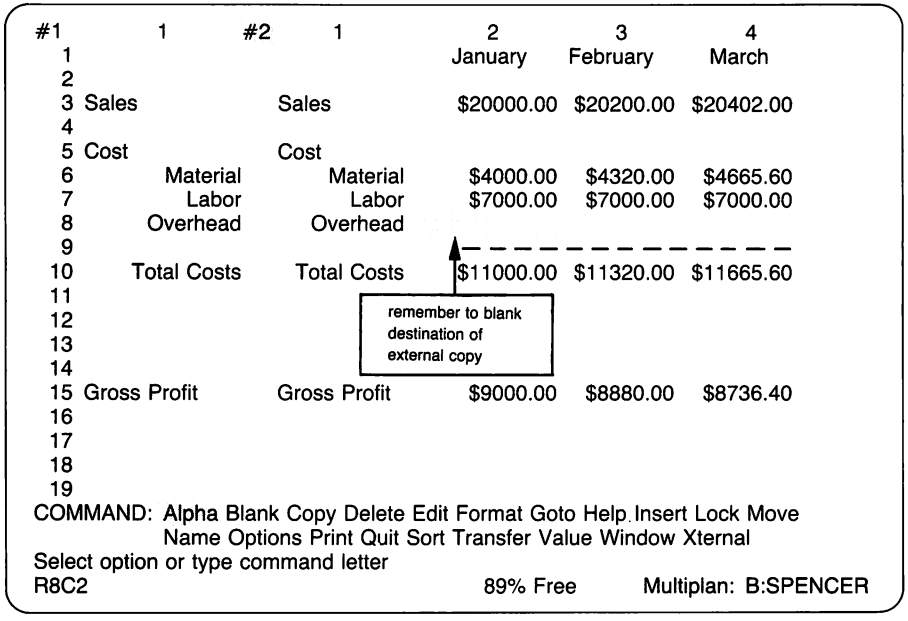
It is important that you now decide about using names. Press **N**.

Multiplan-86 proposes to define the name *SPENCOST.Materialcosts* to refer to R6C2:13, the area that received the values. To define the name, simply press RETURN.

When the Name command is used immediately after an eXternal Copy command, Multiplan-86 proposes the response in the "name" field of the eXternal Copy command as the name to be defined. This makes it easy to define names for the cells that receive values from another worksheet. Simply Press **N**, then RETURN as soon as you finished each eXternal Copy command. This is the only time the name on the supporting sheet is proposed as a name on the active sheet.

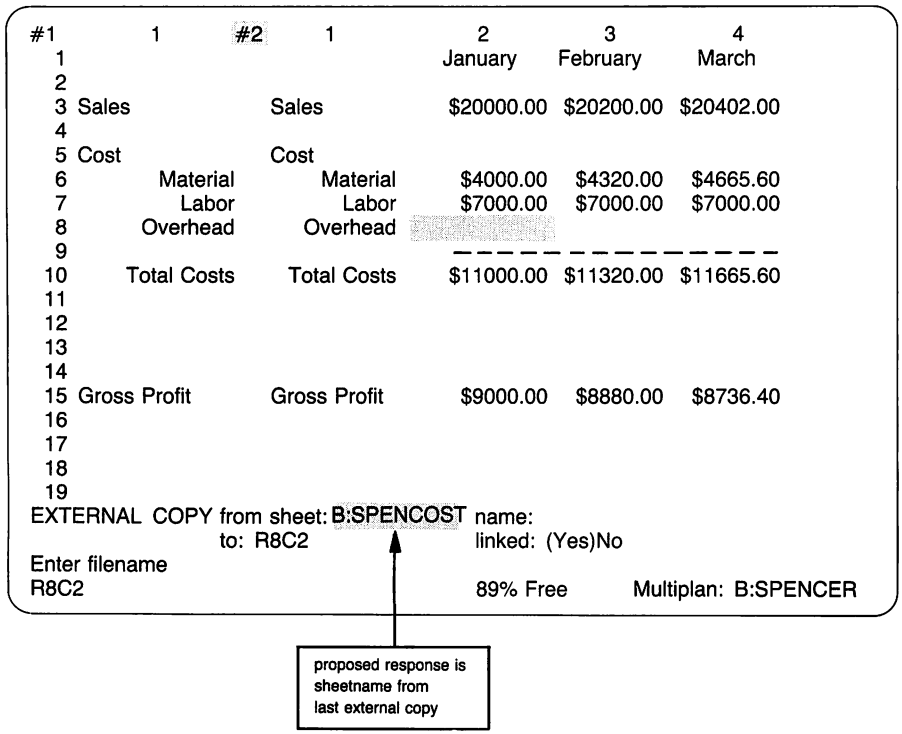
Now, let's copy information from SPENCOST for Overhead costs. Move the cell pointer to R8C2.

Remember: you must first blank out the cells that receive the values from another sheet. Press **B**, then : (colon). Type **13**. Press RETURN. You should see:



Screen 187

Now, press **X**, then **C**

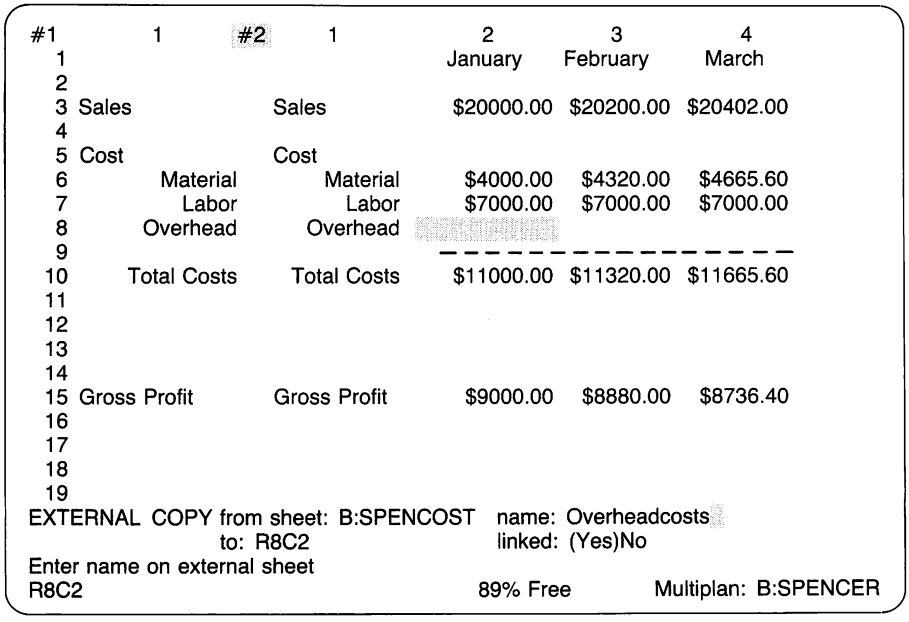


Screen 188

Notice that Multiplan-86 proposes the name of the last worksheet named, B:SPENCOST

So all you have to do now is TAB to the "name" field. Press TAB.

Type **Overheadcosts**



Screen 189

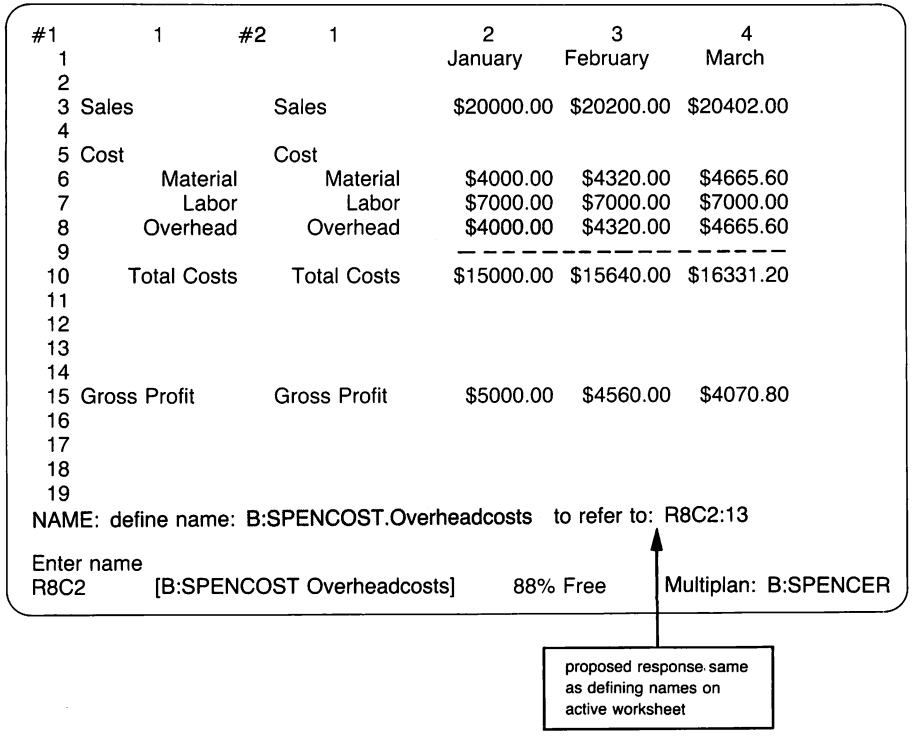
As before, the responses in the "to" and "linked" fields are correct.

Simply press RETURN, and watch the values appear in row 8.

```
#1        1        #2        1          2          3          4
  1                                    January    February   March
  2
  3 Sales            Sales              $20000.00  $20200.00  $20402.00
  4
  5 Cost             Cost
  6        Material          Material    $4000.00   $4320.00   $4665.60
  7          Labor             Labor     $7000.00   $7000.00   $7000.00
  8       Overhead          Overhead     $4000.00   $4320.00   $4665.60
  9                                      ---------- ---------- ----------
 10     Total Costs       Total Costs    $15000.00  $15640.00  $16331.20
 11
 12
 13
 14
 15 Gross Profit        Gross Profit      $5000.00   $4560.00   $4070.80
 16
 17
 18
 19
COMMAND: Alpha Blank Copy Delete Edit Format Goto Help Insert Lock Move
         Name Options Print Quit Sort Transfer Value Window Xternal
Select option or type command letter
R8C2     [B:SPENCOST Overheadcosts]  88% Free        Multiplan: B:SPENCER
```

Screen 190

Once again take advantage of the proposed responses for the Name command just after an eXternal Copy command. Press **N**.



Screen 191

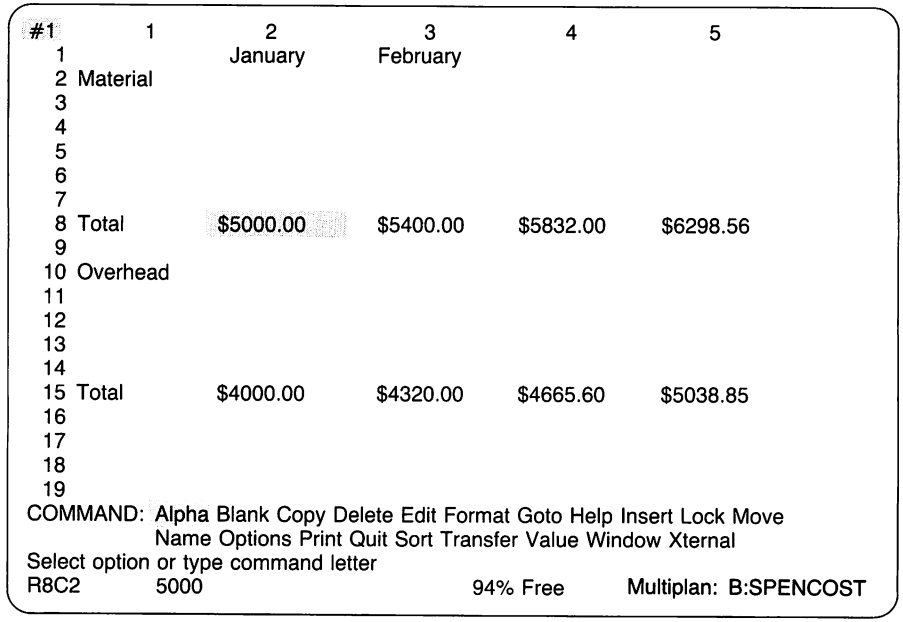
Press RETURN.

The relation between SPENCER and SPENCOST is not permanent until you save the active sheet (SPENCER). Multiplan-86 records the dependency—established with the eXternal Copy command—in both saved sheets. After you have saved SPENCER, SPENCER always depends on SPENCOST, and SPENCOST always supports SPENCER. If you don't save SPENCER now, you have to redo the eXternal Copy command when you next load SPENCER.

Revising a Supporting Sheet

Now, you might like to experiment with the SPENCOST supporting sheet to see how revisions on it affect the SPENCER summary sheet.

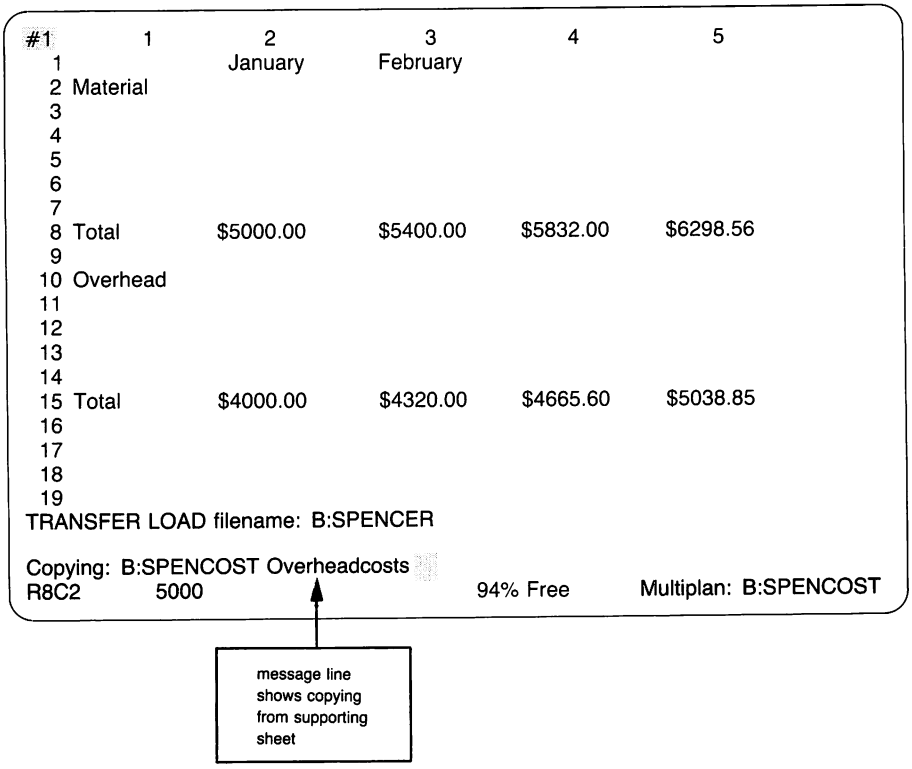
1. **T**ransfer **L**oad B:SPENCOST.
2. Move the cell pointer to R8C2.
3. Type **5000.**
4. Press RETURN; the values for the total of materials should change.



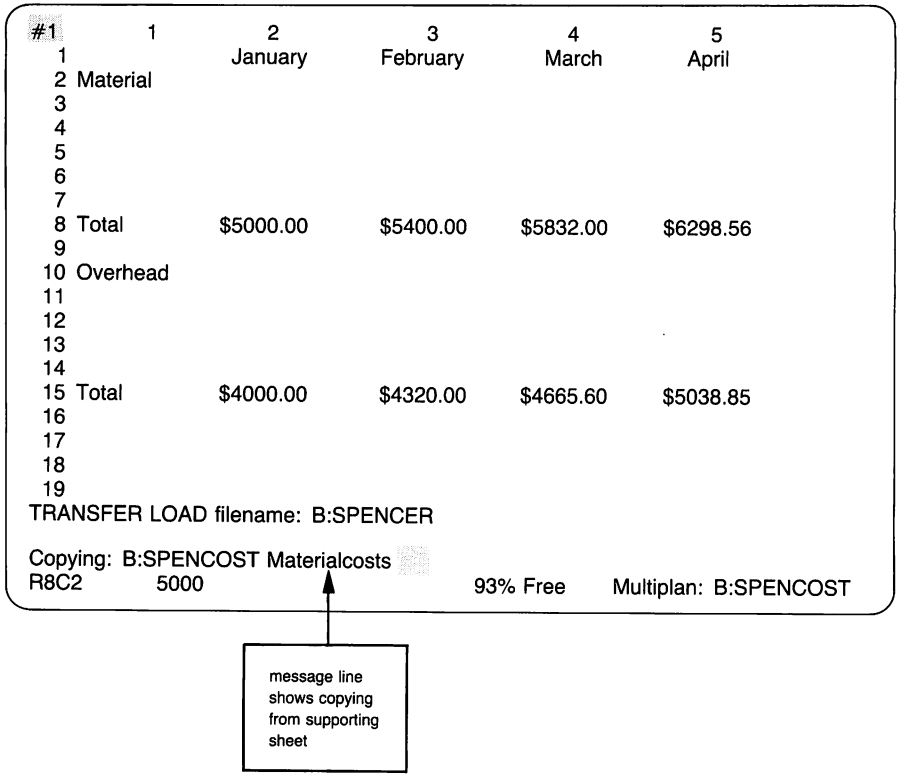
Screen 192

5. Now **T**ransfer **S**ave B:SPENCOST, pressing *Y* to confirm overwriting the old file.

6. **T**ransfer **L**oad B:SPENCER. As SPENCER loads, you see "Copying. . ." messages in the message line:



Screen 193



Screen 194

These messages tell you that Multiplan-86 is copying the information from the supporting sheets onto the dependent sheet. When the SPENCER worksheet is displayed, you see that "Material" shows $5000.00 for January, and the appropriate amounts for the other months.

If, when you use the eXternal Copy command, you responded "No" in the "linked" field, the SPENCER worksheet is not affected by the revisions to SPENCOST.

You will want to select "No" in the "linked" field whenever the data you copy will never change or, if it does change, you don't need the change reflected on the "dependent" worksheet. For example, suppose you want to set up SPENCOST with all the month titles across the top, not just January and February as it is now. SPENCER already has all the months entered. Instead of typing each

month title again, simply use the eXternal Copy command without linking (select "No" in the "linked" field). The steps would be:

Transfer **L**oad B:SPENCOST and **B**lank January and February (R1C2:3).

Press **X** then **C**. Type **B:SPENCER.** Press TAB. Type **R1C2:13** (the range of cells that contain the titles you want). Press TAB twice (assuming the cell pointer is at the first destination cell). Press **N** then RETURN.

The month titles appears across the top of the sheet.

Dissolving Connections between Worksheets

At some time you may want to dissolve the connections between worksheets. The process is very similar to building the connections. **T**ransfer **L**oad B:SPENCER.

Select the eXternal Copy command; press **X**, then **C**. The "from sheet" field should show the name of the worksheet last copied; in this case, B:SPENCOST.

```
#1          1        #2      1          2           3           4
 1                                   January    February      March
 2
 3 Sales                Sales        $20000.00  $20200.00  $20402.00
 4
 5 Cost                 Cost
 6          Material        Material  $4000.00   $4320.00   $4665.60
 7             Labor           Labor  $7000.00   $7000.00   $7000.00
 8          Overhead        Overhead  $4000.00   $4320.00   $4665.60
 9                                  ---------------------------------
10       Total Costs     Total Costs $15000.00  $15640.00  $16331.20
11
12
13
14
15 Gross Profit         Gross Profit  $5000.00   $4560.00   $4070.80
16
17
18
19
EXTERNAL COPY from sheet: B:SPENCOST    name:
                      to: R8C2          linked:(Yes)No
Enter filename
R8C2                                    88% Free    Multiplan: B:SPENCER
```

Screen 195

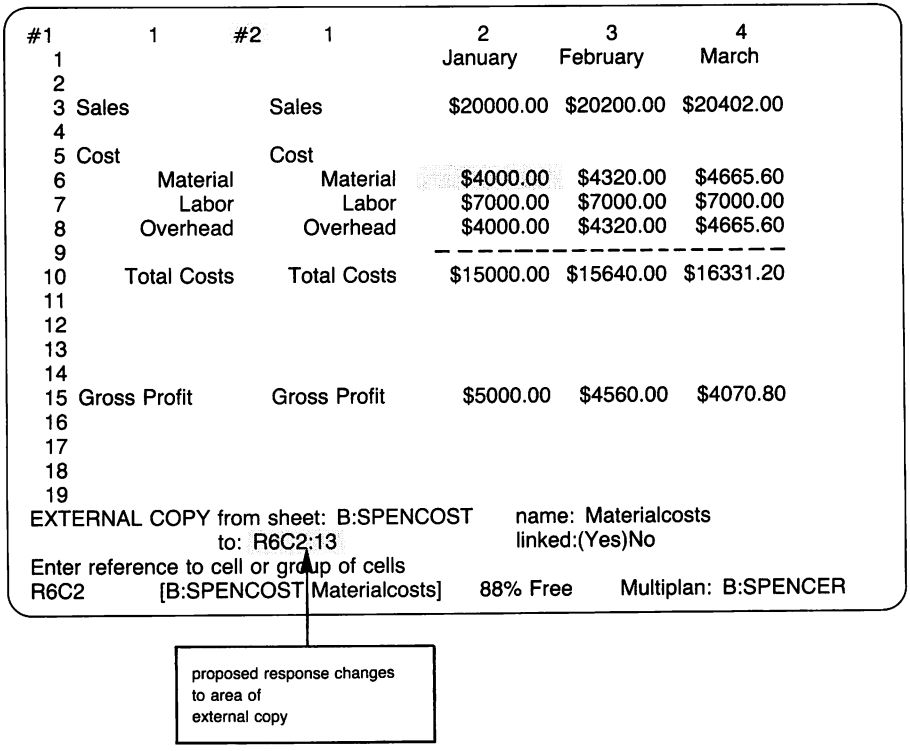
Press TAB to move to the "name" field.

Type the name of the group of cells you want to delete. Let's delete the connection with *Materialcosts*. Type **Materialcosts**.

```
#1        1        #2        1              2          3          4
  1                                         January    February   March
  2
  3 Sales                    Sales          $20000.00  $20200.00  $20402.00
  4
  5 Cost                     Cost
  6          Material                Material  $4000.00  $4320.00  $4665.60
  7            Labor                   Labor  $7000.00  $7000.00  $7000.00
  8         Overhead                Overhead  $4000.00  $4320.00  $4665.60
  9                                           ----------  ----------  ----------
 10       Total Costs             Total Costs  $15000.00  $15640.00  $16331.20
 11
 12
 13
 14
 15 Gross Profit            Gross Profit       $5000.00   $4560.00   $4070.80
 16
 17
 18
 19
EXTERNAL COPY from sheet: B:SPENCOST    name: Materialcosts
              to: R6C2                  linked:(Yes)No
Enter name on external sheet
R6C2        [B:SPENCOST Materialcosts]      88% Free     Multiplan: B:SPENCER
```

Screen 196

Press TAB to move to the "to" field. The entire proposed response is highlighted.



Screen 197

Press the DELETE key; the response disappears.

```
#1        1      #2      1              2          3          4
  1                                     January    February   March
  2
  3 Sales          Sales                $20000.00  $20200.00  $20402.00
  4
  5 Cost           Cost
  6       Material         Material      $4000.00   $4320.00   $4665.60
  7         Labor            Labor       $7000.00   $7000.00   $7000.00
  8      Overhead         Overhead       $4000.00   $4320.00   $4665.60
  9                                     ---------- ---------- ----------
 10    Total Costs      Total Costs      $15000.00  $15640.00  $16331.20
 11
 12
 13
 14
 15 Gross Profit       Gross Profit      $5000.00   $4560.00   $4070.80
 16
 17
 18
 19
EXTERNAL COPY from sheet: B:SPENCOST     name: Materialcosts
                    to:                  linked:(Yes)No
Enter reference to cell or group of cells
R6C2        [B:SPENCOST Materialcosts]   88% Free     Multiplan: B:SPENCER
```

definition of external copy deleted

Screen 198

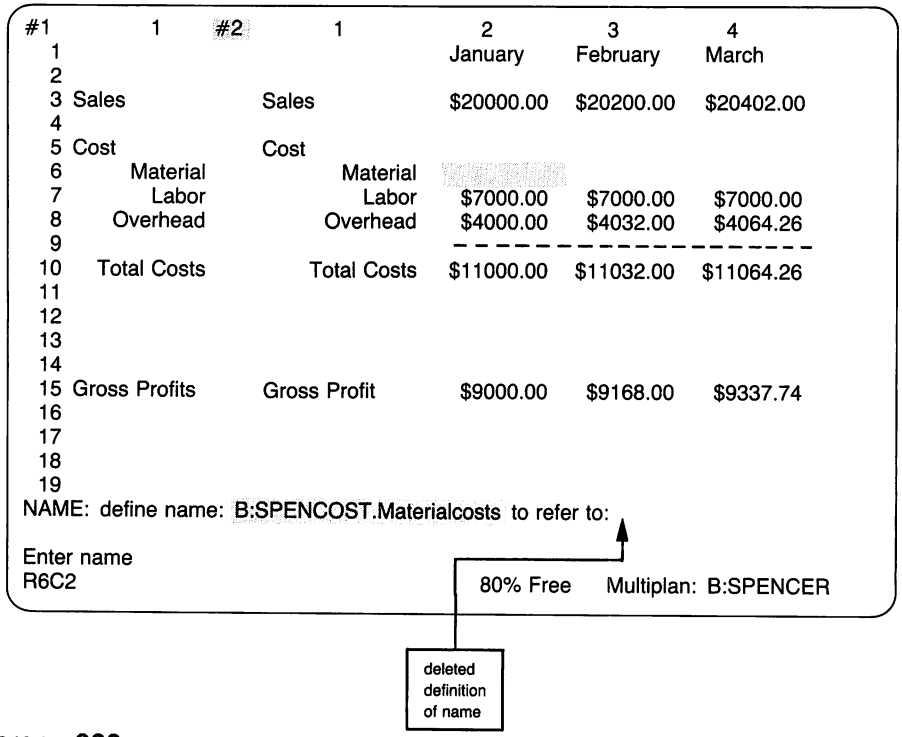
Now, press RETURN. The values in Row 6 disappear.

```
#1          1     #2          1          2          3          4
  1                                    January    February   March
  2
  3 Sales             Sales              $20000.00  $20200.00  $20402.00
  4
  5 Cost              Cost
  6       Material            Material
  7         Labor               Labor    $7000.00   $7000.00   $7000.00
  8      Overhead            Overhead    $4000.00   $4032.00   $4064.26
  9                                      ----------------------------
 10    Total Costs         Total Costs   $11000.00  $11032.00  $11064.26
 11
 12
 13
 14
 15 Gross Profits        Gross Profit     $9000.00   $9168.00   $9337.74
 16
 17
 18
 19
COMMAND: Alpha Blank Copy Delete Edit Format Goto Help Insert Lock Move
         Name Options Print Quit Sort Transfer Value Window Xternal
Select option or type command letter
R6C2                                        80% Free    Multiplan: B:SPENCER
```

Screen 199

The name you defined after using the eXternal Copy command to copy *Materialcosts* is still a defined name on the active worksheet. If you want to delete the definition, use the Name Command now.

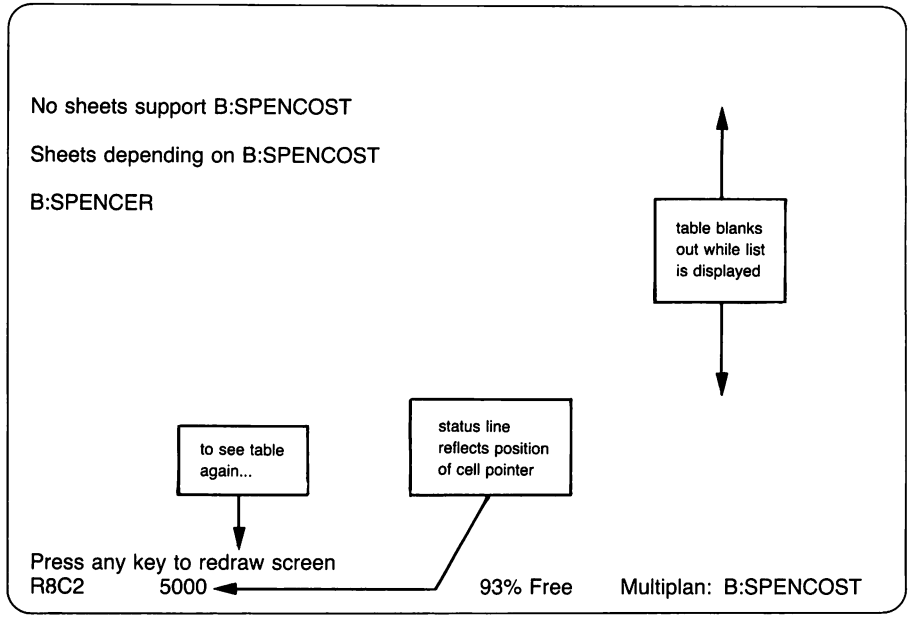
Press **N**.



Screen 200

Multiplan-86 proposes *SPENCOST.Materialcosts* as the name to be defined. Notice that the "to refer to" field is blank. All you have to do to delete the definition of *SPENCOST.Materialcosts* as a name is press RETURN.

The eXternal List Command . You can review the connections between worksheets by using the eXternal List command. Press **X**, then **L**.



Screen 201

The eXternal List command displays what Multiplan-86 knows about the relationship between the various sheets. The list of "sheets supporting" shows the names used in the present sheet that call for values from other, saved sheets. The list of "sheets depending on" shows the names of other, saved sheets that call for a value or values from the active sheet.

Notice that SPENCOST supports SPENCER, but not vice versa, because the copy of the month titles was not a permanent link.

Press any key to redraw the active sheet on the screen.

Once you have entered all of the detail information in new worksheets, named the cells you need, and saved the sheets, you can use the eXternal Copy command to copy information from as many of these related sheets as you need to supply information to the active (dependent) sheet.

Summary

In this session you learned:

- How worksheets interrelate.
- How worksheets provide data to and/or take data from other worksheets.
- How to clear the screen, using the Transfer Clear command.
- How to build supporting sheets.
- How to define names on supporting sheets.
- How to name sheets for easy reference.
- How to use the eXternal Copy command.
- How to revise supporting sheets.
- How to dissolve connections between worksheets.
- How to review the relationships between sheets, using the eXternal List command.

A Final Note . . .

The example of Spencer Ceramics is completed.

Other tasks and other problems to be solved require additional commands and functions. Multiplan-86 provides them.

Multiplan-86 is described in more depth in the *Multiplan-86 Reference Manual,* where you will find descriptions of additional commands that weren't used at all for the SPENCER worksheet.

- Delete
- Move
- Sort

There are additional options and uses for familiar commands like:

- Copy
- Format
- Goto
- Lock
- Options
- Print
- Transfer
- eXternal

Multiplan-86 provides mathematical, financial, and statistical functions for calculations and problem solving. So far you've only seen SUM.

In addition, in the *Multiplan-86 Reference Manual*, you will find descriptions of additional editing keys that make building a worksheet easier. And, you will find an alphabetical list of all the messages Multiplan-86 can display on the message line. Appendix B, " Helpful Hints" suggests ways to save time and space while using Multiplan-86.

Now that you've learned how to use Multiplan-86 in this volume, you can use the *Multiplan-86 Reference Manual* to explore the full potential of Multiplan-86.

Glossary

CANCEL key

A key combination (CTRL/C) that causes Multiplan-86 to abandon the current command and return to command choice.

Absolute reference

A reference to a cell that uses specific row and column numbers, for instance, R17C12. Opposed to relative reference, as RC. See also *Range* and *Reference.*

Action keys

Keys that cause Multiplan-86 to carry out an action at once. The action keys include the CANCEL key (CTRL/C), NEXT WINDOW key, and RETURN key. See also *Direction keys, Edit keys.*

Active

Something in use right now and immediately accessible, such as the active window, active cell, or active field of a command.

Active cell

The cell indicated by the cell pointer. The contents of the active cell can be seen on the status line and can be edited with the Edit command.

Active Window

The window containing the active cell, marked on the screen by a highlighted window number.

Alignment

The rule for the horizontal positioning of the display of a cell's value. Values can be left or right justified, or centered.

Cell

One position on the worksheet, a place where data or a formula can be stored. A cell has a location and can be referred to by one or more names. The contents of a cell determine its value; the cell's format determines how its value is displayed.

Cell Pointer

An illuminated pointer that selects one cell from all the cells in the worksheet. That cell becomes the active cell. The cell pointer is moved from cell to cell with the direction keys, or directly with the Goto command.

Character

A symbol that can be displayed on the screen, including letters, digits, punctuation, and special characters like $, +, and %.

Column

A vertical line of cells down the worksheet. There are 63 columns, designated by the numbers 1 through 63.

Command

An instruction to Multiplan-86 to do something.

Command line

The screen lines just under the worksheet area, beginning with the word COMMAND:, and showing the main command menu. This is where commands are built.

Contents (of a cell)

That which has been put into a cell. If nothing has been put in, the cell is empty, and its contents are blank. Otherwise, the cell contains either data (a string or a number) or a formula.

Cursor

See *Edit cursor.*

Dependent sheet

A sheet that uses values from another sheet. The dependent sheet depends on information calculated on another, saved, sheet to which it is linked by the eXternal Copy command. See also *Link.*

Direction keys

Keys that move the cell pointer. The UP, DOWN, LEFT, and RIGHT ARROW keys move the pointer one cell at a time. The HOME key (Ctrl/Q) moves it to the cell in the upper left corner of the active window.

Directory

The table of file names kept on each disk by the operating system. The directory lists each file and its location on the disk.

Edit

Altering a response in a field of command. The edit keys are used to move a cursor over the response, and the character keys are used to replace or insert characters.

Edit cursor

The highlighted part of a command on the command line, which can be as small as one character or as large as an entire field. The edit cursor is moved with edit keys. The edit cursor shows where alterations can be made to the command.

Edit keys

Keys that move the edit cursor within the command line. Includes WORD RIGHT (PF4), WORD LEFT (PF1), CHARACTER RIGHT (PF3), and CHARACTER LEFT keys (PF2).

Field

A portion of a command in which you type a response to instruct Multiplan-86 in some detail of the command's work. When Multiplan-86 first shows a field, it fills the field with a proposed response; you can replace or edit that response if it isn't what you want.

File

A named unit of data stored on disk or diskette. When a worksheet is saved, it is written into a file. Not all files represent saved worksheets, but those that are saved can be loaded or linked to other worksheets.

File name

The name by which the system knows a file. The file name must be given when a worksheet is saved, loaded, or linked to another sheet.

Format

Rules for the display of a cell's value. The format controls numeric punctuation and the alignment of the displayed value. A format can be specified for a cell or cells with the Format Cell command; cells without a specific format are displayed according to a default format set with the Format Default command.

Formula

A recipe for how a value is to be calculated from data and functions. Whenever the contents of a cell are changed, Multiplan-86 recalculates all the formulas on the worksheet (unless automatic recalculation is turned off).

Function

An operation combining one or more values according to some rule to produce a result, for example, SUM.

Link

The use of data from an inactive sheet in calculations on the active sheet. The inactive sheet is called the supporting sheet. The data to be copied must have been marked with the Name command. Then data from the supporting sheet can be used in formulas on the active sheet.

Load

To make a saved sheet active again. The sheet to be loaded must have been saved. The Transfer Load command is used to copy the saved sheet from its file to working storage, where it becomes the active sheet.

Menu

A list of alternatives. A choice from a menu is indicated in one of two ways: by moving a highlight through the list with the space bar and selecting the highlighted choice with the RETURN key, or by typing the initial letter of the chosen item. The only keys to which Multiplan-86 responds are action keys and the initial letters of appropriate commands.

Message

A notice posted by Multiplan-86 on the message line to explain a problem or suggest what kind of input the system is waiting for.

Message line

The next to the last line on the display.

Name (of a cell or group)

A label or tag, associated with a cell or area of cells by the Name command. Once a cell or area has been named, the name can be used to refer to the cell or cells in formulas. Names can be up to 31 characters long. A name can not contain blanks or special characters. If a title with blanks or special characters is proposed as a name, Multiplan-86 replaces the blanks with underlines and deletes the special characters before displaying the title as a proposed response.

Proposed response

Response supplied by Multiplan-86. It is usually based on the most recent responses by the user or on the current status of Multiplan-86.

Range

The smallest rectangular area of cells containing two references. A range is designated by the colon (:). The range R3:R8 defines the rectangular area containing all of rows 3 and 8, namely rows 3, 4, 5, 6, 7, and 8. See also *Reference.*

Reference

The designation of a cell or an area of cells. The simplest reference is to a single cell: R9C2. A reference can be relative to the cell containing the reference, as in RC. A reference can be to a single cell, as above, or to an area of cells: R6 refers to all of row 6. A reference can be composed of intersections of references, ranges of references, or unions of references. See also *Range.*

Relative reference

A reference to a cell relative to the cell containing the reference, as RC meaning "the row above, in this column." Opposed to absolute reference, in which the actual column and row numbers are stated. See also *Range* and *Reference.*

Response

What the user types in a field of command. It can be a row or column number, a count, a name, or the contents to be put in a cell. When Multiplan-86 displays a command on the command line, it usually supplies a proposed response in every field of the command; the user can replace the proposed response or edit it.

Row

A horizontal line of cells across the worksheet. There are 255 possible rows, designated by the numbers 1 through 255.

Save

The operation of making a permanent copy of the active worksheet. The copy is placed in a file on disk.

Scroll

To move the display of the worksheet across the screen one row or column at a time. Scrolling is done with the direction keys. For example, if the RIGHT DIRECTION key is pressed until the cell pointer reaches the right edge of the screen, and then pressed again, Multiplan-86 scrolls the worksheet display one column to the left.

Status line

Bottom line of the screen, where Multiplan-86 presents status information such as the location of the active cell and its contents.

Supporting sheet

A sheet providing values to another sheet. The sheet supports the other sheet (the dependent sheet) with data that has been designated with the eXternal Copy command. Data on the supporting sheet must have been named with the Name command. See also *Link.*

Value

The information content of a cell: its numeric value if it contains a number; its text if it contains text; or, if it contains a formula, the result of calculating that formula.

Window

A rectangular portion of the display area within which Multiplan-86 displays a part of the worksheet. As many as eight windows can be open at once; they are opened or closed with the Window command. Each window has a window number from 1 through 8 shown in its upper left corner. The window number of the active window is highlighted; that window contains the cell pointer and the active cell.

Worksheet

The simulated worksheet that Multiplan-86 presents to its user: an array of cells, each of which can contain a value.

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