TIMEWORKS®

User's Manual

SwiftCalc™ ST

For ATARI 520ST and 1040ST Computers*

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Customer Support Plan

Timeworks' Telephone Consulting Service is available to all Registered users to support your installation and ongoing operations at no charge. To become eligible for this service, you must complete and return the enclosed Software Registration Card.

The answers to almost all of your questions can be found in your manual. To save you time, please read it thoroughly before calling our Help Line. If your question concerns your hardware, contact your computer, disk drive, or printer manufacturer first. If your question concerns the program, we will be happy to receive your call at the following number during normal business hours (9 a.m. to 5 p.m. central standard time).

Customer Support Help Line: (312) 948-9208.

If you write to us instead, be sure to include a phone number where you can be reached during the day.

NOTE: Please read the Pre-Call Checklist, which you will find in Chapter 10 of this manual, before calling our Customer Support Help Line.

If you enjoy this program, try these other, equally stimulating programs from **Timeworks**, Inc.:

Cat. No.	**Program**
Home Management	
5351	**Data Manager ST**
5352	**Word Writer ST**
5354	**Swiftcalc ST**

- Foreword
- What is a Spreadsheet and What Can It Do for You?
- The Contents of Your SWIFTCALC Package

Foreword

The power of SWIFTCALC ST lies in its ability to apply mathematical functions and algebraic formulas to any spreadsheet-type analysis, such as budgeting, financial planning, or cost estimating. Because SWIFTCALC calculates these formulas for you automatically, you can produce complicated "what if?" reports at the press of a key and make further modifications quickly and effortlessly.

At a Glance:

- SWIFTCALC ST can be used by itself (stand alone) or interfaced with Timeworks' DATA MANAGER ST and WORD WRITER ST software programs. Enables you to produce customized reports incorporating information from all three systems.
- A unique option that rotates your spreadsheet 90 degrees before printing it on one continuous sheet.
- 8192 rows and 256 columns provide 2,097,152 cells (locations in the spreadsheet) in which to place information.
- Performs mathematical functions. Allows the use of minimum and maximum values, averages, sums, integers, absolute values, and exponential notation. Also performs trigonometric functions such as sine, cosine, tangent, and arctangent and logarithmic functions such as natural exponent and logarithm.
- Calculates the present and future value of a dollar and the present and future value of a constant amount (annuity).
- The business graphics package produces bar charts, pie charts, and line graphs from your numerical data, allowing you to compare values graphically.

- Scrolling Help screens list all of SWIFTCALC's available functions. No need to reference your user's manual each time you want to apply a mathematical function.

- Sorts your spreadsheet information by row or column into ascending or descending order.

- Financial models illustrate budgeting, trip planning, and financial analysis. Sample spreadsheets help you become familiar with SWIFTCALC and the program commands.

- Full prompting. You will be guided through this program by thoughtful, easily understood instructions from your computer display, complemented by a manual written in easy-to-understand English.

- Moves or copies cell information to other cells within your spreadsheet.

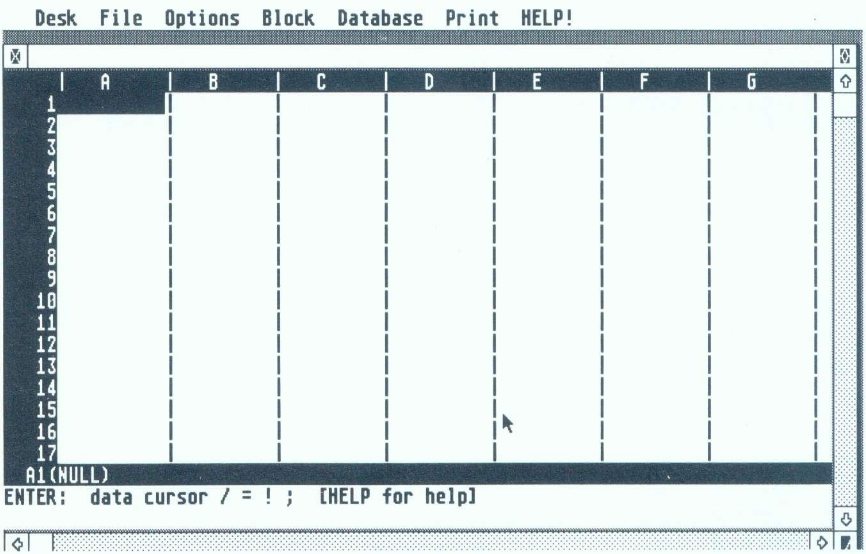
- Inserts or deletes row or columns at the press of a key.

- Choice of several formats: decimal (up to 15 places); graphics; exponential notation; $ dollar sign; or user-defined.

- Moves the cursor in any direction, allowing you to view any section of the spreadsheet you desire.

What is a Spreadsheet and What Can it Do for You?

A spreadsheet is an "electronic worksheet" located in the computer's memory. The worksheet is made up of rows and columns, and each point where a row and column intersect is called a cell. Each cell is labelled by a letter designating its column and a number designating its row. Following is an illustration of the SWIFTCALC display. This will give you an idea of how the spreadsheet will appear on your screen.



Because the spreadsheet is so large in comparison to the computer display, you must look at it in sections. The screen, then, becomes a window into your spreadsheet. By moving the cursor, you can view different sections of the spreadsheet on your display.

Each cell may contain text, numbers, or formulas. You determine what type of information each cell will hold. Text can be used as labels, or titles, for columns or rows in your spreadsheet. The numbers you enter into your spreadsheet are called values. You can change a cell's format, or the number of decimal places, to fit any size value you wish to enter. Most important, you can use algebraic formulas capable of performing a variety of mathematical functions to create specific mathematical relationships between cells. For example, you can multiply the number in one cell by the number in another cell, and place the product in a third cell. If you change the number in one of the first two cells in that formula, the electronic spreadsheet can recalculate the formula for you automatically.

What can a spreadsheet do for you?

A spreadsheet can eliminate your need for a calculator, fully computerizing all of your calculations, especially the repetitive ones. But a spreadsheet has an even greater advantage over a calculator: it allows you to perform complicated "what if" comparisons – like financial analyses and building cost estimates – effortlessly. After you construct your spreadsheet the first time and obtain your results, all you need to do is enter new values and the computer will recalculate all of your formulas automatically, performing a task in seconds that might have taken hours or even days.

Now on to the world of computerized spreadsheets.

The Contents of Your SWIFTCALC Package

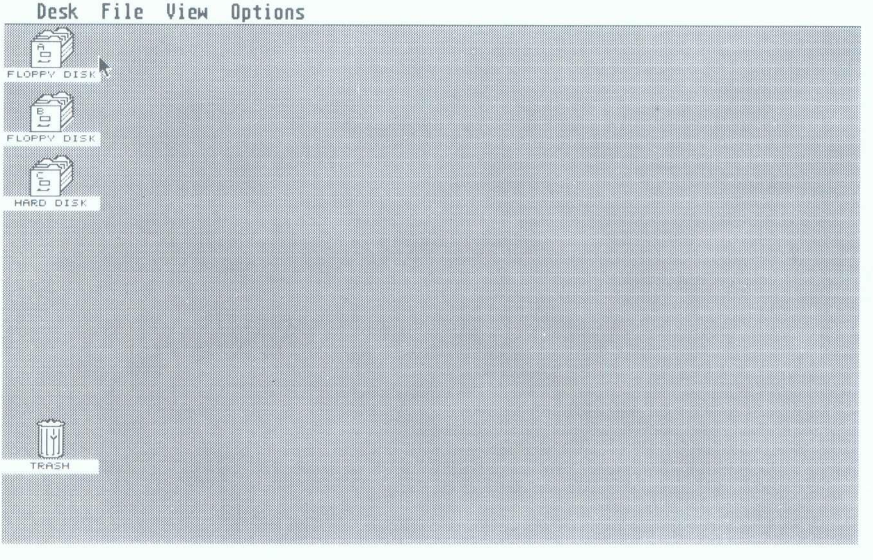
Your SWIFTCALC ST package should contain:

- 2 program disks
- 1 manual
- 1 user's registration card, which you should fill out and return to Timeworks immediately

- The GEM Icons and Mouse
- Formatting a Data Disk
- Installing SWIFTCALC on a Hard Drive

The GEM Icons and Mouse

Before using SWIFTCALC ST, you should become familiar with the Atari 520ST or 1040ST computer manual, which you received with your new computer. This manual will tell you all about the GEM Desktop. The desktop consists of the pictures (called "icons") that you see on your screen when you turn on the computer. Some of these icons represent your hardware, while others represent files or programs on a disk in your drive.



You can select an icon using the mouse that came with your computer. Connect the mouse to joyport 0 on the computer. Then watch the arrow on your screen move as you move the mouse across your table.

After you move the arrow to an icon or menu, you can select that item by pressing down and releasing the left mouse button. This action is called "clicking". Sometimes you can skip a step in the program by "double-clicking" the button. Double-clicking is a very quick double pressing of the button. If the icon that you double-click just reverses color, but nothing appears to be happening on your screen or in the disk drive, you didn't double-click correctly. Try double-clicking again. (You will be told in this manual when you should "double-click".)

The mouse has one other function. You can use it to move, or "drag" something on the screen. In SWIFTCALC, you will use this function most often when you adjust the size of a window on your screen. We will tell you more about this later. For now, let's format a data disk.

Formatting a Data Disk

You must prepare at least one data disk for use with SWIFTCALC. This process is called "formatting". To format a disk, follow these steps:

1. Turn on your computer, monitor, and disk drive. The GEM Desktop will appear on your display.

2. Place your blank data disk in disk drive A. Use the mouse to move the arrow to the icon for disk drive A, and click the left mouse button to highlight the icon.

3. Use the mouse to select the "Format" option on the FILE menu. You will see a dialog box with a warning message. If this disk does not contain information that you wish to keep, click on the OK box. (If you do not want this disk erased, click on CANCEL and start this procedure over with a blank disk.)

4. If you clicked on OK, you will see a second dialog box. The cursor will be on a line labelled "Disk Label". Type in a name for this disk, such as "Data" or "Work". Do not press **RETURN**.

5. Move the arrow to "Single Sided" and "Double Sided" at the bottom of this box. If you are using an Atari SF354 disk drive or if you are using an SF314 drive with a single-sided disk, click on Single

Sided. If you are using an SF314 disk drive with a double-sided disk, click on Double Sided.

6. Click on "Format" to start the formatting process. When the disk is formatted, you will see another dialog box telling you how many bytes are available for storage on this disk. Click on the OK box. You will return to the Format box (the box asking for a "Disk Label"). You can then format another disk. When you have finished formatting disks, click the Exit box in the Format dialog box, and you will return to the desktop.

Installing SWIFTCALC on a Hard Drive

If you are using a hard drive, you will want to copy, or install, SWIFTCALC and all of its files over to your hard drive. To install SWIFTCALC on a hard drive, place the SWIFTCALC ST program disk in your floppy drive A. Then follow these steps:

1. Move to the icon for your hard drive and double-click the mouse button. The disk directory for that drive will appear on your screen.

2. Select the "New Folder" option on the FILE menu. (A "folder" is a subdirectory on your disk.) When the dialog box appears, enter a new name for this folder, such as SWIFTCALC, and click on OK. This new folder will appear on the disk directory.

3. Double click on the icon for your new folder. A blank disk window will appear on your screen. (This is actually the directory of this folder, but there are no files in this folder at the present time.)

4. Move the arrow to the icon for drive A. Press the mouse button, and keep it pressed as you move, or "drag", the icon into the blank window. This action copies all of the files from your program disk, which is in drive A, over to your hard drive.

See pages 13 - 14 for information about loading the program from your hard drive.

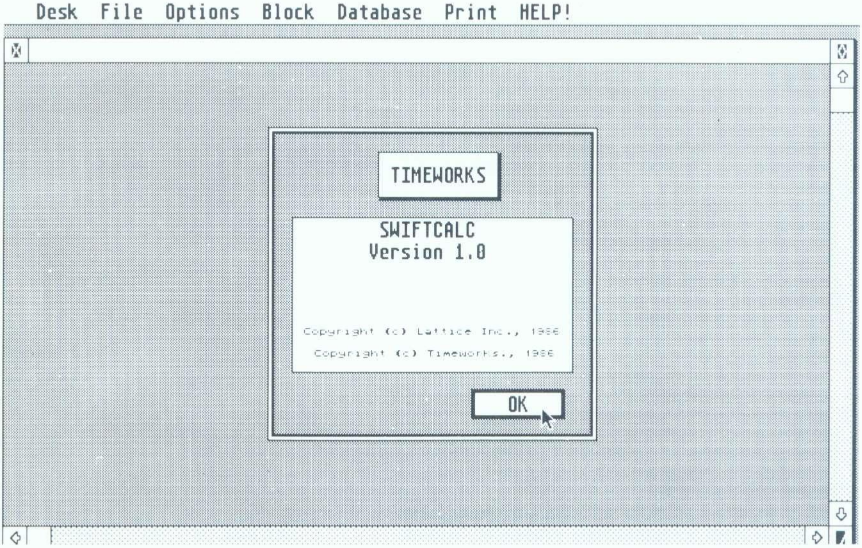
Loading the Program

1. If you have not already done so, turn on your computer, monitor, and disk drive. The Desktop icons will appear on your screen.

2. Place your SWIFTCALC ST program disk in your disk drive.

3. Move the mouse so that the arrow is on top of the icon of Floppy Disk A, if you're using a floppy disk drive, or Hard Drive C, if you're using a hard drive, in the upper left corner of your screen. Double-click the mouse to select this icon.

4. The disk directory of the program disk in drive A or C will appear on your display. Each file on your disk will be represented by an icon. Move the arrow to the icon named SWIFTCALC.PRG. Double-click the mouse button. The program will load, and you will see the following display:



5. Click on OK to continue. The spreadsheet window will appear.

NOTE: SWIFTCALC loads up with medium screen resolution, which gives you an 80-column display. This should work for your setup, but if you need high resolution for your monitor instead, select the "Set Preferences" option in the GEM Desktop. This option will allow you to select a medium or high resolution display. See your computer manual for more information.

Loading the Update File

Your SWIFTCALC program disk includes a file called UPDATE which contains information that does not appear in your manual. If this is the first time you have used SWIFTCALC, it is important that you read this file before using any of the program's features. To load this file, follow these steps:

1. After you load the program, move the arrow to the FILE pull-down menu. Select the "Open File" option.

2. A window will appear on your screen. In this window are the names of files on your program disk. Move the arrow to the file called UPDATE.CAL and click the mouse button. Then click on OK.

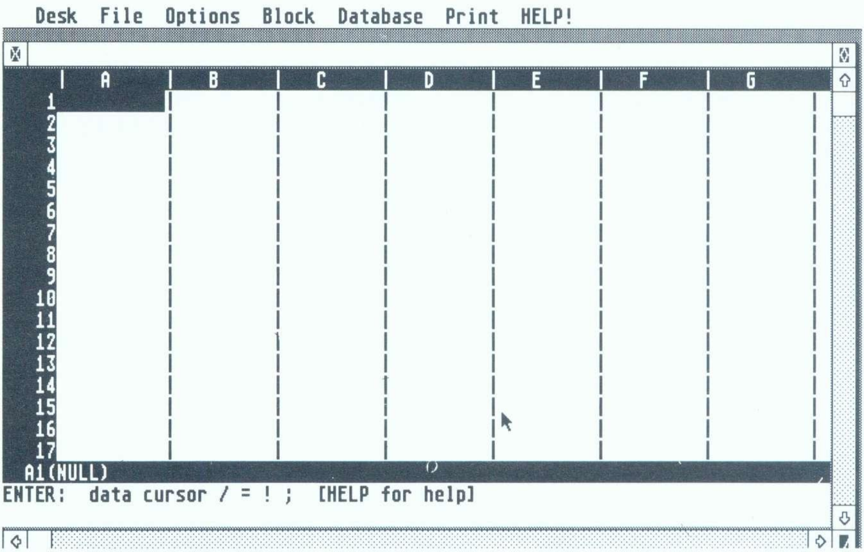
3. You will now see a second dialog box. We'll explain the options in this box later in the manual. For now, click on "Cells & Options" and then click on OK. The document will now load into the computer.

4. Please read the Update file thoroughly. It contains any changes and modifications that are not included in this manual. (See pages 72 - 75 for information on printing this file on your printer.)

The SWIFTCALC Display

NOTE: To change the display colors, turn the sound off, and specify information about your printer, use the "Control Panel" and "Install Printer" options on the DESK pull-down. (For more information on these options, see your computer manual.)

After you load the program, you will see the following display:



At the top of this display you will see the headings for the pull-down menus. The middle section of your screen is the spreadsheet window. At the bottom are SWIFTCALC's most-used functions and their accompanying keys. Let's take a look at each section of your display.

The Pull-Down Menus and Quick Keys

NOTE: When the Control Panel is on your display, do not select an option from a pull-down menu. Remove the Control Panel first by clicking on the Close Box in the upper left corner of the panel.

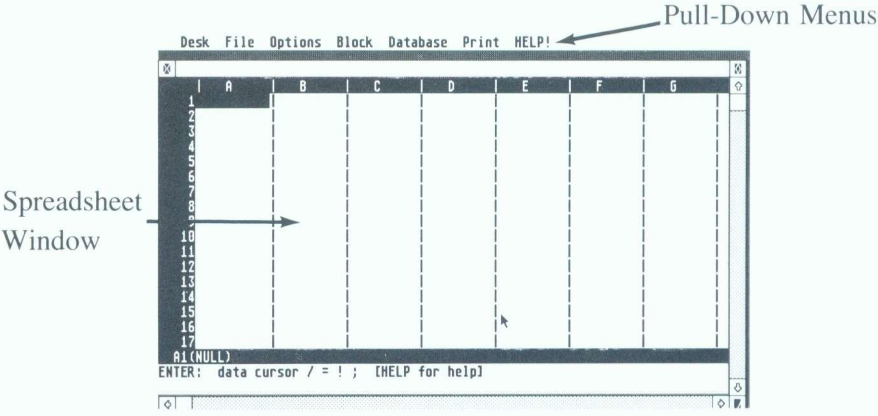
SWIFTCALC ST features pull-down menus, which are easy to use. To select a menu option, just move the arrow to the menu heading you want to use. When the menu appears on your screen, move to an option and click again. The option will then be available to you.

The program also includes a number of special keys, called the Quick Keys, that you can use to operate features in SWIFTCALC. These keys represent SWIFTCALC's commands, which are discussed later in this manual. Next to the title of each section which discusses a command, you will see the Quick Keys that you can use to access that command.

NOTE: Sometimes SWIFTCALC cannot clear your screen completely of the pull-down menus. When this happens, just click on the Size Box in the upper right-hand corner of your display to re-draw your screen. Your data will not be affected.

The Spreadsheet Window

The largest part of the SWIFTCALC display is the spreadsheet window, which contains the rows and columns that make up the spreadsheet. Located across the top of this window, you will see seven columns labelled a through g. Down the left side of the display, you will see 16 numbered rows. The points in the spreadsheet where each row and column meet are called "cells". Each cell is labelled with a letter and number. The letter represents the row where the cell is located. The following illustration shows you the spreadsheet window:



Example:

The cell located in column a on row 1 is called cell "a1".

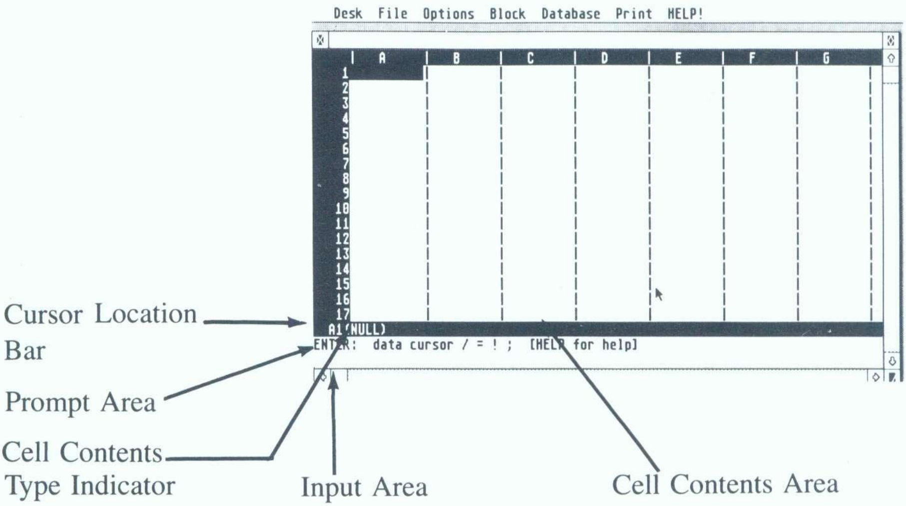
The window on your screen is only a part of a larger spreadsheet which has 256 columns labelled from a to iv, and 8192 rows numbered from 1 to 8192. The first 26 columns are labelled from a to z, the next 26 columns are labelled aa to az, the next 26 are labelled ba to bz, and so on.

Press the right cursor key (→) and the cursor will move toward the right edge of the display. Continue pressing the key. You will notice that the letters at the top of your display, which denote columns, are changing. The cursor is moving, or scrolling, through the spreadsheet. The same will happen if you press the down cursor key (↓). Notice that the numbers denoting rows change as you move the cursor down through the spreadsheet. Press the **CLR/HOME** key to move the cursor back to cell a1.

You can also position the cursor using the mouse. Just move the mouse until the cursor is in the cell with which you want to work. Press the left mouse button, and the cursor will appear in that cell.

The Status, Prompt, and Input Areas

The area below the spreadsheet window is very important. This is where you will enter your spreadsheet information, and this is where you will find other important information during your operation of SWIFTCALC. This area is broken down into three parts: the status area, the prompt area, and the input area.



Let's start with the line that contains the characters "a1". This is the **Cursor Location Bar**, because it tells you the current location of the cursor in the spreadsheet.

The word in parentheses to the right of the "a1" is the **Cell Contents Type Indicator**. This indicator tells you what type of information is in the cell that currently contains the cursor. "NULL" stands for Blank, "TEXT" means just that, "NMBR" stands for Number, and "FORMULA" stands for, of course, Formula. (For more information on these last elements, see pages 23- 32 .)

The area to the immediate right of this indicator is the **Cell Contents Area**. In this space you will see the contents of the cell in which the cursor is currently located. For example, if the cursor is in cell a1, and a1 contains text, the Cell Contents Area would display that text.

The line containing the word ENTER is the **Prompt** area. This area is especially important because here is where you will see the program prompts, which are questions you need to answer to work with SWIFTCALC. Refer to this area often.

Below the Prompt Area is a long box called the **Input Area**. This is where you must enter all of your information into the spreadsheet. After you have entered your information in the cell where the cursor is currently located and pressed RETURN, your entry will appear in that cell.

At the bottom of your screen, you will also see the following prompt:

ENTER: data cursor / = ! ; (HELP for help)

No, this is not secret code – it's actually a list of options that are available to you. Let's take a look at each one – but don't worry about memorizing them, because they're all discussed in detail later in the manual.

Data: This word tells you that you can enter labels, values, or formulas into the spreadsheet.

Cursor: Tells you that the cursor keys are available for your use in moving through the spreadsheet.

/: The Slash Mark is used to call up a number of options. These options are discussed in Chapter 5.

=: Used to move the cursor to a cell in the spreadsheet that you specify. After you press =, just enter the cell address to which you want to move.

!: Tells the computer to calculate the spreadsheet at your command.

;: Used to move from one spreadsheet window to another when you are viewing windows. Windows are discussed in Chapter 5.

HELP: Used to call up a Help display for whatever option you are currently using. Help displays are discussed on page 32 .

Now that you're familiar with the spreadsheet display, let's look at how you can manipulate the spreadsheet window.

Cursor Movement

These keys will move the cursor (not the arrow) to any point in your spreadsheet.

↑ ↓ ←→	The cursor keys are used to move the cursor through your spreadsheet and to access pull-down menu options.
SHIFT →	Moves the cursor one spreadsheet window (7 columns) to the right.
SHIFT ←	Moves the cursor one window to the left.
SHIFT ↑	Moves the cursor up one window (16 rows).
SHIFT ↓	Moves the cursor down one window.
CLR/HOME	Moves the cursor to cell a1.
SHIFT CLR/HOME	Moves the cursor to the cell containing information which is the farthest down and the farthest right in your spreadsheet.

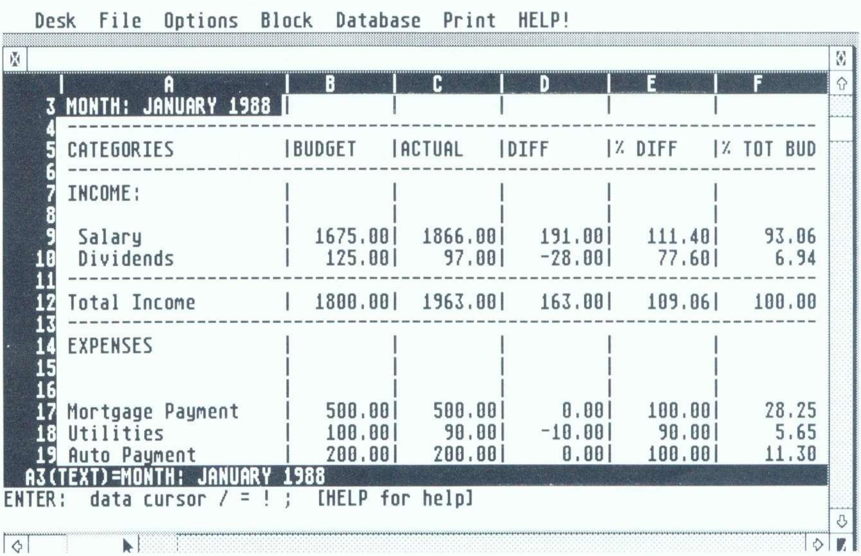
SWIFTCALC offers you two other methods of moving the cursor around the spreadsheet window. See the next section for more information.

The Scroll Bars and Scroll Arrows

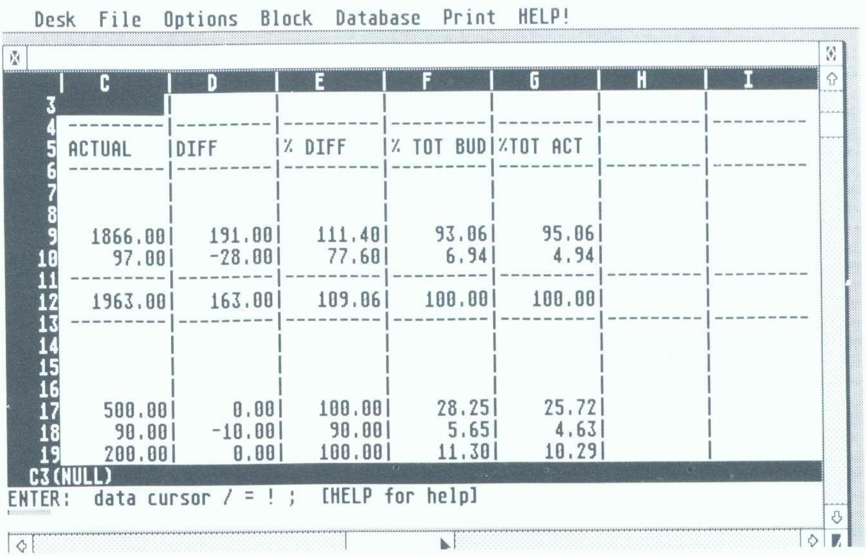
The right side and bottom of the window's border are called the "scroll bars". You can scroll the text in the window by "dragging" the white box (called the "scroll box") within the scroll bar.

NOTE: The scroll bars and scroll arrows work only if you have entered information into the spreadsheet window. If you wish to test these cursor movement methods, load one of the sample spreadsheets into the computer from your program disk. These sample files are called BUD, TRIP, FIN1, and FIN2. Load one of these files using the instructions on page 39 of this manual.

For example, to move to the right in the window, you would move the arrow to the scroll box in the bottom scroll bar. Press the mouse button, and keep in pressed. An outline of the scroll box will appear on your screen:



Keeping the left mouse button pressed, move the box's outline to the right in the scroll bar. Release the button. Your screen might look something like this:



Try moving the cursor around the screen using the scroll bars. You can also use the scroll arrows, which are the arrows in the border which allow you to move, or scroll, your display up, down, left, or right. For example, move the mouse's arrow to the down arrow (↓) in the lower right corner of the border. Click the mouse button once. The window will shift down one row at a time. Clicking the up arrow will move the display up one row at a time.

When you click the right arrow, the display will shift to the right one column at a time. The left arrow will help you move one column to the left at a time.

Entering Information into SWIFTCALC ST

Three types of information can be entered into your spreadsheet: text, numbers, or formulas.

Text is used for titles in columns and rows.

A number is a value that you enter into the spreadsheet. Numbers often are used by the computer to perform calculations.

A formula can include values from the spreadsheet or cell addresses indicating values to be used, or a formula can include values that are not used in the spreadsheet. When the value in one cell is changed, you can tell the computer to recalculate your spreadsheet, updating all of the formulas that use that new value. Next we will look at entering these different types of information into the spreadsheet.

Entering Text

To enter text, move the cursor to the desired cell in the spreadsheet. Then enter the word or phrase that will help you identify that cell and press RETURN. What you have entered will appear in the Cell Contents Area. The characters "TEXT" will appear in the parentheses, indicating that you have entered text.

Notice that as soon as you press an alphabetic key (any key that is not a number or symbol) the computer assumes that you are entering a label. To enter a number or other numeric-type character as a label, press the quote " key first to indicate that you want to enter text. The quotation marks (") will not appear in your spreadsheet.

Example:

Move the cursor to cell c1. Now press the quote " key and enter 2ND QUAR SALES. Press RETURN. The characters "TEXT" will appear in the parentheses at the bottom of the display, indicating that you have entered a label. The Cell Contents Area and the cell in the spreadsheet will show 2ND QUAR SALES.

You may also wish to repeat a character across your entire spreadsheet (such as when you enter a dotted line). To do this, press the ' key, and then enter the character you want to repeat. Press RETURN. The character will be repeated across the spreadsheet until it reaches a full cell.

NOTE: When entering text, you can take advantage of SWIFTCALC's browse mode, which allows you to view other sections of your spreadsheet as you enter your text. Just begin entering your text or number. Then press the \ key (next to the RETURN key). You can then scroll through your spreadsheet to view other cells. When you have found the information you're looking for, continue entering your information, and it will appear in the cell where you originally began entering it.

Entering Numbers

To enter a number, move the cursor to the desired cell in the spreadsheet. Type in a number and press RETURN. (If the number is negative, enter a minus (−) sign first.) You can type in up to 15 characters. (This is the maximum number that the computer will accept.) If you have formatted your cell in a special way, the computer should display your value in the format you have designated (see page 46 for information on special cell formats).

Try entering a value into your spreadsheet using the following example:

Move the cursor to cell c2. Type in the number 12000000 and press RETURN. "NMBR" will appear in the parentheses at the bottom of the display, indicating that you have entered a number.

NOTE: When entering numbers, you can take advantage of SWIFTCALC's browse mode, which allows you to view other sections of your spreadsheet as you enter your numerical information. Just begin entering your text or number. Then press the \ key (next to the RETURN key). You can then scroll through your spreadsheet to view other cells. When you have found the information you're looking for, continue entering your information, and it will appear in the cell where you originally began entering it.

Scientific Notation

NOTE: Scientific notation is a form of shorthand for writing large numbers. To find out more about scientific notation, consult a mathematics book.

When entering a number using scientific notation, always use the following format.

Correct	Incorrect
6.34e+05	6.34e5
3.223e−09	3.223e−9

Do not enter blank spaces before or after the (e). Always enter a zero in front of single digits. (To view the complete numbers produced by the above examples, widen your spreadsheet cells to 20 characters and format the cells for 15 decimal places. If the numbers are longer than 20 characters, you must widen the column again. See Chapter 5 for information on cell formats.)

Entering Formulas

The real power of an electronic spreadsheet lies in its ability to calculate a formula located in one cell, based on values which are located in one or more other cells.

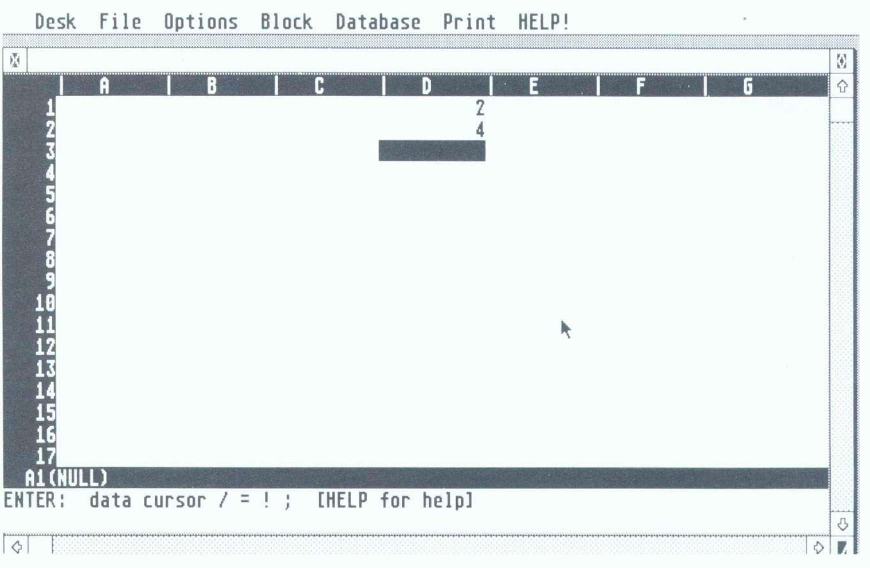
Example:

If you want cell d3 to hold the sum of the values in cells d1 and d2, you would enter a mathematical formula in cell d3 telling the computer to add the values in d1 and d2. The sum would then appear in cell d3.

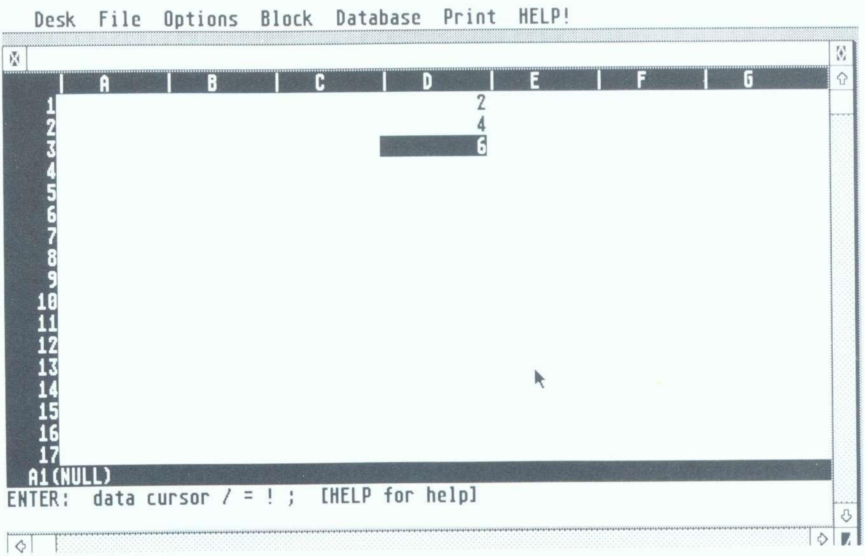
To enter the formula for the above example, place the cursor in cell d3 and press the + key. The word "FORMULA" will appear at the bottom of your display, signifying that you are about to enter a formula. Now enter

d1 + d2

Your display will look like this:



Now press **RETURN** or a cursor key. The following illustration shows the formula in the Cell Contents Area and the result in cell d3.



You can also enter a formula using a method called "pointing". To use this method, you would move the cursor to cell d3 and press the + key. Then move the cursor to cell d1 and press + again. Notice how the cell address d1 appears with a plus sign in the Cell Contents Area. (If this were a multiplication formula, you would move to cell d1 and press the * key; if it were subtraction, you would press the − key, and so on). Lastly, move to cell d2 and press **RETURN** to tell the computer you have finished entering your formula. The address "d2" will appear in the Cell Contents Area, and the computer will calculate the formula, placing the result in cell d3.

In the example above, cell addresses such as d1 and d2 are used to tell the computer that you want to use the values in those cells in your formula. But you can also use the values that are not currently in your spreadsheet. For example, the formula d1+6 uses a cell address (d1) and a value not currently in the spreadsheet (6) in a formula in the spreadsheet.

Your formulas can be up to 69 characters long. They can use addition (+), subtraction (−), multiplication (*), division (/), exponentiation (∧), or any combination of these. You can use these five operations in formulas you enter into your spreadsheet.

NOTE: You should not use the address of the cell that contains your formula in the formula itself. For example, if you are entering a formula in cell c3, you can't use the cell address c3 in that formula. If you do so, the computer will calculate the result using the last value it found in c3.

NOTE: If a calculation results in a number that is either very small or very large in magnitude (say .000000000002 or 9,999,999,999,999, 999), the computer may display this number in scientific, or exponential, notation in the Cell Contents Area. The cell that contains this value will display a row of # signs, but you can format the cell to display the value in scientific notation. See the following section on scientific notation or see Chapter 5 for information on the "Format" menu option.

Rules for Entering Formulas

Follow these rules when entering your formulas:

1. The computer will always calculate the operations in your formula in a specific order: exponential (∧) operations first, division (/) and multiplication (*) second, and addition (+) and subtraction (−) last. Formulas with a series of additions and subtractions or a series of multiplications and divisions would be solved from left to right.

   Examples:

For the formula 2*3∧ 2+4, the computer would first calculate the exponential operation, 3 ∧ 2. (Press SHIFT 6 to enter the ∧ symbol.) The arrow symbol denotes an exponential calculation, which is also known as "raising to a power." 3 ∧ 2 means "3 times 3" or "3 to the second power." (For more information on exponents, see Chapter 6.) The answer to this part of the equation is 9. Then the computer will perform the multiplication operation, multiplying 9 by 2 for an answer of 18. Lastly, it would add 4 to that answer. The result of the entire equation is 22.

For the formula 2+3*2+2, the computer would calculate 3*2 first (6), and then add 2 and 2 to that product, giving you a final answer of 10.

For the formula 2+3+5+4/2, the computer would perform the division problem (4/2) first, and then add that answer, 2, to the other numbers in the formula, giving you a final answer of 12.

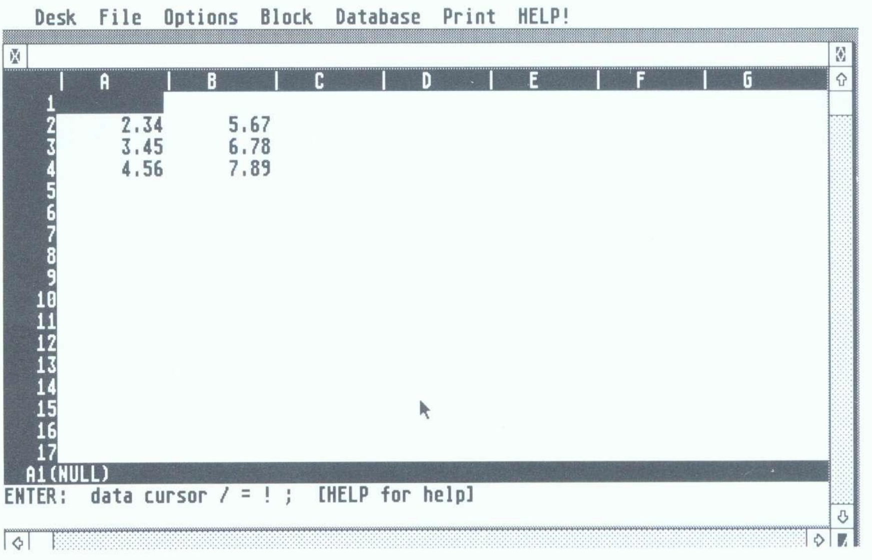
2. You may use parentheses in your formula to designate operations that you want the computer to perform first. Be sure that you use a pair, and not a single parenthesis. If your parentheses are not in pairs, your formula will not be accepted by the computer. Listed below are some examples of formulas using parentheses:

   (2+3)*(2+2)=20

   (4/2)+(5*4)/2=12

Example:

Enter the following values into cells in your spreadsheet. Your spreadsheet will look like this:



Now move the cursor to cell a5 to enter a formula. If you want the value in cell a5 to equal the sum of the values in a2,a3, and a4, press the + key, and then enter a2 + a3 + a4 in the Input Area at the bottom of your screen. Then press **RETURN**. The number 10.35 will appear in cell a5. Notice that only the result of the formula is placed in the cell, but the complete formula is shown in the Cell Contents Area.

Now move the cursor to cell b5 and press the + key. Then enter the formula (b2 + b3 + b4)*2, and press RETURN. The result, 40.68, will appear in cell b5. Notice how the parentheses determined the order of mathematical operations that the computer performed. If the parentheses were left out, the formula would look like this:

b2 + b3 + b4*2

Given this formula, the computer would calculate the multiplication operation (b4*2) first, finding a product of 15.78. Then it would add the values from cells b2 (5.67) and b3 (6.78) to that product. The result of the entire calculation would be 28.23.

NOTE: SWIFTCALC works best for you when your spreadsheet contains no forward references. A forward reference is a formula that uses a value in a cell below or to the right of the original formula.

For example, if the formula in cell a5 of your spreadsheet uses a value in cell c8, your spreadsheet contains a forward reference. The computer calculates row by row or column by column, depending on how you set the "Global" option (see page 51 for more information on this option). Before moving to the next row or column, it would first calculate the formula in cell a5 using the current value in cell c8. Remember, however, that the formula in cell c8 has not yet been updated, so cell a5 would be calculated using whatever value cell c8 currently holds. Next, the computer would calculate the formula in c8, and a new value would appear in that cell. You would then need to press the ! key or F5 to recalculate the spreadsheet, updating cell a5 with the new value in cell c8.

For each forward reference in your spreadsheet, the computer will need to make an extra pass to recalculate your formulas. This is not done automatically.

NOTE: SWIFTCALC offers you a number of mathematical functions to use for your formulas. Chapter 6 discusses those functions in detail. When you have learned about all of SWIFTCALC's functions, take time to construct the sample spreadsheets in Chapter 8. These will give you some practice in working with the spreadsheet.

The Help Windows

To review SWIFTCALC's commands and functions at any time, press the **HELP** key or select the HELP menu heading. A help screen for the command you are currently using will appear on your display. After reading the help screen, press **Esc** to return to the spreadsheet.

- Inserting a Row or Column
- Deleting a Row or Column
- Deleting Cell Information
- The "Execute Calculations" Feature
- The Goto Command
- Editing Cell Information
- The Quick Entry Key
- Marking a Block
- The Format Option

Following is a discussion of the commands available on the function keys. The first set of boxed characters after the title of each section refer to the Quick Keys that are available for the function. Several features include another set of boxed characters. These refer to the Slash Command for that feature. See page 37 for more information on Slash Commands.

Inserting a Row or Column ALT I /I

To insert a new column into the spreadsheet, move the cursor to the location where you want to insert the column. Press F1, and a blank column will be inserted at the left of the cursor location, and all of your formulas will be adjusted accordingly.

To insert a row, move the cursor to the location for the new row, and

The Pull-Dow
Menus

- The Slash Com

the line contains the characters *.* and clic

If you access this option by pressing / L, make sure your data disk is in the drive. When prompted, type in the name of the file you want to load. You will be asked if this is a SWIFTCALC or a DIF/DATA MANAGER file. Make a selection. If this is a SWIFTCALC file, that file will then be loaded from your data disk. (This option is much like opening a file, except that you can't view the names of your files on your screen.) If this is a DIF or DATA MANAGER file, the file will be loaded into column a1 of the spreadsheet window.

Saving a File / S

NOTE: If you access this option using the / S keys instead of the "Save As" menu item, you will first be asked to select a file type, SWIFTCALC or DIF. If you save your spreadsheet as a SWIFTCALC file, you will only be able to use it in SWIFTCALC. If you save it as a DIF file, you will be able to use this spreadsheet in SWIFTCALC and in other spreadsheet programs. Select one of these file types and continue reading this section for further instructions.

Select the "Save" option to store your spreadsheet on your data disk. The spreadsheet will be stored under its current name. If you try to store a spreadsheet with a name that you used for an existing file on your disk, the old file will be overwritten.

If the file has no name, you will be given an opportunity to name it. You will now see a dialog box asking if you want to store all of your spreadsheet contents or only the numbers in the spreadsheet. Select one and click on OK. Your spreadsheet will be saved on your disk.

NOTE: To guard against losing your spreadsheet due to equipment or disk problems, be sure to save it on your data disk at regular intervals.

Renaming Files Before Saving ALT S

The "Save As" option allows you to change the name of your document before you save it. After you select the option, enter a name for the file. Click on the OK box.

You will now see a dialog box asking if you want to store all of your spreadsheet contents or only the values (numbers) in the spreadsheet. Select one and click on OK.

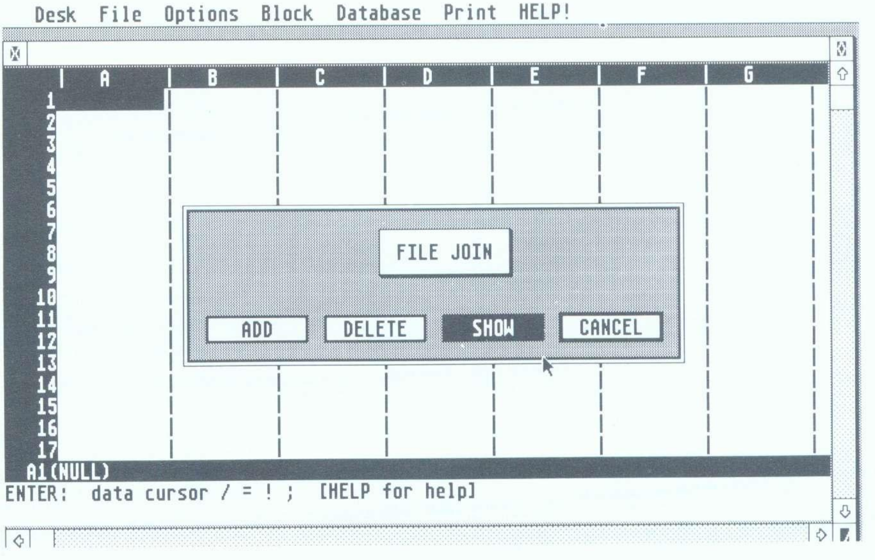
If your disk already contains a file with the name you entered, the old file will remain on your disk, but the computer will change the file extension to .BAK (.BAK stands for "backup"). The new file will also be saved on your disk under this file name, but it will receive the extension .CAL.

NOTE: To save your spreadsheet in a temporary file, press ALT T.

Joining Spreadsheets / J

This option creates "links" that interconnect two spreadsheets. For example, you could create a yearly summary sheet that automatically pulled the totals from each monthly spreadsheet. To create a link, you simply specify a spreadsheet file name and the name of a cell or block in that spreadsheet. When the link is activated, the values are obtained from the file you specified and placed in the current spreadsheet at the cell where the cursor is located when the link is established.

When you select the "Join" option on the FILE menu, menu, you will see a dialog box with the following options.



- **Add:** Select this option to add a link to your spreadsheet. You will then be asked to enter a file name. Enter the name of the spreadsheet file that will be the basis for the link. Then, when prompted, enter the name of the cell that you wish to link to your spreadsheet.

NOTE: A cell name is a name that you assign to a cell using the "Name" menu item. A cell name might be "2nd Quarter Sales", versus the cell address, which is a1 or c10.)

You will now be asked if you want the link to be permanent. If you select No, the program will only link the two spreadsheets once, and then the linking information will be erased. Finally, you will be given a chance to load the linked spreadsheets that you just specified. If you load the link, the cell will be linked to your spreadsheet at the current cursor location.

If you do not wish to load this link now, but your link is permanent, SWIFTCALC will retain this linking information and give you an opportunity to resolve, or load, the link whenever you choose the "Show" option (see below).

- **Delete:** This option will erase a previously created link. The link at the current cursor location will be deleted.

- **Show:** Use this option to display all the permanent links. If any of these have not yet been loaded (resolved), you will be asked if you want to load them now.

Creating a Graph File

Your SWIFTCALC ST program disk includes an extensive Graphics program. Before you can work with this program, however, you must create a file of spreadsheet information in SWIFTCALC. This is the data that the computer will use to draw your graphs.

To create this "graph file", use the F9 key to mark the top and bottom of the block of cells that you want to use in the Graphics program. Then select the "Create Graph File" option. A File Management box will appear. Enter a file name. Do so, and your graph file will be stored on your data disk. You can now move on to Chapter 7 for instructions on using the Graphics program.

The "Abandon" Option / Z

When you are done working with a spreadsheet, select this option to erase it from the computer's memory. Be sure you have saved the spreadsheet on your data disk before you select the "Abandon" option. (You can also select the "Zap" command to clear your spreadsheet. Just press / Z.)

Finding the Status of Your Spreadsheet

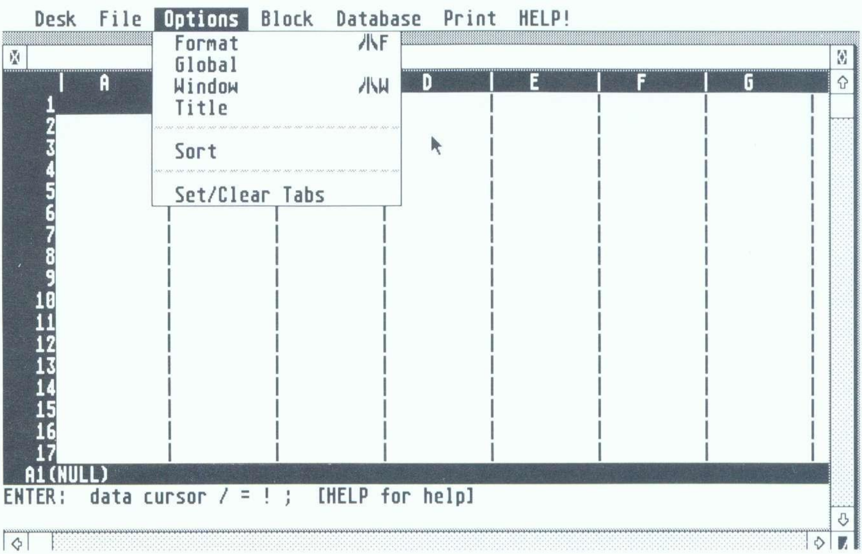
Select this option to receive information on the status of your spreadsheet. This information includes such data as worksheet size and the amount of remaining memory. When you have finished viewing the status of your spreadsheet, click on OK.

Exiting SWIFTCALC ALT Q / Q

Use the "Quit" option to exit SWIFTCALC and return to the GEM desktop. Be sure to save your spreadsheet on disk before you select this option.

The OPTIONS Pull-Down Menu

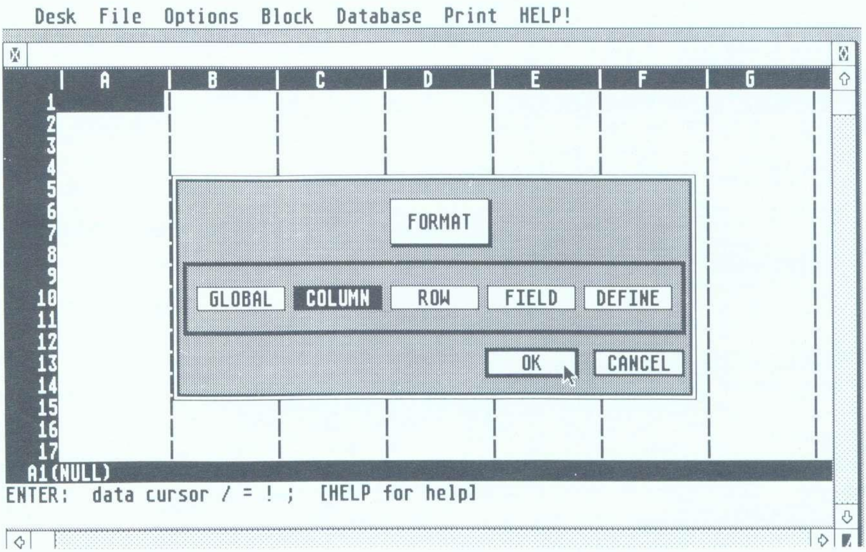
When you select the OPTIONS pull-down menu, you will see the following items:



Let's take a look at what each of these can do for you.

Formatting Cells F10 ALT F /F

When you load SWIFTCALC into your computer, all of the spreadsheet cells share a common format: they are all 9 characters wide, and they will display numbers using a floating decimal format. (This type of decimal format does not automatically add decimal places to each number you enter. You must add the decimal places yourself.) You can change the format by selecting the "Format" option on the OPTIONS pull-down menu. The following dialog box will appear on your display.



The first thing you must to choose is a format type:

- **Global:** The new format will affect ALL the cells in the spreadsheet.

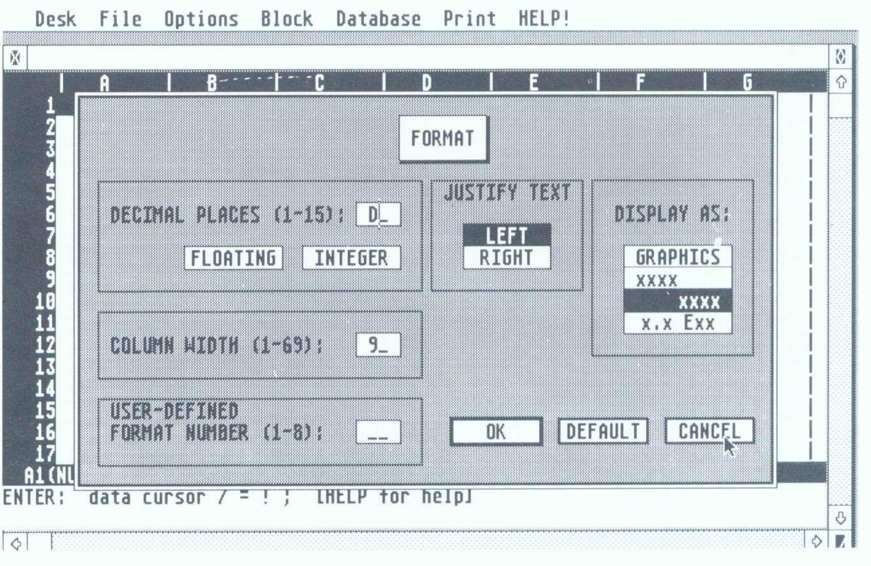
- **Column:** The new format will affect only the cells in the column where the cursor is currently located.

- **Row:** The new format will affect only the cells in the row where the cursor is currently located.

- **Field:** The new format will affect only the cell where the cursor is currently located.

- **Define:** Select this option to define a format of your own. (We'll give you more information about this option in just a second.)

Use the mouse to select a format. You will then see the following dialog box.



The following discussion of the format options will help you select a setting for each option. (To use the settings that load in with the program, simply click on "Default" in this window.)

Specifying Decimal Places for Values

NOTE: You will not be able to specify decimal places if you have chosen the "Row" or "Field" format types. You must use the "User-Defined" option instead (see page 50).

SWIFTCALC's cells are set to display values with as many decimal places as you enter. This is called a "floating decimal format". To change that format, enter a number from 1 to 15. If you click on "Integer", your numbers will be displayed with no decimal places.

Widening Columns

SWIFTCALC's columns are 9 characters wide. If you have chosen the "Global" or "Column" format types, you can widen columns by moving to the "Column Width" box and enter a number from 1 to 69.

Justifying Numbers

To align your numbers at the right side of each cell, move to the "Display As" box and click on the box of Xs that are aligned at the right. To align numbers on the left, click on the box with the Xs at the left.

Graphics

If you choose to enter Yes for the "Graphics" option, the numerical value(s) in the cell or cells you designate will be converted to a bar of asterisks. The overall effect is that of a bar chart. The length of each bar in a column will depend on the width of the column.

NOTE: You can widen your cells up to 69 characters using the "Column Width" option in the "Format" dialog box before selecting the "Graphics" option. Then SWIFTCALC will have the maximum amount of room available to display your values as graphs.

For example, let's say you have formatted a 20-character-wide column to display graphics. In that column are the values 5, 10, and 25, which will be displayed as bar graphs. The bar for the value 5 will be 5 asterisks long and fill one-quarter of the 20-character wide cell. The value 10 will fill half of its cell. The bar for the value 25 (and any value that is too large for the cell it occupies) will fill the entire cell.

NOTE: You may want to convert large numbers to smaller amounts to make them easier to graph. See page 51 for information on scaling numbers down so that you can maintain their proportional relationship to each other. This will also allow the computer to display a more accurate graph, as smaller numbers, or bars of asterisks, will fit into your spreadsheet cells.

Scientific Notation

If you are working with extremely large values, you may want to express them in the spreadsheet using scientific notation. (For more information on scientific notation, consult a mathematics book.) If so, click on "x.x Exx". The computer will display your values in scientific notation automatically.

Justifying Text

To align your text at the left or right of the cells, use this option.

Selecting Your Own Format

NOTE: If you do not want to specify your own format, simply click on the OK box in the Format window.

To define your own format, move the cursor to the "Define" option, and enter a number from 1 to 8. (You can define up to 8 different formats.) If this is the first time you have used this option, enter 1. Then click on the "Define" box at the bottom of the window. The following table will appear on your display.

USER FORMAT CODES	1	2	3	4	5	6	7	8
Insert commas	Y	Y	Y	Y	N	N	N	N
Floating $	Y	Y	N	N	N	N	N	N
() for negative	Y	N	Y	N	N	N	N	N
CR for negative	N	Y	N	Y	N	N	N	N
Blank for 0	Y	Y	Y	Y	N	N	N	N
Round	Y	Y	Y	Y	N	N	N	N
Decimal Places	2	2	2	2	D	D	D	D
Scale Factor	0	0	0	0	0	0	0	0

This option allows you to define up to 8 different formats. When you call up the Format option for a cell, you can enter the number from the "Define" window which corresponds to the format you want to use in that cell.

To specify a format, use the cursor to move around the screen and then select the options you want to use. Listed below is an explanation of each of these features.

- **Insert Commas:** Select this option to display values with commas.

- **Floating $:** If you select Y for this option, your $ signs will appear at the left of the value in each cell.

- **() for Negative:** Select this feature to display negative numbers with (parentheses) around them.
- **CR for Negative:** Select this feature to display the characters CR at the right of your negative values. CR is an accounting term for "credit".
- **Blank for 0:** Select this feature to display blank cells where a 0 has been entered.
- **Round:** Select this feature to round your numbers (depending on the number of decimals you have selected).
- **Decimal Places:** Select a number of decimal places from 1 to 15. If you enter a D for this feature, the program will use the default decimal selection, which displays only as many places as you enter for each number.
- **Scale Factor:** The scale factor is the power of ten by which the cell value will be divided before being displayed. Enter a number from 0 to 9. This is commonly used in financial statements for large companies. If the numbers in the cells are in the millions but you do not want to clutter your spreadsheet with all the extra digits, enter a 3 for this option and the value will be divided by 1000 (10 ∧ 3). A number like 2,333,444 would be displayed as 2,333.

When you have finished defining your format, press RETURN. When you see the Format window, enter the number (1-8) for the "Define" option which corresponds to the format you want to use for this cell. Click on OK again to return to the spreadsheet.

Setting the "Global" Features / G

Use this option to set the "Global" features that affect various aspects of the spreadsheet. When you select this option, you will see the following display:

Adjust all cell references (relative cell addressing)
Preserve cell case after adjustment
Manual recalculation (after ! key)
Calculate row-by-row
Borders
Automatic scrolling
Arrow keys terminate data entry
Spreadsheet grid ON

These options are set at their default selections. Use the up and down cursor keys to move the pointer, and press the SPACE BAR to turn the option next to the pointer on or off. When you have finshed making selections, press RETURN to enter your choices and return to your spreadsheet. Listed below is an explanation of each global option:

- **Adjust All Cell References/Adjust Lower Case Cell References Only:** This option is related to the "Copy" command, which allows you to copy cells from one location to another. If the cells you are copying contain formulas, you need to indicate – using this option – whether any cell addresses in those formulas should not be adjusted in their new locations.

  For example, let's say you want to copy cells b1 through b6 to a new location – cells d1 through d6. Cells b1 through b5 contain numbers, while cell b6 contains a formula which uses the cell addresses b1, b2, b3, b4, b5, and a5. If you wanted to copy this formula and adjust cells b1 through b5 after the copy, but leave cell a5 the same, you would set this global option at "Adjust Lower Case References Only". Then when you enter or edit your formulas, you would enter the cell addresses that you do not want adjusted in capital (upper-case) letters. In our example, the formula would look like this:

  b1 + b2 + b3 + b4 + b5 + A5

  When you use the "Copy" option later, the cell addresses in capital letters will not be changed in any way.

- **Preserve Cell Case After Adjustment/Change Cell to Upper-Case After Adjustment:** If you want a formula to be adjusted only the first time you copy it, but you want it to remain untouched every time thereafter, set this option at "Change Cell to Upper-Case After Adjustment". If you set it at "Preserve Cell Case After Adjustment", the computer will not adjust the case of the cell addresses.

- **Manual Recalculation/Automatic Recalculation:** If you want the entire spreadsheet recalculated every time you make an entry, select "Automatic Recalculation". If you want the computer to calculate the spreadsheet only when you press the ! or F5 keys, select "Manual Recalculation".

- **Calculate Row-By-Row/Calculate Column-By-Column:** This option determines if the computer will calculate in a downward direction (row-to-row) or in a left to right direction (column-by-column).

- **Borders/No Borders:** Use this option to turn off the borders of your spreadsheet (the area that contains the letters and numbers that mark the rows and columns).

- **Automatic Scrolling/Manual Scrolling:** The "Automatic Scrolling" option scrolls, or moves, your screen when you press a cursor key. If you select "Manual Scrolling", when you press a cursor key to move the cursor, the rows and columns will not move as the cursor moves. The computer will only redraw the spreadsheet window when the cursor comes to rest and you press RETURN. (Watch the Status Area at the bottom of your screen for the current cursor location as the cursor moves through the spreadsheet.)

- **Arrow Keys Terminate Data Entry/Arrow Keys Do Not Terminate Data Entry:** You can use the cursor keys to finish a cell entry just as if you pressed RETURN. If you would prefer this method to pressing RETURN after entering each cell's information, select "Arrow Keys Terminate Data Entry".

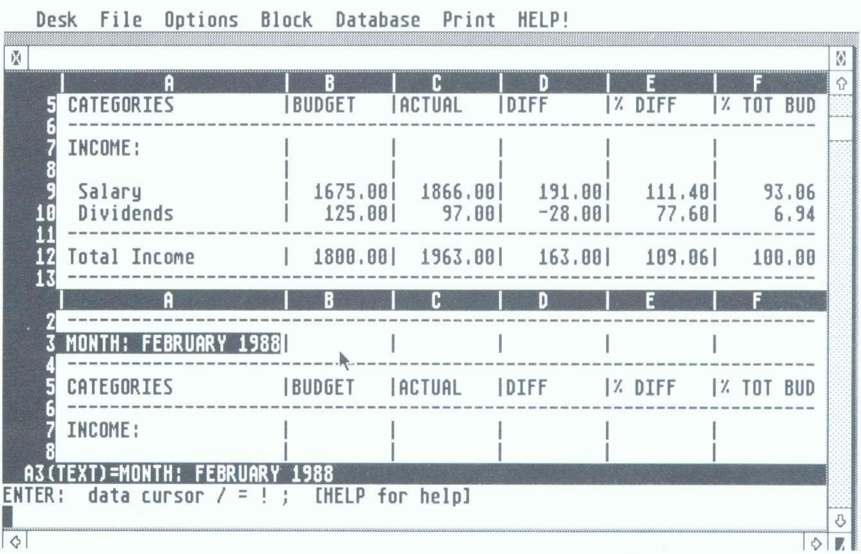
- **Spreadsheet Grid On/Off:** Use this option to turn the lines between columns on and off. Experiment to see which type of display you prefer.

When you press RETURN, all of your changes will be stored in the computer and applied to your spreadsheet. These options will be saved when you store your spreadsheet on a data disk. If you press Esc to exit this window, the options will not be changed.

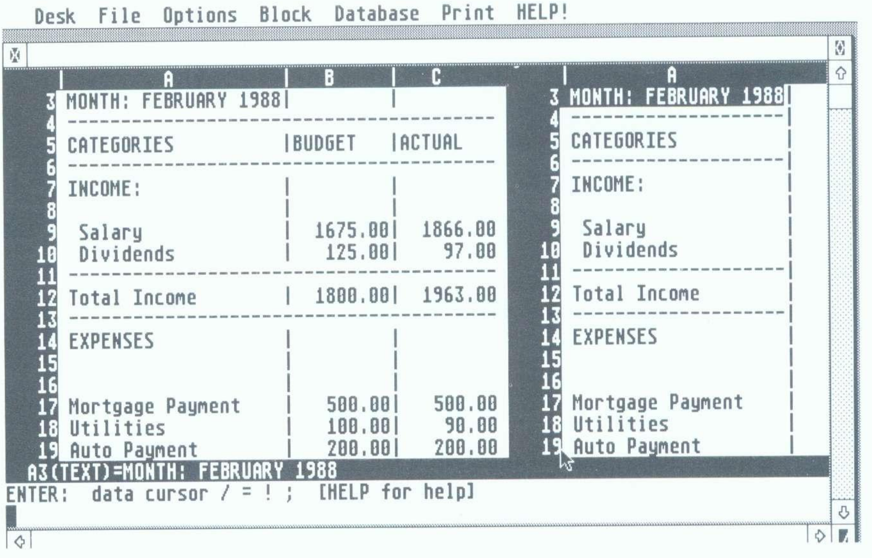
Using Dual Windows in Your Spreadsheet ALT W / W

The "Window" command on the OPTIONS menu allows you to split the screen into two parts, each of which shows a different part of the spreadsheet. After you select the Window option, you will see the following options:

- **Horizontal:** Select this option to display two horizontal windows, starting from the current cursor location.



- **Vertical:** Select this option to display two vertical windows, starting from the current cursor location.



- **None:** Select this option to remove a window from the display.

- **Sync:** If you select this option while a window is active in the spreadsheet, the two windows will be synchronized. When the cursor moves in one window, the cursor position will move in the other window. (You will not see the cursor move in the second window but when you return to that window you should notice the new position of the cursor.)

- **Unsync:** Unsynchronizes the activity in two windows in the spreadsheet.

Use the cursor keys to select your options, or type the first character of the option. You will be able to move between windows by pressing the ALT and A keys or by pressing the ; key.

Setting Titles in the Spreadsheet / T

As you read earlier, the SWIFTCALC screen scrolls as you move the cursor from cell to cell. For example, as you move the cursor down the spreadsheet, the first 16 rows disappear, one by one, as new rows appear at the bottom of the screen and scroll up. The same happens when you move the cursor to the right: the columns at the left disappear to make room for new columns on the right. This means that your titles and headings in these rows and columns have scrolled off-screen.

With the "Titles" option, you can retain a row or column of information on your screen while the rest of the screen scrolls. For example, let's say you want to keep all of the information in row 1 on your screen while you view the information below that row. To do this, move the cursor to row 1 and select "Titles". You will see the following choices:

- **Horizontal:** If you select this option, all the rows above the cursor position will be highlighted and will not scroll off the display while you are using the program. For our example, we would choose "Horizontal".

- **Vertical:** If you select this option, all the columns left of the cursor position will be highlighted and will not scroll off the display while you are using the program.

- **Both:** If you select this option, all the columns left of the cursor and above the cursor position will be highlighted and will not scroll off the display while you are using the program.

- **None:** If you select this option, any of the previous title options you have selected will be canceled.

Select your options using the cursor, or type the first character of the option.

NOTE: You will not be able to place the cursor in a row that contains a title you have set with this option.

Sorting Spreadsheet Information / A

This option allows you to sort information in your spreadsheet into increasing or decreasing alphabetic or numeric order. (Note that the corresponding Slash Command for this option is called "Arrange".) Let's look at the "Sort" option using the following sample spreadsheet.

NOTE: To guard against accidental loss of your spreadsheet information, be sure to save your spreadsheet on disk before performing a sort.

LAST NAME	FIRST NAME	TERRITORY	SALES
Johnson	Tim	North	10,000
Williams	Bill	South	5,000
Johnson	Jane	North	8,000
Adams	Bob	West	7,800
Brown	Betty	East	23,000

Let's say you want to sort the lines of information in this spreadsheet based on sales in increasing order. To do so, select the "Sort" option on the OPTIONS pull-down menu and follow these steps.

1. First you must enter the range of cells you want to sort. Everything inside that range will be sorted, while everything outside that range will not be affected by the sort. To enter the range, enter the cell address of the cell in the upper left corner of the range (block). Then enter a colon (:) followed by the cell address of the cell in the lower right corner of the block. Your range could look like this: a3:d7.

If you have named a block in your spreadsheet using the "Name" option, you can enter that name here instead of two cell addresses. To sort an entire spreadsheet, press RETURN only.

2. Next in response to the prompt, enter a cell address for the column you want to use for the sort (or move to the column and press RETURN). This is called your key field. For the example, you would move the cursor to the column with SALES, and press RETURN.

3. Next you must tell the computer to sort your information in ascending (increasing) or descending (decreasing) order. Use the cursor to point to your choice and press RETURN, or press the first letter of your choice. For the sample, you would select "Ascending".

4. After the sort takes place, your spreadsheet information will be rearranged on your screen in the order you requested. All formulas within the block you marked for the sort will be updated.

Multilevel Sorts

The sample spreadsheet contains two people with the same last name: Johnson. If you performed a sort on the LAST NAME column only, these two people may not be placed in the correct order (Jane Johnson should appear before Tim Johnson). To sort this list according to name, you need to do two sorts. First you must sort the FIRST NAME column. Then you must sort the LAST NAME column. Use the procedure below:

1. Select the "Sort" option.

2. Enter the block you want to sort.

3. Select the FIRST NAME column as the key column.

4. Select "Ascending" sort. Now the list will be sorted according to first name.

5. Select the "Sort" option a second time.

6. Enter the same block as in step 2.

7. Select the LAST NAME column as the key column.

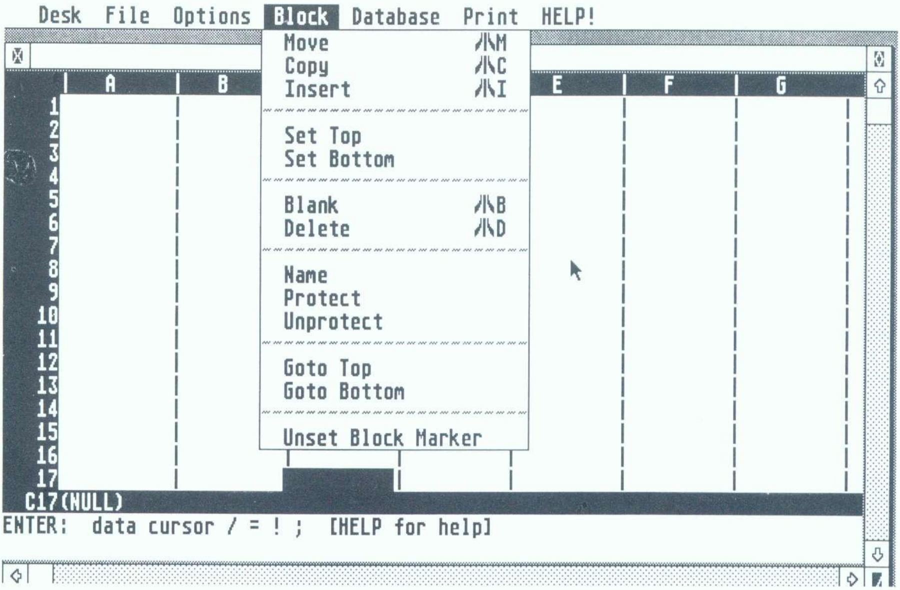
8. Select "Ascending" sort. Now the list will be sorted by last name and first names will also be in order. The final list will look like below:

LAST NAME	FIRST NAME	TERRITORY	SALES
Adams	Bob	West	7,800
Brown	Betty	East	23,000
Johnson	Jane	North	8,000
Johnson	Tim	North	10,000
Williams	Bill	South	5,000

NOTE: The general rule for multilevel sorting is to sort the least significant columns first and the most significant last.

The BLOCK Pull-Down Menu

When you select the BLOCK pull-down menu, you will see the following items:



Three of the options on this menu – "Blank", "Protect", and "Unprotect" – require that you "mark" a block of cells. You can then use these menu items to work with that block. Let's take a look at the options on the BLOCK menu.

Marking a Block

The "Set Top" and "Set Bottom" options on the BLOCK menu are used to mark a block of cells. They operate just like the F9 key. To use these options, move the cursor to the upper left cell of the block you want to work with, and select "Set Top". Then move the cursor to the lower right cell of the block, and select the "Set Bottom" option. The block will be stored in the computer's memory (but it will not disappear from your screen). You can then select a BLOCK menu option ("Name", "Protect", or "Unprotect") to apply to this block. This block will stay marked in the computer's memory until you select the "Unset" option (see the next section) or until you press the UNDO key.

Erasing a Block Marker UNDO

After you have marked a block, you may decide you do not want to work with that block. Select "Unset Block Marker" or press the UNDO key, and the block will no longer be marked in the computer's memory.

Moving Cells / M

To move a row or column to a new location, move the cursor to the row or column you want to move. Select the "Move" option. When the prompt appears at the bottom of your screen, enter either the number of the row or the letter of the column where you want to move this information. Press RETURN, and the move will take place.

Copying Cells ALT C / C

To copy a cell or block of cells to a new location, select the "Copy" option. Then, to copy a single cell, move the cursor to that cell and enter a comma (,). Then move the cursor to the upper left hand corner cell of the range to which you are copying. Enter a colon (:). Now move to the lower right hand corner of the block, and press RETURN again. Your information might look like this:

a1,a5:a10

You can also enter these cell addresses manually, or enter a range name. Just be sure you separate your "copy from" cell address from your "copy to" addresses by a comma. Separate the two addresses of a range by a colon.

To copy a block of cells to another block, enter the range you are copying from (with the two cell addresses separated by a colon). Then enter a comma, followed by the range you are copying to (again, the two addresses in the range must be separated by a colon). The instructions for this copying maneuver might look like this:

a1:a5,b1:e1

After you enter your instructions, and press RETURN, the copy will take place.

Inserting Cells ALT I / I

To insert a block of blank cells into the spreadsheet, select the "Insert" option. When the prompt appears at the bottom of your screen, enter the address of the cell in the upper left hand corner of the block you want to insert. Then enter a colon followed by the cell in the lower right hand corner. Your instructions might look like this:

a6:a10

Press RETURN, and the computer will enter blank cells into the range you have indicated. The rest of your spreadsheet information will be moved over to make room for the new cells.

Erasing Cell Information ALT B / B

To delete information in a cell or marked block, use the "Blank" option. Just mark the block, as described on page 60 . Then select "Blank", and the information in that cell or block of cells will be erased. (If you use the / B keys, you will be prompted to enter your range instead of marking a block.) When a cell or cells are "blanked", all data that is associated with those cells (except protected cells), including format options, will also be erased from the spreadsheet in the computer.

This option could be very useful if you set up a monthly sales schedule or monthly budget. After you have saved your data, select the "Protect" option (see page 64) and protect your text and formulas only. Then select "Blank" and erase your values. You now have a clean spreadsheet with all of your headings and formulas already in place.

Deleting Rows or Columns ALT D /D

To delete a block of cells from the spreadsheet, select the "Delete" option. Then select "Row" or "Column" and enter the address of the row or column you want to delete. If you press RETURN only, the computer will delete the row or column where the cursor is currently located. The rest of your spreadsheet information will be adjusted after the deletion.

Naming Cells or Blocks of Cells /N

This command allows you to assign names to cells and blocks of cells. You can then use these names in commands and formulas in the spreadsheet. When you select this option, you will see a dialog box with the following choices:

- **Add:** Select this option to add a name to a cell or block in your spreadsheet. The name can contain both letters and numbers, but it must begin with a letter and cannot contain more than 15 characters. You will see a second dialog box where you must enter the name you want to use and click on OK. You must then enter the cell or range of cells to which you want to apply the name. Enter the first cell of the range followed by a colon. Then enter the last cell of the range and press RETURN. If this is a single cell, enter the cell's address and press RETURN, or press RETURN only to enter the address of the cell where the cursor is located.

  NOTE: In most cases, you will use the "Name" option to name a single cell. You can then use this cell name in your formulas in place of entering the cell's address.

- **Delete:** Use this option to delete a name from the list. When the second dialog box appears, enter the name you want to delete, and the computer will erase it from the spreadsheet.

- **Show:** When you select this option, a list of the names and the corresponding cells they represent will be displayed on the screen.

Protecting Spreadsheet Information / P and / U

Use this command to "protect" information in your spreadsheet. When a cell is protected, you will not be able to enter data into or delete information from that cell.

To protect cells, use the "Set Top" and "Set Bottom" options to mark the block to be protected (see page 60 for more information). Then select the "Protect" option. (If you perform this operation using the / P keys instead, you will be asked to enter the range to be protected. Remember to separate the two cell addresses that indicate the range with a colon.) You will be asked if you want to protect all of the cells or just the formulas and text. Select one, and this range will be protected.

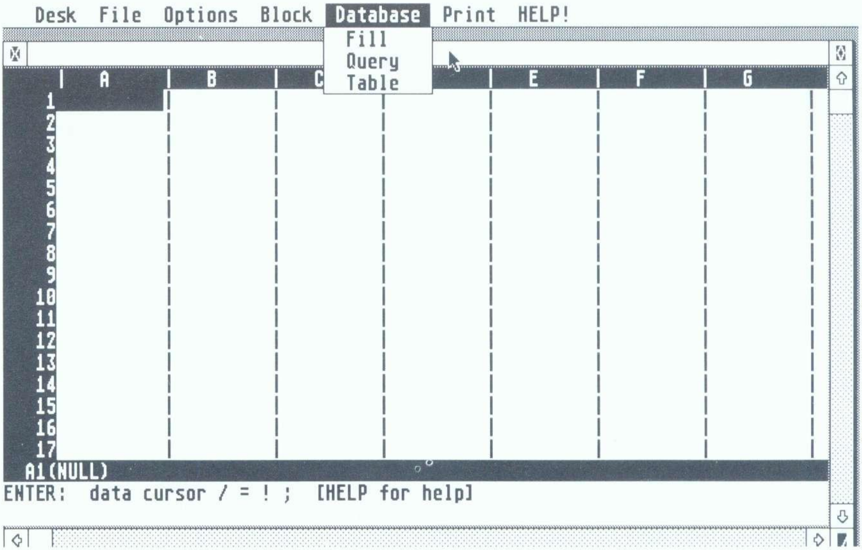
To reverse the protection, use the "Unprotect" option and designate a range.

Moving to the Top or Bottom of a Marked Block

To view the beginning of a marked block, select "Goto Top", and the cursor will move to the first character of the block. To view the end of the block, select "Goto Bottom", and the cursor will move to the last line of the block.

The DATABASE Pull-Down Menu

The options on the DATABASE menu allow you to set up a data base within your spreadsheet. It also allows you to apply data base functions to your spreadsheet information. When you select the DATABASE menu, you will see the following items:



A SWIFTCALC data base is simply a cell range (block) consisting of one or more columns and at least two rows. The first row must contain text which represent the names of "fields" in your records. Each row after the field names is considered one record. Following is a sample data base:

	A	B	C	D	E
1	NAME	ADDRESS	TOWN	STATE	ZIP
2	Johnson	123 Main Street	Chicago	IL	60677
3	Williams	3426 State Parkway	Anytown	NE	23456
4	Smith	654 North Avenue	Westown	OH	12456
5					

The first row (1) consists of the list of field names. Note that all cells under a common heading have the same type of data in them (i.e. column E has a zip code for every record). This is true for each column.

Now let's look at the functions that you can apply to your data base.

The "Data Fill" Option / %

NOTE: When using the Slash Command for this option, press / % to call up the "Database Operations" command. Then press F for Fill.

The "Data Fill" option allows you to enter a series of numbers into your data base. You tell the computer the beginning number and ending number of the series and the value of each step, or increment, of the series, and the computer does the rest for you.

First you must enter the block of cells that you want to fill with values. Enter the cell address of the upper left cell in the block, followed by a colon (:), followed by the address of the lower right cell, and press RETURN.

Next you must enter the starting value of the series of numbers. For the example, enter 0. You will then be asked to enter the "step value". This number allows you to tell the computer the increments for the series of numbers. For the example, enter 5.

NOTE: Your step value must be a whole number. The "Fill" option will not work if your step value includes decimal places or is a value less than 0.

Lastly, enter the ending value of the series (enter 100 for the example). The computer will now compute the series and fill the cells with the series of numbers you requested. The sample data fill would consist of a series of numbers from 0 to 100 in steps of 5 (0, 5, 10, 15, etc.). (If you press RETURN instead of entering an ending value, the computer will fill the entire range you entered with your series of values.)

Experiment with this option – you can't hurt your data, and you may find it useful in your spreadsheet.

The Data Query Function / %

NOTE: When using the Slash Command for this option, press / % to call up the "Database Operations" command. Then press Q for Query.

The "Data Query" option gives you the opportunity to search your data base for records that contain information you specify. Following is an explanation of the four types of queries. Before selecting a query type, read this information and examine the illustration that follows.

- **Delete:** Deletes all the records in the data base that contain the information you specify.

- **Extract:** Copies all the records in the data base that contain the information you specify. This group of records, which the computer copies to another part of the spreadsheet, is called the "output range". (See the following illustration for an example of an output range.)

- **Find:** Places the cursor in the output range that you last produced using the "Extract" function, and allows you to view the records in the range.

	---A---	---B---	---C---	---D---	---E---	---F---
1	LAST NAME	FIRST NAME	TERR	SALES	LAST NAME	SALES
2	Johnson	Tim	North	10,000		23,000
3	Lee	Sam	North	23,000		
4	Williams	Bill	South	5,000		
5	Johnson	Jane	North	8,000		
6	Adams	Bob	West	7,800		
7	Brown	Betty	East	23,000		
8						
9	LAST NAME	FIRST NAME	TERR	SALES		
10	Lee	Sam	North	23,000		
11	Brown	Betty	East	23,000		

Notice that this data base is contained in the range a2:d7. The information in cells e1:f2 is the data that the user specified for an extract query. The output range, which contains the records found during the query, appears in cells a9:b11.

Before you can perform a data query, you must set up two areas in the spreadsheet:

- **Criterion Range:** This area will contain the range of information you want the computer to look for in the search. It may contain some or all of your fields. Move to an unused portion of your spreadsheet. You will need two blank rows. Enter the names of the fields you want to search for in the first row (in our example, these two fields are LAST NAME and SALES). Then move down one row and enter the numerical data for which you want to search. The spreadsheet will then check the first record (row) in the spreadsheet, and, if it satisfies the criteria, will write it to the output range. It will then test the next record in the data base. Cell f2 of the example contains the figure 23,000 because it is the criteria that we entered.

- **Output Row:** This is the area where the computer will deposit whatever data it finds when it searches the data base using your criterion range. The output row should be large enough to be able to receive all of the data found in the search. In the first row, enter the names of the fields that you want written in the ouptut row. The field names must be exactly the same as those in the data base. (See cells a9 and b9 in the above example).

NOTE: After you set up your criterion range and output row, you can name these areas of the spreadsheet using the "Name" option on the BLOCK menu or by pressing / N. Then, when you use the other data base options and you are prompted for a range, you can enter the name of either of these areas instead of having to enter cell addresses.

Now you are ready to use the data base functions.

1. First, you must specify the input range, the range of cells that contain your data base. This range must always include the row that contains your field titles.

2. Next, when prompted, enter the range of cells that contains your criterion range. Remember, this range must include the field titles.

3. Lastly, you must enter the range of cells that you set up as your output row. If your output row is not large enough, you will see an error message, and the data query will be cancelled.

After you complete these steps, the computer will perform the query and display your output range.

Setting Up a Data Table

NOTE: When using the Slash Command for this option, press / % to call up the "Database Operations" command. Then press T for Table.

The "Table" command on the DATABASE menu generates a table of values based on a formula you enter in a cell of the spreadsheet. The computer will then replace the values in that formula using other values that you enter into a section of the spreadsheet. The figure below shows an example of a data table:

```
-------A-------1-------B-------1-------C-------1-------D-------1-------E-------1-------F-------1-------G
1    0             0
2   10      3.162277
3   20      4.472135
4   30      5.477225
5   40      6.324555
6   50      7.071067
7   60      7.745966
8   70      8.366600
9   80      8.944271
10  90      9.486832
11 100            10
12 110      10.48808
13 120      10.95445
14 130      11.40175
15 140      11.83215
```

Cell c1 contains the function +SQRT(a1), which will calculate the square root of the contents of cell a1. (The SQRT function is explained in more detail on page 82 .) The "Data Table" option then continually replaces the value in cell a1 with the other values we have entered in column a. As the value in cell a1 changes, so do the results of the calculation, and these results are systematically displayed in column b.

In this example, cell a1 is known as the "input cell". The input cell is the original value for the table. It does not have to be located within the table range. The group of cells from a1 to c15 is known as the "table range". Range c1 to c15 contains the results of the "table function" calculations.

To use this function:

1. Move to a blank range of your spreadsheet. In the first row of this range (your input cell), enter the formula that will calculate your table data.

2. In the first column of this range, enter the numbers that you want to use in the calculation. You can enter them manually or by using the "Data Fill" option.

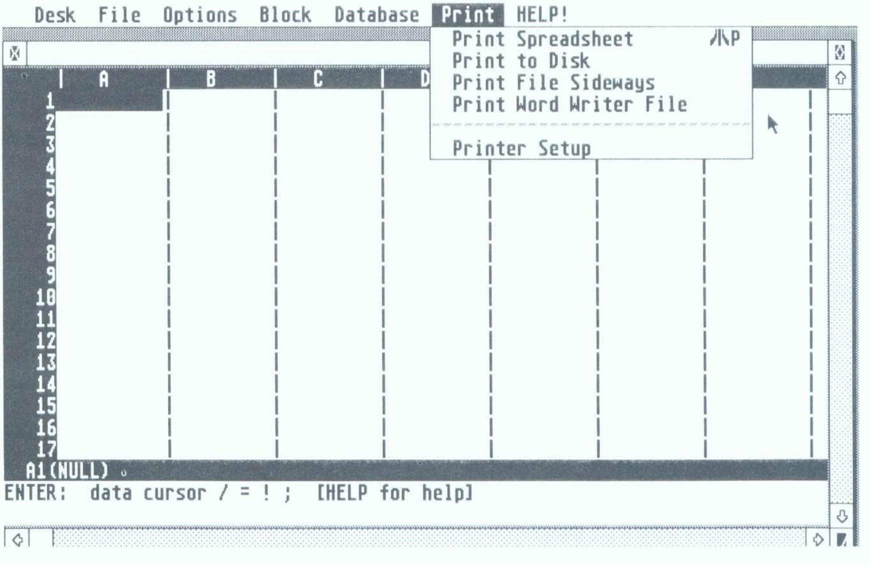
3. Select the "Data Table" option on the DATABASE menu. When prompted, enter the range that you want to use as your table range. To enter this range, type in the first cell address followed by a colon and the address of the lower right-hand corner cell of the range.

4. You will then be prompted for the input cell. In our example, the input cell is a1.

5. The computer will now calculate and display your table data.

The PRINT Pull-Down Menu

When you select the PRINT pull-down menu, you will see the following options:



Configuring Your Printer / O

NOTE: When using the Slash Command for this option, press / O to call up the "Output" command. Then press C for Configure.

The first command you will use is the one that appears last on the PRINT pull-down menu. Before you print a spreadsheet you should use the "Printer Setup" option to give the computer some information on the way you want the spreadsheet printed out. When you select this command, a window will appear on your screen. This window contains a list of items that affect the way your printed spreadsheet will look.

To the right of the list of options are the default settings. You can change any of these settings to fit your own printing needs, but first, take a look at the explanation for each of these settings.

- **Characters Per Line:** Use this option to enter the number of characters that you want to print across your page. For example, most printer paper is 80 characters across. If you want to print across the entire page with no margins, you would set this option for 80. If you want a 15-space margin on one side, you would set this option for 65 (80 – 15 = 65).

  NOTE: When you are using compressed type, you will need to modify the line length of your printout. If you do not re-set the line length from 80 columns to a new line length (say, 132 columns), your printer will not print any more of your spreadsheet than it did before. Instead, it will print 80 columns of your spreadsheet in compressed type.

- **Lines Per Page:** This option allows you to enter the number of characters that you want to print lengthways on a piece of paper. For example, most printer paper is 66 characters, or lines, long.

- **Top and Bottom Margins:** Enter the number of blank lines you want placed at the top and bottom of each page.

- **Form Feeds:** If you select YES for this option, the printer will automatically use form feeds to find the end of the page.

- **Initialization Sequence:** This option allows you to enter printer codes to turn on special type faces. For example, to print a spreadsheet in compressed type, you must enter the ON codes used by your printer for compressed type on this line. Be sure that you separate each code with a comma. (See your printer manual for your printer's correct codes.) If you are not printing in a special type face, you do not need to enter any codes on this line.

  For example, to print in compressed type on an Epson printer, you would enter the code 15 as your initialization sequence.

- **Termination Sequence:** Use this option to enter your printer's OFF codes for whatever type face you are using. Separate each code with a comma. If you are not printing in a special type face, you do not need to enter any codes on this line.

  If you are printing in compressed type on an Epson printer, you would enter the code 18 as your termination sequence.

When you have made the selections for your printout, click on the OK box at the bottom of the display. You will then be asked if you wish to update your parameter file. Select Yes to save your printer setup on your program disk. It will be loaded into the computer each time you load SWIFTCALC.

Printing Your Spreadsheet / O ALT P

NOTE: When using the Slash Command for this option, press / O to call up the "Output" command. Then press P for Printer.

When you are ready to print your spreadsheet, select "Print Spreadsheet" on the PRINT menu. You will then be able to choose one of two options, "Screen" or "Block". If you select "Screen", the spreadsheet that is currently on the screen will be printed on your printer. If you select "Block", you will see the following choices:

- **Output Block:** Use this option to tell the printer which block to print. Press RETURN to print the entire spreadsheet that is currently in the computer.

- **Output Borders:** This option allows you to print the numbers and letters around the outside of the spreadsheet window.

- **Output Block Titles:** If you have labels at the top of your spreadsheet, use this option to tell the computer which lines contain these labels. They will be repeated on all pages of your printout.

After you make your selections, your spreadsheet will be printed on your printer.

Printing to Disk / O

NOTE: When using the Slash Command for this option, press / O to call up the "Output" command. Then press F for File.

This option prints your spreadsheet on a data disk in pure ASCII characters. You can then use it in another program or in a telecommunications program. Just select this option and follow the prompts on your screen to print your file on disk.

Printing Your Spreadsheet Sideways

SWIFTCALC features a very unique option: it will print an entire spreadsheet vertically on the same page at the same time. You can print as wide a spreadsheet as you like, with complete control over margins and spacing. You can also choose from a variety of type sizes.

Before you can print a spreadsheet sideways, however, you must first create a file containing the spreadsheet or block of cells you want to print in this manner.

Creating a File to Print Sideways

Follow these steps to create a file to print sideways.

1. Use the instructions on page 60 to mark the block of cells you want to print sideways.

2. Select the "Create Sideways File" option on the PRINT menu. In response to the prompt, enter a path and file name for this file. The path is the drive and subdirectory where you want to place this file.

3. Your file will now be saved on your disk.

NOTE: If you save a spreadsheet or block of cells as a file for printing sideways, you will not be able to load it back into SWIFTCALC, because the computer will rewrite the spreadsheet in a form that can be read only by the sideways printing option.

If you want to use that spreadsheet in SWIFTCALC in the future, you must also save it on your SWIFTCALC data disk using the "Save" option on the FILE menu. See page 79 for information on saving a file for use with SWIFTCALC.

Using Sideways

Now you are ready to print your file using Sideways. To do so, follow these steps:

1. Place the Sideways disk in the disk drive. Select the "Quit" option on the FILE menu to exit SWIFTCALC. (You can also press ALT Q or / Q to use this option.)

2. The GEM desktop and the disk directory will appear on your screen. Double-click on the icon labelled SW.PRG. The Sideways display will appear on your screen.

3. If you are using Sideways for the first time, move to the FILE menu and click on "Select Printer". A list of printers will appear on your display. Click on your printer. If your printer is not listed, click on a compatible printer. Then click on OK.

4. The Sideways display consists of a diagram of a Sideways printout and a number of settings that affect this printout. Enter a setting by moving to the option and clicking the mouse button. Then (unless otherwise noted below) enter a setting for the option.

   Horizontal Form Size: This option refers to the width (in inches) of your printer paper. You have your choice of settings: 8.5 or 13.5 inches.

Vertical Form Size: This option allows you to enter the distance (in inches) between perforations on your printer paper. Most printer paper measures 11 inches vertically, and that is the default setting for this option.

Left Margin: The left margin is the amount of white space (in inches) between the top of the printer page and the leftmost Sideways print column.

Top Margin: The top margin is the amount of white space (in inches) between the first Sideways printed line at the top of your spreadsheet and the right edge of the paper.

Bottom Margin: The bottom margin is the amount of white space (in inches) between the last Sideways printed line at the bottom of your spreadsheet and the left edge of the paper.

The amount of white space available for printing is determined by subtracting the top and bottom margins from the horizontal form size.

Font Size: This option affects the size of the characters on your printout. Click on the arrows on either side of this window to select an option ranging from Miniscule to Mammoth.

Character Spacing: This option represents the distance between successive characters. You can squeeze characters or spread them apart by changing the value for this option.

Line Spacing: This option represents the distance between successive lines of print. You can squeeze lines together or spread them apart by changing the value for this option.

Doublestrike: Select this option if you want your printer to doublestrike the characters of your printout.

5. After you enter your settings, you can do one of two things:

   - If these are the settings you'd like to use for all of your Sideways printouts, make sure your Sideways disk is in the drive. Select "Save Defaults" on the FILE menu, and these settings will be saved on disk. They will be loaded into the computer automatically whenever you load Sideways.

   - You can save different files of settings using the "Save Settings" option on the FILE menu. You will be asked to enter a file name for each setting file. You can re-load these settings whenever you need them using the "Load Settings" option.

6. To print your Sideways file, select "Print" on the FILE menu. When the File Management box appears, enter the name of the Sideways file you created earlier and click on OK. Then enter the number of the page of your spreadsheet where you want Sideways to begin printing. Click on "Print." After the printer begins, you will be able to pause or stop the printer using the window on your screen.

7. When the printer has finished, place the SWIFTCALC disk in the drive and exit Sideways using the "Quit" option on the FILE menu. Re-load SWIFTCALC using the instructions in Chapter 3 of this manual.

The HELP! Pull-Down Menu

SWIFTCALC features help screens for most of each features. For help with an option, press the HELP key. A screen of information will appear. When you have finished reading this screen, press any key to read the next help screen. To return to your spreadsheet, press Esc.

NOTE: You must have the program disk in your drive to use this help feature.

File Operations /

The "File Operations" slash command is not related to any of the program menus. If you press / while in the Command line, you will move to the "File Operations" command. This command allows you to copy a file, view your disk directory, erase a file, or define a file name prefix. At the bottom of your screen, you will see a prompt with these four choices. Move the cursor to your selection, and press RETURN.

- **Copy:** In response to the prompt, type in the name of a file on your data disk and a name of another file (separated by a comma) and the information will be copied into this new file.

- **Directory:** Will display all the data files that are on your disk. Before the directory is displayed, you will be given a chance to enter a file name suffix.

- **Erase:** Enter the name of a file you want to erase from your data disk.

- **Path:** Use this option to define a new path (subdirectory or drive) for the computer to use when accessing your data disk. If you do not define a path here, this option will not affect your disk accessing in any way. If, however, you are using a hard drive, you may want to indicate the name of the drive and subdirectory that contains your SWIFTCALC files. Do so by entering your path information in the following format:

  C:\spreadsheets

  The C: stands for the hard drive. Enter this drive information followed by the backslash and the name of your subdirectory. (Note that because the backslash key is also used to browse your spreadsheet when entering data, you must press that key twice when indicating your path.)

If you enter a path here, the computer will look at that path automatically whenever you use the "Save" (/S) or "Load" (/L) commands.

Now that you are familiar with the SWIFTCALC menus and Slash Commands, let's take a look at more advanced features, the mathematical functions.

- Exponentiation
- The Square Root of a Value
- The Minimum Value of a Range
- The Maximum Value of a Range
- The Average Value of a Range
- The Sum of a Range
- The Value Count of a Range
- The Integer Value of a Cell
- Financial Analysis Functions
  The Present Value of a Dollar
  The Future Value of a Dollar
  The Present Value of an Annuity
  The Future Value of an Annuity
- IF . . . and Other Logical Statements
- Text Within Formulas
- Choosing Information from a List
- The Lookup Function
- Trigonometric and Logarithmic Functions
- Other Advanced Functions

In this section we will discuss the mathematical functions available to you for use in your formulas. We will refer to the spreadsheet below for all of the examples that follow. Use the instructions for data entry in Chapter 3 of this manual to enter the labels and values shown below into the SWIFTCALC spreadsheet on your screen.

Sample Spreadsheet

	a	b	c	d	e
1		column b	column c	column d	column e
2	row 2	4.50	33.00	10.00	1234.00
3	row 3	3.40	22.00	20.00	1345.00
4	row 4	123.40	44.00	30.00	1023.00
5	row 5	1.34	-12.00	40.00	1672.00
6	row 6	2.00	4.00	50.00	1112.00
7	row 7	3.00	5.00	60.00	2345.00
8	row 8				

Exponentiation

This is a powerful function that lets you calculate square roots, squares, cube roots, and other exponential calculations. An example of an exponential calculation would be $4^4 = 16$ or $3^3 = 27$.

To enter 4^2, type in 4 2 (press **SHIFT** **6** to enter the ∧ sign), and the number 16 will appear in the cell in which your cursor is located.

To find the square root of a value, you must use .5 or the fraction ½ in parentheses. For example, to find the square root of 4, enter 4 .5 or 4 (½). The answer is 2. (You can also use the SQRT function, which is discussed in the next section.)

To find the cube root of a value, you must use .3333 or the fraction ⅓ in parentheses. For example, to find the cube root of 27, enter the formula 27 .3333 or 27 (⅓). The answer is 3.

You can also use cell values in your formula. To find the square of the value in cell b2 of our sample spreadsheet, enter b2 2. The answer is 20.25. Try this using other values in the sample spreadsheet.

The Square Root of a Value

NOTE: Throughout this discussion of mathematical functions, you will see the characters "x","range", and "list". The x stands for any cell address, number, or formula you want to enter into a mathematical function. The word "range" stands for the block of cells to which you want the computer to apply a mathematical function. Enter a range by typing in the address of the upper left hand cell in the block, followed by a colon, followed by the address of the lower right hand cell of the block. "List" stands for a list of cells separated by a comma. Wherever a range is called for, you can also enter a list. (Range, list, and x are also called "expressions".)

The SQRT function gives you the square root of a value. The format you must use for this function is SQRT(x). To enter the formula to find the square root of a value, press + and then enter SQRT. Then enter a parenthesis and the value you want to use, or enter the address of the cell that holds the value you want. Your formula might look like this:

+SQRT (b15)

(It doesn't matter if you enter SQRT in capital or lower-case letters.) When you enter this formula, the computer would calculate the square root of the value in cell b15.

Let's look at the SQRT function using our sample spreadsheet. Try entering the following formulas in blank cells in column f in the sample spreadsheet using the above instructions. (Remember to press the + key before entering these formulas.)

+SQRT(b6)

+SQRT(e7)

The square roots of these values are 1.414213 and 48.4250, respectively.

The Minimum Value of a Range

The MIN function will help you find the minimum value within a range of values in a group of cells. This function saves you time, because you do not have to move the cursor to each and every cell in the range to find its minimum value. SWIFTCALC does it for you. The format you must use for this function is MIN(range).

To enter the formula to find the minimum value of a range, press + and then enter MIN. Then enter a parenthesis and the address of the first cell in the range that you want the computer to check. (You can enter this address manually, or you can use the mouse to point to this cell and press **RETURN**. The address will be entered for you.) Enter a colon (:) and the address of the cell at the end of your range. (The colon is used to separate the two cell addresses.) Then enter a second parenthesis. Your formula might look like this:

+MIN(a5:a25)

When you enter this formula, the computer will check through the range you have specified, including cells a5 and a25.

Let's look at the MIN function using our sample spreadsheet. Try entering the following formulas in blank cells in column f in the sample spreadsheet using the above instructions. (Remember to press the **+** key before entering these formulas.)

+MIN(b2:b7)

+MIN(b5:e5)

The minimum values for these ranges are 1.34 and −12.00, respectively.

Now for a more difficult example. Perhaps you want to find the minimum value in an irregular-shaped block of cells. This block consists of cells b5 through b7, c2 through c7, d2 through d7, and e2 through e4. To do this, first place the cursor in cell f2 (a blank cell) and enter the formula

+MIN(b5:b7)

The value −12.00 will appear in that cell. Now move the cursor to cell f4 and enter the formula

+MIN(d2:d7)

The value 10.00 will appear in that cell. Now move the cursor to cell f6 and enter the formula

+MIN(f2:f5)

The value −12.00 will appear in this cell. This is the minimum value in the entire irregular-shaped range. This is a relatively simple process in which you break down a large job into several smaller jobs.

The Maximum Value of a Range

Use this function to find the largest value in a range of cells. The format for this function is MAX(range). For the range, you must enter the addresses of the first cell and the last cell in the range with which you want to work.

Let's look at the MAX functions using our sample spreadsheet. Try entering the formulas shown below in a blank cell in the sample spreadsheet. (Remember to press the + key before entering these formulas.)

+MAX(b2:b7)

+MAX(b5:e5)

The maximum values for these ranges are 123.40 and 1672.00, respectively.

To find the maximum value in an irregular-shaped block, or range of cells, see page 84 . You can adapt the procedure shown at the end of that section to find the maximum value in an irregular-shaped block.

The Average Value of a Range

Use this function to find the average of the values in a range of cells. The average is defined as the sum of the values divided by the number of values. The format used for this function is AVG(range).

Let's look at the AVG function using our sample spreadsheet. Try entering the formulas shown below in a blank cell in the sample spreadsheet. (Remember to press the + key before entering these formulas.)

+AVG(b2:b7)

In this example, the computer adds all of the values in cells b2 through b7 and then divides that sum, 137.64, by the number of values in the range (6). The average of the values is 222.94.

+AVG(b5:e5)

Using the same process as in the above example, the computer arrives at an average of 425.34.

To find the average value in an irregular-shaped block, or range of cells, see page 84 . You can adapt the procedure shown at the end of that section to find the average value in an irregular-shaped block.

The Sum of a Range

Use this function to find the sum of the values in a range. The format for this function is SUM(range).

Let's look at the SUM function using our sample spreadsheet. Try entering the formulas shown below in blank cells in the sample spreadsheet. (Remember to press the + key before entering these formulas.)

+SUM(b2:b7)

+SUM(b5:e5)

The sums of the values in these ranges are 137.64 and 1701.34, respectively.

To find the sum of the values in an irregular-shaped block, or range of cells, see page 84. You can adapt the procedure shown at the end of that section to find the sum of the values in an irregular-shaped block.

The Value Count of a Range

Use this function to find the number, or count, of values within a range of cells. For example, the count of values in the range (b2:e2) is 4, because there are 4 values in that range of cells. (The COUNT function does not count blank cells or cells that contain labels.) The format used for this function is COUNT(range).

Let's look at the COUNT function using our sample spreadsheet. Try entering the formulas shown below in a blank cell in the sample spreadsheet. (Remember to press the + key before entering these formulas.)

+COUNT(b1:b7)

There are 6 values in this range, so the count is 6.00.

+COUNT(a5:e5)

There are 4 values in this range, so the count is 4.00.

To find the count of the values in an irregular-shaped block, or range of cells, see page 84. You can adapt the procedure shown at the end of that section to find the sum of the values in an irregular-shaped block.

The Absolute Value of a Cell

Use this function to find the absolute value of a number in your spreadsheet. The absolute value of a number is its pure value without regard to negative or positive signs. For example, the absolute value of −5 is 5, and the absolute value of +5 is also 5. You might use this function if you wanted to know the difference between two numbers but it didn't matter to you if the result was either negative or positive.

The format for this function is ABS(x). In this format (and in several others in this manual), the character "x" stands for a value, cell address, or formula that you fill into the format. Use whatever values or formulas you like in this format – they don't have to be from your spreadsheet.

Let's look at the ABS function using our sample spreadsheet. Try entering the formulas shown below in a blank cell in the sample spreadsheet. (Remember to press the + key before entering these formulas.)

+ABS(c5)

In this example, the number in cell c5 is −12.00, but the absolute value is 12.00.

+ABS(b5)

The value in cell b5 is 1.34, a positive number, and its absolute value is also 1.34.

+ABS(5−7)

This example contains an equation, 5−7. The answer to this problem is −2.00, but the absolute value of this number is 2.00.

+ABS(c6−c7)

This example also contains an equation. When you replace the cell addresses with their corresponding numbers, the equation reads 4.00−5.00. The answer to this problem is −1.00, and the absolute value of that number is 1.00.

The Integer Value of a Cell

Use this function to find the integer value of an expression in your formula. An integer is a whole number. Decimal portions and fractions are not whole numbers, and therefore not integers. When the computer gives you the integer value of a number, it eliminates any digits to the right of the decimal point. (This function does not round numbers.)

The format for this function is INT(x). Let's look at the INT function using our sample spreadsheet. Try entering the formulas shown below in a blank cell in the sample spreadsheet. (Remember to press the + key before entering these formulas.)

+INT(3.9)

In this example, the integer value of 3.9 is 3.00, as the computer would disregard any numbers to the right of the decimal.

+INT(b5)

The number in cell b5 is 1.34, and its integer value is 1.00.

+INT(c5)

The number in cell c5 is − 12.00, and the integer value of this number is the same.

+INT(b4+b5)

This example contains an equation. When you replace the cell addresses with their corresponding numbers, the equation reads 123.40 + 1.34, or 124.74. The integer value of this number is 124.00, because the computer disregards numbers to the right of the decimal.

Financial Analysis Functions

SWIFTCALC features four functions that will aid you in working with your financial data: The Present Value of a Dollar (PVD) and Future Value of a Dollar (FVD), the Present Value of an Annuity (PVA), and the Future Value of an Annuity (FVA). These functions will help you examine the long-term consequences of your investment opportunities.

The formats for each of these functions include three variables:

A stands for a monetary amount in dollars

I stands for the interest rate in decimal form (10% = .10)

N stands for the number of time periods that amount is invested (for example, 36 months, 20 years, etc.)

You can replace these variables in your formula with values from your spreadsheet or values that are not from your spreadsheet. You can also use cell addresses to represent a value in your formula. For example, if cell c5 holds the dollar amount that you want to use for variable A in your formula, you can enter c5 in your formula.

NOTE: For a complete discussion of present and future value analysis, consult a book that covers these subjects in greater detail.

The Present Value of a Dollar

This function can be used to find the present value of a dollar amount that you will receive at some point in the future. It will help you decide on the financial wisdom of the investment.

The format for this function is PVD(A,I,N). (See above for an explanation of each of these variables.) Let's look at the PVD function using our sample spreadsheet (Page 81).

Example:

The company you work for has decided to give you a bonus for your hard work. You have been offered two options for payment of the bonus.

Option 1:

At the end of each of the next three years, you would receive cash payments as follows: \$3,000 after the first year; \$4,000 after the second year; and \$5,000 after the third year.

Option 2:

You would receive a one-time cash payment of \$10,000 now.

Assume: 1) an annual interest rate of 10%, and
2) income taxes are not taken into consideration.

To make an effective decision, you need to know the present value of the total amounts that will be paid out to you over the three-year period.

First you must enter the following amounts in blank cells in your spreadsheet.

cell f1: 3000

cell f2: 4000

cell f3: 5000

Now enter the following formula in cell f4:

+PVD(f1,.10,1)+PVD(f2,.10,2)+PVD(f3,.10,3)

f1, f2, and f3 are cell addresses
.10 is the rate of interest
1, 2, and 3 are the number of years

Press **RETURN**, and the answer to this formula will appear in cell f4.

Solution: The present value of the amounts paid out over three years is $9,789.63. Since this amount is less than $10,000, you should opt for the one-time $10,000 cash payment.

The Future Value of a Dollar

The future value of a dollar amount is equal to the principal, or invested amount, plus the interest that this amount will earn during the investment period.

The format for this function is FVD(A,I,N). Let's look at the FVD function using our sample spreadsheet (Page 81).

Example 1:

You have an opportunity to invest $2,500 of your money at a rate of 10%, compounded annually, for 15 years. This function would help you find the cash value of that $2,500 at the end of that time.

Enter the following formula for this option in a blank cell of your spreadsheet:

+FVD(2500,.10,15)

Then press RETURN. The answer will appear in that cell of your spreadsheet. The future value of $2,500 invested at 10% interest for 15 years would be $10,443.12.

Example 2:

Here we want to know the future value of the dollar amount in cell e7 (2345), which we want to invest at an interest rate of 10% for one year.

+FVD(e7,.10,1)

Then press RETURN and the answer to this formula will appear in that cell of your spreadsheet. The future value of $2,345 at the end of 1 year would be $2,579.50.

The Present Value of an Annuity

This function will help you determine the present value of an annuity. An annuity is an amount of money paid to an investor at regular intervals over a period of time, starting at some date in the future.

The format for this function is PVA(A,I,N). Let's look at the PVA function using our sample spreadsheet (Page 81).

Example:

The company you work for has decided to give you a bonus for your hard work. You have been offered two options for payment of the bonus:

Option 1:

You would receive a fixed cash payment of $4,100 at the end of each of the next three years.

NOTE: The Present Value of an Annuity deals with fixed amounts, while the Present Value of a Dollar deals with variable amounts.

Option 2:

You would receive a one-time cash payment of $10,000 now.

Assume: 1) an annual interest rate of 10%, and
2) income taxes are not taken into consideration.

To make an effective decision, you need to know the present value of the amounts that will be paid out to you over the three-year period.

First you must enter the following amount in a blank cell in your spreadsheet.

cell g1: 4100

Now enter the following formula in cell g2:

+PVA(g1,.10,3)

Press **RETURN**, and the answer to this formula will appear in cell g2.

Solution: The present value of the amounts paid out over three years is $10,196.09. Since this amount is more than $10,000, you should opt for the amounts paid out over the next three years.

The Future Value of an Annuity

This function helps you find the future value of an annuity, an amount of money you will receive at regular intervals over a period of time starting at some date in the future.

The format for this function is FVA(A,I,N). Let's look at the FVA function using our sample spreadsheet (Page 81).

Example:

You decide to invest $2,000 each year in an IRA account, which is invested at an annual interest rate of 10%. What will be the future value of this account at the end of 10 years? 15 years? 20 years?

Enter the first formula for this problem in a cell of your spreadsheet:

+FVA(2000,.10,10)

Then press **RETURN**, and the answer will appear in that cell of your spreadsheet. The future value of your investment would be $31,874.85. To find out the future value of this investment after 15 years, just replace the 10 in the formula with 15. The computer will recalculate the formula and tell you that the future value of that 15-year investment would be $63,544.96. Now try entering 20 for 20 years. The future value of that investment would be $114,550.00.

IF . . . and Other Logical Statements

SWIFTCALC allows you to perform tests on your spreadsheet data using special formats to create what are called logical statements. These statements ask the computer to calculate data that you specify, to make a decision about that data for you, and then take a course of action with your data. You enter these statements into your cells just as you would enter any other formula. As you enter them, you also enter the data you want to test. This data could be cell addresses or values from your spreadsheet, or it could be other values you select which do not appear in your spreadsheet. Let's take a look at each of these statements and some examples for using them.

The IF(x,t,f) Statement

In plain English, the IF(x,t,f) statement says, "If expression x is true, then expression t applies. If expression x is false, then expression f applies." This statement asks SWIFTCALC to read the expression in the statement and, in effect, make a decision for you and take some action with your data. The letters x, t, and f can be values, cell addresses, or formulas that you fill into the format. Be sure to enclose the x, t, and f expressions in parentheses.

There are several logical symbols you can use in the x part of the IF statement to ask the computer to test your data.

<	Less than
>	Greater than
=	Equal to
<>	Not equal to
<=	Less than or equal to
>=	Greater than or equal to

Now let's look at a practical use for this statement.

Example:

Let's say your company policy states that if a customer's order totals less than $1,000, he will be charged 5% for freight, and if the order is $1,000 or more, you will only charge 3% for freight. Let's assume you are using cell d22 to hold the total order amount. To perform this calculation, enter the following logical statement in cell d24 (or any empty cell) in your spreadsheet:

+IF(d22<1000,d22*.05,d22 *.03)

This statement says, in effect, "If the value in cell d22 is less than $1,000, then multiply the value in cell d22 by 5% (.05), and if the value in cell d22 is not less than $1,000, then multiply the value in cell d22 by 3% (.03)." When you enter this statement, the computer looks in cell d22, which contains the total order amount. If that value is less than $1,000, the computer multiplies the total order amount by 5%. If the amount is $1,000 or more, the computer will multiply the amount by 3%. In either case, the result will appear in the cell where you entered the If . . . Then . . . Else statement. This amount represents the customer's total freight charges.

Enter some different amounts in cell d22 to represent the total order amount, and watch cell d24 for your results.

NOTE: If you are using a function like MIN or MAX as the first item in your expression, you must precede it with a "+" sign to tell the program that this is a formula and not text. When the function is anywhere else in the formula, you do not need to precede it with a "+" sign.

The AND and OR Functions

SWIFTCALC offers you two operators that you can use in your IF statements, AND and OR. These are best explained using an example.

Let's say your spreadsheet contains information on each salesman in your company, including their monthly sales and the number of sick days they take each month. You'd like to find all of the salesmen who made over $4,000 in sales last month but missed no more than 2 days of work. You've decided that these people deserve a bonus of 1% of their monthly sales.

Let's assume cell c15 holds the monthly sales amount and c18 holds the number of work days missed. Your IF statement would look like this:

IF(AND((c15>=4000),(c18<=2)),c15*.01,0)

This statement says, "If the amount in cell c15 is greater than or equal to 4,000 AND the amount in c18 is less than or equal to 2, then multiply the amount in c15 by 1%. If not, place 0 in the cell where this IF statement has been entered." The AND operator in the IF statement tells the computer that the entire x part of the statement must be true before it will calculate the t portion of the statement.

The OR operator tells the computer to calculate the t portion if either of the x elements in the IF statement are true. For example, if we had used OR in our example, any salesman who had sales of $4,000 OR had missed 2 days or less would have received a bonus.

Text Within Formulas

Most formulas contain terms that are either numbers or references to cells that contain numbers. However, under certain circumstances, you can use quoted text or references to text cells. For example, the expression

+IF(a1<0,"negative","positive")

tells the computer to look in cell a1. If the number there is less than 0, the computer will place the word "negative" in the cell that contains the IF statement. If the number in cell a1 is greater than 0, the computer will place the word "positive" into the current cell.

You can also replace the text in the IF statement with cell addresses. For example, if cell a2 contained the word "positive", you could re-write the above IF statement so that it looks like this:

+IF(a1<0,"negative",a2)

You might use text most effectively in the IF function, and in the CHOOSE and LOOKUP functions, which are explained on pages 98 - 99 .

Choosing Information from a List

Use this mathematical function to choose an item from a list of data. The format for this function is:

CHOOSE(x,list)

This statement says "Choose item x from a list of data." The x is the position in a specified range of the number or cell address that you are looking for. Any number you enter here must always be greater than or equal to zero. The list in this function is a list of items (or a range of cells) that you enter. The CHOOSE function tells you what number falls at the position (x) you specify in the list that you enter. If x is the first item in the list, this function will give you a 1.

The example below shows you how this feature works:

	A	B	C	D	E	F	G	H
1)	1	2	3	4	5	6	7	8
2)	9	10	11	12	13	14	15	16
3)	17	18	19	20	21	22	23	24
4)	25	26	27	28	29	30	31	32
5)	33	34	35	36	37	38	39	40
6)	41	42	43	44	45	46	47	48
7)	49	50	51	52	53	54	55	56
8)	57	58	59	60	61	62	63	64
9)	65	66	67	68	69	70	71	72

The statement CHOOSE(10,a3:h9) asks the computer to find the 10th number in the range from a3 to h9. This number is 26.

The statement CHOOSE(5,a1:a9) asks for the 5th number in the range a1 to a9. This number is 33.

The LOOKUP Function

Use this mathematical function to search for an item from a list and return the value in the adjacent cell. The format for this function is:

LOOKUP(x,range)

Given this function, the computer will search the partial row or column specified as the range for a number higher than x. When it finds a number, the LOOKUP function gives you the value of the cell immediately to the right of the matching cell, if the range is a column, or immediately below the matching cell, if the range is a row.

Use the spreadsheet on page 98 for these examples:

LOOKUP(35,a5:a8)

This statement asks the computer to find the next highest value from 35 in the range from a5 to a8. The next highest value in this range is 41, and the value in the column to the right of it is 42, so the statement gives you an answer of 42.

LOOKUP(43,b1:b9)

This statement asks the computer to find the next highest value from 43 in the range from b1 to b9. This value is 50, and the value in the column to the right of it is 51, so the statement gives you an answer of 51.

To find a value two columns over, you could enter a statement like the one below:

LOOKUP(LOOKUP(a6,a1:a9),b1:b9)

This statement asks the computer to find the next highest value from the number in cell a6 (41) in the range a1 through a9, and then look in the range b1 through b9. The next highest value in that range is 42, and the value in the column to the right of that is 43, so the statement would give you an answer of 43.

Trigonometric and Logarithmic Functions

SWIFTCALC contains a number of trigonometric functions. We recommend that you do not attempt to use these functions unless you have had some instruction in trigonometry or you have consulted a good textbook on this subject. These functions are:

ACOS(x)	ArcCosine
ASIN(x)	ArcSine
ATAN(x)	ArcTangent
COS(x)	Cosine
SIN(x)	Sine
TAN(x)	Tangent

In these functions, the character "x" stands for the radian measure or the cell address that contains that measure. If your measure is expressed in degrees, not radians, you can convert the measure to radians using the following formula:

DEG(x)

You can convert radians back to degrees using this formula:

RAD(x)

SWIFTCALC also contains two logarithmic functions, which are used to find the natural and common logarithm of a value, and a function which gives you the natural logarithm base:

E	Natural Logarithm Base (2.718)
LOG(x)	Common Logarithm
LN(x)	Natural Logarithm

Again, we stress that to use these functions to their maximum potential, you must be familiar with the concepts of trigonometry and logarithms. Consult a mathematics textbook for this information.

Other Advanced Functions Available in SWIFTCALC

SWIFTCALC contains a number of advanced functions, which can be used in your IF statements or by themselves. We recommend that you consult a good algebra textbook before attempting to use these functions.

ERR	Expression evaluation error
FALSE	Returns a value of 0
ISERR(c)	Returns 1 (true) if an expression evaluation error occurred in the cell you have entered for (c)
ISNA(c)	Returns 1 (true) if cell (c) is not available
NA	Current cell is not available
NOT(x)	Returns 1 (true) if x is 0
PI	Returns the value of pi (3.14159. . .)
TRUE	A value of 1

- Graph Types
- Specifying Data for a Graph
- Converting Graphs
- Editing a Graph
- Saving and Loading Graphs
- Printing a Graph
- When You Have Finished Using Graphics

The SWIFTCALC program disk includes a special graphics program. This program can display your data in any of five formats: vertical bar charts, line graphs, horizontal bar charts, pie charts, and scientific graphs. You can also display your data as a variation of one of these graph types.

Before generating a graph, you must create a file of data that the computer will use to draw the graph. To do so, set the top and bottom of the block of cells that you want to graph. Select the "Create Graph File" option on the FILE menu and give your file a name. Your file will be created on your data disk.

Once you've created your graph file, you must load the Graphics program. After saving your data base on disk using the "Save" option, select "Quit" on the FILE menu to exit to GEM. When the disk directory appears, select the GRAPH.PRG icon, and the Graphics program will load into the computer.

Before we go any further, let's take a look at the types of graphs you can produce with this program.

Graph Types

Vertical Bar Charts

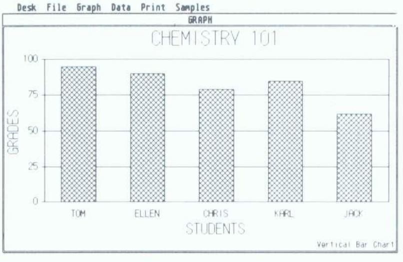
Bar charts, which are commonly used graphs, display values as vertical bars on the graph. SWIFTCALC includes five types of bar charts:

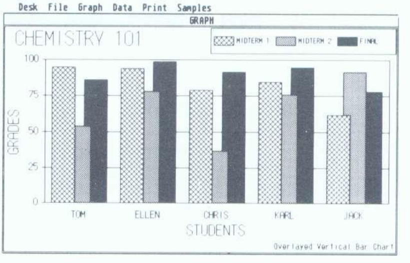
- **Vertical Bar:** Displays one set of data as a series of vertical bars.
- **Overlayed:** Displays several sets of related information as clusters of vertical bars.
- **Stacked:** Displays sets of related information stacked on top of each other.

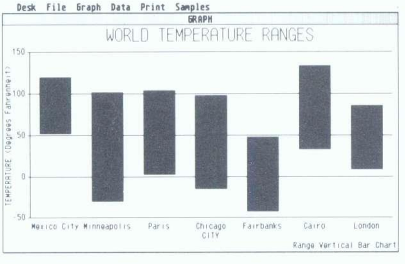
- **Range (hi-low):** Displays information vertically based on a range.

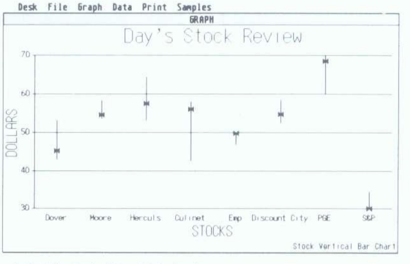
- **Stock (hi-low-close):** Displays stock market information based on hi-low-close prices.

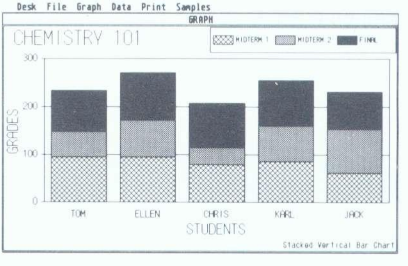
Below is an example of each type of vertical bar chart:











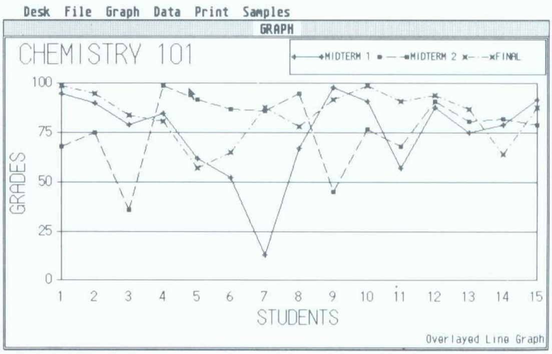
Line Graphs

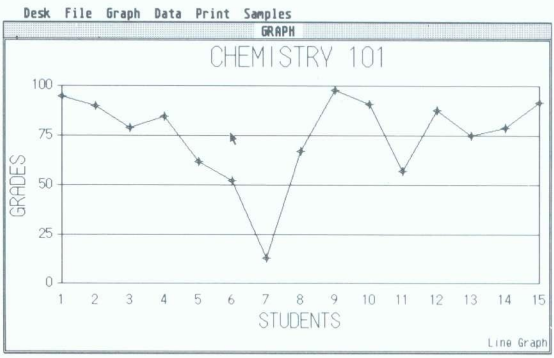
In a line plot, your data is represented by dots on the graph. Then the "dots" are connected to make trends in the data clearer to you. There are three types of line graphs:

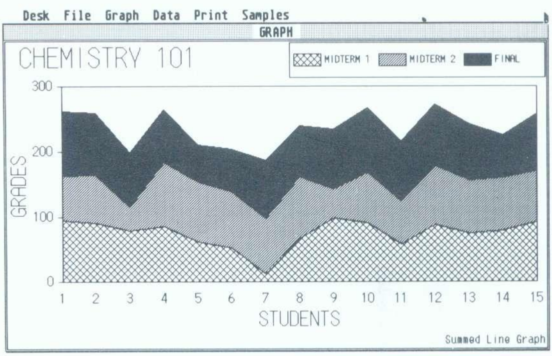
- **Line:** Plots a line graph using one set of data.

- **Overlayed:** Plots line graphs using more than one set of data.
- **Summed:** Sums the values as they are plotted.

Below is an example of each type of line graph:





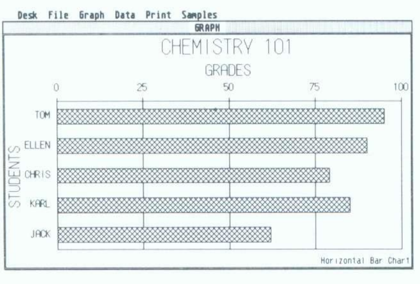


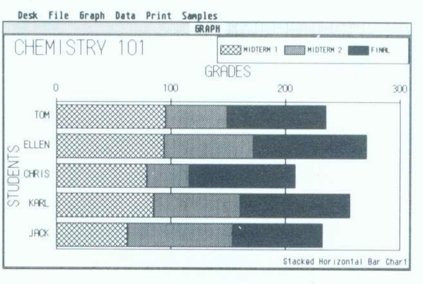
Horizontal Bar Charts

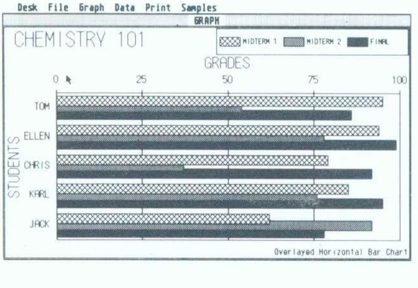
A horizontal bar chart is simply a vertical bar chart set on its side. There are four types of horizontal bar charts:

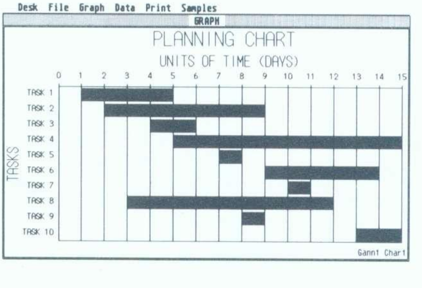
- **Horizontal Bar:** Draws a horizontal bar chart using one set of data.
- **Overlayed:** Displays several sets of related information as clusters of horizontal bars.
- **Stacked:** Displays sets of related information stacked on top of each other.
- **Gannt:** A type of bar chart that is most often used for project planning purposes.

Below is an example of each type of horizontal bar chart:







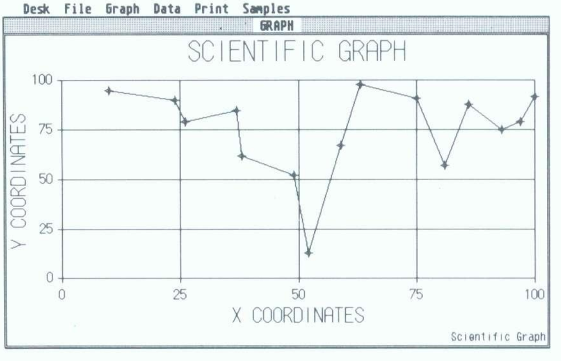


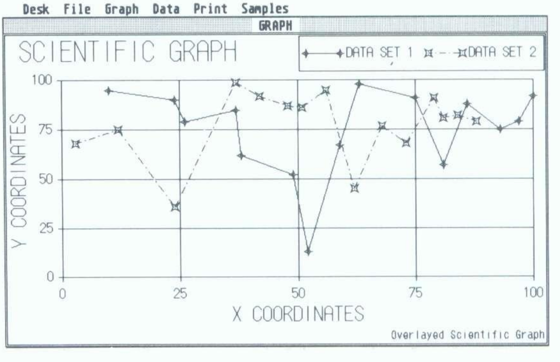
Scientific Graphs

This type of graph plots your data on a grid, connecting each point with a line. There are two types of scientific graphs.

- **Scientific:** Uses one set of data to plot the information.
- **Overlayed:** Uses more than one data set to plot the information.

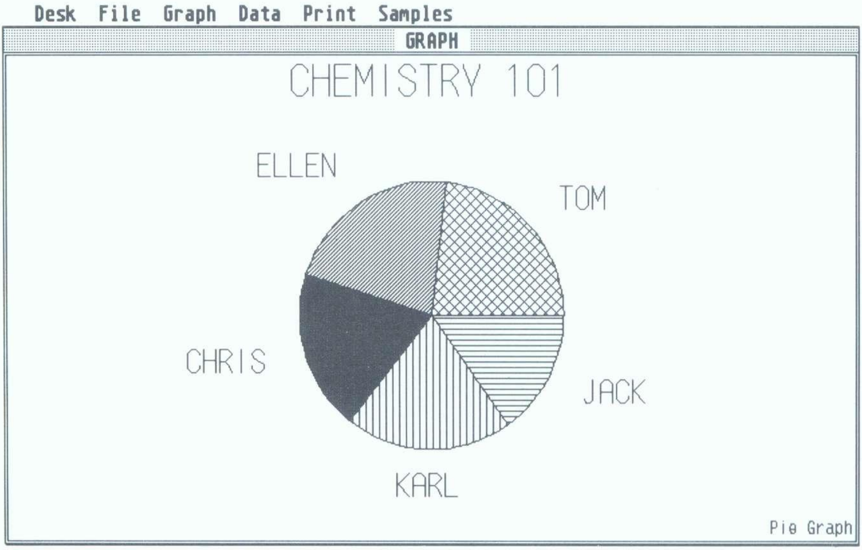
Below are illustrations of scientific graphs:





Pie Charts

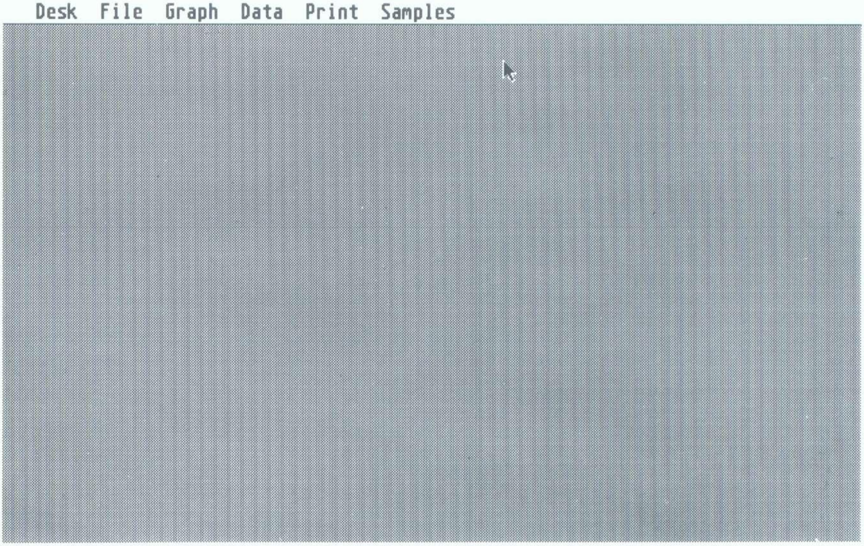
A pie chart displays values using a "pie" format. The size of each pie "slice" will vary according to the size of the value represented by that "slice". Below is an illustration of a pie chart:



Specifying Data for a Graph

NOTE: If you are using the Graphics program for the first time, you may want to take advantage of the sample data we have placed on your program disk. Throughout this section, you will find instructions for working with this sample data.

Once you've loaded the program, you will see the following display:

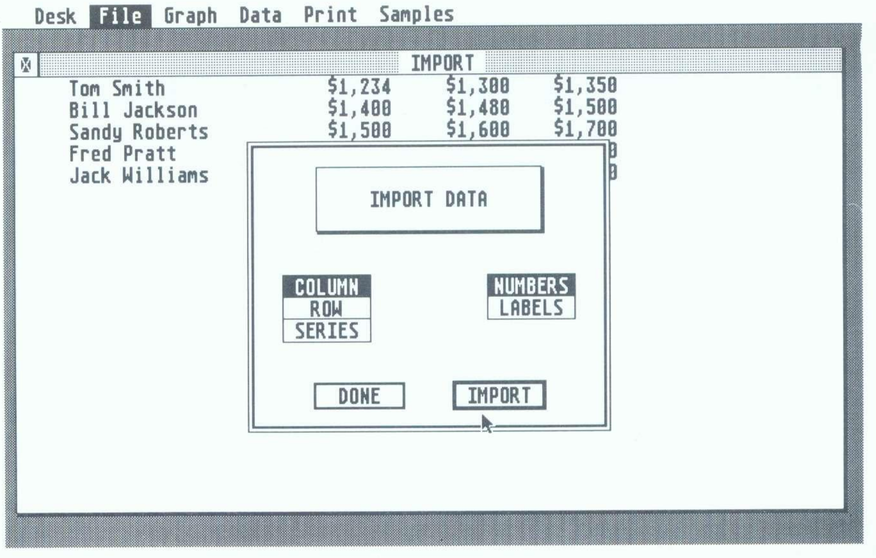


Move to the FILE menu and select “New” to tell the computer that this is a new graph. Now move to the GRAPH menu and select a graph type. (If you are using the sample data, select “Pie Graph”.) A check mark will appear on the menu next to your choice.

Before you can draw this graph, however, you must load in the file of graph data you stored on disk earlier. To do so, place your data disk in the drive (if you are using the sample data, place your program disk in the drive). Select “Import” from the FILE menu. When the File Management box appears, select the file you created in SWIFTCALC that contains your graph data. This file will have an extension of .GRF.) For the sample, select the SAMPLE.GRF file and click on OK.

The file you selected will be loaded into your computer and will be displayed on your screen in columned format. Now, to specify the exact information for your graph, follow these steps:

1. A dialog box will now appear on your display.



First you must specify the labels for your graph. (Labels appear on your graph to identify your graph information.) Click on "Labels". Then click on "Column" if the labels you want to use appear in a column on your display; click on "Row" if they are in a row; or click on "Series" if your labels are arranged in a series separated by commas. (For the sample, click on "Column".) Then click on "Import".

The cursor will now appear in the top left corner of the screen. Place the cursor at the beginning of the first label in the row or column you want to use in your graph. Press **RETURN**. For the sample, move to the T in Tom and press **RETURN**. You have just specified this column of labels.

2. Now you must specify the numbers for the graph. When the dialog box re-appears, click on "Numbers" and then click on "Column", "Row", or "Series". Use the cursor as you did in step 1 to specify the column, row, or series of numbers for your graph. For the sam-

ple, click on “Column”, and then move the cursor to the 1 of 1234 in the Sales column and press **RETURN**. DO NOT include blank cells in your graph.

NOTE: If, after viewing the data on your screen, you find that you do not want to import this data to the Graphics program, simply press **UNDO** to escape to the “Import” dialog box. Then click on DONE to return to the Graphics menus.

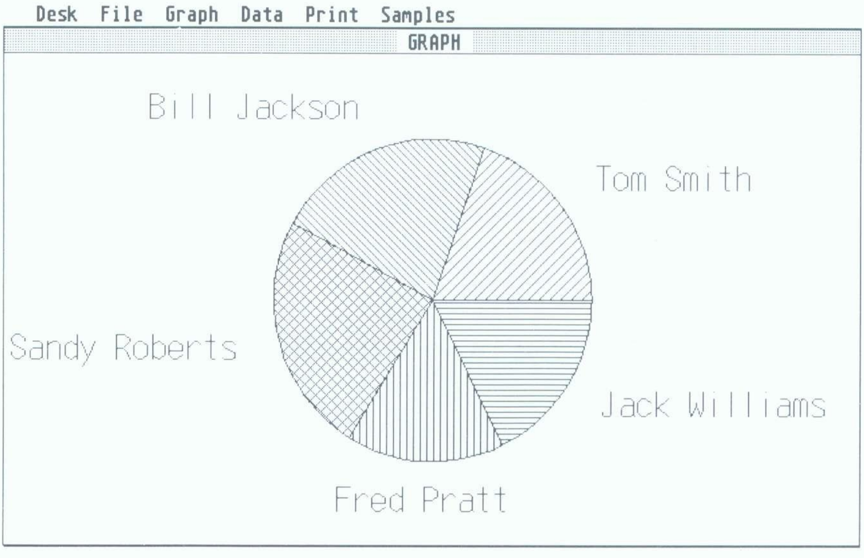
---

3. You have just specified what is called a “data set”. If you are creating a graph that requires more than one set of data, such as an overlayed bar graph, you will need to repeat step 2 to specify another data set. If you are creating a pie graph or a “one data set” type of graph, you are finished importing data. When the dialog box reappears, click on “Done”.

   NOTE: If you have selected a graph that needs only one data set, and you import more than one set, the first data set will be overwritten.

   ---

4. After specifying your data, you can draw your graph by selecting "Draw on Screen" from the PRINT menu or by pressing F10. Your graph will appear on the screen. If you are working with the sample data, your graph should look like this:



NOTE: If you have specified a large data set, the computer will sit and think a bit before it starts drawing your graph.

Converting Graphs

You can re-draw your graph data as another type of graph at any time. Just return to the GRAPH menu and select a new graph type. A check mark will appear on the menu next to your choice. Then press F10 to re-draw your graph. If you are using the sample data, experiment with the different types of graphs that are available in this program.

Editing a Graph

Use the options on the DATA menu to modify the labels and data used for your graph. (If you have selected a Pie Graph, the first three options will not be available to you.) After making changes to your graph using any of the following options, just press F10 to re-draw your modified graph.

Titles

The "Titles" option allows you to alter the main title of your graph or the titles that appear along the X axis (horizontal line) or Y axis (vertical line) of your graph. When you select this option, a box will appear on your display. Enter the text for your titles. You can then press F10 to re-draw your graph. (Pie Graph users can modify their graph's title using the "Data" option.)

Horizontal Axis

Select "Horizontal Axis" to change the title of this axis and to modify the way your numeric data is displayed on this axis. You can also modify the labels that appear on this axis. Just move the cursor to a label you want to modify, and type in a new label.

If you have selected a horizontal bar graph, the "X range minimum" and "X range maximum" lines allow you to specify a numeric range for this axis. For example, if your graph currently shows numbers from 1 to 100 on this axis, you can display a portion of the graph by narrowing this range to 1 to 25.

The "X axis divisions" line allows you to specify how your data is divided and displayed on the axis. If your graph currently shows every tenth number from 0 to 100, you have 10 divisions. To display every twentieth number, you would change this to 5 divisions.

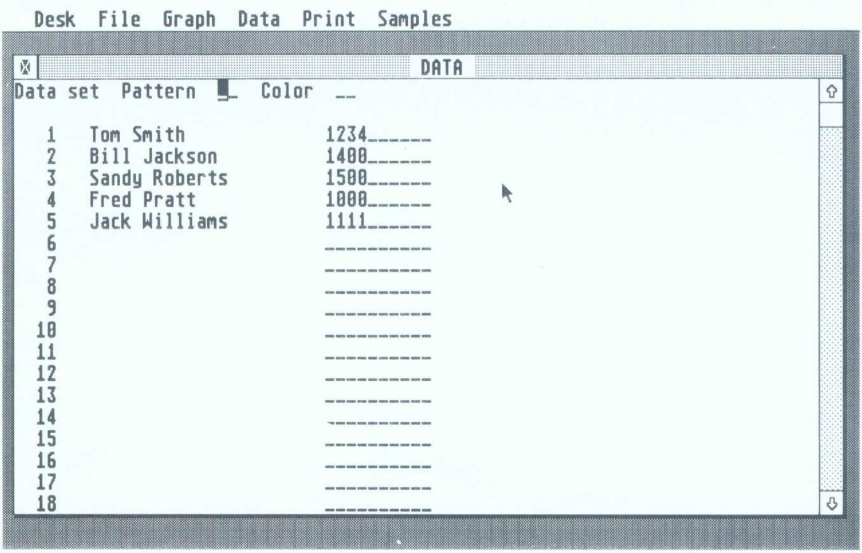
Vertical Axis

The "Vertical Axis" option is much like its counterpart, "Horizontal Axis". You can modify the title and labels that will appear on this axis, as well as the minimum and maximum values and the number of divisions it will display.

NOTE: If you have selected the "Scientific (X/Y)" graph, you can enter minimum and maximum values for both the horizontal (X) and vertical (Y) axes.

Data

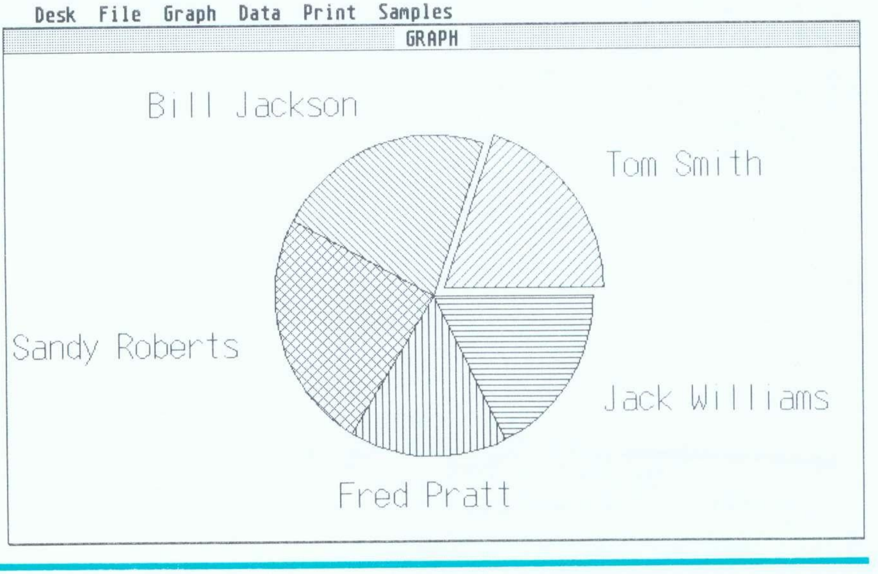
The "Data" option allows you to modify the numeric data you're using for your graph. When you select this option, you will see the following display:



(If you have selected a Pie Graph, your screen will look slightly different.) At the top of this display, you will see the words "Pattern" and "Color". "Pattern" refers to the patterns that are used in the bars and pie segments of your graph. To modify the pattern, select "Patterns" on the SAMPLES menu. When the dialog box appears, decide which numbered pattern you'd like to use. Click on OK to return to the Data window, and enter the number of your chosen pattern next to the word "Pattern" in this window. Then repeat this procedure for "Color".

If you have opted to do a line graph, you can specify a line style by selecting "Lines" on the SAMPLES menu. Then return to the "Data" window, and enter the number of the line style you want to use for your graph.

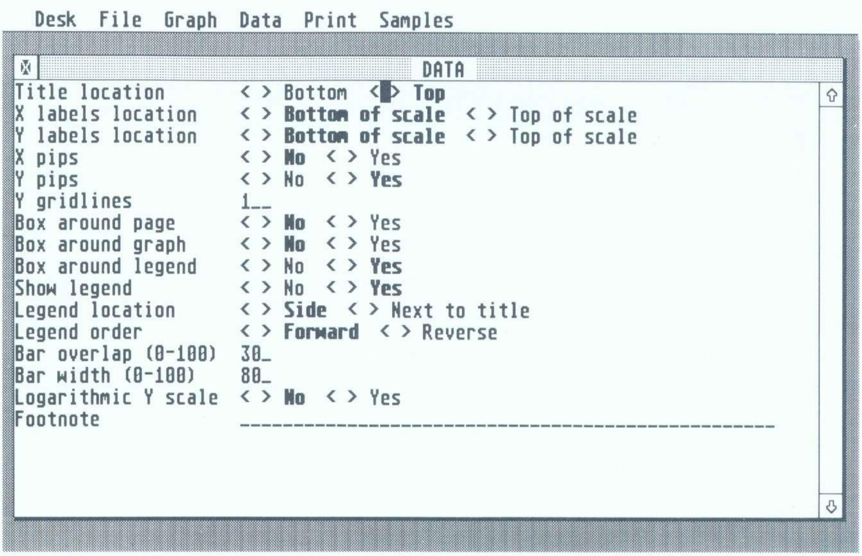
To modify your numbers, move the cursor to a line in your numeric data and type a new number. If you have selected a Pie Graph, you can now modify the graph's title and labels. You will also see an extra column titled "Pullout". You can cause any section of the pie to appear as if it has been "pulled out" from the rest of the graph (this is also known as an "exploded pie graph").



To specify a section to be displayed in this way, move to the appropriate line in the "Pullout" column and press **Y** for yes.

Miscellaneous

The "Miscellaneous" option on the DATA menu includes odds and ends that affect your graph's appearance.



To make a selection in this window, move the cursor to the brackets in front of your selection and press **RETURN**. Now let's look at these options:

- **Title Location:** Allows you to place the graph's title at the top or the bottom of the graph.

- **X Labels Location, Y Labels Location:** These options tell the computer whether you want your labels at the top or bottom of each axis (scale).

- **X Pips, Y Pips:** Pips are the small perpendicular lines along each axis at the exact point where each label and number is placed. Use these options to turn the pips on and off.

- **Y Gridlines:** After reviewing the line styles available in the "Lines" option on the SAMPLES menu, enter the number of the line style you want to use for the horizontal grid lines on your graph.

- **X Gridlines:** After reviewing the line styles available in the "Lines" option on the SAMPLES menu, enter the number of the line style for the vertical grid lines on your graph.

- **Box Around Page:** To draw a box around the entire screen, or page, select Yes for this option.

- **Box Around Graph:** To draw a box around your graph, select Yes for this option.

- **Bar Width:** Allows you to specify a value between 1 and 100 for each bar in a bar graph.

- **Logarithmic Y Scale:** Allows you to specify a logarithmic scale for your vertical axis. See a mathematics book for more information on logarithmic scales.

- **Footnote:** Allows you to enter text that will be placed in the bottom right corner of the graph.

After making selections in this window, press F10 to re-draw your graph to your new specifications.

Saving and Loading Graphs

Now let's store this graph on disk. Select "Save" on the FILE menu. Then enter a file name for the graph, followed by a period (.) and the letters GRA. Press RETURN, and the graph will be saved onto your data disk.

You will be able to load this graph into the Graphics program at any time by selecting the "Open" option on the FILE menu. Then select the name of the graph on your disk. The graph will appear on the display.

Printing a Graph

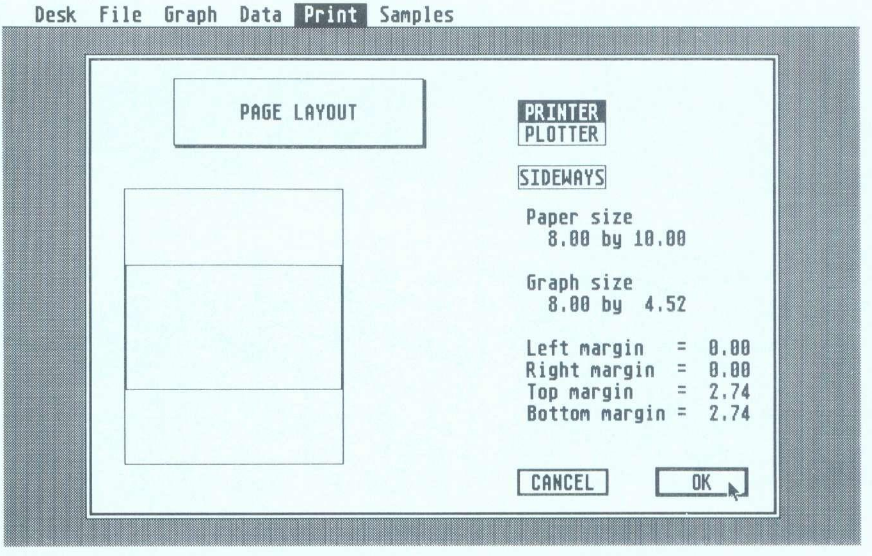
1. Before printing a graph, you must tell the computer about your printing setup. Use the following options on the PRINT menu to do so:

    - **Select Printer:** A window with a list of printers will appear on your display. Select your printer, or select one that is compatible to yours. (See your dealer for compatibility information.) If you are using a plotter instead, select "None" in this window. Then click on OK.

    - **Select Paper Size:** Select this option to tell the computer if you will be printing on paper that is 8″ wide or 14″ wide.

    - **Select Plotter:** A window with a list of plotters will appear on your display. Select your plotter or select one that is compatible to yours. If you are not using a plotter, select "None". Then click on OK.

2. After configuring your system, you must tell the computer how you want your printout to look. Select the "Page Layout" option on the PRINT menu. You will see the following display:



The rectangle and square on the left side of the screen represent your graph on your printer paper. Use the mouse to move the square up and down within the rectangle, indicating where you want your graph printed on your printer paper. You can also drag the bottom of the square up or down to make the graph bigger or smaller on the page.

Now select either "Printer" or "Plotter" in the upper right corner of the screen. The settings on the right side of the screen will change according to your choice of printing device.

Lastly, to print your graph on its side, select "Sideways".

When you have finished making selections, click on OK. You can then select either "High Resolution Print", "Low Resolution Print", or "Plotter" from the PRINT menu. Your graph will be printed.

When You Have Finished Using Graphics

If you have finished editing and drawing your graph, be sure that it is saved on disk. Then you can select the "Abandon" option from the main menu to clear your display and start a new graph.

To leave the Graphics program, select "Quit" on the FILE menu. You will exit to GEM, and you will be able to re-load SWIFTCALC ST.

- Steps for Performing an Analysis
- Examples for Using SWIFTCALC ST

  A Detailed Home Budget

  A Trip Cost Comparison

  Creating Financial Models

Steps for Performing a Financial Analysis

SWIFTCALC is an extremely versatile program which can be used to do a variety of financial analyses. (Don't let the phrase "financial analysis" intimidate you. Your home budget is an example of a simple financial analysis.)

There are a few steps you must take when you want to do an analysis using SWIFTCALC. These steps are:

1. Determine the type of analysis you want to do.

2. Gather the pertinent information you will need to design the spreadsheet.

3. Load your SWIFTCALC program using the instructions in Chapter 3 of this manual. When the spreadsheet window appears on your screen, enter the row and column headings that will define your spreadsheet.

4. Next, move the cursor to the cells that will contain your formulas. Enter your formulas using the guidelines in Chapter 3 of this manual.

5. After you have defined your spreadsheet, save it onto a data disk for safekeeping.

6. Now begin entering values into your spreadsheet. As you enter your values, the results of your calculations will appear automatically on your display.

7. When you obtain the results that you want to keep, you can either save the spreadsheet onto your data disk or print it on paper.

Examples for Using SWIFTCALC ST

To help you get a better idea of SWIFTCALC's potential, this section discusses four different applications for SWIFTCALC. The format and operation of each of these examples are not intended to be as important as the techniques themselves, which you must use to set up your spreadsheets.

You will find sample values for several examples on your SWIFTCALC program disk under the file names "bud.cal", "trip.cal", "fin1.cal", and "fin2.cal". Before attempting to construct one of these spreadsheets yourself, we suggest you load these sample spreadsheets into SWIFTCALC. For example, to work with our budget spreadsheet, load the file called "bud.cal" using the instructions in Chapter 5 of this manual. Then print this sample spreadsheet on your printer. Clear your screen, and then use a printout or the illustration in the manual as your guideline as you follow our step-by-step instructions for constructing these spreadsheets yourself.

A Detailed Home Budget

This example will cover a budget spreadsheet that will help you keep track of your expenses for each month. You will be able to enter budgeted and actual amounts, and SWIFTCALC will calculate the differences and sum up your total expenses. Use the "Open File" option on the FILE menu to load the "bud.cal" file into the computer.

Page 123 shows the entire "bud.cal" spreadsheet. Refer to this often as you follow these instructions to build this sample spreadsheet.

A Budget Calculation Spreadsheet – File Name: bud.cal

MONTH: JANUARY 1988

CATEGORIES	BUDGET	ACTUAL	DIFF	% DIFF	% TOT BUD	% TOT ACT
INCOME:						
Salary	1675.00	1866.00	191.00	111.40	93.06	95.06
Dividends	125.00	97.00	–28.00	77.60	6.94	4.94
Total Income	1800.00	1963.00	163.00	109.06	100.00	100.00
EXPENSES						
Mortgage Payment	500.00	500.00	0.00	100.00	28.25	25.72
Utilities	100.00	90.00	–10.00	90.00	5.65	4.63
Auto Payment	200.00	200.00	0.00	100.00	11.30	10.29
Groceries	100.00	130.00	30.00	130.00	5.65	6.69
Auto/Trans.	50.00	40.00	–10.00	80.00	2.82	2.06
Maintenance	50.00	0.00	–50.00	0.00	2.82	0.00
Med/Dental	100.00	50.00	–50.00	50.00	5.65	2.57
Clothing	150.00	230.00	80.00	153.33	8.47	11.83
Education	20.00	24.00	4.00	120.00	1.13	1.23
Recreation	100.00	80.00	–20.00	80.00	5.65	4.12
Savings	100.00	300.00	200.00	300.00	5.65	15.43
Visa/MC	300.00	300.00	0.00	100.00	16.95	15.43
Other 1	0.00	0.00	0.00	###	0.00	0.00
Other 2	0.00	0.00	0.00	###	0.00	0.00
Other 3	0.00	0.00	0.00	###	0.00	0.00
Total Expenses	1770.00	1944.00	174.00	109.83	100.00	100.00
Net Income (Loss)	30.00	19.00	–11.00	63.33	1.69	.98

Now clear your display using the "Abandon" option on the FILE menu, and follow these steps to build the budget spreadsheet.

Entering Your Row and Column Headings

First you want to enter your row headings in column a, but this column isn't wide enough for your headings. You will have to adjust the column width to 20 characters. To do so, move the cursor to a cell in column a. Then select "Format" on the OPTIONS pull-down menu. When the dialog box appears, select "Column" and click on OK. Enter 20 next to "Column Width" and click on OK.

It's time to enter the dotted lines in the spreadsheet. While the cursor is in cell a1, press the ' key. Then press the - key and press RETURN. The dotted line will be drawn across your spreadsheet. Now you can enter the dotted lines in rows 2, 4, 6, 11, 13, 32, 34, 36, and 37 in the same manner.

Now you must enter all column and row headings in the spreadsheet. Follow page 123 or your printout and enter the column and row headings in the spreadsheet.

Entering Your Formulas for the Budget, Actual, and Difference Columns

Now it's time to enter your formulas.

1. First, move the cursor to cell b12, which will hold the formula for "Total Income" in the Budget column. This is the sum of the values in cell b9, Salary, and cell b10, Dividends. Enter:

   +b9+b10

2. Now move the cursor to cell b33 to enter the formula for "Total Expenses" in the Budget column. This is the sum of the values in cells b17 through b31. Enter:

   +SUM(b17:b31)

   Next, use the "Copy" menu item to copy this formula to cells c33 and d33. Press **/C** to select "Copy". Then move to cell b33. Enter a comma (,), and move to cell c33. Enter a colon (:) and then move to cell d33 and press **RETURN**. You have just entered the statement:

   b33,c33:d33

3. Move the cursor to cell b35 to enter the formula for "Net Income or Loss". This is the difference between your income and expenses. Enter

   +b12 − b33

4. Move the cursor to cell d9 to enter the formula for the difference between your budgeted salary amount (column b) and your actual salary amount (column c). Enter:

   +c9 − b9

   Next copy this formula to cell d10 (to give you the difference between your budgeted dividends amount and your actual dividends amount). Your formula will now be copied to cell d10.

   To find the difference between your budgeted and actual amounts for the categories in the spreadsheet, you must copy this formula to cells d17 through d31. Use the "Copy" menu item to execute this copy task.

Entering The Formulas for the %DIFF Column

Now it's time to enter your formula for the percentage difference between your budgeted and actual amounts in column e. Move the cursor to cell e9 and enter the formula

+(c9/b9)*100

Cell c9 holds the actual amount for the category in row 9. Cell b9 holds the budgeted amount for the month. 100 is the number needed to convert the result of the first part of the formula into a percentage. This percentage amount will tell you how far over or under budget you are. A 100% figure means you have met your budget exactly. An amount over 100% means you have exceeded your budget. An amount below 100% means you have spent less than you budgeted.

To find the percentage difference of budgeted and actual amounts in all of your categories in the spreadsheet, you must copy this formula to cells e10, e12, e17 through e31, e33, and e35. Use the "Copy" menu item to copy this formula.

Entering Formulas for the %TOT BUD Column

Next you must enter your formula for the percentage of total budget. This figure will tell you what percentage of your total budgeted amount your category amount represents. Move the cursor to cell f9 and enter the formula

+(b9/B12)*100

NOTE: Be sure to enter a capital B for B12 so the program will not change this address when you use the "Copy" option.

Cell b9 holds the budgeted income amount for the category in row 9, Salary. Cell b12 holds the total budgeted salary amount for the month.

100 is the number needed to convert the result of the first part of the formula into a percentage. This result of this formula tells you what percentage your budgeted monthly salary represents of your total budgeted income.

Now select the "Global" item on the OPTIONS menu and set the first option to "Absolute Cell Addressing". Press RETURN. Use the "Copy" menu item to copy this formula to cells f10 and f12. Next you must enter the formulas that will find the percentage of total budget for each of the expenses in the spreadsheet. Place the cursor in cell f17 and enter

+(b17/B33)*100

Cell b17 holds the budgeted expense amount for the category in row 17. Cell b33 holds the total budgeted amount for the month. 100 is the number needed to convert the result of the first part of the formula into a percentage. This percentage amount will tell you what part of the total amount this category represents.

Now use the "Copy" menu item to copy this formula to cells f18 through f31, f33, and f35.

Entering Formulas for the %TOT ACT Column

The amounts in the %TOT ACT column tell you what percentage of your total actual amount a category amount represents. To enter this formula, move the cursor to cell g9 and enter the formula

+(c9/C12)*100

Cell c9 holds the actual income amount for the category in row 9, Salary. Cell c12 holds the total actual salary amount for the month. 100 is the number needed to convert the result of the first part of the formula into a percentage. The result of this formula tells you what percentage your actual monthly salary represents of your total actual income.

Now use the "Copy" menu item to copy this formula to cells g10 and g12. Now you must enter the formulas that will find the percentage of total actual amounts for each of the expenses in the spreadsheet. Place the cursor in cell g17 and enter

+(c17/C33)*100

Cell c17 holds the actual expense amount for the category in row 17. Cell b33 holds the total actual amount for the month. 100 is the number needed to convert the result of the first part of the formula into a percentage. This percentage amount will tell you what part of the total amount this category represents.

Now use the "Copy" menu item to copy this formula to cells g18 through g31, g33, and g35. Now that you have entered all of your formulas into the spreadsheet, you can begin entering values. (See page 123 for our finished spreadsheet.)

Entering Your own Values into the Spreadsheet

Now you are ready to use this budget spreadsheet. Enter values that pertain to your own expenses for any given month. In column b, devise your own budget amounts for each of these categories. Then use your checkbook or a collection of receipts to give you the amounts for your actual expenses. If you don't have an amount for a category, enter a 0. After entering your values, press F5 or ! to calculate your spreadsheet.

NOTE: When entering these values, be sure you don't enter values into cells that now contain formulas or you might erase those formulas. Watch the Cell Contents Area to determine those cells that contain formulas. You can use the "Protect" option to safeguard your cell information. See Chapter 5 for information on protecting cells.

Now let's look at a comparison of costs for several different vacations.

A Trip Cost Comparison

Let's assume that you are considering four vacations, and you would like to use some type of organized format to help you view the costs of each trip. The trip cost comparison spreadsheet is on your program disk under the name "trip.cal".

Page 130 shows the entire "trip" spreadsheet. Refer to this often as you follow these instructions to build this sample spreadsheet.

A Trip Calculation Spreadsheet – File Name: trip.cal

ALTERNATE #	1	2	3	4
DESTINATION	WISC	CLUBMED	EUROPE	HAWAII
PREF. RATING	2	10	8	7
# DAYS	5	7	15	10
# OF PEOPLE	2	2	2	2
# OF MILES	400	0	0	0
GAS COST	24.00	0.00	0.00	0.00
CAR RENTAL	0.00	0.00	0.00	400.00
AIRFARE/PERSON	0.00	0.00	800.00	700.00
AIRFARE/TOTAL	0.00	0.00	1600.00	1400.00
LODGING/DAY/PERSON	30.00	150.00	85.00	65.00
LODGING TOTAL	300.00	2100.00	2550.00	1300.00
MEAL/DAY/PERSON	30.00	0.00	30.00	30.00
MEALS TOTAL	300.00	0.00	900.00	600.00
SIGHTSEEING	150.00	0.00	400.00	300.00
EXTRAS & ENTERTAIN.	50.00	200.00	200.00	100.00
RESERVE	100.00	300.00	500.00	300.00
TOTAL	924.00	2600.00	6150.00	4400.00
COST/DAY	184.80	371.43	410.00	440.00
COST/PERSON	462.00	1300.00	3075.00	2200.00
COST/DAY/PERSON	92.40	185.71	205.00	220.00

Entering Your Row and Column Headings

First you want to enter your row headings in column a, but this column isn't wide enough for your headings. You will have to adjust the column width to 22 characters. To do so, move the cursor to a cell in column a. Then select "Format" on the OPTIONS pull-down menu. When the dialog box appears, select "Column" and click on OK. In the "Column Width" box, enter 22 to widen column a to 22 characters.

It's time to enter the dotted lines in the spreadsheet. While the cursor is in cell a1, press the ' key. Then press the - key and press RETURN. Now you must do the same thing to enter the dotted lines in rows 2, 4, 21, 26, and 27.

Now follow page 130 or your printout and enter the column and row headings in the spreadsheet.

Next, select the "Format" option. Click on "Global" and then move to "Decimal Places" and enter 2. Click on OK to exit the dialog box.

Your last task is to specify rows 6, 7, 8, and 9 for no decimal places. Move the cursor to row 6. Then select the "Format" option. Click on "Row" and move to "Decimal Places" and click on "Integer". Click on OK to exit the window. Then repeat this step for rows 7, 8, and 9.

Entering Your Formulas

1. To enter the formula that will calculate your gas cost based on the number of miles you will be traveling, move to cell b10 and enter

   +(b9/20)*1.2

   Cell b9 contains the number of miles for the trip in column b. We are assuming gas mileage of 20 miles to the gallon, and we are assuming that gas costs $1.20 a gallon.

2. To enter the formula that will calculate your airfare cost based on the number of people traveling and the price per person, move to cell b13 and enter

   +b8*b12

   Cell b8 contains the number of people taking the trip and cell b12 contains the cost of airfare per person.

3. To enter the formula that will calculate your total lodging cost based on the number of people traveling and the price per person, move to cell b15 and enter

   +b7*b8*b14

   Cell b7 contains the number of days for the trip. Cell b8 contains the number of people taking the trip, and cell b14 holds the cost of lodging per person per day.

4. To enter the formula that will calculate your total meal cost based on the number of people traveling, and the price per person per day, move to cell b17 and enter

   +b7*b8*b16

   Cell b7 contains the number of days for the trip. Cell b8 contains the number of people on the trip, and cell b16 holds the cost of meals per person per day.

5. To enter the formula for total trip cost, move the cursor to cell b22 and enter

   +b10+b11+b13+b15+b17+b18+b19+b20

6. Now we will enter formulas in cells b23, b24, and b25 which will help us compare the daily costs of each trip. In cell b23, we will enter a formula to find the cost per day for the first trip. Move to cell b23 and enter

   +b22/b7

   Cell b22 holds the total cost of the trip and cell b7 contains the number of days for the trip.

   In cell b24, you must enter a formula to find the cost per person for each trip. Move to cell b24 and enter

   +b22/b8

   Cell b22 contains the total cost of the trip, and cell b8 holds the number of people traveling.

   In cell b25, you must enter a formula to determine the daily cost for each person traveling. Move to cell b25 and enter

   +b23/b8

   Cell b23 contains the cost per day for the trip, and cell b8 contains the number of people traveling.

7. To find the costs for each of the other trips, you can use the "Copy" menu item on the OPTIONS menu to copy these formulas to columns c, d, and e. When prompted for a range to copy, you might enter:

   b10:b25, c10:e10

Now that you have entered all of your formulas into the spreadsheet, you can begin entering values. (See page 130 for our finished spreadsheet.)

Entering Your own Values into the Spreadsheet

Now you are ready to use this trip cost spreadsheet. Enter values for four possible vacations. If a category does not pertain to a specific trip, enter 0 for that cell (for example, some trips may not require airfare). After you enter your information for each category, press F5 or ! to calculate your spreadsheet.

When entering these values, be sure you don't enter values into cells that now contain formulas or you might erase those formulas. Watch the Cell Contents Area to determine those cells that contain formulas.

NOTE: You can avoid accidentally erasing formulas by protecting those cells. Select the "Protect" option on the OPTIONS menu and follow the prompts to protect cells.

Now let's look at some financial modeling applications for your spreadsheets.

Creating Financial Models

Example 1:

You would like to determine how much money you would accumulate if you invested $2,000 in an IRA account at the beginning of each year for 20 years. Various interest rates, compounded annually, could be applied to your invested amount over the 20-year period. To answer this question, try constructing the financial analysis spreadsheet model which you will find on your SWIFTCALC disk under the file name "fin1".

Below is the entire "fin1" spreadsheet. Refer to this often as you follow these instructions to build this sample spreadsheet.

YEAR	AMOUNT INVESTED	CUMULATIVE BALANCE	INTEREST RATE
1	$2,000.00	$2,240.00	.12
2	$2,000.00	$4,748.80	.12
3	$2,000.00	$7,558.66	.12
4	$2,000.00	$10,705.69	.12
5	$2,000.00	$14,230.38	.12
6	$2,000.00	$18,178.02	.12
7	$2,000.00	$22,599.39	.12
8	$2,000.00	$27,551.31	.12
9	$2,000.00	$33,097.47	.12
10	$2,000.00	$39,309.17	.12
11	$2,000.00	$46,266.27	.12
12	$2,000.00	$54,058.22	.12
13	$2,000.00	$62,785.20	.12
14	$2,000.00	$72,559.43	.12
15	$2,000.00	$83,506.56	.12
16	$2,000.00	$95,767.35	.12
17	$2,000.00	$109,499.43	.12
18	$2,000.00	$124,879.36	.12
19	$2,000.00	$142,104.88	.12
20	$2,000.00	$161,397.47	.12
	$40,000.00	$161,397.47	.12

Entering Your Row and Column Headings

First you want to enter your row headings in column a. When you enter the numbers in column a, enter a few spaces before each to center them. Now press **'** and enter the number 1 in cell a6 and press **RETURN**. You will need to enter consecutive numbers in other cells in column a. To save you time, you can use the "Quick Entry" feature, accessed through the **F8** key. After you enter the number 1 as text in cell a6, press **RETURN**, and then press **F8**. Move the cursor to cell a7. The number 2 will appear in that cell. Continue moving the cursor down column a until you reach column a25. After the number is entered in that cell, press **RETURN** to turn off the "Quick Entry" feature.

As you will see from looking at page 135 , column b as it appears on your screen isn't wide enough for the heading you need to enter there. To adjust the column width to 10 characters, use the "Format" option on the OPTIONS pull-down menu. Also, while using the "Format" option, enter 2 for "Decimal Places". Then repeat this procedure to widen column c to 11 characters.

Now follow page 135 and enter all of the labels in the spreadsheet. For rows with dotted lines, press the ' key, and then press the - key followed by RETURN.

To display commas and dollar signs with your numbers, select the "Format" menu item on the FUNCTIONS pull-down menu. Then select the "Define" option and click on OK. When the user-defined table appears, move to column 1 and make your selections by pressing Y or N for each option. Press RETURN. Then go back to the "Format" option and select "Column". Move to the "Define" box and enter the number 1. Click on OK.

Entering the Formulas for This Financial Analysis

Although this spreadsheet may appear complex, it contains only three different types of formulas: the Future Value of a Dollar formula, the SUM formula, and the AVG formula.

1. To enter the first formula in your spreadsheet, move the cursor to cell c6 and enter

   +FVD(b6,d6,1)

   The result of this formula will be your cumulative balance after the first year of investment. Cell b6 contains the amount that has been invested. Cell d6 contains the interest rate for the year, and the number 1 stands for the number of years the money has been invested.

2. Now move your cursor to cell c7 to enter the formula for the cumulative balance after the second year. Enter

   +FVD(c6+b7,d7,1)

   The amounts in cells c6 and b7 equal the amount that has been invested by the end of the second year (the cumulative balance at the end of of the first year plus the amount invested in the second year). Cell d7 holds the interest rate for the year. The number 1 indicates that the amount has been invested for one year.

   To find the cumulative balance at the end of each of the 20 years, copy this formula to cells c8 through c25 using the "Copy" menu item on the BLOCK pull-down menu.

3. Next, move your cursor to cell b27 and enter the formula for the total amount invested. Enter

   +SUM(b6:b25)

   This formula will total all the money you have invested over the 20-year period.

4. Now move your cursor to cell c27 and enter the formula for the total amount you will have in your account at the end of the 20-year period. Enter

   +c25

   This formula, which is actually only a cell address, just repeats the amount from cell c25, the total amount invested.

5. Move your cursor to cell d27 to enter the formula that will calculate the average interest rate you received over the 20-year period. Enter

   +AVG(d6:d25)

The result of this formula will be the average interest rate applied to your investment over the 20-year period.

Now that you have entered the formulas into the spreadsheet, you can begin entering your values. (See Figure 135 for our finished spreadsheet.)

Entering Your own Values into the Spreadsheet

Now you are ready to use this financial analysis spreadsheet. Enter amounts and interest rates that pertain to your own investment program. After you enter your information for each year, press F5 or ! to calculate the spreadsheet.

When you enter values into the "Amount Invested" column, you may want to enter the same value in each cell in the column (as we did in Fig. XX). Then you can see the effects of investing the same amount each year. There is a quick way to enter the same value in each cell of the column.

First, move the cursor to cell b6 and enter an amount. Now move to cell b7 and enter the formula

+b6

This formula, which is actually only a cell address, tells the computer to repeat the amount in cell b6, the amount invested. You can use the "Copy" menu item to duplicate this formula in all cells from b8 to b25. When your spreadsheet is calculated, the computer will use the same value for all cells from b6 to b25.

NOTE: When entering these values, be sure you don't enter values into cells that now contain formulas or you might erase those formulas. Watch the Cell Contents Area to determine those cells that contain formulas.

Now let's go a little farther!

Example 2:

Let's say you want to perform the same financial analysis as the first financial modeling example above, but you want to include certain known expenses that you will be paying out of your account from time to time. You want to see the effects of these withdrawals on your savings schedule. To do so, try using the sample financial analysis spreadsheet model which you will find on your SWIFTCALC program disk under the file name "fin2".

NOTE: The "fin2" spreadsheet builds on your work with the "fin1" model, so you will save yourself some time by just saving the "fin1" spreadsheet, which contains your own values, on disk. You can then re-load it into the computer when you are ready to work with "fin2". You can also load the "fin1" spreadsheet with the sample values into the computer from your SWIFTCALC program disk and use it as a basis for working with "fin2".

Page 140 shows the entire "fin2" spreadsheet. Refer to this often as you follow these instructions to build this sample spreadsheet.

A Financial Analysis Spreadsheet – File Name: fin.2

YEAR	AMOUNT INVESTED	AMOUNT WITHDRAWN	CUMULATIVE BALANCE	INTEREST RATE	REMARKS
1	$2,000.00		$2,240.00	.12	
2	$2,000.00		$4,748.80	.12	
3	$2,000.00		$7,558.66	.12	
4	$2,000.00		$10,705.69	.12	
5	$2,000.00		$14,230.38	.12	
6	$2,000.00		$18,178.02	.12	
7	$2,000.00		$22,599.39	.12	
8	$2,000.00	$3,000.00	$24,191.31	.12	
9	$2,000.00	$3,500.00	$25,414.27	.12	
10	$2,000.00	$4,000.00	$26,223.98	.12	
11	$2,000.00	$4,500.00	$26,570.86	.12	
12	$2,000.00		$31,999.36	.12	
13	$2,000.00		$38,079.29	.12	
14	$2,000.00		$44,888.80	.12	
15	$2,000.00		$52,515.46	.12	
16	$2,000.00		$61,057.31	.12	
17	$2,000.00	$10,000.00	$59,424.19	.12	
18	$2,000.00		$68,795.09	.12	
19	$2,000.00		$79,290.50	.12	
20	$2,000.00		$91,045.37	.12	
	$40,000.00	$25,000.00	$91,045.37	.12	

Inserting a Column into Your Spreadsheet

Now you must set up a column for withdrawals that will allow you to record and track the removal of money from your account. Move the cursor to cell c1, and press the F1 key. A new column will be inserted into your spreadsheet and your current columns (including all existing cell contents) will be moved over one column. In this case, everything in column c will be moved to a corresponding location in column d and column d to e, while column c will now be blank. All of the formulas that were previously entered in the spreadsheet will be updated to reflect this change, and the move will not affect your numerical results.

Now select the "Format" option on the OPTIONS menu and click on "Column". Enter 10 for the width, 2 for the decimal places, and 1 for user-defined.

Entering Your New Column Headings

To enter your new column headings, move your cursor to cell c3 and enter the heading Amount. Then move to cell c4 and enter Withdrawn. Lastly, move to cell f4 and enter the heading Remarks.

Entering Your New Formulas

1. Now you must enter a formula that will give you your cumulative balance at the end of each year less any amount you withdrew during that year. To enter this formula, move the cursor to cell d6 and press the F7 key. The formula that is currently in this cell will appear at the bottom of your screen. Use the text editing keys (space bar, backspace key,and cursor keys) to edit that formula to look like this:

   +FVD(b6 – c6,e6,1)

   Press RETURN when you have finished editing the formula.

Cell b6 contains the amount that has been invested. Cell c6 contains the amount withdrawn during the year. Cell e6 holds the interest rate for the year, and the number 1 represents the number of years that the money has been invested.

2. Now move your cursor to cell d7 to edit the formula for the cumulative balance after the second year less any withdrawn amount. Press the **F7** key. The formula that is currently in this cell will appear at the bottom of your screen. Use the text editing keys (space bar, backspace key, and cursor keys) to edit that formula to look like this:

   +FVD(d6+b7−c7,e7,1)

   Press **RETURN** when you have finished editing the formula.

   The amounts in cells d6 and b7 equal the amount that has been invested by the end of the second year (the cumulative balance at the end of of the first year plus the amount invested in the second year). Cell c7 holds the amount withdrawn over the year, and cell e7 holds the interest rate for the year. The number 1 indicates that the amount has been invested for one year.

   To find the cumulative balance at the end of each of the 20 years, less any withdrawn amount, you must copy this formula to cells d8 through d25.

3. To find the total of the "Amount Withdrawn" column, move the cursor to cell c27 and enter

   +SUM(c6:c25)

Entering Your own Values into the Spreadsheet

Now you can begin entering your own values into the spreadsheet. Using SWIFTCALC, you will be able to substitute different values for annual amounts invested, interest rates, or withdrawals. After you enter a new value into SWIFTCALC, press **F5** or **!** to calculate the spreadsheet.

Interfacing SWIFTCALC ST

Interfacing with DATA MANAGER ST

One of SWIFTCALC ST's most powerful features is its ability to interface with Timeworks' DATA MANAGER ST data base program. This interface capability allows you to transfer information from DATA MANAGER into spreadsheets produced with SWIFTCALC, thereby eliminating data entry errors.

Since SWIFTCALC and DATA MANAGER do not use the same type of file structure, you need to convert your DATA MANAGER data into a form that SWIFTCALC can read. See your DATA MANAGER manual for information on creating DATA MANAGER files.

After you have created your DATA MANAGER file with your data base information, you can load that file into a SWIFTCALC spreadsheet. To load your DATA MANAGER file into SWIFTCALC, select the "Merge" menu item on the FILE pull-down menu in SWIFTCALC or press / L. Enter the name of the DATA MANAGER file you want to load, including its DIF extension. The file will be loaded into column a. You can then move it anywhere in the spreadsheet.

Interfacing with WORD WRITER ST

SWIFTCALC ST offers you the opportunity to merge spreadsheets that you create with SWIFTCALC with documents that you produce with the WORD WRITER ST word processing program. With this feature, you can create customized reports using information from both programs.

Before you can begin this process, you must store your spreadsheet on a data disk for later use with the WORD WRITER program. (This spreadsheet is then called your WORD WRITER file.) Your spreadsheet is saved as ASCII text characters, which the WORD WRITER is able to read. Follow these steps to create a WORD WRITER file:

1. Select the "Print WORD WRITER File" menu item on the PRINT pull-down menu.

2. Next you need to specify the block of cells you want to save for later use in WORD WRITER. To save your entire spreadsheet to use in WORD WRITER, press F5.

   To specify a block of cells, press F3. Then move the cursor to the cell in the upper left corner of the block you want to save and press F7. Move the cursor to the cell in the lower right corner of the block and press F7 again. (If you are saving one cell, move the cursor to that cell and press F7 twice.)

NOTE: You will not be able to load this file back into SWIFTCALC if you save it using this option. You will only be able to load the file into a WORD WRITER document. If you also want to use this file in SWIFTCALC, you must save it on your SWIFTCALC data disk using the "Save" menu item on the DISK COMMANDS pull-down menu. See Chapter 5 for information on saving a file for use in SWIFTCALC.

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3. Lastly, you will be asked to insert your WORD WRITER data disk in the disk drive and enter a file name for your WORD WRITER file containing your spreadsheet information. Do so, and press RETURN. Your file will be saved on your WORD WRITER disk.

To merge your WORD WRITER file, which contains your spreadsheet information, with your WORD WRITER document, follow these steps:

- Load WORD WRITER using the instructions in your manual.

- Insert the WORD WRITER data disk which contains your spreadsheet into your disk drive. Then, load this file (with the spreadsheet) into the computer.

- Now you are ready to add text to your spreadsheet using your word processor. Follow your WORD WRITER manual for instructions on merging documents or entering new text.

Troubleshooting

Troubleshooting

PROBLEM	PROBABLE REMEDY
PROGRAM WILL NOT LOAD	1. Turn off computer and try again. 2. Check computer hookup. 3. Make sure your program disk, not data disk, is in the disk drive.
GRAPHIC CHARACTERS APPEAR ON THE SCREEN AFTER LOADING	Check to see that you are using an RGBI hookup with your monitor.
DISK READ OR WRITE ERROR	1. Insert correct disk into drive. 2. Use a better quality disk for data. 3. Replace data disk with previous backup. 4. Remove write protection tape from data disk. 5. Be sure you are using a formatted data disk.
SCREEN BLANKS OUT, PROGRAM LOST (due to power fluctuations)	Restart all devices and reload program.
DATA WILL NOT SAVE	Use a new formatted data disk.
OTHER PROBLEMS	Call Timeworks, (312) 948-9208

Error Messages

ERROR MESSAGES	ACTION TO TAKE
INVALID NUMBER OR FORMULA	Edit formula without quotes, or spaces between: values, cell addresses, and operation signs.
INVALID COORDINATE	Re-enter your range for the function. Be sure the cell addresses are separated by a colon.
INVALID FILE	Re-enter the name of your file. Check the spelling and the file extension.
CAN'T UPDATE PARAMETER FILE	Insert your program disk in the disk drive before saving printer file.

Pre-Call Checklist

Before You Call...

1. Have you investigated your manual and the Update file on your program disk thoroughly (Troubleshooting, Facts at Your Fingertips, and the Index) for the answer to your question?

2. Has the problem ever appeared before? What procedure did you use to produce the problem, and can you reproduce the situation repeatedly? Have you tried reproducing the problem with hardware other than your own?

3. Are you using any additional equipment with your system, such as a keypad or modem? If so, disconnect the additional hardware and

try to repeat the problem. If not, did you change your hardware or software configurations before you first experienced the problem?

4. If the problem is related to printing, have you checked your printer manual or contacted your printer manufacturer for the answer? Have you read your interface manual or contacted your interface manufacturer?

5. Have you returned your Registration Card to Timeworks?

If You Call...

1. Which Timeworks product are you calling about, and what is the version number? (For example, SWIFTCALC version 1.0) You will find the version number when you select the V (version) slash command.

2. What system are you using? (For example, Atari 520ST or 1040ST.)

3. Have your user's manuals with you when you call, and keep your manual and any other pertinent materials by the phone in case we need to call you back.

If You Write . . .

Include a phone number where you can be reached during the day.

- Facts at Your Fingertips
- Glossary

Quick Reference Section

Facts at Your Fingertips

Adjusting Cell Width (Chapter 5)

1. Place the cursor in the column you want to widen. Select "Format" on the OPTIONS pull-down menu.

2. When the "Format" window appears, select "Column" or "Global" (all cells).

3. When the second window appears, move to "Column Width" and enter a number from 1 to 69. Your cells will be widened.

Commands (Chapter 4)

F1	Insert a column
F2	Insert a row
F3	Delete a row or column
F4	Delete cell information
F5	Execute Calculations
F6	The Goto command
F7	Edit cell information
F8	The Quick Entry key
F9	Mark a block
F10	The Format command

Copying Cell Information (Chapter 5)

1. Select the "Copy" option on the BLOCK menu.

2. Enter the cell or cells you want to copy, followed by a comma. Then enter the range you are copying to separate the addresses in a range with a colon (:).

3. Your copy will take place.

Cursor Movement Keys (Chapter 3)

←	Moves the cursor one cell to the left
→	Moves the cursor one cell to the right
↑	Moves the cursor up one cell
↓	Moves the cursor down one cell
SHIFT →	Moves the cursor 7 columns to the right
SHIFT ←	Moves the cursor 7 columns to the left
SHIFT ↑	Moves the cursor up 16 rows
SHIFT ↓	Moves the cursor down 16 rows
CLR/HOME	Moves the cursor to cell a1
SHIFT CLR/HOME	Moves the cursor to the cell that is farthest down and to the right in the spreadsheet
F6	The Goto command – moves the cursor to any cell you specify

Deleting Information in a Cell (Chapter 4)

1. Move the cursor to the desired cell.

2. Press F4.

OR:

1. Press / B.

2. Enter the range you wish to erase.

Deleting a Row or Column (Chapter 4)

1. Move the cursor to the row or column you want to delete.

2. Press F3.

Editing Information in a Cell (Chapter 4)

1. Move the cursor to the cell you want to edit.

2. Press F7.

3. Use the text editing keys to modify the information in the cell.

Entering Information in SWIFTCALC (Chapter 3)

Text:

1. To enter text, simply type in characters and press RETURN.

2. To enter symbols as labels, press the quote key (") first. Then type in characters and press RETURN.

Numbers:

Type in a number or symbol, and press RETURN . You can enter up to 17 characters in a cell.

Remember:

- If you have formatted a cell for dollar signs and commas, your value may become too large to be displayed in the cell. You will only see a row of number symbols (#) in the cell, but the complete value will be displayed in the Cell Contents Area.

- You can widen your cells so they will display larger values. Review the techniques for widening cells in the first section of this reference guide, "Adjusting Cell Width."

Formulas:

1. Press the = key.
2. Enter your formula and press RETURN.

Remember:

- Your formulas can be up to 240 characters long.
- You can use addition (+), subtraction (–), multiplication (*), division (/), and exponentiation (∧).
- The computer calculates exponential operations first, division and multiplication second, and addition and subtraction last.
- If you use parentheses in a formula, always use a pair.
- Never use the cell address where you are entering the formula in the formula itself.
- Try to limit forward references in your spreadsheets.

Formatting a Cell (Chapter 5)

1. Move the cursor to the cell you want to format, and select "Format" on the OPTIONS pull-down menu.
2. When the Format window appears, select "Global" to format all of your cells, "Column" to format a column, "Row" to format a row, "Field" to format the cell that contains the cursor, or "Define" to define your own format.

3. When the next window appears, select the options you want to use.

4. Your new format will be applied to the cell(s) you specified.

The Goto Command (Chapter 4)

1. Press F6.

2. In response to the prompt, enter the address of the cell to which you want to move.

3. The cursor will move to the cell you specified.

Inserting a Row or Column (Chapter 4)

1. Move the cursor to the new row or column location.

2. Press F1 to insert a column or F2 to insert a row.

Mathematical Functions (Chapter 5)

Functions	Format
The Square Root of a Value	SQRT(x)
The Minimum Value of a Range	MIN(range)
The Maximum Value of a Range	MAX(range)
The Average Value of a Range	AVG(range)
The Sum of a Range	SUM(range)
The Value Count of a Range	COUNT(range)
The Absolute Value of a Cell	ABS(x)
The Integer Value of a Cell	INT(x)
Converting a Percentage to a Decimal Number	PCT(x)
Choosing Information from a List	CHOOSE(x,list)
The LOOKUP Function	LOOKUP(x,range)
Pi	3.14159

Financial Analysis Functions

A = Amount in Dollars
I = Interest Rate (10% = .10)
N = Number of Periods

The Present Value of a Dollar	PVD (A,I,N)
The Future Value of a Dollar	FVD (A,I,N)
The Present Value of an Annuity	PVA (A,I,N)
The Future Value of an Annuity	FVA (A,I,N)

Logical Symbols		Logical Statements
<	Less than	IF (x,t,f)
>	More than	
=	Equal to	
< >	Not equal to	
<=	Less than or equal to	
>=	More than or equal to	
AND		
OR		

Trigonometric Functions

Sine	SIN(x)
Cosine	COS(x)
Tangent	TAN(x)
ArcSine	ASIN(x)
ArcCosine	ACOS(x)
ArcTagent	ATN(x)

Logarithmic Functions

Natural Logarithm	LN(x)
Natural Logarithm Base	E
Common Logarithm	LOG(x)

Mathematical Symbols Used in Formulas (Chapter 2)

+ Addition
– Subtraction
* Multiplication
/ Division
∧ Exponentiation
( ) Parentheses

Moving Cell Information (Chapter 5)

1. Move the cursor to the row or column to be moved.

2. Select the "Move" option on the BLOCK menu.

3. Specify the new location for the information, and press RETURN.

4. The cell(s) you specified will be moved to the new location.

Opening a File (Chapter 5)

1. Select "Open" on the FILE menu.

2. The File Management box will appear. Use the mouse to click on a blank line in this box.

3. Enter a file name for the new file followed by the .CAL extension.

4. Click on OK, and the file will be opened.

Opening an Existing File (Chapter 5)

1. Select "Open" on the FILE menu.

2. The File Management box will appear. Then do ONE of the following:

   - Use the mouse to select a file from the list on your screen. The file will then be opened.

   - Move to the "Directory" line and enter the name of a subdirectory on your disk. When the list of files on that directory appears, use the mouse to select a file to be opened.

   - Click on a ◆ symbol in the File Management box to open a subdirectory. A list of files on that subdirectory will appear. Use the mouse to select a file to be opened.

3. Click on OK and your file will be opened.

Printing Spreadsheets Sideways (Chapter 5)

1. Designate the cells to be saved as a Sideways file.

2. Select "Create Sideways File" on the PRINT menu.

3. Place your SWIFTCALC data disk in the drive, and enter a name for your file.

4. Load "SW.PRG" into your computer from your Sideways program disk. If this is the first time you've used Sideways, use the "Select Printer" option to configure your printer.

5. Make your selections for the printout options (see page 76 for a review).

6. Select "Print" on the FILE menu. Enter the name of your Sideways file and click on OK. Enter the first page number of your spreadsheet and click on "Print".

7. When the printing has finished, re-load SWIFTCALC from the SWIFTCALC disk.

Printing Spreadsheets in SWIFTCALC (Chapter 5)

1. Select "Print Spreadsheet" on the PRINT menu.

2. Select "Block", "Borders", or "Block Titles".

3. If you selected "Block", designate which cells are to be printed. The printer will begin printing the cells you specified.

Protecting and Unprotecting Cells (Chapter 5)

1. Mark the cursor to the cell(s) you want to lock.

2. Select "Protect" on the BLOCK menu.

3. To unprotect the cell(s), mark those cells and select the "Unprotect" option on the BLOCK menu.

The Quick Entry Key (Chapter 4)

1. Move the cursor to the cell which will hold the first entry.

2. Type in your first entry and press RETURN.

3. Press F8.

4. Move the cursor to an adjoining cell in any direction. The computer will make your second entry for you. Continue moving through your cells until all your entries have been made.

The Quick Keys (Chapters 4 and 5)

ALT A	Alternate window
ALT B	Blank (erase) cells
ALT C	Copy cells
ALT D	Delete a row or column
ALT F	Format cells
ALT G	Grid on/off
ALT I	Insert a row or column
ALT M	Move cells
ALT O	Open a file
ALT P	Print spreadsheet
ALT Q	Quit (end the program)
ALT S	Save a file
ALT T	Save temporary file
ALT W	Window command
UNDO	Erase a block marker

Saving Your Printer Setup File (Chapter 5)

1. Press / O. Then press C to configure.

2. When the window appears, move the cursor to "Exit". Then press RETURN.

3. Insert your program disk in the disk drive, and press Y. The file will be stored on your disk.

Saving a Spreadsheet File on Your Data Disk (Chapter 5)

1. Place your SWIFTCALC data disk in the disk drive.

2. Select "Save" on the FILE menu.

3. If you have not done so previously, enter a name for your spreadsheet file, and press RETURN.

4. Your spreadsheet file will be saved on your data disk.

Sorting Spreadsheet Information (Chapter 5)

1. Select "Sort" on the OPTIONS menu. Then enter the range of cells that contain the information you want to sort.

2. Enter the letter of the column you want to sort first.

3. Press A to sort in ascending order or D to sort in descending order.

4. If this is a single-level sort, the sort will take place. If you are sorting by more than one row or column, select "Sort" again. Remark the same block, and select the second column for the sort. Designate "Ascending" or "Descending" and the sort will take place.

The Slash Commands (Chapter 5)

/	File operations
%	Database operations
A	Arrange
B	Blank (erase) a cell
C	Copy cells

D	Delete a row or column
E	Edit cell information
F	Format cells
G	Global command
I	Insert a row or column
J	Join spreadsheets
L	Merge (loading) a file
M	Move cells
N	Name cells
O	Output (print) cells
P	Protect cells
Q	Quit (end the program)
S	Save a file
T	Set titles
U	Unprotect cells
V	Version
W	Window command
Z	Zap command ("Abandon" a file)

Glossary

ANNUITY:	An amount of money paid to an investor at regular intervals over a period of time, starting at some date in the future.
AVERAGE:	The mean of a given number of values, computed by adding those values and dividing the sum by the number of values.
AXIS:	The horizontal or vertical line that represents the boundary of a graph.
BACKUP:	A duplicate set of data to be used in case the original is lost, destroyed or accidentally altered.

BYTE:	In computer language, the name given to eight bits of information. For our purposes, one byte = 1 character.
CHARACTER:	
Numeric:	0 through 9
Alphabetic:	A through Z
Symbol:	! −#$%'*+/=? ( )
Alphanumeric:	Any combination of numerics, alphabetics, or symbols.
COMMAND:	An instruction for the computer to follow.
CONFIGURE:	To tell the computer about your hardware.
CURSOR:	The computer-generated square that pin-points your position on the display.
DATA:	The information you enter to be processed.
DATA BASE:	A collection of data.
DATA DISK:	The disk created to store your information.
DATA SET:	A group of information designated for drawing a graph. Each data set includes the numbers and labels that will appear on the graph.
DELETE:	To remove from the file.
DESKTOP:	See GEM.

DRAGGING:	An action taken with the mouse in which an icon or window can be moved, or "dragged", to another part of the screen.
EXPONENTIATION:	A mathematical operation in which numbers written above other numbers indicate multiplication, or "raising to a power."
FIELD:	A number of characters that represents one specific piece of data. Ex: Description.
FORMAT:	A predetermined arrangement of characters, fields, lines, punctuation, page numbers, etc.
FUNCTION KEY:	The special set of keys on your computer identified as F1, F2, F3, etc.
GEM:	Graphics Environment Manager. An Atari operating system used with the 520ST and 1040ST computers. Also called the GEM Desktop.
ICON:	A picture in the GEM operating system which represents either a piece of your hardware, a file on a disk, or an action that you can take.
INTERFACE:	A connection between two systems or devices.
OPENING A FILE:	The action of telling the computer which file you want to work with.
PROGRAM DISK:	The disk you purchased, containing the SWIFTCALC program.

RANGE:	A column, row, or block of cells in the spreadsheet.
SCIENTIFIC NOTATION:	A way of writing large numbers as fractions and multiples, or powers, of 10.
SCROLL ARROWS:	The arrows in the border of the spreadsheet window which allow you to move, or "scroll", up, down, left, or right.
SCROLL BARS:	The shaded areas of the window's border which allow you to move, or "scroll" up, down, left, or right.
SEARCH:	A systematic examination of information in a specific field of interest.
SEARCH ITEM:	A group of characters within any given field that the computer will search for.
SPREADSHEET:	A worksheet for numerical data usually used for accounting and financial calculations.
SUM:	The total of values added together.
TEXT:	Characters or words entered into the spreadsheet as row or column titles.

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