SuperCalc

in

8 Easy Lessons

or

A Step-by-Step Manual of Procedures

for the

~~Complete Idiot Moron~~

Beginner

Plus Some

Useful CP/M Commands

Prepared

by

Micro Mike's, Inc.
3015 Plains Blvd.
Amarillo, TX 79102 USA

telephone: 806/372-3633

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making technology uncomplicated ... for People[SM]

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INTRODUCTION

Many times when I sit down at my computer to learn a new program, I end up feeling like a complete idiot. After several years, I still find most computer manuals are unintelligible. They assume that I know and understand more than I actually do.

I end up asking for help and one of our smart programmers patiently guides me through some of the basics. During this time, my mind goes blank, eight fingers turn to thumbs and the keys on the terminal suddenly relocate themselves.

Our first brushes with SuperCalc resulted in frustration because we could not understand the manual. Then one of our patient staff sat down and guided me through the basic basics. Slowly, we began to catch on, and we have been able to make good use of an excellent program to ease the pain of several projects.

This manual is designed to reduce that frustration. The sole intent is to help you get started. Once you have an idea what to do, it is relatively simple to make the program do what you want it to do. As with any skill, proficiency is developed only through practice.

We start with the assumption that the user has little or no experience with a computer, that SuperCalc has been installed properly for his computer and terminal and that someone has shown the user how to turn the system on and which drives are A and B.

SuperCalc is an electronic worksheet which permits the user to list and identify rows and columns and make calculations within the worksheet. Once the basics are understood, SuperCalc is limited essentially only by the internal RAM of the computer and the user's imagination.

The maximum size, if there would be sufficient memory, is 63 columns across and 254 rows down. A larger worksheet can be produced by breaking it up into smaller, workable segments.

SuperCalc contains within itself Help Displays to aid the user at each level of operation. All the user need do is follow the prompts and enter a question mark (?), in most cases, and the program will display explanations on the screen.

SuperCalc has 18 commands, ranging from Blank to Zap. Some of the commands will accomplish almost the same task and appear similar, but, each will have at least a subtle difference. Recognizing the subtlities marks the difference between being able to use the program and being proficient.

This manual is divided into eight sessions. The first covers familiarization of the program and the terminal. The next five sessions guide you through all 18 of the commands, during which we will give a few hints or suggestions to make operations a little easier, as well as a few warnings so that some of the more common pitfalls can be avoided.

Two sessions cover working with a large worksheet and give additional information on functions, formulas and logic contained within SuperCalc. The last session covers some of the more useful CP/M commands which will expand your capabilities with your computer system.

Each session starts a brief explanation of what is to be covered, and includes definitions of any new terms and the commands to be covered during the session.

Rather than dump a lot of information on the user at one time, some explanations are given in areas where the author feels it is essential. For example, the naming of a file is done arbitrarily in Session 2, explained in Session 3 and given further explanation in Sessions 6 and 7.

Explanations of the commands are given in the sequence in which the author believes they are the most easily understood.

Before starting, we suggest that several copies of the SuperCalc disk be made and several disks formatted for storing files. If you need help, ask your friendly dealer or programmer.

Although one Help Display may apply to several different commands, these are duplicated in each appropriate place (an exception will be noted in Session 2). This was not done to give the manual bulk but to reduce the necessity (and irritation) of flipping from one section of the manual to another to find information you need. We also do not break paragraphs between pages and we have tried to keep from splitting screen displays.

A note here about terminals (also called CRT, VDT, VDU and screen.) A glance through a computer magazine will show about three zillion makes and models are available, ranging in cost from several hundred dollars to several thousand dollars. They all have one thing in common -- all are different. Your major problem will be determining how your terminal works with SuperCalc. If you get confused, ask for help. Don't get frustrated.

And last, one of the fascinating aspects of computers is their ability to adapt to the needs of the user. What we present here is not necessarily the best way, only a way that works. Find the best way for you.

SESSION 1 -- BASIC INFORMATION

1.1 Introduction

This session is concerned entirely with familiarization of the SuperCalc program and the terminal through which data is entered. The primary goal is to get the user accustomed to moving the active cell around the screen and to be able to enter and change data or commands.

1.2 Definition of Terms

Active Cell -- that area in which data or commands will be entered. On some terminals, the active cell is highlighted in reverse video or identified by half-intensity and on others bracketed by arrows such as < >.

Arrow Keys -- Keys either on the numeric keypad or other keys within the keyboard which have arrows pointing right, left, up and down.

Cell -- That area designated on the worksheet by a Column and Row, such as A1 or BK15. (In this manual we may designate a cell generally by ColumnRow.) The default size of a column is 9 spaces, but it can be adjusted from 1 to 117 characters wide. We need to make a distinction here between a blank cell, which has nothing in it, and an empty cell, a cell that is beyond the limits of a worksheet. A blank cell consumes a little memory; an empty cell does not.

Column -- A column is identified on the SuperCalc worksheet by letters A through BK.

Control Key -- This key, generally found on the left side of the keyboard, is designated on some terminals as CTRL and CONTROL on others. To use this key in conjunction with some commands, hold the CTRL key down and then press the letter associated with a particular command or function.

Control Keys -- The four keys, S,D, E and X, used in conjunction with the control key, which perform the same functions as the Arrow Keys.

Cursor -- Generally a rectangle, but sometimes a line which blinks (on some terminals, it just sits there,) indicating where you are in the program.

Data -- A group of one or more figures or characters or any combination which present a logical unit of information. "Data" are plural (the singular is datum.) Because we still find "data are" to be unnatural and uncomfortable (and datum is a strange word) we go to great lengths to avoid the term.

Default Values -- Those values used in the program which can be changed by the user. If nothing is specified, the program assumes the default values.

Help -- At almost any stage, the user can press the question mark (?) in most cases, and in a few a comma (,), and the program will erase the worksheet and display an explanation of the commands or prompts which will work at that level.

Justified -- Right-justified or left-justified is the lining up of numbers or text on the right or left side of the column.

Kilobyte -- A computer term meaning 1,000 (actually 1,024) and is sometimes abbreviated as K, such as 64K.

Range -- In SuperCalc, a range can be a cell, a row, column or a block designated by two cells (a beginning cell and an ending cell) which are separated by a colon (:) such as A1:G15, or ALL, meaning the whole worksheet.

Row -- A horizontal arrangement of data identified on the SuperCalc worksheet by a number 1 through 254.

Scroll -- To move the worksheet across the screen vertically or horizontally.

Return -- A key on the terminal used in SuperCalc to indicate that the command or data is ready for entry. In fact, a some terminals also have a key called "Enter" and possibly "Entry."

1.3 Commands This Session

/Quit
^Z or CTRL Z or Control Z

1.4 Starting SuperCalc

With the computer system turned on and the operating system prompt, A>, on the screen, enter the command to start SuperCalc as follows:

A>SC

After a moment the program will respond with the SuperCalc copyright message showing the version of SuperCalc the configuration of the program, including terminal and CPU.

Also displayed is a message:

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

One of the major features of SuperCalc is its ability to lend a hand at any stage to aid the user in making everything work. We will go over each of the levels of help, starting here. Enter a question mark (?) and the following will be displayed:

```
/  --> To enter a command
=  --> To specify a cell to jump to
!  --> To force recalculation
;  --> To change screen window

Four arrow keys scroll around the cells.
Four CTRL+Key combinations also scroll:
     CTRL/E --> move UP
     CTRL/X --> move DOWN
     CTRL/S --> move LEFT
     CTRL/D --> move RIGHT

If your terminal has no up/down arrows then:
      Space--> Toggles meaning of Right/Left arrows
               between RIGHT/LEFT and DOWN/UP

CTRL/Z -->Clears out Current entry line

" - Starts Text Cell
' - Starts Repetition of Text Cells
Any other character starts Formula cells

To return to worksheet, enter any character
```

Press any key and the program will return to the copyright message. Press Return and the blank worksheet will be displayed with cell A1 highlighted in reverse video. This is called the **Active Cell.** The display, with the active cell designated by **XXXXXXX**, is as follows:

```
     |   A   ||   B   ||   C   ||   D   ||   E   ||   F   |
   1|XXXXXXX
   2|
   3|
   4|
   5|
   6|
   7|
   8|
  to|
  2Ø|
  > A1
Width: 9   Memory:27   Last Col/Row: A1    ? for HELP
  >1
    Function Keys:  RED=Help; Blue=Keypad Shift ON (OFF)
```

If your terminal doesn't have reverse video or half-intensity, then the active cell probably is identified as follows:

```
     |   A   ||   B   ||   C   ||   D   ||   E   ||   F   |
   1|<      >
```

Learn now to pay attention to the location of the Active Cell. Most major errors occur when data or formulas are entered into the wrong cell.

A cell, unless changed, is nine spaces wide, and can be set to any width from 1 to 117 or spaces. (You can set the width to Ø, but the column disappears completely and can cause confusion.)

The limits of the worksheet are 63 columns across (A-BK) and 254 rows down. The last cell location is BK254.

Let's look at the bottom four lines of the terminal which appear as follows:

```
  2Ø|
 > A1
Width: 9   Memory:27   Last Col/Row: A1    ? for HELP
 >1
   Function Keys:  RED=Help; Blue=Keypad Shift ON (OFF)
```

Below Row 2Ø, is the status line which shows the active cell, the contents of the cell, if any, and all error messages.

The next line down is the prompt line showing the width of the cell (default is nine spaces) amount of memory remaining, expressed in kilobytes, the last position by column and row of the active cell and the "? for HELP."

Below that is the command line in which commands, data and formulas are entered and possibily edited or changed. If everything is entered correctly and Return is pressed, the data will be displayed in the Active Cell. The number to the right of the > sign is the number of characters or spaces so you know when the cell width has been exceeded. Overflow of text ends up in the next cell. Numeric entries will adjusted to fit the space.

The last line is terminal specific. Some terminals do not display a 25th line. This example is specific to the Zenith Z19 terminal. The Blue special function key will turn the keypad off and on and the Red Key can be pressed instead of the question mark to get help.

Let's move the cursor around the the worksheet using the Arrow Keys. With the active cell at A1, move the cursor down and to the right, then to the top of the worksheet and to the left so that the active cell returns to the A1 position. Next, enter an equal sign (=) and notice the lines at the bottom of the screen:

```
> A1
Enter cell to jump to.
  3>=>
```

Now enter a location such as K24, (which means the cell in K Column and Row 24, neither of which is yet on the screen) and press Return. Watch how the screen display is changed:

```
     |   K   ||   L   ||   M   ||   N   ||   O   ||   P   |
   24|XXXXXXX
   25|
   to|
   43|
  > K24
Width: 9   Memory:27   Last Col/Row: A1    ? for HELP
  1>
    Function Keys:  RED=Help; Blue=Keypad Shift ON (OFF)
```

Next, locate the control key, identified on some terminals as CTRL and on others as CONTROL. Hold the CTRL key down with one finger and press D, X, S and E and notice that you have the same movements of the active cell as with the Arrow Keys. Enter =A1 and press Return to move the active cell back to the beginning of the worksheet.

Find the slash key (/) and don't get this confused with the back slash (\). The / is the first character of a command. Enter a / and the next prompt will be:

```
 > A1
Enter: B,C,D,E,F,G,I,L,M,O,P,Q,R,S,T,U,W, Z or ?
  2>/
    Function Keys:  RED=Help; Blue=Keypad Shift ON (OFF)
```

Now enter a question mark (shift and ?). The worksheet will be erased and replaced by the following display:

SuperCalc Commands:

```
B(lank)----->Removes contents of cells.
C(opy)------>Copies contents of cells.
D(elete)---->Deletes entire row or column
E(dit)------>Allows editing the contents of a cell.
F(ormat)---->Change display format of cells, rows,
             or entire worksheet
G(lobal)---->Change global display or calculation options.
I(nsert)---->Create new row or column.
L(oad)------>Read worksheet (or portion) from disk.
M(ove)------>Swap rows or columns.
O(utput)---->Display contents or values of cells on printer,
             console or disk.
P(rotect)--->Prevent future alteration of cells.
Q(uit)------>Exit SuprCalc
R(eplicate)->Reproduce partial rows or columns
S(ave)------>Write worksheet to disk.
T(itle)----->Lock first rows or columns against scrolling.
U(nprotect)->Allow alteration of protected cells.
W(indow)---->Split or unsplit the screen display.
Z(ap)------->Clear worksheet and all settings.
```

Press any key and the worksheet will return to the screen. At this point, try to move the active cell with the arrow or control keys. You can't. (However, if you press CTRL S or the Left Arrow, the slash will disappear.) This is important. Once a command or data entry is started, the functions of the arrow or control keys change to that of an editor. Several exception will be noted later.

The user is urged to learn early to pay attention to the location of the active cell, because it is here that data or formulas are entered. If you don't learn to pay attention to the location of the active cell, you will realize suddenly, at one point or another, that you are entering data in the **WRONG** cell.

Enter a word, any word, and then press the Left Arrow. Notice now that the cursor moved once space to the left. The Right Arrow will move the cursor a space to the right. The Down Arrow will **delete a character** and the Up Arrow will **insert a space.** Move the cursor left to the beginning of the word and type in another word. Notice how the characters are replaced by the new letters.

1.5 Control Z

Until the user becomes comfortable with the program, he or she is likely to enter wrong commands or commands without the slash (/) at which SuperCalc refuses to function or displays a Formula Error. A Control Z (also written as ^Z or CTRL Z) will erase the entry and you can start again.

Hold the CTRL key down and then press Z. The word in the command line is deleted. When all else fails, you can always press CTRL Z to erase whatever is in the command line and start over.

Entry of numbers is straight forward, simply enter the numbers. If you want to use the keypad, you must first press the Blue function key in the top row (or what ever key it is on your terminal.) To use the arrow keys, the Blue key must be pressed again. For this reason, it behooves the user to learn to use both the command keys and the arrow keys with equal facility.

To enter text, first enter a double quote (") and then the text. Failure to do this will result in SuperCalc displaying a "Formula Error." Messages are displayed as follows:

```
> A1                                                  Formula ERROR
Width: 9    Memory:27    Last Col/Row: A1     ? for HELP
  5>COST
     Function Keys:  RED=Help; Blue=Keypad Shift ON (OFF)
```

When this occurs, either edit the entry or press CTRL Z and start over.

This is a good place to note that SuperCalc commands can be entered in either upper case or lower case letters. SuperCalc utilizes one of the redeeming features of CP/M, the capability of interpreting either as a command. Don't be dismayed when you enter a small "l" for load, for example, and SuperCalc will display the command as "Load."

To enter numbers which will not be used in calculations, such as a date numerically, the entry must be started with a double quote mark (") or SuperCalc will think you are entering a formula. If Ø1/Ø1/82 is entered exactly like this, it will be displayed in the active call as .Ø1219512 because the program see this as a formula -- one divided by one divided by 82.

The four basic formulas are entered as follows:

To Add -- ColumnRow+ColumnRow	A1+A2
To Subtract -- ColumnRow-ColumnRow	A1-A2
To Multiply -- ColumnRow*ColumnRow	A1*A2
To Divide -- ColumnRow/ColumnRow	A1/A2

Two of these formulas, subtract and divide, along with SUM and AVERAGE, are used in the following table, a chart to show miles per gallon, cost of the gasoline and the cost per mile. Also we will use the formula for averaging. We will duplicate this table in the next session:

	A	B	C	D	E	F
1	MILEAGE FOR HONDA					
2	Date	Odometer	Miles	Gallons	MPG	Cost
3	Ø1/Ø1/82	56728				
4	Ø1/Ø5	57ØØ3	275	9.4	29.26	11.Ø3
5	Ø1/12	57281	278	9.1	3Ø.56	1Ø.8Ø
6	Ø1/2Ø	575Ø1	22Ø	8.3	26.5Ø	9.5Ø
7	Ø1/27	578ØØ	299	9.9	3Ø.2Ø	11.89
8	Totals		1Ø72	36.7		43.22
9				Average MPG:	29.12	

SUM and AVERAGE require a colon (:) between the ColumnRows and this must be put in parenthesis as follows:

SUM (ColumnRow:ColumnRow)	SUM(A1:A5Ø)
AVERAGE (ColumnRow:ColumnRow)	AVERAGE (A1:A5Ø)

The chart is self-explanatory. The following formulas were used in Cells C4-7, E4-7 and C8, D8, F8 and E9:

C4 = B4-B3	C7 = B7-B6
E4 = C4/D4	E7 = C7/D7
C5 = B5-B4	C8 = SUM(C4:C7)
E5 = C5/D5	D8 = SUM(D4:D7)
C6 = B6-B5	E9 = AVERAGE(E4:E7)
E6 = C6/D6	F8 = SUM(F4:F7)

Let us re-emphasize that if you are having problems identifying the active cell, the direction or arrow keys or special function keys, if they are available, ask for help. Because of the wide variety of terminals available today, it is impossible to describe them all.

And, you must always be on logged Drive A when working with SuperCalc. The program doesn't work any other way. We will cover logged drives in the last session. Generally, this will never be a problem, because the computer will come up in logged Drive A when it is turned on.

Before we end this session, select just a couple of the commands, enter with a / and then follow with a ? and look at several of the help displays.

1.6 /QUIT

To bring this session to a close, we will use the command, /Quit. Enter a slash in the entry line followed by a Q. The next prompt will be:

```
> A1
Quit SuperCalc Y(es) or (N)
  5>Quit,
```

Enter a ? so we can see what SuperCalc says about quitting Supercalc. The following will be displayed:

```
Y(es) exits SuperCalc. This discards all worksheet
      data not /S(aved) on disk.
```

Enter a Y for Yes and the screen will be cleared. Anything that was in memory is lost forever. The CP/M operating system prompt, A>, will appear on the screen.

Generally, you will want to save what you are doing in a file which can be recalled later. This will be covered in the next session. Press Y for Yes to end the session.

We emphasize here the importance of always leaving the program with the /Quit command. First off, it is final and I have found the command gives me pause to think, "Did I save that file? I can't remember, Say No and Save. Now Quit." Additionally, it erases the screen the entire screen if your terminal utilizes the 25th line.

SESSION 2 -- DATA ENTRY, EDIT, FORMAT AND SAVE

2.1 Introduction

We are now familiar with our terminal and we can move the active cell around the worksheet. Also, we've looked at some of the Help Displays on the screen.

We will start using SuperCalc in earnest during this session, covering the basics of making entries, editing entries, using the format command and saving files.

At this point, we are not interested in the appearance of the worksheet. We simply want to make entries and see how SuperCalc works.

One of the best ways for a beginner to set up a worksheet initially is to sit down with pencil and paper and outline the chart, showing columns, descriptions, etc. Once you become familiar with SuperCalc and its operations, you will be able to visualize your worksheet and the pencil and paper routine will no longer be necessary.

2.2 New Terms This Session

Data Entry -- This is the entry of text, numbers, or formulas.

Formulas -- Formulas include all instructions to perform calculations, ranging from the four basic math to the logic and and trigonometric functions, which we can use singly or in equations.

Save -- To write or record the worksheet on a diskette under a file name whereby we can recall that file for later use.

2.3 Commands This Session

/Edit
/Format
/Save

2.4 Data Entry

The computer is turned on, the SuperCalc worksheet is on the screen and the active cell is A1.

For this exercise, let's duplicate the mileage chart at the end of Session 1. The chart is as follows:

```
   |   A   ||   B   ||   C   ||   D   ||   E   ||   F   |
 1|MILEAGE FOR HONDA
 2| Date      Odometer   Miles   Gallons    MPG      Cost
 3|Ø1/Ø1/82     56728
 4|Ø1/Ø5        57ØØ3      275       9.4    29.26     11.Ø3
 5|Ø1/12        57281      278       9.1    3Ø.56     1Ø.8Ø
 6|Ø1/2Ø        575Ø1      22Ø       8.3    26.5Ø      9.5Ø
 7|Ø1/27        578ØØ      299       9.9    3Ø.2Ø     11.89
 8| Totals               1Ø72      36.7               43.22
 9|                        Average MPG:    29.12
```

Enter "MILEAGE FOR HONDA. Before you press Return, notice the entry line:

```
18>"MILEAGE FOR HONDA
```

Press return and notice Row 1 and the way the entry appears:

```
   |   A   ||   B   ||   C   ||   D   ||   E   ||   F   |
 1|MILEAGE F XXXXXXX
```

Text which exceeds the width of the cell (in this case 9 spaces wide) will simply spill over into the adjacent cell or cells. Press Return and the entry in the command line will be displayed in Cells A1 and B1. The active cell is now in B1. If we make an entry here, we will replace the "R HONDA" with whatever we direct the program to print here.

We want to move the active cell to A2 and we can do this several ways. The first is with the Arrow Keys or the Control Keys. However, this starts the cursor moving in another direction. (If we use this method, the active cursor designation will appear either as < A2 or v A2.)

Instead, enter an equal sign (=) which is the command to "jump to" followed by the cell designation "to jump to." The entry will appear as follows:

```
3>=A2
```

Press Return and A2 will become the active cell. Look at the Status Line right below Line 2Ø. It now appears as follows:

```
> A2
```

Again, this simply means that A2 is the active cell and the active cell will move to the right as each entry is made. Now we are ready to enter the column headings. Starting with Column A, enter "Date and press Return. Enter Odometer without the quotation mark and press Return and look at the bottom part of the screen which appears as follows:

```
  >B2
Width: 9   Memory:27   Last Col/Row: A2      FORMULA ERROR
>8  Odometer
```

Using the Left Arrow key or CTRL S, move the cursor to the left until it cover the "0." Now press the Up Arrow or CTRL E and a space will inserted. Enter the double quote marks and press Return.

Finish out the column designations using the same process and after "Cost," jump to cell A3.

Remember that this is a date and not just numbers. On the rest of the dates, start the entry with the double quote marks. This time, enter it without the quotes and see how it is displayed.

Wow! It appears as a decimal figure, .0121951, because the slash (/) is interpreted by SuperCalc as a division sign. Now we want to look at the Editing Command and change this into "text."

2.5 /EDIT

Once an entry has been made in a cell, we can make changes in one of two ways: re-enter the data, or use the Edit command, which permits us go in and make changes without having to retype all of the data.

We want to change the decimal back to a date, so we first must jump back to A3. The active call designation, command line and and entry line appear as follows:

```
> A3              Form=01/01/82
Width: 9   Memory:27   Last Col/Row: A1    ? for HELP
  1>
```

Now, with A3 as the active call, enter a / and an E. It now appears as follows:

```
> A3              Form=01/01/82
From? Enter Cell
  7>/Edit,
```

Let's look at the Help Display available here, so enter a question mark (?), the screen will be erased and the following will appear:

A "range" is a row, column, cell or block.
A "row" is a number from 1 through 253.
A "column" is a letter (pair) from A through BK.
A "cell" is a letter followed by a row, for example" J1Ø.
A "block" is two cells, separated by a colon (:).

An empty range (entering just "return") means the current cell, row, column.

"All" means the range A1:<Last Col/Row>.

Entering "ESC" or "TAB" (depending upon your terminal) allows the arrow keys (or CTRL S/E/D/X keys) to be used to point to a desired cell.

To return to worksheet, enter any character.

The only parts of this Help Display which are pertinent are the "cell" and "empty range" definitions. Press any character and we will get back to the worksheet. We have the active cell at A3, so press Return and the following will be displayed again:

```
> A3
Width: 9   Memory:27   Last Col/Row:B3        ? for Help
9>Ø1/Ø1/82X
```

The cursor is designated by the X. Using the arrow keys or the control keys, move the cursor all the way to the left and over the first zero. Insert a space (Remember? Either the Up arrow or CTRL E) and enter the double quote marks. Press Return and the date will replace the .121951.

B2 is now the active cell, so enter the starting odometer reading and then jump to A4. Enter the date as text and the next odometer reading.

Here we encounter our first formula to calculate miles traveled which is determined by subtracting the previous odometer reading from the present odometer reading. Enter B4-B3 and SuperCalc will enter the miles traveled in C4.

Next enter the number of gallons and then the formula for determining miles per gallon (miles traveled divided by the number of gallons.) In this case, it is C3/D3. Look at the contents displayed in E3 and note that SuperCalc carried out the decimal places to five. We only want two. To do this we will use the Format Command.

2.6 /FORMAT

The Format command permits us to set how the data will be displayed. We can do this on several levels, either globally which means throughout the entire worksheet, or by Column, by Row or by each Entry.

Our active call is at F4. With the = sign, jump back to E4. The display will appear as follows:

```
     |   A   ||   B   ||   C   ||   D   ||   E   ||   F   |
   1|MILEAGE FOR HONDA
   2| Date      Odometer   Miles   Gallons    MPG      Cost
   3|Ø1/Ø1/82     56728
   4|Ø1/Ø5        57ØØ3      275       9.4    29.26
  to|
  2Ø|
 > E4              Form:C4/D4
   Width: 9   Memory:27   Last Col/Row:F4    ? for HELP
     1>
```

Enter a / and an F. The display will now appear as follows:

```
 > E4              Form:C4/D4
 Enter Level: G(lobal), C(olumn), R(ow), or E(ntry)
   9>/Format,
```

Enter a question mark (?) and the following will be displayed:

E(ntry)---->Sets display format for a cell or group of cells.

R(ow)------>Sets display format for all cells in row without a cell format.

C(olumn)--->Sets display format (or width) for column. Affects cells with no entry or row format.

G(lobal)--->Sets display format and column width for all cells and rows without local formats

Formats, for obvious reasons, can be mixed throughout a worksheet. With an E for Entry, the format will affect that cell (or groups of cells if the entry is text), while R for Row and C for Column will affect the row or column where designated. G for Global means setting the format for the whole worksheet where a cell, row or column, have not been formatted previously.

Now that we have examined the Help Display, press any key and the worksheet will return to the screen and the cursor is right where we left it, after the comma following Format. We want to format this column, so press C. With C for Column, the next prompt will be:

```
> E4                Form:C4/D4
Enter Column Letter
  9>/Format,Column,
```

When E is selected, the next prompt will be "Enter Range." R is entered, the next prompt will be "Enter Row Number." The next prompt will be (of if G for Global were selected first):

```
> E4                Form:C4/D4
Define Formats: (I,G,E,$,*,R,L,TR,TL,*,D,column width)
  18/Format,Column,E
```

Enter a question mark at this point, and the following will be displayed:

```
FORMAT command.
Enter one or more of following options:

I(nteger)--->Display numbers rounded to a whole number.
$----------->Display numbers with two digits after ".".
E(xponent)-->Display numbers in scientific notation.
G(eneral)--->Display numbers as they "best fit" in cell.
*----------->Display numbers as a string of stars.
R(ight)----->Format Numbers right-justified.
L(eft)------>Format Numbers left-justified.
T(ext)L(eft)>Display text strings left-justified
  (In this case long text will continue to display
   in occupied adjacent cells.)
T(ext)R(ight)Display text strings right-justified.
D(efault)--->Reset to G(eneral), R(ight), T(ext)L(eft).

In addition, while formatting Global or Column, a column
width of 1-127 may be specified.
```

In this case, we will enter the dollar sign ($) so that calculations will be rounded off to the pennies. Notice that the 29.25532 has been rounded off and the entry now appears as 29.26. The dollar sign does not display, nor will it be printed out in a report. If we want dollar signs in our reports, we will edit the file with a word processing program. That will be covered in Session 6.

We are going to attempt explanations of the other formats, but we are limiting our explantions here to cells which are nine spaces wide. Please note the note at the end of the general explanations as follows:

Integer -- Whole numbers. Any numbers to the right of a decimal are truncated or ignored. With the last entry, the 29.25532 would become simply 29.

Exponent -- Numbers are displayed in scientific notation or their exponential values. This entry would become 2.9255e1, which means 2.9255 times 10. The entry 1234567 would be displayed as 1.2346e6, which means 1.2346 times 1,000,000.

General -- Numbers are displayed as they "best fit" in cell. For example, if we enter 12345678 into a cell, it will appear as such. If we try to enter 123456789, it will appear as an exponent, unless we change the cell width.

* -- This is the graphics format in which numbers are displayed as a string of asterisks. To use this effectively, you will have to increase the cell size accordingly. Entries now are replaced with ********* except the 29.26 under MPG.

R for Right or L for Left -- Numbers displayed in the cells automatically are justified to the right, that is the right-most digits lining up. If we set the format L for left, the numbers are displayed in the cells with the left-most digits lining up.

Text Left or Right -- Text strings are always left-justified, or the text starts at the left margin of the cell. Any text that spills over into the adjoining cells will continue to be displayed. With right justified, the text bumps against the right margin.

Note: The width of the cell makes a difference in the way some formats are displayed. Later, as you gain proficiency is using SuperCalc, explore the format command more thoroughly. It offers a great deal of power, especially when working with astronomical figures such as the national debt.

Now, back to the session at hand. Press Return, the worksheet will be redisplayed and the cursor will be right where we left it. Enter a dollar sign ($) and note how the figure has been changed to two significant decimal places and rounded off.

We need to format the "Cost" column, Column F, the same way, then enter the cost.

Repeat the process for Rows 5, 6 and 7, changing the formulas to accommodate the changes in Rows and Columns. There's a faster way of doing it, but for now, let's get the practice of entering formulas. At the end of Row 7, jump to A8.

In Row 8, enter Totals as text and move the active cell to C8. Here we enter the formula SUM (C4:C7) and in Column D, another addition, SUM (D4:D7).

Average Miles Per Gallon in E8 is figured by the formula AVERAGE(E4:E7). Cost is another addition.

Since we've gone to all this work, let's save our worksheet so that we can use it again in later sessions.

2.7 /SAVE

The Save Command will write the file out to a disk so that the file can be recalled for later use, one way or another.

Let us drop a helpful hint here. When you are going to do any manipulating of the data, save frequently. That way if you foul up and do something you really didn't want to do, you can zap the work sheet and start again with the file as it was the last time you saved. I have lost 30 minutes work on several occasions because I replicated a formula in the wrong column.

Also, never walk away from the computer with anything of value on the screen and unsaved. Too many things can go wrong. The computer can get turned off; some one can kick the power plug loose, someone can play games on you; an earth quake can occur, ad infinitum.

Because of the length of this session, we are not going to look at the Help Displays here. The Help Displays are the same as those used for the Load Command which we will cover in the next session.

Enter /S and the next prompt will be:

```
> E8
Enter File Name (or <RETURN> for directory)
  7>/Save,
```

We consider the naming of files to be important, but we will start on that also in the next session. For now, enter Honda and the next prompt will be:

```
> E8
A(ll) or V(alues)
  13>/Save, HONDA,
```

Let's save it all. Press A. After a moment, the command line will be blank.

To quit, enter /Q. The following will be displayed:

```
>Quit SuperCalc Y(es), else N(o)
>/Quit,
```

Press Y for Yes, and let us emphasize again, the importance of leaving SuperCalc with the /Q command. We believe this is a good habit to develop.

SESSION 3 -- LOAD, ZAP and BLANK

3.1 Introduction

We can, at this point, move the active call around the worksheet with ease and we can enter data.

In this session we will load a file or part of a file, zap a worksheet, blank a cell, row, column or an entire worksheet, and delete a column, row or file.

3.2 New Terms This Session

File -- A file is a group of data on a disk, identified by name by which the file can be recalled. A worksheet when started resides in memory and is gone when you quit the program or zap the worksheet. A worksheet does not become a file until it is "saved" on a diskette.

We have from Session 2 a file on the SuperCalc disk which was named for you arbitrarily. File names can be one to eight characters in length and can be any combination of letters or numbers. Control characters also can be used, but this should be done with caution because control characters become invisible in the directory. On second thought, our recommendation is NEVER use control characters in file names.

We believe that files should be named with care because as the number of files grow, the user should be able to identify the contents of a file by its name. The user should work out his own system for creating names, keeping the system as simple as possible.

3.3 Commands This Session

/Load
/Zap
/Blank

3.4 /LOAD

Load is the command to recall a file from a disk so that more data can be added to it, or so that the file can be used as a template for another file using the same format. At the end of Session 2, we saved a file called "HONDA." When we look at the directory, it will appear as HONDA.CAL, with the .CAL extension designating the file as a SuperCalc file. Note that we determine the name of the file and SuperCalc gives it the .CAL extension automatically.

SuperCalc is in operation, a blank worksheet is on the screen and the active call is in A1.

Enter /L and the following will appear on the screen with the prompt:

```
> A1
Enter File Name (or <RETURN> for directory)
  8>/Load,
```

Enter a question mark (?) and the worksheet will be erased and the following will be displayed:

```
A file name is from 1 to 8 letters and/or
numbers, optionally preceded by a device disk
prefix.  This prefix is a single letter followed by
a colon (:).
Examples
     BALANCE
     1Exempt
     B:Feb24

A <return> allows current file list selection.
To return to worksheet, enter any character.
```

This is Help Display gives us quick information on how to name files. To get back to the worksheet, press any key.

To look at the files, start from this point:

```
> A1
Enter File Name (or <RETURN> for directory)
  8>/Load,
```

Press Return and the following will be displayed:

```
Directory Display for SuperCalc, work disk is A
Current Working File is /NONE

OPTIONS:
     C(hoose) alternate disk drive
     D(irectory) All files
     S(uperCalc) format files only

CTRL-Z to return to worksheet
```

We are told here that we are not working on any file at the present, and we have three options:

Select D for a Directory of All Files, and the following will be displayed:

```
Directory of files on Disk:

  SC      .COM  PIP     .COM  SC.       OVL  STAT       .COM
  HONDA   .CAL
Press any key to continue...
```

These are all of the the files on the disk. Press Return and the previous Help Display will be back on the screen. Press S for SuperCalc format files only and the following will be displayed:

```
SUPERCALC - Directory of files on Disk:
Filename      Creation Comment

HONDA   .CAL  SuperCalc Ver.  1.Ø5
MILEAGE FOR HONDA

Press any key to continue...
```

We have only one SuperCalc file at this time which is HONDA.CAL. The display also shows us that the file was created under version 1.Ø5 and the first line of the file is MILEAGE FOR HONDA.

Let us enter a file that doesn't exist as follows:

```
> Al
Enter File Name (or <RETURN> for directory)
  8>/Load,HANDO
```

Press Return and the program will pause for a moment. Since that file does not exist, the SuperCalc will display this message:

```
> Al                                                    File NOT on Disk
Enter File Name (or <RETURN> for directory)
  8>/Load,HANDO
```

We were positive that we saved the file HANDO. We looked at the disk directory and found HONDA.CAL, but no HANDO.CAL. With a ^Z, clear the command line. Enter /L and then press Return to get the Help Display again. This time Select C for Choose Alternate Disk Drive. The display will change to appear as:

```
Directory Display for SuperCalc, work disk is A
Current Working File is: HANDO    CAL

OPTIONS:
     Drive to use:
     D(irectory) All files
     S(uperCalc) format files only

CTRL-Z to return to worksheet
```

We enter B at this point and the the display returns to:

```
Directory Display for SuperCalc, work disk is B
Current Working File is: HANDO    CAL

OPTIONS:
     C(hoose) alternate disk drive:
     D(irectory) All files
     S(uperCalc) format files only

CTRL-Z to return to worksheet
```

Since we can't find our file on another data disk, either the file does not exist (you forgot to save it!) or we have entered the name wrong. Sure enough, on closer inspection, we find that we have we have the A and the O transposed.

Enter the name correctly. The next prompt will be:

```
> Al
Enter A(ll) or P(art)?
  8>/Load,HONDA
```

Now, we begin to see the power of this command. A complete file can be recalled by A(ll) or part of a file can be recalled with P for Part to start a new file to be added to another file. With a P for Part response, the next prompt will be:

```
> Al
From? (Enter Range)
  8>Load,HONDA
```

Enter the range to cover the area of the file to be loaded.

A note of caution: If you are loading part of a file, be sure that the active cell is in the position where you want the file to start.

For this exercise, enter A for All and the file will appear just as we saved it:

	A	B	C	D	E	F
1	MILEAGE FOR HONDA					
2	Date	Odometer	Miles	Gallons	MPG	Cost
3	Ø1/Ø1/82	56728				
4	Ø1/Ø5	57ØØ3	275	9.4	29.26	11.Ø3
5	Ø1/12	57281	278	9.1	3Ø.56	1Ø.8Ø
6	Ø1/2Ø	575Ø1	22Ø	8.3	26.5Ø	9.5Ø
7	Ø1/27	578ØØ	299	9.9	3Ø.2Ø	11.89
8	Totals		1Ø72	36.7		43.22
9				Average MPG:	29.12	

A note here for future reference: Let us assume that we are going to combine several smaller worksheets into one larger worksheet. We start with one worksheet on the screen. When we load the next worksheet, if we ask for it all at that prompt, it will be loaded over the first worksheet. We tell SuperCalc we only want part and then to the range prompt, we ask for ALL. All of the file will be loaded, starting at the point of the Active Cell.

3.5 /ZAP

The Zap command will clear the entire worksheet and can be used to go from one file to another. We find the command useful when working with a file in which we are manipulating data. Since we save frequently we can Zap a worksheet if we foul up extensively and then load the last file back in and start again.

With a /Z entry, the first prompt will be as follows:

```
> A1
Y(es) to clear everything, else N(o)
  24>/Zap-ENTIRE-Worksheet?
```

We have only two choices, Y for Yes or N for No. We can press all of the other keys on the terminal and SuperCalc will not budge (Oops! A Control Z will zap the Entry Line, but N for No will do the same thing more easily.) Just for the heck of it, let's enter a ?. The following will be displayed:

```
Y(es) erases all data from worksheet, including
global formats and column width.  Zap is
equivalent to exiting SuperCalc and calling
it again.
```

Zap is similar to Quit, but the difference between the two is that Zap just clears the screen and so that you can continue in SuperCalc, while Quit dumps you back to the CP/M operating system and the A>.

Zap the worksheet and Load it in again before continuing.

3.6 /BLANK

Blank might be called a "little Zap," in that it can be limited to a cell, a column, a row, or a range, which can be the entire worksheet.

With the Entry Line blank, enter /B. The next prompt will be:

```
> A1
 Enter Range
   8>/Blank,
```

Enter a question mark (?) and the worksheet will be erased temporarily and the following explanation will be displayed:

A "range" is a row, column, cell or block.
A "row" is a number from 1 through 253.
A "column" is a letter (pair) from A through BK.
A "cell" is a letter followed by a row, for example" J1Ø.
A "block" is two cells, separated by a colon (:).

An empty range (entering just "return") means the current cell, row, column.

"All" means the range A1:<Last Col/Row>.

Entering "ESC" or "TAB" (depending upon your terminal) allows the arrow keys (or CTRL S/E/D/X keys) to be used to point to a desired cell.

To return to worksheet, enter any character.

If we enter a Return here followed by a second Return, the active cell, A1 (which spills over into A2) will be deleted.

To blank more, we must enter a range, such as B2:G2, which would blank out all of Row 2 of our worksheet.

Also note that we can press the ESCape or TAB key (depending upon your terminal) and we can move the active cell around using the Control or Arrow keys.

Blank out a few more sections of the worksheet and finish with a range to blank out everything, leaving the entire worksheet blank. Then Quit to end this session.

We believe that it is a good practice to get back to a control menu or the operating system before shutting down the computer system. In the case of SuperCalc, be certain that you save any important worksheets and then use the Quit command.

SESSION 4 -- INSERT, DELETE and MOVE

4.1 Introduction

The capability of inserting of rows or columns and deleting rows and columns will be covered in this session, as well as moving rows or columns from one area of the worksheet to another location.

4.2 Commands This Session

/Insert
/Delete
/Move

Before continuing this session, Load the HONDA file.

4.3 /INSERT

The Insert command gives the user the ability to add columns or rows one at a time as the worksheet develops.

Enter /I and the next prompt will be:

```
>A1
R(ow) or C(olumn)?
9>/Insert,
```

Enter a question mark (?) and the following will be displayed:

```
A "range" is a row, column, cell or block.
A "row" is a number from 1 through 253.
A "column" is a letter (pair) from A through BK.
A "cell" is a letter followed by a row, for example"
J10.
A "block" is two cells, separated by a colon (:).

An empty range (entering just "return") means the
current cell, row, column.

"All" means the range A1:<Last Col/Row>.

Entering "ESC" or "TAB" (depending upon your terminal)
allows the arrow keys (or CTRL S/E/D/X keys) to be
used to point to a desired cell.

To return to worksheet, enter any character.
```

Only Row and Column are pertinent in this Help Display. Enter R for Row and the next prompt will be:

```
> A1
  Enter Number
9>/Insert,R,
```

If Column is selected, the prompt will be:

```
> A1
  Enter Letter
9>/Insert,C,
```

Enter the number or letter (or pair of letters) and press Return. A blank row or column will be inserted at that point. Be aware that if a column or row is inserted, all cells to the right of the new column and all cells below the row take on new locations. SuperCalc makes all of the adjustments it can, but a calculation may be off because a value is affected by the insert. Generally this shows up on the worksheet as an ERROR.

4.4 /DELETE

Delete differs from Blank in that entire rows or columns are deleted simply by entering the Row Number or Column or letter or letters. Delete also gives the capability of deleting files from a data disk when additional space is needed.

Enter a /D and the following will be displayed with the prompt:

```
> A1
Enter R(ow) C(olumn) or F(ile)
  8> /Delete,
```

Enter a question mark (?) and the following will be displayed:

```
Delete Options:

R(ow)----->to delete an entire row from the worksheet
C(olumn)-->to delete an entire column
F(ile)---->to delete (forever) a file that currently
           exists on disk
```

Press any key to return to the worksheet and enter the Row number or the column letter or pair of letters.

Delete Row removes contents from that row and the rest of the worksheet will move up to fill in the space.

Delete Column removes the contents of that column and all columns to the right are moved to the left to fill in the gap.

Be aware that if a column or row is inserted, all cells to the right of the new column and all cells below the row take on new locations and this can conceivably throw off a calculation or two depending upon location, if that location contains a value which is used in another location. Generally, it shows up as an ERROR in that cell.

Insert and delete several rows and columns before continuing on in this session.

To delete a file, press F for File and the next prompt will be:

```
> Al
Enter File Name (or <RETURN> for directory)
  8> /Delete,File
```

Press Return and the following will be displayed:

```
Directory Display for SuperCalc, work disk is A
Current Working File is /NONE

OPTIONS:
     C(hoose) alternate disk drive
     D(irectory) All files
     S(uperCalc) format files only

CTRL-Z to return to worksheet
```

This Help Display tells us that we are working on file called HONDA.CAL and it is on Drive A. We are given three options. Select D for a Directory of All Files, and the following will be displayed:

```
Directory of files on Disk:

  SC       .COM  PIP      .COM  SC.       .OVL  STAT       .COM
  HONDA    .CAL
Press any key to continue...
```

These are all of the the files on the disk. Press Return and the previous Help Display will be back on the screen. Press S for SuperCalc format files only and the following will be displayed:

```
SUPERCALC - Directory of files on Disk:
Filename       Creation Comment

HONDA    .CAL  SuperCalc Ver.  1.Ø5
MILEAGE FOR HONDA

Press any key to continue...
```

Enter the file name and that file will be deleted. If you enter the name of a file that that doesn't exist or you enter the name of a file incorrectly, the program will warn you:

```
> Al          Text="MILEAGE FOR HONDA              File NOT on Disk
Enter File Name (or <RETURN> for directory)
 19>/Delete,File,HANDO
```

Check your entry. Either it is wrong or the file doesn't exist.

Also note that description back in the first Help Display:

```
F(ile)---->to delete (forever) a file that currently
           exists on disk
```

That little word "forever" is important here. When a file is deleted, it is, for all practical purposes, gone forever. However, let us point out here that actually, the file has been deleted now only from the directory. A really important file can be resurrected, but only if nothing else is written to that disk. This requires a programmer or a utility program designed to recover a file from inadvertent erasure.

4.5 /MOVE

The Move command permits the relocation of a row or column from one area to another. This capability lets the user rearrange his worksheet. Move is limited to a single row or column from one location to another, and the columns or rows are then rearranged to accommodate the move. For example, the material in Row B is moved to Row C, then the material in Row C becomes Row B and so on.

Enter /M and the next prompt will be:

```
>A1
R(ow) or C(olumn)?
7>/Move,
```

Enter a question mark (?) and the following will be displayed:

```
A "range" is a row, column, cell or block.
A "row" is a number from 1 through 253.
A "column" is a letter (pair) from A through BK.
A "cell" is a letter followed by a row, for example"
J10.
A "block" is two cells, separated by a colon (:).

An empty range (entering just "return") means the
current cell, row, column.

"All" means the range A1:<Last Col/Row>.

Entering "ESC" or "TAB" (depending upon your terminal)
allows the arrow keys (or CTRL S/E/D/X keys) to be
used to point to a desired cell.
To return to worksheet, enter any character.
```

Column and Row are the only pertinent definitions here. Press any key and the Help display will be erased and the worksheet returned to the screen with the prompt:

```
>A1
To? (Enter Cell, then Return; or "," for Options
7>/Move,
```

Enter a comma and the following will be displayed:

```
N(o) Adjust.) A(sk for Adjust.), V(alues)
  7>/Move,
```

With a N for No Adjustment, the program will move a column or row as specified.

With a A for Ask for Adjustment, each value and formula in the area to be moved will be displayed one at a time. You have the opportunity at this point to respond with a Y for Yes, make the adjustment or N for No, do not adjust.

With a V for Values, only the values will be moved and none of the formulas will be moved.

As with insert and delete, if a column or row is moved, cells to the right of the column or all cells below the row take on new locations and this can throw all calculations depending upon locations.

4.6 ESCape or Tab Key Special Function

We noted in Session 1 that once a command was started, the Active Cell could not be moved, but an exception would be noted later.

This is later and the exception covers five commands (that we can find), including /Blank, Copy, Replicate, Protect and Unprotect.

When we check the Help Displays for these commands we will find the notation:

> Entering "ESC" or "TAB" (depending upon your terminal)
> allows the arrow keys (or CTRL S/E/D/X keys) to be
> used to point to a desired cell.
> To return to worksheet, enter any character.

This applies to cell or range, generally, and by pressing the ESCape key or the TAB key (depending upon your terminal), this lets you move the cursor around the worksheet with the Arrow or Control Keys. Note that in the Entry Line, SuperCalc will keep track of the active cell location. When you stop, press Return and that action will be directed to that cell.

We guess this also is a good place to note that the single quote mark (') will cause text to be repetitive from the active cell right through to Column BK.

For example, if we entered:

```
6>'TEST
```

we would get a row as follows:

```
TESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTEST
```

as far to the right as the eye can see, all the way to Column BK. We cannot blank any part of this line. We can check any part of this line through the /Edit command, and see 'TEST, but all editing is to no avail.

I didn't see the purpose of this and I commented aloud to the effect that "This is a dumb thing to do." I was told that it would print only as wide as the worksheet. I called up a worksheet and put in a line of hyphens and again it extended to Column BK. So I showed him what I had done.

"Idiot," he said patiently, "I said PRINT!"

So, I loaded a worksheet, deleted all the columns beyond E and printed out the report. Sure enough, the line of hyphens only printed through Column E.

I wasn't satisified, so I reloaded the worksheet and inserted a blank row. In the first blank cell in the new row to the right of the worksheet, I entered "Stop. Jumping to Column A in the blank row, I entered '- and it stopped at Stop. I learned through playing around that it will be duplicated until it enters a cell with something in it.

Out of curiosity, I blanked Stop and the row of dashes continued on like a bullet.

See what you can learn just by asking?

SESSION 5 -- COPY, REPLICATE, PROTECT and UNPROTECT

5.1 Introduction

During this session, we will learn to copy and replicate data and to protect cells or ranges so that the contents cannot be altered. Also, we will looking at unprotecting "protected" cells so that the contents can be later blanked or changed.

5.2 New Terms This Session

Protect -- In SuperCalc terms, protect means to lock a cell or range so that no information within that area can be changed.

Replicate -- To duplicate several times over. The distinction between copy and replicate is that copy is done on a one-to-one basis, while replicate can duplicate the contents of a cell a number of times.

Unprotect -- The opposit of protect, obviously, and presents the opportunity when needed to unlock a cell or range.

5.3 Commands This Session

The following commands will be used during this session.

```
/Copy
/Replicate
/Protect
/Unprotect
```

Before continuing this session, load the HONDA file.

5.4 /COPY

The Copy command permits the duplication of a cell, row, column or range in another location on a one-for-one basis. If you want a cell or range copied in several areas, it will take multiple commands, one for each operation.

Copy also can be used to move large blocks around a worksheet to gain space. Copy the range in from one area to another and then blank out that range in the first area.

The HONDA file is on the screen. Locate the Active Cell at A13 and enter /C. The following prompt will be displayed:

```
> A13
From? (Enter Range)
  7>/Copy,
```

Enter a question mark (?) and the following will be displayed:

```
A "range" is a row, column, cell or block.
A "row" is a number from 1 through 253.
A "column" is a letter (pair) from A through BK.
A "cell" is a letter followed by a row, for example"
J1Ø.
A "block" is two cells, separated by a colon (:).

An empty range (entering just "return") means the
current cell, row, column.

"All" means the range A1:<Last Col/Row>.

Entering "ESC" or "TAB" (depending upon your terminal)
allows the arrow keys (or CTRL S/E/D/X keys) to be
used to point to a desired cell.

To return to worksheet, enter any character.
```

Enter the range. Note that we can copy any part or all of the worksheet in just about any manner we want. For this exercise, enter All. The next prompt will be:

```
> A13
To? (Enter Cell, then Return; or "," for Options
  7>/Copy,
```

We need to look at our options, so enter a comma and the following will be displayed:

```
> A13
N(o) Adjust.) A(sk for Adjust.), V(alues)
  7>/Copy,
```

With an N for No Adjustment, the program will copy the range we established exactly as it appears (mistakes and all, if you made any mistakes) and make any necessary adjustments.

With an A Ask for Adjustments, the program will copy everything that can't be adjusted to the first cell where an adjustment can be made. The prompt will appear approximately as follows:

```
Source location C4. Adjust B4?
N(o) Adjust.) A(sk for Adjust.), V(alues)
 16>B4-B3
```

If we want to change B4 we enter Y for Yes and SuperCalc will make the adjustment. How? Magic, is our best explanation. We can tell it N for No and no adjustment will be made, and the next value will be displayed. To have SuperCalc make the adjustment, press Y for Yes. The process is repeated until all of the values have been displayed.

We can move only the values with a V for Values, which let's do at this time. Move the Active Cell to E4, and look at the status line, C4/D4, and then to E16, and the value, 29.25531914893617. SuperCalc calculates out to 17 places, including a decimal point.

5.5 /REPLICATE

The Replicate command gives the user the ability to reproduce or "duplicate" and modify data or formulas already entered in the worksheet. This can be either one cell or a row, column or range.

We have copied the values from our original worksheet to the new location starting at A13. Go through the Odometer entries and change the figures so that we can see the difference later. Now locate the Active Cell at C16, enter /R and the following prompt will be displayed:

```
> C16              Form=275
From? (Enter Range)
12>/Replicate,
```

Enter a question mark (?) and the following will be displayed:

```
A "range" is a row, column, cell or block.
A "row" is a number from 1 through 253.
A "column" is a letter (pair) from A through BK.
A "cell" is a letter followed by a row, for example"
J10.
A "block" is two cells, separated by a colon (:).

An empty range (entering just "return") means the
current cell, row, column.

"All" means the range A1:<Last Col/Row>.

Entering "ESC" or "TAB" (depending upon your terminal)
allows the arrow keys (or CTRL S/E/D/X keys) to be
used to point to a desired cell.
To return to worksheet, enter any character.
```

Enter the range. In this case, we want to replicate the formula located in C4, so make that entry. The next prompt will be:

```
> C16              Form=275
To? (Enter Range), then Return; or "," for Options
15>/Replicate,C4,
```

We want to replicate the formula in C16:C19, and instead of pressing return, enter a comma (,) and the following will be displayed:

```
> C16              Form=275
N(o Adjust.) A(sk for Adjust.), V(alues)
23>/Replicate,C4,C16:C19,
```

Enter a question mark (?) and the next display will be:

```
Formula adjustment options:

Determines how cell references in formulas
are adjusted for their new positions.

N(o adjust)--->Leave all cell references (like J1Ø)
               unchanged.
A(sk)--------->Gives you the options to change or leave
               each cell reference individually.
V(alues)------>Only move cell values, no adjustment
               is pertinent.

If no option specified (back up and type <return>
instead of <,>) all cell references are modified.
```

If we ask for no adjust, SuperCalc will make all of the adjustments it can. We will replicate the results of the formula in C4 or 275 in all of the cells in the range specified.

If we ask for adjustments, SuperCalc will display each of the values which can be adjusted. We say Yes for values to be adjusted or No if we don't want them changed, and the program makes the necessary adjustments.

Use caution with the Replicate command. It consumes memory.

5.6 /PROTECT

A cell or range can be "Protected" so that the contents cannot be changed inadvertently. This is helpful when setting up a worksheet and then letting someone else not familiar with the program to enter the data.

Once a cell or a part of the worksheet is protected, it is protected forever or until it is unprotected, which ever comes first.

Enter a /P and the following prompt will be displayed:

```
> A1
Enter Range
 1Ø>/Protect,?
```

Enter a question mark and the next display will be:

A "range" is a row, column, cell or block.
A "row" is a number from 1 through 253.
A "column" is a letter (pair) from A through BK.
A "cell" is a letter followed by a row, for example" J10.
A "block" is two cells, separated by a colon (:).

An empty range (entering just "return") means the current cell, row, column.

"All" means the range A1:<Last Col/Row>.

Entering "ESC" or "TAB" (depending upon your terminal) allows the arrow keys (or CTRL S/E/D/X keys) to be used to point to a desired cell.

To return to worksheet, enter any character.

Enter the range and press Return. The command line will be erased. Now, if an attempt is made to change the contents of any cell within that range, the following will be displayed:

```
> B7          P Form-57281                    Protected Entry
Width:  9 Memory:24 Last Col/Row: F11     ? for HELP
 3>5781
```

5.7 /UNPROTECT

A protected cell or range can be unprotected so that the contents can be changed.

Enter a /U and the following prompt will be displayed:

```
> A1
Enter Range
 12/Unprotect,?
```

Enter a question mark (?) and the next display will be:

A "range" is a row, column, cell or block.
A "row" is a number from 1 through 253.
A "column" is a letter (pair) from A through BK.
A "cell" is a letter followed by a row, for example" J1Ø.
A "block" is two cells, separated by a colon (:).

An empty range (entering just "return") means the current cell, row, column.

"All" means the range A1:<Last Col/Row>.

Entering "ESC" or "TAB" (depending upon your terminal) allows the arrow keys (or CTRL S/E/D/X keys) to be used to point to a desired cell.

To return to worksheet, enter any character.

Enter the range and press Return. That area is now unprotected.

Before we bring this session to a close with a /Quit command, let us note here about models, forms or templates for the headings of reports and such which we might want to save for future use. We get the file set the way we want it and then protect it. In the first data line we enter, "This file is protected." and then we move the active cell to the beginning of the row. This message is to remind us that the top is protected and then to use the file, we delete the message line and enter data.

We find that we like to protect these so that we or no one else can fill out the form. When we want to use the form, we call it up, unprotect it, fill it out and then save it under another file name. The original file is still protected.

SESSION 6 -- GLOBAL, TITLE, WINDOW and OUTPUT

6.1 Introduction

Certain functions can be set within SuperCalc which will change the way the program handles recalculations, borders and Active Cell movements. Additionally, we will look at ways of keeping parts of the worksheet on the screen at one time, work with two sections of the worksheet at once and print out the worksheets.

6.2 New Terms This Session

Global -- In the context of SuperCalc, global means throughout the worksheet.

Window -- A way of describing how we view parts of the worksheet.

Title -- Labels or tags used to identify a worksheet and the rows and columns of data.

Output -- A computer term meaning to produce or display. An output device is any instrument such as a terminal or printer which receives data from the computer.

6.3 Commands This Session

/Global
/Title
/Window
/Output

6.4 /GLOBAL

The /Global command will let us change the way recalculations are handled within the worksheet as well as display formulas instead of values, turn the borders off and on and change the way the Active Cell is moved.

Enter /G and the following prompt will be displayed.

```
> Al
F(orm.),N(ext),B(order),T(ab),R(ow),C(ol.),M(an.)A(uto)?
9>/Global,?
```

Next, enter a question mark (?) so we can look at our options. The following Help Display will appear on the screen:

GLOBAL command options:
These options affect calculation or display attributes.
R(ow-wise) -- Specifies that recalculations be done across the rows, that is, all of Row 1 is calculated, then all of Row 2, etc.
C(olumn-wise) -- Calculation is down the column, that is all of Column A, then all of Column B, etc.
A(utomatic Recalculation) -- The entire worksheet is recalculated after numbers or formulas are entered.
M(anual Recalculation) -- In this mode, the worksheet is only recalculated when you enter "!".
The following options are "toggles". If the option is already on, respecifying it turned off and vice versa.
T(ab) -- In Tab mode, advancing between cells skipps all empty or protected cells.
B(orders) -- Controlls whether the row number and column letter borders are displayed.
F(ormula Display) -- In Formula Display mode, the textual contents (rather than current values) are displayed.
N(ext) -- This toggle controls where an "auto-advance" is performed (in the "current direction') after data is entered into a cell.

The following are explanations of each of these options:

R(ow-wise) -- This is the way SuperCalc ordinarily recalculates a worksheet. The recaculation starts in the upper right-hand corner of the worksheet and recalculates all of Row 1, then goes to the left end of Row 2 and recalculates, then Row 3 and so on.

C(olumn-wise) -- Occasionally, one encounters a worksheet where a calculation early in the worksheet depends upon a later calculation and one ends up with a miscalculation. This option directs that SuperCalc calculate by column, starting at the left-most column and calculating down, then the next column and so on. Frankly, we couldn't come up with an example, but the regular manual covers this problem.

A(utomatic Recalculation) -- As formulas or numbers are entered, SuperCalc actually recalculates the whole worksheet. This is the usual method of operation.

M(anual Recalculation) -- When M for Manual Recalculation is called, you determine when the recalculation is to be done by entering an exclamation point (!).

T(ab) -- The Tab mode is useful particularly when changing data and formulas in a worksheet. A T for Tab turns the mode off or on whereby the Active Cell skips all empty or protected cells.

B(orders) -- With a B for Border, the column letters and row numbers can be displayed or printed or eliminated in a screen display or a printout. This will be covered additionally in Section 6.7.

F(ormula Display) -- When F for Formula Display is selected, the formulas are displayed rather than the values. When selected again, it becomes Formula Undisplay.

N(ext) -- When entries are made in the Active Cell and Return is pressed, the Active Cell jumps to the next cell, depending upon which direction it is traveling. With the N for Next option, the Active Cell just sits there until it is moved, either by the Arrow Keys or the Control Keys.

The Global command is another of those commands with which you need to experiment after you gain a little skill in working with SuperCalc.

6.5 /TITLE

The Title command permits the locking of the labels or notations for rows and columns so that these are displayed constantly and do not scroll off the screen. This command is very useful when having someone else enter data and he or she must be able to see the labels to get data in the proper cells.

Enter /T and the following will be displayed on the screen with the prompt:

```
> Al
H(oriz.)m V(ert.), B(oth) or C(lear)?
7>/Title,
```

We want to look at the options. Enter a question mark (?) and the following Help Display will appear:

```
Title Lock.  Tells SuperCalc to "lock" the leftmost
columns and/or uppermost rows so that they are never
scrolled off the screen (or video window).

Options:
H(orizontal)—>Lock current row and all rows above it.
V(ertical)———>Lock  current  column  and all those  to  the left.
B(oth)————————>Simultaneously lock H and V.
C(lear)————————>Erase any title locks.
```

If we want to lock only the column titles, place the Active Cell on the row designating the bottom of the area to be locked and enter H for Horizontal locking. All rows from the Active Cell up are now locked.

With the Honda file on the screen, place the Active Cell in Row 2 and press H. Now jump to A25 and see what happens.

To lock the Row titles, place the active cell on the last row to the right to be locked and enter V for Vertical locking. All rows from the Active Cell to the left are now locked.

Place the Active Cell in Column A and press V. With the = sign, jump to K25. Notice that we lost our Horizontal locking.

To lock both the top and the left, place the active cell on the Honda worksheet in A2 and press B for Both.

6.6 /WINDOW

When working with a spreadsheet more than nine columns by 20 lines, your terminal is, in effect, a window which permits you to see segments of the worksheet. The Window command lets view one part of the screen and work in another part of the worksheet.

The Window command is another of SuperCalc's features that can be a very powerful tool, once you have learned how to control it. Determine whether you want to work with the worksheet horizontally (dividing the worksheet some where by a row) or vertically (dividing the worksheet by a column.)

Place the cursor in the column or row where you want the dividing line and enter /W. The following will be displayed with the prompt:

```
>A1
H(oriz.),V(ert.),C(lear Split),S(ynch.) or U(nsych.)
8>/Window,?
```

Enter a question mark (?) to look at the Help Display which will appear as follows:

```
Window (split-screen) options:

H(orizontal)-->Split into two windows at current row.
V(ertical)---->Split at current column.
C(lear)-------->Erase split (return to single window).
S(ynchronize)->Cause both windows to scroll simultaneously
               when moving parallel to split.
U(nsych.)----->Cause only current window to scroll,
               regardless of direction.
```

The following are general explanations of the options:

H(orizontal) -- With an H for Horizontal, the screen is split into two windows at the current row. For example, if the cursor is in Row 3, the screen will be split, showing Row 1 and 2 above the split and Rows 3 through 19 below the split. The Active Cell will be in Row 3. You can go from top part of the screen to bottom part by pressing the ; (semicolon.)

V(ertical)-- Select V for Vertical and the screen is split into two windows at the current column. For example, if the cursor is in Column C, the screen will be split, showing Columns A and B to the left of the split and Columns C through G to the right of the split. The Active Cell will be in Column C. You can go from one side of the screen to the other by pressing the ; (semicolon.)

C(lear) -- To get back to the single window, enter /W and C for Clear.

S(ynchronize) -- With the S for Synchronize option, both windows will scroll simultaneously when moving parallel to split.

U(nsychronize) -- Only the window containing the active cell will scroll, no matter which direction the movement. This only works if you have first synchronized the scrolling.

Once in the windows are set, you can work in only one part of the screen. To move the active cell from one part of the screen to the other, enter a ; (semicolon.)

Note: You must first split the screen and then with the /W command, then determine if you want the scrolling to be synchronized with an S for Synchronize.

6.7 /OUTPUT

Output is the command which permits printing or storing a worksheet as it appears on the screen in a special file for editing with word processing program. We can do this with all of the formulas or we can do this with the values within the worksheet only.

Generally we work with the Output Command in conjunction with the Global Command.

Enter /O and the following will be displayed with the prompt:

```
>A1
Display or C(ontents) report?
9>/Output, ?
```

Now enter a ? so we can look at our options. The following Help Display will appear on the screen:

```
OUTPUT report Options:

D(isplay)--->Generates report formatted in rows and columns,
             essentially like the interactive display.

C(ontents)-->Lists the exact contents (text or formulas)
             of occupied cells, one per line.
```

A D for Display response will direct that the worksheet be printed or written to a file exactly as it appears on the screen. If you don't want the borders showing rows and columns, first use the Control Z to clear the entry line and enter the Global command where you have the option to turn off (or on) the borders.

If you want only the contents, select C for contents and the resulting printout will list each of the cells, one line at a time.

For example, if we printed out the contents of our Honda file, the first few lines would appear as follows:

```
SuperCalc Ver.  1.Ø5
MILEAGE FOR HONDA
A1        = "MILEAGE FOR HONDA
A2        = "Date
B2        = "Odometer
C2        = "Miles
D2        = "Gallons
E2        = "MPG
F2        = "Cost
A3        = "Ø1/Ø1/82
B3        = 56728
A4        = "Ø1/Ø5
B4        = 57ØØ3
C4        = B4-B3
```

Notice that the contents start with Row A1 and prints out the contents of each cell for that row, then go to B1 and does the same thing for the rest of Row 2 and then go to Row 3.

Select C for Contents or D for Display which we will select here, and the next prompt will be:

```
>A1
Enter Range
9>/Output,Display,?
```

Enter a ? and the following will be displayed:

```
A "range" is a row, column, cell or block.
     A "row" is a number from 1 through 253.
     A "column" is a letter (pair) from A through BK.
     A "cell" is a letter followed by a row, for example"
     J1Ø.
     A "block" is two cells, separated by a colon (:).

     An empty range (entering just "return") means the
     current cell, row, column.

     "All" means the range A1:<Last Col/Row>.

     Entering "ESC" or "TAB" (depending upon your terminal)
     allows the arrow keys (or CTRL S/E/D/X keys) to be
     used to point to a desired cell.

     To return to worksheet, enter any character.
```

Note that we can limit our output to any part of the worksheet which we can define with in the context of range. Enter the range (as usual ALL does it all.) The next prompt will be:

```
> A1
Enter Device: P(rinter), S(etup), C(onsole), or D(isk)
 21>/Output,Display,ALL,
```

Let's enter a ? here. The following will be displayed:

```
P(rinter)--->Allows you to create printed reports
             from the worksheet, using the setup codes
             originally configured when SuperCalc was
             installed

S(etup)----->Print reports (as "P"), but allows specifying
             special printer setup codes, paper width
             or page length.

C(onsole)--->Allows you to preview the report on
             your terminal display.

D(isk)------>Outputs the report to a disk file for
             later use.
```

Operation of each of the options is as follows:

P for Printer will print the report as it appears on the screen. Enter P and the printer will be activated and the following will be displayed:

```
Enter CTRL-Z to STOP print
End of Report...Type any key to return to worksheet
 21>/Output,Display,ALL,Printer,
```

If the worksheet is two or more pages long, SuperCalc will stop and display this message:

```
Enter CTRL-Z to STOP print
More... ('return to continue or CTRL-Z to stop)
 21>/Output,Display,ALL,Printer,
```

If the printout is to be continued, press Return. A Control Z will abort the operation.

With an S for Setup response, the following will be displayed:

```
          Select PRINTER control:

L  = Change page length          (now  66 lines)
       (length = Ø for continuous form.)
W  = Change paper width          (now 132 chars)
S  = Manual setup codes
P  = Print report
CTRL-Z to cancel /O command
```

At the bottom of the screen the prompt will now read:

```
> Al
L(ength), W(idth), S(etup codes) or P(rint)?
 26>/Output,Display,ALL,Setup
```

Select L to reset the length of the page and the following will be displayed:

```
> Al
Enter number (Ø-255), then return.
 26>/Output,Display,ALL,Setup
```

Only Ø-255 will be accepted by the program. Enter the number of lines to be printed on a page, and for purposes of this exercise, let's use 55. The display will now appear as follows:

```
          Select PRINTER control:

L  = Change page length            (now  55 lines)
       (length = Ø for continuous form.)
W  = Change paper width             (now 132 chars)
S  = Manual setup codes
P  = Print report
CTRL-Z to cancel /O command
```

The prompt at the bottom of the screen returns to:

```
> Al
L(ength), W(idth), S(etup codes) or P(rint)?
 26>/Output,Display,ALL,Setup
```

Width in this case means the number of printer positions across the page that will fit on the paper. Standard is 1Ø characters per inch, so 8.5 inch wide paper will hold 8Ø printer columns. The widest most printers go is 132 print columns wide, even in compressed print.

Select W to change the width of the page and the following will be displayed:

```
> Al
Enter number (Ø-255), then return.
 26>/Output,Display,ALL,Setup
```

Only Ø-255 will be accepted by the program.

Let's enter 8Ø as the number of print positions across the page. Press Return and the display will now appear as follows:

```
        Select PRINTER control:

L  = Change page length              (now  55 lines)
       (length = Ø for continuous form.)
W  = Change paper width               (now  8Ø chars)
S  = Manual setup codes
P  = Print report
CTRL-Z to cancel /O command
```

The prompt at the bottom of the screen returns to:

```
> Al
L(ength), W(idth), S(etup codes) or P(rint)?
 26>/Output,Display,ALL,Setup
```

Note here that a page length of Ø can be used for continuous form paper. But, unless the printer has a skip perforation option, you may end up with a row on the perforation.

With an S for Manual Setup Codes, the following will be displayed:

```
> Al
Enter codes (CR when done)
 26>/Output,Display,ALL,Setup
```

With my system, the cursor is blinking after "done)." SuperCalc will not accept anything I enter except Return. I can't even enter a question mark. I think this is the only place where SC fails. I checked the SC manual, which is silent on this option.

With P for Print Report, the printer will be activated. Be sure the printer is turned on and is on line.

With a C for Console, the worksheet will be displayed with one of two prompts:

```
More... ('return to continue or CTRL-Z to stop)
```

or

```
End of Report...Type any key to return to worksheet.
```

You may find it useful to display the report on the screen before printing it out. However, the screen display will not show where the pages will break. Our solution to this problem is to output the worksheet to another file on disk and then edit that file with WordStar or your word processor.

With a D for Disk output, the next prompt will be:

```
> Al
Enter File Name (or <RETURN> for directory)
 26>/Output,Display,ALL,Disk,
```

If help is needed to determine a file name, enter a ? (question mark.) The worksheet will be erased and the following will be displayed:

```
A file name is from 1 to 8 letters and/or
numbers, optionally preceded by a device disk
prefix.  This prefix is a single letter followed by
a colon (:).
Examples
     BALANCE
     1Exempt
     B:Feb24

A <return> allows current file list selection.
To return to worksheet, enter any character.
```

To look at the files, check back in Session 3.

We can call this file anything we want, as long as we follow the conventions established for naming files. We can call it HONDA and we will be able to distinguish the new file from the HONDA.CAL file because it will have a different extension, HONDA.PRN.

All disk files created through the Output to Disk routine will carry the .PRN file automatically. This is an ASCii file, which means it can be read and edited by most of the word processor programs available on the market for the microcomputer. A .PRN file cannot be loaded by SuperCalc.

WORKING WITH A LARGE SPREAD SHEET

Because of the limits of internal RAM, a large worksheet must be divided into smaller workable segments which will fit within the memory of your computer.

Memory limitations gives us a good reason now to look at memory management, which is difficult to explain because of the many variables involved. These variables determine the number of bytes consumed in each cell, which may vary from one byte for one number to "many bytes" which may be consumed in a long, complex formula, but which shows up on the screen as only a few numbers.

A blank cell, which is outside the limits of a worksheet, takes no memory. An empty cell, one which has no entry but is surrounded by other cells which do, takes up a minimum amount of memory.

Theoretically (if we could amass enough memory) our worksheet can contain 16,ØØ2 cells (that's 63 columns across multiplied by 254 rows down.)

Through our experience and the experience of others, we have found our limits to be in the range of 8ØØ cells (we work with CP/M set for 6ØK) which means our worksheet can be 2Ø columns across and 5Ø rows down (or any adjustments between the two, of course.)

Of course, we know that SuperCalc is going to keep count of how much memory is left and tell us when we run out. For this exercise, we entered 12345678 in A1 and then replicated this in A2:A254, B1:B254 and in Column 3 until we ran out of memory, which occurred in C116, at which time, our status, prompt and entry lines appeared as follows:

```
> A1          Form=12345678                                  Memory FULL
Width:  9  Memory:Ø Last Col/Row:C254        ? for HELP
  1>
```

The cursor went back to A1. We can jump the cursor anywhere we want in the worksheet, but the Memory FULL message will be displayed every time we try to add anything to the worksheet and the cursor will be returned to A1.

The concept used in the development of this session was a project to record data covering several years of production of several oil and gas properties. Analysis of this data was then used as the basis for depletion for the individual royalty owner. While the general focus was on production, we also wanted to verify, using the net payment, the figures of the petroleum company.

We started by analyzing the avaialable data, given to use in a large manila envelope, and then we established a format for entry of data. The most logical way was to list each property by its designated number my month and year of production as well as the types of products coming from each property.

Next we determined the column widths, keeping in mind ease of data entry. Appearance was never a consideration until the report was prepared for presentation.

When working with a number of files, we found it advantageous to identify the file name in the title area so that we could see at a glance the name. This reduced the danger of saving one file or another, destroying the first file (which happened twice before we figured this out.)

We discovered there that the naming of files was of paramount importance as the number increased in the project. Again, let us emphasize the importance of system of file names which you can identify later.

As an aside, I have looked at data disks developed by other persons and have quizzed them about what is contained in each file. So can tell me generally what is contained in almost every file. Others look at the directory and get that /Zap(ped) look on their faces. The point is, a logical system saves much time.

We realized right off that each file name was to be associated with one property. Properties were identified by digits, 1Ø of them, too long for a file name. We tried several systems for file names until we hit on one method.

We simply called them property A, B, C and so on and then taped the primary designations to our terminal like so:

A=Property 1234567890
B=Property ØØ13568639
C=Property 9836219072

We started limiting each property to a year, so each file then became A72, A73, B75, D82, etc.

The files were too small, so we combined, A72-79, B73-75, and so on, adding to new files, saving under the new name and immediately deleting the old file.

(By the way, at the end of each data session, we made backup disks of the data files. Our rule of thumb: Any time re-entry of data will take longer than making a backup, make a backup.)

Next we determined which totals, averages and subtotals could be carried to a file which would then be used in the final worksheet.

We also found it advantageous to print out each file as the preliminary data entry was finished. These preliminary printouts served a dual purpose: first to check for accuracy and make corrections, and then to determine which part of each file was to be loaded into the final report.

After data entry was completed and verified, we began gathering all of the yearly totals into a file for each property and then output that file to a print file (.PRN File) which we edited with WordStar and presented it to our CPA brother (we wouldn't do this for anyone, other than our brother.)

We couldn't think of anything clever to write here, so you can use the rest of this page as:

NOTES

FORMULAS AND LOGIC

We have touched on only a few of the built-in functions of SuperCalc, which has a number of ready-made calculations for business and scientific applications. These functions add speed and power for the user, as well as make SuperCalc do the routine such as looking up maximum and minimum values or making a decision when a calculation can go one of several ways.

Emphasis in this section will be to explain in simple terms the built-in functions of SuperCalc and the conventions or rules which must be followed when using the different functions.

8.1 New Terms This Session

Conventions -- The ground rules established for SuperCalc by which entries are made and formulas and functions may be used.

Expressions -- A combination of functions and formulas which can be used to make calculations or decisions.

Formulas -- The combination of math and other functions used to perform calculations.

Syntax -- The way in which formulas, functions and expressions are entered, following the established rules or conventions.

8.2 Basic Understanding

We need to start with a basic understanding. SuperCalc does not make mistakes. It will do exactly what we tell it to do, no more and no less. And, our instructions must fall within the limits of the capabilities of SuperCalc. In other words, while SuperCalc is powerful and can do many tasks, it cannot do everything.

It follows then, that our instructions must be issued carefully, adhering to the rules or conventions which have been established. All of the problems that we encounter in SuperCalc will fall into one of two categories: 1. We don't understand what is supposed to be done, or 2. We fail to follow the rules.

We know that some are going to get discouraged at this point. Do not be dismayed. If little of this seems to make much sense the first time through, keep at it and sooner or later most of it will sink in. For those who are slower (such as the author,) we use examples to try to clarify some of the points.

In earlier sessions, we encountered Formula ERRORS or wrong results several times intentionally (but most of the time inadvertently.) Most of the time SuperCalc displayed an error message to tell us that we "done wrong" but not what. Other times, it just sat there. It didn't take us long to figure out that we had messed up something, but we still had to figure out what. It was our problem because we did not follow the rules.

8.3 Legal vs. Illegal Entry

When we encounter a problem or formula error, it is because we have made an illegal entry, an entry which the program cannot comprehend. SuperCalc is smart, but it cannot read our minds.

We have three types of entries -- text or labels, values or numbers which may be expressed in terms of a location, and formulas and expressions.

Examples of legal and illegal text entries are:

Right	Wrong
"January 1980	July 1980
"01/01/83 (as a date)	01/01/83 (division)

Example of legal and illegal value entries are:

Right	Wrong
12345	12,345
123.45	$123.45
-1234.56	"12345 (as a value)

8.4 Basic Functions

The basic functions (also called operators,) most of which we have already covered include:

+ = Add	A1+B2+C3	(add these values)
- = Subtract	A1-B2	(subtract B2 from A1)
* = Multiply	A1*B2	(multiply A1 times B2)
/ = Divide	A1/B2	(divide A1 by B2)
^ = Exponential	A1^2	(raise A1 to the second power or squared)

To this list we will add SUM because it is an extension of add. It eliminates and the need to list all of the cells involved in a long addition. The form is as follows:

SUM(list)	SUM(A1:A10)	(add all of the values in the range of A1 through A10)

8.5 Maximum-Minimum, Average and Count

We can let SuperCalc do the walking through our worksheets to look for maximum or minimum values, count the number of cells containing values or give us an average for a range of cells.

AVERAGE(list)	AVERAGE(A1:A1Ø)	(calculate the average of the items A1 through A1Ø)
COUNT(list)	COUNT(A1:A1Ø)	(count the number of values in the used cells A1 through A1Ø. If Cells A3 and A7 are are blank or contain text, the count will be 8.)
MIN(list)	MIN (A1:A1Ø)	(find and display the minimum value found in the range of A1 through A1Ø)
MAX(list)	MAX (A1:A1Ø)	(find and display the maximum value found in the range of A1 through A1Ø)

8.6 Net Present Value (NPV)

We searched diligently for a good definition of Net Present Value and never found one which we could really understand; other than the NPV function is used by economists, bankers and investors. The NPV function will calculate interest in reverse, so interest becomes a discount.

NPV can be described in this way: we want to receive $1ØØ a year from today. How much would we need to invest today to get that amount. If the current interest rate is 1Ø percent, by using the NPV function, we find we must invest $9Ø.91.

The NPV function uses as the basis of its calculations a series of cash flows, incomes or returns which (pick the term that strikes your fancy) are assumed to be projected for equal time periods such as annual, and the discount rate is for that interval. The first cash entry is discounted once, the second twice, and so on and added to determine the present total value.

The form is as follows:

NPV(i,col/row range)

NPV(.Ø6,A1:a1Ø) (calculate and display the net present value of the returns A1 through A1Ø based on a 6 percent discount)

The formula used by this function (i = the discount rate and Income = the yearly cash flow or return) is as follows:

$$NPV = \frac{Income}{1+i} + \frac{Income}{(1+i)^2} + \frac{Income}{(1+i)^3} + \frac{Income}{(1+i)^4} + \frac{Income}{(1+i)^5} \text{ etc.}$$

As a practical application, we have a friend who has hit upon hard times and is in need of quick, ready cash. This friend is the owner of a bond with a face value of $10,000 that will pay $500 a year for seven years. On maturity, it will return its face value.

We have $10,000 in an account that is paying us 6 per cent or $600 a year. We need to know how much we can offer our friend for his bond and not lose any money.

We are going to make two basic assumptions at this point: 1) we have a friend, and 2) his bond and its rate of return and our investment and return are as certain as tomorrow's sunrise.

Common sense tells us that by exchanging our $600 a year rate of return for our friend's $500 annual return is going to cost us $100 per year or $700 for the seven years. However, our accountant brother questions our common sense and insists that we use generally accepted accounting principles in arriving at our decision. He starts to work the following formula, using his $9.95 pocket calculator and a 20 columnar pad:

$$NPV = \frac{500}{1.06} + \frac{500}{(1.06)^2} + \frac{500}{(11.06)^3} + \frac{500}{(1.06)^4} \text{ to } + \frac{10500}{(1.06)^7} \text{ etc.}$$

Because we are more advanced (snicker, snicker,) we will use the power of our computer and SuperCalc and its NPV function. We set up our worksheet by establishing the yearly income for the bond, giving the year and the amount as follows:

	A	B	C	D
1		Discount Rate		.06
2			Bond	
3	1983	500	Net Present Value	
4	1984	500		
5	1985	500		
6	1986	500		
7	1987	500		
8	1988	500		
9	1989	10500		

In D1, we enter our discount rate of .06. By putting it in a separate cell, we can change the rate without changing our NPV expression. In D5, we enter the NPV expression (noting the syntax or form as follows:

```
NPV(D1,B3:B9)
```

SuperCalc prints the Net Present Value of the bond in D5 of our worksheet as follows:

```
      |    A    ||    B    ||    C    ||    D    |
  1|          Discount Rate                .06
  2|                                  Bond
  3|      1983       500              Net Present Value
  4|      1984       500                 9441.76
 to
  9|      1989     10500
```

This tells us that to break even over the next seven years, we can give our friend $9,441.76 for his bond. We will not presume to set a value on friendship.

If we know the series of incomes for a period of years, we can calculate the interest or discount through a trial-and-error method, simply by plugging in a rate. If the NPV is lower than the basis for our original investment (in our example $10,000), change it to a higher rate. If the NPV is higher, select a lower rate.

8.7 Lookup Function

Through the LOOKUP function, we can find where a variable fits in a table and then returns a value provided through that table.

The syntax for LOOKUP is as follows:

LOOKUP(Value,ColumnRow:ColumnRow)

When the function is given the value, it looks for the next highest value in the table and returns the value located in the next column to the right and one row up. If our search is in rows, it will search for the next highest value and return the value one column back and the next row down. In other words, when building the lookup table, the value to be returned goes in the column to the left or the row below, depending upon whether you are working in columns or rows.

We will use for our example sales commissions based on 10 percent of the first $10,000 in sales, incremented by .25 of 1 percent for each additional $1,000 to a maximum of 20 percent on sales of $50,000 or more.

We want SuperCalc to look up the commission rate for each of our sales people and calculate the commissions.

A table must be created and located on the on the worksheet, either at the bottom or over to one side (we find over to the side and out of the way the best) before the LOOKUP function can work. Our abbreviated table will appear as follows:

```
   |   F   ||   G   |
 6|    10000       .1
 7|    11000    .1025
 8|    12000     .105
 9|    13000    .1075
10|    14000      .11
11|    15000    .1125
12|    16000     .115
to
44|    48000     .195
45|    49000    .1975
46|    50000       .2
```

We have setup our worksheet listing the salesmen and their sales for the month as follows:

```
   |   A    ||   B    ||   C    ||   D    ||
 1|Salesman Month    Rate     Commission
 2|Smith     14850.00
 3|Jones     37413.00
 4|Black     41515.00
```

In C2, we enter our formula for LOOKUP as follows:

```
LOOKUP(B2,F7:F47)
```

This will return the percentage rate for that amount of sales. To figure the commission, it is simply multiplying B2 times C2. To complete the worksheet, use the /Replicate command. Our completed worksheet appears as follows:

```
   |   A    ||   B    ||   C    ||   D    ||
 1|Salesman Month    Rate     Commission
 2|Smith     14850.00      .11  1633.50
 3|Jones     37413.00    .1675  6266.68
 4|Black     41515.00    .1775  7368.91
```

8.8 Other Functions

SuperCalc has a number of other functions which are handy for scientific calculations. These are presented here for those who can use them, showing the form and one or more examples. Note that we are showing the results to 16 places, the limit. The results may vary, according to the width of the cell. These "other" functions include:

The Absolute Value function returns the absolute value of a number which is always a positive number. The following is the syntax and several examples:

```
ABS(value)          ABS(5)        5
                    ABS(-5)       5
                    ABS(5.25)     5.25
```

The Exponential Value function will convert a value into scientific notation. This is useful when dealing with large numbers, such as personal debts. The form is as follows:

EXP(value)	EXP(25)	72004899337.38509
	EXP(100)	2.688117141816015

The Natural Log value function will calculate the natural logarithm of a number. The form is as follows:

LN(value)	LN(10)	2.302585092994045
	LN(25)	3.218875824868198

The LOG10 function calculates a logarithm to the base 10 of a number. The syntax is as follows:

LOG10(value)	LOG10(10)	1
	LOG10(25)	1.397940008672038

The PI function, when used as a value in a formula, eliminates having to type in a decimal equivalent. The form is as follows:

PI	PI	3.141592653589793

The Square Root function will calculate the square root of a number as follows:

SQRT(value)	SQRT(10)	3.16227766016838
	SQRT(125)	11.18033988749895

The Integer function will convert a number to a whole number by truncating (cutting off) all digits to the right of a decimal point. The syntax is as follows:

INT(value)	INT25	25
	INT(25.999)	25
	INT(.999)	0

8.9 Trigonometic Functions

The built in trigonometric functions and their forms include:

Sine		
	SIN(25)	-.132351750097773
	SIN(100)	-.506365641109726
Arcsine		
ASIN(value)	ASIN(.5)	.5235987755982992
Cosine		
COS(value)	COS(10)	-.839071529076451
Arccosine		
ACOS(value)	ACOS(.50)	1.047197551196598

Tangent

TAN(25)	TAN(25)	-.133526407021535

Arctangent

	ATAN(.5)	.4636476090008065

All of the results of the trigonometric functions are expressed in radians. To covert from radians to degrees, use the following formula:

```
Degrees = Radians*360/2PI
```

To covert degrees to radians, use this formula:

```
RADIANS = Degrees*2PI/360
```

8.10 Order of Evaluation

We can mix functions (any one expression can take up to 110 spaces) through SuperCalc, but we must be careful how we issue our instructions or the result of the operation may give us an incorrect answer. Again, SuperCalc doesn't make the mistake; we make the mistake by now following the rules for Giving SuperCalc the right instructions.

When SuperCalc looks at a formula or expression containing two or more operations, it will follow a prescribed order in the way it makes its calculations. The order of evaluation is made from left to right, as follows:

Parentheses ()
Exponential
Multiplication
Division
Addition
Subtraction

In the simplest terms, SuperCalc can do only one operation at a time. (It may be faster than greased lightning, but it still has to take it one step at a time.)

SuperCalc will look first for the parentheses and do all of those calculations within the parenthese first. Then it will look for the exponentials and, if it finds one or more, calculate those next. Then it looks for the multiplications, make those calculations, then the divisions, then the additions, and , last, the subtractions.

As an example, we want to add 4 and 5 and multiply the sum of the two (9) by 10. Our answer is 90. If we write this expressions exactly like we said it but in SuperCalc terms, it appears like this:

```
4+5*10
```

SuperCalc will give us an answer of 54. Why? Because when SuperCalc looked at our expression, and following the order of evaluation, it couldn't find any parenthese or an exponential. It found the multiplication function (5 times 10) and calculated the answer of 50, to which it added the 4 and came up with an answer of 54. The 54 is a right answer for SuperCalc but it is incorrect according to our logic.

To solve this problem, we must be more specific. We add parentheses to give SuperCalc more specific instructions. We do it this way:

```
(4+5)*10
```

What we are saying, in effect, is this: "Look, SuperCalc. See the parenthese? Ok, add 4 and 5 before you multiply by 10 so that you give us the answer we need."

8.11 Arithmetic Functions

We can give SuperCalc further instructions by combining the use of logic and arithmetic functions. The Arithmetic Functions are as follows:

= equals	(2=2 or 10=10)
< less than	(0 through 9 are less than 10
> greater than	(10 is greater than 0 through 9
<= less than or equal to	(2 is equal 2 but less than 10
>= greater than or equal to	(10 is greater than 9 through 0 and is equal to 10.
<> Not equal to	(2 is not equal to 3)

8.12 Logic Functions

Next, we have the Logic Functions. Actually, we use logic in our everyday decisions, although we may give it little or no thought.

Note that SuperCalc handles these functions in a very specific way. When we use one of the these functions, we must have a certain number of expressions following that function.

These functions and the form in which they must appear are:

```
IF(expression1,expression2,expression3)
AND(expression1,expression2)
OR(expression1,expression2)
NOT(expression)
```

These make more sense when we convert them to English. How often have we wanted something and we said to ourselves:

"If the price is right, I'll buy it."

That's our shorthand statement, which implies more than we said. Let's rephrase the statement, and this time include the implied:

"If the price is less than or equal to my predetermined top dollar, I'll buy it, otherwise I won't buy it."

To express this in SuperCalc terms and logic, and paying close attention to the conventions such as the parenthesis and commas, the statement can be written as follows:

```
IF(expression1,expression2,expression3)
IF(PRICE>=MY TOP DOLLAR,BUY,NO)
```

We set up a Buying Decision chart with SuperCalc showing the name of the item, our top dollar for that item and the price of the item in the store. We will print the difference between the price and our top dollar in Column D if we buy or .ØØ if we don't. In Column E, we will say whether or not we buy it with a 1 for yes or a 2 for no. Initially, our chart will appear as follows:

```
   |   A   ||   B   ||   C   ||   D   ||   E   |
 1|              Buying Decision Chart
 2|Item        Top$     Price    Save  Buy 1=Y,Ø=N
```

Let's enter an item as follows:

```
   |   A   ||   B   ||   C   ||   D   ||   E   |
 1|              Buying Decision Chart
 2|Item        Top$     Price    Save  Buy 1=Y,Ø=N
 3|  A          2Ø.ØØ    19.ØØ
```

We need to point out here that our IF expression is going to print in the active cell where we enter our expression. We cannot direct SuperCalc to print the result in another location.

With that in mind, let's go to D2 where we will enter our first IF expression. In English, we want SuperCalc to determine that IF C2, the price of $19.ØØ is less than or equal to our predetermined top dollar for Item A, or $2Ø.ØØ, then enter the difference between the two.

If C3 is greater than our top dollar, then print Ø (but we've formatted Columns B, C and D for dollars so it will appear as .ØØ) In the language of SuperCalc and following the rules, our expression will appear as follows:

```
IF(C3<=B3,B3-C3,Ø)
```

```
   |   A   ||   B   ||   C   ||   D   ||   E   |
 1|              Buying Decision Chart
 2|Item        Top$     Price    Save  Buy 1=Y,Ø=N
 3|  A          2Ø.ØØ    19.ØØ     1.ØØ
```

In E3, we want SuperCalc to Determine whether or not we bought the item (assuming, of course, that we didn't throw away our good sense and logic and bought the item even if it was priced over our top dollar.) Our boss said it would be easier just to enter a 1 or a Ø, but that would defeat our purpose here.

We said to ourselves, in plain English, if anything appears in D3, then print a 1, but if a .ØØ appears, then print Ø. We worked out this formula:

IF(D3>=.Ø1,1,Ø)

This is translated back into more proper (for SuperCalc) English as: IF(D3 or 1.ØØ is greater than or equal to .Ø1, then print a 1, if not, print a Ø)

Now, row 3 of our chart looks like this:

	A	B	C	D	E
1		Buying Decision Chart			
2	Item	Top$	Price	Save	Buy 1=Y,Ø=N
3	A	2Ø.ØØ	19.ØØ	1.ØØ	1

When we add more items to the chart, we use /Replicate to duplicate our formulas in Columns D and E.

The AND, OR, NOT functions return a value of Ø or 1, which can then be used to determine another value. We couldn't come up with any good example to show these functions, but we know that these functions can be mixed with the IF function. These functions vary as follows:

AND(expression1,expression2)

The AND function evaluates two expressions. Both expression1 and expression 2 must be true to return a value of 1. If one or the other or both are false, AND will return a value of Ø.

AND(B1=B2,C3=A1)

This means that if B1 and B2 are equal AND C3 and A1 are equal, a 1 will be returned in the active cell. If either or both of the expressions are not equal, a Ø will be printed in that cell.

OR(expression1,expression2)

The OR function gives us a choice. If one expression or the other is true, the value returned will be 1. If both are false, the value will be Ø.

OR(B1=B2,C3=A1)

This means that if B1 and B2 are equal, OR C3 and A1 are equal, a 1 will be printed in the active cell. If neither of the expressions is true, a Ø will be printed in that cell.

NOT(expression)

The NOT function is a reverse. If the expression is not true, a value of 1 will be returned. If it is true, the value will be Ø.

NOT(B1=5Ø)

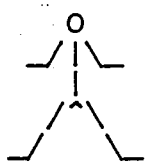
This means that if B1 is equal to 5Ø, then a Ø will be printed in the active cell. If B1 is not equal to 5Ø, then a 1 will be printed.

We said earlier that we can mix the AND, OR, and NOT functions with the IF function; but be warned the syntax or form becomes a nightmare when you start mixing. For example, we want to include an OR in our IF expression. It will appear as follows:

IF((OR(expression1, expression2)) ,expression2,expression3)

We saw earlier that IF uses parentheses to define the limits of the three internal expressions which are further defined by commas. The OR also uses the parentheses to define its internal expressions. That is the reason for the double parentheses. Also note here, the order of evaluation. The OR function will be evaluated first so that its value can be evaluated in the IF statement.

Before you get too skittish about all of this, play around with it for a while. We find it easier to work from an example than trying to understand a description of how something works. Some people have a knack for this sort of thing. Other's do not. It's kind of like working crossword puzzles or drawing.



USEFUL CP/M COMMANDS

9.1 Introduction

The ability to use a few of the built-in CP/M operating system commands and several utility programs will give the end user more flexibility in utilizing his computer system.

These commands will change logged drive, help in searching for particular files, determining the size of files, determining the amount of space remaining on a disk, copying files to another disk, and renaming of files. We also will look at the capability of looking at a raw file on the disk or printing it out on the printer.

Explanations here for the operation of these commands are not exhaustive. The explanations cover only a few of the basics which are easily used. Additional information on these and other commands can be found in the CP/M Manual.

9.2 New Terms This Session

Warm Boot -- The ability to reload parts of CP/M without turning off the system. When some programs are run, they "overwrite parts of CP/M and a warm boot restores CP/M to "normal."

9.3 New Commands This Session

Change Logged Drive
CTRL P or ^P (to turn the printer off and on)
DIR
ERA
STAT
PIP
REN
TYPE

These commands operate from the CP/M operating system prompt which appears as follows:

```
A>
```

9.4 Change Logged Drive

When the computer system is started, the CP/M operating system prompt (A>) comes up on Logged Drive A. Sometimes it is more convenient to work on Drive B (or C, D, etc., depending upon how many disk drives are on the system.) Starting at the operating system prompt, enter the drive letter followed by a colon:

```
A>B:
```

Press Return and the operating system will respond as follows:

```
A>B:
B:
```

You may now refer to or use files or programs on the logged drive B with out making reference to the drive number, B:

9.5 ^P for Printer

The CTRL P or ^P when issued through the CP/M operating system will toggle the printer on and off, if your computer system is configured properly.

Starting with the CP/M operating system prompt on the screen, press the Control key down, press P and then press Return. If your printer is near by you may have heard a noise, but for further verification, type a word or two and this should appear on the printer.

From this point on, until another ^P is entered, all entries on the keyboard will be printed out on the printer. Remember that the ^P command should be used in pairs -- the first to engage the printer and the second to disengage.

This can be used to get a printout of a directory, status, or look at a document. Specific uses include printing out a directory or the status of a disk, or printing out a raw file. When a file is printed out, it will have no margins and, depending upon the printer, may have some strange characters.

9.6 DIR for Directory

A directory or catalog of a disk can be viewed on the screen or printed out on the printer through the DIR command. To print on the printer, start from the operating system prompt, >A and press CTRL P, then execute the command. Be sure at the end of the session, to press CTRL P again to disengage the printer.

To obtain a directory, enter DIR as follows and press Return:

```
A>DIR
```

A disk directory will be displayed as follows:

```
A>DIR
A: PIP      COM  : SC       COM : SC       OVL
A: STAT     COM  : SUMMIT   COM : HONDA    CAL
A: HONDA2   CAL
```

DIR will display a directory of the files on another disk by directing it to another drive as follows:

```
A>DIR B:
```

9.7 ERA for Erase

ERA is the command to erase and it must be followed by a complete (any extensions if used must appear after a period) file name or or one of the following designations:

A>ERA FILENAME.EXT will delete that file name only.

A>ERA *.* will erase every file on the disk.

When this command is given, the operating system will display another prompt before the command is executed:

All? (Y/N)

An N for No response will nullify the command. Enter a Y for Yes and all of the files will be erased.

Note: The ERA command does not erase a file area, but it, in effect, erases the file name in the directory. An extremely important file inadvertently removed by ERA can be recovered. Do not write to this disk and be prepared to pay for the service.

A>ERA S*.* will erase every file on the disk starting with the letter S and having any extension.

A>ERA *.EXT(ension) will erase every file on the disk with that extension, such as .COM or .CAL

9.7 STAT for Status of Disk

The STAT command will give you the status of the disk, showing the amount of space remaining, expressed in kilobytes. This can be extremely important because you could lose an important file by not having enough space to store it.

STAT.COM must be on the one of the drives, generally, the logged drive, before command will operate.

To determine how much space remains, enter STAT as follows:

A>STAT

Press Return and the operating system, after a moment, will respond with the following:

```
A>STAT
A: R/W, Space 94k
```

This means that the disk has 94k of read/write space remaining for a file or series of files. Occasionally, you may encounter a file or disk which is R/O or ready only, which means essentially that you can change the file or write to the disk.

The status of individual files can be obtained by entering a specific file name. An example is as follows:

```
A>STAT SC.COM (This is one of the SuperCalc files)
```

Press Return and the operating system will respond as follows:

```
A>STAT SC.COM

 Recs  Bytes  Ext  Acc
  192    24k    1  R/W  A:SC.COM
Bytes Remaining on A:  94k
```

The status of all of the files on a disk can be determined by the following:

```
A>STAT *.*
```

Press Return and after a moment, the operating system will display all of the files in alphabetical order, with the last line showing the amount of space remaining. The following is an example of this command:

```
A>STAT *.*

 Recs  Bytes  Ext  Acc
   24     4k    1  R/W  A: HONDA.CAL
   14     4k    1  R/W  A: HONDA2.CAL
   58     8k    1  R/W  A: PIP.COM
  192    24k    1  R/W  A: SC.COM
  160    20k    1  R/W  A: SC.OVL
   41     6k    1  R/W  A: STAT.COM
   10     2k    1  R/W  A: SUBMIT.COM
```

The status of all of the files on a disk beginning with a specific letter can be listed. The following example shows all of the files starting with the letter "H."

```
A>STAT H*.*

 Recs  Bytes  Ext  Acc
   24     4k    1  R/W  A: HONDA.CAL
   14     4k    1  R/W  A: HONDA2.CAL
Bytes Remaining on A: 96k
```

A>STAT *.COM will give the status of every file with that extension.

Status of another drive can be determined as follows:

```
A>STAT B:
```

All of the variations of STAT can follow the B:.

9.8 PIP for Copy

PIP is the copy command of CP/M and will duplicate one or several files on another disk.

PIP.COM must be on the logged disk before this command will operate.

PIP cannot be used to duplicate a complete program disk because it will not copy any reserved tracks where CP/M actually resides. A gross copy utility program or SYSGEN.COM, is required to copy the reserve tracks.

The form of the PIP commands are as follows:

```
A>PIP B:=A:SC.COM
```

This tells the CP/M operating system to copy the file SC.COM from Drive A to Drive B. Press Return and the cursor will drop to the next line. When the copy process is completed, the operating system prompt will be printed on the screen.

All of the files on one disk can be copied to another disk with the command *.*. The entry will appear as follows:

```
A>PIP B:=A:*.*
```

This means copy all of the files on Drive A onto Drive B.

As each file is being copied, the command will list each file as it starts as follows:

```
A>PIP B:=A:*.*

COPYING -
HONDA.CAL
SC.COM
SC.OVL
ETC.
```

A>PIP B:=A:S*.* directs that all files starting with the letter "S" be copied.

A>PIP B:=A:*.CAL directs that all files ending with that extension be copied.

To PIP a file on one disk and change the name of the file on another disk, follow this format:

```
A>PIP B:NEWFILE=A:OLDNAME
```

To copy from one data disk to another data disk, follow this procedure:

```
A>PIP (press Return)
```

The command will respond with an asterisk as follows:

```
A>PIP
*
```

At this point, remove the program disk from Drive A and replace it with a formatted disk. For this example we will copy all of the files. The command will be as follows:

```
A>PIP
*A:=B:*.*
```

Press Return and the operating system will respond by printing the name of each file as it is being copied. If during the copy process something goes wrong, the last file listed was not copied.

When the copy is complete, the PIP command will respond with another asterisk. Press CTRL C (also called a warm boot) which will be followed by the operating system prompt as follows:

```
*^C
A>
```

9.9 REN for Rename a File

The command to rename a file is REN but it operates in reverse in that the new name is given first and then current name, as follows:

```
A>REN NEWNAME=OLDNAME
```

Press Return and the cursor will drop to the next line and the operating system prompt will appear again on the screen.

The REN command is helpful when organizing files for later reference. As an example, you want to store store several files now on different disks, but duplicate file names occur. CP/M will not recognize the duplicate names and will simply copy one file over another of the same name. The name of a duplicate file can be changed before it is copied, or changed during the PIP copy process.

9.10 TYPE to Read a File

A file as it is stored on the disk can be viewed on the screen or printed out on paper through the TYPE command. To print out on paper, use the ^P command to engage the printer.

This command is limited in that it will display ASCII files only. SuperCalc files (those ending with .CAL) are written in a special format. A SuperCalc file must be written into an ASCII file before it can be handled by the TYPE command. See the Output command in Session 6.

Also, this displays the file exactly as it is stored on the disk. A printout will have no margins and will not permit any paging. Depending upon the printer, the printout may contain some strange characters.

Starting from the CP/M operating system prompt, enter TYPE and the full name of the file as follows:

```
A>TYPE FILENAME.EXT
```

The operating system will start displaying the the file, scrolling rapidly off the top of the screen. To halt the scrolling, press CTRL S, which will freeze the screen display. To continue the scrolling, press CTRL S again. Be warned in using this command, ya gotta be fast. It takes practice.

To abort the operation, press CTRL C. This will return the operation to the operating system prompt.

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