

*SuperCalc*TM

SuperCalc™

User's Guide & Reference Manual

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PART I: INTRODUCTION

What is SuperCalc?

The SuperCalc™ program is designed for CP/M®-based microcomputers. The program is structured to be used as a tool for solving everyday financial or business problems for all types of businesses. The program is intended to help organize practical problems because the designers of the SuperCalc program realize the importance of seeing the problem stated clearly before you can find realistic solutions. For this purpose, the architects of the SuperCalc program paid special attention to the clarity, simplicity and "common sense" approach of the messages on the screen and instructions in this guide.

In other words, the SuperCalc program is designed to act as a simple means to tap the power of the computer and to make it do the time-consuming things you used to do with paper, pencils and a calculator. Words and numbers are displayed in a worksheet format. The status information and prompt messages on the screen assist you in setting up your worksheet by step-by-step keystrokes. The screen on your computer terminal acts as a window representing a part of the worksheet. You can manipulate the content of the entire worksheet by pressing a few characters on the keyboard. The SuperCalc program lets you specify which data are to be displayed where and in what format (e.g., integers, dollars and cents,

scientific notations, etc.). To guide you, various "help" messages are available at all times while you are working on the program. Just use the Answer Key™ feature when you need additional information on the operation of the program.

The SuperCalc program is an indispensable tool for exploring possibilities and comparing alternatives in everyday decision-making processes. Data can be changed easily and numbers recalculated quickly. The program efficiently and accurately displays information, thus aiding you in developing complete and consistent reports. Once worksheets are generated, they can be stored on disks to access, edit and print later.

The SuperCalc program runs on microcomputers that use the CP/M disk operating system, available on a wide variety of terminals. The installation procedure for operating the system, along with a list of terminals the program currently supports may be included with this guide. If your system requires an installation procedure, an installation booklet is enclosed describing the steps you must take to customize the SuperCalc program to your particular terminal. If you are just becoming familiar with your operating system, be certain to read this booklet prior to using the SuperCalc program.

Getting the Most Out Of This Guide

Like the SuperCalc program itself, this guide is intended to be a useful tool for people of different backgrounds, interests and knowledge. Whatever your previous experience with computers, this guide will help you use the program effectively and effortlessly.

Part Two, "Getting Acquainted," is primarily a tutorial or series of lessons that lets you familiarize yourself with the SuperCalc program at a comfortable pace. These lessons will guide you through the basic commands of the SuperCalc program. The tutorial includes short hands-on examples for you to do on your computer system. The final three chapters of this section use realistic managerial, accounting and scientific applications to pull together what you have learned.

The tutorial section contains material suitable for people with very different levels of experience, so we recommend that you read the first short chapter, **Learning Tips**, before starting the lessons. The chapter, **An Introduction to Concepts**, provides an overview of the SuperCalc program that can help you understand how the various parts relate to each other. The "pre-lesson" called **Getting Started** will probably be most useful to you if you are new to computers.

Part Three, "SuperCalc Reference," includes both a brief summary reference (which is the first place to look if you need to check on something) and a detailed reference chapter that expands on some of the basics covered in the summary. The SuperCalc program is a simple, straight-forward and efficient program to use. The general and detailed reference sections are for the novice as well as the expert who needs to check the characteristics of a particular command or sequence of commands.

Words that may be unfamiliar to you or that have some special meaning in relation to the SuperCalc program are explained when they are first used. If you come across the word again later and are not sure you understand it, check the glossary.

The guide has five appendices. The first two, **Standard or Default Settings and Commands Involving Formula Adjustment**, list that information in one convenient place. The third and fourth appendices, **Memory Use-Hints and Concepts and Suggestions**, will probably be most useful to you after you have more experience using SuperCalc. The fifth appendix discusses the proper care of the floppy disks.

PART II: GETTING ACQUAINTED

Learning Tips

Section Overview

This tutorial section will help you quickly teach yourself to use the SuperCalc program. The section has four chapters in addition to this one. The next chapter, *An Introduction to Concepts*, is optional, but we strongly recommend that you read it. It introduces some key SuperCalc terms and gives you an overview that can make learning the parts easier. Chapter 5, *Getting Started*, is a kind of pre-lesson. It is divided into two parts—one for those who are familiar with operating their computer systems and another with additional information for less experienced users.

The nine lessons in Chapter 6, with examples in Chapter 7, are the core of this section. The lessons have been carefully designed as a kind of “dialogue”—a friendly, three-way meeting between you, your guide, and your SuperCalc program. Remember that these lessons make most sense in a hands-on situation. If you try simply to read through the lessons, your understanding of the SuperCalc program will remain fuzzy and incomplete. It would be like taking a trip through Europe by a reading a map.

Learning the SuperCalc Program

The best way to learn to use the SuperCalc program is to review Chapter 4 and the relevant material in Chapter 5. Then sit down at your computer terminal with this guide; follow the *Getting Started* instructions for bringing up the SuperCalc program, and begin the lessons. You will learn by doing.

We show you how to do something. You try it and see what happens. If necessary, we give some further explanation and perhaps another “mini-example” to

try. The SuperCalc program makes it easy to recover from a wrong move. You can't hurt the program, and making a mistake will never jeopardize your work.

Set Your Own Pace

Lessons are designed to let you learn at your own pace. Most contain optional mini-examples and extra information that let you develop confidence and deepen your understanding. If you are experienced with computers, you may find that you can skip these. If computers are new to you, we suggest that you do them all. The experience will be valuable when you develop your own “real-world” worksheets.

Self-Contained Building Blocks

Lessons are self-contained. At the end of each one, you choose whether to go right on to the next lesson or to stop for a while. They are reasonably short, and you should feel free to start up the SuperCalc program and learn a little more whenever it is convenient.

The lessons build on one another, combining what you have learned with new material in an easy, step-by-step way. In the first lessons, you get some basic tools. You learn how to move about on your worksheet and how to enter or change various kinds of information. Very soon you will be developing material to be saved and used again in later lessons. (For your protection, *always* save material when the guide asks you to do so—even if you plan to go immediately to the next lesson. It's good insurance against unexpected power failures or other interruptions.)

They display status, prompt, and entry information. As you progress through the lessons, you will learn more about these lines and their contents. For now, a few simple concepts will suffice. The SuperCalc program uses both the status and prompt lines to give you information. In general, the first of the three lines gives you a "status" report with information about such things as the Active Cell and its contents. The second line "prompts" you, asking what you want done next, as well as listing your immediate options. The bottom line on the screen is the entry line. This is where you tell the SuperCalc program what to do by entering commands or data.

Help Available

If you are ever confused, puzzled, or unsure about what to do next, just press the "?" key to ask for help. You can do this at any point—even in the midst of entering some command. The display on the screen will immediately change to show additional information about your choices. You can bring back the regular worksheet display by pressing any other key.

Interpretive Prompting

Interpretive prompting means that you only need to give the first character of a command on the entry line, and the SuperCalc program will immediately fill in the rest of the word. The program will also use the prompt line to indicate what you should do next. The "/" symbol precedes most commands. If you press "/", the character appears on the entry line and the prompt line will change to show you a list of possible single-letter commands. Suppose you then press B. You have put /B on the entry line. The SuperCalc program fills out the rest of the command. /B becomes /Blank. In this example, the prompt line will change again to ask you to specify what should be "blanked."

Modifying Your Commands and Data

The SuperCalc program makes it easy for you to *edit* information on the entry line. If you make a mistake

while entering a command or data, you can quickly rectify your mistake by adding or deleting characters without affecting the correct portion of your entry. You will learn to use the same editing techniques to modify the contents of a cell.

Protecting Your Work

The SuperCalc program provides several "insurance policies" to safeguard against accidentally destroying work that should be preserved. You can *protect* individual cells or groups of cells in the worksheet so that their contents and *format* will not be changed unless you specifically *unprotect* them. Similarly, the SuperCalc program will check with you before executing commands that have major consequences for your work; for example, clearing the entire worksheet or exiting from the SuperCalc program before saving your new or modified worksheet.

Cells—Their Format, Contents, and Value

When you first start the SuperCalc program, cells are only potential locations on your worksheet and take no space in your computer's memory. You bring a cell into existence by "using" it in some way, by putting something into it or by *formatting* it, that is, preparing it to express an entry in a particular manner: as an equation, text, or numeric value.

Cell Format

When you *format* a cell, you tell the SuperCalc program how you want the content to look on your screen. This display format may differ from the way the cell contents looked when you entered them. For example, you might want a numeric value to display in ordinary notation (1776), with or without a decimal; or in scientific notation (1.776×10^3). You could enter your data in whichever format was convenient, and the SuperCalc program would convert the data into the display format that you had specified. Similarly, you could change any of a cell's format attributes without affecting the actual contents. You can specify formats for individual cells or groups of cells, for rows, for columns, or for the entire worksheet.

Cell Contents

A cell can hold text, a number, or a formula. *Text* is useful for things like column headings, descriptions, or notes. (Example: January, Discount Sales.) It can be up to 116 characters long. *Numbers* can have up to 16 digits of precision in either ordinary or scientific (exponential) notation. Using scientific notation, you can raise these 16 digits by a power of ten, up to 10^{99} , either positive or negative. *Formulas* allow calculations based on values stored in other cells. (Examples: $A5+10$, $SUM(B1:B9)$, $E7/9-BK2$.) The SuperCalc program has many special functions for use in formulas. You can use formulas to compare values in cells or groups of cells and then perform one calculation or another, depending on the result of the comparison.

If you put a formula into a cell, the SuperCalc program also puts into the cell the value that results from calculating that formula. You can display either the original formula or its current value. When a cell's value changes, the program will recalculate formulas referring to that cell.

Cell Value

Many SuperCalc operations use the numeric value of cells—for example, adding an entire column. The

value of a cell containing a number is the value of that number. The value of a cell with a formula is the value obtained by calculating the formula. Cells that have text or that are empty or blank are considered to have a value of zero.

Display Width

The display width formatting attribute defines the width of the column you see displayed and is independent of the "width" of the data in the cell. For example, you might have a 12-digit number in a cell. The program will show you what it can of the number. With a display width of 12 or more, you could see the entire number. With a display width of 9, you could see 9 digits, and so forth. Whatever the display width, the SuperCalc program will consider all 12 digits in calculations. You can set display widths from 0–127 characters. Different columns can have different widths. When SuperCalc starts up, columns are set at a standard or *default* width of nine characters. The status line shows you the display width of the column containing the active cell.

This has been a very brief overview of *some* of the essential features of the SuperCalc program. The lessons in the following chapters will let you expand this basic knowledge by exploring these and other SuperCalc features in detail, step by step.

program on your system. In order to help you with that task, which is quite easy, this section also gives you some information about CP/M systems in general.

This additional information is given only as a convenience. This section does not replace the manuals that came with your computer system. It is meant only to give you some essential information and to guide you in what topics to look up in your systems manual. The topics we will cover are:

1. Powering up your system.
2. Inserting your system disk.
3. Booting (loading) your system.
4. Determining whether or not the SuperCalc program is on the system disk.
 - a. If so, how to start up the SuperCalc program.
 - b. If not, how to place it on another drive, make that drive the system drive, and start the SuperCalc program up on that drive. (The SuperCalc program must be on the system drive.)
5. Removing the disk(s) when you have finished.
6. Shutting down your system.
7. Making your own checklist and labels.

After you have gone through the start-up procedure once, you may find it helpful to make some "mini-documentation" of your own. It doesn't have to be anything fancy, just some simple labels and checklists to remind you of the key points.

Here are examples of the kind of things that can be especially useful during the first few times that you use a system—or when you come back to the system after being away for some time.

- a. *Start-up Checklist* Your computer system's documentation should include start-up procedures that are more specific than the ones in this guide. If it does not—or if they are not clear and concise—make yourself a checklist and post it near your system. (If the system manual does have something like that, make a copy of it and post it.)
- b. *Which Drive is Which* If your disk drives are not labeled (A, B, etc.), put labels on them.
- c. *How to Insert a Disk* You may also find it helpful to put labels on your drives that indicate which way the disk should face when you insert

it. For example, "DISK LABEL UP" or "DISK LABEL LEFT."

Before starting this practice session, get your system manuals out and have them handy. You should at least have the manual for your CP/M operating system and a manual that shows you how to power up and boot (load) your system from a system disk. You will also need a pencil, note pad, and perhaps some labels.

It will be helpful if someone who is experienced with your system can guide you through the start-up procedure the first time, but it is not necessary.

1. Powering up your system

For this step, you must consult your hardware manual, because different computer systems have different requirements. The procedure is usually very simple. It may be a matter of being sure the system is plugged in and then turning a key or pressing a switch. Or you may have to turn on more than one piece of equipment.

2. Inserting your system disk

A "system disk" is one that has the CP/M operating system on it, including a portion called the "boot track" which allows it to start itself. The disk should be clearly labeled, but if you are not sure that a disk has the CP/M system, go ahead and try it. You won't hurt the disk or the system.

Your system's disk drive has slots (probably two or more) where you can insert disks. The slots may be vertical or horizontal, and they may have small doors. (Some drives without doors may have a slotted piece of rubber over the drive opening.)

The disk drive must be running before you insert the disk. Open the door, if there is one, to the slot for drive A. Drive A is usually the "system drive." If you do not know which drive is drive A, check the documentation that came with your disk drives. Your documentation may call this "Drive zero"; that will be "Drive A" to CP/M. (If you cannot locate your documentation, step 3 below suggests a way to determine which is the system drive.)

When you insert the disk in the slot, the label on the disk must face a certain way. If you put the disk in wrong, you won't hurt anything. You can take it out, reverse it and put it back in.) Here is how to tell which way the disk label goes: Look inside the slot, and see a small cone where the center hole of the disk

will be when you slide the disk inside. The label should face away from the cone.

Slide the disk in. You will hear a change in the sound of the drive, and feel the disk seated in place. You may have to press it into place, but no force is needed. If it does not go all the way in, do not force it. Get assistance.

When the disk is in place, slide the door closed if there is a door.

3. Booting (Loading) Your System

This step gives the CP/M operating system control of your computer. It is necessary to do this before you can bring in the SuperCalc program.

Here again you will have to consult your manual. Some computer systems have a button or a switch to press; some may require you to perform a different sequence of actions. It may even happen that when you have put the system disk in the proper drive, your system will load itself automatically.

For the moment, let's assume that you have a switch or button to press. Do that, and watch the drives. Usually, there is a small light over each drive; when the system attempts to access a disk in a drive, the light for that drive will light.

When you press the button or switch, the light goes on for the drive known as "the system drive". If your CP/M disk is not in that drive, remove it, and put it in the drive which lit. (Most drives have a button that you push to remove the disk. If there is a door, it will slide open, and the disk will move a little distance out, so that you can easily pull it the rest of the way.) Then, insert the disk in the correct drive and proceed. Inserting the disk may be enough; if not, re-boot.

When the CP/M system is loaded, it will write some text on your terminal screen and will also write a "prompt", such as A>.

This prompt means that the system is ready to accept your commands.

4. Determining if the SuperCalc program is on the system disk

The CP/M operating system has a command called "Directory" that will show you a directory of the contents of the disk. Your CP/M manual will give you information on the DIR command.

All you have to do is type DIR and press CR. On your screen you should see a list of the items on your system disk. (If not, check further in the manual, or get assistance.)

When you have the directory, look for an entry of SC followed by COM. If you see it, go to step 4a; if not, go to 4b.

4a. Starting the SuperCalc program from the system disk.

This is easy. Type SC and press CR. The program will be loaded in and will begin running. It will display a page of information, and give you the choice of pressing "?" to see a help display or pressing CR to go to your worksheet.

Press ?.

After you have looked at the help display, press CR.

Now you can go directly to lesson 1 and begin learning to use the SuperCalc program. If you do so, come back to step 5 of this chapter when you finish your lesson work for this session

If you do not want to begin the lessons right now, here is how to get back to the CP/M operating system:

- a. Press I
- b. Press Q
- c. Press Y

4b. Starting the SuperCalc program from another disk

The first step is to locate the disk with the SuperCalc program on it. It may be nearby and labelled as such. If you cannot find it, get assistance.

Note: If you have only the original SuperCalc disk, be sure that there is a back-up copy before you use it. It is better to reserve the original disk as back-up and run from a copy.

Insert the disk in drive B and close the door. Let's check the directory for drive B. Type DIR B: and press CR.

Look for SC with an extension of COM. If you find it, good; if not, remove the disk and try another.

At this point we will assume that you have a usable copy of the SuperCalc program on a disk. (Not the original.) Insert it in another drive. For now, let's

assume that you have one other drive, drive B. You may have drives C and D or even more. If so, you may use anyone of them. Just change the designation in our example (B) to the one you actually use (say, C).

The SuperCalc program must be "executed" or "run" on the system drive. So when you have the SuperCalc disk in drive B, you must make drive B the system drive. This is easy to do: Type **B:** and press **CR**.

The CP/M prompt on your screen will change from A to B, indicating that the B drive is now the system drive.

Now you can load the SuperCalc program and start running it.

To do so, type **SC** and press **CR**.

The program will display a page of information on your screen and give you the choice of pressing either the ? key, to see a help display, or CR, to go to the SuperCalc worksheet display. Press ?.

When you have examined the information, Press **CR**.

Now you can go directly to lesson 1 and begin learning to use the SuperCalc program. If you do so, come back to step 5 of this chapter when you have finished your lesson work for this session.

If you do not want to start the lessons now, you can get back to the CP/M operating system by typing:

- a. /
- b. Q
- c. Y

5. Removing the disk(s) when you have finished

You must take all disks out of the disk drive before shutting off its power.

On most drives there is a button near the slot. Push it, and you will hear a change in the sound of the drive and see the disk move partly out. Pull it gently all the way out and put it in its protective jacket. Do this with all disks in the drives before shutting down the system.

6. Shutting down your system

Here again you will have to consult your system

manual. This may be a simple matter of turning off a key or pressing one switch, or you may have to turn off several items of equipment. It is a good idea to make a note for yourself of the appropriate steps for your system.

System Concepts

Here are a few CP/M operating system concepts that are especially relevant to the SuperCalc program. The information given here is basic and is meant only to suggest further study in your system documentation. These particular concepts have been selected for mention because they affect the following operations:

- loading and executing the SuperCalc program
- using the SuperCalc *save* and *load* commands to save and reload worksheets
- using the SuperCalc *output* command to save report text on a disk file and to print that text later
- using CP/M commands to look at file directories, to erase files, to rename files, and to copy files.

Some Useful CP/M Commands

CP/M commands can be directly executed from your terminal only when the CP/M system is in control. You cannot use them while you are running the SuperCalc program. Here is a list of CP/M commands that will be useful in conjunction with your use of the SuperCalc program and your SuperCalc worksheets. The commands are explained in your CP/M manual.

- DIR** - Displays a directory of the files on a disk.
- REN** - Renames disk files.
- PIP** - Copies disk files to another disk; also prints disk "text" files (see the /PRN file name extension information below). When copying SuperCalc ".cal" files, always include the square bracket 0] parameter (refer to CP/M documentation).
- ERA** - Erases disk files.
- STAT** - In addition to displaying useful information about disks, this can be used to set "read only" (write-protected) status for disk files and for entire disks. (This is different from physical write-protection for an entire disk.)

Drive Designation

Files are assumed to be on the disk in your system drive unless you specify otherwise. This means that you can refer by name alone to any file located on that disk. For example, LESSON5.CAL. References to files on other drives must include a drive designation, which consists of the drive's identifying letter and a colon; for example, B: LESSON5.CAL.

CP/M File Name and File Name Extensions

Files on a disk have individual names, which are kept in a directory on the disk. Each name on a disk must be unique. (Of course, different disks may have files of the same name.)

Valid CP/M file names must start with an alphabetic character. They may be from one to eight characters long. The name may not contain blank spaces or any of these characters:

< > . , : = ; *]

File Name Extensions

File names usually have a three-character extension, such as SC.COM or REPORT.PRN. The File name and extension are separated by a "." as shown.

Some extensions have a significance for the CP/M system. One has a significance to the SuperCalc program. Three of the possible extensions are discussed briefly here:

1. **COM** (as in **SC.COM**). The COM extension tells CP/M that the file can be "loaded" and "executed" by typing its name at the console (the terminal). For example, we load and execute (start up) the SuperCalc program by typing SC(CR).
2. **CAL** (as in **LESSON3.CAL**). This extension has a special meaning to the SuperCalc program. When you save a worksheet (using the SuperCalc *save* command), you provide a file name with or without an extension. If you do not specify an extension, the SuperCalc program automatically gives the file the .CAL extension. Similarly, when you load a worksheet (using the SuperCalc *load* command), the .CAL extension is assumed unless you provide an extension.

When you look at a disk directory, the .CAL extension is a quick way to locate the SuperCalc worksheets.

3. **PRN** (as in **REPORT.PRN**). This has a special meaning to the CP/M system and is used for disk files that can be printed by certain system utility programs (for example, the CP/M command PIP). Such files are set up in what is called "print image," meaning that the contents of the disk file can be printed as a text or as text-control characters. (A character that will control underlining is an example of a text-control character.)

The SuperCalc command, *output*, allows you to print or display a worksheet and also allows you to save it as a print-image file for later printing. When you specify a disk file name for *output*, the SuperCalc program automatically supplies .PRN unless you add an extension of your own.

Write-Protecting a Disk

An entire disk can be physically write-protected. When it is protected, no one can write on it or erase it. The CP/M system detects this protection and gives you a suitable message if you try to write or erase information on that disk.

The method of physical write-protection varies, depending on whether your disks are 8-inch or 5¼-inch disks.

8-inch disks are protected *unless* a notch in the casing is covered. The covering is usually a silver reflective label, which is folded over the notch. Placing the silver label on the disk is sometimes called "write-enabling" the disk.

With 5¼-inch disks the situation is *reversed*. A silver label is put on them to *protect* them.

Your system disk drive documentation will explain in detail how to write-protect or write-enable a disk.

Write-Protecting a File

The CP/M system allows you to "write-protect" individual files by name on a disk (see CP/M STAT command). When you do this, the file cannot be written over or erased. If you try to write over or erase a protected file, the CP/M system will give an error message. Consult your CP/M manual on the STAT command for information on how to write-protect a file.

NOTES

Chapter 6

THE LESSONS, 1 to 9

The following twelve lessons are provided to teach you the basic skills needed to use the SuperCalc program. Each lesson walks you through key features of SuperCalc building your knowledge of the program. The individual lessons are designed to augment the reference section.

Sit down at your terminal, place your disk in the system and let's learn about this powerful tool: SuperCalc.

LESSON 1: Moving the Active Cell Around the Worksheet

Imagine that you are examining a map through a magnifying glass. When you use the SuperCalc program, think of the video screen or "display window" as your magnifying glass; through it, you can view any area of your map or SuperCalc worksheet. In this lesson you will learn how to move your magnifying glass across the surface of the worksheet. You will make the display window move or "scroll" to show you different parts of your worksheet.

In the same way that you use latitude and longitude measurements to designate a unique location on a map, you will learn to locate and enter data on the SuperCalc worksheet in positions specified with reference to alphabetically designated columns and numerically designated rows. A unique letter and number combination names every location on your

worksheet. In this lesson, you will also learn how to point to, or specify, a unique address on the display area of your worksheet by using a pointer or cursor.

This lesson assumes that you know how to load the SuperCalc program from your diskette. If you do not, you should read **Getting Started**.

Bring up the SuperCalc program if you have not done so already as part of your work in **Getting Started**. (Remember that the drive it is on must be the system drive.)

With the SuperCalc program now running you should see its title page on your screen, including the SORCIM copyright and address.

SuperCalc™
Version 1.00
Terminal: Myterminal xx
CPU: 8080
S/N-000101 ,Sys 2.x

Copyright 1981
SORCIM CORP.
Santa Clara, CA

Enter "?" for HELP or "return" to start.

At the bottom of the screen is a line that reads:
Enter "?" for HELP or "return" to start.

Press the **return** key. From now on we'll call it "CR" for carriage return.

Note: Alternatively, or if your keyboard is not equipped with the arrow keys, you can

	A	B	C	D	E	F	G	H
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
>A1								
Width: 9	Memory:33	Last Cell:A1	? for HELP					
1 >								

Let's examine the screen. You will note that columns A through H, and rows 1 through 20 are represented. You will see that the coordinate A1 is highlighted. On most terminals, you will see a bright underscore at that position. (Some terminals may have "reverse video," which means you will see a bright bar there. Or perhaps your terminal uses < > as an indicator.) This is the "worksheet cursor" and designates the Active Cell. The active cell is the location or destination of any data that we enter.

Any coordinate—for instance, A1, B3, B6, or G19—is called a "cell" because it represents a unique position on our "worksheet". The worksheet cursor can be positioned to any cell on the screen. This is accomplished by pressing any of the arrow keys at the right side of your keyboard.

use the **d, s, e, x** keys along with the **Control** key (CNTRL) to move right (d), left (s), up (e), or down (x). When one of these keys is pressed simultaneously with the control key, it will function like its corresponding arrow key. For convenience, we will refer only to arrow keys in the manual.

Let's press the **right arrow**. The worksheet cursor should have moved one cell to the right, to B1. Again press the same key, to move to C1. Try the down direction. Experiment, using these four keys to move the Active Cell indicator around to different locations on the worksheet display.

Scrolling

What happens if you try to go above Row 1 or to the left of Column A? Nothing. You have reached the worksheet margin in these directions. But what about moving to the right or down? Try it, if you haven't already. You will quickly discover that when you move as if to go off the screen to the right or downwards, the columns or rows appear to renumber themselves. Actually those cells that were "off-screen", beyond the range of your display window, are brought into view, a column or row at a time.

Move one column to the right beyond the edge of the screen. You see that the columns change from A through H, to B through I. At any given moment you will be looking at only a portion of the potentially usable worksheet. This is what we mean by the "display window". As we move this window either horizontally or vertically, we are "scrolling" the display.

Try moving off the screen to the right, but this time

continue to hold the key down instead of just striking it once. If your keyboard is so equipped, you will see the screen continue to scroll until you stop pressing the key.

If your keys do not "repeat" when you hold them down, your terminal may have a special "Repeat key" instead. Use it together with the arrow key for the same result.

Continue to "scroll" the screen until you come to column Z. Note that the remaining columns are represented by two letters, AA, AB, and so on.

The Status, Prompt, and Entry Line

The Status Line

Notice the three lines at the bottom of your screen. The top line is the Active Cell and worksheet cursor "status" line. The SuperCalc program uses this line

	W	X	Y	Z	AA	AB	AC	AD
1								40
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
A1								
Width: 9	Memory:33	Last Cell:AD1	? for HELP					
1 >								

to report to you the status of each of these functions.

The first character, an arrow (A, V, <, >), indicates the direction in which the worksheet cursor will move when you use the (CR). To change the direction of the cursor movement, press an arrow key that points in another direction from which the cursor is presently moving.

The next entry on the status line is the "address" of the current Active Cell. The status line allows you to read from your worksheet the location of the Active Cell more conveniently than you could by visually triangulating the cursor position with respect to the worksheet borders.

If the current Active Cell is empty, there will be nothing else displayed on the "status" line; however, if the Active Cell contains text, numbers, or formulas, the contents of the cell will appear as you originally entered it. It will be displayed like this:

Form= (contents of cell as per original entry).

Now move the worksheet cursor around, and watch the status line as the Active Cell and direction indicators change.

The second line is the "prompt" and secondary status line. This line will display the current cell width, available memory, and indicate that last cell used for your current application. When you are in command-entry mode the message displayed here will change depending on what command you are currently using. The prompt message lists your options at any given moment:

The bottom line is the "entry" line. It displays a 1> at the left margin. This line allows us to communicate with the SuperCalc program. It displays the information we type in at the keyboard—data, commands, or responses to prompt messages. The entry line is your scratch pad. It allows you to check and edit the data or text you wish to enter before you commit it to the worksheet. As we input characters, the entry line cursor will move to indicate where the next character will appear. At the left-hand margin, the number 1 will change to 2, 3, etc. as the cursor moves.

The GoTo Command

It is natural to wonder if there isn't some way to

move the worksheet cursor quickly to a desired position without using a stepwise combination of arrow keys. There is. Typing "=" initiates the *go to* command.

What if you mistyped "="? What can you do about it? You can use the left arrow key to backspace and then try again. We'll explain this feature more fully later on, but for now you know how to correct a mistake.

The prompt line now reads "Enter cell to jump to." This is typical of the helpful conversational efforts you can expect from the prompt line. Now type M31 or m31. Either will work. (The SuperCalc program accepts either lower case or upper case letters for any entries, but you cannot use a lower case letter "l" for the numeral one, "1.") But for any action to occur, you must press the return key, CR. It's a good habit to check your work first, by reading the entry line.

Now press CR, if you haven't done so already. If you did everything right, we have very quickly moved to the part of the worksheet where M31 is located. Cell M31 now appears at the top leftmost corner of your display window. See if you can use the "=" to find out how large the worksheet is. When you are finished, *go to* A1 again.

Here is an additional feature of the *go to* command. Move the Active Cell to anywhere near the middle of the screen, say to E8. Enter =, but specify no cell, just press CR. Notice how the Active Cell remains E8, yet the display window is repositioned so that the Active Cell appears at the top left corner.

We have now used the arrow keys and the "=" key. Remember that for most situations, any entry must be followed by pressing the CR key. The SuperCalc program will then accept and display our entry.

Press the CR key a few times, and notice that the position of the Active Cell advances to the next cell. The direction taken—left, right, up, or down—depends on which arrow key was last used.

Press the **down arrow**, and then CR a few times. Now the **left arrow**, and CR several times. The arrow keys set the direction, and then the CR advances the worksheet cursor cell by cell. (Remember you can always check the status line to find the current direction.)

The Quit Command

What about some of the other operations? Let's try "/". Press the / key. You see that the prompt line changes. It now says, "B,C,D,E,F,G,I,L,M,N,O,P,Q,R,S,T,U,W,Z, or ?."

The prompt line is telling you that these letters represent the only meaningful actions you can take now that you have entered the "/".

Each letter designates an option of the "/" commands. Whenever you wish to examine this command option list in its expanded form, press "?" and the list will be displayed on your screen. To return to your worksheet display, press CR. We will explore many of these commands soon, but for now you should know about one in particular.

Press the Q key. What happened? First the /Q was automatically interpreted by the SuperCalc program so that your /Q appears on the entry line as /Quit. Second, the prompt line changed. It now reads, "EXIT

SuperCalc ? Y(es) or N(o)".

If you want to stop here and continue the lesson later, press the Y key; otherwise, press N.

What you have you learned in this lesson?

In this lesson you have seen the display window scroll and learned what "current direction" means. You have also learned how to:

- Identify the worksheet cursor and locate the Active Cell.
- Move the worksheet cursor anywhere on the worksheet.
- Move the cursor with the four arrow keys, the alternate diamond keys, and the CR.
- Use the = (or GoTo) command, either as a shortcut to a new location, or to reposition the worksheet with respect to the active cell.
- Read the Active Cell location, current direction, and column display width on the status line.

NOTES

LESSON 2: Data Entry—Numbers, Text, and Simple Formulas

From Lesson 1 you have gained a general understanding of the control and display characteristics of the SuperCalc program. In this lesson, you will learn how to enter data. You will also learn the *zap* command (/Z) to clear the worksheet, using the "in-line editing" features, and using the *edit* command (/E).

If the SuperCalc program is not already loaded, load it now. (See *Getting Started* if you aren't sure how to do this.)

Now let's actually make some entries on our worksheet.

In this exercise, we will be entering numbers down the column, so we want to set the worksheet cursor to move "down". Do so by pressing the **down arrow**. Now use the *go to* command to place the active cell marker at A1.

Enter the number 5 on the entry line. Do not press CR yet. You may cancel an operation any time by pressing the CNTRL key and the Z key simultaneously. If you start to do something but then change your mind, pressing CNTRL-Z will allow you to start over without harming your worksheet.

You have "5" on the entry line. Now press CR.

Pressing CR will enter whatever is currently shown on the entry line; that is, the characters you have

typed will be sent to the active cell, and the entry line will be cleared. In our example, the data item "5" should now appear on the screen in cell A1.

Notice that the worksheet cursor moved to A2. Enter 6, but do not press CR yet. Did you notice that before you typed 6, there was a 1 at the left edge of the entry line? Now there is a 2. You will see this number increase each time you type a character on the entry line. The number you see is always one more than the number of characters you have typed. For now, this information helps you fit your data into the column width you have—remember the "9" on the status line. In a later lesson, you will learn how to change the column width, and this character count will be even more helpful.

Now press CR, and cell A2 will contain the value 6. Cell A3 has become the Active Cell.

Let's try another entry, 12 and CR.

The same thing should have happened. The worksheet cursor is progressing down the column, automatically anticipating the location of your next entry.

Now press the right arrow. Enter 56, press CR. What happened?

56 appears in B4, and the worksheet cursor has moved to cell C4. After each entry, the worksheet cursor will continue to move automatically to the next cell. The direction it will move has been set by whichever of the arrow keys was last used. For instance, suppose we wish to change the contents of cell B4. Press the left arrow. Enter 8 press CR.

This will replace the previous entry of "56". But, in addition, the worksheet cursor continues now in a leftward direction to A4.

	A	B	C	D
1	<	5 >		
2				
3				
4				

	A	B	C	D
1		5		
2		6		
3		12		
4	<	>	8	
5				

Try entering different letters and numbers as data, using the arrow keys to change direction. Take a few minutes.

Depending on how adventurous you were, you may have made some discoveries. Generally speaking, there are two kinds of entries—"text" and numbers. Your entry will be regarded as a number unless you type a single or double quotation mark as the first character, in which case it will be entered as repeating text or text respectively.

Headings, labels, and explanatory notes are all examples of text entries. In a mathematical sense, they are simply regarded as having a value of zero. If you forget to lead these with quotation marks the computer will respond with an error message. The quotation marks will not appear on your screen; they simply signal the computer that you are making a text entry. You do not have to close the quotation marks.

The Zap Command

Let's try some examples, but first let's start with a fresh screen.

Remember we used the *quit* command to exit from the SuperCalc program altogether in Lesson 1: Now we'll use another command, *zap*.

Enter *!*, and note that the prompt line again displays for us all possible "*!*" commands.

> B3	Width: 9	Memory:33	Last Cell:A1	? for HELP
1 >				

Enter *Z*; the interpretive prompting now reads "Zap-ENTIRE-worksheet?" The effect of the *zap* command is to clear the entire worksheet and return everything to its original state, just as it was when you first loaded the SuperCalc program. Because the effect is so drastic, the program uses the prompt line to remind us that the entire worksheet will be emptied and to verify that we really want to do this. The prompt asks, "Y(es) to clear everything, else N(o)?"

We do want to clear everything, so enter *Y*, and the SuperCalc program will do just that. Whatever we had put on the worksheet is now gone, permanently.

Characteristics of Textual and Numerical Entries

Now enter "Oranges in cell B1 and 250 in B2. Remember to lead off Oranges with quotation marks(""). Notice that text is left-justified and numeric values are right-justified within the column.

	A	B	C	D
1		Oranges		
2		250		
3		<	>	
4				
5				

Now move the Active Cell back to B2 and watch the rightmost display of the status line. It will say "Form=250". Move the Active Cell to B1; the same display will say "Text=Oranges".

How wide are the columns, how large a number can we enter? How much text? Remember we mentioned "display width" earlier when looking at the status line. Note again the "9" on the status line.

The 9 tells us that the column currently accessed (the column with the Active Cell) is set to display nine characters. Nine is the standard or *default* value that the SuperCalc program will use for the display width of all columns unless you specify otherwise. You will soon learn how to specify display widths. A cell may contain as many as 110 characters.

Move the worksheet cursor to B3, and type "Alberta peaches". This piece of text is certainly longer than nine characters, but the SuperCalc program allows display of your *text* to extend over neighboring cells if they are unused. Now go to A1 and try the same thing.

Your entry did not display in full because B1 is occupied. But the entire entry was accepted to cell A1 even if only a portion of it (the first nine characters) is displayed. (Notice that the status line indicates the contents of A1 as Text= "Alberta peaches").

Move to B4. Enter, without commas, 2500000000. The number is too large to display. The SuperCalc program converts it to scientific notation, a more compact format, and displays it as 2.5e9. 2.5e9 is the display form of the expression 2.5×10^9 , or the conventional abbreviation of 2,500,000,000. The SuperCalc program provides many different display and format options. These will be described in more detail later.

	A	B	C	D
1	Alberta	pOranges		
2		250		
3		Alberta peaches		
4		2.5e9		
5				
6				

If exponential numbers are new to you, here is a quick look at what they are and how the SuperCalc program displays them. Exponential numbers are

displayed as "powers of 10." You will soon see what this means.

Go to Cell C1 and set column C for exponential display. We use the *format* command to do this. Enter */F*, for the command, and C, for "column formatting." When the prompt asks you what column to format, you can just press the "*,*" key, because you are at column C. Then enter *E*, for exponential, and press *CR*.

Press the **down arrow** to set the current direction as down. Now enter 1776. Cell C2 shows "1.776e3." What does this mean? e3 means "exponential 3" or "10 to the power of 3." 10 to the power of 3 is 1000; 1.776 times 1000 is 1776. That's all that 1.776e3 means.

Try entering 1000. Is 1e3 what you expected? What will 100 be? Try it. Now enter 2000, and then enter .002. Notice that 2000 is 2e3 and that .002 is 2e-3. e3 is thousands; e-3 is thousandths. What is -2000? Try it and see.

What happens if you enter a number in exponential notation? Let's try it. Enter 567e13. Are you surprised to see it display as 5.67e15? The SuperCalc program prefers to put the decimal point just after the first digit and will adjust the exponent value to do so.

Explore on your own—entering numbers as you ordinarily would, and entering them in exponential form. Try to guess beforehand what the display will be.

When you feel comfortable with exponential notation, let's give the SuperCalc program a little job to do.

Press the **down arrow**, (*v*), to reset the cursor direction; then, **go to**, (*=*), D1.

In cell D1, enter 93000000. That is 93 million, which is the number of miles between the earth and the sun. 9.3e7 is 9.3 times 10 million, which seems right. Now in cell D2, enter 5280*D1. The value displayed, 4.910e11, is the number of feet in 93 million miles. What about inches? Enter 12*D2 in cell D3. 5.892e12 is the number of inches in 93 million miles.

So 5.892e12 is the number of inches between the earth and the surface of the sun? Well, not really. It is the number of inches in 93 million miles, but 93 million is the number of miles between here and the sun expressed to the nearest million.

Lesson 2

What 5.892e12 really tells us is that there are about 5.9 times 1,000,000,000,000 inches between here and the sun. Only the first two digits of 5.892 are significant, because only the 93 was significant in 93 million miles.

Why bring this up? Because that is the point of scientific notation. Scientific notation allows us to quickly grasp the essential points of a number and discard the unessential.

The first part of the number gives us the essentials (and probably some others that we can discard). The exponent value, the number after E, tells us whether we are talking about 10s, 100s, 1000s, or millions, billions, trillions. Or billionths and trillionths, for that matter.

In short, exponential or scientific numbers give us the essentials: the significant digits and the general magnitude of the value.

Three types of exponential expressions may occur:

- 1) $1.776e3$; 1.776×1000 or 10^3
- 2) $1.776e-3$; $1.776 \times 1/1000$ or 10^{-3}
- 3) $-1.776e3$; -1.776×1000 or 10^3 (a negative number.)

	A	B	C	D	E
1	Alberta	pOranges			
2		250			
3		Alberta	peaches		
4		2.5e9			
5					
6					
...					
...					
> A5					
Width: 9	Memory:33	Last Cell:B4	? for HELP		
4>	Pin apples				

In-line Editing

Right now, let's investigate the SuperCalc program's "in-line" editing feature. If you have used the exponential notation section of the lesson, "zap" your worksheet and reenter your original data.

Move the Active Cell to B5. Type this incorrect spelling, **Pinapples**, but *do not* press CR. As you know, you could use a *left* arrow to backspace and re-type from the point of the error. The *right* arrow key just moves in the opposite direction.

Now use the left and right arrows, move back and forth across your text, but take care not to backspace beyond the leftmost character. Notice that nothing is changed, but the position of the cursor on the entry line. Now locate that cursor on the "a". Notice, too, that the number 4 appears at the left of your entry line. This indicates that the cursor is located at the fourth character position.

Press the **up** arrow key, and see what happens.

A space has been created for us just ahead of the "a" so that we may insert the correction without having to re-type good text. Enter **e**. Your entry line now says "Pineapple. What if you had needed to insert several characters, or to delete some?"

Press the **up** arrow key continuously and generate a large gap in the text. Press the **down-arrow** key once, and notice that the gap is reduced by one character. Hold the key down, and watch the blank spaces be

deleted. Go ahead and enter "Pineapples, and then make up other examples. Practice with these keys until you are confident with this "in-line editing" feature. Try it with numeric entries, too.

Regardless of where the cursor is positioned on the entry line, all of the visible text or numeric values will

go into the Active Cell when you press CR.

You have discovered that the arrow keys have two different uses. They move the active cell around the worksheet *until* you type a character on the entry line. Then the SuperCalc program recognizes that you have begun to enter data, and the prompt changes to "Enter into cell (or CNTRL-Z to abort command)." The function of the arrow keys changes in data entry mode; they are used for editing.

The Edit Command

We have seen how to edit data *before* we actually enter it into the Active Cell. How can we edit data that we have already sent to a cell? Of course, we could enter the data again in its entirety. The new entry would replace the old one. But there is a better way. We can use a new command, the *edit* command (/E).

Make B4 the Active Cell (use *go to* or move the worksheet cursor). Enter /E, for *edit*. You see the prompt line now says, "From? Enter cell." It is asking where to find the material to be edited.

Because in this case we want to edit the contents of the Active Cell, we don't have to give a cell address. Simply press CR, and the SuperCalc program will bring the Active Cell's contents to the entry line.

Make your changes, using the arrow keys. For instance, delete three of the zeros from 2500000000. When your change is complete, press CR, and your modified entry replaces the old one in B4. If you

haven't done this, try it now.

You may sometimes wish to edit the contents of a cell and enter them into *another* cell. For example, position the Active Cell to B5 (our destination cell). Enter /E. In response to the prompt, "From?", enter B4 (our source cell), and press CR. The contents of B4 will be copied to the entry line. After you have made your change, press CR and the edited version of B4 will be copied back to B5.

Note that no matter where it comes from, the "new" or "edited" data on the entry line is always entered into the *Active Cell*. In our first example, the original contents of B4, the Active Cell, were modified and replaced by our edited version. In the second example, the contents of B4 were *not* changed. The edited material went into B5, the Active Cell, and the source material remained unchanged in B4.

If you want to stop here, use the *quit* command. Or if you wish, continue on to lesson 3.

What have you learned in this lesson?

In this lesson you have learned how to:

- make number and text data entries
- cancel an operation by using Control-Z
- replace one data entry with another
- set the direction in which the worksheet cursor moves
- recognize and use exponential notation
- do *in-line* editing
- use /E, the *edit* command

NOTES

LESSON 3: Blanking, Protecting, Unprotecting, and Saving Your Work

In Lesson 2, we expanded our knowledge to include the fundamentals of data entry for the purposes of creating text or for entering numeric data to be used in actual calculations. In this lesson, you will gain more experience entering data. You will learn to blank, protect, unprotect, and save your data. You will also learn to use the /G command to make some general or "global" changes in your worksheet display and to use the /F command to make certain formatting changes.

If you are continuing directly on from lesson 2, do a /Z command so that we may start with an empty screen. Otherwise, load the SuperCalc program in accordance with the instructions in "Getting Started".

Use the **down arrow** to set the current direction. Use the *go to* command to go to A1. Enter "Apples. At A2, enter 5. Continue in this way with A3 through A9, entering values of 8, 3, 11, 4, 9, 6, and 12 respectively.

In lesson 2, we learned how to modify a cell's contents, to *edit*. But what if we want to "blank" a cell, to clear out its contents?

We can do that with a new command, the *blank* command. It can be used to blank out, or erase, data that you have already entered on any size portion of your worksheet. You can blank an individual entry or cell, partial or complete rows or columns, or entire blocks (rows and columns) of cells. We will try an example of each in this lesson.

Enter / and note the prompt line. Now enter B. The interpretive prompting fills this out, /B|ank. And the prompt line changes to say, "Enter range." You must now specify the portion, or range, of the worksheet that you wish to blank.

Type A4 and press CR. The contents of A4 have been

"blanked", that is erased. Or you can enter /B, place the worksheet cursor on the cell you wish to blank, and with no cell reference, press CR. Try doing this with cell A5. When working regularly within the SuperCalc program, use whichever method is more convenient for you. Remember that since the cursor can only point to an individual cell, the cursor-CR method of the /B command will only affect an individual entry.

Enter /B again. Now in response to the prompt, "Enter range", specify A6 through A8 by typing A6:A8. Press CR. This is how we can specify a range of cells for either a row or a column. The range that you designate will always include the end points.

	A	B	C	D
1	Apples			
2		5		
3		8		
4				
5	<	>		
6				
7				
8				
9		12		
10				

The Protect Command

Re-enter the numbers we just blanked out. Create a new column of numbers in column B. Label it "Oranges."

Now let's use */P* to protect a cell. Enter */P*. We use the **protect** command in the same way as the **blank** command. That is, enter a cell or a range. For example, enter **A5**. Press **CR**. Move the cursor to **A5** and note that a "P" appears now next to the "Form" display on the status line. This indicator tells you that the Active Cell is "protected".

	A	B	C	D
1	Apples	Oranges		
2		5	1	
3		8	2	
4		3	3	
5	<	11	>	4
6		4	5	
7		9	6	
8		6	7	
9		12	8	
10				

If your terminal provides half-intensity display, you will also see the protected cells at half intensity.

Let's continue by protecting a range of cells.

Type */P* and enter **A8:B8**. Press **CR**. This will protect that portion of row 8.

What is the significance of what we have done?

Remember we said that */B* could blank out an entire block of cells. Let's attempt to blank out that block of cells from row 2 through row 8 for both columns A and B. How do we specify this?

Enter */B*. Now enter **A2:B8**. (We define the range for a Block of cells as a diagonal, top leftmost cell followed by the lower rightmost cell in the block.)

Now press **CR**, and let's consider the results of our actions.

Row 1, with our titles, should remain because it lay outside the range of the block-definition we used with the **Blank** command. **A5** and row 8 remain because they were protected. Row 9 remains, not because it was protected but because it, too, was beyond the range we blanked out.

Try to change the contents of **A9**. Now try the same thing with **A5** or **B8**. Because these cells have been protected, they cannot be changed or blanked out. This feature can provide you with a large measure of safety when you are working around information that has taken you time to develop, and which you cannot afford to accidentally lose.

The **unprotect** command (*/U*) can be used to unprotect cells, partial rows, partial columns, or blocks of cells. We could use the command twice to unprotect cell **A5** and row 8, but can we do it with just one */U* command?

Yes. **Unprotect** the "block", row 5 through 8 of columns A and B. What is the proper range specification? Did you say **A5:B8**? Correct.

Formula and Numeric Display Options

Move the Active Cell to **A2**. Enter **3+5**. What happened? The value of the expression, 8, was placed in **A2**. If the worksheet cursor is not at **A2**, move it there and examine the status line. The rightmost display will read "Form=3+5", our original expression.

What has the SuperCalc program actually stored, "3+5" or the "8"?

However complicated the expression is, the SuperCalc program will calculate the result and display it. This allows us to use the entry line like a scratch pad. For instance, we may be adding two columns of numbers but only be interested in their total value.

Again at **A3** enter **1+A2**. The SuperCalc program will recognize this as a formula referring to cell **A2** and will quickly calculate and display the value based upon the value in **A2**. Further, if we change the contents of **A2**—for instance, to "5"—we should observe that the new value of **A3** will be recalculated as well. Try it!

Now move the Active Cell to **A3**. The screen displays "6" there, the current value, while the status line displays "Form = 1+A2." Apparently, the SuperCalc program is keeping track of both. In **A4**, let's

enter **A3*.65**. (The "*" means multiply and is equivalent to the "X" sign in conventional notation. Division is represented by "/".)

Locate the active cell at **A10**. Enter **SUM(A2:A9)**.

SUM is a built-in function. The SuperCalc program provides many special built-in functions, including **SQRT** (square root), **AVERAGE** (mathematical mean), **NPV** (net present value), trigonometric functions, **IF** conditionals, and many more. (See for more detail on formulas and functions.) For **SUM**, we can specify a list of ranges (as we have done in this example) and cells, for example, "SUM (A8, B9, A2)."

Now change the value of any cell in column A and watch the sum be recalculated.

The Global Command—Formatting Options

Earlier we determined that the SuperCalc program is keeping track of our formulas although it only displays their current values on the worksheet. How can we review all the original formulas more clearly? Enter */G*.

Note that SuperCalc's interpretive prompting fills this out to read */Global*. What could this conceivably mean? The prompt line now reads, "F(orm.), N(ext), B(order), T(ab), R(ow), C(ol.), M(an.), A(uto)?" We could think of the */G* command as a way to make

	A	B	C	D
1	Apples	Oranges		
2	5			
3	1+A2			
4	A3*.65			
5	11			
6				
7				
8	6	7		
9	5	8		
10	SUM(A2:A9)			
11	<	>		
12				

overall or "global" changes to the worksheet, rather than specific or local changes. It is as if we had a map of California before us and we could, at will, transform it into a topographical map, a population density map, a tourist attraction map, etc.

Our concern here is with formulas, so Enter **F** and see your formulas displayed.

To return to the other style of display (cell values), simply repeat the sequence */G, F*. The SuperCalc program will alternate or flip-flop between the two display modes.

Determining Column Width

Enter **9** in cell **B10**.

In formulas made, you will notice one problem. The **SUM** formula in **A10** has two characters more than our column width, which is only 9. Let's widen the column to accommodate our entry.

Enter */F* for *format*. The prompt line will respond with "Enter Level: G(lobal), C(olumn), R(ow), or E(ntry)." The "G" in this case is not the same as the */G* command. Here it simply qualifies the */F* command. But its meaning is similar; that is, "for all" or "every".

Now enter **G**. The prompt line now displays, "Define Formats: (I, G, E, \$, R, L, TR, TL, *, D, column width)". As you can see, the */F* command has many possible parameters; however, for now, let's enter a new column width by typing **12** and **CR**. Now move the cursor to column B and note the status line display, "12". Notice that we changed *all* columns to a width of 12 characters. We could have specified the new width for just a single column by **C** for column level.

Now that we are using commands with several levels of prompts, it may be useful to point out another use for the left arrow key—one that you may have discovered for yourself already. Backspacing with the left arrow will always take us back to the prior "step" in a command, to a less completely specified statement.

For instance, enter */F, G, 12* again. Now backspace once with the left arrow (or **CNTRL-s**). Backspace again, and see that the prompt changes to its earlier

message, "Enter Level: G(lobal), . . ."

If we wished, we could then enter a level other than G(lobal), and continue on with the command sequence. Instead, let's backspace once more.

You will see the list of "/" command options on the prompt line. Backspace again. And now we have finally backed all the way to the original prompt.

Of course, no matter how far we have gone in specifying some command, range, or option, we can always use **CNTRL-Z** to abort; that is, to cancel everything we have started to enter. Simultaneously pressing the **CNTRL** key and "z" will return us to the original prompt. You can use this technique, for example, if you start to enter data on the entry line and then notice that the Active Cell is not positioned where you want it.

Now return to the display mode that displays cell values rather than formulas. (**G, F.**)

The Save Command

We will want to save the work we have done in this lesson so that we may use it later. We can do this with the **/S** command (**Save**). This command makes a copy of our entire worksheet and stores it on a diskette located on either drive A or drive B, depending on which we specify.

Enter **/S**. The prompt requests, "Enter File name." You can respond to this in one of several ways, depending on where you want to store your file. If you wish to save it on the disk on the system drive (the same disk that has the SuperCalc program), enter **WORK1** and **CR**. Or you can specify the drive to use by entering either **A:WORK1, CR** or **B:WORK1, CR**. Do not leave any blank spaces in your file name. The computer will not accept "TOM 1", but only "TOM1". (If you have more than two disk drives, you can

specify **C:WORK1** or **D:WORK1**, and so on.) If you are unsure what is meant by "system drive," review that material in "Getting Started".

After you have entered the file name, the prompt line inquires further, "A(ll) or V(alues)?"

Since we wish to save both our formulas and our values, enter **A**, for all. Your disk drive unit will whirl and click contentedly for a few moments.

We will use this file to "load" our work back into the system when we resume with lesson 4, so keep the disk handy. Now enter **/Q** and exit from the SuperCalc program, all our work "disappears." It is gone irretrievably *unless* you specifically save it with the *save* command before exiting.

What have you learned in this lesson?

In this lesson you have learned:

- How to blank the contents of a cell or group of cells by using the **/B** command.
- How to protect and unprotect cells, using the **/P** and **/U** commands, and what protection does for a cell.
- That in an arithmetic expression, "*" means multiply and "/" divide.
- That you can enter numerical expressions and formulas, that the SuperCalc program will calculate and display the results, and that it will continue to recalculate as necessary.
- How to use the *global option* command, **/G**, to display formulas or their calculated values on the worksheet display.
- How to use the *format* command, **/F**, to change column display width.
- How to use the backspace (left arrow) key to return to an earlier step in a command sequence.
- How to create a file and *save* your work by using the **/S** command.

LESSON 4: COPY AND REPLICATE

In Lesson 3, we began to see the power of the SuperCalc program—in particular, its ability to recalculate automatically all values that depend upon the values in other cells. In this lesson we will gain even more insight into its versatility. You will learn to use the *load* command (**/L**), *copy* command (**/C**), *replicate* command (**/R**), and the current—cell key (**ESC**). The **/C**, **/R**, and **ESC** commands are basically time saving commands.

THE LOAD COMMAND

We are going to continue using the worksheet we began to develop in Lesson 3. Let's retrieve the file we created at the end of that lesson. We will use the *load* command, **/L**, to this. (If the file is not on the disk that has the SuperCalc program, be sure to insert the disk with the file into your other disk drive.)

Enter **/L**. How you respond to the prompt message "Enter File name" depends on where you stored the file. If it is on the same disk as the SuperCalc program, it is on the system drive. So you should enter **WORK1** and press **CR**. (If the file is not on the system drive, you should designate the appropriate drive by entering **A:WORK1** or **B:WORK1**, etc. before pressing **CR**.)

The disk drive will repond with some clicking, and the prompt line will change to read, "A(11) or P(art)?"

Enter **A**, for "all", and the material we saved from our last effort will be copied from the disk and appear on the screen.

The Copy Command

Now that we have restored our work from the previous lesson, let's investigate another command,

copy (**/C**). The *copy* command is easy to use. You can *copy* a single cell, a partial row or partial column, or a block of cells.

In this first example, we will copy the data in column A into column C. Enter **C**. The prompt line responds with, "From? (Enter Range)."

In response, enter **A1:A10, (CR)**. This time the prompt asks, "To? (Enter Range), then Return; or ", " Options." We just want a "standard" copy this time—we will look at "options" later. So enter **C1** and press **CR**.

Now use the *copy* command to copy the contents of cell A10 to B10.

Change the display to show formulas, and look at the contents of B10 and column C. The formulas have all been translated automatically relative to the column. All cell references have changed to reflect the new location of the formulas. If we had moved to a new row, as well as a new column, relative row designation would also have been adjusted.

	A	B	C
1	Apples	Oranges	Apples
2	5		5
3	1 + A2		1 + C2
4	A3*.65		C3*.65
5	11		11
6			
7			
8	6	7	6
9	5	8	5
10	SUM(A2:A9)	SUM(B2:B9)	SUM(C2:C9)
11			
12			

Generally, this automatic adjustment is exactly what we want. But there are other options open to us. For instance, we can specify that there be no adjustment, or we can tell the SuperCalc program to ask whether each occurrence of a cell reference should be adjusted or left alone. We will try this soon.

The *copy* command makes a one-to-one copy of its source material into a destination of the same type of size; cell to cell, row to row, or column to column. But suppose you want to repeat a series of values and formulas many times, perhaps to compare alternative cases.

The Replicate Command

You can use another very powerful command, *replicate* (/R), to do that. It will make a "one-to-many" copy of a cell, a partial row, or a partial column and will distribute these copies over a destination range that is larger than the source range. Change the display to show formulas.

Let's replicate a single cell, A10.

Enter /R. For "Form", enter A10, (CR). For "To?" enter the range. D10 through F10, by typing, D10:F10 and CR. And note how the command performs.

Try replicating the partial column A3 through A4 in-

	A	B	C	D	E	F
1	Apples	Oranges	Apples			
2	5	1	8			
3	1+A2	2	1+C2	1+D2	1+E2	1+F2
4	A3*.65	3	C3*.65	D3*.65	E3*.65	F3*.65
5	11	4	11			
6	4	5	4			
7	9	6	9			
8	6	7	6			
9	7	8	7			
10	SUM(A2:A9)	SUM(B2:B9)	SUM(C2:C9)	SUM(D2:D9)	SUM(E2:E9)	SUM(F2:F9)
11						

to D3 through F3. These columns, D through F, now have data in rows 3, 4, and 10.

Fill up these columns by entering some data (whatever you want) in rows 2 and 5 through 9.

The *replicate* command has the same formula-adjustment options as the *copy* command. Let's try one of them now.

Enter into cell A12, the formula A2 + A2.

Now enter /Rreplicate, A12, B12:F12. After you enter "F12" enter an additional "," to get the options. They will be displayed on the prompt line: "N(o Adjust), A(sk for Adjust.), V(alues)."

Enter A.

The prompt changes to say, "Source location A12. Adjust A2?" and the first A2 is highlighted on the entry line.

Respond with N, for no adjustment. Now the second reference to A2 is highlighted on the entry line. Let's respond with Y. You see that the first part of our formula remained unchanged while the second was adjusted, according to our responses. In this way, we can specify one component of a cell to be held constant, while other components are adjusted relative to their new location.

Replicate cell A1, to D1 through F1. Then use /E to edit the contents of C1 through F1 so they will be APPLES-1, APPLES-2, and so forth.

	B	C	D	E	F
1	Oranges	Apples-1	Apples-2	Apples-3	Apples-4
2	1	8	3	4	5
3	2	1+C2	1+D2	1+E2	1+F2
4	3	C3*.65	D3*.65	E3*.65	F3*.65
5	4	11	6	7	8
6	5	4	10	11	12
7	6	9	13	14	15
8	7	6	1	2	3
9	8	7	4	5	6
10	SUM(B2:B9)	SUM(C2:C9)	SUM(D2:D9)	SUM(E2:E9)	SUM(F2:F9)
11					
12	A2 + B2	A2 + C2	A2 + D2	A2 + E2	A2 + F2
13					

It's very important to save the work we have completed up to this point. We will use it again in Lesson 5. If you want to save it on the same disk as the SuperCalc program, enter /S, then WORK1, CR; otherwise, specify the drive that has your destination disk. (If you want to jog your memory about the *save* command, try *help*, (?). Or you could look back at Lesson 3 or at the detailed reference.

To help protect your work, the SuperCalc program checks to see if you already have a file with the same name on your destination disk. If you do, the SuperCalc program asks you, "OK to overwrite?" If you no longer need the original version, then reply with "Y." Otherwise, rename the new file you want to save. (In this case, you can overwrite because you won't need the old "WORK1" file created in lesson 3. The worksheet developed in this lesson is the one we will use later.)

Try replicating a row, or rows, or a block. If a practical application of your own comes to mind, try to begin an example on the screen. If you want to save this first effort of your own, be sure to use a different name—for example, TRIAL or MYTRY. (Safety tip: It is a good idea to choose a name substantially different from WORK1, so that there is less chance of inadvertently overwriting the material you will need on this tutorial. "WORK2", for example, is so close that it might cause you some confusion.)

By now you have probably realized that the SuperCalc program offers you a great many command op-

tions. This makes it a tremendously powerful and versatile tool. We will not discuss all the options in this tutorial section. Instead, we encourage you to investigate them on your own. You should find it easy to make the best possible use of the SuperCalc program by combining what you learn here with information available in the reference section of this guide and through the *help* function, (?), built into the SuperCalc program itself.

The Current-Cell key: ESCAPE key.

This is a good time to become acquainted with the "current-cell" key. It can be used to boost the efficiency of certain kinds of data manipulation, which use the *copy* and *replicate* commands. The ESC key serves as the current-cell key.

Whenever a cell or range is required by the SuperCalc program, the Active Cell coordinate will be placed on the entry line if we simply press the ESC key.

Let's set up an example and learn how to use this feature. Start with a fresh screen. After you have saved any work you want for later, use the *zap* command.

Enter 123 into A1. Use the *replicate* command to fill every cell on the visible screen with "123". Can you do this? Try it before looking ahead.

Here is how your entries should have looked. First, enter, /Replicate, A1, B1:H1. Then, /Replicate, A1:H1,A2:A20. Or, /R, A1, A2:A20. Then, /R, B1:H1.

Now you should have "123" everywhere for the purposes of our example.

Enter /B, for *blank*. The SuperCalc program now wants you to specify a cell or a range to be blanked. Let's start with a single cell.

Press the ESC key. The address of the Active Cell will appear on the entry line. Use the arrow keys to move the worksheet cursor to another location—for example, C11. Notice the Active Cell address on the entry line change as we go.

Now press CR. Observe. Notice that the latest Active Cell was blanked, and that the Active Cell location has returned to its original place. Again, enter /Blank, and press ESC.

Use the **arrow** keys to make cell C16 be the Active Cell. The entry line now reads /Blank, C16.

We can use this to begin a range specification. Just enter ":". The line now reads /Blank, C16:C16. Now move the worksheet cursor to cell H16. Notice that the second address of our range is incremented as we go. Now press CR. The cells in the range C16 through H16 have been blanked.

In brief, this is what happens. Once you have set the ESC function, the arrow keys will move the worksheet cursor and set the cell location on the entry line. A colon ":" will generate a limiting location (end point) for a range specification. Pressing ESC or CR key will terminate the ESC function and allow the arrow keys to be used for editing. The ESC movement of the Active Cell is only temporary; when you terminate the ESC function, the Active Cell returns to its starting place.

Here is another sample. Enter /Blank. Press ESC. Move the worksheet cursor to D4, press ":" and move again to H14, press CR. We have blanked cells in the block from D4 to H14.

	A	B	C	D	E	F	G	H
1	123	123	123	123	123	123	123	123
2	123	123	123	123	123	123	123	123
3	123	123	123	123	123	123	123	123
4	123	123	123					
5	123	123	123					
6	123	123	123					
7	123	123	123					
8	123	123	123					
9	123	123	123					
10	123	123	123					
11	123	123						
12	123	123	123					
13	123	123	123					
14	123	123	123					
15	123	123	123	123	123	123	123	123
16	123	123						
17	123	123	123	123	123	123	123	123
18	123	123	123	123	123	123	123	123
19	123	123	123	123	123	123	123	123
20	123	123	123	123	123	123	123	123

By using the ESC key and placing the Active Cell at the appropriate points, we can let the SuperCalc program define our statements. At first, this may seem a little difficult, but with some practice, you will begin to find it increasingly useful. This feature allows us to modify our screen simply by pointing with the Active Cell to the boundary of the range of cells we wish to blank without our having to blank each cell individually.

Here are some examples you can try using *replicate* and ESC. Enter in E5, aac. Enter /Replicate. Press ESC, place the Active Cell at E5, then press ":" or CR. Now press ESC again for the "To?" portion of our entry. Move the Active Cell to E6, enter ":" and move the Active Cell to E13, then press CR.

One more example. /Replicate, ESC, move the Active Cell to E5, enter ":" , move to E13, press CR. Press ESC, move to G7, enter ":" , move to J7, press CR.

The ESC key allows us to identify cells either by their contents or their location on the worksheet, and to perform operations on them, without concerning ourselves with their cell address. The ESC function can be used any time you have information on the entry line. You can use it in commands or with data. For

example, you can use it to provide cell locations in formulas.

There is no need to save any of this work. At this point you may *quit* or continue on to Lesson 5.

What have you learned in this lesson?

- How to use the *load* command, (/L), to bring a worksheet in the SuperCalc program from a disk file.
- How to use the *copy* command, (/C).
- That the SuperCalc program will adjust formulas automatically when data is moved to new locations—or that the program will let you specify whether to leave part or all of a formula unchanged.
- How to use the *replicate* command, (/R), to make a "one-to-many" copy of a cell, a partial row, or a partial column and to distribute the copies over a range.
- That you can use the ESC key to bring the Active Cell location to the entry line and can then change the location by using the arrow keys to move the worksheet cursor. You have also learned the special use of ":" with the ESC function.

The Insert and Delete Commands

Here are two other complementary commands that can create or delete intermediate columns and rows. They are *I* (*insert*) and *D* (*delete*).

Let's insert a new row between rows 9 and 10.

Enter */I*, followed by *R* for row. Respond to the next prompt by entering 10, and a "new" row appears.

Look at the formulas in row 11, and you will see they are unchanged. The SuperCalc program has no way of knowing if you want to include the new row in the SUM equations—you would have to change them yourself.

Nevertheless, the SuperCalc program does know something. Note first the range we have specified in

our SUM formulas.

Now let's insert another row at 7. */Insert, Row 7*.

Look at the SUM formulas in row 12. They have been adjusted, extended automatically from A2:A9 to A2:A10, because the row we just inserted fell within the range we had described.

Now enter */D* and *R* (for row). For row number, enter 14 and *CR*. Row 14 is deleted. If we delete row 7, will the SUM formulas be adjusted back to A2:A9? Try it and see.

Let's delete a column, and try an experiment as well. Let's find out what happens to a value that depends on one that we delete. Enter into cell E9 the equation, F2. E9 will contain whatever value F2 contains. Change the display to show cell value.

	A	B	C	D	E	F
1	Apples	Apples-1	Apples-2	Apples-3	Apples-4	Oranges
2	5	8	3	4	5	1
3	1 + A2	1 + B2	1 + C2	1 + D2	1 + E2	2
4	A3*.65	B3*.65	C3*.65	D3*.65	E3*.65	3
5	11	11	6	7	8	4
6	4	4	10	11	12	5
7						
8	9	9	13	14	15	6
9	6	6	1	2	3	7
10	7	7	4	5	6	8
11						
12	SUM(A2:A10)	SUM(B2:B10)	SUM(C2:C10)	SUM(D2:D10)	SUM(E2:E10)	SUM(F2:F10)
13						
14	A2 + A2	A2 + B2	A2 + C2	A2 + D2	A2 + E2	A2 + F2

Now enter */Delete, Column, F, CR*. The column entitled Oranges has been deleted. E9 displays "ERROR". The SuperCalc program has no value to use in calculating the value of E9, and warns us of that with this message. Once a cell is in error, any reference to it will display a similar error message. As you see, the SUM value also indicates ERROR.

It produced an ERROR in the SUM formula. The general rule is not to delete either of the boundaries specified in a range like the one in our example. Our example was "SUM(A2:A9). Deleting either A2 or A9 will cause an ERROR condition because the SuperCalc program cannot guess your exact intentions. These warnings help us avoid inadvertently

	A	B	C	D	E	F	G	H
1	Apples	Apples-1	Apples-2	Apples-3	Apples-4			
2	5	8	3	4	5			
3	6	9	4	5	6			
4	3.9	5.85	2.6	3.25	3.9			
5	11	11	6	7	8			
6	4	4	10	11	12			
7	9	9	13	14	15			
8	6	6	1	2	3			
9	7	7	4	5	ERROR			
10								
11	51.9	59.85	43.6	51.25	ERROR			
12								

If cell E9 should, in fact, have "F2" in it, we could simply enter that formula again, and everything would be set right. Now put a number or F2 into E9, whichever you wish. Notice that the error display in the SUM value also goes away. It is replaced by the recalculated value.

leaving references to non-existent cells after a *delete* command.

If we delete row 10, will this affect our range specification for the SUM formulas in row 10? No, because row 10 is beyond the range. Delete row 10.

Use the *blank* command to blank out the block from A7 to E9. Now reenter SUM(A2:A6) in A7, and then use *replicate* to place it in cells B7 through E7.

What will happen if we delete row 9? Try it.

Use the */I*, the *insert* command, to create a new column at A for labels.

Now enter Variable A in cell A2, Formula 1 and Formula 2 in A3 and A4, respectively. Enter Variable B and Variable C in A5 and A6, and Total in A7.

	A	B	C	D	E	F
1		Apples	Apples-1	Apples-2	Apples-3	Apples-4
2	Variable A	5	8	3	4	5
3	Formula 1	1 + B2	1 + C2	1 + D2	1 + E2	1 + F2
4	Formula 2	B3*.65	C3*.65	D3*.65	E3*.65	F3*.65
5	Variable B	11	11	6	7	8
6	Variable C	4	4	10	11	12
7	Total	SUM(B2:B6)	SUM(C2:C6)	SUM(D2:D6)	SUM(E2:E6)	SUM(F2:F6)
8						
9						

At this point, use /S to save your work. This time, let's call it "LESSON5." It will be used later.

Now that you have saved your work, let's try something new. We should start with a fresh worksheet, so use the zap command.

As we have seen, doing insertions and deletions at the boundaries of specified ranges creates problems. But because you will often want to add or delete from lists—including, naturally, the beginning or end of the list—here is a useful suggestion.

At B1, enter TITLE. From B2 through B4, enter some numbers. At B5, enter "-----". At B6, enter SUM(B1:B5). Notice that our range specification includes our title line and the ledger line (—). This is harmless, because in a mathematical sense, "text" is regarded as having a value of zero.

	A	B	C
1		Title	
2		3	
3		4	
4		5	
5		-----	
6		SUM(B1:B5)	
7			
8			
9			

Now you may insert or delete with impunity. Enter /Insert, Row, 5, and add new number. Now delete row 2. Delete row 5. As you can see, you can add entries or remove entries without concerning yourself about the top and bottom of your column.

By the way, here is an easy way to put in lines of repeating characters like the "-----" you entered in cell B5. The SuperCalc program has a function to repeat text. Go back to cell B5 and enter ' and press CR.

As you see, the single quote (') causes the display of " ' " to be repeated to fill the cell display, and in fact to continue displaying to the right until it meets a non-blank cell. Not bad for three keystrokes. Take a look

at the contents of cell B5. As you see, they are what you typed in.

Experiment with this one a bit. Find some open space and try:

'123 and press CR.
'abcd and press CR.
'* and press CR.
' * and press CR.

And so on: Try your name.

Sometimes you may be working on a complex worksheet with many values which are functions of other values. Because your data may be incomplete, you may mistakenly view some totals or values as significant when in fact they are not yet complete.

Here is what you can do in such cases. Using the example we started above, now enter NA into cell B3, for instance. This tells the SuperCalc program that you intend to have a value here at some future time so the value of the cell should be considered as "Not Available" rather than zero. You will see that as soon as we enter NA, cell B6 is also flagged as NA.

	A	B	C
1		Title	
2			4
3		N/A	
4			7
5		-----	
6		N/A	
7			
8			
9			

NA and ERROR behave identically; the difference is the display: "NA" or "ERROR". By using NA, you inform yourself of the ramifications of any incompleteness or oversights.

You may either quit here or continue on to Lesson 6.

What have you learned in this lesson?

In this lesson you have learned:

- How to use the *move, insert, delete* commands. (/M, /I, /D).
- That those commands automatically adjust your formulas to fit the new worksheet.
- That if you delete cells which are referred to by formulas elsewhere, you get error messages. You

learned how to fix that error.

- How to use "" to repeat the display of one or more characters.
- How to use NA to make sure that you do not forget to enter important information.

NOTES

LESSON 6: Format

By now you have learned many of the basics that you need in order to use the SuperCalc program. You may remember that when we introduced the *format* command, /F, in Lesson 3, we used it to change the display width of all the columns on the worksheet. But the prompt line indicated that there were a number of other options available to us with this command. In this lesson, we will examine these options more closely.

We will use the worksheet that we have been developing in previous lessons. It is the one you saved under the name "LESSON5" in the last lesson.

If you are continuing directly on from Lesson 5, use /Z now, so that you will have a fresh start. Otherwise, bring up the SuperCalc program.

Now load the file, LESSON5.

Integer Format

Look at your worksheet. Is it displaying formulas? We will want to look at cell *values*, not formulas, in

this example. Use the *global options* command, /G, if you need to change the display.

Look at column B. If it does not contain a decimal fraction (for example, 6.4), enter one.

Enter /F, and note the prompt line: "G(lobal), C(olumn), R(ow) or E(ntry)." This means we can specify whether our format change will affect all cells, a column only, a row only, a cell, or a range of cells.

Let's enter C for column. The prompt line now asks what column we want to affect. Enter the column letter, in this case, B. Press CR.

Now the prompt gives us a great variety of choices, "Define Formats: (I, G, E, \$, RL, TR, TL, D, column width)." Enter I, for *integer* format. Press CR. Look at the entries on the display, and see what happened to the value in B4—and to any other decimal fractions you might have had on your worksheet.

Only the integer portion of the values is displayed. Integer format will round our values to the nearest whole number.

	A	B	C	D	E	F
1		Apples	Apples-1	Apples-2	Apples-3	Apples-4
2	Variable A	5	8	3	4	5
3	Formula1	6	9	4	5	6
4	Formula2	4	5.85	2.6	3.25	3.9
5	Variable B	11	11	6	7	8
6	Variable C	4	4	10	11	12
7	Total	30	37.85	25.6	30.25	34.9
8						
9						

Until now we have always used the SuperCalc program's standard or "default" display format to display numbers. That is the "G" or *general* format. We have seen that with general format, numbers too large to display in ordinary notation will be converted to scientific or exponential notation automatically. In *integer* format, numbers too large to display will appear as a series of >>>> s at the cell location. (In fact, whatever the format, >>>> s will be displayed whenever a number cannot be shown. The SuperCalc program will round off as necessary, even if it can only display one significant digit, the E, and the exponent.)

Enter 123456789 at cell B5.

Now reduce the display width to 8. Do you remember how? /F, G, 8.

Notice the >>>>>>. Now change the column widths back to 12.

Again enter /Format, Column, B, CR. This time specify G, for *general* format. Notice that the fractional portion of our data values has been restored.

Exponential Notation

For scientific or exponential notation, enter /Format, Column, B, (CR), Exponent, (CR). This format displays numbers as a power of 10. For example, 1776 is 1.776E3, or 1.776×10^3 ; 1,000,000 is 1.0E6, or 1.0×10^6 .

Look at your worksheet. As you can see, the SuperCalc program converted all our data to this format. If the data does not look familiar to you, you may wish to experiment a bit. Enter some ordinary numbers in this column, and watch how the program displays them.

	A	B	C	D	E	F
1		Apples	Apples-1	Apples-2	Apples-3	Apples-4
2	Variable	5	8	3	4	5
3	Formula	6	9	4	5	6
4	Formula	4	5.85	2.6	3.25	3.9
5	Variable	>>>>>>	11	6	7	8
6	Variable	4	4	10	11	12
7	Total	>>>>>>	37.85	25.6	30.25	34.9
8						
9						

	A	B	C	D	E	F
1		Apples	Apples-1	Apples-2	Apples-3	Apples-4
2	Variable A	5e0	8	3	4	5
3	Formula 1	6e0	9	4	5	6
4	Formula 2	3.9e0	5.85	2.6	3.25	3.9
5	Variable B	1.2345681e0	11	6	7	8
6	Variable C	4e0	4	10	11	12
7	Total	1.2345681e0	37.85	25.6	30.25	34.9
8						

\$ Format

The next format option may be more familiar to you. Enter /Format, Global, \$, (CR). The dollars and cents format comes into view. Numbers will be rounded to the nearest cent. (Note that the SuperCalc program adds the ".00" to whole numbers, but does not insert a "\$").

We could specify a range of cells—that is, a partial row or a partial column—at this point. Or we could specify a single cell. Let's change the format of C6, the Active Cell. Of course, you could type "C6" on the entry line. Instead, press ",", or CR and see what happens.

The SuperCalc program automatically added C6, the Active Cell, to the entry line. Now enter E for Expo-

	A	B	C	D	E	F
1		Apples	Apples-1	Apples-2	Apples-3	Apples-4
2	Variable A	5e0	8.00	3.00	4.00	5.00
3	Formula 1	6e0	9.00	4.00	5.00	6.00
4	Formula 2	3.9e0	5.85	2.60	3.25	3.90
5	Variable B	1.2345679e8	11.00	6.00	7.00	8.00
6	Variable C	4e0	4e0	10.00	11.00	12.00
7	Total	1.2345681e8	37.85	25.60	30.25	34.90
8						
9						

Individual and Global Format Changes

Let's change the format for a single cell. Move the worksheet-cursor to C6, making that the Active Cell.

Enter /Format, Entry. Notice that the prompt line reads, "Enter range".

ment and press CR. Note the change on your worksheet.

Now, suppose we wished to convert all the display back to the "general" format. Could we make a "global" change? Let's try it. Enter /Format, Global, General (CR).

Well, everything has changed, except those cells where we have been changing formats. Why? The

	A	B	C	D	E	F
1		Apples	Apples-1	Apples-2	Apples-3	Apples-4
2	Variable A	5e0	8.00	3.00	4.00	5.00
3	Formula 1	6e0	9.00	4.00	5.00	6.00
4	Formula 2	3.9e0	5.85	2.60	3.25	3.90
5	Variable B	1.2345679e8	11.00	6.00	7.00	8.00
6	Variable C	4e0	4.00	10.00	11.00	12.00
7	Total	1.2345681e8	37.85	25.60	30.25	34.90
8						
9						

SuperCalc program will change all the formats when "Global" is indicated—except those that you have specified by the Column, Row, or Entry options. It leaves these untouched, because you set them individually.

level. The next levels, in order, are row, column, and finally the global formats. In this case, the column defaulted to the existing global format because there was no intervening row format.

See if you can "default" the format on C6.

	A	B	C	D	E	F
1		Apples	Apples-1	Apples-2	Apples-3	Apples-4
2	Variable A	5e0	8	3	4	5
3	Formula 1	6e0	9	4	5	6
4	Formula 2	3.9e0	5.85	2.6	3.25	3.9
5	Variable B	1.2345679e8	11	6	7	8
6	Variable C	4e0	4e0	10	11	12
7	Total	1.2345681e8	37.85	25.6	30.25	34.9
8						
9						

What can we do so that "global" changes will include any column, row, or cell that was formatted individually? Column B, for example? If you said we must "undo" the individual format, you were right.

Position the Active cell to column B. Enter /Format, Column, (CR). Now enter D, for default, and press CR. Notice that column B has changed to *general* format.

When a *format* setting that refers to a column or row is defaulted, it changes back to whatever format operates on the next level. An entry level format, entered as a cell or a range of cells, is the "highest"

Display Format: Right and Left Justification

Enter /Format, Row, 1, CR. You will see these options ("... R, L, TR, TL...") on the prompt line. They allow us to change the setting of right or left justification. The standard or "default" values are left-justified text and right-justified numbers. Let's shift the text on row 1 so that all text entries are right justified. Can you do it? Of course, you can. TR stands for "Text Right".

	A	B	C	D	E	F
1		Apples	Apples-1	Apples-2	Apples-3	Apples-4
2	Variable A	5e0	8.00	3.00	4.00	5.00
3	Formula 1	6e0	9.00	4.00	5.00	6.00
4	Formula 2	3.9e0	5.85	2.60	3.25	3.90
5	Variable B	1.2345679e8	11.00	6.00	7.00	8.00
6	Variable C	4e0	4e0	10.00	11.00	12.00
7	Total	1.2345681e0	37.85	25.60	30.25	34.90
8						
9						

Now that you have done that, let's try another one.

Enter /Format, Global, L, CR. All numbers will now be justified to the left.

Format entries may be entered in combination; for example, /F, G, R, \$. Try this one, and you will see the numbers right-justified in dollars and cents format.

Graphic Display

We have one more *format* option to try, "graphic" display. Place the Active Cell at C2. Enter =, CR to put C2 at the upper left of our screen. Enter /Format, /Global. Enter the * to specify graphic format. We will also need some display space, so enter 75 as our column width. Press CR. If your values in column C are less than 75, you will see them represented by bar graphs composed of asterisks. Values greater than 75 will fill the column and the screen width; you cannot tell if they are 75 or larger.

	C
2	*****
3	*****
4	****
5	*****
6	****
7	*****
8	*****

But it is possible to make the column display wider than the screen. The screen is 75 characters wide. You can specify a column width up to 126. Then you can scroll back and forth to see the whole line. You might like to try doing this with column C. Try putting values between 75 and 126 into the column and scrolling to see their display.

This was a very brief look at the *graphic* format option. In practice, you will want to make the graphic display fit within a column width of convenient size and still give a comparison of values. In Lesson 8, we will find out how to do this by "scaling" the values in order to fit them within the column.

There is no need to save our work from this lesson. But remember we will use the file LESSON5 again, so do not overwrite it.

Now you may either *quit* or continue on to Lesson 7, as you wish.

What have you learned in this lesson?

In this lesson you have learned:

- That formats can be entered globally, by column, row or cell (including a range of cells).
- The Integer, General, Exponential, and \$ formats of display.
- How to change individual column widths.
- How to *default* formats.
- How to alter justification for text or numbers.
- How to transform numerical values into graphic display.

NOTES

LESSON 7: Title Lock and Window (Split Screen)

You now know enough about the SuperCalc program and its many commands to put it to practical use. You have used the different *format* options. This lesson adds two more commands to your store of tools.

One of them, *title lock*, is useful if you want to keep a portion of the worksheet locked in place while you scroll the rest of the screen. Although it is called "title lock" because locking titles can be especially useful, any part of the screen can be locked. The other, *window*, lets you "split" your screen and look at different parts of your worksheet at the same time. Let's try them now.

Title Lock

First, of course, start the SuperCalc program, if it is not already running. Or, if you are continuing directly on from Lesson 6, zap the screen so that you will have a fresh worksheet.

Now load the file that we saved under the name LESSON5. What can *title lock* do for us? Place the Active Cell at A1. Enter /T. The prompt line asks, "H(orz), V(ert), B(oth), or C(lear)?". The SuperCalc program wants to know which titles you want locked in place.

Press V, for vertical titles.

Now scroll the screen so as to move off the screen to the right. You will see that the titles at the left of our screen are "locked" in place, while the rest of the screen scrolls as usual. The position of the Active Cell when you enter the T command determines how much of the screen will be locked in place.

Use the H option to lock the top row of titles in place.

Move the worksheet cursor down the screen, and watch the information scroll up while the row 1 titles stay in place. Now, go back to A1 by using the = command.

Now let's clear the locked row. Enter /T. Then enter C, for "Clear". We are telling the SuperCalc program that we do not want anything locked. Use the /I command to insert a new row 1 for an additional title. At

	A	B	C	D	E	F
1			Sample Worksheet			
2		Apples	Apples-1	Apples-2	Apples-3	Apples-4
3	Variable A	5	8	3	4	5
4	Formula 1	1 + B3	1 + C3	1 + D3	1 + E3	1 + F3
5	Formual 2	B4*.65	C4*.65	D4*.65	E4*.65	F4*.65
6	Variable B	11	11	6	7	8
7	Variable C	4	4	10	11	12
8	Total	SUM(B3:B7)	SUM(C3:C7)	SUM(D3:D7)	SUM(E3:E7)	SUM(F3:F7)
9						

C1, enter **Sample Worksheet**.

This time let's lock both the horizontal and vertical titles with one command. Position the Active Cell at A2. Enter /T. Enter B, for "Both". This locks column A and rows 1 and 2.

Move the worksheet cursor down and to the right to make the display scroll both up and to the left. Note that rows 1 and 2 and column A stay in place.

Window—Split Screen

What if you want to view two widely separated areas of your worksheet at the same time? The *window* command will allow you to do this. We will use one of the sample programs on your SuperCalc program disk to demonstrate *window*. But we will need to have a new worksheet.

Use the *zap* command to clear everything.

	A	B	C	D	E	F
1		This is a Sample S				
2						
3		Jan	Feb	Mar	Apr	May
4	ASSETS					
5	Acct.s Receivable	1000.00	1050.00	1102.50	1157.63	1215.51
6	Cash	250.00	500.00	525.00	551.25	578.81
7	Unsold Goods	250.00	262.50	65.63	289.41	303.88
8						
9	Total Assets	1500.00	1812.50	1693.13	1998.28	2098.20
10	LIABILITIES					
11	Acct.s Payable	1000.00	916.67	833.33	750.00	666.67
12	Storage Costs	50.00	50.00	50.00	50.00	50.00
13	Labor	100.00	105.00	110.25	115.76	121.55
14	Materials	50.00	52.50	55.13	57.88	60.78
15						
16	Total Liabilities	1200.00	1124.17	1048.71	973.64	898.99
17						
18	NIBT	300.00	688.33	644.42	1024.64	1199.20
19	Dep. Allowance	100.00	100.00	100.00	100.00	100.00
20	Taxable Income	200.00	588.33	544.42	924.64	1099.20

Now let's load that sample program. Use /L and enter the file name, **BALANCE**. BALANCE is a complete sample SuperCalc worksheet. We will study it more closely later. For now, just scroll to column N, and notice that we have columns representing months and total column for the year.

Go back to A1, and scroll down to row 24 to see "Net Income". Go back to A2. Now move the Active Cell to column D. This will designate where we wish to "split" the screen.

Enter /W, for window. The prompt reads, "H(orz), V(ert), C(lear Split), S(ynch), or U(nsynch)". We are going to split the screen vertically into two separate display windows, so enter V.

Notice that now, starting at column D, there is a second set of row numbers. This is the left-hand border of our new display. You should realize that the worksheet itself has not been split. We have simply created two display windows through which to view it. Either window may now be scrolled independently.

Scroll the display and notice that the right-hand window remains still.

Now press the ";" key. This will transfer us to the "other" window. Regardless of which window we are working in at a given moment, the ";" key will serve to move us over to the other.

Instead of splitting our screen into a right and a left half, we could split it horizontally. In fact, we can do this without having to return to a single window display. First set the Active Cell at the point at which you wish to split the screen horizontally. For our example, move the Active Cell to row 15 and then enter /Window, H.

When you wish to remove the split screen, enter /W and then C for clear split.

The S option indicates to the SuperCalc program that we wish to scroll both windows in a "synchronized" fashion. That is, we want them to scroll simultaneously. Let's try it.

Split the screen vertically at D again, but now enter /W, S. Now scroll the displays together. To "unsynchronize" the displays so that only one window will scroll at a time, enter/W,U.

With split screen in effect, each window has its own "global" identity for both the *global options* and *format* commands. For instance, we could specify for-

	D	E	F	G	H	I	J	K
1								
2								
3	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
4								
5	1102.50	1157.63	1215.51	1276.28	1340.10	1407.10	1477.46	1551.33
6	525.00	551.25	578.81	607.75	638.14	670.05	703.55	738.73
7	65.63	289.41	303.88	319.07	335.02	351.78	369.36	387.83
8								
9	1693.13	1998.28	2098.20	2203.11	2313.26	2428.92	2550.37	2677.89
10								
11	833.33	750.00	66.67	583.33	500.00	416.67	333.33	250.00
12	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00
13	110.25	115.76	121.55	127.63	134.01	140.71	147.75	155.13
14	55.13	57.88	60.78	63.81	67.00	70.36	73.87	77.57
15	A	B	C	D	E	F	G	
16	Total Liabilities		1200.00	1124.17	1048.71	973.64	989.99	824.78
17								
18	NIBT		300.00	688.33	644.42	1024.64	1199.20	1378.33
19	Dep. Allowance		100.00	100.00	100.00	100.00	100.00	100.00

Press ";" to place us in the lower screen, and scroll down so we can see Net Income. Press ;. Move the cursor to B5 and change the value. Watch as recalculation takes place. Within moments you will see the Net Income change in the lower window.

Similarly, we could use *format* to specify General format in one window and Integer in the other. We could even look at the same data, if we wished, in two different formats at once.

Enter /W,U. Scroll both displays to show January through April. Now change to display formulas for one side of the screen. Enter /W,S. Now you can scroll through the data in one window and compare it to the formulas as you go.

What have you learned in this lesson?

In this lesson you have learned:

- How to lock any number of rows or columns in place so that they will remain in place while the rest of the screen scrolls.

	A	B	C	D	E
1	This is a Sample SuperCalc Worksheet				
2					
3		Jan	Feb	Mar	Apr
4	ASSETS				
5	Acct.s Receivable	1000.00	1050.00	1102.50	1157.63
6	Cash	250.00	500.00	525.00	551.25
7	Unsold Goods	250.00	262.50	65.63	289.41
8					
9	Total Assets	1500.00	1812.50	1693.13	1998.28
10	LIABILITIES				
11	Acct.s Payable	100.00	916.67	833.33	750.00
12	Storage Costs	50.00	50.00	50.00	50.00
13	Labor	100.00	105.00	110.25	115.76
14	Materials	50.00	52.50	55.13	57.88
15					
16	Total Liabilities	1200.00	1124.17	1048.71	973.64
17					
18	NIBT	300.00	688.33	644.42	1024.64
19	Dep. Allowance	100.00	100.00	100.00	100.00
20	Taxable Income	200.00	588.33	544.42	924.64

The *window* and *title lock* affect the way our worksheet is displayed. The effect is temporary and may always be reversed. When you *save* your worksheet to a disk, the *title lock* and "split screen" information is included; When you load your work back to the screen, it will look exactly as it did before.

If you want to take a break now, use *quit* to exit from the SuperCalc program.

- How to split the screen, either horizontally or vertically, into two windows and how to move back and forth from one "window" to the other.
- How to "synchronize" the windows.
- That you can specify different *global* display options (cell values or formulas) and Global level *format* options for each window.

LESSON 8: Graphic Format Option & Recalculation Options

In this lesson we will look more closely at some of the options available with two of the SuperCalc program's most powerful commands, *format* and *global options*. By now you have enough experience to appreciate what they can do for you. We will need to start with a fresh screen—so use *zap* if you are continuing directly from Lesson 7.

We touched briefly on graphic representation of data in Lesson 6 and promised that you would learn more about it. Now it's time to work a bit with it, so that you will feel confident to try it with your own data. Let's enter some numbers in column A, from row 2 to row 20; use numbers between 1 and 50.

Now enter /Format, Column, A, CR, *, 50, CR.

We have done two things—we have changed to graphic display, and we have increased the width of column A to 50, in order to accommodate our largest number.

Suppose we wish to have the number itself display as well. Try this: Enter /F, C, A, CR, Default, CR. Enter /G, D, F to show formulas. Enter at B1, the "formula", A1. Enter /Replicate, B1, B2:B20.

	A
1	45
2	3
3	12
4	50
5	23
6	13
7	8
8	31
9	29
10	6
11	43
12	21
13	9
14	17
15	25
16	36
17	48
18	23
19	7
20	41

	A	B
1	45	A1
2	3	A2
3	12	A3
4	50	A4
5	23	A5
6	13	A6
7	8	A7
8	31	A8
9	29	A9
10	6	A10
11	43	A11
12	21	A12
13	9	A13
14	17	A14
15	25	A15
16	36	A16
17	48	A17
18	23	A18
19	7	A19
20	41	A20

Enter /F, C, B, CR, *, 50. Enter /G, F.

Now we have a one-for-one graphical display. But what if the values we wish to display are as large as 600 or 1000? Let's put a "scaling" formula into column B, so our largest value will be equal to the column width. You may remember from Lesson 6 that we could make column B longer—up to 126 characters—but it would be difficult to view beyond the screen width, so we may as well leave it at 50 characters.

If we divide any value in column A by the maximum value within our sample from A1 to A20, the result will express its *size* (relative to the maximum). And since our maximum, whatever it is, will be represented by 50 characters (*) of display, we can multiply the size by 50 to determine our "scaled" value.

Now we have an opportunity to use another built-in function: *Max*. The value of *Max* will be the largest value within the specified range or list. We will use *MAX* to scale our graphic displays so that they are relative to the maximum value. Our formula will look like this: $A1*50/MAX(A1:A20)$.

	A	B
1	45	$A1*50/MAX(A1:A20)$
2	3	$A2*50/MAX(A1:A20)$
3	12	$A3*50/MAX(A1:A20)$
4	50	$A4*50/MAX(A1:A20)$
5	23	$A5*50/MAX(A1:A20)$
6	13	$A6*50/MAX(A1:A20)$
7	8	$A7*50/MAX(A1:A20)$
8	31	$A8*50/MAX(A1:A20)$
9	29	$A9*50/MAX(A1:A20)$
10	6	$A10*50/MAX(A1:A20)$
11	43	$A11*50/MAX(A1:A20)$
12	21	$A12*50/MAX(A1:A20)$
13	9	$A13*50/MAX(A1:A20)$
14	17	$A14*50/MAX(A1:A20)$
15	25	$A15*50/MAX(A1:A20)$
16	36	$A16*50/MAX(A1:A20)$
17	48	$A17*50/MAX(A1:A20)$
18	23	$A18*50/MAX(A1:A20)$
19	7	$A19*50/MAX(A1:A20)$
20	41	$A20*50/MAX(A1:A20)$

Enter /G, F. Enter $A1*50/MAX(A1:A20)$ at B1. Now we will use one of the *replicate* options. Enter /R, B1, B2:B20 and the , for options. Enter A, for "A(sk for Adjust)". Respond Y for "yes" for the first A1, then N for "no" for the other two values in the formula.

If you would like to see what your formulas look like, use /G, F. Your formulas should look like this.

Enter /G, F to return to the graphic display. Our graph looks the same but now change the value in any cell to, say, 75. Notice that all the other lines are "scaled", relative to 75. Enter 150.

You may wish to save this example for your own use later. Use *save* and call the file GRAPH or something easy to remember.

Now let's change our formula to scale from the minimum to the maximum value in A1 through A20. Go to B1 and use *edit*. We will insert new information into the formulas:

$$A1-MIN(A1:A20)*50/MAX(A2:A20)$$

Move the cursor to the left and put in (, then move right to the * and insert 13 spaces. Then, replace the blanks with $-MIN(A1:A20)$

Replicate it for A2 through A20, using the *ask* option. Be careful to adjust only the first cell reference in the formula.

Enter /G, F. Notice how the results of this formula differ from those of our first formula. Try different values to test and verify your work.

Recalculation Options

If you enter a new value in column A, notice that the program takes considerable time to go through all the necessary recalculation of formulas. It may take even longer with a larger worksheet, because the SuperCalc program recalculates automatically every time we enter a new value.

We can suspend that automatic recalculation. Enter /G, M. Now try entering new numbers for the graph.

As you can see, the time required for their entry is greatly reduced.

This is fine, but what does "manual" recalculation

mean? Certainly, we don't do it ourselves with pencil and paper. How can we get the SuperCalc program to do it? By now you have used almost every option offered. You may have wondered from time to time just what the "!" is for.

Besides its usual exclamatory function in text, "!" has a very special meaning to the SuperCalc program: Pressing ! "forces" a recalculation.

Try pressing !.

Manual mode allows you to make periodic recalculations at your convenience. When you wish to re-establish automatic recalculation, enter /G, A for "automatic".

Order of Recalculation

When the SuperCalc program recalculates, it does so in a certain order. You can change that order. Usually, the order of calculation will not affect the results of your recalculations, and you can ignore it. But there are times when it can make a difference. Let's explore this problem.

First, use *zap* to get a fresh worksheet.

Enter 4 into cell A1, 6 into A2, and $SUM(A1:A2)$ in A3. Now enter A3 into B1.

Look at the values. Everything seems fine. A3 and B1 both display 10. Now change the value in A1 to 3.

Observe that B1 does not yet contain the 9, which is the new result in A3. Why?

The SuperCalc program recalculates row by row. First row 1, then row 2, then 3, and so forth. Obviously, A3 was still 10 when B1 referenced its value during recalculation.

Now enter /G. The prompt line now says, "F(orm), N(ext), B(order), T(ab), R(ow), C(ol), M(an), A(uto)?"

We have just determined that in our example recalculation should proceed column by column, so let's enter C. This will change the order of recalculation.

Enter 5 in A1. And now everything seems to work, because the SuperCalc program is proceeding down

columns as it recalculates. Both A3 and B1 display 11.

It is possible to create a situation where neither order of calculation can give us current values in all cells.

Here is an example. First, *zap* the worksheet.

Enter 5 in cell A1. In C1, enter A1. In A3, enter A1. Now go to B2 and enter $C1 + A3$. You can see a problem coming up, can't you?

Of course, at the moment all looks fine—C1 and A3 display 5, B2 displays 10. Now go to A1, and enter 4.

Cells C1 and A3 display 4, which is correct. But B2 has 9. When it was calculated, one of the cells was 4, the other was 5.

Change the order and try again. /G, C. Then enter 6 in A1. C1 and A3 show 6, but B2 shows 10. When it was calculated, one cell had 6 and the other had the leftover 4.

Press !. Now B2 has 12, the correct value. You have forced a second recalculation and have the correct value.

This example is unrealistic and improbable. Still you should be aware that it is possible to create situations involving out-of-order references, which give misleading values.

In a case like this one, we can press ! and cause a second recalculation, which gives us the correct values. (You see that you can use "!" in automatic mode as well as in manual mode. Generally, of course, you don't need to).

Cases of out-of-order references like this one are called "forward" references, because the reference is "forward" to a value not yet recalculated. They can occur in actual worksheets, perhaps because a worksheet is especially complex or because it has been amended or changed in ways very different from its original design.

A real-life example of forward reference might happen like this: You build a worksheet with a table of expenditures by category (columns) and locations (row). You SUM the rows and columns to get totals. Everything works fine. Later, you add a table comparing various category and location totals. Everything still works fine, because you know where the second table should be. Then, someone else adds new material to the worksheet, and moves one of

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LESSON 10: A Projected Balance Sheet

This example is called BALANCE. It will look familiar, because we used it in the last chapter.

Load BALANCE now, and let's take a closer look at it. It has a split window, of course. That's why we used it earlier. What else can you find out about it? How far does the information extend? Is there a title lock present? Is scrolling synchronized or unsynchronized?

Play around with it. See what you can find out on your own before reading any further.

The left window has information extending to column N. Both windows have information down to row 26. Scrolling is not synchronized now, and you will probably find it more convenient if you synchronize the scrolling. There are two locked portions in the left window: column A and rows 1-4.

What about the worksheet's contents? This seems to be a balance sheet for some project within a larger enterprise—notice "Department Allowance" on row 20.

As you scrolled around, you may have found that most of the figures are formulas. Set the formula display for the left window, if you haven't already done so, and notice that all figures for the months of February through December are either formulas that depend on prior months or are constants repeated from the January column. The totals column in the right window consists only of formulas.

The balance sheet is a projection based on the January figures. Assets, liabilities, and net profits are projected. For example, in row 5 we see the assumption that accounts receivable (sales) will grow steadily at 5% a month. In row 13 we see that storage costs are constant. Taxes (row 23) are a constant 30%.

What happens if you change some of these assump-

tions? Try it. They can be changed easily.

You can change constant figures in the January column and replicate them across the row for February through December. You can change the February value for formulas, and then replicate across March through December (without options, so that the SuperCalc program adjusts automatically).

You will notice that slightly raising or lowering constant values, such as storage costs (row 13), or constant relationships, such as taxes (row 23), has a fairly predictable effect. But slightly changing the expected percentage of increase in sales (row 5) can have a more marked effect. There are other places where a slight change in a value will have a significant effect, because it causes a change in trend. (For example, rows 5, 6, 7, 14, and 15.)

What is the effect of a *decline* in sales (row 5)? An increased rise in labor costs?

As we said, this example is realistic, but it is simplified. It is typical of a worksheet developed to get a quick impression of a possible project or of the prospects for an existing project. You could adapt the example for similar projections of your own.

For many applications, it would be more realistic to assume seasonal changes than it is to assume constant changes (like the 5% sales growth). You might see what happens if you make sales and their associated values rise in summer and fall in winter, or some similar pattern.

In a more realistic forecast, other values might change at intervals. Storage costs might increase once in the middle of the year. Taxes might rise when sales increased beyond a certain amount.

You can use the SuperCalc condition function (IF) to test a total value and increase the tax rate when the total exceeds a certain amount. One way to do that is

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to test the taxable income figure for each column (row 21).

Try this experiment. Let's say that if the taxable income is greater than \$1800, the tax rate rises from 30% to 32%. Insert a row at 23. and put the title **Tax Rate** at A23. Now put the following formula in B23: **IF(B21 = < 1800, .3, .32)**. Replicate the formula, without options, across the row from February

through December.

Now the tax rate will be 30% when the taxable income is \$1800 or less, and 32% when it is greater. In what month does the rate increase?

Now change taxes (row 24). Change B24 from **.3*B21** to **B23*B21**. Replicate this change, without options, across row 24 from February through December.

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Horizontal lines for taking notes.

LESSON 11: Break-Even Analysis

The idea behind a break-even analysis is a simple one. When you market a product, you have two kinds of costs. There are fixed costs, such as development and overhead; and there are variable costs associated with making the product, such as parts and labor. When you sell the product, you want to price it in such a way that you recover your fixed costs, your incremental (or variable) costs, and also make a profit. The break-even point is the point where you switch from loss to profit.

This example is called BRKEVN. Load it now, and see what it looks like.

The setup is basically simple. Let's step through an example. You will probably want to set recalculation to manual mode until we have plugged in all the variables we want to provide.

We set the retail price in B2 and the discount rate in B19. (We could have directly specified a wholesale price, but specifying price in terms of retail price and a discount from that allows us to experiment with variations in pricing policy for the public and for the people who will wholesale this product for us.)

In B18 we set the quantity increment, such as 50, 100, or 1000, whatever is suitable for the particular product. Then we provide our fixed and variable costs.

At this point we can calculate the results with ! and see the break-even point. Maybe we will see how the profits can mount up and make us rich (if we chose right)—or how miserable our prospects are (if we chose wrong).

Now let's tinker a bit and see what happens. You may want to set automatic recalculation at this point.

Try changing some of the fixed costs, then some of the variable ones.

You will notice, for example, that increasing fixed costs delays the point where you break even, but does not have a great effect on your eventual profits. But changing variable costs has a continuing effect.

Try pricing and discount changes. Were you surprised at the results?

Now let's look at how the worksheet is built. Set formula display.

Take a look at column C, Units Sold. C2 starts with B18, which is quantity increment. C3 is C2 plus quantity increment, and so on down the column. The formula for each value consists of the value above plus the increment.

What is an easy way to build a column of values like that?

Yes. You would put the values shown in cells C2 and C3. Then you would replicate C3 down the column, using the Ask option. You would tell the SuperCalc program to adjust the first value and not adjust B18.

Now look at column D, Profit and Loss. These formulas may look rather forbidding, but once we have figured them out, we will see that the calculation is straightforward.

Let's start with a look at D2. This shows as: **C2*B3*(.01*(100-B19))-(B9+(B16*C2))**

Going down the column, we see that the other formulas are similar. In D3, the formula has C3 in place of C2, but all other values are the same. This pattern continues. For each entry in column D, the column-C references refer to the adjoining Units Sold value.

So the formula in D2 starts out with Units Sold times Retail Price (that is, C2*B3).

The **.01(100-B19)** simply subtracts the discount rate (B19) from 100 and makes it a per cent. If B19 con-

Data Entry

The SuperCalc program accepts numbers, formulas, and text. Ordinary numbers can have 16 significant digits plus a decimal point. Scientific, or exponential, numbers can have 16 significant digits and a decimal point, all raised to a power of ten. The limit is the 63d power of 10. Text can have up to 110 characters. Formulas can have up to 110 characters and can include arithmetic expressions, relational expressions, functions, and references to cells. The next chapter, "Detailed Reference" will give you further detail on data entry.

In-Line Editing

Once you begin to type a command or data on the entry line, the four arrows—and the alternate diamond keys—no longer move the worksheet cursor around the worksheet. Instead, you can use them to edit information on the entry line. You can always correct your commands or data while they are on the entry line. The /Edit command allows you to use the edit process, and enter the changed contents into the Active Cell after you have committed an entry to the worksheet.

Left and right arrows (or **CNTRL s** and **d**) move the data-entry cursor non-destructively across the entry so that the cursor can be positioned where the change is to be made.

Because a cell can contain 110 characters, which is longer than can be shown on the entry line, the SuperCalc program will scroll your entry during the edit process, allowing you to examine any portion of it.

Wherever the cursor is, a new character can be entered to replace the old one. The cursor then moves right one location.

Down arrow (**CNTRL x**) deletes a character each time it is pressed. The cursor stays in position.

The Up arrow (**CNTRL e**) inserts a new space at the cursor location each time it is pressed. The cursor stays in place, and spaces fill out to the right of it. The space(s) can then be filled with additional characters.

Remember, what you see on the entry line is what gets entered into the Active Cell. When you finish

making your changes and enter the data or execute the command, SuperCalc takes *everything* on the entry line, not just the material to the left of the cursor.

Recalculation

The ! command forces recalculation. In manual calculation mode, the command is the only way to have the program recalculate values. In automatic mode, it provides an additional recalculation.

Moving From Window to Window

The ";" command moves the worksheet cursor from one portion of a split window display to the other portion. See the /Window command.

The "/" Commands

All other commands consist of / and a single letter. SuperCalc's interpretive prompting fills out the rest of the word, and the prompt line lists the options available. These commands are summarized on the following pages and described in detail in the next chapter.

Formula Adjustment

Some commands cause formulas to be moved into new locations. It is usually desirable to have formulas adjusted for their new locations. For example, cell D4 has the formula "+B4*C4". If the contents of cells B4, C4, and D4 are moved to T7, T8, and T9, the formula in T9 should read "+T7*T8". The SuperCalc program ordinarily makes such adjustments automatically.

For some commands, options allow you to move formulas without adjustment, or to be queried so that you can choose for each cell reference of each formula whether or not it should be adjusted. Some commands also have an option to move values only; formulas are not transferred, only their values.

Condensed Reference to the / Commands

/Blank

Blank the contents and clear the formatting of a cell, partial column, partial row, or block.

/Copy

Make a one-to-one copy of a cell, partial column, partial row, or block to a new location. Options give a choice of formula adjustment or copying values only.

/Delete

Delete a column or a row; automatically adjust the rest of the worksheet.

/Edit

Edit the contents of a specified cell and place them in the Active Cell.

/Format

Specify formatting for a cell or group of cells, a column, a row, or the entire worksheet. Choices (one or more):

Numeric display

Integer notation (value rounded to integers).

Ordinary notation, if it will fit, or scientific notation.

Scientific notation.

Dollar amount (rounded to nearest cent, ".00" appended to whole numbers).

Right or left justify, text or numerical values.

Graphic display, using *s to represent the number.

Text display. Left or right justify.

Column width. Specify number of characters for one column or all columns.

/Global

Set worksheet options:

Options

Display/Suppress borders

Display values of formulas or formulas

Recalculate automatically/on request

Tab over/through protected data

Set order of recalculation as columns across/rows down

Set or clear auto-advance in current direction.

/Insert

Insert a new empty column or row; automatically adjust the rest of the worksheet.

/Load

Load the worksheet contents and settings from a disk file. You may load all or part of the worksheet at a location you specify. Options give a choice of formula adjustment or of loading values only.

/Move

Move a column or row to a new location; automatically adjust the rest of the worksheet.

/Output

Write all or part of the worksheet to the printer, the terminal, or a disk test file. Options allow writing the displayed information or the contents of cells.

/Protect

Protect the contents and formatting of a cell, partial column, partial row, or block from change.

/Quit

Exit from SuperCalc to the system; optionally, save the worksheet.

/Replicate

Make a one-to-many copy of a cell to a group of cells, a partial column to a group of partial columns, or a partial row to group of partial rows. Options give a choice of formula adjustment or of replicating values only.

/Save

Save the worksheet contents and all settings on a disk file. Options give a choice of saving all contents or values only.

/Title

Lock columns, rows, or both into their place on the display window. Other information will scroll; these will remain fixed.

Summary Reference

/Unprotect
Remove protection from the contents and formatting of a cell, partial column, partial row, or block.

horizontally or vertically. Each portion can have separate format settings and options.

/Zap
Set entire worksheet to empty cells and clear all settings. (Overrides protected cells.) Equivalent to a fresh start.

/Window
Split the display window into two portions,

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Horizontal lines for notes.

Chapter 9

Detailed Reference

The material in this chapter is divided into these major sections: "Data Entry and Data Display," "Status, Prompt, and Entry Information," "Formulas and Functions," and a "Detailed / Command Reference."

Distinguishing Among Numbers, Text, and Formulas When Entering Data

Numbers start with digits (0-9), +, -, or . (period). An entry that begins with a period is assumed to be a decimal entry beginning with zero and a decimal point.

Text starts with quotation marks.

Formulas can start with the same characters as numbers—that is, 0-9, +, -, or period. They can also start with a (. You can put arithmetic expressions, relational expressions, functions, and references to cells within formulas.

Data Entry and Data Display

This section provides some detailed information about the data you can put into cells and the formats you can use to display that data.

Data Display

You will find more information about display options under "/Format" and "Global Options" in the "Detailed Reference to / Commands" later in this chapter.

Limits for Data Entry

Numbers. 16 significant digits, plus optional decimal point and optional sign for ordinary numbers. 16 significant digits, plus decimal point and optional sign for exponential numbers (scientific notation). These 16 digits can be raised to the 63rd power of 10.

Numbers. Ordinarily right justified; optionally, left.

Largest ordinary number: 9999999999999999
Smallest ordinary number: -9999999999999999

Largest exponential number: 9.999999999999999e62
Smallest exponential number: -9.999999999999999e62

The way in which numbers appear when displayed depends on the display format selected, not on the way they looked when entered into the cell. The content of the cell is not affected by the display format.

Display options allow numbers to be displayed in the following ways:

Text.
110 characters. Examples: "Expenses, January"

- General (ordinary numbers if they fit column display width; otherwise exponential)
- Exponential (scientific notation), rounded if necessary Integer (integers only; if there is a decimal number, round up or down to make it integer)

Formulas.
110 characters Examples: "7+A5, 9+5*E7, SUM(B1:B9), MIN(A4, D4, G4)"

- Dollar amounts, rounded to the nearest cent; ".00" is appended to whole numbers
- Graphic display, using *s to show relative values in bar graph form

For any display format, if the numeric display cannot fit into the column, then > > > fills the column.

A column can be widened to display a number or text in full. Column width can be set from 1 to 126.

Text. Ordinarily left justified; optionally, right.

If text is too large for the column, the text display will continue into the adjoining blank cell(s) to the right. If it cannot continue into adjoining columns, it is cut off at the right.

Formulas. Ordinarily the resulting value is displayed; optionally, the formula. On the status line, the formula is displayed. When the formula is displayed in a cell, it can continue into adjoining blank cells as text does.

Status, Prompt, and Entry Information

SuperCalc uses the prompt and status lines near the bottom of your screen to send you messages. You use the entry line. Here is a more detailed look at some of the things you may find on those lines.

Active Cell Status

The status line is the first of the three lines. This line always displays information about the Active Cell. This information displayed includes: The "Current Direction" that you have been moving, the Active Cell location, the Active Cell's specific format and protection, and the textual contents of the Active Cell.

Here is an example of a status line:

```
> A5 L$TR P Text="February
```

Here is what it means: [xxxxx ERROR]

```
>
  The current direction of the
  worksheet cursor, set by the last ar-
  row key pressed. It may be >, <, v, or
  A.
```

A5 Is the Active Cell location. Data entered will go into that cell. Commands that use the current column or row will use the column or row containing that cell; in the example, column A and row 5.

L\$TR Active Cell format settings; in this case, numbers Left justified, \$ format, and Text Right justified. The detailed reference for /Format gives full information on these settings.

P Data protection. P if the Active Cell is protected, blank if unprotected.

Text="February" The contents of the Active Cell; in this case, Text. Repeating text is indicated by "Rtxt=". Numbers or formulas show as "Form". For example, "Form=73" or "Form=12*B9."

The SuperCalc program also uses the status line to display error messages and certain informational messages. These special messages disappear and the status information reappears as soon as you press any key.

Prompt and Global Status

The middle of the three information lines serves a dual purpose; while you are entering a command, this line "prompts" you by outlining the choice of possible entries you may make. For example, after you have entered /Delete, the prompt line reads:

R(ow) or C(olumn)

This prompts you that you must next tell the SuperCalc program whether you wish to delete a Row or a Column. If you then enter Row, the prompt line changes to:

Enter Row Number

to remind you that a row is specified by a Number.

Whatever the prompt is, if you press ? a short but detailed explanation of your options will be displayed on the screen.

When you have finished entering a command, the middle line reverts to its other function: global

status. It then tells you about your worksheet's current status. An example is:

```
Width: 9 Memory:32 Last Cell:J10 ? for HELP
```

This information is:

Width:9 Column width. This is the display width of the column that contains the Active Cell. The standard or default setting is 9, but you can specify a different width. You can set all columns to the same width or set different widths for different columns. In the event that you change the default setting, the status line will list the display width that you have selected.

Memory:32 Available memory, in "kilobytes" (a kilobyte is the memory sufficient for 1024 characters or digits). This number changes as you add data to the worksheet.

Cell:J10 This tells you the lower right-hand corner of an imaginary block that just contains all of your worksheet. In other words, J is the right most column that you have used, and 10 is the lowest row (biggest row number).

? for HELP This reminds you that typing "?" will always give you an explanation of the options you have at that moment. If you press "?", you will receive an explanation of your choices.

The / key precedes most commands. If you press it, the prompt line will change to list possible entries and the "?" symbol. Pressing "?" will give you an explanation of the choices listed on the prompt line.

As you proceed within commands, or make other possible entries, the prompt line will change to show you your current choices. Whenever you press "?", a short but detailed explanation of your options will be displayed on the screen.

Entry

This is the line where you tell the SuperCalc program what to do by entering your commands or data. Your

experience with the self-teaching materials in Part Two and the information elsewhere in the summary and detailed reference chapters will tell you what you need to know about entering data or specific commands.

Formulas and Functions

Formulas specify calculations and comparisons. Formulas use values in other cells (which may be themselves the result of formulas), constants, and built-in functions. These values are combined using arithmetic and relational operators:

+	addition
-	subtraction
*	multiplication
/	division
^	raising to a power
=	is equal to
<>	is not equal to
<	is less than
<=	is less than or equal to
>	is greater than
>=	is greater than or equal to

The built-in functions:

ABS(value)

Absolute value.

AVERAGE(list)

Arithmetic mean of the non-blank values in the list.

COUNT(list)

The number of non-blank entries in the list.

ERROR, NA

Display "ERROR" or "NA" (not available) for the cell having this function and for any cell with a formula referring to this cell.

EXP(value)

Raise "e" exponentially. Value is the exponent.

OR(expression 1, expression 2)

Results in "true" (value of 1) if either expression 1 or expression 2 are "true" (non-zero), otherwise results in "false" (value of 0).

AND(expression 1, expression 2)

Results in "true" (value of 1) if both expression 1 and expression 2 are "true" (non-zero), otherwise results in "false" (value of 0).

NOT(expression)

Results in "true" (value of 1) if expression is "false" (zero), otherwise results in "false" (value of 0).

IF(exp1,exp2, exp3)

If expression 1 is true, then use expression 2, otherwise use expression 3. Expression may be combined with AND, OR NOT to form expression 1.

INT(value)

Integer portion of value. The value is not rounded. This is not to be confused with I/Format, which will round-off numerical entries.

LOOKUP(value,column/row range)

Search the range for the last value less than or equal to the search value given. Return the adjacent value from the column to the right of search column or the row below the search row. Assumes the search range is in ascending order of values.

Ln(value), LOG10(value)

Natural log, log base 10, of the value.

MAX(list), MIN(list)

The maximum or minimum value in the list.

NPV(discount, column/row range)

Net present value of a group of cash returns at the given rate of discount. The cash amounts are assumed to be projected for equal time periods, such as every year; and the discount rate is for that interval. The first cash entry is discounted once, the second twice, and so forth, and added to form the total value.

PI

Pi to 16 significant digits.

SIN(value), ASIN(value), COS(value), ACOS(value), TAN(value), ATAN(value)

Trigonometric calculation of the value. ASIN is arcsine, etc. Trigonometric results are give in radians.

SQRT(value)

Square root of value.

SUM(list)

Sum of the values in the list.

Here is a quick explanation of what "value," "range," and "list" mean in this context.

Value is a constant, the value of a cell, or a combination of these values made by using the arithmetic operators.

Examples:

Constants: 12, 5.9, 3.4e3

Cell values: A12, B19, BK54

Combinations: 12+5.9, B19-3.7, A12*B14, (9+E5)/4

The combinations are also called "expressions." They are evaluated from left to right; * and / are evaluated before + and -. Use parentheses to group terms in your expressions so that SuperCalc will evaluate them as you wish. Examples:

$5+4*3+1=18$ (that is, $5+12+1$)

$(5+4)*3+1=28$ (that is, $9*3+1$)

$5+4*(3+1)=21$ (that is, $5+4*4$)

$(5+4)*(3+1)=36$ (that is, $9*4$)

Here are some examples of functions with values:

ABS(A12), SQRT(9.5*E7), LN(3.5 e4), TAN(C5 + E5)

Range is simply a partial column or partial row, such as B4:B12 or B4:H4. Here are some examples of functions that use both a value and a range:

LOOKUP(7,C5:J5) LOOKUP(A4,D3:D12),
NPV(.18,D12:H12) NPV(B4,G3:G8)

List You can mix all of the above. A list can have values, expressions, and ranges. Here are some examples:

SUM(A12,B9,D5)
SUM(C12:E12,H3:H7)
SUM(MAX(E3:B9),MAX(C12:E12))
COUNT(E3:E12,F8:J8)
AVERAGE(B7,B8:H8,C12:C20)

Sample worksheets provided on your SuperCalc disk give examples of these formulas in actual use. The examples are explained in the lessons. This material will help you understand how you can put the formulas to work; it is especially useful for IF, LOOKUP, and NPV.

THE / COMMANDS

All the commands are entered with / and the first letter of the command. The rest of the command is automatically filled out on the entry line. For example, "B" appears as "Blank". The prompt line lists the choices available to you for that command. When you enter /, the prompt line shows the possible one-letter entries. When you choose one of these, the prompt line changes to show the choices available for that particular command. Whenever you wish further information about your options, you can press the ? key.

Some commands have several levels of entry; that is, there will be a sequence of prompts and entries before the command is executed. An example is the command to copy from one location to another. If you are entering one of these multi-level commands, it is possible to back out of your current entry by using the back (left) arrow. In fact, you can back entirely out of the command without executing it. You may also cancel any command by entering CNTRL-Z (holding down the Control key while pressing Z).

Commands, like data, can be edited with the in-line editor. Remember that when you press carriage return (CR), everything visible on the entry line will be executed—not just the part of the command to the left of the cursor.

A few commands use only the current cell, column, or row. Most allow you to specify which cell, column, or row in the command line. Column addresses may be entered as either capital or lower-case letters; SuperCalc will convert lower-case column entries to capitals. If you want to specify the current cell, column, or row (as appropriate) in such commands, simply press "," (comma) to enter the current location into the command line.

The current-cell key (ESC) can also be used to enter the current cell, column, or row into the command line. (If only the column or row is needed, the other part of the current cell location is ignored.) As explained in "A Summary Reference," once you press the ESC key, you can move the Active Cell temporarily to a new location. Its address changes on your entry line and can be used in your command. Pressing : allows you to develop two cell addresses, such as B5:E5, which is convenient for many commands.

The carriage return (CR) ends a command, causing it to be executed. In some cases, a comma (,) can also end a command because pressing the comma enters the last item of information needed in the command line. The command is complete, so the SuperCalc program executes it.

DATA COMMANDS**/Blank**

Blank the contents and clear the cell format of a cell, partial column, partial row, or block. Blank clears the formatting of the cell if it has been formatted individually (that is, at the E level; see /Format, below). Formatting for a column or row is not affected, even if every cell in it is blanked. Only the /format command can change the format for a column or row. Protected cells will be bypassed.

Prompt: Enter Range

Examples:

/Blank, c7 (CR)
/Blank, c7:c12(CR)
/Blank, c7:h7(CR)
/Blank, c7:h12(CR)

/Edit

Edit the contents of a specified cell and place them in the Active Cell. If the Active Cell is protected, you cannot edit.

Prompt: From?

Specify a cell; "," means the current or Active Cell. The cell contents come to the entry line, replacing the command on the line.

Editing is done with the in-line edit function. Use the arrow or alternate diamond keys to move the cursor non-destructively left and right to characters you want to change. The character that will be altered is the one under the cursor. You can replace characters one-for-one simply by typing new characters over them. You can delete characters, including blanks, by pressing the down arrow (or CTRL-x). You can insert

blanks by pressing the up arrow (or CTRL-e). Then if you wish you can replace the blanks by typing other characters over them.

Example:

The Active Cell contains
"Janaurry".

/Edit and ";" brings this to the entry line. Use the left arrow to move the cursor to the second "a", Janaurry. Type "ua". Move cursor right to one of the "r"s, Januarry. Press the down arrow to delete it, and press carriage return. (Remember, pressing **CR** puts the entire entry into the cell no matter where the cursor is positioned.)

The Active Cell now contains "January".

/Format

Specify formatting for a cell or group of cells, a column, a row, or the entire worksheet. Choices (one or more):

Numeric display. Ordinary, scientific, both; dollar amounts; right or left justify.

Text display. Right or left justify.

Column width. Specify display width for one column or all columns.

Prompt: Enter Level: G(lobal),
C(olumn), R(ow), or E(ntry)

Specifies the format for displaying numbers or text in the entire worksheet (G), in a column (C), a row (R), or a cell or group of cells (E). If you reply C or R, you are asked to specify the column or row; ";" will specify the current column or row. If you reply E, you can specify a single cell or a range of cells; that is, a partial column or partial row. Using E to specify formatting at the cell level gives the highest priority of formatting.

The next prompt message you receive depends on the level of formatting you specified.

A level of **G** or **C** has this prompt:

Define Formats: (I, G, E, \$, *,
R, L, TR, TL, D, column
width)

A level of **R** or **E** has the same prompt; except that "column width" is not included because it is not a valid choice.

You may enter as many of the formats as you wish.

Here is a list of the possible format choices:

- I Display numbers as integers. Decimal fractions are rounded up or down to convert them to whole numbers.
- E Exponential. Display numbers in scientific notation, as a power of 10. For example, 1776 is 1.77e3. 1,000,000 is 1.0e6. Round if necessary.
- G General. Display the number as an ordinary number if it fits in the column width; otherwise, display it as an exponential number.
- \$ Dollar amount. Round to the nearest cent; append ".00" to whole numbers. No \$ is displayed.
- * Graphic display for numbers. Use asterisks to show the relative sizes of numbers. Allows bar graph display.
- R, L Right, Left Justify. For numbers.
- TR, TL Text Right, Text Left Justify. For text.
- 0-126 Column width, for the specified column or for the worksheet.
- D Default. Reset to the next level of formatting. See note 2 below.

When your entries are contradictory, the SuperCalc program will act on the one entered last. For example, if you enter "R, L, I, G", then L and G will take effect and R and I will be ignored.

NOTES:

1. **Format** does not apply to data entry. The contents of a cell are kept as entered; **Format** specifies how the contents are displayed.

2. Where formats differ, the order of

precedence is first the cell (E), then row (R), column (C), and finally worksheet or "global" (G). That is, cell formatting overrides any format for the column or row where the cell is. Where row and column intersect, row formatting overrides. Any of these override the global settings.

When the program is started up, these global format settings are in effect: general numeric display (G), numeric right justify (R), text left justify (TL), and a column width of 9.

Examples:

/Format, C, E, 12 (CR)
/Format, R, TR, (CR)
/Format, G, \$, 11, (CR)
/Format, E, E, (CR)

WORKSHEET ADJUSTMENT COMMANDS

/Delete

Delete a column or row.

Prompt: R(ow) or C(olumn)

If you reply **R**, the prompt becomes:

Enter Row Number

You may then enter a number from 1 to 254, or ";" for the current row.

If you reply **C**, the prompt will be:

Enter Column Letter

You may enter a letter designation from A to BK, or ";" for the current column.

This command causes the contents and formatting of the specified row or column to be deleted. The command will not execute if a protected cell is in that row or column.

The rest of the worksheet adjusts:

- Rows below the deleted row move up, and all row numbering adjusts. If row 4 is deleted, row

5 moves up and becomes the new row 4, and so on.

- Columns to the right of the deleted column move left. If column D is deleted, column E moves and becomes column D, and so on.

Examples:

/Delete, R, 5, (CR)
/Delete, C, E, (CR)

All formulas on the worksheet are automatically adjusted as necessary. The adjustments preserve references to cell contents by giving their new location. For example:

Row 3 is deleted.

A prior reference was SUM(B2:B5).

That reference becomes SUM(B2:B4).

The contents that were at B5 are now at B4.

A reference to B3 itself would cause an error if column B or row 3 is deleted. This is because the contents vanish, and there can be no new reference to them. The SuperCalc program cannot assume that this is a special case, one where you want the old formula to refer to the new contents of cell B3. For example:

Cell A6 has the formula SUM(B3, F3, G3).

Column B is deleted.

Cell A6 will now display "ERROR" because the contents of B3 have vanished. To correct the error, you must correct the reference to B3 in cell A6.

/Insert

Insert a new empty column or row.

Prompt: R(ow) or C(olumn)?

If you reply **R**, the new prompt is:

Enter Row Number

You may enter a number from 1 to 254, or ";" for the current row.

If you reply **C**, the prompt is:

Enter Column Letter

You may enter a letter or letters from A to BK, or “,” for the current column.

This inserts a new row or column of empty cells between existing rows of columns. A new row appears above the specified row, a new column to the left of the specified column.

The rest of the worksheet adjusts. Columns move right, rows move down. The contents of each column or row are preserved but have a new designation. The contents, if any, of the last row (254) or column (BK) are discarded. The command will not execute if that last row or column contains a protected cell.

Example:

/Insert R, 5(CR)

/Insert C, D(CR)

All formulas on the worksheet are automatically adjusted as necessary. The adjustments preserve references to cell contents by giving their new location. For example:

Row 3 is inserted.

A prior reference was SUM(B2:B5).

That reference becomes SUM(B2:B6).

The contents that were at B5 are now at B6.

A prior reference to B3 itself will become a reference to B4 when a new 3 is inserted.

/Move

Move one column or row to a new location.

Prompt: R(ow) or C(olumn)?

If your reply is **R**, the prompt is:

Enter Row Number

You may enter a number from 1 to 254, or “,” for the current row.

If you reply “**C**”, the prompt is:

Enter Column Letter.

You may enter column designation from A to BK.

After you have specified a row or column, the SuperCalc program will ask the destination of the move. The prompt is: To?

Reply with a row or column designation, whichever is appropriate. Pressing “,” or the current-cell key (ESC) will designate the current row or column.

Move adjusts the worksheet without destroying any data or any formatting. It moves a specified column left or right and inserts it in a new location, or moves a specified row up or down and inserts it in a new location. The columns or rows in between move to fill the old location. They move in the opposite direction to the basic move.

Example:

/Move R, 5, 12(CR)

/Move C, E, A(CR)

All formulas on the worksheet are automatically adjusted as necessary. The adjustments preserve references to cell contents by giving their new location. For example:

Row 3 is moved to row 5. The former rows 4 and 5 move up to become new rows 3 and 4. The former row 3 becomes row 5.

A prior reference was SUM(B2:B5).

That reference becomes SUM(B2:B4). The contents of B5 are now at B4.

BUILD DATA AND/OR WORKSHEET COMMANDS

/Copy

Make a one-to-one copy of a cell, partial column, partial row, or block to a new location. Options give a choice of formula adjustment or copying values only.

Prompt: From? (Enter range)

Specify a cell, partial column, partial row, or block.

The next prompt is:

To? (Enter Range), then Return; or “,” for options.

Copy makes a one-to-one copy of the source into a destination of the same shape and size. Enter a single cell address to give the new location:

For a partial column, give the upper cell.

For a partial row, give the left cell.

For a block, give the upper left cell.

Press carriage return (CR), or if you wish a choice of options for copying formulas, press the comma key (,).

If you press **CR**, then all the formulas are copied and automatically adjusted; that is, all references to other cells are adjusted for their new location, if possible.

If you press “,” to select options, the SuperCalc program will prompt you:

N(o) Adjustment, A(sk for Adjust), V(alues only)

N—Copies formulas exactly as they are.

A—Allows you to choose for each reference to another cell address within a formula whether to copy it as is or to have the SuperCalc program adjust it.

V—Copies the values only, without formulas.

When you choose the Ask option, each formula that qualifies for possible adjustment is displayed on the entry line. Its source and destination address are shown on the prompt line. The SuperCalc program positions the cursor at each cell reference on the entry line, and you are asked to reply “**Y**” or “**N**”. **Y** means, “Yes, automatically adjust.” **N** means “No adjustment, transfer as is.”

Examples:

Copy cell to cell:
/Copy, b9, c12(CR)

Copy partial column to partial column:
/Copy, b9:b15, e9(CR)

Copy partial row to partial row:
/Copy, b9:g9, h12(CR)

Copy block to block:
/Copy, b9:g15, k20(CR)

Copy without adjustment:
/Copy, b9, c12, N(CR)

Copy, ask for individual choice of adjustment:
/Copy, b9, b15, e9, A(CR)

/Replicate

Make a one-to-many copy of a cell to a group of cells, a partial column to a group of partial columns, or a partial row to a group of partial rows. Options give a choice of formula adjustment or replicating values only.

Prompt: From (Entry Range)

Specify a cell, partial column, or partial row, followed by a comma.

The next prompt is:

To? (Enter Range), then Return; or “,” for options.

Replicate makes a one-to-many copy of its source into a destination that is larger than the source:

A cell into a partial column or partial row.

A partial column into a group of partial columns. The destination address is given as the left and right cell addresses on the top row of the destination group. The partial column will be copied once for each cell in that portion of the row.

A partial row into a group of partial rows. The destination address is given as the upper and lower cell addresses for the left column of the destination group. The partial

row will be copied once for each cell in that portion of the row.

Specify the destination and press CR, or if you wish a choice of options for copying formulas, press , (comma).

The options are the same as those for /Copy. If you press CR, formulas are automatically adjusted. The options are no adjustment, or to be asked whether or not to adjust for each reference to another cell address, or to replicate values only, leaving formulas behind. See /Copy above for details.

Examples:

Replicate a cell into a partial column
/Replicate,b12,e3:e8(CR)

Replicate a cell into a partial row
/Replicate,b12,e3:j3(CR)

Replicate a partial column into a group of partial columns
/Replicate,b3:b7,d3:j3(CR)

In this example, the partial column is five cells deep. The result will be a block of cells repeating that partial column seven times. The top of that block is on row 3.

Replicate a partial row into a group of partial rows.
/Replicate,b3:e3,g5:g7(CR)

The partial row here is four cells across. The result will be a block of cells repeating the partial row three times. The left side of that block is column G.

Replicate without adjustment
/Replicate,b12,e3:e8,N(CR)

Replicate, ask for individual choice of adjustment
/Replicate,b12,e3:j3,A(CR)

Note: /Copy and /Replicate

As a special case, /Replicate can make a one-for-one copy just as /Copy does. /Copy

cannot replicate (make multiple copies). /Copy can, however, do something that /Replicate cannot do; it can copy a block.

DATA PROTECTION COMMANDS

/Protect

Protect a cell, partial column, partial row, or block.

Prompt: Enter Range.

Protects cell contents and formatting from change. Data cannot be entered into, or edited into, a protected cell. /Blank, /Format, /Copy, /Replicate, and Load all bypass protected cells. That is, the commands will operate on surrounding cells but leave the protected cells unchanged. /Delete will not work if a protected cell is in the specified row or column.

There is one exception: the /Zap command overrides protection.

Examples:

/Protect,c3(CR)
/Protect,c3:c9(CR)
/Protect,c3:g3(CR)
/Protect,c3:g9(CR)

/Unprotect

Removes protection from cell, partial row or block.

Prompt: Enter Range

Allows cell contents or format to be changed. (There is no error if you try to remove protection from something that is not protected).

Examples:

/Unprotect,c3(CR)
/Unprotect,c3:c9(CR)
/Unprotect,c3:g3(CR)
/Unprotect,c3:g9(CR)

PART III: SUPERCALC REFERENCE

SAVE AND RESTORE COMMANDS

/Load

Load the worksheet contents and settings from a disk file. You may load all or part of a worksheet at a location you specify. Options give a choice of formula adjustment or loading values only.

Prompt: Enter File Name (or RETURN for directory)

Enter the name of the file, with the drive designation if the disk is not on the system drive. The file name must have the extension ".CAL". This extension is assumed, and you do not have to enter it. Do not leave blank spaces in the file name.

For example:

SALESFEB(CR)
B:SALESFEB(CR)

If you reply A, the entire worksheet is loaded in its original location as it was when saved. The *load* is finished.

If you reply P, then further questions appear on the prompt line:

From? (Enter Range)

Specify the position of the saved worksheet that you wish to load.

To? (Enter Range) then Return or "." for options.

Enter the cell address at the upper left of your destination, which may be a new location for that portion of your worksheet. Press CR if you wish automatic adjustment of formulas for the new location; otherwise press "." for options. The options are: N(o Adjust), A(sk for Adjust); V(alues). See/Copy for an explanation of these options.

If there are protected cells in the destination area, they will remain unchanged.

Examples:

/Load,QUARTER3(CR)
/Load,B:QUARTER3(CR)

/Save

Save the worksheet contents and all settings on a disk file. Options give a choice of saving all contents or values only.

Prompt: Enter File Name (or RETURN for directory)

Enter the name you have chosen for saving your worksheet. Also enter the drive designation if you do not want to write it to the disk in the system drive. The SuperCalc program will automatically give the file the extension ".CAL". You do not need to enter it as part of the file name.

The next prompt is:

A(ll) or V(alues)

"A" specifies that all cell contents are to be saved; "V" that values will be saved without formulas. For either case, all of these are saved: format settings, global options, title locking, window splitting, and Active Cell location.

Note: If you specify the name of an existing file, the program will display the following prompt:

File already exists: C(hange name), B(ackup) or O(verwrite)?

Examples:

/Save,WORK5(CR)
/Save,B:WORK5(CR)

WORKSHEET DISPLAY COMMANDS

/Title

Lock columns, rows, or both into their place on the display window. Locked information will not scroll; other information on the screen can scroll. Title Lock uses the current row and column.

Prompt: H(orz.), V(ert), B(oth), or C(lear)?

H locks the current row and all rows above it.

V locks the current column and all columns to the left of it.

B locks both the current row and column and all rows above and columns to the left.

C removes the title lock.

A new title lock replaces a prior one.

/Window

Split the display window into two parts. Each portion can have separate format settings and options. Window uses the current row or column.

Prompt: H(orz.), V(ert.), C(lear Split.), S(yrch.) or U(nsynch.)

H The screen is split horizontally, with the current row moving down to be replaced by a second border. The Active Cell moves up one cell in its column.

V The Screen is split vertically, with the current column moving right to be replaced by a second border. The Active Cell moves left one cell in its row.

Note: In both these cases, there is an alternate Active Cell in the original location. You can switch between the two Active Cells by pressing “;”. They move independently.

C Clear the split screen. The portion that was above or to the left is the “primary” screen; it is now displayed in full.

S Synchronize scrolling in the two portions.

U Unsynchronize scrolling. The two portions will scroll independently.

Within the two portions of the screen, formatting and global options can be set independently. It is possible to show the same data with different formatting and options; for example, to show the same column as values and as formulas.

When the split is cleared, the options and formats for the primary screen remain. The primary screen is the portion above or to the left.

DATA DISPLAY/PRINTING COMMANDS

/Output

This command writes part or all of the worksheet to the printer, the terminal, or a disk text file. You can write out a partial column, partial row, or block. If you write the report to a disk file, you can use your system text editor to add further information or modify formats before printing or to include the SuperCalc report within other text.

The worksheet information can be written out in the way it is displayed or as the actual cell contents.

OTHER COMMANDS: GLOBAL OPTIONS, QUIT, ZAP

/Global

Set worksheet options.

Prompt: F(format), N(ext), B(order), T(ab), R(ow), C(ol.), M(an.), A(uto).

If you respond to the prompt by pressing F, The display window will show the formulas contained in the cells instead of the values that results from the formula calculations. If formulas are currently being displayed, pressing F will cause the values to be displayed.

If you respond to the prompt by pressing N, “auto-advance” of the cursor will occur (in the “current direction”) after the data is entered into a cell. If auto-advance of the cursor is already in effect, then pressing N causes no auto-advance of the cursor after the data is entered into a cell.

If you respond by pressing B, the display of the worksheet border will be suppressed. If you already suppressed the border display, then pressing B will restore the border

display. (“Border” refers to the column and row designations across the top and down the left side of your display window.)

Response of T, activates Tab mode. If SuperCalc was already in Tab mode then pressing T will deactivate the Tab mode. In Tab mode, advancing between cells skips all empty or protected cells. Therefore, a protected or an empty cell can never be selected as the active cell in this mode.

Options “R”, “C”, “M” and “A” concern recalculation.

R means recalculate by rows, from the top down. (Rows are recalculated left to right).

C means recalculate by columns, from the left across. (Columns are recalculated from top down.)

If you reply A, then recalculation is automatic. If you reply M, then recalculation is done on your request, whenever you press the ! key.

Exit from SuperCalc and return to the operating system.

Prompt: EXIT SuperCalc? Y(es) or N(o)

If you reply Y, you return to the operating system. If you reply N, you return to the SuperCalc program. Any other reply is ignored.

If you have work that could be lost when you quit, the SuperCalc program gives you a chance to save the work before exiting.

/Zap

Clears the contents and formatting from the entire worksheet.

Prompt: Entire Worksheet (Y(es) to clear everything, else N(o)

Zap clears the contents and formatting from the entire worksheet. All cells become empty. All format settings and modes of operation revert to their standard settings. Everything starts fresh, as if you had just started up the SuperCalc program.

Zap is the only command that can override protection of cells.

Remember, when you zap the worksheet, nothing remains.

Example:

/Zap,Y
/Zap,N

NOTES

Chapter 10

SuperCalc Error Messages: Cause and Cure

This chapter provides you with a detailed description of the error messages that you may receive while using the SuperCalc program. They are discussed in alphabetical order. For each error message we have included a brief explanation of its cause and a procedure for correcting the situation that resulted in the error message.

Here is a list of errors considered:

BDOS Error,	Column Error,
Copy Definition Error,	Disk Full,
Drive Not Ready,	File Not on Disk,
Formula Error,	Memory Full,
Overlay Error,	Protected Entry,
Range Error,	Replicate Definition Error,
Window Parameter Error,	and Worksheet Full

Some of these errors come from your CP/M operating system rather than from the SuperCalc program. They are included here for your convenience.

BDOS Error

This is an error message from the CP/M operating system. It will appear on your screen as "BDOS ERROR ON *d:error*". The *d* stands for a drive designation, such as A or B; the actual designation will appear on your screen. The *error* in our example stands for the detailed error message that will appear on your screen. For example:

```
BAD SECTOR  
SELECT  
READ ONLY  
FILE R/O
```

CP/M uses a simple approach to handle errors:

- If you want to retry the operation, press any key *except* CNTRL-C.
- If you want to quit, press CNTRL-C. You will return to the CP/M operating system. You will have no chance to save your work in the SuperCalc program, because CP/M will not return you to the SuperCalc program.

For error messages READ ONLY or FILE R/C, there is no point in retrying the operation. The condition will not change.

Consult your CP/M system documentation for information about the BDOS error conditions. In addition to the CP/M documentation, you should select the documentation provided with your disk drives for information about recovering from disk-drive problems such as BAD SECTOR OR SELECT.

Column Error

Cause:

Incorrect specification of a column. Correct specification is a letter from A to Z or two letters from AA to BK.

To Correct:

Use the in-line editor to correct the entry and re-enter the command, or cancel the command with CNTRL-Z.

Disk Full

Cause:

The disk designated to receive the file does not have enough space. The SuperCalc program will ask if you want to re-do the operation (Y) or not (N). If you want to re-do the operation, remove the disk and insert another one, which has enough space, then press Y. If you press N, the operation is aborted, and you return to the SuperCalc program.

Drive Not Ready

This is a system error message from the BIOS portion of your CP/M operating system. To retry or cancel the operation, see the procedure given under BDOS ERROR above. It is possible that the drive will become ready and that retrying will work. If you retry several times without success, consult your disk-drive documentation for further information.

File Not On Disk

This occurs with the *load* command.

Cause:

The file name given is not found on the disk drive specified or implied in the entry.

To Correct:

Check your command entry.

1. Check the drive designation. If you did not specify one, the SuperCalc program assumes you mean the system drive.
2. Check the spelling of the file name.
3. Is the correct disk on the drive?

For cases 1 and 2, use the in-line editor to correct the drive designation or the file name and re-enter the command.

For case 3, either place the correct disk in the drive, or if this is not feasible, cancel the command with CNTRL-Z.

Formula Error

Cause:

There are two possible causes.

1. You entered text without a leading ". The SuperCalc program assumed that you intended to enter a formula, and it cannot make sense out of the entry as a formula.
2. There is some error in the way you specified a formula. Check it for correct specification of function name, correct use of expressions, balanced parentheses, valid cell names, etc. (See the section on "Formulas and Functions" in chapter 10, "Detailed Reference", for a list of all valid expression and function names.)

To Correct:

Use the in-line editor to correct your entry and re-enter, or cancel the entry with CNTRL-Z.

Memory Full

Cause:

Too much content in the worksheet. (This is a different case from Worksheet Full, described below, in which there are too many cell stubs on the worksheet.)

To Correct:

Blank any contents that you can spare. If you can, move material to the upper left of the worksheet, try-

ing to preserve a roughly rectangular shape. Save the worksheet, zap the screen and reload the worksheet.

If this does not free enough space, then you must break the worksheet into convenient portions for future work. To do this, zap the screen and reload selected portions of the saved worksheet. Build two or more worksheets out of these portions, saving them as separate worksheets.

Overlay Error

This is a serious error that prevents the SuperCalc program from being used.

Cause:

There are two possible causes.

1. The SuperCalc program has not been "installed" or has been "installed" incorrectly. Installing the SuperCalc program means customizing it to your computer system. This customizing involves specifying the terminal that you are using, the disk drives available, the memory space available, and the version of the CP/M operating system that you use.
2. The version of the CP/M operating system that you are using is incompatible with the SuperCalc program. Your version of CP/M may be an early or outmoded one, or it may have been incorrectly installed.

To Correct:

1. If you are installing the SuperCalc program yourself, re-install it, checking the installation documentation carefully as you proceed. If you still have the error, consult your dealer or Sorcim Corporation. If your dealer installed the SuperCalc program, have the dealer re-install it.
2. Consult your dealer or Sorcim Corporation to determine if the CP/M system is incompatible. If this is the case, then contact the supplier of your CP/M system for information and assistance.

Protected Entry

Cause:

This message can appear as the result of an error, or it may appear as an informational note. If the message is the result of an error it will appear during data entry or the *edit* command. You are attempting to enter data into an Active Cell which is protected. You must either remove the data from the entry line or cancel the *edit* command.

To Correct:

If you wish to put data in that cell, *unprotect* the cell and re-do the operation.

1. This message may appear as an informational note during a *blank*, *copy*, *load*, or *replicate* command. If there are protected cells in the area being blanked or in the destination area of the copy, load, or replicate command, the protected cells in the area remain unchanged; the other cells in the area have been changed. If you meant to leave the protected cells unchanged, all is well. If not, you may wish to unprotect them and re-do the command.

Range Error

Cause:

Incorrect specification of a range. A range may be a single cell, a partial column, or a partial row.

To Correct:

Use the in-line editor to correct the entry and re-enter the command, or cancel the command with CNTRL-Z.

Row Error

Cause:

Incorrect specification for a row. Correct specification is a number from 1 to 254.

To Correct:

Use the in-line editor to correct the entry and re-enter the command, or cancel the command with CNTRL-Z.

Replicate Definition Error

Cause:

The destination may be specified incorrectly, or the destination area may be too small.

1. Specification error for the destination.
 - a. If the source is a single cell, the destination should be specified as a partial column or partial row.
 - b. If the source is a partial column, the destination should be specified as cells on the upper row of the destination. This will look like a partial row.
 - c. If the source is a partial row, the destination should be specified as cells in the column on the left of the destination. This will look like a partial column.
2. Destination area is too small (will not fit).

Given the size of the source and the location of the destination, the result will not fit within the worksheet boundaries.

To Correct:

Correct the specification using the in-line editor and re-enter the command, or cancel the command with CNTRL-Z. (Note: The SuperCalc program caught the error before attempting to execute the command.)

Window Parameter Error

This occurs during the window command.

Cause:

Attempting to split the screen with the *window* command when the Active Cell is at the left or right edge or the top or bottom row of the display screen. Because of the way that the command works, the split cannot be made at the edges of the screen.

To Correct:

Either move the Active Cell away from the edge of the display window or scroll the screen to provide an additional column or row between the edge and the location you desire for the split.

Worksheet Full

Cause:

The worksheet is too large in size; there are too many cell stubs. (This is different from the case described above in Memory Full, where the worksheet has too much content.)

To Correct:

If you can, *blank* any unnecessary contents and move the other contents to the upper left, trying to preserve a roughly rectangular shape. Then *save* the worksheet, *zap* the screen, and reload.

Appendix Three, "*Memory Use—Hints and Concepts*", explains how it is possible to create unintentionally far more cell stubs than necessary. You may get a Worksheet Full message even though you have few contents and they are at the upper left. In such a case, saving the worksheet, zapping the screen, and reloading the worksheet will get rid of unnecessary cell stubs.

Part IV: Appendixes

Appendix I

Standard or Default Settings

The SuperCalc program uses standard settings for display and formatting and standard modes of reference. These are also called *default* settings or modes. You can change these by choosing among available options described in the Reference Section. For convenience, here is a list of the standard settings and standard modes.

The following default settings can be changed by using the /F(ormat)command:

Column Width: 9

Numeric Display:

Right-justified.

Standard numeric format. (Cells that contain formulas will have their values displayed; if the number is too large to fit into the column, the number will be displayed in scientific notation.)

Text Display:

Left-justified.

The following default settings can be changed by using the /G(lobal) command:

Border Display:

Row numbers (1-254) and Column designations (A-BK) are always displayed. (When

the screen is split, the Row numbers and Column designations are displayed for both windows.)

Calculation:

Automatic calculation upon receiving new or altered data followed by a CR.

Order of Calculation:

Calculation is performed by Rows, from left to right and top to bottom.

Numeric Display:

Standard numeric display. (Cells that contain formulas will have their values displayed.)

Tab Mode:

Tab mode is inactive. That is, the cursor advances to the next cell in the current cursor direction.

Automatic Cursor Advancing:

Auto-advance mode is active. That is, the cursor will advance to the next cell in the *current cursor direction* after data entry followed by a CR.

Additional standard operations:

When you execute a /Copy or /Replicate command, formulas with references to other cells are automatically adjusted to their new locations unless you choose one of the options provided for these commands.

Appendix II

Commands Involving Formula Adjustments

This appendix provides a list of commands that cause or allow formula adjustment. See Part Three, "*SuperCalc Reference*," for specific information about formula adjustment and the individual commands.

/Delete, */Insert*, and */Move* all cause automatic formula adjustment. They have no options. Deleting a column or row that contains a cell upon which a formula outside the range of the deletion depends will

cause an error.

/Copy and */Replicate* allow formula adjustment. Adjustment is automatic, unless you specify otherwise by selecting one of the options. The options allow you to disable formula adjustment or to choose individually for each outside reference whether or not SuperCalc should adjust it.

/Load will adjust formulas if the material is being loaded into a worksheet location different from the one where it originated. In this case, you have the same options as in */Copy* and */Replicate*. (Naturally, there will be no adjustment if you are loading into the original worksheet area.)

Appendix III

Here are some useful hints for using the SuperCalc program. Some of this material is covered elsewhere and is repeated briefly here for convenience. Some is unique to this appendix.

The material is divided into four general categories: Display, Building Worksheets, Security, and Memory Management.

Display

A Command, Text, or Formula Too Long for the Entry Line Information on the entry line will scroll left when it reaches the end of the line. You can enter a command, text, or a formula that is too long to display in its entirety. You can then use the in-line editor to examine any part of the entry by moving the cursor to the left or right. The information will scroll to show the hidden part of the line. When you want to enter the line, press **CR**. The SuperCalc program will take the entire entry, not just the portion to the left of the cursor.

Column Width Greater Than Screen Width

You may sometimes want to make the width of a column greater than the width of your screen. In such cases, you can scroll to see all of the display. If you have a printer with a wide carriage, you can use the *output* command to print the full width of the information. This can be useful for long text notes, explanations, or graphic display of numeric values.

To See the Same Information in Different Formats

The *window* command lets you look at the same information in different formats simultaneously. Split the single display window into two smaller windows. After you have split the screen, you can move one window so that it shows the same information as the other. Each part of the screen can have its own format settings for entries, rows, columns, or the entire worksheet. Each can have its own global options settings. By using this technique, you could display both values and formulas for the same cell contents.

When you set formats or global options for a split screen, remember that the portion above or to the left on your screen is "dominant". That is, when you cancel the split, the settings that were in effect for the upper or left window will remain in effect for the entire single display window.

Building Worksheets

Combining worksheet portions to build new worksheets the *save* command saves the entire worksheet, but the *load* command can load all or part of a worksheet. It can place the part loaded at any worksheet location. This means that you can construct the nucleus of a new worksheet from parts of one or more existing worksheets.

When you have a fully developed worksheet with data, you can save it both with and without data. For example, you have developed a monthly report, which you *save*. Then you *blank* all the variable con-

tents of the report, which you save. Then you *blank* all the variable contents of the report and *save* only the information that will not change, such as titles, formatting, the general layout of the sheet, formulas, and any constant values. Next month you can *load* this file, fill in the new information, and *save* it as your current monthly report.

Using Protect To Build New Worksheets From Old

The *blank*, *copy*, *load*, and *replicate* commands all bypass protected cells, leaving their contents unchanged while changing surrounding cells. You can use this capability to combine information in detail, protecting key information and then surrounding it with new information by using *load*, *copy*, or *replicate*.

Summing a Partial Column or Partial Row

When developing a worksheet, you may often find yourself inserting new columns or rows within a range covered by a SUM formula. This can be awkward. Inserting or deleting at the top or bottom of an existing column or at the left or right of an existing row can mean redoing your formula. For example, you wish to insert a new row 12 and have to change the formula SUM(C2:C12) to SUM(C2:C13).

Here is a way to avoid this difficulty. Include a header or title at the top or left and an extra cell at the bottom or right within your sum. For a column, the extra cell could have "-----" as a total line.

For example:

	C	
1	January Receipts	
2		35
3		405
	.	
	.	
	.	
9		38
10	-----	
11	SUM(C1:C10)	

As text, C1 and C10 have a zero value. Including them in the sum makes no difference. We can insert or delete rows from 2 through 9 and have the SUM formula automatically adjust to the new situation.

Security

Security includes protecting your work from accidental loss or change and protecting confidential information in your worksheet.

Save Your Work Often

It is important to save your work frequently while you are entering data or building worksheets. This practice insures you against losing the time and effort you have invested. It protects you against problems that are completely out of your control—such as power failures or hardware problems with your disk drive.

The Update option of the *save* command is a convenient way to do this. Every time you save your work, use the same name; for example, "TRIALBAL". The first time you save your work, it is stored on the disk as TRIALBAL.CAL. The second time you save it, the SuperCalc program will tell you that there is a file of that name (TRIALBAL) and ask what you want to do. If you choose the Update option, your new worksheet will be saved as TRIALBAL.CAL and the earlier one will become TRIALBAL.BAK, your backup file. Whenever you use the Update option after that, the SuperCalc program will give you the two most recent files as filename.CAL and filename.BAK; it will erase any earlier files.

Having the backup file can be very convenient; you may want to go back to that file in case a change does not work out in actual operation. You can use CP/M operations to change your file names so that filename.BAK becomes filename.CAL. Or, you can directly *load* the file by giving its full name including the .BAK extension.

Protecting Your Worksheets

The CP/M operating system allows you to specify files or entire disks as "read only". Designating your worksheet files as Read Only allows others to examine them or print reports from them, but not change or erase them.

Protecting Information With "Values Only"

The SuperCalc option to save Values Only offers another protection. Your full worksheet may have important proprietary information within its formulas or lookup tables.

After you have saved a full copy for yourself, you can save a Values Only worksheet for others to use. In that worksheet, you may wish to remove lookup tables.

Similarly, you can use the *output* command to put a Values Only copy of selected portions of your worksheet on a disk file for others to use. They can print that file or use the system text editor to include it in their own text file.

Appendix IV

Taking Good Care of Your Floppy Disks

Disks cost only a few dollars each, but the information on them may be worth hundreds or thousands of dollars and a considerable investment of time. The information is safe if the disks are handled properly. But disks are fragile, and people sometimes mishandle them without intending any harm.

Here is a check list to help you keep your disks in top operating condition:

1. Make copies of your important files. Keep backup files that are write-protected. (Chapter 5, "Getting Started," includes information about CP/M resources for copying and protecting files and disks.)
2. Handle disks carefully. Do not bend them.
3. Protect disks from grease, dust, and dirt. Never touch the exposed surface of the disk where it shows through the protective sleeve that surrounds it.

If a disk is not inside the drive, it should be inside

a protective envelope. Better still, the disk and its envelope should be inside a box. A nonmetallic box is best for storing disks.

4. Protect disks from magnetic fields. This means keeping your disks away from electrical equipment. Do not put disks on top of the drive or on the computer. Some screw drivers are magnetized; so, in general, keep screwdrivers away.

A ringing telephone can damage information on a disk. Do not have a phone near your disks or on top of the disk drive.

5. Always start the disk drive before inserting disks. Always remove disks before turning off the drive. This is to protect them from surges of electrical power and to insure that the read/write head inside the drive moves smoothly into contact and out of contact with the surface of the rotating disk.

In case you forget these precautions, modern disk drives have some built-in safety factors that will usually prevent harm to your disk. But it is best to put safety first—Turning the drive on or off with a disk inside still subjects the disk to an unnecessary risk.

GLOSSARY

Active Cell

The cell on the worksheet that is currently "active" and can receive data; sometimes called **current cell**. It is indicated on your screen by the **worksheet cursor**. Data entered on the entry line goes into the Active Cell. The **edit** command edits the contents of the Active Cell. The location of the Active Cell determines the **current column** and **current row**. The **status line** shows the location of the Active Cell.

alternate diamond keys

Control (CNTRL) e, x, s, d. (Hold down the control key and simultaneously press one of these keys.) They have the same effect as **arrow keys**; that is, they can be used to move the **worksheet cursor** or for **in-line editing**. CNTRL e, x, s, and d are, respectively, equivalent to up, down, left, and right.

arrow keys

The four arrow keys—up, down, left, and right—have the basic function of moving the **worksheet cursor** around the **worksheet** displayed on your screen, thereby specifying the **Active Cell**. They have an additional function when doing **in-line editing**. There is another set of keys with the same functions as the arrow keys: the **alternate diamond keys**—Control e, x, s, and d.

blank cell

A cell without contents. But some minimal information about a blank cell is kept in memory, so it is not the same as an **empty cell**, which takes no memory space. Appendix III, "Memory Use—Hints and

Concepts," explains this difference.

block

Rectangular group of cells, can be thought of as a group of **partial rows** or **partial columns**. A block is defined by its upper left and lower right cells; for example, B3:F5 is a block of fifteen cells, five across and three down.

byte

Storage space for one character; that is, a letter, digit, or special character such as \$ and %.

cell

The basic unit of storage for the SuperCalc program. A cell can contain a number, text, or a formula. Cells are organized in a grid, called the **worksheet**. A cell is **empty** until it is used in some way. Empty cells take no storage space. See **worksheet**.

cell address

Each cell in the **worksheet** has a unique address: at the intersection of its column and row. For example, the cell located where column G and row 12 intersect is cell G12.

column

All cells in a column, including empty cells and cells with contents. Columns are vertical. They are designated with letters; for example, column D. Valid column addresses are A-BK. (See **worksheet**.)

current cell

The cell in the worksheet grid pointed to (highlighted) by the worksheet cursor; see **Active Cell**.

current-cell key:

(ESC) When this key is pressed, it places the **current cell** address on the entry line, to be used as desired in a command or expression. At the same time, pressing this key also activates the **arrow keys** for moving the **worksheet cursor**. If the worksheet cursor is moved, the current cell address on the entry line dynamically changes to show the new location.

current column

The column having the current or **Active Cell**.

current direction

The direction in which the **worksheet cursor** is set to move. For example, if the current direction is "down" when you enter something into cell B5, then B6 becomes the new **Active Cell**. If the direction is "right", C5 becomes the new **Active Cell**. The direction is specified as up, down, left, or right by pressing the corresponding **arrow** or **alternate diamond** key. The direction remains "set" until you change it by pressing a different arrow key.

current row

The row having the current or **Active Cell**.

cursor

A blinking box on your video screen, taking one character's space. Usually the cursor is seen on the entry line and shows where the next character that you type will go. When doing **in-line editing**, the cursor passes over characters, highlighting them. In that mode, the character under the cursor can be deleted, inserted, or replaced.

empty cell

When the SuperCalc program is started up, all cells are empty. An empty cell takes no memory space in your system. It is only a potential location, for you to use as needed. An empty cell is different from a **blank cell** because the SuperCalc program keeps some minimal information about blank cells. Appendix III, "Memory Use—Hints and Concepts," gives more information about this difference.

entry line

The bottom line on your terminal screen. It is indicated by > at the left margin. The entry line will display your commands and data as you interact with SuperCalc.

ESC key

See **current-cell key**.

global

Affecting the entire **worksheet**. Used in describing option; some options may have a local or neighborhood effect—one cell, one column, one row. Global options affect the entire worksheet. The SuperCalc program has both a **global** command and a global option within the **format** command.

help

You may press ? at any time. The SuperCalc program will then change the display to show you more information about your current options. You can return to your worksheet by pressing any key.

integer

A whole number. It is also one of the display options. If you specify "integer" display format, the SuperCalc program will round off decimal fractions and display the nearest whole number.

interpretive prompting

You give commands to the SuperCalc program with one or two keystrokes. It immediately fills in the rest of the word. For example, you type /B; the SuperCalc program immediately fills in /Bblank. And the **prompt** line changes to ask you to specify what should be blanked.

kilobyte

Storage space for 1024 characters; that is, for 1024 letters, digits, or special characters such as \$ and %.

partial column

A contiguous group of cells within a column; for example, "B3:B7" designates five cells in column B. (See **column**.)

partial row

A contiguous group of cells within a row; for

example, "B3:F3 designates five cells in row 3. (see **row**.)

prompt, prompt line

The second of the three lines at the bottom of your terminal screen. This is where the SuperCalc program asks you what you want to do next. The line indicates your immediate options. You choose among them and put your response—command information or data—on the **entry line**.

row

All cells in a row, including empty cells and cells with contents. Rows are horizontal. They are designated with numbers; for example, row 3. Valid row addresses are 1-254. (See **worksheet**.)

status line

The first of three lines at the bottom of your screen is status line. The SuperCalc program uses it to keep you informed about your worksheet and its display. It includes such things as cursor advance direction and the actual content of the **Active Cell**—numeric

value, formula, or text—which may look different on the worksheet display as a result of format choices you have made. Error messages are displayed at the right side of this line.

worksheet

The worksheet exists in your computer's memory. It is made up of **cells** organized in a grid. The grid has vertical **columns** and horizontal **rows**. There are 63 columns and 254 rows. Cells in the worksheet come into existence as they are used. Until then, they do not take up memory space in your computer; they are potential, not actual, cells.

worksheet cursor

The worksheet cursor indicates the **Active Cell** on your display screen. How the cell is indicated will vary according to your terminal. The cell may be underlined on the screen, put in reverse video, or indicated with < >. The location of the current cell also shows on the status line. The **arrow keys** move the worksheet cursor.

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SuperCalcTM

A Brief Guide to Installing the SuperCalc Program

Please read before you study the Manual

NO. 4152

 **SORCIM**

Installing the SuperCalc Program

These instructions will tell you how to create a working copy of the SuperCalc™ program, and how to test it for correct operation.

There are eight steps to be carried out. Some are very simple, while others require a bit of thought. Here is a summary of the steps:

- Step 1: Start your machine and load CP/M
- Step 2: Prepare a Work Diskette to hold the SuperCalc program
- Step 3: Put the disks in your drives
- Step 4: Run the Installation submit file
- Step 5: Put the Distribution Diskette away
- Step 6: Tailor the SuperCalc program for your terminal
- Step 7: Optionally, tailor the SuperCalc program for your printer and for a larger screen
- Step 8: Test the SuperCalc program for correct operation

In most of the steps, we'll tell you what you will see on the terminal and how you should respond to it. We'll show the expected terminal displays indented on the page, and we'll show what you should type in bold letters, like this:

A> you type this (Return)

That means that you should see "A" on the terminal, and that you should respond by typing "you type this" and pressing the Return key.

Step 1: Start your computer.

Turn on your computer and load the CP/M operating system. You know that CP/M has been loaded when you see:

A>

on the screen.

Step 2: Prepare a Work Diskette to hold the SuperCalc program.

We can't be as specific here as we'd like to be. This step requires a certain amount of CP/M "know-how," and it depends on how you organize your library of diskettes. You need a diskette of which the following things are true:

- It has a copy of CP/M on it (it is "bootable").
- It contains copies of the PIP and SUBMIT commands.
- It has at least 132K bytes of free space.

If you are in doubt about how to find or prepare such a diskette, turn to the back page of this pamphlet. We've put some detailed hints there. If you're still in the dark after reading that, talk to your SOR-CIM dealer.

Step 3: Set up for Installation.

Put the Work Diskette (the one prepared in Step 2) into the A drive of your system.

Put the Distribution Diskette (the one from the pocket in the cover of the SuperCalc manual) in the B drive.

Press **control-c** (control and C together) to restart CP/M.

Step 4: Run the Installation Submit file.

Note: If you are not placing your distribution diskette in the B drive, then do NOT use the submit file. Instead do the following:

- 1) Use PIP by typing the following three command lines. We assume that your distribution diskette is in the C

drive, if it is in another drive then use that drive's name. We assume that you are copying onto the A drive. If not, then use the drive's name you are copying to.

```
PIP A:=C:SC.*[V]
PIP A:=C:INSTALL*.*[V]
PIP A:=C:*.CAL[V]
```

2) Next, read the following to understand what is being done and to check for any errors that may have occurred. If the above note does NOT apply to you, then proceed as follows. Enter the command:

A> submit b:install (Return)

The file B:INSTALL.SUB will be submitted for execution by CP/M. It contains a number of commands. You will see them performed. First, there are several Erase (ERA) commands. They will probably provoke NO FILE responses from CP/M. That's fine.

Then the PIP command is called three times to copy groups of files from the Distribution Diskette to the Work Diskette. The first group looks like:

```
COPYING—
SC.COM
SC.OVL
```

The second group includes the files:

```
INSTALL.COM
INSTALL.DAT
INSTALL.OVL
INSTALL.SUB
```

The third group of files contains:

```
BALANCE.CAL
BARRIER.CAL
BRKEVN.CAL
```

We expect that these copies will run smoothly, but in rare cases something might go wrong, so here are the possible

symptoms and their causes. Should you see one of these two messages appear:

```
NOT FOUND: something
Bdos Err on B: Bad Sector
```

your Distribution Diskette is faulty. In that case, abandon this procedure and contact your dealer at once.

Should you see this message:

```
Bdos Err on A: Bad Sector
```

your Work Diskette is faulty. Prepare another and start over. Should you see one of these messages:

```
NO DIRECTORY SPACE
DISK WRITE ERROR
```

there wasn't enough space on your Work Diskette. Prepare another that has at least 132K bytes of space.

When the PIP commands are finished, the submit file ends. Your Work Diskette now contains a complete copy of the SuperCalc program, its installation files and three sample worksheets.

Step 5: Put the Distribution Diskette away.

You are finished with the SuperCalc program Distribution Diskette. Put it away in a safe place where it is protected from heat and dust. You will only need it again in two cases. If you lose the Work Diskette you'll have to go through this procedure to make another. And, if you ever want to order a later release of the program or need a software change, you'd have to send the disk back to the dealer. Except for those things, you won't be using it any more.

This is a good time to fill out the registration card and set it aside to be mailed.

Step 6: Tailoring the SuperCalc program to your terminal.

You must inform the SuperCalc program of the make of your terminal so that it can take advantage of the terminal's special features in building screen displays. You can update the SuperCalc program to use a different terminal at any time.

This is done with the Install command. Note that you don't have to use Install from the same kind of terminal you'll be using with the SuperCalc program. You can run Install from one kind of terminal, and use it to set up the SuperCalc program for a different kind.

Call the Install program:

A> install (Return)

It shows you this; you reply Y:

```
SUPERCALC Install Program
Version : 1.xx
```

This program will Install your SuperCalc file for the terminal that you wish to use.

Do you wish to proceed (y/n)? Y

Install then wants to know how to find the SuperCalc program. It asks, and you answer, as follows:

```
Enter name of SuperCalc(tm) file
as:
"d:filename" where "d" is the
drive.
Enter "?" for more Help.
Enter name: a:sc.com (Return)
```

The program now shows you a menu of terminal manufacturers. The menu is somewhat abbreviated. It doesn't mention terminals that are compatible with the ones shown. There is a complete list of supported terminals at the end of this pamphlet. Look at it now.

Install is waiting for a reply to its question,

Enter A-O, Y, Z, or ? :

Suppose you have a Soroc IQ 140 terminal. It appears in the list of supported terminals and you can see the make "Soroc" at letter G of the menu; therefore, you would respond with a G. Install would then ask you to choose between the IQ 120 model and the IQ 140 model.

Suppose you have a Heathkit H19 terminal. The list of terminals says that it should be installed as if it were a Zenith Z19. You would note the name "Zenith" as letter k of the menu and choose it. Since the Z19 is the only Zenith model supported, you wouldn't be asked about a specific model.

Pick your terminal and answer Install's questions now. If you respond with the letter of a make for which the SuperCalc program supports more than one model, the Install program will ask you to choose among the different models. If you respond with a make for which only one model is supported, you'll be given a chance to change your answer.

What if your terminal is NOT on the list? That means that it is not currently supported by the SuperCalc program. Check the manual that came with your terminal. It may tell you that your terminal is "software compatible" with one of those that is on the list. If that is the case, select the compatible terminal; if not, contact your SuperCalc dealer. It is possible that your dealer can do a custom configuration for your terminal.

The SuperCalc program assumes that the screen of the terminal is 24 lines down and 80 columns across. A few terminals have optional larger screens. If your terminal has larger screen dimensions, complete this step and then perform Step 7, in which you will adjust the screen size.

Once you've indicated your terminal, Install presents the following choices. Respond with an A and a Y, as shown.

This is what you may now do:

- A. Save SuperCalc on disk.
- B. Return to the first menu.
- X. Quit Install program.

Enter A-B or X or ? : A

You have selected:
(your chosen terminal type)

Are all modifications complete (y/n) ? Y

The SuperCalc command file, SC.COM, is updated on disk. Now when the SC command is called it will expect to find the make and model of the terminal that you specified.

Step 7: Tailoring the SuperCalc program for the printer.

Unless your terminal has a larger than usual screen, it is NOT necessary to do this step when first installing the program. You might defer it until you have used the SuperCalc program and read Lesson 9 of the manual. You can do, or re-do, this step at any time.

The SuperCalc command "/Output" is used to prepare a printable display of a worksheet. That command needs information about the system printer in order to do its work. It is possible to tell it what it needs to know at the time you give the /Output command. Usually it is convenient to set up the normal values beforehand. This is done with the Install program. With it you can update your SuperCalc command with:

- The dimensions of a large terminal screen
- The width of your normal paper in columns

- The length of a sheet of your normal paper in lines
- A series of control codes to be written at the start of each printed listing

Call the Install program:

A> install (Return)

Install greets you and asks if you want to proceed. Tell it Y for yes.

Install asks for the file name of the SuperCalc command. Tell it the file name a:sc.com (Return).

Install presents its main menu, with a list of terminal makes and the options Y and Z. We want Z, "Edit printer and terminal data."

Now you are presented with this display:

The current printer initialization string is:
Unconfigured.

Do you wish to change this data (Y/N)?

The "initialization string" is a sequence of control codes that will be sent to the printer at the start of any /Output listing.

If you don't know of any sequence of codes that would be useful, just reply N to the question. In order to make use of the initialization string, you must know the control codes to which your printer responds. You can find that information in the manual that came with the printer.

Suppose your printer had a "compressed" print format that allowed it to put 132 narrow characters on a line. Suppose that the control characters that set "compressed" format were ESC (escape) and C. If you wanted your normal /Out-

put listings to be in this format, you would reply Y to the question. Install would then display:

Enter the number of hex bytes in the data string.

The maximum number of bytes allowed is 9.

Enter number of bytes : 2 (Return)

You would reply "2" as shown, because ESC and C add up to two codes ("bytes", "characters" and "control codes" all amount to the same thing).

Install would then ask for each byte, like this:

Enter new byte in Hex : 1B (Return)

Enter new byte in Hex : 43 (Return)

The byte values must be entered in hexadecimal. You would find the hexadecimal values of control codes and letters in a chart of the ASCII character set. There is probably such a chart in the printer manual from which you learned the code sequence.

After you have dealt with the initialization string, either by responding N for no change, or by entering a new string, Install presents a new menu:

This is the data to edit.

- 1. No. of video lines (down) — 24
- 2. No. of video columns (across) — 80
- 3. No. of printer lines — 66
- 4. No. of printer columns — 80
- X. Exit to menu.

Enter 1-4 or X :

Items 1 and 2 control the dimensions of the screen display at the terminal. They are set to 24 lines and 80 columns when you select a terminal type as in Step 6, above. If your terminal has larger dimensions, you can set them now, just select 1 or 2 and answer the question that follows.

Item 3 controls the page size of an /Output listing. /Output will insert a page break and new column headings after each group of lines. Use this menu to set the normal page size. When using the SuperCalc program, you can supply a special page size or prevent page breaks entirely by choosing the Setup option during the /Output command.

Item 4 controls the width of an /Output page. /Output will put as many worksheet columns across a page as will fit into that many printer (one character wide) columns.

Suppose that (having set up your printer for 132 "compressed" print columns with the initialization string) you wanted to make 132 the normal width of a page. You would select item 4:

Enter 1-4 or X : 4

and Install would show you this question:

The current no. of printer columns is 80

Enter new value or enter 0 for no change : 132 (Return)

and you would respond 132 as shown.

When you have changed the items you want to change, enter the choice X. Install will offer you its closing menu; select A, "Save SuperCalc on disk." Install will ask if you are finished; reply Y and the SuperCalc command file will be updated.

Step 8: Testing the SuperCalc program.

You've done it! Let's see if the SuperCalc program works (it's a 99 and 44/100 percent sure thing).

Call the SuperCalc program into the machine with the SC command:

A> sc (Return)

You should be presented with the version number of the SuperCalc program and other information, and the instruction:

Enter "?" for HELP or "return" to start.

Press **Return**. You should see the standard SuperCalc program display, as depicted on page 6-2 of the manual.

Does your terminal have keys marked with arrows? If so then you should find that holding the control key and pressing E, X, S and D have the same effect.

Then test the disk operations. Press the / key, then the L key, and see:

7> /Load,

near the bottom of the screen. Enter:

7> /Load, balance (Return)

The SuperCalc program waits for you to enter an A or a P. Press A. There will be some disk activity and the screen should fill with a worksheet called BALANCE.

If you changed the size of the terminal screen in Step 7, then BALANCE may not fill the screen now. You can make it do so with the Window Clear command: enter / and W and C.

That completes the checkout procedure. Let's terminate the program. Press /, then Q, then Y. The SuperCalc program should end and return control to CP/M.

You have a working SuperCalc system. Turn to the manual, where you will find lessons in the use of the SuperCalc program in Part II. The example worksheets—Brkevn, Barrier, and Balance—are described in Chapter 7. Happy computing!

Later Operational Steps

In this step-by-step procedure we have not shown all the things you can do to set up your SuperCalc system. Later, when you have more experience with the system, you may want to do some of the following:

Copying the SuperCalc program. You may want to have several diskettes, each with a copy of the SuperCalc command and a set of related worksheet files. That's fine, although you should notice that your license agreement with SORCIM restricts the total number of copies you can have at one time. It is not necessary to keep copies of the Install program and the sample worksheets on every diskette. To copy just the command files, use PIP. For instance:

```
A> pip b:=a:sc.*[v]
```

will copy the two parts of the SuperCalc command from the A drive to the B drive. Those two parts are SC.COM and SC.OVL, and both must be present for the command to run.

Renaming SC.COM. You might want to use a different command name than "sc". That's easily done:

```
A> ren fudge.com=sc.com
```

will rename the command so that you have to say "fudge" to call the SuperCalc program. However, you must NOT rename the other part of the command, SC.OVL. That name must be left alone.

Multiple Configurations. You might want to have different configurations of the SuperCalc program. Suppose, for instance, that your normal terminal is a Zenith Z19, but that sometimes you use an ADM-3. The configuration data is part of SC.COM. You could have two versions of that file (under different names, of course), one configured for the Z19 and one for the ADM-3.

Configure the SuperCalc program as shown in Step 6 for the Z19, then use PIP to make a copy:

```
A> pip scadm3.com=sc.com[v]
```

Use the Install program to configure SCADM3.COM for the second terminal (when Install asks for the name of its input file, respond a:scadm3.com instead of a:sc.com). Then you can use the command "sc" usually, and the command "scadm3" when the terminal is in use.

Hints on Preparing the Work Diskette

If you are not accustomed to preparing CP/M diskettes for use it will probably save you time to have someone do it for you. Present that other person with a new diskette and ask them to do the following things to it. Take notes so you can do it yourself another time. There is a summary of the more important CP/M commands and methods in Chapter 5 of the SuperCalc manual.

A. *Format it.* To format is to write every record on the diskette with null data. The manufacturer of the computer system provides the formatting command and chooses its command name so we can't tell you what it is called in your system. Some systems allow a choice of sector sizes and recording densities. The choice of sector size and density is made at the time of formatting.

B. *Put a copy of CP/M on it* (or, "make it bootable"). That is usually done with a command named SYSGEN, but some vendors give the command a different name.

C. *Put copies of PIP and SUBMIT on it.* That is done with the PIP command itself. Assuming that the newly-formatted diskette is in drive B, and, assuming that PIP and SUBMIT exist on the diskette in drive A, the commands are:

```
A> pip b:a:pip.com[v] (Return)
A> pip b:a:submit.com[v] (Return)
```

D. *Check the free space available.* That's easily done—for a diskette in the B drive,

```
A> stat b: (Return)
```

will report the free space. If there's 132K bytes or more, there is enough room for installation. Here are the approximate sizes of the files copied by the installation submit file:

INSTALL.COM— 14K	BALANCE.CAL— 8K
INSTALL.DAT— 14K	BRKEVN.CAL — 6K
INSTALL.OVL— 34K	BARRIER.CAL — 6K
SC.COM — 26K	INSTALL.SUB — 2K
SC.OVL — 22K	

for a total of 132 bytes.

Actually, you may not have to go through Steps A, B, and C. You might already have a suitable diskette that you can dedicate to the SuperCalc program. But, if you are sure of that, then you know enough about CP/M that all this information is old hat to you.

SuperCalcTM

Please, dear Customer, read this first!

Are you eager to try out your new copy of the SuperCalcTM program?

We at SORCIM are also eager to have you begin using our product. But it's even more important to us that your first encounter with the program goes smoothly.

We have prepared this pamphlet to tell you just

what you need to do in order to install the SuperCalc program and give it an initial test. It will take only a few minutes for you to read through the steps on the following pages, and only a little longer to carry them out. After that small investment of time, you will have a working copy of the SuperCalc program ready to be used.

Thanks, and happy solutions!

The Sorcim Staff

Supported Terminals and Compatible Terminals

This list shows all the makes of terminals currently supported by the SuperCalc program. Not all makes appear in the menu displayed by the Install program. When a make does not appear in

that menu, the list shows the make and model of a compatible terminal. When using Install to configure the SuperCalc program, respond as if you had the terminal in the right-hand column.

<u>Make and model of terminal:</u>	<u>Should be installed as:</u>
ABM80	DEC VT-52
ADDS M6210	
ADDS Viewpoint	
Apple II computer	
DEC VT-52	
DEC VT-100	
Direct 800	DEC VT-100
Hazeltine 1400-series	
Hazeltine 1500-series	
Heathkit H19 or H89	Zenith Z19
Infoton 100	
Lear Siegler ADM-3A	
Lear Siegler ADM-5	
Lear Siegler ADM-31 or -32	
Lear Siegler ADM-42	
Radio Shack Model II (Pickles & Trout (CP/M) only)	
Soroc IQ 120	
Soroc IQ 140	
SuperBrain	
Teleray 100	DEC VT-100
Televideo TVI 910	
Televideo TVI 912 or 920	
Televideo TVI 925	TVI 920 or 950
Televideo TVI 950	
Vector Graphics (Flashwriter II only)	
Visual model 100	
Visual model 200	
Visual model 400	ANSI standard
Xerox System 820 (the SAM system)	
Xerox System 860	as Xerox 820
Zenith Z19 or Z89	
ANSI standard terminal configuration	

The last entry, "ANSI standard," refers to terminals that conform to the ANSI standard for

Escape sequences. Such conformance will be mentioned in the terminal manual.

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